Surficial Geologic Map of the 7.5 Minute Roanoke Quadrangle in Woodford County, IL

Abstract
This study involved the construction of a geologic map of the Roanoke 7.5 minute quadrangle in Woodford County at a scale of 1:24,000. This area contained sections of the Eureka Moraine which is included in the Wisconsin glacier event. Methods used to construct this mapping area included using soil data from soil survey, well data, as well as LiDAR data. There were four major sediment formations that were found at the subsurface in the Roanoke quadrangle. The formations include the Cahokia Alluvium, the Wedron Group (Lemont Formation), The Henry Formation, and finally the Peoria formation. The Cahokia Alluvium consisted of interbedded sand, silt, clay, and gravel that were deposited by glacial loess. Alluvium is found along the river systems including West Branch Panther Creek. The Wedron Group consist of the Tiskilwa and Lemont formations but only the Lemont formation is found in the subsurface of the Roanoke quadrangle. The Lemont formation is a diamicton that ranges from blue to brown clay and is interpreted as a till deposit. The Henry formation consists of an interbedded sand, gravel, and silt. This is interpreted as a glacioluvial, and was formed when the melting of glaciers carried the deposits downstream. Finally the Peoria formation has been described as a light tan or brown silt to sandy silt loam deposits.

Introduction: The 7.5 minute Roanoke Quadrangle is located in Woodford county Illinois. The Wisconsin Glaciation was the main factor in creating the landscape and the caused mass transport as it moved down towards middle and lower Illinois. While the glaciers were stagnant, meltwater drained creating large, narrow deposits of sand and gravel, called eskers. As the glaciers retreated left behind moraines that make up this area.

Method: First I took the soil survey from GIS and converted into formations based on parent material in the area. The use of topographic maps and moraine maps were used to add more detail to the shape of the where each formation lies within the given area. Along with LiDAR data these resources came together to create the final map.

Results: Roanoke’s surficial geology primarily contains the Wasco and Mackinaw Members of the Henry Formation, the Hager member of the Lemont formation, the Peoria silt of the Henry formations and finally the Cahokia formation. All of these units were formed by the Wisconsin glacier event and are Quaternary in their age. The main formations in Roanoke is the Lemont and Hager formations. The Hager member is a red to gray clay loam diamicton, which typically contains gravel, sand, and silt. This formation is directly connected to the glacial ice and is contained in the subsurface. The Lemont formation is a silty clay loam diamicton that is lightly covered by loess. The Lemont formation consist of In the subsurface, Quaternary Tiskilwa Formation, Illinoian units, and Pennsylvanian bedrock are present. The Cahokia is an alluvium stream deposit, that consists of bedded silts, clays, and gravel. The Peoria Silt is a loess deposit consisting of yellowish brown and gray silt with some sand. The Wasco Member of the Henry Formation is characterized by glacial landforms such as kames and eskers in the area and is found in the upper left hand corner of the mapping area. The Mackinaw Member of the Henry Formation is found surrounding the river system and is an outwash deposit consisting of coarse sand and gravel. Both Lemont and Tiskilwa make up the Wedron Group but only the Lemont formation is found in the mapping area.

Discussion: This area was formed by the Wisconsin glacial event. The advancements and the re-advancements of the glacial event created the separate moraines and formations that run through this area. Each separate Lemont formation is representing different advances in the glaciation period. In this area the Lemont formation is broken up into the Lemont and the Hager member is separate in the top right hand corner. The Henry formation in this area is classified by the Wasco facies that created a kame in the top right hand corner. The lower left hand corner includes mackinaw facies (henry formation) that are made of ice outwash deposits.

References: http://isgs.illinois.edu/sites/isgs/files/maps/statewide/quaternary-deposits.8x11.pdf

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