

The paper on material inventories reported in this Bulletin should be of interest to engineers who may be considering a State-wide study of local road-building materials. Several States have completed such inventories and have found them useful for planning purposes. The rapid depletion of known aggregate sources in some States has accelerated interest in methods of finding and recording the location of new sources of construction materials. For this reason more emphasis has been placed on the engineering use of airphotos, county soil maps and geological maps. The use of these sources of information with supplemental detailed field reconnaissance has been found necessary for covering large areas such as a State. In connection with the field reconnaissance the use of geophysical methods similar to those described in this Bulletin is an effective means of accelerating site exploration because the number of test pits can be substantially reduced without sacrificing the accuracy of the field study.

Airphoto interpretation for determining the character and distribution of soils has been used rather extensively by engineers in recent years. The early work was confined to the study of glacial terrain; later it was expanded to the study of residual areas in various parts of this country. In recent years, considerable work has been done in Alaska. The paper on permafrost reported in this Bulletin points out the importance of considering topographic position in areas subject to permanently frozen soils occurring in their native environment.

The location of permafrost areas is a major consideration in highway and airport construction because the subsequent thawing of those soils after the environmental conditions have been altered by construction results in excessive maintenance or reconstruction expenditures. It is reasonable, therefore, to expect that greater use will be made for location purposes of airphoto interpretation in regions subject to permanently frozen soils.

The Committee is interested in receiving suggestions from the practicing engineer regarding new developments in soil surveying and mapping. It is only through this medium that new ideas and factual information can be obtained which will be of interest to other engineers.

## THE STATUS OF GEOLOGIC MAPPING IN THE UNITED STATES

The engineer responsible for the design and construction of large structures such as dams, tunnels, bridges and buildings usually requires a detailed geologic study of the proposed construction site before starting the preparation of plans.

On the other hand, the role of the geologist in highway engineering usually has been confined to the study of major landslides, the location of sand and gravel or rock deposits and the investigation of highway locations which are likely to require deep cuts extending through the surficial mantle of soil into the bedrock.

There is considerable useful engineering information obtainable from the interpretation of geologic maps. Soils are related to the type of parent material from which they are derived. When the influence of climate and relief are considered the engineer can make reasonable predictions on the type of soils that will be associated with the different parent materials indicated by geologic maps.

In areas where the terrain is not economically suitable for agricultural use we have only limited information on soils. These areas usually are associated with regions of arid to semi-arid climate and the residual soils are apt to be thin in the areas where extensive cuts and fills are required to maintain suitable highway alignments. Under those design conditions the engineer will find that the interpretative information obtained from geologic maps will be useful for highway location and for planning the necessary engineering survey work.

In most instances, due to map scale limitations, all types of maps must be generalized to some degree. The engineer must recognize the limitations of maps. It is suggested that he consult the geologist to determine the accuracy of the particular types of maps available for the area in which he plans to do road work.

In many instances geologic maps used in conjunction with airphotos will enable the engineer to determine details

omitted during the preparation of the geologic maps. Consequently, it is often possible by proper interpretation to minimize the amount of ground reconnaissance required for making engineering estimates of terrain conditions from available maps.

The following information presented on the status of geological mapping in the United States was furnished by the US Geological Survey at the request of the Committee. The Committee felt that this information should be made available to the engineer so that it could be used in highway planning work.

### GEOLOGICAL INDEX MAP OF THE UNITED STATES

The index map of the United States, (Fig. 1) prepared in the US Geological Survey, shows in a general way the areas in the continental United States that have been covered by geologic maps on different scales. The areas that have the largest scale maps are shown in black. The geologic maps for much of the area shown in light gray are State geologic maps approximately 8 mi. to the in. Some of these maps were published by the US Geological Survey and others by State Geological Surveys or societies. The areas shown in white had no published geologic maps on a scale as large as 8 mi. to the in. at the time the illustration was prepared (May 1948). A geologic map of the entire country, scale about 40 mi. to the in., was published by the US Geological Survey in 1933 and may be obtained from that organization for \$2. 50.

More detailed information about published geologic maps for individual States is given in a series of geologic map indexes obtainable from the US Geological Survey. Each published geologic map is outlined on a State base map; an explanatory key gives the source and date of publication,

author, and scale. Publication of these geologic map indexes began in July 1947 and 23 are now available. The scale of most of the indexes is 1: 750,000, or about 12 mi. to the in. A few were published on a scale of 1: 1,000,000, or about 16 mi. to the in. Outline patterns that show the areas covered by geologic maps are printed in 4 colors to indicate approximate scales of the maps. The geologic map indexes that are now available may be obtained as indicated below.

Obtainable from Director, US Geological Survey, Washington 25, D. C., for the prices indicated:

Maine	\$. 25	West Virginia	. 25
Ohio	. 25	Mississippi	. 25
Georgia	. 35	North Carolina	. 50
Tennessee	. 40	South Carolina	. 25

Obtainable from Map Distribution Office, US Geological Survey, Denver Federal Center, Denver, Colorado, for the prices indicated:

Colorado	\$. 70	North Dakota	. 40
Idaho	. 25	Oregon	. 25
Iowa	. 35	South Dakota	. 30
Kansas	. 30	Utah	. 25
Missouri	. 30	Washington	. 35
Montana	. 35	Wyoming	. 50
Nebraska	. 35	New Mexico	. 70
Nevada	. 30		

Information as to geologic-map coverage of specific areas can be obtained by writing to the Director, US Geological Survey, Washington 25, D. C. Most of the States have geological surveys or similar State agencies that can supply information on availability of geologic maps and work in progress within their States. The locations of their offices are listed in Table 1. Massachusetts does not have a State survey but information on the geology of that State can be furnished by the US Geological Survey Office, room 513, at 100 Nashua Street, Boston 14, Massachusetts.

