

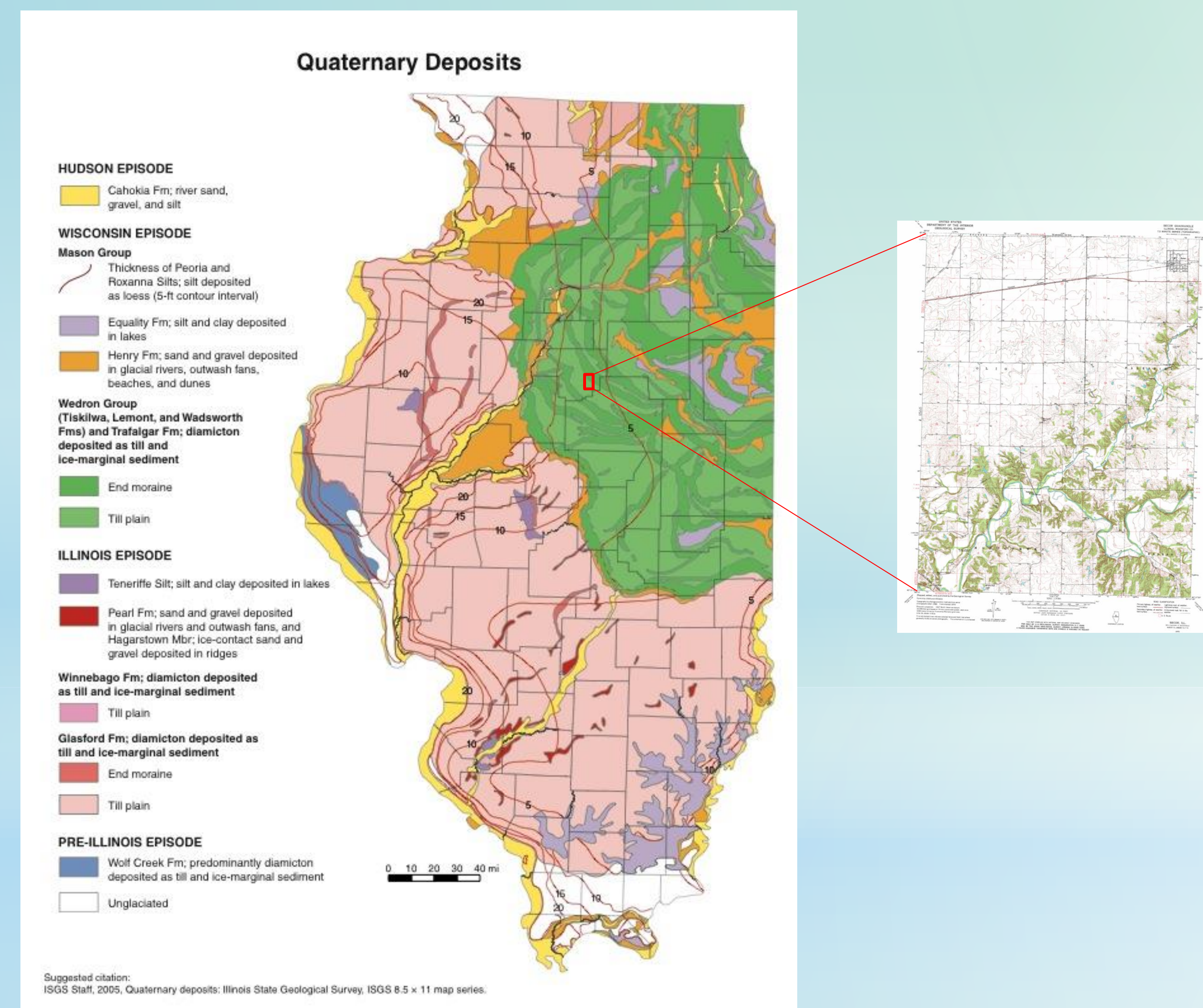


Surficial Geologic Map of the Secor 7.5 Minute Quadrangle, Woodford County, Illinois

