

Integrating and Managing Water Quantity Data in Wisconsin

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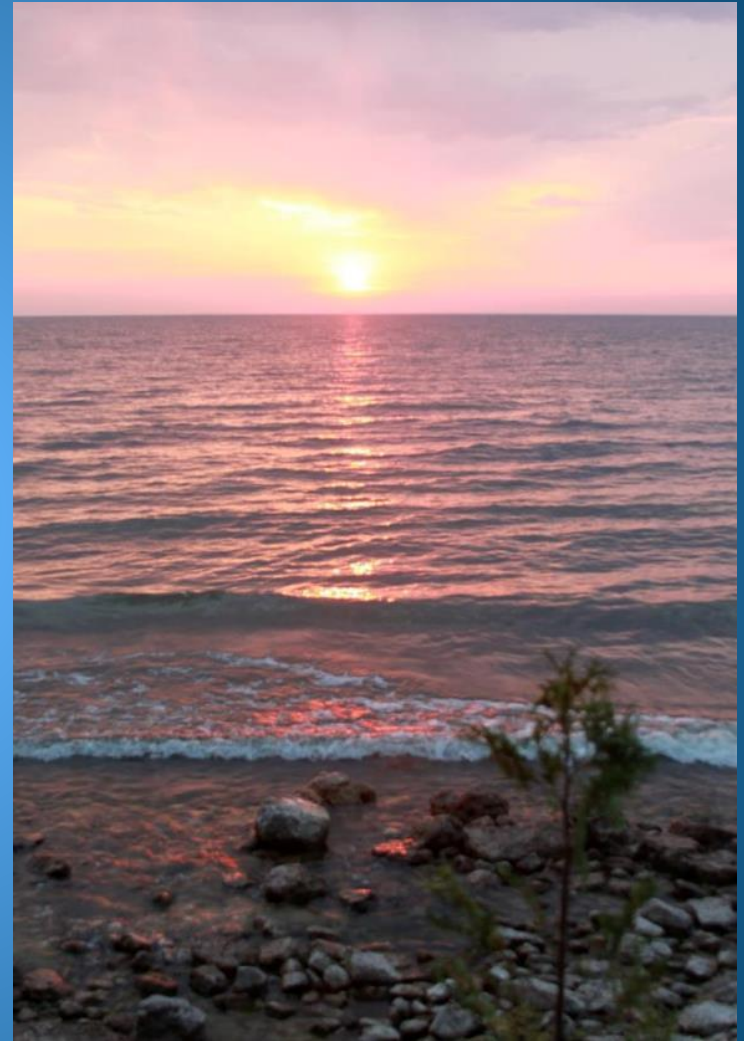


Photo: Door County, Lake Michigan

Today's Presentation

Why are data needed?

What data are being collected?

How do we use data?

How can we share the data?



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Why are data needed?

WDNR Water Use Objectives

- Statute requirement to “create an accurate and accessible water resources inventory” (s.281.346(11))
- Manage statewide withdrawals
- Understand groundwater-surface water interactions and the effects of withdrawals and consumptive uses

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Where are data being collected?



