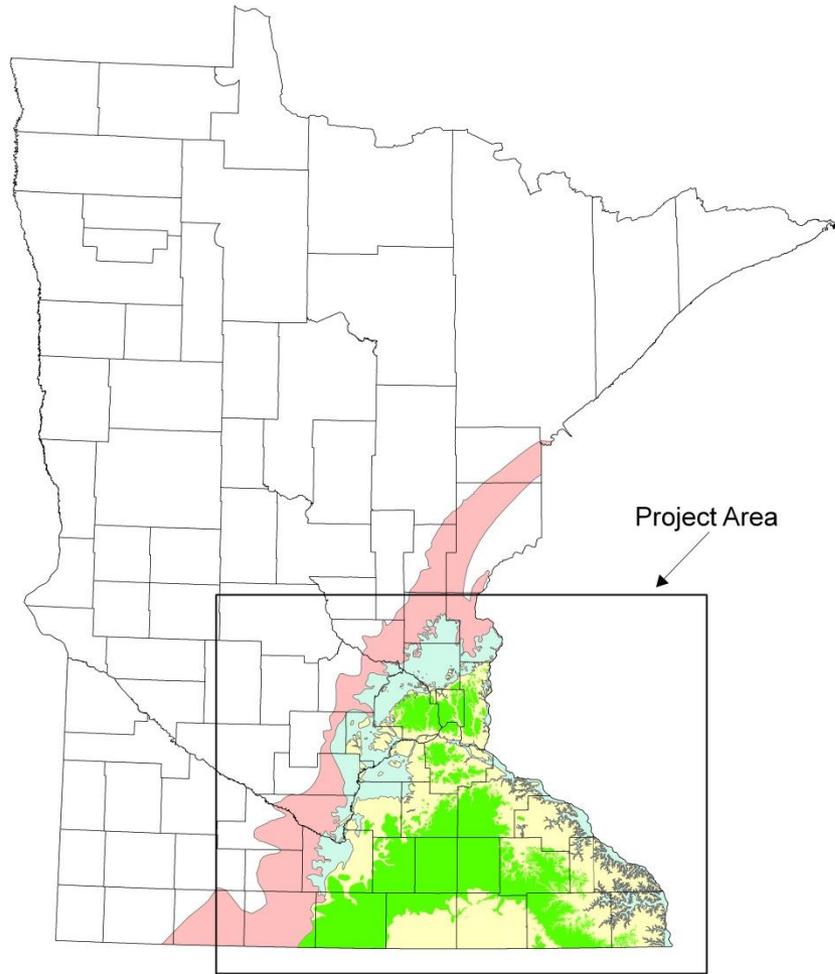


Minnesota NGWMN Pilot Update

Minnesota Pollution Control Agency and
Minnesota Department of Natural Resources





Legend

-  Upper Ordovician Aquifer Extent
-  Prairie du Chien/Jordan Aquifer Extent
-  Tunnel City/Wonewoc Aquifer Extent
-  Mt Simon Aquifer Extent



Pilot Network Statistics

- 89 wells in Pilot Network
- Wells monitored only for water levels measured on a monthly basis excluding winter months (52 wells), water quantity monitoring included 37 wells
- The period of record for wells selected for pilot program range from 5 to 25 years of water level data

