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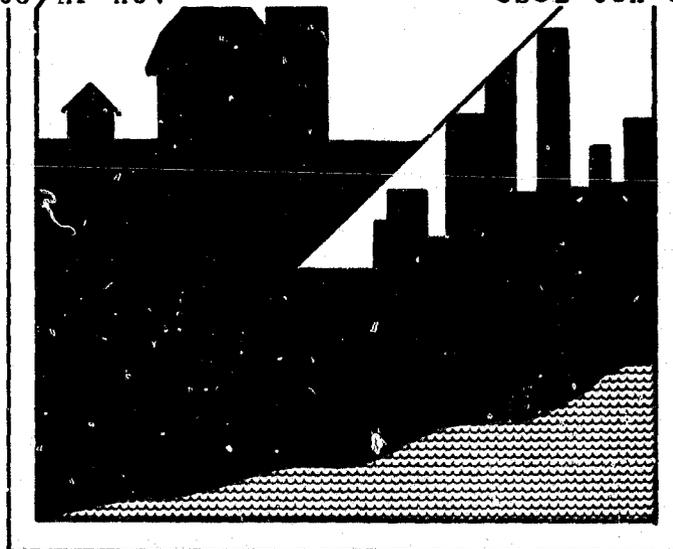
STATE SOIL EROSION AND SEDIMENT CONTROL LAWS

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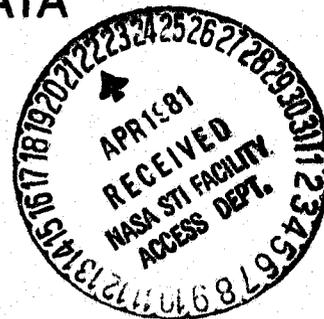
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A REVIEW OF STATE
PROGRAMS AND THEIR
NATURAL RESOURCE DATA
REQUIREMENTS



Prepared By: Susan B. Klein
Natural Resource Information Systems Project
National Conference of State Legislatures

SOIL EROSION AND SEDIMENT
CONTROL LAWS

A REVIEW OF STATE LAWS
AND THEIR NATURAL RESOURCE
DATA REQUIREMENTS

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SECTION I
INTRODUCTION

Removing sediment and other non-point pollution from the nation's waterways is an important part of the water quality improvement effort taking place under Public Law 92-500, the Federal Water Pollution Control Act as amended by the Clean Water Act of 1977 (P.L. 95-217). Section 208 (Water Quality Management) of the Clean Water Act requires development and implementation of areawide water quality management plans containing management and regulatory programs to control point and non-point source pollution. The planning process is generally referred to as "208 Planning".

Conservation districts, which are subdivisions of state governments and cover virtually all of the privately owned land in the nation, have been involved in programs designed to reduce soil erosion and related non-point pollution since their inception in the 1930's. Until recent years, such programs were voluntary, but with the emergence of new demands for clean water and a rapid shift in land use from agricultural to nonagricultural uses which have accelerated the processes of soil erosion and sedimentation, many states have enacted legislation making sediment control mandatory. The purpose of this report is to summarize state legislation providing for erosion and sediment control and define the data requirements of these programs.

Twenty states, the District of Columbia, and the Virgin Islands have enacted erosion and sediment control legislation during the past decade. These laws provide for the implementation or the strengthening of statewide erosion and sediment control plans for rural and/or urban lands. This report quotes and reviews that legislation and the state programs developed to implement these laws and extracts the natural resource data requirements of each program. The legislation includes amendments to conservation district laws, water quality laws, and erosion and sediment control laws. Also included is a summary of legislation which provides for legislative review of administrative regulations (Appendix A) and a summary of Landsat applications and/or information systems that have been involved in implementing or gathering data for a specific soil erosion and sediment control program (Appendix B). A summary of principal concerns affecting erosion and sediment control laws is also provided for in Section VI of this report.

Fifteen of the 22 erosion and sediment control programs are regulatory. All the laws contain some provision for enforcing conservation requirements, most of which involve three general types of regulatory mechanisms: (1) an approved erosion and sediment control plan required for land-disturbing activities; (2) an approved plan for issuing a permit for an activity involving land-disturbing activities; (3) requirement for compliance with established permissible soil loss limits. Some of the laws are broad, whereas others deal with specific areas of concern. Regulations established in each state are generally required to: (1) be based upon relevant physical and developmental information concerning the watersheds and drainage basins of the state; (2) include appropriate surveys to identify areas with critical erosion and sediment problems; and, (3) contain conservation standards for various types of soils and land uses which must include criteria, techniques, and methods for erosion and sediment control.

MAP 2 AUTHORITY STAMP

SECTION II

IDENTIFICATION OF STATE EROSION AND SEDIMENT
CONTROL LAWS AND THEIR PRINCIPAL PROVISIONS

EROSION AND SEDIMENT CONTROL LEGISLATION

Delaware	Erosion and Sediment Control Act Del. Ann. Code Chapter 40, Title 7, July 12, 1978
District of Columbia	Soil Erosion and Sediment Control Act of 1977 D.C. Law 223, September 23, 1977
Georgia	Erosion and Sedimentation Act of 1975 Ga. Code Ann. Secs. 5-2301a-5--2313a
Hawaii	Soil Erosion and Sediment Control Hawaii Rev. Stats. Ch. 180-C
Illinois	Soil and Water Conservation District Act S.H.A., Ch. 5, Sec. 106-138.10
Iowa	Soil Conservation Districts Law I.C.A. Sec 467A.1-467A.53
Maine	Water Pollution Abatement Licensing Program Me. H.P. 1185-L.D. 1458, Approved June 8, 1979
Maryland	Sediment Control Act Ann. Code Md., Nat. Res., Sec 8-1101--8-1108 July 1, 1970
Michigan	Soil Erosion and Sedimentation Control Act Mich. Stats. Ann Secs. 13.1820(1)-13.1820(17)
Minnesota	Soil and Water Conservation Minn. Stats. 40.01-40.15
Montana	The Natural Streambed and Land Preservation Act of 1975* R.C.M. Sec. 26-1510--26-1523
Nevada	Act Providing for the Control of Water Pollution from Diffuse Sources * Nev. Rev. Stats. Sec. 445.131 et seq.; Nev. A.B. 572 May 26, 1979
New Hampshire	Dredging Law * N.H. RSA 149:8-A
New Jersey	Soil Erosion and Sediment Control Act N.J. Stats. Ann. Sec. 4:24-17.5--4:24-55
New York	Soil and Water Conservation Law McKinneys Cons. Laws of N.Y., Book 52-B
North Carolina	Sedimentation Pollution Control Act of 1973 Gen. Stats. N.C. Secs. 113A-50---113A-66

Ohio	Agricultural Pollution Abatement and Urban Sediment Pollution Abatement Ohio HB 513, Approved Oct. 13, 1978 Page's Ohio Rev. Code Ann. Secs. 1515.01.30, .32, .33, .99, 307.79, .791; 6111.04, .44; 305.31, .32, .35, .42
Pennsylvania	The Clean Streams Laws of Pennsylvania * 35 Pa. Stats. Secs. 691.1 et. seq.
South Carolina	County Sediment Control Programs Code of Laws of S.C. Secs. 48-13-10---48-13-60
South Dakota	Act to Regulate Land-disturbing Activities Within the State, Resulting in Soil Erosion and Sediment Damage S.D.C.L. Secs. 38-8A---38-8A-21
Virginia	Erosion and Sediment Control Act Code of Va. Tit. 21, Ch.1, Secs. 21-89.1---21.89.15
Virgin Islands	Environmental Protection, Shore and Erosion Control V.I. Code Tit. 12, Secs. 531-538

*Law includes authority for erosion and sediment control among other authorities.

SUMMARY OF PRINCIPAL PROVISIONS OF STATE LAWS PROVIDING FOR EROSION AND SEDIMENT CONTROL

(A reference to the particular law will be essential for complete explanation of provisions)

PROVISIONS	Montana Territory	Montana	Nevada	New Hampshire	New Jersey	New York	North Carolina	Ohio	Pennsylvania	South Carolina	South Dakota	Virginia	Virginia Islands
TYPE OF STATE LAW													
Erosion and sediment control	X	X	X	X	X	X	X	X	X	X	X	X	X
Conservation districts					X	X		X				X	
Water quality and stream control										1			

METHODS OF CONTROL	Montana Territory	Montana	Nevada	New Hampshire	New Jersey	New York	North Carolina	Ohio	Pennsylvania	South Carolina	South Dakota	Virginia	Virginia Islands			
Approved erosion and sediment control plan required for land disturbance	X	X	X	X		X	X	X	39	X	X	2	X	26	X	X
Establishment of soil loss limits				X												
Permits on basis of an approved plan	X	X	X	X	X	36	X	X		X	23	X	X	27	X	X

RESOURCES COVERED	Montana Territory	Montana	Nevada	New Hampshire	New Jersey	New York	North Carolina	Ohio	Pennsylvania	South Carolina	South Dakota	Virginia	Virginia Islands				
Natural resources	X	X		14	17	X		X									
Land	X	X	X	X	X	X		X	X		X	25	X		X	X	X
Soil	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X
Water	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Streams and streambanks						43		X	X				X	X	X		

EXEMPTIONS FROM LAW OR FROM PENALTIES	Montana Territory	Montana	Nevada	New Hampshire	New Jersey	New York	North Carolina	Ohio	Pennsylvania	South Carolina	South Dakota	Virginia	Virginia Islands				
Agriculture and horticulture		33	X	X		44	37	X	19		33	X	X	4	X	5	X
Mining				X		X			X				X	X	X	X	
Homes or small sites			X	X	X	X	X		6					X	X		
Highways or railways				X													X
Minor land disturbances	X	X	X	X	X	X	X		X		33	X	X	4	24	X	
Cost sharing assistance unavailable	X					X	X										

STATE CONTROL AGENCY	Montana Territory	Montana	Nevada	New Hampshire	New Jersey	New York	North Carolina	Ohio	Pennsylvania	South Carolina	South Dakota	Virginia	Virginia Islands				
Participating agencies:																	
Soil and Water Conservation	X			X		X			X	X	X	X		X	X	X	
Natural Resources		34		X		X	X	X	X	X	X	X		X	X	X	
Other			30	15	18	32		38	20	9	40	42	21	29	13	9	
State responsibilities:																	
Develop policies and programs	X	X			X	X		X	X		X	X	X	X	X	X	X
Develop criteria standards, guidelines	X	X	X	16	X	X		X	X	X	X	X	X	X	X	X	X
Adopt rules and regulations	X	X		X		X		X	X	X	X	X	X	X	X	X	X
Approve local programs or plans	X	X	X		X	X		X	X	X		X	X	X	X	X	X
Perform enforcement functions	X	X	X	X		X		X	X		X	X	X	X	X	X	X
Assist local agencies with:																	
Ordinances, regulations, and programs	X		X		X	X		X	X	X	X	X	X	X	X	X	X
Enforcement			X		X	X		X	X		X	X	X	X	X	X	X
Cost sharing	X			X	X			X	X		X	22	X	X	X	X	X
Approve state and federal agency plans	X	X		X		X		X			X		X				
Adopt program if local agency fails to do so	X	X		X	X	X		X			X	X	X	X	X	X	X

NOTE: An "X" indicates that the respective law contains the provision listed, numbers refer to footnotes.

SUMMARY OF PRINCIPAL PROVISIONS OF STATE LAWS PROVIDING FOR EROSION AND SEDIMENT CONTROL

PROVISIONS	Mass. Act & Alt. Provisions	Delaware	District of Columbia	Georgia	Hawaii	Illinois	Iowa	Maine	Maryland	Michigan	Minnesota	Montana	Nebraska	New Hampshire	New Jersey	New York	North Carolina	Ohio	Pennsylvania	South Carolina	Virginia	Virginia Islands
LOCAL CONTROL PROGRAM																						
Participating local agencies:																						
Conservation districts	X	X	31	X	X	X	X	X	X	X	X	X			X	X		X	X	X	X	X
Counties	X	X		X	X	X			X	X	X	X	41		X	X	X	X	X	X	X	X
Cities	X	X		X			X		X	X	X		41		X		X	X	X		X	X
Towns or townships	X								X	X	X	X			X	X	X					

CONSERVATION DISTRICT RESPONSIBILITIES

Review and approve erosion and sediment control plans	X	X		X			X	X	X	X		X			X	X	X		X	X	26	X	X
Establish soil loss limits						X	X																
Assist county or other local agency develop ordinances or regulations		X			X				X	X	X		X		X		X						
Adopt standards, criteria, guidelines			31		X				X	X	X	X			X						X	X	
Adopt rules and regulations						X					X	X											X
Perform enforcement functions 10	X	X				X	X		X	X		12			X				X	X		X	X
Adopt an erosion and sediment control program	X	X				X			X		X							X			X	X	X

COUNTY, CITY, TOWN, OR TOWNSHIP RESPONSIBILITIES

Adopt programs	X	35							X	X		41		X	X		X		X		X	X	
Review and approve plans	X								11	X		X		X	X	X	X	X					
Adopt ordinances	X	X		X	X				X	X		X		X	X	X	X						
Issue permits on basis of approved plan	X	X	X			X			X	X				23	X		X		X			X	
Perform enforcement functions 10	X	X	X			X			X	X		X		X	X	X	X	X	X	X	X	X	X
Issue rules and regulations	X								X						X	X	X				X		

FOOTNOTES

- | | | |
|--|---|--|
| <ol style="list-style-type: none"> 1. Authorities contained in laws and regulations 2. Acceptable plan required at site of activity 3. Erosion control practices may not be required on land used for such purposes only 4. Exempted from permit requirements only 5. Except as to grading, excavating, or filling 6. Except in Calvert County 7. Within city limits 8. Department of Fish and Game 9. Department of Environmental Resources 10. May include permits, inspection, complaints, violation procedures, fines, other legal actions 11. in municipalities not within a district 12. Special provisions for emergency actions 13. Division of Soil and Water Districts 14. Air and other resources 15. Division of Environmental Protection of the Department of Natural Resources 16. Established by law 17. And other resources 18. Department of Health | <ol style="list-style-type: none"> 19. Persons engaged in agriculture who have agreements with conservation districts are not subject to site plans, land use plans, or permits, but are subject to enforcement procedures 20. Department of Agriculture 21. Secretary of Agriculture and Commissioner of Environmental Protection 22. May assist with grants 23. Certification 24. Emergency repairs 25. Agricultural land as described in the law 26. Required where district determines that an agricultural land-disturbing activity is violating adopted standards 27. Permit issuing authorities must require compliance with district standards 28. Department of Public Works 29. NC Sedimentation Control Commission 30. DC Department of Environmental Services 31. DC Agencies engaged in land disturbing activities 32. State Department of Agriculture | <ol style="list-style-type: none"> 33. Certain specified exceptions 34. Department of Natural Resources and Environmental Control 35. Political subdivisions not precluded from adopting more stringent programs 36. Waste discharge license required for discharge of any pollutant 37. For agricultural activities having an approved erosion and sediment control plan or conservation plan 38. Board of Environmental Protection 39. Initial design of project must provide measures to prevent pollution 40. State Environmental Commission 41. State Department of Conservation and Natural Resources may delegate authority as to diffuse sources (non-point) at Water Supply and Pollution Control Commission 42. Attorney General ruled that protective storm water measures may be imposed by districts under the 1970 law 43. Erosion control practices as defined in statute may not be required on agricultural land 44. Forestry |
|--|---|--|

Note: This is a revised Summary of which the original was provided by the National Association of Conservation Districts, "Nonpoint Note" No. 26, November 5, 1979

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SECTION III

MATRIX 1: COMPARISON OF STATE TRENDS TOWARDS REGULATING LAND-DISTURBING
ACTIVITIES

MATRIX 2: COMPARISON OF STATE NATURAL RESOURCE DATA REQUIREMENTS

This section compares trends between states toward regulating land-disturbing activities. The first matrix portrays whether a permit and/or erosion and sediment control plan is required before a permit to conduct the activity is granted. State standards have been set regulating the contents of the erosion and sediment control plan. These standards are developed by the state lead agency and adopted by the counties, municipalities and soil and water conservation districts. Both the state and local erosion and sediment control program and to some extent the individual's erosion and sediment control plan must be based on general natural resource data to meet the need of controlling erosion on the most fragile soils. The primary areas requiring data collection within the state programs are:

- Permit issuance
- Compliance with state standards
- Establishing soil loss limits
- Conservation plan development

The second section shows general natural resource data requirements extracted from the state regulations. An explanation of what each category entails follows this matrix.

The numerical code used in the following matrix is:

- 1 - Permit Required - regulatory
- 2 - Permit Not Required - voluntary
- 3 - Exempt from Rules and Regulations

MATRIX 1
COMPARISON OF STATE TRENDS TOWARDS REGULATING LAND DISTURBING ACTIVITIES

	DE	DC	GA	HI	IL	IA	ME	MD	MI	MN	MT	NV	NH	NJ	NY	NC	OH	PA	SC	SD	VA	VI	
Urban Activities	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1
Stormwater Runoff/Flood-water Damage	1	1	1	2	1	1	1	2	2	2	2	2	1	1	2	2	1	1	1	1	1	1	1
Forest Practices	3	3	3	1	1	3	2	2	2	2	2	1	2	2	2	2	1	1	1	1	3	3	3
Waste Discharges	1	1	1	1	1	1	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1
Minor	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Surface/Strip Mining	3	3	3	3	3	1	1	1	1	1	1	1	1	1	1	2	2	3	3	3	3	3	3
Granite Quarrying	3								3					1									
Public Road Construction			2	3	1	2	2	2	2	1	1	1	1	1	1	1	3	3	3	3	3	3	1
Shore/Bank Erosion	1	1	1	2	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Agricultural Practices (excluding harvesting or tilling)	3	2	2	1	1	3	1	2	2	2	2	2	2	2	2	2	2	1	3	1	3	3	3

MATRIX 2
STATE NATURAL RESOURCE DATA REQUIREMENTS

	DE	DC	GA	HI	IL	IA	ME	MD	MI	MN	MT	NV	NH	NJ	NY	NC	OH	PA	SC	SD	VA	VI	
Cropland Conversion	X			X	X	X				X						X				X		X	
Land Use	X		X	X	X	X		X		X			X	X	X	X	X	X	X	X	X	X	
Vegetation	X	X	X	X	X	X				X			X			X							
Soils	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Topography/ Geology	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Total Acreage Disturbed			X	X	X	X			X					X			X			X	X	X	
Critical Area	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Coastal Ecology	X	X	X				X															X	
Water	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Measuring Shorelines and Transportation Routes			X	X	X	X		X		X				X	X	X						X	
Drainage Basins/ Watersheds	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Forests							X	X		X				X								X	

MAJOR DATA CATEGORIES

A. Cropland Conversion

Pasture offers one of the greatest opportunities to increase forage production and decrease erosion. The erosion rate on cropland is substantially higher than on pastureland. Loss of pasture to cropland is, therefore, a serious threat to controlling erosion in rural areas. Monitoring the conversion is necessary to inform management agencies of the extent of the problem which could also identify critical areas in need of immediate attention.

B. Land Use

In many states, rapid shifts in land use from agricultural and rural to non-agricultural and urbanizing uses have accelerated the process of soil erosion and sediment deposition, resulting in polluted waters. Land use maps and information are necessary to determine the extent of the urbanization problem, prime farmland that should remain the same and the capacity and productivity of the land being threatened by development. Land use maps could also help determine the impact urban activities would have on adjacent land uses and water bodies.

C. Vegetation

Existing vegetation helps stabilize soil movements and should be identified and used in development activities to prevent erosion. Vegetation information is necessary in order to effect revegetation to minimize erosion and stabilize disturbed areas. Temporary vegetative cover (temporary fast growing seedlings) is effective for areas subject to erosion for up to twelve months or until the establishment of permanent vegetative cover (trees, shrubs, vines, sod, grasses, and legumes.) Permanent vegetative cover is applicable on highly eroded areas where vegetation is difficult to establish by normal seeding or planting methods.

D. Soils

Information about soils and their limitations is necessary to indicate properties important to soil stabilization. The necessary information includes:

1. type
2. depth
3. slope
4. permeability
5. erodibility factor
6. limitation for urban uses
7. sediment yield
8. soil productivity and use
9. average annual soil losses for cropland, pasture and forest

Poor soils that are identified from the soils data should be converted to pastureland to retard erosion. Soil-related information is also necessary when determining permanent vegetative cover used in controlling critical erosion problems.

E. Topography/Geology

Topographic data is necessary to provide slope information to identify natural barriers to erosion. This information can be displayed through topography/contour maps and can be used in development plans which are required to conform to topography to create the lowest erosion potential. Water bodies and location of roads can also be displayed on topographic maps.

Geologic information is necessary. It can be used to impose special conditions to prevent damage caused by erosion.