FIGURE 1. AREAS OF PUBLISHED GEOLOGIC MAPS ON DIFFERENT SCALES  
REDUCED FROM ORIGINAL MAP BY LEONA BOARDMAN MAY 1948  
DEPARTMENT OF INTERIOR, US GEOLOGICAL SURVEY

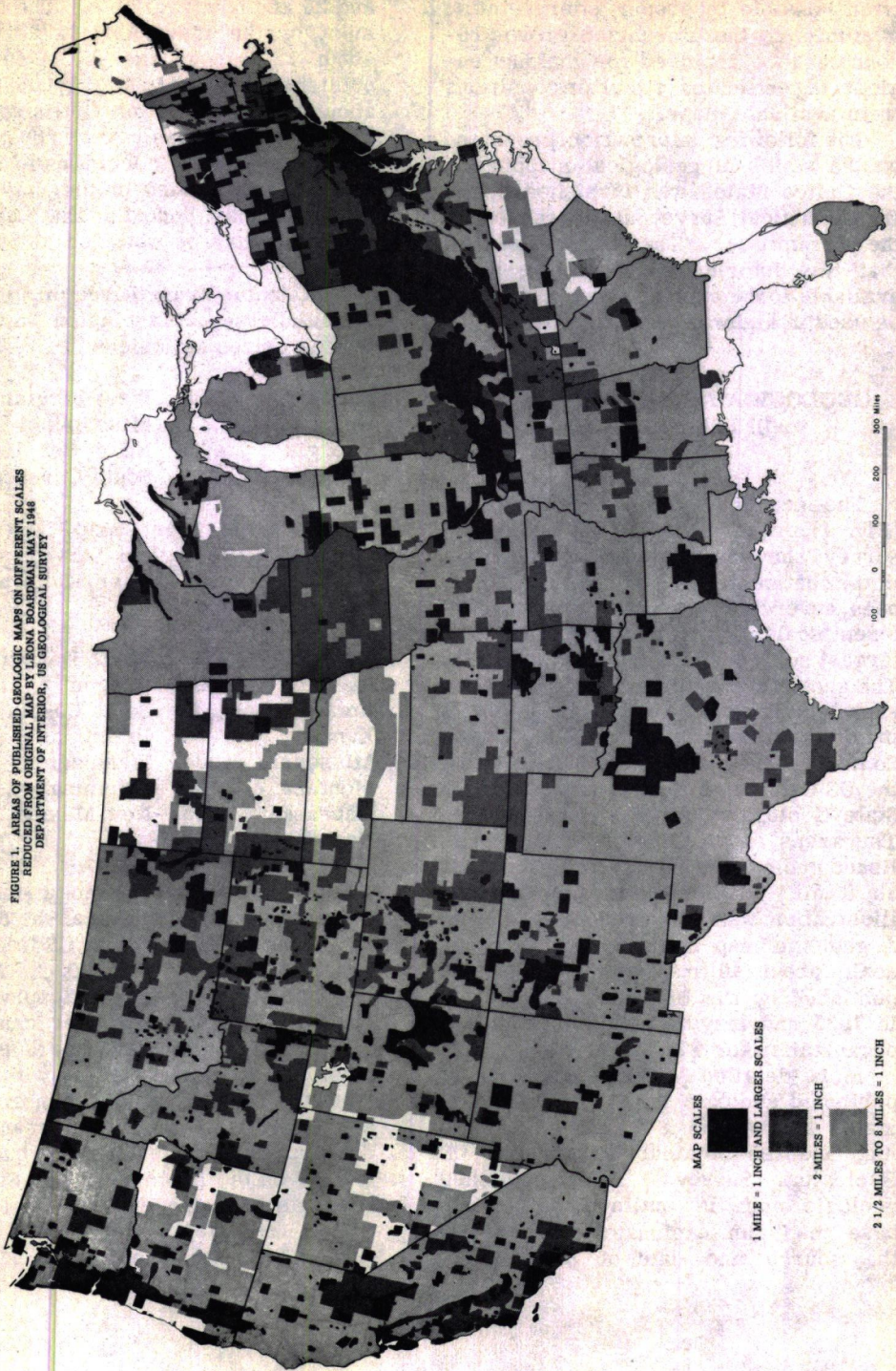


TABLE 1  
TABULATION OF STATE GEOLOGISTS BY STATES

State	State Geologist and Address
Alabama	Dr. Walter B. Jones, State Geologist, Geological Survey of Alabama, University
Arizona	Dr. T. G. Chapman, Director, Arizona Bureau of Mines, University of Arizona, Tucson
Arkansas	Mr. Harold B. Foxhall, Director, Division of Geology, Arkansas Resources and Development Commission, State Capitol, Little Rock
California	Dr. Olaf P. Jenkins, Chief, Division of Mines, Department of Natural Resources, Ferry Building, San Francisco 11
Colorado	Mr. Fred Jones, Vice Chairman, Colorado Geological Survey, State Museum Building, Denver
Connecticut	Dr. Edward L. Troxell, Director, Connecticut Geological and Natural History Survey, Trinity College, Hartford 6
Florida	Dr. Herman Gunter, Director, Florida Geological Survey, P.O. Drawer 631, Tallahassee
Georgia	Capt. Garland Peyton, Director, Department of Mines, Mining and Geology, State Division of Conservation, 425 State Capitol, Atlanta
Idaho	Mr. A. W. Fahrenwald, Director, Idaho Bureau of Mines and Geology University of Idaho, Moscow
Illinois	Dr. M. M. Leighton, Chief, State Geological Survey Division, 100 Natural Resources Building, University of Illinois Campus, Urbana
Indiana	Dr. Charles F. Deiss, Chairman and State Geologist, Division of Geology, Indiana Department of Conservation, Indiana University Bloomington
Iowa	Dr. H. Garland Hershey, Director and State Geologist, Iowa Geological Survey, Iowa City
Kansas	Dr. John C. Frye, Executive Director, State Geological Survey, The University of Kansas, Lawrence Dr. Raymond C. Moore, State Geologist and Director of Research, State Geological Survey, The University of Kansas, Lawrence
Kentucky	Mr. Daniel J. Jones, State Geologist, Department of Geology, Kentucky Geological Survey, University of Kentucky, Lexington
Louisiana	Mr. Leo W. Hough, State Geologist, Louisiana Geological Survey, Department of Conservation, Geology Building, University Station, Baton Rouge 3
Maine	Dr. Joseph M. Trefethen, State Geologist, Maine Geological Survey, University of Maine, Orono
Maryland	Dr. Joseph T. Singewald, Jr., Director, Department of Geology, Mines and Water Resources, Board of Natural Resources, Baltimore 18

TABLE 1 (continued)

## TABULATION OF STATE GEOLOGISTS BY STATES

State	State Geologist and Address
Michigan	Mr. G. E. Eddy, State Geologist, Geological Survey Division, Department of Conservation, Lansing 13
Minnesota	Dr. G. M. Schwartz, Director, Minnesota Geological Survey, University of Minnesota, Minneapolis 14
Mississippi	Dr. W. C. Morse, Director, Mississippi Geological Survey, University
Missouri	Dr. Edward L. Clark, State Geologist, Division of Geological Survey and Water Resources, Department of Business and Administration, Buehler Building, Rolla
Nebraska	Dr. G. E. Condra, State Geologist, Conservation and Survey Division, The University of Nebraska, Lincoln 8
Montana	Dr. Francis A. Thomson, Director, State Bureau of Mines and Geology, Butte