Estimated Costs

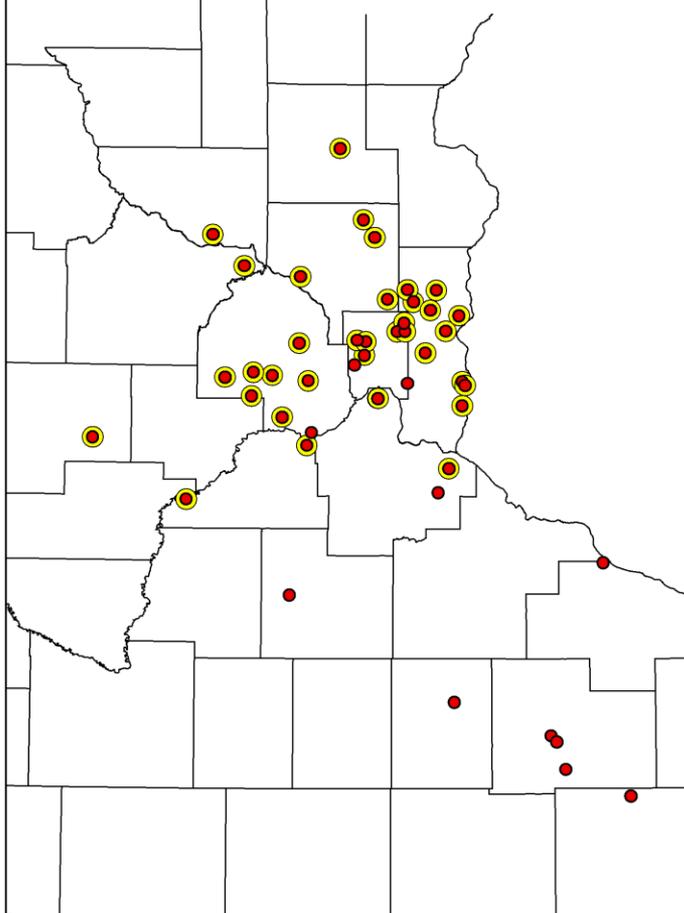
- The additional annual operation and maintenance costs required to meet the recommendations in the Framework \$87,500
- The capital costs to fill the identified gaps in the Water-Level Trend Network and meet the guidance in the Framework Document were estimated to be \$2,525,000
- The initial implementation of the Surveillance Monitoring Network, including capital and operation and maintenance costs, was estimated to cost \$1,170,000

Water Quality Updates since 2010

- The MPCA has been expanding its monitoring of surficial sand and gravel aquifers with over 100 new monitoring wells
- Approximately 5 private domestic wells in the network have been inaccessible due to changes in property ownership
- The MPCA now uses the commercial data management system EQulS to store field and laboratory data and has developed automated electronic data submission for the system
- The MPCA's approved water-quality data continues to flow on a monthly basis to EPA WQX

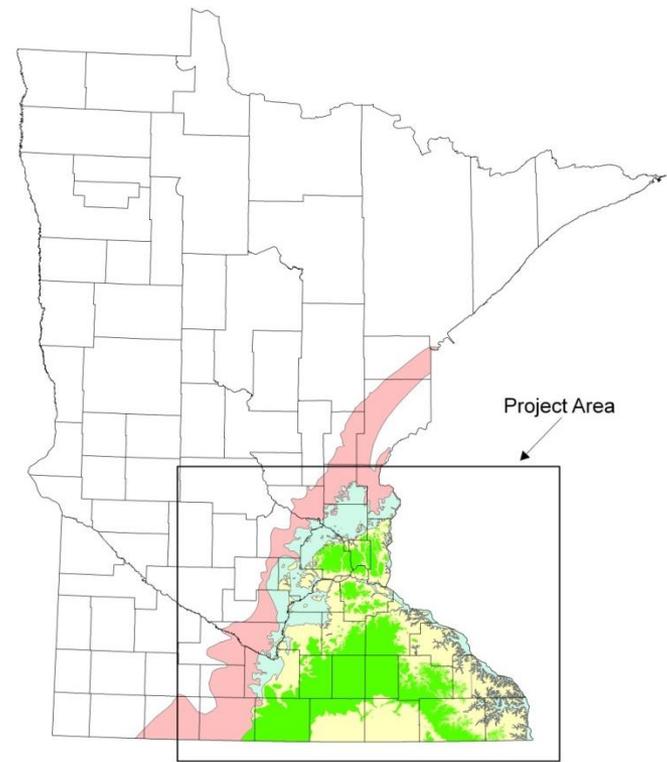
Water Level Network Updates Since 2010

- State Wide Network Active Wells
750 (2010) | 950 (2014)
- Goal of adding 75-100 new wells per year
- Over 300 wells now have hourly continuous monitoring
 - Most with data sets > 3 years
 - Currently rolling out program to equip entire monitoring network with continuous monitoring while having local partners download and submit both continuous and discrete measurements
- Sealed and/or replaced over 150 poorly functioning observation wells