F. Total Acreage Disturbed

Determining the extent of erosion and sediment damage is necessary before control measures can be imposed. For extensively damaged areas, obtaining this information is more practicable through the application of remote sensing techniques.

G. Critical Areas and Areas With Potential for Degradation

Identifying this information is necessary to determine which areas are in immediate need of erosion control practices. Remote sensing techniques could best accomplish this task or support preliminary findings.

H. Coastal Ecology

To properly manage coastal resources and control beach erosion, several states with coastal boundaries have mandated their erosion control program to provide for erosion control measures in coastal zone areas. For this reason, information on the ecology, land use and erosion potential of these areas is necessary.

I. Water

Protecting state waters from sediment deposition is the main purpose of erosion control. Water bodies and navigable waters must be identified before strategies to control erosion and prevent pollution of state waters are undertaken. State waters already extensively damaged by sedimentation also need to be identified to direct immediate erosion control practices to damaged areas.

J. Measuring Shorelines and Transportation Routes

As frequent locations of land-disturbing activities (i.e. from forestry operations, development and waste disposal activities) streambanks, lakeshores, roadside sites, dams, reservoirs, rivers and harbors need to be monitored for extent of erosion and sedimentation damage and measured to determine the area within the state's jurisdiction subject to resource management.

K. Drainage Basins/Watersheds

The boundaries of a watershed and drainage basin need to be defined. These boundaries are used as the basis for data collection, storage analysis and retrieval.

L. Forests

Much damage to forest streams is caused by soil erosion and sedimentation during logging operations. Several states have incorporated provisions for regulating forest product harvesting operations to minimize disturbance to forest soil/cover and accelerated soil erosion and sedimentation. For this reason, forest product harvesting and reforestation operations need to be monitored to determine their impact on stream erosion. Conversion of forest land to other uses and forest road construction are also activities of special interest to resource managers.

SECTION IV

MEETING NATURAL RESOURCE DATA REQUIREMENTS

The need to acquire and use large amounts of natural resource data has led to the development of natural resource information systems in many states. These information systems bring together and organize data resources providing timely, cost-effective and objective information for decisionmaking in policy formulation and for developing and managing programs. Critical questions can be addressed with an information system by providing a formal process for collecting, storing, processing and delivering data to those who need it.

Government agencies involved in planning, developing, managing and conserving soil resources can use a natural resource information system to fulfill their statutory or administrative responsibilities in a cost-effective manner. As illustrated in Matrix 2 in section III, (State Natural Resource Data Requirements), state erosion and sediment control programs require a substantial amount of natural resource data to be acquired, analyzed and interpreted before and during program implementation. Most of the states implementing an erosion and sediment control program use soils data and other natural resource data acquired from conventional U.S. Soil Conservation Service Maps, low altitude aerial photographs and costly ground sampling techniques to meet data requirements. Eleven states (Georgia, Illinois, Iowa, Michigan, Minnesota, New Jersey, North Carolina, Ohio, South Carolina, South Dakota and Virginia) are using remotely sensed data and/or an information system to meet natural resource data requirements. With an information system, soils, topographic and geologic data acquired from field surveys and maps can be stored together with remotely sensed data (aerial photos and Landsat data tapes). The remotely sensed data, when displayed as maps and map overlays and combined with field inventory and map data, can be useful in the assessment of water quality and soil erosion problems and can determine the severity of the problem in a particular drainage basin.

The ability to access information based on geographic location is clearly advantageous because virtually all natural resource data are collected on a site specific basis. Retrieval of data is greatly simplified when an individual has the option of specifying the geographic boundaries for which data are required, thereby automatically retrieving only that information which is relevant to the area under consideration. A person studying sedimentation and stream erosion problems for a particular river could define the boundaries of a river's watershed and then request all pertinent information for that area (rainfall, soil types, land cover, etc.). Further, the data can then be displayed as maps, visually illustrating the location of various phenomena in relation to each other.

As mentioned, Landsat is an effective tool for inventorying and analyzing natural resources and is being used for this purpose by many state agencies. It is an effective means of helping to meet natural resource data requirements of state erosion and sediment control legislation. Landsat provides information efficiently on current land cover, surface water location and vegetation. Cost effectiveness and ability to monitor resources for change (global coverage is provided every eighteen days) are some of the advantages of Landsat over aerial photography and other data sources. The appropriate use of Landsat derived information with other data sources can best be achieved with the framework of a statewide comprehensive natural resource information system. "Appendix B" summarizes state applications of Landsat and/or natural resource information systems used in meeting natural resource data requirements of various conservation programs concerned with controlling non-point source pollution.

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Landsat Applications

Landsat provides the best means available to provide necessary updates of land cover data. More specifically, natural vegetation, coastal ecology, beach erosion, watershed boundaries and other surface features can be monitored. Landsat is useful for detecting changes in earth-surface features or activities. The repetitive coverage is ideal for monitoring urban expansion, deforestation, and a host of other items of interest in land resource planning and management. Changes can be detected either through manual interpretation or by means of special computer techniques.

Frequent applications of Landsat could include:

- Land Use/Land Cover Mapping
- Change Detection
- Detecting Water Pollution Sources
- Locating and Mapping Surface Water Bodies
- Detecting Coastal Land Use Change
- Measuring Shorelines
- Tracing Beach Erosion
- Crop Inventories
- Forest Harvest Monitoring
- Vegetation Mapping
- Monitoring Strip Mining and Strip Mine Reclamation
- Studying Man's Impact on Land

The above applications are also useful in helping to detect non-point pollution sources (those generated over large areas such as feed lots, agricultural fields and harvested forests).

SECTION V
STATE PROFILES

DELAWARE

TITLE: Erosion and Sediment Control Act
Del. Ann. Code Chapter 40, Title 7 Adopted July 12,
1978

LEAD AGENCY: Department of Natural Resources and Environmental
Control

STATE CONTACT: Lee Emmons, Program Manager
Division of Soil and Water Conservation
Department of Natural Resources and
Environmental Control
Tatnall Building
Dover, Delaware 19901
302/736-4411

DELAWARE'S EROSION AND SEDIMENT CONTROL PROGRAM

Introduction

Enacted in 1978, the Erosion and Sediment Control Act was a direct result of the development of a federally approved Coastal Management Program for the State of Delaware. Through the development of a more coordinated and comprehensive system for managing coastal resources, the Erosion and Sediment Control Act was passed. Directed primarily at large-scale construction projects, the Erosion and Sediment Control Act marks a milestone in the state's efforts to protect its valuable water resources.

While the Department of Natural Resources and Environmental Control is the lead agency, local units of government have primary responsibility for implementing the erosion and sediment control program. The program requires an approved and certified erosion and sediment control plan for land-disturbing activities. Unfortunately, the \$50,000 appropriated to carry out the purpose of the chapter was not funded. Hence, no programs have been implemented yet.

Major Program Features

1. The Department of Natural Resources and Environmental Control was required to develop and coordinate a comprehensive state erosion and sediment control program.

Implementation required the Department to develop and adopt, no later than six months from the effective date of the Act, regulations for erosion and sediment control. The regulations provide for escrow accounts or performance bonds to insure that any person engaged in land-disturbing activities be held financially responsible.

2. Each district in the state was required, within one year after the adoption of the state regulations, to develop and adopt a soil erosion and sediment control program consistent with the state program and regulations for erosion and sediment control. Before adopting a new or revised district program, a public hearing must be conducted.

3. After adopting a new or revised district program, the district is required to submit the program to the Department for review and approval. If a district fails to submit a program consistent with the state program within a specified period, the Department must develop and adopt its own program to be carried out by the district.

4. The Department must adopt and implement the necessary rules and regulations to carry out the policies of this Act before districts can adopt and implement local programs. Agriculture or forestry practices, or other activities on lands of less than 20 acres, are exempt during the interim program.

5. Minor land-disturbing activities and agriculture or forestry practices on lands in parcels of one acre or less, on lands with an average slope of less than 6 percent or determined by the Secretary of the Department of Natural Resources and Environmental Control not to contribute to the erosion or sedimentation problem, are exempt from the provisions of this Act. In addition, landowners occupying or operating private agriculture or forestry land are not considered to be engaged in land-disturbing activities if they are implementing an approved farm conservation plan, if they do not have available at least 50 percent cost-sharing assistance, or if they are unable to pay the private share required for participation in cost-sharing assistance are not considered to be engaged in land-disturbing activities.

6. No person may engage in any land-disturbing activity until (s)he has submitted a plan for erosion and sediment control subject to review and approval by the district. An approved plan is required for the issuance of grazing, building or other permits involving land-disturbing activities.

7. No erosion and sediment control plan will be approved unless it meets conservation standards consistent with the general Coastal Management Program's coastal water policies and statewide comprehensive erosion and sediment control program developed by the Department.

8. The General Assembly will annually appropriate to the Department a sum not to exceed \$50,000 to carry out the purpose of the chapter.

9. Any violation is subject to a civil penalty of not more than \$2,500 for each day the violation occurs. However, the extent of erosion control practices which Delaware farmers can reasonably afford is limited. Thus, the mandatory provisions apply only to those farmlands causing the most serious problems.

DISTRICT OF COLUMBIA

TITLE: Soil Erosion and Sediment Control Act of 1977
D.C. Law 2-23, September 28, 1977
24 D.C. Register No. 4, page 792

LEAD AGENCY: Department of Environmental Services
D.C. Agencies engaged in land-disturbing activities

STATE CONTACT: William Garlow, Chief
Hydraulics Control Branch
Department of Environmental Services
5000 Overlook Avenue, SW
Washington, DC 20032
202/767-7614

DISTRICT OF COLUMBIA EROSION AND SEDIMENT CONTROL PROGRAM

Legislative Policy

It is the policy of the Council of the District of Columbia in regulating land-disturbing activities mainly to prevent both accelerated soil erosion and sedimentation and sediment deposit in the Potomac River and its tributaries, including the sewer system of the District of Columbia.

Major Program Features

1. The Department of Environmental Services was required to establish minimum standards and specifications for the effective control of soil erosion, sediment deposition, and non-agricultural runoff in the District of Columbia. The District of Columbia adopted the U.S. Department of Agriculture's standards and specifications, effective November 20, 1975. The Department of Environmental Services was informed that the adoption of these standards and specifications fulfilled the aforementioned requirement. These standards are intended to protect adjoining properties from damage caused by eroding soil. Surveys have been started in the most critical areas. A soil erosion control handbook including erosion control measures that are unique to the District of Columbia has been published.

2. To engage in a land-disturbing activity on any property within the District of Columbia a person must obtain a building permit from the Department of Economic Development. Permit approval is contingent upon submitting an erosion and sediment control plan which has been reviewed and approved by the Department; the plan must show how erosion will be controlled both while the land-disturbing activity is underway and after it is completed. All DC agencies engaged in land-disturbing activities were required to develop erosion and sediment control standards and specifications consistent with those approved by the Department by March 28, 1978. Once approved, the agency involved in land-disturbing activities is required to conform to the agency's standards and specifications. The Department's Hydraulic Control Branch (Flooding and Erosion Control Section) is authorized to enforce the agency's program to ascertain compliance with the Health Regulations of the District of Columbia and the Soil Erosion and Sediment Control Act.

3. A violation of this Act is deemed a misdemeanor subject to a fine not to exceed \$300 or 10 days of imprisonment or both, for each violation or failure to comply.

4. The following are guidelines for erosion and sediment control planning in the District of Columbia adopted by the Department of Environmental Services on July 28, 1978.

- Study the development area and evaluate the soil limitations and other conditions such as topography, natural drainage, geology and accessibility.
- Select a development plan that is compatible with the site conditions.
- Identify existing features that can be used in the development to prevent erosion, such as vegetation, wildlife habitat, water areas and topsoil.
- Prepare a development plan which will minimize existing site limitations and provide for erosion and sediment control measures.
- Limit grading to areas of workable sizes so as to limit the duration of exposure of disturbed and unprotected areas. All appropriate conservation practices should be applied on the first disturbed section of land before the next section is opened up.
- Strip and stockpile topsoil for later use on areas to be stabilized by permanent vegetation. Protect the stockpiled material with mulch or temporary vegetation.
- Control runoff either by diverting or conveying it safely through the areas with structural measures.
- Install sediment basins and other appropriate erosion and sediment control structures prior to or during the first phase of land grading.
- Seed and/or sod the retention ponds for stormwater runoff, and mulch the sediment basins, diversions, waterways, and related structures immediately after they are built.
- Employ sediment traps to protect inlets or storm sewers below silt-producing areas.

GEORGIA

TITLE: Erosion and Sedimentation Act of 1975
Ga. Code Ann. Secs. 5-2301a--5-2321

LEAD AGENCY: Local governments that adopt ordinances

STATE AGENCY: Lewis Tinley, Environmental Specialist
Environmental Protection Division
Land Protection Branch
Department of Natural Resources
270 Washington Street, SW
Atlanta, GA 30334
404/656-2833

Mr. Ken Obenauf, Staff Engineer
Georgia Soil and Water Conservation Committee
PO Box 8024
Athens, GA 30603
404/542-3065 or 542-3071

GEORGIA EROSION AND SEDIMENT CONTROL PROGRAM

Introduction

Enacted in 1975 and amended in 1980, the Georgia Erosion and Sedimentation Act is directed primarily toward controlling major sediment producers (i.e. large construction such as shopping centers, subdivisions and industrial sites). The amendatory action strengthened the law which requires establishing a permitting program to control land-disturbing activities.

The law contains two unique characteristics. First, local units of government are given two options. They may adopt comprehensive programs for erosion and sediment control, or allow permitting and enforcement responsibilities to be handled by the State Environmental Protection Division. The second requires a soil and water conservation district to review all plans for erosion and sediment control. The law states that erosion and sediment control plans for each nonexempt activity be prepared and submitted with an application for a permit to the local unit of government. The plans are then forwarded to the appropriate district for determining the adequacy of the plans. After a thorough analysis, the plans are returned to the issuing authority with the district's approval or disapproval.

The districts have accepted this responsibility, and are reviewing plans much faster than the time period allowed by law. A primary reason for the district review requirement concerns cases where local units of government allow the Environmental Protection Division to handle the permit program. The district review insures review by people familiar with the local situation and problems. Ninety-two out of 159 counties have now adopted erosion and sediment

control ordinances which have been officially accepted by the Division. An additional 10 counties have adopted ordinances needing minor modifications. The Division has also accepted 150 city ordinances.

In the final analysis, Georgia's urban erosion and sediment control program, when viewed statewide, is lessening soil erosion and preventing sediment damages from construction activities. Present trends indicate an increasing rate of improvement as the program gains momentum.

Major Program Features

1. The rules and regulations, ordinances or resolutions adopted in order to comply with the Act to govern land-disturbing activities, require sound conservation and engineering practices to prevent and minimize erosion and resulting sedimentation, and which are consistent with the following requirements:

- (a) Stripping vegetation, regrading and other development activities must be conducted with care to minimize erosion.
- (b) Cut-fill operations must be kept to a minimum.
- (c) Development plans must conform to topography to create the lowest practical erosion potential.
- (d) Whenever feasible, natural vegetation must be retained, protected and supplemented.
- (e) The disturbed area and the duration of exposure to erosive elements must be kept to a minimum.
- (f) Disturbed soil must be stabilized as quickly as possible.
- (g) Temporary vegetation or mulching must be employed to protect exposed critical areas during development.
- (h) Permanent vegetation and structural erosion control measures must be installed as soon as practicable.
- (i) To the extent necessary, sediment in run-off water must be trapped by the use of debris basins, sediment basins, silt traps, or similar measures until the disturbed area is stabilized.
- (j) Adequate provisions must be provided to minimize damage from surface water to the cut face of excavations or the sloping surfaces of fills.
- (k) Cuts and fills may not endanger adjoining property.
- (l) Fills may not encroach upon natural water courses or constructed channels in a manner adversely affecting other property owners.
- (m) Grading equipment must cross flowing streams by using bridges or culverts except when they are not provided. These crossings should be kept to a minimum.

2. The governing authority of each county and each municipality was required to adopt a comprehensive ordinance establishing the procedures governing land-disturbing activities within their respective boundaries. Such ordinances were required to be consistent with the standards provided by this Act.

3. Two years after the effective date of this chapter, the Board of Natural Resources must adopt procedures governing land-disturbing activities that are conducted in counties and municipalities without an ordinance. These procedures must conform to the provisions of this Act.

4. No land-disturbing activities can be conducted without a permit. No permit can be issued unless an erosion and sediment control plan has been approved according to the provisions of this Act by the appropriate district or governing authority.

5. Exemptions: Surface mining, granite quarrying, minor land-disturbing activities, single family residence construction, agricultural practices, forestry land management practices, projects carried out under the technical supervision of the U.S. Soil Conservation Service of the U.S. Department of Agriculture, any project involving five acres or less and is more than 200 feet away from the bank of any state waters which drain a land area of at least 100 square miles, and construction or maintenance by: (a) Department of Transportation; (b) Georgia Highway Authority; (c) Georgia Tollway Authority; (d) Airport or public utilities under Public Service Commission; (e) Road construction and maintenance by counties and municipalities; and (f) Water and sewage authorities as established by the General Assembly.

6. If a county or municipality has enacted and enforced ordinances which meet or exceed the standards, requirements and provisions of this Act, that county or municipality will be certified as an issuing authority for purposes of this Act.

7. Violations are subject to a civil penalty not to exceed \$1,000 per day. (As amended through S.B. 137, the previous state enforcement provision was a fine, administered through the Water Quality Control Act, not to exceed \$25,000.) In a recent statewide assessment of the erosion and sediment control program, an interesting observation was made. It seems the success of a program is based more on the effectiveness of the inspection program than on the severity of the penalty. While violations are subject to a maximum fine of \$1,000, many units of government have exceptional inspection programs. Thus, enforcement was hardly needed and maintenance problems were rare.

8. The State Soil and Water Conservation Committee, the administrative and policymaking body of Georgia's soil and water conservation districts, initiated a comprehensive technical assistance program for Georgia citizens. This program is set up as follows:

- An Information Program which better informs Georgia's citizens of the implications and responsibilities of the law. Included are a series of presentations, television appearances and numerous newspaper articles.
- A Model Erosion and Sediment Control Ordinance to assist the local city and county governments.
- Seminars for engineers involved in land-disturbing activities.

● "A Manual for Erosion and Sediment Control in Georgia" which contains complete and easy-to-use information on designing control plans. It is a readable index that can be used by non-engineers but is issued to engineers and developers, issuing authorities, plan reviewers and the surface mining industry.

● Other publications to assist those involved with Erosion and Sediment Control:

"Georgia's Erosion and Sediment Control Law"

"On Site Erosion Control" which bridges the gap
between plan preparation and physical installation

HAWAII

TITLE: Soil Erosion and Sedimentation Act of 1974
Hawaii Rev. Stats. Ch. 180-C

LEAD AGENCY: County Governments and
Soil and Water Conservation Districts

STATE CONTACT: Jacqueline Parnell, Environmental Planner
State of Hawaii Department of Health
Environmental Health Division
PO Box 3378
Honolulu, Hawaii 96801
808/548-4362

HAWAII'S SOIL EROSION AND SEDIMENT CONTROL PROGRAM

Introduction

Preserving Hawaii's beaches and coastal ecology was the motivating factor for passing the Soil Erosion and Sedimentation Act. The Bill was enacted in 1974 in response to the Legislature's realization that sediment from urban and highway construction and unprotected agricultural land was causing damage to fish and wildlife, recreation, and navigation throughout the state. The Act is intended to assure that county ordinances provide consistent conservation standards and coverage of activities and that all state agencies comply with county ordinances. The Act does not specify that local regulatory programs be consistent with state standards outlined in Public Health Regulations, Chapter 37-B. Chapter 37-B states that the stringency of conservation technology be based on a severity rating number which represents the potential erosion and sediment problem that is caused by the particular land-disturbing activity. It also encourages each county to develop its own severity rating number system.

The 15 Hawaiian soil and water conservation districts are designated as management agencies for implementation of the erosion and sediment control component of the 208 plan for agricultural lands. These districts have agreed that comprehensive conservation programs will include a combination of approved conservation practices that can also serve as best management practices for the agricultural nonpoint source element of the state's water quality management plan. Agriculturalists also agree that water pollution is as important a problem as soil erosion. This explains the consistency between the purposes of the statewide erosion control program and the special sediment control programs for critical areas identified by the 208 program.

Major Program Features

1. The county governments, in cooperation with the soil and water conservation districts and other appropriate state and federal agencies, were required to enact ordinances for the purpose of controlling soil erosion and sediment.

2. The ordinance for erosion and sediment control was required to include a provision whereby standards shall be considered met if it can be shown that the land is being managed in accordance with soil conservation practices acceptable to the applicable district directors, and that a comprehensive conservation program is being actively pursued.

3. The counties were required to enact ordinances within one year from June 15, 1974. (all four counties have adopted ordinances.)

