ASSOCIATION OF AMERICAN STATE GEOLOGISTS

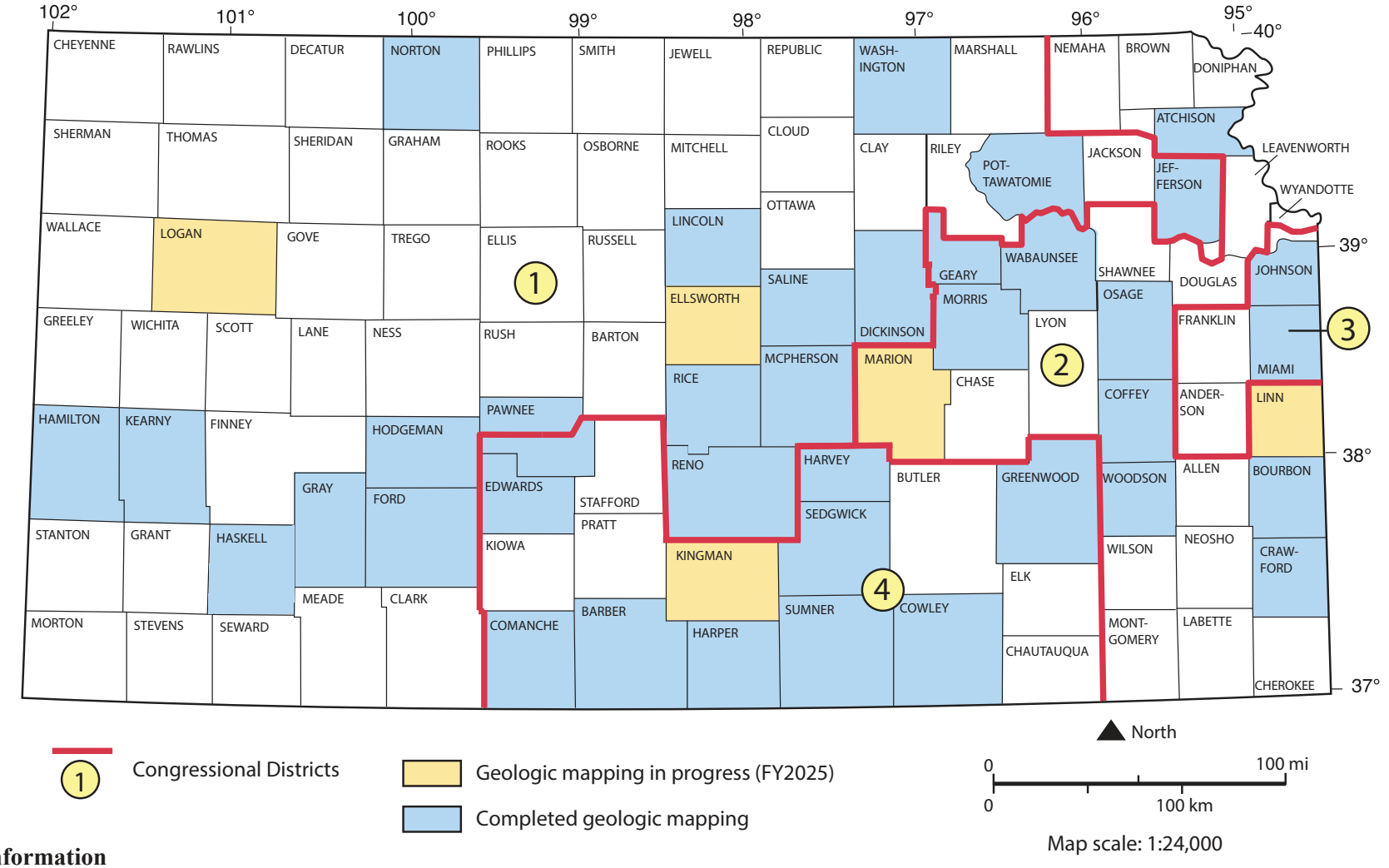
KANSAS GEOLOGICAL SURVEY
The University of Kansas

UNITED STATES GEOLOGICAL SURVEY
USGS science for a changing world

National Cooperative Geologic Mapping Program

STATEMAP Component: States compete for federal matching funds for geologic mapping

KANSAS



Map scale: 1:24,000

Contact information

Kansas Geological Survey
Director: James Kalbas (785.864.8363)
STATEMAP Contact: Jon J. Smith (785.864.2179)
http://www.kgs.ku.edu/

USGS Geologic Mapping Program Office
Program Coordinators: Kate Ritzel (571.512.1641)
Michael Marketti (703.328.3102)
http://ncgmp.usgs.gov/

October 2025

What is a Geologic Map?

