George H. Ryan, Governor
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ILLINOIS STATE GEOLOGICAL SURVEY
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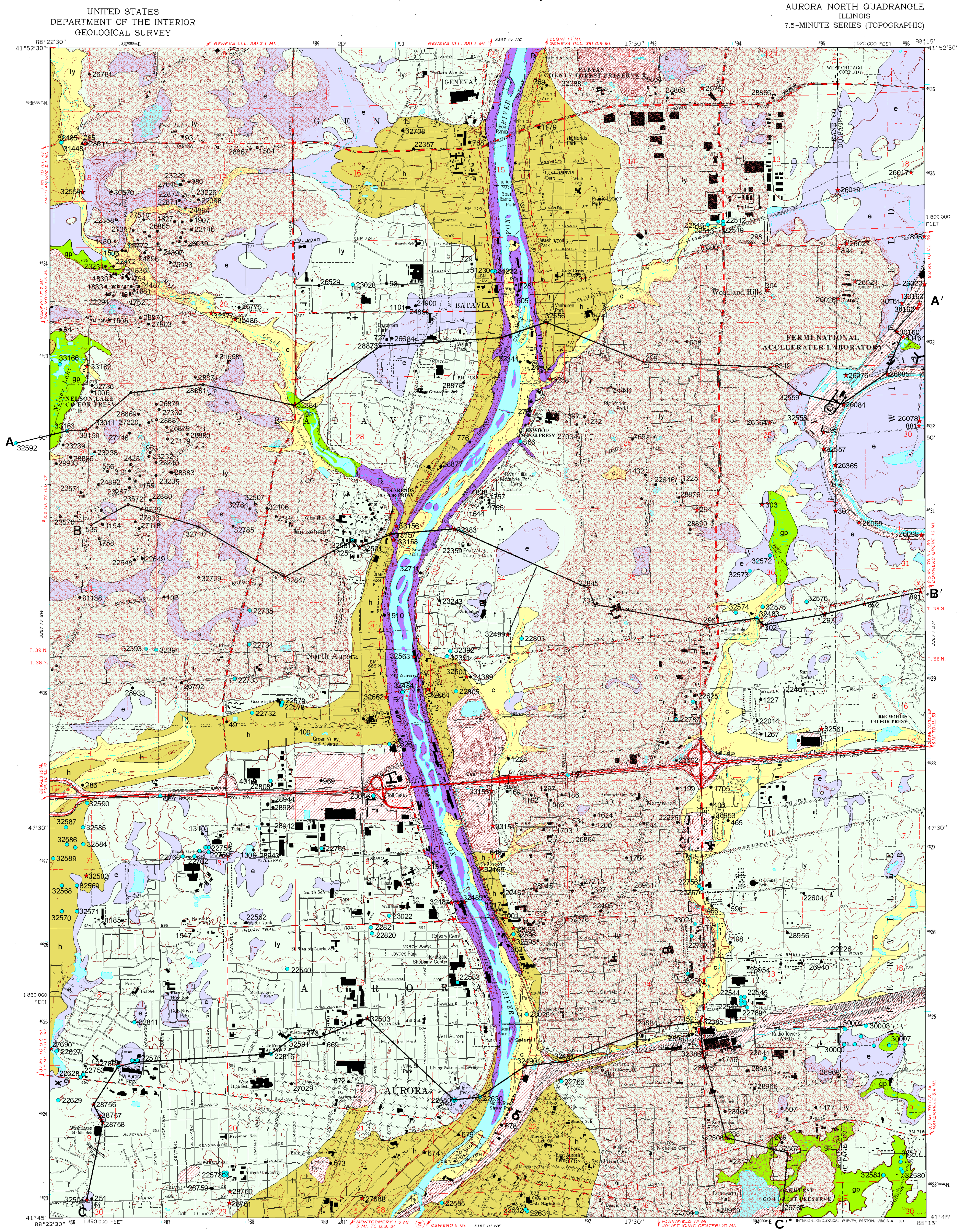
Illinois Geological Quadrangle Map: IGQ Aurora North-SG
2001

