

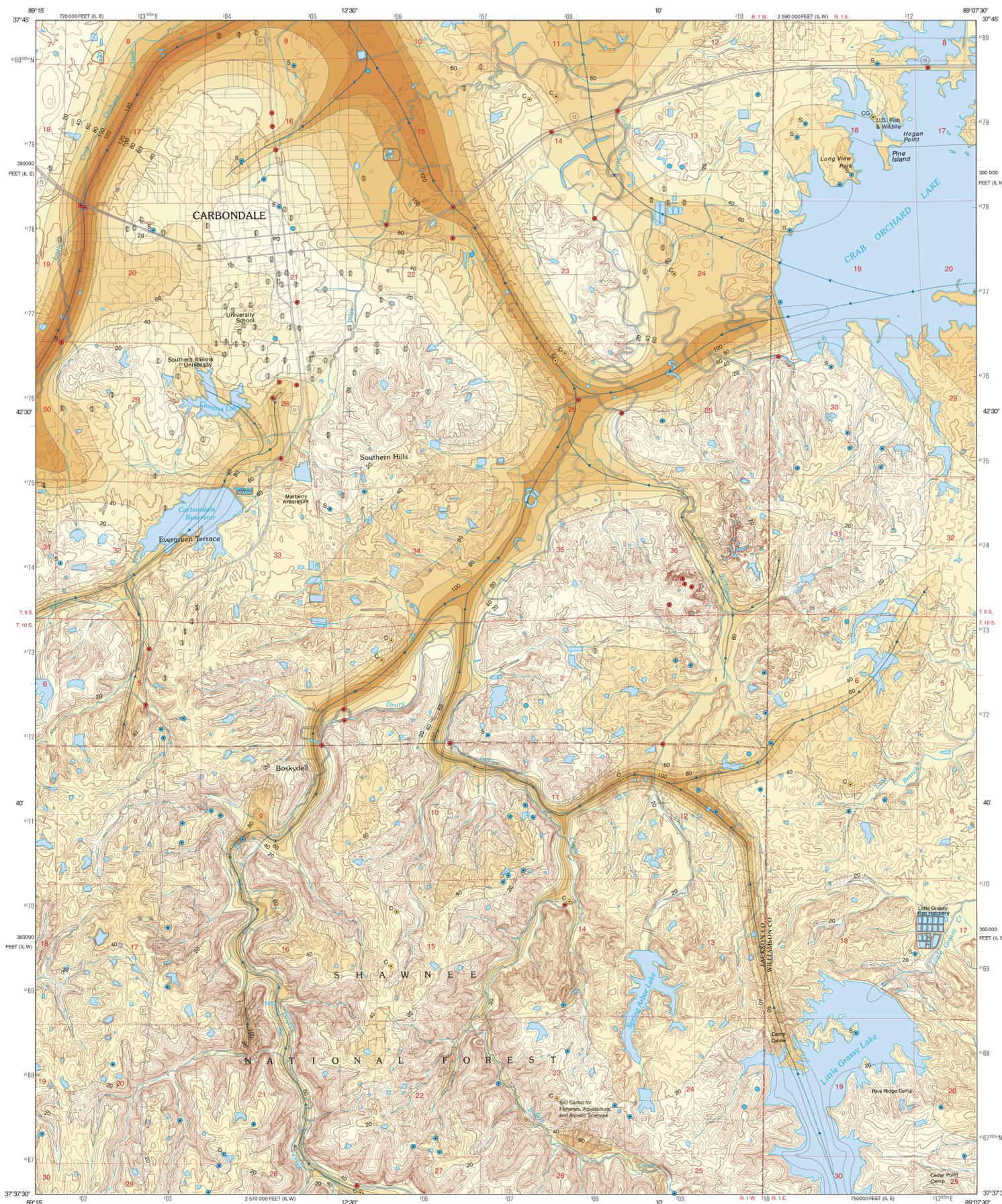
# DRIFT THICKNESS OF CARBONDALE QUADRANGLE

## JACKSON AND WILLIAMSON COUNTIES, ILLINOIS

Prairie Research Institute  
ILLINOIS STATE GEOLOGICAL SURVEY

Illinois Geologic Quadrangle Map  
IGQ Carbondale-DT

W. John Nelson  
2013



### Introduction

This map shows the thickness of un lithified Quaternary surficial sediments in the Carbondale 7.5' Quadrangle, southern Illinois. These sediments include diamicton (till), windblown silt (loess), deposits of glacial meltwater lakes, and stream deposits (alluvium). For further information on Quaternary materials in the Carbondale Quadrangle, the reader is referred to the surficial geologic map (Nelson 2013).

### Data Sources

Data from more than 300 test holes were used to construct this map. Among the data sources are logs from water wells, stratigraphic test holes, and borings for coal, oil, and gas. These records are on file at the Geologic Records Unit of the Illinois State Geological Survey (ISGS). Wherever possible, locations of control wells were verified in the field. Data from bridge and highway borings made by the Illinois Department of Transportation were obtained from the District 9 Office in Carbondale. Maps by Flowers (1968) indicate depth to bedrock in several dozen borings in the northern half of the quadrangle. Wen-June Su of the ISGS furnished depth of refusal (minimum depth to bedrock) for 13 shallow borings in and near the city of Carbondale. Logs are not available for the borings used by Flowers (1968) and Su. Additional information on drift thickness was gleaned from outcrop study in the field. All data were posted to work maps and contoured by hand.

