

# Updating Wisconsin's Statewide Groundwater Monitoring Network

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2. U.S. Geological Survey (USGS)
3. WI Dept. of Natural Resources (DNR)



**Wisconsin Geological &  
Natural History Survey**

## Today's outline

- What is the Statewide Groundwater Monitoring Network?
- History of the monitoring network
- The Monitoring network today
- Current project to upgrade the network

# What is the Statewide Groundwater Monitoring Network?

- Network of groundwater monitoring wells in several unconfined and confined aquifer systems across the state
- Operated and maintained by USGS and WGNHS
- Water levels are measured by using:
  - Manual (periodic) or
  - Automated (continuous) data collection
- Location of monitoring sites depends on availability of existing wells and project activity

# What is the Statewide Groundwater Monitoring Network?

- Water-level data is used for a variety of applications
  - Well siting and water supply system design
  - Contaminant investigations
  - Calibration targets for groundwater flow modeling
  - Documenting impacts of pumping, drought, flooding
  - Development of landfills highway, industrial sites
  - Groundwater resource evaluation and research



# History of the monitoring network

UNITED STATES  
DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

WATER RESOURCES BRANCH  
404 ENGINEERING EXPERIMENT STATION  
OHIO STATE UNIVERSITY  
COLUMBUS, OHIO



Professor Aldo Leopold,  
Wisconsin Conservation Commission,  
Madison, Wisconsin.

Dear Professor Leopold:

Reference is made to the observation well program which I conducted from 1935 to 1942 in connection with a ground water survey of the Wisconsin Conservation Department's forest protection districts. Records and descriptions of this work are given in several

Oscar Edward Meinzer (1876-1948), has been called the "father of modern groundwater hydrology"

Served as chief of the Ground Water Division of the U.S. Geological Survey (1912 – 1946)

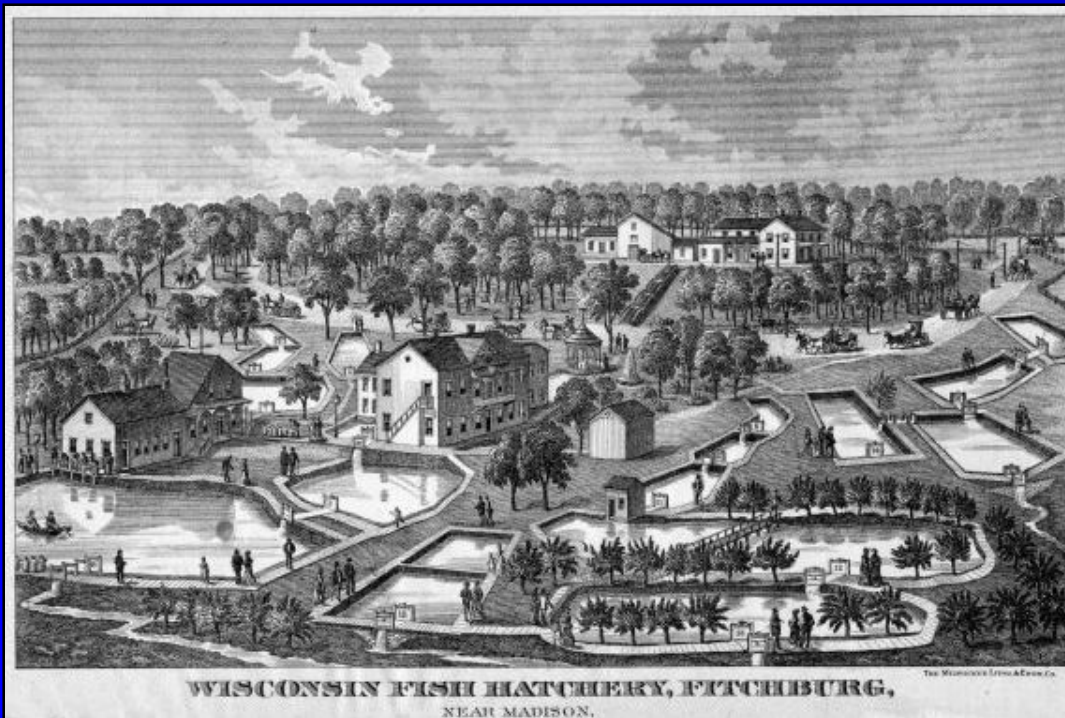
A handwritten signature in cursive script that reads "Gaylord T. Owen".

