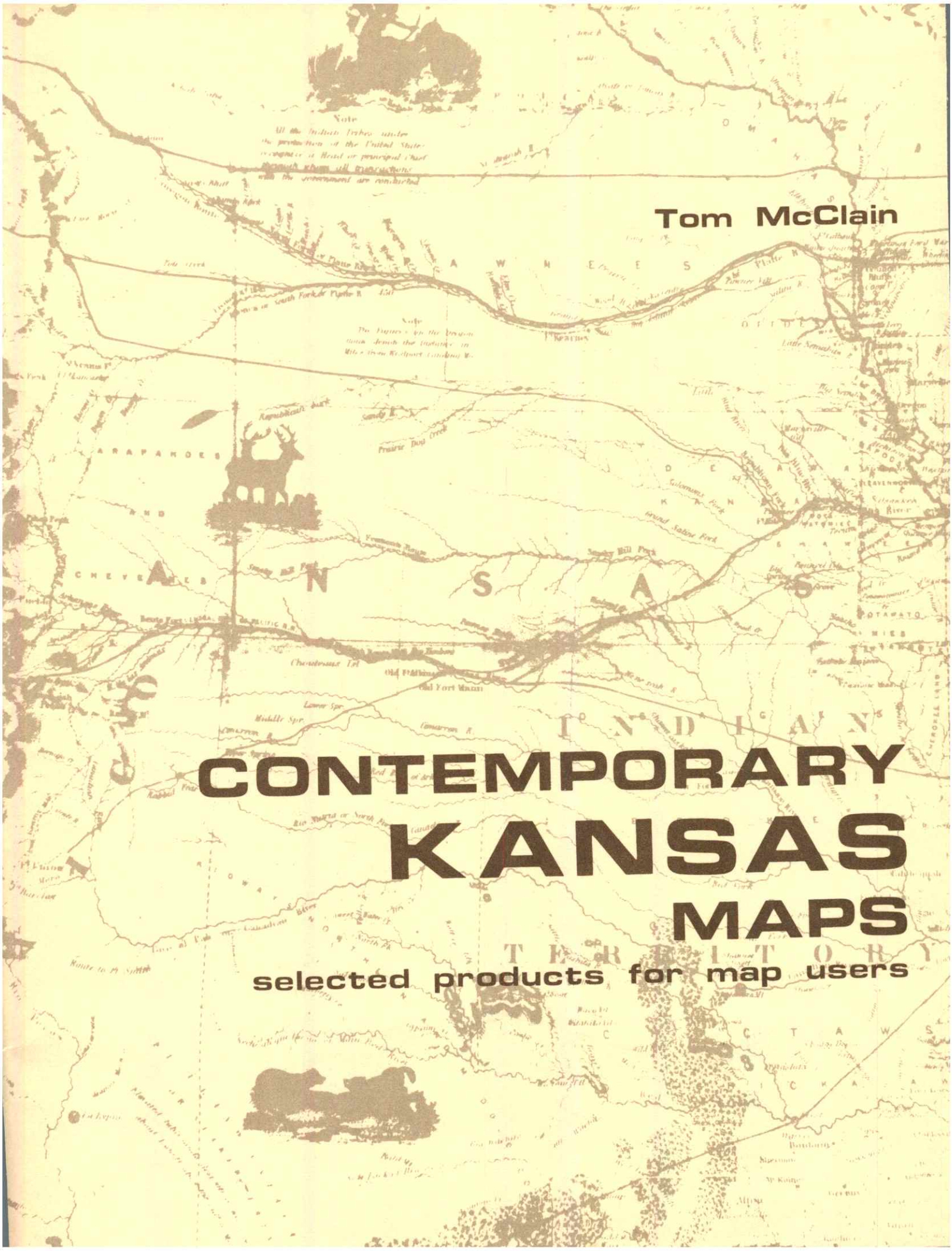

Tom McClain

# CONTEMPORARY KANSAS MAPS

## selected products for map users

# CONTEMPORARY KANSAS MAPS

**Selected Products for Map Users**

Thomas McClain

Environmental Geology Series 1
Kansas Geological Survey
The University of Kansas
Lawrence, Kansas
May 1977

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# INTRODUCTION

The last time the Kansas Geological Survey published a summary of maps available to the public was 1924. That publication, Geological Survey Circular #1 compiled by former Director Raymond C. Moore, contained listings of maps available from the Kansas Geological Survey as well as other organizations. All the maps listed in that circular are now out-of-print and copies of most are nonexistant.

At that time, many of the maps available from the Geological Survey were related to the petroleum industry of the state. The Geological Survey is still involved in aiding the state's petroleum industry; however, there is a strong emphasis on and assistance to other parts of the state's economy, particularly in supplying data for planning uses. Along with physical data in such areas as geology and water, the Kansas Geological Survey has a number of maps available that may be of use to planners. In addition, other selected sources of maps and data are presented. Because aerial photography and satellite imagery are important in planning, a brief list of sources for this material is included.

Every organization, whether federal, state, local, or private, has maps that are used for showing spatial relationships. A list of all these products is beyond the scope of this publication. Listed herein are maps, map products, and generally available physical data from federal, state, and local organizations and individuals that are available "off the shelf." An attempt has been made to list organizations that have not only base maps but physical data available for planners. Even though an agency may have no maps published as such, it may have other reports which contain valuable data. Prices of products, where shown, prevailed at the time of publication and are subject to change.

There are many agencies other than those listed here which do not publish maps as such, but do have data that may be of use. Two other data references are 1)Guide to Aerial Photography and Space Imagery in Kansas by the Kansas Applied Remote Sensing program at the University of Kansas Space Technology Center (see page 49 for address) and 2)Catalog of data held by state agencies compiled by K. Q. Camin, Wichita State University. Contact: Dr. K. Q. Camin, Department of Economics, Wichita State University, Wichita, Kansas.

Appreciation is expressed to the many agencies and individuals that provided assistance in compiling the index maps and text.

## MAP SCALE

Map scale is expressed as a ratio and represents a fixed relationship between measurements on a map and corresponding distances on the ground. For example, the scale 1:24,000 found on the standard USGS 7-1/2 minute quadrangle series means that 1 unit, such as 1 inch, 1 foot, or 1 meter, on the map represents 24,000 inches, feet or meters on the earth's surface. Listed below are some of the more common scales.

| Scale | 1 inch = | Inches per Mile |
|---|---|---|
| 1:20,000 | 1667 ft. | 3 1/6 |
| 1:24,000 | 2000 ft. | 2 1/2 |
| 1:31,680 | 2640 ft. | 2 |
| 1:50,000 | 4166 | 1 1/4 |
| 1:62,500 | 1 mile (approx) | 1 |
| 1:63,360 | 1 mile (exactly) | 1 |
| 1:100,000 | 8333 ft. | 5/8 |
| 1:250,000 | 4 miles (approx) | 1/4 |
| 1:500,000 | 8 miles (approx) | 1/8 |
| 1:1,000,000 | 16 miles (approx) | 1/16 |

SOIL CONSERVATION SERVICE

Soil Surveys of Kansas Counties

Soil survey reports illustrate the type and location of soils on an air photo background. The soil maps in these reports have scales of 1:20,000 for eastern Kansas and 1:24,000 or 1:31,680 for western Kansas. The data can be used for agricultural management, soils engineering, and many other uses. Some of the data presented are soil-water relationships, soil textures, horizon sequences, slopes, reaction, shrink-swell potential, soil-plant relationships, and depth to bedrock.

Soil survey reports are compiled by the SCS and the Kansas Agricultural Experiment Station. The maps are available from the county offices of the Soil Conservation Service and the Cooperative Extension Service, Kansas State University, Manhattan, Kansas. Figure 1 shows the status of soil surveys in Kansas.

Unpublished soil information is available at county Soil Conservation Service offices and from:

Kansas Agricultural Experiment Station
Kansas State University
Manhattan, Kansas 66506
913-532-5804 or:

USDA-SCS
Box 600
Salina, Kansas 67401
913-825-9535

Under an agreement with the Kansas Geological Survey, each county SCS office has on file a geologic map of the county drawn on the 1/2 inch per mile highway base map. These maps are not available for sale, but may be inspected at each local SCS office and used for general planning purposes. Figure 2 indicates the counties where maps are available.

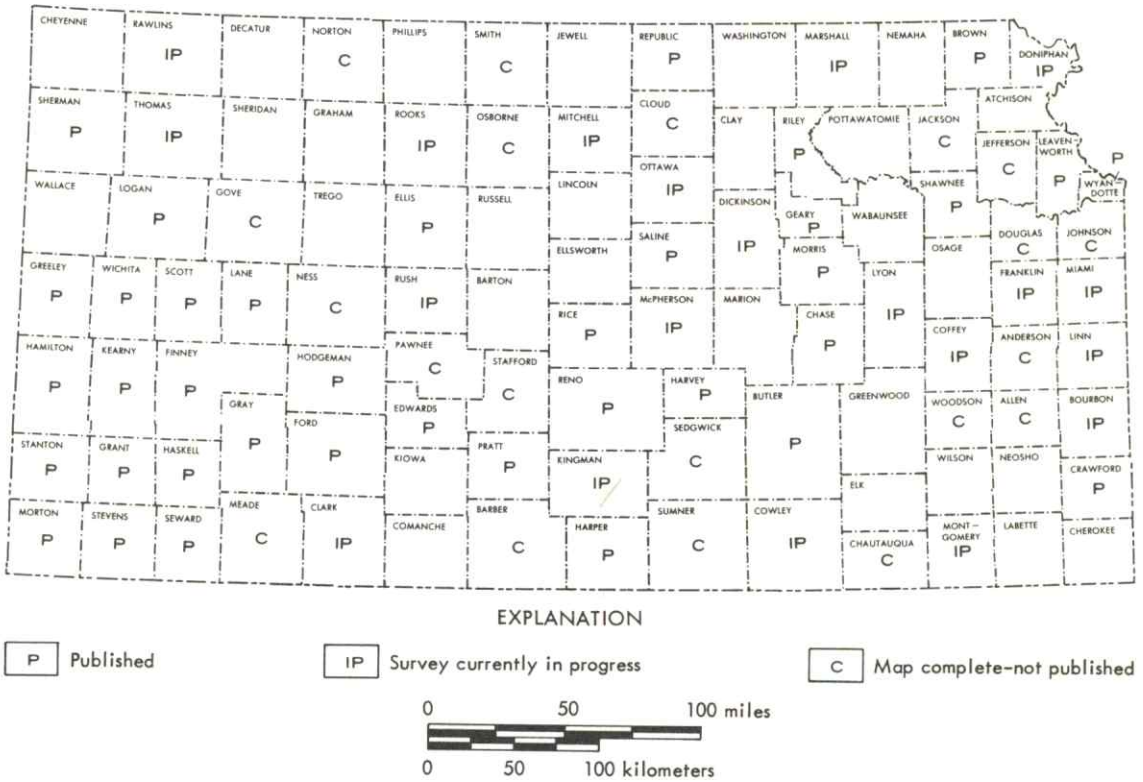


Figure 1. - Status of Soil Surveys in Kansas.

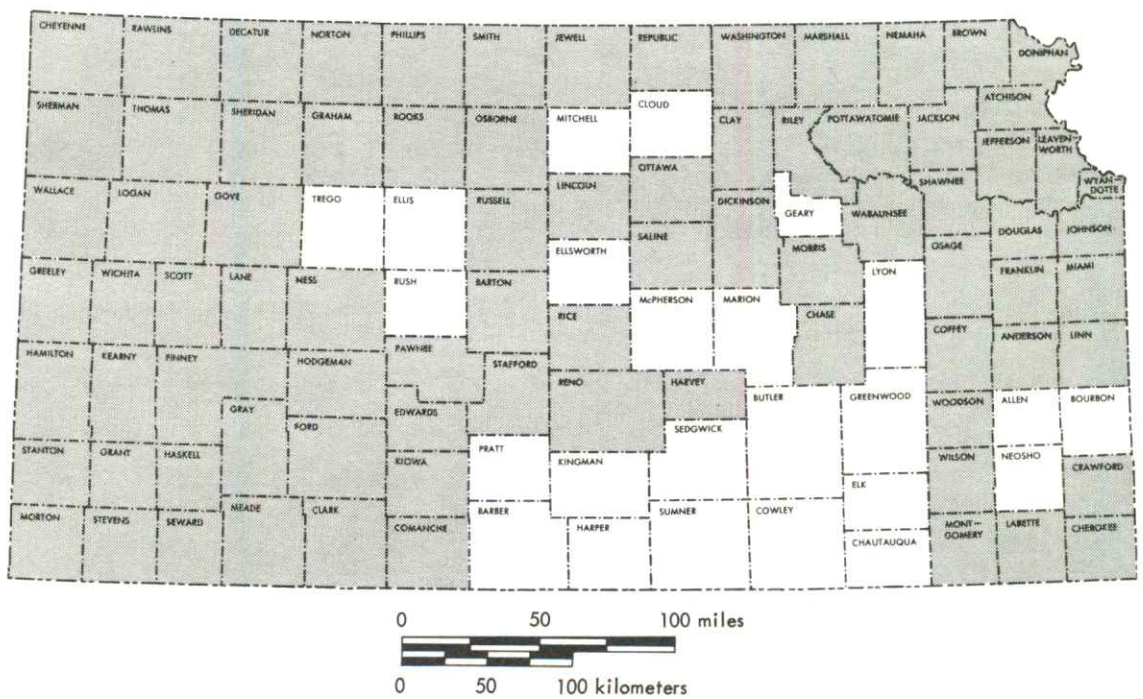


Figure 2. - Index of County Geologic Maps Completed for the SCS.

