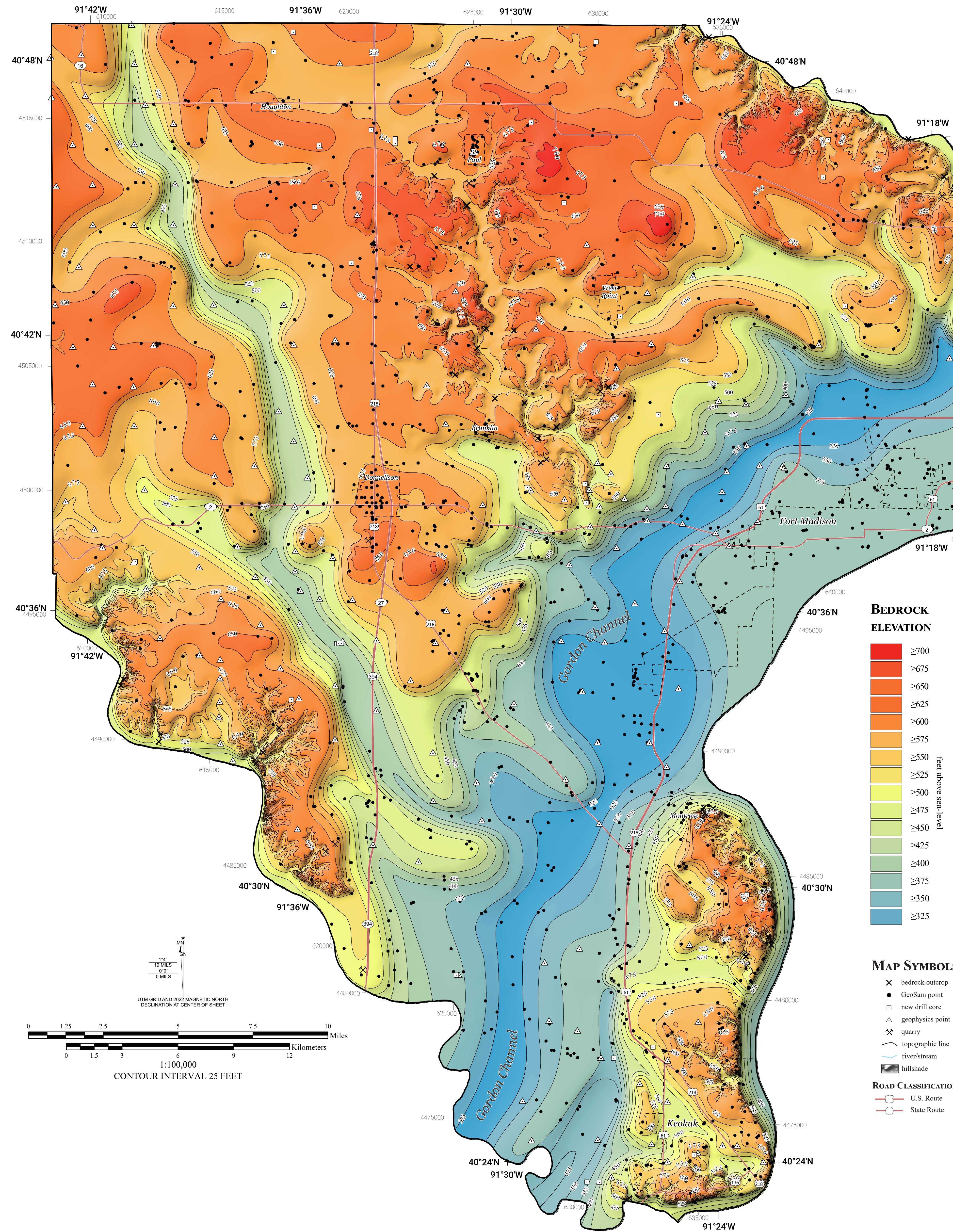


# BEDROCK ELEVATION AND QUATERNARY THICKNESS MAPS OF LEE COUNTY, IOWA

Ryan Clark and Phil Kerr  
Iowa Geological Survey, IIHR-Hydroscience & Engineering, University of Iowa, Iowa City, Iowa

