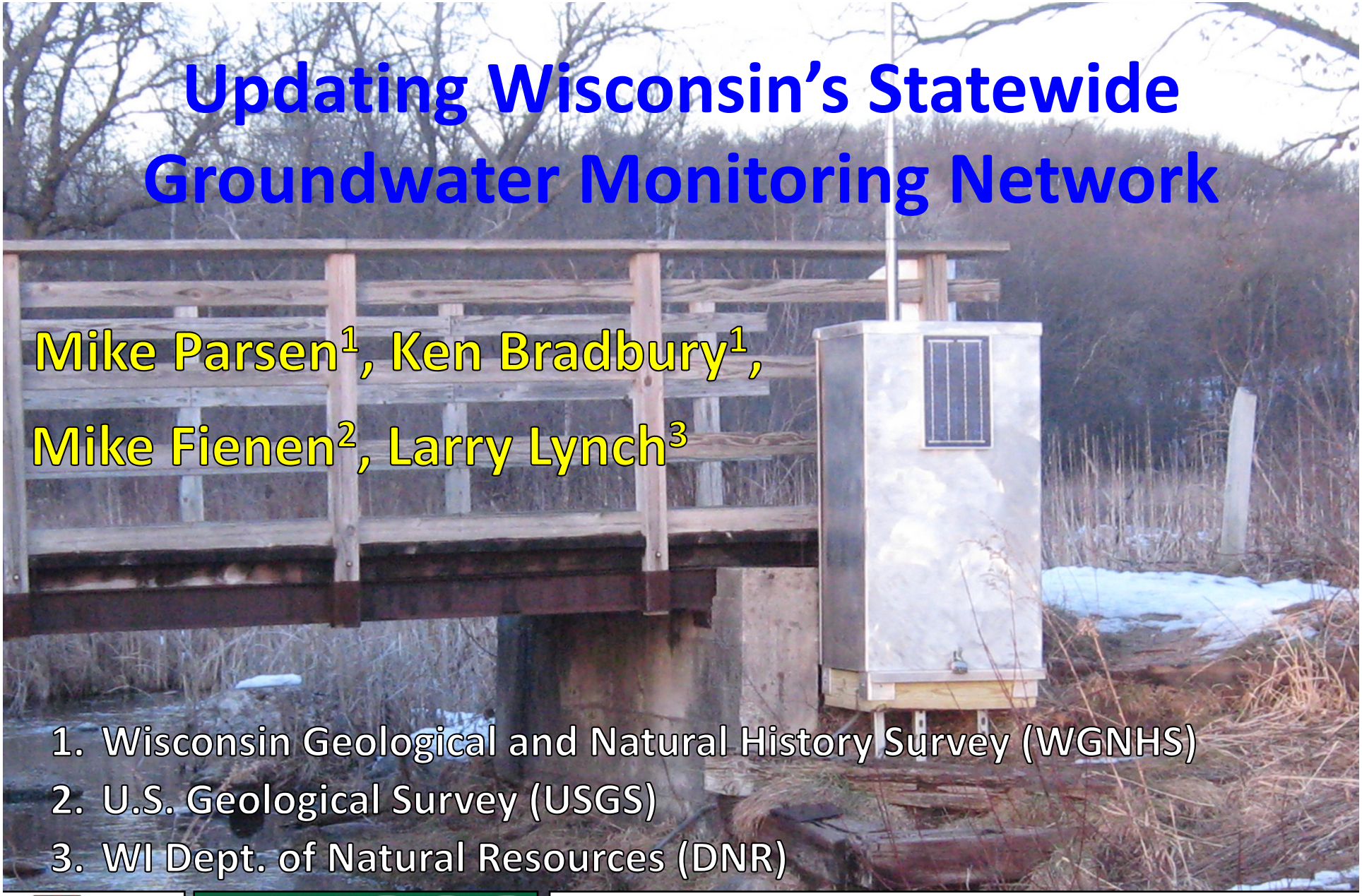
Updating Wisconsin's Statewide Groundwater Monitoring Network



Mike Parsen[1], Ken Bradbury[1],

Mike Fienen[2], Larry Lynch[3]

1. Wisconsin Geological and Natural History Survey (WGNHS)
2. U.S. Geological Survey (USGS)
3. WI Dept. of Natural Resources (DNR)

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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

