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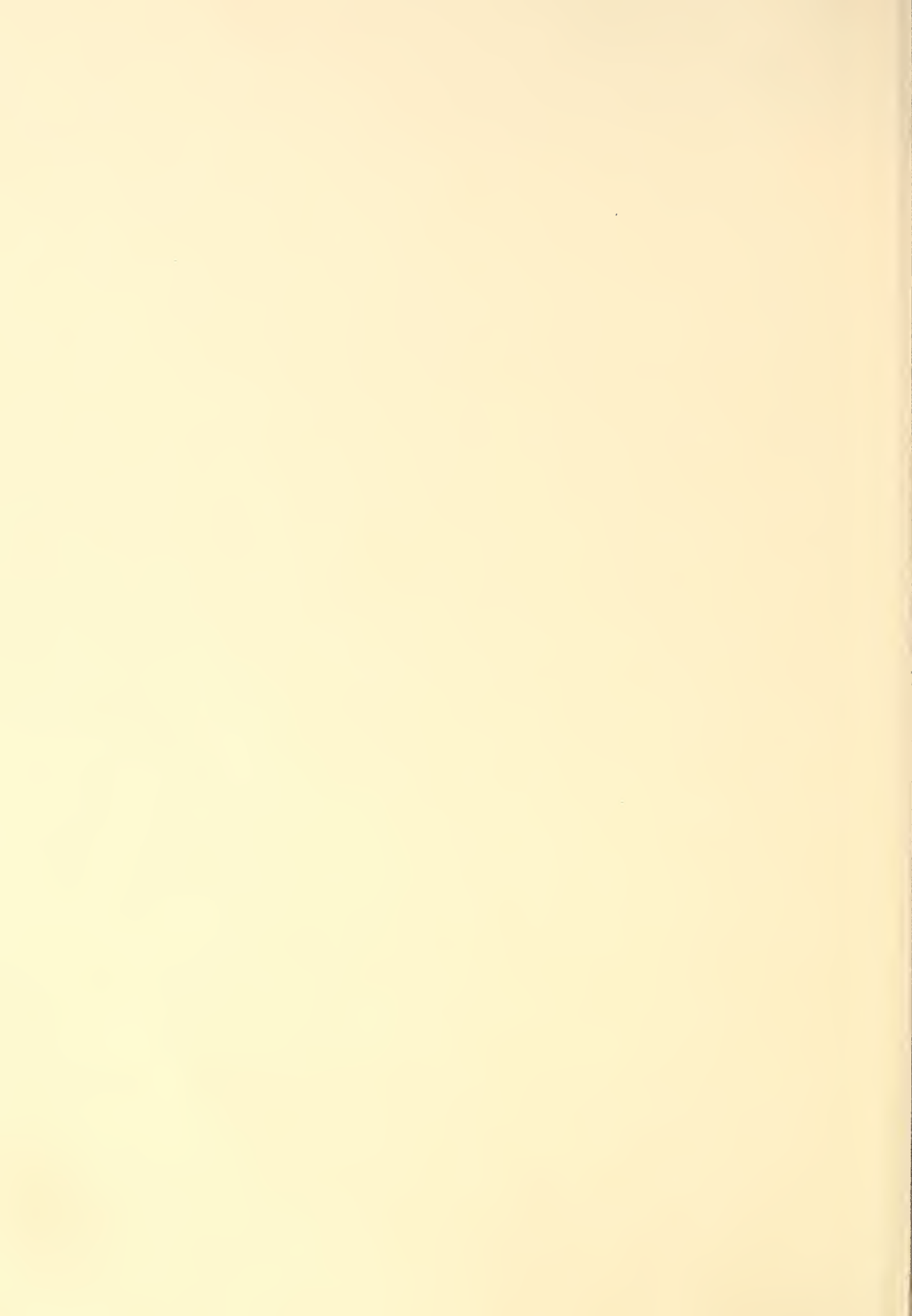
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# STAFF REPORT

THE MODEL IMPLEMENTATION PROGRAM--  
A COOPERATIVE EFFORT BY USDA AND EPA  
FOR WATER QUALITY MANAGEMENT:  
An Overview

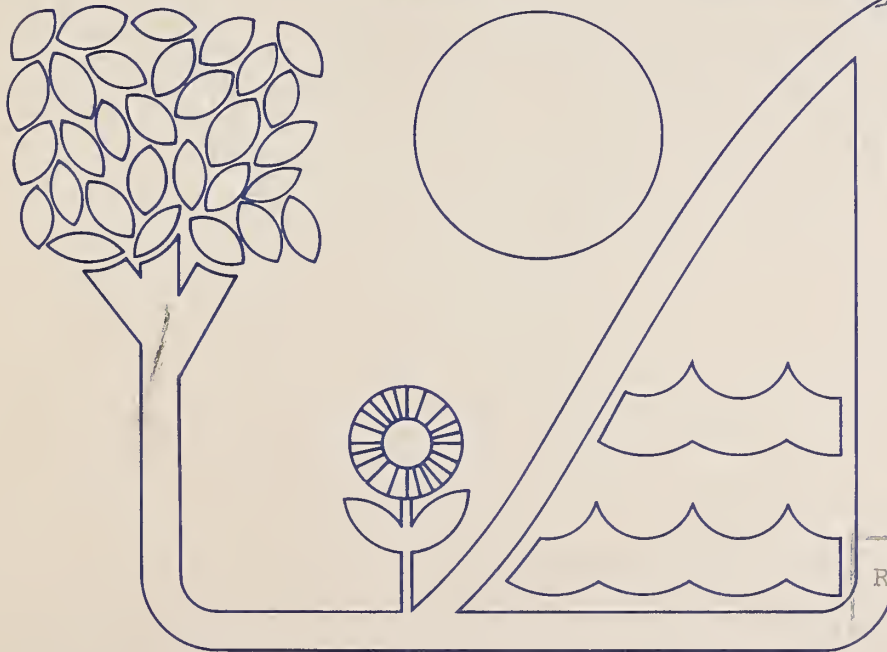
ESCS Staff Report NRED 80-13

Dean T. Massey  
Natural Resource Economics Division  
Economics, Statistics, and Cooperatives Service  
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September 1980



THE MODEL IMPLEMENTATION PROGRAM--A COOPERATIVE EFFORT BY USDA AND EPA FOR WATER QUALITY MANAGEMENT: An Overview. By Dean T. Massey; Natural Resource Economics Division; Economics, Statistics, and Cooperatives Service; U.S. Department of Agriculture; Washington, D.C. 20250; September 1980.

ABSTRACT

The establishment, purposes, expectations, background, agency participation, and financing of the Model Implementation Program are described along with the selection process for individual project areas. A description is given for each project area, best management practices needed and installed, farmer and agency participation, financial support, successes, and problems. The MIP has demonstrated that USDA programs can be effectively concentrated in selected areas and USDA agencies and EPA can cooperate among themselves and with State and local agencies in accelerated water quality management program. Problems exist in cost-sharing limitations.

Key words: Model Implementation Program; Rural Clean Water Program; Clean Lakes Program; cost-sharing; nonpoint source pollution; agricultural pollution; best management practices; conservation practices; water quality improvement; water quality monitoring.

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\* \* \* \* \*



## PREFACE

The purpose of this report is to provide an overview of the Model Implementation Program experience and to serve as a guide to others developing agricultural and silvicultural water quality related projects. To explain this experience the report first describes the establishment, purposes, expectations, and background of the program, the cooperation between USDA and EPA, and the criteria and process used to select the seven project areas. Secondly, the report goes into more detail on each individual project and describes the water quality problems for that area, the agency organizational structure, farmer participation, cost-sharing, the best management practices selected to correct the water quality problems, and, finally, any problems encountered in initiating the projects. A more detailed report on the MIP and seven individual project areas entitled "Evaluation of the Model Implementation Program," can be obtained from the author by writing to him at the University of Wisconsin Law School, Madison, Wisconsin 53706.

Three types of evaluations will be made during the various phases of the 3-year Model Implementation Program. One will determine if USDA and EPA agencies at national, regional, State, and local levels can coordinate and accelerate their programs and activities among themselves and with local governments and gain sufficient support and participation from local governments and farmers to install best management practices on the land. Another type of evaluation will determine if sufficient practices can be installed under the MIP effort to reduce agricultural and silvicultural nonpoint source pollution and the sufficiency of these practices to reduce nonpoint source pollution. A third type of evaluation will determine the

impact those best management practices installed under the MIP had on water quality improvement.

This report and the more detailed one deal only with the cooperative effort made by the various USDA and EPA agencies and local governments in coordinating and accelerating their programs and activities through the summer of 1979 and the progress made to implement best management practices. Other reports will be prepared when sufficient data becomes available to evaluate the effectiveness of the installed best management practices on nonpoint source pollution and the consequent impact on water quality.

Many individuals in the U.S. Department of Agriculture, particularly the members of the USDA Section 208 Work Group, were helpful in providing information and reviewing the report. Particularly helpful were Wayne Chapman and James Meek (SCS), William Crosswhite (ESCS), William Sallee (ASCS), Charles Irby (FS), and Jesse Lunin (SEA-Agricultural Research). The cooperation and assistance received from the Federal, State, and local agency personnel associated with the individual MIP projects in providing reports and documents were appreciated and proved invaluable. Special appreciation goes to Deborah T. Smith, Information Staff, USDA, for editorial comments and Frances C. Goldner, University of Wisconsin, for typing the final report.

## SUMMARY AND CONCLUSIONS

The Model Implementation Program (MIP) is a joint effort by the U.S. Department of Agriculture (USDA) and U.S. Environmental Protection Agency (EPA) to cooperate in a 3-year demonstration coordinating ongoing USDA and EPA programs and accelerating delivery of resources to reduce agricultural and silvicultural nonpoint source pollution in selected test areas. Seven project areas located in Indiana, Nebraska, New York, Oklahoma, South Carolina, South Dakota, and Washington were selected in January 1978 from a group of 50 applications to participate in the program.

The primary purpose of the MIP is to demonstrate the effectiveness in small geographic areas of concentrating and coordinating the various USDA and EPA water quality management programs and to illustrate how the water quality management plans developed under Section 208 of the Federal Water Pollution Control Act Amendments of 1972 can be translated into action. Evaluation of the Model Implementation Program will be useful in improving the effectiveness of similar nationwide efforts such as special projects under the Agricultural Conservation Program where water quality needs are identified. Experience gained from the individual MIP projects can be applied to implementing the Rural Clean Water Program under the Clean Water Act of 1977 and nonpoint source pollution portions of the Section 208 water quality management plans. Other expectations of the MIP are to strengthen the working relationships between EPA and USDA nationally and among USDA agencies at all levels to improve water quality, develop a monitoring system that can be used to evaluate the effectiveness of best management practices, and develop new ways of providing incentives to farm owners and operators to accelerate the application of best management

practices.

Rather than creating new agencies at any level of government or giving existing agencies new powers, the Model Implementation Program uses existing agencies with their existing powers and capabilities at each level of government to implement the individual projects. All USDA and EPA agencies and programs that have an influence on erosion and sediment control and water quality management will be integrated in the program. Nationally, the MIP is conducted under the direction of the USDA Section 208 Work Group (now USDA Work Group on Water Quality) and the Implementation Branch of EPA's Water Planning Division in the Office of Water and Hazardous Material. The Work Group and Implementation Branch coordinate USDA and EPA agency activities at the national level.

The State USDA Section 208 Coordinating Committees, which had previously been established and consist of personnel from USDA and State agencies, the university experiment stations, cooperative extension, and EPA, coordinate the Model Implementation Program activities at the State level. Locally, USDA agencies, such as the SCS district conservationists and their staffs and the State and county Agricultural and Stabilization Conservation committees, and regional and county agencies and officials, such as soil and water conservation districts, rural development committees, planning and water quality agencies, foresters, and extension agents, operate the program. The structural organization at the local level and the coordination with State agencies is different with each MIP designated project area.

Cost-share assistance for the project areas under the MIP are available from various existing EPA and USDA programs and activities,



including EPA's Clean Lakes Program and research and development funds and USDA's Agricultural Conservation Program (ACP), Great Plains Conservation Program (GPCP), Resource Conservation and Development Program (RC&D) projects, and small watershed projects under the Watershed Protection and Flood Prevention Act. USDA funding and financial arrangements is through existing authorities and procedures. Most of the USDA funds are provided by the Agricultural Stabilization and Conservation Service (ASCS), which is responsible for administering the ACP designed to conserve and protect agricultural resources by cost-sharing with farmers and ranchers to establish conservation measures. ASCS allocated approximately \$1.5 million from its national reserves to the seven MIP project areas in calendar year 1978. Approximately \$1.4 million has been allocated by ASCS from its national reserves for Fiscal Years 1979 and 1980.

Some of the goals and purposes of the Model Implementation Program have already been attained in varying degrees in some project areas. The MIP has demonstrated that current USDA programs under existing authorities and agency structure can be effectively concentrated in selected areas and that USDA agencies and EPA can cooperate among themselves and with State and local agencies in an accelerated water quality management program. The degree of success in the short period of time since establishing the program appears to depend on the close relationships between agencies and organizational structures already existing in a particular project area prior to MIP. Progress has been slower in those project areas where a cooperative effort and an organizational structure had to be established after the start of the program.