SURFICIAL GEOLOGY MAP

Aurora North Quadrangle, Kane and Du Page Counties, Illinois

B. Brandon Curry



Produced by the United States Geological Survey in cooperation with State of Illinois agencies
Control by USGS and NOS/NOAA
Topography by photogrammetric methods from aerial photographs taken 1963. Field checked 1964. Revised from aerial photographs taken 1988. Field checked 1991. Map edited 1993.
Projection and 10,000-foot grid ticks: Illinois coordinate system, east zone (transverse Mercator grid ticks, zone 16, shown in blue, 1927 North American Datum (NAD))
North American Datum of 1983 (NAD 83) is shown by dashed corner ticks
The values of the shift between NAD 27 and NAD 83 for 7.5-minute intersections are given in USGS Bulletin 1875

Scale 1:24,000

0 — 2 miles
0 — 2 kilometers
0 — 2000 feet

Base map contour interval 10 feet
Base map compiled at the Illinois State Geological Survey (ISGS) from digital data provided by the U.S. Geological Survey and the ISGS

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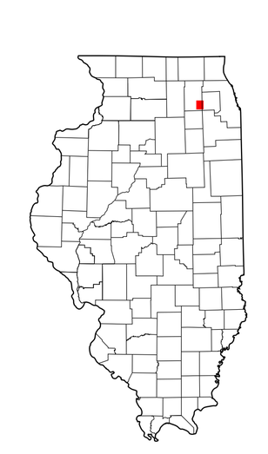

1	2	3
4		5
6	7	8

1 Elburn
2 Geneva
3 West Chicago
4 Sugar Grove
5 Naperville
6 Yorkville
7 Aurora South
8 Normantown

ADJOINING 7.5-MINUTE QUADRANGLES

MN GN 0°52′ 1° 18 MILS 16 MILS

UTM GRID AND 1993 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

For further information about this map contact:
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Released by the authority of the State of Illinois: 2001

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IMPORTANT INFORMATION ON THE USE OF THESE MAPS AND OTHER MATERIALS

This document has been carefully reviewed and edited and meets the standards of the Illinois State Geological Survey with regard to scientific and technical quality and is suited to the purpose and the use intended by its authors. It presents reasonable interpretations of the geology of the area and is based on available data. However, the interpretations are based on data that may vary with respect to accuracy of geographic location, the type and quantity of data available at each location, and the reliability of the data sources. Consequently, the accuracy of unit boundaries and other features shown in this document varies from place to place. Variations in the texture, color, and other characteristics of unlithified glacial and nonglacial sediments can make it difficult to delineate unit boundaries, particularly those in the subsurface. Any map or cross section included in this document is not meant to be enlarged. Enlarging the scale of an existing map or cross section, by whatever means, does not increase the inherent accuracy of the information and scientific interpretations it portrays.

This document provides a large-scale conceptual model of the geology of the area on which to base further work. Any map or cross section included herein is not intended for use in site-specific screening or decision-making. Use of this document does not eliminate the need for detailed studies to fully understand the geology of a specific site. The Illinois State Geological Survey, the Illinois Department of Natural Resources, and the State of Illinois make no guarantee, expressed or implied, regarding the correctness of the interpretations presented in this document and accept no liability for the consequences of decisions made by others on the basis of the information presented here.

Quaternary Geology

The deposits from two continental glaciations, associated lakes, and meltwater streams constitute most of the surficial deposits in the Aurora North Quadrangle. The earliest Quaternary glaciers probably arrived in Kane County more than 500,000 years ago, but there are no deposits of this age preserved in the map area. In the southern part of the map, bedrock valleys are shown that contain sediment deposited during the next-to-last glaciation (Illinois Episode) from about 180,000 to 130,000 years ago. An ancient weathering horizon, the Sangamon Geosol, formed in Illinois Episode sediments from about 130,000 to 55,000 years ago (Curry 1989, Curry and Pavich 1996). Capping the layer of weathered glacial sediment or bedrock is a thin, discontinuous layer of dark brown, organic-rich sediment known as the Robein Member of the Roxana Silt. Based on radiocarbon analyses, the Roxana Silt was deposited between about 50,000 and 25,000 years ago (Wickham et al. 1988). Wood fragments, including in situ tree stumps, have been discovered in this sediment to the west of the map area in the Sugar Grove Quadrangle (Curry et al. 1999).

