

BACOG's Water Resources Initiative

Local Programs for Groundwater Protection

Drinking Water 1-2-3

MPC Academy - September 12, 2019



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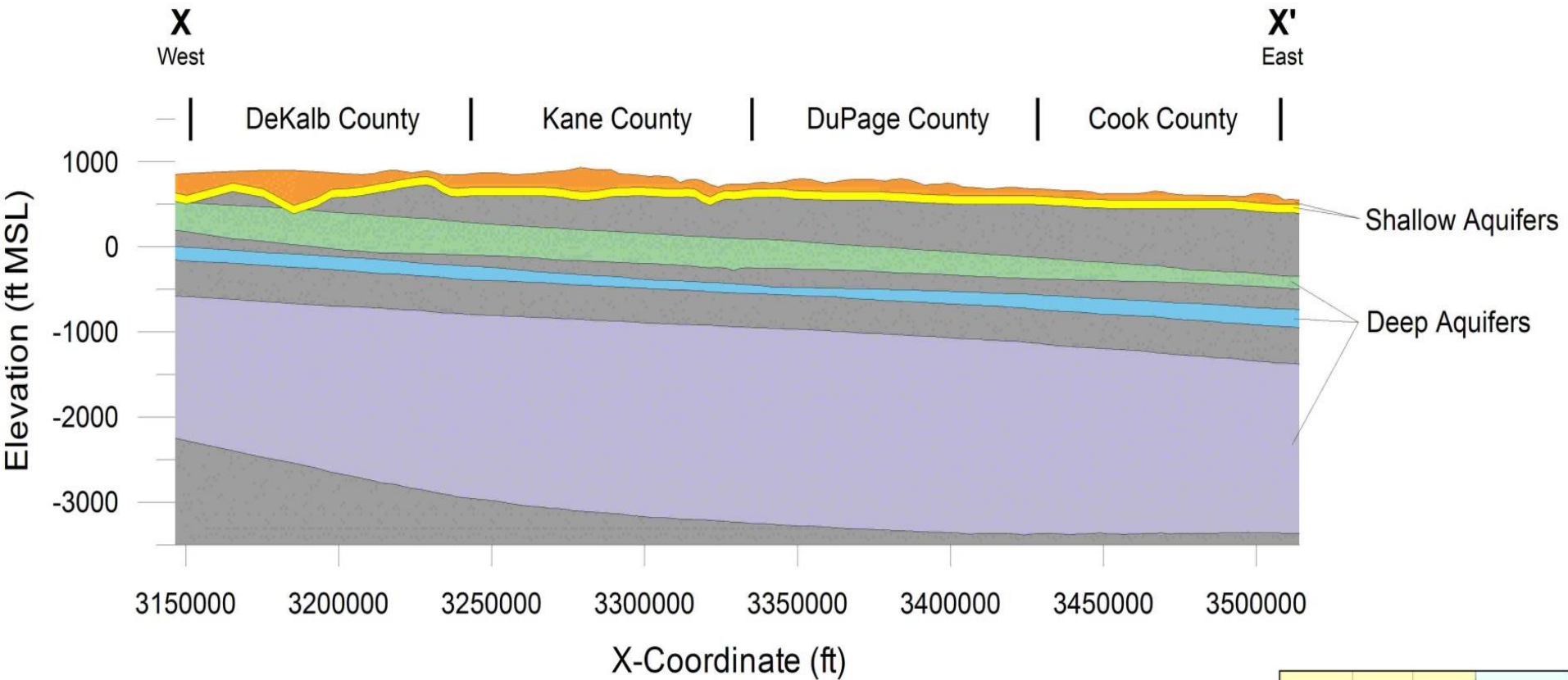
Barrington Area Council of Governments

- Intergovernmental Cooperation & Collaboration
- Regional Planning
- Legislative Advocacy
- Services to Members
- BACOG Regional Comprehensive Plan
 - Development
 - Natural Resources



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Aquifers of Northeastern IL



Shallow Aquifers

- Quaternary Unit
- Shallow Bedrock Aquifer

Deep Aquifers

- Ansell Unit
- Ironton-Galesville Unit
- Mt. Simon Unit

Confining unit



Why Study the Shallow Aquifer System?

