

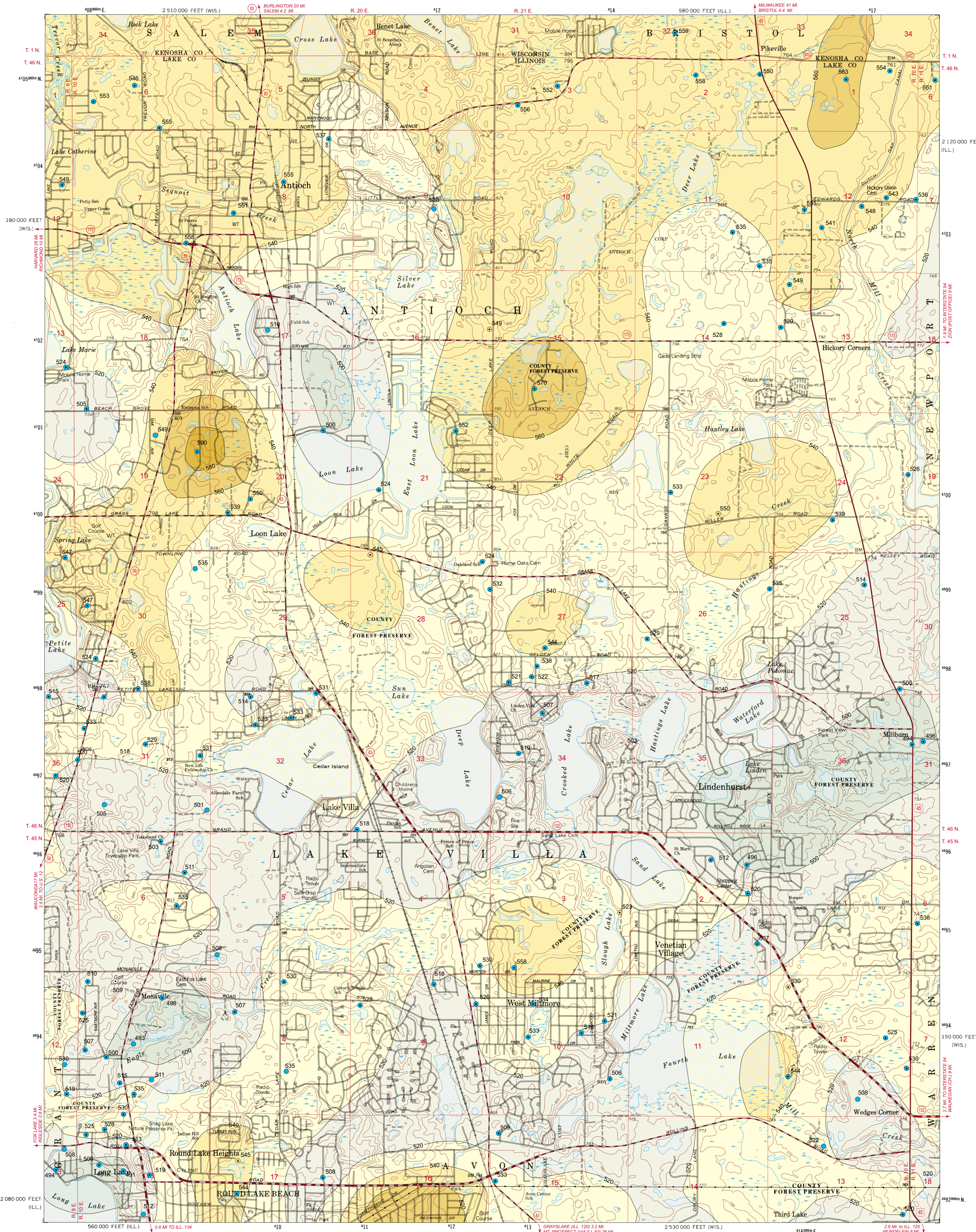
BEDROCK TOPOGRAPHY OF ANTIOCH QUADRANGLE

LAKE COUNTY, ILLINOIS AND KENOSHA COUNTY, WISCONSIN

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

Illinois Preliminary Geologic Map
IPGM Antioch-BT

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2004



Bedrock Topography

This map shows the mean elevation above sea level of bedrock for the Antioch Quadrangle. The bedrock is undifferentiated Silurian-age dolomite (Larsen, 1973; Willman, 1973) and is entirely covered by glacial drift. Previous mapping of the bedrock topography is limited and has only been completed at the county scale (Leetaru, in review).