### Overall Pattern

The southern limit of Pleistocene glaciation passes through the southern part of the Carbondale Quadrangle (Willman and Frye 1980, Nelson 2013). Bedrock ridges of the Shawnee Hills blocked further southward advance of the ice. As a consequence, glacial sediment (diamicton or till of the Glasford Formation) is thin and patchy in the southern part of the map area. Bedrock outcrops are numerous, mantled by wind-blown silt (loess), which, in most places, is less than 10 feet thick. Thus, modern and preglacial topography in the southern part of the Carbondale Quadrangle are closely similar. Thick alluvial and lacustrine sediments occur along the valley bottoms of Drury Creek and other large streams.

The northern part of the quadrangle has a lower elevation, less topographic relief, and thicker drift—more than 40 feet in most places—although several upland areas have less than 20 feet of drift. Uplands are covered with Glasford Formation and loess, whereas valleys contain lake sediments (Equality Formation) and stream sediments (Cahokia Formation).

### Preglacial Valleys

The most noteworthy features shown on this map are preglacial valleys, which, in several cases, differ markedly from modern drainage.

Prior to Illinoian glaciation, the Big Muddy River flowed southwest across the northwest corner of the Carbondale Quadrangle. This buried valley presently is occupied by Little Crab Orchard Creek, which flows northeast. The bottom of the buried valley (in bedrock) is more than 150 feet below the present land surface. West of the map area, the preglacial Big Muddy coursed into the Pomona Quadrangle (Seid et al. 2007), where it entered the valley of present Cedar Creek south of the glacial limit. Thence the Big Muddy followed an entrenched valley west to the Mississippi River.

Crab Orchard Creek originally joined Drury Creek on the southeast side of Carbondale. The combined streams then flowed northwest to join the Big Muddy River just north of the map area. After glaciation, Crab Orchard Creek shifted to its present course, approximately one mile east.

Piles Fork currently flows northeast to Crab Orchard Creek. Before glaciation, a stream in the western part of this valley flowed southwest, directly to the ancestral Big Muddy.

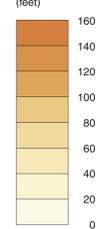
Instead of running northeast as it does presently, Little Grassy Creek originally veered toward the west to join Indian Creek. Modern Sycamore Creek flows north, crossing preglacial Little Grassy Creek at nearly a right angle. Hence, Sycamore Creek is entirely a postglacial stream.

Less dramatic course changes took place on Drury and Indian Creeks in the southern half of the map area. To cite one example, south of Boskydell near the center of the SW 1/4 of Section 9, Drury Creek flows on Pennsylvania sandstone through a short, narrow gorge. On the ridge about 700 feet northwest, a water well penetrated 105 feet of drift overlying bedrock. The bedrock surface in this well is at about 355 feet elevation, or 50 feet below the present valley bottom. Thus, the well was drilled into a buried, preglacial valley. Following glaciation, Drury Creek was diverted southeast of its original channel, where it cut a new gorge into sandstone.

### References

- Flowers, G.D., 1968, The depth to bedrock and the nature of the surficial material in the Carbondale, Illinois area: M.S. thesis, Southern Illinois University, Carbondale, 85 p.
- Nelson, W.J., 2013, Surficial geology of Carbondale Quadrangle, Jackson and Williamson Counties, Illinois: Illinois State Geological Survey, Illinois Geologic Quadrangle Map, IGQ Jackson-SG, 2 sheets, 1:24,000.
- Seid, M.J., W.J. Nelson, and J.A. Devera, 2007, Bedrock geology of Pomona Quadrangle, Jackson County, Illinois: Illinois State Geological Survey, Illinois Preliminary Geologic Map, IPGM Pomona-BG, 2 sheets, 1:24,000.
- Willman, H.B. and J.C. Frye, 1980, The glacial boundary in southern Illinois: Illinois State Geological Survey, Circular 511, 23 p.

### Drift Thickness



### Data Type

- Stratigraphic boring
- Water-well boring
- Engineering boring
- ⊥ Probe test hole
- SSC FOX Labels indicate samples (s), geophysical log (e), or core (c). Label name indicates well name. Dot indicates location accurate within 100 feet.

### Line Symbols

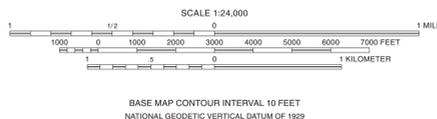
- dotted where concealed
- Axis and flow direction of preglacial stream

Note: Well and boring records are on file at the ISGS Geological Records Unit and are available online from the ISGS website.

Base map compiled by Illinois State Geological Survey from digital data (Raster Feature Separates) provided by the United States Geological Survey. Topography compiled 1963. Planimetry derived from imagery taken 1993. PLSS and survey control current as of 1996.

North American Datum of 1927 (NAD 27)  
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

Recommended citation:  
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Geology based on log evaluation by W. John Nelson, 2000–2001.

Digital cartography by Jane E. Johnshoy Dornier and Trisha S. Rentschler, Illinois State Geological Survey.

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### ROAD CLASSIFICATION

- U.S. Route
- State Route
- Local road

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ADJOINING QUADRANGLES		
1	2	3
4	5	6
7	8	

1 Murphysboro  
2 De Soto  
3 Herrin  
4 Pomona  
5 Crab Orchard Lake  
6 Cobden  
7 Makanda  
8 Lick Creek

115°  
MAGNETIC DECLINATION  
APPROXIMATE MEAN DECLINATION, 2013