## BEDROCK ELEVATION



### INTRODUCTION

The Bedrock Elevation and Quaternary Thickness Maps of Lee County, Iowa, were produced in conjunction with the surficial and bedrock geologic maps. The bedrock surface within the county, like much of Iowa, is mostly concealed by glacial deposits. The boundary between Paleozoic bedrock and unconsolidated Quaternary materials is likely just as irregular as the land surface itself. Therefore, the thickness of Quaternary deposits varies widely across the county, generally ranging from 0 to 23 m (0–75 ft) and reaching a thickness of up to 122 m (400 ft) in the Gordon Channel in the eastern part of the mapping area. Bedrock exposures typically occur along the Mississippi, Des Moines, and Skunk rivers as well as the Sugar Creek valley in the central part of the county.

Bedrock topographic lines were drawn based on borehole records, geophysical survey data, and occurrences of bedrock exposures evaluated for the Bedrock Geologic Map of Lee County, Iowa (OFM-22-1). Where the bedrock surface is exposed or lies within a few feet of the land surface, the bedrock topography essentially mimics the land surface topography. Bedrock topographic detail is muted where bedrock is deeper and borehole data is scarce, such as within the Gordon Channel in the eastern part of the map. The thickness of Quaternary materials was generated by subtracting the elevation of the bedrock surface from the land surface elevation. The Surficial Geologic Map of Lee County, Iowa (OFM-22-2) provides further information regarding the nature and extent of Quaternary deposits within the mapping area.

### METHODOLOGY

The Bedrock Elevation and Quaternary Thickness Maps of Lee County, Iowa were constructed using the same datasets as the surficial and bedrock geologic maps. Geologic information utilized included drilling records housed in the Iowa Geological Survey (IGS) GeoSam database, existing maps and technical reports, Iowa Department of Transportation data, and reports from engineering projects and quarry operators. Field reconnaissance of 44 bedrock outcrops, six abandoned quarries, and five active quarries was completed, as well as the collection of 176 passive seismic data points.

More than 1,600 boring records from the IGS GeoSam database, including both driller's logs and lithologic descriptions of well cutting samples (strip logs), were evaluated. Each record was checked for locational accuracy using information from the driller's logs, historic plat books, county assessor information, and direct communication with landowners. The depth to the surficial-bedrock contact was determined for each well and assigned an elevation value by subtracting it from the surface digital elevation model (DEM). These data points provided the framework for the Bedrock Elevation Map of Lee County, Iowa. Additional information was gained from an assessment of the Natural Resources Conservation Service county soil survey by identifying soil series that indicate shallow bedrock.

Bedrock elevation contours were digitized manually on screen using ArcGIS software at a 25-foot contour interval. The bedrock elevation raster was generated using interpolations of the bedrock surface created with the "Topo to Raster" and "Empirical Bayesian Kriging" tools in ArcMap 10.8 or ArcGIS Pro 2.8. The Quaternary Thickness Map of Lee County, Iowa was created by subtracting the bedrock elevation raster values from the surficial DEM raster. The resulting surface was rounded to the nearest integer and contours were generated from this result and then smoothed.

