Minnesota Geological Survey and the Great Lakes Geologic Mapping Coalition

- **Previous** *(2011-2012)*
  - Subsurface Quaternary geology of Anoka County – cost-share with LCCMR

- **Current** *(2012-2013)*
  - Subsurface Quaternary geology of Morrison and Sherburne Counties – cost-share with LCCMR

- **Proposed**
  - Enhancement of databases to support subsurface Quaternary geological mapping
Mcleod County Geologic Atlas

Links to PDF images of published maps, Part A

Plate 1, Data-Base Map
Plate 2, Bedrock Geology
Plate 3, Supplement to Bedrock Geology
Plate 4, Surficial Geology
Plate 5, Quaternary Stratigraphy and Distribution of Sand Bodies
Plate 6, Bedrock Topography, Depth to Bedrock and Mineral Endowment

GEOLOGIC ATLAS OF MCLEOD COUNTY, MINNESOTA
What is a County Geologic Atlas?

- A study of the geology and ground water resources of a county
  - MGS investigates the geology
  - DNR investigates chemistry, quantity, aquifer levels, and pollution sensitivity of the ground water
- Used for planning, resource management, environmental protection, and education
- Maps, databases, and illustrations formatted for a wide range of users
The pie chart shows the distribution of funding sources for a project. The largest portion, $750,000, is from the Legislative-Citizen Commission on Minnesota Resources (LCCMR). Other sources include:

- Department of Natural Resources: $250,000
- USGS STATEMAP: $140,000 (cost-shared)
- Great Lakes Mapping Coalition: $80,000 (cost-shared)
- Clean Water Funds: $75,000 (cost-shared)
Mcleod County Geologic Atlas
Links to PDF images of published maps, Part A

Plate 1, Data-Base Map
Plate 2, Bedrock Geology
Plate 3, Supplement to Bedrock Geology
Plate 4, Surficial Geology
Plate 5, Quaternary Stratigraphy
and Distribution of Sand Bodies
Plate 6, Bedrock Topography, Depth to Bedrock
and Mineral Endowment

GEOLOGIC ATLAS OF MCLEOD COUNTY, MINNESOTA
Mapping Buried Glacial Aquifers

2-Dimensional cross sections

3-Dimensional surfaces

3-Dimensional models of buried sand layers
Cross Sections

[Diagram of cross sections showing geological layers and borehole data]

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**MINNESOTA DEPARTMENT OF HEALTH**

**WELL AND BORING RECORD**

**Record No. 779325**

- **Date of Boring**: 09/27/2011
- **Date of Completion**: 09/27/2011

**Well Details**

- **Well Name**: SPOTTED DOG
- **Well Address**: 209/31 NORTH 61 ST
- **Well ID**: 5
- **Completion Method**: Non-Specified

**Geological Material**

<table>
<thead>
<tr>
<th>Material</th>
<th>Color</th>
<th>Hardness</th>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clay</td>
<td>Brown</td>
<td>Soft</td>
<td>0</td>
<td>50</td>
</tr>
<tr>
<td>Sand</td>
<td>Brown</td>
<td>Soft</td>
<td>50</td>
<td>61</td>
</tr>
<tr>
<td>Sand/Rocks</td>
<td>Brown</td>
<td>Medium</td>
<td>61</td>
<td>130</td>
</tr>
<tr>
<td>Sand/Rock</td>
<td>White</td>
<td>Medium</td>
<td>130</td>
<td>160</td>
</tr>
</tbody>
</table>

**Drilling Fluid**

- **Type**: Non-Specified

**Casing Details**

- **Casing Diameter**: 4 in. to 125 ft
- **Type**: Non-Specified

**Remarks**

- **Could Not Find the City of Northfield for Well Address**

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**UNIVERSITY OF MINNESOTA**

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B. Lusardi, 1/2013 Indianapolis
County Well Index (CWI) 472,048 water-well logs statewide
Quaternary Data Index (QDI) 21,630 sample sites supported by Great Lakes Mapping Coalition 2010-2011
# Minnesota Quaternary Lithostratigraphy

## Global Correlations

<table>
<thead>
<tr>
<th>Global Correlations</th>
<th>Red River Valley</th>
<th>Upper Minnesota River Valley</th>
<th>Southwest</th>
<th>South-Central</th>
<th>Southeast</th>
<th>Twin Cities Region</th>
<th>Central</th>
<th>North-Central</th>
<th>Northeast</th>
</tr>
</thead>
</table>

### MIS 2-5

- **Sherack**
- **Pothole River**
- **BRIDGWAT**
- **Foreground**
- **Newcomen**
- **WELLS**
- **CANCELLATION**
- **St. Helens**
- **Teal**
- **Westward**
- **Huron**

### MIS 6-18

- **South Park**
- **Greenbelt**
- **Minnesota**
- **Osage**
- **Red Lake**
- **Weverton**
- **Washburn**
- **St. Croix**
- **Sandstone**
- **Rose Creek**
- **Elmwood**

### MIS >18

- **Vista X**
- **Vista Y**

## Legend

- Silt and clay
- Silts and/or gravel
- Mixed Mountain provenance diamicton
- Mixed Riding Mountain and Winnipeg
- Northwest with reworked Superior
- Winnipeg provenance diamicton
- Mixed Winnipeg and Rainy
- Rainy provenance diamicton
- Mixed Rainy and Superior
- Superior provenance diamicton

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*Supported by Great Lakes Mapping Coalition 2010-2011*

*University of Minnesota*
Anoka County
87 cross-section lines spaced .5 km apart with nearly 27,000 water-well records, bridge borings and scientific drill holes