



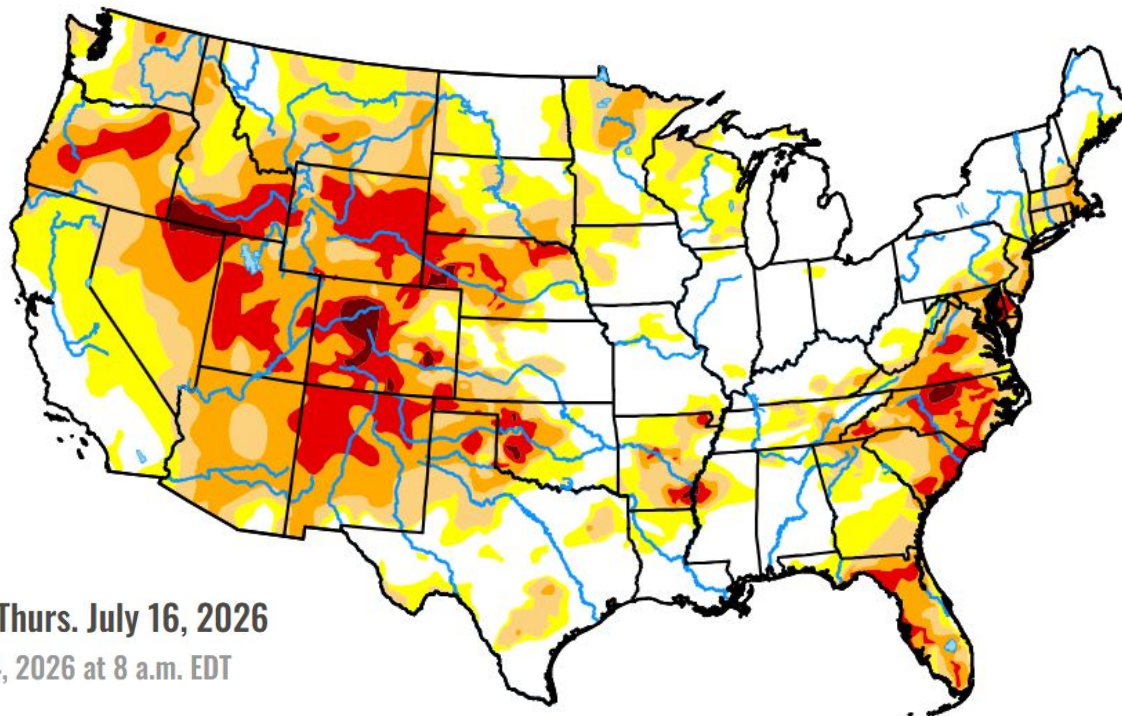
2026 SUMMER CONFERENCE

Know Your Resource: Using Small Production Well Data for Confident Decision Making

Charles Dunning, PhD
VP Hydrology



Groundwater is changing...