All MIP project areas have established active information and education programs. Landowners and operators have learned from these programs and from individual contacts about the MIP and other USDA programs available for reducing nonpoint sources of pollution. Success in gaining landowner and operator acceptance in such a short period depends somewhat on the previous relationship between USDA agencies at the local level and landowners and operators. A one-on-one contact is needed in most instances to get a landowner or operator to install best management practices.

Problems existed with the \$2,500 limitation per landowner on ACP cost-share funds during the first year of MIP and with the 90 percent cost-share paid by ASCS. These limitations present a particular hardship where the needed best management practices are expensive, such as animal waste management facilities and changes in irrigation systems. Use of State and local funds to supplement the ACP cost-share funds, which is done in Nebraska, may help.

Evaluation of the best management practices and monitoring of water quality is just getting started in most project areas. Those project areas that already had monitoring and evaluation contracts with EPA and were doing monitoring had a head start. The time it takes to finalize a contract with EPA appears to be too long in some project areas if the results are to be known by the end of the MIP period.

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THE MODEL IMPLEMENTATION PROGRAM--  
A COOPERATIVE EFFORT BY USDA AND EPA FOR WATER QUALITY MANAGEMENT:  
An Overview

INTRODUCTION

In September 1977, the U.S. Department of Agriculture (USDA) and the U.S. Environmental Protection Agency (EPA) joined in an agreement to concentrate on solving agriculture- and silviculture-related water quality problems in selected areas of the country. That agreement, known as the Model Implementation Program (MIP), is a joint effort by USDA and EPA to cooperate in a 3-year test to demonstrate the effectiveness of coordinating their existing programs and accelerating delivery of resources to reduce agricultural and silvicultural nonpoint source pollution. Seven project areas located in Indiana, Nebraska, New York, Oklahoma, South Carolina, South Dakota, and Washington were selected in January 1978 from a group of 50 applications submitted by 43 States to participate in the program.

An evaluation of the Model Implementation Program will determine if coordinated and accelerated USDA and EPA efforts can establish an effective water quality management program, thereby, demonstrating the potential effectiveness of similar concerted efforts nationwide where water quality needs are identified. Three types of evaluations will be made during the various phases of the 3-year test period. One will determine if USDA and EPA agencies at national, regional, State, and local levels can coordinate and accelerate their programs and activities among themselves and with local governments and gain sufficient support

and participation from local governments and farmers to install best management practices (BMP's) on the land. Another type of evaluation will determine if sufficient BMP's can be installed under the MIP effort to reduce agricultural and silvicultural nonpoint source pollution and the sufficiency of these practices to reduce nonpoint source pollution. A third type of evaluation will determine the impact those best management practices installed under the MIP had on water quality improvement.

The purpose of this report is to provide a brief summary of the Model Implementation Program experience and to serve as a guide to others developing agricultural and silvicultural water quality related projects. To explain this experience the report first describes the establishment, purposes, expectations, and background of the program, the cooperation between USDA and EPA, and the criteria and process used to select the seven project areas. Secondly, the report goes into greater detail on each individual project and describes the water quality problems for that area, the agency organizational structure, farmer participation, cost-sharing, the best management practices selected to correct the water quality problems, and, finally, any problems encountered in initiating the projects. This report only deals with the cooperative effort made by the various USDA and EPA agencies and local governments in coordinating and accelerating their programs and activities through the summer of 1979 and the progress made to implement best management practices. Sufficient data was not available at that time to evaluate the effectiveness of the installed best management practices on nonpoint source pollution reduction and the consequent impact on the improvement of water quality.

## MODEL IMPLEMENTATION PROGRAM

### Establishment

Personnel from the Environmental Protection Agency (EPA) and U.S. Department of Agriculture (USDA), particularly the Soil Conservation Service (SCS) and Agricultural Conservation and Stabilization Service (ASCS), began in the spring of 1977 to discuss methods for implementing the agricultural and silvicultural nonpoint source pollution portion of the water quality management plans developed under Section 208 of the Federal Water Pollution Control Act Amendments of 1972. Other USDA agencies, such as the Forest Service (FS), Farmers Home Administration (FmHA), Science and Education Administration (SEA), and Economics, Statistics, and Cooperatives Service (ESCS), later became involved in the discussions. These discussions identified the need for pilot or demonstration projects where existing USDA and EPA programs of technical and financial assistance would be coordinated and accelerated to implement best management practices (BMP's)\*. The BMP's would be evaluated for their effectiveness in controlling nonpoint source pollution and improving water quality. A Memorandum of Working Relationship was developed between USDA and EPA in September 1977 to conduct a Model Implementation Program for Water Quality Management using existing EPA and USDA

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\* Best management practices are those practices or combination of them that are determined by a State or designated areawide planning agency after problem assessment, examination of alternative practices, and appropriate public participation to be the most effective and practicable, including technological, economic, and institutional considerations, means of preventing or reducing the amount of pollution generated by nonpoint sources to a level compatible with water quality goals.

programs and activities. Goals set down for the joint effort included:

1. Select three to five geographic (which were part of a Section 208 water quality management plan) areas (seven were chosen as project areas) where the Model Implementation Program (MIP) would be developed, implemented, and evaluated using existing USDA and EPA programs.
2. Identify the legislative background, regulations, funding authority, and so forth, supporting programs that could be targeted to help control agricultural and silvicultural nonpoint source pollution.
3. Develop and improve lines of communications among USDA programs and with EPA.
4. Identify possible weaknesses and gaps in existing Federal legislation.
5. Reorient priorities to allow for coordinated action among the various USDA and EPA programs.
6. Carry the unified approach to field personnel at State and county levels.
7. Through implementation, to demonstrate and evaluate the effectiveness of the MIP for water quality management and applicability to other areas in the Nation.

### Purposes and Expectations

#### Purposes

The primary purpose of the Model Implementation Program (MIP) is to demonstrate the effectiveness in small geographic areas of concentrating and coordinating the various USDA and EPA water quality management programs and illustrate how the water quality management plans developed under Section 208 of the Federal Water Pollution Control Act Amendments of 1972 can be translated into action. Other purposes of the MIP are to:

1. Demonstrate that current USDA and EPA programs can be concentrated to improve water quality under existing authorities and agency structure.
2. Demonstrate the effectiveness of interagency cooperation at the Federal, State, and local levels in an



accelerated water quality management program to improve water quality.

3. Demonstrate that USDA and EPA agencies can effectively coordinate programs among themselves at the Federal, State, and local levels and with State and local agencies.
4. Demonstrate and evaluate the efficiency and effectiveness of best management practices in reducing nonpoint source pollution to improve water quality.

### Expectations

Evaluation of the Model Implementation Program will be useful in improving the effectiveness of similar nationwide efforts such as special projects under the Agricultural Conservation Program (ACP) where water quality needs are identified. Experience gained from the individual MIP projects can be applied to implementing the Rural Clean Water Program (RCWP) under the Clean Water Act of 1977 and nonpoint source pollution portions of the water quality management plans developed under Section 208 of the Federal Water Pollution Control Act Amendments of 1972. Other expectations of the program are to:

1. Strengthen the working relationships between EPA and USDA nationally and among USDA agencies at all levels to more effectively implement the Section 208 water quality management plans through RCWP.
2. Develop a monitoring system that can be used to evaluate the effectiveness of best management practices and the RCWP.
3. Develop new ways of providing incentives to farm owners and operators to accelerate the application of best management practices.

This report only deals with the working relationships between EPA and USDA agencies and among USDA agencies and their coordination with State and local agencies and the implementation of best management

practices. Later reports will evaluate the effectiveness of the best management practices, water quality improvements, and new ways to provide incentives to accelerate the application of best management practices.

### Background

Authority for the Model Implementation Program (MIP) is based on the Federal Water Pollution Control Act Amendments of 1972, Soil Conservation Service (SCS) memorandums, and various agreements between Federal agencies. The objective of the 1972 FWPCA amendments, as amended by the Clean Water Act of 1977, is to " . . . restore and maintain the chemical, physical and biological integrity of the Nation's waters." A return to "fishable and swimmable waters," wherever attainable, by 1983 is an interim goal of the Act and the national goal is to eliminate the discharge of pollutants into navigable waters by 1985. As a means of achieving these goals, the Act provides that processes for assuring adequate control of pollutants be developed and implemented in each State.

Section 208 of the Act is one of the basic tools for achieving the goals. It requires the establishment of a process for planning and implementing programs to reduce pollutants from all point and nonpoint sources and coordinating various controls for their reduction. Water quality management plans must be prepared under Section 208 for the entire State either on an areawide basis by a designated regional planning agency or by a State agency for the nondesignated areas. Emphasis in the plans is on controlling nonpoint source pollution, particularly for those pertaining to the nondesignated areas, which comprise most of the Nation.

Water quality management plans developed by either the State or designated regional agencies must first identify nonpoint sources of

pollution from (a) agriculture and forestry, including runoff from manure disposal areas and from land used for livestock and crop production, (b) mining related activities, and (c) construction activities. The plans must then provide procedures and methods, including land use requirements, to control to the extent feasible nonpoint source pollution from agriculture, forestry, mining, and construction activities. Broad goals of the continuing planning process required by Section 208 are to assure that the necessary institutional arrangements and management programs are established to make and implement coordinated decisions designed to achieve water quality goals and standards; to develop a statewide and areawide water quality assessment; to establish water quality goals and State water quality standards which take into account overall State and local policies and programs, including those for land use and other related natural resources; and to provide the strategic guidance for developing the annual State program for the prevention, reduction, and elimination of pollution.

EPA has adopted regulations giving specific requirements for developing the continuing planning process and preparing the State and areawide water quality management plans. Section 208 water quality management planning has been one of the priority programs of EPA since 1975 when most Section 208 planning grants began. Water quality management plans prepared by designated agencies on an areawide basis or by the State for nondesignated areas must be certified by the governor and submitted to the appropriate EPA Regional Administrator for approval.

Various USDA agencies have been making inputs to the Section 208 continuing planning process on an individual agency basis. In several



instances USDA employees are serving on advisory committees and technical panels. Authority for this participation was an interdepartmental agreement entered into pursuant to Section 304(j) of the 1972 FWPCA amendments by the Environmental Protection Agency and the Departments of Agriculture, the Army, and the Interior in the fall of 1973 to cover planning and plan implementation assistance and fund transfers. USDA took the position that it would respond favorably to invitations to provide planning assistance when requested and would actively solicit such invitations when they were not extended.

Steps were taken in 1976 to assure that USDA would be effectively represented in the planning process at the national, State, and regional levels. The Secretary created the "USDA Section 208 Work Group" within the Department at Washington to coordinate Section 208 planning activities at the national level among USDA agencies and between USDA and EPA and other organizations. A procedure was established for coordinating USDA efforts for Section 208 activities at the State and regional levels. SCS was asked to create a "USDA Section 208 Coordinating Committee" in each State, composed of representatives from each USDA agency located in that State, to ensure effective and timely USDA assistance to State and area-wide agencies engaged in Section 208 planning.

USDA, and especially SCS, assistance to State and designated areawide Section 208 planning agencies is consistent with the technical assistance given local governments for many years. SCS technical assistance is provided through conservation districts, associations of conservation districts, and State soil conservation agencies. Taking into account the Soil Conservation Service's relationship with local governments, SCS was

given the lead role among all USDA agencies for planning activities under the Federal Water Pollution Control Act Amendments of 1972 and was to coordinate its Section 208 planning assistance with other USDA agencies at all levels and maintain liaison with EPA. SCS is to provide assistance to Section 208 planning agencies consistent with its authorities, resources, program policies, procedures, and standards and in accordance with the objectives and priorities of soil conservation districts.

Congress adopted four acts in the 1970's that strengthen USDA's role in water quality management and add further importance to the Model Implementation Program. Section 35 of the Clean Water Act of 1977 amended Section 208 of the 1972 FWPCA amendments by adding a new implementing subsection (j), titled "Agricultural Cost Sharing." Subsection 208(j), better known as the "Rural Clean Water Program" (RCWP), authorizes the Secretary of Agriculture, with the concurrence of the EPA Administrator, to establish and administer a program of long-term contracts to provide technical and cost-sharing assistance to eligible rural landowners and operators for the purpose of installing and maintaining best management practices. Funds have not been appropriated under Section 208(j). However, \$50,000 was appropriated under the 1980 Agricultural Appropriations Act for an experimental Rural Clean Water Program.

The other three pertinent acts adopted by Congress are the Surface Mining Control and Reclamation Act of 1977, Forest and Rangeland Renewable Resources Planning Act of 1974, and Soil and Water Resources Conservation Act of 1977. Section 406 of the Surface Mining Control and Reclamation Act of 1977 establishes the Rural Abandoned Mine Program, which is a voluntary program designed to aid land users in reclaiming,

conserving, and developing coal-mined lands that are either abandoned or inadequately reclaimed. Both the Forest and Rangeland Renewable Resources Planning Act of 1974, administered by the Forest Service, and Soil and Water Resources Conservation Act of 1977, administered by the Soil Conservation Service, direct USDA to make periodic assessments of the Nation's basic natural resources and to take actions that will protect and improve these resources.