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Abstract:

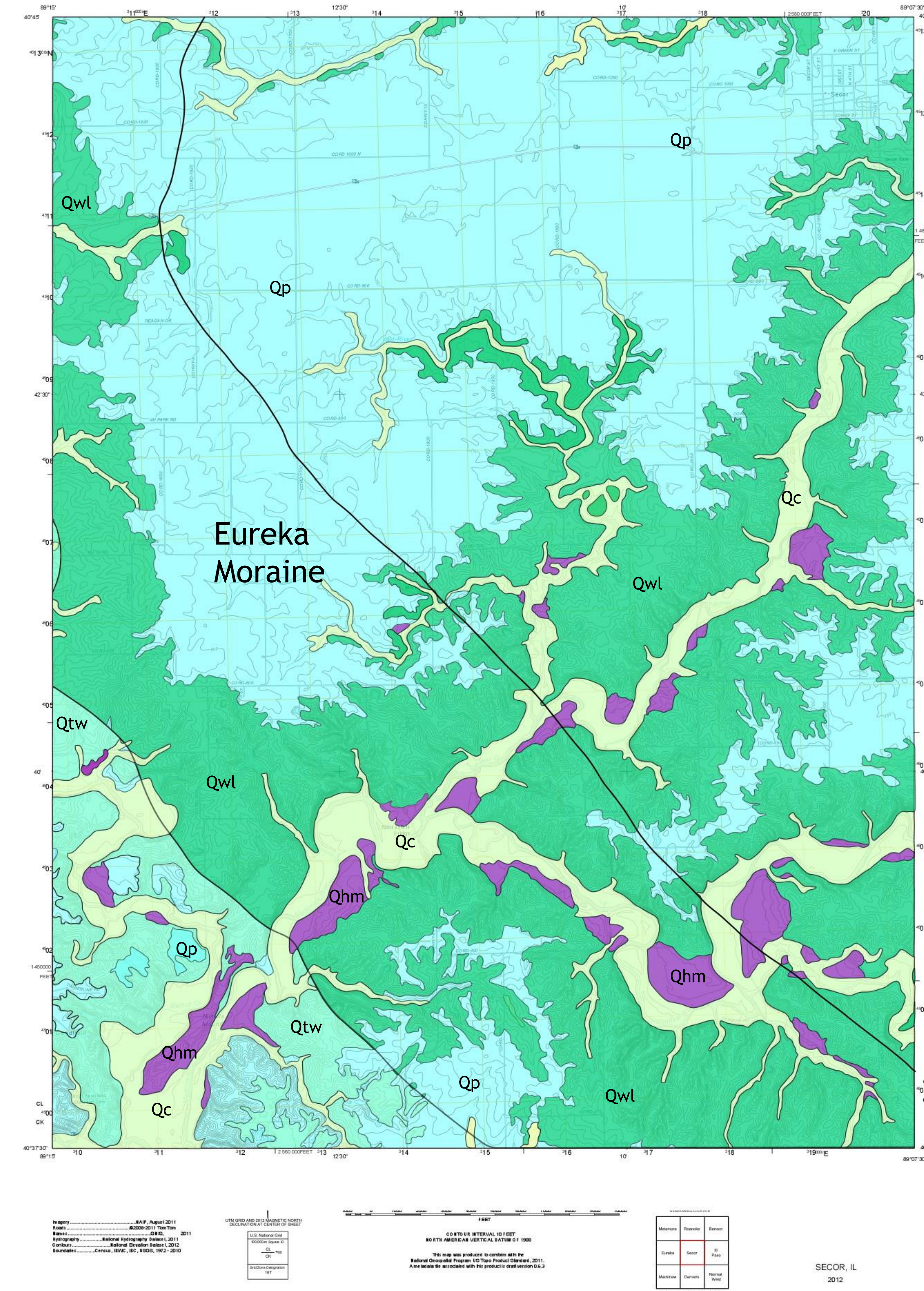
The surficial geologic map of Secor, Illinois was created on Canvas15 using various geologic data. The information gathered for the formation of the surficial geologic map came from the I.S.G.S., the U.S.G.S., and Woodford County Soil Survey. The quadrangle spans from 40° 37' 30" to 40° 45' north latitude and 89° 15' to 89° 07' 30" east longitude and is part of Woodford County, Illinois. The Makinaw River, Denman Creek, Panther Creek, and Walnut Creek all flow through the Southern part of the quadrangle, while the Red River flows through the northern and southern parts. The Eureka Moraine spans through NW corner to the SE corner of the map. South of the Eureka Moraine border is the Tiskilwa Formation, which is predominantly till. The Lemont and Peoria Formations make up the northern section of the quadrangle above the Eureka Moraine. The Lemont Formation is comprised of a till deposit and the Peoria Formation is mainly loess, which is only mapped if it is greater than 60" in thickness. In order to differentiate between the Lemont and Tiskilwa Formations, data from the Surficial Deposits of Illinois was used. The Cahokia Formation is observed along the creeks, and the lesser Henry Formation fills in the terraces. Outwash found in stream terraces is characteristic of the Henry Formation; while the Cahokia Formation is a loamy and silty alluvium found in floodplains.