4. The Department of Health was required to adopt conservation standards within 90 days after passage of this Act. (Conservation standards became effective January 28, 1975.)

5. If any county or counties fail to enact soil erosion and sediment control ordinances within one year from the date of this bill, the Department of Health was required to promulgate rules and regulations within 180 days, to be effective within those counties failing to enact such ordinances.

6. The Soil and Water Conservation Districts Law authorized the districts to:

(a) provide for and encourage surveys, investigations, and research relating to soil and water conservation and to publish and disseminate such information;

(b) provide for and encourage demonstrations relative to the control and prevention of erosion and the conservation of soil and water resources, and carry out preventive and control measures on publicly owned lands within the district with the consent of the agency having jurisdiction. On all other lands the district must gain the consent of the land occupier;

(c) cooperate, or enter into agreement with, and to furnish financial or other aid to any agency or land occupier within the district, for carrying on soil and water conservation control methods and operations, subject to such conditions as the directors consider necessary;

(d) construct, improve, and maintain any structures necessary for carrying out the purposes of this Act; and

(f) develop plans for the conservation of soil and water resources and the control and prevention of erosion within the district, and to publish or bring them to the attention of district land occupiers.

ILLINOIS

TITLE: Soil and Water Conservation District Act
Ill. S.H.A. Ch. 5, Sec. 106-138.10

LEAD AGENCY: Department of Agriculture

STATE CONTACT: James F. Frank, Superintendent
Division of Natural Resources
Illinois Department of Agriculture
Emerson Building/Illinois State Fairgrounds
Springfield, IL 62706
217/782-6297

ILLINOIS SOIL EROSION AND SEDIMENT CONTROL PROGRAM

Introduction

Enacted in 1977, the Illinois Soil and Water Conservation Act is directed at both rural and urban sedimentation and erosion problems. The Act states that the prime reason for accelerated erosion and sedimentation problems resulting in pollution of the state's waters is due to rapid shifts in land use from agricultural to non-agricultural uses. Basically, the Act provides for the development of a statewide, comprehensive and coordinated erosion and sediment control program for both urban and rural lands. The intent of the erosion and sediment control program is to apply conservation practices to Illinois land to reduce soil losses from erosion to acceptable levels. This program must be based on conservation guidelines developed by the State Department of Agriculture for the purpose of implementing and administering the erosion and sediment control program. The Department has completed this phase of the program within the time period specified and, beginning in April 1980, local soil conservation districts began the process of adopting a soil erosion and sediment control program consistent with the state's guidelines. It is anticipated that once the districts adopt an approved soil erosion and sediment control program they will assume prime responsibility for implementing the program.

The program is designed to work cooperatively with those involved in land-disturbing activities, to eliminate the erosion and sedimentation problem, taking into account economic and time factors needed to eliminate problems in critical areas. Once a general understanding is reached by all involved of the soil erosion process, the problems it causes, and the funding needed, Illinois' soil erosion and sedimentation control program may be quite useful and effective.

Major Program Features

1. The State Soil and Water Conservation District's Advisory Board, consisting of seven members, was created to consult and advise with the qualified persons

necessary to assist in implementation of the erosion and sediment control provisions of this Act.

2. The Department has powers and duties to:

- (a) assist district directors in carrying out any of their powers and programs;
- (b) coordinate the programs of the several districts through advice and consultation;
- (c) consider, review and express its opinion concerning any rules, regulations, ordinances or other action of the board of directors; and
- (d) develop and coordinate a comprehensive state erosion and sediment control program, including guidelines to be used by districts in implementing this program.

3. The Department must adopt and revise guidelines for erosion and sediment control, but must hold public hearings before making final decisions.

In developing its guidelines for implementing and administering the comprehensive state erosion and sediment control program, the Department established conservation standards for various types of soils and land uses which included criteria, techniques and methods for the control of erosion and sediment resulting from land-disturbing activities. Present goals are listed below. These goals are extracted from the State Erosion and Sediment Control Guidelines for agricultural lands as adopted April 18, 1980). "T value" in this section means the average annual tons per acre soil loss a given soil can experience and still maintain its productivity over an extended period of time. Both physical and economic factors are considered.

- 1983 - 1988 - reduce soil loss standards to 4T (8-20 tons/acre/year)
- 1988 - 1994 - reduce soil loss standards to 2T (5-10 tons/acre/year)
reduce soil loss standards to T (0-5 tons/acre/year) on slopes of less than 5 percent provided this can be accomplished through conservation tillage.
- 1994 - 2000 - reduce soil losses on all land subject to this program at or below 1.5 T value
- 2000 - on reduce soil losses on all land subject to this program at or below T value.

Table 1 provides the estimated sheet and rill erosion rates and cropland erosion rates in Illinois.

Districts have the opportunity to adopt more stringent standards which will prevail for all agricultural land within the district.

4. The state erosion and sediment control program, when adopted, must be consistent and compatible with policies, procedures and guidelines established by the Illinois Department of Transportation, Division of Water Resources, under its Coastal Zone Management Program for construction along Lake Michigan.

5. Each district in the state is required, by April 1982, to develop and adopt a soil erosion and sediment control program and standards that are technically feasible, economically reasonable and consistent with the state program and guidelines developed by the Department of Agriculture. To assist in developing its programs and standards, each district will name an advisory committee of not less than eight members who are representative of a wide variety of interests.

The district must submit its program and standards to the Department for review and approval. If a district fails to adopt a program and standards and submit them to the Department by the time specified, the Department will develop an appropriate program and standards to be carried out by the district.

To carry out its program, a district is required to establish conservation standards for various types of soils and land uses. The program must include criteria, guidelines, techniques and methods for the control of erosion and sediment resulting from land-disturbing activities and must be consistent with the state's program and guidelines.

6. Any person engaged in land-disturbing activities must be encouraged to comply with the district's standards for erosion and sediment control. Land-disturbing activities relating to surface mining are exempt. Upon request, the district or the Department must supply to any one engaged in a land-disturbing activity, adequate information and technical assistance to enable that person to comply with the district's or Department's standards.

7. District programs or, if appropriate, Department programs, are required to provide for cost-sharing assistance of enduring erosion and sediment control devices, structures and practices and must specify the cost-sharing ratios, not to exceed 75 percent, which must apply. According to state agency reports, funding is being used more efficiently. In changing over the method of erosion control practices from terracing to conservation tillage, construction costs have been reduced dramatically. For example, in Illinois, it will cost \$750 million to meet soil loss tolerances with heavy reliance on conservation tillage, whereas heavy reliance on terrace practices would cost the state \$1.6 billion. The state's goal is to familiarize landowners with cost-sharing assistance for erosion and sediment control so it may adequately respond to funding needs.

8. In the interest of controlling excessive erosion on non-agricultural land and construction sites and maintaining water quality, the following principles are required to be met:

- (a) only the smallest practical area of land should be exposed at any one time during development;
- (b) exposure of land during development must be kept to a minimum;
- (c) natural features inhibiting erosion, such as trees, groves, waterways, and other similar resources, must be preserved;
- (d) the development must be fitted to the topography and soils;
- (e) temporary vegetation and/or mulching must be used to protect critical areas;

(f) permanent final vegetation and structures must be installed as soon as possible;

(g) provisions must be made to effectively accommodate the increased runoff caused by changed soil and surface conditions during and after development; and

(h) sediment must be reasonably retained on the site.

9. A person found in violation of the state's soil erosion and sediment control program has one year from the day the Notice of Violation is served to design a schedule for compliance. A formal hearing for noncompliance will be held if the schedule is not complied with.

TABLE 1

ILLINOIS EROSION INVENTORY ESTIMATE⁽¹⁾

LAND USE	EROSION RATES			CONSERVATION NEEDS		PRIME FARMLAND
	Acres	Tons Yearly	Tons Per Acre	Treatment Needed	Treatment Not Needed	Acres
				Acres		
Cropland	23,819,000	160,056,000	6.72	15,205,000	8,614,000	19,075,000
Pasture land	3,068,000	16,058,000	5.23	2,092,000	976,000	1,139,000
Forest land	3,026,000	11,817,000	3.91	2,235,000	791,000	602,000
Grazed	(600,000)	(10,281,000)	17.14	(584,000)	(16,000)	—
Not Grazed	(2,426,000)	(1,536,000)	63	(1,651,000)	(775,000)	—
Other ⁽²⁾	2,721,000	—	—	483,000	994,000	565,000
RURAL TOTAL	32,634,000	187,931,000		20,015,000	11,375,000	21,381,000

(1) Data taken from the 1977 National Erosion Inventory completed by the U.S.D.A., Soil Conservation Service. The studies, to date, provide state level accuracy for sheet and rill erosion.

(2) Conservation needs column does not include acreage (1,244,000 acres) in water areas, active mines, quarries, farmsteads, etc. This data is not now available.

CROPLAND EROSION RATES BY LAND CAPABILITY CLASS⁽¹⁾

Land Capability Class	Slope Range (Percent)	Acres	Treatment Needed (Acres)	Erosion Rates ⁽²⁾
I	0-2	4,579,000	1,962,000	3.55
II e	2-5	6,067,000	5,027,000	8.38
III e	5-15	2,138,000	1,889,000	15.79
IV e	15-20	778,000	717,000	18.62
VI e	20-30	415,000	379,000	34.93

(1) This table includes only those land capability classes where water erosion is the primary hazard.

(2) Average erosion rate in tons per acre per year for both treated and untreated cropland.

Revised 6/79

IOWA

TITLE: Soil Conservation Districts Law
I.C.A. Sec. 467A.53, amended by H.F. 2561 (1980)

LEAD AGENCY: Department of Soil Conservation
Local Soil Conservation Districts

STATE CONTACT: Lawrence G. Vance, Director
Iowa Department of Soil Conservation
Wallace State Office Building
Des Moines, Iowa 50319
515/281-5851

IOWA'S EROSION AND SEDIMENT CONTROL PROGRAM

Introduction

Agriculture is the foundation of Iowa's economy, and Iowa's citizens and legislature are very concerned about the integrity of the state's soil resources. Through a series of public hearings it was declared that the present average rate of topsoil loss from Iowa cropland is unacceptable. As a result of this determination, the Iowa Legislature enacted a comprehensive soil erosion control law in 1971. The law requires soil conservation districts to establish maximum soil loss limits for all lands within the district, and requires landowners who exceed such limits--and who are causing damage to adjacent lands--to implement practices to control the soil erosion. In the case of agricultural land, public cost-share funds must be provided if the owner is mandated to install control measures.

In 1980, the legislature amended the soil erosion and sediment control statute through the passage of H.F. 2561. This legislation, commonly referred to as the "Iowa Soil 2000", is in effect a statement of policy. The stated intent is to reduce erosion to a nondepleting level by the end of this century. Changes that strengthened the regulatory aspects of its agricultural provisions and that addressed urban erosion were enacted. New efforts will be directed to the agricultural sector with results measured at five year intervals. Districts are now required to review and approve erosion control plans before the appropriate city or county agency can issue a construction permit.

General Statement of Policy

Since Iowa's agricultural foundation is currently being undermined by critical excessive erosion of topsoil, it was determined that the prompt control of that soil erosion was in the best interest of the people of the state. Moreover, control of nonpoint source pollution of the state's rivers and lakes can be largely achieved by proper soil conservation techniques. A state policy was adopted to accomplish these goals. It included a conservation education program for all age levels, incentives for good soil management, technical assistance to agricultural landowners and operators, and a commitment to control soil erosion by the year 2000.

Program Description

A high degree of cooperation exists between the Department of Soil Conservation, the Department of Environmental Quality, Iowa State University, the Iowa Extension Service, the U.S. Soil Conservation Service and the conservation districts to establish and carry out the program. Maximum soil loss limit regulations were adopted by each district and approved by the State Soil Conservation Committee. The Soil Conservation Districts Law requires inspections to be made when a complaint is filed with the district. If excessive erosion is occurring, an administrative order is issued to require the landowner to take corrective action.

The "Iowa Soil 2000" legislative policy to control soil erosion by the year 2000 provides additional steps that should be taken, beginning in 1980 to achieve this goal. The are:

- Five-Year Objectives - Accelerate the availability of county soil survey maps and information. Each farm unit in Iowa should be provided a "conservation folder" by 1985 containing information on the topography, soil composition, natural or artificial drainage characteristics and other pertinent factors concerning a farm unit, which are necessary for the preparation of a sound and equitable conservation agreement for that farm unit.

By 1985, erosion of the most fragile soils should be controlled, which under present use and management will be depleted in 20 years. Excessive soil erosion on all farmland should be reduced by 40 percent.

Also by 1985, nonpoint pollution should be controlled on at least 12 high-priority watersheds. This would be based on the Iowa agricultural nonpoint source pollution plan.

- Ten-Year Objectives - Require each landowner or operator to keep his/her conservation folder current with soil loss rates provided by the local district. By 1990, erosion should be controlled on soil which under present agricultural use and management will be depleted in 40 years. Reduce excess erosion on all agricultural lands an additional 40 percent. Control nonpoint pollution on an additional 24 high priority watersheds.
- Fifteen-Year Objectives - By 1995, excessive erosion must be controlled on all agricultural land to a nondepleting level. Control nonpoint pollution on at least an additional 50 high priority watersheds.
- Twenty-Year Objectives - By the year 2000, Iowa should be maintaining a nondepleting level of soil loss on agricultural land and controlling sediment production on all Iowa land. Cost-effective practices should continue to be developed so that erosion is held at a nondepleting level. Control nonpoint pollution on all watersheds.

Although the law is highly regulatory, major efforts are being made to motivate landowners to voluntarily apply soil conservation measures. The voluntary program is being strengthened with the expectation that farmers will get the job done on a voluntary basis with as little regulation as possible.

This legislation, which in part was based on the state's 208 nonpoint source plan, the U.S. Soil Conservation Service's Resource Conservation Act plan and a special hearing, gets down to the farm level and puts a deadline on soil conservation. Because preservation of the soil's fertility is a vital concern to society in general, the use of public money to help achieve this objective is justified. The current rate of finding will not be adequate to implement the program on the 20-year schedule. It will be necessary to appropriate additional state and federal funds to effectively reduce soil erosion and resultant sedimentation. Table 2 illustrates the goals and accomplishments of soil conservation efforts in Iowa.

Major Program Features

1. The law provided for the formation of soil conservation districts and established the Department of Soil Conservation to perform the functions required by Iowa law.
2. The Soil Conservation Committee approves administrative rules proposed by the Department before the rules are promulgated.
3. The Department has been authorized to:
 - (a) offer assistance to the commissioners of districts in carrying out any of their powers and programs;
 - (b) render financial aid and assistance to districts for the purpose of carrying out the policy of this Act;
 - (c) review, amend and give final approval to the conservancy district plan; and
 - (d) establish and maintain an interagency coordinating committee for the purpose of preparing and disseminating recommendations for coordinating efforts to deal with water and soil management problems.
4. Districts and commissioners have the following powers and duties to:
 - (a) conduct surveys, investigations and research relating to the character of soil erosion and sediment, floodwater and sediment damages and the control measures needed;
 - (b) conduct demonstration projects of the methods by which soil resources may be conserved and soil washing may be prevented;
 - (c) carry out preventive and control measures within the district; and
 - (d) furnish financial or other aid to any agency or owner or occupier of land within the district, in carrying on erosion-control, watershed protection and flood prevention operations. Cost-sharing is authorized but not yet funded for up to 60 percent of the cost of a project including five or more contiguous farms having five hundred acres or more and constituting 75 percent of the agricultural land lying within a watershed.
 - (e) provide state cost-sharing funds totalling \$6.5 million annually to appropriate:

(1) "Iowa Till" program - \$500,000 has been allotted to implement any system that leaves crop residue covering 50 percent or more of the ground surface. The State of Iowa is funding this program to reduce erosion until permanent controls can be applied. At the same time, 60 percent of the erosion problem on agricultural land will be controlled.

(2) Wind Erosion Control Incentives - This program utilizes \$500,000 annually from the road use tax funds to acquire property rights in land for the purpose of planting and maintaining wind breaks as outlined in the Iowa Till program.

(3) Compensation for Crop Losses due to Soil Conservation Practice Installation.

(4) Fifty percent cost-share assistance for permanent practices.

(5) Seventy-five percent cost-share assistance for permanent practices installed on land above lakes that are on the state's priority list.

(6) Seventy-five percent cost-share assistance for permanent practices installed due to an administrative order.

(f) conform to the duly promulgated rules of the conservancy districts;

(g) require landowners who receive state soil conservation aid to maintain permanent practices for 20 years;

(h) encourage soil conservation education in local schools and expand public information and education efforts; and

(i) make incentive payments to encourage summer construction of permanent soil and water conservation practices providing up to 60 percent of the cost.

5. Owners of real property are required to establish and maintain soil and water conservation practices or erosion control practices.

6. Commissioners were required to adopt regulations which established soil loss limits and provide for their implementation.

7. Commissioners are authorized to inspect farmland for excess soil erosion and to take court action requiring measures to stop erosion. Any person who fails to comply with a court order within the time specified will be in contempt of court.

8. No landowner is required to establish conservation practices unless 75 percent cost-share funds have been approved, or a lesser amount set by the committee.

9. The commissioners are required to implement the following:

a. furnish each farm unit with a conservation folder by January 1, 1985;

b. complete a farm unit conservation plan by January 1, 1985 or five years after the folder is developed; and

c. must offer a soil conservation agreement with the owner within one year after completion of the conservation plan.

10. State cost-share funds will not be made available for use if no conservation agreement is in effect by January 1, 1986 or one year after the plan is completed. Farm units which have received an administrative or court order to comply with applicable soil loss limits are exempt from this restriction.

11. An approved erosion control plan is required before a permit is issued to projects engaged in land-disturbing activities. This applies only to those cities and counties with appropriate building codes and zoning ordinances. Agricultural, horticultural and forestry practices, single family residences, mining operations, public road construction, and activities disturbing less than 10,000 square feet are exempt.

12. Effective January 1, 1981, each tract of land which has not been plowed or used for growing new crops within the past 15 years is classified as agricultural land under conservation cover. Such lands plowed or used for growing row crops thereafter will be limited to 50 percent of the cost-share amount otherwise appropriated for conservation practices.

TABLE 2

Iowa Soil Conservation Goals and Accomplishments

Conservation Practice	Yrs. to Adeq. Treat	Remaining Needs	Unit	Desired Annual Rate of Progress	Application & Personnel Annual Cost	Average Annual Accomplishment	Percentage of Desired Annual Rate Accomplished
Group Plans	25	33,985	No.	1,359	\$ 293,630	658	48%
Conservation Planning	10	49,956	No.	4,996	1,618,569	2,813	56%
Conservation Tillage	10	14,972,780	Ac.	1,497,278	11,678,768	269,560	18%
Contouring	15	7,953,638	Ac.	530,224	954,376	110,201	21%
Stripcropping	20	883,161	Ac.	44,158	242,869	9,404	21%
Critical Area Planting	15	310,502	Ac.	20,700	12,916,803	21,984	106%
Pasture Planting	15	1,777,132	Ac.	118,475	9,945,566	31,476	27%
Past. & Hayl. Adeq. Trt.	20	2,318,939	Ac.	115,947	4,753,826	29,289	25%
Frmstd. & Fdlt. Windbr.	15	65,714	Ac.	4,381	1,200,392	818	19%
Tree Planting	50	381,695	Ac.	7,634	1,679,473	640	8%
Wildlife Land Adeq. Trt.	40	201,331	Ac.	5,033	1,056,932	6,340	126%
Terraces	25	6,210,000	Ac.	248,400	104,079,600	40,000	14%
Erosion Control Str.	35	67,072	No.	1,916	15,971,891	880	46%
Grassed Waterway	10	234,262	Ac.	23,426	36,263,457	5,518	24%
Ag. Waste Mgt. System	25	25,819	No.	1,033	5,759,869	27	3%
Pond	35	42,681	No.	1,219	3,847,235	527	43%
Subsurface Drains	35	1,935,173,007	Ft.	55,290,657	41,998,783	23,906,479	43%
Surface Draws	35	56,245,113	Ft.	1,607,003	1,446,303	487,468	30%
Sediment & Water Control Strs.	25	1,199,073	Ac.	47,963	24,892,795	549	1.14%
Surface Mine Rec.	30	44,174	Ac.	1,472	5,982,237	174	12%
Wildlife Upld. Hab. Mgt.	40	1,402,319	Ac.	5,033	1,956,932	12,513	249%

TOTAL ANNUAL APPLICATION AND PERSONNEL COSTS TO ADEQUATELY TREAT IOWA'S LANDS \$286,740,306

MAINE

TITLE: Water Pollution Abatement Licensing Program
ME. H.P. 1185-L.D. 1458, Approved June, 1973

LEAD AGENCY: Department of Environmental Protection
in cooperation with local soil and water
conservation districts

STATE CONTACT: Al Prysunka, Director
Division of Water Quality Evaluation and Planning
Department of Environmental Protection
State House
Augusta, Maine 04333
207/289-2591

THE WATER POLLUTION ABATEMENT LICENSING PROGRAM

In 1973, Maine enacted the Law for the Protection and Improvement of Waters which includes a licensing program for the abatement of pollution. The program is pursuant to the Federal Water Pollution Control Act as amended, and forbids the discharge, directly or indirectly, of pollutants, including sediment, into state waters unless a license has first been obtained from the Board of Environmental Protection.