### Agency Participation

#### Inter-Agency Involvement

As stated, one purpose of the Model Implementation Program (MIP) is to evaluate the effectiveness of a coordinated effort by existing Federal, State, and local agencies to accelerate implementation of best management practices that improve water quality in small, designated areas throughout the country. Rather than creating new agencies at any level of government or giving existing agencies new powers, the program uses existing agencies with their existing powers and capabilities at each level of government to implement the individual projects. All USDA and EPA agencies and programs that have an influence on erosion and sediment control and water quality management will be integrated in the program.

Nationally, the MIP is conducted under the direction of the USDA Section 208 Work Group and the Implementation Branch of EPA's Water Planning Division in the Office of Water and Hazardous Material. The Work Group and Implementation Branch coordinate USDA and EPA agency activities at the national level. EPA activities at the local level are conducted primarily through its regional offices and research laboratories. Individual USDA agencies conduct their activities through their regional,

State, and county offices.

The State USDA Section 208 Coordinating Committees, which had previously been established and consist of personnel from USDA and State agencies, the university experiment stations, cooperative extension, and EPA, coordinate the Model Implementation Program activities at the State level. Locally, USDA agencies, such as the SCS district conservationists and their staffs and the State and county Agricultural and Stabilization Conservation (ASC) committees, and regional and county agencies and officials, such as soil and water conservation districts, rural development committees, planning and water quality agencies, foresters, and extension agents, operate the program. The structural organization at the local level and the coordination with State agencies is different with each MIP designated project area. However, regardless of the structural organization, success of the program depends on cooperation between the agencies at the local level.

#### Federal Agency Participation

Under the Memorandum of Working Relationship, EPA and several USDA agencies are assigned areas of responsibilities for the Model Implementation Program (MIP). These USDA responsibilities apply at the national level as well as to their subordinate State and local agencies and the assigned EPA responsibilities apply at the national level and to their regional offices and various research and development laboratories.

Environmental Protection Agency. Under the Memorandum of Working Relationship EPA provides funds and personnel to assist in selecting the MIP project areas, to participate on the State USDA Section 208 Coordinating Committees, and to provide financial assistance for monitoring



and evaluating best management practices and eligible Clean Lakes Program projects within the MIP designated areas.

Soil Conservation Service. If local conservation districts concur, SCS provides farmers with technical and financial assistance within the MIP project areas. Specific responsibilities of SCS under the Memorandum of Working Relationship are to:

1. Assist with developing, implementing, and evaluating individual, group, and community conservation plans that provide the very best control and treatment measures that are economically feasible to maintain, restore, or improve water quality;
2. Provide assistance with inventory and evaluation of water quality management, including best management practice application needs and status;
3. Plan and apply Resource Conservation and Development Program measures that improve water quality;
4. Expand and accelerate the land treatment portions of small watershed projects constructed under the Watershed Protection and Flood Prevention Act to improve water quality;
5. Give priority to the MIP project areas for personnel and funds to develop and apply assistance, such as the Great Plains Conservation Program which benefits water quality; and
6. Provide soil surveys and water quality management interpretive soil maps and information for the MIP project areas.

Agricultural Stabilization and Conservation Service. Under the Memorandum of Working Relationship the Agricultural Stabilization and Conservation Service (ASCS) is responsible for giving special funding emphasis under the Agricultural Conservation Program for cost-sharing, needed conservation, and water quality measures in the Model Implementation Program project areas. In addition, ASCS is to furnish land use and crop history data and aerial photography for the MIP project areas, data on cost-sharing

conservation measures already applied in the MIP project areas, and disaster emergency assistance funds where applicable. ASCS is also maintaining data on best management practices established in the MIP project areas.

Farmers Home Administration. Farmers Home Administration (FmHA) is assigned responsibilities for cooperating with State and areawide Section 208 planning agencies and other USDA agencies within the MIP project areas in order to maximize the beneficial impact of its programs on water quality. Credit programs under the FmHA are broad enough to permit loans to finance best management practices and provide technical management assistance, primarily for eligible family-size farms and ranches. Such loans may be used to improve water supply systems for home use, livestock, and irrigation and for financing land and water development measures, forestation, drainage of farmlands, pasture improvement, and related land use adjustments. FmHA loans are also available for Resource Conservation and Development Program projects and small watershed projects constructed under the Watershed Protection and Flood Prevention Act.

Forest Service. The Forest Service (FS) is to provide technical assistance through the State forester to develop and implement forest management plans that will correctly identify forest related water quality problems and through the State forester provide water quality management inventory and evaluation assistance for non-Federal forest lands. They also are responsible for encouraging local sponsors to expand and accelerate treatment needs identified in the forest land plan for small watershed projects constructed under the Watershed Protection and Flood Prevention Act and encouraging planning and application of

project measures in Resource Conservation and Development Program areas to meet water quality management needs for forest lands. In addition, the FS is to carry out forest management plans of the National Forest Lands in coordination with State and areawide Section 208 water quality management plans.

Science and Education Administration. Since the Memorandum of Working Relationship became effective the Science and Education Administration (SEA) was created and assumed the functions of the Agricultural Research Service (ARS), Cooperative State Research Service (CSRS), and Extension Service (ES). The Science and Education Administration-Agricultural Research (SEA-AR) (formerly ARS) and Science and Education Administration-Cooperative Research (SEA-CR) (formerly CSRS) is to furnish available water quality information applicable to the MIP project areas and serve as technical consultants on all research related matters, including evaluating the effectiveness of best management practices. In cooperation with the directors of the State Cooperative Agricultural Extension Service and EPA, the Science and Education Administration-Extension (SEA-E) (formerly ES-USDA) is responsible for assisting in coordinating education and information programs for the MIP project areas, providing technical specialists at the State and local levels to accelerate the extension programs in the MIP project areas, and developing and conducting programs to demonstrate best management practice applications.

Economics, Statistics, and Cooperatives Service. The Economics, Statistics, and Cooperatives Service (ESCS) (formerly Economic Research Service) is responsible for furnishing available social and economic information that is applicable to the MIP project areas; serving as con-

sultants to help determine natural resource development, conservation, and community impacts; and assisting in evaluating environmental and economic trade-offs of water quality plans and pollution control programs.

#### Financial Support of Agencies

Cost-share assistance for the project areas under the Model Implementation Program (MIP) are available from various existing EPA and USDA programs and activities, including EPA's Clean Lakes Program and research and development funds and USDA's Agricultural Conservation Program (ACP), Great Plains Conservation Program (GPCP), Resource Conservation and Development Program (RC&D) projects, and small watershed projects under the Watershed Protection and Flood Prevention Act. USDA funding and financial arrangements will be through existing authorities and procedures.

EPA funds are disbursed through individual agreements between that agency's regional offices or research and development laboratories and other Federal agencies, State water quality agencies, universities, or the local MIP project sponsoring agencies. By the middle of 1979 EPA had allocated approximately \$1.5 million in funds to six of the seven MIP project areas. A vast majority of these funds were provided by contracts to universities to monitor and evaluate best management practices. In addition, EPA funds are available to States for projects under the Clean Lakes Program pursuant to Section 314 of the amended Federal Water Pollution Control Act Amendments of 1972.

Most of the USDA cost-share funds are provided to the MIP project areas by ASCS, which is responsible for administering the Agricultural Conservation Program (ACP) designed to conserve and protect agricultural



resources by cost-sharing with farmers and ranchers to establish conservation measures. Each year ASCS establishes policies, guidelines, and procedures to govern ACP by setting forth cost-share limits and eligible practices. ACP cost-share funds authorized annually by Congress are allocated by ASCS to each State based on its soil and water conservation needs. The State Agricultural Stabilization and Conservation (ASC) Committee, in turn, allocates the funds to the ASC county committees. ASCS retains a certain percentage of the funds authorized by Congress at the national level as reserves for transfer to special projects; ASC State committees also retain funds as a reserve at the State level.

ASCS allocated approximately \$1.5 million from its national reserves to the seven MIP project areas in calendar year 1978. ASCS took \$83,000 of unobligated funds from South Dakota and Washington and gave \$38,000 and \$45,000 to Indiana and New York, respectively, during the first part of December 1978. Approximately \$1.27 million of ACP cost-share funds were obligated as of December 31, 1978. ASCS allocated \$1.4 million from its national reserves to the MIP project areas for use in FY 1979 and \$1.39 million for use in FY 1980. States may also use their own reserve ACP cost-share funds in the MIP project areas. Table 1 indicates the ASCS 1978 allocation from national reserves, funds available on December 15, 1978, obligated funds as of December 31, 1978, and allocation of funds from the national reserves for Fiscal Years 1979 and 1980 for each State with MIP projects.

Table 1--Allocation and obligation of funds for Model Implementation Program project States

MIP States	Nat'l reserve allocation : 11-30-78	Available funds : 12-15-78	Total funds obligated : 12-31-78	Nat'l reserves allocated : FY 1979	Nat'l reserves allocated : FY 1980
	<u>Dollars</u>				
Indiana	275,000	313,762	<u>1/</u> 313,762	275,000	350,000
Nebraska	275,000	275,000	246,073	275,000	200,000
New York	275,000	370,000	<u>2/</u> 370,000	300,000	250,000
Oklahoma	150,000	150,000	101,584	125,000	125,000
South Carolina	150,000	150,000	137,563	125,000	165,000
South Dakota	150,000	48,000	47,250	100,000	100,000
Washington	275,000	100,000	49,832	200,000	200,000
Total	1,550,000	1,406,762	<u>3/</u> 1,266,064	1,400,000	1,390,000

1/ Includes \$762 from Indiana State reserve.

2/ Includes \$50,000 from New York State reserve.

3/ Total from 1978 ACP national reserve for special projects is \$1,215,302; includes 5% transfers to SCS.

From its FY 1978 end of year funds the Forest Service (FS) made \$77,000 available to the MIP project areas in New York and South Carolina to be used in FY 1979 and thereafter for technical assistance in water quality monitoring and hydrological information exchange. New York proposes to have one professional forester and two forest technicians working in the MIP project area during FY 1979. FS provided the New York project area with \$30,000 in FY 1979.

The Soil Conservation Service has assigned one to five additional persons to the field offices in each MIP project area to provide technical assistance for a total of 19 persons. In addition, SCS also provides about 11 persons at the area, State, technical service center, and national level to work on the Model Implementation Program. Technical assistance cost to SCS is approximately \$1.2 million. Great Plains Conservation Program assistance is available in the Oklahoma project area.

#### Selection Process for Project Areas

The Memorandum of Working Relationship transmitted to the EPA Administrator by the Secretary of Agriculture on September 16, 1977, provided that EPA and USDA jointly identify three to five geographic areas where the Model Implementation Program (MIP) could be developed, implemented, and evaluated with concerted USDA and EPA support. A few days latter all USDA agency heads were notified of the memorandum and the Administrator of the Soil Conservation Service asked the State USDA Section 208 Coordinating Committees to meet and nominate candidates for MIP projects. Nominations for the projects were to be submitted by the States to the USDA Section 208 Work Group in Washington by November 30, 1977, and final selection of

the three to five projects was to be made by December 31, 1977.

Suggested guidelines to assist State USDA Section 208 Coordinating Committees in nominating their candidate project areas were developed by the USDA Section 208 Work Group. Candidates for MIP project areas should meet the following criteria:

1. Contain nonpoint source pollution water quality problems identified by the Section 208 planning agency;
2. Involvement of the applicable conservation district(s) in the Section 208 planning process should be significant;
3. Cover an area small enough that USDA resources can be concentrated so that a high proportion of the needed practices can be applied within a 2- or 3-year period;
4. Practices anticipated under the program be consistent with the established long-range plans and priorities of the conservation district(s);
5. Conservation district(s) leadership strong enough to implement the program;
6. Evidence be provided of strong local support for the program, including that of the conservation district(s), ASC committees, and Section 208 planning agencies; and
7. Indication that USDA agencies will redirect their existing resources to meet the special needs required for the program.

Forty-three States submitted 50 applications to the USDA Section 208 Work Group by November 30, 1977. Seven States -- Arizona, California, Colorado, Illinois, North Dakota, Ohio, and South Carolina -- submitted two applications and seven States -- Hawaii, Mississippi, New Hampshire, Rhode Island, Texas, Vermont, and West Virginia -- did not submit applications.

Initial screening of the 50 applications was done by personnel from the USDA Section 208 Work Group and Implementation Branch of EPA using a common scoring procedure with each application. Each application was

scored by four to six staff members on the basis of merit compared to the MIP selection process criteria. To provide consistency in the scoring process, scorers were given worksheets and asked to rate 11 statements pertaining to the application on a scale of 1 to 10. The statements related to the Section 208 water quality management plan status; USDA agency participation in the plan's preparation; seriousness and complexity of water quality problems; USDA, EPA, State, and local programs and commitment for solutions to the water quality problems; and potential water quality accomplishments within a 3-year period. Some of the statements counted more than others -- five statements were given a rating factor of 1 and three were each given rating factors of 2 and 3. The maximum score an application could receive was 200.

