

Surficial Geologic Map of the Benson 7.5 Minute Quadrangle in Woodford County, IL

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Abstract

The Benson 7.5 Minute Quadrangle (Scale 1:24,000) is located in Woodford County, Illinois. Methods used in generating this surficial geologic map were analysis and conversion of soil data, analysis of LiDAR data and interpretation of well water logs. Formations were interpreted and mapped based on lithological and thickness descriptions of well data from the Woodford County Soil Survey. The surficial geology of the Quadrangle is comprised of Quaternary glacial sediment units that were deposited during the Wisconsin episode. Quaternary units include the Wedron Group, the Henry Formation, the Peoria Silt, and the Cahokia Alluvium. Units present with less than five feet in thickness were not considered as mappable. The Wedron Group makes up the majority of the surficial geology of the Quadrangle. The Wedron Group contains the Lemont Formation, a grey, silty clay diamicton, which has been deposited on a ground moraine. The Peoria Silt is a yellow-brown sandy silt interpreted as loess. The Henry Formation, a sand and gravel unit of the Mason Group, can be found where outwash deposits are thick enough to map. The Cahokia Alluvium contains poorly sorted sand, silt and clay sized grains and can be found in abundance along the Panther Creek, a modern stream system which flows through the Quadrangle.

Introduction

The Benson 7.5 Minute Quadrangle is located in Woodford County, Central Illinois. The landscape in this area was sculpted by the most recent glacial advancement nearly 25,000 years ago. The Wisconsin glaciation caused mass transport and burial of previous earth materials. As the Wisconsin ice sheets retreated, large accumulations of glacial debris were left behind to form moraines. (<https://www.isgs.illinois.edu/outreach/geology-resources/glaciers-smooth-surface>).

Methodology

Soils data was provided by the Woodford County Soil Survey to be converted into formations based on the parent material. Topographic maps were used to digitize and define the boundaries in greater detail. Water well data from the Illinois State Geological Survey (ISGS) was used to confirm geologic interpretations. The glacial episode maps clarified the boundaries of the formations and members of the Wisconsin and Illinois glaciations.

Results/Discussion

The surficial geology of the Benson 7.5 Minute Quadrangle consists of the Cahokia Alluvium, Henry Formation, and Lemont Formation. All of these units are Quaternary in age. The Peoria Silt, a loess deposit consisting of yellowish brown and grey silt, is present in northern areas of the Quadrangle but, it was interpreted as being unmappable due to its lack of thickness and erratic presence. Cahokia is a modern alluvium stream deposit, found at low elevations, consisting of a mixture of bedded silts, clays and gravel. The Henry Formation, a coarse sand and gravel deposit, may be exposed as terraces near the Cahokia Alluvium. The Lemont Formation dominates the rest of the Quadrangle. In areas of Illinois, the Lemont Formation can be divided into the Haegar, Yorkville, and Batestown Members. However, it was unable to be differentiated by looking at well data and is therefore represented as an undivided unit.

References

- Francen, Rick T., 1999, Soil Survey of Woodford County, Illinois, Natural Resources Conservation Service, 593 p.
 Hansel, A.K. and Johnson, W.H., 1996, WEDRON AND MASON GROUPS: Lithostratigraphic Reclassification of Deposits of the Wisconsin Episode, Lake Michigan Lobe Area: Illinois, Illinois Department of Natural Resources, 4, 25-57 p.