Total relief of the bedrock surface on the Antioch Quadrangle area is about 100 feet with elevations ranging from about 490 to 590 feet above mean sea level. Bedrock elevations above 540 feet are more common in the northern part of the quadrangle than in the southern where a buried east-west trending bedrock valley is the most prevalent subsurface feature. The highest point (590 ft) mapped is in the west-central portion of the quadrangle, while the lowest point (491 ft) is found in the southwest corner of the study area.

Methodology

During data compilation and analysis, we examined the records of 497 boreholes that were located either on the quadrangle or within a 1-mile buffer (fig. 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, with 120 of these being located within the quadrangle boundaries. The additional 71 bedrock borings within the 1-mile buffer were used to better characterize polygon edges 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 provided 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 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. The top of bedrock elevation was calculated by subtracting the depth to bedrock from the surface elevation, which was derived from a digital elevation model (DEM). To generate the bedrock surface, data points were interpolated using the spline with tension method and the resulting grid then was contoured at 20-ft intervals. Based on subsequent analysis, the contours in a few areas were modified to more realistically portray the bedrock topography. All data are on file at the Geological Records Unit of the Illinois State Geological Survey.

Acknowledgments

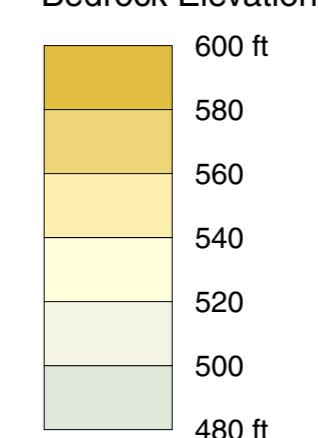
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References

- Larsen, J.I., 1973. Geology for Planning in Lake County, Illinois: Illinois State Geological Survey, Circular 481, 43 p.
- Leetaru, Hannes, E., Michael L. Sargent, Mathew H. Riggs, and Dennis R. Kolata, in review. 3D Visualization of Bedrock Resources in Lake County, Illinois: Illinois State Geological Survey Open-File Map, 2 sheets.
- Willman, H.B. 1973. Rock Stratigraphy of the Silurian System in Northeastern and Northwestern Illinois: Illinois State Geological Survey Circular 479, 55 p.

Bedrock Elevation



Data Type

- Stratigraphic boring - to bedrock (orange dot)
- Water well (blue dot)
- Water well - to bedrock (blue dot with center)
- Other - to bedrock (white dot with center)

Note: Data symbol labels indicate elevation above sea level.