After the four to six scorers independently rated each MIP project application, the individual scores for each were averaged for a final score. Average scores ranged from 80 to 163. On December 15, 1977, the USDA Section 208 Work Group and EPA personnel met to review the ratings. Applications scoring over 130 points included 20 applications from nine of ten EPA regions. The USDA Section 208 Work Group and EPA wanted one application from each EPA region, so the top scoring application from a State within EPA Region X (Washington), which scored below 130, was added, bringing the total to 21 applications. At the request of the EPA Regional Administrators applications from Idaho, Kansas, Nebraska, and Oklahoma scoring below 130, but of particular interest to them, were added to the other 21 applications for additional consideration. Thus, the initial screening process reduced the 50 applications to 25 for intensive review.

The second screening consisted of an evaluation within each USDA



agency and EPA to ascertain the relative merits of the remaining 25 applications as project areas, the ability of ongoing USDA programs to focus on the problems in a short time, and the probability that important water quality results would be available within 3 years. In addition, each USDA agency and EPA contacted its subordinate field offices to gain a better understanding of the individual proposals, some idea of their support for the application, and an estimate whether existing programs and priorities could be focused on the project area. As a result of this agency review and an evaluation of inputs from the State USDA agencies and EPA regional offices, the USDA Section 208 Work Group and EPA met on January 4, 1978, and selected 11 applications from the 25. They included projects from the States of California, Connecticut, Indiana, Maine, Nebraska, New York, Oklahoma, South Carolina, South Dakota, Washington, and Wyoming.

On January 9, 1978, the USDA Section 208 Work Group invited representatives of agricultural, forestry, environmental, and public interest groups to meet with them and EPA to discuss the final 11 applications. It was agreed that no more than one project area would be selected from each EPA region. Weighing the advice of those attending the January 9th meeting and through consensus, the USDA Section 208 Work Group and EPA on January 11, 1978, selected the following seven project areas for Model Implementation Program designation:

- Indiana -- Indiana Heartland Area
- Nebraska -- Maple Creek Watershed
- New York -- West Branch Watershed, Delaware River
- Oklahoma -- Little Washita River Watershed
- South Carolina -- Broadway Lake Watershed
- South Dakota -- Lake Herman Watershed
- Washington -- South Yakima Conservation District

State offices of the Soil Conservation Service and Agricultural Stabilization and Conservation Service in the seven States selected for MIP projects were notified of their selection on January 23, 1978. State USDA Section 208 Coordinating Committees in those States prepared either a plan of work or plan of operation. A copy of each State's plan was submitted to the USDA Section 208 Work Group by March 1, 1978. Such plans specified the areas to be treated, the problems to be solved, and the best management practices needed to solve those problems. The plans also showed how all available resources would be used and coordinated to apply the best management practices, including measures to use information, education, monitoring, research, technical, and cost-sharing assistance. Subareas were designated in those MIP project areas too large to be feasibly treated within the 2- to 3-year period.

## MODEL IMPLEMENTATION PROGRAM PROJECTS

This portion of the report gives a detailed description of each Model Implementation Program project area and describes the water quality problems for that area, the best management practices needed and installed to correct the water quality problems, farmer participation, financial support, and agency organizational structure and participation. In addition, this portion of the report describes the success of the program in each project area and the problems encountered in initiating the program.

### Indiana

#### Description of Project Area

The Indiana Model Implementation Program (MIP) project area includes two critical watersheds in the Indiana Heartland Planning Region, Stotts Creek and Eagle Creek. They were identified in the Section 208 Water Quality Management Plan prepared by the Indiana Heartland Coordinating Commission as having soil erosion and resulting sedimentation problems, but representing different nonpoint pollution situations. Stotts Creek Watershed is in Johnson and Morgan counties, south of Indianapolis, and the Eagle Creek Watershed is in Boone, Hamilton, Hendricks, and Marion counties, north of Indianapolis. These two watersheds were chosen because of their dissimilar topographical characteristics and contrasting erosion and sediment problems. This situation allows a comparative analysis of the effectiveness of applying best management practices under different topographic conditions. Both watersheds yield very heavy sediment loads, seriously affecting the water quality in the streams and



in Eagle Creek Reservoir. The entire drainage area of Eagle Creek Reservoir (2.1 square miles) is within the MIP project boundary.

The Stotts Creek Watershed is located near the southern boundary of the planning region. Because of the moderately rolling and strongly sloping agricultural lands the area has somewhat less intensive grain farming operations than the Eagle Creek Watershed. Land use in the 40,000-acre Stotts Creek Watershed is almost entirely agricultural with approximately 98 percent of the area occurring as cropland, woodland, and grassland. Due once again to the rough topography, a comparatively high percentage of the watershed is in woodlands (15 percent) and grasslands (12 percent). Cropland accounts for about 73 percent of the watershed (table 2). There are 386 farms in the MIP project area.

In contrast to Stotts Creek, the Eagle Creek Watershed in the northern part of the planning region is in the relatively flat glacial till plain. There is very intensive row crop farming operations in this watershed. Land use in the approximately 136,000-acre watershed is approximately 90 percent agricultural, with 1,045 farms. Cropland accounts for 88 percent of the agricultural land, with both woodland and grassland occupying 6 percent of the total (table 2). The Eagle Creek Reservoir which was constructed in 1970, has 1,344 acres of water and has a maximum depth of 45 feet. This reservoir, along with the Geist and Morse reservoirs, are utilized as municipal water supply sources. Eagle Creek Reservoir is in a 3,500-acre county park. High residential growth rates are projected for certain areas in the watershed.

Table 2--Indiana Heartland Area: Land use and cropland needing treatment

Items	Watersheds			
	Eagle Creek		Stotts Creek	
	Acres	Percent	Acres	Percent
Watershed	106,200	100	39,725	100
Agricultural lands	96,035	90	38,994	98
Cropland	84,054	88	28,456	73
Pasture	6,395	6	4,540	12
Forest	5,586	6	5,998	15
Reservoir	1,344	1	0	0
Other land use	8,821	9	731	2
Cropland needing treatment	33,358	40	13,531	48

Best Management Practices Needed

Soil erosion and sediment have been identified in the agricultural nonpoint source pollution portion of the Section 208 Water Quality Management Plan as the major pollutant in the watershed. There are 84,054 acres of cropland in the Eagle Creek Watershed, of which 33,358 acres or 40 percent need soil erosion control treatment, and there are 28,456 acres of cropland in the Stotts Creek Watershed, of which 13,531 acres or 48 percent need the same type of treatment. Goals for soil loss reduction were established in the Section 208 Water Quality Management Plan and for the Model Implementation Program. Land treatment goals established for the MIP were those measures that could significantly improve water quality

in a relatively short time. A comparison of the Section 208 Water Quality Management Plan goals and the MIP 3-year goals for each best management practice in both watersheds is shown in table 3.

Table 3--Indiana Heartland Area: Section 208 Water Quality Management Plan  
and MIP project goals for best management practices

Best management practices	Unit	Watersheds			
		Eagle Creek	Stotts Creek	208 goal	MIP goal
Crop residue management	Acres	14,283	5,550	7,175	2,400
Chisel plowing (fall)	Acres	14,028	6,730	2,251	500
Cover crops	Acres	4,756	1,625	731	300
Minimum tillage	Acres	15,227	4,650	5,745	1,500
No till planting	Acres	299	175	648	280
Contour farming	Acres	198	110	451	150
Parallel terraces	Feet	131,956	28,500	87,377	25,000
Diversions	Feet	7,640	5,500	11,405	7,500
Grass waterways	Acres	95	37	53	37
Erosion control structures					
Drop spillway	Number	72	29	24	13
Pipe inlets	Number	94	47	48	28
Ditchbank seeding	Feet	57,931	19,000	14,507	8,500
Crop rotations/grass	Acres	529	300	851	581
Critical area plantings	Acres	203	74	327	120
Stream border plantings	Feet	11,240	4,500	11,990	7,000
Pasture plantings	Acres	313	305	188	210
Tree plantings	Acres	14	23	24	29
Wildlife plantings	Acres	79	63	212	70
Conservation ponds	Number	5	12	8	24
Fencing for livestock exclusion	Feet	15,198	4,000	52,390	31,000
Animal waste systems	Number	7	8	0	8

### Best Management Practices Installed

Due emphasis was placed on installing structural measures during the first year under the Model Implementation Program. Measures applied so far with Agricultural Conservation Program cost-share funds in the MIP project area include vegetative cover, cover crops, terraces, ponds, sediment and chemical retention structures, sod waterways, and diversions (table 4). In addition to the best management practices already performed, ACP cost-share funds were approved for best management practices on 4,886 acres in 1978 and on 5,622 acres during the first 6 months of 1979.



Table 4--Indiana Heartland Area: Best management practices installed, June 30, 1979

Best management practices	Acres served
Permanent vegetative cover established	128
Permanent vegetative cover improvement	151
Terrace systems	25
Diversions	7
Cropland protective cover	52
Permanent vegetative cover on critical areas	200
Water impoundment reservoirs	728
Sediment retention, erosion, or water control structures	933
Sod waterways	705
Animal waste control facilities	27
Forest tree plantations	10
Forest tree stand improvement	172
Total	3,148

Landowner Participation

Agricultural Conservation Program (ACP) cost-share funds were made available to farmers under the Model Implementation Program on April 11, 1978. Critical areas within the MIP project were identified on soil survey maps and landowners were contacted and encouraged to participate. Over 2,500 letters explaining the MIP and ACP cost-sharing were sent to landowners in the project area during 1978 and personal contacts were made

with 419 of them.

By the end of 1978 the Agricultural Stabilization and Conservation (ASC) county committees had approved ACP cost-share funds for 166 farmers and the work had been performed and paid for on 48 farms. During the first 6 months of 1979, 153 farmers were approved for cost-share funds and the best management practices had been performed and paid for on 42 farms.

### Financial Support

The Agricultural Stabilization and Conservation Service (ASCS) initially allocated \$225,000 from its national reserves to Indiana for the Heartland MIP project during calendar year 1978. That amount was increased to bring the total amount available to the Indiana MIP project for 1978 to \$313,000. Total ACP cost-share funds approved and obligated to the MIP project by the six ASC county committees as of December 31, 1978, was \$313,762, of which \$762 was from the Indiana ASCS State reserves and \$69,677 worth of practices had been performed and paid for by that date.

ASCS allocated \$275,000 and \$350,000 from its national reserves to the Indiana Heartland MIP project for Fiscal Years 1979 and 1980, respectively. During the first 6 months of 1979 the six county ASC committees approved \$304,511 in ACP cost-share funds for best management practices and paid \$43,250 for practices installed.

The ACP practices eligible for cost-share funding, priority given the practices, and level of cost-share rates to install best management practices were established for the MIP project area at a special ASC State committee meeting. Cost-sharing funds were permitted at 90 percent for some high priority best management practices installed in the MIP project area. All practices permitted at the 90 percent level in 1978 are also

permitted to be funded at that same level for 1979. Otherwise, the maximum level for funding is 80 percent.

Financial support is also provided to the Indiana Heartland MIP project area through three contracts with EPA for modeling, monitoring, and educational activities. The Indiana Heartland Coordinating Commission (IHCC) has a \$430,000 contract with EPA Region V that provides funds for IHCC to subcontract with Purdue University for modeling and evaluating the impact of best management practices performed in the watershed on water quality and with Holcomb Research Institute at Butler University for projecting land use in the watershed. IHCC also has a \$50,000 contract with EPA Region V to provide funds for administering the MIP project. In addition, EPA's Corvallis Environmental Research Laboratory has a contract with DePauw University to do biological monitoring in some of the streams in the MIP project area.

#### Agency Participation

USDA and State agency coordination at the State level is through the Indiana Land Use Task Force, which is the State's USDA Section 208 Coordinating Board. State agencies involved are the Division of Forestry, Division of Fish and Wildlife, State Soil and Water Conservation Committee, Indiana State Board of Health, and Indiana Stream Pollution Control Agency. The divisions of Forestry and Fish and Wildlife and the Soil and Water Conservation Committee are within the Indiana Department of Natural Resources.

Local responsibility for the MIP project rests with the soil and water conservation district, agricultural stabilization and conservation (ASC) committee and county extension board in each of the six counties

working with SCS, ASCS, Cooperative Extension Service, and other USDA and State agencies at the county level. The development of local MIP committees or multicounty committees to coordinate the MIP activities is at the discretion of the local soil and water conservation district, agricultural stabilization and conservation committee, and county extension board in each county.

Coordination of MIP activities among the six counties is being done by the Indiana Heartland Coordinating Commission (IHCC), which is the designated Section 208 planning agency for the eight counties in the Indiana Heartland Planning Region. IHCC is also responsible for the research activities in the MIP project area. To insure local involvement and provide continuing dialogue among participating agencies, IHCC established a MIP Local Policy Committee composed of two representatives from each of the six counties within the project area. These representatives are selected from the ASC committee, extension board, and soil and water conservation district board of supervisors in each county. Each of the three boards from each county must meet and appoint two members from the three boards to be on the MIP Local Policy Committee. This committee, which represents landowners and county organizations, is to provide overall guidance to the MIP project and work directly with the USDA project coordinator, IHCC coordinator, researchers, and participating agencies at all levels.