Nevada	Mr. Jay A. Carpenter, Director, Bureau of Mines, Box C, University Station, Mackay School of Mines, Reno
New Hampshire	Mr. T. R. Meyers, Geologist, New Hampshire State Planning and Development Commission, Conant Hall, University of New Hampshire, Durham
New Jersey	Mr. Meredith E. Johnson, State Geologist, Geologic and Topographic Survey, Department of Conservation and Economic Development, Room 415 State House Annex, Trenton 7
New Mexico	Dr. Eugene Callaghan, Director, New Mexico Bureau of Mines and Mineral Resources, Socorro
New York	Dr. John G. Broughton, State Geologist, State Geological and Natural History Surveys, State Education Building, University of the State of New York, Albany 1
North Carolina	Dr. Jasper L. Stuckey, State Geologist, Division of Mineral Resources, Department of Conservation and Development, Raleigh
North Dakota	Dr. Wilson M. Laird, State Geologist, North Dakota Geological Survey, University of North Dakota, Grand Forks
Ohio	Mr. John H. Melvin, State Geologist, Geological Survey of Ohio, Orton Hall, Ohio State University, Columbus 10
Oklahoma	Mr. Robert H. Dott, Director, Oklahoma Geological Survey, Norman
Oregon	Mr. F. W. Libbey, Director, State Department of Geology and Mineral Industries, 702 Woodlark Building, Portland 5
Pennsylvania	Mr. S. H. Cathcart, Director, Bureau of Topographic and Geologic Survey, Department of Internal Affairs, Harrisburg
Rhode Island	Dr. Alonzo W. Quinn, Chairman, Mineral Resources Committee, Rhode Island Port and Industrial Development Commission, Providence 3
South Carolina	Dr. Laurence L. Smith, State Geologist, Department of Geology, Mineralogy and Geography, University of South Carolina, Columbia

TABLE 1 (continued)

## TABULATION OF STATE GEOLOGISTS BY STATES

State	State Geologist and Address
South Dakota	Dr. E. P. Rothrock, State Geologist, State Geological Survey, State University, Lock Drawer 351, Vermillion
Tennessee	Mr. H. B. Burwell, State Geologist, Division of Geology, Department of Conservation, G-5 State Office Building, Nashville 3
Texas	Dr. John T. Lonsdale, Director, Bureau of Economic Geology, The University of Texas, University Station, Box B, Austin 12
Utah	Mr. Arthur L. Crawford, Director, Utah Geological and Mineralogical Survey, College of Mines and Mineral Industries, University of Utah, Salt Lake City 2
Vermont	Mr. Charles G. Doll, State Geologist, State of Vermont Development Commission, East Hall, University of Vermont, Burlington
Virginia	Mr. William M. McGill, State Geologist, Virginia Geological Survey, Box 1428, University Station, Charlottesville
Washington	Mr. Sheldon L. Glover, Supervisor, Division of Mines and Geology, Department of Conservation and Development, Room 404, Transportation Building, Olympia
West Virginia	Dr. Paul H. Price, State Geologist, West Virginia Geological and Economic Survey, P.O. Box 879, Morgantown
Wisconsin	Mr. E. F. Bean, State Geologist, Geological and Natural History Survey, Science Hall, The University of Wisconsin, Madison
Wyoming	Dr. H. D. Thomas, State Geologist, The Geological Survey of Wyoming, University of Wyoming, Laramie