Existing Conditions in BACOG:

- Entirely dependent on groundwater nearly all shallow system
- Growth continues, within and around us
- Lack of infrastructure & alternate supply
 - ✓ 7,840 wells, nearly all of which are private
 - ✓ 99% of wells are in shallow aquifer system
 - ✓ ~65% of population has private well water
- Sensitive, groundwater-dependent natural areas
- Water quality & contamination risks

ISWS & CMAP project declining water levels and increasing contamination

Why? Impacts to Community

- A house without water? Or with contaminated water?
- Drill wells deeper / Drill new wells / More water treatment
- Direct costs to residents
- Ecosystem & environmental changes
- Property values
- Stewardship



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BACOG Water Resources Initiative

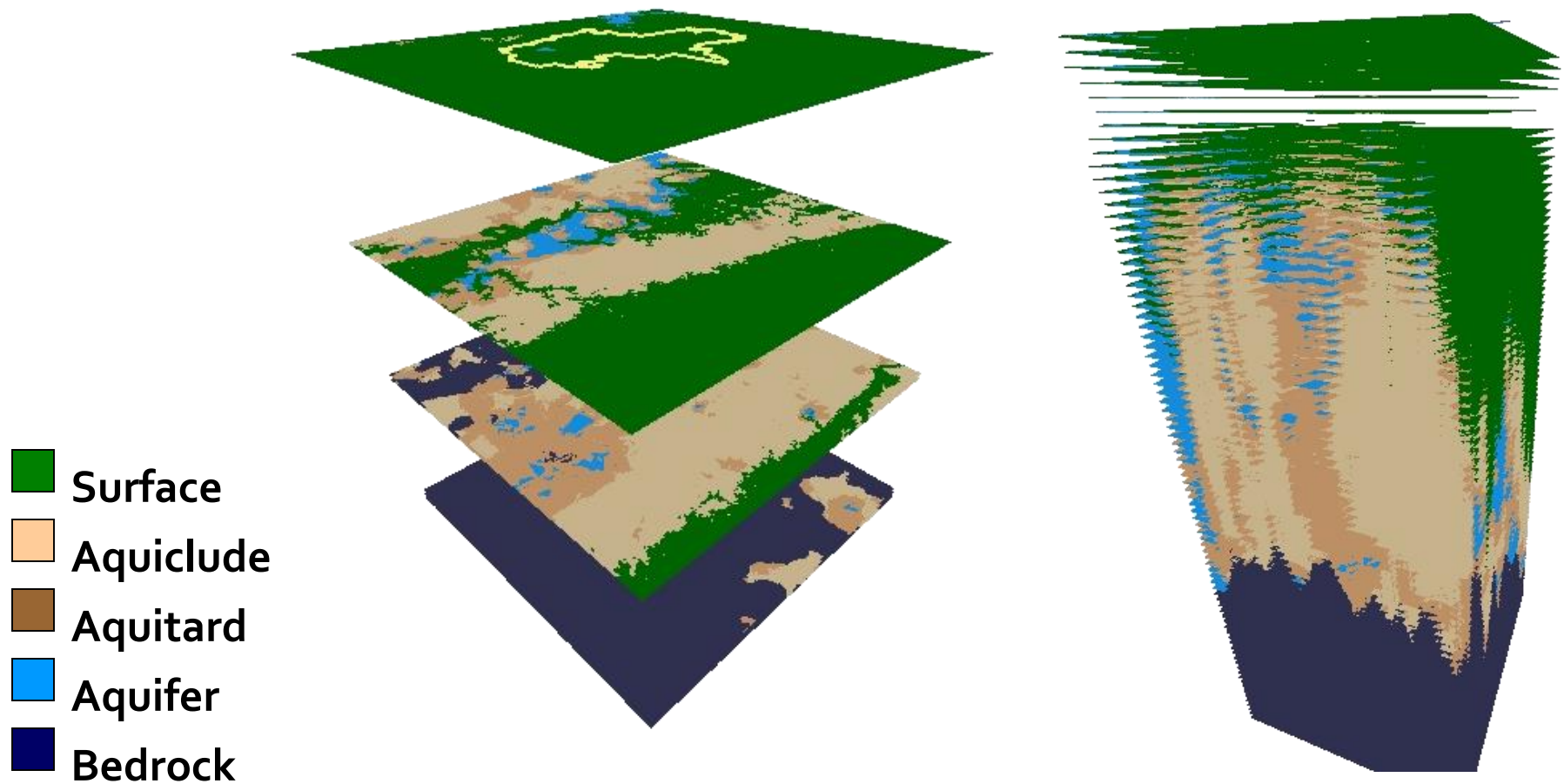
Program Components

1. Mapping of Shallow Aquifer System: Groundwater Supply & Quality
2. Private Well Water Testing
3. Planning & Development
4. Public & Youth Education
5. Aquifer Water Levels Monitoring

