Wisconsin
Department of Natural Resources

Drinking Water and Groundwater Study Group Meeting

Madison

January 10, 2019

Internal Updates

Kyle Burton – Field Operations Director

Monitoring Assessment Process

- ***EPA gives DNR authority to reduce monitoring frequency***
  - ***Potential to grant monitoring waivers for:***
    - ***Asbestos***
    - ***VOC***
    - ***SOC***
    - ***IOC***

- ***The objective of the monitoring assessment program is to reduce the frequency of monitoring while assuring the safety of the drinking water.***

Monitoring Assessment Process

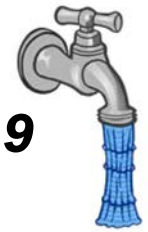
- **The monitoring assessment criteria include:**
  - **Identification of a water source's proximity to potential contaminant sources**
  - **Analysis of local geology**
  - **Evaluation of well construction criteria**
  - **Review of previous source water analytical results**

- **Monitoring waivers allow public water supply systems to reduce sampling frequencies by three, six or nine years.**

Monitoring Assessment Process

- ***Public water supply owners need to submit a monitoring waiver application to be eligible for waivers.***
  - ***DNR prepares documents and sends to system***
  - ***System must confirm well and potential contaminant locations and return assessment to DNR***
  - ***DNR completes assessment and issues waivers***
  - ***Potential cost savings for systems up to $2500.00 annually***
- ***System types on 3 year cycles***
  - ***Municipal, Other-than-Municipal, Non-Transient Non-Community***

Monitoring Assessment Process



- ***2019 = Municipal Systems***
  - ***Waiver Packets mailed January / February 2019***
  - ***Systems return packets March 2019***
  - ***Assessments completed / Waivers issued June 2019***
  - ***Preliminary Monitoring Schedules issued August 2019***

Consistency Update

- ***Sanitary Surveys***
  - ***Several teams close to finalizing revised handbook chapters.***
    - ***Municipal and Non-Transient Non-Community***
  - ***Working with Small Business Assistance Program to create "Pre-Survey Checklists" to share with systems prior to surveys.***

Reminders

- ***Annual cross connection control reports for 2018 are requested by March 1, 2019, per NR 810.15.***

- ***2019 Seasonal Start-Ups***
  - ***Transient Non-Community Systems***
    - ***Receive Brochure – must fill out at return***
    - ***Link to Seasonal Start-Up Presentation Slides:***

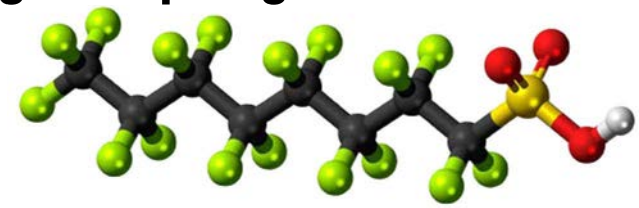
      https://dnr.wi.gov/topic/DrinkingWater/documents/StudyGroup/Presentation20180405.pdf

Lead & Copper Update

- ***Continuing with 2018 Initiative – Large 12 and Systems with ALEs***
  - ***Data trickling in from Large 12***
  - ***Several systems installing pipe-loops in-house to evaluate lead and copper control***
  - ***~20 systems conducting CCT Studies – huge effort not seen from PWS since 1990's***
- ***NN Monitoring year***
  - New sampling guidance
  - More clarity on treatment processes

PFAS Update

- **Environmental Management Division Ongoing PFAS Work:**
  - **DG and RR collaborated with the DHS to develop a standard operating procedure for responding to situations when PFAS may be found in drinking water.**
  - **A communication plan, including a public webpage on PFAS, is being developed in collaboration with the Office of Communications and DHS.**
  - **The EM Division is reaching out to other divisions in the agency to address cross-media issues, such as PFAS in wildlife and potential uses in forestry applications.**
  - **The EM Division is working to establish collaborative workgroups with other states to share technical information regarding PFAS including sampling techniques, screening criteria, etc.**



Proposed Additional PSC Annual Report Elements For CY 2019

Cathy Wunderlich – DNR, Public Water Engineering Section Chief
Bruce Rheineck – DNR, Groundwater Section Chief

PSC Annual Reports

Wis. Stats. §196.07 requires water utilities to report each calendar year's data, by April 1 of the following year:

- Financial Section
  - Income Statements
  - Balance Sheets
  - Payroll
  - Depreciation
  - Property/Supplies/Assets
  - Debt
  - Taxes, Interest

PSC Annual Reports

- Water Section
  - Operating Revenues & Expenses
  - (Water) Sales for Resale
  - Operation/Maintenance Expenses
  - Infrastructure
    - Source Water Supply
    - Pumping & Power Equipment
    - Storage Facilities
    - Water Treatment Plant
    - Water Mains
    - Public & Private Owned Water Services
    - Ind. & Station Meters
    - Hydrants and Valves

PSC Annual Reports

How is this information used?

PSC (PSC 185)

- Financial Outreach/Viability
- Rate Cases
- Water Loss, Meters
- Construction Authorization

DNR (NR 166; NR 810)

- Safe Drinking Water Loan Program
- Sanitary Surveys

PSC Annual Reports

Specific Unanswered Questions:

1. What comprises the state's infrastructure- sources, materials and treatment facilities?
2. What are the upfront capitol and annual O&M costs associated with addressing groundwater contaminants- what are those specific contaminants?

PSC Annual Reports

What If We Understood:

- What contaminants are being removed or controlled;
- Where in the state they are occurring;
- What are the associated costs with addressing these contaminants;
- Trends in this information?

PSC Annual Reports

This data could:

- Help inform and guide research, development, source water protection activity projects;
- Assist in regulatory response to responsible parties; and
- Support solicitation of federal funding.

PSC Annual Reports

What information would be solicited?

Specific treatment expenses…

- Fluoride, disinfection, pH adjustment (for CCT?), contaminant removal (primary or secondary), corrosion control treatment
- Sampling costs- broke out by routine operational vs. contaminant/treatment monitoring
- Disposal costs- Hauling of wastes, solid waste disposal, WWTF treatment/costs, etc.

PSC Annual Reports

When would the information be required?

Calendar Year 2019

due to

PSC by April 1, 2020

Break

Central Sands Lake Study

Adam Freihoefer– DNR, Water Use Section Chief
Jeff Helmuth - DNR Hydrogeologist

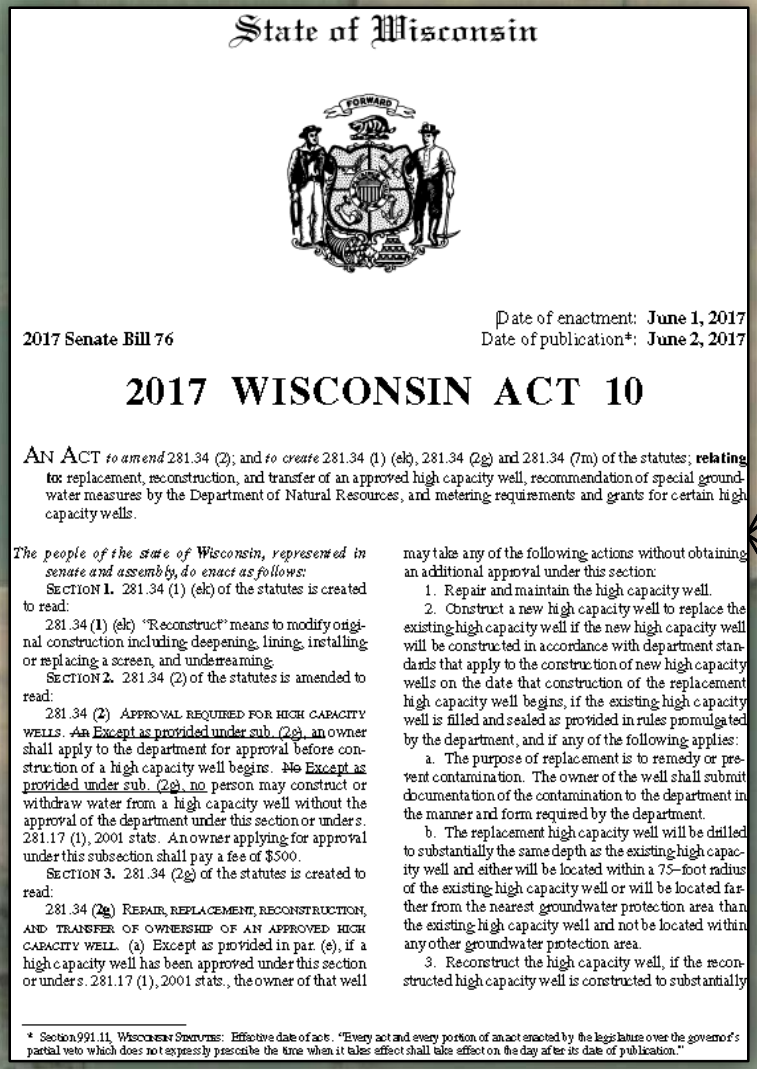
Water Use Program: What We Do

Mission:

Sustainably manage the quantity and quality of water in the state to ensure that water is available to be used to protect and improve our health, economy and environment now and into the future

- Water Use Registration & Reporting
- Diversions & Water Use Permitting
- High Capacity Wells
- Water Conservation & Efficiency
- Water Resources Inventory

2017 Wisconsin Act 10 Overview



State of Wisconsin

2017 Senate Bill 76

Date of enactment: **June 1, 2017**
Date of publication*: **June 2, 2017**

2017 WISCONSIN ACT 10

AN ACT *to amend* 281.34 (2); and *to create* 281.34 (1) (ek), 281.34 (2g) and 281.34 (7m) of the statutes; **relating to:** replacement, reconstruction, and transfer of an approved high capacity well, recommendation of special groundwater measures by the Department of Natural Resources, and metering requirements and grants for certain high capacity wells.

The people of the state of Wisconsin, represented in senate and assembly, do enact as follows:

SECTION **1.** 281.34 (1) (ek) of the statutes is created to read:

281.34 **(1)** (ek) "Reconstruct" means to modify original construction including deepening, lining, installing or replacing a screen, and underreaming.

SECTION **2.** 281.34 (2) of the statutes is amended to read:

281.34 **(2)** APPROVAL REQUIRED FOR HIGH CAPACITY WELLS. ~~An~~ Except as provided under sub. (2g), an owner shall apply to the department for approval before construction of a high capacity well begins. ~~No~~ Except as provided under sub. (2g), no person may construct or withdraw water from a high capacity well without the approval of the department under this section or under s. 281.17 (1), 2001 stats. An owner applying for approval under this subsection shall pay a fee of $500.

SECTION **3.** 281.34 (2g) of the statutes is created to read:

281.34 **(2g)** REPAIR, REPLACEMENT, RECONSTRUCTION, AND TRANSFER OF OWNERSHIP OF AN APPROVED HIGH CAPACITY WELL. (a) Except as provided in par. (e), if a high capacity well has been approved under this section or under s. 281.17 (1), 2001 stats., the owner of that well may take any of the following actions without obtaining an additional approval under this section:

1. Repair and maintain the high capacity well.

2. Construct a new high capacity well to replace the existing high capacity well if the new high capacity well will be constructed in accordance with department standards that apply to the construction of new high capacity wells on the date that construction of the replacement high capacity well begins, if the existing high capacity well is filled and sealed as provided in rules promulgated by the department, and if any of the following applies:

a. The purpose of replacement is to remedy or prevent contamination. The owner of the well shall submit documentation of the contamination to the department in the manner and form required by the department.

b. The replacement high capacity well will be drilled to substantially the same depth as the existing high capacity well and either will be located within a 75–foot radius of the existing high capacity well or will be located farther from the nearest groundwater protection area than the existing high capacity well and not be located within any other groundwater protection area.

3. Reconstruct the high capacity well, if the reconstructed high capacity well is constructed to substantially

* Section 991.11, WISCONSIN STATUTES: Effective date of acts. "Every act and every portion of an act enacted by the legislature over the governor's partial veto which does not expressly prescribe the time when it takes effect shall take effect on the day after its date of publication."

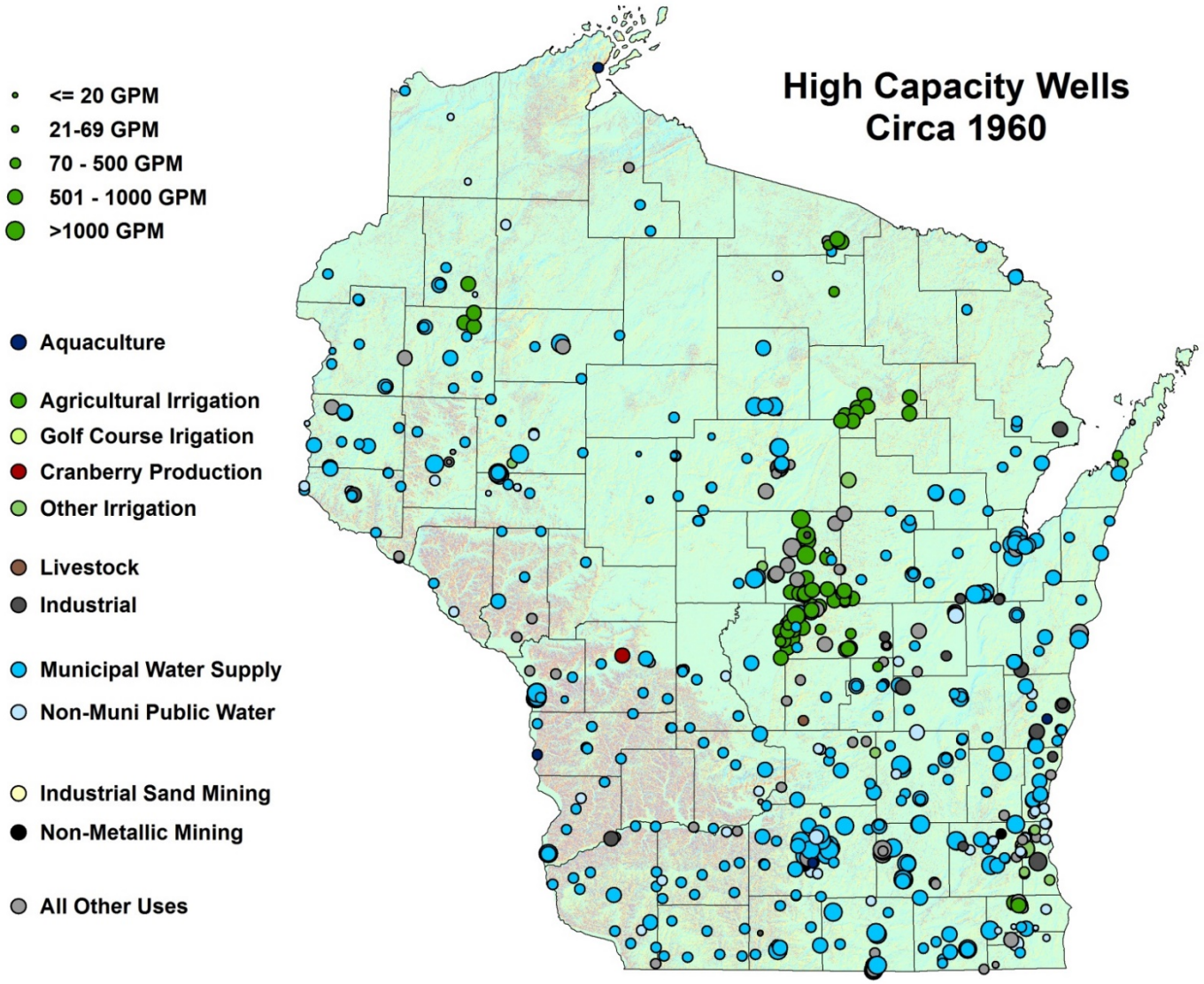
- Replacement, reconstruction, and transfer of high capacity wells
- Model and evaluate hydrology of specified water bodies to determine whether existing and potential groundwater withdrawals are causing significant impacts to water bodies
- High capacity wells constructed, replaced, reconstructed, or transferred within the study area after June 3, 2017, must submit metered water use to DNR
- Lake associations allowed to obtain a high capacity well to assist in study of lake within study area

The Central Sands Lakes Study: Why?

