Prairie Research Institute
ILLINOIS STATE GEOLOGICAL SURVEY

SURFICIAL GEOLOGY OF MCHENRY COUNTY, ILLINOIS

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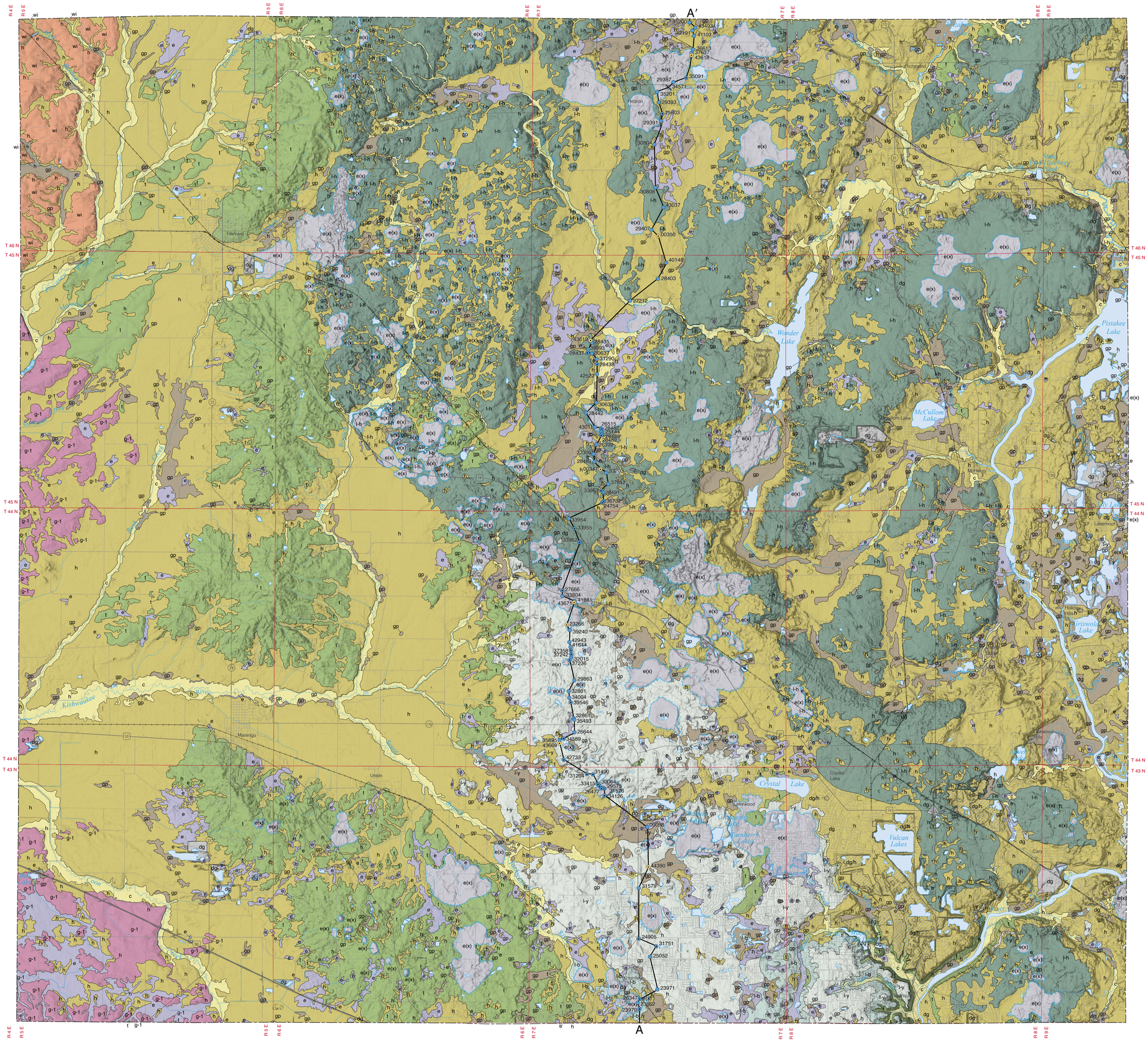
2021

STATEMAP McHenry County-SG



Base map compiled by Illinois State Geological Survey from digital data (2020 TIGER/Line Shapefiles) provided by the United States Census Bureau. Hillshade produced from 2017 lidar elevation data in the McHenry County collection made available by the Illinois Height Modernization Program (ILHMP). Transverse Mercator Projection. North American Datum of 1983.