## U.S. ARMY CORPS OF ENGINEERS

The U.S. Army Corps of Engineers is involved in water resources planning and management in Kansas. For a summary of the Corps' past, present and future projects in Kansas see Water Resources Development in Kansas, published in 1976 by the Corps of Engineers, Southwestern Division, Dallas, Texas. Kansas is divided into three Corps of Engineers districts (see Fig. 3). For a copy of the above publication or for more information, contact:

District Engineer
U.S. Army Engineer District
P.O. Box 61
Tulsa, Oklahoma 74102

District Engineer
U.S. Army Engineer District
P.O. Box 1580
Albuquerque, New Mexico 87103

District Engineer
U.S. Army Engineer District
700 Federal Building
Kansas City, Missouri 64106


Figure 3. - Army Corps of Engineers Districts

## U.S. BUREAU OF RECLAMATION

The Bureau of reclamation publishes a map illustrating water resource development in Kansas (Map No. 60-701-252), 1970. Two sizes are available - 10 1/2" x 18" and 21" x 36". The multi-colored map shows existing, under construction, and potential surface-water development sites in Kansas. Included are Army Corps of Engineers, Bureau of Reclamation, and Soil Conservation Service projects. Also included are such features as pipelines, pumping plants, canals, diversion dams, and reservoirs.

To obtain the map, write to:

Bureau of Reclamation
Regional Office, Lower Missouri Region
P.O. Box 25247
Denver, Colorado 80225

10 1/2" x 18" $0.50
21" x 36" $1.00

## U.S. GEOLOGICAL SURVEY

The USGS has several divisions; the following two have map data relative to Kansas.

## U.S.G.S. TOPOGRAPHIC DIVISION

### National Cartographic Information Center

The National Cartographic Information Center (NCIC) is one of the newer parts of the U.S. Geological Survey's Topographic Division. Its purpose is to "assess the vast and sometimes overlapping cartographic information holdings of 30 different federal agencies, and countless state, county, and private organizations."

A NCIC network, consisting of a group of cooperating agencies and offices from various levels of government and private enterprise, joined through their mutual interest in the availability of cartographic data, is being developed. This cooperative network provides the means for collecting information from many different and physically separate sources, organizing the information, and distributing the information at many different locations. The Topographic Division Headquarters at Reston, Virginia, is responsible for the overall direction, collecting centralized federal information, and for supplying information that is national in scope. However, the principal affiliates actually hold and maintain major cartographic data bases. The regional centers (such as NCIC, Mid-Continent Mapping Center) are responsible for their geographic areas, collecting information from state and regional federal agencies, and providing assistance to the cooperating centers in their area. The cooperating centers are the points of contact between the user community and the regional centers, supplying data and technical assistance where they can. Cooperating states are encouraged to assist in data acquisition from their affiliates, thereby broadening the data base.

Some of the types of data available from NCIC include:

1) Information on maps and charts currently held by federal agencies;

2) Information on all of the U.S. Geological Survey's quadrangle maps adapted to a computer base that can generate, in easily decipherable form, a catalog on computer output microfilm.

NCIC also publishes a quarterly newsletter which contains information on current projects, services, and products. A complete list of services and products is available from:

National Cartographic Information Center
507 National Center
12201 Sunrise Valley Drive
Reston, Virginia 22092
(703) 860-7000

and/or

National Cartographic Information Center
1400 Independence Road
Rolla, Missouri 65401
(314) 364-3680

## Topographic Maps

Topographic mapping in Kansas is carried on by the U.S. Geological Survey, in cooperation with the Kansas Geological Survey and the Kansas Department of Transportation. Early reconnaissance maps were published by the USGS as 30-minute sheets (approximately 27 x 35 miles). More recent maps are available as 15-minute sheets (approximately 14 x 17 miles); contour interval is generally 20 feet. More detailed maps, issued as 7 1/2-minute sheets (approximately 7 x 9 miles), are available for about 80% of the State; the contour interval is generally 10 feet. Cost of each map is $1.25. Contact the Kansas Geological Survey or the USGS for an index of published maps. The following types of standard maps and by-products are available.

## Standard Maps

Standard USGS 7 1/2-minute, 1:24,000-scale topographic map (one inch = 2,000 feet). Usually published in five colors--

Blue - shows water features
Black - shows manmade features (and names)
Green - distinguishes wooded areas from clearings
Brown - shows contours
Red - Government Land Office survey lines, urban tint, and major road networks.

Clear or matte-surface 24 x 30 inch, black and white, reproducible film positives can be prepared from the color-separation plates which are used in the reproduction of the multi-colored published maps. A separate color-separation plate is used for each color that is shown on the published map. A film positive showing any or all of the color-separation plates can be made.

The 7 1/2-minute, 1:24,000-scale USGS topographic map - interim revision series. The most effective process to meet user requirements for rapid and frequent updating of data. Changes detected on recently flown aerial photography are overprinted on existing maps in a distinctive purple color. No field examination is made. These changes are planimetric additions to the initial printed map. Obsolete information is removed from existing plates, minor changes are made to effect contour registration, and a new lettering plate is made to carry the purple type. This technique clearly identifies changes occurring in a given time span - information which may be of considerable use to planners. The USGS tries to publish the revised maps within one year from the day the photography is flown. The topographic map index indicates which quadrangles have undergone revision.

Advance Map Prints. In areas where published 7 1/2-minute maps are not available but mapping is in progress, there may be a preliminary, monocolor copy of the topographic map available; this is called an advance map print. Depending on the stage of mapping, the advance map print contains the same information as the published topographic map, but is available sooner. The manuscript copies come in several stages and a limited number of these are kept on file until the quadrangle is published. For more information, contact the Kansas Geological Survey, Environmental Geology Section or the U.S. Geological Survey in Rolla, Missouri.

7 1/2-minute, 1:24,000-scale orthophotoquads. Orthophotoquads are dimensionally correct, black and white air photo mosaics of the area covered by a standard 7 1/2-minute, 1:24,000 scale quadrangle. Published in addition to the existing series of standard line maps, their main advantage is that they can be produced at 1/10 of the cost. The photoimagery usually provides more data than can be portrayed on a line map. The orthophotoquads are scheduled for unmapped areas as an interim first-phase product. The Kansas Geological Survey maintains one set of orthophotoquads for inspection in its Lawrence office; additional copies may be ordered from the USGS in Rolla. Figure 4 shows the quadrangles in Kansas for which orthophotoquads are available. The following types of formats are available in standard 7 1/2-minute quadrangle size: Diazo paper, $1.25 each; continuous tone image on photographic paper, $8.00 each; continuous tone image on scale stable film, $12.00 each.

7 1/2-minute, 1:24,000-scale orthophotomap. A color-enhanced version of the orthophotoquad which includes contours, elevations, boundaries, and labels tailored to suit the area and intended use of the map. Kansas has no quadrangles as orthophotomaps at this time.

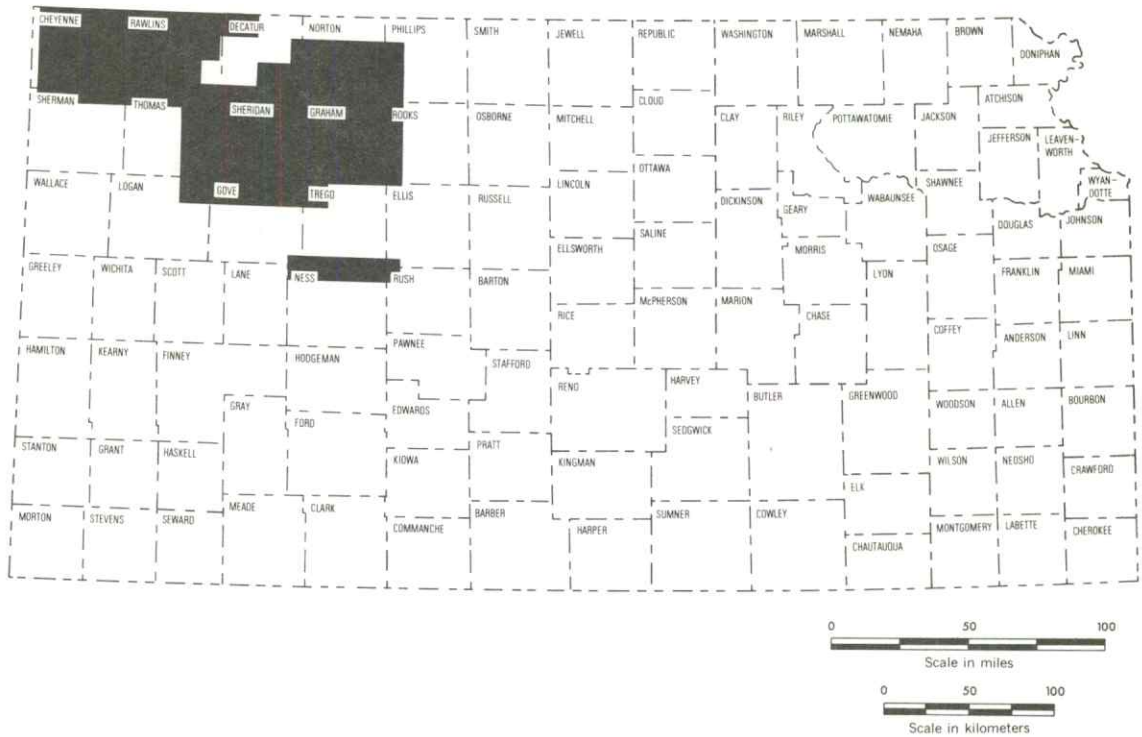


Figure 4. - Index map showing availability of orthophotoquads.

The standard USGS 15-minute, 1:62,500-scale topographic map (one inch = approximately 1 mile). Similar to 1:24,000 series. Reproducible film positives can be prepared from the 15-minute series also. See the standard USGS Topographic Map Index for 15-minute maps available in Kansas.

Intermediate Scale Series. One of the newer products being offered by the U.S. Geological Survey is the intermediate scale series. This series is being compiled in either a quadrangle and/or county format and will be available in either a topographic and/or planimetric edition.

The intermediate quadrangle format is 1-degree by 30-minutes and is at a scale of 1:100,000, while the county format will be available at either 1:50,000- or 1:100,000-scale. These maps are usually compiled from existing 7 1/2-minute quadrangle maps. The intermediate scale series has been initiated in response to increasing user requests for a base map to fill the gap between the 1:24,000-scale series and the 1:250,000-scale series. The maps in this series will be completely metric.

The USGS is just beginning this series. The only products available for the State of Kansas to date are planimetric editions at a scale of 1:100,000 for the counties of Harper, Republic, and Shawnee. In addition, planimetric maps are being compiled for the counties of Butler, Leavenworth, Riley, and Wyandotte.

An experimental 1:50,000-scale topographic edition of Morris County, Kansas has been published. A limited number of prints were circulated to Morris County officials, local and regional planners, and State agencies for user response. Based on these and other responses, the specifications used to compile the Morris County have been rewritten. Recently published intermediate scale maps have been compiled using these revised specifications. Inspection copies of the Morris County topographic map may be seen at the Environmental Geology Section at the Kansas Geological Survey.

Slope Maps. Slope maps are another of the new products being published by the U.S. Geological Survey. A slope map is essentially a 7 1/2-minute topographic map (scale of 1" = 2,000') with the slope zones shown as a range of percents (0-3%, 3-5%, 5-10%, 10-15%, etc.). The slope zones are indicated either by shades of gray on the black and white version or by different colors on the colored version of the map. They are inexpensive to produce and are very useful for planning road grade, sewage systems, housing developments, etc. Slope maps for the following 7 1/2-minute quadrangles around Lawrence and Kansas City, Kansas are available to the public: Lawrence East, Lawrence West, Bonner Springs, Basehor, Wolcott, Edwardsville, Parkville, Shawnee, North Kansas City, and Kansas City. Slope maps may be obtained from the Kansas Geological Survey.

Land-Use Maps. In cooperation with the Ozarks Regional Commission and the Kansas Department of Economic Development, the USGS has compiled land-use maps and data for Kansas. The project is done on the twelve, 1:250,000 scale (1 inch = about 4 miles), topographic maps that cover the state (see Figure 5 for index).

Sets of 5 clear plastic overlay sheets will be made for each of the 12 maps, delineating the categories indicated below.

1) Hydrologic units
2) Federal land ownership
3) Census Co. Subdivisions
4) Political units
5) Land use

Urban areas and built-up land will be delineated down to a minimum of 10 acres and all other categories to a minimum of 40 acres.

For more information on the program or to purchase the maps, contact the Kansas Department of Economic Development (see KDED), the U.S. Geological Survey, Rolla, Missouri or the Ozarks Regional Commission, 1100 North University, Suite 109, Evergreen Place, Little Rock, Arkansas 72207.

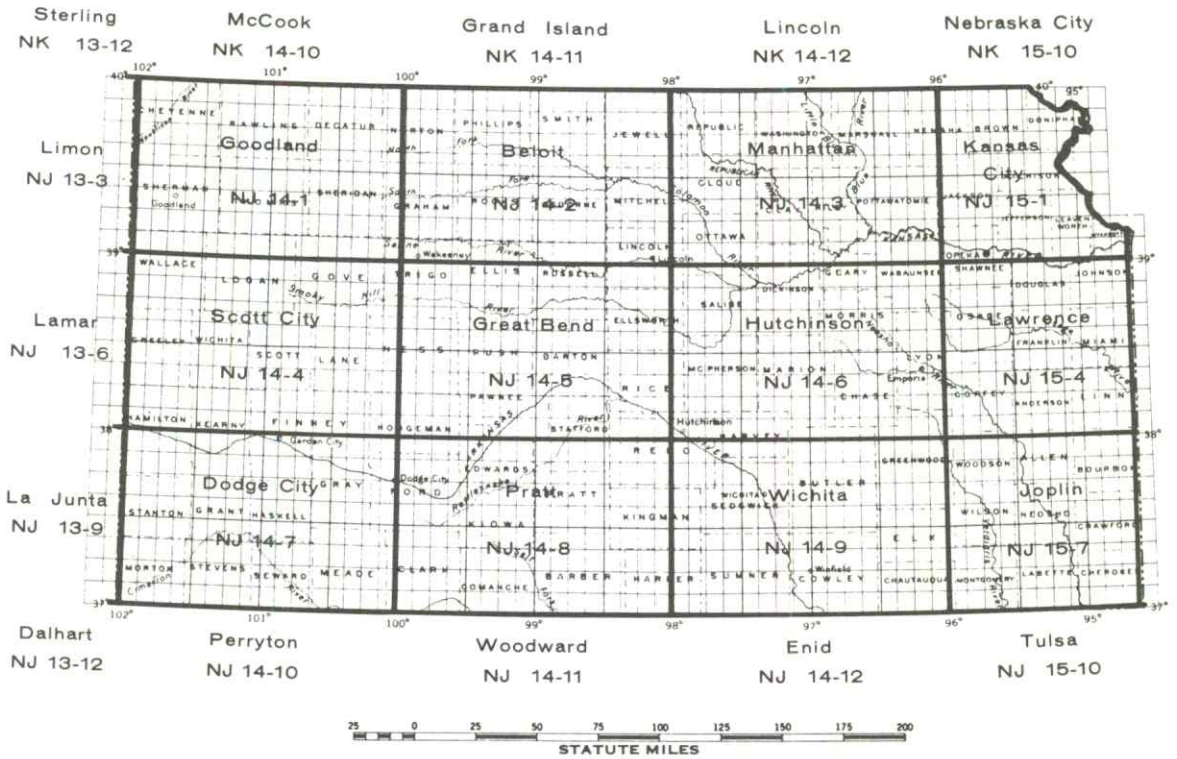


Figure 5. - Index map for 1:250,000 scale topographic maps.