Because the topsoil is very shallow, Maine's soil erosion problem is more critical than most states. Critical erosion areas are experiencing a total soil loss of up to 80 tons/acre/year with the most severe problems located on acreage planted in potatoes. At present, procedures for developing an erosion and sediment control plan or conservation plan are in draft form which will provide a framework for obtaining a variance to the water pollution abatement license provision. The plans include the necessary procedures to prevent water pollution from sediment, provided adequate financial assistance is available to implement the plan.

Several voluntary procedures have been suggested to help alleviate the erosion problem and lead to more quality control of farm operations. Farmers are encouraged to:

- (a) plant potatoes in fields having lower slope;
- (b) install irrigation practices; and
- (c) cut down and rotate acreage planted in potatoes.

Over a time period, farmers who adopt voluntary conservation practices should expect higher yields, an improvement in soil quality and an increase in yearly income due to a rise in potato prices.

Because the program is relatively new, farmers lack a general understanding of the plan. The high cost of installing conservation control systems is also a problem; incentives need to be developed to encourage farmers to comply.

Major Program Features

After conducting a public hearing, the Board of Environmental Quality was authorized to adopt, amend and repeal reasonable rules and regulations for erosion and sediment control necessary for the proper administration, enforcement, implementation and interpretation of any provision of the Water Pollution Abatement Law. The Board is required to make recommendations to each subsequent Legislature with respect to the classification of the waters and coastal flats based upon reasonable standards of quality and use. The Board must also recommend to the Legislature methods of control, abatement and prevention of pollution of the state waters. In addition, the Board is authorized to establish and conduct a continuous planning process in cooperation with appropriate federal, state, regional and municipal officers and agencies, consistent with the requirements of the Federal Water Pollution Control Act.

Draft regulations for the development of an erosion and sediment control plan have been prepared. According to these draft regulations, erosion and sediment control plans may be submitted to the applicable conservation district by either the landowner or operator. The landowner is responsible for carrying out plan requirements which must reflect at all times the current agricultural activity for which the land is being used.

The erosion and sediment control plan must describe: (1) measures to reduce soil losses on tilled agricultural land to three tons per acre per year; (2) proper animal waste management techniques to prevent surface and ground water contamination; (3) proper application of pesticides in accordance with the rules of the Pesticide Control Board; and (4) proper use of fertilizers.

A variance will be granted by the Board of Environmental Quality to those persons who meet the following conditions:

- (a) the appropriate district has recommended the erosion and sediment control plan;
- (b) the Board certifies that the plan meets the objectives of the state's water quality statutes; and
- (c) the Department determines that the agricultural activities comply with the applicable portion of the plan, or the appropriate district has certified that funds are not available to implement the applicable portion of the plan.

If agricultural activities are in non-compliance with the erosion and sediment control plan, any discharge of chemicals, rock, sand, dirt or other agricultural wastes will be in violation of the provisions of the Water Pollution Abatement Law and subject to the appropriate penalty. Any person who violates any provision of this Law will be subject to a civil penalty of not more than \$10,000 for each day of violation. Any person who willfully violates any provision of the Law will be subject to a fine not to exceed \$25,000 for each day the violation occurs.

MARYLAND

TITLE: Sediment Control Act
Ann. Code Md., Nat. Res., Sec. 8.1101 - 8.1108

LEAD AGENCY: Department of Natural Resources
Counties and Municipalities

STATE CONTACT: Roy E. Benner, Sedimentation Specialist
Maryland Department of Natural Resources
Water Resource Administration
Pawes State Office Building
Annapolis, Maryland 21401
301/269-2265

MARYLAND'S SEDIMENT CONTROL PROGRAM

Introduction

The Maryland Law enabling the creation of soil conservation districts was passed in 1937. Maryland's commitment to solving erosion and sediment control problems in urban areas formally began in 1961 when the Attorney General declared sediment to be a pollutant. The five major sources of sediment pollution in Maryland were found to be: agriculture, silviculture, construction activities, surface mining and hydraulic modifications.

More comprehensive sediment control legislation applying to construction activities was adopted in 1970. The Statewide Sediment Control Act, the first such law in the nation, became effective July 1, 1970. It authorized the Department of Natural Resources to adopt criteria and procedures for counties and local districts for the implementation of soil and shore erosion control programs. Revised standards and specifications for soil erosion and sediment control became effective in July 1975. The philosophy of the 1970 legislation is that "after-the-fact" approaches to controlling sediment are far too costly and damaging to both land and water resources. A preventative approach was chosen: Carefully designed sediment control plans were required to correlate with grading plans, assuring that erosion is controlled before serious problems occur.

It was found that even with good erosion control during development, followed by good vegetative stabilization, streams in the drainage area continued to run muddy during storms. Increased runoff resulting from urban development caused increased erosion and scouring of the once stable stream banks. The need for on-sight stormwater retention/ detention elements in sediment control programs was recognized, and on April 6, 1971 the Attorney General ruled that "protective stormwater measures may be imposed by the districts under the 1970 sediment control law." At present, the state is urging the districts and the counties to consider adopting storm-water retention as an element of local sediment control programs. The state is encouraging techniques to increase

which will be the key to eliminating or at least reducing, erosion of the streambeds and banks.

The Department of Natural Resources is responsible for overseeing the state sediment control program which requires that before land is cleared, graded, transported, or otherwise disturbed for any purposes, the proposed earth change must first be submitted to the local district for approval. In addition, each county and municipality is required by law to adopt a grading and sediment control ordinance subject to the approval of the Department. All 23 counties had adopted ordinances by the end of 1972.

A great deal of liaison, cooperation and consultation among federal and state agencies, districts, counties, cities and the private sector has been carried out to bring the total program to its present stage of implementation.

A recently completed survey conducted by the U.S. Geological Survey, partially funded by the Water Resource Administration, showed that the sediment control program resulted in improvements in grading practices and control measures. This has resulted in a 60 to 80 percent reduction in the sediment yield from construction sites between 1966 and 1974.

Major Program Features

1. A county or municipality may issue grading and building permits as required by law. No grading or building permits may be issued until the developer submits a grading and sediment control plan approved by the local district and certified to be followed.
2. Counties and municipalities have the authority and responsibility for developing the local sediment control program and the procedures and ordinances to implement and enforce it. Municipalities were required to adopt ordinances by July 1, 1972 while counties had to adopt ordinances by March 1, 1972.
3. Agricultural land management practices, construction of agricultural structures, and construction of single family residences on lots of two or more acres are exempt from the provisions of the law. (Many have questioned the exemption of agricultural practices, which may result in the development of a more regulatory approach to agricultural activities.)
4. The Department of Natural Resources has leadership in assisting local governments, including districts, in carrying out their responsibilities. It is required to review and approve all land clearing, soil movement and construction by any state or federal agency.
5. A violation is a misdemeanor subject to a \$5,000 fine or one year in prison.
6. The Water Resources Administration supervises the statewide program for sediment pollution control. The Agency assists local governments to maintain and update satisfactory sediment control programs and proposes regulations to be implemented by state agencies for construction works of improvement.

The Department is required to:

- (a) review and approve county and municipal grading and sediment control ordinances which must be consistent with the guidelines and regulations adopted by the Department;

- (b) review and approve sediment control plans in conjunction with the districts;
- (c) review operating sediment control programs;
- (d) provide inspection and enforcement authority in conjunction with local government authorities;
- (e) adopt criteria and procedures to be used by counties and local districts to implement soil and shore erosion control programs;
- (f) review and evaluate all sediment control programs every three years; and
- (g) take action needed to enforce the adoption and implementation of a county, municipality or the Washington, D.C. Sanitary Commission's grading and sediment control ordinance.

Inspection and enforcement is the responsibility of the county or municipal authority designated by the grading and sediment control ordinance. Appropriate enforcement action will be taken if the sediment control plans and grading permits are not complied with.

7. A beach erosion control district was established to maintain the Atlantic Coast beaches of the state and the integrity and continuity of the dunal system.

8. Principals of Reducing Erosion and Sedimentation from Developing Areas

- (a) Plan the development to fit the particular topography, soils, waterways and natural vegetation at a site.
- (b) Expose the smallest practical area of land for the shortest period of time.
- (c) Apply "soil erosion" control practices as a first line of defense against on-site damage.
- (d) Apply "soil erosion" control practices as a perimeter protection to prevent off-site damage.
- (e) Implement a thorough maintenance and follow-up operation.

MICHIGAN

TITLE: Soil Erosion and Sedimentation Control Act
Mich. Stats. Ann. Secs. 13.1820(1) - 13.1820(17)

LEAD AGENCY: Counties and Municipalities which have adopted ordinances

STATE CONTACT: Steve Szyszkowski, Geologist
Soil Erosion and Sediment Control Unit
Land Resources Division
Department of Natural Resources
Box 30028
Stevens T. Mason Building
Lansing, Michigan 48909
517/373-8000

MICHIGAN EROSION AND SEDIMENT CONTROL PROGRAM

Introduction

The Michigan Erosion and Sedimentation Control Act of 1972 became effective January 1, 1973. As amended in 1979, the Act focuses on controlling urban and rural erosion and sedimentation to protect the quality of the state's waters. Primary degradation of the waters of the state results from nonregulated construction practices. For this reason, a regulatory program was enacted requiring all persons engaged in land-disturbing activities to first acquire a permit approved by the appropriate enforcement agency. The rules and regulations for agricultural practices did not take effect until January 1, 1979, while rules and regulations for urban practices have been in effect since 1974.

Counties and municipalities which have adopted ordinances by July 1, 1975 have prime responsibility for administering and enforcing Michigan's erosion and sediment control program. Municipalities have the authority to administer a more restrictive program. All ordinances must be based on the unified statewide soil erosion and sediment control program developed by the Department of Agriculture which includes water quality standards developed by the Water Resource Commission.

Major Program Features

1. The Unified Statewide Soil Erosion and Sedimentation Control Program. The Department of Agriculture, with the assistance of the soil conservation districts had to prepare and submit to the Water Resource Commission for approval a unified statewide soil erosion and sediment control program. The program identified land uses which were to be governed by the Act and include recommendations, guidelines, and specifications for the control of soil erosion to prevent sedimentation of the waters of the state. The program also sets forth the means by which agricultural practices were to comply with the guidelines and specifications set forth.

The Commission was required to make available to the Department:

- (a) information on the effects of sediments on water quality and the damages of water resources that might be attributed thereto;
- (b) the location of those state waters which are degraded or have potential for being degraded by sedimentation; and
- (c) water quality standards which are required to be included in the program to protect the designated uses of the waters of the state.

2. The Water Resources Commission, with the assistance of the Department of Natural Resources was required to prepare the rules for a unified soil erosion and sediment control program by October 1, 1973. The rules provide for the review and approval of site plans, land use plans or permits relating to erosion and sedimentation control. The Commission must make notice of proposed rules for review and comment before promulgation.

3. The county is responsible for the administration and enforcement of the rules throughout the county except within a city, village or charter township that has adopted an ordinance consistent with the county's.

4. Persons engaged in agricultural practices may enter into agreement with the appropriate district to pursue such practices in accordance with the rules promulgated by the Commission.

5. A violation of the policies of this Act is a misdemeanor.

6. Logging and mining practices and the plowing or tilling of land for the purpose of crop production or the harvesting of crops are exempt from the policies of the Act.

Additional Agency Functions

A city, village or charter township may provide by ordinance for soil erosion and sedimentation control on public and private land uses within its boundaries. The ordinance may be more restrictive and must have been approved by the Commission by July 1, 1975 in order to have taken effect.

MINNESOTA

TITLE: Soil and Water Conservation Districts Law
Minn. Stats. 40.01 - 40.15

LEAD AGENCY: Soil and Water Conservation Board

STATE CONTACT: Vernon Reinert, Executive Director
Soil and Water Conservation Board
Department of Natural Resources
Box 19
Centennial Building
St. Paul, Minnesota 55155
612/296-3767

MINNESOTA SOIL AND WATER CONSERVATION PROGRAM

Introduction

Improper land use practices have caused serious wind and water erosion on the state's lands, runoff of polluting materials, increased costs to maintain agricultural productivity, increased energy costs and increased flood damage. Land occupiers have the responsibility to implement the practices which correct those conditions and to conserve the soil and water resources of the state.

It is the policy of the State of Minnesota to encourage those who occupy land to conserve the soil and water resources through the implementation of practices that effectively reduce or prevent erosion, sedimentation, siltation and agriculturally-related pollution.

Minnesota currently operates a non-regulatory erosion and sediment control program. The 1977 Soil and Water Conservation Districts Law does not require soil and water conservation districts to adopt rules and regulations to control erosion and sedimentation. The program encourages land occupiers to implement best management practices to control sediment and erosion by providing, through the districts, cost-sharing assistance up to 75 percent of the total cost for upland erosion control and agricultural waste measures. In addition, erosion and sediment control activities on streambank, lakeshore and roadside sites may be undertaken at a rate of up to 50 percent of the total cost. Up to 10 percent of the total annual appropriation may be used for technical assistance grants to districts and 5 percent for administrative costs of districts.

The Soil and Water Conservation Board has the prime responsibility for implementing the erosion and sediment control program. The Act authorizes the Board, in cooperation with local districts, to administer the cost-share program with land occupiers. To receive assistance, landowners are required to install and maintain for 10 years erosion and sediment control practices which will also protect water quality in Minnesota. Legislation proposed in the 1979-1980 legislative session may be reintroduced during the 1981 legislative

session in the hopes of establishing a regulatory program similar to Iowa's soil conservation program. If adopted, local districts will be authorized as the major regulatory authority for Minnesota's soil and water conservation program. Districts will be required to develop soil loss limits and additional funding for critical problem areas will be proposed. It has been suggested by the Executive Director of the Soil and Water Conservation Board that a regulatory program would be more successful in treating critical soil erosion, sedimentation and water quality areas.

Major Program Features

1. The Soil and Water Conservation Board is required to prepare, in cooperation with local districts and appropriate agencies, a program plan for the accomplishment of its duties. The program plan is used in decisions to allocate funds to the districts.
2. Upon receipt of grant monies, districts are responsible for making all local decisions concerning the program. Districts, after approving a project, are responsible for issuing payment.
3. The State Cost-Share Program. The State Board may allocate funds to districts to be used to share the cost of implementing erosion control and water quality improvement practices. In 1980, \$1,835,200 was appropriated to districts for solving sediment and erosion control problems. Local districts were required to update their soil conservation program before receiving state cost-share funds.

A district board may contract on a cost-share basis to furnish financial aid to a land occupier or state agency for the implementation of permanent systems for erosion control and water quality improvement. Landowners will be held liable for those funds appropriated to practices not maintained or willfully removed.

4. The Soil and Water Conservation Board has the following main powers and duties to:

- (a) offer appropriate assistance to local districts in implementing any of their powers and programs;
- (b) keep districts informed of the activities and experiences of all other districts;
- (c) coordinate the programs and activities of the districts with appropriate agencies by advice and consultation;
- (d) approve or disapprove the plans or programs of districts relating to the use of state funds administered by the State Board;
- (e) develop and implement a comprehensive public information program concerning the districts' activities and programs, the problems and preventive practices of erosion, sedimentation, agriculturally-related pollution and flood prevention;
- (f) assist in the implementation of a statewide program to inventory and classify soil types throughout the state as determined by the Minnesota Cooperative Soil Survey. It is anticipated that the soil surveys for the entire state will be completed or underway by 1990;

(g) conduct research concerning the nature and extent of erosion, sedimentation, flooding and agriculturally-related pollution, the amounts and sources of sediment and pollutants delivered to the waters of the state;

(h) develop programs to reduce or prevent soil erosion, sedimentation, flooding and agriculturally-related pollution;

(i) develop a priority system within the state to identify critical areas; and

(j) ensure compliance with statewide programs established by the State Board.

5. Soil and water conservation districts have been granted the power to:

(a) conduct surveys, investigations and research to identify problems and preventive practices;

(b) conduct erosion and sediment control demonstration projects;

(c) implement necessary practices for any purpose specified in this Chapter;

(d) enter into agreement with land occupiers or appropriate agencies to furnish financial or other aid;

(e) construct and maintain structures necessary for the performance of operations authorized under this Chapter; and

(f) develop and revise a comprehensive plan specifying the practices to implement the state policy.

MONTANA

TITLE: The Natural Streambed and Land Preservation Act of 1975
R.C.M. Sec. 26.1510--26.1523

LEAD AGENCY: Soil Conservation Districts

STATE CONTACT: Ole M. Ueland, Administrator
Conservation Districts Division
Department of Natural Resources and Conservation
32 South Ewing
Helena, Montana 59601
406/449-5640

MONTANA'S EROSION AND SEDIMENT CONTROL PROGRAM

Introduction

The Montana Soil Conservation Districts Law was enacted in 1939. The Act provides for a policy of preserving the natural or existing shape, form and course of streams, and in so doing to keep erosion and sedimentation to a minimum. It provides for the creation of soil conservation districts, spells out the powers of districts and supervisors, includes a provision for the adoption of land use regulations, and describes cooperation between districts and state agencies. Cities and towns were originally excluded from districts but about half of them have now voted to be included.

In 1975, the Montana Legislature passed the Natural Streambed and Land Preservation Act (S.B. 310). This law requires districts to review and approve all non-governmental proposed projects affecting perennial streams. Any project engaged in by any person without prior approval is declared a public nuisance and subject to proceedings for immediate abatement. When a district receives notice of a proposed project, the Department of Fish and Game (DFG) is notified. If the DFG or district requests it, a review "team" consisting of representatives of the district, DFG, and the private landowner examines the site of the proposal.

In 1975, the state received a grant from the Environmental Protection Agency (EPA) to obtain information needed to build a successful program of erosion, sediment and related non-point source pollution control. Included in the review of erosion and sediment activities in Montana for this study is an examination of the regular district program, activities under S.B. 310, and the EPA-sponsored statewide sediment control study in relation to manpower requirements and education and training needs.

Major Program Features

1. A person planning to engage in a project is required to present written notice before beginning any portion of the project.

2. By July 1, 1975, the Board of Natural Resources and Conservation, after consulting with the association of conservation districts, was required to adopt rules setting minimum standards and guidelines for the purposes of the Act.

3. By January 1, 1976, the districts were required to adopt by resolution, after holding a public hearing, rules setting standards and guidelines for projects and exclusions within their districts, which are required to be consistent with the Board's standards. All 59 districts have adopted standards in this manner.

4. Any person initiating a project without written consent is guilty of a misdemeanor subject to a fine of not less than \$25 nor more than \$500, for each day the violation occurs. In addition, that person committing the violation must restore the damaged stream to as near its previous condition as possible. Any person who violates the time provisions of this Act is guilty of a misdemeanor and is subject to a \$5 fine per day.

5. Activities correcting the interference of the delivery of water under a valid water right or use permit and the removal of debris from a stream channel are exempt from the provisions of this Act provided such activities do not alter the existing stream channel or constitute a proposed project.

6. If a project requires modification or alterations from the original project plan, a percentage of the cost of those modifications or alterations will be assigned to the project participant.

Renewable Resource Development Grant

The Montana Department of Fish, Wildlife and Parks (DFWP) applied to the Department of Natural Resources and Conservation for a grant from the Renewable Resources Development Clearance Fund for the purpose of funding a streambank preservation program. The purpose of this program is to preserve stream habitats by financially assisting landowners in the design, planning, construction or alteration of streambank projects.

The 1979 Montana Legislature, through HB 824, appropriated \$100,000 for the streambank preservation program for the biennium ending June 30, 1981.

House Bill 824 appropriated the money to the Department from the Renewable Resource Development Clearance Fund account and required the execution of an agreement between the Department and the DFWP, governing the administration and disbursement of funds.

Eligibility is limited to land occupiers as defined in the Soil Conservation Act. Projects with greatest benefit to public fisheries, water quality, soil conservation, public access and human life are given priority. Financial assistance may be provided for costs of design, planning and construction of projects that are hydrologically sound, are in the best long-term interest of the people of Montana, and will protect other associated resources and also solve the problems of the project. The state's share is limited to \$5,000 per individual project sponsor.