Figure 4: Image of East Panther Creek along Illinois Route 251. <http://www.ahuengineers.com/portfolio/TransportationPantherCreek.aspx>

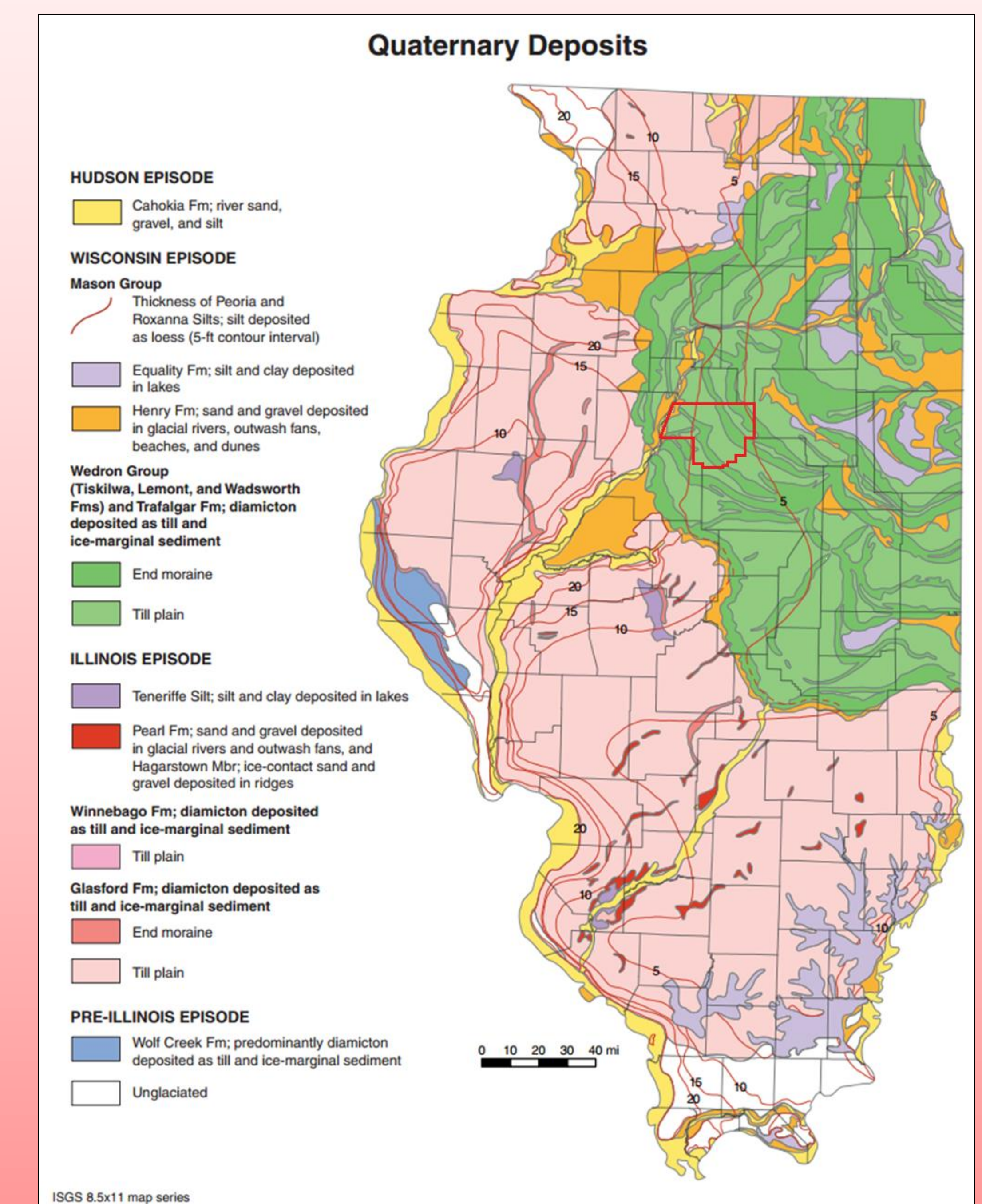
