



SURFICIAL MAP OF THE STREATOR NORTH 7.5 MINUTE QUADRANGLE, LASALLE COUNTY ILLINOIS.

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Abstract

The Streator North 7.5 minute Quadrangle is located in LaSalle County Illinois between 88° 45' and 88° 52' 30" west longitude and 41° 15' and 41° 07' 30" north latitude. The purpose of this research was to construct a detailed surficial geologic map of the Streator North 7.5 minute Quadrangle at a 1:24,000 scale using the current stratigraphic classification. This project was a continuation in an effort to map all of LaSalle County at this scale. This was accomplished using a combination of techniques. Soil maps and descriptions found in the USDA Soil Survey maps were used to construct a preliminary geologic map. Based on each description the parent material of each soil type was determined. Traditional field mapping and interpretations of well log data were then used to check this initial map. Five stratigraphic units were identified in this area; Cahokia Alluvium (QhC), Peoria Silt (Qps), Equality (Qe), Lemont (Qly) and Carbondale Formations (Pc). The Cahokia Alluvium was found along the Vermillion River and Prairie Creek. The majority of the area consists of the Lemont Formation which is a massive red to gray diamicton. The Equality formation is red to gray bedded silt and clay. This formation is mainly located in the northeastern and southwestern portions of the map. The Peoria Silt is massive yellow loess which is five or more feet thick. This is the sparsest of the Quaternary formations and is located in small sections throughout the entire area. Few outcrops of the Carbondale Formation bedrock were located along the Vermillion River. Funding for this research was provided by the Illinois State Geologic Survey and the United States Geologic Survey.

Introduction/Objectives

This investigation is part of the Illinois State Geological Survey (ISGS) priority mapping project for the upper Illinois River Valley (LaSalle, Putnam, and Bureau counties). The upper Illinois River Valley mapping project is coordinated by Richard C. Berg, Senior Geologist at the ISGS. The ISGS has systematically evaluated 1,071 7.5' quadrangles in the state on the basis of twenty-three economic, educational, environmental, geologic, and hazard factors (ISGS 1992 Special Report #1). Based on these factors all of the quadrangles in the upper Illinois River Valley which include the Illinois River and its major tributaries (including the Streator North Quadrangle) were classified among those in the state where there is the greatest need for large-scale (1:24,000) geologic mapping. The EDMAP program is supporting this mapping projects, and has supported many in the past.

This area was last geologically mapped in 1942 as part of the Streator 15 minute Quadrangle at a 1:62500 scale. Since then the stratigraphic nomenclature has been revised. The primary objective of this investigation is to construct a detailed surficial geologic map of the Streator North 7.5 minute Quadrangle at a 1:24000 scale using stratigraphic units that are consistent with the current stratigraphic nomenclature. Subordinate purposes of this investigation are to delineate possible resources environmental concerns, and to provide a basis for future field mapping and hydrogeologic, structural, stratigraphic, and geomorphic research.

Geology

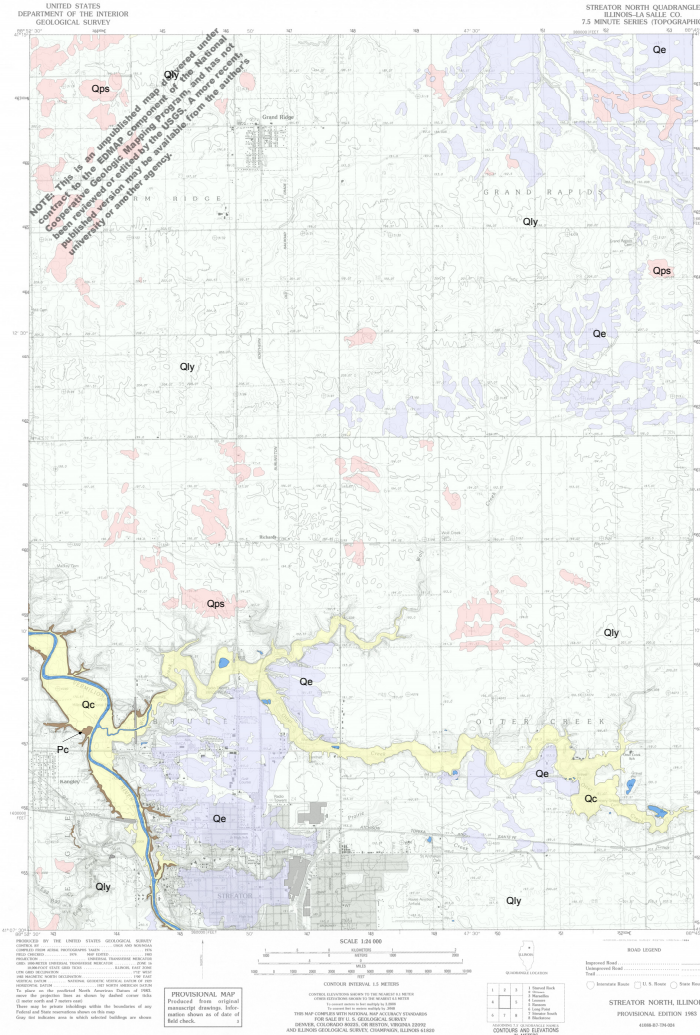
The topography of the study area is flat with some low rolling hills, typical of the till planes of the Central Lowland province. This topography is due to the multiple episodes of glaciation that the area experienced. The main topographic features of the area are the Lake Pontiac Plain, which covers the majority of the study area and Chatsworth Moraine, which is on the eastern side of the quadrangle, and the Farm Ridge Moraine to the North.