1:250,000-scale topographic map series. There is complete map coverage of the United States at this scale (one inch represents approximately 4 miles). See Fig. 5 for the maps that cover Kansas.

These maps are useful for the review of larger areas because each map covers about 7,500 square miles. These maps are particularly useful for reconnaissance of large projects and for broad regional planning. Where more information is required, the 1:62,500 or 1:24,000-scale maps may be used. As mentioned earlier, the 1:250,000 series is being used to make the land-use maps for the state.

The 1:250,000-scale maps of the conterminous United States have been digitized. Tapes are being copied and will be available to users through the National Cartographic Information Center.

The 1:250,000-scale topographic maps may be purchased at the Kansas Geological Survey office in Lawrence.

State series. Kansas state maps are prepared at the scale of 1:500,000 and 1:1,000,000. The maps are generally prepared in two editions - planimetric and contour. They depict urban areas, major communication routes, major hydrographic features, and county boundaries. They are used by federal and state agencies as base copy for state-wide, regional, and area maps of various types and purposes. They are also used by many private industrial and commercial organizations as well as by the general public. For a list of maps see page 29.

1:1,000,000-scale topographic map series (one inch = approximately 16 miles). Three maps in this series cover Kansas. Pikes Peak (NJ-13), Wichita (NJ-14), and Ozark Plateau (NJ-15) (see diagram). The maps are multicolored and show cultural futures, transportation routes, hydrologic features, political boundaries, national parks, national forests, and Indian reservations. The maps have topographic contours in meters and elevation zones are color coded. The maps may be purchased from the U.S. Geological Survey, Branch of Distribution, Denver, Colorado 80225 or Reston, Virginia 22092.

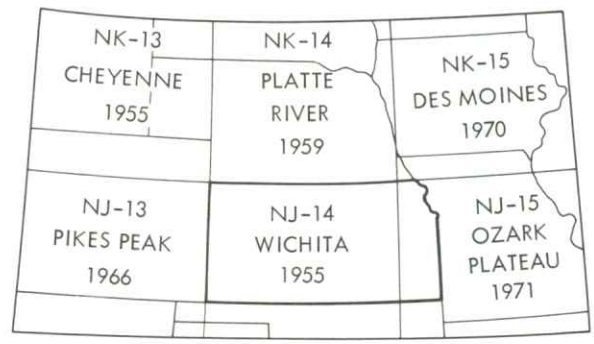


Figure 6. - Index to 1:1,000,000 scale maps.

National atlas of the United States. In 1970, the U.S. Geological Survey published the first complete National Atlas of the United States. There are 417 pages in the single volume and it contains 750 general reference and special subject maps, in color, at basic scales of 1:7,500,000, 1:17,000,000 and 1:34,000,000. It also contains explanatory text, bibliographic references, and other interpretative materials. Its production involved the coordinated efforts of some 80 federal agencies and scores of commercial organizations, non-profit institutions, individual researchers, and consultants.

The Atlas provides scientific presentations in small-scale cartographic format of the principal physical, historical, socio-economic, and cultural characteristics of the nation for a broad spectrum of users including managers and decision makers in government and business, planners, research scholars, and others engaged in national and regional planning and research. The National Atlas is available for inspection at most libraries, many federal and state government offices, and educational institutions.

Large-scale urban mapping. Experimental large-scale metropolitan mapping projects are presently underway in several cities in the United States. Orthophotoquads at 1:2,400-scale (1 inch = 200 feet) have been prepared for Ft. Wayne, Indiana, and Charleston, South Carolina. In other places, maps at different scales are being made. For more information on this program, contact the USGS, Rolla, Missouri.

LANDSAT (formerly ERTS) Browse Files. LANDSAT (ERTS - Earth Resources Technology Satellite) is a NASA-sponsored earth-orbiting satellite which transmits black and white images of the earth's surface. The satellite orbits at an altitude of 500 miles and each image covers an area of approximately 110 square miles. Browse files for public use of the images are being initiated in each of the USGS's mapping centers. World-wide coverage of LANDSAT imagery is currently available at each mapping center. The imagery is on 16mm film with 8mm imagery. SKYLAB imagery is added as it becomes available. The map user may view imagery with available microfilm readers. New model readers with print-out capabilities and other modern equipment to aid the map user will be added as time and funding permit. Direct computer service to the EROS center in Sioux Falls, South Dakota, is available with each of the browse files.

Browse files are currently installed at the:

National Cartographic Information Center
USGS National Center
Reston, Virginia 22092
(703) 860-7000;

Mid-Continent Mapping Center
1400 Independence Road
Rolla, Missouri 65401
(314) 364-3680;

National Space Technology Laboratories
U.S.G.S.
Bay St. Louis, Mississippi 39520
(601) 688-3541;

Rocky Mountain Mapping Center
USGS Federal Center, Bldg. 25
Denver, Colorado 80225
(303) 233-3611;

Western Mapping Center
345 Middlefield Road
Menlo Park, California 94025
(415) 323-8111.

## By-Products

By-products are used for or result from the production of standard USGS maps. They are avilable to users usually at a standard price. Except where noted, contact the USGS, Rolla, for more information.

(1) Aerial photographs - contact
These are aerial photographs at the scale of the negative. Flight height depends on mapping requirements and complete coverage of the United States is available if all sources are considered. An index is published showing the aerial photography that is the most suitable for general purpose use.

(2) Aerial photographs - enlarged
Aerial photographs are enlarged as specified by the customer.

(3) Aerial photographs - rectified
Rectified photographs are processed to remove the effect of aerial camera tilt, providing a more uniform scale.

(4) Photoindexes
Aerial photography is indexed in quadrangle form primarily for use in selecting aerial photography to be ordered.

(5) Diapositives
These are aerial photographs provided on glass plates to fit the Kelsh or ER-55 plotter. The customer may use them on his own photogrammetric equipment to compile his own maps.

(6) Photographs of aerotriangulation data
A data bank is being developed containing horizontal photo-control data used in the aerotriangulation phase of map-making. At the time of aerotriangulation, coordinates are established on several points per photograph, to be used in adjusting the aerial photographs to map scale and to geodetic control. These points are identified on the diapositives used in map compilation, and computer-adjusted coordinate data are recorded on punch cards.
Low-altitude photographs showing paneled horizontal control will be retained in the same data bank.

(7) Photographs of supplemental vertical control data.
These are photographs having enough elevations that they may be used to vertically orient (level) photogrammetric models. They are copied when ordered. Customers having stereoplotting instruments may use these photographs with copies of the aerotriangulation data to compile special use maps.

(8) Geodetic control lists
These are lists, by 15-minute quadrangle, of USGS Topographic Division horizontal and vertical mapping control, electronic traverse stations, and bench marks. The elevation above sea level is given for permanent and temporary bench marks of third-order or higher accuracy. Geodetic and state plane coordinates are given for horizontal control stations. Descriptions of all permanent marks are given, facilitating recovery of the mark at the ground site.
These marks provide known data for beginning or ending survey lines. They may also be used as a horizontal or vertical reference for making maps. For more information or to order data, contact the Environmental Geology Section at the Kansas Geological Survey, 913-864-4991, or the USGS.

(9) Geodetic control diagrams
Since 1959 the Topographic Division, U.S. Geological Survey, and the National Geodetic Survey, National Ocean Survey, have been cooperating in publishing a series of geodetic control diagrams showing the location and quality of geodetic control. They are published in the format of the 1:250,000-scale series, with the base printed in subdued blue. Horizontal and vertical control established and/or adjusted by the National Geodetic Survey is shown in black, that of USGS in red, and appropriate control of the other Federal agencies in brown or buff. These geodetic control diagrams provide a cartographic index as to the availability of geodetic data and are used extensively by federal, state, local, and private organizations involved in land planning, surveying, and mapping, and civil engineering projects. They are very beneficial in helping to locate the permanent control marks listed in the geodetic control list. For more information or to order diagrams, contact the Kansas Geological Survey, Environmental Geology Section, 913-864-4991, or the USGS.

(10) Advance map prints
These are monochrome composite paper copies of topographic maps that are available more than a year prior to publication of the finished maps. Many map users find the timeliness critical to their needs.
Advance prints are kept on file at the Kansas Geological Survey and the USGS, Rolla, until publication of the finished map. For more information, contact the Kansas Geological Survey, Environmental Geology Section or the USGS.

(11) Reproducible feature-separates
These are monochrome single or composite film copies of the separate drafting plates used in printing a published map. Expanded map use has created demands for special purpose maps of restricted content. Some users find it beneficial to eliminate data which would be on the published maps, to facilitate adding special data suitable to their own needs. The film copy provides

the added advantage of scale stability. (See reference on page 8 for standard 7 1/2-minute, 1:24,000 scale topographic maps). For more information, contact:

Kansas Geological Survey
Environmental Geology Section
Campus West, The University of Kansas
Lawrence, Kansas 66044
(913) 864-4991

or

Chief, Mid-Continent Mapping Center
U.S. Geological Survey
1400 Independence Road
Rolla, Missouri 65401
(314) 364-3680

## Other U.S.G.S. Publications

The following are selected USGS publications which contain maps and data. They are referenced on Fig. 7.

### Water Supply Papers

W 1499-I - Water Resources of the Wichita area, by L.R. Petri, C.W. Lane, and L.W. Furness. 1964. PI1-I69.

W 1651 - Chemical quality of surface waters and sedimentation in the Saline River Basin, Kansas, by P.R. Jordan, B.F. Jones, and L.R. Petri. 1964. 90 p.

W 1798-B - Fluvial sediment in the Little Arkansas River Basin, Kansas, by C.D. Albert, and G.J. Stramel. 1966. p. B1-B30.

W 1891 - Geohydrology of Finney County, southwestern Kansas, by W.R. Meyer, E.D. Gutentag, and D.H. Lobmeyer. 1970. 117 p. $3.05.

W 1982 - Chemical quality of water in the Walnut River Basin, south-central Kansas, by R.B. Leonard. 1972. 113 p. $3.95.

### Circulars

The majority of the circulars are reports of construction materials available in the north-central part of the state. Although the circulars are generally out-of-print, copies may be borrowed from many libraries in Kansas. The following areas are covered by construction materials reports:

| Circular No. | Area | Circular No. | Area |
|---|---|---|---|
| 15 | Cedar Bluffs area, Trego County | 51 | Graham County |
| 21 | Phillips County | 79 | Republic County |
| 24 | Norton County | 88 | Cloud County |
| 25 | Smith County | 106 | Mitchell County |
| 27 | Rooks County | 118 | Sheridan County |
| 30 | Ellis County | 132 | Rawlins County |
| 38 | Jewell County | 179 | Osborne County |
| 40 | Decatur County | | |

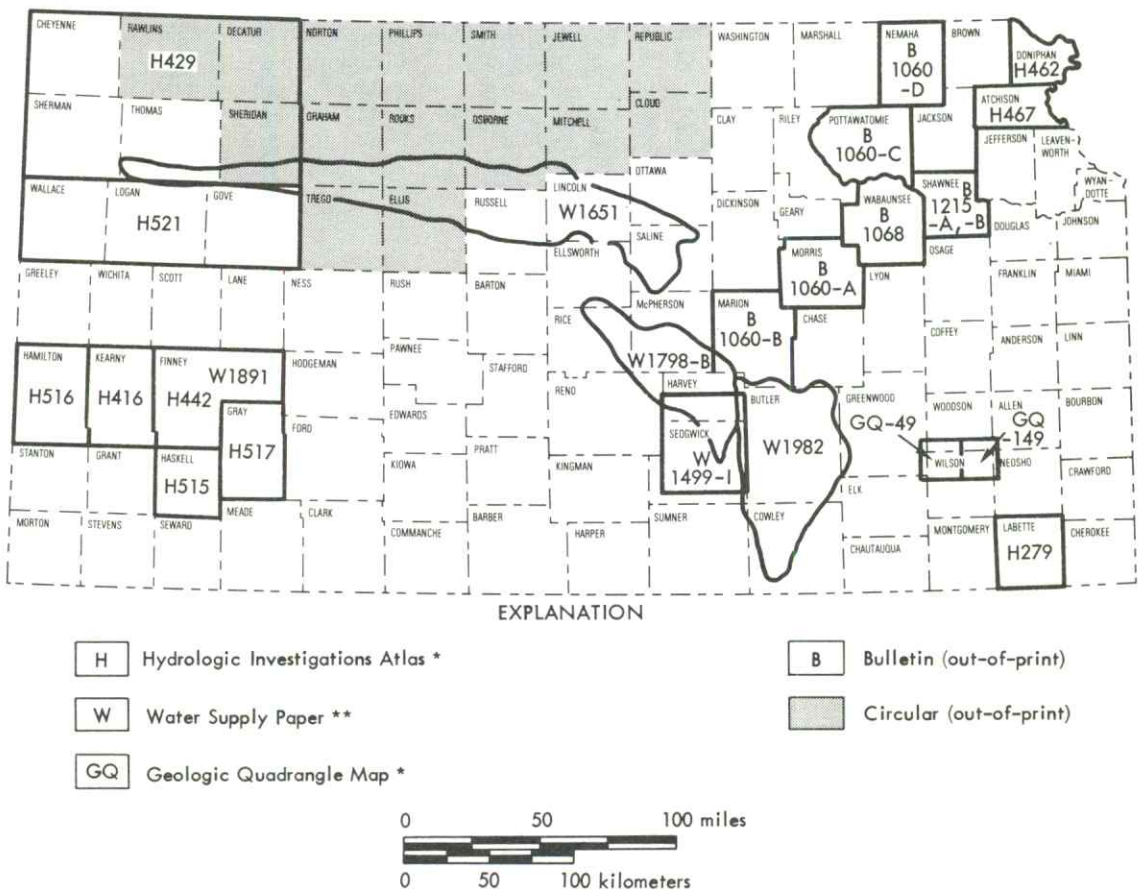


Figure 7. - Index of selected U.S. Geological Survey publications.