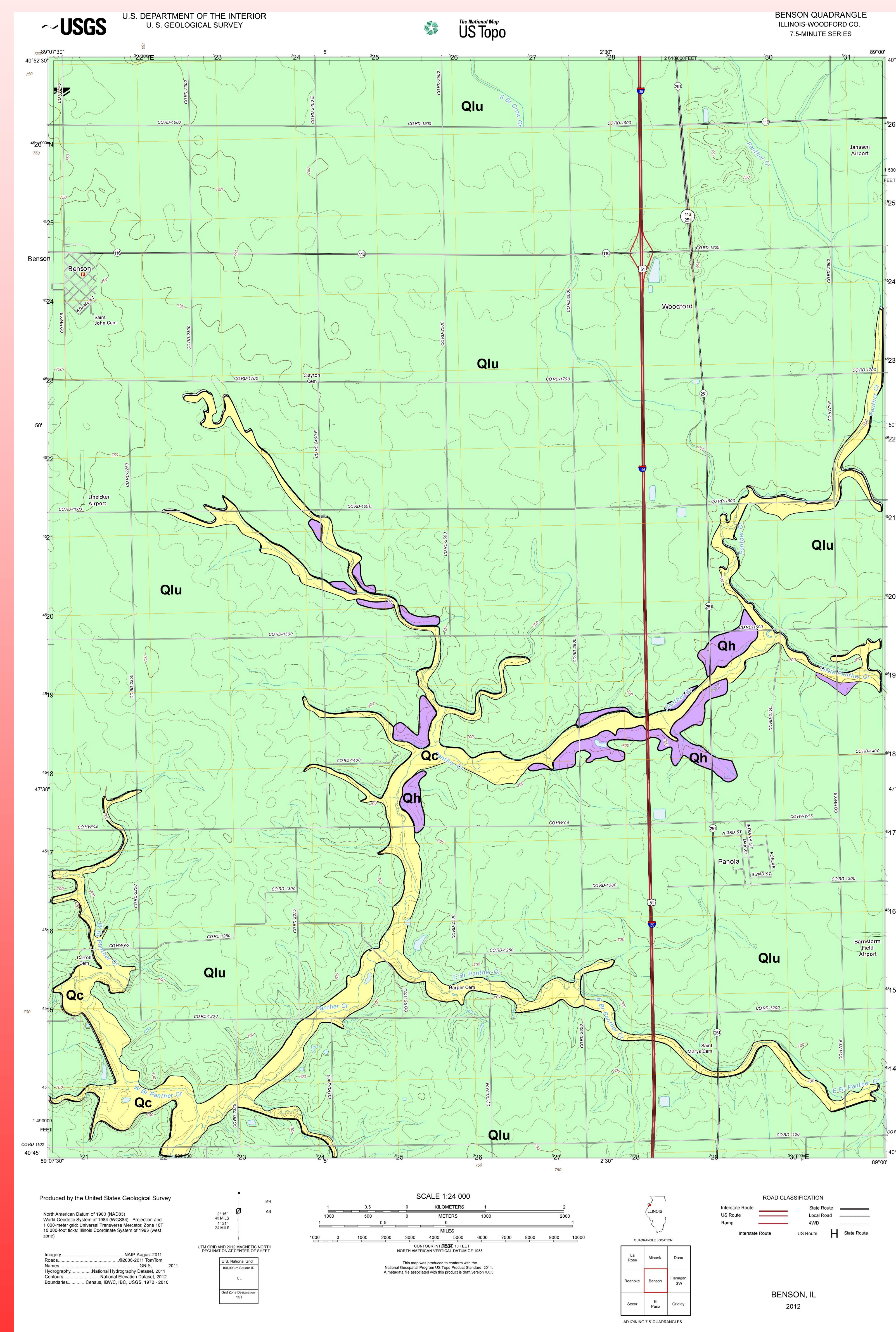
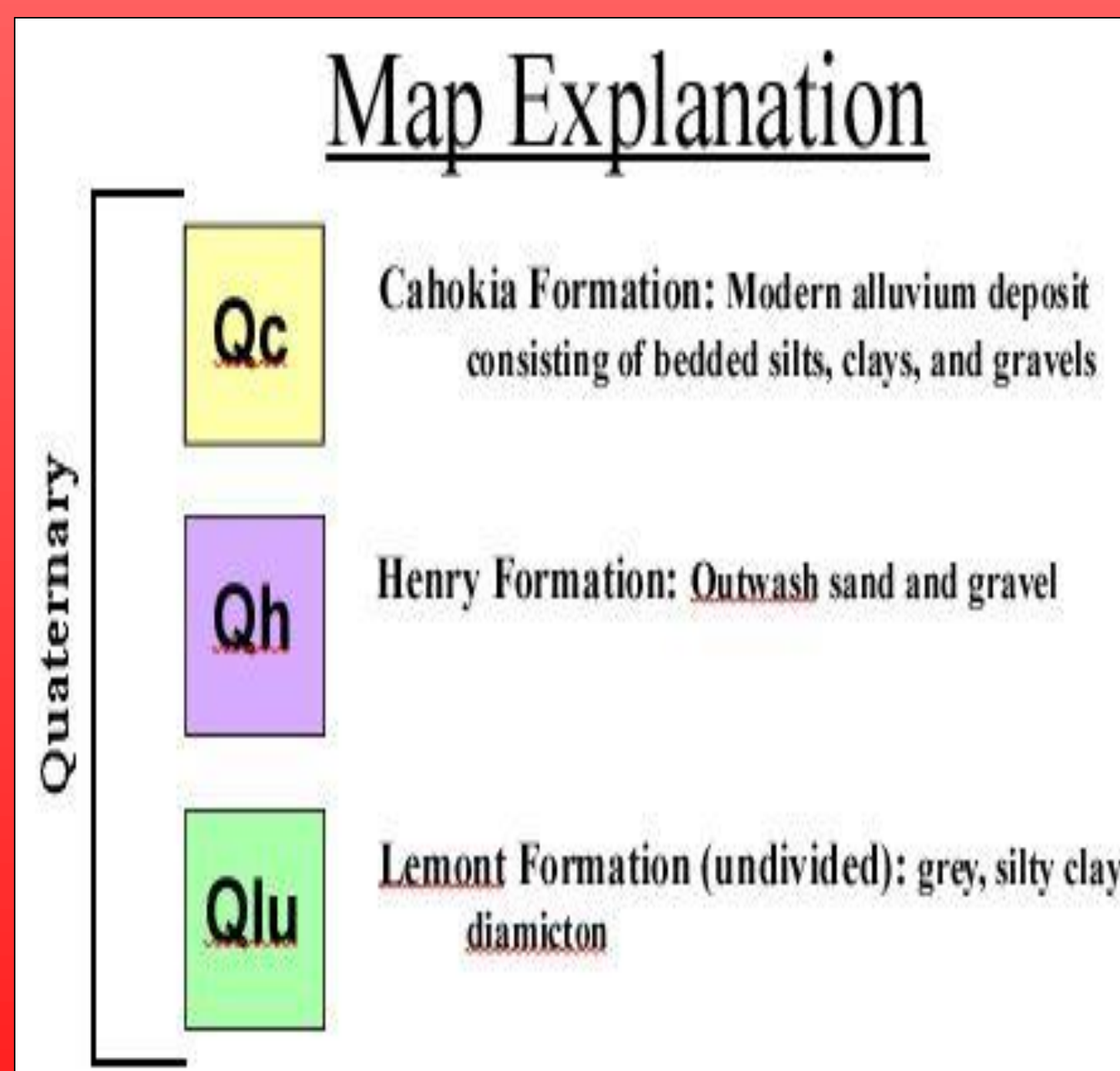


