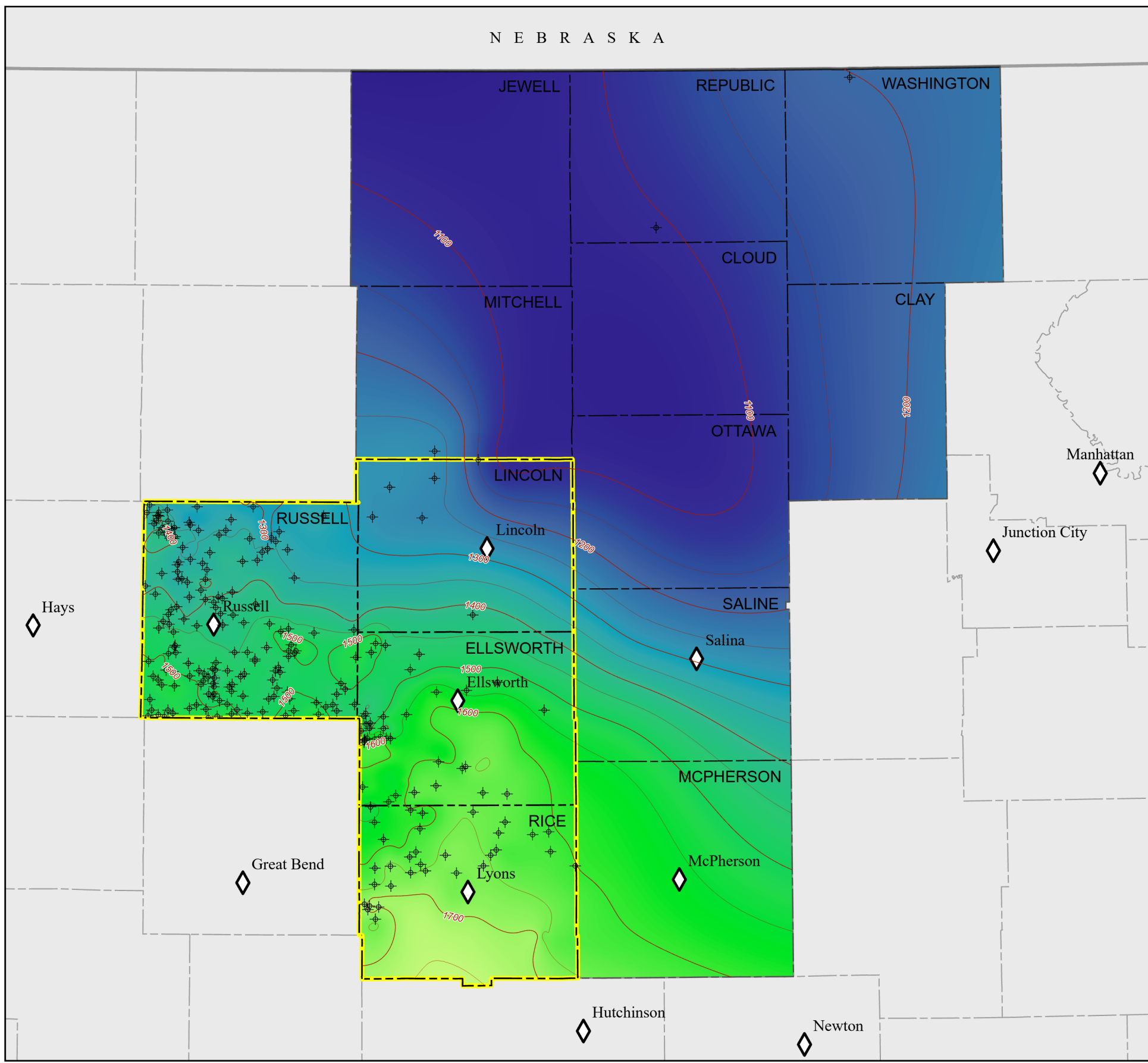