## Bulletins

Bulletins are generally out-of-print. Many libraries and educational institutions in Kansas are depositories for this material.

Bulletin 1060A. Geology and construction-material resources of Morris County, Kansas, by M.R. Mudge, C.W. Matthews, and J.D. Wells. 1958. p. 1-61.

Bulletin 1060B. Geology and construction-material resources of Marion County, Kansas, by F.E. Byrne, C.P. Walters, J.L. Hill, and L. Riseman. 1959. p. 63-95.

Bulletin 1060C. Geology and construction-material resources of Pottawatomie County, Kansas, by G.R. Scott, F.W. Foster, and C.F. Crumpton. 1959. p. 97-178.

Bulletin 1060D. Geology and construction-material resources of Nemaha County, Kansas, by M.R. Mudge, C.P. Walters, and R.E. Skoog. 1959. p. 179-256.

Bulletin 1068. Geology of Waubaunsee County, Kansas, by M.R. Mudge and R.H. Burton. 1959. 210 p.

Bulletin 1215. Geology of Shawnee County, Kansas. A, Geology of eastern Shawnee County, Kansas, and vicinity, by W.D. Johnson, Jr., and W.L. Adkinson; B, Geology of western Shawnee County, Kansas, and vicinity, by W.D. Johnson, Jr., and H.C. Wagner. 1967. p. 1-123 and 125-254.

## Hydrologic Investigation Atlases

Selected Hydrologic Investigations Atlases available for Kansas are listed below and are available from the Kansas Geological Survey.

HA-279. Geology and ground water in Labette County, Kansas, by W. L. Jungmann and C. C. Williams. 1969. Scale 1:63,360.

HA-416. Ground water in Kearny County, southwestern Kansas, by E. D. Gutentag, D. H. Lobmeyer, and H. E. McGovern. 1972. Scale 1:125,000. 2 sheets.

HA-429. Water resources of northwestern Kansas, by R. H. Pearl, R. S. Roberts, K. M. Keene, and T. J. McClain. 1972. Scale 1:250,000. 2 sheets.

HA-442. Ground water in Finney County, southwestern Kansas, by E. D. Gutentag, D. H. Lobmeyer, H. E. McGovern, and W. A. Long. 1972 (1973). Scale 1:250,000. 3 sheets.

HA-462. Geohydrology of Doniphan County, northeastern Kansas, by C. K. Bayne. 1973. Scale 1:62,500.

HA-467. Geohydrology of Atchison County, northeastern Kansas, by J. R. Ward. 1973 (1974). Scale 1:62,500. 2 sheets.

HA-515. Ground water in Haskell County, southwestern Kansas, by E. D. Gutentag and L. E. Stulken. 1974. Scale 1:250,000. 2 sheets.

HA-516. Water resources of Hamilton County, southwestern Kansas, by D. H. Lobmeyer and C. G. Sauer. 1974. Scale 1:125,000. 2 sheets.

HA-517. Ground water in Gray County, southwestern Kansas, by H. E. McGovern and W. A. Long. 1974. Scale 1:250,000. 2 sheets.

HA-521. Water resources of Gove, Logan, and Wallace Counties, west-central Kansas, by Thomas J. McClain, Edward D. Jenkins, Katherine M. Keene, and Marilyn E. Pabst. 1975. Scale 1:250,000. 2 sheets.

## USGS WATER RESOURCES DIVISION

The USGS Water Resources Division office in Lawrence, Kansas, compiles two types of maps that delineate flood-prone areas in the state. See Table 1 for a list and Figure 8 for an index of quadrangles available. One type is a map compiled on the 7 1/2-minute, 1:24,000 scale, topographic map and outlines areas prone to flooding. The other is a pamphlet that covers flood-prone areas in or near cities of 2,500 or more. See Table 2 for a list of cities. The pamphlet is a part of the 7 1/2-minute map that covers a much larger area. Figure 9 shows a part of Junction City area pamphlet. To obtain maps or for more information, contact:

District Chief, Water Resources Division
U.S. Geological Survey
1950 Avenue "A", Campus West
University of Kansas
Lawrence, Kansas 66044
913-864-4321

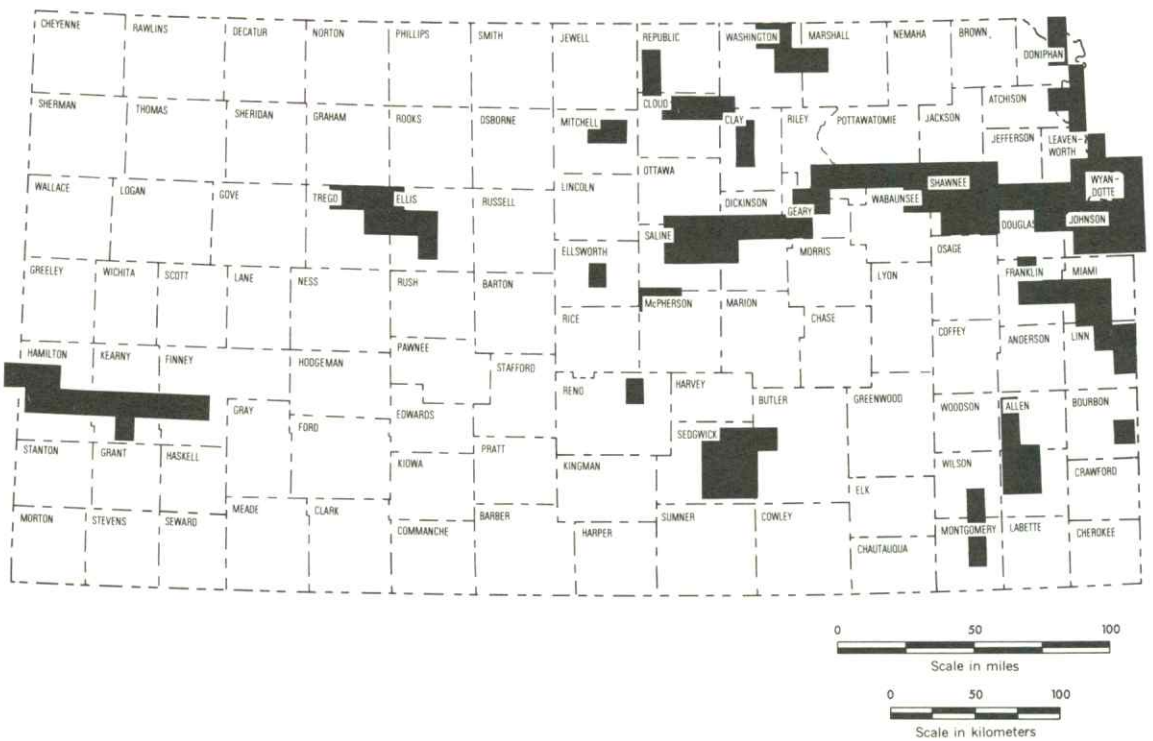


Figure 8. - Index of 7 1/2-minute maps indicating flood-prone areas.

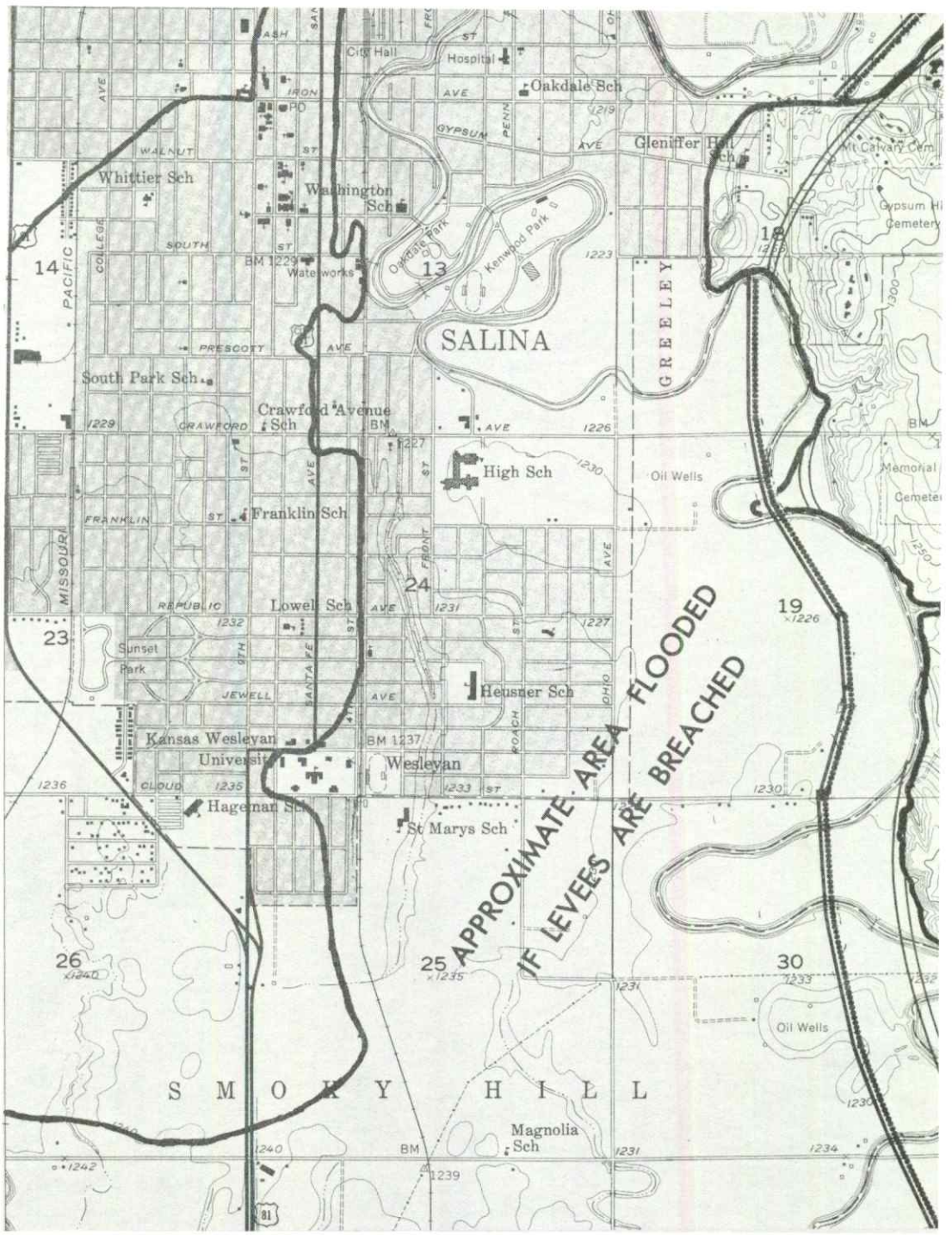


Figure 9. - Portion of a flood-prone area map.

Table I

Alphabetical listing of flood-prone area maps (7 1/2-minute quadrangles) available in Kansas District Office (with the years of historic flood where applicable)

Abilene (1951)
Atchison NE
Auburn
Basehor
Beloit (1951)

Belvue (1951)
Benton
Boicourt
Bonner Springs (1951)
Chanute (1951)

Chapman (1951)
Clay Center NW
Clay Center SW
Clifton
Clyde

Concordia (1935)
Deerfield
Deerfield NE
DeSoto (1951)
Edwardsville (1951)

Ellis
Ellsworth (1938)
Elmont
Emporia (1951)
Eudora (1951)
Eureka

Fontana
Fort Scott (1915)
Garden City East (1965)
Garden City West (1965)
Gardner

Grantville (1951)
Grove
Hanover SE
Hanover SW
Hanover W

Hays North (1957)
Hays South (1957)
Hill City 4 SW
Hill City 4 SE
Holland (1951)

Holly East
Hudson
Hudson SE
Humbolt
Hutchinson
Independence (1943)
Iola (1951)

Junction City (1951)
Kackley
Kanona
Kansas Falls (1951)
Keats (1951)

Kendall
Kipp (1951)
La Cygne
Lakin
Lakin NW

Lakin SE
Lawrence East (1951)
Leavenworth
Lindsborg
Manhattan (1941, 1951)

Maple Hill (1951)
Marysville (1941)
Marquette
Meriden
Midland (1951)

Neodesha (1951)
New Cambria (1951)
Niles (1951)
Oberlin
Ocheltree

Ogallah
Ogden (1951)
Olathe
Osawatomie (1951)
Ottawa North (1951)

Ottawa South (1951)
Paola East (1951)
Paola West (1915)
Peoria (1951)
Perry (1951)

Pleasanton
Rantoul (1951)
Rice
Richland
Rossville

St. George (1951)
St. Marys (1951)
Salina (1951)
Salina SW
Scandia

Shawnee (1951)
Silver Lake (1951)
Solomon (1951)
Solomon Rapids (1951)
Stilwell

Sycamore (1943)
Syracuse East
Syracuse West
Syracuse West NW
Tonganoxie (1951)

Trenton (1951)
Tribune 3 SE
Tribune 3 SW
Troy
Wakarusa

Wakeeney West
Wakeeney East
Wamego (1951)
Washington NE
Wathena

Willard (1951)
Williamstown (1951)
Wolcott
Wreford
Yocemento

Topeka Atlas
Wichita Atlas

Alphabetical listing of flood-prone area maps on file in Kansas (also available in Missouri District Office)

Amazonia, Mo.-Kans.
Atchison East, Mo.-Kans.
Belton, Mo.-Kans.
Forbes, Mo.-Kans.
Grandview, Mo.-Kans.
Halls, Mo.-Kans.
Kansas City, Mo.-Kans.
North Kansas City, Mo.-Kans.
Parkville, Mo.-Kans.
Platte City, Mo.-Kans.
Weston, Mo.-Kans.