NEVADA

TITLE: Act Providing for the Control of Water Pollution From Diffuse Sources
Nev. Rev. Stats. Sec. 445.131 et seq.; Nev. A.B.572,
May 26, 1979

LEAD AGENCY: Counties and Municipalities

STATE CONTACT: Wendell McCurry, Water Quality Officer
Environmental Protection Division
Department of Conservation and Natural Resources
201 S. Fall Street
Capitol Complex Room 221
Carson City, NV 89710
702/885-4670

NEVADA WATER POLLUTION CONTROL PROGRAM: CONTROL OF DIFFUSE SOURCE POLLUTANTS

Introduction

Nevada's program for pollution control of diffuse sources is part of the State Water Pollution Control Program. The law enables Nevada to encourage and promote waste collection and pollution control methods for all significant sources of water pollution including point and diffuse sources to maintain the quality of the waters of the state. It was enacted in 1973. In 1979, legislation was adopted giving the State Environmental Commission authority to enact diffuse source regulations as part of the Water Pollution Control Program.

"Diffuse source" means any source of water pollution, including sediment from the erosion of soils, which is diffused to the extent that it is not readily discernable and cannot be confined to a discrete conveyance. The term is intended to be equivalent to the term "nonpoint source" as used in the federal statutes and regulations. Local interest from the farming and ranching community during the State "208 Planning" process, and legislative concern over compliance with the water quality standards of the Water Pollution Control Program helped trigger diffuse source legislation. This legislation authorized the counties and municipalities to prescribe controls for diffuse sources provided they have the staff and funds to do so. Initially, controls on diffuse sources will be implemented as a voluntary program. If unsuccessful, a mandatory program will be considered.

Major Program Features

1. The Environmental Commission has the exclusive power to promulgate rules and regulations to carry out the provisions of the Act including standards of

water quality and amounts of waste which may be discharged into water. Before adopting any regulation, the Commission is required to hold a public hearing.

2. The Department of Conservation and Natural Resources was designated as the state water pollution control agency. It has the authority to develop comprehensive plans and programs for preventing, reducing or eliminating pollution.

3. The Commission was required to establish water quality standards by July 1, 1973. The water quality standards had to be based on water quality criteria which numerically or descriptively defined the conditions necessary to maintain the designated beneficial use(s) of the water. The water quality standards must reflect water quality criteria which define the conditions necessary to support, protect and allow the propagation of fish, shellfish and other wildlife and to provide for recreation in and on the water if these objectives are reasonably attainable.

4. The Environmental Commission may prescribe controls for diffuse sources for:

(a) any diffuse source existing on July 1, 1979, if the Department determines that the source is significantly causing or adding to water pollution in violation of a water quality standard;

(b) any diffuse source created after July 1, 1979, if controls are necessary to prevent the degradation of any water of high quality in the waters of the state.

5. The Department of Conservation and Natural Resources will delegate administration of the Department's controls of diffuse sources to any county or city provided that the Department finds the county or city has the necessary money and staff to administer the program effectively.

6. Provisions concerning diffuse sources are exempt from the regulatory provisions of the Act, and are not subject to the penalties imposed upon persons who violate provisions concerning point sources of pollution.

NEW HAMPSHIRE

TITLE: Dredging Law
NH RSA 149:8-A

LEAD AGENCY: Water Supply and Pollution Control Commission
Municipalities with adopted ordinances

STATE CONTACT: Fred Alkind, Sanitary Engineer
Water Supply and Pollution Control Commission
PO Box 95
Hazen Drive
Concord, NH 03301
603/271-3503

NEW HAMPSHIRE DREDGING LAW

The New Hampshire law enabling the control of pollution of the state's waters was enacted in 1947. The Water Pollution and Disposal of Wastes Act (Chapter 149) authorized the New Hampshire Water Supply and Pollution Control Commission to administer and enforce an abatement program for all sources of pollution within the state.

In 1972, the Dredging Law was added to Chapter 149 providing for the control of (1) land-disturbing activities in or on the border of the surface waters of the state and (2) projects significantly altering the characteristics of the terrain. The Law requires those persons engaged in such activities to submit detailed plans concerning the proposal to the Commission. The Commission is required to review these plans before a permit to conduct a land-disturbing activity is issued.

Initial determination to develop more detailed regulations based on the 1972 Dredging Law came out of the state's 208 impetus on water quality control. The Commission was expected to take further action on proposed regulations in July 1980.

The citizens of New Hampshire are very concerned about the issues dealing with the quality of the state's waters. The public is also aware of the effects soil erosion and sediment have upon water quality. Unfortunately, the cost of control methods and a limited tax base (New Hampshire has no state sales or income tax) has somewhat limited the scope of the entire Water Pollution Control Program.

NEW JERSEY

TITLE: Soil Erosion and Sediment Control Act
N.J. Stats. Ann. Sec. 4:24-17.5---4:24-55
State Soil Conservation Committee

LEAD AGENCY: State Soil Conservation Committee
Soil Conservation Districts
Municipalities

STATE CONTACT: Sam Race, Coordinator
Soil and Water Conservation Services
Division of Rural Resources
New Jersey Department of Agriculture
PO Box 1888
Trenton, NJ 08625
609/292-5541

NEW JERSEY EROSION AND SEDIMENT CONTROL PROGRAM

Introduction

New Jersey's Soil Erosion and Sediment Control Act is supplemental to Chapter 24, the New Jersey Soil Conservation Law of 1937, which provides for the conservation of the soil and soil resources of New Jersey and for the control and prevention of soil erosion. The original 1937 law laid out the groundwork for controlling soil erosion. It established the State Soil Conservation Committee and the Soil Conservation Districts to carry out the functions of the law, of which the primary one is the development of comprehensive plans for the conservation of soil resources and for the control and prevention of soil erosion. The program is intended to reduce the danger from stormwater runoff, retard nonpoint pollution from sediment and conserve and protect the resources of the state.

Under the new law, the State Soil Conservation Committee is required to issue standards and rules for controlling soil erosion and sedimentation. Before any municipality can issue a construction permit for a land-disturbing activity, the local soil conservation district must approve a soil erosion and sediment control plan submitted by the developer. The plan must conform to the state standards.

The New Jersey Soil Erosion and Sediment Control Act is aimed primarily at preventing urban soil erosion and sedimentation. New land-disturbing activities that require approval of a soil erosion and sediment control plan include: (1) demolition of one or more structures; (2) construction of a parking lot; (3) construction of a public facility; (4) operation of any mining or quarrying activity; and (5) clearing or grading of any land for other than agricultural or horticultural purposes. The bill requires any person engaged in a land-disturbing activity that does not call for a state or

local government permit to submit and receive approval of a soil erosion and sediment control plan from the local soil conservation district. Projects undertaken by the Department of Transportation do not require such approval, but must comply with standards set jointly by the Department of Transportation, the Department of Environmental Protection, and the State Soil Conservation Committee. They must also be endorsed by the soil conservation district.

Major Program Features

1. The State Soil Conservation Committee has the power to formulate, promulgate, amend and repeal standards for the control of soil erosion and sedimentation.
2. Approval by the state, county, municipality or instrumentality, of an application for development for any project, is contingent upon certification by the local district of a plan for soil erosion and sediment control. Those municipalities adopting ordinances which conform to state standards and have obtained approval from the State Soil Conservation Committee, are exempt from district jurisdiction. Of 567 municipalities, 85 have chosen to adopt soil erosion and sediment control ordinances.
3. Regulations apply to land-disturbing activities of 5,000 square feet of surface area or more, with the exception of all minor disturbances conducted on single family residences that are not part of a subdivision.
4. Any person who violates any of the provisions of this Act or fails to comply with the provisions of a certified plan is liable to a penalty of not less than \$25 nor more than \$3,000.

Rules and Regulations

1. The Committee has the authority to offer assistance to the district supervisor in carrying out any of its powers and programs.
2. The districts may:
 - (a) conduct surveys, investigations, and research relating to the character of soil erosion and the preventive and control measures needed;
 - (b) conduct projects in order to demonstrate methods of soil erosion control;
 - (c) carry out preventive and control measures within the district;
 - (d) furnish financial or other aid to any agency or landowner within the district to carry out erosion control and preventive operations within the district;
 - (e) develop comprehensive plans for the conservation of soil resources and for the control and prevention of soil erosion within the district; and
 - (f) formulate regulations governing the use of lands within the district in the interest of conserving soil and soil resources and preventing and controlling soil erosion. Districts are required to conduct public meetings and hearings on tentative regulations and objections by owners of 25 percent or more of land within the district.

3. Regulations to be adopted by the districts can include:

- (a) provisions requiring the construction of terraces, terrace outlets, check dams, dikes, ponds, ditches, and other necessary structures;
- (b) provisions requiring observance of particular methods of cultivation including contour cultivating, contour furrowing, lister furrowing, sowing, planting, strip cropping, seeding, and planting of lands to water-conserving and erosion-preventing plants, trees and grasses, forestation and reforestation;
- (c) specifications of cropping programs and tillage practices to be observed;
- (d) provisions limiting the cultivation of highly erosive areas or of areas on which erosion may not be adequately controlled if cultivation is carried on; and
- (e) provisions for such other means, measures, operations and programs as may assist conservation of soil resources and prevent or control soil erosion in the district.

NEW YORK

TITLE: Soil and Water Conservation Districts Law
McKinneys Cons. Laws of NY, Book 52-B

LEAD AGENCY: State Soil and Water Conservation Committee

STATE CONTACT: Bill Croney, Executive Secretary
State Soil and Water Conservation Committee
Cornell University, 142 Emerson Hall
Ithaca, NY 14853
607/256-4420

NEW YORK'S SOIL AND WATER CONSERVATION PROGRAM

Introduction

New York's Soil and Water Conservation Law is directed primarily at rural erosion and sediment control and the conservation of the soil and water resources of the state. Most soil and water conservation districts maintain that water quality control is a high priority, with streambank erosion a main concern.

While agriculture is the single largest industry in New York State (NYS), agricultural activities (mostly dairy and hay production) are not considered a significant contributor to nonpoint source pollution. The need for control of urban land-disturbing activities has decreased because NYS is no longer undergoing extensive urban expansion. Rural areas are now increasingly aware of the need for preserving agricultural land for the production of food and other agricultural products.

The soil and water conservation districts law requires the State Soil and Water Conservation Committee to develop a policy on soil and water conservation to be administered and enforced by the districts. The districts are required to provide a soil and water conservation plan to landowners within the district by January 1, 1985, and to other owners or occupiers of land by January 1, 1987. Comprehensive plans developed by the district for the conservation of soil and water resources must meet Committee approval.

Major Program Features

1. The State Soil and Water Conservation Committee was established to carry out the functions of the law.
2. The districts are authorized to:
 - (a) conduct surveys, investigations and research relating to the character of soil erosion and floodwater and sediment damages, and the preventive and control measures needed;

- (b) carry out preventive and control measures within the districts;
- (c) cooperate to furnish financial or other aid to any agency or occupier of lands within the district, in carrying out erosion control, flood prevention and sediment damage prevention operations and land use adjustments;
- (d) develop comprehensive plans for the conservation of soil and water resources and for the control and prevention of soil erosion, the prevention of floodwater and sediment damages and for agriculture water management within the district. Every owner or occupier of agricultural land is required to apply to the appropriate district for a soil and water conservation plan for the land under his/her ownership or control.

Soil Capability and Productivity Land Classification System

The 1971 NYS Agricultural Districts Law provided for an Agricultural Value Assessment (AVA). Since its onset in 1971, the implementation of the AVA has greatly improved.

In April of 1980, the NYS Legislature adopted a land classification system based on soil resources and soil characteristics related to agricultural productivity. The program involves developing a procedure for placing a relative value on agriculture land based on the National Cooperative Soil Survey and soil capability and productivity of the agricultural land in NYS.

The process of developing an AVA consists of using the land classification system, grouping soils and applying dollar values to each category within the system. The soil and water conservation districts were recommended to have the lead in developing the farm-by-farm soil information necessary for this system. This information is a component of the farm conservation plan administered by the districts through the Soil and Water Conservation Districts Law. It is anticipated that soils on all agricultural land in NYS will be mapped by 1985.

In addition to basing the AVA on the National Cooperative Soil Survey, it was recommended that:

- (1) mineral soil classification be based on productivity index and capability class;
- (2) organic soil will be based on depth, drainage and flood protection; and
- (3) the state be divided into climate regions based on number of frost-free days.

NORTH CAROLINA

TITLE: Sedimentation Pollution Control Act of 1973
Gen. Stats. NC Secs. 113A-50--113A-66

LEAD AGENCY: North Carolina Sediment Control Commission
Local governments

STATE CONTACTS: Stephan G. Conrad, Director
Division of Land Resources
Department of Natural Resources and Community Development
PO Box 27687
Raleigh, NC 27611
919/733-3833

NORTH CAROLINA'S EROSION AND SEDIMENT CONTROL PROGRAM

Introduction

Sediment is a major pollutant in North Carolina. In 1973, the state enacted the Sedimentation Pollution Control Act directed toward preventing the pollution of state waters through the control of major sediment producers, primarily construction sites and road maintenance.

The Erosion and Sediment Control Program is administered and enforced by the North Carolina Sediment Control Commission. The Commission (or local government, with the Commission's guidance and approval), is authorized to develop, promulgate and administer a comprehensive erosion and sediment control program which is required to include mandatory standards for land-disturbing activities. Each local government program requires the submission of an approved erosion control plan for all privately funded land-disturbing activities subject to review by both the local government and the appropriate soil and water conservation district. The Commission has exclusive jurisdiction over government-funded construction projects with regard to enforcement of erosion and sediment control.

An important factor in the success of North Carolina's mandatory Erosion and Sediment Control Program is the high degree of cooperation between the state and the contractors and home builders involved in land-disturbing activities. This cooperative environment has enabled the agencies involved in sediment pollution control to administer their program through educational efforts; where voluntary compliance is not obtained, the law is enforced by the state through civil penalties and injunctive relief.

Major Program Features

1. To implement the comprehensive state erosion and sediment control program, the Sediment Control Commission was required to develop and adopt on or before

July 1, 1974, rules and regulations for the control of erosion and sedimentation resulting from land-disturbing activities. Before adopting or revising any rules and regulations, public hearings were required on the proposed actions.

2. In implementing the erosion and sedimentation control program, the Commission is authorized to:

(a) assist and encourage local governments in developing erosion and sediment control programs, develop a model local erosion control ordinance and approve or disapprove local plans;

(b) assist and encourage other state agencies to develop erosion and sediment control programs;

(c) develop recommended methods for control of sedimentation.

3. To assist the Commission in developing the erosion and sediment control program, the Commission is authorized to appoint an advisory committee consisting of technical experts in the fields of water resources, soil science, engineering and landscape architecture.

4. Mandatory Standards for Land-Disturbing Activity: (a) No land-disturbing activity during periods of construction or improvement to land will be permitted in proximity to a lake or natural watercourse, unless a buffer zone is provided along the margin of the watercourse to confine visible siltation within 25 percent of the buffer zone nearer the land-disturbing activity. Land-disturbing activities in connection with the construction of facilities on, over, or under a lake or natural watercourse are exempt.

(b) The angle for grading slopes and fills cannot be greater than the angle which can be retained by vegetative cover or other adequate erosion control devices or structures. Slopes left exposed must, within 30 working days of completion of any phase of grading, be planted or provided with ground cover, devices, or structures sufficient to restrain erosion.

(c) Whenever land-disturbing activity is undertaken on a tract comprising more than one acre, if more than one contiguous acre is uncovered, a ground cover sufficient to restrain erosion must be planted or otherwise provided within 30 working days on that portion of the tract upon which further active construction is not being undertaken.

5. Local Erosion Control Programs: Local governments which have received the Sediment Control Commission's approval for an erosion and sediment control program are authorized to adopt ordinances, rules and regulations necessary to establish and enforce such control programs and to create or designate agencies or subdivisions of the local government to administer and enforce the programs.

6. Any person who violates any provision of this law is guilty of a misdemeanor punishable by imprisonment not to exceed 90 days, or by a fine not to exceed \$5,000, or by both, at the discretion of the court.

OHIO

TITLE: Soil and Water Conservation District Law
Agricultural Pollution Abatement and Urban Sediment
Pollution Abatement
Ohio HB 513, Approved Oct. 13, 1978

LEAD AGENCY: Ohio Department of Natural Resources
Division of Soil and Water Districts

STATE CONTACT: Floyd Heft, Chief
Division of Soil and Water Districts
Ohio Department of Natural Resources
Fountain Square
Columbus, Ohio 43224
614/466-5283

OHIO EROSION AND SEDIMENT (POLLUTION ABATEMENT) PROGRAM

Introduction

In 1941, the Ohio Legislature passed HB 646 which provided for the creation of the Ohio Soil and Water Conservation Committee and local soil and water conservation districts to carry out a voluntary program of soil and water conservation on agricultural lands.

The Soil and Water Conservation Committee was changed to the Soil and Water Conservation Commission in 1969 by SB 160 and placed in the Ohio Department of Natural Resources.

In 1971, SB 305 was passed, amended by SB 397 in 1972, SB 513 in 1978, and HB 655 in 1980, providing for the development of a program for the abatement of agricultural and urban sedimentary pollution. This program is administered by the Division of Soil and Water Districts with the concurrence of the Soil and Water Conservation Commission and the Ohio Environmental Protection Agency (OEPA).

Under the 1971 program, districts became responsible for assisting landowners and operators to meet established soil and water conservation standards. While enforcement procedures were lacking for agricultural lands, local ordinances adopted by some counties or municipalities required erosion and sediment control for development or other land-disturbing activities before issuing rezoning classifications or building permits. Local jurisdictions with such ordinances look to conservation districts and the U.S. Soil Conservation Service for technical standards and plan review.

In 1978, HB 513 was enacted authorizing the Division of Soil and Water Districts and local districts to establish and administer rules and procedures for agricultural pollution and urban sediment pollution abatement. Rules and

procedures for state enforcement authority were established for animal waste pollution abatement only, although rules were adopted establishing state standards and program procedures for urban sediment pollution abatement. The law authorized the Chief of the Division to enter into cooperative agreements with districts to obtain compliance with rules and orders of the Chief. The Chief has the power to enter all lands to inspect and investigate conditions and to request the County Prosecuting Attorney to bring action for non-compliance with the rules of the Division relating to animal waste pollution. This shifted the responsibility for enforcement from the OEPA to the Department. The shift was appropriate and the standards now being used are a required level of conservation or management standards, rather than air and water quality standards.

The legislation covers agricultural pollution including soil sediment and attached substances and animal waste. It also provides that the program be carried out by the Division in cooperation with local conservation districts.

The program provides for the adoption of Soil Loss Tolerance Factors utilizing the U.S. Department of Agriculture's Universal Soil Loss Equation to determine if an adequate level of conservation practices and/or management is applied to meet the standard. A level of management, rather than water quality, is also used to determine if an animal waste pollution problem exists. The program also provides for state financial cost-sharing for installation of needed practices to meet agricultural soil loss limits and for animal waste control.

The 1978 law awakened the public to the detrimental effects of soil erosion and sedimentation. All 88 soil and water conservations districts had entered agreements for pollution abatement with the State Division before the 1980 amendatory legislation was enacted. The enactment of HB 655 is a continued dedication toward a soil conservation ethic and the abatement of agricultural and urban sediment pollution through voluntary conservation standards.

Major Program Features

1. The Soil and Water Conservation Commission is authorized to:

(a) assist in keeping the supervisors of local districts informed of their powers and duties, program opportunities, and the activities and experiences of all other districts;

(b) recommend to the Director of the Department of Natural Resources priorities for planning and construction of small watershed projects, and to make recommendations to the Department Director concerning coordination of programs as proposed and implemented with the districts; and

(c) recommend to the Department Director, Governor, and the General Assembly, programs and legislation with respect to the operations of districts which will encourage proper soil, water, and other natural resource management and promote the economic and social development of the state.

2. As of May 2, 1980, each county has a district parallel to the geographic area of the county, with each district constituting a political subdivision of the state.

3. The Supervisors of a district are authorized to:

(a) conduct surveys, investigations, and research relating to the character of soil erosion, floodwater and sediment damages, and to provide for the conservation, development, utilization, and disposal of water needed within the district;

(b) develop plans for the conservation of soil resources and for the control of soil erosion and works of improvement for flood prevention, and to provide for the conservation, development, utilization, and disposal of water within the district;

(c) implement, construct, repair, maintain, and operate preventive methods and other works of improvement for natural resource conservation, development and flood prevention, and to provide for the conservation, development, utilization, and disposal of water within the district; and

(d) enter into agreement or contracts with the Department of Natural Resources to determine, inspect, and fund agricultural pollution and urban sediment pollution abatement measures so that landowners, operators, managers and developers can meet adopted state standards for a quality environment.

The Director of the Department of Natural Resources is required to make recommendations to reduce the adverse environmental effects of each project that a district plans to undertake and is required to disapprove any such projects which will adversely affect the environment without equal or greater benefit to the public. The district may call on the Soil and Water Conservation Commission for their recommendations.