A MIP Technical Steering Committee composed of representatives of EPA, SCS, Indiana State Board of Health, IHCC, Holcomb Research Institute, DePauw University, Purdue University, and U.S. Geological Survey was established to provide IHCC with specialized technical resources for



establishing and operating monitoring, modeling, and research aspects of the project. This committee is also to develop evaluation criteria for analyzing best management practices installed in the MIP project area.

Administrative coordination for the MIP project is provided by an IHCC coordinator and a USDA coordinator. The IHCC coordinator is responsible for the various phases of the project funded through EPA and the USDA coordinator is responsible for project activities funded through the U.S. Department of Agriculture.

#### Success of Model Implementation Program Project

The Indiana Heartland MIP project has been successful in coordinating USDA programs and practices among six counties at the local level and in obtaining EPA funding to monitor and evaluate those practices. Much of the credit for the coordination can be given to the IHCC and the close working relationship between its MIP coordinator and the USDA coordinator.

Both the USDA agencies and IHCC either on their own or through the Cooperative Extension Service have been very active in promoting information and education programs. The MIP Local Policy Committee encourages farmer input into overall program guidance and coordination. In addition, the committee provides suggestions for project monitoring and modeling programs and the research and evaluations.

Approximately 40 percent of the landowners in the Stotts Creek Watershed, which has a higher estimated erosion problem than the Eagle Creek Watershed, have requested ACP cost-share funds for one or more best management practices. An analysis of the location of participants in both



watersheds showed more than 90 percent of the participation was located in areas identified on the general soils map as having critically high potential erosion.

#### Problems Associated with Model Implementation Program Project

Landowners could not sign up for ACP cost-sharing funds in 1978 until April 11th, which was about the time they were planting their crops. Practices installed in 1978 were those that could be planned and implemented during the summer growing season. The \$2,500 maximum amount paid to one landowner in 1978 was another limiting factor. This amount, however, has been raised to \$3,500 in 1979.

Emphasis in 1979 was on conservation tillage, such as fall chisel plowing and no-till planting. Those measures were approved for ACP cost-sharing at the 90 percent rate and special rental equipment was made available to the farmers. Problems arose in the conservation tillage equipment rental program; a major problem was the delay and difficulty in setting up and adjusting the equipment. To solve this problem the MIP Local Policy Group recommended hiring a tillage technician to provide this service; however, the IHCC was unable to negotiate funding for such a person.

The construction of the large in-stream automated sampling stations has been completed in each watershed; however, the installation of the small stations designed to monitor specific best management practices was delayed because of the difficulty in securing long-term agreements with the landowners for appropriate sites.

## Nebraska

### Description of Project Area

The Model Implementation Program (MIP) project area selected for Nebraska is a subwatershed of the Maple Creek Watershed known as the Middle Fork and West Fork drainage area. It is near Clarkson, in northeast Nebraska, about 100 miles north of Lincoln. The area includes 33,088 acres with approximately 200 farm operators and is located in parts of Colfax, Platte, and Stanton counties. Leigh, a town with a population of 501, is located in the MIP project area.

About 85 percent of the land in the MIP project area is cropland, 11 percent is pastureland, and 5 percent is for roads, urban, and miscellaneous uses. The cropland is used primarily to produce corn, soybeans, grain, sorghum, wheat, and alfalfa. There are several feedlots in the MIP project area. The topography of the project area is characterized by steep hills with irregular short slopes from 100 to 500 feet in length. Major natural waterways have a moderately flat grade that meanders and regularly flood surrounding land. Average annual precipitation is 28 inches.

### Best Management Practices Needed

Major water quality problems in the Maple Creek Watershed are caused by the diverse nonpoint pollutant sources characteristic of the area. That portion of the area being used primarily for cropland has an exceptionally high annual soil loss from erosion; a large portion of the area loses more than 25 tons of soil per acre per year. Farmers intensively crop the uplands that consist of gentle to strongly sloping loess soils. Runoff from cultivated land on these steep slopes with low perme-

able soils and short, intense thunderstorms is high in sediment from soil erosion. Additionally, agricultural pesticides, herbicides, and commercial fertilizers that cling to topsoil particles, or are otherwise present in the soil or on plants, are carried with runoff and contribute to surface water pollution. Cattle feedlots are also a source of nonpoint pollutants. The municipal wastewater discharges from the two communities in or adjacent to the MIP project area are the major point sources of pollution.

Approximately 65 percent of the MIP project area needs conservation land treatment. The best management practices that generally apply to this type of land are conservation tillage, terraces, contour farming, grassed waterways, diversions, erosion control dams, water storage dams, conservation cropping systems, sediment basins, and grass buffer strips.

Ninety-three of the 200 operating units in the project area were natural resource district cooperators when the Model Implementation Program was initiated. Seventy-four farm conservation plans had been developed, but many were in need of revision. Of the 165 operating units needing farm conservation plans, 132 need complete plans and 33 need partial ones. Present staff at the SCS field offices is sufficient to provide conservation planning for 65 operating units, but planning for the remaining 100 units must be provided by a MIP project soil conservationist. There are approximately 35 miles of main drains in the watershed that require 70 miles of fencing to control grazing. About half of the drains need grass filter strips seeded on both sides of the drain, which amounts to 280 acres. Other best management practices needed in the project area include:

Terraces and diversions -- 608 miles  
 Grassed waterways -- 600 acres  
 Contour farming -- 20,000 acres  
 Conservation tillage -- 21,500 acres  
 Conservation cropping system -- 25,520 acres  
 Cropland converted to grass -- 2,150 acres  
 Grade stabilization structures -- 25  
 Sediment control structures -- 25

Best Management Practices Installed

Table 5 indicates the best management practices approved and installed using Agricultural Conservation Program (ACP) cost-share funds during the first year of the Model Implementation Program.

Table 5--Maple Creek Watershed: Best management practices approved and installed, December 31, 1978

Best management practices	Acres served	
	Approved	Installed
Seeding	20	20
Terraces	1,595	347
Diversions	40	25
Windbreaks	16	16
Conservation tillage	1,870	1,768
Erosion control structures	1,512	412
Waterways	637	247
Animal waste control facilities	20	0
Total	5,710	1,835

Very little conservation construction work was accomplished during

the first 6 months of 1979 due to the late, wet spring. Fourteen farmstead windbreaks (10 acres) were planted in the MIP project area and three small dams were installed. Two more of these dams are in the process of being built. Seventy landowners plan on installing the following practices during the remainder of 1979: 29 terrace systems, 15 small dams, 5,000 acres of conservation terraces, and 10 windbreaks.

#### Landowner Participation

ACP cost-share funds became available to landowners in the Maple Creek MIP project area on April 14, 1978. Ninety-seven percent of all landowners or operators in the MIP project area were contacted. Of the 256 people contacted, 70 were interested in doing some conservation work in 1979. Sixty-one showed some interest but did not have definite plans for doing conservation work in 1979, and the remaining 115 indicated no interest in doing conservation work at the present time.

#### Financial Support

The Agricultural Conservation and Stabilization Service (ASCS) allocated \$275,000 from its national reserves to the Nebraska Maple Creek MIP project area in calendar year 1978. This was in addition to the \$114,519 of regular ACP cost-share funds that had been allocated already in 1978 to the three counties (Colfax, Platte, and Stanton) by the ASC State office, which made the total \$389,519. The \$275,000 was allocated as follows: Colfax County - \$115,000; Stanton County - \$111,250; and Platte County - \$35,000. Five percent, or \$13,750 of this \$275,000, was transferred to SCS for technical services. During the first year \$233,763 of the 1978 funds from the ASCS national reserves were committed. In addition,



requests for conservation practices amounting to \$45,190 was still pending.

ASCS allocated another \$275,000 and \$200,000 in ACP cost-share funds from its national reserves to the Maple Creek MIP project area for Fiscal Years 1979 and 1980, respectively. As of July 1, 1979, conservation practices totalling \$328,385 were approved in the three counties and practices totalling \$89,245 were installed. All practices are cost-shared at 90 percent of the average cost, which is at a higher level for the MIP project area than for other areas of the county, and all three counties have accepted common per unit costs.

During the last quarter of 1978 Farmers Home Administration (FmHA) provided \$44,000 in loans. FmHA made \$137,800 in loans with three landowners in the MIP project area during the first quarter of 1979 and \$554,920 in loans with six landowners during the second quarter.

On June 6, 1978, EPA awarded a \$118,400 grant to the Nebraska Natural Resources Commission (NRC) for water quality monitoring in the MIP project area and public education programs. NRC is responsible for administering that contract. The total agreement is for \$157,860, which includes \$39,460 for in-kind services by State and local sponsors for the period June 1, 1978 to July 31, 1979. The agreement involves NRC, Nebraska Department of Environmental Control, Lower Elkhorn Natural Resources District (NRD), Science and Education Administration-Agricultural Research, Institute of Agricultural and Natural Resources Experiment Station at the University of Nebraska-Lincoln, and University of Nebraska Cooperative Extension Service. SEA-Agricultural Research and the University of Nebraska Experiment Station carried out the physical, chemical, and biological monitoring at a cost of \$107,380. The Cooperative Extension

Service (CES) has been carrying out a planned information and education effort that is providing tools to the local people and in doing so has used \$12,000 of EPA funds, plus contributing in-kind services.

EPA approved a grant request from NRC for \$25,275 to purchase additional monitoring equipment. A grant request is now pending with EPA for aerial photography and topography mapping of the MIP project area. The NRC has requested \$113,327 and \$105,454 in EPA funds to continue the monitoring and public education programs for the period October 1, 1979 to September 30, 1980, and October 1, 1980 to September 30, 1981, respectively.

Lower Elkhorn NRD planned to contribute considerable money to the MIP project area during the first year. Lower Elkhorn NRD will pay the cost-share rates to landowners who go over the \$2,500 ASCS limitation to make the 90-percent payments. Also, under the district's Land for Conservation Program, many landowners will receive an additional \$40-per-acre payment for establishing terrace systems during June, July, and August. Most terrace systems presently being installed in the MIP project area are being done under this Lower Elkhorn NRD program. Under the Lower Elkhorn NRD wildlife programs, all cooperators are eligible for payments of \$7.50 to \$32.50 per acre for participating in the practices offered. All of these programs can be applied for at each county SCS office throughout the Lower Elkhorn NRD.

During 1978 the Lower Elkhorn NRD allocated \$150,000 for land treatment and \$40,000 for wildlife habitat development in the Maple Creek project area. A considerable portion of the \$40,000 was used to retire lands unsuitable for cultivation and put them to better adapted uses.

Between \$30,000 and \$40,000 of the \$150,000 allocated for land treatment was used to provide landowners with cost-share funds. These funds contributed to the cost-share when the \$2,500 limitation was exceeded. Many of those who applied a practice were participants in the Land for Conservation Program, which provided a \$40-per-acre payment to landowners who leave their fields open in the summer and establish needed terrace systems. Twenty-seven landowners signed up under this program for terraces to be established during the 1979 summer.

#### Agency Participation

The Nebraska USDA Rural Development Committee and its local counterparts at the county level provide the organizational structure for coordinating the MIP project. The State committee, with its State USDA Section 208 Coordinating Subcommittee, provides overall coordination. This subcommittee consists of personnel from the Economics, Statistics, and Cooperatives Service (ESCS), CES, ASCS, SCS, FmHA, and SEA-Agricultural Research and has invited participants from EPA, Nebraska Natural Resources Commission (NRC), Nebraska Association of Resource Districts, Lower Elkhorn NRD, and Nebraska Department of Environmental Control to assist. USDA Rural Development Committees for Colfax, Platte and Stanton counties, along with Lower Elkhorn NRD, take the leadership in implementing the work plan at the local level. These local rural development committees consist of the SCS conservationist and county extension advisory, ASC, and FmHA committees or boards. Lower Elkhorn NRD serves as manager to coordinate all agencies and activities in the MIP project area and is assisted by NRC.

Natural resource districts in Nebraska have authority to levy a 1-mill

tax on the value of all real property within their boundaries to perform their programs. Districts may provide funds to augment the Agricultural Conservation Program and other special ASCS projects and make direct payments to farmers for applying conservation measures and converting lands to wildlife habitat. The Lower Elkhorn NRD has been using these funds primarily to provide farmers with cost-share funds beyond the ASCS \$2,500 limitation.

Close coordination is required among agencies for monitoring and evaluating the MIP. The Nebraska Natural Resources Commission has contracted with the University of Nebraska's Institute of Agriculture and Natural Resources to conduct biological sampling and with SEA-Agricultural Research to conduct chemical water quality sampling. Collection of biological data is the responsibility of the Institute. SEA-Agricultural Research is responsible for collecting water samples, conducting laboratory chemical analysis, and storing the results on the computer for baseline and runoff event data. Establishment of monitoring sites are the responsibility of the Institute and SEA-Agricultural Research with the assistance of EPA, SCS, Lower Elkhorn NRD, and the Nebraska Department of Environmental Control. Responsibility for analysis of the data, correlation, and preparation of the report on best management practices and their impact on water quality is the responsibility of SCS and the Institute with the assistance of SEA-Agricultural Research, Nebraska Department of Environmental Control, and Lower Elkhorn NRD. The Department of Environmental Control is responsible for coordinating all monitoring and evaluation activities.