DIVISION OF SOIL SURVEY - BUREAU OF  
PLANT INDUSTRY USDA

The status of agricultural soil mapping in the United States was presented in Highway Research Bulletin No. 22, "Engineering Use of Agricultural Soil Maps". Since this survey was completed additional areas have been mapped and field work has been initiated in other areas. The following tabulations were prepared by the Committee from information furnished by the Division of Soil Survey, Bureau of Plant Industry, USDA.

The counties or soil areas in which soil surveys are in progress or have been completed are tabulated in Table No. 2. These areas are listed by States and where field work is in progress the party chief and soil correlator has been included for ready reference purposes.

The address of the soil correlator is given in Table No. 3 and it is suggested that these men should be consulted regarding specific details of mapping in these areas. In many cases they may be able to furnish the engineers

with ozalid copies of their field work that has been completed in the areas. They also are likely to have useful information regarding the soil profile descriptions of the map-units used to delineate the soils in the area mapped. They can point out the soil map-units which are most likely to contain sources of granular material for road building purposes and at the same time assist the engineer in obtaining a better understanding of their system of soil classification.

Since Highway Research Board Bulletin No. 22 was published, a number of county soil maps listed as in progress have been published. The new publications are listed in Table No. 4. It is recommended that this information, together with the information in Table No. 1, be used to revise your copy of Highway Research Board Bulletin No. 22.

The Committee will issue supplemental information circulars at intervals to call the engineer's attention to new soil maps completed or to areas in which soil mapping is in progress.

TABLE 2

SOIL SURVEYS IN PROGRESS OR COMPLETED IN PRESENT FISCAL YEAR  
DIVISION OF SOIL SURVEY, BUREAU OF PLANT INDUSTRY, USDA

State	County or Soil Area	Party Chief	Soil Correlator <sup>a</sup>
Alabama	De Kalb County <sup>1</sup>	G. A. Swenson <sup>b</sup>	M. J. Edwards
	Lawrence County <sup>2</sup>	- -	- -
California	Madera County	L. K. Stromberg <sup>S</sup>	R. A. Gardner
	Merced County	- -	- -
Colorado	Delta-Montrose Area <sup>1</sup>	E. W. Knobel	W. G. Harper
Connecticut	Hartford County <sup>1</sup>	A. E. Shearin	W. B. Lyford <sup>b</sup>
Florida	Escambia County <sup>1</sup>	J. H. Walker <sup>S</sup>	Hasty or Martin
	Hillsborough Co. <sup>2</sup>	- -	- -
	Sarasota County <sup>1</sup>	R. G. Leighty <sup>b</sup>	I. L. Martin
Georgia	Fulton County <sup>2</sup>	- -	- -
Idaho	Canyon County <sup>1</sup>	M. S. Fosberg <sup>S</sup>	W. J. Leighty
Illinois	Lawrence County <sup>1</sup>	J. B. Fehrenbacher <sup>S</sup>	W. D. Shrader
	Menard County <sup>2</sup>	- -	- -
	Will County <sup>1</sup>	P. T. Weale <sup>S</sup>	W. D. Shrader
Indiana	Fayette County <sup>1</sup>	S. D. Alfred <sup>S</sup>	O. C. Rogers
	Parke County <sup>2</sup>	- -	- -
Iowa	Monona County <sup>1</sup>	J. E. McClelland <sup>b</sup>	W. D. Shrader
	Shelby County <sup>1</sup>	J. E. McClelland <sup>b</sup>	W. D. Shrader
Kansas	Saline County <sup>2</sup>	- -	- -
	Webster Unit (Part Osborne Co.) <sup>1</sup>	C. H. Atkinson <sup>b</sup>	W. H. Johnson
	Republic Co. (All Scandia Unit) <sup>1</sup>	C. H. Atkinson <sup>b</sup>	W. H. Johnson
Louisiana	St. Mary Parish <sup>1</sup>	S. A. Lytle <sup>b</sup>	Hasty or Martin
Michigan	Keweenaw County <sup>1</sup>	W. H. Colburn <sup>S</sup>	I. J. Nygard
	Mackinac County <sup>1</sup>	W. H. Colburn <sup>S</sup>	I. J. Nygard
	Montcalm County <sup>2</sup>	- -	- -
	Ontonogan County <sup>3</sup>	- -	- -
	Sanilac County <sup>1</sup>	I. F. Schneider <sup>S</sup>	O. C. Rogers
Minnesota	Brown County <sup>3</sup>	- -	- -
	Fillmore County <sup>2</sup>	- -	- -
	Mower County <sup>1</sup>	H. F. Arneman <sup>S</sup>	I. J. Nygard
Mississippi	Bolivar County <sup>1</sup>	C. C. Morgan <sup>S</sup>	Hasty or Martin
	Coahoma County <sup>2</sup>	- -	- -
	DeSota County <sup>1</sup>	C. C. Morgan <sup>S</sup>	I. L. Martin
	Sunflower County <sup>1</sup>	C. C. Morgan <sup>S</sup>	Hasty or Martin
Missouri	Boone County <sup>1</sup>	C. L. Serivner <sup>S</sup>	W. D. Shrader
	Moniteau County <sup>1</sup>	J. A. Frieze <sup>S</sup>	I. L. Martin
Montana	Bitterroot Valley Area <sup>1</sup>	W. C. Bourne <sup>b</sup>	H. H. Williams
	Roosevelt Co. (Part No-Souris Proj.) <sup>1</sup>	A. J. Cline	H. H. Williams
Nebraska	Buffalo Co. (Part Wood River Proj.) <sup>1</sup>	J. A. Elder <sup>b</sup>	H. H. Williams
	Hall Co. (Part Wood River Proj.) <sup>1</sup>	D. A. Yost	H. H. Williams
	Saunders County <sup>1</sup>	T. E. Beesley	H. H. Williams