Legend

- **Pilot Wells**
- **Pilot Wells with Continuous Data Collect**

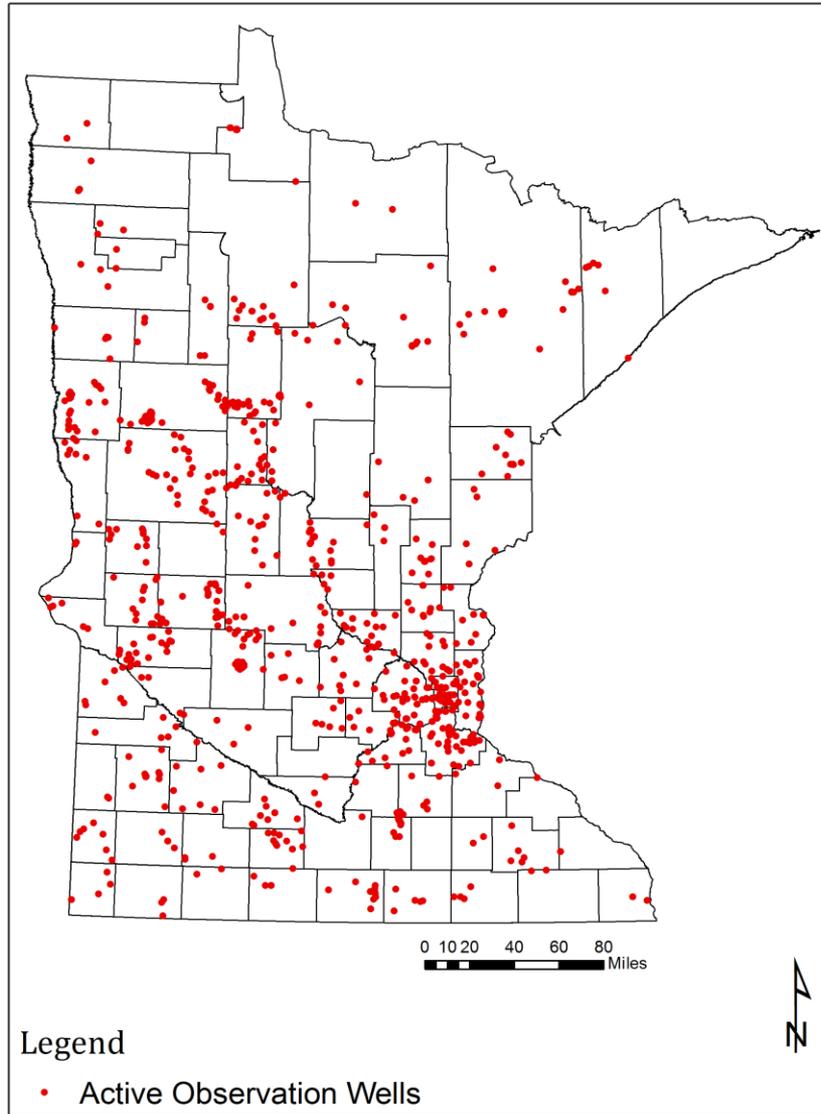


Legend

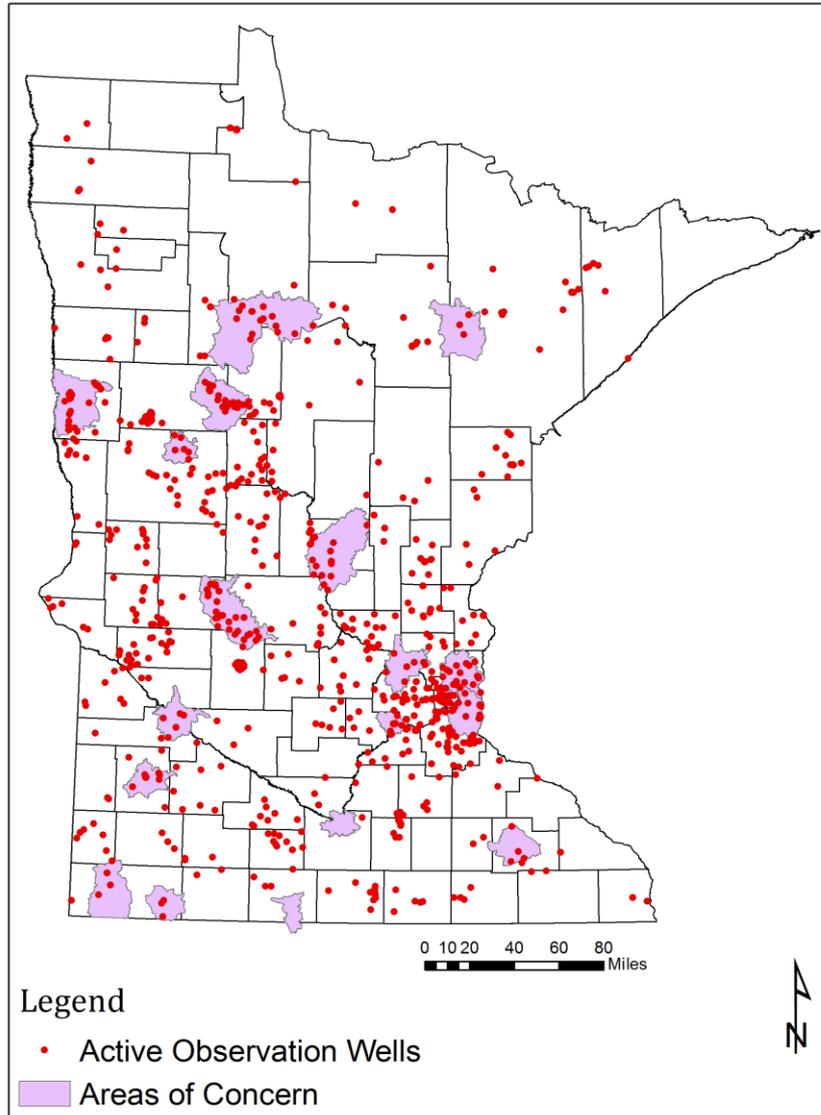
- Upper Ordovician Aquifer Extent
