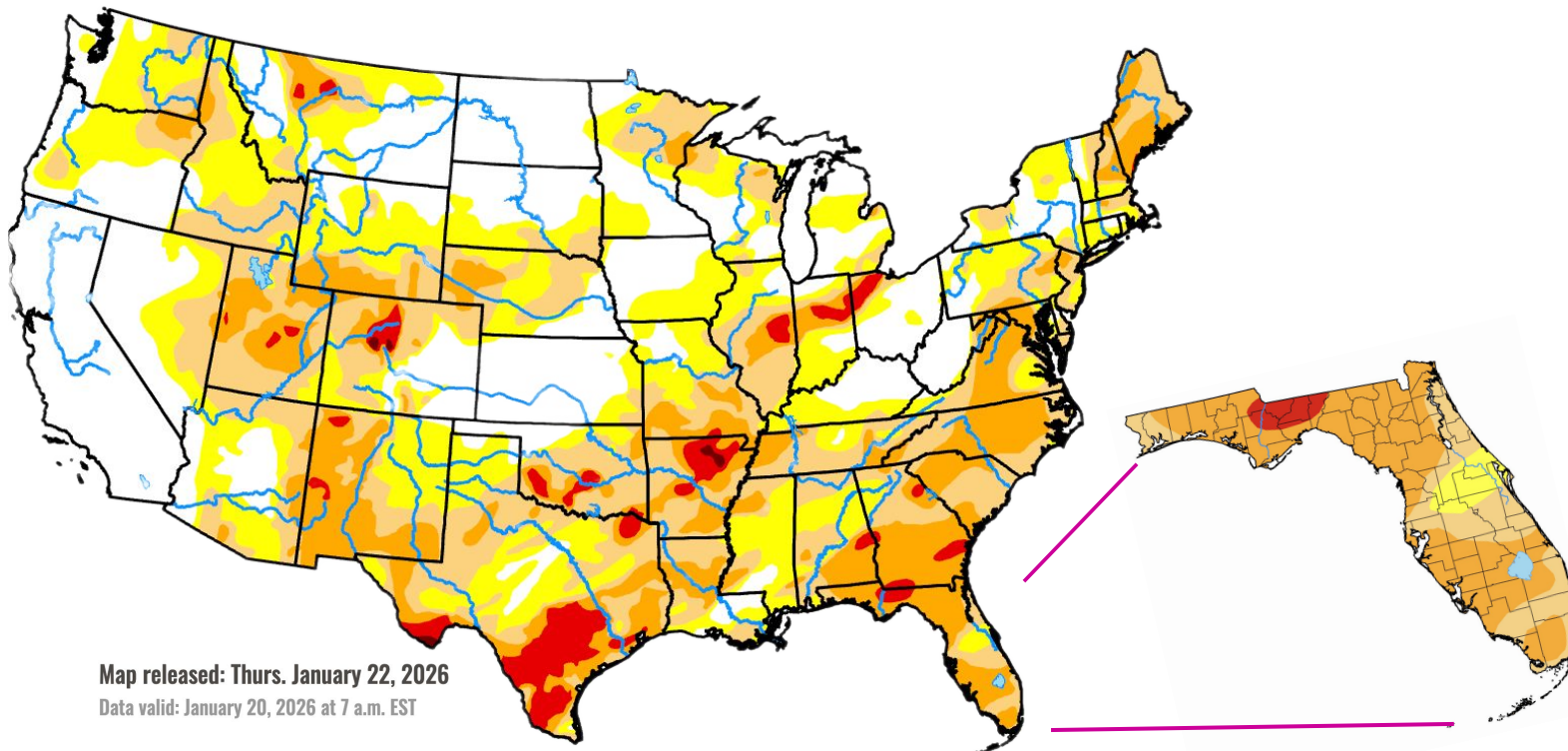


2026 FLORIDA GROUNDWATER CONFERENCE

High-Value Groundwater-Level Monitoring Using Submersible Pump Wells: Enhancing Operational and Management Insight

Charles Dunning, PhD
VP Hydrology

Groundwater is changing...



Map released: Thurs. January 22, 2026

Data valid: January 20, 2026 at 7 a.m. EST

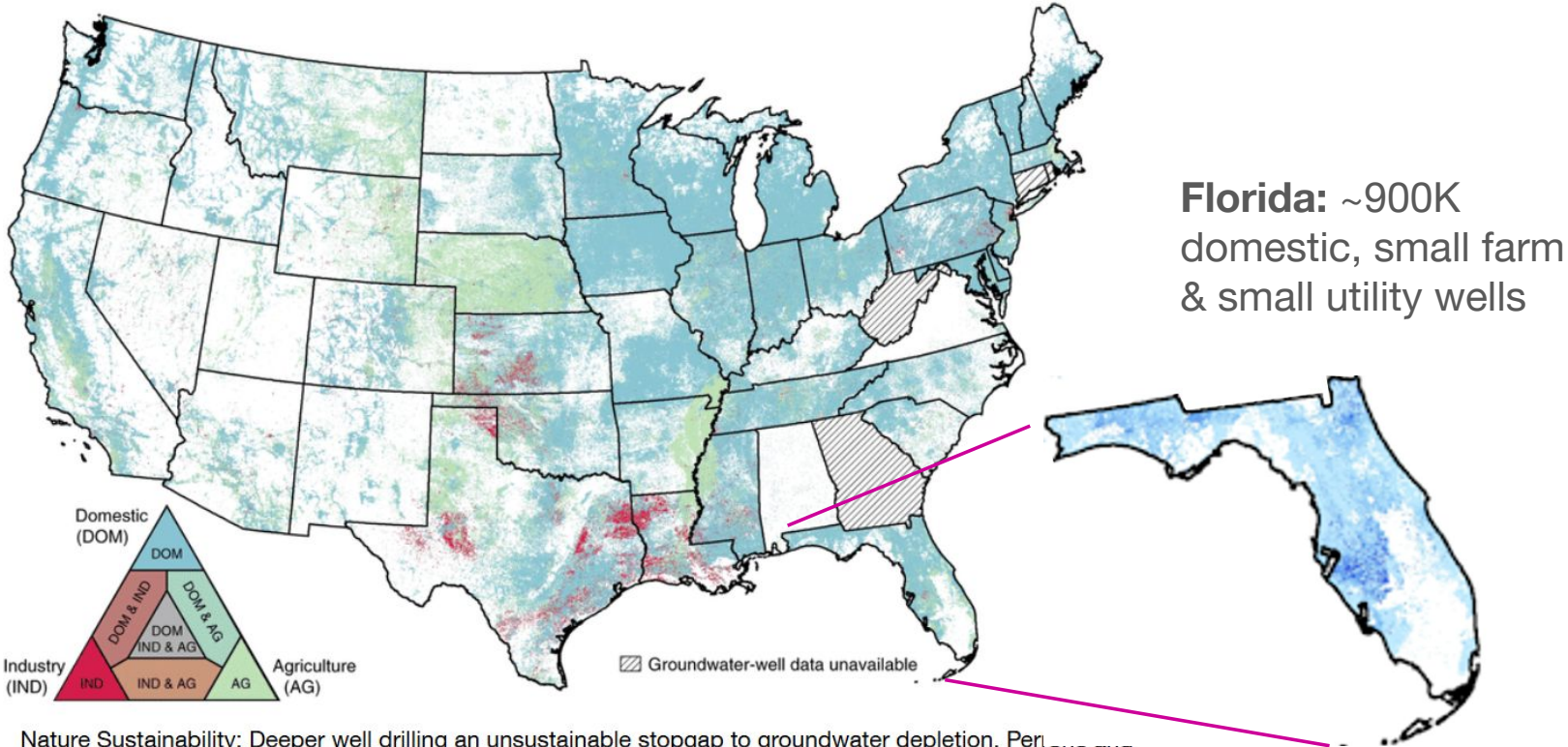
... differently everywhere

For greater insight and better understanding, **we need to monitor in more places**

The **cost** of new wells and **access** to more locations can be challenging



We have existing assets



Nature Sustainability: Deeper well drilling an unsustainable stopgap to groundwater depletion, Per Scott, 2019

There are challenges...



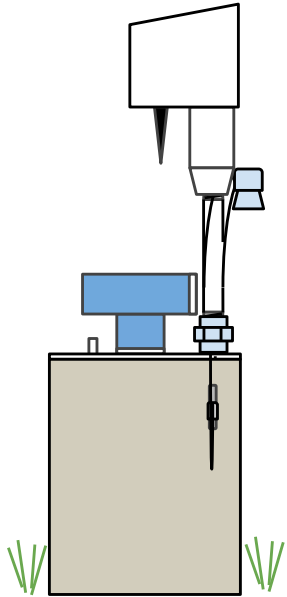
- **Inconsistent construction:**
not uniform, nor clean
- **Pump interference:**
pump noise and level influence
- **Access:**
well-owner coordination for measurement/ downloads

...but purpose-built technology makes it possible



- Start with **existing assets**
- Simplify **data collection and management**
- Streamline **reporting and sharing**

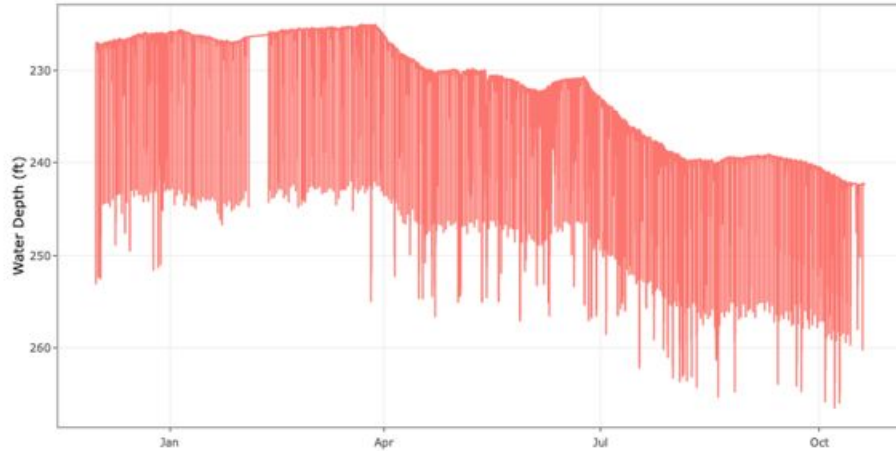
Measurement can start with WellIntel's sensor



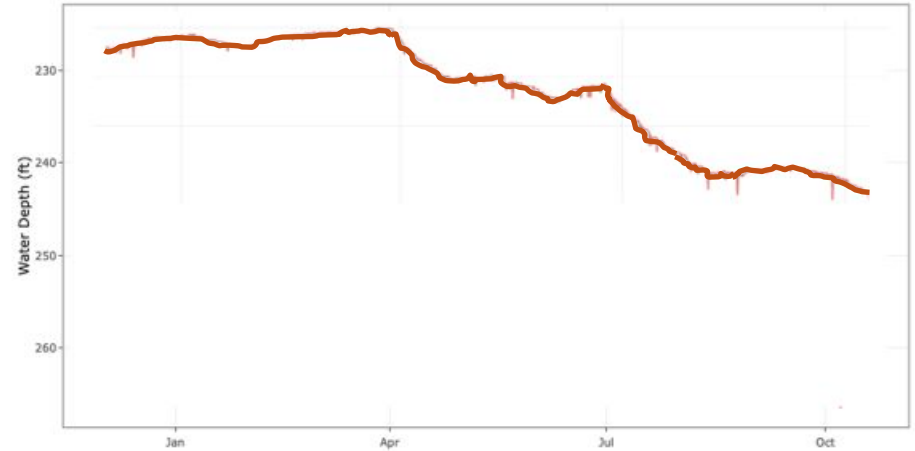
- **Designed** for submersible pump and monitoring wells
- **Acoustic**, digital signal
- **Plug and play** install ~ 1 hour
- **USGS-tested** 0.1' accuracy