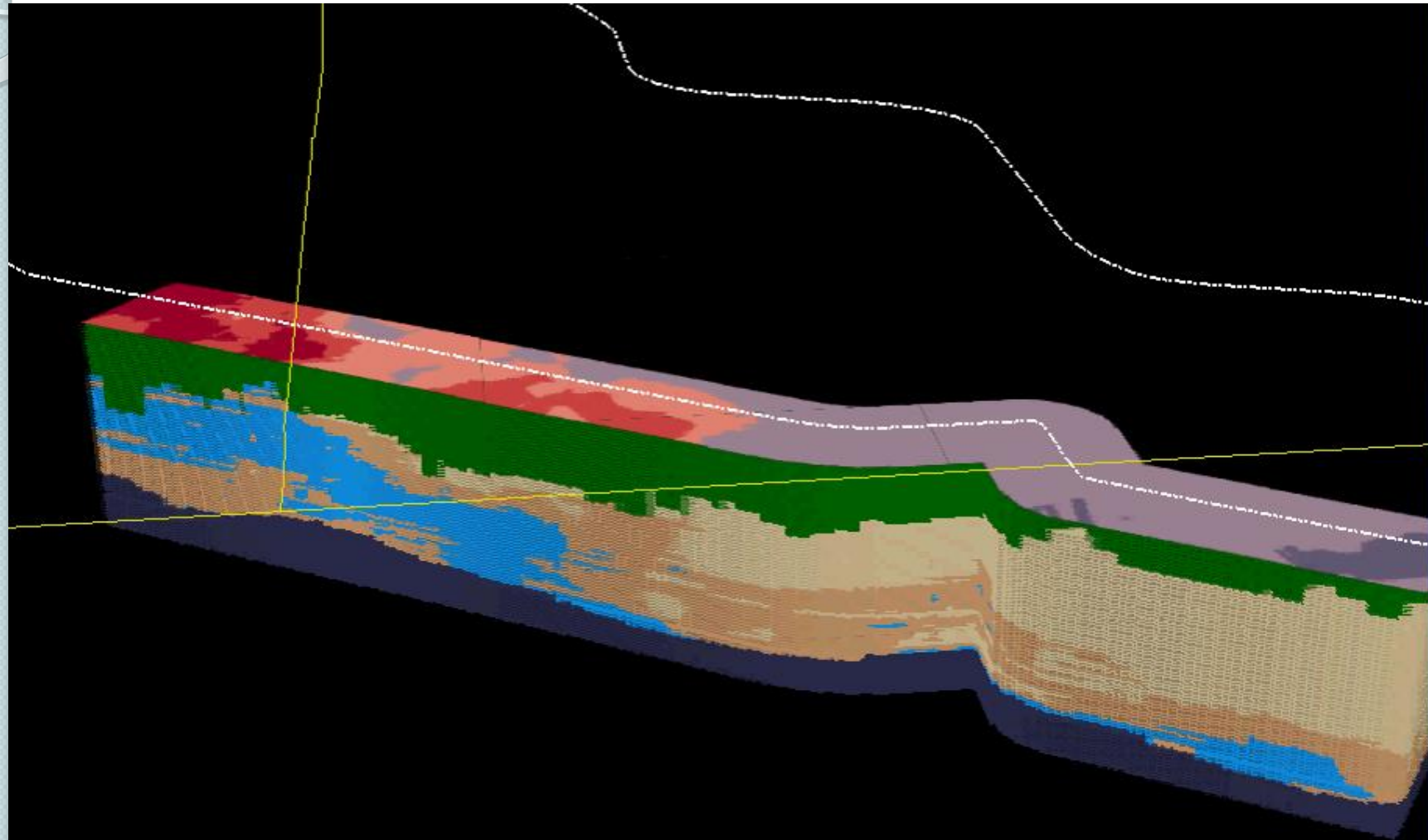


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The 3D Model








Interactive 3-D Model: Clip of Route 14 & Rail Road



Groundwater Recharge Areas

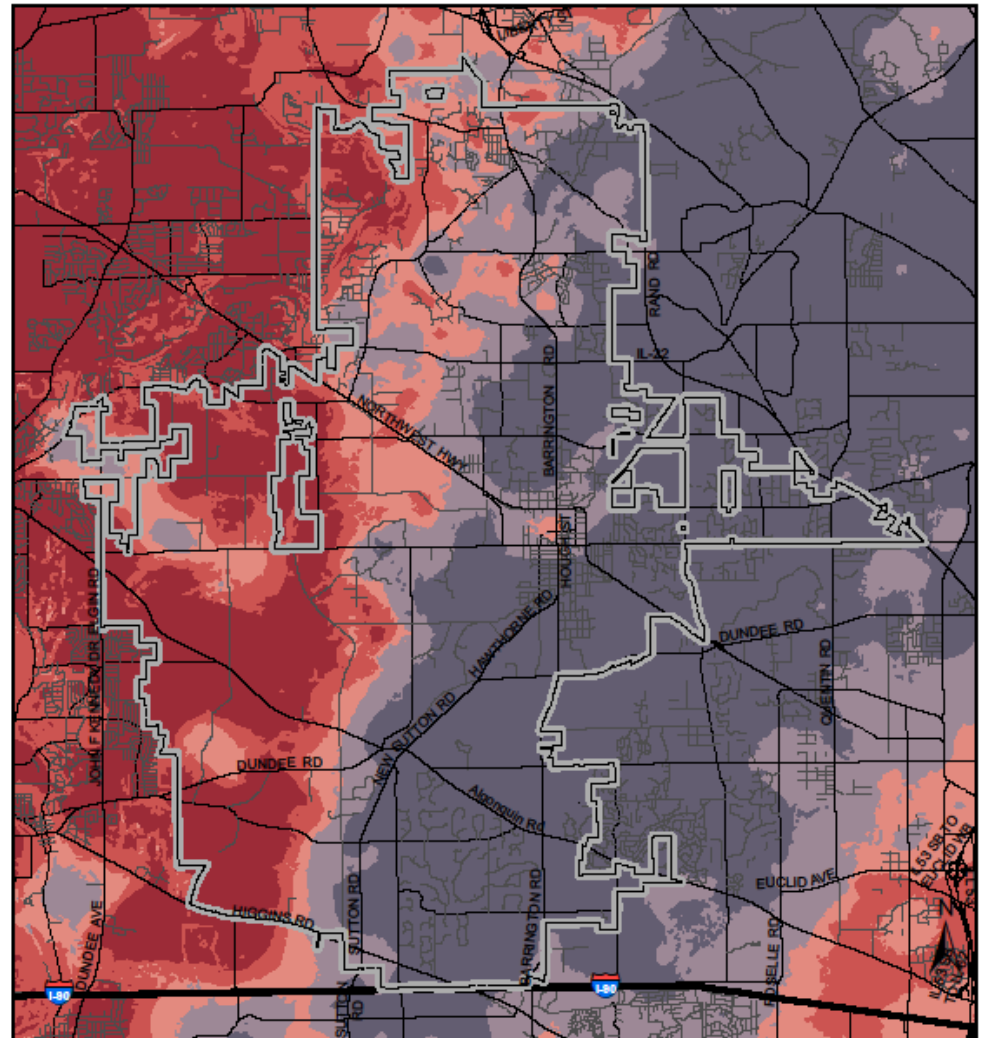
Recharge characteristics were mapped in the BACOG area as a result of the research undertaken as part of the water resource initiative. A system of relative travel times for infiltrating water to reach the uppermost aquifer was established based on soil characteristics. These travel times were used to classify area recharge characteristics as being highly sensitive, sensitive, moderately sensitive, poor, or very poor.