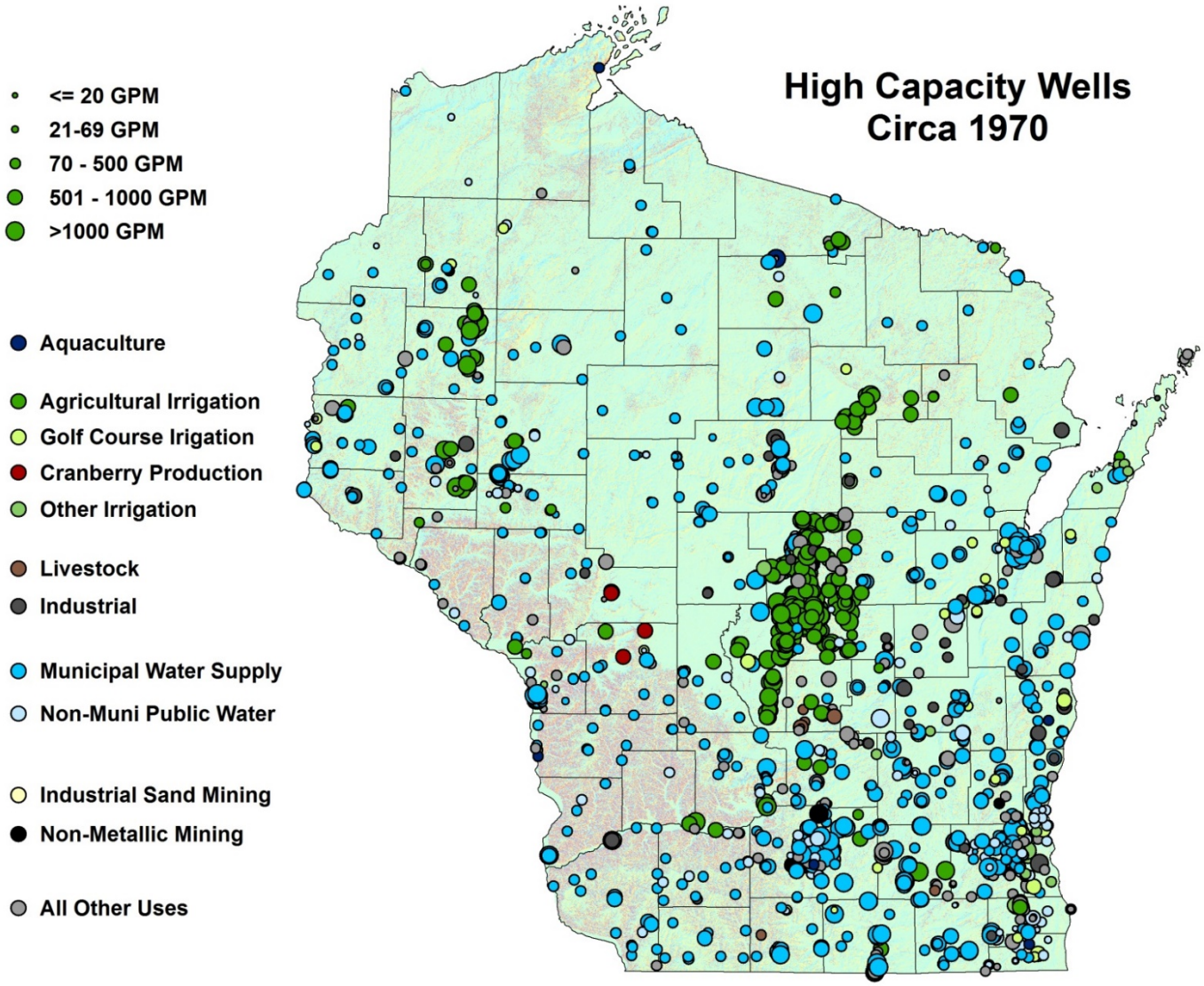
Photo: Patrick Durkin

Picture taken from the boat ramp at Long Lake, June 2016

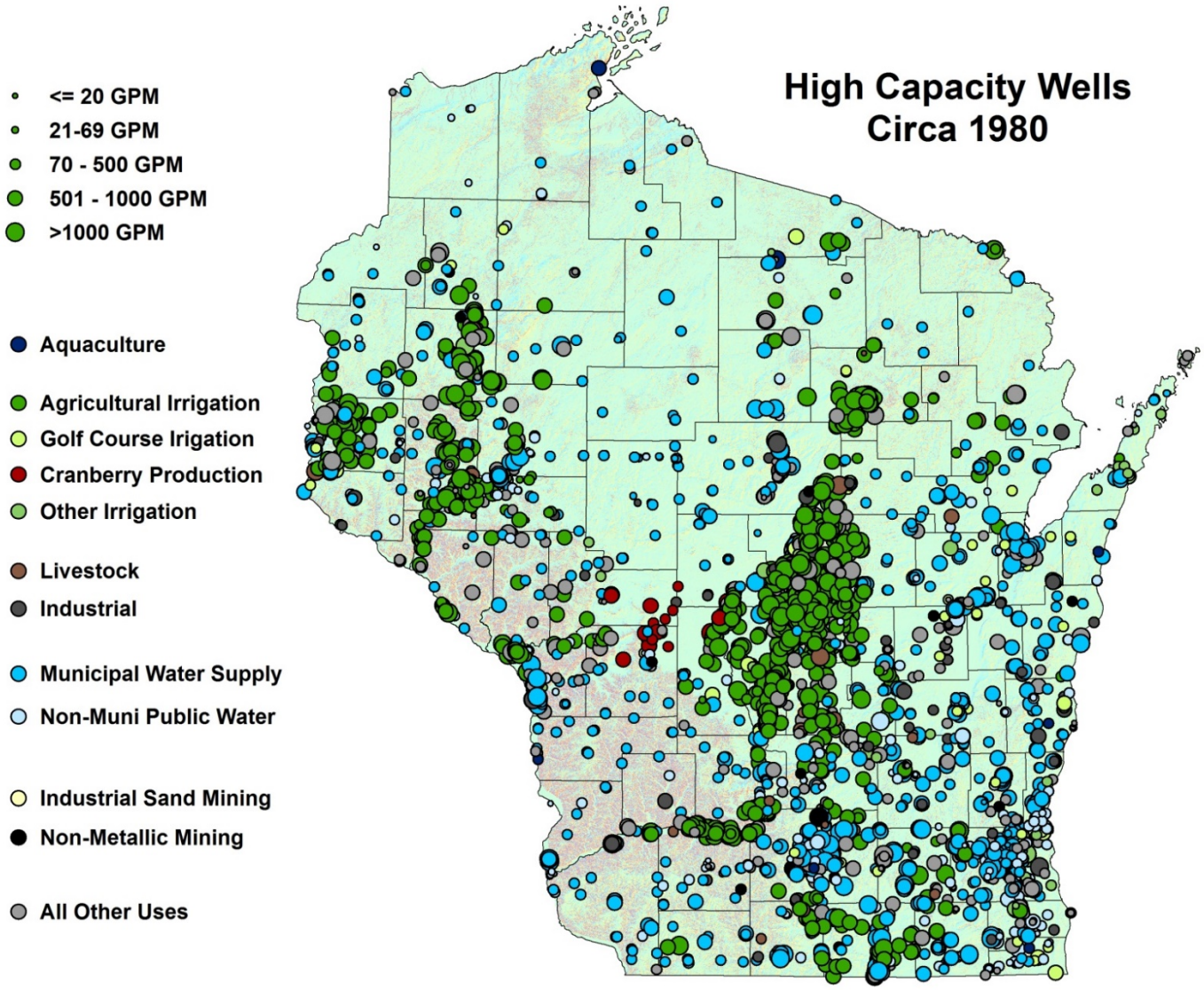
Distribution of High Capacity Wells: 1960



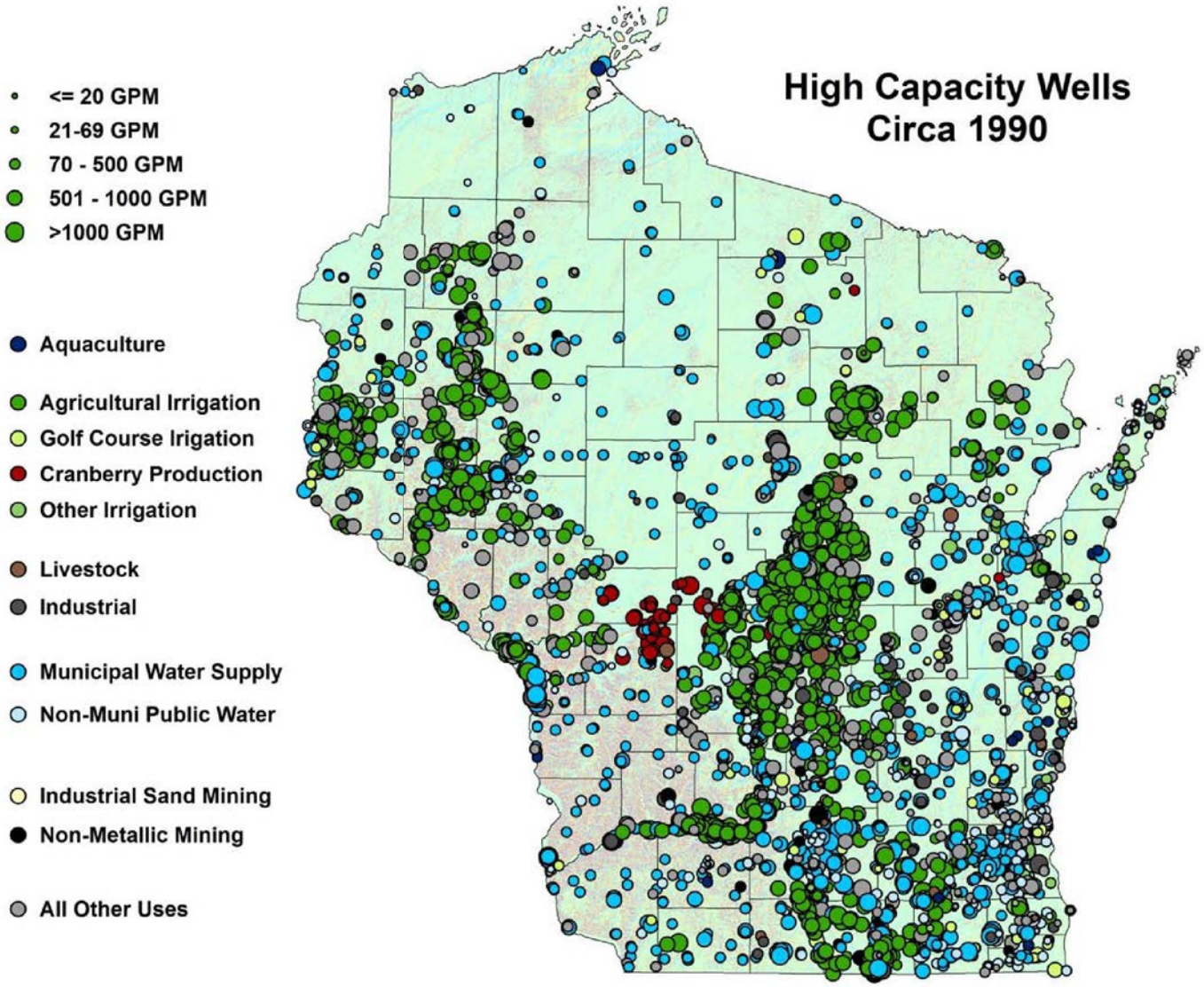
Distribution of High Capacity Wells: 1970