Monitor and tag pumping-related activity, optionally filter impact data

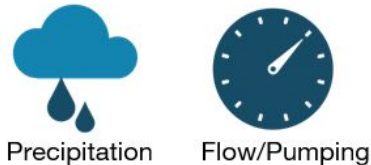


all readings - timed, pump start,
pump stop, pump recovery



timed readings only

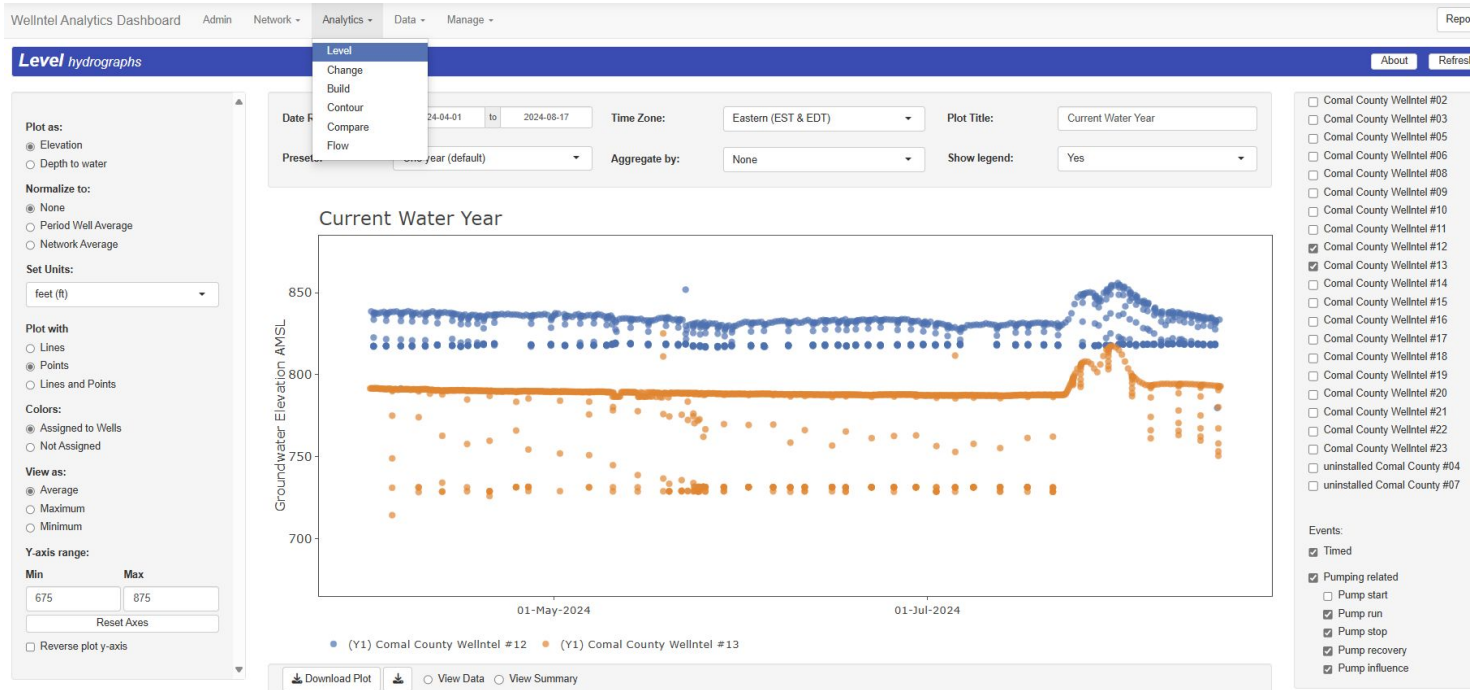
Create context with historic, public and other sensor data



Spreadsheets/ CSVs
Single measurements
APIs
SCADA



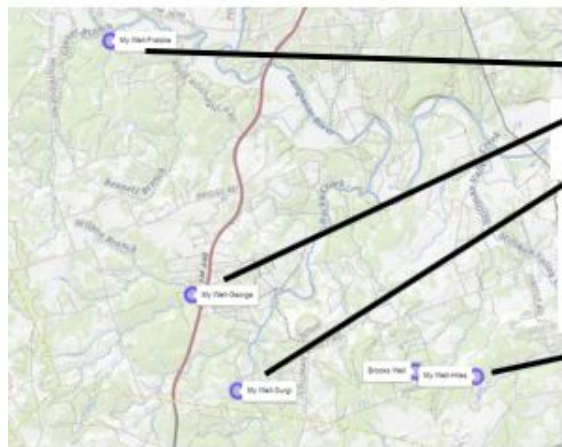
Cloud dashboard to simplify, share analysis



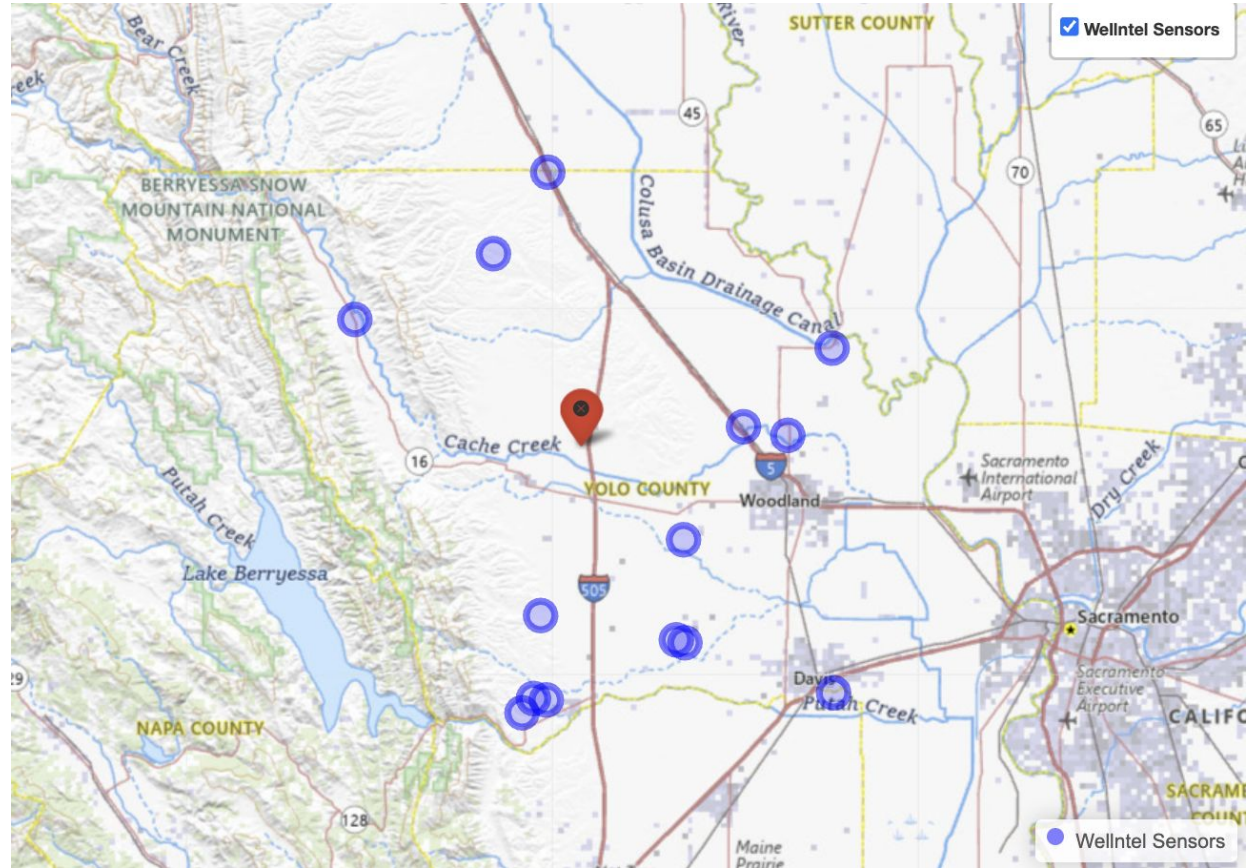
Key insight gained from production wells:

- **Hydrogeologic setting**
- Local and multi-year **level trends**
- Pumping dynamics, local and multi-well **impacts**
- **Regional insight** for management

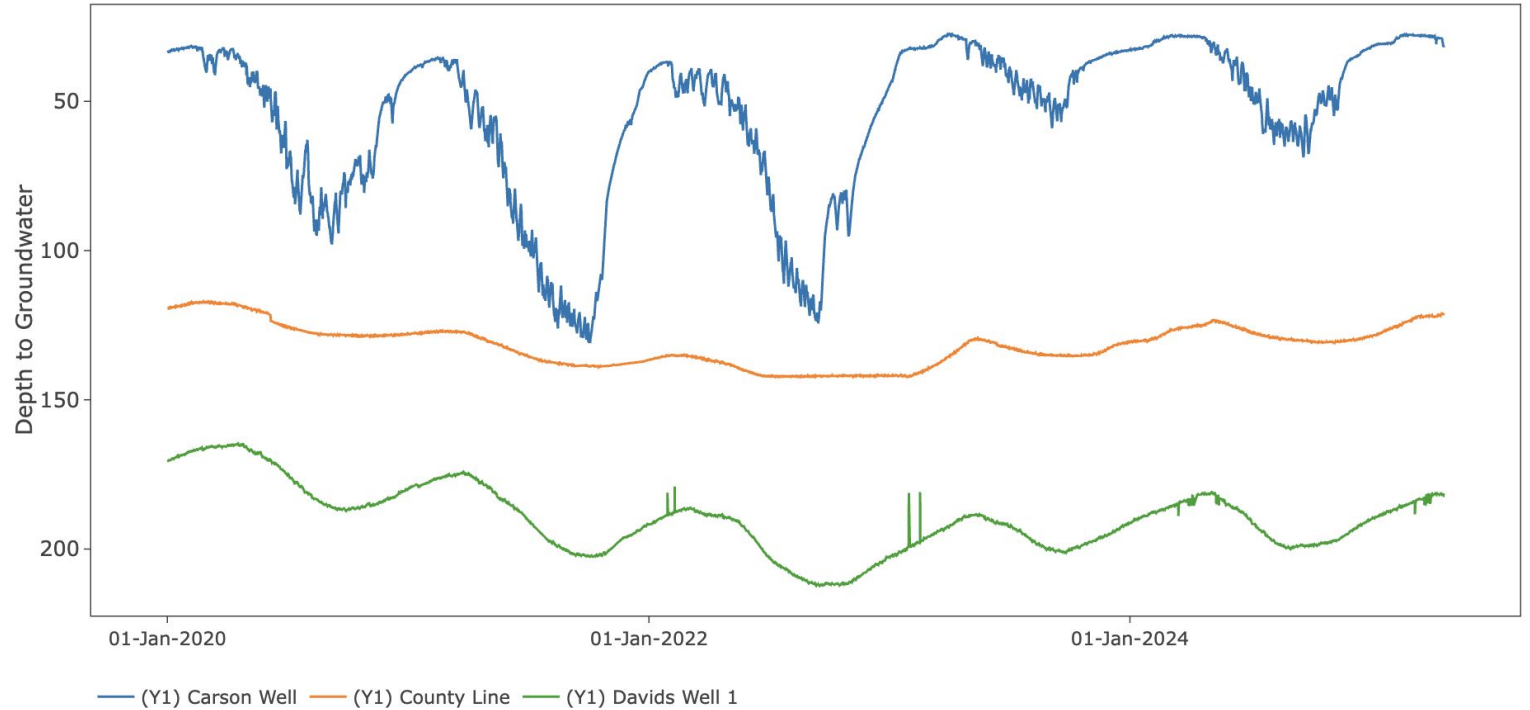
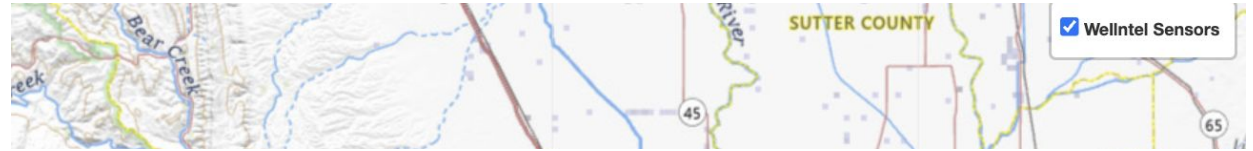
Hydrogeologic setting



