

2004 Denver Annual Meeting (November 7–10, 2004)

Paper No. 249-4

Presentation Time: 1:30 PM-5:30 PM

USING 3-D MODELS TO VISUALIZE THE HYDROGEOLOGIC SETTING FOR GROUNDWATER RESOURCES PLANNING

[HANSEL, Ardith K.](#), STIFF, Barbara J., LARSON, David R., BARNHARDT, Michael L., and STUMPF, Andrew J., Illinois State Geol Survey, 615 E. Peabody Dr, Champaign, IL 61820, hansel@isgs.uiuc.edu

As a pilot study of the Central Great Lakes Geologic Mapping Coalition, we are creating 3-D models of the glacial materials above bedrock for 7.5' quadrangles in Lake and McHenry Counties in northeastern Illinois. The glacial drift is 150 to 350 feet thick and contains several relatively thick, areally extensive sand and gravel aquifers that are significant sources of water supply for this rapid-growth area. Data used in the modeling are of highly variable quality and primarily are from water-well records (including drillers' logs), logs of stratigraphic test borings, natural gamma logs, and shallow seismic reflection profiles. Our 3-D mapping has revealed a succession of glacial sediments representing three major events of the last (Wisconsin Episode) glaciation. Tills of these events are generally lithologically distinct and intertongued with proglacial lacustrine and fluvial facies. Saturated sands and gravels of the fluvial facies are significant aquifers in the mapping area. Stacking and burial of debris-rich ice along the western flank of the Lake Michigan lobe during each event also produced abundant reworked supraglacial and ice-marginal facies, which add complexity to the glacial succession. To understand the subsurface distribution of these glacial deposits and visualize them for groundwater applications, we are creating lithologic, stratigraphic, sedimentary facies, and hydrostratigraphic models. We are using a combination of the different types of 3-D models plus histograms, pie charts, and vertical slices to help us provide decision-makers the critical geologic interpretations necessary to understand the hydrogeologic setting of the glacial-drift aquifers and to protect this vital groundwater resource.

[2004 Denver Annual Meeting \(November 7–10, 2004\)](#)

[General Information for this Meeting](#)

Session No. 249--Booth# 103

[Geological Mapping: Providing for Successful Water and Land Resource Planning \(Posters\)](#)

Colorado Convention Center: Exhibit Hall

1:30 PM-5:30 PM, Wednesday, November 10, 2004

Geological Society of America Abstracts with Programs, Vol. 36, No. 5, p. 576

© Copyright 2004 The Geological Society of America (GSA), all rights reserved. Permission is hereby granted to the author(s) of this abstract to reproduce and distribute it freely, for noncommercial purposes. Permission is hereby granted to any individual scientist to download a single copy of this electronic file and reproduce up to 20 paper copies for noncommercial purposes advancing science and education, including classroom use, providing all reproductions include the complete content shown here, including the author information. All other forms of reproduction and/or transmittal are prohibited without written permission from GSA Copyright Permissions.