The first glaciers of the last (Wisconsin) episode entered the Aurora North Quadrangle about 24,500 years ago, remained in the quadrangle until about 17,500 years ago (Curry et al. 1999), and deposited three major glacial units. The youngest of these, the Yorkville Member of the Lemont Formation, is the predominant surficial deposit of the Aurora North Quadrangle and is composed mostly of gray silty clay diamicton with discontinuous lenses of sand and gravel. The Yorkville sediments form the ridge-like, north-south–trending Minooka Moraine east of the Fox River and the subdued north-south–trending St. Charles Moraine west of the Fox River (fig. 1). The older Wisconsin Episode diamicton units, the sandy Batestown Member of the Lemont Formation and the loamy Tiskilwa Formation, are present in the subsurface, but their distribution is patchy in the eastern and southern parts of the quadrangle.

The succession of three glacial diamicton units and associated outwash and lake sediment were eroded during postglacial flooding along the Fox River valley. In some places, the earliest postglacial streams deposited sand and gravel units up to 30 feet thick. Subsequent erosion has exposed bedrock in many places along the Fox River. Lake sediment and peat accumulated in depressions (kettles) left by melted blocks of ice and in valleys tributary to the Fox River that were temporarily blocked by outwash and other sediment. Aeolian silt and clay (loess) as much as 4 feet thick mantles most glacial sediments. The loess is generally organic-rich and has been altered by development of the modern soil. Because loess is ubiquitous, its extent was not mapped. Thin deposits of river and stream sediment (alluvium) deposited in the last 10,000 years mantle the glacial sediment and bedrock. This alluvium is not covered by loess.

Mapping Methods

This surficial geology map is based on previous mapping (Curry 1990, Grimley 1998, Grimley and Curry 2001), on logs from numerous engineering borings and stratigraphic test borings (e.g., Landon and Kempton 1971, Kemmis 1978), and on the Kane County soil survey maps of Goddard (1979). The areal extent of surficial lake sediment (map unit e) was partly based on interpretation of color infrared aerial photography done in 1988 by the United States Geological Survey's National Aerial Photography Program. These interpretations were verified by examining samples obtained from hand-auger test holes. The matrix texture of the Yorkville Member diamicton is very similar to surficial lake sediment; the materials were differentiated primarily on the basis of their moisture contents (12 to 24% for diamicton; 30 to 50% or greater for surficial lacustrine sediment). Alluvial deposits were mapped on the basis of their landscape position in valleys and from the soil survey (Goddard 1979). The areas mapped as surficial peat, sand and gravel, and bedrock were taken from the maps of Goddard (1979). Some of these areas, especially in the southeastern part of the quadrangle, were verified in several shallow structural borings for subdivisions. Stratigraphic nomenclature of the glacial deposits is from Hansel and Johnson (1996).

Cross sections showing the vertical and lateral extent of the surface and subsurface units of the Aurora North Quadrangle were constructed based on interpretations of data from (1) deep stuctural borings at the Fermilab National Accelerator Laboratory (Soil Testing Services 1969, 1970; Landon and Kempton 1971; Kemmis 1978, 1981; Graese et al. 1988; Curry 1991; Paul Kesich, personal communication); (2) water-well logs done by Layne-Western, Inc. for various city agencies (Gilkeson et al. 1987, McFadden et al. 1989); (3) unpublished deep structural borings for the Settler's Hill Landfill (Ian Wilkerson, personal communication); (4) unpublished engineering borings for bridges; and (5) shallow structural borings for several subdivisions, especially in the southeastern part of the quadrangle. In addition, records from numerous water wells on file at the Geological Records Unit at the Illinois State Geological Survey were used to augment the detailed logs just described. Only a few outcrops were observed in the quadrangle. The largest exposure on the quadrangle is the eastern highwall of the quarry south and east of the Interstate 88–Fox River crossing. At the quarry, 25 to 30 feet of gray silty clay diamicton of the Yorkville Member overlies discontinuous, thin layers of brown loam diamicton, and coarse sand and gravel of the Batestown Member.

Lithologic information from boring 32499 was projected onto cross section B–B′. This boring provides the only high-quality record that, along with the soils maps of Goddard (1979), indicates that the area of low relief west of the Minooka Moraine and west of the Fox River is underlain by silty clay diamicton of the Yorkville Member. The data were projected so that the surface elevation of the boring matches the elevation along the line of the section.

