



Cooperative Groundwater Monitoring (CGM)

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New Data Providers Meeting
December 6, 2017

Monitoring Network

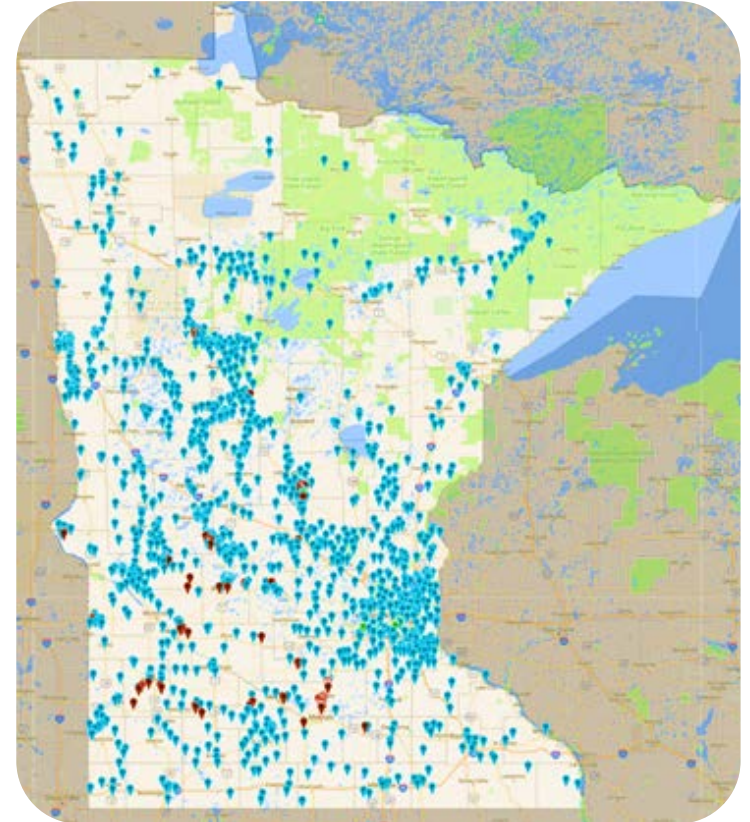
1944—Beginning of the DNR observation well network

2,640 monitoring sites that include:

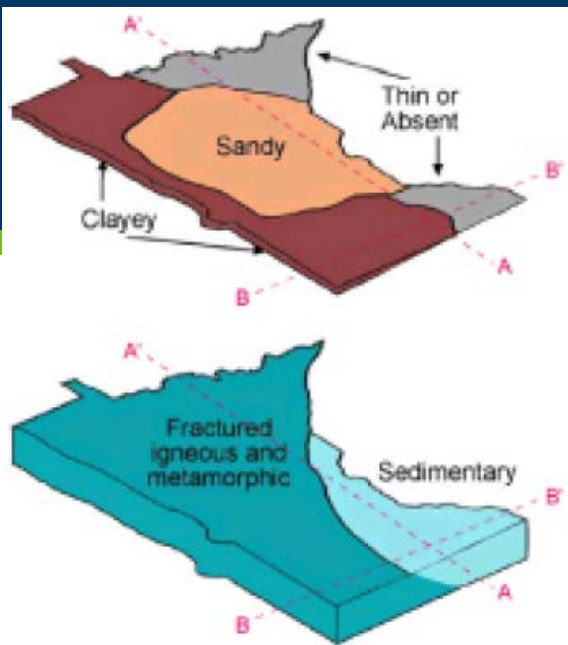
- Observation wells (1,034 actively monitored)
- Appropriation permit wells (600+ wells)
- Wetland wells
- Other types of wells