Geologic maps are an important source of natural-resource information, depicting the bedrock (solid rock at or near the earth's surface), as if the soil and vegetation had been removed. Geologic maps show the distribution, rock type, age, and horizontal distribution of bedrock near the earth's surface. In Kansas, bedrock includes limestone, sandstone, and shale. Geologic maps also show known related geologic structures (faults, fractures, and folds). Surficial materials brought in by wind, water, or ice (e.g., sand dunes, alluvium, glacial drift) also are mapped. Alluvium—thick deposits of unconsolidated sand, gravel, clay, and silt in stream valleys—is younger than underlying bedrock. In some areas, bedrock is covered by windblown sand dunes or silt (called loess). Glacial drift is material transported by glaciers and deposited directly on the land. Geologic maps primarily are used to assess geologic resources and geologic hazards, in construction, in siting of landfills, to aid in mineral and groundwater exploration, and for academic research.

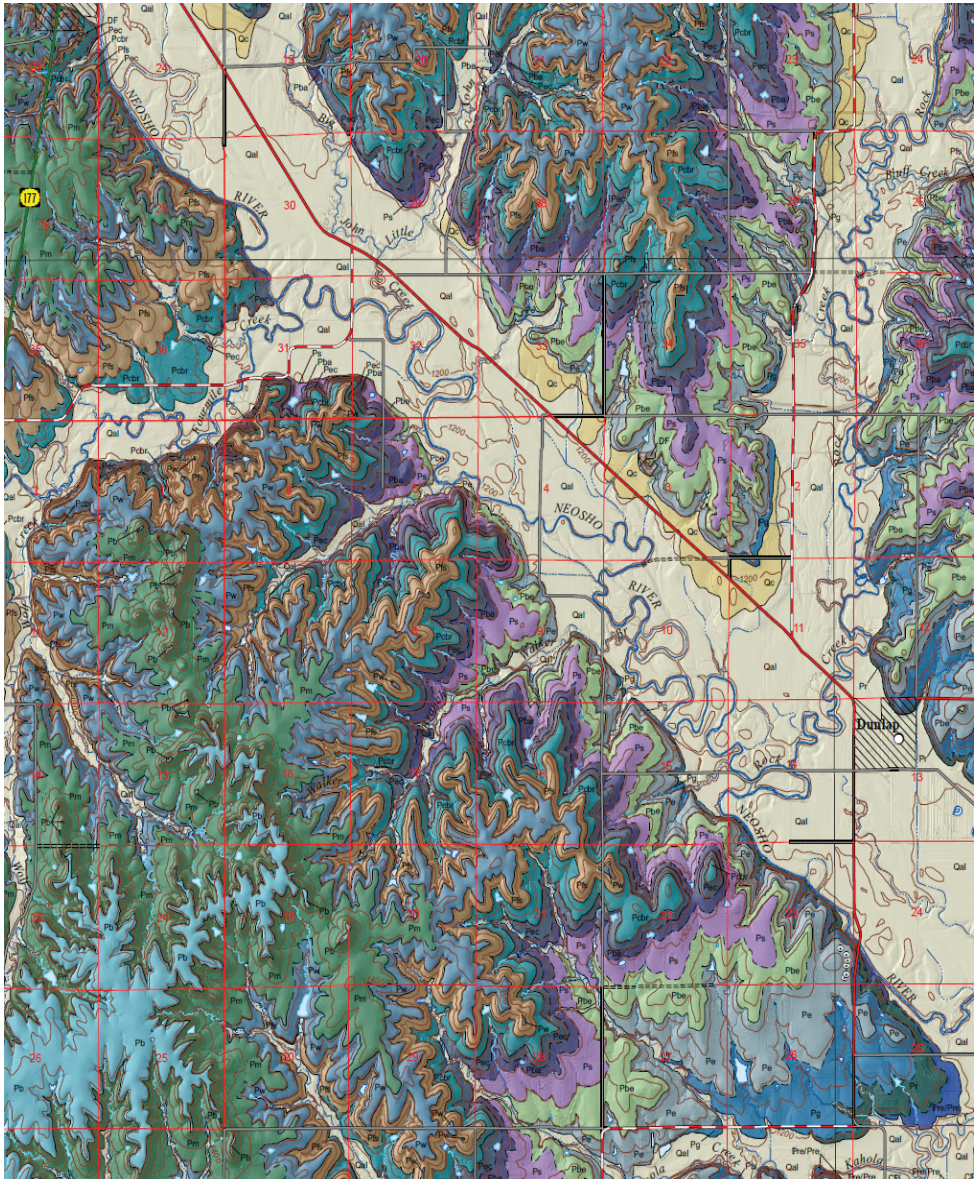
Benefits and Uses of Geologic Maps

Geologic maps are the starting point for any geologically related investigation and are useful in construction and engineering projects, city and county planning, and environmental activities. Large projects (dams, roads, bridges, buildings) require detailed geological analysis because of monetary, health, and safety concerns. Smaller projects, such as surface-water impoundments, houses, and water wells, also benefit from understanding surface bedrock. Other examples of geologic map uses include:

- Evaluating geologic hazards (landslides, earthquakes, land subsidence)
- Planning transportation and utility routes
- Selecting sites for public facilities (landfills, treatment facilities, waste-disposal sites, schools)
- Developing and protecting groundwater
- Assessing, exploring, developing, and managing natural resources (oil, gas, coal, salt, sand and gravel aggregates)
- Basic earth-science research

Recent outcomes include:

- Geologic mapping in **Pottawatomie County** identified several subsurface faults, information with implications for existing structures and new construction.
- Geologic mapping in **Kearny**, **Haskell**, **Gray**, and **Ford** counties underlain by the High Plains aquifer are used to develop policy recommendations and improve ground water management
- Mapping of **Harvey**, **Sedgwick**, **McPherson**, and **Reno** counties provided information on the Equus Beds aquifer, the primary groundwater source for industrial, municipal and irrigation uses in south-central Kansas.
- Geologic mapping in **Johnson** and **Miami** counties have provided important information on the location of limestone units as a source for concrete and asphalt aggregates in the Kansas City area.
- Maps of **Saline** and **Geary** counties were used for the design of surface-water diversions, dams, waste management systems, and other infrastructure in these fast-growing suburban counties.



Map inset from Sawin R. S., and West, R. R., 2016, Surficial geology of Morris County, Kansas: Kansas Geological Survey, Map M-125, scale 1:50,000

