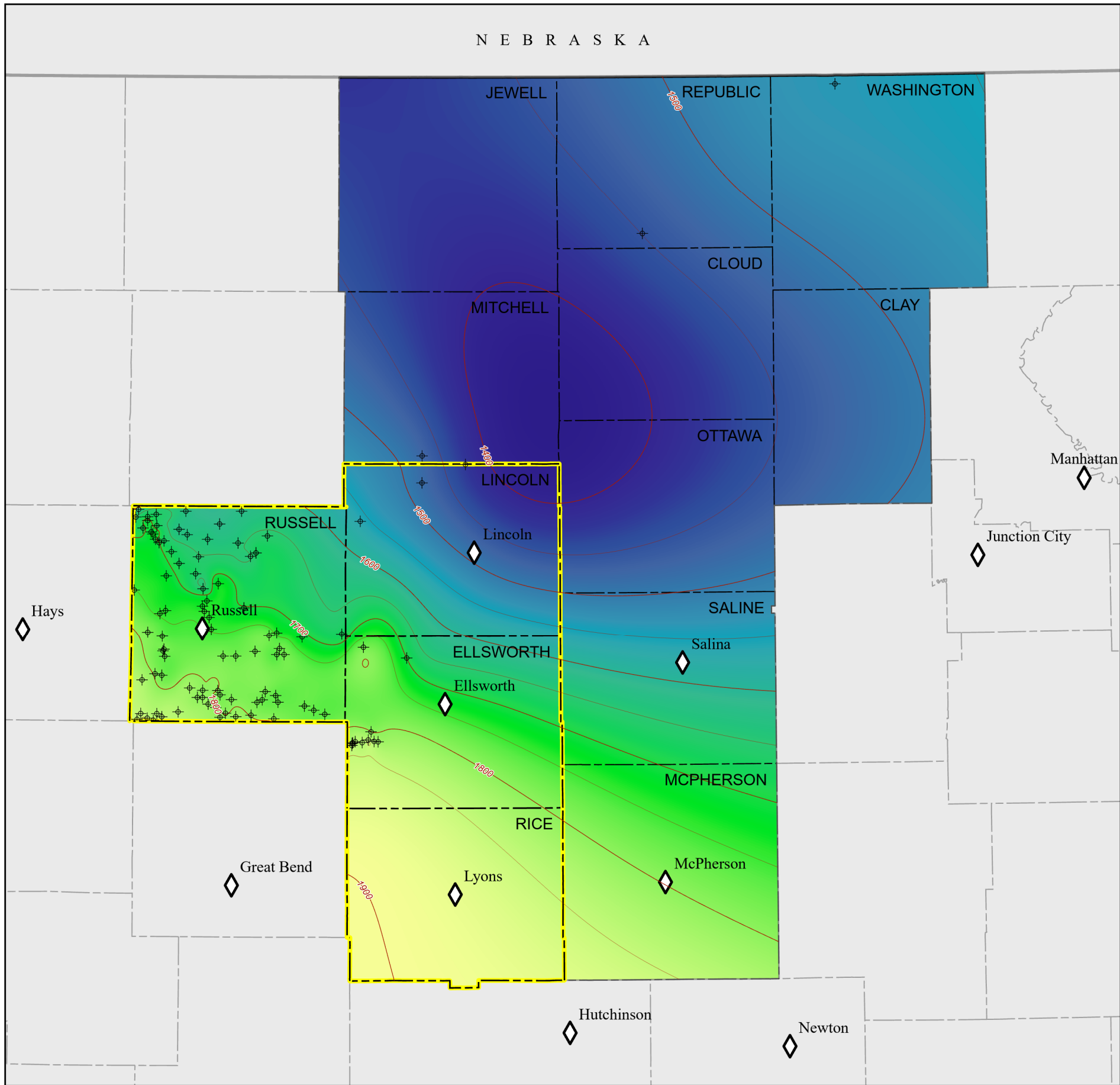