Recharge Designation	Description
 Highly Sensitive	In the highly sensitive areas relative travel times are measured in days. Recharge sensitivity is estimated to be greater than 80 percent, indicating that recharge is very fast and that the risk for groundwater contamination from a pollutant surface spill is high. The percent of annual precipitation that reaches the groundwater in the highly sensitive recharge areas is estimated to be about 48 percent.
 Sensitive	The relative time of travel in the sensitive recharge areas ranges from days to one or two years, and the recharge sensitivity ranges from approximately 60 to 79 percent. The estimated portion of annual precipitation that reaches the groundwater is about 30 percent.
 Moderately Sensitive	The areas having moderately sensitive recharge characteristics exhibit an estimated relative travel time of one or two years to about 40 years. The recharge sensitivity is estimated to be in the range of 40 to 59 percent, and the portion of annual precipitation reaching groundwater is estimated at 10 percent.
 Poor Recharge	Poor to very poor recharge areas exhibit relative travel times that range from 42 years to hundreds of years or more. The recharge sensitivity is estimated to be less than 40 percent and the portion of annual precipitation reaching groundwater is estimated at 6 percent.
 Very Poor Recharge	

Recharge Characteristics provided by Kurt O. Thomsen, Ph.D., P.G.

Map: Disclaimer of Liability: This data is provided "AS-IS" without warranty of any kind, expressed or implied. BACOG and its member governments make no warranties, guarantees, or representations as to the suitability of this information for user's purposes or that the operation of the files/maps will be without defect.

BACOG Area Groundwater Recharge









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Map produced by BACOG, April 2014



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0 1 2 3 Miles

-  BACOG Boundary
-  Highly Sensitive Recharge
-  Sensitive Recharge
-  Moderately Sensitive Recharge
-  Poor Recharge
-  Very Poor Recharge

Private Well Water Testing

- WR Committee & Partners
- Public Education

"Lead in Drinking Water"



Presentation by Walt Kelly,
Illinois State Water Survey

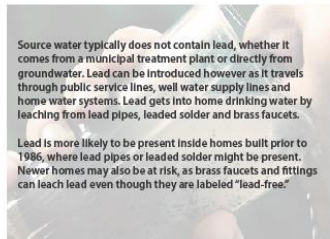
October 5th, 2016
6:00 pm

The Garlands of Barrington
1000 Garlands Lane, Barrington



Walt Kelly is a groundwater geochemist who has been at the Illinois State Water Survey since 1992. He is also, since 2013, the Head of the Groundwater Science Section at the Water Survey. The Water Survey is part of the Prairie Research Institute at the University of Illinois at Urbana-Champaign.

- **Maximum thresholds for lead!**
- **Community-supplied water vs private well water!**
- **Where lead comes from!**
- **Health effects of lead!**
- **What to do if your water has lead?**



Source water typically does not contain lead, whether it comes from a municipal treatment plant or directly from groundwater. Lead can be introduced however as it travels through public service lines, well water supply lines and home water systems. Lead gets into home drinking water by leaching from lead pipes, leaded solder and brass faucets.

Lead is more likely to be present inside homes built prior to 1986, where lead pipes or leaded solder might be present. Newer homes may also be at risk, as brass faucets and fittings can leach lead even though they are labeled "lead-free."

Lead testing kits will be offered at the BACOG event in conjunction with Lake County Health Department. Cost is \$25 each kit.

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847-381-7871
www.bacog.org

Take Care of Aquifers!

Groundwater in the BACOG area is of good quality and sufficient for human needs, at the moment. Water supply is not infinite, however, and clean water is not a guarantee. Computer models show that groundwater levels are falling, and we know certain contaminants such as chlorides have risen over the past few decades. Your personal actions contribute to the availability and cleanliness of water for future generations.