Gaylord T. Owen,  
Geologist.

- O.E. Meinzer expressed support for groundwater observation network and cooperation between USGS and Wisconsin Conservation Commission (*Precursor to the Wisconsin Natural Resources Board which sets policy for the DNR*)

# History of the monitoring network

*“It is widely acknowledged that ground water is in many respects the most important of all water resources, and that systematic gaging and interpretation of ground water levels furnish data of great practical significance and application to water-conservation work, pisciculture, forestry, the recreation industry, and land use planning.”*



*Gaylord T. Owen*  
Gaylord T. Owen,  
Geologist.

Nevin Fish Hatchery (Fitchburg, WI)  
Source: Wisconsin Historical Society

# History of the monitoring network

*The stated goal of the observation network was to:*

- Determine the relationship between precipitation and groundwater levels*
- Obtain reliable and continuing groundwater level data of both unconfined and artesian aquifers*
- Determine to what extent fluctuations in ground water levels can forecast stream flow and lake level*



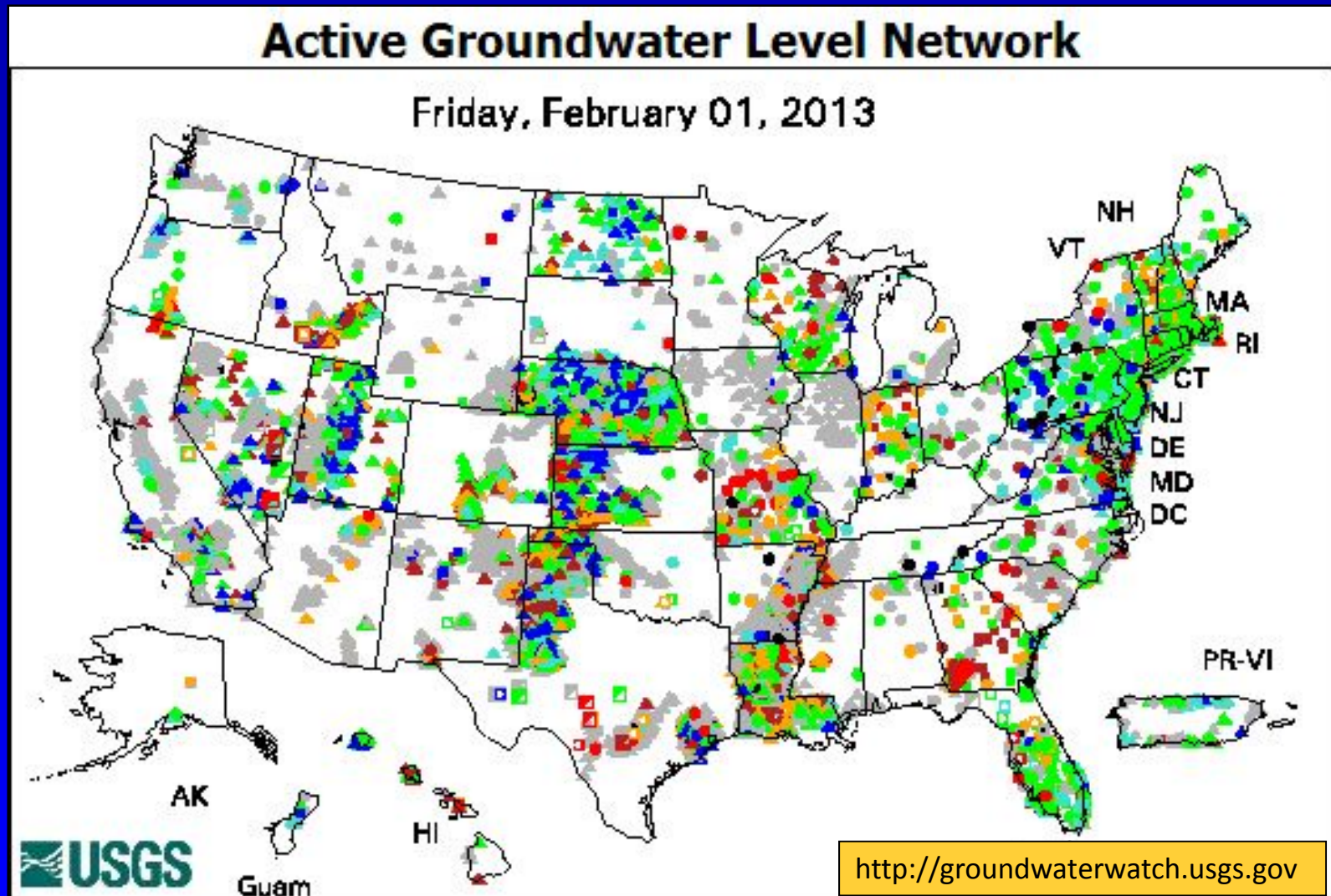
*Gaylord T. Owen*  
Gaylord T. Owen,  
Geologist.