Photo: Well drilling, courtesy of WGNHS

Groundwater

Streams



Photo: Chaffee Creek, Central Sands, WI

Lakes



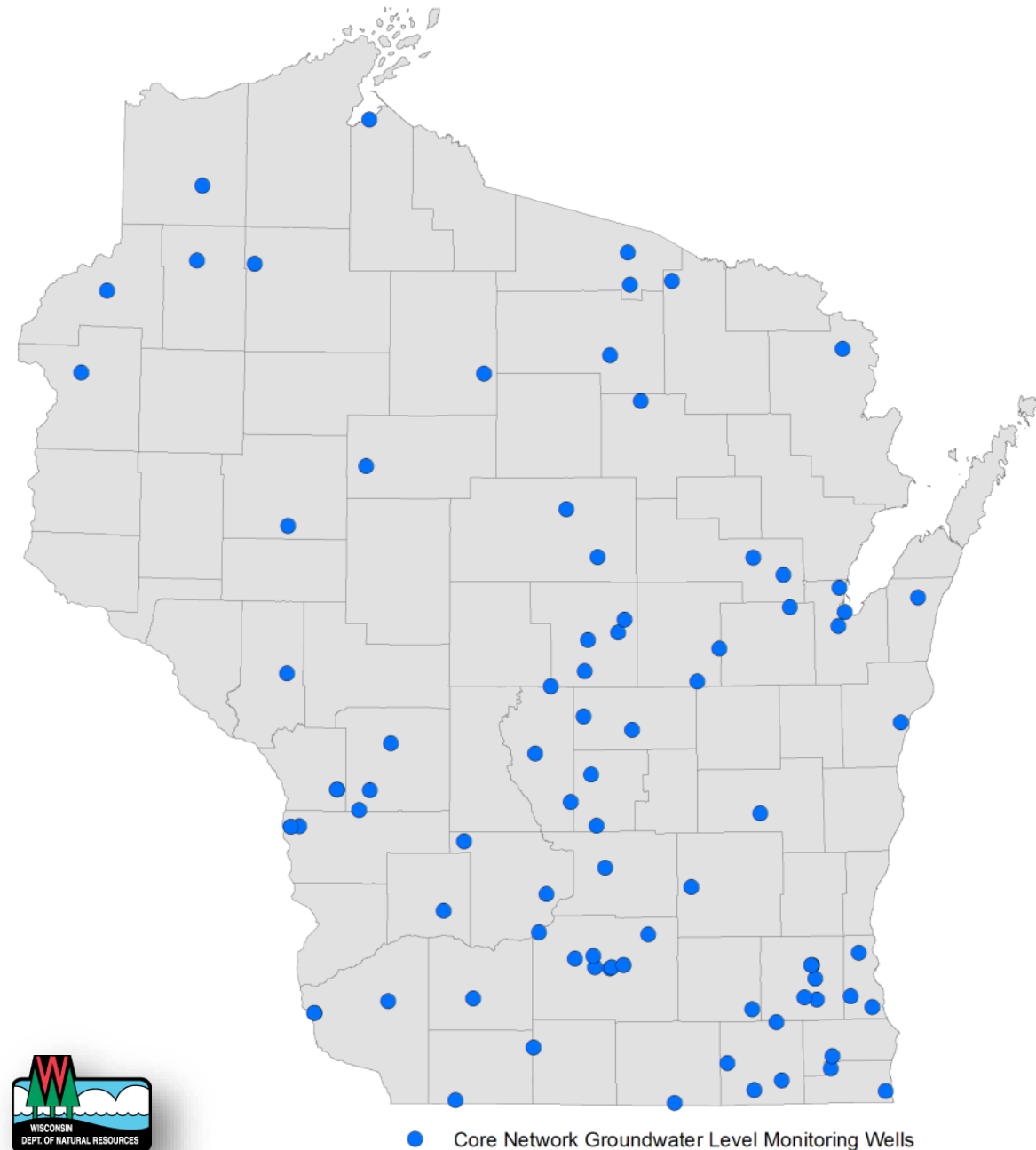
Photo: Long Lake, Central Sands, WI

Springs



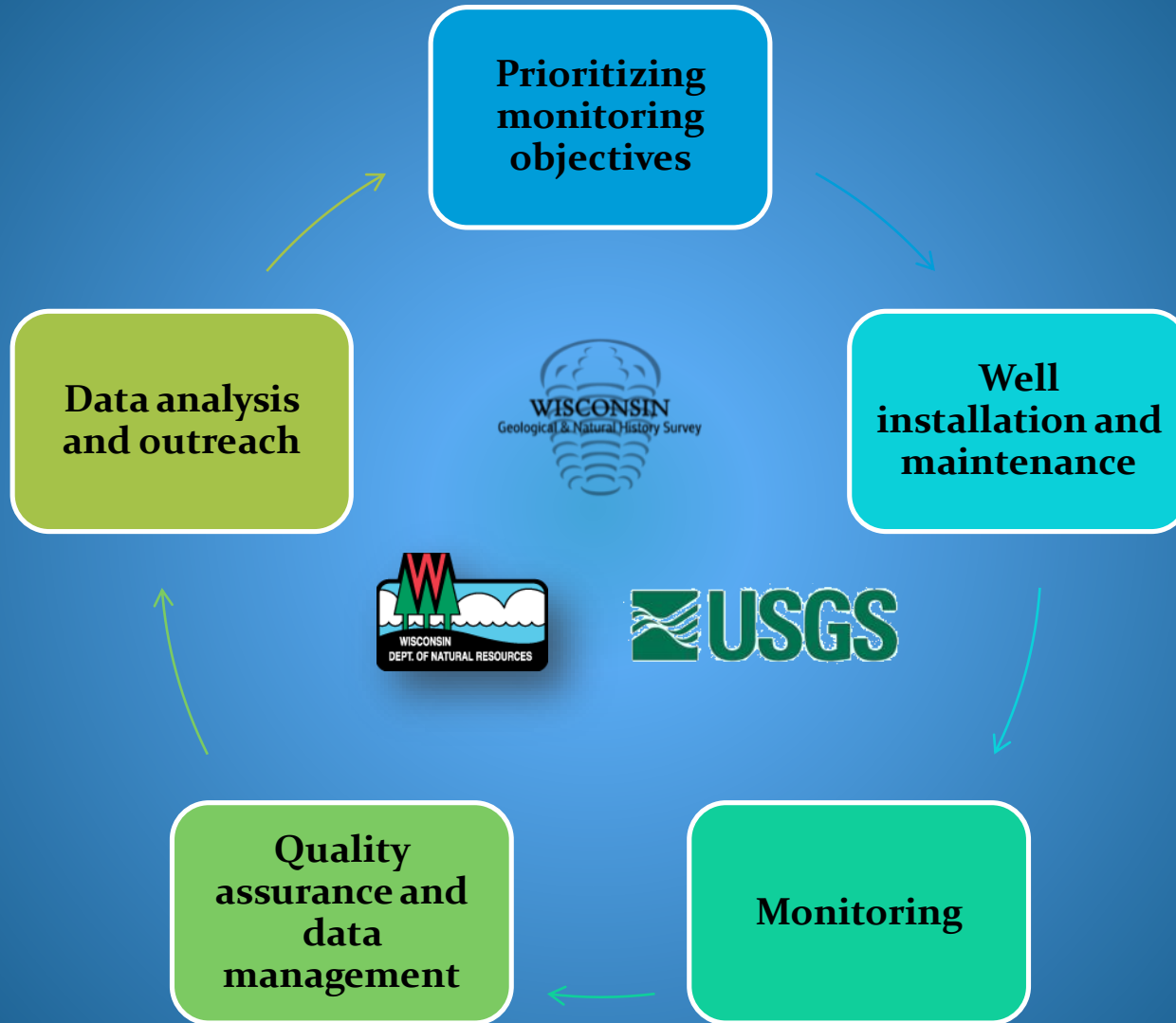
Photo: Pheasant Branch Springs, Sand Boil