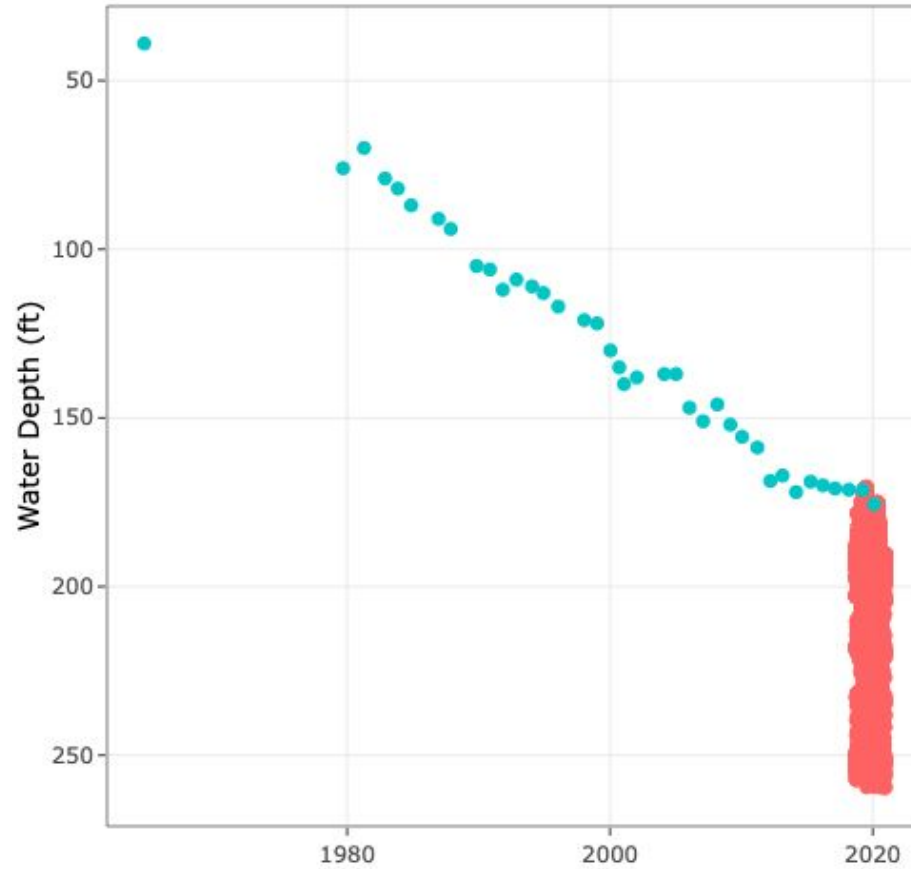
Multi-year trends



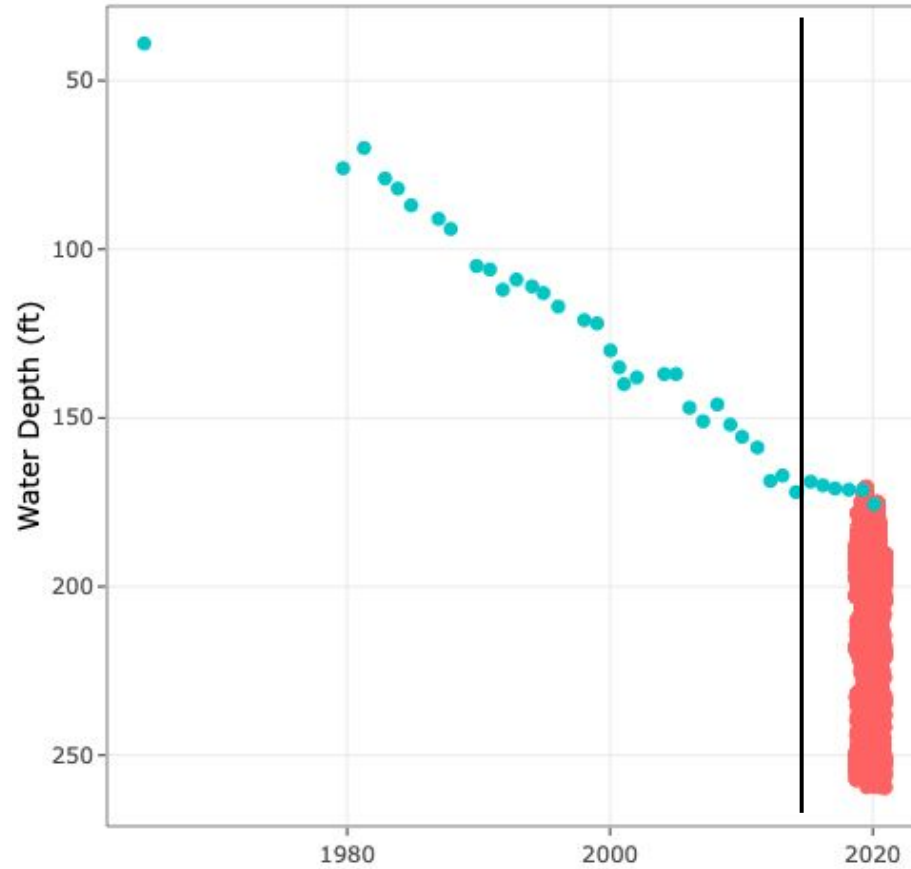
Multi-year trends



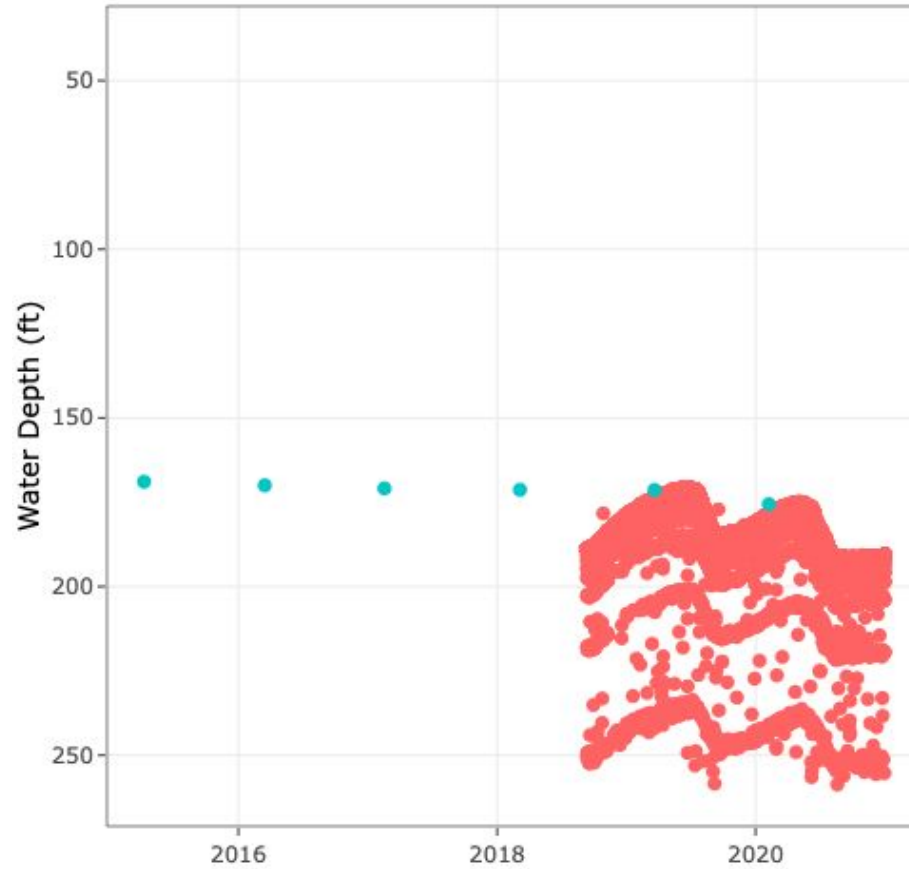
Multi-decade trends



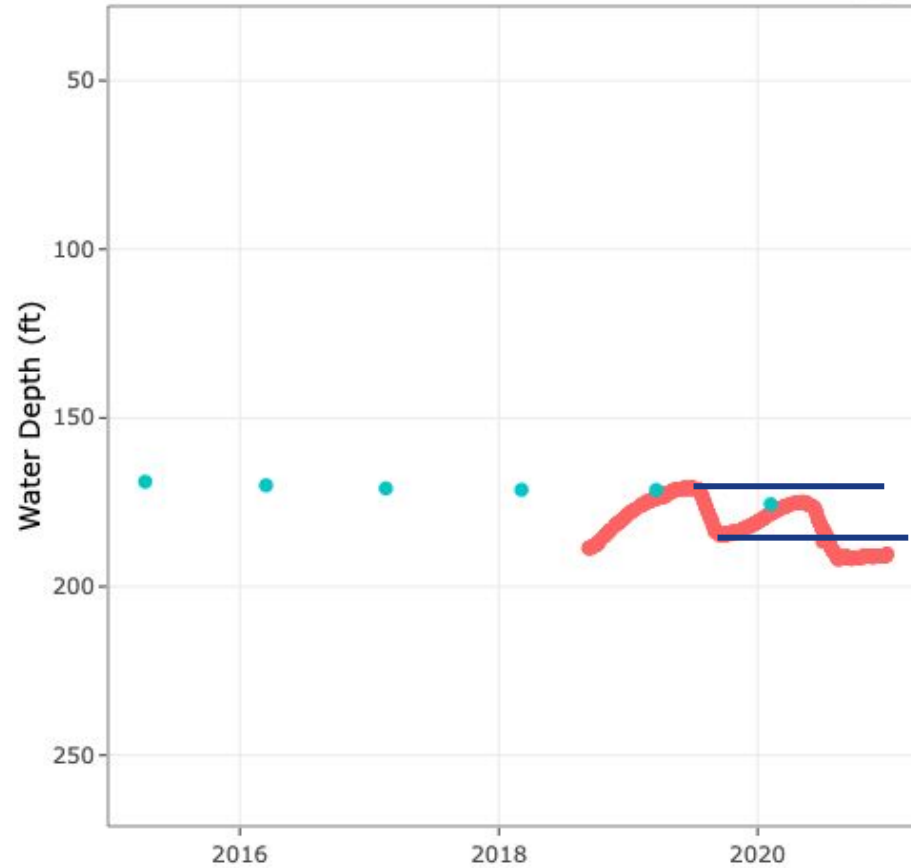
Multi-decade trends



Multi-decade trends



Multi-decade trends

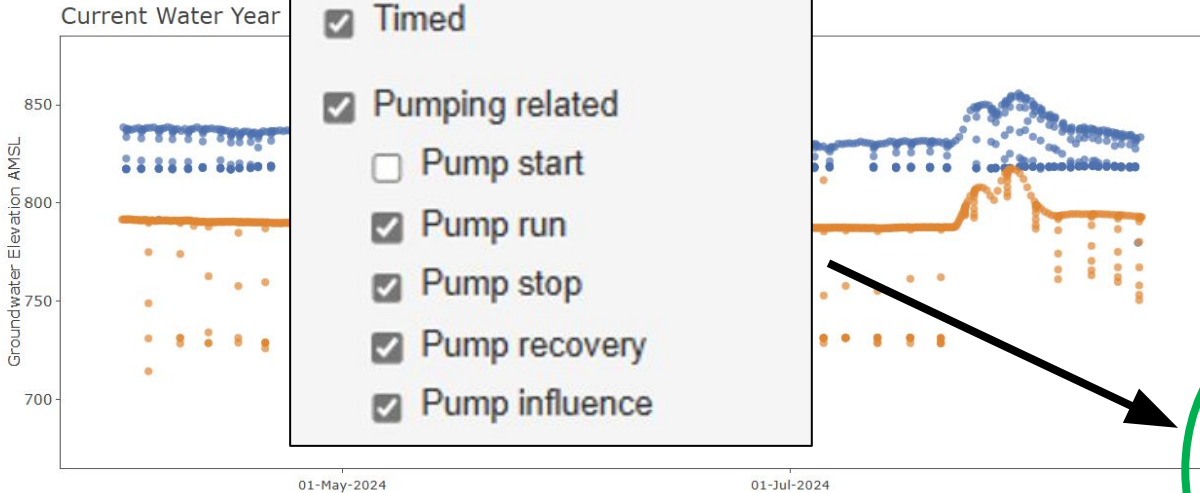


Level hydrographs

About Refresh

- Level
- Change
- Build
- Contour
- Compare
- Flow

Date Range: 2024-04-01 to 2024-08-17 Time Zone: Eastern (EST & EDT) Plot Title: Current Water Year Show legend: Yes



Events:

- Timed
- Pumping related
 - Pump start
 - Pump run
 - Pump stop
 - Pump recovery
 - Pump influence