### Success of Model Implementation Program Project

Ninety-seven percent of all the landowners and operators in the MIP project area have been contacted. Thirty-seven landowners applied practices in 1978 that benefited 1,686 acres. This resulted in an estimated total annual soil loss reduction of 15,852 tons or an average reduction of 9.4 tons per acre benefited. Seventy landowners planned on doing some conservation work in 1979 that would benefit 4,000 acres and reduce soil loss by 40,000 tons. Approximately 85 percent of the Agricultural Conservation Program cost-share funds available from the national reserves was obligated in 1978. Managers of the Maple Creek MIP project have coordinated and integrated available conservation practice funds from the Nebraska Natural Resources Commission (NRC) and Lower Elkhorn NRD in the project area. Under the Nebraska Water Conservation Act of 1977 the Nebraska Water Conservation fund was established under the administration of the NRC to financially assist private landowners to apply conservation practices. Twenty-seven landowners applied to Lower Elkhorn NRD for a \$40-per-acre payment to institute conservation practices.

### Problems Associated with Model Implementation Program Project

Of all the landowners or operators contacted almost one-half of them indicated they had no interest at the present time in doing any conservation work. According to an ESCS survey of a portion of the landowners and operators in the MIP project area, few were using recommended conservation practices designed to control erosion. Most indicated they were unaware of the seriousness of soil erosion on their farms and that they were dissatisfied with the low cost-share rate (90 percent). Another



problem is the belief by some farmers that the MIP has some connection to a dam structure located in Maple Creek, which is opposed by some farmers in the area. The MIP project area is located above the dam structure.

Only about 34 percent of the ACP cost-share funds allocated from the ASCS's national reserves for 1979 have been obligated. One of the reasons for this may be the late, wet spring that hindered the construction of conservation structures. The \$2,500 limitation per farm during the first year of MIP was also a problem.

### New York

#### Description of Project Area

New York's Model Implementation Program (MIP) project area is the West Branch Watershed of the Delaware River. It is located above Cannonsville Reservoir in southeastern New York and consists of 287,224 acres (450 square miles). All land in the watershed, except for 2,702 acres located in Schoharie County, is in Delaware County. The main stream of the West Branch is about 56 miles long and flows in a southwesterly direction into the Cannonsville Reservoir. That reservoir is a large deep lake having a surface area of 4,750 acres and is about one-half mile wide and 15.3 miles long. Cannonsville Reservoir is owned and operated for public water supply by New York City.

Land uses in the West Branch Watershed are predominantly woodland (70 percent) and dairy agriculture (22 percent) with several villages and food processing industries affecting the water quality in the stream and reservoir. Total population of the watershed is approximately 15,500 and trends indicate that this will remain relatively stable. Table 6 indicates the various land uses in the MIP project area in 1975.

Table 6--West Branch Watershed, Delaware River:  
Land uses, 1975

Land uses	Acres	Percent
Cropland	40,332	14
Pasture	21,970	8
Woodland	200,544	70
Open land, formerly cropped	8,259	3
Urban and built up area	2,502	1
Other land uses	3,839	1
Water or impervious surface	9,778	3
Total	287,224	100

There were a total of 369 farms in the MIP project area in 1974, of which 352 were dairy farms. These dairy farms had approximately 17,500 milk cows and approximately 9,500 young stock for a total of 27,000. A typical dairy farm had 53 acres of cropland, 30 of hayland, 83 of pasture-land, 113 of woodland, and 8 acres for miscellaneous use for a total of 287 acres and had 50 milk cows and 27 head of young stock. Most of the dairy farms with large herds were located in the northwest portion of the watershed.

#### Practices Needed

The West Branch Watershed MIP project area is marked by a concentration of dairy farms and feedlots and large acreages of sloping cropland and forest land with erosion problems. Excessive quantities of nutrients

from the West Branch Watershed enter Cannonsville Reservoir and cause extensive algae growth, which degrades its water quality and affects the reservoir's use as a public water supply. The algae growth is so severe during the summer and early autumn months that New York City takes only small amounts of water from the reservoir during this period. Nutrient (phosphorous) enrichment of the reservoir is the critical water quality problem.

Much of the water quality problem is attributable to barnyards being located so close to the West Branch of the Delaware River. Twenty-five percent are adjacent to the stream or road ditch, 46 percent are from 0 to 200 feet, and another 20 percent are from 200 to 400 feet. Table 7 indicates the practices needed.

Table 7--West Branch Watershed, Delaware River:  
practices needed

Practices	Unit	Needed
Land treatment		
Streambank stabilization	Feet	6,210
Cropland	Acres	32,852
Pastureland	Acres	5,495
Woodland	Acres	12,032
Animal waste facilities and associated measures		
Fencing	Miles	90
Buffer strips	Acres	185
Animal waste facilities	Number	352

## Practices Installed

Top priority for conservation planning was given to those farms with high priority barnyard problems. Construction was completed on 22 animal waste management systems in 1978, 18 more were under construction, 31 were designed ready for construction, and 5 were waiting to be designed. Twelve more farmers requested SCS assistance on designing systems, but cancelled before the year's end. In addition, 40 other farmers entered into mini-long term agreements in 1978 to install management systems over the next 3 years. Table 8 indicates the practices approved and installed during 1978.

Table 8--West Branch Watershed, Delaware River: practices approved and installed, December 31, 1978

Practices	Acres served	
	Approved	Installed
Permanent vegetative cover established	749.7	607
Stripcropping system	49	30
Diversions	258	8
Crop protection cover	6.5	6.5
Sediment retention structures	30	2
Sod waterways	61	5
Animal waste facilities	111	18
Tree stand improvement	80	0
Streambank stabilization	55	2
Permanent vegetative cover on critical areas	123	0
Total	1,523.2	678.5

Forestry practices were performed with regular Agricultural Conservation Program (ACP) cost-share funds on 223 acres in the MIP project area during 1978. ACP funds were approved for work on an additional 140 acres.

Landowner Participation

One hundred and sixty-six farmers in the West Branch MIP project area are cooperators with the Delaware County Soil and Water Conservation District. After 37 of the 43 farmers in the four priority tributaries of the West Branch were visited by SCS staff, 34 of them signed up for



practices and 26 of these were for barnyard improvements. Seventy-eight percent of the high priority farmers in the highest priority tributary watershed participated during the first year of the Model Implementation Program. It appears that the most successful way to get participation is the one-to-one approach with a SCS staff member explaining the MIP and practices offered to a farmer so that the farmer can see how it relates to the individual needs of the farm.

### Financial Support

New York was originally allocated \$275,000 in ACP cost-share funds from ASCS national reserves. That amount was increased to \$304,000 by the end of 1978. In addition, the ASC State office allocated \$50,000 from its State reserves to the MIP project. A total of \$10,552 in other special ASCS cost-share funds were allocated to the MIP project in 1978.

During calendar year 1978 a total of \$354,000 in ASCS cost-share funds were obligated for work on 151 farms. Of this amount, \$169,516 was requested for 111 farmers for annual practices and \$195,036 for 40 farmers for mini-long term agreements over the next 3 years. As of December 31, 1978, \$78,834 was expended for practices performed on 78 farms. All of this is in addition to the \$115,000 in regular ACP cost-share funds allocated to Delaware County for 1978, which was all obligated.

ASCS allocated \$300,000 and \$250,000 of ACP cost-share funds to the West Branch MIP project area for Fiscal Years 1979 and 1980. Of the amount for FY 1979, approximately \$166,000 was committed by June 30, 1979. The ASC county committee agreed to accept only applications for mini-long term agreements for this money in order to reduce the number of referrals so the FY 1979 deadline for completion of MIP practices could be met and

also to provide time for completion of those practices carried over from 1978 under the program.

Cost-share rates for conservation practices on cropland have been set between 50 and 75 percent. Rates for streambank stabilization are 80 percent and those for animal waste management systems and milking center control facilities are 90 percent. The maximum cost-share rate for mini-long term agreements is 75 percent.

FmHA made one loan for a manure storage facility and one for a barnyard runoff control system. Forest Service (FS) provided \$56,000 in funds for Fiscal Years 1978 and 1979. SCS provided approximately \$54,000 worth of technical assistance to farmers in 1978.

#### Agency Participation

The Delaware County MIP Advisory Group, which developed the plan of operation, and coordinates activities at the local level, consists of representatives of the Delaware County Farm Bureau, Catskill Center for Conservation and Development, Inc., Delaware County Agricultural Stabilization and Conservation Committee, Delaware County Soil and Water Conservation District, and local USDA representatives of the Cooperative Extension Service, FmHA, ASCS, and SCS.

New York State USDA Section 208 Advisory Group, which reviewed and approved the Plan of Operation, consists of representatives from SCS, ASCS, FmHA, FS, ESCS, Science and Education Administration (SEA), and New York State College of Agriculture and Life Sciences. The New York State Department of Environmental Conservation and EPA participate in the New York State USDA Section 208 Advisory Group meetings. SCS provides the interagency coordinator at State and local levels. The NYS Department of

Environmental Conservation is responsible for monitoring and evaluating the effectiveness of best management practices on water quality.

#### Success of the Model Implementation Program Project

Innovative low-cost systems were developed through the MIP for animal waste management and are now being used on farms with high priority problems. Waste management systems provide other benefits to farmers while addressing water quality needs, such as drier barnyards, improved herd health, and less sediment in milk. Farmers who have never before participated in USDA conservation programs are requesting assistance with their barnyards and are becoming soil and water conservation district cooperators. MIP has demonstrated that an existing soil and water conservation program in a county can be modified to address identified agriculturally caused water quality problems while also addressing traditional erosion control needs. The MIP project also has improved agency cooperation and coordination at both the State and local levels.

#### Problems Associated with Model Implementation Program Project

When the MIP project started some farmers felt the program lacked flexibility. For example, the cost-share limit was set at \$2,500 and there was a 75-percent maximum cost-share rate on long-term agreements. These were two critical items since a lot of the high priority farmers had the biggest problems with the most expensive solutions and the least amount of money available to spend on conservation practices. New ASCS procedures require that ACP cost-share funds obligated in 1978 for barnyard improvements that are not constructed in 1978 have to be counted

toward the farmer's 1979 cost-share limit. Thus, if the barnyard improvement exceeds the 1979 cost-share limit of \$3,500, the farmer will be ineligible to sign up for annual conservation practices in 1979.

As it turned out the cost-share limit was a benefit since it resulted in looking more closely at some of the traditional practices that have been used to see if any changes could be made that would make the practices more cost-attractive to the farmers. For example, though there have been a few expensive manure storage systems installed, SCS has developed new standards and specifications for temporary manure storage, permitting facilities to be constructed for less than \$1,500. New alternatives are being considered for milkhouse waste problems that can be constructed for under \$2,000.

Another problem is the lack of SCS personnel to promptly implement practices and develop conservation plans. Plans for waste control management systems take a lot of time to prepare. The ASC county committee stopped taking MIP applications after June 15, 1979, to enable the SCS staff to service the referrals that had been received by that date. A second problem with constructing barnyard management systems was an insufficient number of contractors to perform the work.

Still another constraint in constructing animal management waste systems is the requirement that farmers obtain a permit from NYS Department of Environmental Conservation whenever they are doing any work in the barnyard that disturbs the banks of a protected stream, such as outletting a tile carrying water from roof gutters into a stream. This permit sometimes takes up to a month to obtain. Through the efforts of the State Soil and Water Conservation Committee, the Delaware County Soil and Water



Conservation District was able to obtain a general permit from Department of Environment Control covering all barnyard practices in the West Branch Watershed MIP project area where there is a need to outlet water into a protected stream.

Oklahoma

Description of Project Area

The Oklahoma Model Implementation Program (MIP) project area is the Little Washita River Watershed in Caldo, Grady, and Comanche counties. It is included in the planning area of the Oklahoma Statewide Section 208 Water Quality Management Plan, which is being developed by the Oklahoma Department of Pollution Control. The watershed has an area of approximately 154,270 acres (241.04 square miles) and as indicated in table 9 the land use is predominantly agricultural.

Table 9--Little Washita River Watershed: Land uses

Land uses	:	Acres	:	Percent
Rangeland	:	71,685	:	46
Pastureland	:	46,283	:	30
Cropland	:	32,116	:	21
Roads	:	3,195	:	2
Other	:	991	:	1
Total	:	154,270	:	100

Topography of most of this south central Oklahoma watershed is gently rolling hills. Surface elevations range from 1,045 feet above mean sea



level where the Little Washita enters the Washita River to approximately 1,535 feet at the northwestern boundary of the watershed. The upland area is generally well drained. The main alluvial valleys range from approximately 6,000 feet wide to less than 200 feet near the headwaters. Average annual rainfall for the watershed, depending upon the particular part of it, ranges from 31.60 to 33.26 inches. Approximately 80 percent of the rainfall normally occurs in the growing season, with April, May, and June being the wettest months.

#### Best Management Practices Needed

Water quality problems in the Little Washita River Watershed are caused primarily by sediment from eroding croplands and county roads. This results from the high variability in rainfall with corresponding fluctuations in runoff from soils that are easily eroded. Such problems are typical of much of south central Oklahoma. Other water quality problems are phosphate and dissolved nitrate, sulfate, and chloride. Oil and gas field wastes also contribute to the water quality problem.