Photo: WI DNR

# The monitoring network today



Nationwide





# The monitoring network today

## Wisconsin

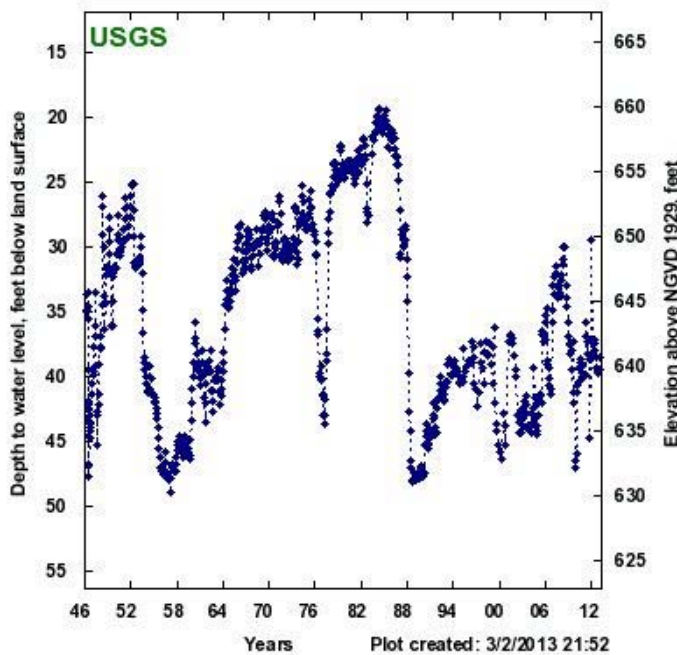



**USGS Home**  
**Contact USGS**  
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Site Statistics

Periodic Groundwater Data

430706087583601 - ML-08/21E/35-0118



Years Plot created: 3/2/2013 21:52

◆ Periodic Water Level Measurement

Summary for Period of Record Periodic Water Levels

Depth to water level, feet below land surface


Approved Periodic Water Level Values


Begin Date	End Date	Number of Values
04/12/46	01/16/13	759


  

Highest WL	Date of Highest WL	Lowest WL	Date of Lowest WL
19.33	05/02/84	48.99	02/15/57


Groundwater Levels Options

 View latest data on NWISWeb

 View annual monthly statistics for all data types

 Download Groundwater levels in text format

<http://groundwaterwatch.usgs.gov>



**Explanation**

● Observation Wells

Courtesy of Rob Waschbusch (USGS)

# The monitoring network today

- Jointly operated by the USGS and WGNHS
  - Rob Waschbusch, Jason Smith (USGS)
  - Ken Bradbury, Pete Chase (WGNHS)
- 97 observation wells in the network
  - 38 read by volunteer observers
  - 37 read by USGS field technicians
  - 22 continuously recording (5 real-time)
  - 2 spring gaging locations (installed 01/2013)
- Funding has gradually declined in recent years as water-use-fee revenue was diverted from program
- Current project to upgrade monitoring network seeks to reverse this trend