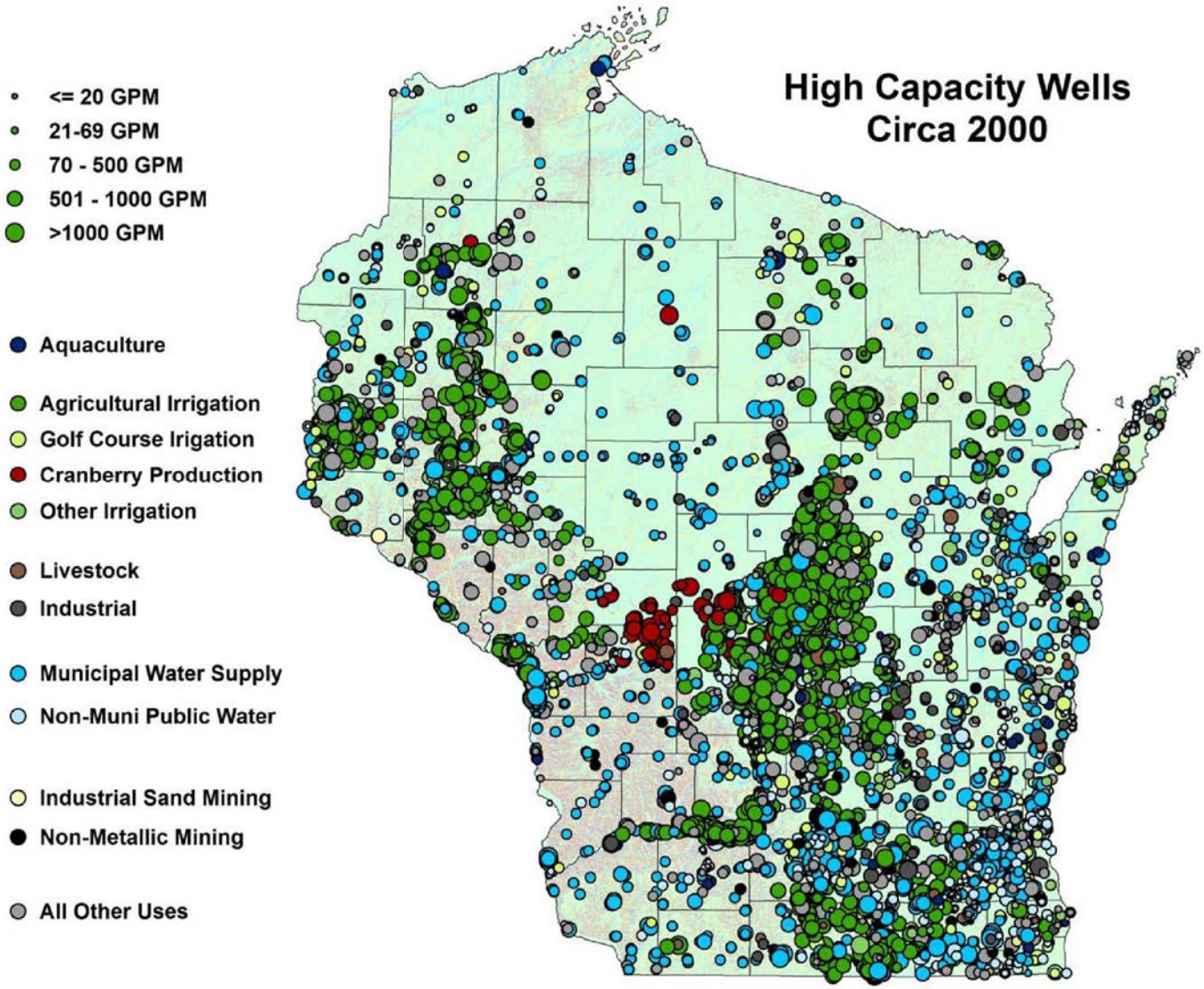
Distribution of High Capacity Wells: 1980



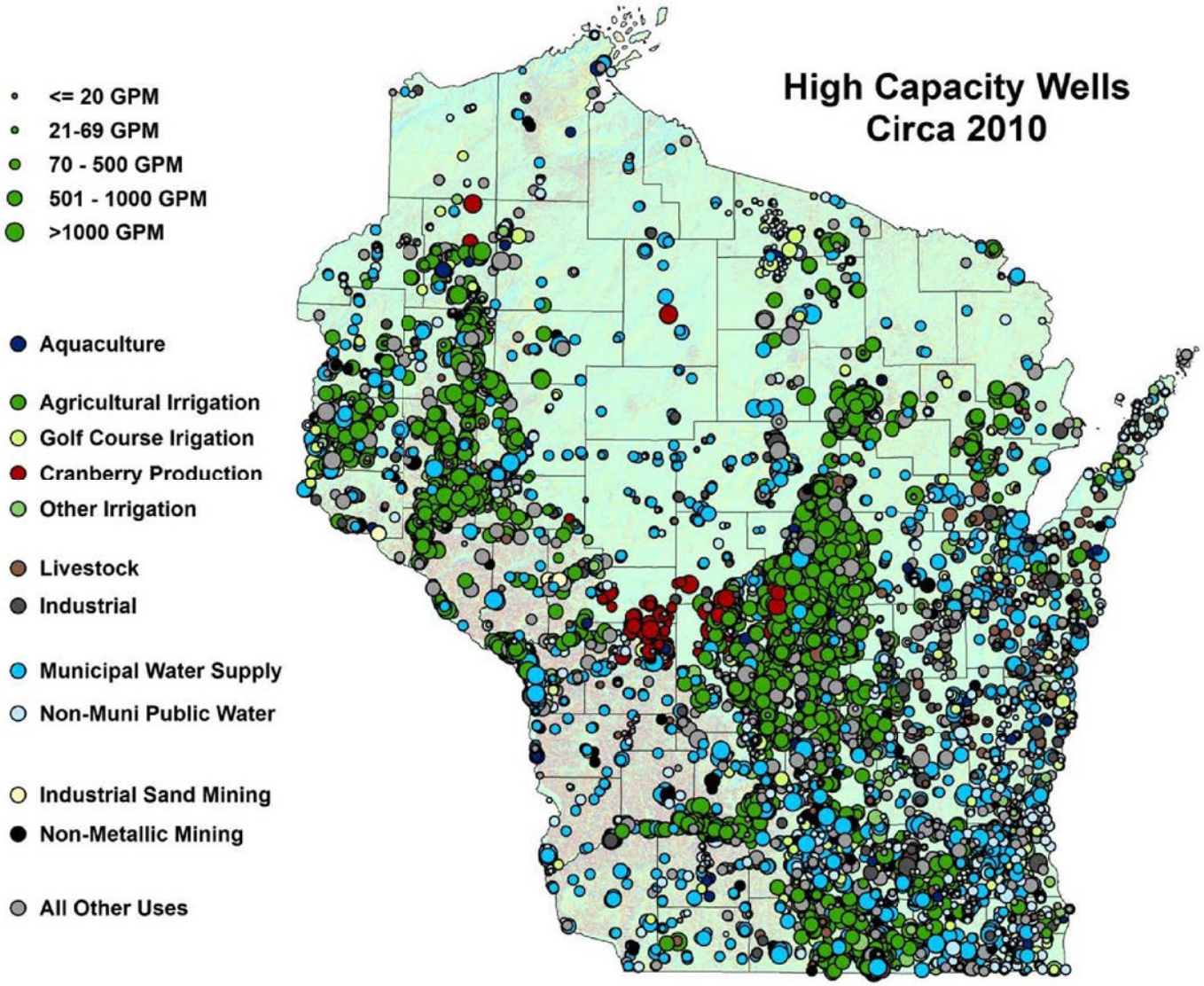
Distribution of High Capacity Wells: 1990



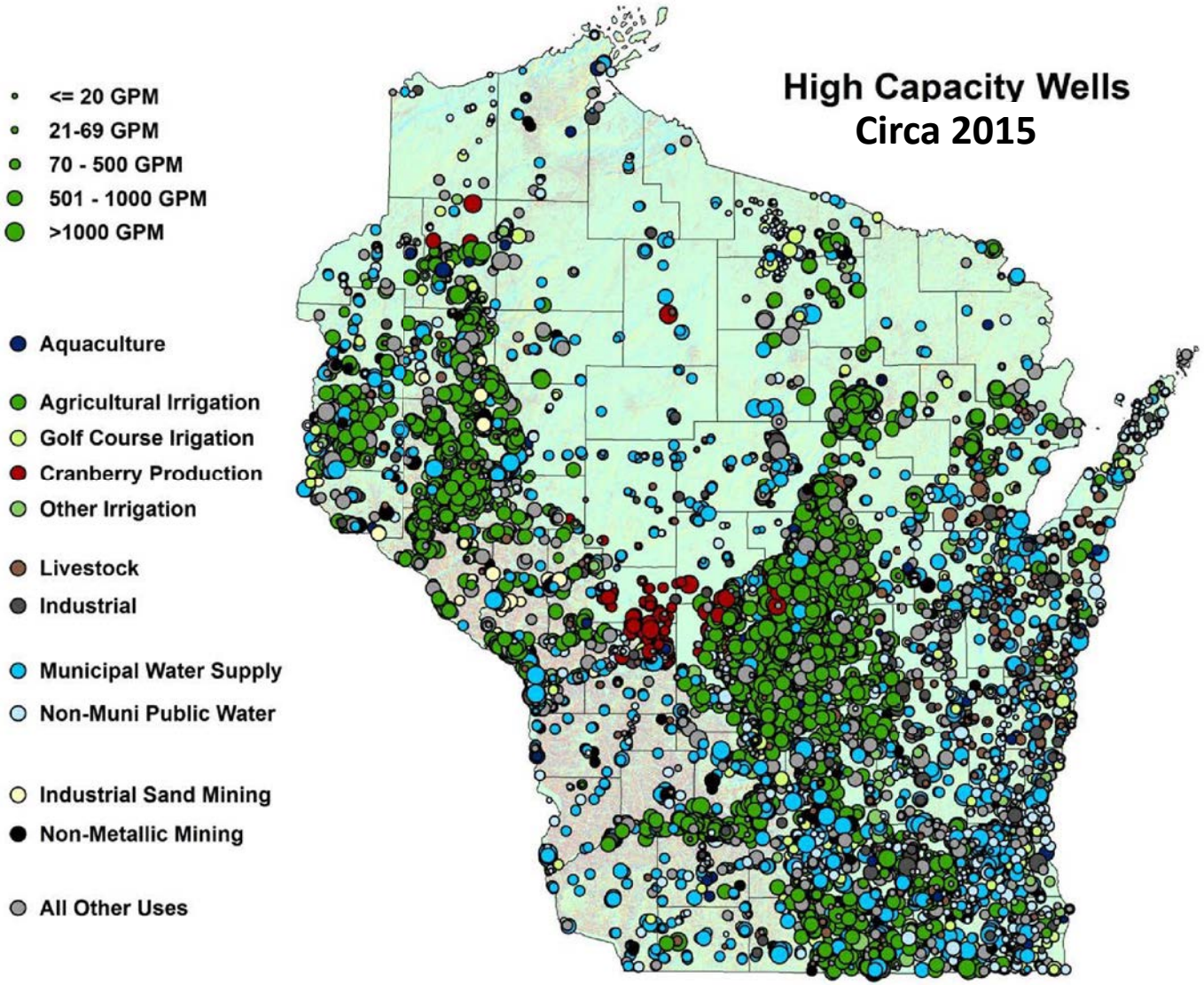
Distribution of High Capacity Wells: 2000



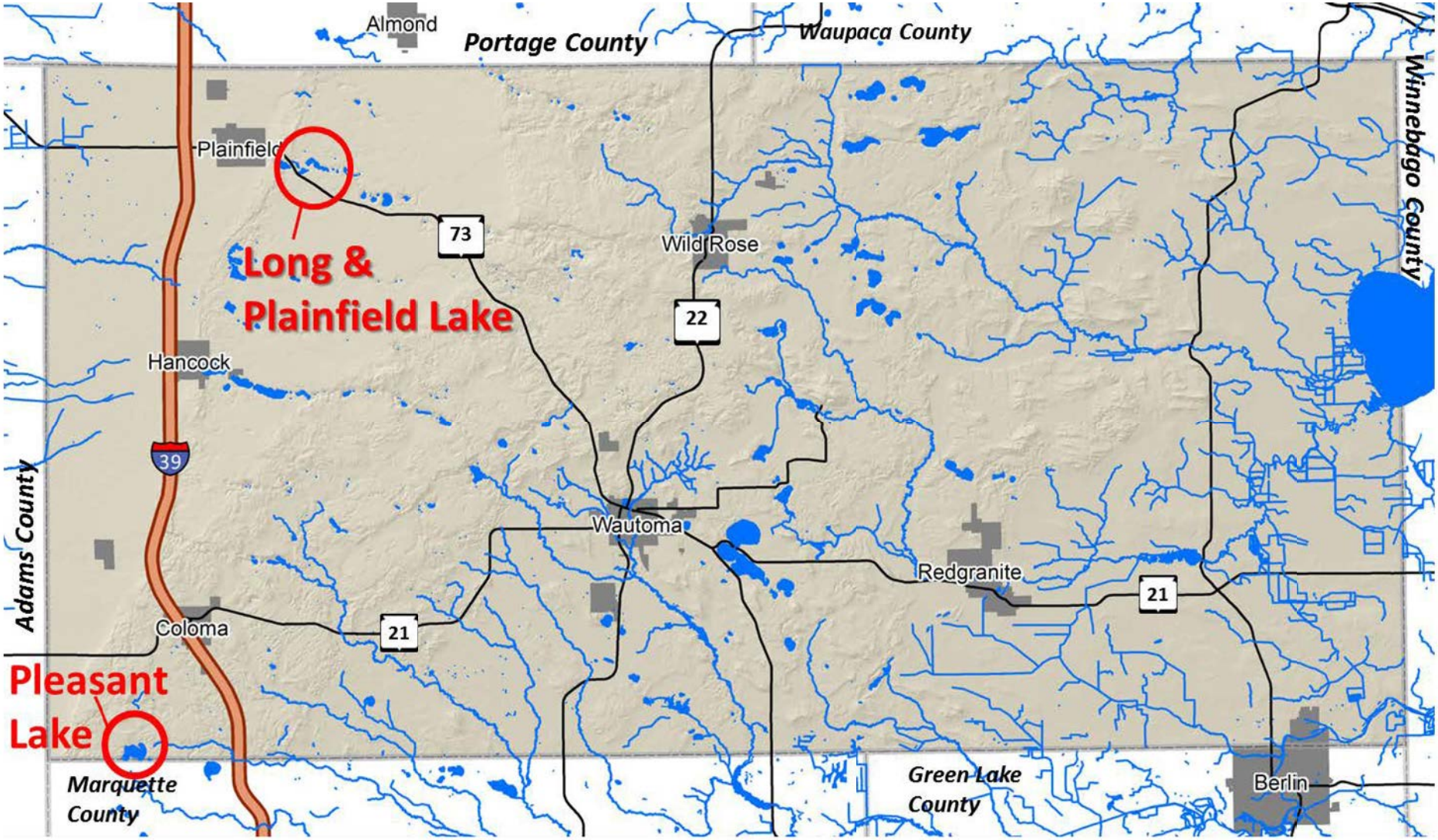
Distribution of High Capacity Wells: 2010