Six percent of the pastureland (2,859 acres) needs revegetation and two percent (1,157 acres) needs critical area treatment, while 11 percent of the rangeland (8,069 acres) needs revegetation and three percent (2,454 acres) needs critical area treatment. Revegetation is needed on 12 percent of cropland (3,809 acres) and nine percent (2,977 acres) of it needs terraces. In addition, 478 erosion control structures are needed throughout the watershed. Four hundred acres of the roads are severely eroded, 665 acres moderately eroded, and 310 acres slightly eroded. At least 330 roadfills consuming almost 2 million cubic yards of earth are needed.

### Best Management Practices Installed

Best management practices performed from July 1, 1978 to June 30, 1979, with Agricultural Conservation Program (ACP) cost-share funds allocated to the MIP project area and funds from the Great Plains Conservation Program, Resources Conservation and Development Program, and flood prevention and critical area treatment programs under the Flood Control Act of 1944 are as follows:

- Conservation plans prepared -- 4,896 acres
- Conservation plans revised -- 3,699 acres
- Critical area treatment -- 412.1 acres
- Pasture & hayland planting -- 776 acres
- Waterways -- 27.1 acres
- Diversions -- 29,860 feet
- Terraces -- 12,541 feet
- Fencing for vegetative protection -- 12,226 feet
- Ponds -- 15
- Livestock water lines -- 2
- Livestock water tanks -- 3
- Erosion control structures -- 4

### Landowner Participation

The signup period for ACP cost-share funds under the MIP started on July 1, 1978. Since that time 185 landowners have requested assistance. One hundred and ninety-five individuals and groups received assistance and 152 of them applied best management practices. FmHA has assisted 680 families in the MIP project area with loans and grants.

### Financial Support

ASCS allocated \$150,000 from its national reserves to the Little Washita MIP project area for Calendar Year 1978. Of that amount, \$101,584 was obligated as of December 31, 1978. ASCS allocated \$125,000 from its national reserves to the MIP area for each Fiscal Years 1979 and 1980.

Financial assistance is also available from SCS cost-share administered

funds under GPCP, RC&D, and flood prevention and critical area treatment programs of the Flood Control Act of 1944. SCS spent \$45,112 in 1978 under GPCP and during the same year it spent \$954,609 for the construction of three watershed structures with Flood Control Act funds and \$51,668 under the same authority for critical area treatment. In 1979, \$103,000 was available under GPCP and \$55,000 under the Flood Control Act for critical area treatment.

FmHA provided \$14,215,270 for loans during FY 1978 and \$16,567,000 for FY 1979. EPA has committed \$133,000 to be used in the project area for the construction of monitoring equipment.

#### Agency Participation

The Oklahoma State USDA Section 208 Coordinating Committee, composed of representatives of SCS, ASCS, FmHA, Forest Service, Science and Education Administration-Agricultural Research, and SEA-Extension Service, is providing overall coordination for the project. Other agencies, such as EPA, Economics, Statistics, and Cooperatives Service, Bureau of Indian Affairs, Oklahoma Department of Pollution Control, Oklahoma Conservation Commission, and Oklahoma Commissioners of the Land Office, are providing assistance at the State level. Local level implementation of the work plan is being performed by the conservation district boards of directors, ASC county committees, FmHA boards, and extension advisory committees. A local coordinator furnished by SCS has been appointed to oversee the project.

#### Success of Model Implementation Program Project

One of the successes of the Little Washita MIP project has been the

integration of SCS funding under the Great Plains Conservation Program, Resource Conservation and Development Program, and Flood Control Act flood prevention and critical area treatment programs with that of the ASCS's ACP cost-share funds. Loans and grants from the FmHA have also been integrated into the MIP project. A close working relationship has also been developed between SCS and the Oklahoma Conservation Commission and the Oklahoma Department of Pollution Control. An inventory of the MIP project area has been completed by SCS and conservation districts to identify specific problems.

#### Problems Associated with Model Implementation Program Project

Implementation of the project was very slow. County development boards were late in meeting to select practices and establish cost-share levels. Even though the signup date for ACP cost-share funds was not until July 1, 1978, over two-thirds of the funds were obligated by December 31st.

#### South Carolina

##### Description of Project Area

The Broadway Lake Watershed, South Carolina's Model Implementation Program project area, contains approximately 25,196 acres and is located in Anderson County, east of the city of Anderson. Broadway Lake, which is 302 acres and located in the project area, holds a strong potential for recreation. There are currently approximately 400 farmers in the MIP project area. Individual land uses in the watershed are indicated in table 10.

Table 10--Broadway Lake Watershed: Land uses

Land uses	Acres	Percent
Pasture & hayland	8,200	32
Forest	7,000	28
Cropland	6,500	26
Other uses	<u>1/</u> 3,069	12
Water	<u>2/</u> 400	2
Total	25,196	100

1/ Includes residential, roads, recreation, and commercial

2/ Includes Broadway Lake with 302 acres

Best Management Practices Needed

Water quality problems result from erosion, sedimentation, agricultural chemicals, animal wastes, and flooding. Sedimentation has damaged the entire 302-acre lake with 80 acres determined to be completely unusable. The Broadway Lake Watershed is subject to severe water erosion, which contributes a significant amount of silt into the streams. In the lower reaches of the watershed where the slopes are relatively steep, erosion is severe, while in the upper creeks, erosion is moderate. Frequent flooding of the floodplain along Broadway Creek and its tributaries makes it uneconomical to try to manage these areas for maximum agricultural production. Consequently, the floodplain area is used for low-grade pasture, hardwood timber growth, or has been abandoned. A large area above the confluence of Watermelon and Rock creeks has become a swamp and year-round standing water is killing the hardwood stands. Table 11 indicates



the best management practices needed and the MIP project goals.

Table 11--Broadway Lake Watershed: Best management practices needed and MIP project goals

Best management practices	Unit	Needed	MIP project goal
Cover crops	Acres	2,000	1,500
Minimum tillage	Acres	2,000	1,200
Stripcropping	Acres	1,000	500
Field borders	Feet	200,000	100,000
Grassed waterways	Acres	140	110
Terraces	Miles	220	200
Diversions	Feet	40,000	30,000
Agriculture waste management systems	Number	8	8
Pasture & hayland planting	Acres	1,200	1,000
Pasture & hayland management	Acres	3,000	2,500
Farm ponds	Number	40	30
Tree planting	Acres	400	200
Timber stand improvement	Acres	5,500	1,000
Wildlife habitat development	Acres	300	200
Critical area treatment			
Field (grass)	Acres	50	43
Field (trees)	Acres	50	40
Gullies	Acres	20	10
Roadbanks	Acres	38.3	38.3
Debris basins	Number	19	19
Conservation plans	Number	251	200
Woodland examination	Number	200	100

#### Best Management Practices Installed

Prior to establishing the MIP project there were 89 farm soil conservation plans covering approximately 8,000 acres. Table 12 indicates the 1978 MIP best management practices goals and the accomplishments under the program for 1978. In addition, permanent vegetation cover improvements were performed on 516 acres in the MIP project area during the same period with regular ACP cost-share funds.

Table 12--Broadway Lake Watershed: Best management practices, MIP goals, and accomplishments, 1978.

Best management practices	Unit	MIP goal	MIP accomplishments
Cover crops	Acres	400	70
Minimum tillage	Acres	300	25
Stripcropping	Acres	100	0
Field borders	Feet	20,000	2,200
Grassed waterways	Acres	40	9.7
Terraces	Miles	30	7
Diversions	Feet	6,000	1,050
Agriculture waste management systems	Number	2	0
Pasture & hayland planting	Acres	300	180
Pasture & hayland management	Acres	500	1,543
Farm ponds	Number	6	12
Tree planting	Acres	50	11.5
Timber stand improvement	Acres	200	194
Wildlife habitat development	Acres	50	26
Critical area treatment			
Grass	Acres	10	30
Trees	Acres	10	0
Gullies	Acres	2	2
Roadbanks	Acres	9	0.5
Debris basins	Number	5	2
Conservation plans	Number	40	58
Woodland examination	Number	20	10

During the first quarter of 1979 the following conservation practices were applied:

- Cover crops -- 64 acres
- Agricultural waste management systems -- 1
- Pasture planting -- 10 acres
- Pasture improvement -- 199 acres
- Timber stand improvement -- 30 acres

#### Landowner Participation

The higher percentage payments for best management practices instituted under the MIP was a principal factor in getting farmers to apply

conservation measures in the Broadway Lake Watershed. Since the middle of April 1978, when the MIP project began, until the end of the year, SCS serviced 77 county Agricultural Stabilization and Conservation (ASC) referrals for Agricultural Conservation Program (ACP) cost-sharing assistance. During that time cost-share funds were approved by the ASC county committee for 115 farmers and work was paid for and performed for 97 farmers. SCS received 65 referrals from the ASC county committee during the first quarter of 1979 and determined there was a need with 39 of these referrals. Fifty-two farmers had ACP cost-share funds approved by the ASC county committee during the first quarter of 1979.

Of the slightly over 400 farmers in the MIP project area, SCS estimated a potential for 340 farm conservation plans. As 89 were prepared prior to establishing MIP, 251 are needed. A goal of 200 has been set for completion during the MIP duration. Goals of 40, 80, and 80 were set for 1978, 1979, and 1980, respectively, for a total of 200 conservation plans. Fifty-eight farm conservation plans were completed in 1978.

#### Financial Support

The Agricultural Stabilization and Conservation Service (ASCS) allocated \$150,000 from its national reserves to South Carolina for the Broadway Lake Watershed MIP project area in Calendar Year 1978. A total of \$106,241 in ACP cost-share funds was approved by the ASC county committee and \$87,404 was paid for work performed by the end of the year. ASCS allocated \$125,000 and \$165,000 to South Carolina for the MIP project from its national reserves for Fiscal Years 1979 and 1980, respectively. The ASC county committee approved \$51,013 in ACP cost-share funds during the first three months of 1979 for conservation work.

Special cost-share rates for the MIP project were set at 90 percent for high-priority practices. Medium-priority practices were set at 80 percent and low-priority practices at 60 percent. Regular ACP cost-share rates were at 60 percent.

EPA Region IV has provided financial support through Section 208 of the Federal Water Pollution Control Act Amendments of 1972 to assist with water quality monitoring and funds for a project coordinator (\$16,310). Also, the South Carolina Land Resources Conservation Commission received a Clean Lakes Program grant under the 1972 FWPCA amendments for \$153,365 to construct debris basins and slope and seed roadside banks. EPA's Water Planning Division in Washington provided \$4,000 to publish a MIP project newsletter. The EPA Corvallis Environmental Research Laboratory awarded a 3-year grant for \$189,474 to Clemson University's Environmental Engineering Department to evaluate the effect of best management practices on the aquatic ecosystem.

#### Agency Participation

Institutional arrangements for coordinating the MIP project involve a local coordinating committee, local advisory committee, and State coordinating committee. The local coordinating committee is responsible for developing and implementing the work plan and consists of the project coordinator, who is employed by the South Carolina Land Resources Conservation Commission, SCS soil conservationist for Anderson County, chairman of Anderson County ASC Committee, executive director for Anderson County ASC, cooperative extension agent, county supervisor of FmHA, project forester of South Carolina Commission of Forestry, and district engineer for the South Carolina Highway Department. The local advisory committee



is responsible for representing people within the MIP project area and advising the local coordinating committee of actions and activities needed. It is composed of citizens in the MIP project area.

The State coordinating committee is responsible for providing overall direction and coordination of the MIP project and is composed of agencies comprising the South Carolina State USDA Section 208 Coordinating Committee and State agencies. Those on the State coordinating committee are the SCS State Conservationist; director, Cooperative Extension Service, Clemson University; director, South Carolina Experiment Station, Clemson University; director, State ASC; State director, FmHA; deputy director, South Carolina Department of Health and Environmental Control; director, South Carolina Land Resources Conservation Commission; State forester, South Carolina Forestry Commission; and forest supervisor, U.S. Forest Service.

#### Success of Model Implementation Program Project

Over 91 percent of the ACP cost-share funds allocated to the Broadway Lake MIP project area during 1978 were obligated by the end of the year. Work has been approved during the first 3 months of 1979 for approximately 40 percent of the ACP cost-share funds allocated for that year. Coordination has been good among agencies at the local level.

#### Problems Associated with the Model Implementation Program Project

In most instances the accomplishments in 1978 did not meet the year's goals set for the MIP project area. In spite of the letters to landowners and TV and radio programs on the MIP project many farmers were still not aware of the program. Another factor that has affected landowner partici-



pation is the large amount of acreage being farmed by tenants. Most of these tenant operators rent large acreage and use large farm equipment for land preparation, seeding, and cultivation, which is not conducive to either best land management or water quality in this area of small terraced fields. It is estimated that 60 to 75 percent of the cropland in the MIP project area falls into this situation. Soybeans are the basic cash crop and they do not lend themselves to a crop rotation system where an abundance of crop residue is left on the land. Therefore, it is difficult to design a farm program and application of best management practices to bring the soil loss to an acceptable minimum level on cropland rented by operators. An additional problem was not having enough trees available for planting on forest lands during the first spring.

