Protection of the Mahomet Aquifer

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ILLINOIS

Henry Allan Gleason Nature Preserve
Andrew Bradshaw - http://lincolnlandnature.blogspot.com/
The Mahomet Aquifer

[Map showing the Mahomet Aquifer project review area with cities such as Champaign, Urbana, Bloomington, Normal, Springfield, Peoria, Decatur, and Danville marked.]

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Why Does PRI Study the Aquifer?

- Understanding the resource
  - Geology
  - Hydrology
  - Chemistry
- Water Supply
  - Sustainability of current and future use
  - Protection of water quality
How Does PRI Study the Aquifer?
PRI Natural Gas Working Group (NGWG) goals are to:

1. **Assist stakeholders** in their responses to address natural gas leakage…

2. **Consider natural gas storage activities in Illinois** …as they relate to natural resource … protection issues

“Introductory Guide”, includes:

- Basic information about the Mahomet aquifer and natural gas storage, and
- A list of **potential aquifer protection issues** for task force consideration

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For more information, see:
https://prairie.illinois.edu/content/natural-gas-working-group
The Future of Science of the Mahomet Aquifer

Illinois State Geological Survey Circular 594

1. Reviews different concepts, interpretations, and identities of the Mahomet aquifer

2. Provides a summary of the June 28, 2017 “Future of Science of the Mahomet Aquifer” stakeholder workshop

3. Makes the case for the need to map the aquifer in 3D, and in high resolution with airborne technology
Resources for the Task Force

- Water supply and demand
- Geology
- Hydrogeology
  - Flow
  - Recharge
- Groundwater Flow Model
- Yield estimates for:
  - Lake Decatur
  - Lake Springfield
  - Lake Bloomington
  - Lake Vermilion
Resources for the Task Force

- Mahomet Aquifer Consortium
- Regional Water Supply Planning Committee
- PRI scientists serve as technical advisors
Resources for the Task Force

- Water quality reports
- Arsenic studies
- Isotope studies
- Microbial studies
- Water quality database
Formed by Glaciers

Thwaites Glacier
Antarctica

The New River in West Virginia
Deposition in Bedrock Valleys

- Three major advances
- Interglacial erosion
- Layered sands and clays with some interconnections between aquifers

Panno et al., 2005
Conceptual Flow Model
Who Uses the Aquifer?

Agriculture

Public Water Supplies (IAWC Well 57)

Photo: Mason County Democrat
Mahomet Aquifer Demand

210 million gallons per day (MGD)

> 1600 large-capacity wells
Groundwater Flow Patterns

- County Boundary
- Major Stream or River
- Groundwater Elevation Contour (10ft interval)
- Groundwater Flow Direction

Groundwater Elevation (ft AMSL)
- Value
  - High: 695
  - Low: 420
Groundwater Flow Model
Water Level Drawdown near Champaign
Sangamon River at Old Route 48 in Monticello, August 2012
Response to Recharge and Drought
Head Change From Mean

Irrigation

Champaign-Urbana

ft

11

2

0

-2

-11

Month-Day-Year

10 2 2
Head Change From Mean

Month-Day-Year
10 2 2010

Sangamon River

Champaign-Urbana
Natural Contaminants - Arsenic
Thank you

New wells north of Lincoln Ave. pumping station, 1915.