The Quaternary material in this study area is Wisconsin and Illinois in age. The Wisconsin material is divided into two groups, the Wedron and the Mason Groups. The Wedron Group consists of ice contact deposits and the Mason Group consists of eolian, lake and outwash deposits; these two formations have an intertonguing relationship. In this area the Wedron Group will be mapped as undivided as the Lemont Formation. The Mason Group units present in this area are the Peoria Silt, the Henry Formation, and the Equality formation. The Peoria Silt is an eolian loess deposit; the Equality Formation is a lake deposit; and the Henry Formation is an outwash deposit but is not present at the surface in this area. The Illinois Age material in this area is the Pearl Formation which is a glacial outwash formation. The Pearl Formation in fills the Ticona Channel, a buried bedrock valley which is in part located at the northern section of the Streator North Quadrangle, this formation is not present at the surface in this area.

The bedrock in this area is Pennsylvanian aged Carbondale Formation. Due to the rising and falling sea level this formation consists of cyclic shale, limestone, coal, sandstone, and underclay. Numerous coal seams from this formation have been mined extensively in and around the town of Streator and throughout Illinois.

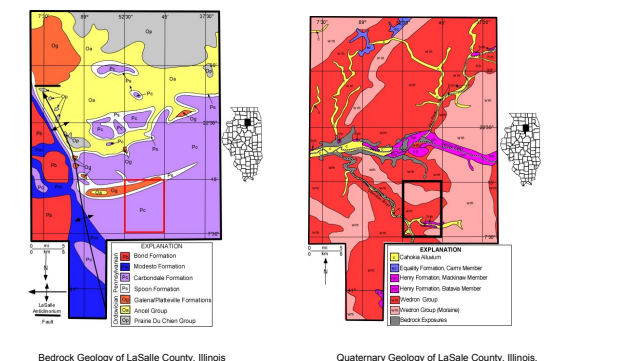
Site Description

The Streator North 7.5' Quadrangle is located in LaSalle County, Illinois. This study area is within the area between 88° 45' and 88° 52' 30" west longitude and 41° 15' and 41° 07' 30" north latitude. The land in this area is mostly used for agricultural purposes. The Vermillion River flows northwest through the southwestern edge of the Quadrangle. The main urban areas are the town of Streator, which is located on at the southern edge of the quadrangle, the town of Grand Ridge, which is located on the northern side of the quadrangle, and the town of Kangley, which is located on the eastern edge of the quadrangle.



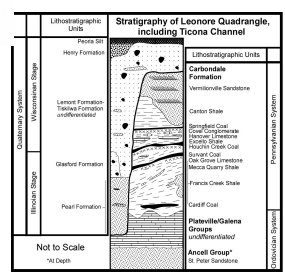
Lithostratigraphic Units

Material	Lithostratigraphic Units And Interpretations
Dark gray to black stratified silt, sand, and some gravel	Qc Cahokia Formation: Forms terraces inside of meanders and at the mouths of tributaries. (modern stream deposits) Thickness: 0-6 m.
Brown to gray to red bedded silt and clay	Qe Equality Formation: Lacustrine sediment deposited in glacial and postglacial lakes. Lonestones (isolated stones) and lenses of gravel, sand, diamicton, organic debris, and wood are present locally in the silt and clay. Thickness: 2-20 m.
Light yellow tan to gray silt.	Qps Peoria Silt: Predominantly proglacial loess derived primarily from meltwater channels. In some areas it may contain small amounts of eolian sand, and locally it contains colluviated and sheetwash silt. Thickness: 0-10 m.
Calcareous, gray fine to coarse textured (silty clay to sandy loam) diamicton.	Qly Lemont Formation: Subglacial and ice-marginal facies of several offlapping glaciogenic sequences. Predominant clast lithologies consist of Paleozoic shale and carbonate. Locally is overlain by illinoian till. Thickness: 0- 60 m.
Sandstone, limestone, shale, and coal	Pc Carbondale Formation: Alternating layers of sandstone, limestone, shale, and coal. Thickness:
	Contact
	Water
	Disturbed Land



Methodology

- Soils maps obtained from the United States Department of Agriculture (USDA) and the topographic map of the Streator North 7.5 minute Quadrangle obtained from the ISGS were scanned at a high resolution and saved as a Tagged Image Format (TIF) file and imported into *Global Mapper*. To minimize distortion the two scanned images were manually geo-rectified in this program using a digital raster graphic (DRG) obtained from the ISGS and common points such as road intersections which were on both images and the DRG.
- The soils map consisted of polygons which had a number corresponding to the particular soil type within it. Based on the description of the soil given in the soil survey book the parent material was determined. The soils map was hand colored based on the parent material of each soil.
- The geo-rectified soils map and the topographic map were imported into *Canvas 9.0*.
- Groups of soils were traced in *Canvas 9.0* and assigned certain colors to represent the Quaternary aged formations in the area and the Pennsylvanian bedrock.
- This map then check using water well log data obtained by the ISGS.
- Field checking is in progress.



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