TABLE 2 (continued)

 SOIL SURVEYS IN PROGRESS OR COMPLETED IN PRESENT FISCAL YEAR  
 DIVISION OF SOIL SURVEY, BUREAU OF PLANT INDUSTRY, USDA

State	County or Soil Area	Party Chief	Soil Correlator <sup>a</sup>
New Hampshire	Rockingham County <sup>1</sup>	Roeslon Feuer <sup>S</sup>	Lyford <sup>b</sup>
New York	Franklin County <sup>1</sup>	M. E. Austin <sup>b</sup>	Cline or Lyford <sup>b</sup>
	Lewis County <sup>1</sup>	C. S. Pearson <sup>S</sup>	M. C. Cline <sup>b</sup>
North Carolina	Duplin County <sup>1</sup>	E. F. Goldston <sup>S</sup>	Hasty or Lee
	Pasquotank County <sup>2</sup>	- -	- -
North Dakota	Renville Co. (Part Mo-Souris Proj. <sup>1</sup> )	B. L. Matzek <sup>b</sup>	C. A. Mogen
Ohio	Clark County <sup>2</sup>	- -	- -
	Fairfield County <sup>1</sup>	J. E. Petro <sup>b</sup>	O. C. Rogers
Oklahoma	Creek County <sup>2</sup>	- -	- -
	Pawnee County <sup>1</sup>	H. M. Galloway <sup>b</sup>	Harvey Oakes
Oregon	Douglas County <sup>1</sup>	A. C. Anderson	R. C. Roberts
Pennsylvania	Potter County <sup>1</sup>	K. V. Goodman	W. R. Lyford <sup>b</sup>
South Dakota	Brodking County <sup>1</sup>	F. C. Weston <sup>S</sup>	C. A. Mogen
	Hand Co. (Part Mo-Oahe Proj. <sup>1</sup> )	A. J. Klingelhoofs <sup>b</sup>	C. A. Mogen
	Spink Co. (Part Mo-Oahe Proj. <sup>1</sup> )	F. C. Weston <sup>S</sup>	C. A. Mogen
Tennessee	Blount County <sup>1</sup>	Joe Elder <sup>S</sup>	L. R. Odem
	Bradley County <sup>1</sup>	R. L. Flowers <sup>S</sup>	L. R. Odem
	Franklin County <sup>2</sup>	- -	- -
	Houston County <sup>2</sup>	- -	- -
	Lawrence County <sup>1</sup>	J. R. Overton <sup>S</sup>	L. R. Odem
	Marion County <sup>2</sup>	- -	- -
Texas	Maury County <sup>1</sup>	A. B. Harmon <sup>S</sup>	L. R. Odem
	Brazos County <sup>1</sup>	I. C. Mowery <sup>b</sup>	H. H. Templin <sup>b</sup>
Utah	Weber Area <sup>1</sup> (contains potential irrigable lands in Weber, Davis, Morgan, Summit Cos., and S.E. Cor. Boxelder Co.)	V. K. Hugie	W. G. Harper
	Beryl-Enterprise Area <sup>1</sup>	G. H. Schafer	W. G. Harper
Virginia	Louden County <sup>1</sup>	H. C. Porter <sup>S</sup>	Lagon or Obenshain <sup>b</sup>
	Norfolk County <sup>1</sup>	E. F. Henery <sup>S</sup>	Edwards or Obenshain <sup>b</sup>
	Nottoway County <sup>2</sup>	- -	- -
	Prince Edward County <sup>2</sup>	- -	- -
Washington	Island County <sup>2</sup>	- -	- -
	Mason County <sup>1</sup>	R. H. Fowler <sup>S</sup>	R. C. Roberts
	Skagit County <sup>1</sup>	A. O. Ness	R. C. Roberts
Wisconsin	Grant County <sup>1</sup>	C. H. Robinson	I. J. Nygard
	Richland County <sup>2</sup>	- -	- -
Wyoming	Goshen County <sup>1</sup>	C. J. Fox	Thorp or Johnson

<sup>a</sup>See Table 3 for address of soil correlator.