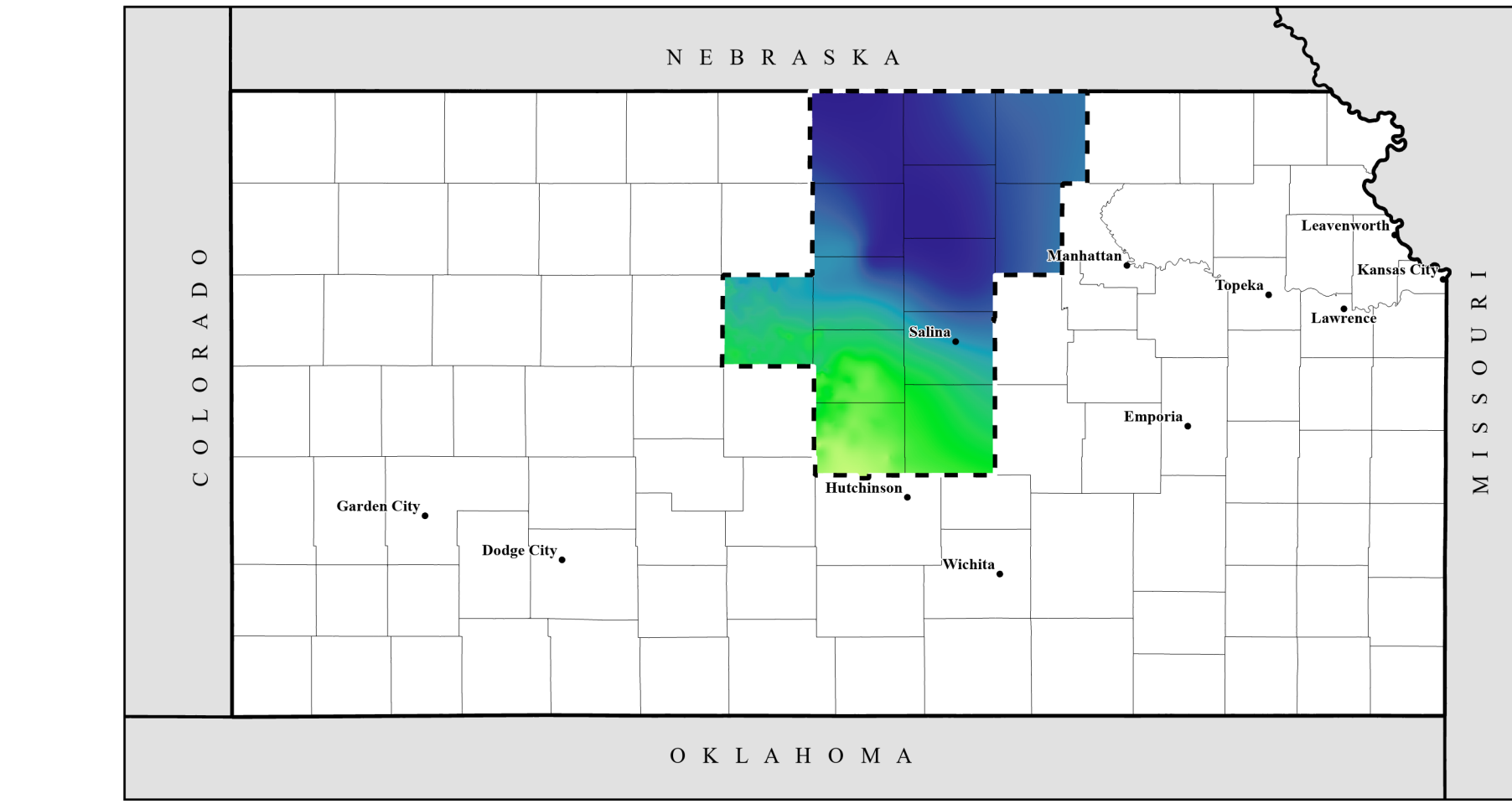