- Prairie du Chien/Jordan Aquifer Extent
- Tunnel City/Wonevoc Aquifer Extent
- Mt Simon Aquifer Extent



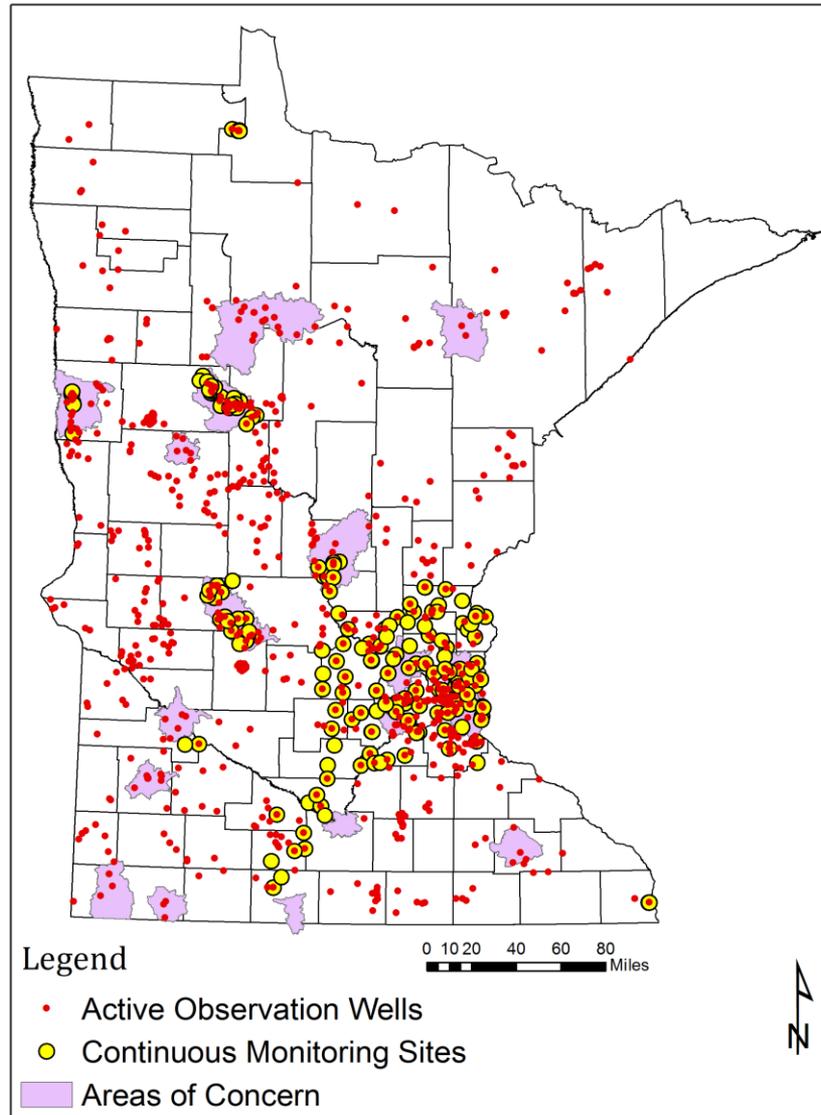
Current Water Level Observation Well Network



