Drift Thickness of Naperville Quadrangle
Du Page County, Illinois

Prairie Research Institute
ILLINOIS STATE GEOLOGICAL SURVEY

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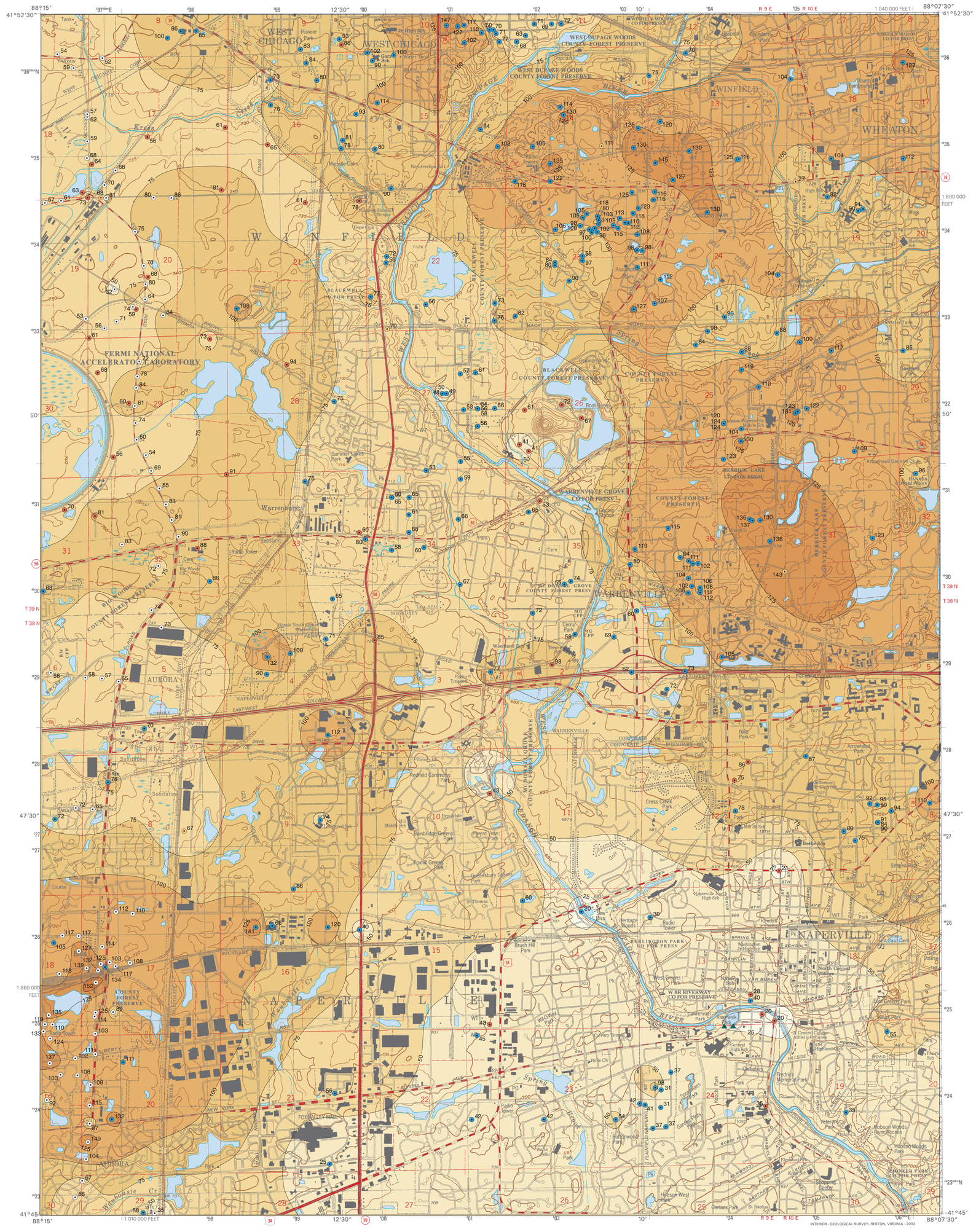
2013

Illinois Geologic Quadrangle Map
IGQ Naperville-DT



Introduction

This drift thickness map shows the location of borings, provides drift thickness values, and contours those data at 25-foot contour intervals. Drift is the surficial material of Quaternary age (generally less than about 200,000 years old) that includes primarily deposits of glacial origin such as diamicton (till and debris flow deposits), sand and gravel outwash, silty and clayey loess and lake deposits, marl, peat, and alluvium. The map has many uses, such as identifying the most suitable areas to extract (or protect) bedrock resources.