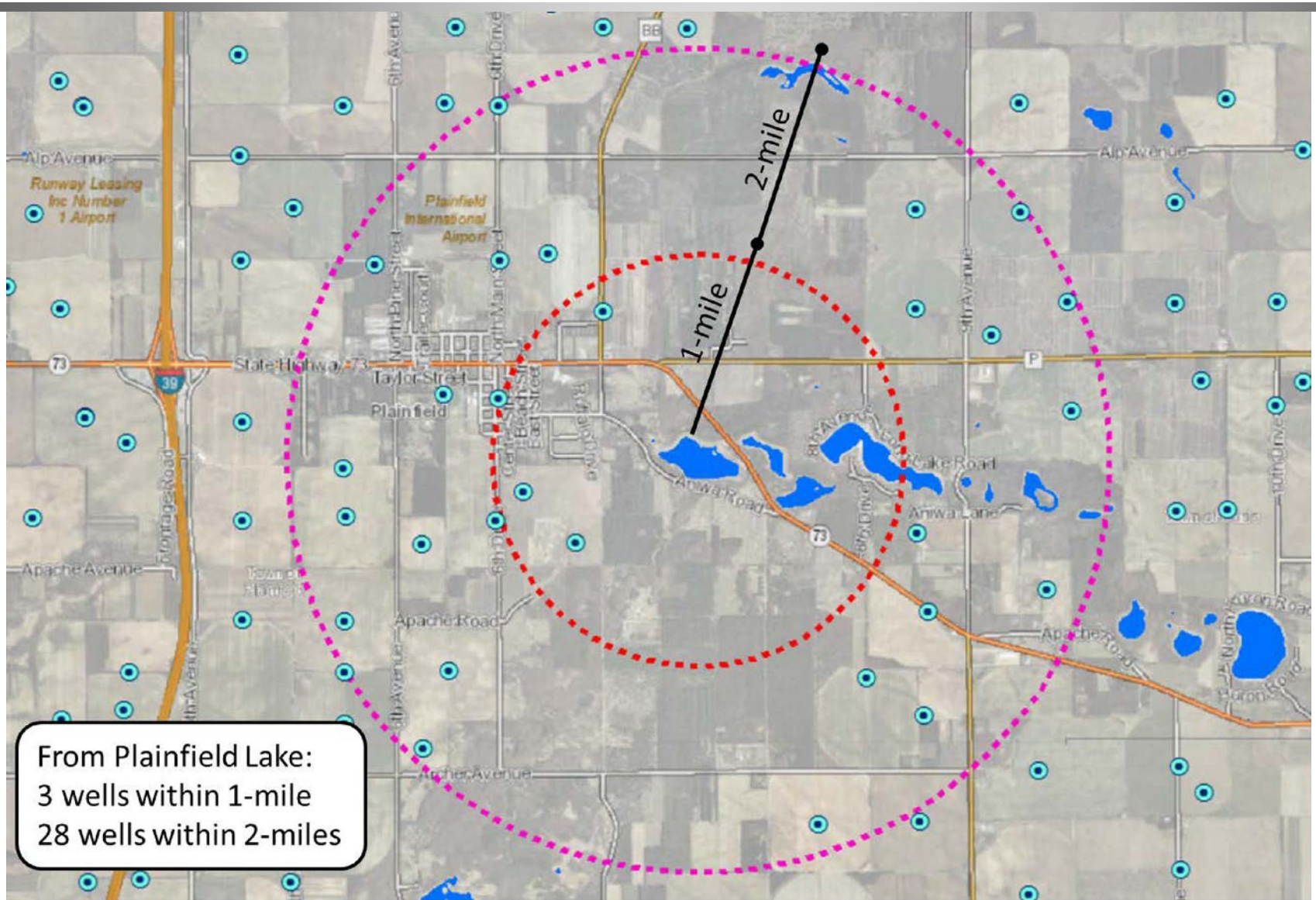
Distribution of High Capacity Wells: 2015



The Central Sands Lakes Study: Waushara County



What is the role of pumping?



From Plainfield Lake:
3 wells within 1-mile
28 wells within 2-miles

What is the role of climate variability?

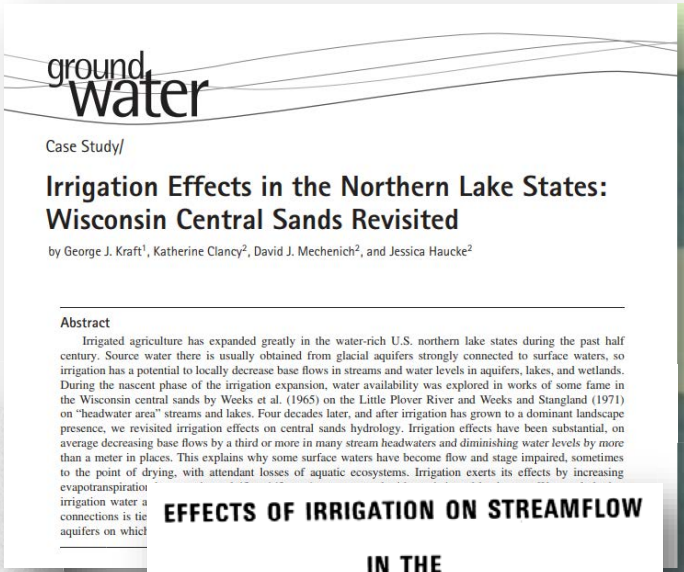
Plainfield Lake, August 2016

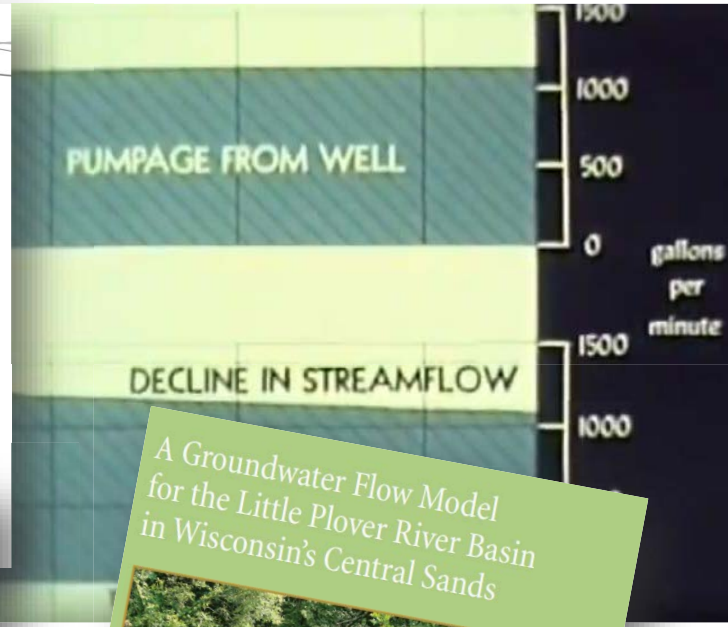
Plainfield Lake, October 2018

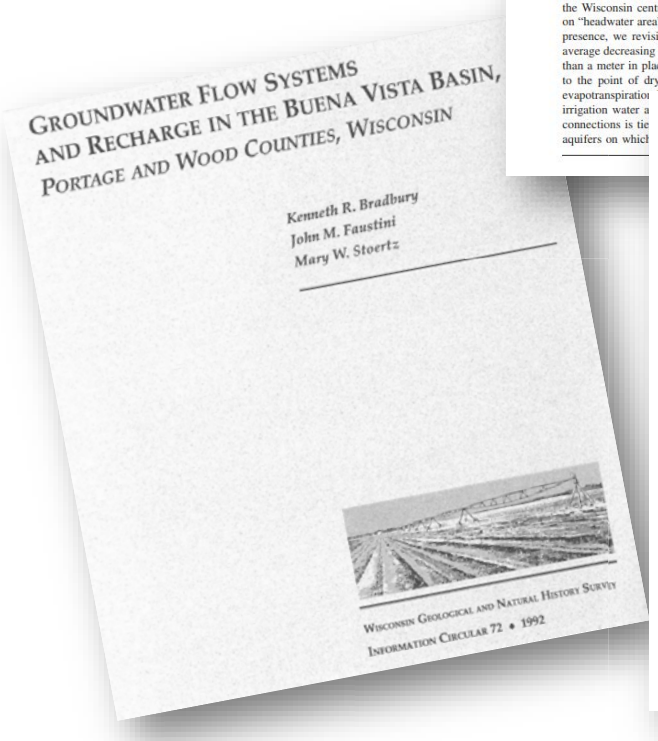
Photos by Jon Robaidek, DNR

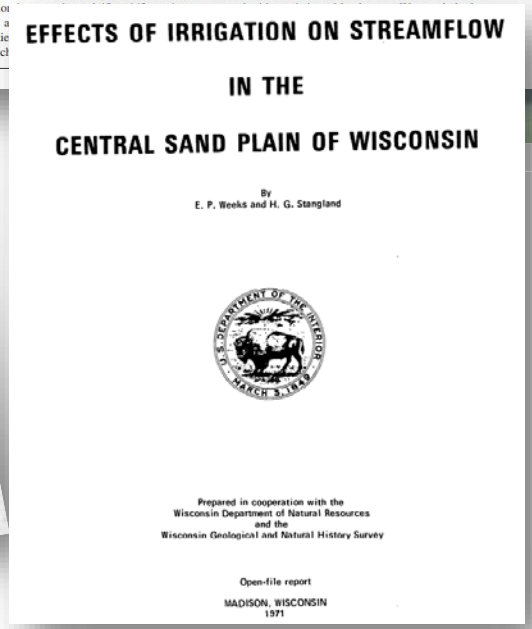
Central Sands Groundwater Research

Focus on Groundwater/ Surface Water Interactions





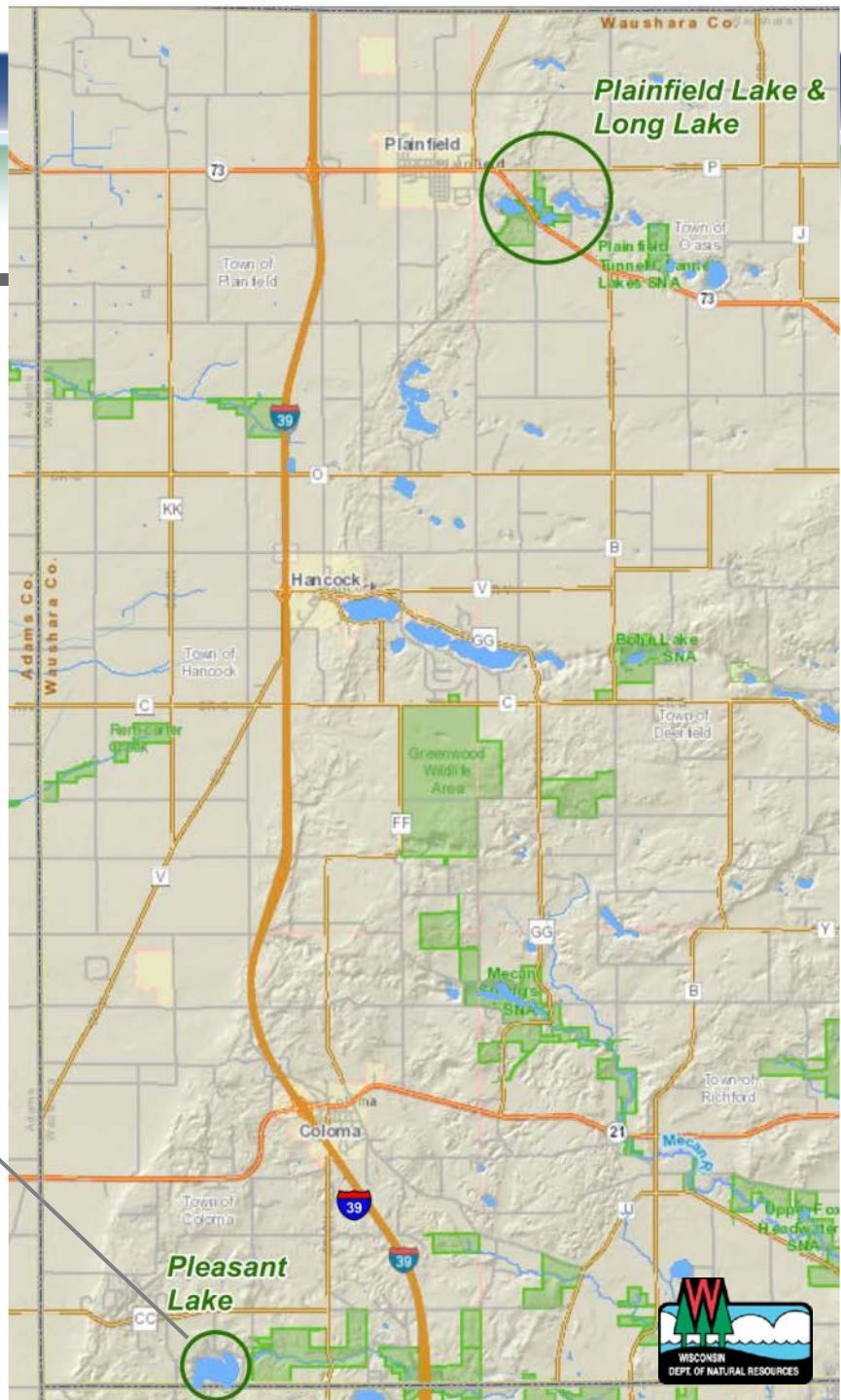




Central Sands Lakes Study

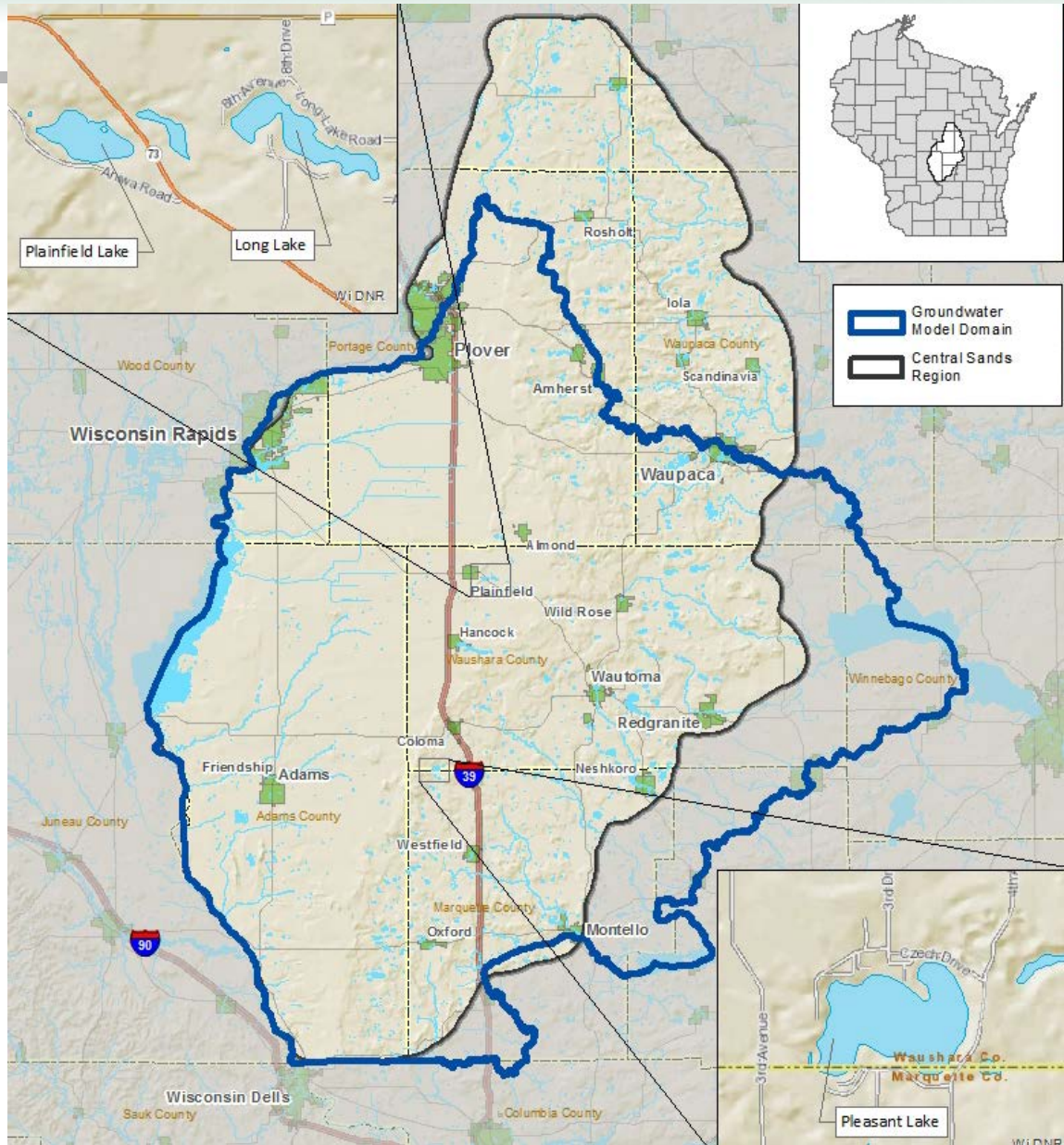
2017 Wisconsin Act 10 requires the WDNR to:

Evaluate and model the hydrology of Pleasant Lake, Plainfield Lake, and Long Lake "*to determine whether existing and potential groundwater withdrawals are causing or are likely to cause a significant reduction of the lake's water level below its average seasonal levels*"

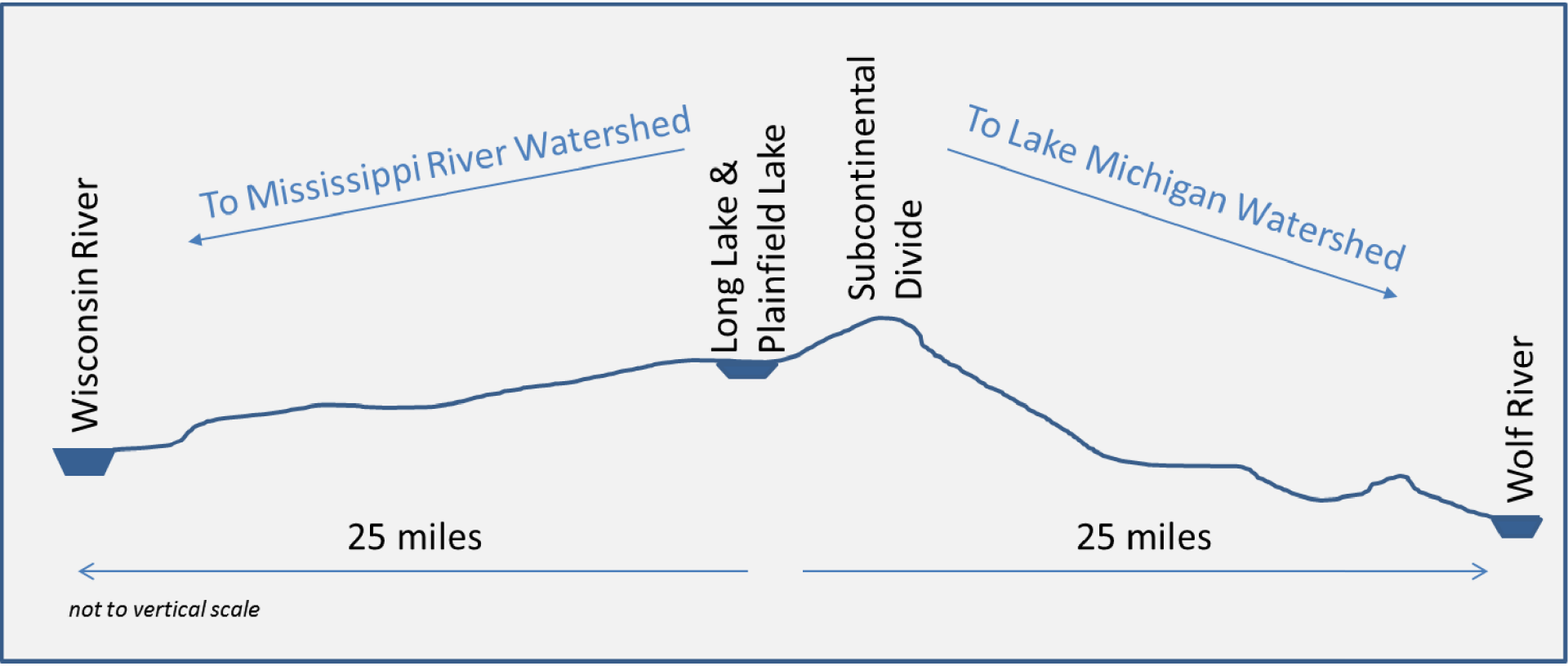


Study Area

- Study is focused on 3 lakes in Waushara County
- The modeled area will need to be large because the study lakes are far from major surface waters
- There will be more detail and monitoring data needed for model accuracy in the area close to the lakes



Landscape Position of Lakes



CSLS Components

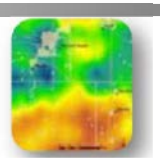
- Use **groundwater flow modeling** to determine if there are cumulative impacts of current and potential pumping.
- Conduct **a field study** to verify the connection and causal relationship between lake levels and pumping.
- **Define average seasonal water levels** for each of the three lakes and what a **significant reduction** below those levels means.
- If significant reductions are predicted then **recommend special measures** to prevent significant reductions below the average seasonal level.

Plainfield Lake

Long Lake

CSLS Timeline (July 2017 – June 2021)

Data Collection
Model Development



✓ Results
✓ Special Measures
✓ Economic Impact Analysis

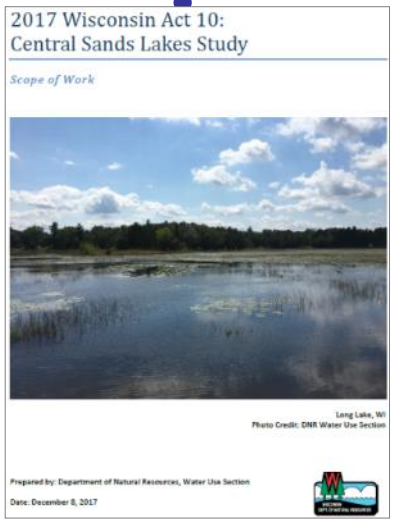
2017

2018

2019

2020

2021



✓ Data Collection / Field Study

✓ Lake Significance

✓ Groundwater Modeling & Scenarios

✓ Public Hearing & Comments

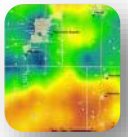
✓ Reports to Legislature

CSLS Workflow

Data Collection

Groundwater Flow Modeling

Resource Evaluation for Significance



Field Study

If significant impacts are identified and special measures are required then…

Share findings, identify potential special measures, & economic impact analysis

Public Hearing

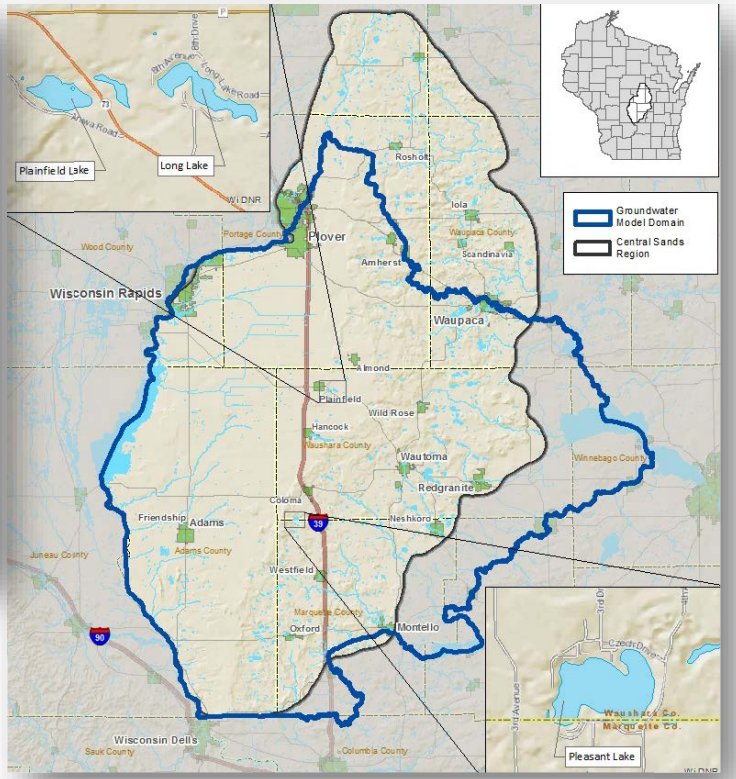
Reports to Legislature by June 2021

Scale of CSLS Data Collection

In-Lake

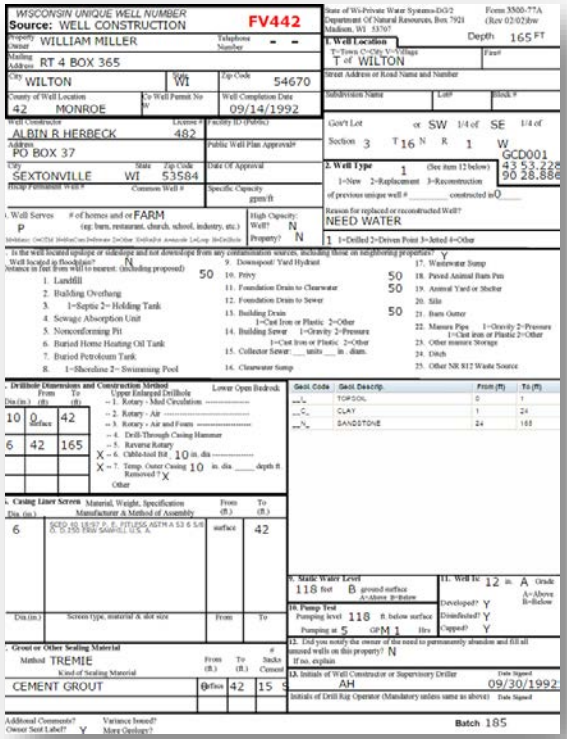
Near Lake

Regional System

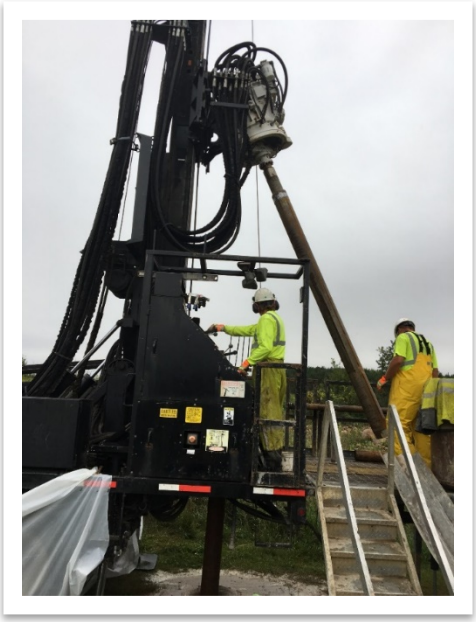


Data Collection: Geology and Hydrology

Well Construction Reports


WISCONSIN UNIQUE WELL NUMBER
Source: WELL CONSTRUCTION FV442
Property Owner WILLIAM MILLER
Mailing Address RT 4 BOX 365
City WILTON State WI Zip Code 54670
County of Well Location 42 MONROE
Well Completion Date 09/14/1992
Well Constructor ALBIN R HERBECK License # 482
Address PO BOX 37
City SEXTONVILLE State WI Zip Code 53584
Well Serves # of homes and or FARM
Depth 165 FT
1. Well Location T of WILTON
2. Well Type 1
Reason for replaced or reconstructed Well? NEED WATER
Drillhole Dimensions and Construction Method
Casing Liner Screen
Grout or Other Sealing Material Method TREMIE
CEMENT GROUT
Initials of Well Constructor or Supervisory Driller AH Date Signed 09/30/1992
Batch 185

Rotosonic Drilling



Surface Geophysics

- Passive Seismic
- Active Seismic

Photo Credit: WGNHS

CSLS Monitoring Data Collection

Used to calibrate groundwater flow model:

Streamflow Gages (USGS)

Lake Levels (USGS)

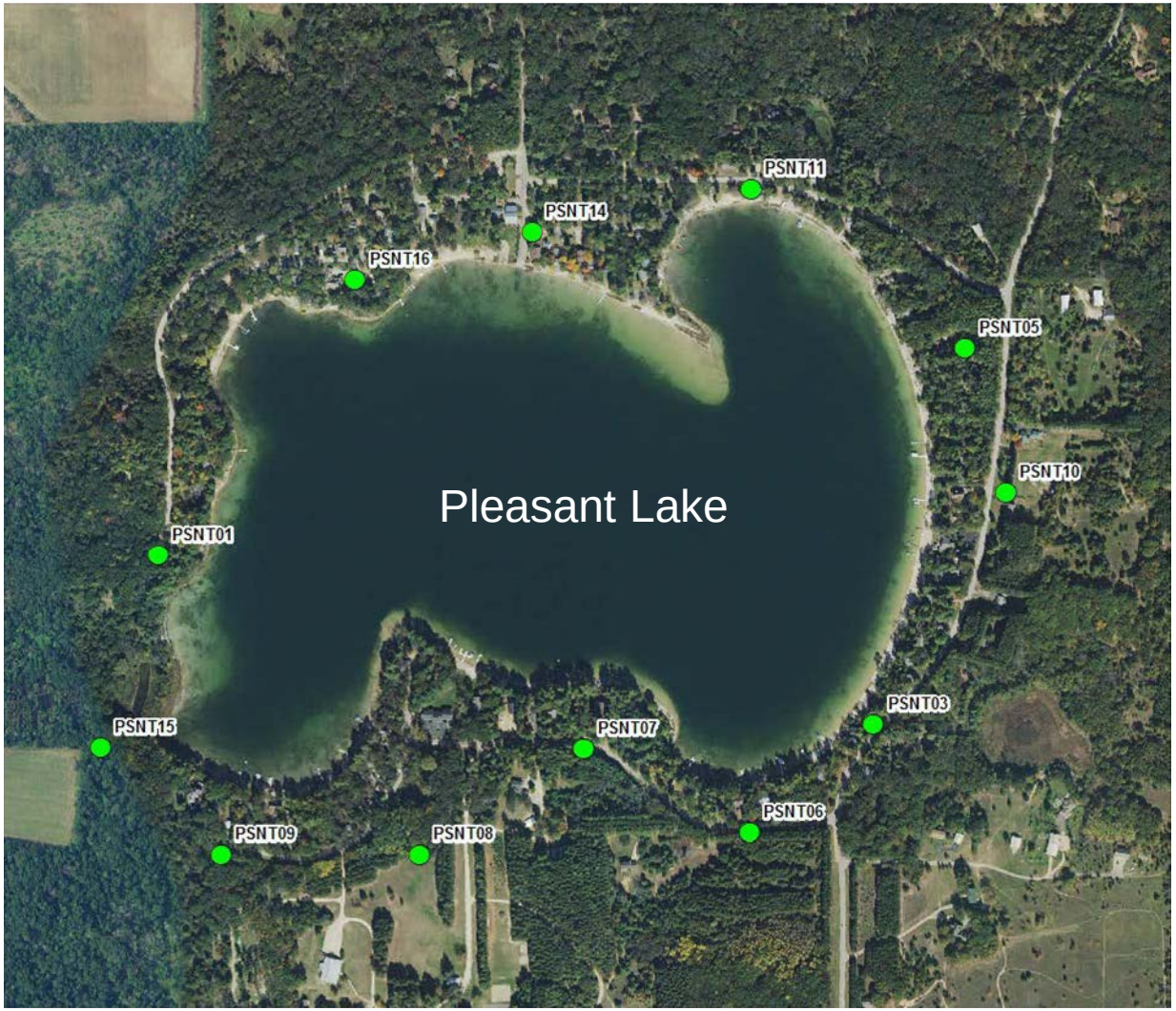
- Continuous (Pleasant, Long, and Plainfield)
- Other Central Sands Lake levels - monthly
    - DNR staff
    - County staff and volunteers