1906: Oldest *actively measured well*

677 wells equipped with loggers



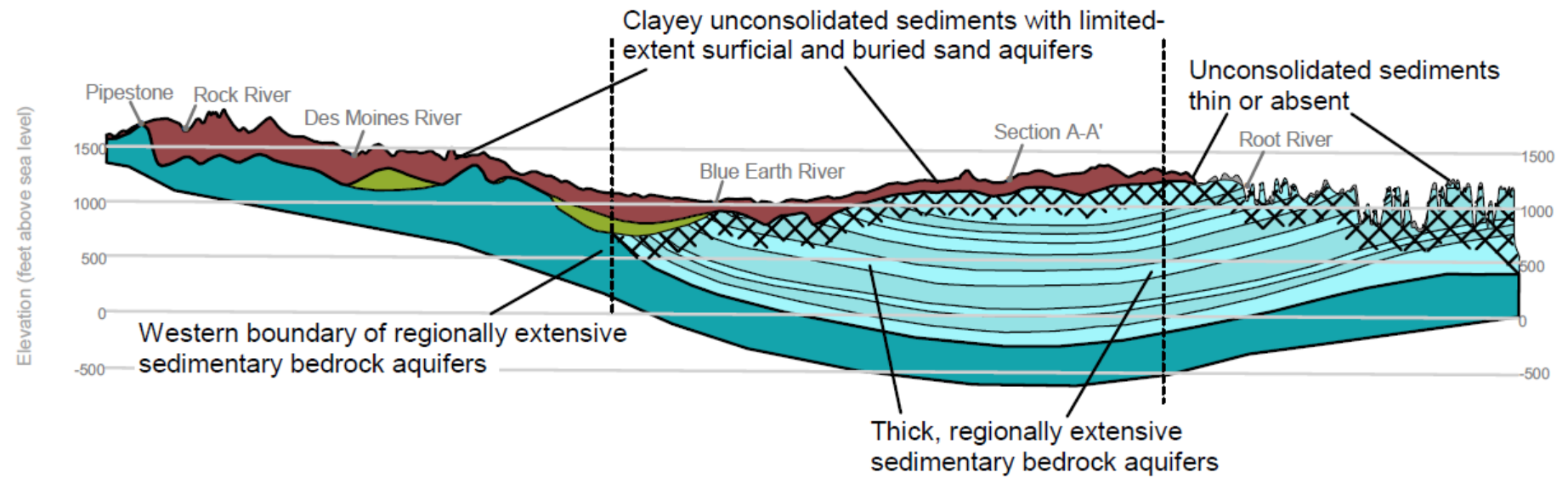
General hydrogeology



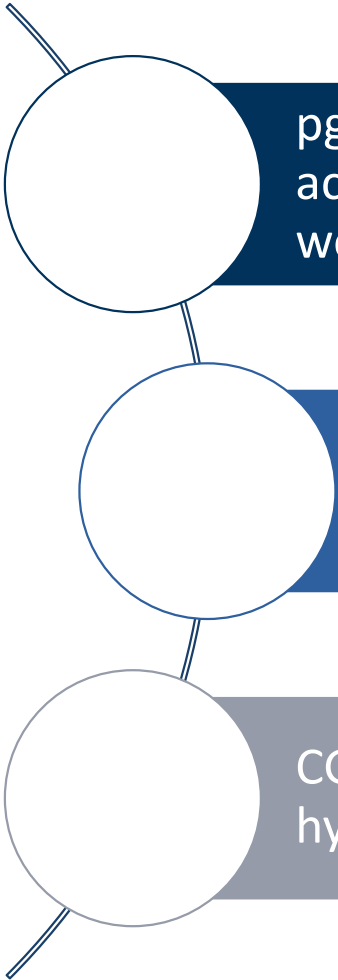
http://www.dnr.state.mn.us/waters/groundwater_section/mapping/atlases.html

B West

East B'



DNR Groundwater Level Database



pgAdmin III, PostGreSQL 9.2 or Observation Well database accepts: Hand measurements, Time Series Data and stores well metadata

Hydstra: Stores groundwater and surface water data, handles data corrections and provides output to CGM, transition to WISKI will be complete in Feb 2018

CGM Web Output: Displays groundwater levels through hydrograph and has provisions for downloadable data

Groundwater Level Data Entry/Upload



Soil and Water Conservation District and DNR staff can upload field and logger measurements into Groundwater Level database web input

Please log in.