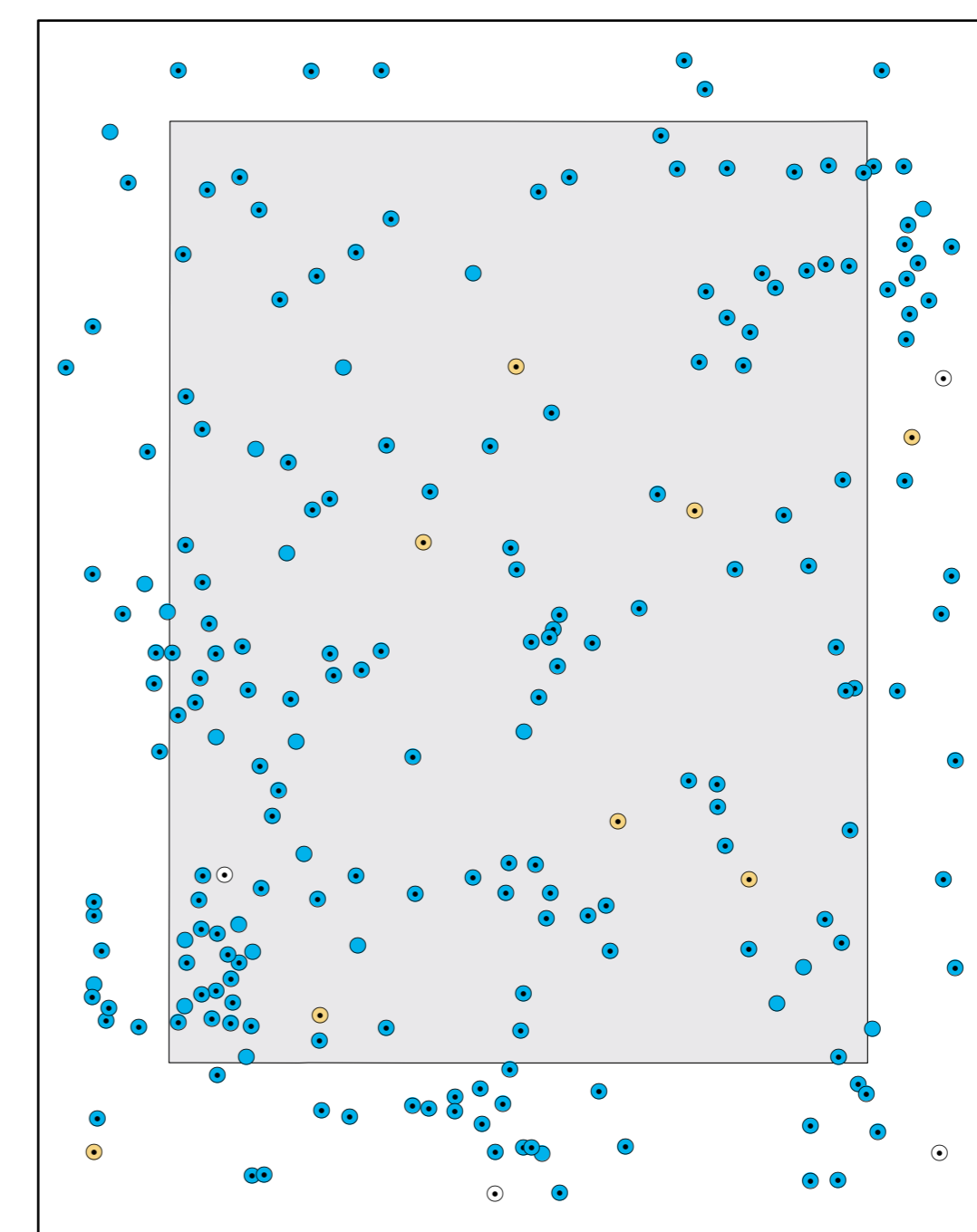
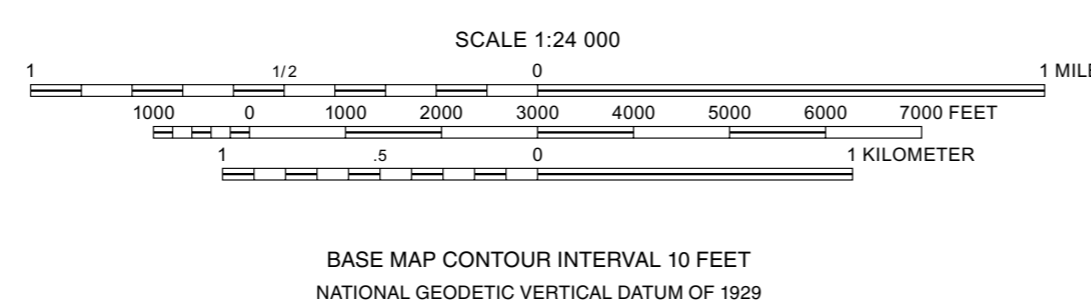


Figure 1 Map showing the location of borings used to model the bedrock topography. Borings are symbolized in blue for water wells, orange for stratigraphic borings and white for 'other' borings.

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 1986.

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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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.

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ADJOINING QUADRANGLES

- Silver Lake
- Feddick Lake
- Pleasant Prairie
- Fox Lake
- Waukegan
- Wauconda
- Grayslake
- Libertyville

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