

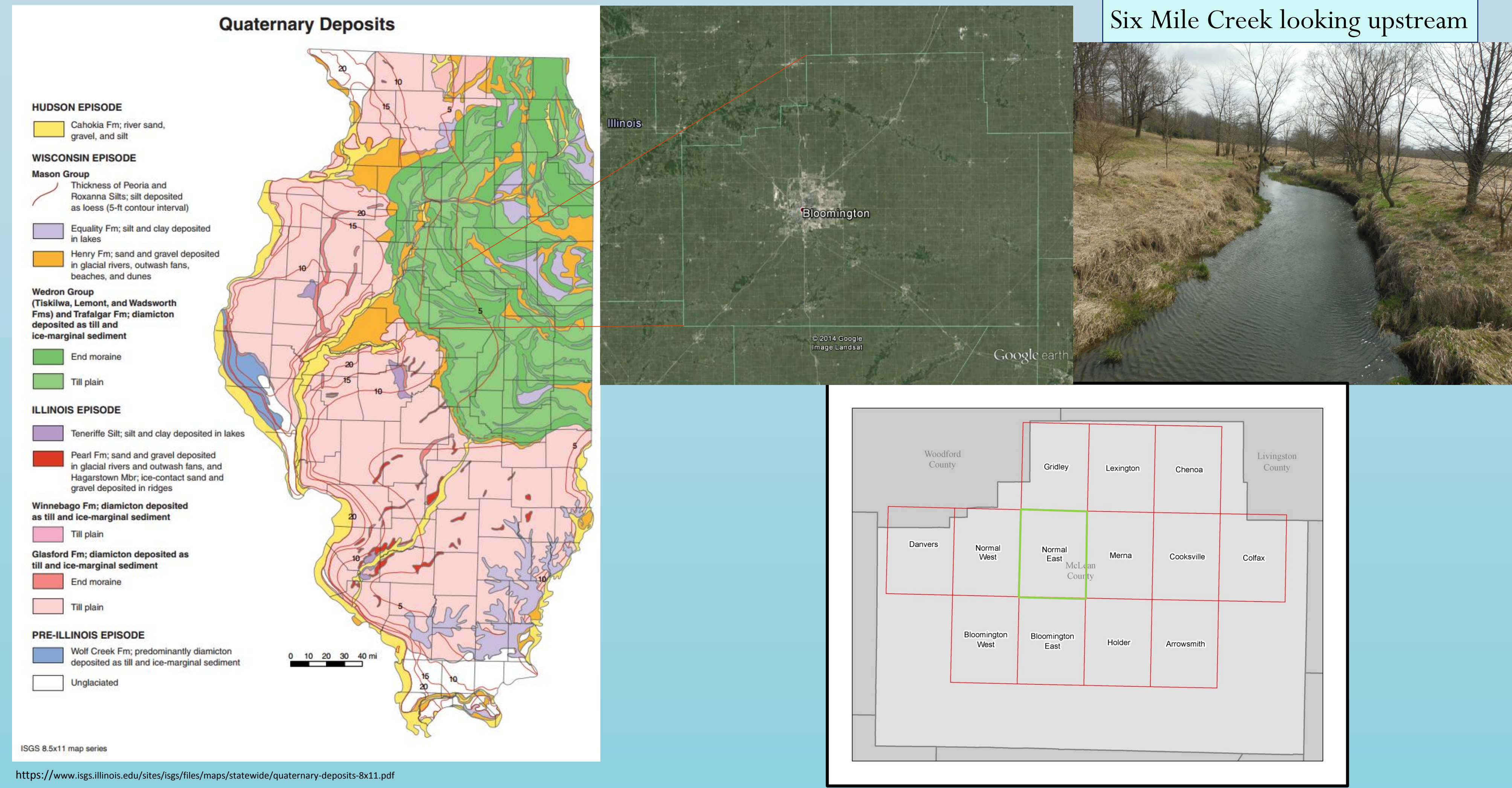
Surficial Geologic Map of the Normal East 7.5 Minute Quadrangle, McLean County, IL