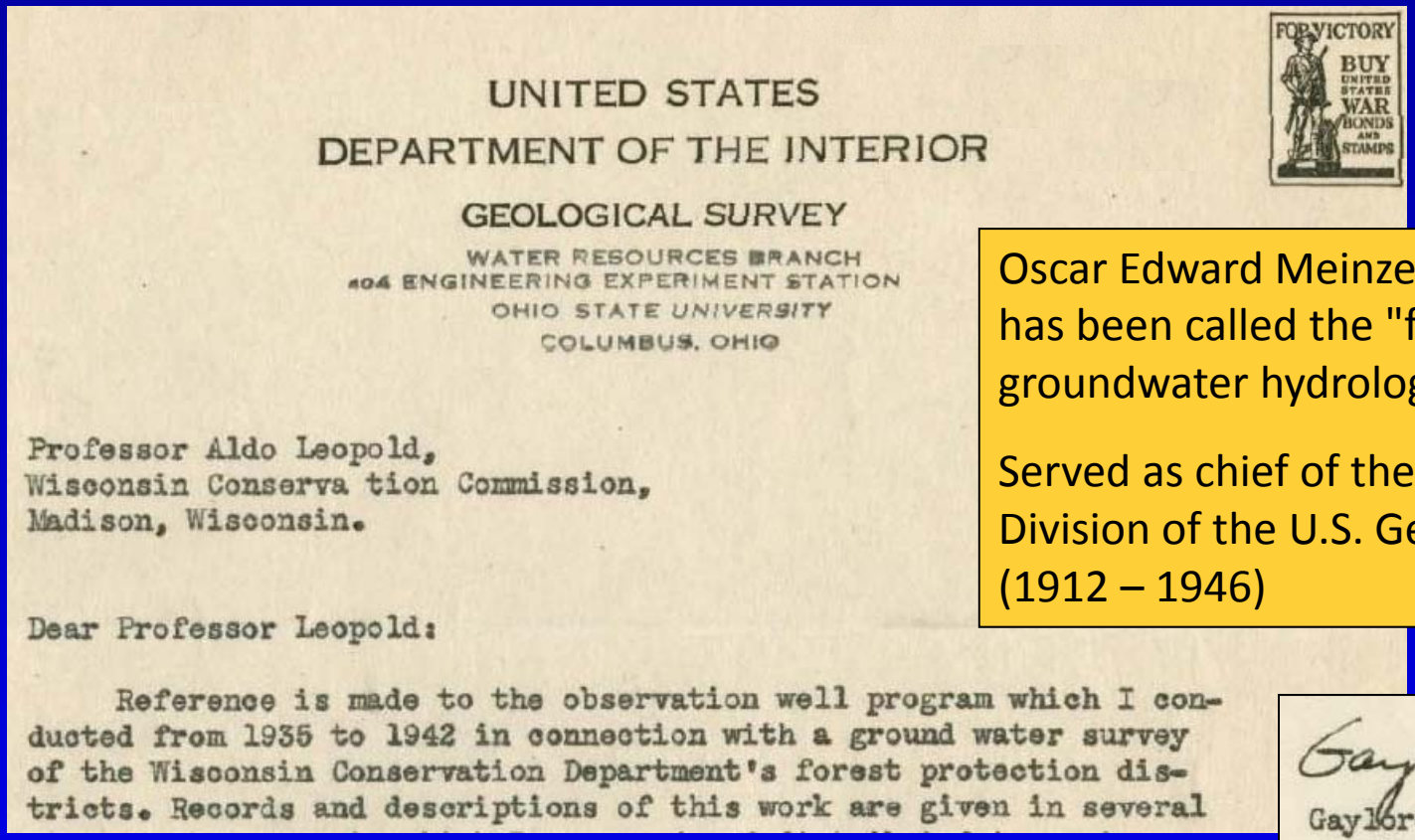
What is the Statewide Groundwater Monitoring Network?

- 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

FOR VICTORY BUY UNITED STATES WAR BONDS AND STAMPS

Professor Aldo Leopold,
Wisconsin Conserva tion 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

Gaylord T. Owen

Gaylord T. Owen,
Geologist.