We know from BACOG studies where our water is located, how much there is, and which areas recharge (replenish) the aquifers. Zoning and building decisions can protect or impair groundwater recharge. Sensitive recharge areas, mapped by BACOG, are also pathways for potential contaminants to the aquifers.

The shallow aquifer system is a single, interconnected resource. Your well is likely drawing water from the same groundwater source as your neighbor's well.

How much water you use and how you protect water quality can affect not only your well but also your neighbors' wells and the supply of clean water for the region. We each have a stake in and responsibility for this precious resource – groundwater!

Have You Done Your Yearly Test?



Pick-up Test Kits: October 5 - 8

Pick up drinking water test kit at the Village Hall for the reduced price of \$12 **October 5 - 8 ONLY**. Exact change or a check payable to "Lake County Health Department".

Return water test kits on Tuesday, October 13, between 3:30 pm – 7:00 pm ONLY at The Garlands of Barrington.

Samples will be transported by BACOG to Laboratory. Any homeowner with abnormal results will receive a phone call from the Lake County Health Department.

Households with private wells are advised to have a test for total coliform, E. coli bacteria and nitrate on an annual basis to detect these invisible, odorless contaminants.

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www.bacog.org

Sign-up

To sign-up for testing go to www.bacog.org/watertesting.html or scan the QR code below.



Learn More

Want to learn more about the groundwater in your area? Go to bacog.org/knowyourwater.html and explore what we have learned, through participants like you, about groundwater in the BACOG area.

About BACOG

The Barrington Area Council of Governments is a regional planning organization whose members include the Villages of Barrington, Barrington Hills, Deer Park, Lake Barrington, North Barrington, South Barrington, and Tower Lakes, as well as Barrington and Cuba Townships.



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Know Your Water

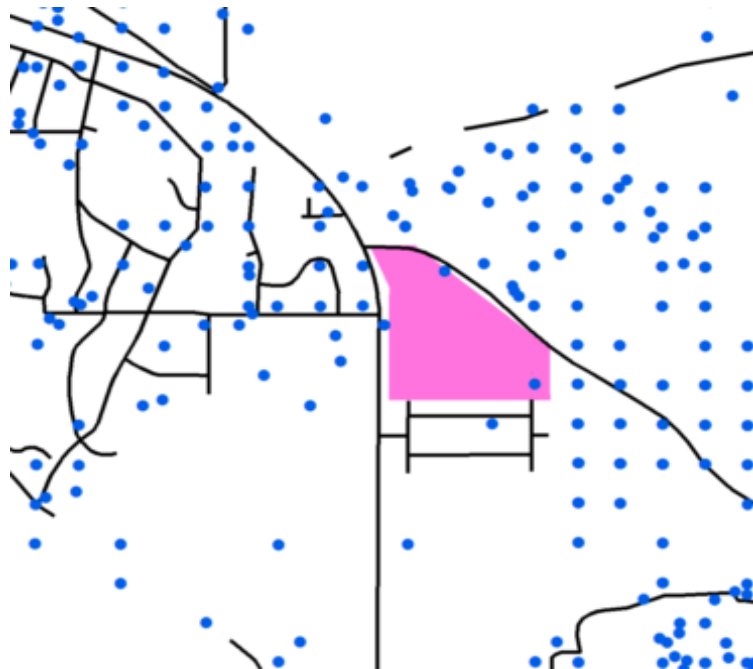
Water Testing Edition



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Planning

- Comprehensive Plans
- Development Decisions
- Open Space Acquisition



Groundwater – Local Goals and Objectives

Groundwater Sustainability – Water Supply

- Protect the shallow aquifers from overuse
- Encourage the detention/retention of stormwater and wastewater in the watershed for aquifer recharge purposes
- Analyze significant proposed developments for their impacts on groundwater supply with technical assistance from the Barrington Area Council of Governments and their model and maps
- Encourage sufficient groundwater recharge through protection of sensitive recharge areas
- Encourage conservative and reasonable use of water at all times, and urge water use restrictions during drought conditions
- Implement water conservation techniques and Best Management Practices that reduce the need to construct additional infrastructure or develop new wells, and which will have the dual benefits of saving money and conserving water
- Support the BACOG comprehensive aquifer water levels monitoring program
- Prepare aquifer recharge area and groundwater protection plans, ordinances and tools that will consider, among other factors, land use and zoning, open space preservation, and Best Management Practices in development decisions
- Incorporate groundwater recharge area and aquifer protection objectives into public land acquisition decisions

