

# Illinois State Geological Survey

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# Quaternary Deposits of Carroll County, Illinois

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Digital Cartography by Christopher S. McGarry  
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State of Illinois

Department of Natural Resources

## Explanation

### QUATERNARY SEDIMENTS

**HUDSON EPISODE** (postglacial; younger than 12,000 years old - 12 ka)

**Cahokia Alluvium**  
Stratified silt, clay, and sand with wood and shell fragments; Occurs in modern creek valleys and river channels and is 5 - 25 ft. thick. Includes significant amounts of redeposited loess. Overlies thick sand and gravel (Henry Fm.) in the floodplain and backwater channels of the broad Mississippi River Valley.

**Grayslake Peat**  
Peat and muck with interbedded silt and clay; occurs in swampy depressions within valleys; estimated to be 5 - 15 ft. thick.

**WISCONSIN EPISODE** (approx. 55 - 12 ka)

**Parkland Sand**  
Well sorted, stratified, eolian sand, approximately 5 - 30 ft. thick; occurs as sheet sand or dune sand; typically overlain by 0 - 5 ft. of Peoria Silt (loess). Mapped only on uplands (eolian sands in the Mississippi Valley are included with Henry Fm.).

**Henry Fm.**  
Stratified sand and gravel up to 200 ft. thick in the Mississippi Valley; overlain by only 0 - 1 ft. of Peoria Silt on the Savanna Terrace. Includes up to 30 ft. of surficial dune sand.

**Equality Fm.**  
Laminated silt and clay; occurs as slackwater lake deposits along the Plum River, Johnson Creek, Carroll Creek, and Camp Creek in the western portion of the county.

**Peoria and Roxana Silts** (mapped only where glacial till is absent)  
Eolian silt (loess). Mapped where > 5 ft. thick. Leached of carbonates from 4 - 12 ft. deep. Loess deposits cover most of the county, but gradually decrease in thickness from up to 35 ft. (but highly variable) in western areas, to 20 - 25 ft. in central areas, to 10 ft. in northeastern areas, on uneroded uplands. Peoria Silt makes up most of the thickness, with underlying Roxana Silt < 5 ft. thick. Loveland Silt (Illinois Episode loess and colluvium), containing the Sangamon Geosol, can occur underneath Wisconsin Episode loess in unglaciated western areas. Bedrock occurs at 5 - 50 ft. depth, below loess and residuum.

**SANGAMON EPISODE** (approximately 130 - 55 ka)  
Nondeposition or erosion of underlying units. Weathering and soil development (formation of Sangamon Geosol).

**ILLINOIS EPISODE** (approximately 200 - 130 ka)  
**Ogle Member of Glasford Fm.** [5 - 20 feet thick]  
Yellow-brown to grey diamictic; varies in texture from sandy loam in eastern areas of the county to loam, silt loam and silty clay in central areas (see inset figure); includes some interbedded sand and gravel; the Sangamon Geosol has weathered the upper 5 - 7 ft.; otherwise calcareous. This unit is overlain by 5 - 25 ft. of Wisconsin Episode loess and is typically underlain by 0 - 15 ft. of residuum or sorted Quaternary drift above bedrock. Within mapped areas, total drift thickness is typically 10 - 40 ft., but is thicker over buried valleys.

**Ogle Member of Glasford Fm.** [20 - 50 feet thick]  
Color and textural variations are as described above. This unit is overlain by 5 - 25 ft. of Wisconsin Episode loess and is typically underlain by 0 - 20 ft. of residuum or sorted Quaternary drift. Within mapped areas, total drift thicknesses is typically 40 - 75 ft., but is thicker over buried valleys.

**Pearl Fm.** (not including Hagarstown Member)  
Sand and gravel, sorted and stratified, with some interbedded silt, weathered in upper portions by the Sangamon Geosol. Overlain by 5 - 25 ft. of Wisconsin Episode loess. Occurs in bedrock valleys and in an outwash plain (southwest of Mt. Carroll). Pearl Fm. was not mapped where overlain by > 5 ft. Ogle M. of Glasford Fm.