4. The Division, subject to the approval of the Department of Natural Resources Director, is authorized to:

(a) provide administrative leadership to local districts in planning, budgeting, staffing, and administrating district programs; and assist in the training of district supervisors and personnel in their duties, responsibilities, and authorities;

(b) administer the pollution abatement program pertaining to state responsibilities, and provide staff assistance to the Commission in exercising its statutory responsibilities;

(c) assist in expediting state responsibilities for watershed development and other natural resource conservation works of improvement;

(d) coordinate the development and implementation of cooperative programs and working agreements; and

(e) subject to the approval of the Commission adopt, amend, or rescind rules. These rules are required to:

(1) establish standards to achieve a level of management and conservation practices in farming or silvicultural operations. These standards will abate wind or water erosion of the soil or the degradation of the waters of the state by soil sediment. Rules must also establish criteria determining the acceptability of these management and conservation practices. The rules adopted under this division

must also provide for the achievement over a period of years of the applicable soil loss tolerance factors or permissible soil loss values established by the United States Department of Agriculture. No phase of the pollution abatement program that is more stringent than the initial one will apply until the chief of the Department of Natural Resources, Division of Soil and Water Districts publishes a study of the economic impact of implementing the next phase. Not earlier than one month after this, a public hearing must be conducted in each of the six soil and water conservation districts on the proposed implementation, amendment, or postponement of the next phase of the pollution abatement program.

(2) establish standards to achieve a level of management and conservation practices which will abate wind or water erosion of the soil or the degradation of the state waters by soil sediment. The standards must be designed to implement applicable areawide waste treatment management plans prepared under section 208 of the "Federal Water Pollution Control Act". These standards and criteria will not apply in any municipality or county that adopts ordinances or rules pertaining to sediment control, nor to lands being used in a strip mine operation or surface mine operation;

(3) recommend criteria and procedures for approving urban sediment pollution abatement plans and issuing permits before grading, excavating, filling, or other whole or partial disturbance of five or more contiguous acres of land owned by one person or operated as one development unit, and require implementation of the plan;

(4) establish standards to manage concentrated animal feeding operations on farms, which will reduce the degradation of the state waters by animal waste; and establish criteria for determining the acceptability of those management practices; and

(5) establish procedures for administration of rules for agricultural pollution abatement and urban sediment pollution abatement and for enforcement of rules for animal waste management.

(f) name an agricultural pollution abatement technical advisory board and an urban sediment pollution abatement technical advisory board while developing rules for adoption;

(g) cost-share with landowners on practices for abating water pollution from animal wastes and soil sediment, specify the enduring agricultural pollution abatement practices eligible for cost-sharing, and establish the cost-share limits; and

(h) provide technical assistance in connection with new or relocated projects involving highways, underground cables, pipelines, railroads, and other improvements affecting the water management of lands.

5. Violations and Penalties: Persons who fail to comply with an order requiring the compliance with rules and regulations of the animal waste pollution abatement program are guilty of a minor misdemeanor.

6. Ohio Environmental Protection Agency Authority: The OEPA's permit to construct and permit to operate only apply to agricultural pollution if more than 1000 animal units are involved in an animal waste management situation or if an animal waste treatment works has a controlled direct discharge or any discharge prohibited by the U.S. Environmental Protection Agency.

PENNSYLVANIA

TITLE: The Clean Streams Law of Pennsylvania
35 Pa. Stats. Secs. 691.1 et seq. (1977)

LEAD AGENCY: Department of Environmental Resources
Bureau of Soil and Water Conservation

STATE CONTACT: Afton Schadel, Chief
Division of Soil Resources and Erosion Control
Bureau of Soil and Water Conservation
Department of Environmental Resources
PO Box 1467
Harrisburg, Pennsylvania 17120
717/787-5267

PENNSYLVANIA'S SOIL EROSION AND SEDIMENTATION CONTROL PROGRAM

Introduction

The Pennsylvania General Assembly enacted PL 2724 in 1937 which provided for the creation of soil conservation districts. Only a few districts were organized under this law. In 1945, the General Assembly enacted the Soil Conservation Law which created the State Soil Conservation Commission and revised procedures for the creation of soil conservation districts and their governing boards. The state law has been amended a number of times to reflect changing conditions. There are now 66 districts in Pennsylvania covering all counties except Philadelphia.

The districts' programs have been primarily agriculturally oriented towards soil conservation on farmlands. Technical assistance was provided by the US Department of Agriculture's Soil Conservation Service (SCS) and efforts were entirely on a voluntary basis. Erosion and sediment control in non-agricultural areas was minimal before 1972.

The State Conservation Commission and conservation districts were transferred to the Department of Environmental Resources (DER) from the Department of Agriculture in 1971. This change resulted in districts becoming more directly involved with environmental programs of water quality management, solid waste disposal, forest management, surface mining, state parks, etc. This arrangement enabled districts and cooperating agencies to attend to erosion and sediment control activities and to conservation methods on all lands.

Several developments revealed the need for an expanded program for erosion and sediment control. These included erosion and sediment problems created by industrial development and urbanization; a growing citizen and political interest in total watershed management problems; and the general recognition that sediment is the largest single pollutant when measured by volume of the state's water resources.

On September 21, 1972, following a study by the Environmental Quality Board (EQB) and public hearings, rules and regulations for erosion and sedimentation control were adopted by the EQB pursuant to the existing Clean Streams Law. The objective of the Clean Streams Law is not only to prevent further pollution of state waters, but also to reclaim and restore to a clean, unpolluted condition every stream in Pennsylvania that is presently polluted. Under the regulations for erosion and sediment control, all earthmoving activities, regardless of size, must have an erosion and sedimentation control plan. In addition, earthmoving activities greater than 25 acres must also have an erosion and sediment control permit.

The Department of Environmental Resources developed an operating procedure that would utilize conservation districts' expertise in the program. The staffs of the Bureau of Water Quality Management, the Bureau of Soil and Water Conservation, and the Bureau of Litigation and Enforcement jointly developed the procedure.

On projects requiring DER permits, an application for an erosion and sedimentation control permit is submitted to the conservation district along with an erosion and sediment control plan. The conservation district has 45 days to act on the application. Following technical review, the conservation district board, at an official meeting, takes action to recommend to DER that a permit should either be issued or denied. This recommendation is forwarded to DER's regional office where the permitting process takes place.

Through a policy established by the Secretary of the Department of Environmental Resources, the Bureau of Soil and Water Conservation provides technical support on erosion control matters to other bureaus within DER. Inspection and enforcement activities are handled by the Office of the Deputy for Protection and Regulation and Deputy for Enforcement. Included in the operating procedures is a provision that DER may assign portions of the enforcement program to local jurisdictions.

The resources management portion of the program has been assigned to the Bureau of Soil and Water Conservation and the 66 conservation districts. The Bureau's Division of Soil Resources and Erosion Control implements DER's program through information, training, administrative and liaison activities. Districts provide information, planning assistance, plan review and land use monitoring assistance to the Department of Environmental Resources. Twentysix districts have contracted for authority in the inspection portion of the program.

Pennsylvania's program applies to all lands within its borders. An excellent education program exists in all parts of the state for developers, engineers, municipal officials, farmers and others to explain erosion and sediment control. Since the beginning of the regulatory erosion and sediment control program, numbers of permit applications for earthmoving activities have decreased annually reflecting districts' activities in promoting conservation, contractors changing their site plans, as well as a slowdown in construction starts.

Major Program Features

1. Powers and Duties: In adopting rules and regulations, establishing policy and priorities and in issuing orders or permits, the Environmental Quality Board and Department of Environmental Resources are required to consider:

- (a) water quality management and pollution control in the watershed as a whole;
- (b) the present and possible future uses of particular waters;
- (c) the feasibility of combined or joint treatment facilities;
- (d) the state of scientific and technological knowledge; and
- (e) the immediate and long-range economic impact on the Commonwealth and its citizens.

The EQB is authorized to:

- (a) formulate, adopt, promulgate and repeal rules and regulations to implement the provisions of this act; and
- (b) establish policies for effective water quality control and water quality management, and develop and implement comprehensive public water supply, waste management and other water quality plans.

The DER is authorized to:

- (a) review and take appropriate action on all permit applications; and
- (b) issue orders to implement the provisions of this Act.

The Bureau of Water Quality Management (BWQM) and the Bureau of Soil and Water Conservation (BSWC) of the Department of Environmental Resources jointly administers the DER's erosion and sediment control program. The BSWC is authorized to approve the administration of the erosion and sediment control program by a unit of local government. (The BSQM and Bureau of Litigation must also approve this action.)

2. Under the policies and procedures adopted January 1, 1977, pursuant to the rules and regulations adopted by the EQB on September 21, 1972, the BSWC is authorized to work with Conservation Districts to inform landowners of the need for an erosion and sediment control plan when earthmoving activities are undertaken.

Conservation districts have agreed to monitor land use and attempt to secure voluntary compliance by landholders to the DER's rules and regulations on erosion and sediment control.

3. On September 21, 1972, the EQB adopted regulations for the control of erosion and sedimentation. The DER developed a program to implement these regulations and thereby prevent pollution of the waters of the Commonwealth. The Department of Environmental Resources recommends special factors to be considered in developing a plan. The erosion and sediment control plan is required to be designed to prevent accelerated erosion and sedimentation, and must consider all factors which contribute to erosion and sedimentation including, but not limited to, the following:

- (a) the topographic features of the project area;
- (b) the types, depth, slope and areal extent of the soils;
- (c) the proposed alteration to the area;
- (d) the amount of runoff from the project area and the upland watershed area;
- (e) the staging of earthmoving activities;
- (f) temporary control measures and facilities for use during earthmoving;

- (g) permanent control measures and facilities for long-term protection; and
- (h) a maintenance program for the control facilities including disposal of materials removed from the control facilities or project area;

4. Permit Required: The regulations require any person or municipality engaged in an earthmoving activity to obtain a DER permit before any earth is disturbed. Activities exempt from obtaining a DER permit are those (1) involving plowing or tilling for agricultural purposes; (2) for which a plan has been developed by the Soil Conservation Service; (3) requiring a permit under the Water Obstruction Act, the Surface Mining and Reclamation Act, and/or the Clean Streams Law or; (4) which affect less than 25 acres.

5. Responsibilities of Landowners and Land Occupiers: Whenever the Sanitary Water Board finds that pollution or a danger of pollution is resulting from a condition which exists on land in the Commonwealth, the Board can order the landowner or occupier to correct the condition in a manner satisfactory to the Board.

6. Responsibilities of Agricultural Landowners and Users in Erosion and Sedimentation Control: A conservation plan must be prepared and implemented for all agricultural activities which might disturb the land surface. Golf courses, sod production, mushroom production, home gardens and federal, state, municipal and private parks are not considered agricultural activities. The conservation plan for agricultural activities must be implemented by July 1, 1977. Erosion and sedimentation control plans may vary according to the potential erosion and sedimentation hazard. The conservation plan must consist of a soil map, a conservation plan map and a narrative describing the nature of the control practices. The Agricultural Conservation Plan as a minimum contains an erosion and sedimentation control plan for proposed and present earth disturbing activities.

7. Soil Erosion and Sediment Control for Forestry Practices: Because of the steep terrain in the Appalachian Mountains, much damage to forest streams is caused by soil erosion and sedimentation during logging operations. Muddy water that is harmful to fish and other aquatic life, unsuitable for human consumption and recreational uses can often be traced to poorly managed logging operations.

Forest product harvesting operations involve activities which disturb forest soil cover and can lead to accelerated soil erosion and sedimentation. The Bureau of Forestry of the DER has conducted studies determining that well planned and conducted forest product removal operations will cause between 7 and 10 percent of the area harvested to be affected by direct soil disturbance. These disturbed areas are potential accelerated soil erosion and sedimentation hazards. It was, therefore, required that all persons engaged in forest product harvesting operations submit an erosion and sediment control plan by October 21, 1972, and obtain a permit for such activities by July 1, 1973.

8. Violations and Penalties: It is unlawful for any person or municipality to discharge into state waters, or permit to be discharged from property owned or occupied by that person or municipality, any substance resulting in pollution. The Clean Streams Law declares this type of discharge a nuisance. Any

person or municipality who violates any provision of this Act is guilty of a summary offense and subject to a fine of not less than \$100 nor more than \$1000 for each separate offense.

Any person or municipality who willfully violates any provision of this Act is guilty of a misdemeanor of the third degree and is subject to a fine of not less than \$2500 nor more than \$25,000 for each separate offense, or to imprisonment for a period of not more than one year, or both.

Any person or municipality who, after conviction of a misdemeanor for any violation within two years as provided above, willfully violates any provision of this Act is guilty of a misdemeanor of the second degree and subject to a fine of not less than \$2500 nor more than \$50,000 for each separate offense, or to imprisonment for a period of not more than two years, or both.

SOUTH CAROLINA

TITLE: County Sediment Control Program
Code of Laws of S.C. Secs. 48-13-10 -- 48-13-60 (1976)

LEAD AGENCY: Counties that have adopted local ordinance in cooperation
with appropriate soil and water conservation districts

STATE CONTACT: Mark Corley, Chief
Conservation Planning and Resource Development
Land Resource Conservation Commission
2221 Devine Street, Suite 222
Columbia, SC 29205
803/758-2823

COUNTY SEDIMENT CONTROL PROGRAMS

Introduction

In South Carolina, the law enabling the creation of conservation districts was passed in 1937. It provided for the incorporation of South Carolina's 46 counties into soil and water conservation districts for the purpose of conserving soil and water resources and the prevention of soil erosion and resultant sediment damages.

An Act to authorize County Sediment Control programs became effective in 1971. As amended through 1976, the program does not require counties to adopt erosion and sediment control ordinances. In those counties choosing to establish an erosion and sediment control plan, no construction activities can be undertaken until a permit has been obtained pursuant to an approved erosion and siltation control plan. Commercial mining operations, agricultural land management and cultural practices, on-farm building construction and single family residences which are not part of a subdivision do not require a county grading permit.

Only one county in South Carolina (Lexington County) has established an active sediment and erosion control program with required permits and sediment reduction plans before soil is disturbed for construction. The Lexington County Sediment and Erosion Control Program has worked well. At least two other counties have passed ordinances but have failed to establish active programs. Several other counties have attempted to pass ordinances but have met too much opposition from the building sector for approval.

A regulatory program is being proposed providing that Act No. 194 (County Sediment Control Program) be amended or superseded by legislation for the development of a statewide sediment and erosion control program for construction activities, with exemptions as provided in the legislation. Such legislation would provide for any local government or combination of local governments to administer and enforce an erosion and sediment control program. It would be the responsibility of the state to enforce a sediment and erosion control program in those counties that do not do so voluntarily.

Major Program Features

1. Each county sediment control plan must include a certification by a registered professional engineer or soil conservationist that the plan is designed to contain silt on the property concerned to the maximum extent feasible.
2. No grading permit shall be issued until the applicant has submitted a plan to control erosion and siltation and the plan has been approved by the local soil and water conservation district board.
3. The designated county agency charged with administration and enforcement of a sediment control program may adopt procedures and regulations consistent with the Act to carry out the provisions thereof.
4. Any person who violates the provisions of a grading plan submitted to obtain a grading permit is guilty of a misdemeanor and subject to a fine of not more than \$1,000 or six months imprisonment, or both.

County Sediment Control Program Guidelines

In keeping with the policy of the Land Resource Conservation Commission to assist conservation districts in South Carolina, a guide for developing county sediment control programs was prepared in July 1972.

The suggested procedure for establishing a county sediment control program is as follows:

1. The adopted resolution calling for the establishment and enforcement of a County Sediment Control Program should:
 - (a) assign responsibility for developing the Sediment Control Regulation and the necessary administrative procedures;
 - (b) assign responsibilities for administering and enforcing the Regulation; and
 - (c) specify the expected source(s) of funding to administer the Program.
2. Formulate a County Sediment Control Regulation.
3. Establish procedure for administering the county grading permit system.
4. Establish procedures for coordination of responsible county agency(ies) and conservation district.
5. Adopt minimum standards and specifications for conservation measures needed to prevent erosion and control sediment in the county.
6. Conduct an informational program to create an understanding of the program and obtain compliance.

Erosion and Sediment Control Regulation

The purpose of this regulation is to protect lands and waters within the county, to the extent practical, from the results of soil erosion and sedi-

mentation through controls of some of the disturbances and changes of the surface of the earth. The regulation calls for an approved erosion and sediment control plan before issuing a county grading permit.

Soil erosion and sediment control plans should contain the following considerations, as applicable:

- (a) the smallest practical area of land is exposed by clearing and grading at any one time during development;
- (b) when feasible, natural vegetation is retained and protected from damage. Topsoil is saved where practical, for replacing on graded areas;
- (c) temporary plant cover, mulching and/or structures to control runoff are used to protect areas subject to erosion during the period of development or land use change;
- (d) provisions are made to effectively accommodate the increased runoff caused by the changed soil and surface conditions. Diversion ditches, grassed or surfaced waterways and outlets, enlarged and protected drainage channels, and effective use of street gutters and storm sewers are effective means;
- (e) sediment basins (debris basins) are installed, where practical, to remove the major part of sediment from runoff waters leaving the disturbed area; and
- (f) the permanent vegetation cover and the long-term erosion protection structures are established as soon as practical in the development process.

SOUTH DAKOTA

TITLE: Act to Regulate Land-Disturbing Activities
Within the State, Resulting in Soil Erosion
and Sediment Damage
S.D.C.L. Secs. 38-8A-1 -- 38-8A-21 (1977)

LEAD AGENCY: Conservation Districts

STATE CONTACT: Keith Horner, Director
Division of Conservation
Department of Agriculture
Room 332, Anderson Building
Pierre, SD 57501
605/773-3258

SOUTH DAKOTA SOIL EROSION AND SEDIMENT CONTROL PROGRAM

Introduction

On July 1, 1976, South Dakota enacted legislation to control land-disturbing activities. The Act to Regulate Land-Disturbing Activities Within the State, Resulting in Soil Erosion and Sediment Damage, authorized the State Conservation Commission to develop comprehensive state erosion and sediment control guidelines before July 1, 1977. The guidelines developed by the Commission were to consist of recommended soil loss limits and suggested conservation standards.

Conservation districts in cooperation with counties, municipalities and other affected units of local government were required to develop proposed district conservation standards by July 1, 1978. The proposed standards are subject to review by the Commission. Once approved, the district has three months to adopt conservation standards consistent with the control of erosion and sediment resulting from land-disturbing activities. Sixty-five out of sixty-nine districts have adopted conservation standards in compliance with the Commission's guidelines.

Major Program Features

After formal adoption of district conservation standards, each permit issuing authority is required to include provisions in its permit procedure to ensure that any proposed action relating to a permit is in compliance with the district conservation standards.

Agricultural and minor land-disturbing activities are not required to be reported to the district unless they are in violation of adopted conservation standards. If there is a violation, the land disturber will be required to prepare an erosion and sediment control plan. The land disturber has six months to submit a control plan to the district for approval; once approved s(he) has six months to implement the plan.

VIRGINIA

TITLE: Erosion and Sediment Control Act
Code of Va. Tit. 21, Ch. 1, Secs. 21-89.1 -- 21.89.15

LEAD AGENCY: Local municipalities

STATE CONTACT: Gerard Seeley, Jr., Chief Engineer
Virginia Soil and Water Conservation Commission
830 E. Main Street, Suite 800
Richmond, VA 23219
804/786-2064

VIRGINIA EROSION AND SEDIMENT CONTROL PROGRAM

Introduction

The Virginia General Assembly adopted the Soil and Water Conservation Districts Act in 1938 to carry out erosion and sediment control programs on a joint federal, state and local basis, primarily through the creation of local soil and water conservation districts. The law addressed erosion control on agricultural lands through voluntary programs of local districts.

Fairfax County adopted an erosion and sediment control ordinance that took effect in January 1967. It was the first urban erosion and sediment control program in Virginia. It required developers to submit an erosion and sediment control plan to the county for approval before land clearing or grading could begin.

In July 1971, the State Water Control Board adopted a policy for waste treatment and water quality management in the Occoquan Watershed. The policy required local political subdivisions to adopt a siltation control ordinance containing adequate enforcement provisions to control siltation on development projects within the Occoquan Watershed.

During 1971, the Erosion and Sediment Control Task force of the Governor's Council on the Environment reported on erosion and sedimentation problems in Virginia. The report included recommendations on several features to be incorporated in a legislative proposal to combat the problem. In August 1971, the Attorney General gave an opinion stating that sediment and silt are pollutants under the state water control law and therefore must be considered in determining water quality in Virginia.

The efforts of Virginia's Soil and Water Conservation Commission and the Erosion and Sediment Control Task Force resulted in the 1972 enactment of a bill for erosion and sediment control on land-disturbing projects involving other than agricultural or silvicultural activities. The purpose of the law was to establish and implement a statewide, coordinated program to control

erosion and sediment and to conserve and protect the land, water, air and other natural resources of Virginia. The State Soil and Water Conservation Commission was made responsible for administering the law.