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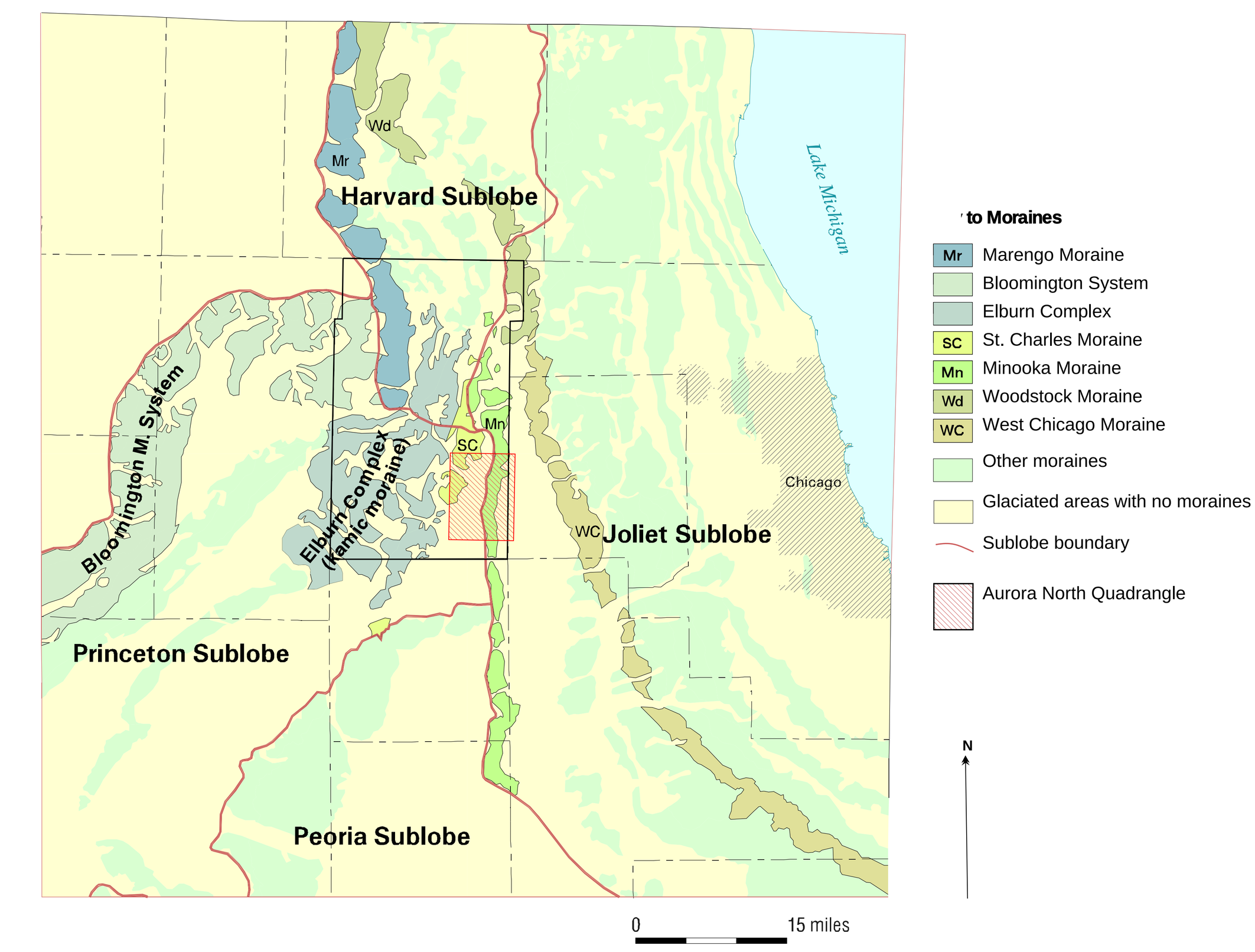


Figure 1 Wisconsin Episode moraines in northeastern Illinois. Moraines, shown in blue and green, were formed near the terminus of glacial ice during various positions of the Lake Michigan Lobe. Glacial ice advanced in a westerly and southwesterly direction into Illinois from the Lake Michigan basin. The older moraines of this figure occur generally to the west and the younger moraines to the east. On this map, adapted from Willman and Frye (1970) and Hansel and Johnson (1996), Kane County is outlined in black, and the Aurora North Quadrangle is hachured in red.