Emerging Areas of Concern



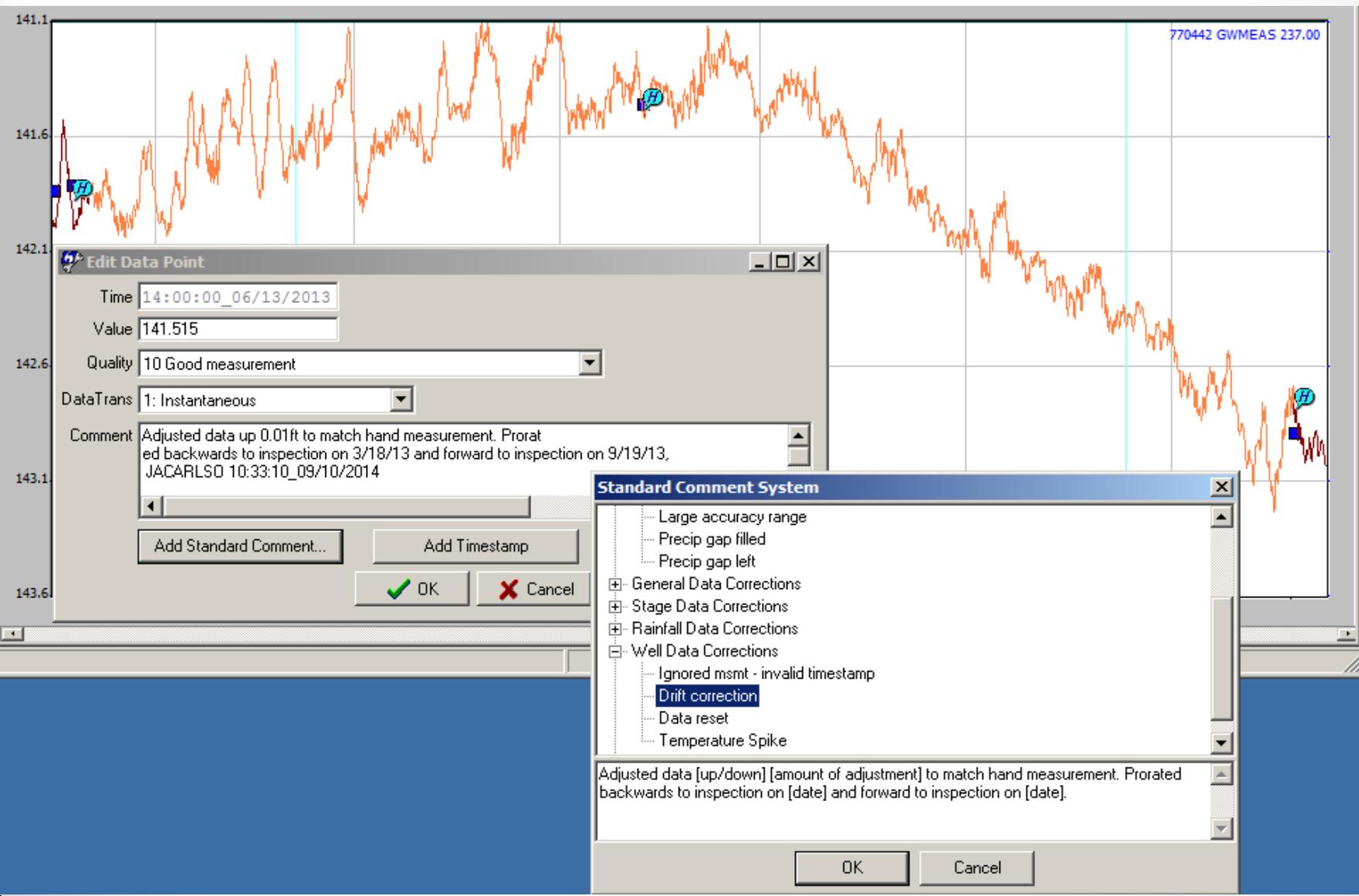
Continuous Data Collection



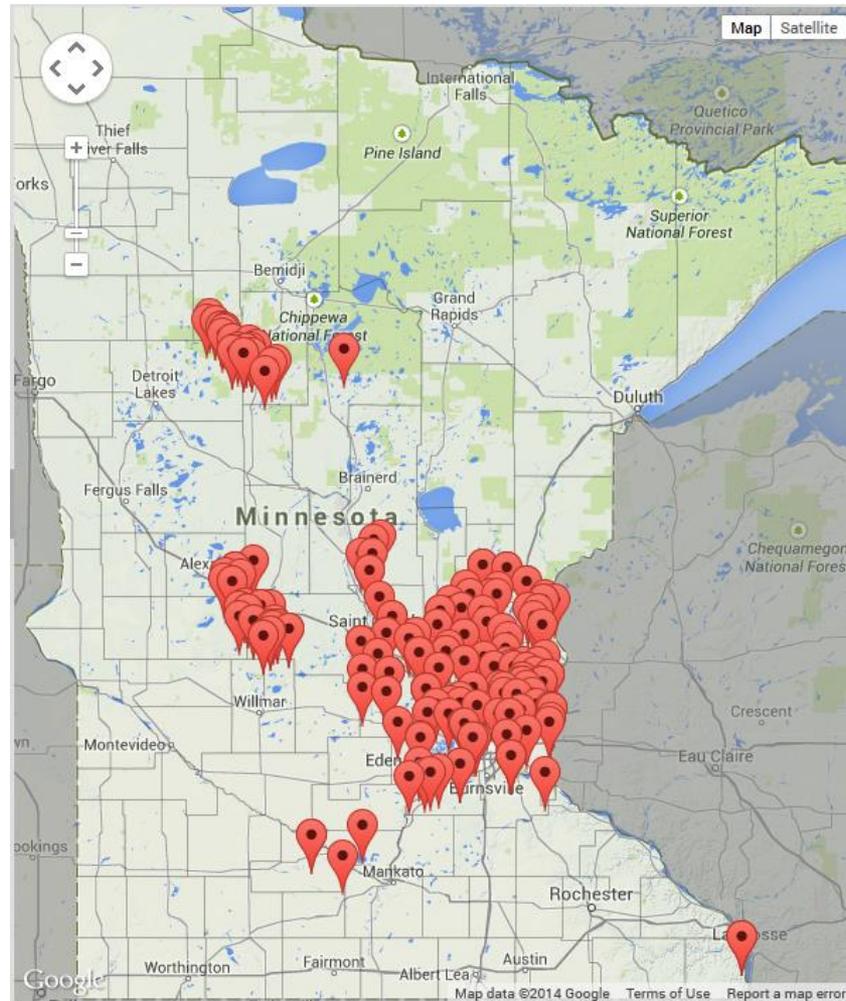
Data System Updates

- Upgraded to Hydstra hydrologic relational database for data management and analysis of continuous data
- Upgraded to EQulS Water Data Management System for Water Quality Data and paired discrete water level data
