

2003 Seattle Annual Meeting (November 2–5, 2003)

**Paper No. 32-9**

**Presentation Time:** 8:00 AM-12:00 PM

## **THREE-DIMENSIONAL GEOLOGIC MAPPING AND GROUNDWATER APPLICATIONS IN NORTHEASTERN ILLINOIS**

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As a pilot study of the Central Great Lakes Mapping Coalition, we created a 3-D stratigraphic model of the glacial materials above bedrock for the Antioch 7.5' quadrangle. Glacial drift is 200 to 350 feet thick and contains multiple aquifers that are the primary groundwater source for this rapidly developing area of northeastern Illinois. The glacial deposits of this region represent three major events of the last (Wisconsin Episode) glaciation during which tills and proglacial lacustrine and fluvial sediments were deposited between about 25,000 and 14,000 radiocarbon years ago. These materials are classified into intertongued lithostratigraphic units (diamictos and sands and gravels), which based on their physical properties and distribution often dictate whether or not aquifers exist. Often the units can be delimited from drillers' logs on the basis of material, color, and water-bearing characteristics. The model was created primarily on data from water-well drillers' logs (275 with good descriptions were selected from several thousand logs). Higher-quality data from test borings to bedrock (8) and natural gamma logs (31) provided key stratigraphic control to better interpret the drillers' logs. After the model was developed, the entire water-well database was further analyzed to determine the percentage of wells in each section that were screened in the various units. The 3-D model illustrates the complexity of units in the glacial drift. Geologic mapping in the region provides decision-makers the critical information necessary to manage and protect groundwater resources and to explore for new sources.

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Session No. 32--Booth# 116

[Geological Mapping: Key to Successful Management of Water and Land Resources \(Posters\)](#)

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