Guidelines, standards and criteria were adopted by the Commission and became effective July 1, 1974. Local erosion and sediment control programs consistent with the state program were developed 18 months later and 172 programs are being carried out by (1) four soil and water conservation districts; (2) 168 counties, cities, and incorporated towns; or (3) a joint venture between a district and municipality. These local programs must be approved by the Commission.

Major Program Features

1. State Erosion and Sediment Control Program. Standards, guidelines and criteria were developed by the Soil and Water Conservation Commission for the effective control of soil erosion, sediment deposition and non-agricultural runoff. The Commission conducted public hearings on the proposed standards before their adoption or revision.

2. Local Erosion and Sediment Control Programs. Each local government or conservation district was required to adopt a program which was at least as stringent in its guidelines, standards and criteria as the state program, except that securing approval of or obtaining a permit can not be more difficult than the law provides; nor may local governments require compliance for those land-disturbing activities exempted by state law. The law exempts certain minor land disturbances, individual public utility construction and repair, separately built single-family dwellings and usual horticultural, forestry and agricultural practices. Projects of state agencies are exempted from local control; they require approval by the Commission. Plans for interjurisdictional projects may be submitted to the Commission or to each locality involved at the option of the applicant.

The local programs required an erosion and sediment control plan approved by the local government before land-disturbing activities could begin. The local authority can require an applicant to insure that emergency measures for appropriate conservation be taken at the applicant's expense. To insure this, the authority can require a letter of credit, cash escrow, performance bond or other legal arrangement before issuing the permit.

The local programs provide for monitoring and inspection of land-disturbing activities. If anyone violates any part of the local ordinances, the enforcement authority can prosecute or seek injunctions or other appropriate legal relief to stop the damaging activity. Local programs also included a plan for carrying out necessary training, information and education programs to insure orderly implementation.

Each county and municipality that has adopted erosion and sediment control ordinances serves as the local unit for inspection and enforcement. Under memoranda of agreement, local conservation districts review erosion and sediment control plans for technical adequacy and provide technical assistance from the U.S. Soil Conservation Service (SCS). With the help of SCS and the Extension Service, districts conduct local training, education and information programs.

3. Regulating Land-Disturbing Activities. No person can engage in any land-disturbing activity since the adoption of the conservation standards by the districts, counties, cities or towns until an erosion or sediment control plan for the activities has been submitted to the respective authority for review and approval.

4. Penalties. A violation of this article constitutes a misdemeanor and is subject to a fine not exceeding \$1,000 or 30 days imprisonment for each violation, or both.

VIRGIN ISLANDS

TITLE: Environmental Protection, Shore and Erosion Control
V.I. Code Tit. 12, Secs. 531-538, March 25, 1971

LEAD AGENCY: Virgin Islands Water and Soil Conservation District

STATE CONTACT: Puerto Rico Department of Agriculture
PO Box 10163
San Turce, Puerto Rico 00908
809/722-2120

THE VIRGIN ISLANDS' ENVIRONMENTAL PROTECTION PROGRAM

Introduction

The Legislature of the Virgin Islands found that the lands and waters comprising the watersheds of the Virgin Islands are great natural assets and resources. Improper development of land results in changed watershed conditions such as: erosion and sediment deposition on lower-lying land and in the tidal waters, increased flooding, cut and drainage filling and alteration, pollution and other harmful environmental changes. In order to protect the natural resources of the Virgin Islands, promote the health, safety and general welfare of its citizens, and to protect private and public property, the Legislature determined that it was necessary to establish an environmental protection program for land development to prevent soil erosion and provide for the conservation of beaches, shorelines and the coastal zones.

Major Program Features

1. The Environmental Protection Program. The Virgin Islands water and soil conservation district was required to prepare and adopt an Environmental Protection Program (EPP) in collaboration with the Virgin Islands Office of Planning, the Department of Conservation and Cultural Affairs, Agriculture, Public Works, and Health by September 25, 1971.

The EPP consists of rules and regulations which prevent improper development of land and harmful environment changes. The program includes comprehensive erosion and sediment control measures applicable to both public and private developments including the construction and maintenance of streets and roads.

2. Earth Change Plans. Upon the adoption of the EPP, no person can clear, grade, fill or otherwise disturb land for any purpose or use unless an Earth Change Plan (ECP) has first been submitted to and approved by the district and is in compliance with the EPP. Any department, agency, board, authority or other instrumentality of the Government (state or federal) must submit its ECP to the Department of Conservation and Cultural Affairs. The Commissioner of Public Works has enforcement authority.

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3. Exemptions. Common household gardening, truck farming and the cultivation of land for agricultural purposes under approved soil and water conservation practices are exempt from the provisions of this Act.

4. Violations. Any violation of this Act is a misdemeanor subject to a fine not exceeding \$5000 or one year's imprisonment for each and every violation.

5. Compliance with the Virgin Islands' Coastal Zone Management Act of 1978. Any person wishing to develop in the first tier of the coastal zone must first obtain a coastal zone permit which is in compliance with this Act.

SECTION VI

SUMMARY OF PRINCIPLE CONCERNS AFFECTING THE
IMPLEMENTATION OF EROSION AND SEDIMENT
CONTROL LAWS

SUMMARY OF PRINCIPLE CONCERNS AFFECTING THE IMPLEMENTATION OF EROSION AND SEDIMENT CONTROL LAWS

	Delaware	District of Columbia	Georgia	Hawaii	Illinois	Iowa	Maine	Maryland	Michigan	Minnesota	Montana	Nevada	New Hampshire	New Jersey	New York	North Carolina	Ohio	Pennsylvania	South Carolina	South Dakota	Virginia	Virgin Islands	
TYPE OF PROGRAM																							
Regulatory	X	X	X			X	X	X	X				X	X		X	X	X	X	X	X	X	X
Non-regulatory				X	X					X	a	X			X		b						
TYPE OF CONCERN																							
Funding for Program	X				X	X	X	X	X	X	X		X	X	X	X	X						
Lack of Personnel					X	X		X	X	X				X	X	X							X
Lack of Understanding of Erosion Process and Control Methods					X		X				X			X	X		X		X			X	X
Bill Interpretation			X															X		X	X		
Compliance With Standards					X		X		X		X	X					X	X	X				
Enforcement			c						X					X	X		X						X
All Sediment Sources Not Covered															X	e	d						
Control Practices Unaffordable						X							X					X					

- a. Diffuse source control is a voluntary program within a regulatory program
- b. Animal waste pollution abatement program is regulatory
- c. Amendments have been added to alleviate this problem
- d. Rules and regulations for urban sediment not included
- e. Forestry and agriculture not covered

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APPENDIX A

LEGISLATIVE REVIEW OF ADMINISTRATIVE REGULATIONS

GEORGIA (Ga. Stat. 3A-104(e)(f)) A 1977 law provides for legislative review of regulations by standing committee predesignated by the speaker and senate president for each agency. If the committee objects to a regulation, it may introduce a resolution repealing or modifying the regulation at the next session requiring two thirds majority vote or the governor's signature. The legislature cannot override a veto of such a resolution.

ILLINOIS (Ill. Rev. Stat., Chap. 127, Sec. 1001 et seq) The bipartisan Joint Committee on Administrative Rules established under the Illinois Administrative Procedures Act reviews all proposed regulations and makes recommendations to the agency to modify or withdraw the rule. While the agency is not bound to accept the committee's recommendations, it must respond to them.

IOWA (Iowa Code Ann. Sec. 17A.8) The Administrative Rules Review Committee established in 1975 is currently reviewing all promulgated rules. The regulatory review process is advisory but places the burden of proof on the agency once objections to a regulation are made.

MAINE (5MRSA c. 308 §2501 et seq) A law enacted by the 1977 session provides that agencies submit all current rules to the legislature by January 15, 1978 for review by the appropriate standing committees. These committees must hold public hearings and recommend to the legislature an expiration schedule for all rules. A committee may recommend immediate expiration of a current rule. The legislature must then pass bills to implement these expiration schedules. All new rules which go into effect after January 1, 1978 automatically expire

effective date and may send the rules back to the agency if the rules are not in the proper format.

NEW YORK (N.Y.S.A., Legislative Law, Art. 5-B, Secs. 86-88) A 1978 law formally created the Administrative Regulations Review Commission. The Commission, was originally created by joint resolution in 1977. Agencies must file their proposed rules with the commission at least 21 days prior to their effectiveness. The commission has the power to examine agency rules as to their statutory authority, their compliance with legislative intent, their impact on the economy and government operations, their impact on affected parties. In addition, the commission may hold hearings and has been granted subpoena power.

NORTH CAROLINA (G.S. 120-30.19 et seq) A 1977 law created the Administrative Rules Review Committee as a permanent committee of the Legislative Research Commission (LRC). All rules adopted by agencies are filed with the director of the LRC, who refers them to the review committee. The committee has up to 60 days to review these rules and may file objections. The agency must respond within 60 days of receipt of the committee's report. Agencies are not bound to comply with the committee's objection, and if they don't, the rule goes back to the full LRC for review. The LRC can make recommendations for legislative action to the General Assembly if the agency fails to comply with any commission objection. The law also provides for selective review of all preexisting regulations. It was effective on October 1, 1977 and expired June 1, 1979.

OHIO (Sec. 101.35, 111.15, 119.01, & 119.03 of Rev. Code) A 1977 law created the Joint Committee on Agency Rules Review. All proposed rules must be submitted to the committee 60 days prior to adoption. If during that time, the committee disapproves a rule, a concurrent resolution to that effect is intro-

five years after their effectiveness unless the legislature passes a bill terminating their effectiveness in less than five years.

MARYLAND (Md. Ann. Code 1977, Art 40, §40A) The Standing Committee on Administrative, Executive, and Legislative Review reviews regulations as they are published in the "Maryland Register". The committee has no power to suspend or veto proposed regulations, but its views are often persuasive with agencies when it raises questions about proposed regulations.

MICHIGAN (Mich. St. Ann. 24,201-24,315, Act No. 108, Public Acts of 1977) The Joint Committee on Administrative Rules has a 60-day period in which to approve or disapprove all proposed rules. Under a 1977 law passed over the governor's veto and effective on January 1, 1978, if the committee disapproves a rule or fails to approve it within 60 days, the rule cannot be adopted by the agency unless the legislature overrules the committee action within 60 days. The state supreme court has refused to consider a request by the governor for an advisory committee opinion on the constitutionality of this law. In addition, opinions of the Attorney General have questioned the constitutionality of legislative disapproval of rules by concurrent resolution, rather than by bill. Legislative power to review and suspend regulation during the interim is authorized in Article IX, section 37 of the state constitution. Michigan has more than 30 years experience with some type of legislative oversight of administrative regulations.

MINNESOTA (Minn. St. 3.965) The Legislative Commission to Review Administrative Rules may hold public hearings to investigate complaints concerning rules and, on the basis of testimony received, suspend any rule. In practice, however, the committee reviews all proposed rules. If a rule is suspended by the committee, such action must be sustained by the legislature at its next session. Before

the committee suspends any rule, it shall submit it to the appropriate standing committees for their review and recommendation. Emergency rules are effective for only 90 days, during which time they must be repromulgated under the regular procedure in order to remain in effect beyond that time.

MONTANA (Sec. 2-4-401 et seq, MCA 1978) An Administrative Code Committee was established in 1975 to review all proposed rules. This committee makes recommendations for action by the agencies to the legislature which, by joint resolution, can repeal or compel the amendment or adoption of a rule. Legislation enacted in 1977 mandates that all bills authorizing agencies to promulgate rules include a statement of legislative intent. The new law (SB 37) also shifts the burden of proof to the agency in any subsequent legal action challenging the rule as having been adopted in an "arbitrary and capricious disregard" of the purpose of the authorizing statute. Another 1977 law (SB 120) allows the committee to poll the members of the legislature by mail during the interim to determine whether a proposed rule is consistent with legislative intent.

NEVADA (Chap. 233B. 101 et seq NRS) Under a 1977 law, all proposed regulations are submitted to the Nevada Legislative Commission, which must review them at its next monthly meeting. If the commission objects to a regulation, it is returned to the agency, which must resubmit either the same regulation or an amended version to the commission. The regulation is forwarded to the speaker and the senate president for referral to the appropriate standing committee. The legislature can enact legislation amending the statute under which the objectionable regulation was promulgated.

NEW HAMPSHIRE (NRRSA Sec. 541A) In 1977, the legislature enacted a law creating a Joint Committee on Review of Agencies and Programs. The committee will have the power to sunset agencies and review their existing rules. In addition, the law provides the standing committee the power to review rules prior to their

duced. The legislature must adopt the resolution within 60 days to nullify the rule. Any rule promulgated during the interim may go into effect, but the committee and the legislature may disapprove the rule by concurrent resolution within the first 60 days of the next regular session. The committee may meet during the interim and may suspend objectionable rules by a two-thirds vote by its members. The suspension must be sustained by the legislature by concurrent resolution within 60 days of the convening of the next regular session.

SOUTH CAROLINA (Act No. 176 of 1977) The legislature in 1977 passed legislation amending and clarifying a 1976 law creating the state register and providing for legislative review and approval of agency rules. Under the new law, the Legislative Council supervises the printing of the state register, in which are printed all proposed and promulgated rules. Proposed agency rules are reviewed by the appropriate standing committee in each house. These rules cannot go into effect until 90 days after receipt by the legislature. The legislature may adopt a joint resolution during that time either approving or disapproving the rule. The 90-day review period continues to run as long as the legislature is in session. After "sine die" adjournment, the 90-day period ceases to run until the convening of the next regular session. Emergency rules can be promulgated for 90-day periods only when the legislature is not in session.

SOUTH DAKOTA (SDCL 1-26.1,1.2) The Interim Rules Review Committee reviews all proposed rules and makes recommendations to agencies and to the legislature on any suggested amendments to the Administrative Procedures Act. By a 5/6 vote of the six-member committee, a proposed rule can be suspended until 30 days after the next legislative session convenes. Unless the committee suspension is sustained by the legislature through passage of a bill within this 30-day period, the rule may take effect. All proposed rules submitted to the committee must have attached to it a fiscal note, prepared by the agency and reviewed by the Bureau of Finance and Management. The fiscal note must include the fiscal impact on state govern-

ment, the assumptions made in preparing the statement and the source of statistics used.

WYOMING (Wyo. Stat. Sec. 28-82 to 28-89) Under this 1977 law, all existing rules and all future proposed rules must be filed with the Legislative Service Office (LSO). The LSO reviews the rules and reports to the Legislative Management Council. If the LSO has found a rule objectionable and the council agrees, the disapproved rule goes to the governor, who may agree to repeal the rule. If the governor disagrees with the council's recommendation, the council can only recommend that the full legislature act through what is called a "legislative order" (presumably a statute). Legislative action must take place before the end of the legislative session in order to nullify a rule.

APPENDIX B
STATE LANDSAT APPLICATIONS AND INFORMATION SYSTEMS

LANDSAT APPLICATIONS IN GEORGIA

In Georgia, as in most states, one of the most probable ongoing uses for Landsat is for current land use/land cover information in support of nonpoint source pollution control. Georgia is a large and diverse state, in which many non-point source activities occur that contribute to stream pollution. One of the most significant is agriculture. Approximately 13.9 million acres (37%) of the state's 37.2 million acres are in agricultural usage, including 5 million acres classified as "prime farmland." Another significant contributor of non-point source pollution in terms of relative land cover is forestry. Georgia's commercial forest acreage exceeds about 23 million acres, of which only about 2% or less is harvested annually or is undergoing some other type of site disturbance. Other land use/land cover activities contributing to non-point source pollution in Georgia that could be monitored with the assistance of Landsat are:

- a salt-water intrusion in coastal areas;
- some hydrologic modification projects such as water quality in reservoirs; and
- some large mining activities.

When the requirement for statewide and areawide planning was initiated, the Georgia Department of Natural Resources had already developed the capability to analyze Landsat digital tapes with the assistance of the Georgia Institute of Technology, and thus found Landsat to be a cost-effective and convenient data source to assist the inventories for these planning efforts.

Landsat was used in the first phase of 208 planning efforts to develop land use/land cover statistics for the 198 Water Quality Management Units (WQMU) and 15 River Basins in Georgia. The computer-compatible Landsat data allows the computation of the acreage of various land cover conditions within a watershed (WQMU) that may be related to land-disturbing activities that have a potential for non-point source pollution. From these statistics and supplemental information, the Environmental Protection Agency developed a comparative ranking of the watersheds based on their potential for non-point source pollution. Best management practices could also be recommended for each watershed.

ILLINOIS LANDSAT PROJECT

A state workshop on remote sensing technology and applications was held in Springfield, Illinois on March 23, 1978. The Landsat land cover inventory for 13 southwestern counties was described and products of that effort displayed. The results of this pilot study were used in the Illinois Remote Sensing Feasibility Study in November 1978. The study's primary purposes were to catalog current types and sources of physical resource information collected by various state and regional agencies, define existing information needs among these groups, and assess the ability of Landsat and other remote sensing information to meet these needs. No additional action has been taken by the Illinois Department of Agriculture to utilize remote sensing technology to implement the erosion and sediment control program.

Illinois' ALICE System: The ALICE System is a general purpose, computerized, image processor with provisions for the efficient and economical digitization, encoding, analysis and display of visual, graphic and mapped information. The ALICE System can preserve a high degree of spatial resolution from mapped soil information. After being computerized, the soil data can then be used in computerized analyses with an assurance of accuracy and reliability in the calculations and geographic location of the soil-related regions of concern. With the current version of the ALICE software, soil information can be computerized with or without geographic boundaries. By combining a visual analysis of this type with a statistical analysis of the soil type area measurements calculated by ALICE, a very high-powered analysis can be accomplished. It is hoped that this analysis can help implement the soil loss equation regulations developed by the USDA/SCS and will approach the control of soil erosion and sedimentation at the county level in the State of Illinois.

Recent efforts by the ALICE group at the Applied Mathematics Division of Argonne National Laboratory in areas related to soil and environmental analysis has lead to a proposal to address issues relating to the calculation of soil loss at a regional scale. The proposed program, which will determine the potential average annual erosion rates of surficial soils, will attempt to resolve specific problems by the use of the Universal Soil Loss Equation (USLE). This will be accomplished by proposing the implementation and application of the USLE on the ALICE System. It is anticipated that the result of this effort will be an improved, more accurate and efficient means of determining the potential average annual erosion rates of surficial soil from a computerized analysis of information recorded on USDA/SCS soil survey maps in conjunction with other soilrelated factors obtained from other sources.

The only development that will be required to successfully implement and apply the USLE on the ALICE System is the development of computer software. This software will effectively associate soil data produced by existing ALICE programmed processes with data provided by user agencies. The data, required from user agencies relates to agricultural management and practices and is required as inputs to the USLE.

IOWA'S LANDSAT DEMONSTRATION AND EVALUATION PROJECT

Iowa agencies conducted a project in January 1979, which investigated the utility of Landsat data for state resource problems. The evaluation of potential soil erosion was the principal subject of the project. An intensive analysis of a small watershed was used to evaluate the applicability of Landsat data and related data handling techniques to soil erosion problems. The erosion potential of the basin was assessed using the universal soil loss equation. As a result of the demonstration project, the Iowa Geological Survey received State funding to purchase the hardware and software needed to conduct analyses of Landsat data.

The implications for developing this capability in Iowa are significant. Current soil erosion potential could be assessed over either large or small areas as it never could before. Landsat data in conjunction with other soils data would be useful in establishing specific policies and goals for existing and new conservation programs. It would also allow an accurate evaluation of the actual effects of these programs, often before they have been implemented. The Soil Conservation Department expressed a high degree of interest in developing this capability in Iowa. If adequate funds are provided for the digitizing process, Landsat data could become an integral part of the "Iowa Soil 2000" Program.

THE MICHIGAN RESOURCE INVENTORY ACT

The first step to initiate a consistent and comprehensive inventory of land resources to assist in making decisions which affect their future viability was taken when the Michigan Legislature overwhelmingly passed and appropriated funds to support the Michigan Resource Inventory Act (PA 204 of 1979).

The Act requires the completion of land resource and current land use/cover inventories, and the establishment of a multi-faceted technical assistance program and a 20-member Inventory Advisory Committee (IAC).

The long-range implications of the Act could be substantial. Through the IAC's preparation of consistent land resource identification criteria and classification systems, costs will be reduced because information will be interchangeable. But more importantly, knowledge and communication between land resource management agencies will be improved because they will be dealing with the same information base. Finally, the technical assistance program envisioned by the Act will be of great help to local governments, especially those without planning staffs or with limited financial resources.

NEW JERSEY LANDSAT INFORMATION SYSTEM

The New Jersey Division of State and Regional Planning has integrated Landsat data with computerized maps of the State's political jurisdictions and watersheds. This statewide information system is used to provide land cover information to decision-makers in a context to which they can easily relate. A system of interactive, English-dialogue computer programs permits planners and natural resource managers to analyze Landsat data for any of the state's 567 municipalities, 21 counties and 118 watersheds.