Map released: Thurs. July 16, 2026

Data valid: July 14, 2026 at 8 a.m. EDT

... differently everywhere

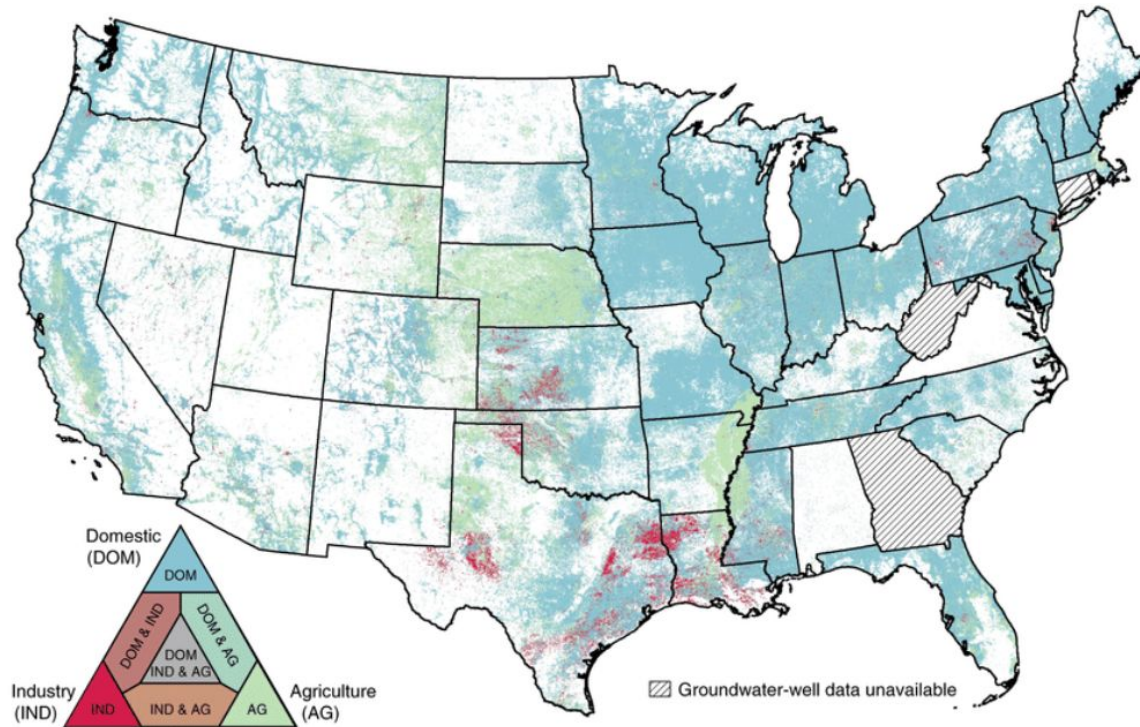


For greater insight and better understanding, **we need to monitor in more places**

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, Perrone and Scott, 2019



There are challenges...



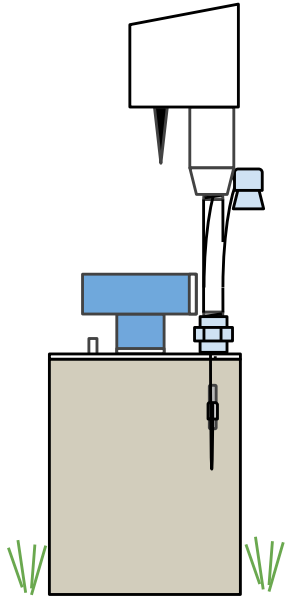
- **Inconsistent construction:**
not uniform, nor clean
- **Pump interference:**
pump noise and level influence
- **Access:**
well-owner coordination for measurement/ downloads