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## QUATERNARY THICKNESS

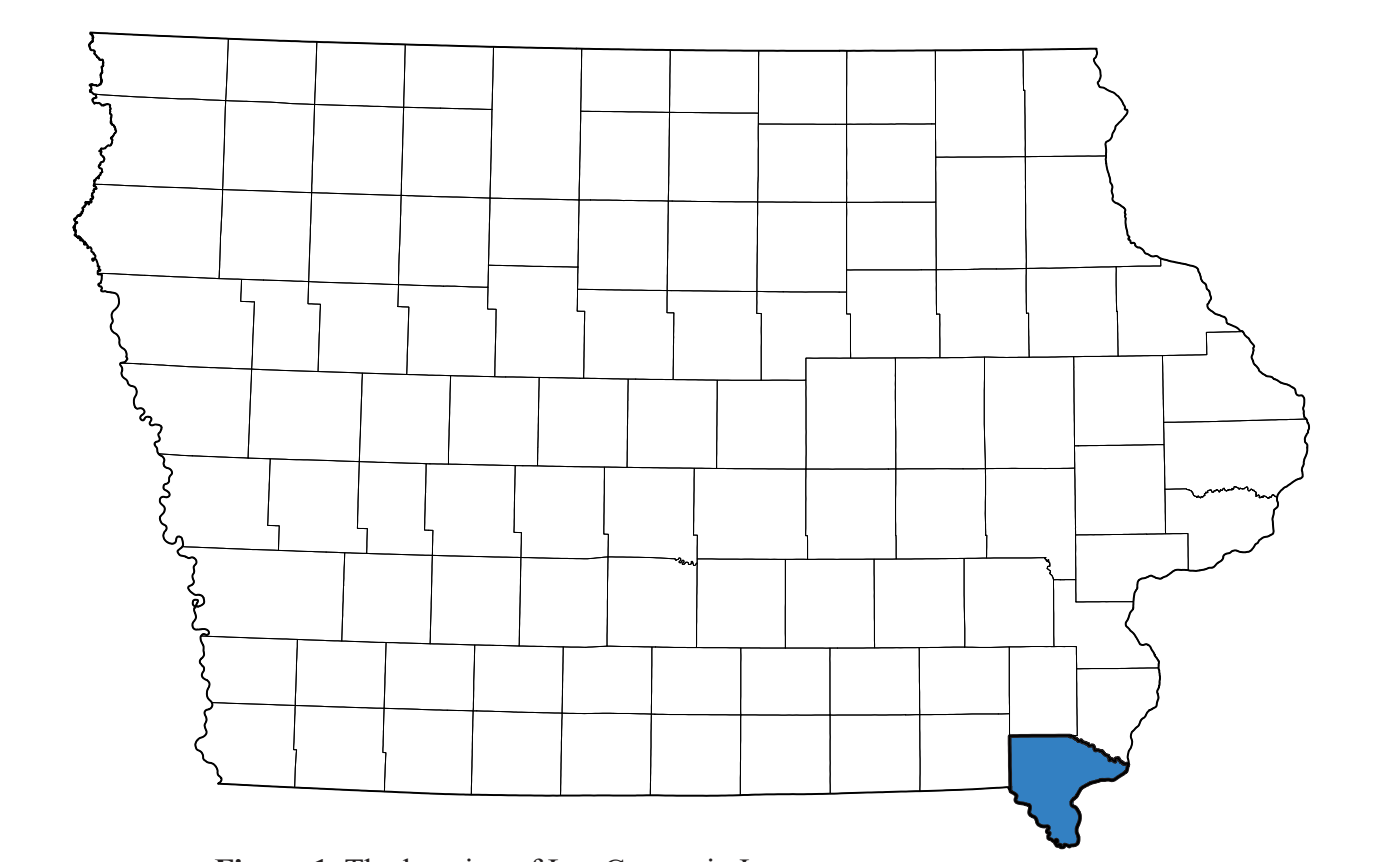
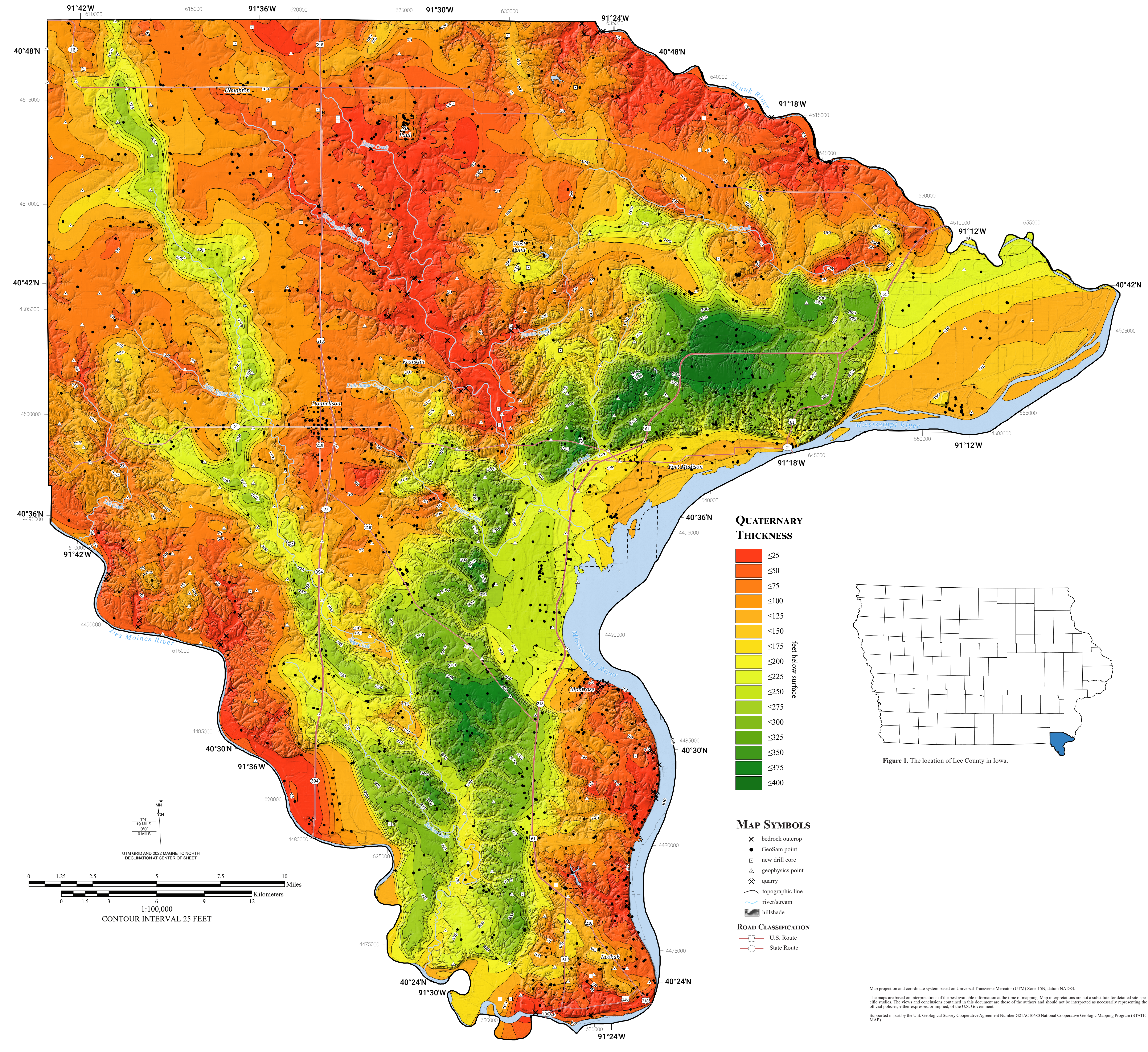


Figure 1. The location of Lee County in Iowa.

Map projection and coordinate system based on Universal Transverse Mercator (UTM), Zone 15N, datum NAD83. The maps are based on interpretations of the best available information at the time of mapping. Map interpretations are not a substitute for detailed site-specific studies. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the U.S. Government. Supported in part by the U.S. Geological Survey Cooperative Agreement Number G14C0006 National Cooperative Geologic Mapping Program (STATI-MAP).