<sup>b</sup>State and Bureau

<sup>S</sup>State

<sup>1</sup>Soil Survey assignments for summer of 1950

<sup>2</sup>Soil survey in progress of publication

<sup>3</sup>Reconnaissance map in progress of publication

TABLE 3

## SOIL CORRELATORS - DIVISION OF SOIL SURVEY

J. Kenneth Ableiter, *Chief Soil Correlator*, Bureau of Plant Industry USDA  
Beltsville, Maryland

*Northern States* - Connecticut, Illinois, Indiana, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri (north of Missouri River), Mississippi, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia and Wisconsin

Guy D. Smith, Principal Soil Correlator, Northern States, USDA Bureau of Plant Industry, Beltsville, Maryland

O. C. Rogers, Senior Soil Correlator, East Midwestern States, USDA Bureau of Plant Industry, Beltsville, Maryland

Iver J. Nygard, Senior Soil Correlator, Northern Lake States, Div. of Soils, Agricultural Experiment Station, University Farm, St. Paul 1, Minnesota

W. D. Schrader, Soil Correlator, West-Midwestern States, Department of Soils, University of Missouri, Columbia, Missouri

N. C. Clane, Agent (correlation) New York, Department of Agronomy, Cornell University, Ithaca, New York

W. H. Lyford, Agent (correlation), Northeastern States, Department of Agronomy, College of Agriculture, Durham, New Hampshire

*Southern States* - Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Missouri (south of Missouri River), Mississippi, North Carolina, South Carolina, Tennessee and Virginia

W. S. Ligon, Principal Soil Correlator, Southern States, 508 New Sprinkle Building, c/o TVA Knoxville, Tennessee

I. L. Martin, Senior Soil Correlator, (same address as listed above)

M. J. Edwards, Senior Soil Correlator, (same address as listed above)

L. R. Odem, Soil Correlator, Southern States, (same address as listed above)

A. H. Hastly, Soil Correlator, (same address as listed above)

S. S. Obenshain, Agent (correlation), Virginia Department of Agronomy, Virginia Agricultural Experiment Station, Blacksburg, Virginia

*Great Plains States* - Colorado (east of Continental Divide), Kansas, Montana, Nebraska, North Dakota, Oklahoma, South Dakota, Texas and Wyoming

James Thorp, Principal Soil Correlator, Great Plains States, 204 Nebraska Hall, University of Nebraska, Lincoln 8, Nebraska

B. H. Williams, Senior Soil Correlator, Northern Great Plain States, (same address as listed above)

C. A. Mogen, Soil Correlator, Northern Great Plains States, (same address as listed above)

W. M. Johnson, Soil Correlator, Northern Great Plains States, (same address as listed above)

R. H. Templin, Senior Soil Correlator, Southern Great Plains States, Texas Agricultural Experiment Station, College Station, Texas

Harvey Coles, Soil Correlator, Southern Great Plains States, (same address as listed above)

*Far Western States* - Arizona, California, Colorado (west of Continental Divide), Idaho, Nevada, New Mexico, Oregon, Utah and Washington

R. C. Roberts, Principal Soil Correlator, Far Western States, 322 Woolsey Building, 2168 Shattuck Avenue, Berkeley 4, California

F. A. Gardner, Senior Soil Correlator, Central Far Western States, (same address as listed above)

TABLE 3 (continued)

## SOIL CORRELATORS - DIVISION OF SOIL SURVEY

- W. J. Leighty, Soil Correlator, Northern Far Western States, 322 Woolsey Building, 2168 Shattuck Avenue, Berkeley 4, California
- G. M. Schaefer, Soil Correlator, Northern Far Western States, (same address as listed above)
- W. G. Harper, Senior Soil Correlator, Southern Far Western States, US Salinity Laboratory, P. O. Box 672, Riverside, California

TABLE 4

## AGRICULTURAL SOIL BULLETINS AND MAPS PUBLISHED SINCE HIGHWAY RESEARCH BOARD BULLETIN NO. 22 WAS ISSUED IN 1949

State	County or Area	USDA Rating	State	County or Area	USDA Rating
Georgia	Chandler County	(1)	New Hampshire	Cheshire County	(1)
	Union County	(1)		Sullivan County	(1)
Indiana	St. Joseph County	(1)	North Carolina	Jackson County	(1)
Iowa	Tama County	(1)		Transylvania County	(1)
Michigan	Madland County	(1)	Oregon	Astoria County	(1)
Minnesota	Rock County	(1)	Tennessee	Cumberland County	(1)

## SOIL CONSERVATION SERVICE - USDA

The Committee on Surveying and Classifying Soils In-Place for Engineering Purposes prepared the following information from material obtained from the Soil Conservation Service of the USDA. It is the opinion of the Committee that since a large number of the States are using the county agricultural soil maps, it would be desirable to call to the attention of the engineer another source of soil information which is similar in many respects to that found in the county soil bulletins.

In areas not covered by county soil maps there are likely to be detailed soil maps prepared by the Soil Conservation Service for individual farms. The same system of soil classification as used for county soil maps is used in making these detailed soil maps for farms. Therefore, this information can be used in a similar manner in airphoto soil interpretation. This practice will

minimize the field checks usually required for estimating the engineering significance of airphoto soil patterns occurring in the area.

In many areas large parts of counties listed as not having a county soil map (see Highway Research Board Bulletin No. 22 for status of county soil mapping in the United States) may be mapped on a farm basis. These individual farm soil maps, together with the description of soil series and the soil key developed for correlating the soils found in the area will furnish the engineer with a useful source of terrain information for estimating soil conditions in the inter-farm areas from airphoto soil patterns.