...but purpose-built technology makes it possible



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

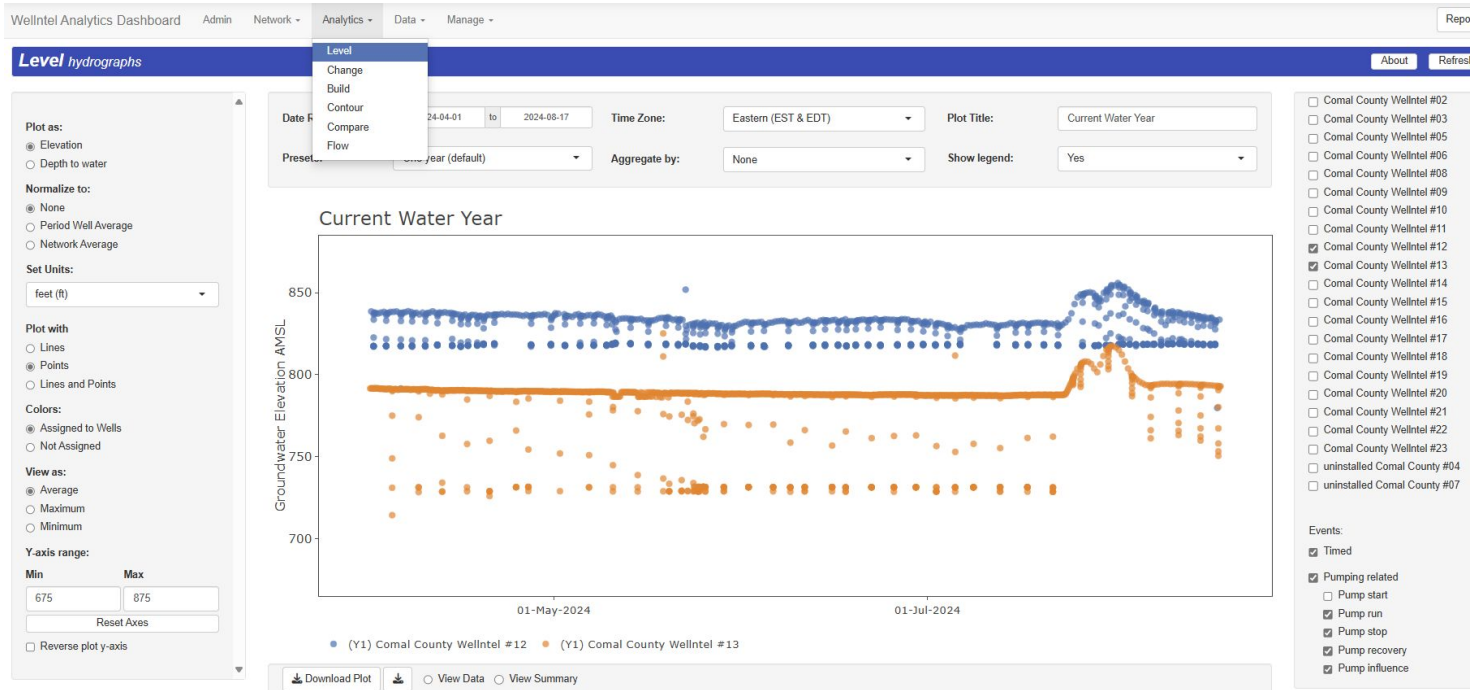
Acoustic measurement of water levels



- **Acoustic** signal
- **Designed** for submersible pump and monitoring wells
- **Straightforward** installation ~ 1 hour
- **USGS-tested** 0.1 ft accuracy