Map 1: Quaternary Deposits of Illinois. Secor Quadrangle is highlighted in red, and a topographic map of Secor Quadrangle is shown to the right of this map

Introduction:

The distinct geology of the Secor Quadrangle located in Woodford County, Illinois was created by the Wisconsinian glaciation, which occurred approximately from 300,000 to 125,000 years ago. The Quaternary glaciers moved from the northern part of the Arctic and traversed southward making it almost all the way to the southwestern border of Illinois before they melted completely. The glacial and melt water deposits formed and shaped the present day landscape of Illinois. The glaciers covered most of Illinois causing the deposits to cover the bedrock creating the flat lands that are seen in Illinois today. The main deposits of the glaciers were gravels, sands, and clays. These deposits may be up to 500 feet thick (Killey and Berggren, 2000). The 7.5 minute Secor Quadrangle is comprised for five different formations: Henry, Tiskilwa, Lemont, Peoria, and Cahokia Formations. The Tiskilwa is only seen below the Eureka Moraine, which spans from the northwest to southeast corners of the map, and the Lemont is observed within and above the Eureka Moraine. The Cahokia Formation is a Quaternary alluvium deposit, which is observed along the rivers and creeks in the area. The Henry Formation fills in the terraces and is characterized by a thick sand and gravel deposit (McKay, Berg, Stump, and Weibel, 2010). The Lemont and Tiskilwa Formations are till deposits, while the Peoria Formation is loess. The present day rivers and streams along with the Quaternary glaciers that once covered this area are the major contributors to the surficial geology of the Secor Quadrangle.