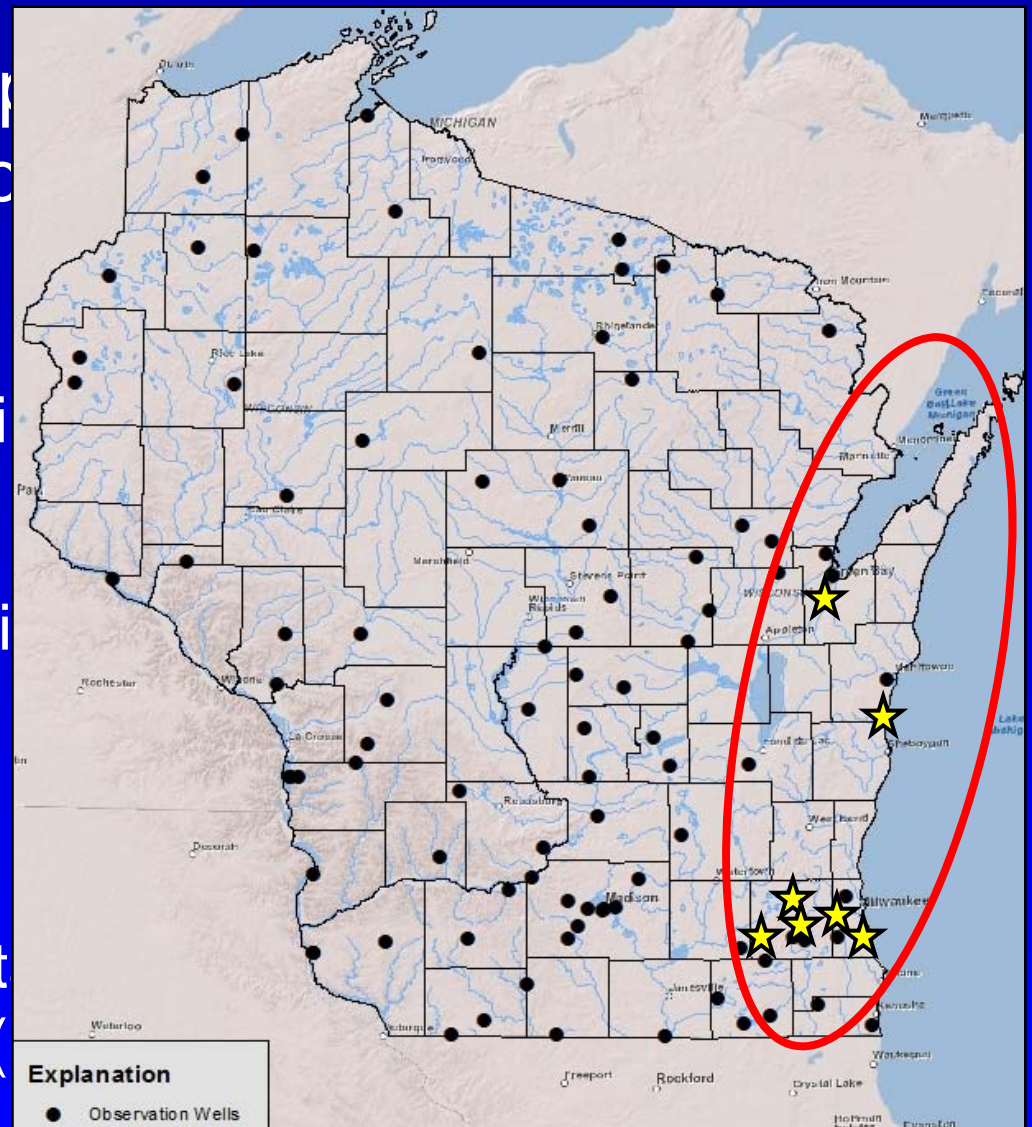
# Current project to upgrade the network

- Funded by WDNR (Great Lakes Compact)

- 1 year project with opp funding to maintain up

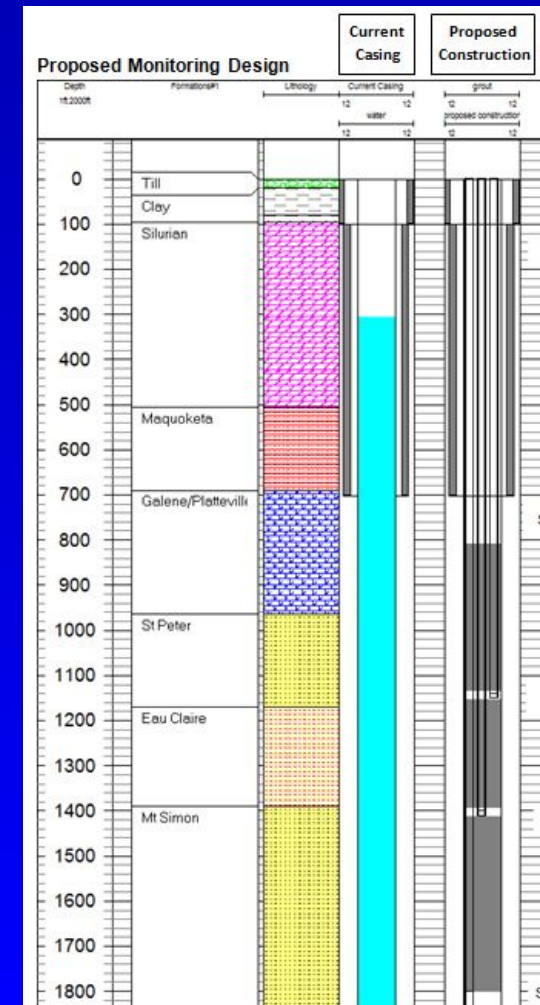
- Project goals:

- Evaluate several existi Michigan corridor
- Equip suitable wells wi equipment
- Drill additional wells in
- Install spring gaging st Moraine State Forest (



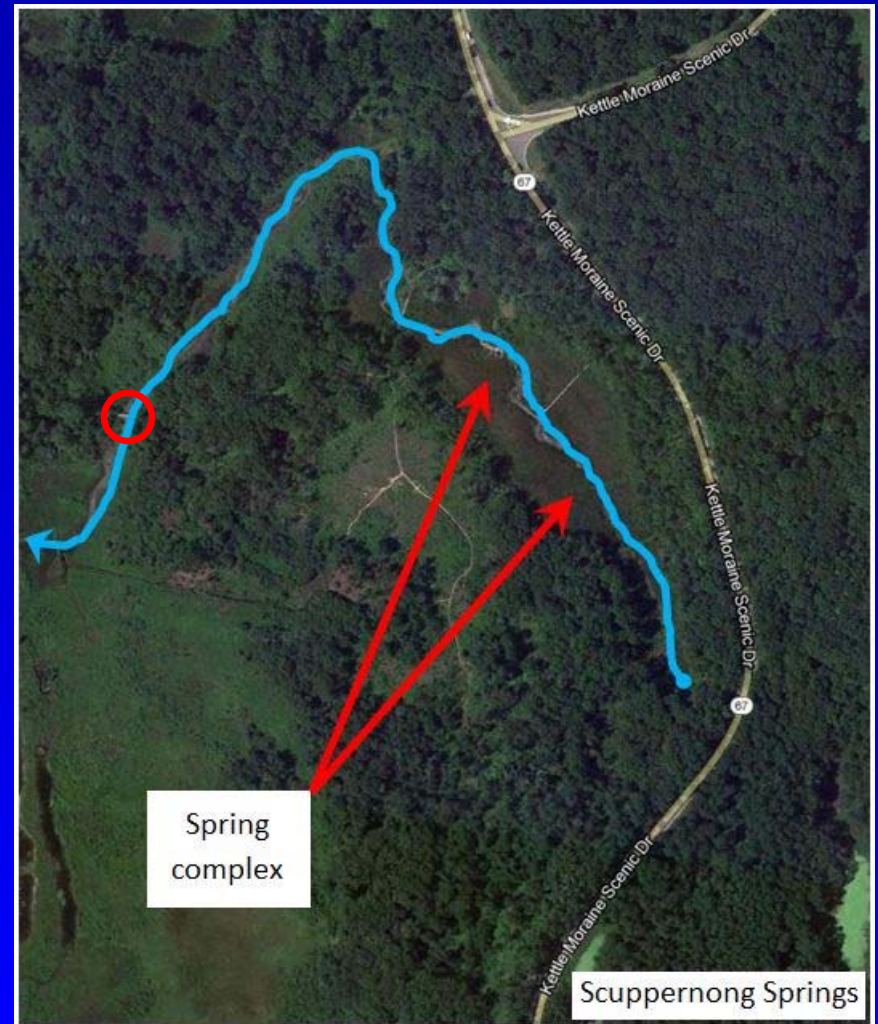
# Current project to upgrade the network

- An 1,800-ft well along Hwy-41 (WisDOT property) is being evaluated and may be outfitted with multiple piezometers



# Current project to upgrade the network

- 2 spring gaging stations installed in KMSF (Southern Unit)
  - Scuppernong Springs
  - Paradise Springs




# Current project to upgrade the network

- Spring gaging stations are recording cumulative spring flow (groundwater discharge)
- Data is available on the USGS Surface water network at <http://waterwatch.usgs.gov>


“CrowdHydrology” coming soon to KMSF gaging stations!

**What's the water height today? Text us.**


**1**  
Find the ruler!



**2**  
What's the height measurement at water surface?



**3**  
Text "W11000" and the height from step 2  
Send to: 715-659-0511



**What to do:**

1. Look around for a ruler mounted in the water.
2. Read the measurement at the water's surface.
3. Text "W11000" and the height to 715-659-0511.