Cloud dashboard to simplify, share analysis

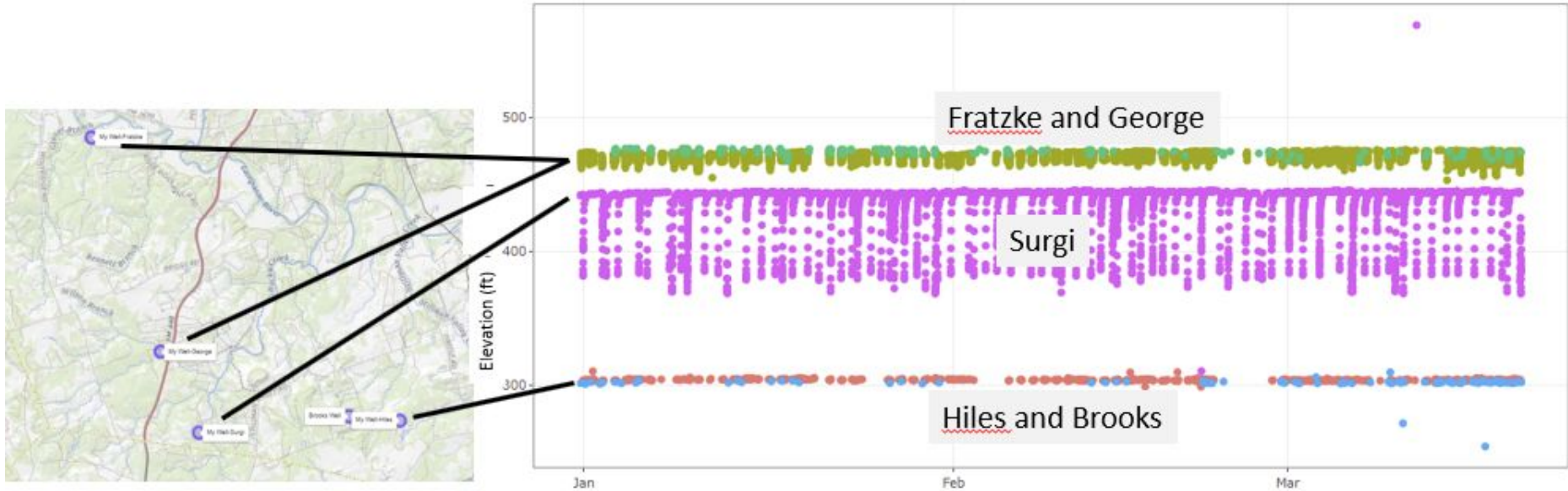


Key insight gained from production wells:

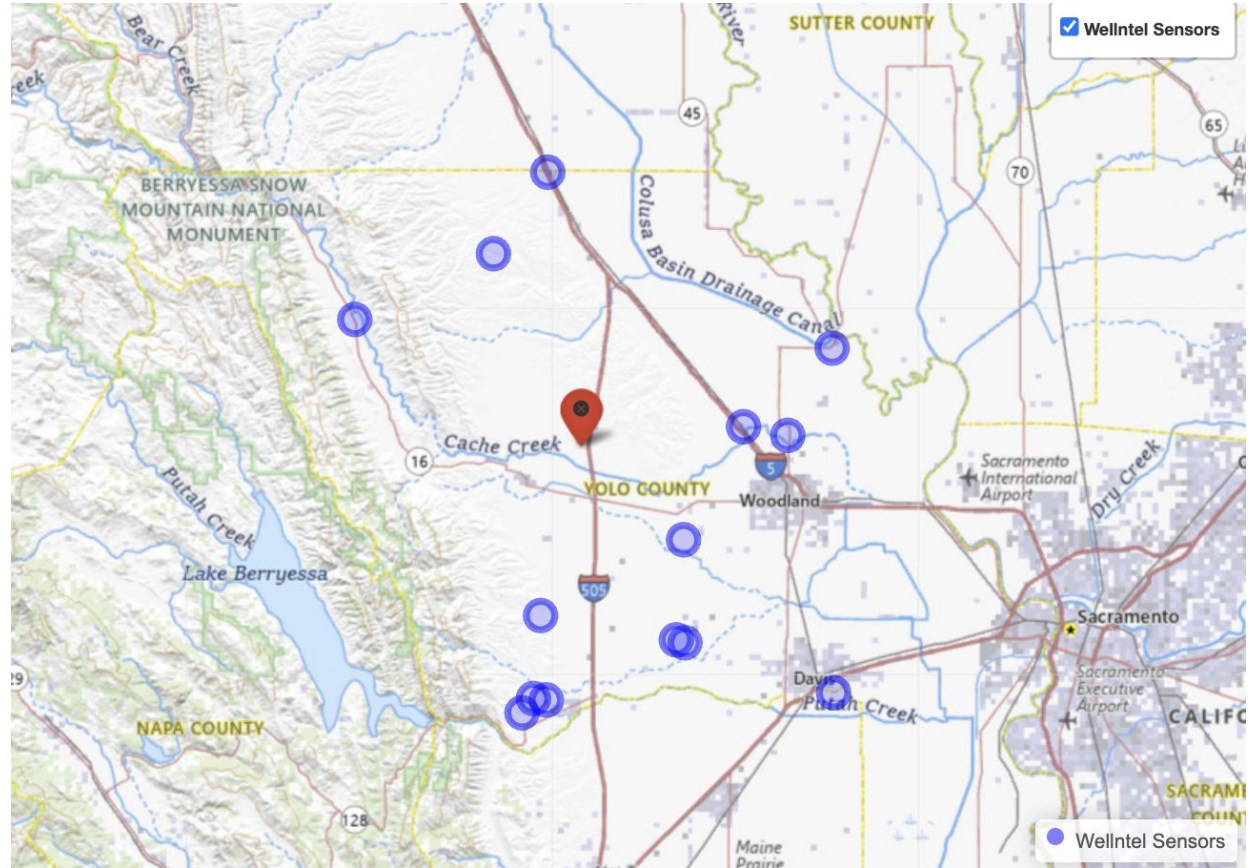
- **Hydrogeologic setting**
- **Level trends**
- **Pumping dynamics**
- **Local/regional insight**