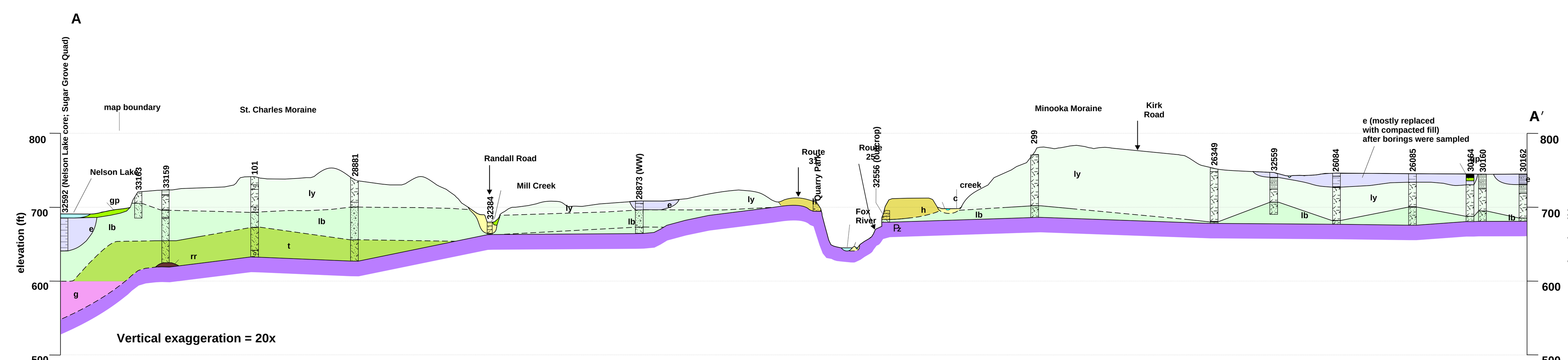
Materials		Lithostratigraphic units and interpretations	Maximum thickness
QUATERNARY DEPOSITS **Hudson Episode (postglacial)**			
Peat and muck; including interbedded sand, silty clay, and marl; commonly associated with lake sediments of the Equality Formation	gp	**Grayslake Peat** Decomposed wetland vegetation and sediment	40 feet at the Ironwood Subdivision, Southeastern Aurora
Sand and gravel, and well-sorted sand adjacent to streams, grading laterally to layered, organic-rich, fossiliferous silt and clay; associated with the Equality Formation	c	**Cahokia Formation** Floodplain sediment	10 feet adjacent to Mill Creek; possibly thicker along reaches of the Fox River
Hudson and Wisconsin Episodes			
Silt and clay; layered to massive, thin beds of sand are common; fossiliferous in many places; unit present at surface, buried by postglacial sediment, and found intertonguing with sand of the Henry Formation	e	**Equality Formation** Lake deposits in kettles and other depressions; also in valleys tributary to the Fox River	50 feet at Nelson Lake, buried by Grayslake Peat (northwestern part of map)
Wisconsin Episode (last glaciation)			
Sand and gravel, or sand; contains lenses of silt and clay, or diamicton	h	**Henry Formation** Outwash deposited along valleys and beyond former glacier margins	30 feet along the Fox River
Diamicton; silty clay, silty clay loam, and clay, with layers and lenses of sand and gravel or silt. Layered diamicton, silt, and sand indicated on lithologic logs on cross sections. Yellow-brown to olive where weathered; gray where unweathered	ly	**Yorkville Member, Lemont Formation** Till and debris flow deposits	70 feet, forming the Minooka Moraine west of the Fox River
Diamicton; sandy loam, with abundant cobbles; includes continuous layers and lenses of sand and gravel, or sand; brown to grayish pink	lb	**Batestown Member, Lemont Formation** Till and debris flow deposits	40 feet, east of Nelson Lake
Buried deposits (cross sections only) Diamicton; loam to clay loam (roughly equal amounts of sand, silt, and clay in the < 2-mm matrix); with lenses of sand and gravel, or sand; pinkish brown; compact	t	**Tiskilwa Formation** Till and debris flow deposits	30 feet, east of Nelson Lake
Silt and clay; organic-rich, black to dark brown; leached of carbonate minerals; contains wood fragments	rr	**Robein Member, Roxana Silt** Pedogenically altered loess, loess and diamicton	7 feet, east of Nelson Lake
Illinois Episode (next-to-last glaciation)			
Diamicton; compact, sandy and bouldery with abundant lenses of coarse sand, and gravel, or silt; occurs below buried organic-rich sediment of the Robein Member or compact diamicton of the Tiskilwa Formation in buried bedrock valleys; pinkish brown	g	**Glasford Formation** Till and debris flow deposits, outwash, and lacustrine sediments	100 feet in the St. Charles and Aurora Bedrock Valleys
PALEOZOIC BEDROCK			
Dolomite with chert lenses; gray to yellowish brown, fossiliferous, vuggy; also shaly dolomite and brown shale	Pz	**Kankakee and Joliet Formations** (Silurian); **Maquoketa Group** (Ordovician)	35 feet of Silurian dolomite is exposed in quarries along the Fox River