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SCALE 1:62,500

1 0 1 2 3 4 5 MILES

1 0 1 2 3 4 5 6 7 KILOMETERS

ROAD CLASSIFICATION

Interstate Route — State Route
U.S. Route — Local road

ADJACENT COUNTIES
1 Boone
2 De Kalb
3 Kane
4 Du Page
5 Cook
6 Lake

APPROXIMATE MEAN DECLINATION, 2021

Geology based on field work and data compilation by B. Curry and J. Thomason, Illinois State Geological Survey, 2008–2013.

Digital cartography by Katie Mandera, Deette Lund, and Emily Bunse, Illinois State Geological Survey.

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This map has not undergone the formal Illinois Geologic Quadrangle map review process. Whether or when this map will be formally reviewed and published depends on the resources and priorities of the ISGS.

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QUATERNARY DEPOSITS

Description	Unit	Interpretation
HUDSON EPISODE (~14,700 years before present [B.P.] to today)[1]		
Fill (disturbed earth material); primarily material reworked from local underlying deposits; generally less than 30 feet thick	**Disturbed Ground** dg (present over underlying unit)	**Disturbed land;** embankments and mounds (gray); pits and quarries (open diagonal lines with underlying unit showing through)
Peat and muck; black to brown; interbedded with sand and silty clay (gray) and marl (white to light gray); less than 10 feet thick in most places	**Grayslake Peat** gp	**Organic-rich deposits:** decomposed wetland vegetation and sediment in depressions and on slopes, often associated with discharge of groundwater
Sand and gravel, well-sorted sand, and lenses of peat, grading laterally to organic-rich silt and clay with fossil wood, moss, snails, ostracodes, and rootlets in most places; as much as 40 feet thick in the Fox River valley; generally less than 5 feet thick in smaller upland valleys	**Cahokia Formation** c	**Alluvium in modern floodplains;** overbank point bar and channel deposits
HUDSON EPISODE (~14,700 B.P. to today) and WISCONSIN EPISODE: Michigan Subepisode (~29,000–14,700 years B.P.)[1]		
Silt, clay, and fine sand; gray to brown; layered to massive; with fossil wood fragments, moss, gastropod shells, ostracodes, leaves, and rootlets in many places; surficial deposits are generally less than 20 feet thick, but may reach more than 40 feet thick	**Equality Formation** e	**Lake deposits** in kettles and proglacial slackwater lakes in valleys tributary to the Fox River
Succession of sand and gravel (lower unit, 0 to 15 feet thick), **laminated, fossiliferous silt** (middle unit, 3 to 40 feet thick), **and weathered sand and gravel or sandy diamicton** (upper unit, 0 to 15 feet thick); as much as about 50 feet total thickness	**Equality Formation-complex** e(x)	**Ice-walled lake deposits forming high level terraces;** formed of sorted sediment of the Mason Group, including sand and gravel of the Henry Formation and very fine sand, silt, and clay of the Equality Formation
WISCONSIN EPISODE: Michigan Subepisode (~29,000–14,700 years B.P.)[1]		
Sand and gravel, or sand; with lenses of silt and clay, or diamicton; yellowish brown, brown to gray; generally stratified; as much as 180 feet thick. Includes several facies and tongues described below	**Henry Formation** h	**Proglacial outwash forming terraces along major rivers and streams;** outwash deposited in deltas and alluvial fans in stagnating ice environments
Diamicton; sandy loam to loam; friable; dolomite-rich; with lenses and beds of sand and gravel; less than 20 feet thick in most places	**Haeger Member, Lemont Formation** l-h	**Till and debris flow deposits** associated with the Woodstock Moraine; common association with ice-walled lake deposits (e(x))
Sand and gravel, sand or gravel; coarsens upwards in many places.	**Beverly Tongue, Henry Formation** (cross sections only) h-b	**Proglacial outwash**
Fine facies, sand, fine to medium with silty zones, stratified; generally found below the Beverly Tongue of the Henry Formation or below the Haeger Member; generally less than 60 feet thick in most places	**Beverly Tongue, Henry Formation (fine facies)** (cross sections only) h-b(f)	**Colluvium**; along steep slopes and in karstic areas; common along the bluffs of the Mississippi River Valley interspersed with bedrock outcrops
Diamicton; silty clay, silty clay loam, and clay; gray, oxidizing to yellowish brown; includes layers of sand and gravel, silt, and silty clay; as much as 100 feet thick	**Yorkville Member, Lemont Formation** l-y	**Till, debris flow deposits, and lake sediment** associated with the Barlina and Huntley Moraines
Sand and gravel; silty in places; less than about 60 feet thick	**Unnamed Tongue, Henry Formation** (cross sections only) h-u	**Proglacial outwash**
Diamicton; sandy loam to loam with abundant cobbles; friable; gray to grayish brown, oxidizing to yellowish brown to brown; includes common layers of sand and gravel, and stringers of silt and fine sand; as much as 50 feet thick	**Batestown Member, Lemont Formation** l-b	**Till, debris flow deposits, and lake sediment** associated with the Barlina and Huntley Moraines
Diamicton; clay loam to loam matrix with lenses of sand and gravel, or sand; reddish brown; as much as about 300 feet thick below the Marengo Moraine	**Tiskilwa Formation** t	**Till and debris flow deposits** associated with Marengo Moraine
Sand and gravel; silty in places; as much as about 80 feet thick	**Ashmore Tongue, Henry Formation** (cross sections only) h-a	**Proglacial outwash**
ILLINOIS EPISODE (~200,000–130,000 years B.P.)[1]		
Fine sand; as much as 50 feet thick	**Pearl Formation** (cross sections only) pl	**Glaciolacustrine sand**
Diamicton; brown to pinkish brown loam diamicton less than 100 feet thick below Capron Ridge	**Winnebago Formation** wi	**Till and debris flow deposits**
Diamicton; sandy loam to loam, reddish brown, pinkish brown, and brown; bouldery in places; abundant lenses of sand and gravel; as much as about 380 feet thick in Troy Bedrock Valley	**Glasford Formation, upper facies** g-1	**Till, debris flow deposits, and outwash**
Sand and gravel; silt loam	**unnamed tongue, Glasford Formation** (cross sections only) gs1	**Proglacial outwash interbedded with silty lacustrine sediments**
Diamicton; sandy loam to loam, reddish brown, pinkish brown, and brown; bouldery in places; abundant lenses of sand and gravel; as much as about 380 feet thick in Troy Bedrock Valley	**Glasford Formation, middle facies** (cross sections only) g-2	**Till, debris flow deposits, and outwash**
Sand and gravel; silt loam	**unnamed tongue, Glasford Formation** (cross sections only) gs2	**Proglacial outwash interbedded with silty lacustrine sediments**

