

Volume 5

Special Reports

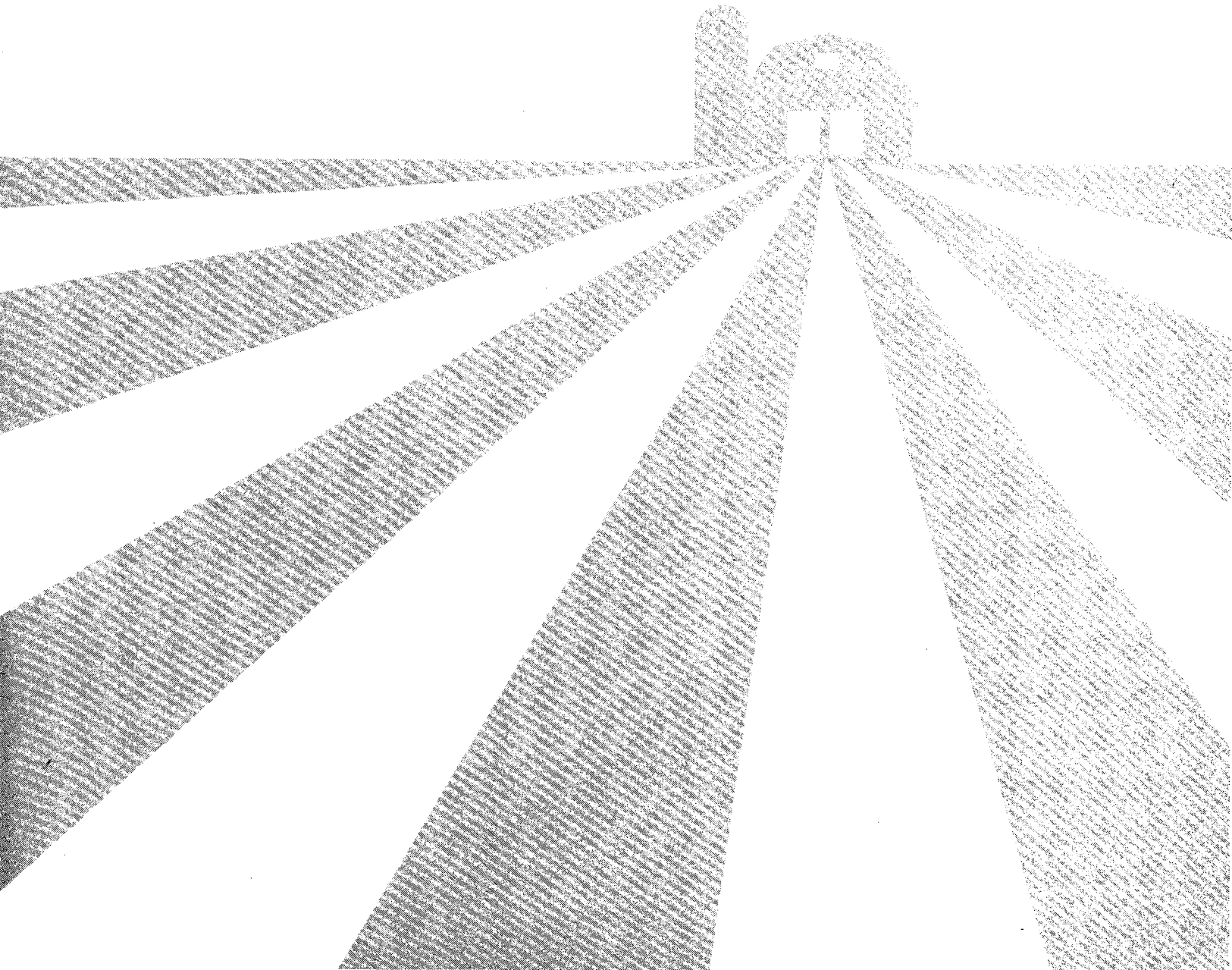
Part 5

**Drainage of
Agricultural Lands**

AC78-SR-5

1978
CENSUS OF
AGRICULTURE

U.S. Department of Commerce
BUREAU OF THE CENSUS

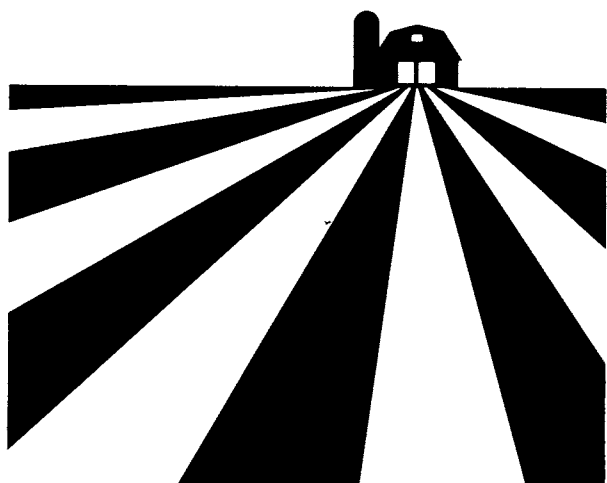


1978
CENSUS OF
AGRICULTURE

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**Drainage of
Agricultural Lands**

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Issued October 1981



U.S. Department of Commerce

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This report was prepared in the Agriculture Division under the general supervision of **Orvin L. Wilhite**, Chief (to January 1980) and **Arnold L. Bollenbacher**, his successor. **Kenneth R. Norell**, Assistant Chief for Special Surveys, was responsible for overall planning and management.

The planning and compilation of the statistics for this report were under the direction of **Joseph A. Horak**, Chief, Irrigation and Drainage Branch (retired May 1981), with primary staff assistance by **William R. Adams**, **Steven W. Stanley**, and **Jeanette K. Mon. Sharon C. Spivey**, under the direction of **John E. Adkins**, was directly responsible for computer processing of data in preparation for tabulation. **Paulette M. Bonchak** was directly responsible for the table data and publication standards used. **Cecelia H. Peets**, **Regina E. Lindsey**, and **Karin G. Beach** provided editorial services.

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HISTORY

Since 1920, the Bureau of the Census has periodically collected statistics on agricultural drainage. These statistics have been collected in both the census of agriculture, which is a direct enumeration of individual farms, and in the census of drainage, which has primarily been a census of community (group) or public drainage undertakings and of large scale private drainage undertakings. Statistics for on-farm drainage were collected in the censuses of agriculture for 1920, 1930, 1969, and 1974.