Table 2

Streams near cities of 2,500 or more with flood-prone areas delineated on 8" x 14" pamphlet

Big Blue R. at Marysville
Republican R. at Concordia
Kansas R. at Lawrence
Kansas R. at Manhattan
Kansas R. at Junction City
Smoky Hill R. near Abilene
Smoky Hill R. near Salina
Marais des Cygnes R. near Ottawa
Marais des Cygnes R. near Osawatomie
Marais des Cygnes R. near Fort Scott
Verdigris R. at Neodesha
Verdigris R. at Coffeyville
Neosho R. near Emporia
Neosho R. near Humboldt
Big Creek near Hays

## KANSAS DEPARTMENT OF ECONOMIC DEVELOPMENT (KDED)

KDED has a number of state base maps with the counties outlined. They are at varying scales ranging from page size to 21" x 31". Some show cities and towns; others show only county outlines. These are an excellent source of base maps for multi-county to state-wide planning. For more information, contact:

Kansas Department of Economic Development
503 Kansas Avenue
Topeka, Kansas 66603
913-296-3485
KANS-A-N 561-3485

KDED has available copies of the 1:250,000 scale land-use maps (see page 11). Contact KDED at the above address for more information.

## KANSAS FORESTRY, FISH AND GAME COMMISSION

The Commission has the following management area maps available. They are generally monocolor and range from page size to approximately 18" x 27".

Big Hill Game Management Area
Cedar Bluff Reservoir & Game Mgmt. Area
Cheney Reservoir & Game Mgmt. Area
Council Grove Reservoir & Public Hunting Areas
Elk City Lake & Public Hunting Areas
Fall River Lake & Game Mgmt. Areas
Finney County Bison Refuge
Hunting & Fishing Guide to Glen Elder Dam - Waconda Lake
Jamestown Waterfowl Mgmt. Area
John Redmond Reservoir & Public Hunting Areas
Kingman County Game Mgmt. Area
Lovewell Reservoir & Game Mgmt. Area
Marais Des Cygnes Waterfowl Mgmt. Area
Marion Game Refuge & McPherson County State Lake
Milford Reservoir & Game Mgmt. Area
Neosho Waterfowl Mgmt. Area
Hunting & Fishing Guide to Norton Reservoir
Perry Reservoir & Game Mgmt. Area
Pratt Sandhills Game Mgmt. Area
Sherman County State Lake & Game Mgmt. Area
Guide to Strip Pit Fishing & Hunting
Toronto Lake & Public Hunting Areas
Tuttle Creek Reservoir & Game Mgmt. Area
Webster Reservoir & Game Mgmt. Area
Wilson Reservoir & Game Mgmt. Area
Kansas State Map of Rivers

There are also two brochures: PUBLIC HUNTING IN KANSAS which has a small state map pin-pointing the public hunting areas and, KANSAS FORESTRY, FISH & GAME COMMISSION which contains a state map showing public hunting areas, Regional Fish & Game offices, state fishing lakes, federal reserves, and state fish hatcheries. For more detailed information or to obtain maps, contact the main office:

Kansas Forestry, Fish and Game Commission
P.O. Box 1028
Pratt, Kansas 67124
316-672-5911
KANS-A-N 565-6120

or one of the regional offices in Chanute, Colby, Concordia, Dodge City, Manhattan, or Newton.

## KANSAS GEOLOGICAL SURVEY

The Kansas Geological Survey has the following maps and reports available.

(M Series - $2.50)

M-1 Geologic map of Kansas, 1964. Scale 1:500,000 ( 1" = 8 mi), 38" x 53". Multi-colored map showing the location and name of outcropping rock formations in the state. Detailed description of the rock units can be found in Kansas Geological Survey Bulletin 189, "The Stratigraphic Succession in Kansas."

M-3A Oil and gas fields in Kansas, 1975. Scale 1:500,000 (1" = 8 mi), 38" x 53". Multi-colored map showing producing and abandoned fields of oil, gas, and combination oil and gas. Also shows underground natural gas storage areas.

M-4A General availability of groundwater and normal annual precipitation in Kansas, 1975. Scale 1:500,000 (1" = 8 mi), 38" x 53". Blue-shaded map showing the limits of the aquifers in Kansas and the potential yield in gallons per minute, to properly constructed and equipped wells. Also has isohyetal lines showing normal annual precipitation in inches.

M-5 Saturated thickness and specific yield of Cenozoic deposits in Kansas, 1967. Scale 1:500,000 (1" = 8 mi), 38" x 53". Map shows volume of water in storage per unit area of major groundwater aquifers. Borders of drainage basins in eastern Kansas are shown and groundwater divides or areas of significant change in specific yield are shown in western Kansas.

M-6 Oil and gas pipelines and related industries in Kansas, 1974. Scale 1:500,000 (1" = 8 mi), 38" x 53". Map shows locations of pipelines carrying crude oil, natural gas, and other petroleum products. Also shown are locations of carbon black plants, oil refineries, and plants for extraction of natural gasoline and helium. Underground storage areas for liquid petroleum gas and natural gas are also shown.

M-7 Configuration of the top of Precambrian rocks in Kansas, 1976. Scale 1:500,000 (1" = 8 mi), 32" x 53". Multi-colored map shows contours at the top of the Precambrian rocks and the control wells used to develop the contours.

Geologic map of Kansas - 8 1/2" x 11", color. No Charge.

Geologic map of Kansas - postcard size, color. 10¢ each.

In addition to the above maps, there are available a number of state base maps on which data may be plotted. They range from page size to 11" x 22" and various maps show such features as county boundaries, township and range, and major drainage patterns (see Fig. 10). To obtain copies of these small base maps, contact the Graphic Arts Section of the Kansas Geological Survey.

## Miscellaneous Maps Published by the U.S. Geological Survey for sale at the Kansas Geological Survey

Base map of Kansas, showing counties, townships, drainage, railroads, highways, elevation contours, etc., 1963. Scale 1:500,000 (34" x 60"). $2.00.

Base map of Kansas without highways and contours, 1963. Scale 1:500,000 (34" x 60"). $1.50.

Base map of Kansas without highways and contours, 1963. Scale 1:1,000,000 (15" x 30"). $1.00.

Geology of the Fredonia Quadrangle, Kansas, by Holly C. Wagner, 1954. Map GQ 49, scale 1" = 1 mi). $1.50.

Geology of the Altoona Quadrangle, Kansas, by Holly C. Wagner, 1961. Map GQ 149 (scale 1" = 1 mi). $1.50.

The Kansas Geological Survey maintains a file of USGS 7 1/2-minute advance map prints for areas where mapping is in progress, but published maps are not available. Also available are records of horizontal and vertical control stations (bench marks) for the state. For more information on either of these items, contact: Kansas Geological Survey, Environmental Geology Section, 1930 Avenue "A", Campus West, The University of Kansas, Lawrence, Kansas 66044.

## SCS - County Geologic Maps

Under an agreement with the U.S. Department of Agriculture - Soil Conservation Service, the Kansas Geological Survey supplies, upon request by each county SCS office, a geologic map of that county drawn on a county highway base map (1/2 inch per mile). <u>These maps are not published</u>, but copies are available for inspection at either the State Geological Survey or the county SCS offices. See Figure 2 for counties where maps are available.

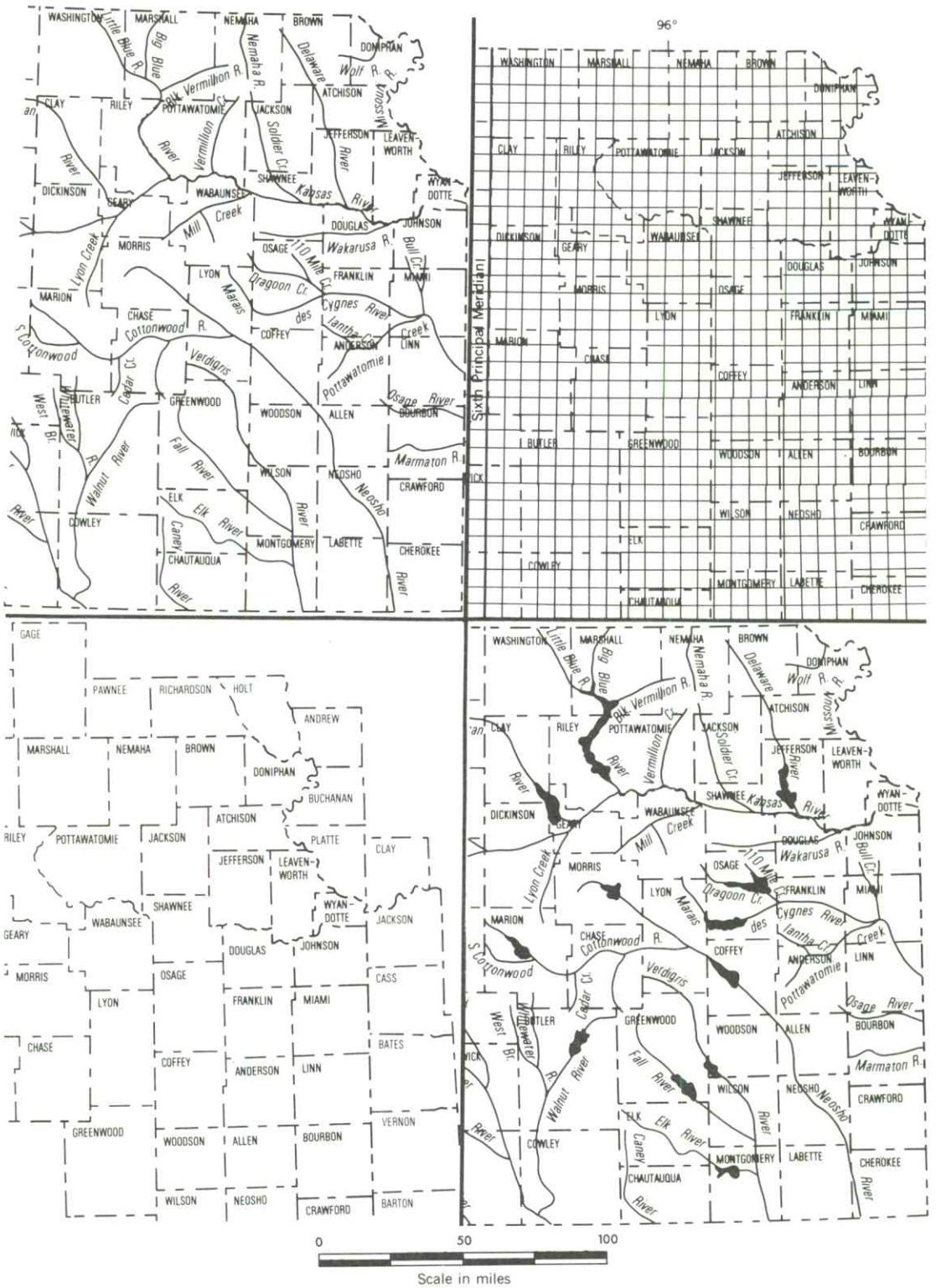


Figure 10. - Examples of page-size state base maps available from the Kansas Geological Survey.

## County and Areal Geology Reports

The Kansas Geological Survey and the U.S. Geological Survey for many years have published geologic and hydrologic studies of areas of Kansas. See Figure 11 for an index to selected publications. Many of these, single and multi-county studies in particular, have information other than geology. Generally, there is information on the quantity and quality of groundwater available, location and general information on domestic, irrigation, municipal, and industrial water wells, logs of test holes drilled, depth to water table, etc. Many studies also have maps showing the thickness of unconsolidated material above bedrock. See Figure 12 for a partial list of locations of KGS and USGS investigations in progress. The Kansas Geological Survey has published a list of in-print publications which is free upon request. Publications may be ordered by writing to the Kansas Geological Survey.