Mapping Methods

The drift thickness map was made using ArcGIS 9.3 software. Drift thickness was determined by subtracting the bedrock surface elevations from ground surface elevations. There are 407 data points in the Naperville Quadrangle (Fineberg and Curry 2012a). The locations of these data points (each verified by a state survey scientist or qualified engineer) were used to extrude ground surface elevations from the DEM (Digital Elevation Model) of Du Page County. A grid of drift thickness values was created using the IDW (Inverse Distance Weighted) tool in ArcMap. The grid was contoured at 25-foot intervals using the Contour tool in ArcMap. The contours were adjusted to honor all the data points on the final drift thickness map and then smoothed to create the final map.

Results

The drift is thinnest along the West Branch Du Page River in downtown Naperville, where bedrock is locally exposed in several former quarries now used as recreational lakes. The drift is relatively thin in the northwest corner of the quadrangle as well. Thick drift occurs in the southwestern and northeastern portions of the quadrangle. The thickest drift is associated with the sediment fill in the Aurora Bedrock Valley and its tributaries (Fineberg and Curry 2012b) as well as in the headwaters of buried bedrock valleys that once drained toward Lake Michigan and are now buried by the Valparaiso Morainic System (Curry and Fineberg 2012).

Data

Bedrock Elevations
Mean sea level (MSL) elevations of the bedrock surface were interpreted from refractive seismic data (Heigold 1990), logs of water-well drillers, engineering test borings (e.g., Landon and Kempton 1971), and descriptive lithologic logs and natural gamma-ray logs of the Illinois State Geological Survey (e.g., Curry et al. 1988). The locations of the water wells were verified by geologists and hydrogeologists of the Illinois State Geological Survey and Illinois State Water Survey. The location of many engineering borings was verified by using aerial photographic documentation and GIS. The location and elevation of the seismic data were estimated from a topographic map by Heigold (1990).

Surface Elevations
The surface elevations of water wells, engineering borings, stratigraphic, and gamma logs were interpolated from a DEM derived from the Du Page County LiDAR using ArcGIS 9.3 software. The LiDAR DEM has a raster grid of 3.47 feet with an accuracy of ±0.4 feet.

Acknowledgments

We gratefully acknowledge Donald E. Luman (ISGS) who processed and obtained the recently acquired LiDAR data from Du Page County's Information Technology Department, GIS division.

References

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Drift Thickness
(feet)

175	150	125	100	75	50	25	0

Data Type

- Outcrop
- Stratigraphic boring
- Water-well boring
- Engineering boring
- Seismic data
- 75 Numeric labels indicate drift thickness in feet.

Note: Most well and boring records are available online from the ISGS Web site.

Base map compiled by Illinois State Geological Survey from digital data (500 dpi Digital Raster Graphic) provided by the United States Geological Survey. Topography compiled 1988. Planimetry derived from imagery taken 1998 and other sources. Public Land Survey System and survey control current as of 1991. Boundaries current as of 2002.

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

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SCALE 1:24,000
1 MILE
7000 FEET
1 KILOMETER

BASE MAP CONTOUR INTERVAL 10 FEET
SUPPLEMENTARY CONTOUR INTERVAL 5 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

Geology based on field work by B. Brandon Curry and Henry D. Fineberg, 2010.

Digital cartography by Jennifer E. Carrell and Jane E.J. Domier, Illinois State Geological Survey.

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ADJOINING QUADRANGLES
1 Geneva
2 West Chicago
3 Lombard
4 Aurora North
5 Wheaton
6 Aurora South
7 Normantown
8 Romeoville

APPROXIMATE MEAN DECLINATION, 2013

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