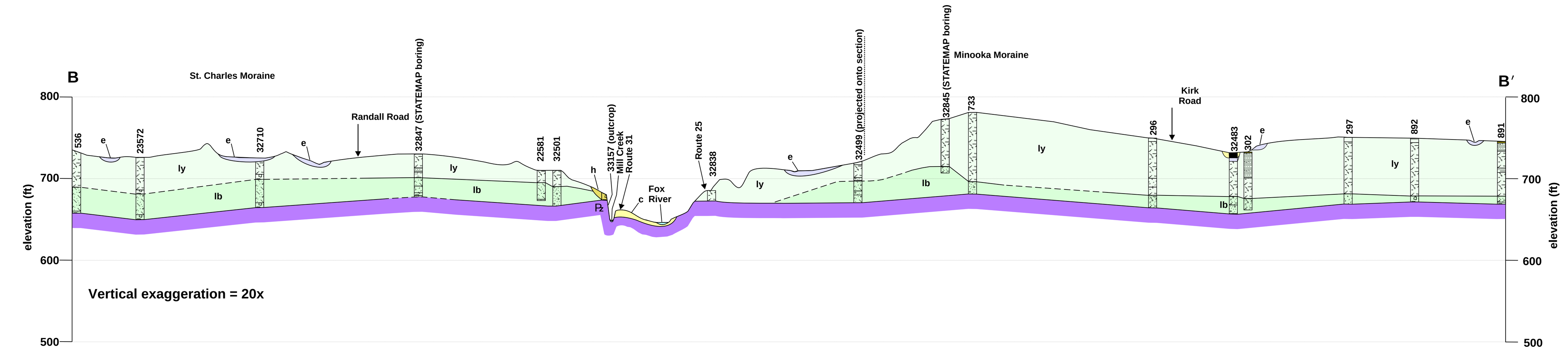
disturbed land — water — moraine

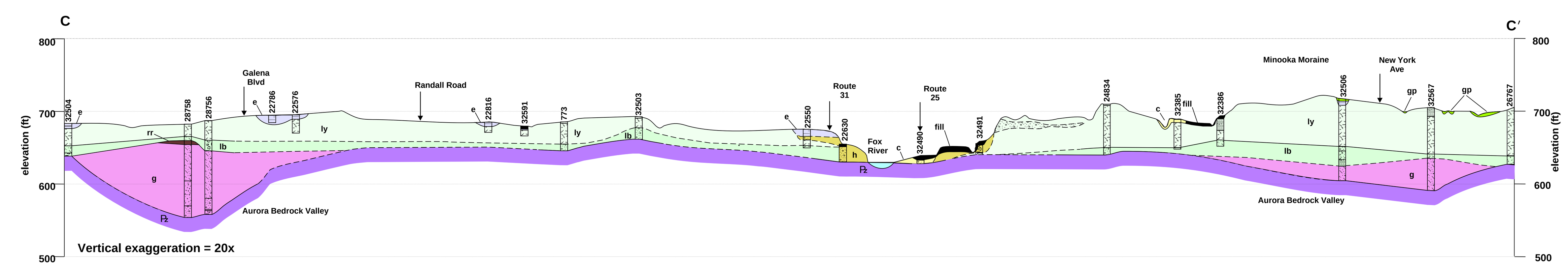
Data Points

- Water wells
- Shallow structural borings
- ★ Deep borings and outcrops with laboratory data

Data are labeled with county API numbers, unique numbers that identify records of water wells and borings available at the Geological Records Unit of the Illinois State Geological Survey. The location of every data point has been field verified.







Lithologic symbols for borings along cross sections

- Silt and clay
- Sand and gravel
- Gravel and boulders
- Matrix-supported diamicton; matrix textures of clay, silty clay, and silty clay loam
- Matrix-supported diamicton; matrix textures of loam, silt loam, sandy loam, clay loam, and silty clay loam
- Thin layers of matrix-supported diamicton, fine sand, sand and gravel, and silt; the layers are usually less than 2 feet thick
- Disturbed land; variable lithology

Other symbols in cross sections

- Lithologic contact
- Estimated, queried, or approximated lithologic contact