- Comal County WellIntel #02
- Comal County WellIntel #03
- Comal County WellIntel #05
- Comal County WellIntel #06
- Comal County WellIntel #08
- Comal County WellIntel #09
- Comal County WellIntel #10
- Comal County WellIntel #11
- Comal County WellIntel #12
- Comal County WellIntel #13
- Comal County WellIntel #14
- Comal County WellIntel #15
- Comal County WellIntel #16
- Comal County WellIntel #17
- Comal County WellIntel #18
- Comal County WellIntel #19
- Comal County WellIntel #20
- Comal County WellIntel #21
- Comal County WellIntel #22
- Comal County WellIntel #23
- Uninstalled Comal County #04
- Uninstalled Comal County #07

Events:

- Timed
- Pumping related
 - Pump start
 - Pump run
 - Pump stop
 - Pump recovery
 - Pump influence

Plot as:

- Elevation
- Depth to water

Normalize to:

- None
- Period Well Average
- Network Average

Set Units:

feet (ft)

Plot with:

- Lines
- Points
- Lines and Points

Colors:

- Assigned to Wells
- Not Assigned

View as:

- Average
- Maximum
- Minimum

Y-axis range:

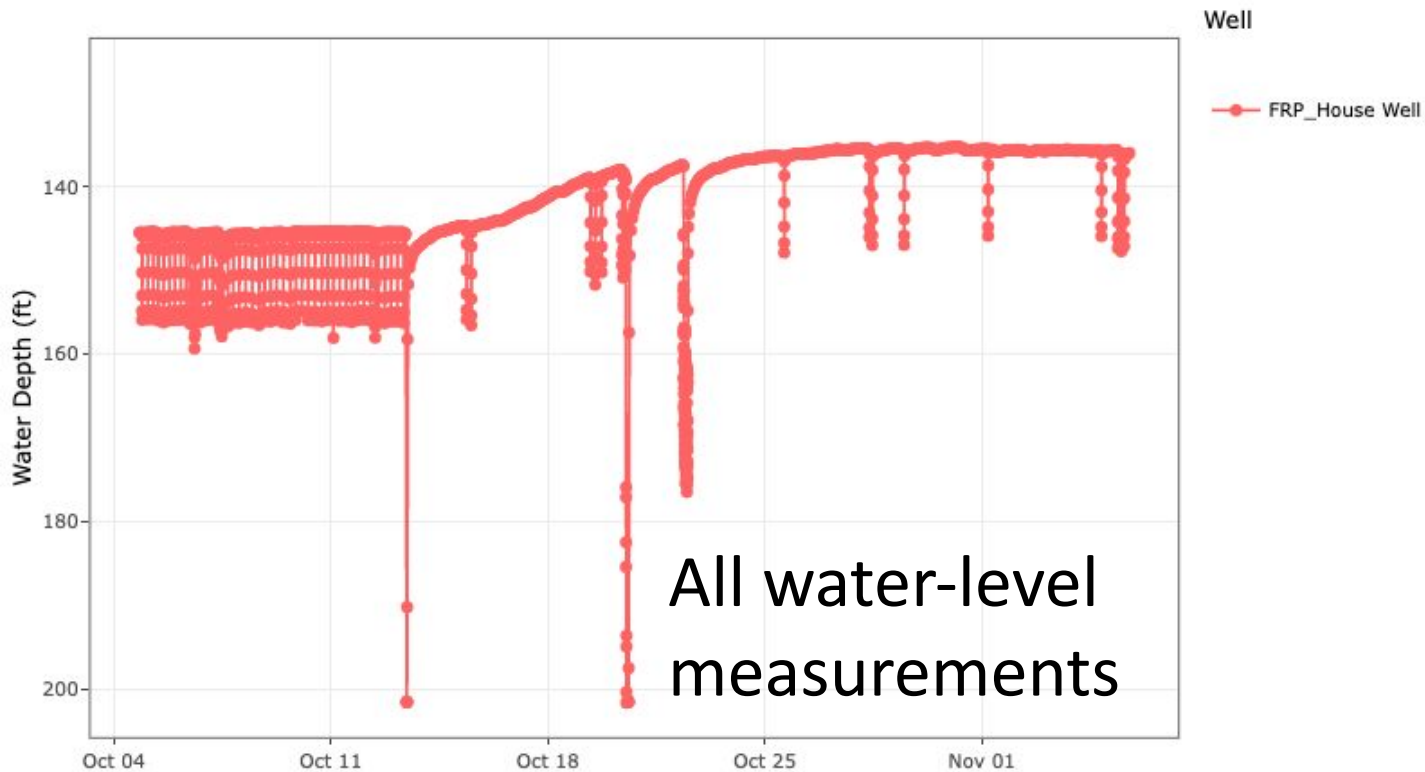
Min: 675 Max: 875

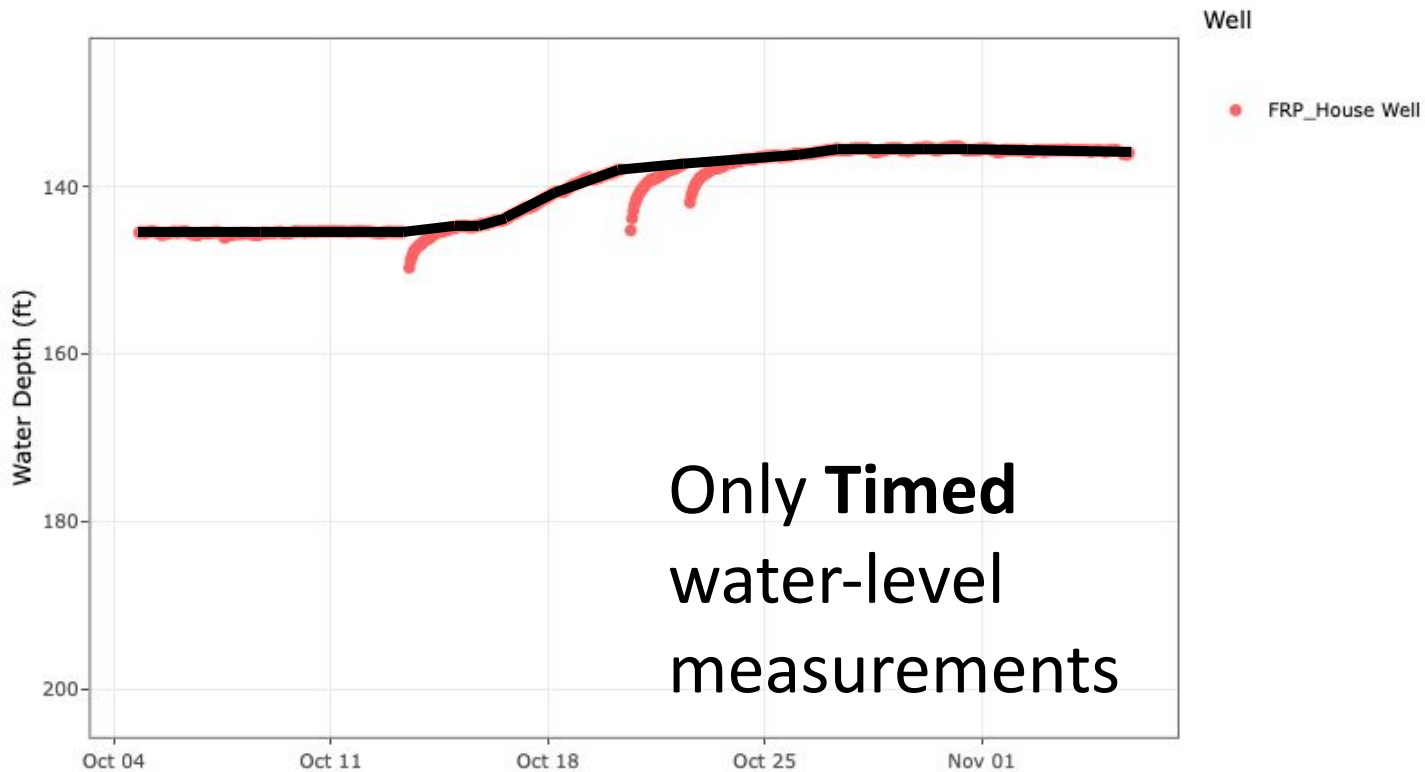
Reset Axes

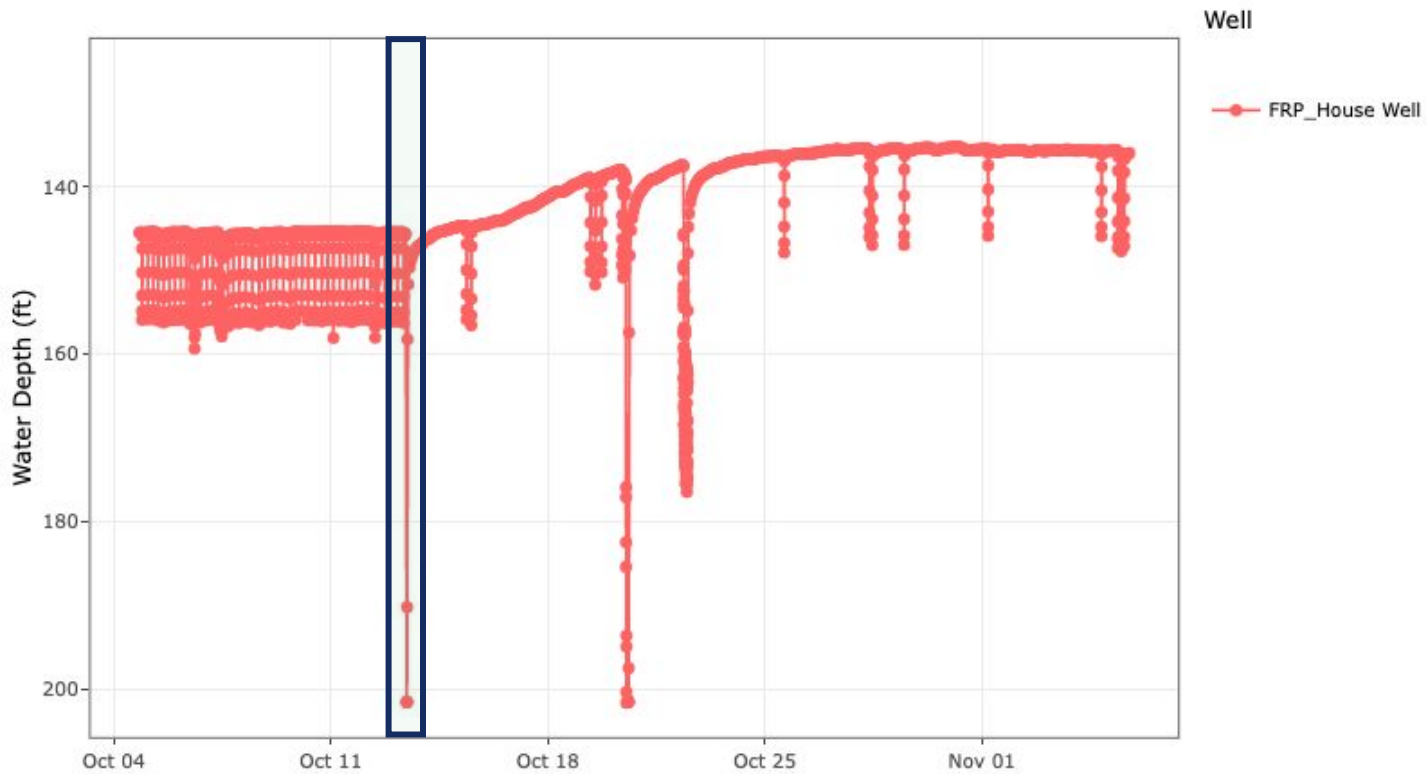
Reverse plot y-axis

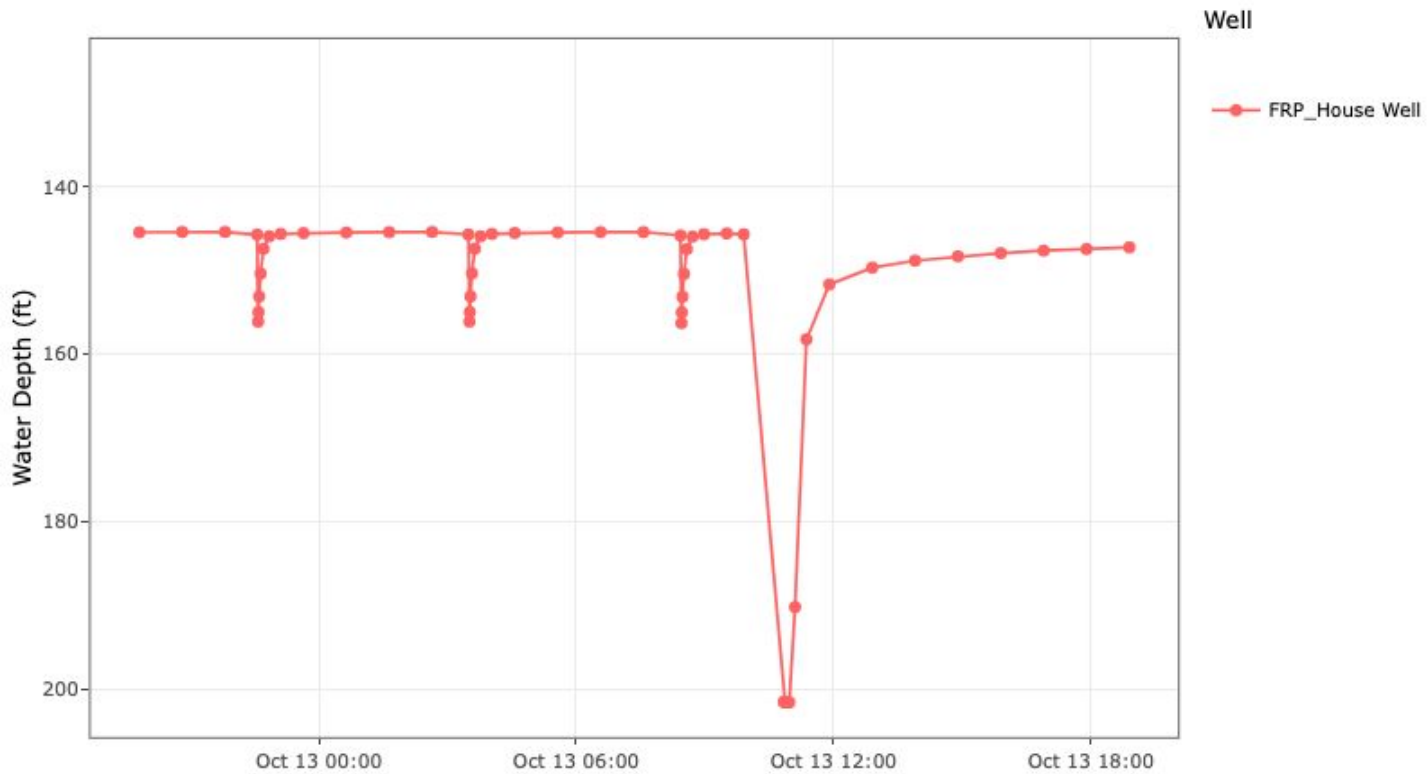
Download Plot View Data View Summary

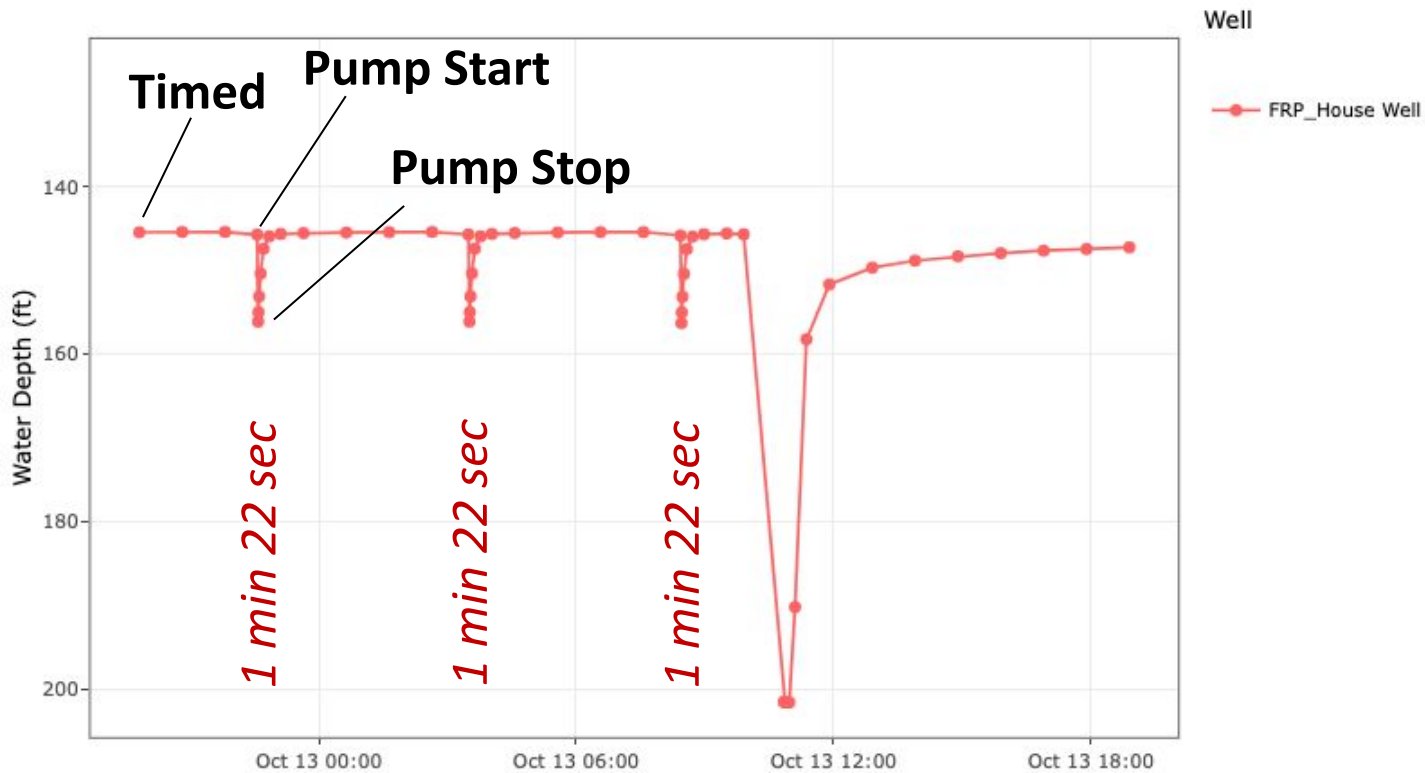


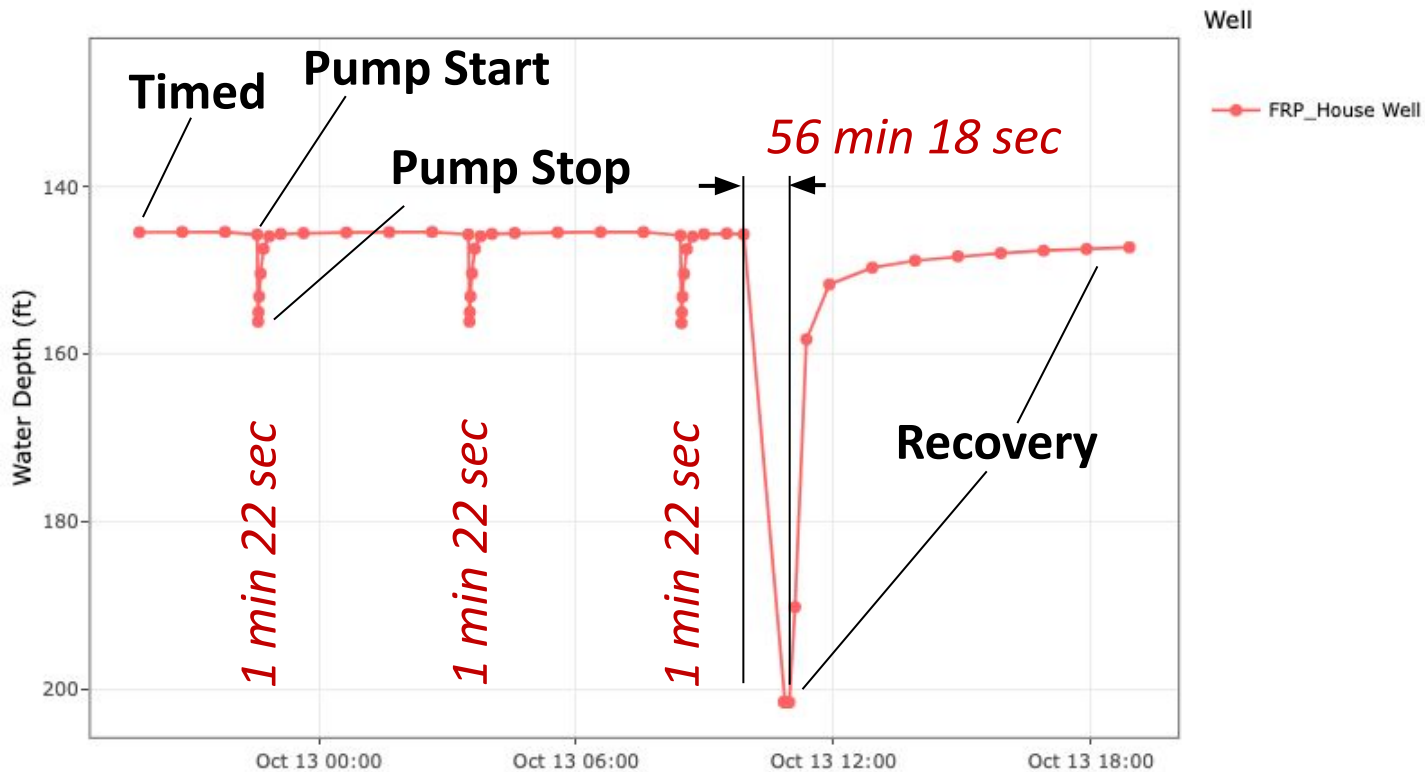




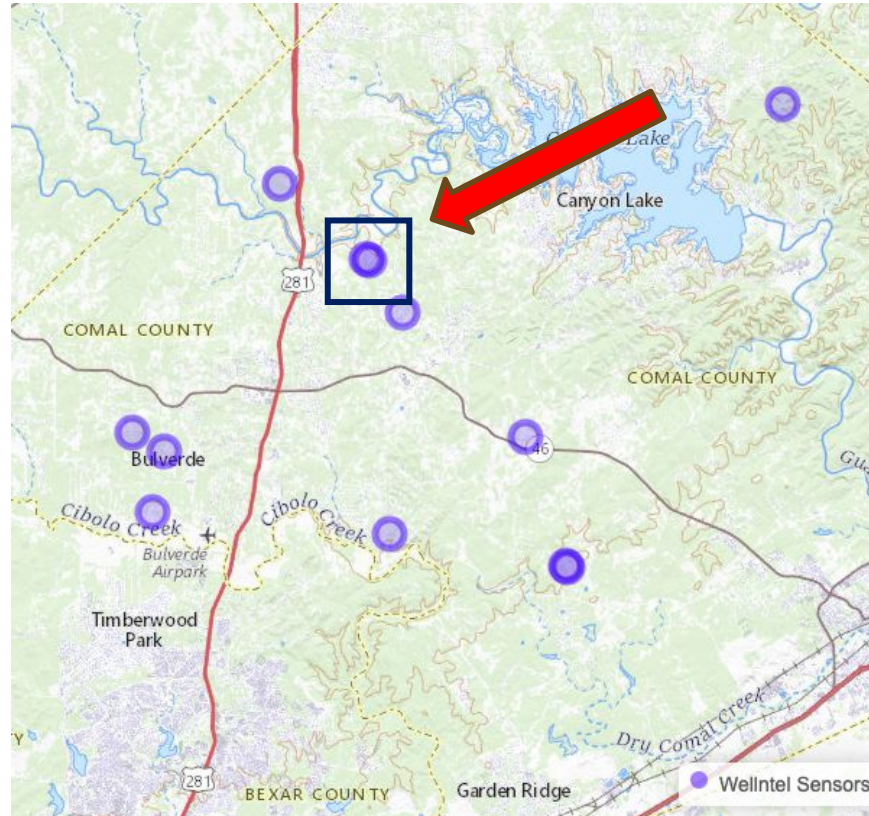