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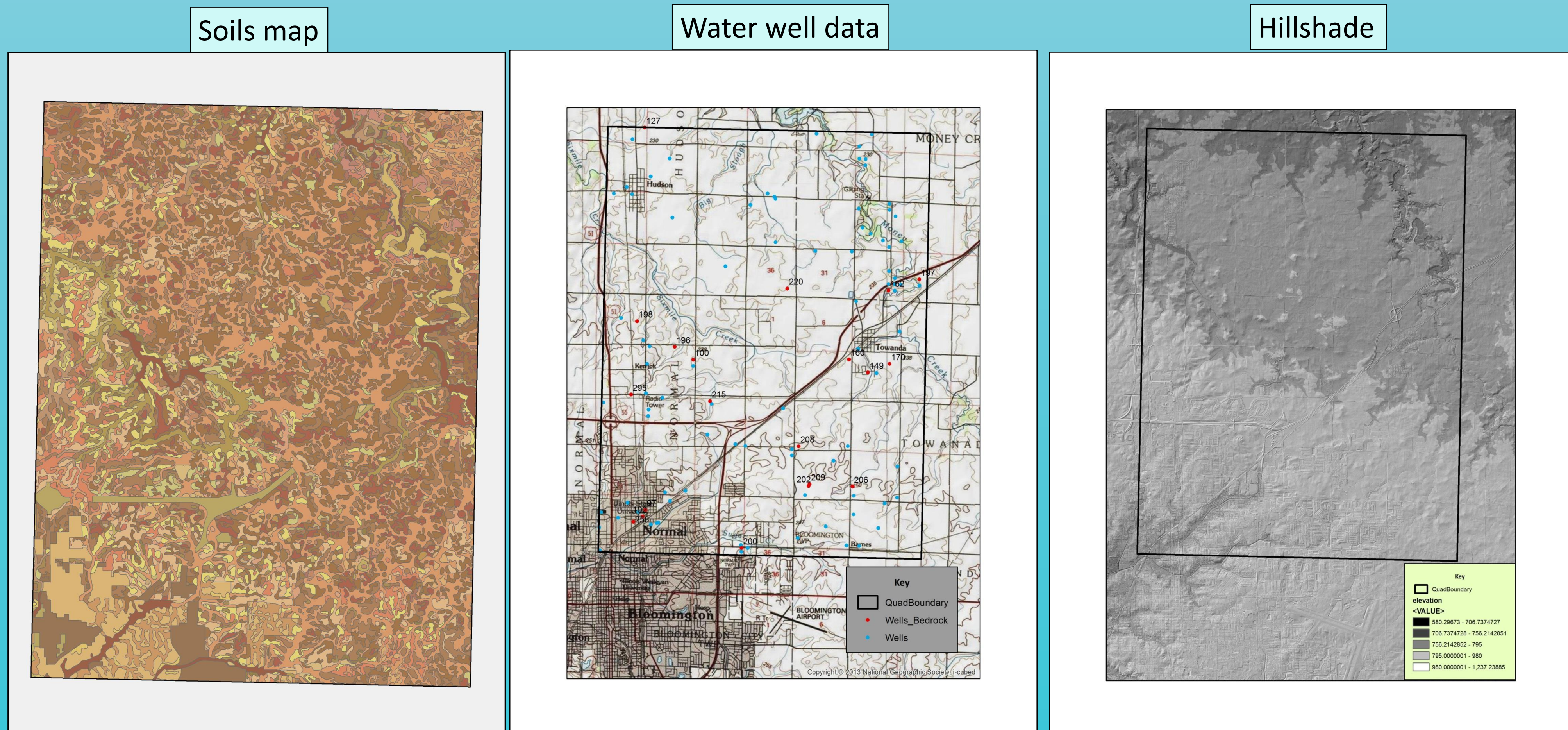
Abstract