**Hagarstown Member of Pearl Fm.**  
Moderately sorted sand and gravel up to 100 ft. thick and overlain by thin loess (0 - 10 ft.). Weathered in upper portions by the Sangamon Geosol.

**Teneriffe Silt**  
Massive or laminated silt and clay. Occurs as lacustrine deposits possibly along Lost Creek, in northeastern Carroll County and in the subsurface in buried valleys. Also occurs as a veneer of 2 - 6 ft. loess and lacustrine silt above Ogle Member of Glasford Fm. and is altered by the Sangamon Geosol.

**ORDOVICIAN AND SILURIAN BEDROCK**  
**Bedrock near surface** (at < 5 ft. depth)  
Bedrock is dominantly Galena and Plattville Groups (Ordovician dolomites), Maquoketa Group (Ordovician shale), and undivided Silurian dolomites. For more information, see "Bedrock Geology in Carroll County, Illinois" by C. McGarry (ISGS OFS 1997-13d).  
**Bedrock is covered** by 0 - 5 ft. of loess, colluvium, diamictic, or residuum. The residuum on dolomite is a red clay, 0 - 4 ft. thick, formed by chemical alteration of bedrock; it is underlain by 1 ft. of dolomite sand.

- Disturbed Land
- Water
- Municipality
- Marsh/Swamp
- Till Boundary
- Till Boundary (inferred)
- US Highway
- State Highway

The Quaternary deposits of Carroll County, Illinois are quite varied due to the presence of the Mississippi River and Valley, the advance of an Illinois Episode glacier northwest to its terminus, and intense periglacial erosion during the late Wisconsin Episode. As a result of this mapping, the border of the Illinois Episode glacial deposits (Ogle Member of Glasford Fm.) was substantially changed. Traditionally, the Driftless Area has only included areas in Carroll County northwest of the Plum River Valley. However, this mapping discovered a large area south and east of that where till is absent. Some portions of this area could have been ice covered, with thin drift being later eroded off bedrock highs. Unglaciated uplands in northern and western Carroll County, contain only eolian deposits, derived from the Mississippi Valley, overlying residuum and/or bedrock.

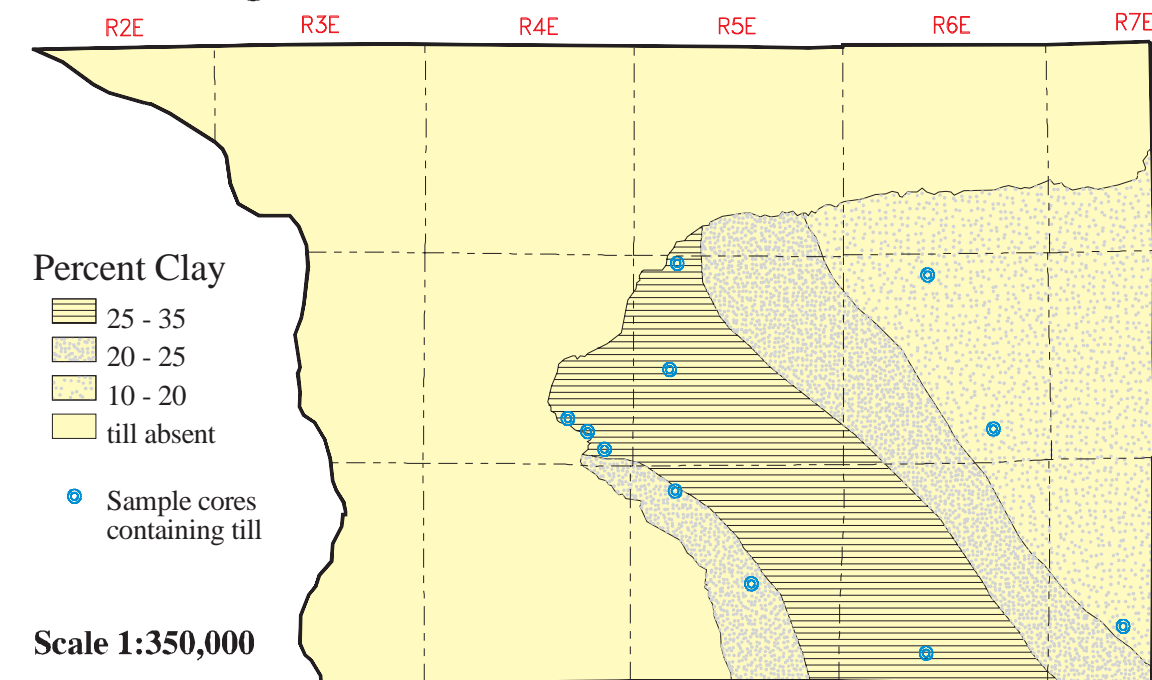
In the Mississippi Valley, thick sand and gravel (Henry Fm.) is an important water-bearing unit. On uplands, water wells draw primarily from fractured dolomite. Henry Fm., Pearl Fm., (including Hagarstown Member) and Parkland Sand have been mined for their sand and gravel resources. Thin sand bodies of limited areal extent occur within Ogle Member till.