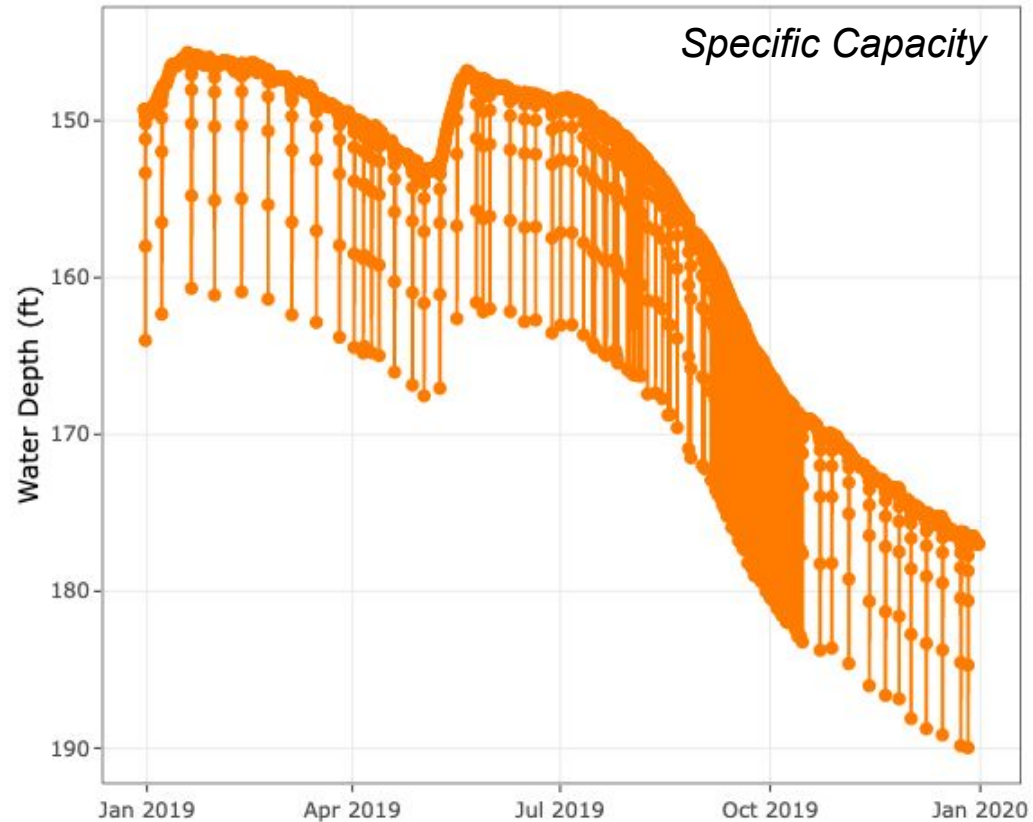


Single-well analysis



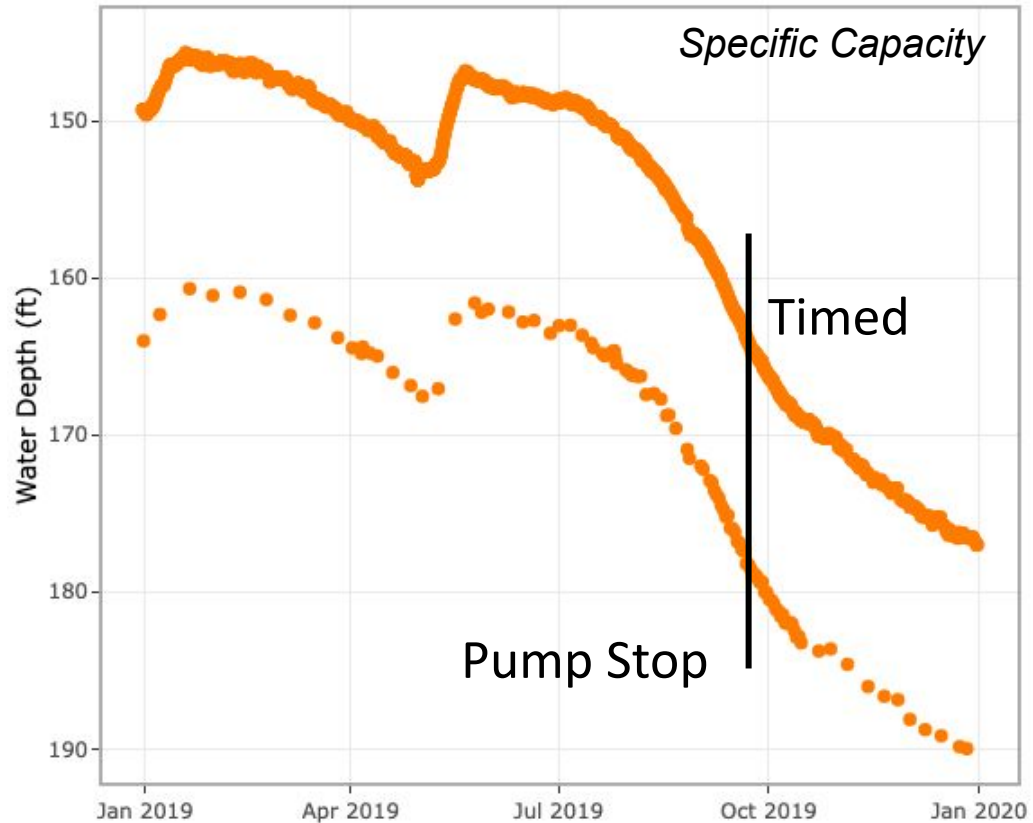
Single-well analysis

Q
Drawdown



Single-well analysis

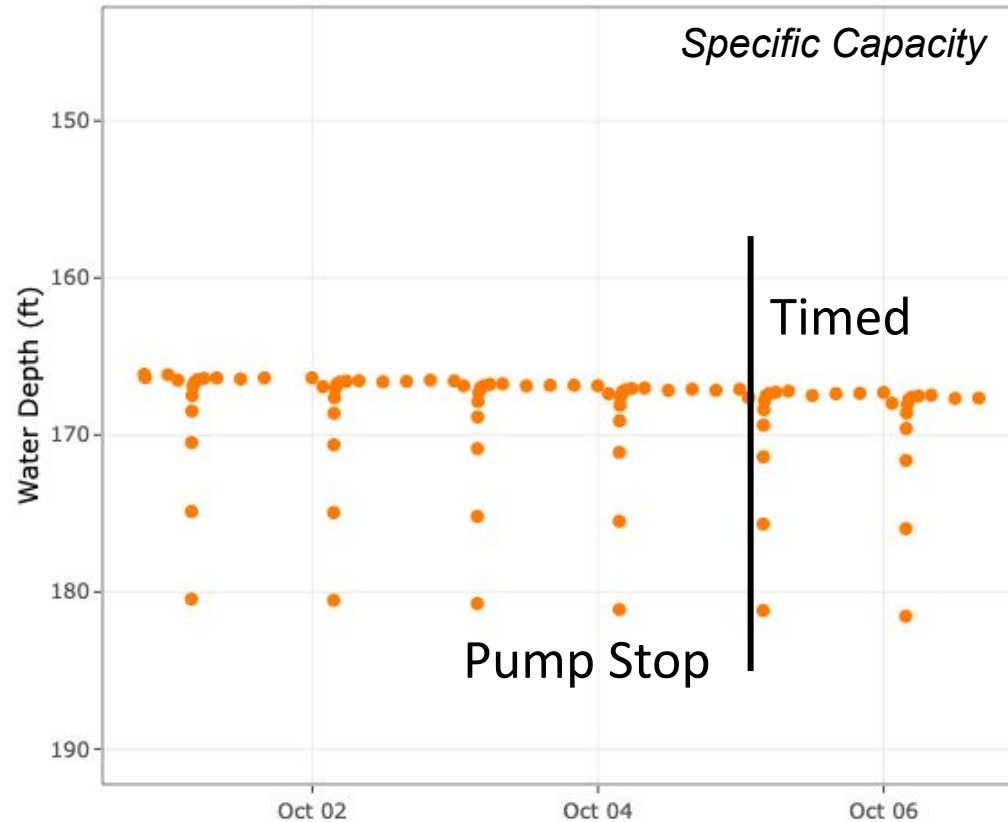
Q
Drawdown



Single-well analysis

Q
Drawdown

Gallons per minute
Feet of drawdown



Multiple-well analysis

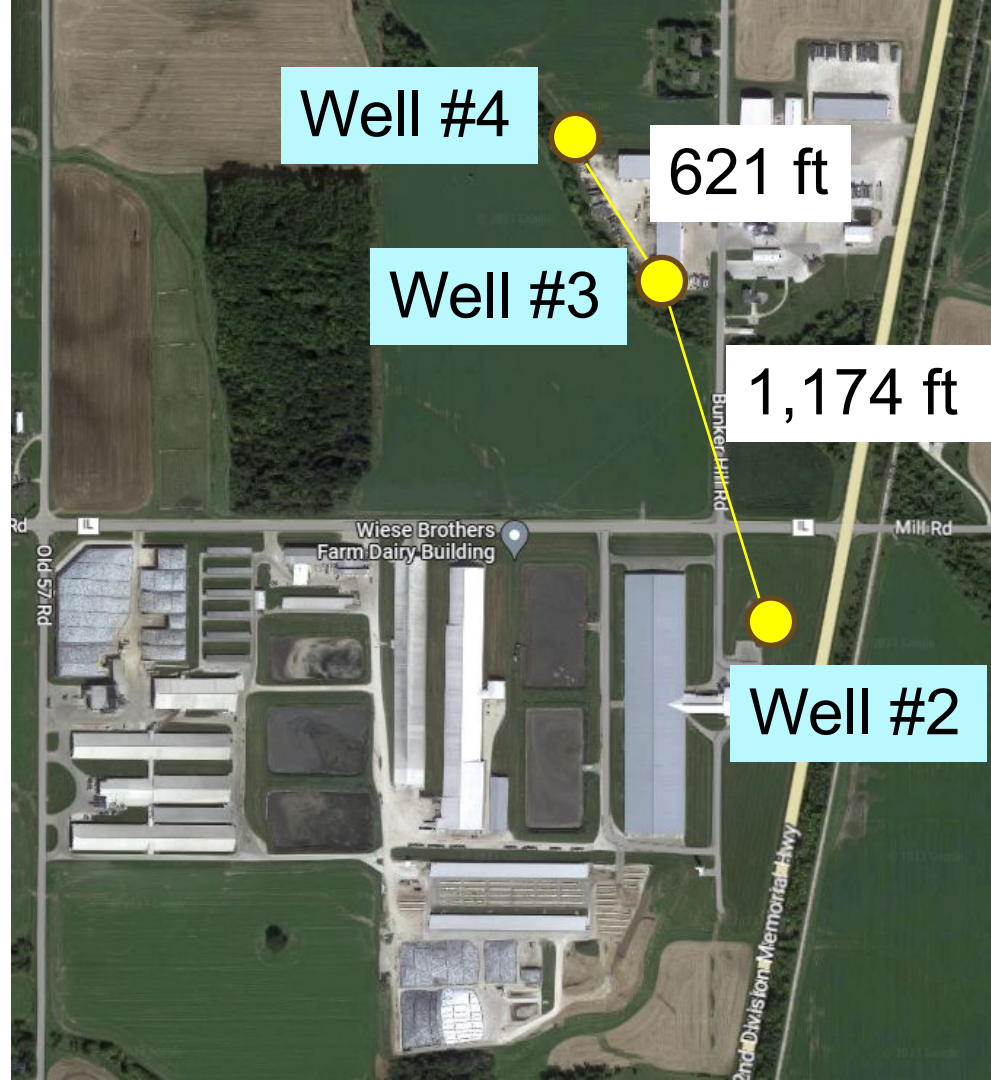
NE Wisconsin
5000-head
Dairy CAFO



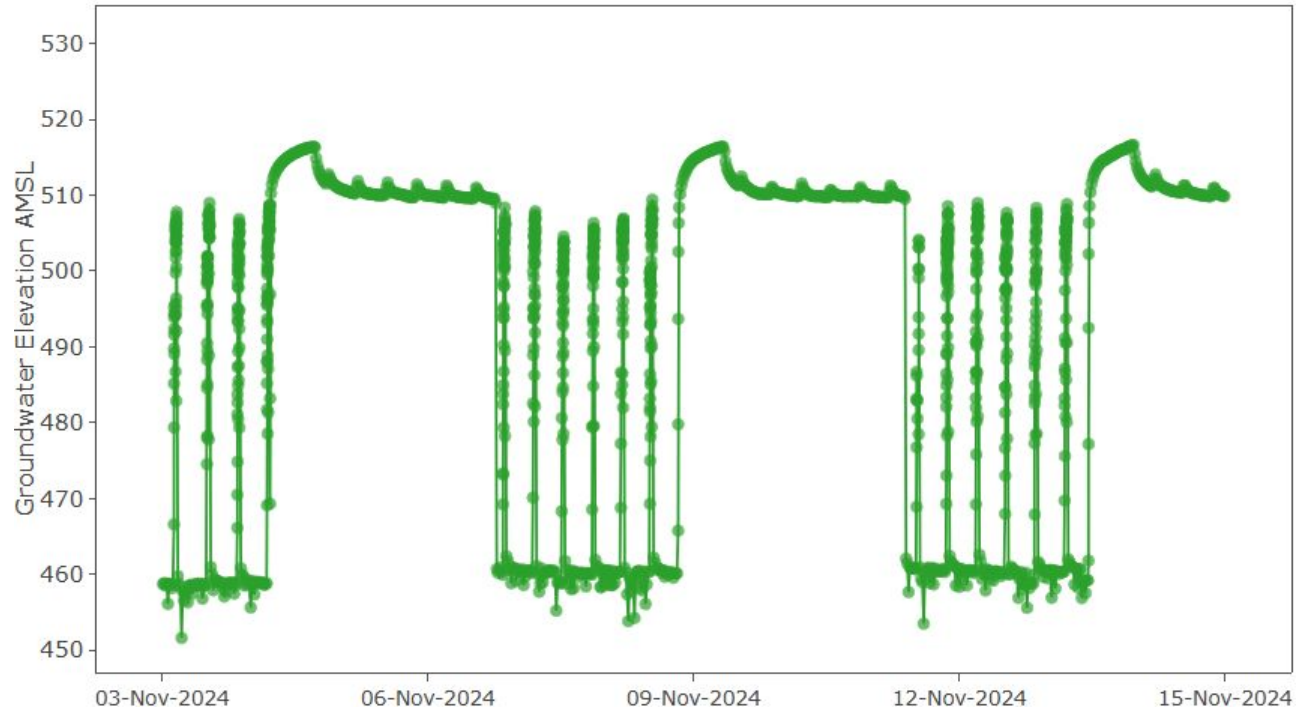
Multiple-well analysis

Water for all dairy operations comes from three wells that are pumped with the following schedule in rotation:

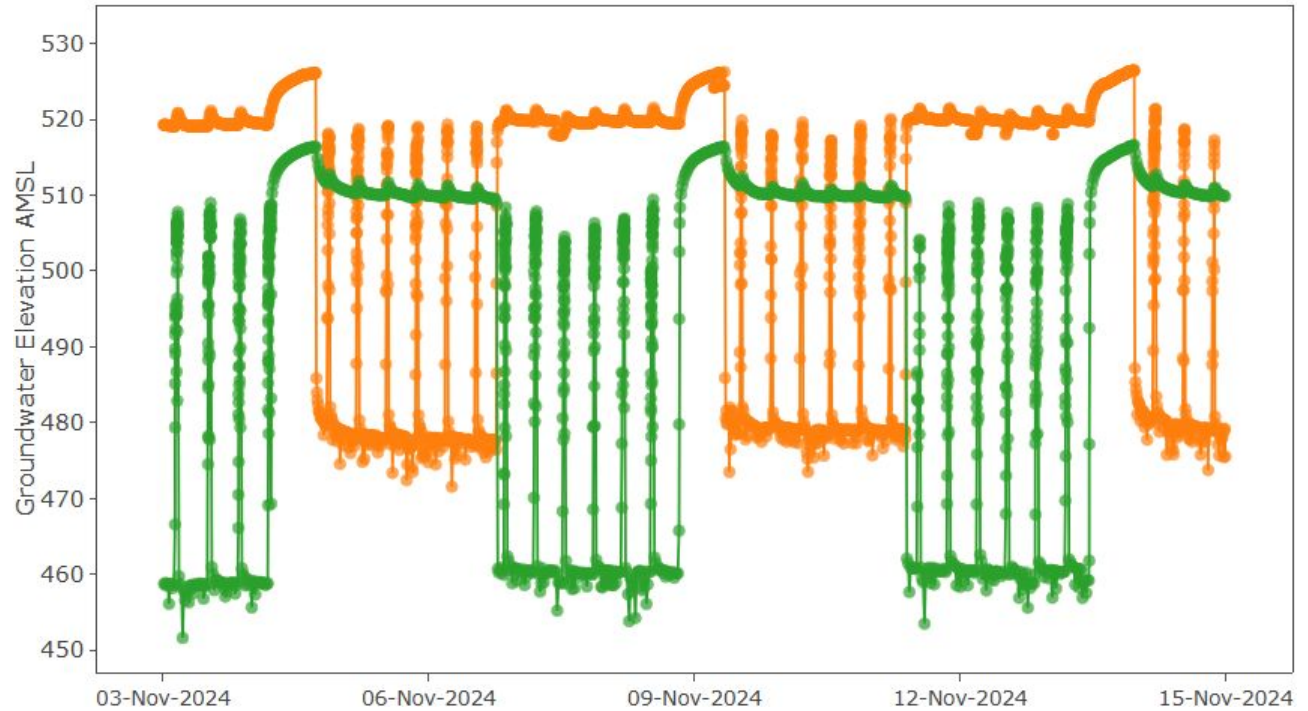
- 48 hours – Well #4
- 48 hours – Well #3
- 12 hours – Well #2