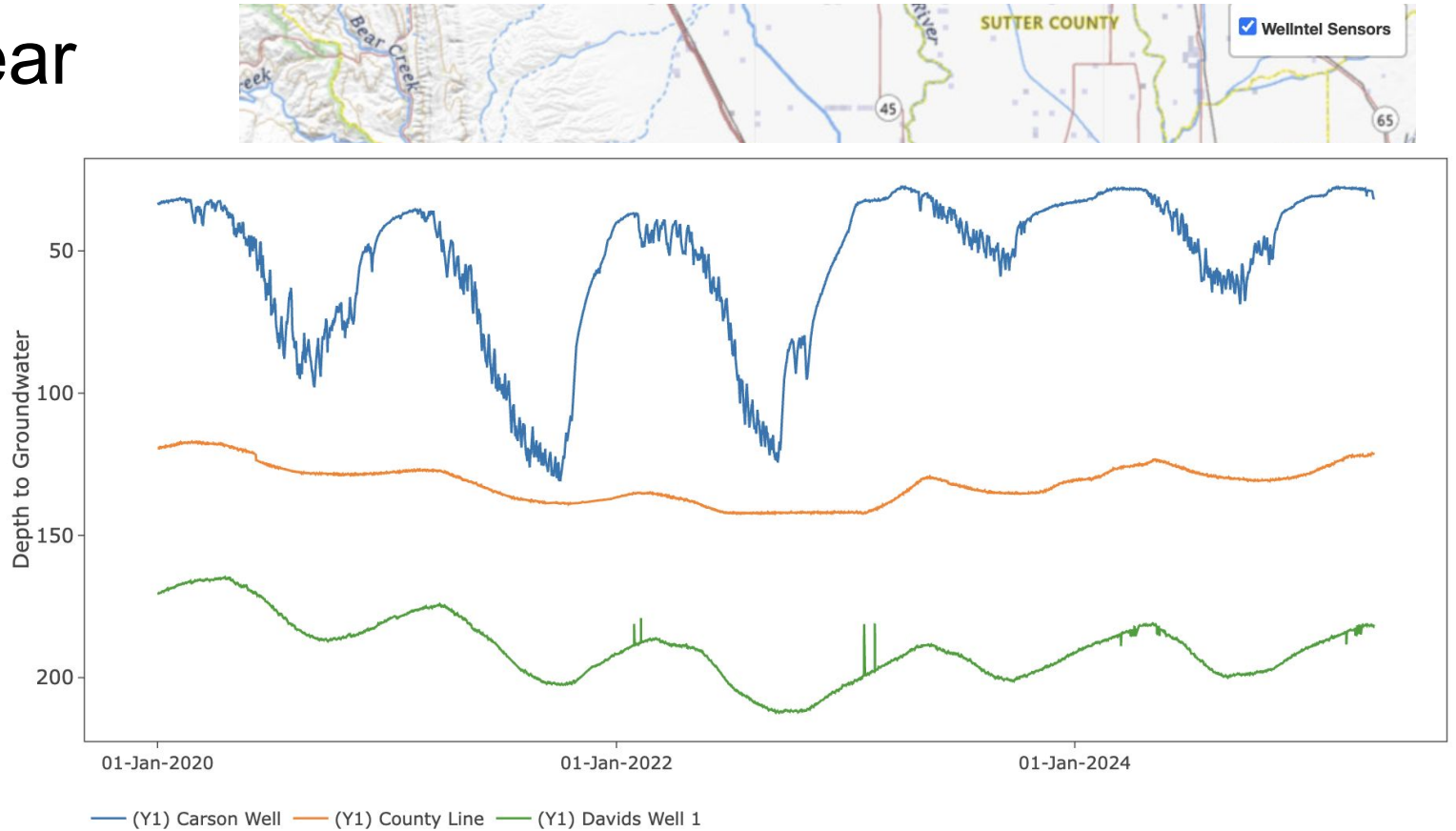
Hydrogeologic setting



