Department of Natural Resources
ILLINOIS STATE GEOLOGICAL SURVEY
William W. Shilts, Chief

DRIFT THICKNESS OF ANTIOCH QUADRANGLE
LAKE COUNTY, ILLINOIS AND KENOSHA COUNTY, WISCONSIN

Illinois Preliminary Geologic Map
IPGM Antioch-DT

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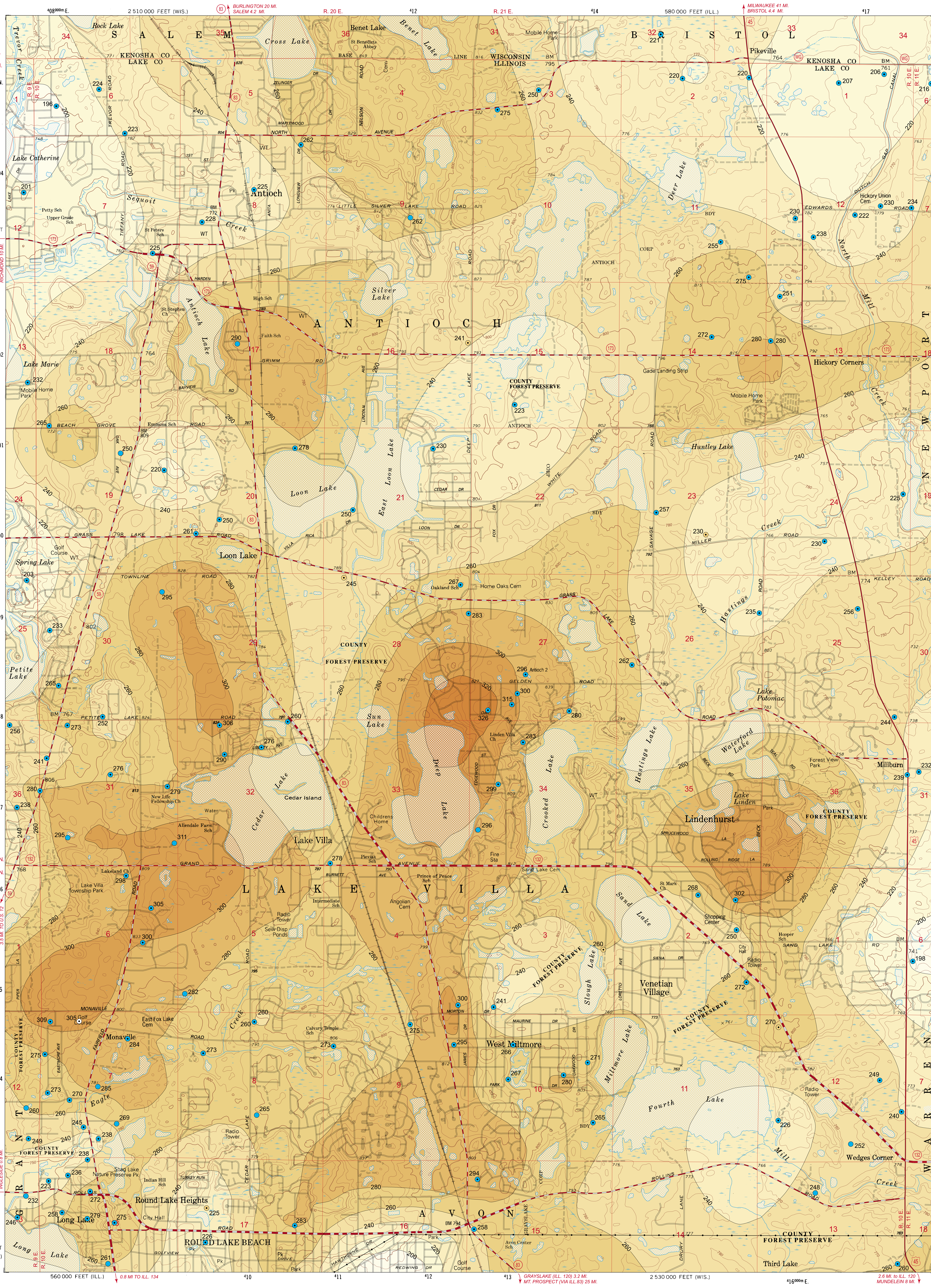
2004



Drift Thickness (ft)

340
320
300
280
260
240
220
200
180

Data Type

- Stratigraphic boring - to bedrock
- Water well
- Water well - to bedrock
- Other - to bedrock

Note: Data symbol labels indicate drift thickness in feet.