PALEOZOIC BEDROCK

Rock; predominately dolomite with some shaly zones; upper surface is often fractured with solution cavities and mineral precipitation; some oil staining locally	Bedrock (cross sections only) R	**Bedrock associated with shallow marine environment of Silurian Period;** buried by 100–320 feet of Quaternary sediments

[1]The time periods for the Wisconsin Episode and the Hudson Episode are reported as calibrated radiocarbon years and can be directly compared to calendar years before 1950 (Stuiver et al. 2021).

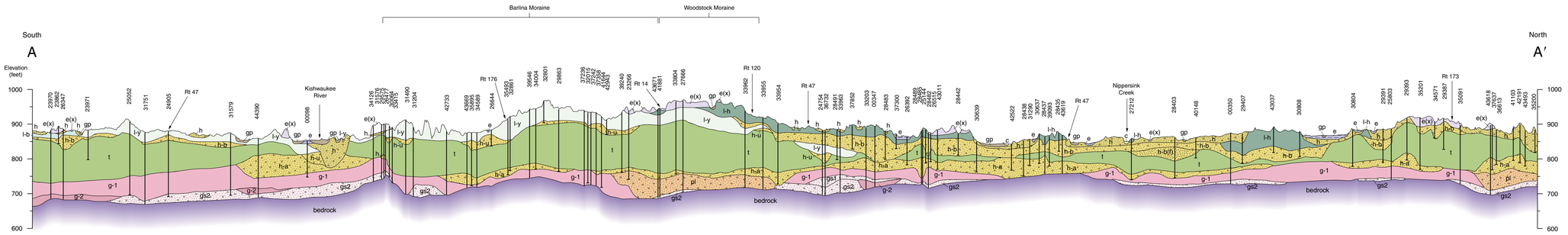
Point Data

- Stratigraphic boring
- Water-well boring
- Monitoring well
- 26211 — Labels indicate the county number or other database ID. A dot inside the symbols indicates the boring extends to bedrock.