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SUMMARY OF STATEMAP GEOLOGIC MAPPING PROGRAM IN KANSAS

Federal Fiscal YR	Project Title	State Dollars	Federal Dollars	Total Project Dollars
93	Greenwood, Clark, Comanche, Bourbon, and Ford counties; digitized data base for state	$131,496	$64,385	$195,881
96	Greenwood and Bourbon counties continued; Comanche, Hamilton, and Kearny counties begun	70,565	70,000	140,565
97	Bourbon, Comanche, Hamilton, and Kearny counties continued	61,101	61,000	122,101
98	Bourbon, Comanche, Hamilton, and Kearny counties continued	74,545	74,544	149,089
99	Barber, Crawford, and Gray counties; digital geologic bases from existing maps in Johnson and Osage counties	62,460	50,000	112,460
00	Barber, Crawford, and Gray–Hodgeman counties; digital geologic base from existing map in Pottawatomie County	61,618	60,839	122,457
01	Barber, Crawford, and Hodgeman counties; digital compilation in Pottawatomie and Wabaunsee counties and 30 x 60 El Dorado quad.	139,834	139,690	279,524
02	Crawford, Pawnee and Edwards, and Saline counties; compilation of geologic map bases from existing map in Wabaunsee County	150,544	150,516	301,060
03	Crawford, Saline, Washington, Pawnee, and Edwards counties	106,796	106,123	212,919
04	Geologic mapping and compilation of digitized county data bases in Saline, Geary, Washington, Pawnee, and Edwards counties	107,976	107,951	215,927
05	Geologic mapping and compilation of digitized county data bases in Geary, Washington, Norton, and Dickinson counties	82,288	82,405	164,693
06	Geologic mapping and compilation of digitized county data bases in Geary, Washington, Norton, and Dickinson counties	98,706	98,698	197,404
07	Geologic mapping in Reno, McPherson, Dickinson, Miami, and Morris counties	153,888	153,798	307,686
08	Geologic mapping in Reno, McPherson, Harvey, and Morris counties	207,043	206,604	413,647
09	Geologic mapping in Reno, McPherson, Harvey, and Morris counties	200,235	199,432	399,667
10	Geologic mapping in Reno, McPherson, Harvey, Morris, Haskell, and Jefferson-Atchison counties	235,063	228,078	463,141
11	Geologic mapping in McPherson, Harvey, Morris, Haskell, and Jefferson-Atchison counties	225,069	220,697	445,766
12	Geologic mapping in Haskell, Jefferson-Atchison, Miami, and Rice counties	167,620	167,050	334,670
13	Geologic mapping in Haskell, Jefferson-Atchison, Miami, and Rice counties	114,665	111,565	226,230
14	Geologic mapping in Haskell, Miami, Rice, and Sedgwick counties	167,320	154,147	321,467
15	Geologic mapping in Miami, Rice, Sedgwick and Lincoln counties	124,588	120,532	245,120
16	Geologic mapping in Miami, Rice, Sedgwick and Lincoln counties	155,821	151,416	307,237
17	Geologic mapping in Sedgwick, Sumner, Harper and Cowley counties	155,731	155,315	311,046
18	Geologic mapping in Sedgwick, Sumner, Harper and Cowley counties	131,360	147,401	278,761
19	Geologic mapping in Sedgwick, Sumner, Harper and Cowley counties	136,794	146,294	283,088
20	Geologic mapping in Sedgwick, Sumner, Harper and Cowley counties; geodatabases of Miami County and Precambrian Basement Geology	427,965	427,965	855,930
21	Geologic mapping in Sedgwick, Sumner, Harper, Cowley and Logan counties; geodatabase of Cambro-Ordovician Arbuckle Group	517,951	517,950	1,035,901
22	Geologic mapping in Sumner, Harper Cowley and Logan counties; geodatabase of Surficial Geology, Interstate nomenclature reconciliation	599,195	599,195	1,198,390
23	Geologic mapping in Sumner, Cowley, Logan, Linn, and Marion counties; Missisppian map, Interstate nomenclature reconciliation	605,816	605,816	1,211,632
24	Geologic mapping in Cowley, Logan, Linn, Ellsworth, and Marion counties; Missisppian, and Dakota subsurface maps	567,462	567,463	1,134,925
25	Geologic mapping in Linn, Logan, Ellsworth, Marion and Kingman counties; Chattanooga Shale, Missisppian, and Dakota subsurface maps	582,172	582,175	1,164,347
	TOTAL	**$6,623,687**	**$6529044**	**$13,152,731**

KGS Participation in the USGS STATEMAP Program

The STATEMAP component of the National Cooperative Geologic Mapping Program (NCGMP) is a partnership between the USGS, Association of American State Geologists (AASG), and State geological surveys. In 1992, Congress established the NCGMP and its components to meet the current and future needs for detailed geologic maps by the Federal and State governments and the private sector. The State of Kansas has participated in the STATEMAP portion of the NCGMP since its inception.

STATEMAP cooperative agreements are funded through an annual competitive grant process. Every Federal dollar awarded to a State Geological Survey is matched by a State dollar. Geologists at the State Geological Surveys conduct the geologic mapping and share the results with the USGS, primarily as surface geologic maps on USGS 7.5-minute topographic quadrangles.

The primary beneficiaries of geologic mapping in the State of Kansas are the citizens of Kansas. Limitations on water resources and competing land-use pressures resulting from population growth remain a driving force for geologic mapping planning in Kansas. Concurrent with population growth is the demand for construction aggregates, critical mineral resources, oil and gas, and identification of such natural hazards as sinkholes and seismicity. STATEMAP supported geologic mapping provides information vital for state agencies, companies, and private citizens in evaluating these economically and culturally important issues.

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