Figure 1: Quaternary Deposits of Illinois. Woodford County outlined in red. <https://www.isgs.illinois.edu/sites/isgs/files/maps/statewide/quaternary-deposits-8x11.pdf>

Water Well Data

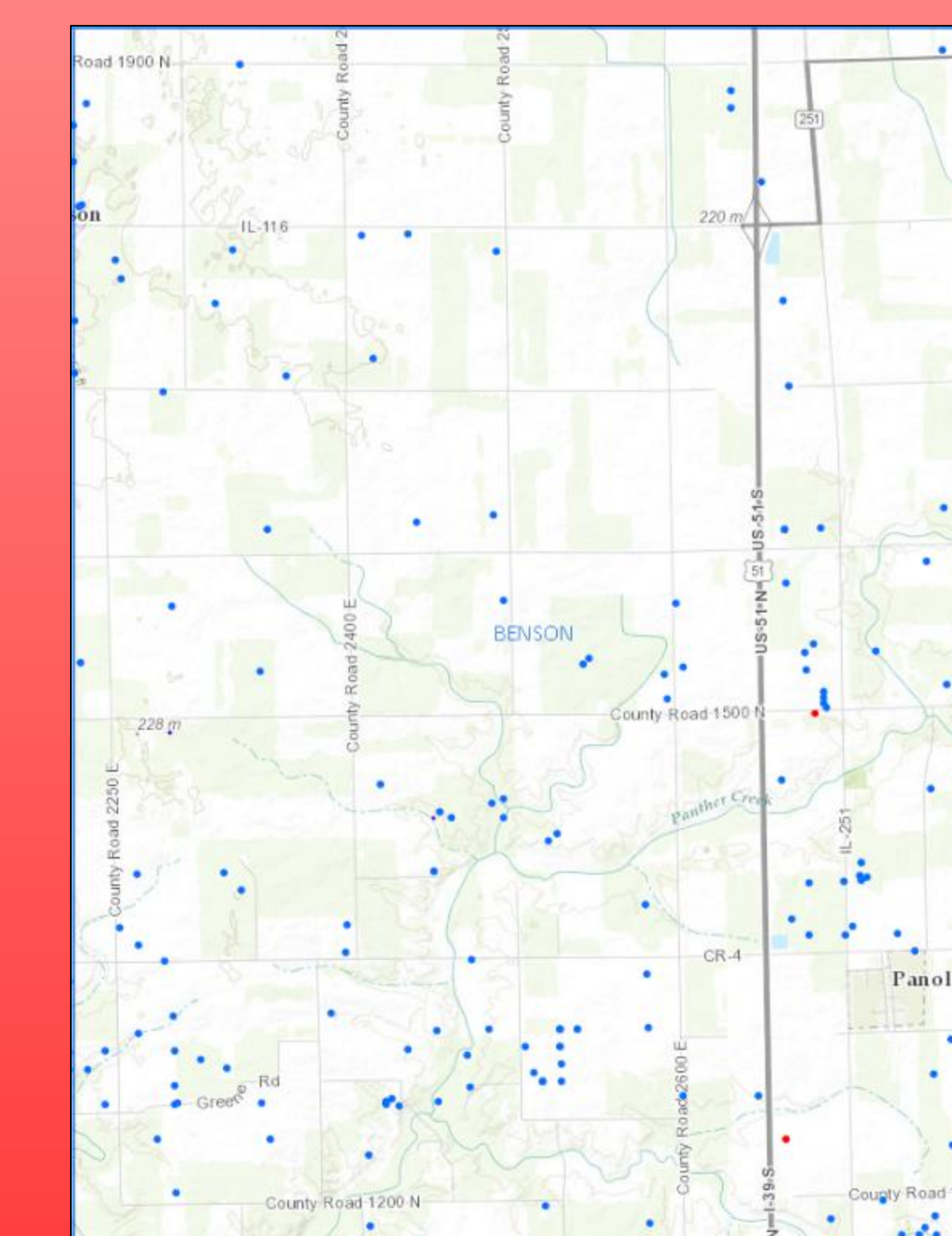