Visit [www.crowdhydrology.org](http://www.crowdhydrology.org) to see your measurement. (It will take a few minutes to load your point.)

CrowdHydrology collects water data using social media and citizen science. When you text us today's water height, we use your measurement to create a historical record of this lake or stream. If enough people send data, we can help predict floods and droughts.

State and local agencies can't put scientific monitoring equipment on every water body, but CrowdHydrology provides a way for local communities to track any lake or stream that's important to them. Help support CrowdHydrology by sending a measurement every time you visit this area.

CrowdHydrology  
POWERED BY social water

PARTNERS:  
USGS  
IOWA DEPARTMENT OF NATURAL RESOURCES



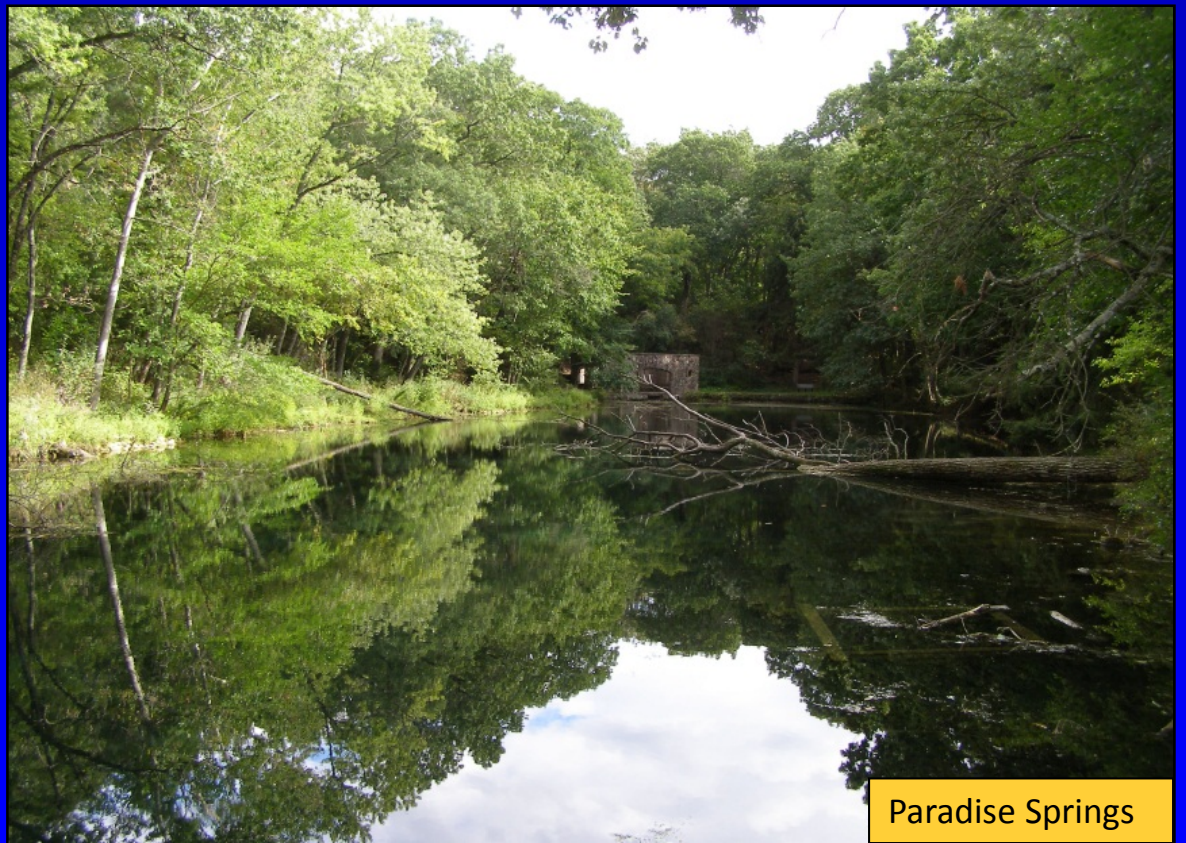
# Current project to upgrade the network

- A video project is also in the works to demonstrate the value of the statewide groundwater monitoring network
- John Karl – Videographer (UW Aquatic Sciences Center)



What's a Spring-.mp4

<http://www.youtube.com/watch?v=uHfz1ZmW6c>



Paradise Springs

# Updating Wisconsin's Statewide Groundwater Monitoring Network

Questions?



**Wisconsin Geological &  
Natural History Survey**