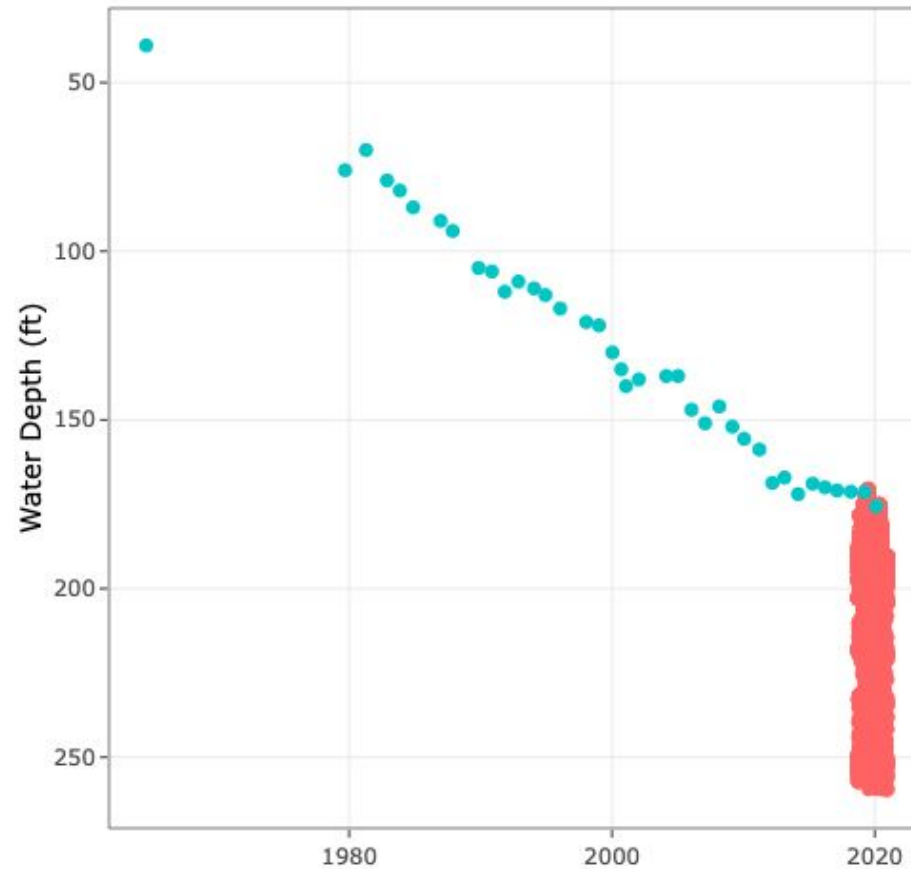
Multi-year trends



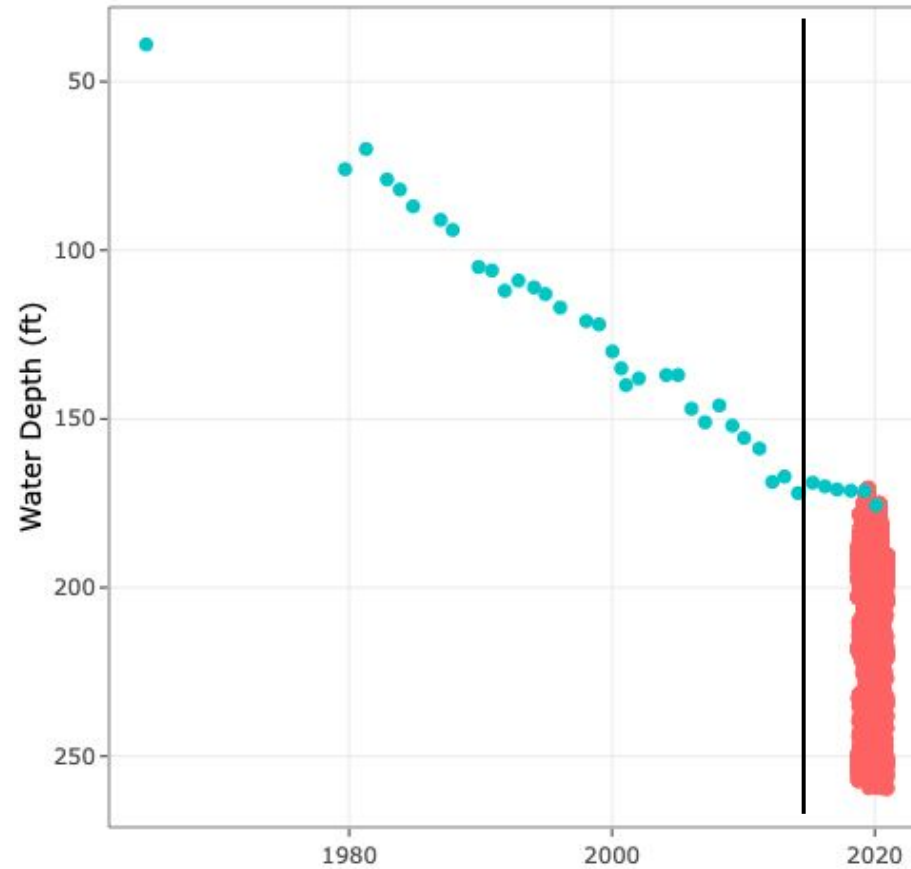