This study involved the construction of a surficial geologic map of the 7.5 minute Normal East Quadrangle in McLean County, Illinois which covers 40°30' to 40°37'30" latitude and 89°00' to 88°52'30" longitude. This area includes part of the Bloomington moraine, which is a recessional moraine of the Wisconsin glacial stage. Methods used in the construction included water well data, conversion of soil survey, and field outcrop descriptions. There are four major sediment units exposed in the Normal East Quadrangle, all Quaternary in age. These formations are 30 to 90 meter in thickness and; include the Peoria Silt, Wedron Group, the Cahokia Alluvium, and the Henry Formation. Pennsylvanian bedrock rests beneath these sediments. The Peoria Silt is yellow clay which is interpreted to be loess that is 0-6 meters in thickness. The Peoria Silt is exposed over much of the Quadrangle. The Wedron Group consists of the Lemont and Tiskilwa Formations. In the Normal East Quadrangle, only the Lemont Formation is exposed. Lemont is diamict consisting of gray, black, blue, brown, and green clay which is interpreted to be silty loess combined with loamy till. This till is as much as 60 meters thick, found in both the surface and subsurface, and is typically found in ground moraines which make up most of the Normal East Quadrangle. The Cahokia Formation consists of gravel, sand, and yellow, blue, black, green, and gray clay which is interpreted to be clayey colluvium and silty alluvium that has variable thickness. Alluvium is primarily found along the major creeks, including Sugar Creek, Six Mile Creek, and Money Creek. The Henry Formation is sand and gravel which is interpreted to be valley train outwash. Outwash gravel is primarily found in both the surface and subsurface, along Sugar Creek and in other stream terraces or outwash plains.

Introduction: The 7.5 Minute Normal East Quadrangle is located in McLean County, central Illinois. The landscape in this area was created by the glaciation that most recently advanced into the area nearly 25,000 years ago. The Wisconsin Glaciation caused mass transport and burial of earth materials as it moved south. While the glaciers were stagnant, meltwater drained creating long, narrow deposits of sand and gravel, called eskers. The glaciers left behind deposits of glacial debris, known as moraines, as they retreated (<https://www.isgs.illinois.edu/outreach/geology-resources/glaciers-smooth-surface>).