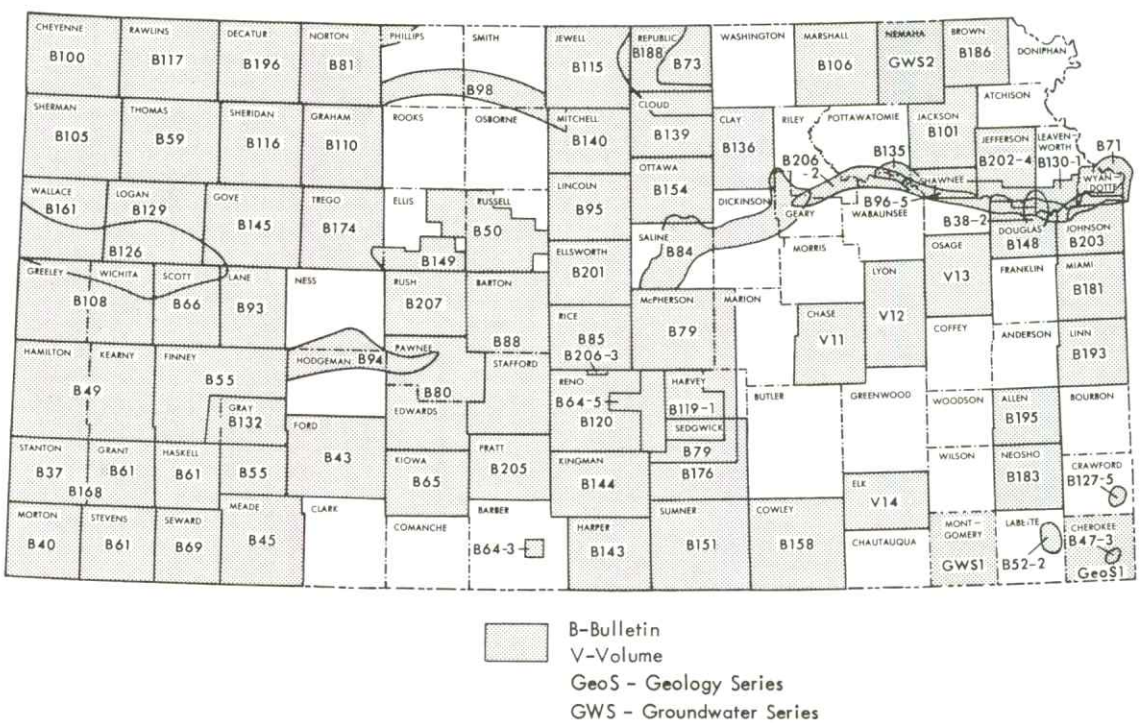


Figure 11. - Index of selected Kansas Geological Survey publications.

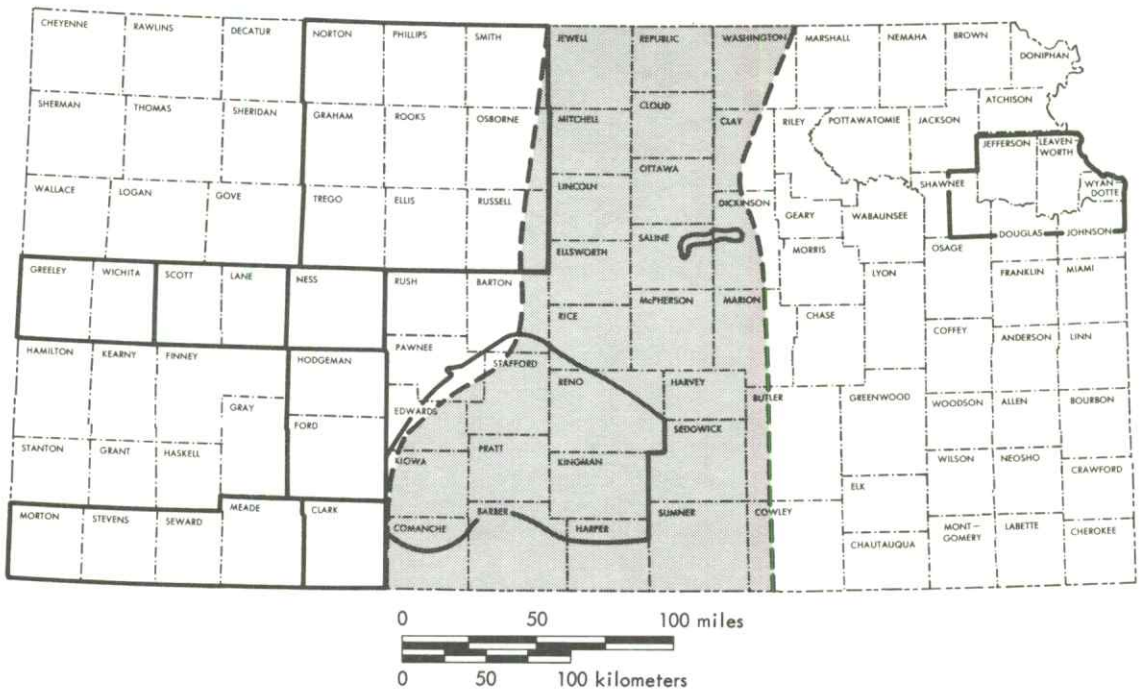


Figure 12. - Index showing locations of geologic, hydrologic, and water quality investigations in progress (KGS and USGS).

## KANSAS PARKS AND RESOURCES AUTHORITY

The Parks and Resources Authority has available page size maps of a number of the state's lakes and reservoirs. The scale is variable depending on the reservoir involved. The maps are printed on both sides; one side showing an overall view of the reservoir and the other side illustrating details of the recreation areas (see Fig. 13). These are available free at the State Park offices at the reservoirs or from:

State Park and Resources Authority
801 Harrison
Topeka, Kansas 66612

### List of Reservoir Maps Available

Cedar Bluff Reservoir
Cheney Lake
Lake Crawford
Elk City Reservoir
Fall River Reservoir
Waconda Lake
Kanopolis Reservoir
Lovewell Reservoir
Lake Meade
Melvern Reservoir
Milford Reservoir
Norton Reservoir
Perry Reservoir
Pomona Reservoir
Lake Scott
Toronto Reservoir
Tuttle Creek Reservoir
Webster Reservoir
Wilson Reservoir

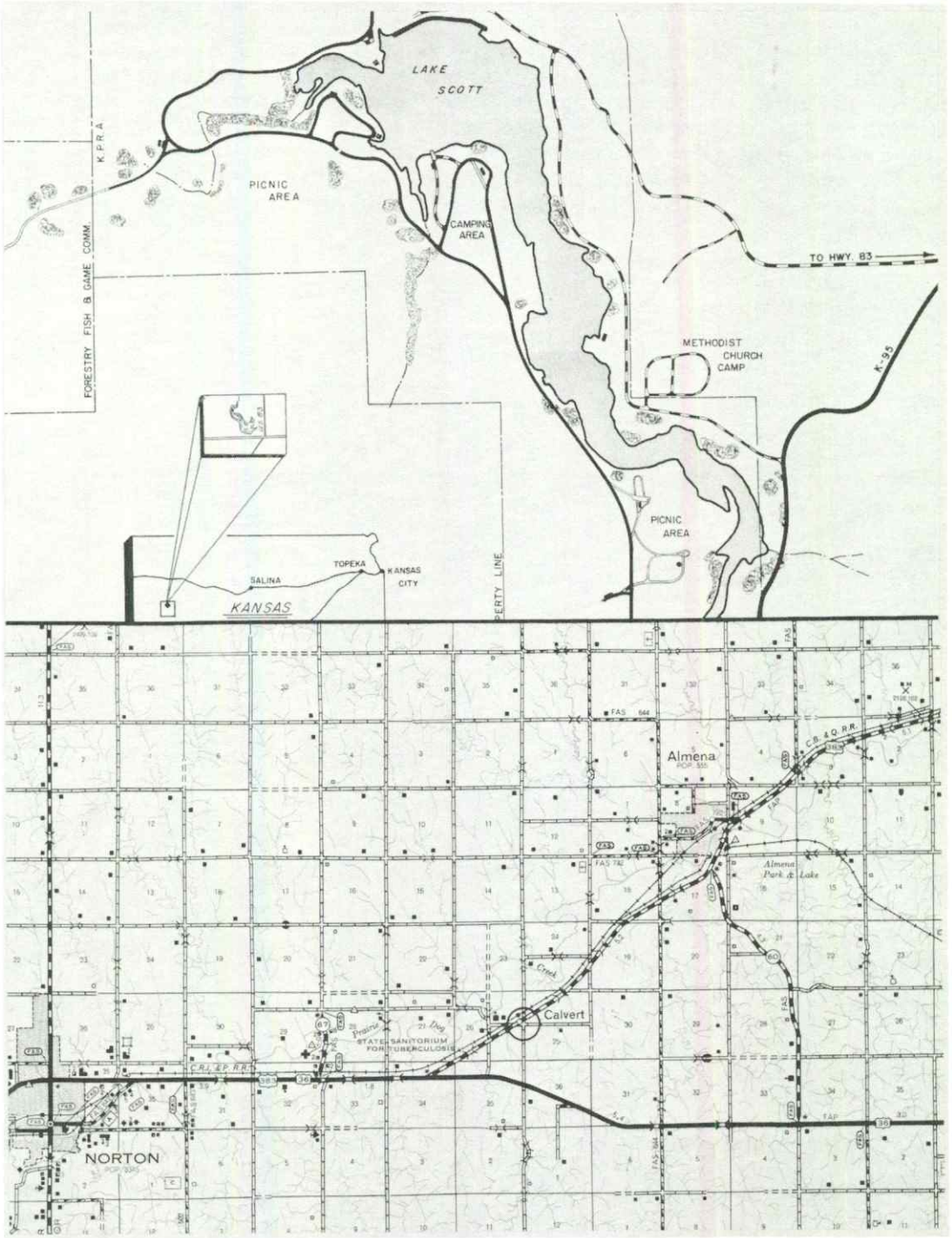


Figure 13 and - Example of reservoir map available from Kansas Parks and Recreation Authority and
Figure 14. - 1/4"/mile county highway base map.

## KANSAS DEPARTMENT OF TRANSPORTATION

The Kansas Department of Transportation (formerly State Highway Commission) maintains a stock of maps which may be used for the highway, culture, and drainage features shown on the maps or as base maps to plot other data. See Tables 3 and 4, and Figure 14. The Department of Transportation also publishes a "Construction Materials Inventory" series. These reports are an inventory of the geologic materials in various counties that are suitable for construction purposes. The reports list the type of material (clay, sand, gravel, limestone, etc.), geologic source, location, and a description of the engineering properties of the material. The published reports are listed in Table 4. The publications are available from:

Planning and Development Department
Kansas Department of Transportation
State Office Building
Topeka, Kansas 66612
913-296-3841

Table 3

Construction Materials Inventory Series

| | | | |
|---|---|---|---|
| 1. | Ellis County | 17. | Rawlins County |
| 2. | Coffey County | 18. | Franklin County |
| 3. | Mitchell County | 19. | Nemaha County |
| 4. | Sumner County | 20. | Jefferson County |
| 5. | Linn County | 21. | Butler County |
| 6. | Sherman County | 22. | Doniphan County |
| 7. | Marshall County | 23. | Bourbon County |
| 8. | Brown County | 24. | Johnson County |
| 9. | McPherson County | 25. | Douglas County |
| 10. | Harvey County | 26. | Shawnee County |
| 11. | Osage County | 27. | Miami County |
| 12. | Kingman County | 28. | Crawford County |
| 13. | Pratt County | 29. | Republic County |
| 14. | Morton County | *30. | Cloud County |
| 15. | Seward County | *31. | Ottawa County |
| 16. | Stevens County | | |

*Report in preparation

Table 4

| Description | Type | Approx. Scale inches per mile | Size | Price |
|---|---|---|---|---|
| STATE MAPS | | | | |
| State Highway System, County Lines, and County Seats | Blue Line | | 20" x 46" | .75 |
| | Blue Line | 1/8" | 36" x 70" | 1.50 |
| State Highway System, County Lines, Cities and Villages and F.A.S. | Blue Line | 1/8" | 33" x 54" | 1.50 |
| State Highway System, County Lines, Cities and Villages and Major Drainage | Blue Line | 1/8" | 33" x 54" | 1.50 |
| | Blue Line | 3/16" | 44" x 80" | 3.00 |
| County Outlines and Names | Blue Line | | 30" x 54" | 1.50 |
| | Blue Line | | 24" x 40" | 1.00 |
| | Printed Black | | 8 1/2" x 11" | .05 |
| | Printed Black | | 14" x 20 1/2" | .10 |
| Traffic Flow Map | Two Color | | 16" x 38" | .25* |
| City Traffic Count Maps (5000-35,000 Pop.) | Two Color | | 11" x 17" | .15 |
| HIGHWAY DIVISION MAPS | | | | |
| State Highway System, County Lines, Cities and Villages, Railroads and Principal Streams | Blue Line | 1/8" | 18" x 20" | .50 |
| | Blue Line | 1/4" | 36" x 40" | 1.00 |
| COUNTY MAPS | | | | |
| All Public Highways, drainage, farm units and other culture | Blue Line | 1" | 36" x 60" | 1.50 |
| | Printed Black with Drainage Blue | 1/2" | 19" x 31" | .35 (3 for 1.00) |
| | Printed Black | 1/4" | 8 1/2" x 11" | .10 |
| Complete Set (105 counties) | Unbound | 1/2" | | 35.00 |
| Complete Set (105 counties) | Unbound | 1/4" | | 10.00 |
| CITY MAPS | | | | |
| Line maps of K.C., Wichita and Topeka | Blue Line | 2" | Variable | 2.00 |
| City plats of all incorp. cities except K.C., Wichita and Topeka | Blue Line | Variable | 18" x 24" | .25 |
| City maps (1,000-15,000 Pop.) | Printed Black | 1" = 2000' | 11" x 17" | .15 |

Copies of the Official State Highway Map are Available without charge

*No Charge for single copy

## WATER RESOURCES BOARD

The Kansas Board of Water Resources is primarily involved in water resources planning and has a number of publications on various aspects of water resources in Kansas. The reports are not necessarily maps; however, the texts contain maps. The reports cover areas such as water quality, sediment load in streams, irrigation water supply, water law, and industrial, municipal and rural water demands as well as a number of other topics. For a list of publications or more information, contact:

Kansas Water Resources Board
Room 407, Mills Building
109 West 9th Street
Topeka, Kansas 66612
913-296-3185

## KANAS GEOLOGICAL SOCIETY

For many general planning uses, much of the information available from the Kansas Geological Society would be too detailed. The Society, however, is a valuable source of data on the oil and gas industry in Kansas and can contribute knowledge of the petroleum industry in a particular region.

The Kansas Geological Society has the following maps for sale:

Lithologic criteria for identification and subdivision of the Mississippian rocks in western Kansas by Joseph Clari, 1948. Price $3.00. No scale given.

Pre-Pennsylvanian Paleogeologic Map of Kansas, 1961. Black and white, $4.00. Color, $14.00. No scale given.

Structural Maps of the petroleum geology of the Aldrich-Arnold area, Ness County, Kansas, 1963. Six contour maps, each 30" x 40" plus one cross section; size 23" x 36" and nine page report. Price $10.00.