DNR Employees please use your Outlook password.

Email:

Password:

Login

[Forgot my password](#)

Users enter data to sites they are assigned to

Minnesota Department of Natural Resources

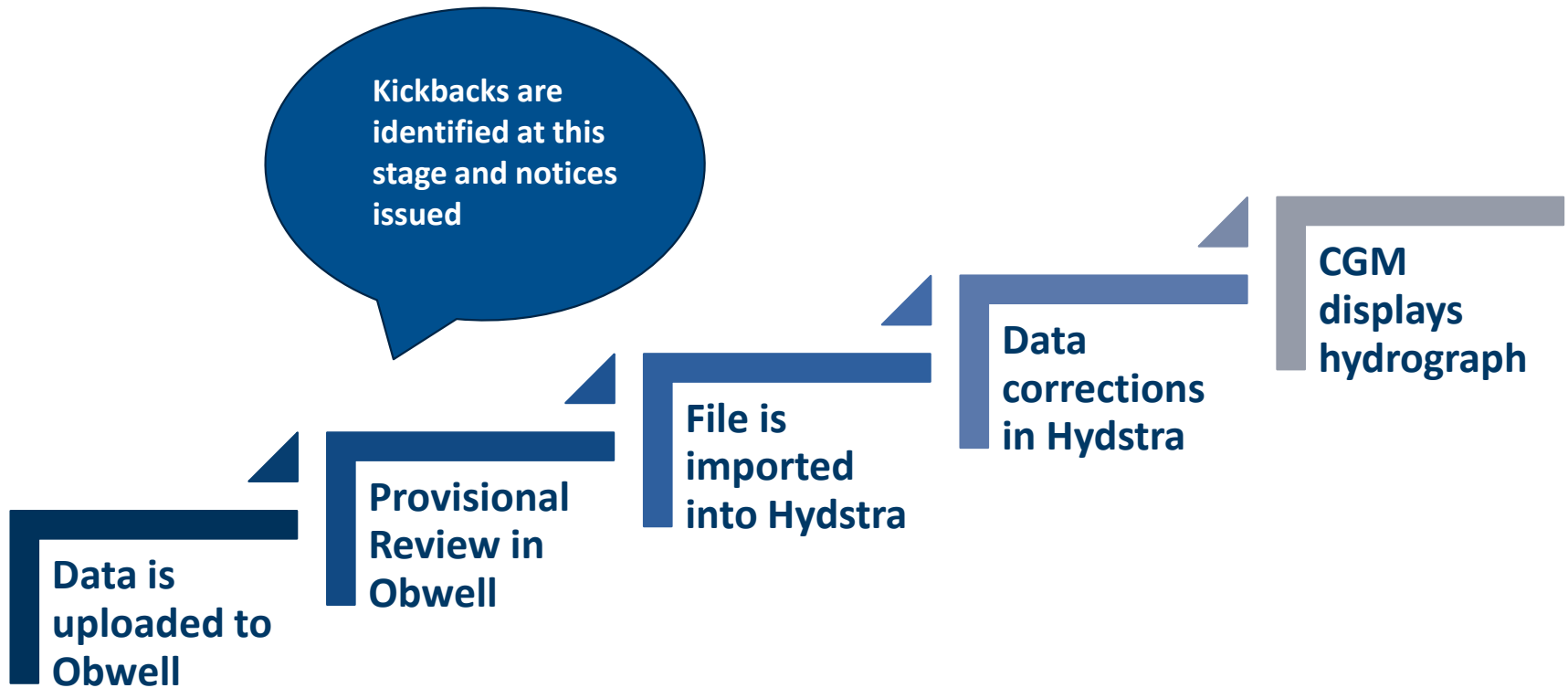
MN DNR Observation Well Database

Wells

MDH Unique #	Obwell #	Name	Nearest Town	
Aitkin Soil & Water Conservation District				
475801	01004	QBAA nr Isle, Mille Lacs Band of Chippewa		Enter Observations
497674	01005	QBAA nr Isle, Sole Source #5	Isle	Enter Observations
497675	01006	QBAA nr McGrath, Sole Source #6	McGrath	Enter Observations
497741	01007	QBAA nr Aitkin, Sole Source #9A	Glory	Enter Observations
497742	01008	QBAA nr Aitkin, Sole Source #10	Wealthwood	Enter Observations