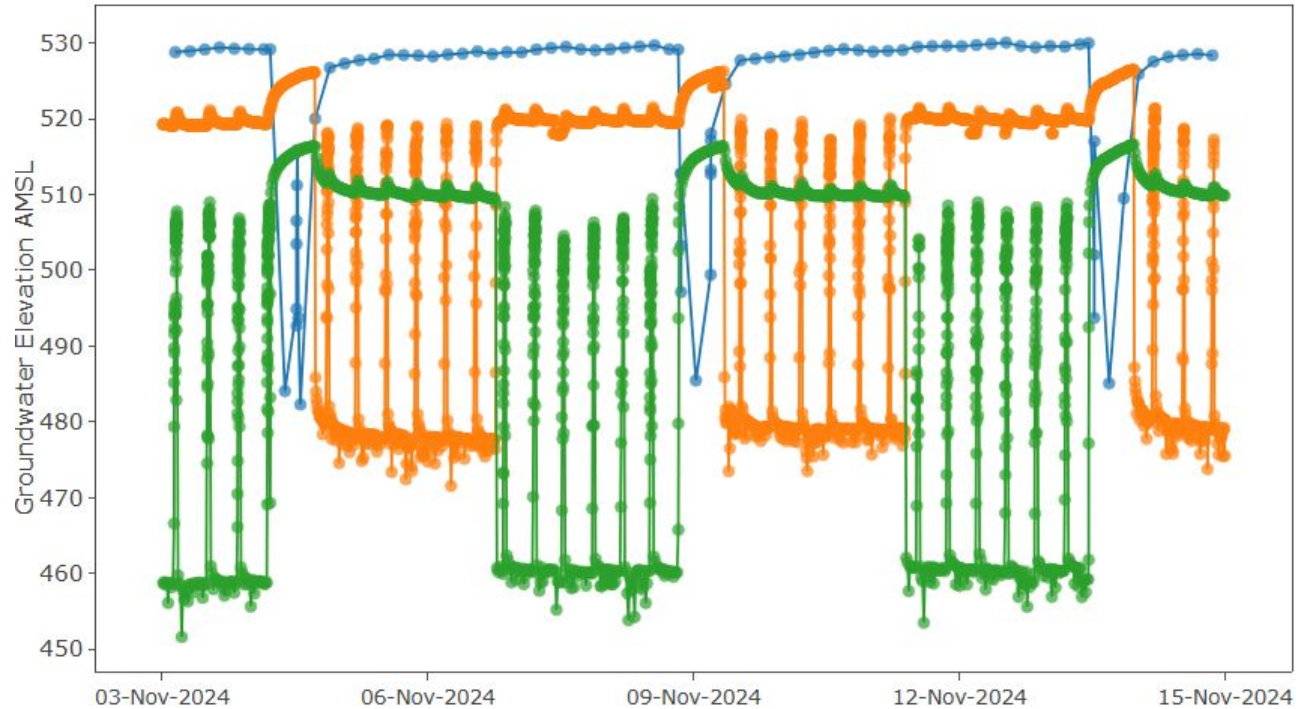
Multiple-well analysis



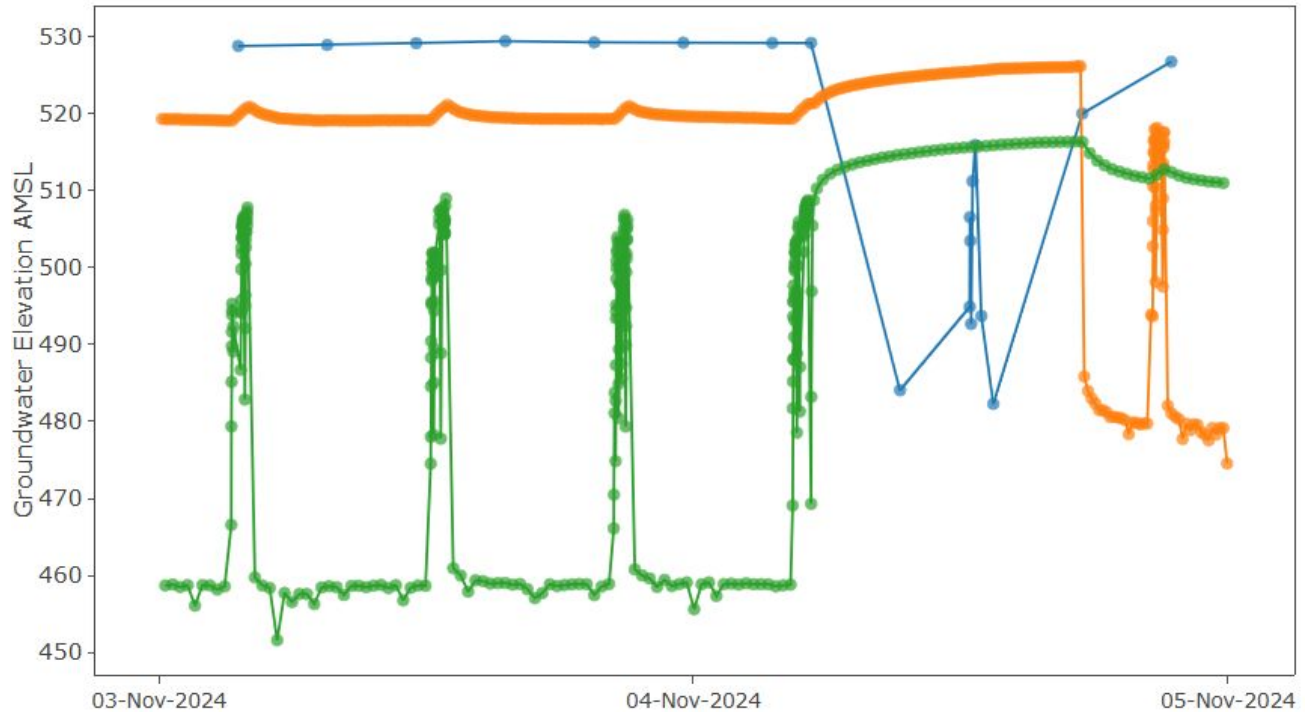
Multiple-well analysis



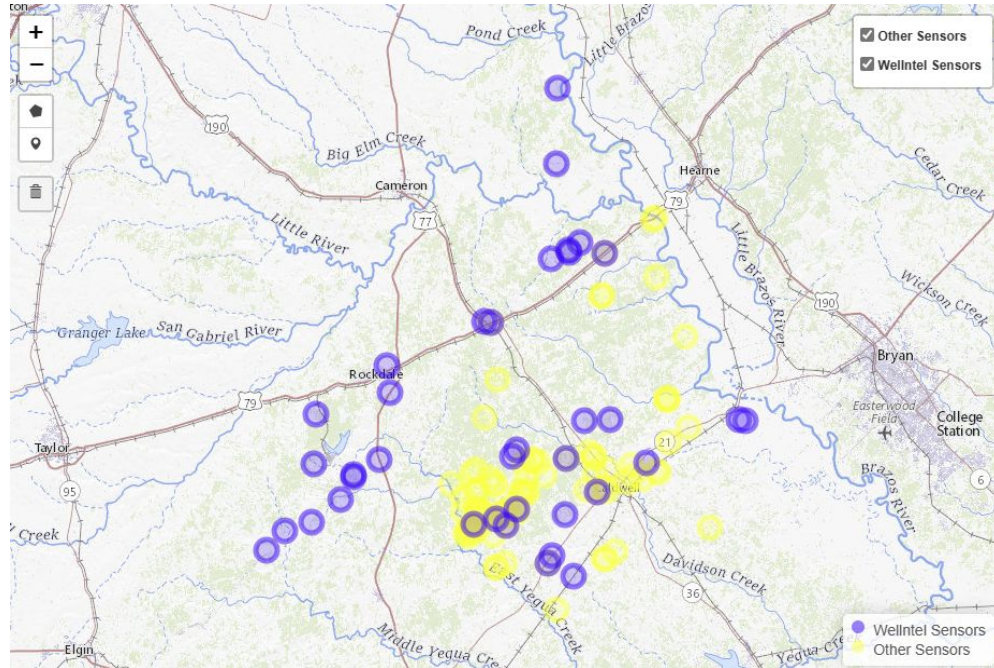
Multiple-well analysis



Multiple-well analysis

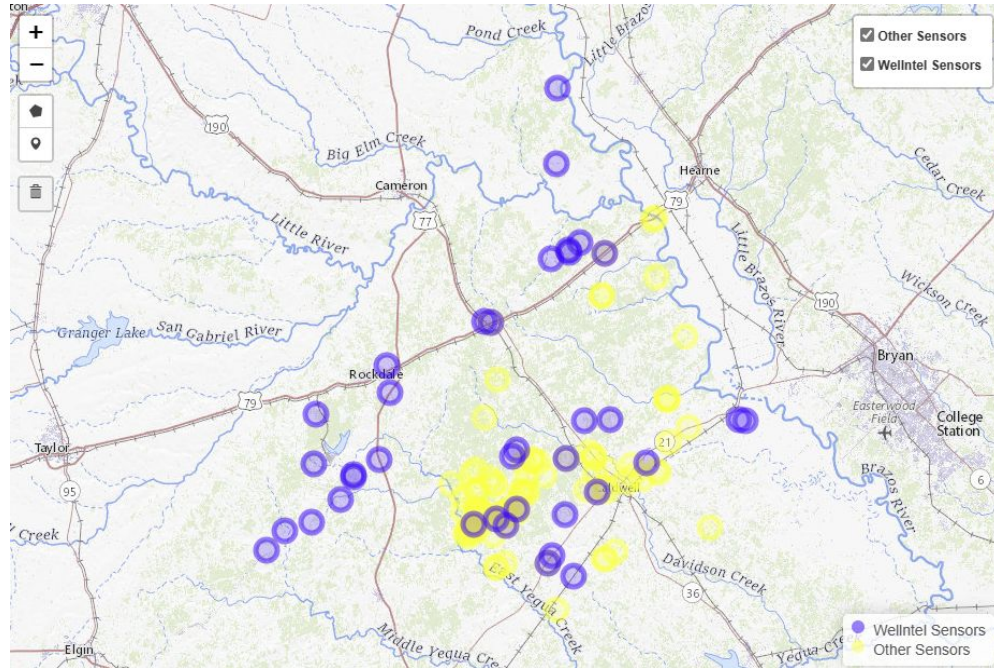


Regional insight to improve management



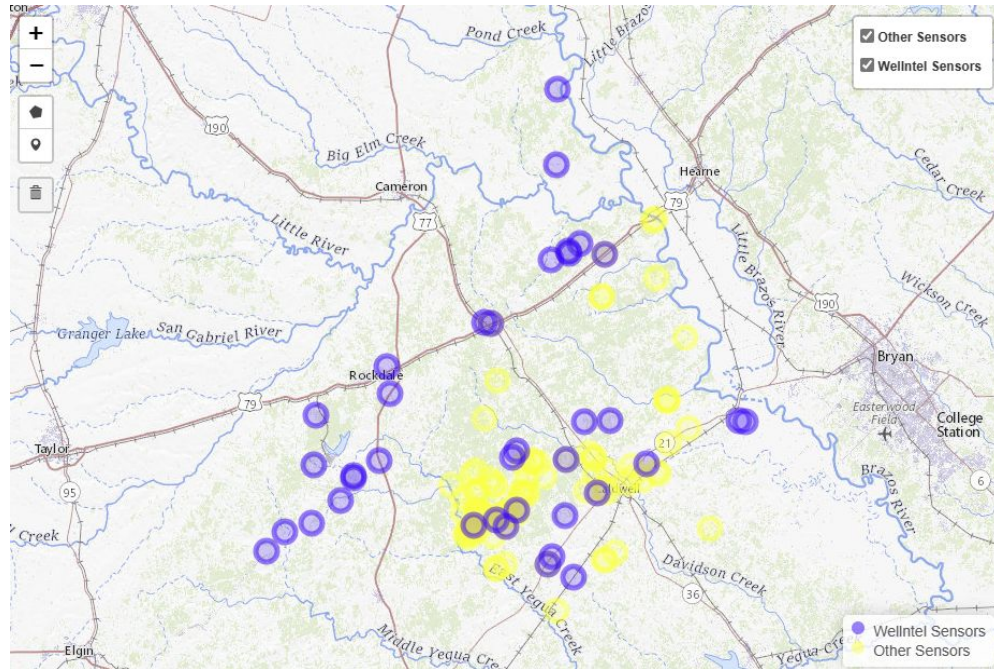
- Challenge: Texas *Major Aquifer* - diversion of water 142 miles to San Antonio, measuring and monitoring local impacts near well field

Regional insight to improve management




- Solution: Large and growing monitoring network, integration of other sensors and historical data

Regional insight to improve management



- Results: Real-time impacts illuminated, adaptive management, GWAP

Regional insight to improve management

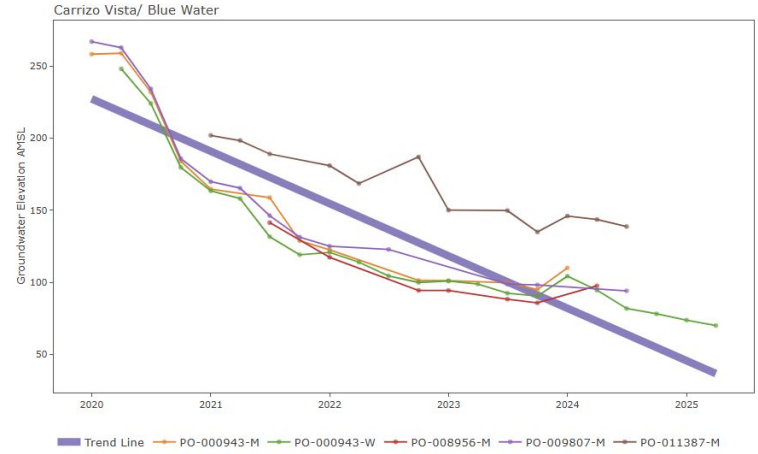
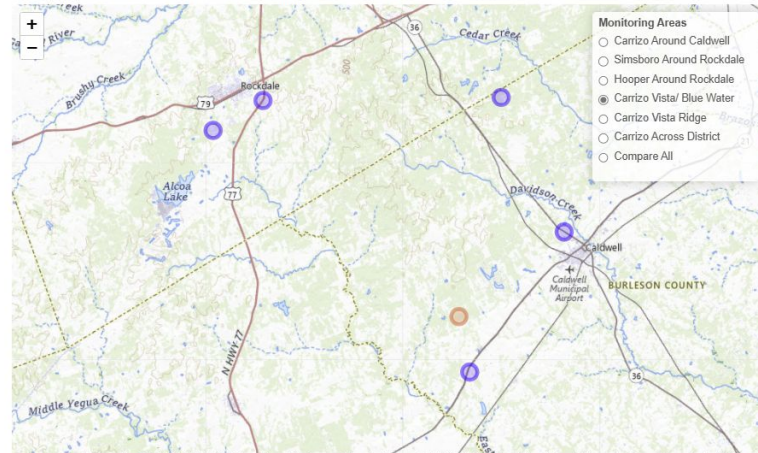


REAL-TIME GROUNDWATER LEVELS

View and download groundwater change by management district

←
How

Post Oak Savannah Groundwater Conservation District Monitoring Areas