Groundwater Sustainability – Water Quality

- Protect the shallow aquifers from contamination
- Analyze significant proposed developments to determine the effects of land uses, by products of development, densities, impervious surface, hazmat and other factors on the potential for groundwater contamination, especially in relation to recharge areas, with technical assistance from the Barrington Area Council of Governments and their model and maps
- Prevent the introduction of pollutants and contaminants, especially in identified sensitive groundwater recharge areas
- Discourage the overuse of pesticides, fertilizers, salt and other chemicals to prevent contamination of the groundwater
- Encourage maintenance of individual on-site water supply and wastewater



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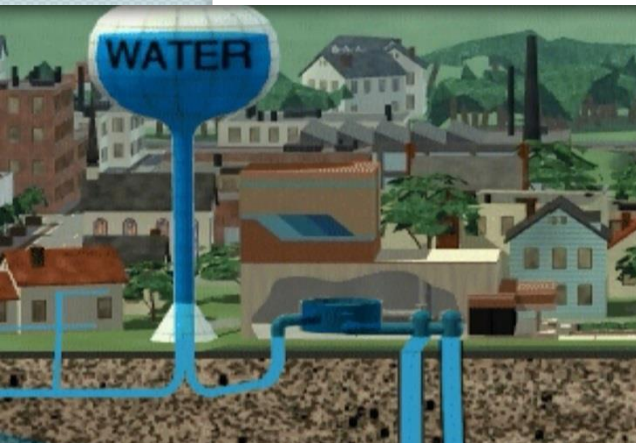
Education

- **Elementary School Video**

- Where does our water come from?
- How do we get groundwater into the house?
- Is our area's water good to drink?
- Where does wastewater go?
- How are aquifers replenished?
- Is our water supply sustainable?
- What can we do to protect our water?



www.BACOG.org



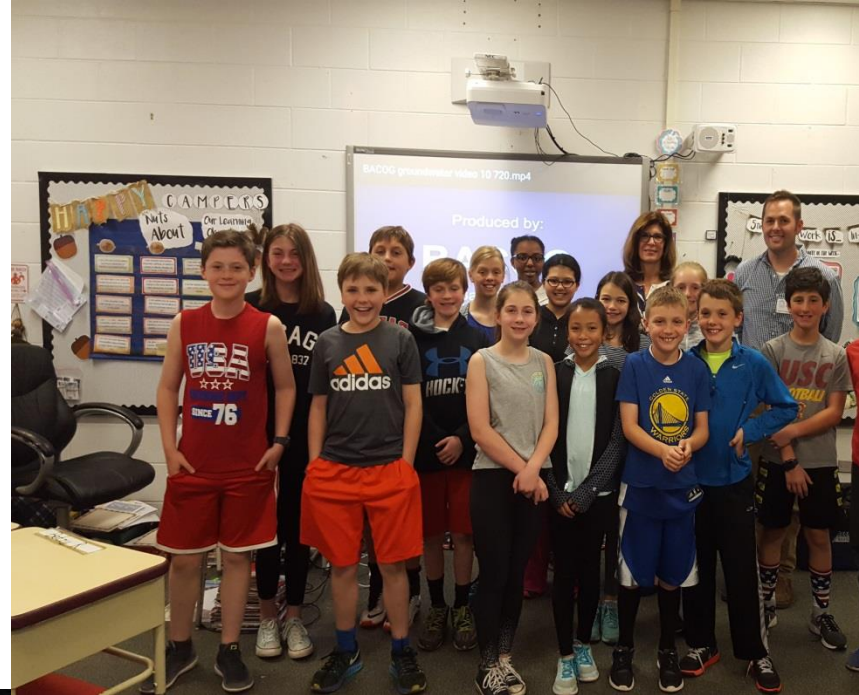
Our Groundwater

Presented by the
Barrington Area Council of Governments



Youth Education

Skype-with-a-Scientist



Aquifer Water Levels Monitoring Program

Why?