Note: The county number is a portion of the 12-digit API number on file at the ISGS Geological Records Unit. Most well and boring records are available online from the ISGS website.

Line Data

- Contact
- Ice-contact scarp
- A—A′ Line of cross section



dg Disturbed ground
gp Grayslake Peat
e Equality Formation
h Henry Formation
h-b Beverly Tongue, Henry Formation
l-y Yorkville Member, Lemont Formation
l-b Batestown Member, Lemont Formation
h-a Ashmore Tongue, Henry Formation
g-1 Glasford Formation, upper facies
g-2 Glasford Formation, middle facies
bedrock (Paleozoic)
c Cahokia Formation
e(x) Equality Formation, complex
l-h Haeger Member, Lemont Formation
h-b(f) Beverly Tongue, Henry Formation (fine)
h-u Unnamed Tongue, Henry Formation
t Tiskilwa Formation
pl Pearl Formation
gs1 unnamed tongue, Glasford Formation
gs2 unnamed tongue, Glasford Formation

Cross Sections
Laminated silt and clay
Sand, loamy sand, or gravelly sand
Sand and gravel
Lithologies as described in stratigraphic legend on map sheet 1
Contact
Borehole

Horizontal scale: 1 inch = 5,208 feet
Vertical scale: 1 inch = 149 feet
Vertical exaggeration: 35×

Geologic Summary

Most of the landscape, natural resources and ecosystems of McHenry County are a result of glacial activity during the Quaternary Period of geologic time (2.6 mya to 11 kya; Curry et al. 2010, 2011). Regional topographic ridges and valleys, lowland wetland ecosystems, and locations of modern streams are clear examples of the impact of recent glaciations in shaping modern-day McHenry County.

The oldest Quaternary deposits recorded in McHenry County are those of the Banner Formation (found only in the subsurface), which are 730-190 kya (Curry et al. 2011). Those deposits are likely discontinuous and have only been found occasionally throughout the study area (Curry et al. 1997; Curry 1995). Due to their infrequent detection, we do not understand the distribution of Banner Formation deposits, and so they were not mapped in this study. They are buried by more extensive, younger glacial deposits of the Illinois Episode (190,000 to 130,000 years ago), which include both the Glasford and Winnebago Formations. Two extensive sequences of Glasford Formation deposits were mapped as part of this study. These formations include sand and gravel sediments deposited by glacial meltwater, silt-rich lake sediments, and poorly sorted, clay-rich, ice-contact sediments.

After the Illinois Episode, a period of non-glaciation occurred (130,000-55,000 years ago), which weathered some of the older glacial sediments, and eroded and removed others. During the early Wisconsin-Episode (~55,000–29,000 years ago), organic-rich soils formed in wind-blown silt across the landscape. These soils, recognized as the Morton-Robein complex sediments, are commonly found preserved in the subsurface of McHenry County, beneath younger deposits of the Wisconsin-Episode glaciation (Curry and Pavich 1996).

At least three separate glacial advances that occurred during the Wisconsin Episode glaciation (~29,000 to 14,000 years ago) deposited and sculpted most of the sediments and landscapes that we see presently in McHenry County (Hansel and Johnson 1996). Some of these more prominent landscape features include, for example, the Marengo, Barlina, and Woodstock moraines, which formed along the edges of former glaciers and mark the terminal extent of three different glacial advances across the county. These moraines are often largely composed of till sediments of the Tiskilwa Formation, and the Yorkville and Haeger Members of the Lemont Formation, respectively. Other prominent landscape features include the modern pathways of the Kishwaukee River, Nippersink Creek, and the Fox River, which were the former paths of glacial meltwater streams and often contain thick sequences of coarse-grained sand and gravel of the Henry Formation. Thin deposits of modern river sediments and lake sediments (Cahokia and Equality formations, respectively) are present in active stream valleys and lake environments. A more extensive explanation of the nature and character of glacial deposits in McHenry County can be found in Curry et al. (1997).

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