Disclaimer: Data is intended for informational and analytical purposes only. While efforts have been made to ensure the accuracy and completeness of this data, it may contain inaccuracies, inconsistencies, or errors. As such, this data should not be relied upon for operational or decision-making purposes. WellIntel and Post Oak Savannah GCD disclaims any liability for decisions made or actions taken based on the data provided. Contact: POSGCD at admin@posgcd.org for any questions or further information

Date Range

 to

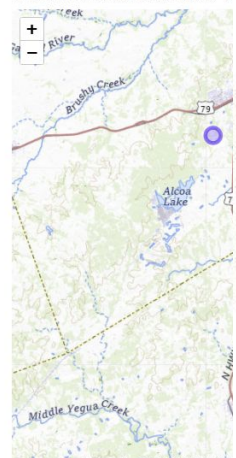
View Summary
 View Sample Data



Regional insight to improve management

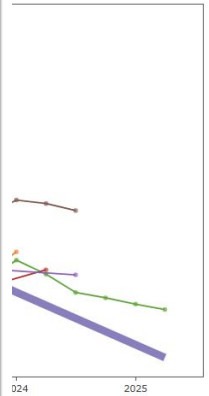
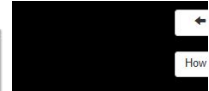
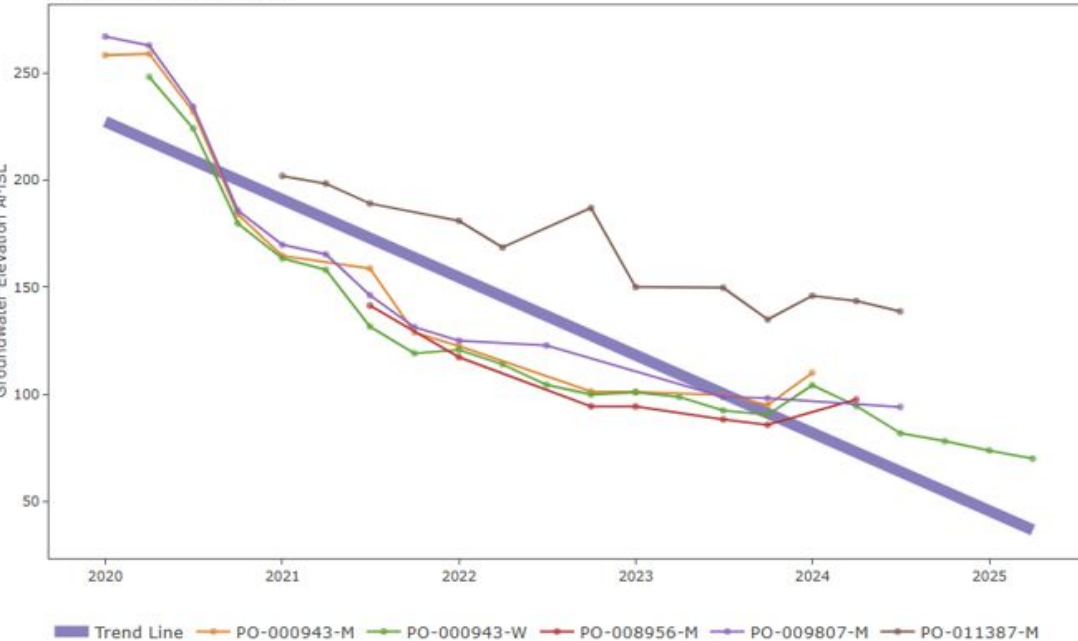


Post Oak Savannah Groundwater C



Disclaimer: Data is intended for informational purposes only. It may contain inaccuracies, inconsistencies, and Post Oak Savannah GCD disclaims any liability for use of the data. For more information, contact admin@posgcd.org for any questions or further assistance.

Carrizo Vista/ Blue Water



9807-M PO-011387-M

[Download Data](#)

[Download Plot](#)



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