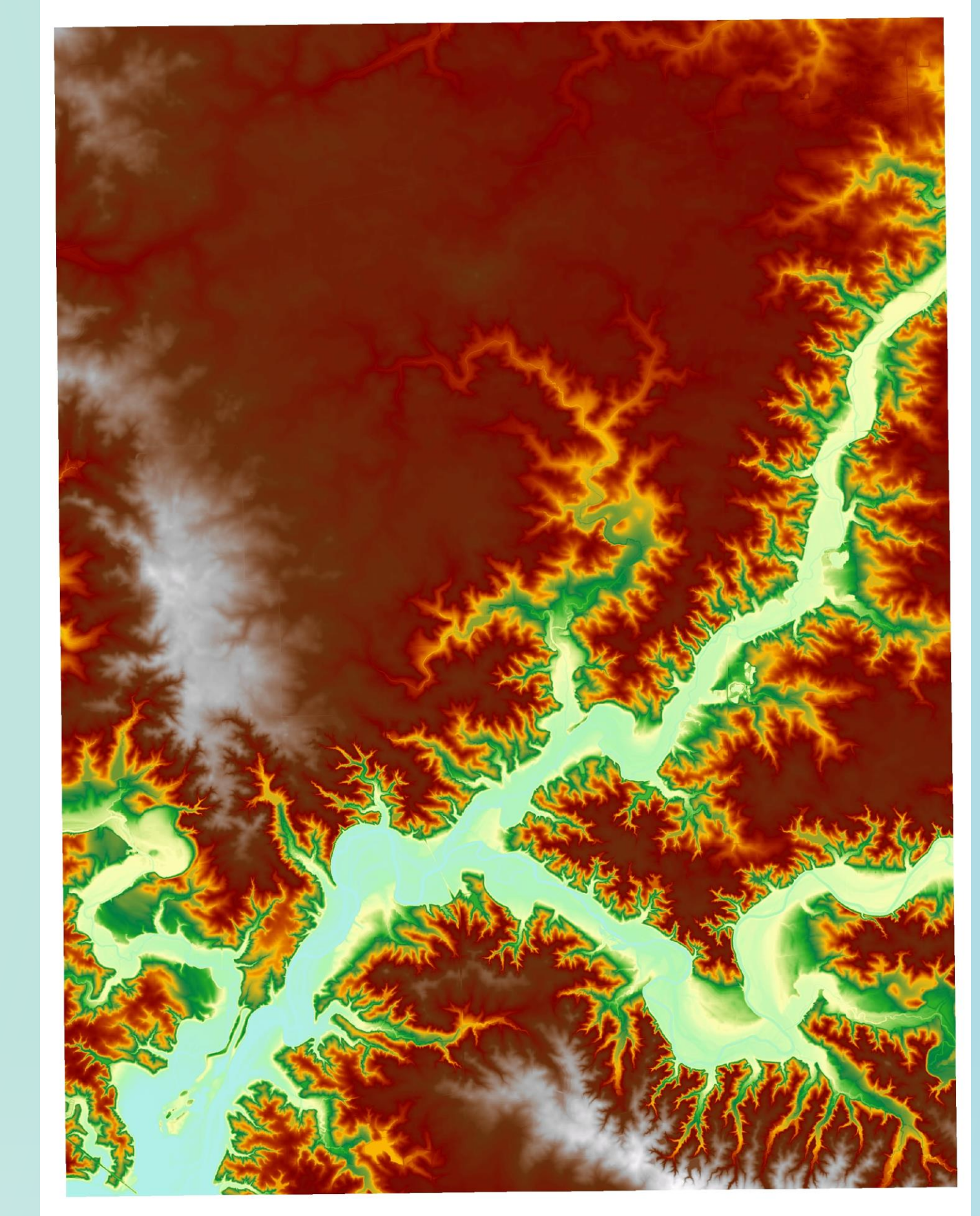
Map 2: The surficial geologic map of the Secor Quadrangle in Woodford County, Illinois.

Surficial Geologic Map of the Secor 7.5 Minute Quadrangle, Woodford County, Illinois