Censuses of drainage projects were taken every 10 years from 1920 to 1960. In planning for the 1969 and 1978 censuses of drainage, it was found that the need for data from projects had diminished. Noting that much of the data collected in the censuses of drainage had also been collected from local drainage districts in the quinquennial censuses of governments, it was decided to eliminate this duplicate collection effort and to obtain most of the needed data from the census of governments. The census of governments is authorized under the provisions of title 13, section 161, which provides for the census of governments to be taken in 1957 and every fifth year thereafter.

AUTHORITY AND AREA COVERED

The census of drainage is authorized under the provisions of title 13, United States Code. Section 142(a) provides for a census of agriculture to be taken in 1979, 1983, and every fifth year thereafter. Section 142(b) provides for a drainage census to be taken in conjunction with the census of agriculture in 1979, covering the year 1978, in 1988, and every tenth year thereafter.

This report presents statistics on agricultural drainage and land use for the United States, States, and counties from the 1978 Census of Agriculture and statistics on drainage districts for the United States and States from the 1977 Census of Governments.

SOURCES OF DATA

The 1978 Census of Drainage incorporated statistics from three sources: (1) The 1978 Census of Agriculture provided

information on number of farms and acres of land use by categories; (2) State and county offices of the Soil Conservation Service, U.S. Department of Agriculture provided county estimates on acres of agricultural land benefited by artificial drainage practices in 1978; and (3) The 1977 Census of Governments provided some financial and employment information for special drainage districts.

DISTINCTION BETWEEN ON-FARM OR INDIVIDUAL DRAINAGE AND PROJECT OR GROUP DRAINAGE

In the area of drainage and irrigation statistics, data users are cautioned to make a distinction between on-farm or individual (operator-owned) facilities and project or group (community) facilities. Generally, projects own and operate large scale outlet systems (drainage) or storage and delivery systems (irrigation) which connect and service a number of individual farm systems. To provide data users with some measurement of the total drainage effort, this report presents statistics representing both on-farm (tables 2 and 3) and off-farm drainage (table 1) activities.