Multi-year trends



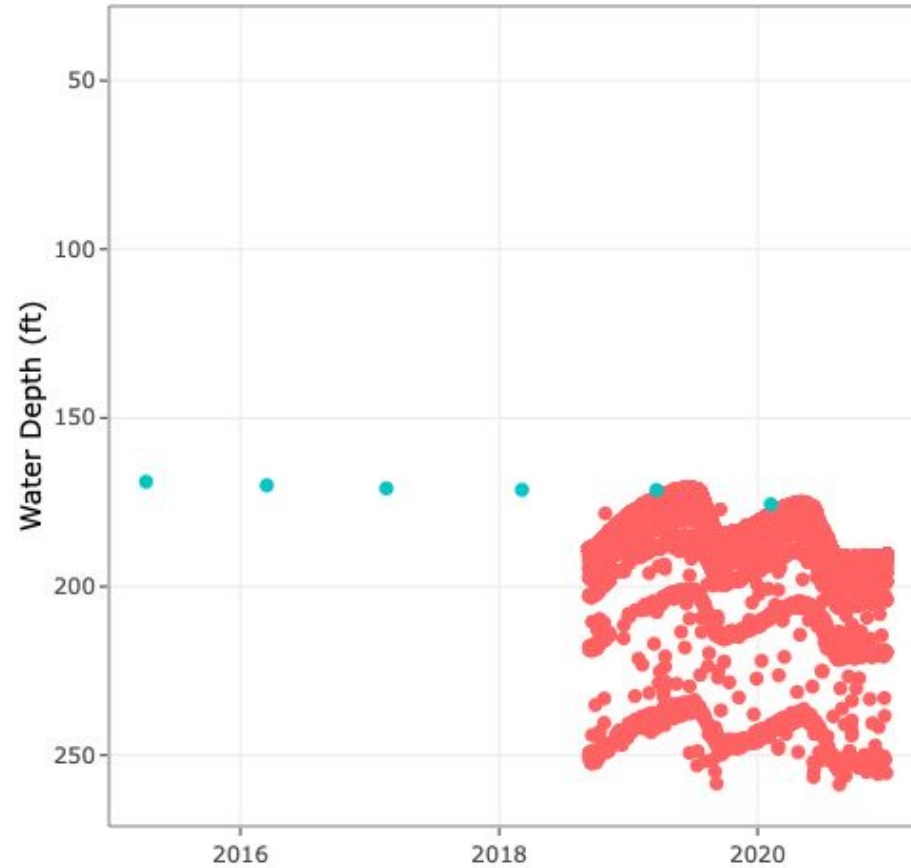
Multi-decade trends