### South Dakota

#### Description of Project Area

The Lake Herman Watershed, South Dakota's Model Implementation Program project area, is located in Lake County, 50 miles northwest of Sioux Falls and about 2 miles west of Madison. Predominant land use in the 44,672-acre watershed is farming. Major crops are corn and small grains (75 percent) to support livestock operations, with the remaining portion (25 percent) in hayland, pasture, or covered by water. There are also a number of feedlots in the watershed.

Lake Herman, which is a natural and recreational lake, has a surface area of 1,326 acres, a mean depth of 5.6 feet, a maximum depth of 8 feet, a volume of 7,525 acre-feet, and a mean hydraulic retention line of 3.3 years. It is at the head of a chain of four lakes. Four major tributaries drain into the lake, two from the north-northwest, one from the south, and

one from the southwest. Approximately 60 percent of the shoreline is in private ownership, with the remainder being public or semipublic. Lake Herman State Park, Camp Lokodia 4-H Camp, and an Izaak Walton camp grounds are located on the lakeshore. Approximately 70 homes are located around the lake.

Water quality problems in the MIP project area are from feedlot runoff and sediment and its associated nutrients from cropland. In-lake data shows a high amount of sediment loading, which is the major water quality problem of the lake, and that biological oxygen demand (BOD) and chemical oxygen demand (COD) are quite high in the southeastern bay of the lake. It has been recommended that sediment traps be constructed on the lake's tributaries.

#### Best Management Practices Needed

Conservation land treatment has been readily accepted by landowners and operators in the watershed project area. A survey conducted prior to establishing the MIP indicated that 65 percent of the land was adequately treated. Approximately 15,750 acres needed treatment. Five sediment control dams were needed at the time of the MIP application. Table 13 indicates the best management practice goals set by the MIP for the project area.

Table 13--Lake Herman Watershed: Best management practice goals set by MIP for project area

Best management practices	Unit	MIP goal
Conservation plans (prepare)	Number	79
Conservation plans (revise)	Number	35
Terraces and diversions	Miles	40
Grassed waterways	Acres	50
Grade stabilization structures	Number	5
Sediment control structures	Number	5
Fencing	Miles	20
Contour farming	Acres	1,000
Conservation tillage	Acres	20,500
Conservation cropping systems	Acres	14,250
Cropland converted to grass	Acres	800
Feedlot waste facilities	Number	8
Field windbreaks	Miles	60
Farmstead windbreaks	Acres	100
Rotation seedings	Acres	2,000

#### Best Management Practices Installed

Best management practices installed in the MIP project area as of December 31, 1978, are as follows:

Terraces -- 7.1 miles  
 Vegetative cover in crop rotation -- 414 acres  
 Permanent vegetative cover -- 191 acres  
 Windbreaks -- 9.8 acres  
 Wildlife habitat -- 53 acres  
 Conservation tillage -- 4,878 acres  
 Sod waterways -- 0.3 acres

#### Landowner Participation

Landowner participation was low, and less than one-third of the Agricultural Conservation Program (ACP) cost-share funds allocated to the MIP project area from the ASCS national reserves were used in 1978. Landowner attendance was also low at the public hearings held with regard to

taking land for the sediment control structures, even though there was considerable publicity.

#### Financial Support

ASCS allocated \$150,000 from its national reserves to the MIP project area for Calendar Year 1978. That amount was reduced to \$48,000. As of December 31, 1978, \$47,250 in ACP cost-share funds had been obligated in the project. ASCS allocated the South Dakota MIP project area \$100,000 from its national reserves for each of Fiscal Years 1979 and 1980.

EPA has provided the South Dakota Department of Environmental Protection (SDDEP) with \$45,000 in funds to hire a full-time administrative assistant to coordinate the activities of the Lake Herman Watershed MIP and technical assistance in developing a work plan for the MIP. SDDEP was also provided \$20,000 in EPA funds to conduct a dredge study on Lake Herman. EPA's Regional office provided \$2,400 for a public information program that is being designed for the project. In addition, EPA approved a grant application in the amount of \$340,175 submitted by the Lake County Conservation District, local sponsors of the MIP, under the Clean Lakes Program of the Federal Water Pollution Control Act Amendments of 1972 for the construction of sediment control structures in the Lake Herman Watershed.

The East Dakota Conservancy Subdistrict passed a resolution of intent to grant \$15,000 to the Lake Herman Watershed MIP project area to be used as matching funds and the Old West Regional Commission agreed to supply \$100,000 to the project area to be used over a 3-year period as matching funds.

### Agency Participation

Various Federal, State, and local agencies are involved in planning and implementing this MIP project. Federal and State agencies include SCS, ASCS, FmHA, Science and Education Administration-Agricultural Research (SEA-AR), Economics, Statistics, and Cooperatives Service, Forest Service, Extension Service, EPA, South Dakota Department of Environmental Protection, South Dakota Department of Wildlife, Parks and Forestry, and South Dakota Conservation Commission. The South Dakota State USDA Section 208 Coordinating Committee, which is composed of representatives of the above USDA agencies in South Dakota, provides overall coordination of the MIP project.

Local sponsors of the MIP project (Lake County Conservation District and Lake Herman Development Association) have organized a steering committee (Lake Herman Task Force) to coordinate the project at the local level and develop plans and procedures and have hired a full-time project coordinator to assist in carrying out the project objectives and develop an efficient working relationship among the various agencies involved in the project. In addition to the above, other local agencies and personnel include the SCS district conservationist, Lake County ASC Committee, county extension agent, East Dakota Conservancy Subdistrict, and First Planning and Development District.

### Success of Model Implementation Program Project

Best management practices implemented as of October 31, 1978, bring the total treated acres needing treatment to 80 percent. That figure was 65 percent prior to establishing the MIP project. The reason for the large increase in land treatment during the first year on a small amount of money was because many of the best management practices, such as conservation



tillage, applied to a large acreage had a low unit cost. The costly practices are the sediment control dams. Local sponsors have a strong public information and education program.

#### Problems Associated with Model Implementation Program Project

A little less than one-third of the ACP cost-share funds allocated from the ASCS national reserves for 1978 were obligated by the end of that year. In spite of the strong information and education program in the MIP project area, landowner participation was low. Three reasons for this lack of participation are: (1) the \$2,500 limitation per farming unit, which represents only a small percentage of actual cost for feedlot and larger dam projects, (2) the lack of planning time given prior to receipt of the funds, and (3) the late harvest due to adverse weather conditions in 1977 (many landowners had to harvest corn in the spring, thereby lengthening the production season) and the crop rotation schedule.

#### Washington

##### Description of Project Area

The Model Implementation Program (MIP) project area in the State of Washington is a portion of the 313,000 acres of irrigated land in the South Yakima Conservation District (1,450,000 acres) located in the south central portion of the State. Irrigated cash crops predominate in the project area. This type of farming creates erosion problems on sandy loam soils and rolling terrain.

Two subbasins (Sulphur Creek and Granger) were identified as having the highest priority water quality problems associated with irrigation in the South Yakima Conservation District. The Granger Subbasin consists of

22,340 acres and 242 operating farms, and the Sulphur Creek Subbasin is 41,495 acres with 550 operating farms. The two problem areas were selected as the MIP project area on the basis of the magnitude of water quality problems and feasibility for treatment within a 3-year period under limitations of manpower and cost-sharing.

A priority area was designated in each subbasin, in order to assure effective treatment of the most critical sediment problems in the two subbasin problem areas during the MIP project, and to make good use of available manpower and other resources. Priority Area No. 1 lies entirely within the Sulphur Creek Subbasin and consists of 11,495 acres of irrigated land with 169 farms. Crops associated with a relatively high erosion hazard, such as vegetables and row crops, comprise 75 percent of the area and the remainder is pasture, hay, small grains, and fruit trees. Priority Area No. 2 lies mostly within the Granger Subbasin and is composed of 10,245 acres with 176 operating farms. Sixty-five percent of this priority area consists of vegetables and row crops and the remainder is hay, pasture, small grains, and fruit trees.

#### Best Management Practices Needed

The principal source of pollution resulting from farming practices is the suspended sediment in surface water runoff. Next in importance are the high phosphate levels in the water. A third source of pollution is the dissolved nitrogen in the irrigation return flows. This may be caused by subsurface flows which comprise an estimated 35 to 40 percent of the discharge from the Sulphur Creek Drain. Thirty-seven percent of the land in Priority Area No. 1 has slopes greater than 5 percent and 28 percent of the land in the second priority area has slopes greater than 5 percent.

Best management practices needed include irrigation water conservation, erosion control structures, sod waterways, and water management systems.

#### Best Management Practices Installed

Agricultural Conservation Program (ACP) cost-share funds were approved for best management practices on 932 acres and paid for on 253 acres where the practices were completed in 1978. Funds were approved for establishing permanent vegetation cover (114 acres), sediment retention structures (106 acres), sod waterways (11 acres), irrigation water conservation (667 acres), and water management systems (34). All of the best management practices approved and installed were in Priority Area No. 1 and they consisted principally of converting irrigation systems from the furrow to sprinkler method.

#### Landowner Participation

By the end of 1978 about 75 percent of the operators in Priority Area No. 1 had been contacted; 50 percent of them expressed some interest in the annual, long-term, or pooling agreements under the Agricultural Conservation Program. A total of 41 referrals from SCS to the ASC county committee had been approved by that date. Of the 41, 36 were for annual practices, 3 were for long-term agreements and two were for pooling agreements. Best management practices were applied by 17 operators at the year's end and best management practices were under construction by 6 more operators.

#### Financial Support

ASCS allocated \$275,000 from its national reserve to Washington for the MIP project area for Calendar Year 1978. By the end of the year best

management practices had been approved for only \$45,100 of those funds and only \$6,315 had been paid. Of the amount approved, \$24,840 was for three mini-long term agreements. ASCS has allocated Washington \$200,000 from its national reserves for each Fiscal Years 1979 and 1980.

EPA has made \$20,000 available to the Washington Department of Ecology, Washington Conservation Commission, and South Yakima Conservation District for planning and management purposes relative to the Model Implementation Program. In addition, the Department of Ecology has requested in excess of \$100,000 to be used for monitoring and evaluating the best management practices applied to solve water quality problems.

#### Agency Participation

Washington State Conservation Commission was designated the MIP planning agency and had ultimate responsibility for developing the project plan of operation. Direct guidance is provided by the Washington Department of Ecology and the Washington State USDA Section 208 Coordinating Committee.

The South Yakima Conservation District (SYCD) was designated as the management and implementation agency and is responsible on the local level for dealing with individual landowners. SYCD supervisors are responsible for implementing the plan of operation. To advise the SYCD on policy matters relative to both planning and implementation, the SYCD board of supervisors has appointed the Yakima County Section 208 Steering Committee comprised of two supervisors from SYCD, one supervisor from each of the other three conservation districts in Yakima County, the chairman of the Yakima County Section 208 Water Quality Committee, one member of the Roza Irrigation District board of directors, one representative from the Sunny-



side Valley Irrigation District, and one member of the ASC county committee.

In addition to the SYCD, three Federal and three State agencies have significant roles in the MIP project. These agencies include the SCS, ASCS, FmHA, Washington Department of Ecology, Washington State Conservation Commission, and Washington Extension Service. These six principal agencies formed an interagency technical support group consisting of one professional staff person from each agency. Functions of this technical support group are to advise the Yakima County Section 208 Steering Committee on implementing the plan of operation, provide technical advisory services to the management agency (SYCD) for the duration of the project, and facilitate continuing interagency cooperation and communication.

EPA Region X and the State SCS office interpret national MIP policy and provide necessary guidance through the Washington State USDA Section 208 Coordinating Committee to the Department of Ecology and more specifically to the Washington Conservation Commission and South Yakima Conservation District on implementing best management practices on land. Also providing technical support and advice to the Yakima County Section 208 Steering Committee and technical support group is a technical advisory committee consisting of personnel of SCS, ASCS, FmHA, Forest Service, U.S. Geological Survey, EPA, Washington Extension Service, Washington Department of Ecology, Washington Conservation Commission, and Washington Association of Conservation Districts.

#### Success of Model Implementation Program Project

The management agency has been fairly successful in getting farmers



to sign long-term agreements and pooling agreements. Approximately 30 percent (41) of the farmers in Priority Area No. 1 requested ACP cost-share funds to install best management practices during the first year and funds for those practices were approved. Agencies at the Federal, State, and local levels have established a close working relationship as the result of the MIP project. Educational and informational efforts by Washington Extension Service personnel have greatly increased local awareness of water quality problems and a willingness to correct them.

#### Problems Associated with Model Implementation Program Project

Many of the best management practices needed in the project area are concerned with changes in the irrigation system and these changes are expensive. Problems have arisen in some instances with the \$2,500 limitation on ACP cost-share funds where farmers are unable to finance the balance of the system which may be as high as \$1,000 per acre. This could have been responsible for less than one-third of the cost-share funds originally allocated to Washington in 1978 being obligated by the end of the year and could affect the expenditure of funds in 1979.

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