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)

- 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)*

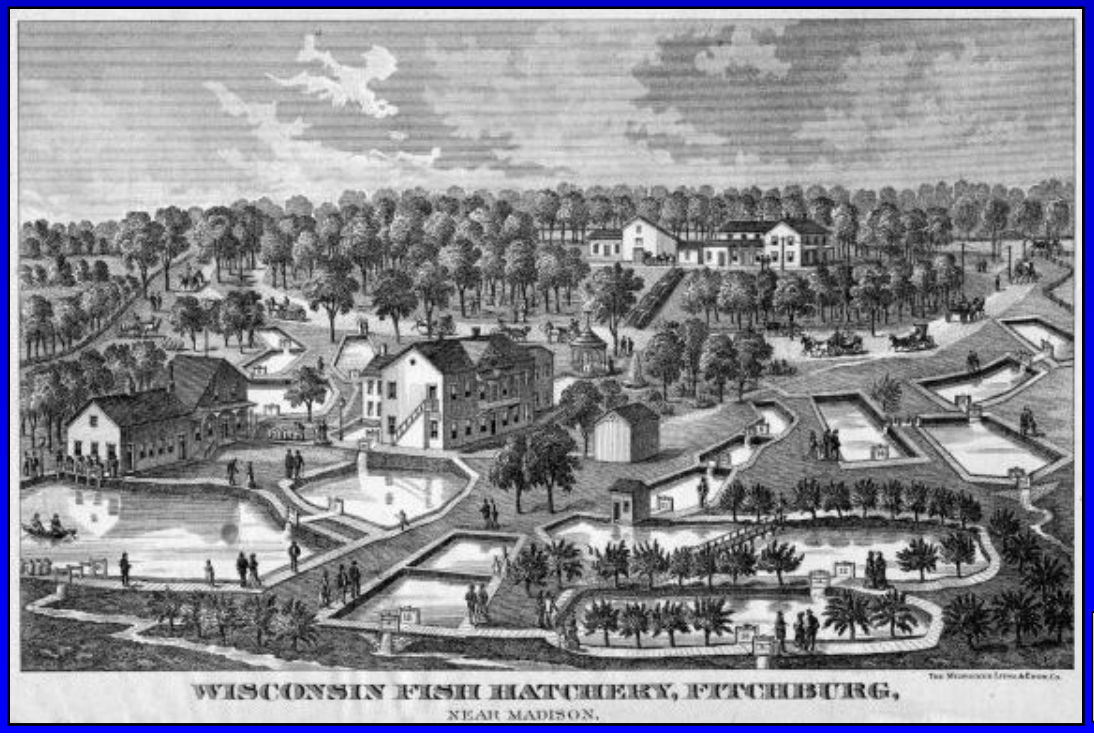
Source: Wisconsin Historical Society

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.