Groundwater Level Monitoring Network



- Partnership: USGS, WGNHS, DNR, volunteers
- “Core Network” includes ~93 long-term wells
- Short-term “project wells” are funded separately

Groundwater Level Monitoring Network

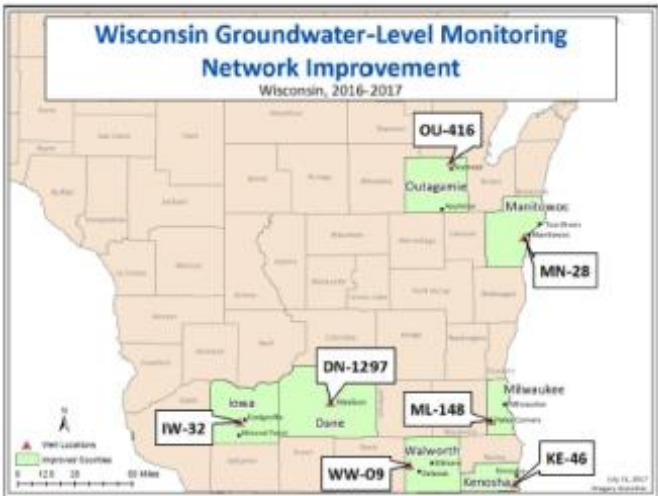


Groundwater Level Monitoring Network

Wisconsin Groundwater-Level Monitoring Network Improvement

Project activities: Well Maintenance (Objective 4) and Well Drilling (Objective 5)
July 31, 2017
USGS Award # G16AC00302
08/01/2016 to 07/31/2017

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WISCONSIN GEOLOGICAL AND NATURAL HISTORY SURVEY | OPEN-FILE REPORT 2017-04

Well Information

Name
Location (lat/long)
USGS/WGNHS IDs
Land surface elevation
County
Well depth
Hole depth
Casing depth
Screened interval
Aquifer (primary/national)
Work needed
Historical information
Notes of interest
Status/funding sources



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**How do we
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How do we use the data?

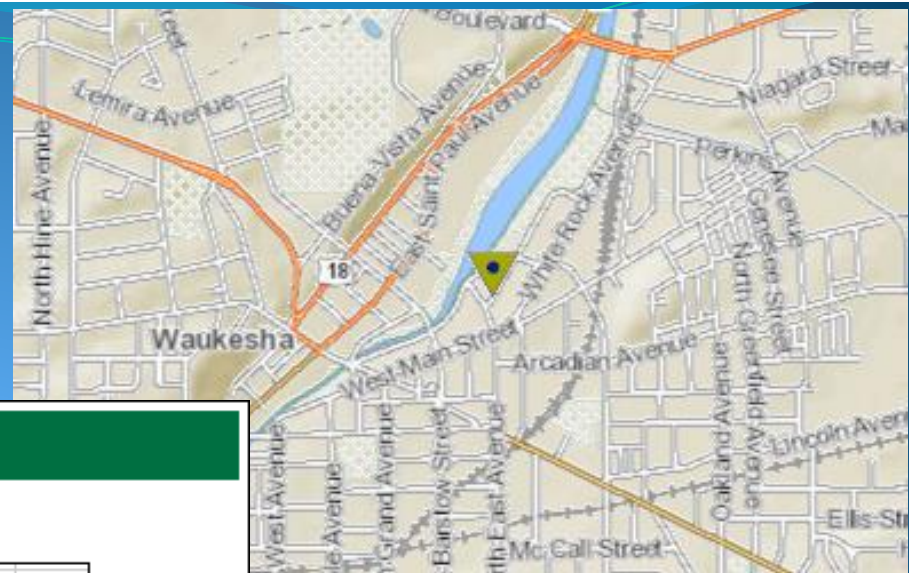
- Understand the relationship between water resources and withdrawals
- Distinguish between climate variability vs. groundwater withdrawals
- Support groundwater flow models, and other decision support tools
- Assess cones of depression, groundwater divides and surface water impacts