In addition, the Society provides the following publications and services:

| | |
|---|---|
| Type logs | General Information on the oil and gas Industry in Kansas |
| Guidebooks | |
| Drillers logs | Drilling time logs |
| Electric logs | Maps of Ness County |
| Cross sections | Nomenclature cards |
| Stratigraphic logs | Well sample processing |
| Kansas oil and Gas Field Study Series volumes 1-2-3-4 | |

For a complete list of publications and prices, contact:

Kansas Geological Society
303 Insurance Building
212 North Market
Wichita, Kansas 67202
316-265-8676

## REGIONAL PLANNING COMMISSIONS

Kansas is divided into 14 multi-county regions, most of which have planning commissions. The planning commissions are sources of data for physical and human resources. Figure 15 shows the locations of the organized planning commissions.

### Addresses of Regional Planning Commission Offices

Mid-American Regional Council
20 West 9th Street, 3rd Floor
Kansas City, Missouri 64105
816-474-4240

Southeast Kansas Regional Planning Commission
P.O. Box 664
Chanute, Kansas 66720
316-431-0080

Big Lakes Regional Planning Commission
Courthouse Annex
Fifth and Poyntz
Manhattan, Kansas 66502
913-776-4859

Flint Hills Regional Planning Commission
P.O. Box L
Strong City, Kansas 66869
316-273-8503

Mid-State Regional Planning Commission
P.O. Box 963
McPherson, Kansas 67460
316-241-2771

Chikaskia-Indian Hills-Golden Belt
Regional Planning Commission
P.O. Box 301
Pratt, Kansas 67124
316-672-5541

Greater Southwest Regional Planning Commission
P.O. Box 893
Garden City, Kansas 67846
316-276-9176

Northwest Kansas Planning & Development Commission
P.O. Box 248
Hill City, Kansas 67642
913-674-2151

North-Central Regional Planning Commission
Municipal Building
Beloit, Kansas 67420
913-738-2218

Mo-Kan Regional Council
4529 South 169 Highway
St. Joseph, Missouri 64507
816-233-3144

Central Plains Tri-County Regional
Planning Committee
Wichita/Sedgwick County MAPD
104 South Main
Wichita, Kansas 67202
316-262-0611

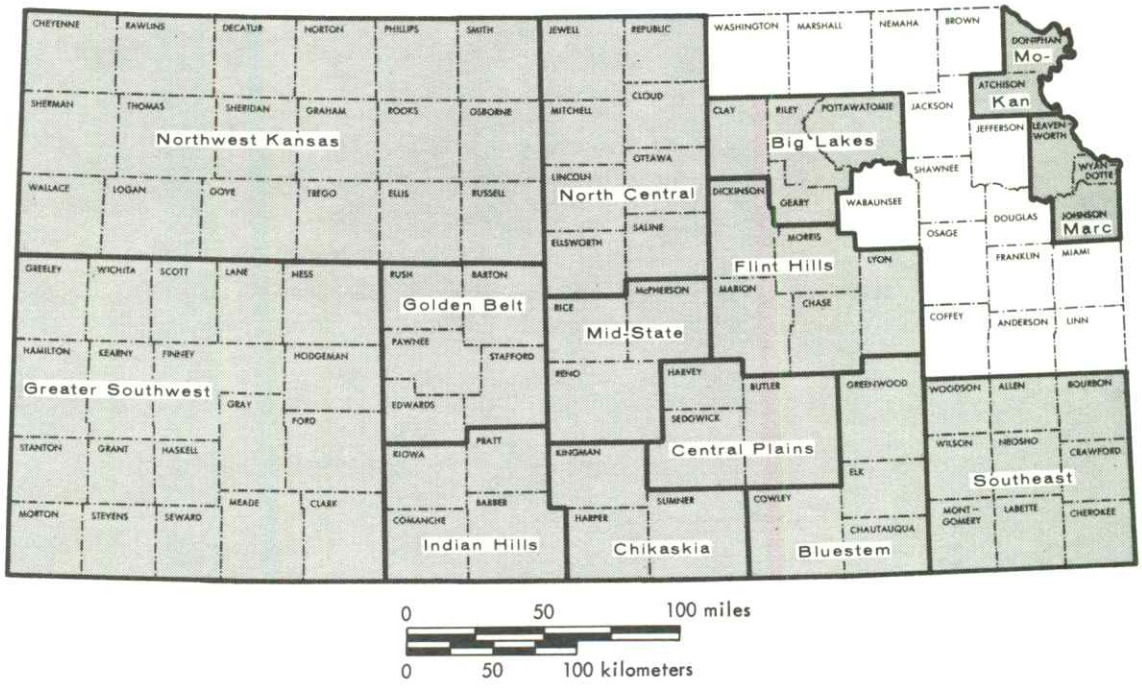


Figure 15. - Organized multi-county planning regions.

## RESOURCE CONSERVATION AND DEVELOPMENT PROJECTS (RC & D's)

RC & D's are multi-county organizations designed to improve, develop, and utilize human and natural resources in the project area. Each RC & D publishes a project plan which is a compilation of the human and natural resources of the area. The plan is a comprehensive document containing maps and text describing the project area and is a general reference and data source. Figure 16 shows the organized RC & D projects.

### Addresses of RC&D Project Offices

Lake Region RC&D Project
1302 South Main
Ottawa, Kansas 66067

Four Rivers RC&D Project
405 West Second, Box 188
Minneapolis, Kansas 67467

See-Kan RC&D Project
Box 502
Chanute, Kansas 66720

Sunflower RC&D Project
706 East Main, Box 125
Harper, Kansas 64105

Flint Hills RC&D Project
Box M
Strong City, Kansas 66869

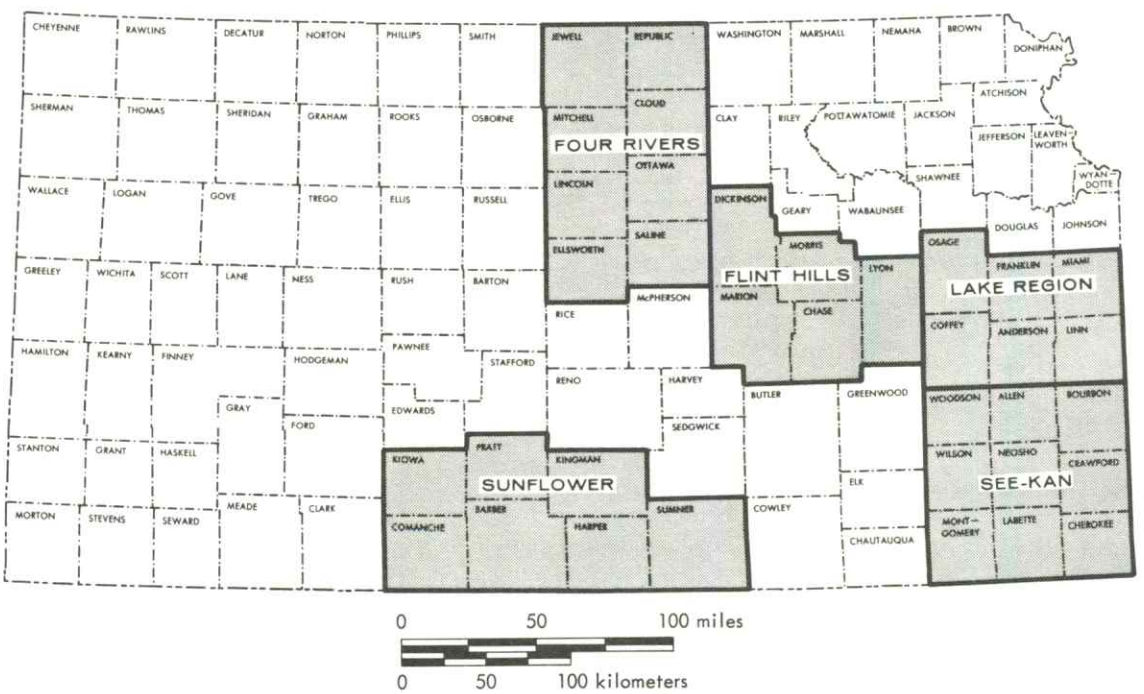


Figure 16. - Organized Resource Conservation and Developments Projects (RC&Ds).

## THE UNIVERSITY OF KANSAS SPACE TECHNOLOGY CENTER

Many of the maps available from the Space Technology Center deal with land use. Categories of land use such as Level I, Level II, Level III, and Level IV are used. Level I consists of broad, general categories such as the ones shown below.

1) urban and built-up land
2) agricultural land
3) range land
4) forest land
5) wetland
6) water
7) barren land
8) timber
9) permanent snow and ice

The subsequent levels are subdivisions of Level I. For example, agricultural land (Level I) could be subdivided into cropland and pasture (Level II) which could be subdivided into cropland harvested, including bush-fruits (Level III) which could then be divided into particular crops (Level IV) such as grapes, wheat, etc. Figure 17 shows a portion of a land-use map prepared for the Four Rivers RC&D Project.

### Maps Available

Kansas Land-Use Patterns, 1973. Scale 1:1,000,000 (1" = 16 mi); data from 1973 LANDSAT imagery; printed in color; Level I and II. Multi-colored map showing state-wide land-use patterns.

LANDSAT mosaic of Kansas, 1973. Scale 1:1,000,000 (1" = 16 mi); data from various 1972 and 1973 LANDSAT imagery; printed in black and white. Photo-like image of Kansas showing cities, roads, agricultural patterns, etc.

Cherokee County Land-Use Map, 1973. Scale 1:63,360 (1" = 1 mi); data from 1973 high altitude aircraft imagery; printed in black and white; Levels I, II, and III. Map showing land-use patterns.

Reconnaissance Land-Use Map of Chikaskia River Basin, Kansas. Scale 1:250,000 (1" = 4 mi); data from 1973 LANDSAT and SKYLAB imagery; printed in black and white; Levels I and II. Map showing land-use patterns.

Reconnaissance Land-Use Map of Pawnee River Basin, Kansas. Scale 1:250,000 (1" = 4 mi); data from 1972 LANDSAT imagery; printed in black and white; Levels I and II. Map showing land-use patterns.

Land-Use, Recreation and Vegetation Map, Republican River from Concordia to Clyde, 1975. Scale 1:24,000 (1" = 2/5 mi); data from 1974 low altitude aircraft imagery; printed in color; Levels I, II, III, and IV. Map showing physical features.

Clinton Reservoir Land-Use Map, 1973. Scale 1:125,000 (1" = 4 mi); data from 1972 low altitude aircraft imagery; Levels I, II, and III. Multi-colored map showing land-use patterns.

Metropolitan Area of Kansas City, Kansas and Kansas City, Missouri, 1975. Scale 1:250,000 (1" = 4 mi); data from 1969 and 1974 high altitude aircraft imagery; printed in color; Levels I and II. Multi-colored map showing patterns of urban change in relation to prime agricultural land between 1969 and 1974.

Four Rivers RC&D Base Map, 1974. Scale 1:500,000 (1" = 8 mi); data from 1973 LANDSAT imagery; printed in color; Levels I, II and III. Multi-colored map showing land-use patterns.

Reconnaissance Map of Land Use in Sumner County, Kansas, 1975. Scale 1:125,000 (1" = 4 mi); data from 1973 SKYLAB and 1975 LANDSAT imagery; Level I. Multi-Color map showing land-use patterns.

Rangeland Condition and Cedar and Sage Distribution in Barber County, Kansas, 1975. Scale 1:125,000 (1" = 4 mi); data from 1950 aerial photos and 1973 SKYLAB and LANDSAT imagery. Multi-colored map showing changes in cedar and sage distribution and rangeland condition since 1950.

Douglas County Land-Use Map, 1976. Scale 1:24,000 (1" = 2/5 mi); data from 1976 aerial photos; Levels I, II, III, IV. Black and white map showing land-use patterns.

LANDSAT (ERTS) Imagery. Complete coverage of Kansas. 1:1,000,000, available for inspection.

Contact the Kansas Applied Remote Sensing Program at the Space Technology Center for the publication, Guide to Aerial Photography and Space Imagery in Kansas.

Recently completed is a Center Pivot Irrigation Map of Kansas. This map will show locations of center pivot sprinkler irrigation in southwest Kansas.