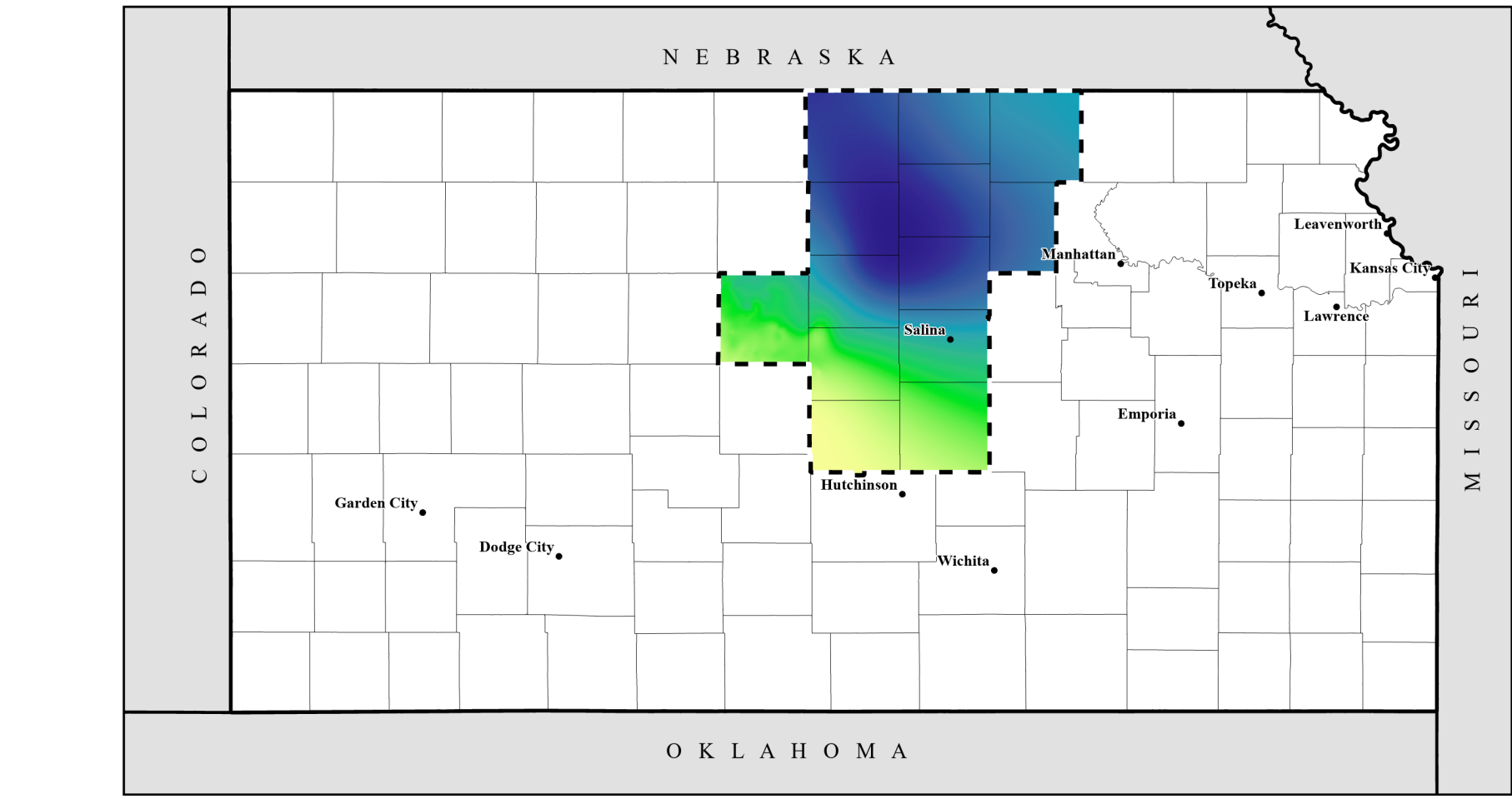