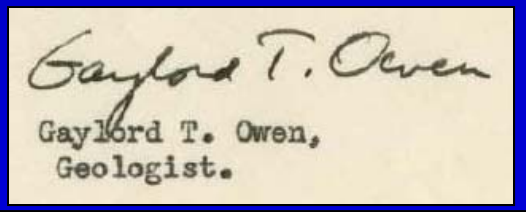


Nevin Fish Hatchery (Fitchburg, WI)
Source: Wisconsin Historical Society

History of the monitoring network

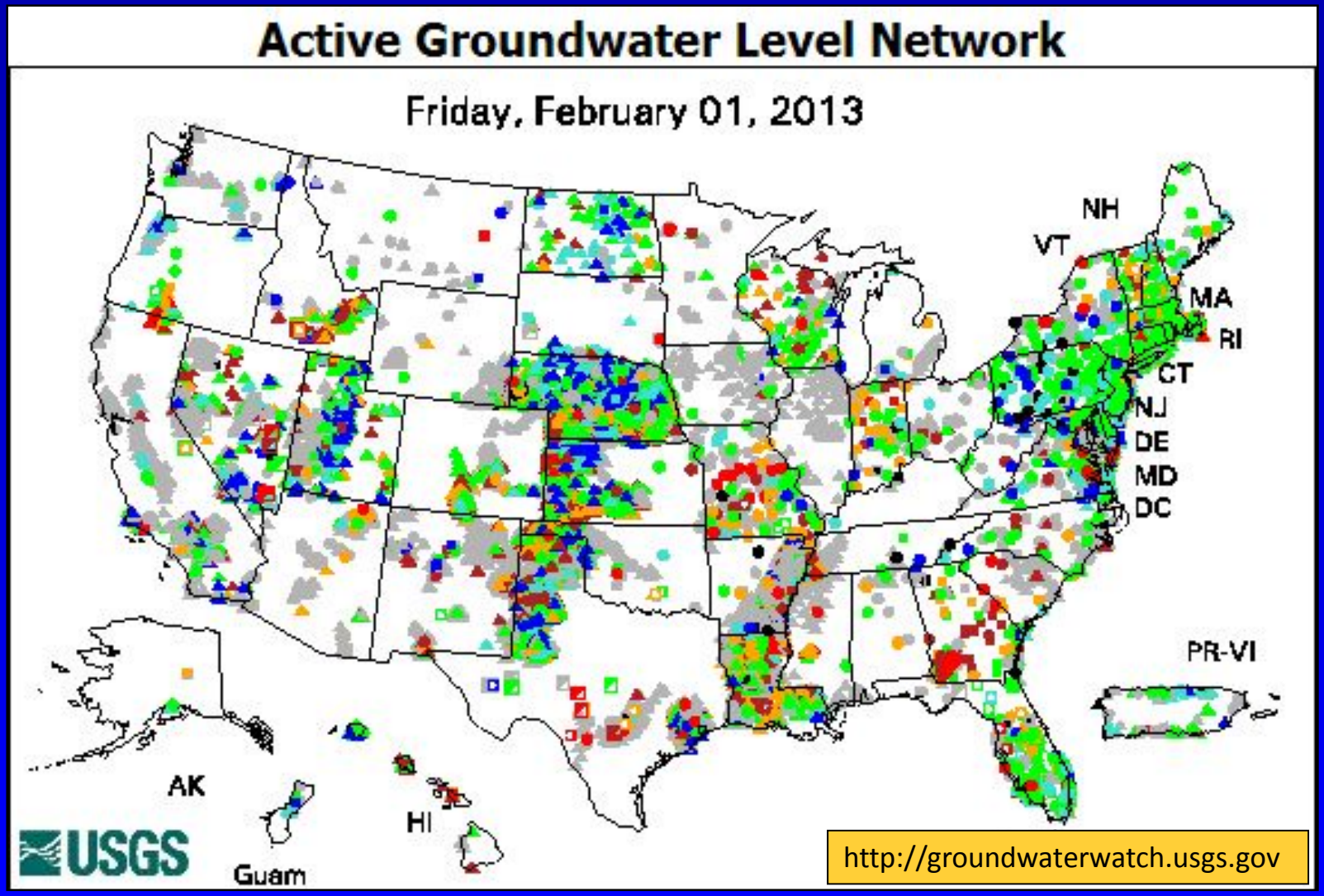
The stated goal of the observation network was to:

- *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*



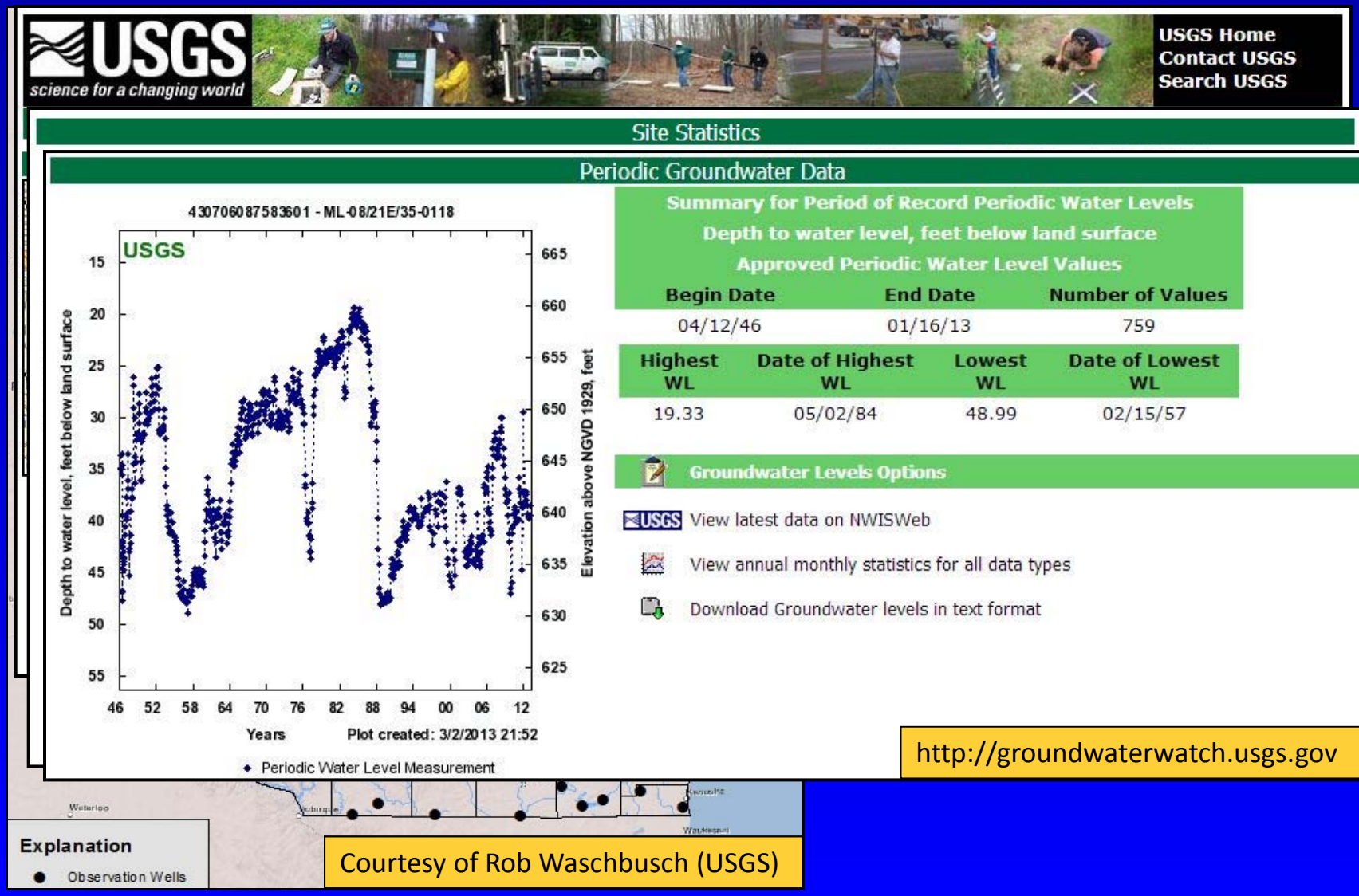
The monitoring network today

Nationwide



The monitoring network today

Wisconsin



Courtesy of Rob Waschbusch (USGS)