- Developing a robust public groundwater data website for viewing and downloading data
- Increases towards conforming to NGWMN in field methods and meta data tracking
- Developed standardized field recording forms and operating procedures internally and rolling out to local partners

Hydstra Hydrologic Database



Groundwater Data Website Development



CTCW at Afton, St. Croix Valley Athlet

Site ID: 603059
County: Washington
Lat/Lon: 44.936931/-92.783782
Gage Zero: 872.934 ft NGVD29

[MDH Well Log Report](#)

Provisional Data

Most Recent Data: (TODO - show times)

Water Level: 767.387 ft

Water Temperature: 9.133 C°

Period of Record:

2012-1-8 to 2014-7-11

Approved Data

Period of Record:

2001-5-17 to 2014-1-29



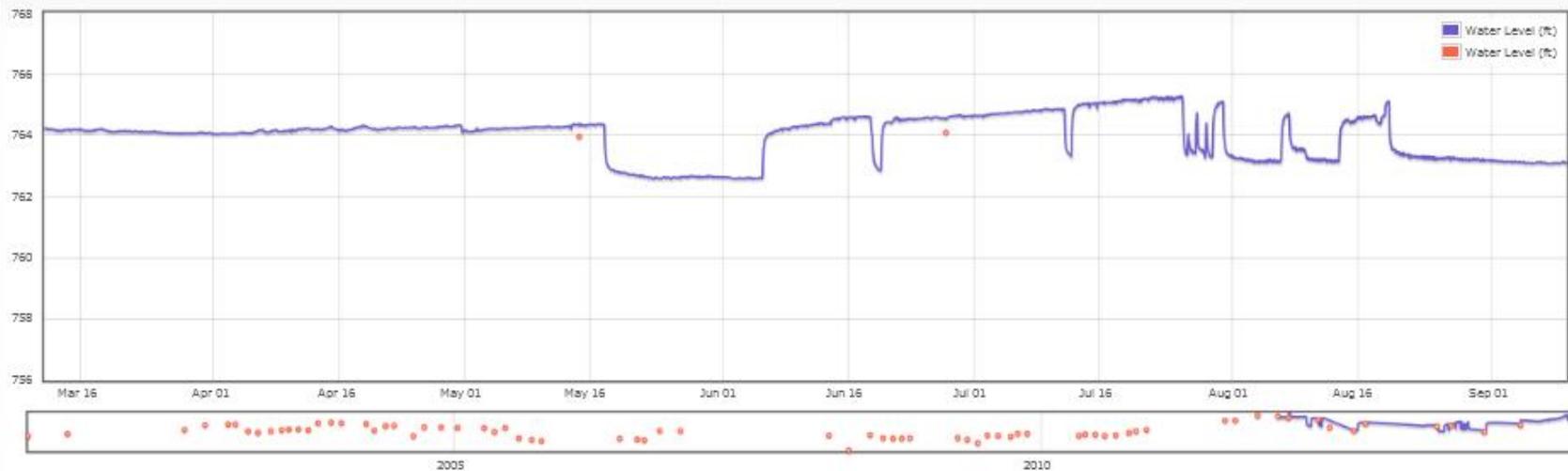
Hydrograph

Well Construction

Available Data

Range: 2013-3-11 to 2013-9-9

Quick range:

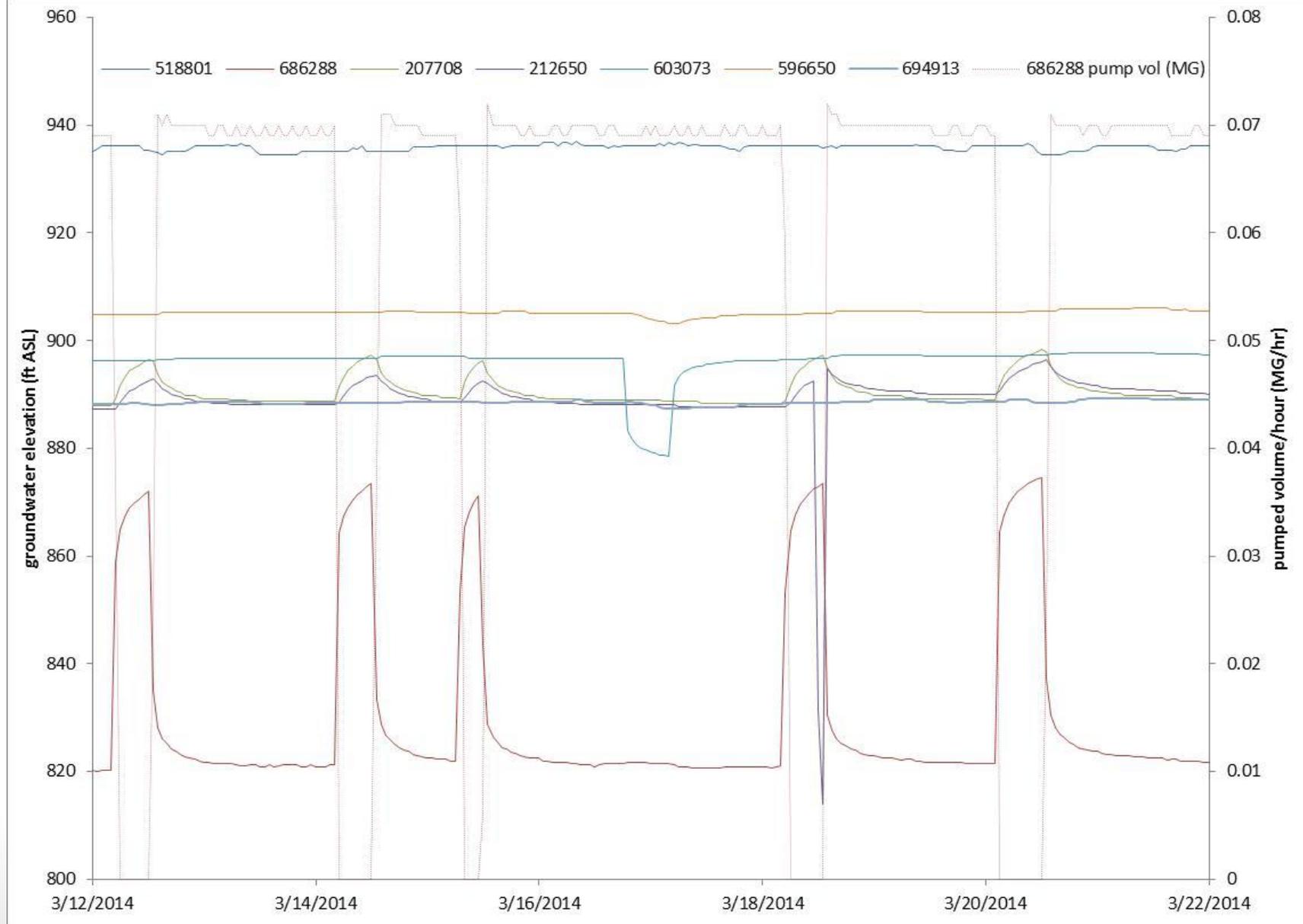


Capture and use of municipal groundwater level data

- Municipal SCADA systems currently collect useful groundwater data for system operation
- DNR is working to record and compile these data for groundwater monitoring purposes



Uses of municipal SCADA data



Framework Recommendations

- Provide additional guidance to the states in determining the number of wells required to support assessments
- Increase the recommended frequency of water level measurements
- Lengthen water quality sampling frequency in aquifers with longer residence times
- Add additional guidance in defining unstressed or targeted wells to insure consistency