To order the above maps or data or for more information, contact:

KARS Program
Nichols Hall
2291 Irving Hill Drive, Campus West
Lawrence, Kansas 66045
913-864-4775

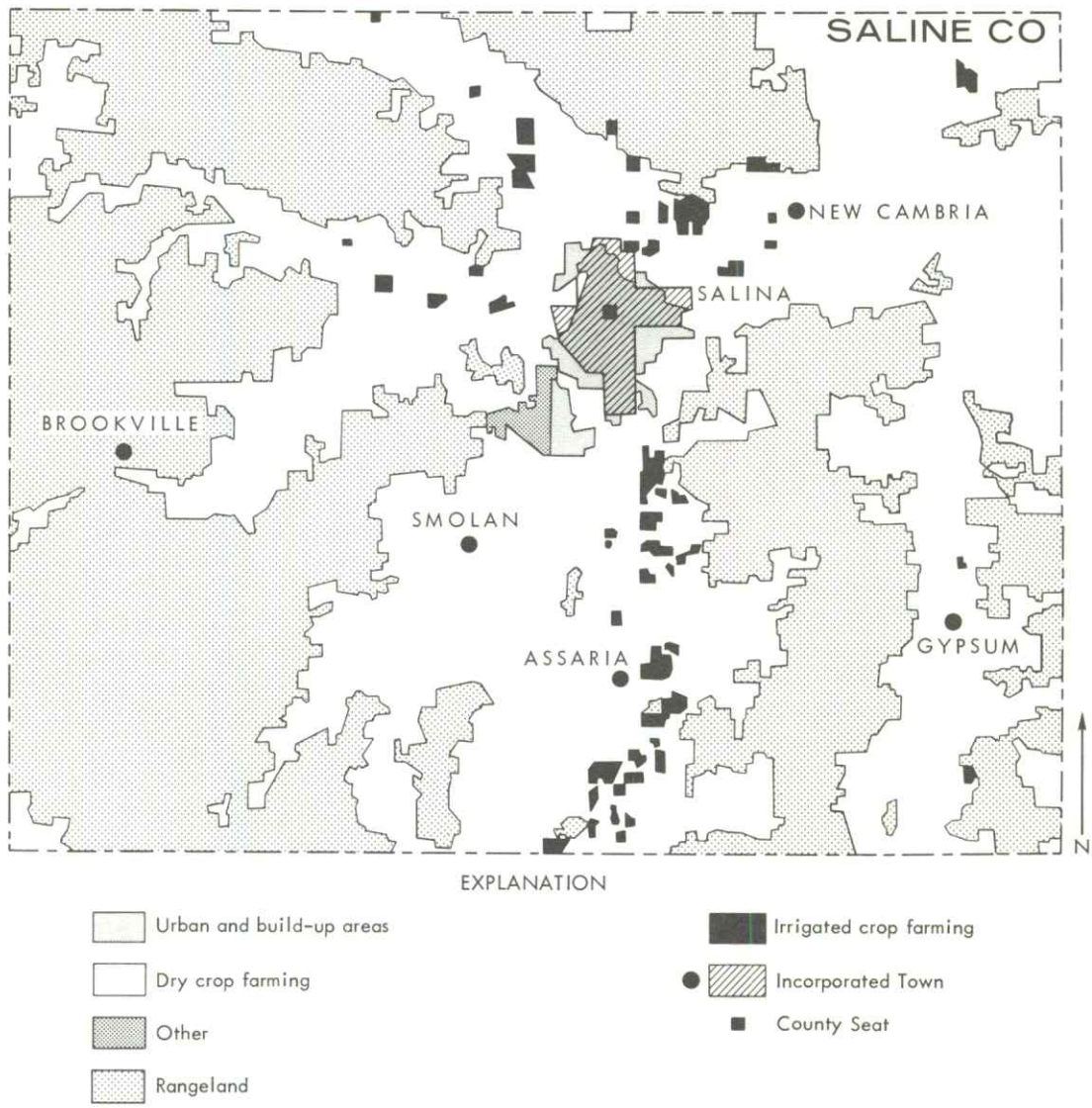


Figure 17. - Example of part of a land-use map produced by UKSTC.

## MISCELLANEOUS MAPS

### Vegetation Map

Dr. A. W. Kuchler of the University of Kansas, Department of Geography, has published a paper entitled "A New Vegetation Map of Kansas." It describes the potential natural vegetation in Kansas and includes a multi-color, 1:800,000 scale map that illustrates the vegetation zones. The price of the map and text is $2.00 and may be ordered from:

Dr. A.W. Kuchler
Department of Geography
University of Kansas
Lawrence, Kansas 66045

### Soils of Kansas

Multi-colored map (12" x 23") showing generalized major soil associations in Kansas. Scale 1:1,125,000. 1 inch = 17.5 miles. Published by the Kansas Agriculture Experiment Station, Department of Agronomy Contribution No. 1359. Compiled by O.W. Bidwell, Kansas Agricultural Experiment Station and C.W. McBee, Soil Conservation Service. No charge for single copies. Order from:

KAES Distribution Center
Umberger Hall
Kansas State University
Manhattan, Kansas

A companion publication to the generalized soil map is Kansas Geological Survey Bulletin 208, "Using Soils of Kansas For Waste Disposal" by Gerald W. Olsen. This Bulletin is intended as a guide for anyone planning a waste disposal system. Each soil type in Kansas is rated for different types of waste disposal according to tested and standardized criteria based on soil properties. Copies of the Bulletin may be obtained from the Kansas Geological Survey ($3.50).

## County Land-Use Maps

Dr. Kathleen Q. Camin of the Department of Economics, Wichita State University, has published land-use maps of Harvey and Crawford Counties, Kansas.

Harvey County Land Use, 1970. Scale 1:31,680 (1/2" = 1 mile). Multi-colored map showing patterns of land use based on 1970 aerial photographs from the SCS and ASCS. Contains such categories as crops, forests, transportation, cities and towns, etc.

Crawford County Land Use, 1970. Scale 1:31,680 (1/2" = 1 mile). Description is similar to Harvey County land-use map.

In progress are land erosion maps of five counties, including Allen, Harvey, Meade, Phillips, and Jefferson. These maps will classify the erosion characteristics of the soil.

For more information, contact:

Dr. Kathleen Q. Camin
Department of Economics
Wichita State University
Wichita, Kansas 67208

## Sources of Historical or out-of-Print Maps

The references listed in this section have available for inspection out-of-print or historical maps of the early United States and Kansas dating from the first European exploration. Many of the fascinating old maps show the progression of settlement from east to west during the early days of the United States. They are invaluable references for research into past population migration patterns.

Historical Atlas of Kansas by Socolofsky and Self, 1972. University of Oklahoma Press, Norman, Oklahoma. Available at Bookstores.

Kansas in Maps by Robert W. Baughman. Kansas State Historical Society, 1961. Available at Bookstores.

Kansas State Historical Society
10th and Jackson
Topeka, Kansas
913-296-3251

Kansas Collection
Spencer Research Library
University of Kansas
Lawrence, Kansas 66045
913-864-4420

Documents Division
Farrell Library
Kansas State University
Manhattan, Kansas
913-532-6516

Linda Hall Library
5109 Cherry
Kansas City, Missouri
816-363-4600

For reproductions from historical and military maps or reproductions of township plats in Kansas, contact:

General Services Administration
National Archives and Records Service
Cartographic Archives Division, Room G-13
Pennsylvania Ave. at 8th St., NW
Washington, D.C. 20408

For reproductions from historical and military map collections, contact:

Library of Congress
Geography and Map Division
845 South Pickett Street
Alexandria, Virginia 22304

Individual County Historical Societies.

In many cases, faculty members of the Geography Departments of the colleges and universities in Kansas have an interest in maps and are a good source of materials and references.

## Aerial Photography and Satellite Imagery

### Government Agencies

Agricultural Stabilization and Conservation Service
Aerial Photography Division
ASCS-USDA
2505 Parley's Way
Salt Lake City, Utah 84109
(801) 524-5856

Coverage: Most of the U.S. (Status book available upon request)
Film Type: Black and White (spring, summer, or fall)
Scale: Mostly 1:20,000, some 1:40,000

The ASCS has the most complete aerial photo coverage of the state. Each county office has an index of photos for that county. To order photos, contact the nearest county ASCS office or:

Kansas State ASCS Office
2601 Anderson Avenue
Manhattan, Kansas 66502

Soil Conservation Service (SCS)
Cartographic Division
U.S. Department of Agriculture
Hyattsville, Maryland 20251
(301) 436-8186

Coverage: Scattered U.S. (Status book available upon request)
Film Type: Black and White (Usually during non-growing seasons)
Scales: Mostly 1:20,000, some 1:45,000 - 1:55,000

National Cartographic Information Center
U.S. Geological Survey, 507 National Center
Reston, Virginia 22092
(703) 860-6052
See page 7 for background on NCIC.

Other governmental agencies hold photographic coverage of those lands under their jurisdiction. Some of these include: the Army Corps of Engineers, Bureau of Land Management, Bureau of Reclamation, Bureau of Indian Affairs and the Forest Service.

Old photography (pre-1950) taken by several governmental agencies is held by:

National Archives (GSA)
Cartographic Records Division
Washington, D.C. 20408
(202) 962-0173
(Status book available)

LANDSAT & SKYLAB Imagery and Photography

Available from the following agencies:

User Services Unit
EROS Data Center
Sioux Falls, South Dakota 57198
(605) 594-6511, ext. 151
Federal Telecommunications System Phones Use
(605) 336-2381

Aerial Photography Division
ASCS-USDA
2505 Parley's Way
Salt Lake City, Utah 84109
(801) 524-5856

Coverage: LANDSAT - Worldwide: SKYLAB, Gemini, and Apollo - scattered
Film Type: LANDSAT images available in black and white prints, selected areas available in color infrared composite.
SKYLAB, Gemini, and Apollo - scattered areas in black and white, color, and color infrared/filters vary.
Scales: LANDSAT - 1:1,000,000 on 9 x 9 inch prints
SKYLAB, Gemini, and Apollo - Varies
See also the reference for NCIC.

The Space Technology Center at Kansas University has aerial photography for selected parts of Kansas. The KARS Program also has available "Guide to Aerial Photography and Space Imagery in Kansas" which lists major sources of aerial photography and space imagery in Kansas. Contact:

KARS
K.U. Space Technology Center
2291 Irving Hill Drive, Campus West
Lawrence, Kansas 66044
(913) 864-4775

The Kansas Department of Transportation holds aerial photography flown for highway studies in Kansas. Copies are available to the public. For more information on coverage, film types, scales, availability, etc., contact:

Photogrammetry Section
Kansas Department of Transportation
State Office Building
Topeka, Kansas 66612
(913) 296-3416
KANS-A-N 561-3416

## Aerial Photography Services

There are a number of organizations that photograph areas on a contract basis and/or hold aerial photography for parts of Kansas.

Western Air Maps, Inc.
P.O. Box 5186
Lenexa, Kansas 66215
(913) 888-5266

Bucher and Willis
P.O. Box 1287
Salina, Kansas 67401
(913) 127-3603

or

Bucher and Willis
6183 The Paseo
Kansas City, Missouri 64110
(816) 363-2696

Wilson and Company
P.O. Box 28
Salina, Kansas 67401
(913) 827-0433

Van Doren, Hazard, Stallings, Schnacke
P.O. Box 719
Topeka, Kansas 66601
(913) 267-1414

M. J. Hardin & Associates, Inc.
Aerial Photography International, Inc.
1019 Admiral Boulevard
Kansas City, Missouri 64106
(816) 842-0141

Howard, Needles, Tammen & Bergendoff
1805 Grand Avenue
Kansas City, Missouri 64108
(816) 474-4900

KARS
K.U. Space Technology Center
2291 Irving Hill Drive, Campus West
Lawrence, Kansas 66044
(913) 864-4775

The Kansas Geological Survey has aerial photographic coverage available for inspection of various parts of Kansas. Coverage is by 7 1/2-minute quadrangles and by county. The scale is commonly 1:20,000 but varies. Contact the Mineral Resources Section or the Environmental Geology Section of the Kansas Geological Survey.

AGENCY ADDRESSES
(For your quick reference)

USDA - Soil Conservation Service
Box 600
Salina, Kansas 67401 (913) 825-9535
County Soil Maps - General Soil Information

U.S. Army Corps of Engineers
District Engineer
U.S. Army Engineer District
P.O. Box 61
Tulsa, Oklahoma 74102

District Engineer
U.S. Army Engineer District
P.O. Box 1580
Albuquerque, New Mexico 87103

District Engineer
U.S. Army Engineer District
700 Federal Building
Kansas City, Missouri 64106

U.S. Bureau of Reclamation
Regional Office, Lower Missouri Region
P.O. Box 25247
Denver, Colorado 80225

U.S. Geological Survey
Branch of Distribution
Box 25286, Federal Center
Denver, Colorado 80225
Map sales for areas west of the Mississippi

U.S. Geological Survey
Branch of Distribution
1200 South Eads Street
Arlington, Virginia 22202
For USGS scientific and technical publications as well as maps for all states and territories

National Cartographic Information Center
Mid-Continent Mapping Center
1400 Independence Road
Rolla, Missouri 65401 (314) 364-3680
For general information relating to USGS maps, air photos, and related products available for Kansas

U.S. Geological Survey
Water Resources Division
1950 Avenue "A", Campus West
Lawrence, Kansas 66044 (913) 864-4321
For information on water resources in Kansas

Kansas Department of Economic Development
503 Kansas Avenue
Topeka, Kansas 66603 (913) 296-3481
KANS-A-N 561-3481
Land-use maps and page size maps

Kansas Forestry, Fish & Game Commission
P.O. Box 1028
Pratt, Kansas 67124 (316) 672-5911
KANS-A-N 565-6120
Maps of game management areas in Kansas

Kansas Geological Survey
1930 Avenue "A", Campus West
Lawrence, Kansas 66044 (913) 864-4991
KANS-A-N 564-4991
Topographic and geologic maps of Kansas, geologic and water resources publications and information. Page size base maps.

State Park and Resources Authority
801 Harrison
Topeka, Kansas 66612 (913) 296-2281
KANS-A-N 561-2281
8 1/2" x 11" maps of reservoirs in Kansas

Kansas Department of Transportation
Planning and Development Department
State Office Building
Topeka, Kansas 66612 (913) 296-3841
KANS-A-N 561-3545
State, highway division, county, and city maps showing public highway drainage and culture. Construction materials inventory publications on Kansas counties.

Kansas Geological Society
303 Insurance Building
212 North Market
Wichita, Kansas 67202 (316) 265-8676
Petroleum industry related maps and data

Regional Planning Commissions
Maps and data on physical and human resources. See page 39 and Fig. 15 for locations of organized planning regions.

Resource Conservation and Development Projects
Maps and data on physical and human resources. See page 41 and Fig. 16 for location and address of organized RC&D's.

University of Kansas Space Technology Center
KARS
Nichols Hall
Lawrence, Kansas 66044 (913) 864-4775
KANS-A-N 564-4775
Land-use maps, aerial photography and satellite imagery.

Dr. A. W. Kuchler
Department of Geography
University of Kansas
Lawrence, Kansas 66045 (913) 864-4276
KANS-A-N 564-4276
Vegetation map of Kansas

Kansas Agricultural Experiment Station
KAES Distribution Center
Umberger Hall
Kansas State University (913) 532-5804
Manhattan, Kansas 66506 KANS-A-N 562-5804

Kathleen Q. Camin
Department of Economics
Wichita State University
Wichita, Kansas 67208 (316) 689-3220
KANS-A-N 563-3220

Land-use maps of Harvey and Crawford County

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Environmental Geology Series 1

Kansas Geological Survey
Lawrence, Kansas
1977