Figure 2: Location of water wells in Benson Quadrangle represented by blue dots

Elevation Data

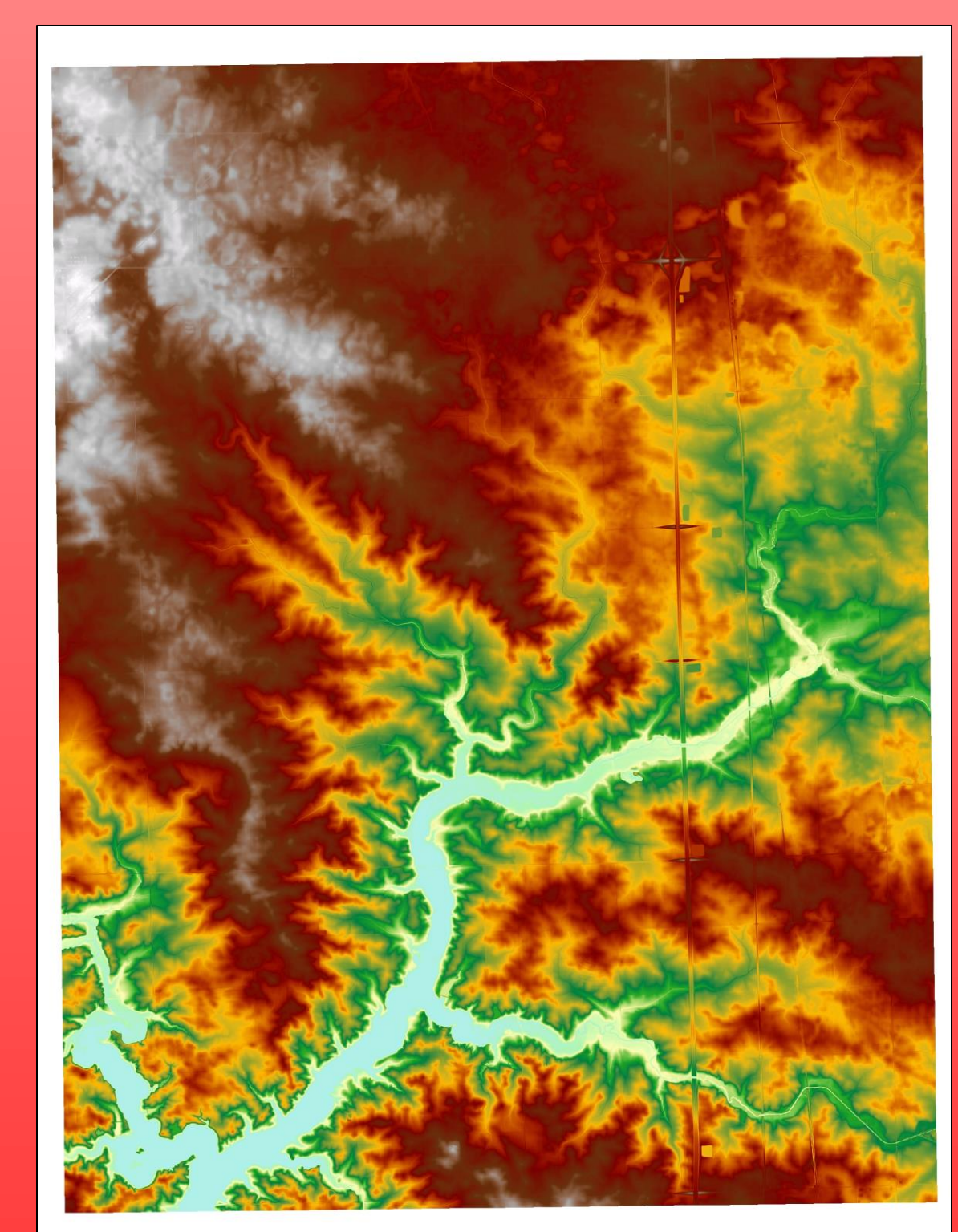


Figure 3: Elevation data of Benson Quadrangle. Red is highest elevation; Green is lowest elevation

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