Projected decreases in groundwater levels & discharge to waterways

- Baseline of groundwater levels 2015
- Monitoring demonstrates changes and any trends
- Action recommendations can be based on data
- Supports model development by the State



Monitoring Data Sources

- 3 ISGS Dedicated Monitoring Wells with Transducers
- 15 ISGS Dedicated Monitoring Wells - Manual
- 5 Stream Gages with Transducers in Flint Creek
- 57 Municipal Pumping Wells in 14 Municipalities within and adjacent to BACOG
- Precipitation Data



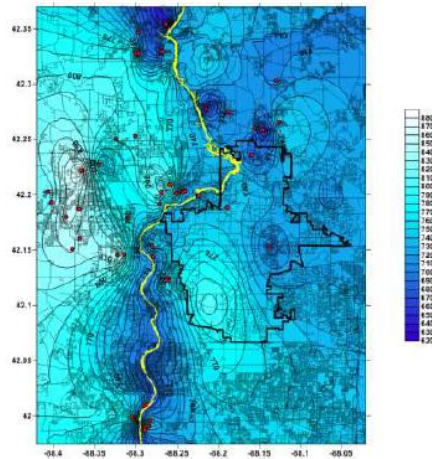
Baseline Water Levels Report & Maps, January 2015

Development of a Groundwater Monitoring System Protocol and Determination of Baseline Surface and Groundwater Water-Level Conditions

For

The Barrington Area Council of Governments

January, 2015



KOT ENVIRONMENTAL CONSULTING, INC.

A Veteran Owned Small Business

Interim Monitoring Data Report, July 2016



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SHALLOW AQUIFER SYSTEM WATER LEVELS MONITORING PROGRAM
INTERIM REPORT, JULY 2016

Janet L. Agnoletti, Executive Director

I. INTRODUCTION

Background / Purpose

Because the BACOG area is almost entirely reliant on the shallow aquifer system for all its water needs, there is growing concern about the sustainability of this resource. Water consumption due to growth and development has increased around and within the BACOG area and will continue. For the BACOG area, there is no alternate water supply. Lake Michigan water and river water are not available here, and even if another source of water supply were to become available, there is very little piped infrastructure to distribute such a supply. The cost to build distribution systems throughout nearly 90 square miles would be prohibitive.

Most areas have individual residential private wells or subdivision wells; over 7,800 shallow aquifer system wells provide supply for a population of approximately 35,000. A significant drop in water levels could pose a huge financial impact as private well owners might need to drill deeper or relocate wells. A threat to water levels or water quality would be a threat to public health and safety as well.

There are thousands of acres of natural areas locally, many of which are dependent on groundwater to feed them. A significant drop in water levels could also mean significant changes to those natural areas if groundwater discharge were no longer adequate to sustain rivers, streams and ponds and natural areas such as fens, woods and wetlands. If the natural areas that define the BACOG area and quality of life were to decline, property values could be negatively affected.

State studies suggest there will be a downward trend in water levels in the coming decades – by 10 to 20 feet in some BACOG communities – so monitoring those conditions has become more critical. To address this situation, the Executive Board unanimously approved RESOLUTION #13-04 “Supporting the Establishment and Funding of a Comprehensive Groundwater Monitoring Program under the Barrington Area Council of Governments” on November 19, 2013. Establishing a baseline and then trends in water levels in the shallow aquifer system is necessary information moving forward. Water level data can provide an indication of “what we need to do” in upcoming years to protect the aquifer system that is virtually the sole water supply for the region. Under Resolution #13-04, all BACOG governments share the costs of the program due to the regional nature of this initiative and benefit to all communities.

BACOG Aquifer Water Levels Monitoring Program

Going Forward:

- 5-Year Analysis/Report of Water Levels - 2020
- Baseline Water Quality Maps & Report (in progress)
- Long-term, On-going Data Collection
- Assessment against Baselines: Trends
- Local Data-based Management of the Resource



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