COMPARABILITY OF DATA

In general, data on land in farms and the various land use categories from the 1978 Census of Agriculture are comparable with earlier censuses. However, the acreage estimates in this report for agricultural land artificially drained greatly exceed similar estimates from earlier censuses. The larger estimates for on-farm agricultural drainage in 1978 resulted from the decision to collect the data from State and county Soil Conservation Service offices rather than having individual farmers report it in the census of agriculture as had been done in 1969 and 1974. The change in data collection procedures was an effort to improve the accuracy of the drained land figures, which were grossly underreported when collected as part of earlier censuses of agriculture.

AGRICULTURAL DRAINAGE

For the 1978 Census of Drainage, "drained land" refers to an area of agricultural land benefited to some extent by water removal to improve the soil environment for plant growth. Both surface and subsurface drainage are included (ditches, subsurface drains, dikes, pumping plants, and land grading). Drainage that is part of irrigation systems is excluded. Drainage in irrigation systems installed for salinity control and temporary control of high water tables is included.

Special drainage districts referred to in this report are local governmental units established to drain agricultural lands. Generally, each district is managed by a board elected by the land

owners within the district. Legally organized drainage districts have a method of apportioning the cost of drainage work; the right to collect revenue through local property taxes or special assessments on the property that is benefited; the right of condemnation against private property for public use; and a method of financing.

SCOPE OF THE CENSUS

Land in farms and land use data in this report are for places that meet the definition for "farm" used in the 1974 and 1978 Censuses of Agriculture. For statistical purposes, any place that sold or normally would have sold \$1,000 or more of agricultural products during the census year is considered a farm.

In collecting county estimates for acres of agricultural land artificially drained from the Soil Conservation Service, the term "agricultural land" approximates the term "land in farms" used in the census of agriculture. Therefore, in most counties, the figures for drained land can be reasonably related to figures for land in farms. However, in some heavily drained counties, the acres for drained land may exceed the acres for land in farms. This can occur in counties having considerable acreages of drained land such as woodland or idle land, which are not part

of agricultural operations that meet the 1978 census farm definition.

Data for land in farms, land use, and drained land were collected from counties in all 50 States. Data for financial and employment characteristics of special drainage districts enumerated in the 1977 Census of Governments were collected from 29 States where such projects existed.

DEFINITIONS AND EXPLANATIONS

Additional history, definitions, explanations, planning background, and census methodology are presented in appendix A of this report.

ABBREVIATIONS AND SYMBOLS

The following abbreviations and symbols are used throughout the tables:

- Zero.
- (X) Not applicable.
- (NA) Not available.
- (D) Data withheld to avoid disclosure of information for individual farms.
- (Z) Less than half of the unit reported.

SUMMARY OF FINDINGS

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ON-FARM OR INDIVIDUAL DRAINAGE

Data from the 1978 Census of Drainage show that the agricultural drained land in the United States is estimated to total over 105 million acres. Illinois, the leading State, had 9.7 million acres drained. Approximately 10 percent of the total land in farms for the United States is estimated to be artificially drained or partially drained. Louisiana is the leading State in percentage of farmland drained, with 72 percent of its land in farms being drained.

Drainage activity is concentrated in the United States with nearly one-half in seven States—Illinois, Iowa, Arkansas, Louisiana, Indiana, Florida, and Minnesota.

Regionally, drainage activity is concentrated in the North Central States which account for 49 percent of the drained land, followed by the South Central States which account for 27 percent. Other highly drained areas include Florida, the coastal areas of North Carolina and South Carolina, the Central Valley area of California, Delaware, and the Eastern Shore counties of Maryland.

DRAINAGE DISTRICTS

The 1977 Census of Governments classified a total of 2,254 local governmental units in 29 States as "special drainage districts" on the basis that their main reported function was drainage of agricultural lands. Over one-third, 877 districts, of the total number of drainage districts are in Illinois. Other leading States in number of drainage districts are Maryland, Mississippi, Delaware, Arkansas, and Iowa, all of which report over 100 districts.