PRELIMINARY STRUCTURE MAP OF THE CRETACEOUS KIOWA FORMATION IN NORTH-CENTRAL KANSAS

Kate A. Andrzejewski, Jay L. Kalbas, and Kolbe D. Andrzejewski  
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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 Kiowa Formation structure map depicts the subsurface three-dimensional unfolded structure of the top bounding surface of the Kiowa Formation and the unconformable basal bounding surface of the Dakota Formation in north-central Kansas across 13 counties (Cherokee, 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. Core and outcrop data demonstrate the surface is a composite unconformity representing the transition from shoreface and deltaic environments of deposition to fluvial-coastal plain depositional systems as part of a regressive system tract. This interpretation shows complexity in the top bounding surface of the Kiowa Formation likely due to the erosional nature of the contact with the overlying Dakota Formation. Broadly, the interpretation shows a gradual NNE deepening trend across the mapping area with the shallowest structures occurring in Rice County near the south-central 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 DRI and Robert F. Walters Digital Geological Library for areas lacking coverage. Netlog 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. The surface was generated using designated well tops in conjunction with interpolating overlying and underlying unit thickness using the isochore interpolation algorithm within Petrel. The surface was then exported as a zmap 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 SLD 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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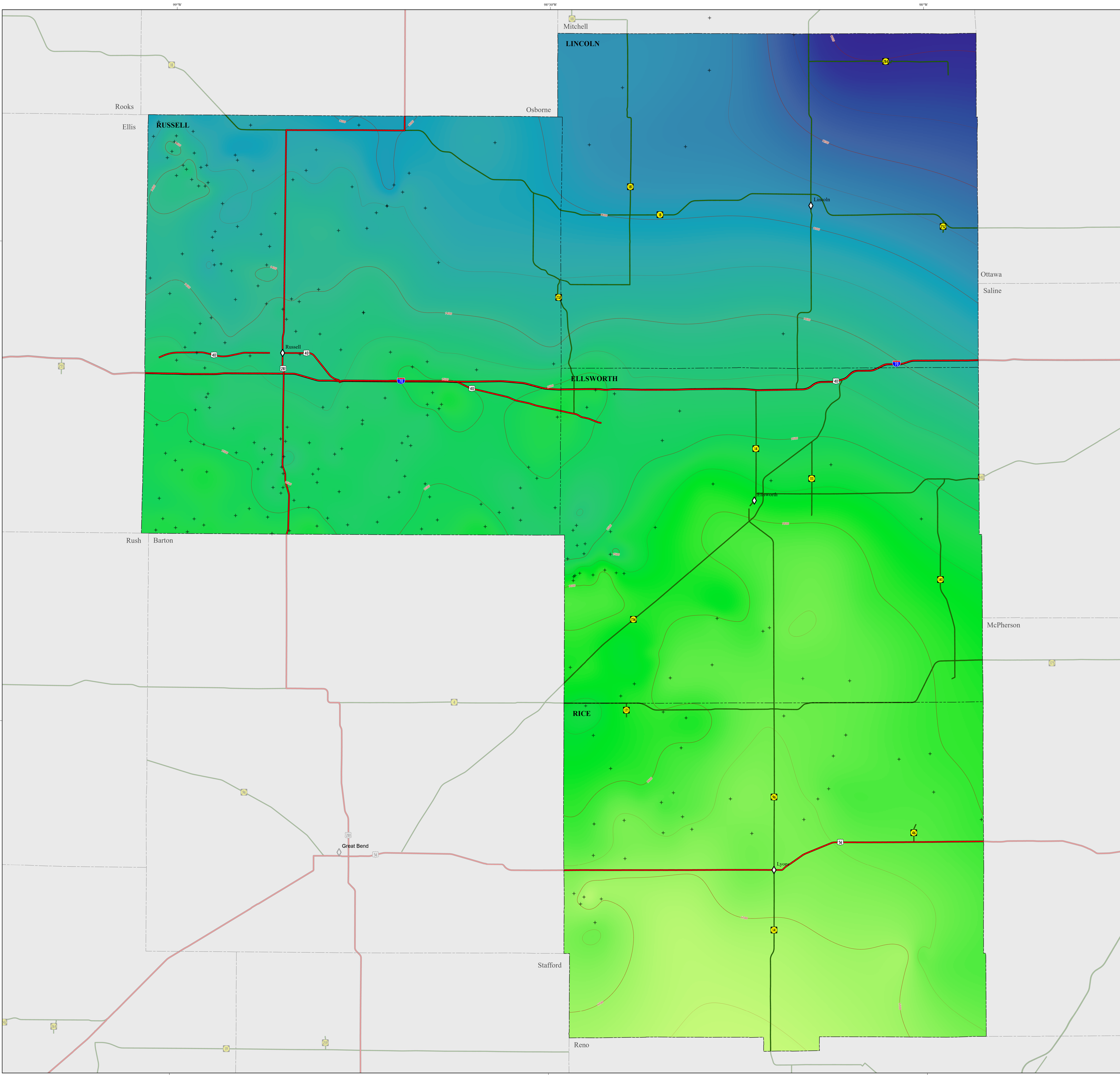
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SUGGESTED REFERENCE TO THE MAP

Andrzejewski, K. A., Kalbas, J. L., and Andrzejewski, K. D., 2025, Preliminary structure map of the Cretaceous Kiowa Formation in north-central Kansas: Kansas Geological Survey, Open-File Report 2025-42, scale 1:170,000, unpublished.

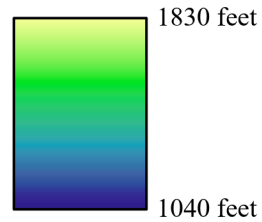


Well (n=243)

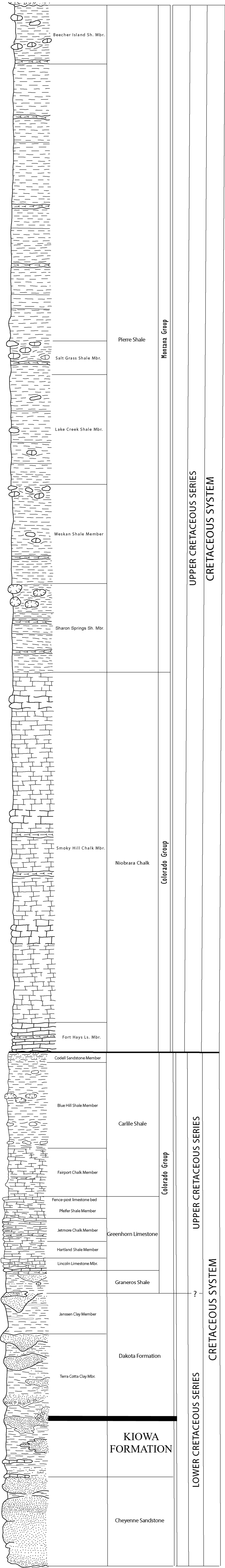


SCALE 1:170,000  
LAMBERT CONFORMAL CONIC PROJECTION  
WITH STANDARD PARALLELS AT 33 AND 45 N  
CENTRAL MERIDIAN 100 30' W  
NORTH AMERICAN DATUM OF 1983

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  
Gravelly sandstone or siltstone  
Unconformity  
Beaumont  
Shaly limestone  
Sand and gravel, conglomerate, or "river beds"  
Shale with concretions

M E S O Z O I C E R A