Groundwater Levels (USGS, WGNHS and DNR)

- Groundwater monitoring wells

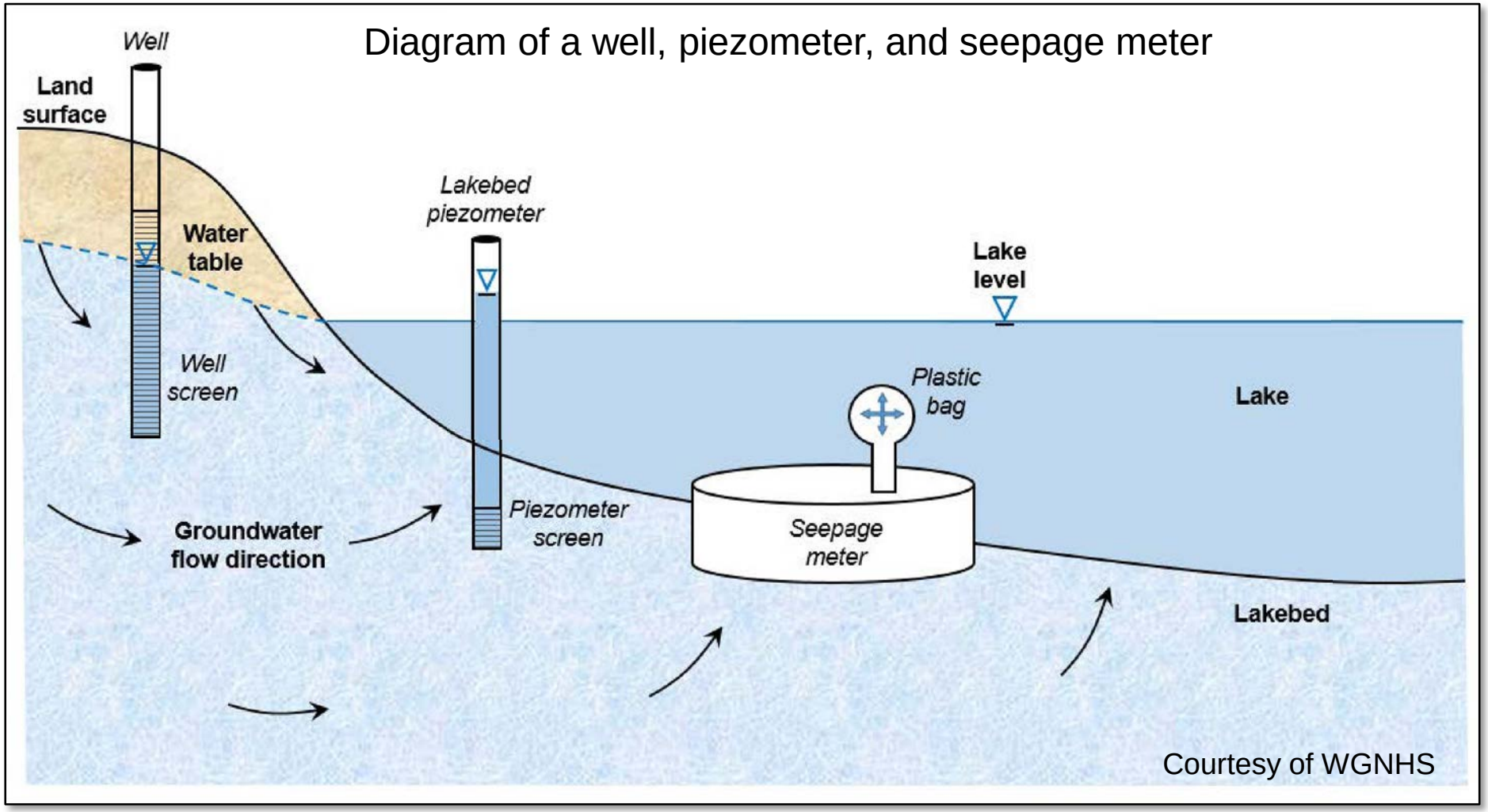
Data Collection: Geology and Hydrology

Geoprobe borings and monitoring wells around each of 3 lakes



Data Collection: Geology and Hydrology

(WGNHS) - Lake Surveys



CSLS Data Collection: Lake Characterization

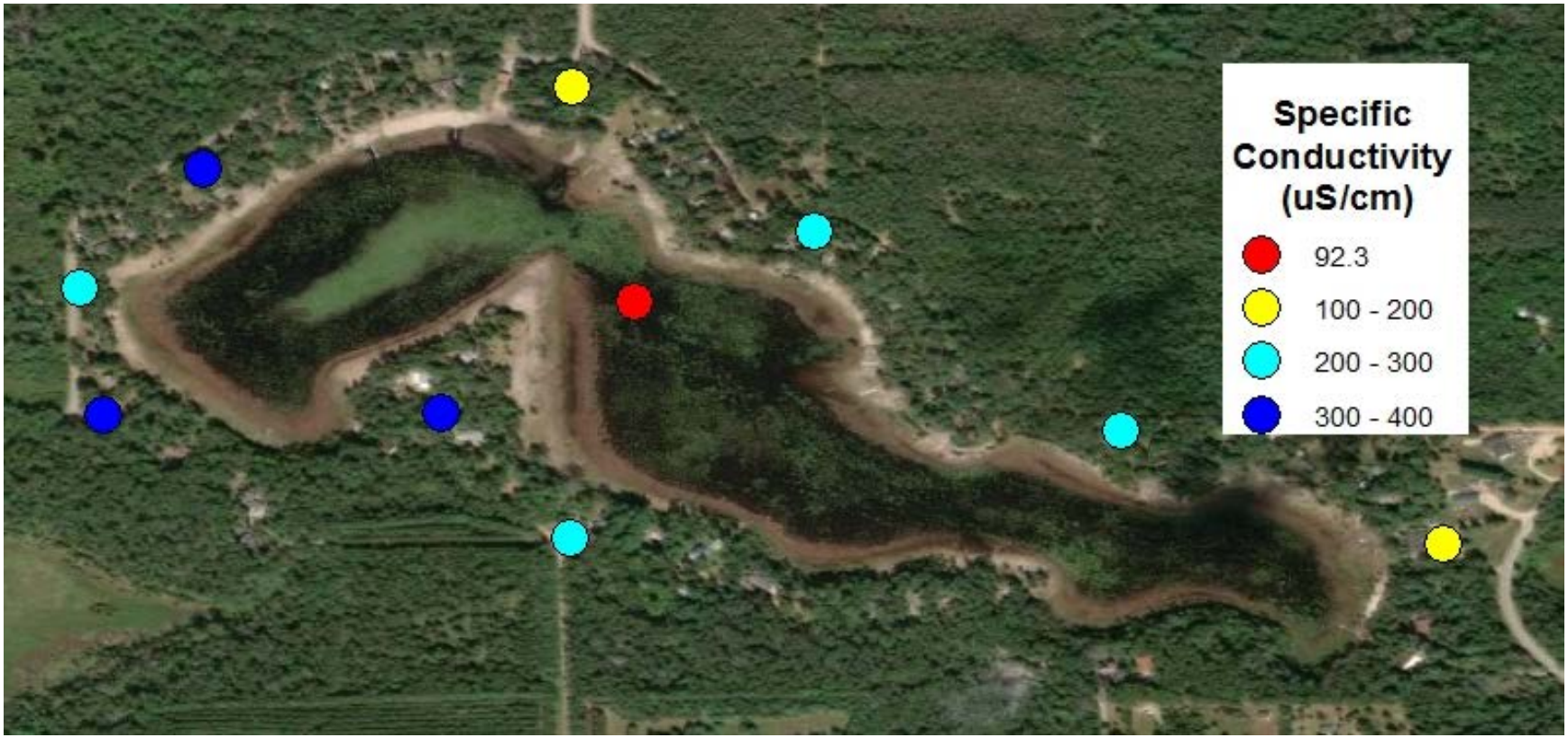
Fish, Aquatic Life and Wildlife Habitat surveys

- Do changing lake levels affect habitat, fish species and population, and aquatic plant species?

CSLS Data Collection: Lake Characterization

Groundwater and Lake chemistry

- Major ions
- Specific conductance
- O and H Isotopes



CSLS Data Collection: Lake Characterization

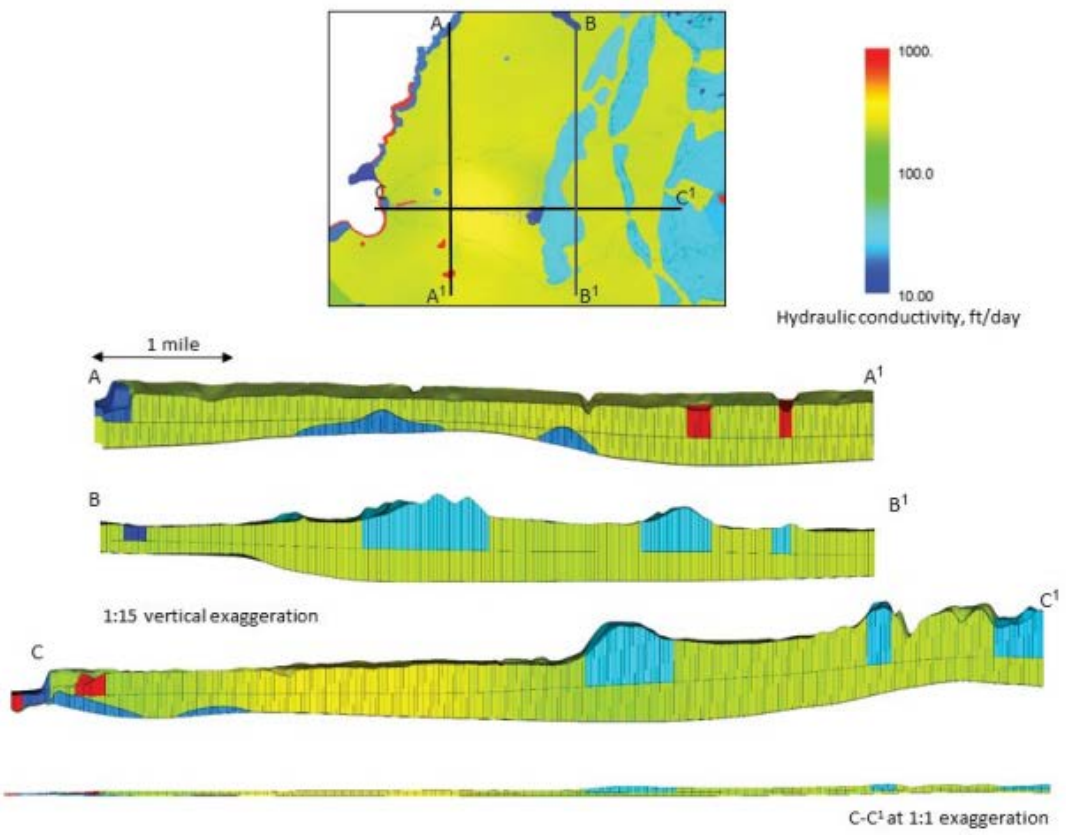
Navigation and Recreational Surveys

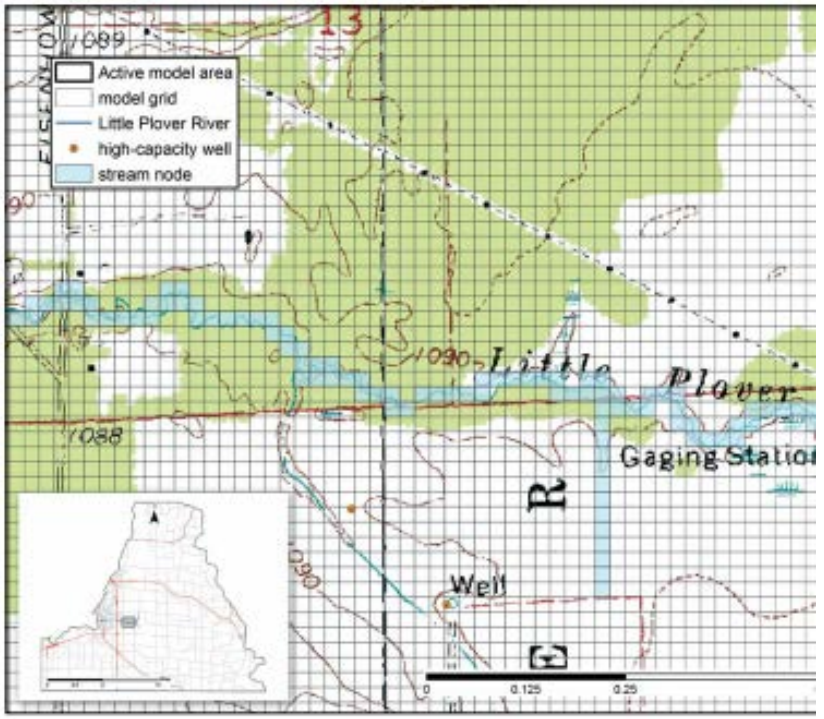
- Bathymetric mapping/pier survey
- How are uses affected by changing lake levels?