PRELIMINARY STRUCTURE MAP OF THE CRETACEOUS GRANEROS SHALE IN NORTH-CENTRAL KANSAS

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2025



The map above illustrates the study area consisting of 13 counties in north-central Kansas. The larger-scale map to the right focuses on a 4 county extent of Lincoln, Rice, Ellsworth, and Russell. These four counties contain a much higher density of well log records, thus providing higher confidence in the generated surface.

Abstract

The Graneros subsurface structure map shows the three-dimensional unfaulted structure of the upper bounding surface of the Dakota Aquifer System at or adjacent to the composite maximum flooding surface of the Greenhorn Cyclothem. The Graneros structure surface was interpreted from 106 wells across 13 counties in north-central Kansas (Clay, Cloud, Ellsworth, Lincoln, Jewell, McPherson, Mitchell, Ottawa, Republic, Rice, Russell, Saline, and Washington). A larger-scale map of Lincoln, Ellsworth, Rice, and Russell counties is provided as they contain a much higher density of well log records, thus providing higher confidence in the generated surface. The Graneros top surface marks the abrupt transition from argillaceous mudstone deposits of Graneros Shale to carbonate-dominated deposits of the Greenhorn Limestone. Picks are based on total gamma ray concentrations and log stacking patterns calibrated to core and outcrop control at seven localities in the mapping area. This interpretation shows a gradual N20°E deepening trend across the mapping area with the shallowest structures occurring in Rice County near the southwest border of the mapped area.

Methods

Digitized well logs from the KGS oil and gas database were imported into Schlumberger Petrel software. Additional logs were collected from the KGS DRL and Robert F. Walters Digital Geological Library for areas lacking coverage. Neuralog was used to convert raster paper well logs to digital files before being imported into Petrel. The well tops were then edited and finalized within Petrel. Designated well tops were used to generate a surface within Petrel using the convergent interpolation algorithm. The surface was then exported as a map and imported into Global Mapper Software and was converted into a tiff file. The tiff file was then imported into ESRI ArcGIS Pro Software package, where layers including ancillary and reference information were added to the final map product.

About

This geologic map was funded in part by the USGS National Cooperative Geologic Mapping Program, STATEMAP award number G24AS00043 (FY2024).

This map was produced using the ArcGIS system developed by Esri (Environmental Systems Research Institute, Inc.) and SLB Petrel.

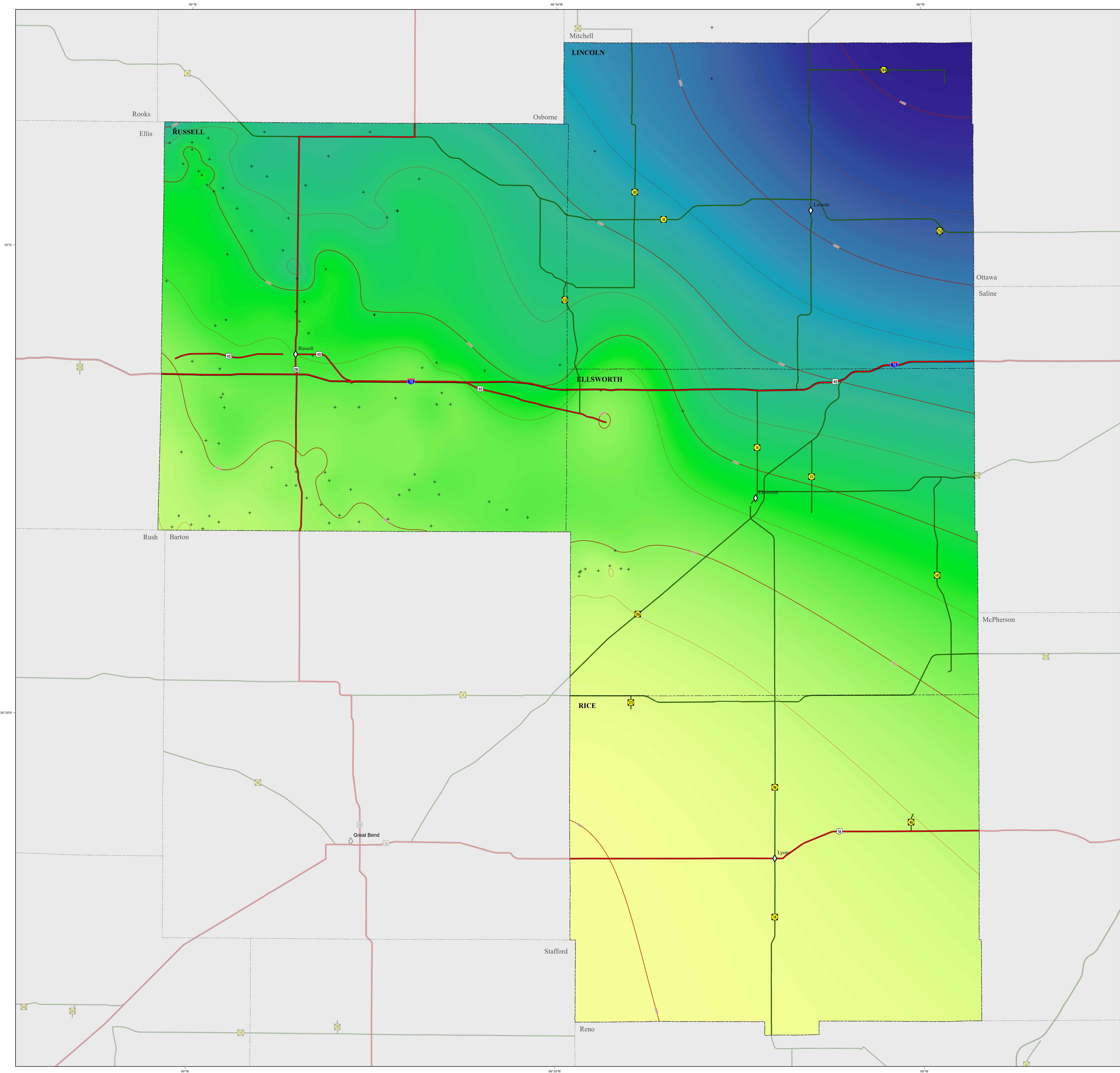
This map is a preliminary product and has had less scientific and cartographic review than other KGS map products. The KGS does not guarantee this map to be free from errors or inaccuracies and disclaims any responsibility or liability for interpretations made from the map or decisions based thereon.