The type of farm soil maps used for land classification by the Soil Conservation Service is indicated in Figure 2. The soil scientist usually can furnish the engineer with other detailed information useful for making his engineering

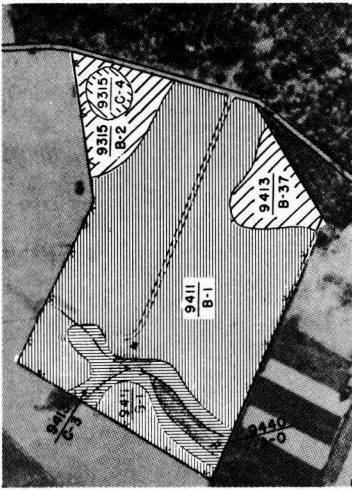






Figure A  
**LAND USE CAPABILITY MAP**  
 of  
 a 50 acre section of a Monmouth County vegetable farm.

Land Use Capability Classes

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**Class II** land. Deep soil, Sassafras loam (9411); gentle slope, 2-5 percent, little erosion. Can be cultivated with easily applied practices to control runoff and erosion.
- 

**Class III** land. Deep soil, Sassafras sandy loam (9413); slope 2-5 percent (B) or 5-10 percent (C); severe erosion; can be cultivated with intensive treatment to control runoff and erosion. Also deep sandy soil, Evesboro loamy sand (9315); slope 2-5 percent; moderate erosion; can be cultivated with intensive treatment to build up fertility and save moisture.
- 

**Class IV** land. Deep sandy soil, Evesboro loamy sand (9315); slope 5-10 percent; severe erosion. Too droughty and erodible for regular use as cropland. Can be used for hay or pasture.
- 

**Class VI** land. Level, wet land, Pocomoke silt loam (9440). Suitable for pasture or woodland.

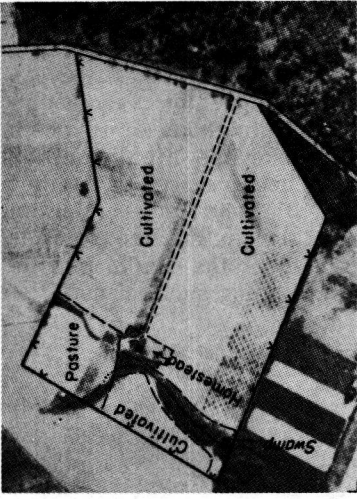


Figure B:- Same farm showing field arrangement and use at time of planning.

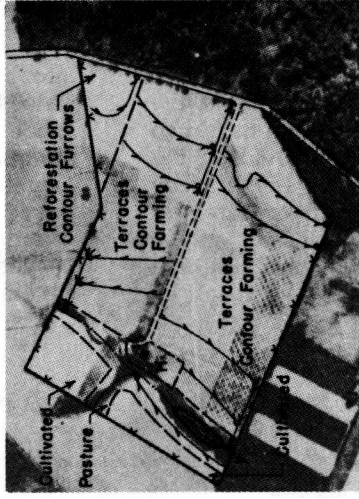


Figure C:- Same farm re-planned for erosion control, water conservation, and better land use.

**LEGEND**










-  Public road
-  Private road
-  Crop boundary
-  Stream
-  Present fence and farm boundary
-  Diversion terraces
-  Diversion outlet
-  House
-  Pond

Figure 2. Example of Farm Soil Maps Made by Soil Conservation Service

survey of the area. Information on nomenclature, soil profile characteristics of the map-units, the type of parent material from which each soil series is derived, and the internal drainage of the soil in place usually can be obtained from the soil scientist working in the area.

The extent of farm mapping in the United States is shown by the map contained in the pocket located on the back page of this Bulletin. In the areas shown in red the regional or State soil scientists listed in Tables 5 and 6 should be helpful. It is suggested that the engineer consult his regional or

State soil scientists because they can often refer him to one of the district soil scientists who is working in the area where additional soil information is needed.

Another use of this farm soil map information is in counties or areas which have been mapped by reconnaissance soil survey methods or in which the nomenclature or specification of the map-units have been revised since they were published. The soil scientist usually can furnish the correlation between the older and the new map-units developed for mapping such areas.

TABLE 5

## TABULATION OF REGIONAL SOIL SCIENTISTS BY STATES AND REGIONS

Region	States within Region
1. Northeastern Region H. R. Adams 6816 Market Street Upper Darby, Pennsylvania	Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New York, Pennsylvania, New Jersey, Maryland, Delaware, West Virginia
2. Southeastern Region G. L. Fuller Montgomery Building 199 North Church Street Spartanburg, South Carolina	Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Tennessee, Kentucky, Puerto Rico
3. Upper Mississippi Region A. H. Paschall 434 N. Plankanton Avenue Milwaukee 3, Wisconsin	Ohio, Indiana, Illinois, Missouri, Iowa, Minnesota, Wisconsin, Michigan
4. Western Gulf Region R. M. Marshall (P. O. Box 1898) 3500 Cleburne Road Fort Worth 1, Texas	Texas Oklahoma Arkansas Louisiana
5. Northern Great Plains Region R. O. Lewis (P. O. Box 713) Post Office Building Lincoln 1, Nebraska	Montana, Wyoming, North Dakota, South Dakota, Nebraska, Kansas
6. Southwestern Region M. R. Isaacson (P. O. Box 1348) 222 East Central Avenue Albuquerque, New Mexico	Arizona New Mexico Colorado Utah
7. Pacific Region S. W. Cosby Swan Island Portland 18, Oregon	Washington, Oregon, Idaho, Nevada, California, Alaska, Hawaii