CSLS Modeling and Evaluation

USGS State-of-the-Art Groundwater Flow Model

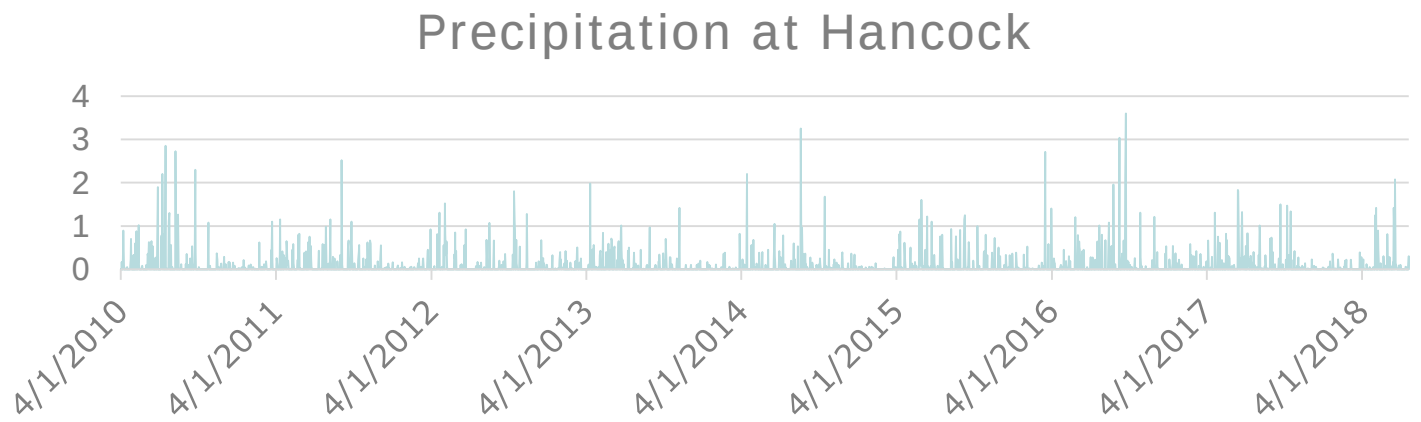
- 3D, transient, Modflow model
- Based on previous models, recent innovations, & CSLS data collection

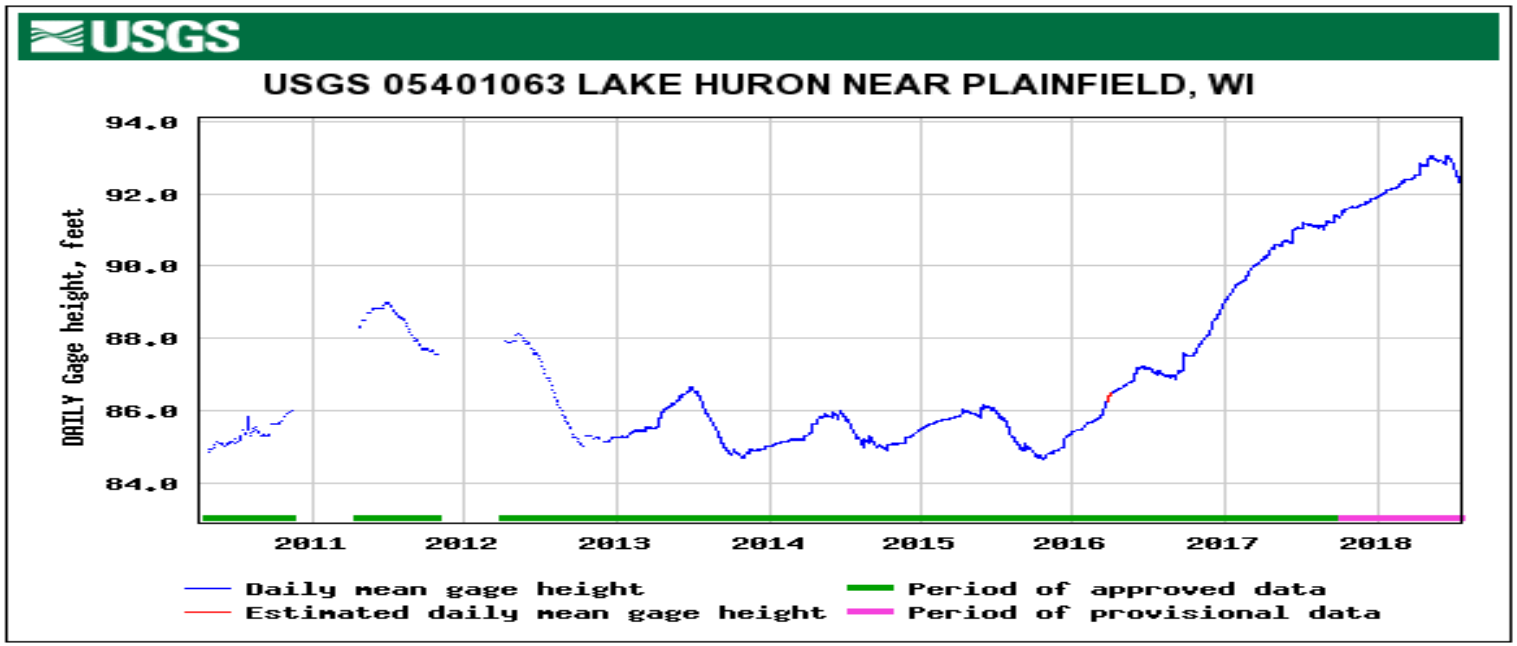




Figures: WGNHS

CSLS Modeling and Evaluation

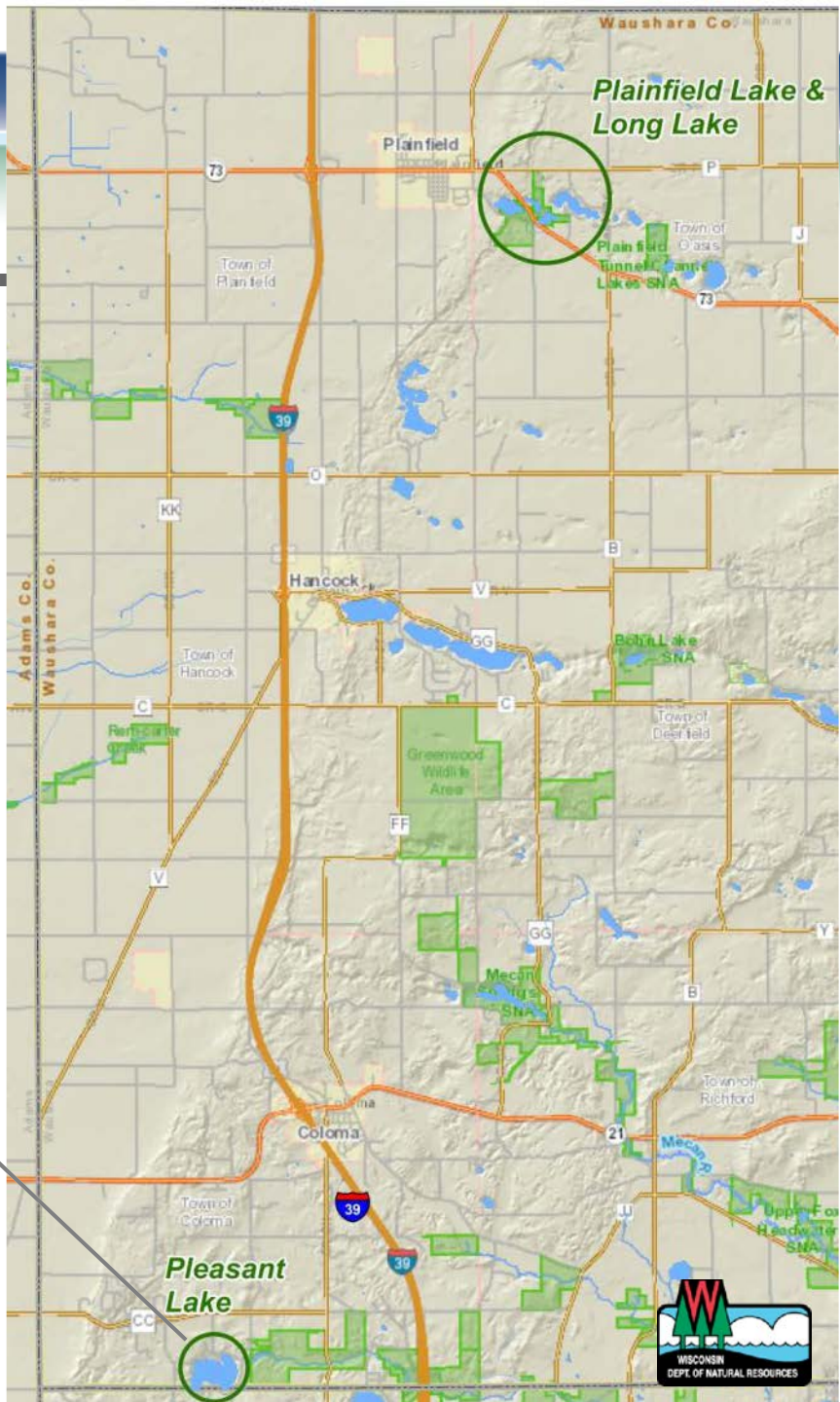




Central Sands Lakes Study

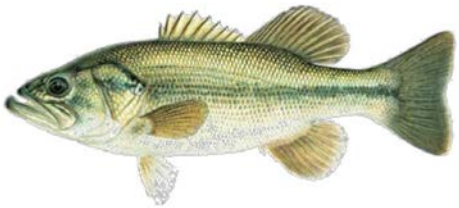
2017 Wisconsin Act 10 requires the WDNR to:

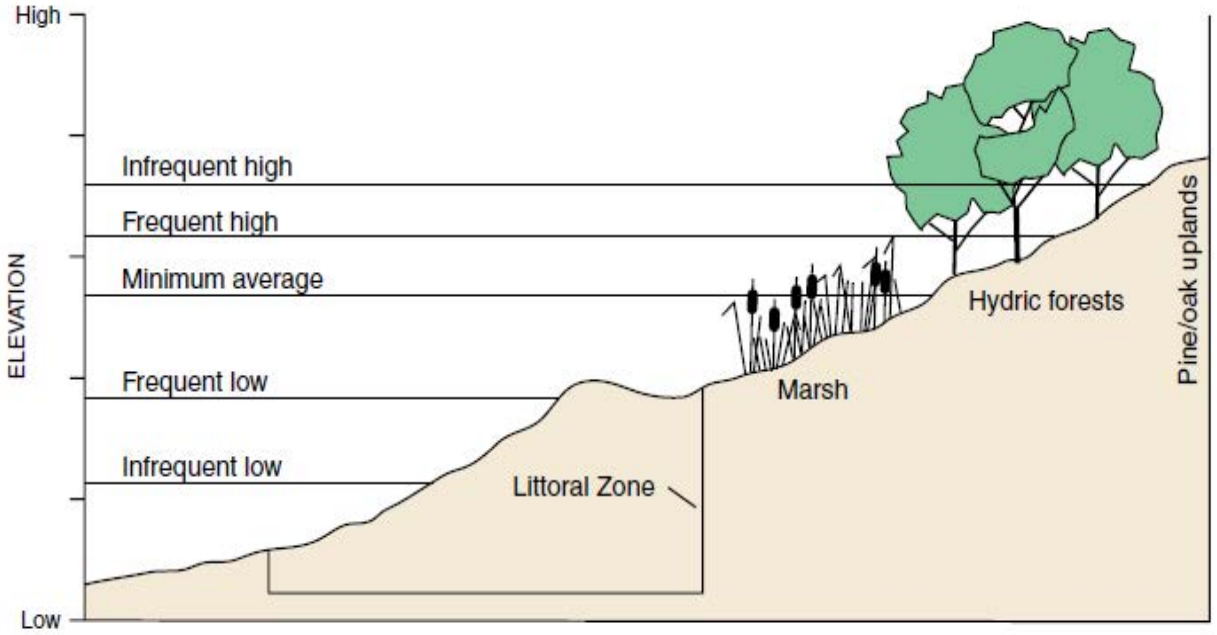
Evaluate and model the hydrology of Pleasant Lake, Plainfield Lake, and Long Lake "*to determine whether existing and potential groundwater withdrawals are causing or are likely to cause a significant reduction of the lake's water level below its average seasonal levels*"



Lake Impact Significance Evaluation

- Various lake attributes will likely have different sensitivities to lowered lake levels
- Define minimums based on most sensitive attributes
- Define the minimum lake level regime in terms of exceedance probabilities





CSLS Field Study

- Required if special measures are recommended to mitigate impacts

- Would likely consist of pumping one or more high-capacity wells near one of the 3 study lakes for as long as 30 days and measuring drawdown, gradient, isotopic changes

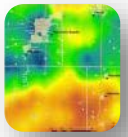
Photos by Jon Robaidek, DNR

CSLS Components: Workflow

Data Collection

Groundwater Flow Modeling

Resource Evaluation for Significance



Field Study

If significant impacts are identified and special measures are required then…

Share findings, identify potential special measures, & economic impact analysis

Public Hearing

Reports to Legislature by June 2021

Partners and Outreach

Principal Partners :

- WGNHS
- USGS
- DNR Water Quality and Fisheries Programs
- UW

Presentations on the Central Sands have been given to:

- Wisconsin Potato and Vegetable Growers Association (WPVGA)
- Central Sands County Staff (LCD)
- Pleasant Lake Association
- Long Lake Association
- Marquette County Lakes Association
- Little Silver Lake Association
- WI Farm Bureau
- WI Section of the American Society of Agricultural and Biological Engineers (ASABE)

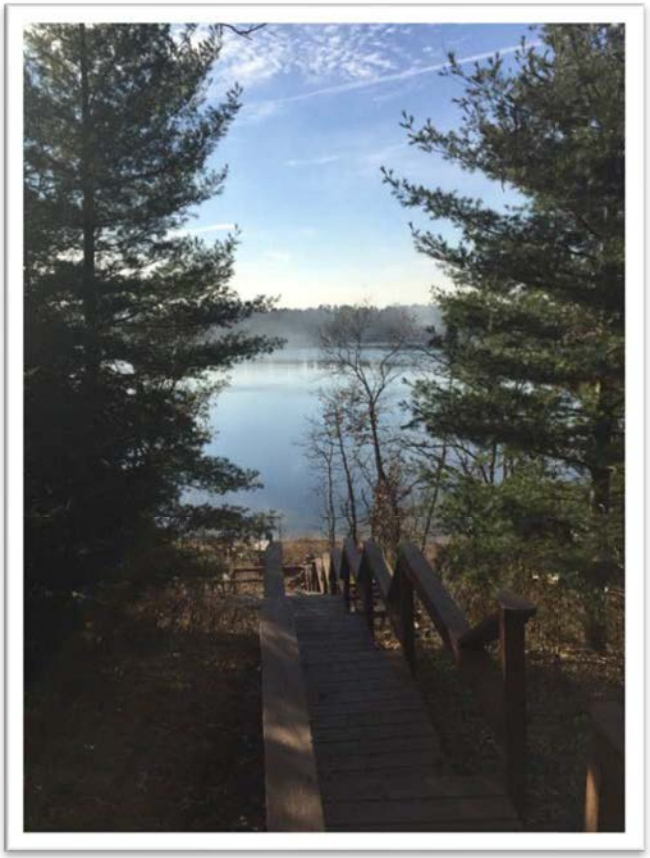


Photo: USGS

Central Sands Lakes Study

Contact: Jeff Helmuth, WDNR CSLS Project Manager
Phone: (608) 266-5234 or jeffrey.helmuth@wisconsin.gov
Email: DNRDGCentralSands@wisconsin.gov
Visit: http://dnr.wi.gov and search “Central Sands” or “Central Sands Lakes Study”

http://dnr.wi.gov, Search “Central Sands Lakes Study”

Central Sands Lakes Study

The Central Sands region is a contiguous area east of the Wisconsin River with sand and gravel deposits greater than 50 feet deep. The Central Sands region spans several counties and includes more than 800 miles of trout streams and 300 lakes – which provides for water-related recreational activities and supports the local tourism industry. Water withdrawn from this aquifer, primarily through high capacity wells, provides water for local municipalities, private wells, industries and agriculture.