[Wells](#) | [Contracts](#) | [Today's Entries](#) | [User Profile](#) | [Log Out](#)

Flow of Data: Input to OUTPUT



Data is displayed on web output at the end of each night at 8:00pm CST

How Data are used

How Data are used by DNR:

1. Used to assess water resources for permitting decisions
2. Monitor trends
3. Interpret impacts of pumping and climate
4. Plan for water conservation
5. Evaluate water conflicts

How Data are used by non-DNR

Cooperative groundwater monitoring website

OBSERVATION WELL DATA SHEET					
DNR Well # 32005	Well Name CHRISTIANIA BRIDGE		Measuring Pt. Description Top of Pipe 2.40 ft agl		
SWCD Jackson	Location T104 R35 S19 CCAB		Water Year 2002 <small>(Oct 1, 2001 through Sep 30, 2002)</small>		
Date Mon. day yr	Tape Held (ft)	Wetted Length (ft)	Depth Below Measuring Point (ft)	Observer's Initials	Comments
OCT. 24 2001	90.0	.40	89.60	BMJ	
NOV. 21 2001	90.0	.39	89.61	BMJ	
DEC. 20 2001	90.0	.38	89.62	BMJ	
Data Sheets for Oct.-Dec. due Dec. 30.					
MAR. 24 2002	90.0	.41	89.59	BMJ	
APRIL 17 2002	90.0	.51	89.49	BMJ	
MAY 20 2002	90.0	.30	89.70	BMJ	
JUNE 24 2002	90.0	.32	89.68	H	
End of Fiscal Year 2002 Invoice for readings taken July, 2001 through June, 2002 due June 30. Data Sheets for March-June due June 30.					
JULY 26 2002	92.0	2.0	90.00	H	
AUG. 27 2002	91.8	1.0	90.00	H	
SEPT. 25 2002	91.0	.8	90.20	H	
End of Water Year 2002 Data Sheets for July-Sept. due Sept. 30.					

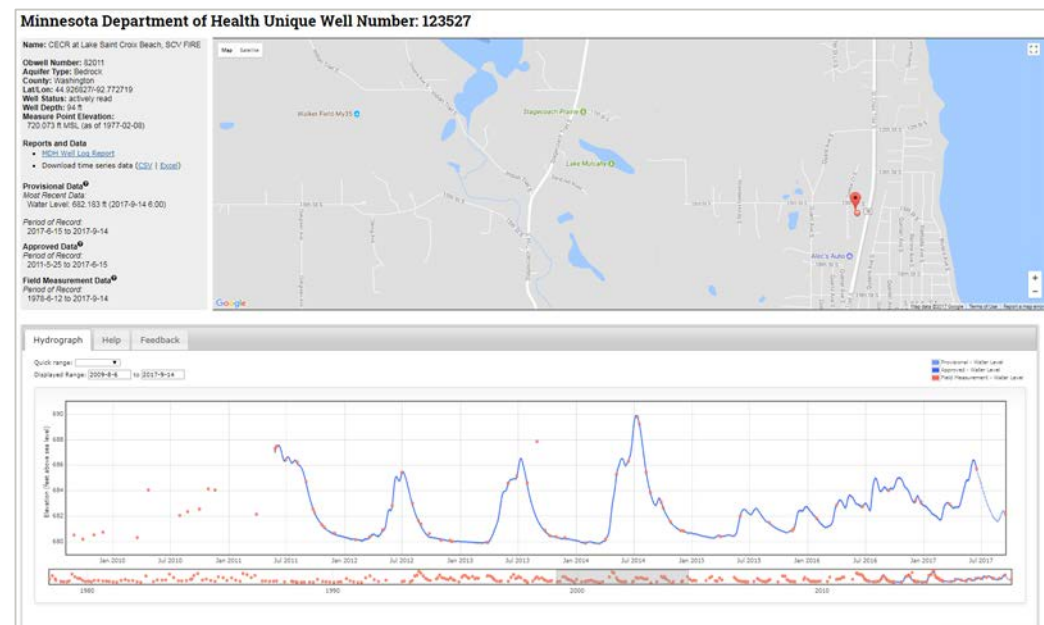
Cooperative Groundwater Monitoring (CGM) Website