Data used to create this map were compiled from ISGS well logs, Illinois Department of Transportation borings, United States Department of Agriculture soil survey maps, project field observations, and project exploratory borings. For data point locations, see "Locations of Data Points of Carroll County, Illinois" by C. McGarry (ISGS OFS 1997-13h).

### REFERENCES

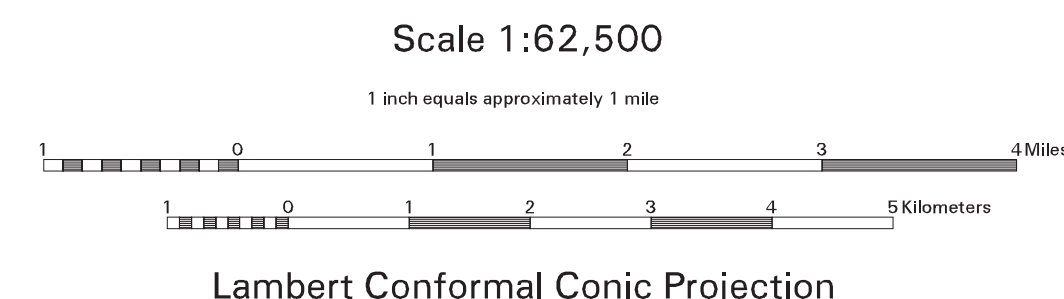
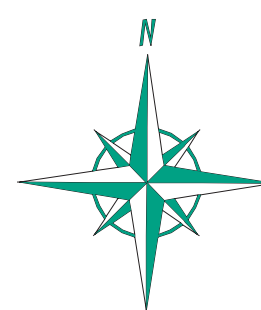
- Flock, M.A., 1983, The Late Wisconsin Savanna Terrace in Tributaries to the Upper Mississippi River, Quaternary Research, v.20, p.165-176.
- Hansel, A.K. and W.H. Johnson, 1996, Wedron and Mason Groups: Lithostratigraphic Reclassification of the Deposits of the Lake Michigan Lobe Area, Bulletin 104, Illinois State Geological Survey.
- Ray, B.W., 1975, Soil Survey of Carroll County, Illinois, United States Department of Agriculture.
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### Textural Variation in the Ogle Till Member, Glasford Formation



Pebbly loam till, with only 10 - 20% clay, occurs in eastern areas of the county, reflecting glacial advance over Galena and Plattville Group dolomites and St. Peter sandstone. More clay-rich till, with > 25% clay, occurs in a band in the south-central part of the county, reflecting incorporation of Maquoketa Group shales, as ice advanced to the northwest. For more information, see "Bedrock Geology of Carroll County, Illinois" by C. McGarry (ISGS OFS 1997-13d). Clay contents are of < 4 micrometer fraction and were measured by hydrometer analysis.

This map was prepared by the Illinois State Geological Survey, in cooperation with the Illinois Department of Commerce and Community Affairs and the Carroll County Board. It is part of a suite of maps created to assist county officials in addressing geologic questions concerning suitable sites for landfill development. Maps produced for this study are intended for regional land use planning purposes. More detailed mapping is needed for site specific considerations. This map has been reviewed for scientific accuracy and has been edited to meet the quality standards of maps in the ISGS Map Series.



T25N

T24N

T23N

R2E

R3E

R4E

R5E

R6E

R7E