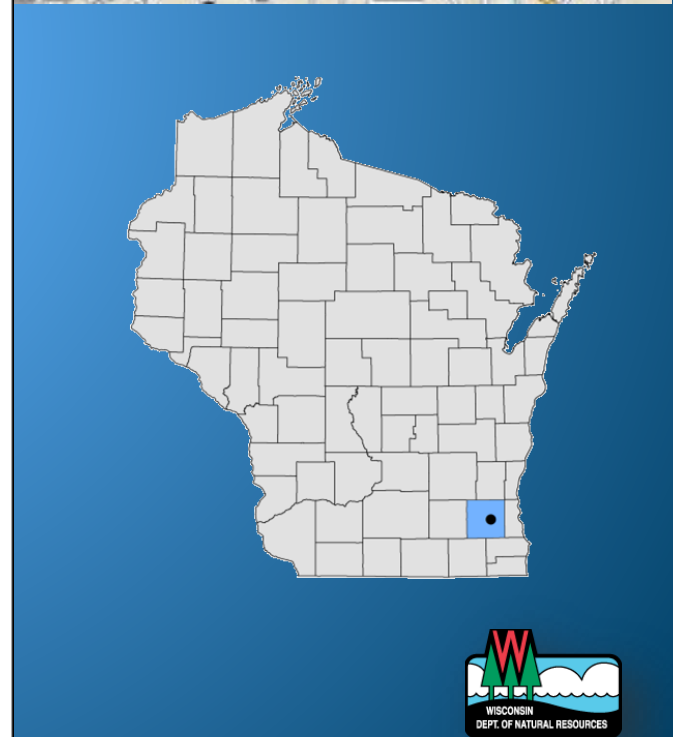
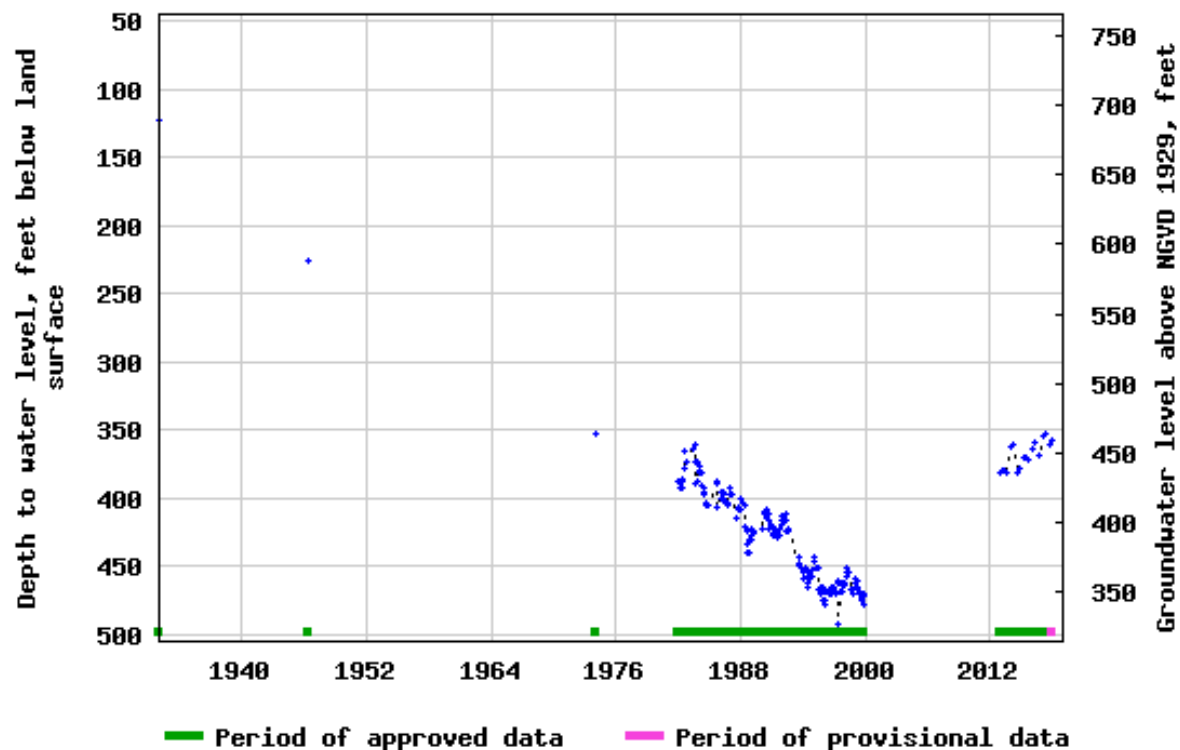
Figure 48. Simulated groundwater exchange with the Little Plover River

How do we use the data?

Example: Waukesha Diversion Review (SE Wisconsin)