TREND FROM PROJECT DRAINAGE TO ON-FARM DRAINAGE

Department of Agriculture studies of investment in drainage facilities show that the rapid growth era for project or group drainage was from 1900 to 1930.¹ Since about 1930, new capital investment in project facilities has almost been matched by depreciation and abandonment of drainage facilities. As a result, the net value of project facilities has increased very little.

From about 1940, drainage activity as measured by net value of capital investment in facilities shows a trend towards on-farm drainage. The statistics below show the relative growth in importance of on-farm drainage compared with project drainage as measured by cumulative net capital value of drainage facilities.¹

From 1920 to 1930, area within projects expanded approximately 29 percent, from 65.5 million acres to 84.4 million acres. After the 1930's, the expansion stabilized as project area only increased 18 percent, from 87.0 million acres in 1940 to 102.7 million acres in 1950. Little change occurred in the total area within drainage projects in the 1950's with the total for 1960 being 101.9 million acres, a decrease of about 1 percent from the previous census.

The data collected in the 1977 Census of Governments from drainage districts on revenues received, expenditures, debts, and employment indicate that the majority of districts apparently are inactive. For fiscal year 1976-77, 57 percent of the districts reported "none" for revenues received; 62 percent reported "none" for expenditures; 92 percent reported "none" for amount of long-term debt outstanding; 89 percent reported no full-time employees; and 83 percent reported no part-time employees working the pay period ending October 15, 1977.

DECLINE IN DRAINAGE PROJECT ACTIVITY

The decline in new drainage activity in recent years stems from: (1) Over the years since settlement of the United States began, nearly all farmland that required drainage for agricultural purposes through large-scale community and public efforts has been drained or partially drained; (2) the technology of on-farm drainage has improved to the extent that more farmers can install their own systems, using improved materials and

Cumulative Net Value of Drainage Facilities in the United States

(Billions of dollars, 1972)

	Total drainage facilities	On-farm facilities		Project or group facilities
		Number	Percent of total	
1910.....	1.730	0.085	4.9	1.645
1920.....	2.880	.180	6.3	2.700
1930.....	3.940	.215	5.5	3.725
1940.....	3.770	.210	5.6	3.560
1950.....	4.470	.940	21.0	3.530
1960.....	5.090	1.500	29.5	3.590
1970.....	5.570	1.855	33.3	3.715
1975.....	5.500	1.760	32.0	3.740

¹U.S. Department of Agriculture. **Natural Resource Capital in U.S. Agriculture**, ESCS Staff Report. March 1979. See pp. 11, 12, 33, and 34.

technical services of the Soil Conservation Service and other public agencies; and (3) in recent years, there has been a reversal of the policy of the Federal Government from encouraging drainage projects through financial and technical assistance to the present policy advocating wetlands protection and preservation.

Present expectations are that most new drainage will be confined to on-farm practices to improve existing cropland needing improved drainage and for some conversion of wet soils in forest or pastureland to cropland. Project drainage is expected to be limited to maintenance and renovation of existing systems. It is possible that this present outlook for drainage activity may be altered in the future by critical food supply problems,