Drift Thickness

This map displays the thickness of glacial drift over bedrock. The drift consists of a combination of glacial diamictons (till and sediment flow deposits), proglacial sands and gravels, lake sediments and organic-rich materials which cover the entire study area (Larsen, 1973). The thickness of drift ranges from about 195 to 325 feet. Previous mapping of the drift thickness in the study area is limited and those estimates of thickness were based on county (Larson, 1973) and statewide-scale (Piskin and Bergstrom, 1975) studies.

Generally, the drift is thickest in the central portion of the quadrangle and is thinner toward the quadrangle boundaries. Commonly, drift is thickest over bedrock valleys and thinnest over bedrock highs. The borehole recording the thickest drift (326 feet) is in the center of the quadrangle, while the point of thinnest drift (196 feet) is in the northwest corner of the study area.

Methodology

Drift thickness is an estimate of the depth to bedrock from the ground surface. During data compilation and analysis, 497 borings either on the quadrangle or within a 1-mile buffer were examined (Figure 1). Of these, 474 penetrated bedrock and 23 ended in glacial drift. Key words used by drillers in their drill logs to indicate bedrock include limestone, dolomite, rock, and bedrock. To generate this map, only 191 of the 474 bedrock borings were used; 120 of these were located within the quadrangle boundaries. The additional 71 bedrock borings within the 1-mile buffer were used to better characterize drift thickness along the quadrangle boundaries. Where data points were densely clustered (e.g., the southwestern portion of the study area), representative borings were selected to establish a more even data distribution. Boreholes ending in glacial drift (16 borings inside the quadrangle boundaries and 7 holes within the 1-mile buffer) were also used to control the minimum depth to the bedrock surface, i.e., where the top of bedrock was known to occur at a depth greater than the model calculations suggested. Because no boreholes with data on bedrock elevation occur at these locations, these shallower wells provide a minimum depth, above which bedrock can not occur.

The location of each well was verified using tax records, plat books, and Internet-based locating software. When required, wells were repositioned. The level of confidence in the final verified location was ranked from 1 (high accuracy) to 5 (low accuracy). The highest quality boreholes, with respect to both geologic information and location, are the ISGS GPS-surveyed stratigraphic borings, whereas the lowest quality data points are generally residential water wells. For this map, we initially used only the boreholes that combined high quality location data (ranks 1 and 2) with high quality geologic data, however, we later added some data points of lower quality to fill in data needs and to maintain uniform data distribution. Of the 214 borings used to create this map, 202 are water wells, 8 are stratigraphic borings, and 4 are 'other' holes, which means either the type of well is unknown or its status is 'dry'.

The data were compiled within ArcGIS. Points were interpolated using the spline with tension method and the ensuing drift thickness grid was contoured at 20-ft intervals. Based on subsequent analysis, the contours in a few areas were modified to more realistically portray the drift thickness. All data are on file at the Geological Records Unit of the Illinois State Geological Survey.

Acknowledgments

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The cooperation of E.H. Glenn and Sons Inc., Blake and Sons, Beach Pump and Well, J. Huemann and Sons, Henry Boysen Company, S.O.S. Service Inc., A. and C. Snelton, Snelton and Sons, Wachholder Well Drilling and the Lake County Health Department is gratefully acknowledged. M. Barnhardt, A. Hansel, and A. Stumpf reviewed the map. The Central Great Lakes Geologic Mapping Coalition, and the State of Illinois provided funding.

References

Larsen, J.I., 1973, Geology for Planning in Lake County, Illinois: Illinois State Geological Survey, Circular 481, 43 p.

Piskin, K. and R.E. Bergstrom, 1975, Glacial Drift in Illinois: Thickness and Character: Illinois State Geological Survey, Circular 490 35 p.