USGS 430052088133501 WK-06/19E/02-0006



How do we use the data?

Example: Central Sands Lakes Study

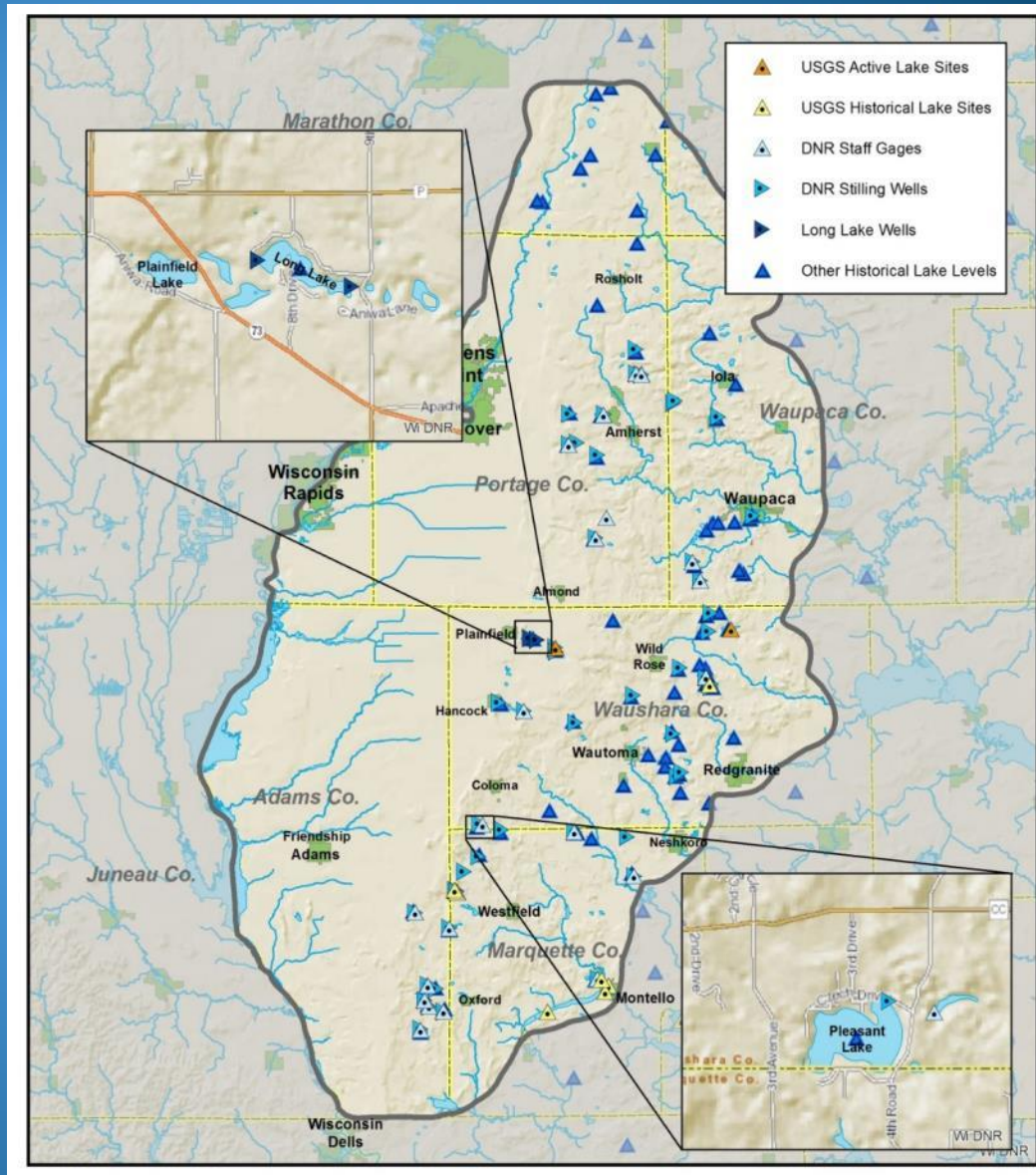
Groundwater levels
Lake levels
Streamflows
Withdrawals