DNR provides well metadata and groundwater level data publically, on the **Cooperative Groundwater Monitor** website

Features of website:

1. Downloadable data through Excel or CSV files
2. Hydrograph for water levels
3. Site location on map
4. Basic well metadata such as well completion date, depth and measure point elevation



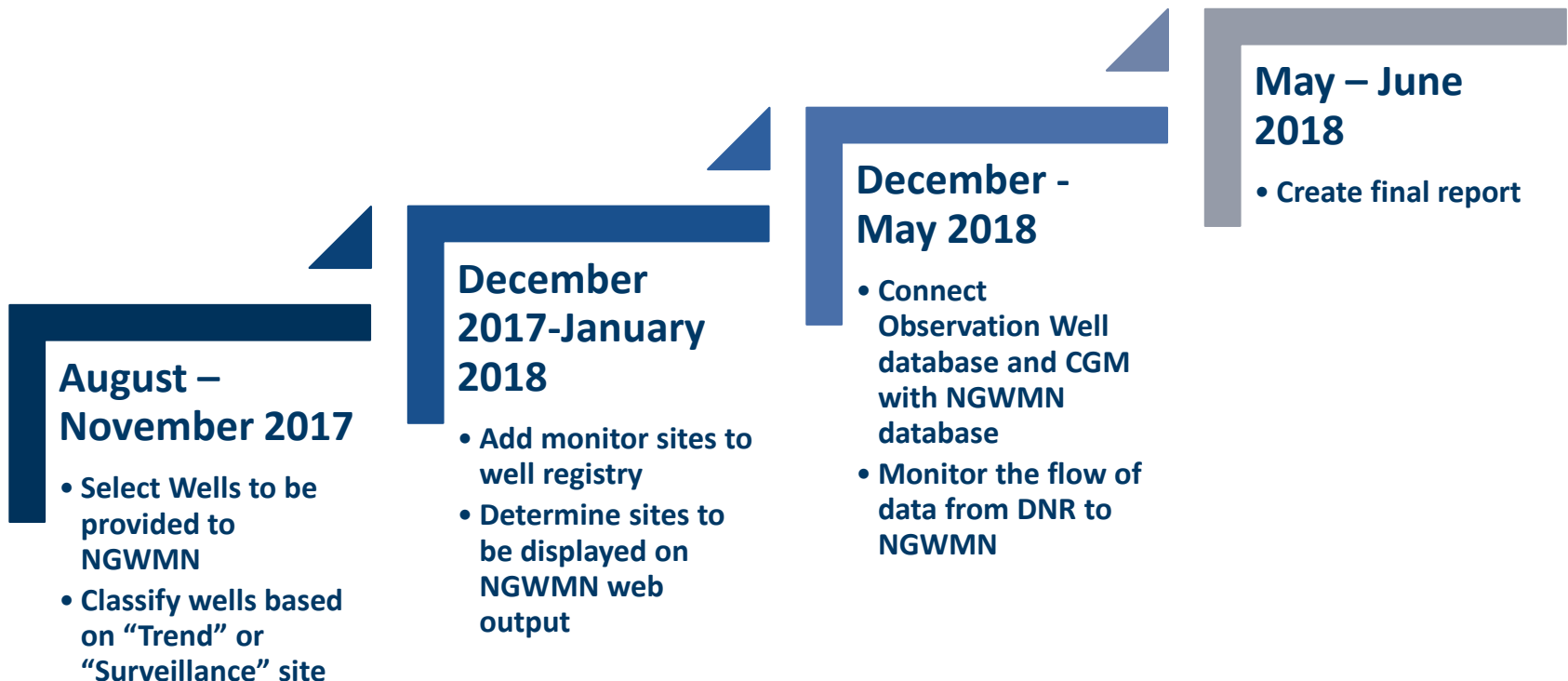
Website Address (google "DNR CGM"):