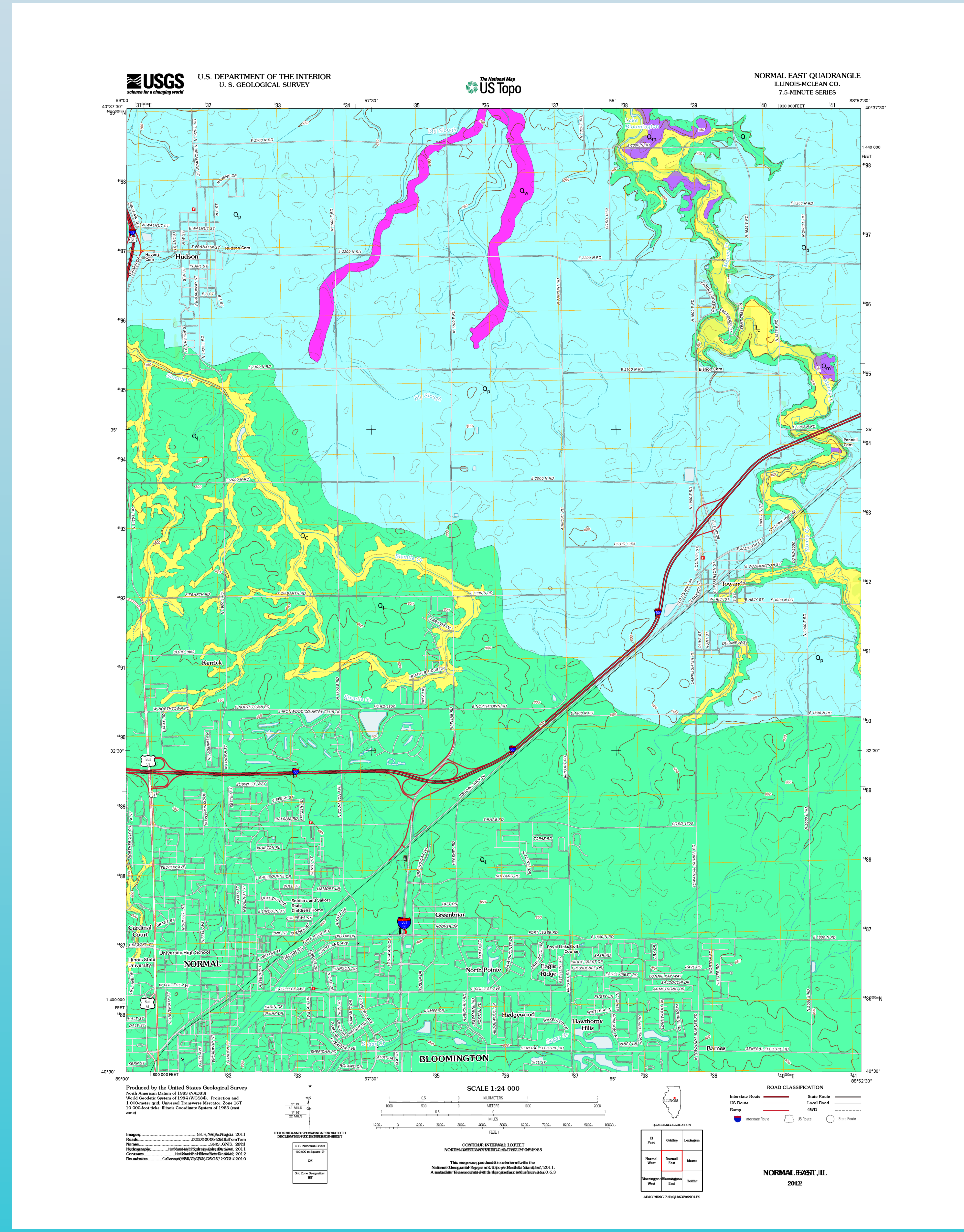


Methods: Soil survey GIS layers were converted into formations based on parent material. Then topographic maps were used to digitize the borders in more detail. Water well data were primarily used to verify geologic interpretations and were correlated stratigraphically. Glacial landforms, loess covers, and terraces were identified using a Digital Elevation Model (DEM) raster and hillshade derived from 2012 LiDAR data.



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Discussion: Based on long, irregular morphology and sand and gravel about 1 meter (3 feet) thick, there are two probable eskers between Big Slough and Lake Bloomington in the northern area. The southwest corner of the map is heavily urbanized; however, it is most likely made of undifferentiated Batestown and Tiskilwa due to the past glacial advances and re-advances. Each member in the Lemont Formation has been interpreted to represent a glacial advance during the Wisconsin glaciation. The Eureka and Normal moraines could both be thought of as separate lobes that were formed during the glacial advance that the Batestown Member represents. The Eureka Moraine is the northern lobe and the Normal Moraine is the southern lobe (Not separated on the map).



Results: Normal East's surficial geology primarily consists of the Cahokia Formation, Peoria Silt, the Wasco and Mackinaw Members of the Henry Formation, and the Batestown Member of the Lemont Formation. All of these units are Quaternary in age. In the subsurface, Quaternary Tiskilwa Formation, Illinoisan units, and Pennsylvanian bedrock are present. Cahokia is a modern alluvium stream deposit, found at low elevations, made of bedded silts, clays, and gravel. Peoria Silt is a loess deposit consisting of yellowish brown and gray silt with some sand. The Peoria is commonly found overlying the Lemont Formation, especially in the northern area of the Normal East Quadrangle. The Wasco Member of the Henry Formation consists of ice-contact sand and gravel making up glacial landforms such as kames and eskers. The Mackinaw Member of the Henry Formation is an outwash deposit consisting of coarse sand and gravel. In Normal East, the Mackinaw makes up terraces found near Money Creek. The Batestown Member is the oldest member of the Lemont Formation. This gray till diamict primarily makes up the recessional-terminal Eureka-Normal Moraine that trends northwest-southeast. Also, surrounding the terraces and alluvium in Money Creek, more of the Batestown is exposed. Both Lemont and Tiskilwa make up the Wedron Group. The gray to red diamict of the Tiskilwa Formation is the oldest unit in the Wedron Group. The Illinoisan till consists of the Glasford Formation and the Illinoisan outwash consists of the Pearl Formation. The Pennsylvanian bedrock consists of the McLeansboro Group which includes the Mattoon, Bond, Shelburn-Potoka, and Carbondale Formations. This is undivided coal, shale, and limestone.

Reference:
Hansel, A.K. and Johnson, W.H., 1996, WEDRON AND MASON GROUPS: Lithostratigraphic Reclassification of Deposits of the Wisconsin Episode, Lake Michigan Lobe Area: Illinois, Illinois Department of Natural Resources, 4, 25-57 p.