Groundwater Flow
Modeling

Resource Evaluation
for Significance

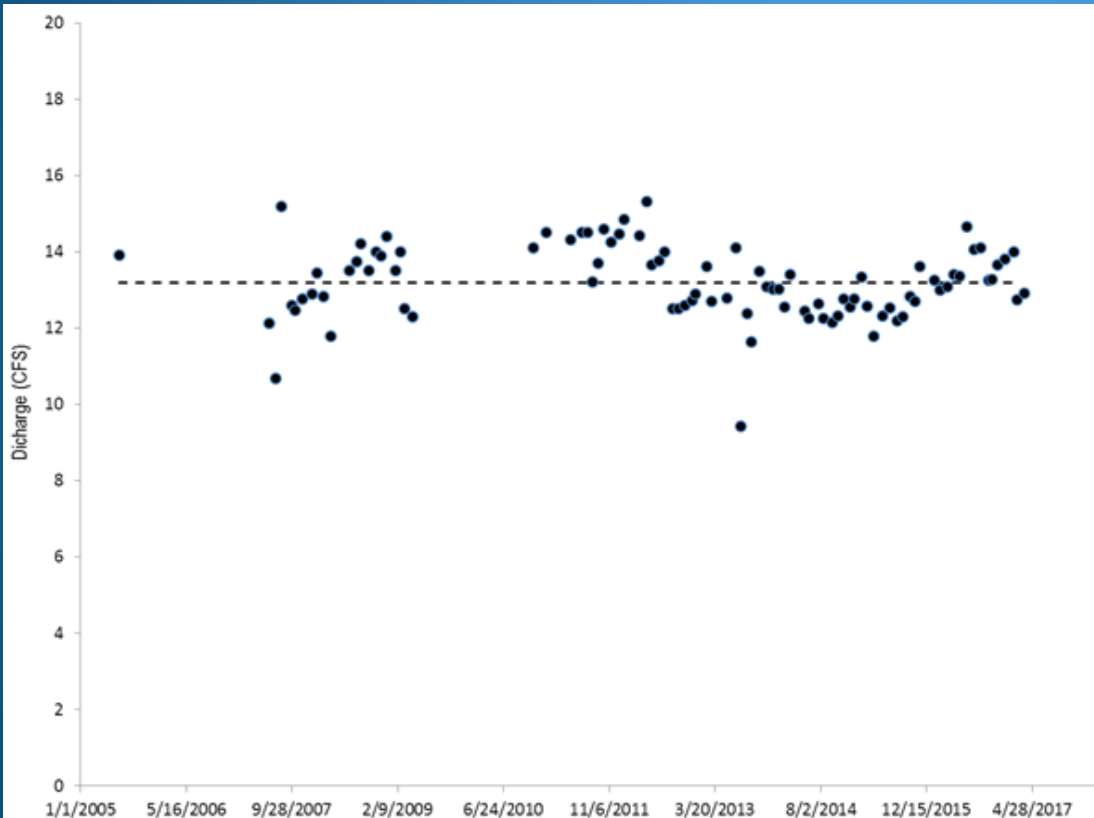
Field Study



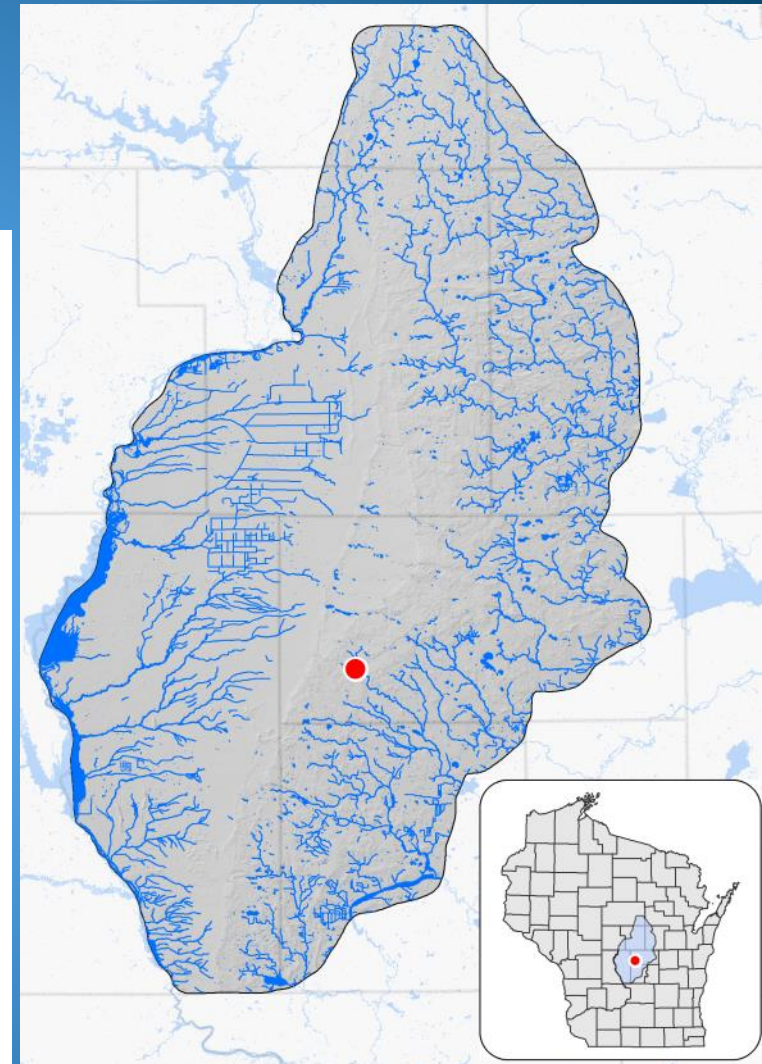
How do we use the data?

Example: Mekan River (Central Sands)

- Determining where to place gage
- Value of instantaneous data



Mekan R. UWSP baseflow measurements (2005 – 2017)



Measurement location

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How can we share the data?

A web-based viewer that displays publicly available water quantity data

Wisconsin Water Quantity Data Viewer

Tools

Home Identify Query Filter Zoom In Zoom Out Pan Initial View Previous Extent Bookmarks Point Distance Plot Coordinates Water Use Codes Print Export

Basic Tools Find Data Navigation Draw

Layers

All Available Layers

- ☒ Well Applications and Approvals
- ☐ High Capacity Withdrawal Locations
- ☐ USGS Water Quantity Monitoring
- ☐ WDNR Water Quantity Monitoring
- ☐ WGNHS Spring Monitoring
- ☐ Groundwater Protection Features
- ☒ Basemaps

Quick Commands

Hayward Eagle River Rhinelander Wausau Stevens Point Appleton Oshkosh La Crosse Madison Milwaukee

Basemaps

WISCONSIN DEPT. OF NATURAL RESOURCES

Water Quantity Viewer: USGS water levels and streamflow

The screenshot displays the Water Quantity Viewer interface, which includes a layers panel on the left, a map area, and a quick commands panel.

Layers Panel:

- All Available Layers
- ☒ USGS Water Quantity Monitoring
 - ☒ USGS Groundwater Monitoring
 - ☒ USGS Ongoing GW - Glacial
 - ☒ USGS Ongoing GW - Bedrock
 - ☒ USGS Historical Groundwater
 - ☒ USGS Historical GW - Gla...
 - ☒ USGS Historical GW - Be...
 - ☒ USGS Historical GW - Un...
 - ☒ USGS Historical GW <10 ...
 - ☒ USGS Surface Water Monitoring
 - ☒ USGS Streamflow Sites
 - ☒ USGS Lake Level Sites
 - ☒ USGS Other Sites
- Wisconsin DNR Water Quantity Monitoring
- NHS Spring Monitoring