<http://www.dnr.state.mn.us/waters/cgm/index.html>

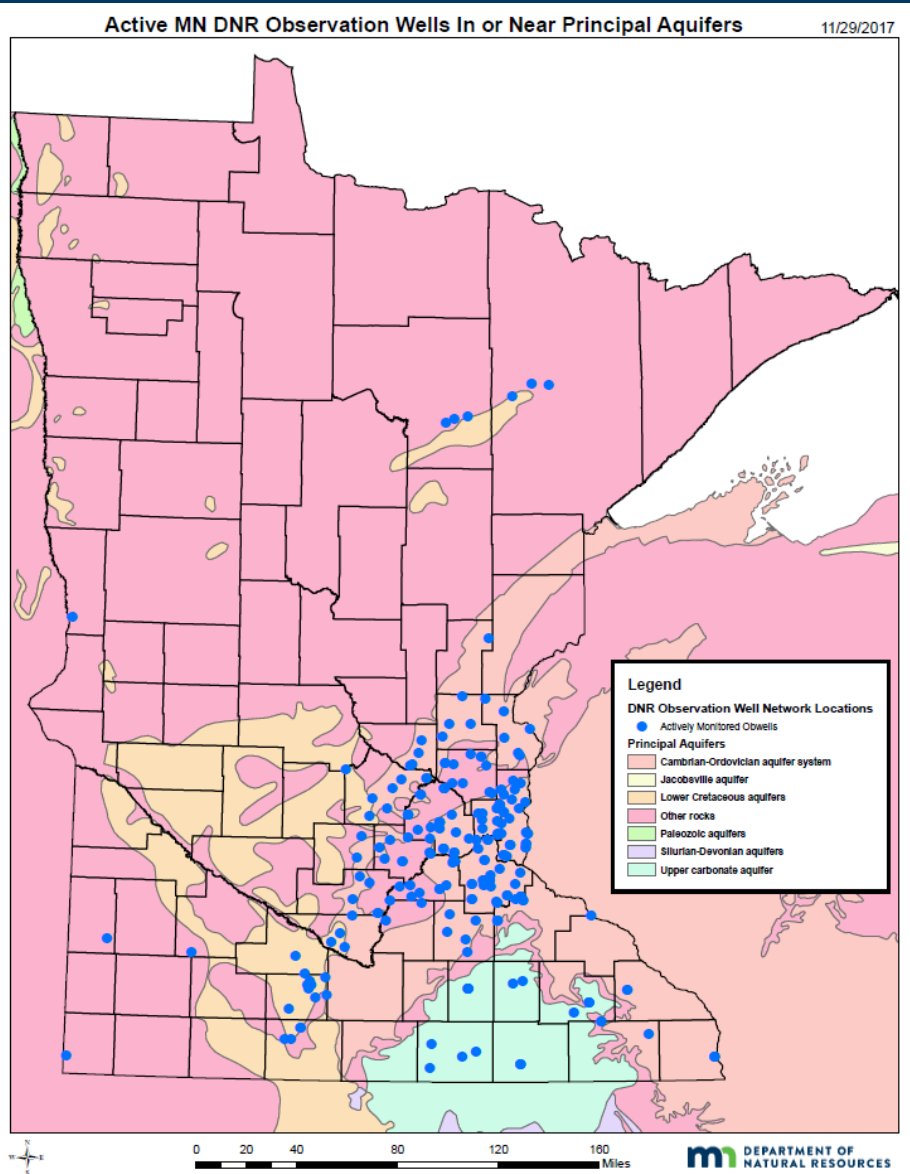
Current Project: New Data Provider

Minnesota Department of Natural Resources is in process to be a “New Data Provider” to NGWMN FY17