TABLE 6

## TABULATION OF SOIL SCIENTISTS BY STATES

*Alabama* - Miles E. Stephens, Land Use Building, Alabama Polytechnic Institute, Auburn

*Arizona* - Roger D. Headley, Agricultural Experiment Station, University of Arizona, Tucson

*Arkansas* - Marvin Lawson, Agricultural Experiment Station, University of Arkansas, Fayetteville

*California* - Leonard R. Wohletz, 15 Shattuck Square, Addison Building, Berkeley

*Colorado* - E. Malton Payne, 202 Agronomy Building, Colorado Agricultural Experiment Station, Fort Collins

*Connecticut* - G. A. Quakenbush, New Jersey Agricultural Experiment Station, New Brunswick, New Jersey  
(Mr. Quakenbush is State Soil Scientist in both Connecticut and New Jersey.)

*Delaware* - M. F. Herahberger, Maryland Agricultural Experiment Station, College Park, Maryland  
(Mr. Herahberger is State Soil Scientist in both Delaware and Maryland.)

*Florida* - O. C. Lewis, Smith Building, 129 South Pleasant Street, Gainesville

*Georgia* - Richard R. Covell, Old Post Office Building, Athens

*Idaho* - C. F. Parrott, 106 Morrill Hall, University of Idaho, Moscow

*Illinois* - A. A. Klingebiel, Agricultural Experiment Station, University of Illinois, Urbana

*Indiana* - T. C. Bass, Lafayette Loan and Trust Building, Main Street, Lafayette

*Iowa* - Byron A. Barnes, Room 2, Landscape Architecture Building, Iowa State College, Ames

*Kansas* - Claude L. Fly, Agricultural Experiment Station, Manhattan

*Kentucky* - W. W. Carpenter, Dudley School Building, Lexington

*Louisiana* - D. L. Fontenot, Postal Annex, Alexandria

*Maine* - J. Stewart Hardesty, The Maples Building, University of Maine, Orono (Mr. Hardesty is State Soil Scientist in both Maine and New Hampshire.)

*Maryland* - M. F. Hershberger, Maryland Agricultural Experiment Station, College Park

*Massachusetts* - Montague Howard Jr., Agricultural Experiment Station, University of Vermont, Burlington  
(Mr. Howard is State Soil Scientist in Massachusetts, Rhode Island, and Vermont.)

*Michigan* - C. A. Engberg, Michigan State College of Agriculture, East Lansing

*Minnesota* - Alex S. Robertson, Agricultural Experiment Station, University Farm, St. Paul 8

*Mississippi* - D. T. Webb, Mississippi Agricultural Experiment Station, State College

*Missouri* - Harold E. Grogger, Post Office Building, 6th and Cherry Streets, Columbia

*Montana* - Dave R. Cawfield, Montana Agricultural Experiment Station, Bozeman

*Nebraska* - Lloyd E. Mitchell, Conservation and Survey Section, University of Nebraska, Lincoln

*Nevada* - - - - -

*New Hampshire* - J. Stewart Hardesty, The Maples Building, University of Maine, Orono, Maine (Mr. Hardesty is State Soil Scientist in both Maine and New Hampshire.)

*New Jersey* - G. A. Quakenbush, New Jersey Agricultural Experiment Station, New Brunswick

*New Mexico* - H. J. Maker, New Mexico Agricultural Experiment Station, State College

*New York* - Arnold J. Baur, New York State College of Agriculture, Cornell University, Ithaca

*North Carolina* - W. W. Stevens, 1911 Dormitory, State College, Raleigh

*North Dakota* - Lloyd Shoensmith, North Dakota Agricultural Experiment Station, Fargo

*Ohio* - H. H. Morse, 316 Rowlands Building, 12 North Third Street, Columbus 15

*Oklahoma* - Louis E. Derr, Agronomy Department, Oklahoma A and M College, Stillwater

*Oregon* - William W. Hill, Agricultural Experiment Station, Oregon State College, Corvallis

*Pennsylvania* - F. G. Loughry, Agriculture Building, Pennsylvania State College, State College

*Rhode Island* - Montague Howard Jr., Agricultural Experiment Station, University of Vermont, Burlington, Vermont (Mr. Howard is State Soil Scientist in Massachusetts, Rhode Island, and Vermont.)

TABLE 6 (continued)

## TABULATION OF SOIL SCIENTISTS BY STATES

*South Carolina* - P. H. Montgomery, Federal Land Bank Building, 1401 Hampton Street, Columbia

*South Dakota* - - - - -

*Tennessee* - Nathan I. Brown, 1123 Church Street, Nashville

*Texas* - James D. Simpson, Texas Agricultural Experiment Station, College Station

*Utah* - D. F. Trussell, Utah Agricultural Experiment Station, Logan

*Vermont* - Montague Howard, Jr., Agricultural Experiment Station, University of Vermont, Burlington

*Virginia* - R. E. Devereux, Eheart Building, Jackson and Main Streets, Blacksburg

*Washington* - Warren A. Starr, Box 508, Agricultural Experiment Station, Pullman

*West Virginia* - Boyd J. Patton, Agricultural Experiment Station, West Virginia University, Morgantown

*Wisconsin* - William DeYoung, State Farm Insurance Building, 2702 Monroe Street, Madison

*Wyoming* - Harold Bandschadler, 207 Grand Avenue, Laramie