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SUGGESTED REFERENCE TO THE MAP

Andrzejewski, K. A., Kalbas, J. L., and Andrzejewski, K. D., 2025, Preliminary structure map of the Cretaceous Graneros Shale in north-central Kansas: Kansas Geological Survey, Open-File Report 2025-41, scale 1:170,000, unpublished.

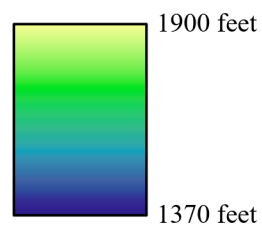


Well (n=106)

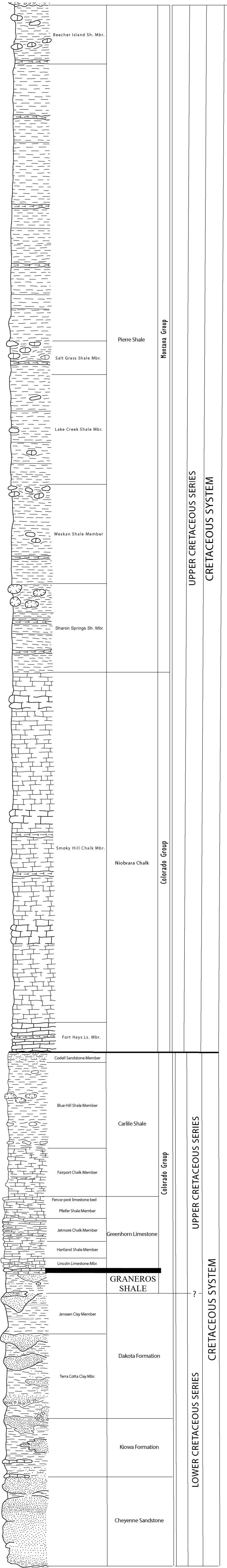


SCALE 1:170,000
LAMBERT CONFORMAL CONIC PROJECTION
WITH STANDARD PARALLELS AT 33 AND 45 N
CENTRAL MERIDIAN 100 30' W
NORTH AMERICAN DATUM OF 1983

Contour Interval = 50ft
Depths at MSL (Mean Sea Level)



- City
- Interstate
- U.S. highway
- State highway
- Contour



EXPLANATION

- Shale or claystone
- Limestone
- Sandstone or sand
- Green-bedded sandstone or siltstone
- Reefstone
- Shaly limestone
- Sand and gravel, conglomerate, or "venter beds"
- Shale with concretions
- Uncertainty

M E S O Z O I C E R A