Minnesota (DNR/PCA) was one of five Pilot Participants to evaluate the practicability of a National Groundwater Network in 2011



Monitoring Network and Goals



3 Principal Aquifers

■ Cambrian Ordovician

■ Lower Cretaceous

■ Upper Carbonate

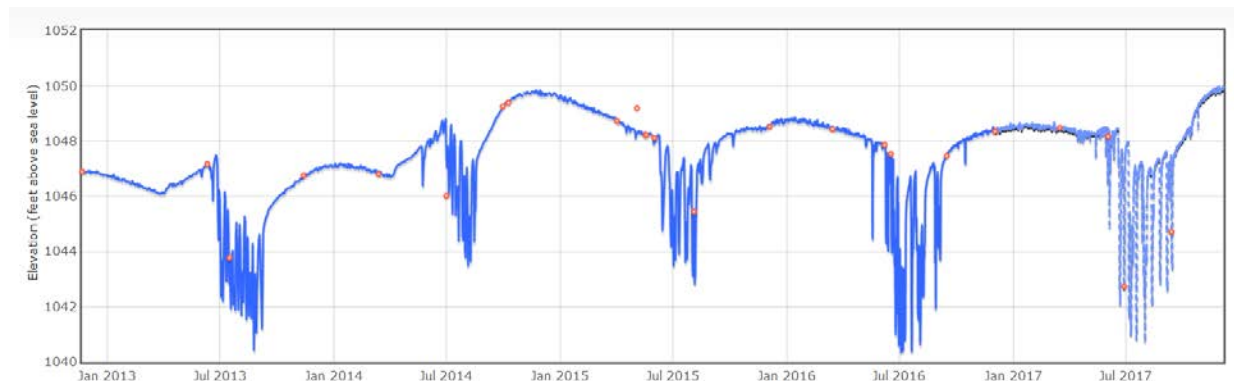
- DNR observation well in a principal aquifer

42 Local aquifers monitored with observation wells

Site Selection and Classification

Determining the Subnetwork:

- Some wells will deliver “**Background Conditions**” as they exist away from large-scale pumping but, many more are in areas of intense seasonal use that will demonstrate “**Documented changes**”.



Site Selection and Classification



After reviewing sites for their subnetworks, DNR will:

- Review **active sites** for criteria of “Trend” or “Surveillance”
 - Bias sites for selection with loggers for “Trend” classification
 - Note: All observation wells are measured at least quarterly – 8 times annually
 - Stronger consideration for sites with longer periods of record and nested well sites
- Plot selected sites onto **Principal Aquifer** map and determine the appropriate density per square mile
- Provide data from select sites to NGWMN
 - Selection process will be continual throughout Fiscal Year

USGS and DNR Field Protocol

The 2011 NGWMN Pilot Study with DNR concluded that few modifications were needed to the DNR's field practices to meet the requirements of the NGWMN.

- DNR's current practices are similar to those described in the current guidance for the NGWMN and modeled to USGS field practices



Web Services Connection Process

DNR is in process to create web connection with the NGWMN



- This process will require the assistance of MN.IT Services and thus, a **Service Level Agreement** is needed to solicit this assistance, which is anticipated to be completed in December 2017
- DNR had a previous web service connection with NGWMN that needs to be updated to be reactivated
- It is estimated that the web services connection should be completed in approximately 60 hours
- The only missing data elements are **latitude and longitude**

Contact Information



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Questions

Observation Well Program Link:

http://www.dnr.state.mn.us/waters/groundwater_section/obwell/index.html