Under 2017 Wisconsin Act 10 [exit DNR], the department will evaluate and model the potential impacts of groundwater withdrawals on three specific lakes in the Central Sands region through the Central Sands Lakes Study. The three lakes in the study are all in Waushara County – Long Lake and Plainfield Lake near Plainfield, and Pleasant Lake near Coloma.

The study will include the use of a groundwater flow model to evaluate cumulative impacts from existing and potential groundwater withdrawals on the three lakes. The groundwater flow model will involve data collection and compilation across the region. As required by Act 10, field studies will also be utilized to evaluate the impact of groundwater withdrawals on lakes.

The department will determine if there is the potential for significant impacts to the lake's average seasonal levels as a result of groundwater withdrawals. If the potential for significant impacts exist, as determined by the study report, the department will provide recommendations for special measures to mitigate those impacts to the legislature. If special measures are recommended, an economic impact analysis of those measures will be conducted.

What's new?

The department released a Scope of Work in December 2017.

Central Sands Lakes Study documents

- Technical project details
- Spring 2018 CSLS Factsheet [PDF]

Central Sands background & resources

- Background
- Little Plover River Study [exit DNR]

High capacity wells

Apply
for a high capacity well.

Find
existing high capacity wells.

Water use
related requirements.

Drillers and installers
resources and information.

SUBSCRIBE

Subscribe to receive email updates about the Central Sands Lakes Study.

High capacity well information

- Overview
- Application and instructions
- Application review process
- Property/ownership transfers
- Replacements
- Reconstruction

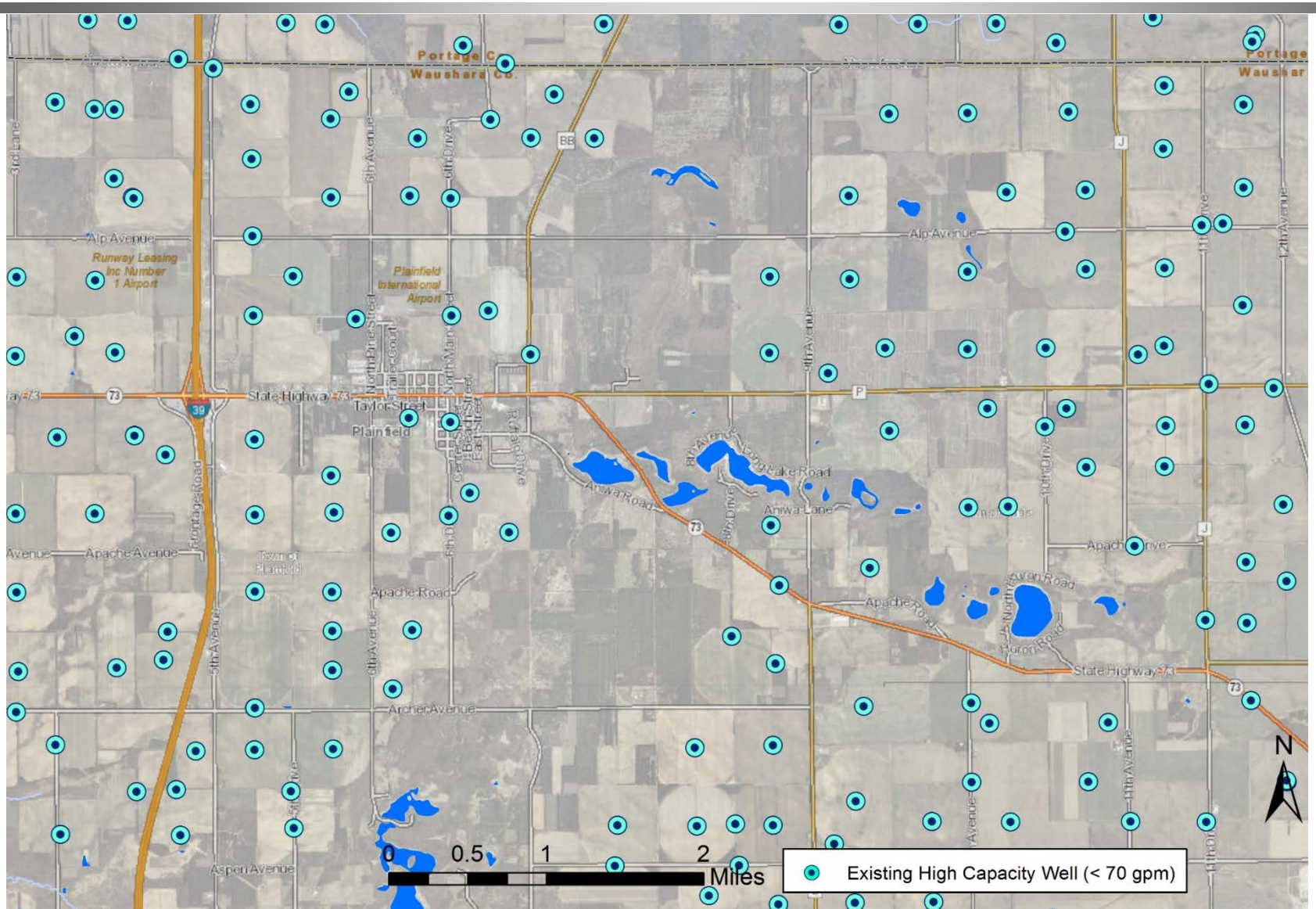
Related topics

- Wells

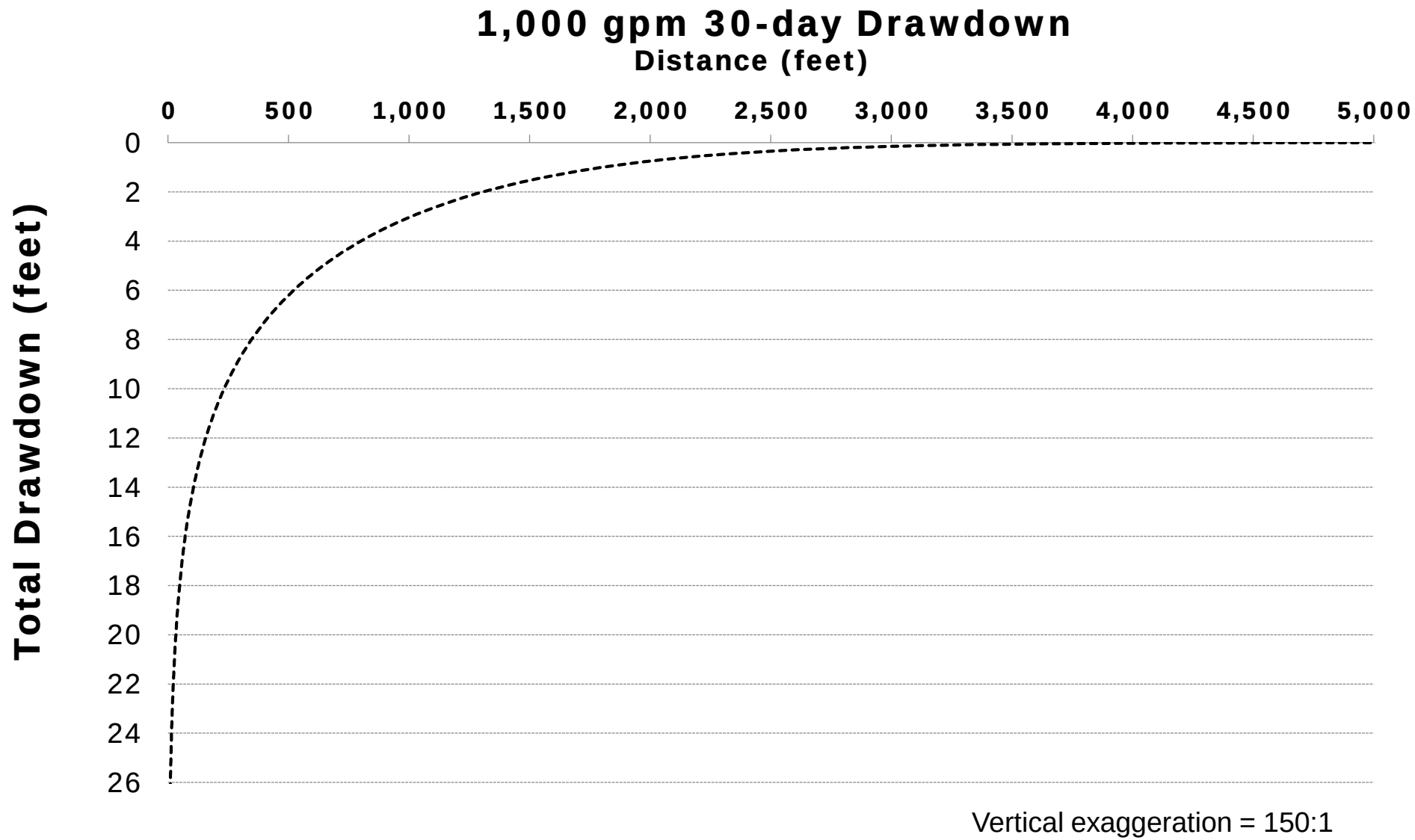
Contact information
For information on this page, contact:

Subscribe for updates on the study here.

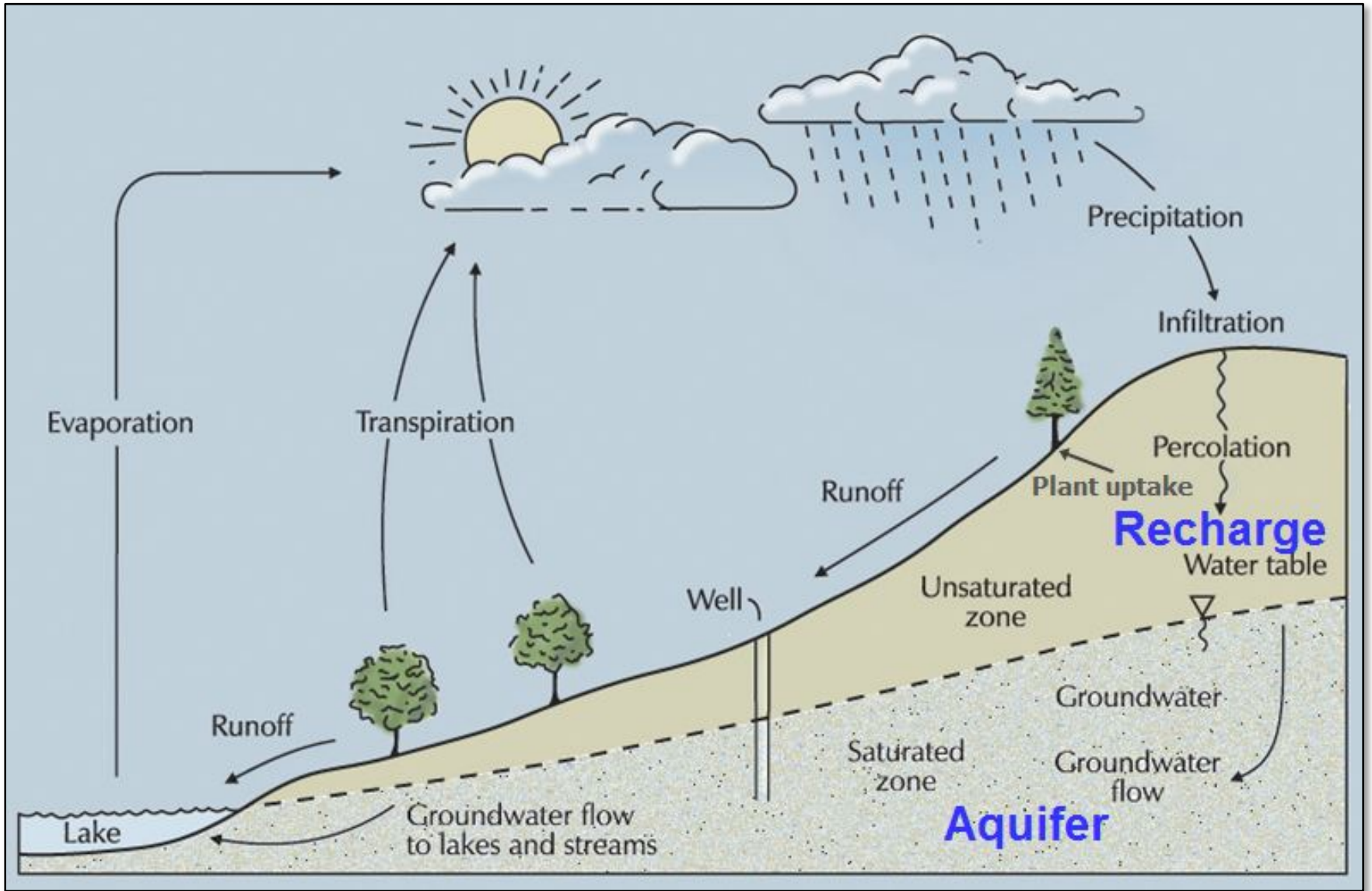
Well density and land use in the Plainfield area



Aquifer drawdown due to pumping one well



Central Sands Hydrology Review



Member roundtable

Hot topics

Wrap–up and adjourn

Next Meeting Date:

April 4, 2019

GEF 2, State Natural Resources Building, Madison, 9:30a.m. – 12:30 p.m.

Meeting minutes will be posted on the Drinking Water & Groundwater Study Group website