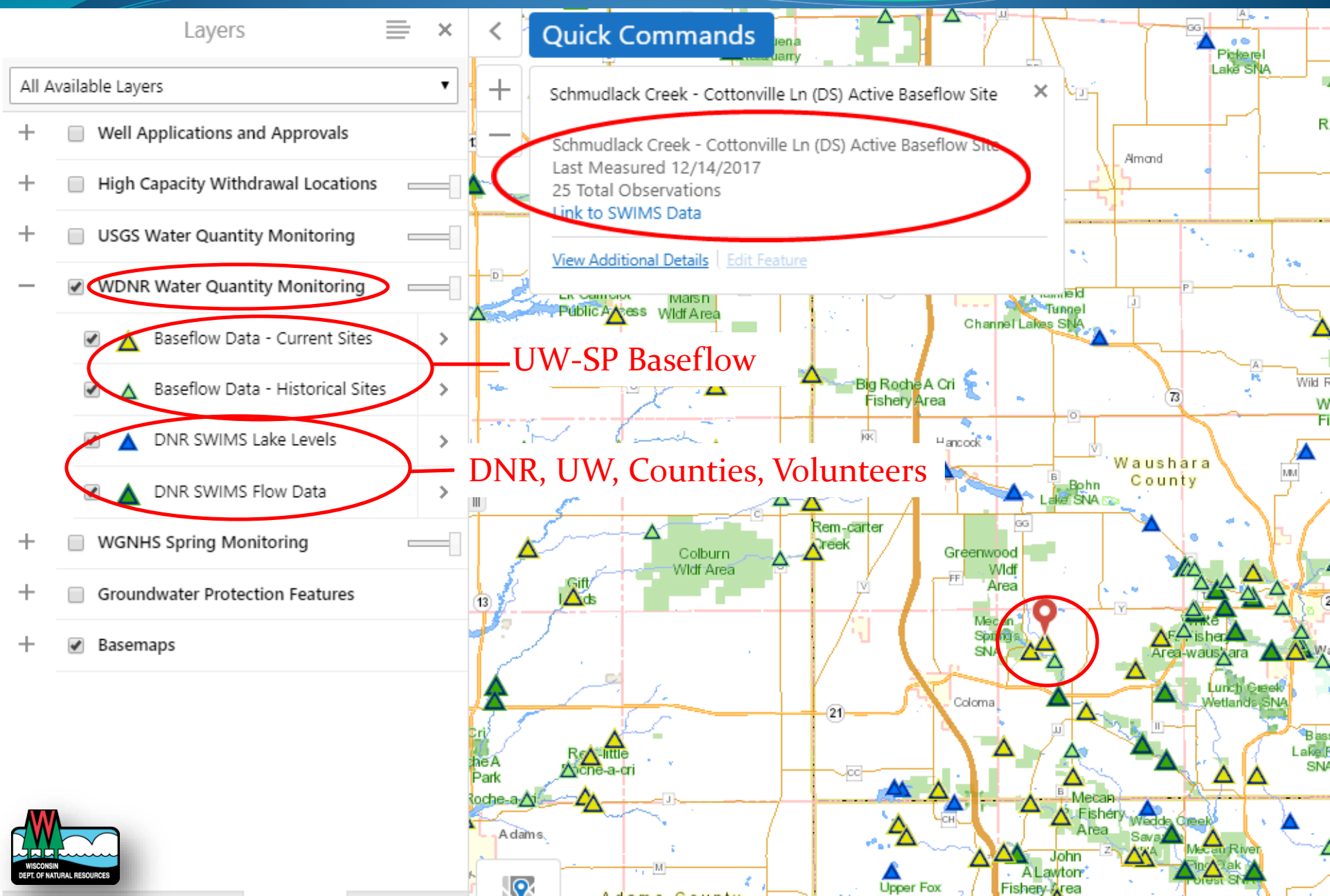
Quick Commands Panel:

- WS-19/09E/09-1001 - USGS
- WS-19/09E/09-1001 - USGS Groundwater Level
- WS-19/09E/09-1001 - 440827089255001
- 62 meas. of GW
- Sep-1994 to Jan-2018
- [Link to USGS-NWIS Data](#)
- [Link to Groundwater Watch](#)
- [View Additional Details](#) | [Edit Feature](#)

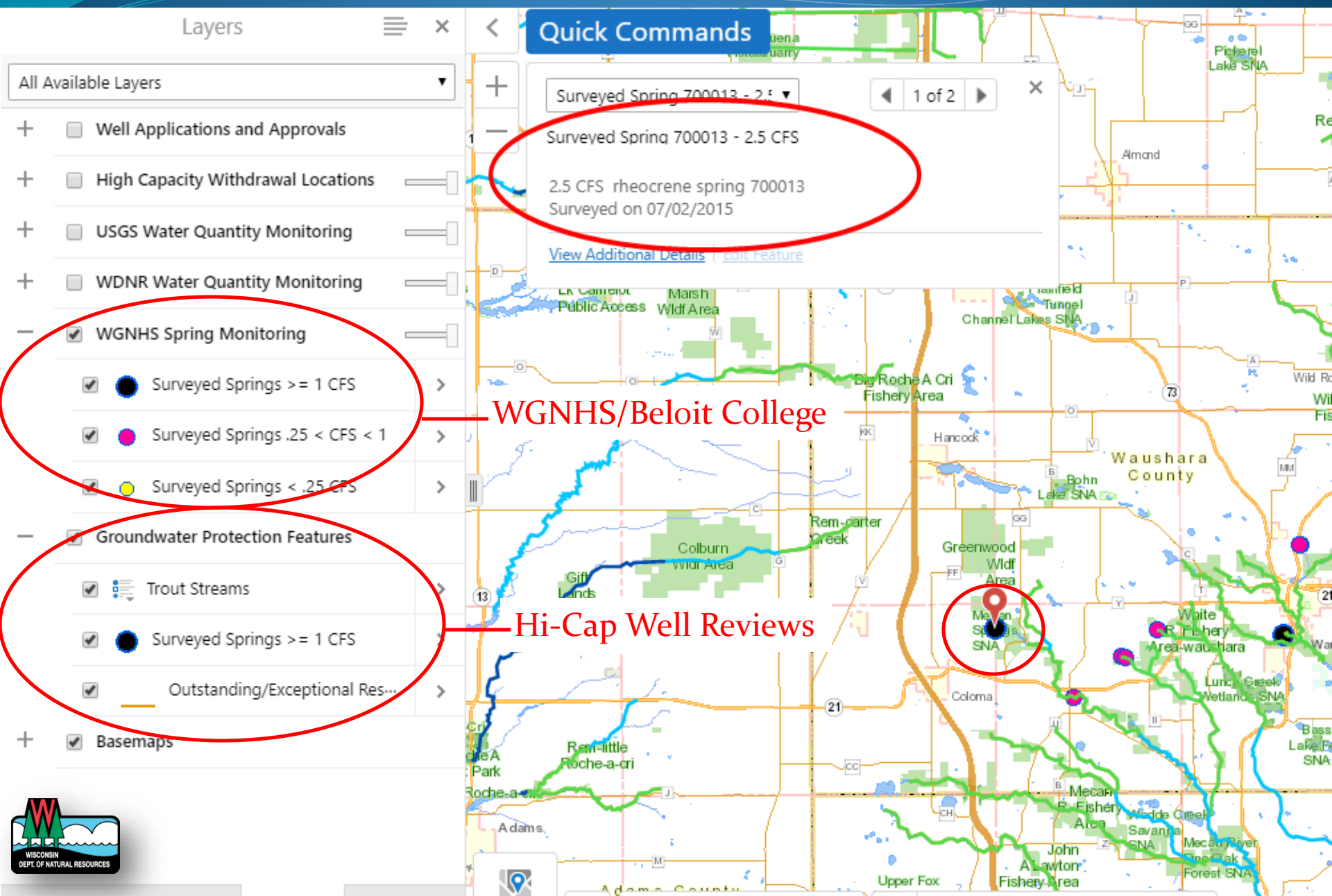
Map Area:

The map shows a region with various water features, including streams, lakes, and wetlands. A red pin is placed on the map, indicating a specific location. The map also displays various geographical features such as the Colburn Wildf Area, Gift Lands, and Waushara County.

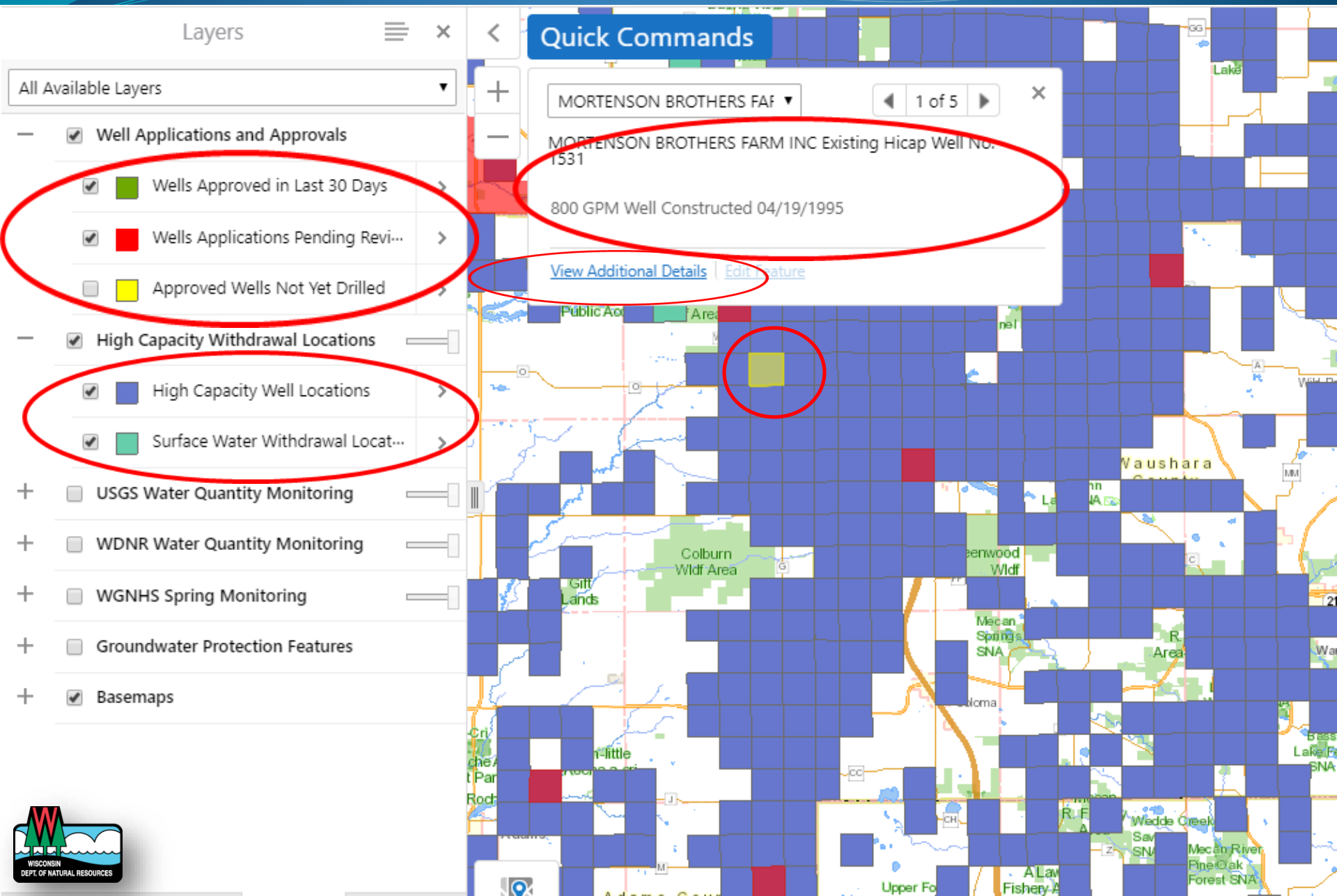
Water Quantity Viewer: Baseflow, Lake Levels, Streamflow



Water Quantity Viewer: Springs and Protected Features



Water Quantity Viewer: Water Use



Acknowledgments

Special thanks (not limited to):

- WDNR (various programs)
- USGS
- UW-System
 - WGNHS, UW-Extension
 - UWSP Center for Watershed Science and Education
 - UW-Limnology
- Beloit College
- DATCP
- County Staff
- Citizen Monitoring Volunteers
- Public Lands
- Private Landowners



How do we use the data?

Example: Green Bay well documenting rebound in NE Wisconsin



USGS 443228088003101 BN-24/20E/24-0076