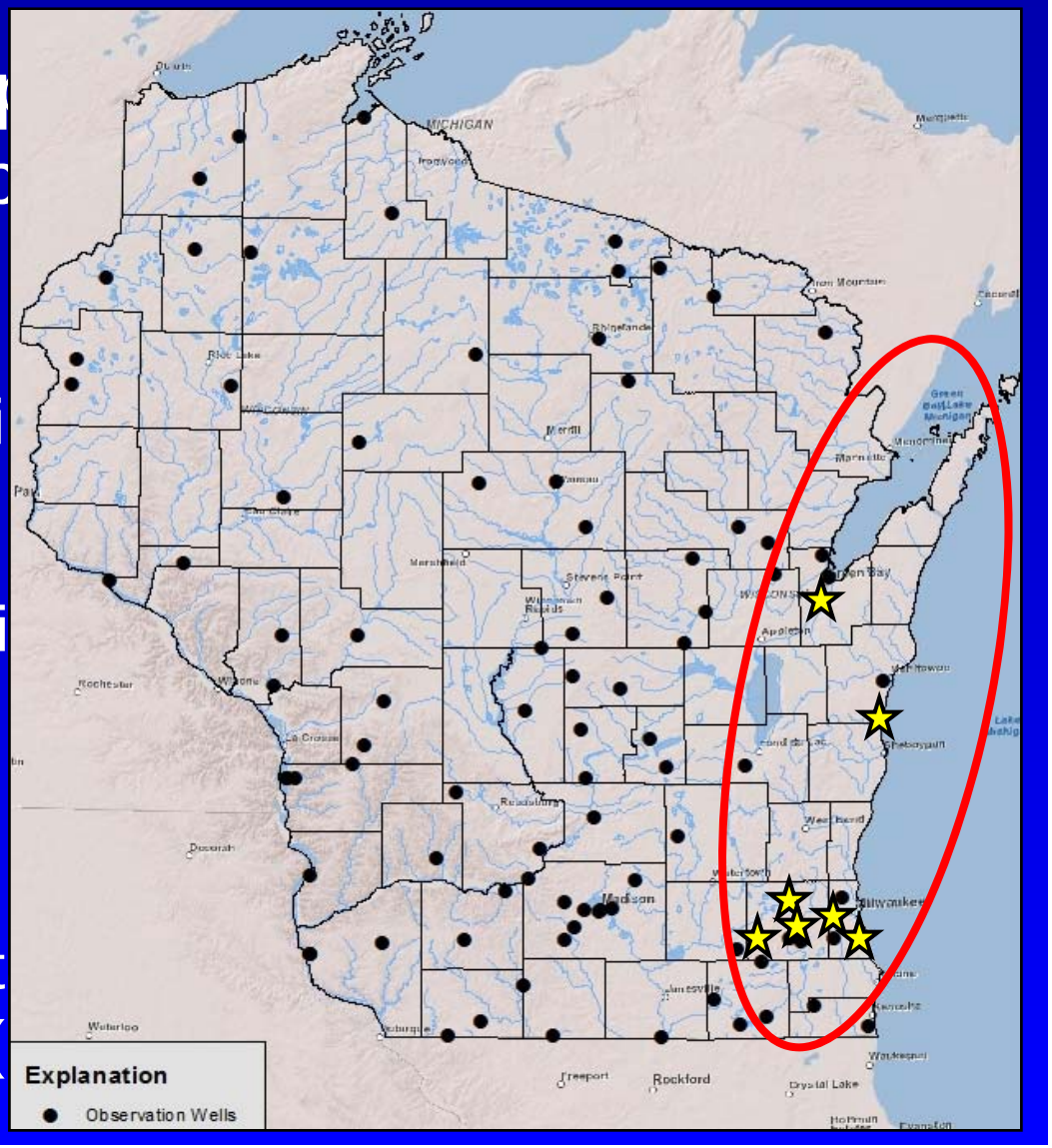
The monitoring network today

- 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

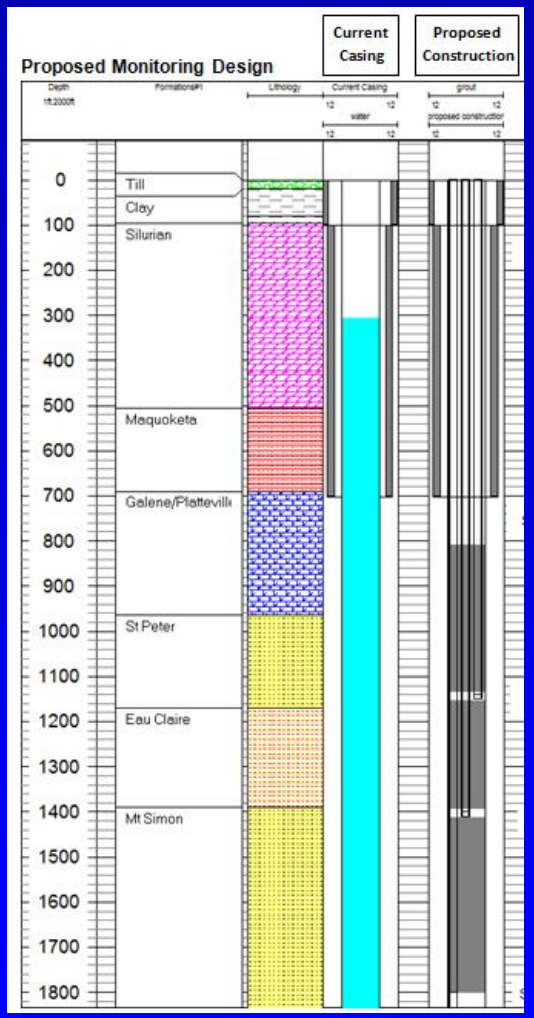
Current project to upgrade the network

- 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 (



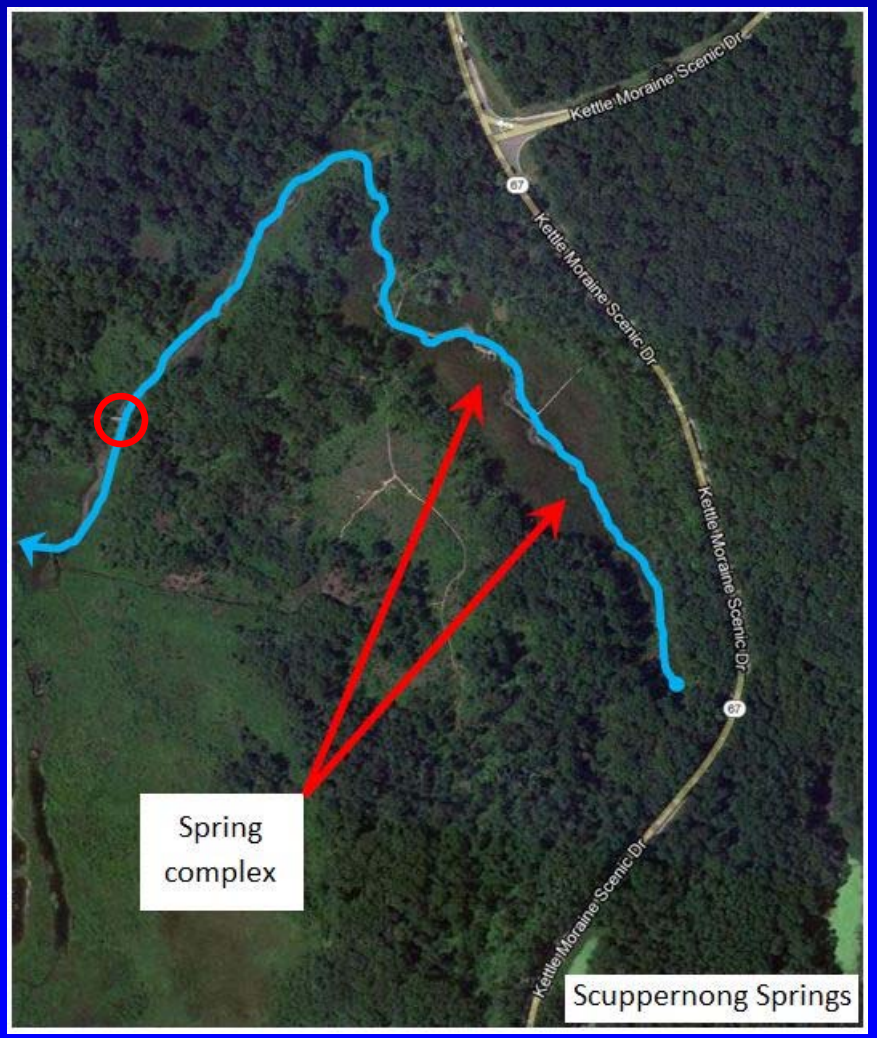
Current project to upgrade the network

- 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