These data are currently being used to provide land cover maps and acreage statistics for water quality planning purposes. Five counties and parts of several others, comprising 2694.45 square miles, have been mapped in eight categories:

- forest
- vacant/pasture
- cropland
- high density urban
- low-density or suburban
- barren/extractive/bare soil
- wetland
- surface water

The state will be expanding its use of Landsat by obtaining interactive computer graphics equipment and using the categorized data as input to various modeling processes. In addition, merging the remote sensing data with demographic information, which can also be displayed by municipality, will provide a powerful graphic tool for decision-making.

THE MINNESOTA LAND MANAGEMENT INFORMATION SYSTEM

The Minnesota Water Pollution Control Agency is taking advantage of enhanced capabilities of statewide information system to analyze and classify lake quality using Landsat and other data.

The Minnesota Land Management Information System (MLMIS) began in the mid 1960's. Funding was earmarked for accelerating natural resource projects through the Minnesota Outdoor Recreation Commission (since renamed the Legislative Commission on Minnesota Resources).

The Minnesota Land Management Information System was developed as a joint research project between the State Planning Agency and the Center for Urban and Regional Affairs of the University of Minnesota. Financial support for developing the project has come from a variety of sources with major contributors being the state legislature and state agencies.

In July 1977, the MLMIS staff and computer terminals were moved to the State Planning Agency as the nucleus of the Land Management Information Center (LMIC). Operational funding for the professional staff is provided within the legislative appropriation to the State Planning Agency. A separate revolving account is used for billing clients who request special services from the Information Center. LMIC is a division of the State Planning Agency with a service bureau theme. It is not intended to serve the State Planning Agency exclusively, or even primarily. It is available on an equal basis to all governmental agencies and private organizations operating in the state.

In 1979, MLMIS received an LCMR appropriation to purchase its own minicomputer system. The Land Management Information Center has developed its own data handling software package called Environmental Planning Programming Language (EPPL). This software is designed to enter, analyze and display information using grid-cells of any size. With the new computer system, polygon form data entry is now possible.

The 40-acre parcel is the predominant geographic entity in the system for which data are collected statewide; it is based on the U.S. Public Land Survey. The computer files contain information for each of the 1.4 million 40-acre parcels in the state. The files include data on cultural features of parcels (such as ownership or road access), locational characteristics (township and minor civil division boundaries) and physical characteristics (forest cover, soils and geomorphic regions).

In addition to the 40-acre cell data base, selected studies have used both more general cell resolution (25-square kilometer, USGS quadrangle format, and one square mile) and more detailed resolution (10-acre, 2.5-acre, 100-meter, Landsat pixel, 50-meter, and smaller). The system was enhanced to allow merging of various other grid-cell data files and to capture and convert polygon data.

Basic MLMIS data and specialized data from other sources have been combined to produce a variety of products for over 200 clients. Major types of studies include: facility siting (landfills, power plants) resource management (crop-land suitability, erosion/sedimentation, scenic amenity); master plans (community planning, park and wildlife areas); environmental assessment (highway corridors and transmission lines); and establishing mapping priorities (USGS topographic mapping). Until recently, efforts by system staff emphasized the development of a basic data file. Although some data may still be entered for special studies, primary emphasis is shifting to coordination with other data collection and entry programs. This is greatly enhanced in Minnesota because the Legislative Commission on Minnesota Resources requires MLMIS compatibility with all natural resource acceleration programs it funds.

THE LAND RESOURCES INFORMATION SERVICE OF NORTH CAROLINA

Under the program directives given to the North Carolina Land Policy Council in the Land Policy Act of 1974, a "system of information and data concerning the land resources of the entire state" was to be developed. A mechanism for providing systematic exchange of land use, environmental, economic and social information among all levels of government was desired. It was from this mandate that the Land Resources Information Service (LRIS) was formed.

Since its commencement in the Fall of 1977, LRIS's top priorities have been to establish a structure for housing the state's land resource data and facilitate the access to and use of that data by those involved in land resource planning and management activities. A key component was the acquisition of a sophisticated configuration of computer hardware and software. The LRIS system consists of a Data General minicomputer and various peripheral devices for the automated capture, display, manipulation, and summation of graphic, geographically-referenced data. Using this hardware and a package of user oriented software, LRIS has the necessary components for constructing a statewide land resource data base and providing assistance to a variety of ongoing state programs.

While designed to serve state and local agencies on a cost recovery basis after its first year of operation, initial LRIS activities were directed to ward supporting programs within three state agencies which had provided initial funding for LRIS, including water and land quality programs within the Department of Natural Resources and Community Development.

The data bases to support these projects have been entered into LRIS on an incremental basis. Information for detailed soils, land use, topography, roads, streams, etc., is being captured for specific geographic areas of the state where planning projects are currently active. On a more general level, statewide information has been developed for generalized soils, topography, population, political boundaries, drainage basin boundaries, and 1970 census enumeration district boundaries. Once in the LRIS system, this information can be accessed singularly, or in combination with any other data sets, where scale, analysis, criteria, geographic area, and form of output are defined interactively by the user.

Most of the LRIS data base construction activity involves manual conversion of graphic data to a computerized format. However, present demand for information far outstrips LRIS in-house capabilities to perform the data capture. Thus, LRIS is actively seeking existing sources of digital information. One such source is the Landsat satellite imagery that could provide current land use/land cover information for large geographic areas of the state. Interest in the utilization of Landsat is not new in North Carolina. In fact, from the outset of the planning and development of LRIS, a basic requirement of the system configuration acquired was that it serve as a basis for the eventual handling of the Landsat data. While LRIS has not yet applied Landsat data to a production effort, compatibility of a classified Landsat scene with LRIS data sets has been successfully demonstrated in a test area and its use for future projects is anticipated.

Typical LRIS applications to date have relied heavily on the data compositing or overlay capability of the system. Identification is made of those geographic areas having the specific combination of physical characteristics of relevance to a particular study. For example, a recent project with the Soil Conservation Service (SCS) involved identifying areas which, because of land

use, soil type, and nearness to streams, had a high probability of contributing to nonpoint source water pollution from various land uses. The objective of this study was to utilize LRIS data handling capabilities to:

- Isolate areas with high potential for having agricultural-related water problems resulting from erosion and sedimentation;
- Calculate soil loss for these areas in terms of tons/acre/year by applying the Universal Soil Loss Equation;
- Identify the best management and treatment practices and associated cost of application; and
- Graphically and tabularly summarize the results.

The results from the SCS project highlight another aspect of the first year efforts of LRIS--its success at establishing a mechanism for facilitating communication among the collectors and users of land resource information at all levels - federal, state and local. LRIS provides the structure for bringing together the numerous data sets on the state's resources. This allows the program to provide more data at a lower cost to individual users. Through the combined efforts of the North Carolina planning programs, the Land Resources Information Service is well on its way to fulfilling its legislative mandate--to build a statewide data base of land resource information.

OHIO CAPABILITY ANALYSIS PROGRAM

The Ohio Department of Natural Resources - Division of Water, has a program to assist local agencies in the use of natural resource information. The land capability analysis program analyzes resource data, such as soil, in terms of its ability to support various land uses, such as homesites. A computer mapping and information storage system, the Ohio Capability Analysis Program (OCAP), was developed by the Department to assist with the land capability analysis program. OCAP is not the only tool for doing a capability study, but it is of major importance in Ohio.

The object of the land capability analysis program is to translate detailed resource maps available with the Department into maps that local people can easily use. Some of the most valuable aspects of the OCAP computer maps are:

- (1) They help decision-makers interpret soil and other resource information that is often confusing.
- (2) Soil related information, such as permeability or bearing strength, can be easily mapped.
- (3) Resource maps that are originally published at a variety of scales can be mapped at one scale with the computer.
- (4) Maps can be reproduced and updated easily and inexpensively.
- (5) The resource information can be evaluated simultaneously and analyzed to locate areas with potential or problems.
- (6) Irregular boundaries such as watersheds can be extracted from the resource information.

The product from a land capability analysis using the OCAP system is a set of maps defining major natural resources limitations and advantages in a county. With these maps, the planner or other user can rapidly evaluate a county's problems and potential.

There are several steps to a capability analysis study using OCAP. The first step is gathering basic resource information and other data, including boundary and land use maps. The most important information is a detailed soil survey, which is available for almost three-fourths of the state. A general soil map has less information, but can be used in place of the detailed survey. In addition to the soil survey, other types of resource information include: topography, geology, groundwater, land use (including some evaluation of vegetation), political boundaries, watershed boundaries and natural areas.

Once the original maps are assembled, they are transferred to a computer format through a digitizing process. The end product is a computer map which duplicates the original map. To make the computer map easier to read, a transparent overlay with road patterns and other information is used with it. Color computer maps which are easier to read are also being produced.

Another important option in the OCAP system is the ability to select information from large county maps for smaller areas within them, such as townships. Boundary lines--including townships, watersheds, census tracts, and sewer districts--can be incorporated into OCAP, allowing the system to readily produce maps of resource information for areas within any of these boundaries. The boundaries can also be used with maps analyzing several resources for a particular land use.

Analysis of resource data can be done in several ways. Essentially, OCAP enables the user to evaluate all or selected types of natural resources maps at once. This is accomplished by overlaying or compositing the maps in the computer. The computer can handle more detail and larger areas, and can accomplish the task faster than a manual process. The person doing the analysis specifies the information to be overlaid and how it will be evaluated by the computer. The computer does the computation and prints a map showing limitations or potential for particular land use. This can be done with as few as two data factors or as many as thirty.

The final product of a capability study is a set of maps, some with one type of information, such as land use or degree of slope, and some with a combination of several types of information. The latter may be evaluating potential for a particular land use. Each character on a map at a scale of 1" = 2000' represents an area of 1.15 acres. This degree of detail is important if the local agencies are to make effective use of the information, especially in areas where land use, soils, or slope vary greatly within a small area. In spite of the detail, computer maps should not be used in place of a site analysis, because the source information on which the computer maps are based is not accurate at the site level.

LANDSAT IN SOUTH CAROLINA

With support from the NASA Earth Resources Laboratory, South Carolina conducted a demonstration project on environmental effects of river diversion and erosion hazard assessment in 1978.

On August 22, 1978, interested participants gathered at the University of South Carolina for an introduction to Landsat and its future direction. The South Carolina Land Resources Conservation Commission, Research and Statistical Service attended the successful conference. As a result of these activities with NASA, as well as the Bureau of Mines, the state is proceeding to institutionalize its Landsat capability within the Computer Services Division of the University of South Carolina. The necessary software packages were obtained and hardware was procured.

RECENT AUTOMATED MAPPING TECHNIQUES IN SOUTH CAROLINA

Automated mapping techniques are being used in several studies in South Carolina. They include determination of prime agricultural areas, and study of wood energy potential in Greenville County, South Carolina; evaluation of the accuracy and the use of USGS Land Use and Land Cover maps; land cover classification of the Catawba-Wateree Waterbasin; and development of conceptual and issue management models for the U.S. Fish and Wildlife Service.

In conjunction with the South Carolina State Budget and Control Board, the University of South Carolina, Graphics Division maintains a very active role in the development of these computer mapping techniques. Approximately 20% of Graphics' time is devoted to developmental work, while 80% of the time is devoted to production work.

Current Applications Projects. The Energy Research Institute contracted with Graphics in January 1980 to conduct a study of the wood energy potential in Greenville County, S.C. This project is being done in cooperation with Clemson University and will be a comprehensive study of not only the current supply of wood energy but also the demand and accessibility of this energy form. The project is due for completion in December 1980.

Graphics came to an agreement with the USGS in July 1980 to digitize the detailed classes of landcover for the entire state of South Carolina. The estimated completion time for this project is second quarter of 1981.

The United States Fish and Wildlife Service has contracted with Graphics to develop conceptual and issue management models which will be used in analyzing various ecological issues in coastal South Carolina.

Graphics will:

- 1) Digitize vegetative cover maps;
- 2) Input and calculate survey elevation data;
- 3) Collect river elevation verses dam discharge data;
- 4) Overlay flood plain data with vegetation cover data; and
- 5) Generate flood plain area from river elevation and topographic data.

Russell Dam Area Assessment. Graphics has proposed to do a study on the Richard B. Russell Dam and Lake area for 1980-1981. The lake, as authorized by Congress to be completed in 1984, will have many environmental as well as economic consequences on the area. The two major objectives for this study are:

1. To build a data base using Landsat data incorporated with other ground (man-made or natural) features.

2. To use the data base for resource use analysis of the Russell Dam area.

Once the data have been gathered they will be used to:

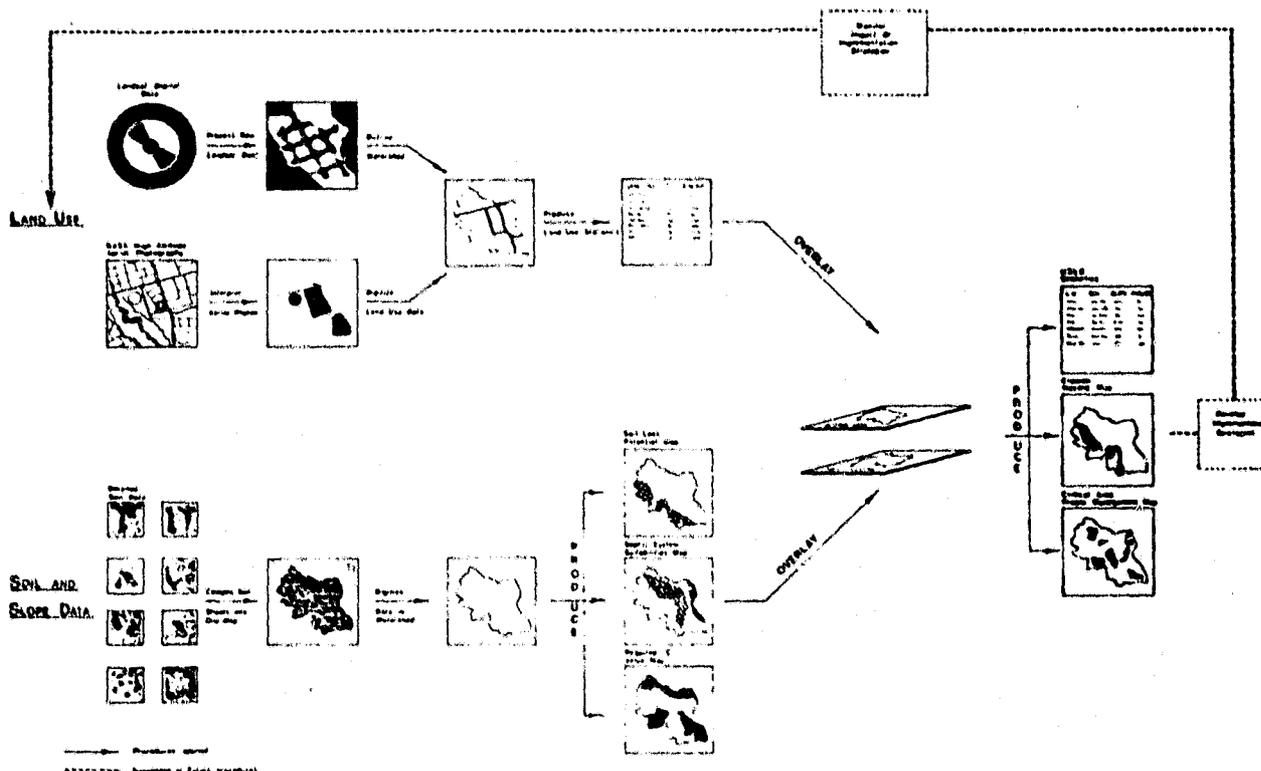
1. Evaluate erosion potential;
2. Identify reasonable access corridors to the lake;
3. Identify wildlife and marine habitats;
4. Identify sites for public recreation facilities; and
5. Identify sites for residential development.

This study will act as a guide to further development and management decisions for the Russell Dam area.

REMOTE SENSING APPLICATIONS FOR WATER QUALITY PLANNING IN SOUTH DAKOTA

Since 1977 the South Dakota State Planning Bureau has served as a 208 data analysis subcontractor to the state's Department of Environmental Protection for its study of nonpoint source pollution problems. Analyses were provided through the Bureau's Planning Information Section which has developed capabilities to gather, interpret and store natural resource and other types of data in a computerized format for assisting South Dakota state and local governmental agencies.

The process used for determining the magnitude of nonpoint source pollution is illustrated in the figure below. The Bureau produced land cover maps and acreage statistics for ten designated water quality study areas, and developed erosion interpretation maps and septic suitability maps for three of the ten areas.



The land cover maps were produced from digital Landsat tapes. The classification of the data employed software contained in the Landsat Imagery Analysis Package (LIMAP), which was developed by the Planning Bureau. LIMAP contains programs capable of all preprocessing, classifying, and final mapping functions needed to accurately map land cover. The land cover classifications were based on a "modified supervised" approach, in which training fields were selected and clustered for each land cover category. Ground data used for training field selection and final verification came from crop files maintained by county offices of the Agricultural Stabilization and Conservation Service. Final overall classification accuracies varied from 84% to 89% correct for each study area.

Part of the 208 project was to determine whether or not individual sites met soil loss tolerances established by the Soil Conservation Service. This was done as follows:

- (1) Detailed soil maps were digitized for those sites under consideration.
- (2) The Universal Soil Loss Equation (USLE) was applied to the soils data to develop a soil loss potential map. According to this equation, soil loss is mainly dependent upon the combined effects of rainfall, soil type, slope length, slope gradient, land cover and conservation practices.
- (3) Maps were produced illustrating the land cover needed to meet annual soil loss tolerances, as established by the Soil Conservation Service. These required vegetative cover maps are also called "C" value maps.
- (4) A computer compositing technique was used to overlay soil loss potential maps with the land cover maps (previously described), thus isolating erosion hazard areas for the particular year.
- (5) Finally, the required vegetative cover maps were overlaid onto the erosion hazard maps to show whether or not individual sites met the soil loss tolerances established by the Soil Conservation Service.

The composite mapping techniques used for this application provided perspectives not obtainable when any one variable is analyzed separately. The various maps produced by the Bureau aided in delineating areas for different management strategies to control nonpoint sources of pollution.

Current Landsat 208 Activities in South Dakota

The State Planning Bureau is presently completing another 208 project using 1979 data. Land cover maps were produced for six new water quality study areas. Two of these areas were mapped using new EROS Digital Image Processing System (EDIPS) Landsat data. Both medium-altitude black and white and medium and high-altitude color infrared photography were used for the other study areas. These different types of data provide an opportunity for comparing the utility of each for 208 projects.

The Information Section has also produced a generalized soil erosion potential map of South Dakota. The potential for soil erosion by water was determined through the analysis of soil type, topography and precipitation characteristics for each soil association in the state. Color maps were created from a 4" by 5" color transparency produced on a film recorder.

Under this year's contract, the Planning Bureau has provided county-level population projections through demographic modeling for use in planning for waste treatment facilities. Computer time has also been provided for conducting wasteload allocations with a computerized river simulation model maintained at the Bureau's computer facility.

VIRGINIA RESOURCE INFORMATION SYSTEM

In 1978, Virginia took the first steps towards developing a comprehensive, statewide resource information system. As authorized by a resolution of the General Assembly, an interim study committee was formed, a preliminary study was completed and actual committee consideration began that summer.

Among several of the indicated needs for accurate and up-to-date information were:

- (a) water resource availability, quality and use in localities, river basins and the state as a whole;
- (b) atmospheric conditions including air quality, climatic conditions, flooding, droughts, soil conditions and other factors affecting human health, farm and forest production, commerce and recreational activities;
- (c) land resources including soil capability for crop and forest production, highway and building support, airport industrial siting and other development purposes; mineral and energy resources; and land use trends and future potentials.

The Executive Branch needed timely, up-to-date and accurate information on Virginia's resources in order to make effective policy decisions and amend laws affecting overall needs of the Commonwealth.

Through these efforts it was recommended that the General Assembly authorize development of a comprehensive Virginia Resource Information System (VARIS) with the office of Commerce and Resources. VARIS will be initiated concurrent with the 1980-82 fiscal biennium to concentrate on developing programs, plans and procedures for initiating and controlling comprehensive services. VARIS' hardware and support materials will be expanded during the 1982-84 fiscal biennium for broad-based geographic information and environmental monitoring systems. By 1986, VARIS will be fully developed to provide up-to-date resource information that will serve statewide, regional and local needs.

It was recommended that VARIS be aimed at serving user needs including but not limited to: (a) collection, storage, networking and retrieval of information; (b) high quality appropriate processing services to serve user needs; and (c) providing assistance to agencies on information relating to regulatory programs, monitoring and other support services related to Virginia's resources.

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