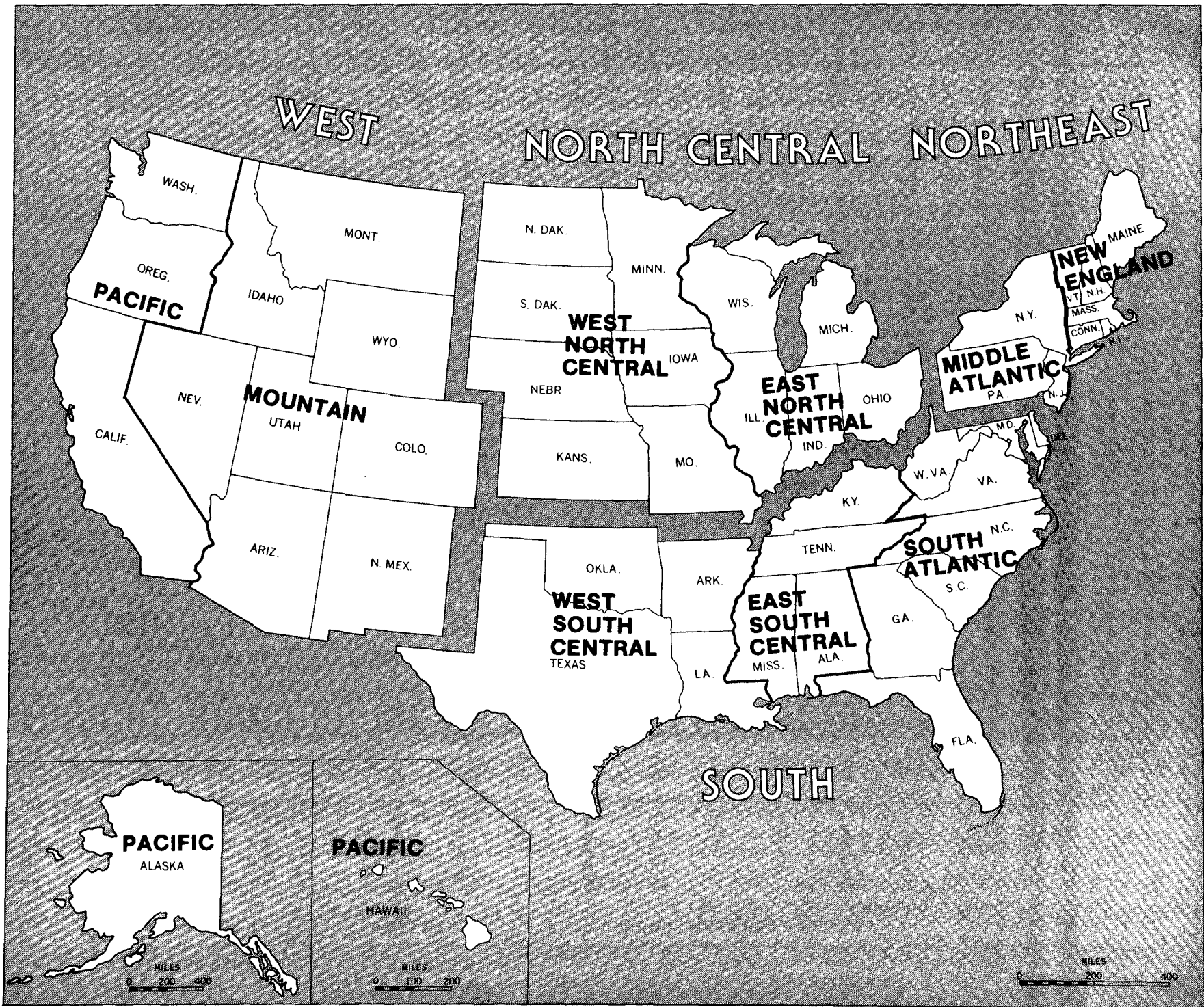
which may dictate large-scale conversion of wetlands to cropland despite ecological concerns.

Federal laws such as the Clean Water Act of 1977 and the Federal Water Pollution Control Act Amendments of 1972 empower the Federal Government to restrict alteration of many of the Nation's wetlands, unless the proposed project can be demonstrated as being in the public interest. Executive Order No. 11990, signed May 24, 1977, restricts Federal involvement in new drainage projects by ordering Federal agencies "to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative."

For a more detailed explanation of the distinction between the terms "wetlands" and "wet soils," see appendix A.

DATA REFERENCE GUIDE: 1978

Statistics	Tables
Drainage districts, number	1
Employees, number	1
Expenses	1
Long-term debt outstanding	1
Revenue received	1
Farms, number	2, 3
Irrigated land	2, 3
Land area, approximate	2, 3
Land drained	2, 3
Land in farms	2, 3
Land use	2, 3
Cropland, total	2, 3
Cropland harvested	2, 3
Cropland pastured	2, 3
Cropland, other	2, 3
Other land	2, 3
Other pastureland and rangeland	2, 3
Woodland	2, 3



REGIONS AND DIVISIONS OF THE UNITED STATES