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Key

Description	Unit	Interpretation
Silt and silty clay unbedded with fine sand, and locally gravel and redeposited bedrock clasts. Brownish soil to moderately stiff gray. Calcareous or non-calcareous and typically overlies Henry Formation or interfingers with Cahokia floodplain facies. 5-30 feet thick.	Cahokia Formation Qc	Alluvial fan deposits of post-glacial redeposited loess and fill in fans where streams and ravines emerge from uplands onto low-slope valley floors, subject to flooding.
Stratified sand and gravel with cobbles and boulders. Yellowish brown to grayish brown, calcareous. Usually clean and moderately well sorted. Unconformably overlies older sand and gravel deposits, glacial diamictions, or bedrock. 10-20 feet thick in the tributary valleys and 10-80 feet thick in Illinois River Valley.	Henry Formation (Mackinaw Facies) Qm	Fluvial (riverine) and ice-marginal outwash deposits in Illinois River Valley terraces, former bars, and channels and locally in terraces along tributaries to Illinois River. It was deposited proglacially by meltwater from distant glaciers, not consistently. Differentiable from sand and gravel of underlying Peoria Formation or Sankaty Sand Member where intervening tills are absent.
Generally light yellow tan to gray silty to sandy silt. Eolian deposits that contain beds of well sorted sand, fossil small shells, organic woody debris, and rarely clay layers.	Henry Formation (Peoria Silt) Qp	The Peoria Silt is predominantly pre-glacial loess that was derived from glacial meltwater channels. It contains some eolian sands and locally contains colluviated and sheet wash silt.
Unstratified pebbly silty clay loam diamiction. Olive (oxidized) to grayish-brown (unoxidized). Firm to hard, compact, calcareous, massive to jointed sand, gravel, silt and clay with some cobbles and few boulders. It is overlain in places by wind-blown silt (loess) of the Peoria Silt. Unconformably overlies Dry Creek tongue and Tiskilwa Formation or older units. 5-35 feet thick.	Lemont Formation Ql	Till and associated sediment derived from glacial ice. Encountered in the subsurface only, underlying till of the Bateson Member.
Loam to clay loam diamiction. Gray to pinkish gray that oxidizes to red-brown, brown, or yellow-brown. Locally contains thick beds of silt, sand, and gravel. Lowest diamiction of the Wadron Group.	Tiskilwa Formation Qw	Till and debris flow deposits.
	Contact	
	Eureka Moraine Boundary	



Map 3: Surface elevation map using LiDAR of the 7.5 Minute Secor Quadrangle.

Results and Discussion:

After analyzing and interpreting soils data and LiDAR data, a final surficial geologic map of the Secor 7.5 Minute Quadrangle was created on top of a topographic map of Secor (Map 3). The surficial geology of this area is entirely Quaternary in age. As shown on the map, there are five formations that cover this area. The Lemont and Tiskilwa Formations are the two till deposits that cover this area and are Wisconsinian in age. The Peoria silt is a loess deposit, the Mackinaw facies is an outwash deposit that covers the terraces, and the Cahokia Formation is an alluvium deposit. By comparing the geologic map to the LiDAR data, some comparisons can be made. The alluvium deposits follow the streams, and they occur in the light blueish-green and bright orange colors on the LiDAR map (Map 3). The loess and till deposits occur where Map 3 is dark reddish-brown. This is the first detailed surficial geologic map of the Secor Quadrangle. Future studies that could be done would include field mapping of the area. This would allow for more precise contacts between the formations and would provide and even more detailed map of the area.

References:

Francen, R.T., 1999, Soil of Woodford County, Illinois: United States Department of Agriculture and Natural Resources Conservation Service.
 Killey, Myrna M. and Berggren, Dwain J., 2000, Quaternary Glaciations in Illinois: Illinois State Geological Survey.
 McKay, Donald E. (III), Berg, Richard C., Stump, Andrew J., and Weibel Pius C., 2010, Geology of the Middle Illinois River Valley: Illinois Geological Survey.
 1970, Secor Quadrangle: Illinois State Geological Survey, scale 1:24,000, 1 sheet.

Methods:

Soils data gathered from the USDA Natural Resources Conservation database for the Secor Quadrangle was analyzed to determine the formations in the quadrangle. By looking at the parent material for the numbers in the quadrangle, a unit for that number could then be obtained. Once the formation for every number in the quadrangle was determined, the number and a formation color could be matched up using Canvas15. Topographic and LiDAR maps were then used to gain a better understanding of the geology of the area and further interpretations of the units were made. Once all the formations and contacts for the entire quadrangle were determined, Canvas15 was used to draw in the contacts leading to the final production of the geologic map.

Acknowledgements:

The Illinois State Geological Survey for Secor quadrangle map, and the USDA for soils data.