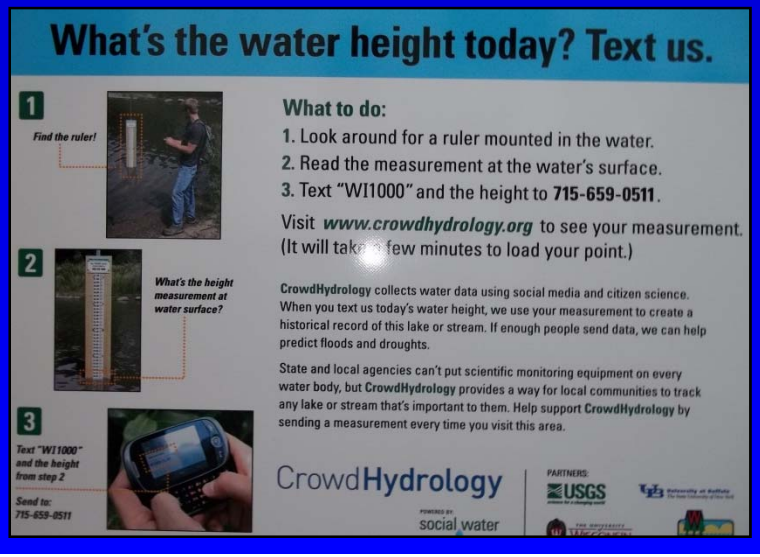
- 2 spring gaging stations installed in KMSF (Southern Unit)
  - Scuppernong Springs
  - Paradise Springs



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!



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=uHfz1Zm_W6c

Paradise Springs

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Questions?

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