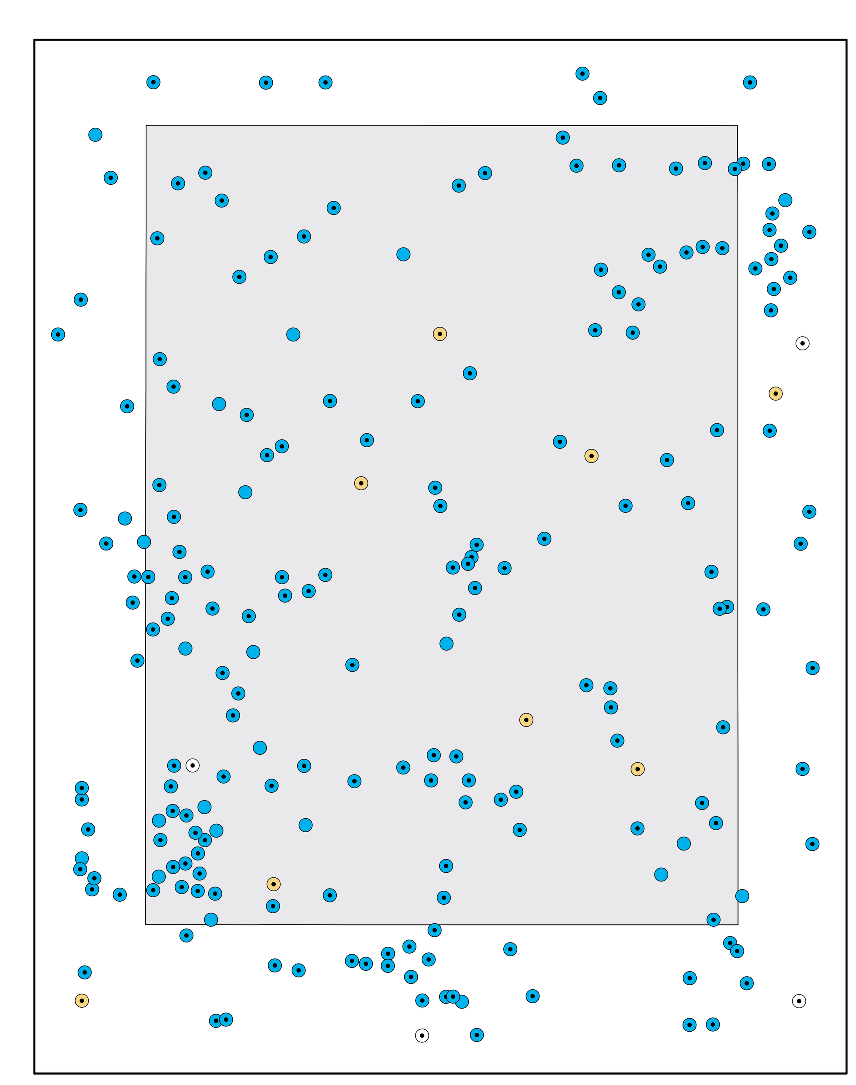

Figure 1 Map showing the location of borings used to model the drift thickness. Borings are symbolized in blue for water wells, orange for stratigraphic borings and white for 'other' borings.

Base map compiled by Illinois State Geological Survey from digital data provided by the United States Geological Survey. Topography and PLSS compiled 1960, digital revision 1993. Planimetry derived from imagery taken 1988.

North American Datum of 1983 (NAD 83)
Projection: transverse Mercator
10,000-foot ticks: Illinois State Plane coordinate system, west zone (transverse Mercator)
1,000-meter ticks: Universal Transverse Mercator grid system, zone 16

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SCALE 1:24 000
1 1/2 0 1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 .5 0 1 KILOMETER

BASE MAP CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

Released by the authority of the State of Illinois: 2004

Geology based on fieldwork and data compilation by A.B. Dixon-Warren and S.M. O'Malley, 2003.

Digital cartography by M. Barrett, Illinois State Geological Survey.

This Illinois Preliminary Geologic Map (IPGM) is a lightly edited product, subject to less scientific and cartographic review than our Illinois Geological Quadrangle (IGQ) series. It will not necessarily correspond to the format of IGQ series maps, or to those of other IPGM series maps. Whether or when this map will be upgraded depends on the resources and priorities of the ISGS.

CENTRAL GREAT LAKES GEOLOGIC MAPPING COALITION

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

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1	2	3
4	5	
6	7	8

ADJOINING QUADRANGLES
1 Silver Lake
2 Paddock Lake
3 Pleasant Prairie
4 Fox Lake
5 Wadsworth
6 Wauconda
7 Grayslake
8 Libertyville

2½°
MAGNETIC NORTH
TRUE NORTH
APPROXIMATE MEAN DECLINATION, 2004

ROAD CLASSIFICATION

- Primary highway, hard surface
- Secondary highway, hard surface
- Light duty road, hard or improved surface
- Unimproved road
- Interstate Route
- U.S. Route
- State Route