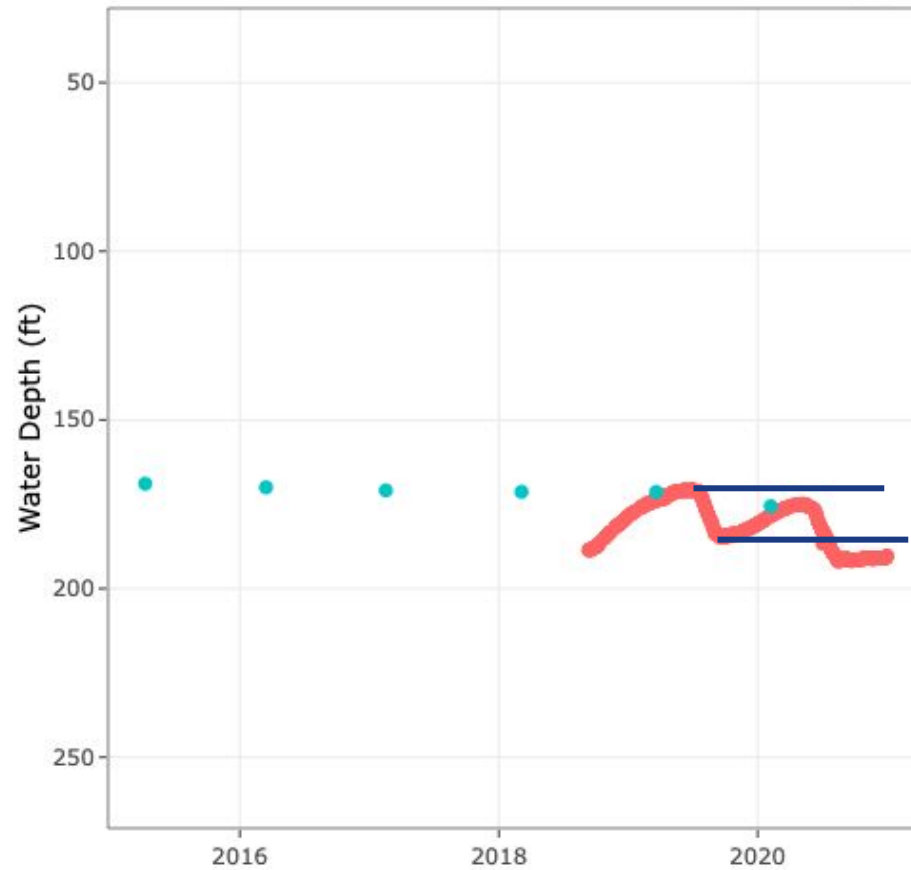
Multi-decade trends



Multi-decade trends

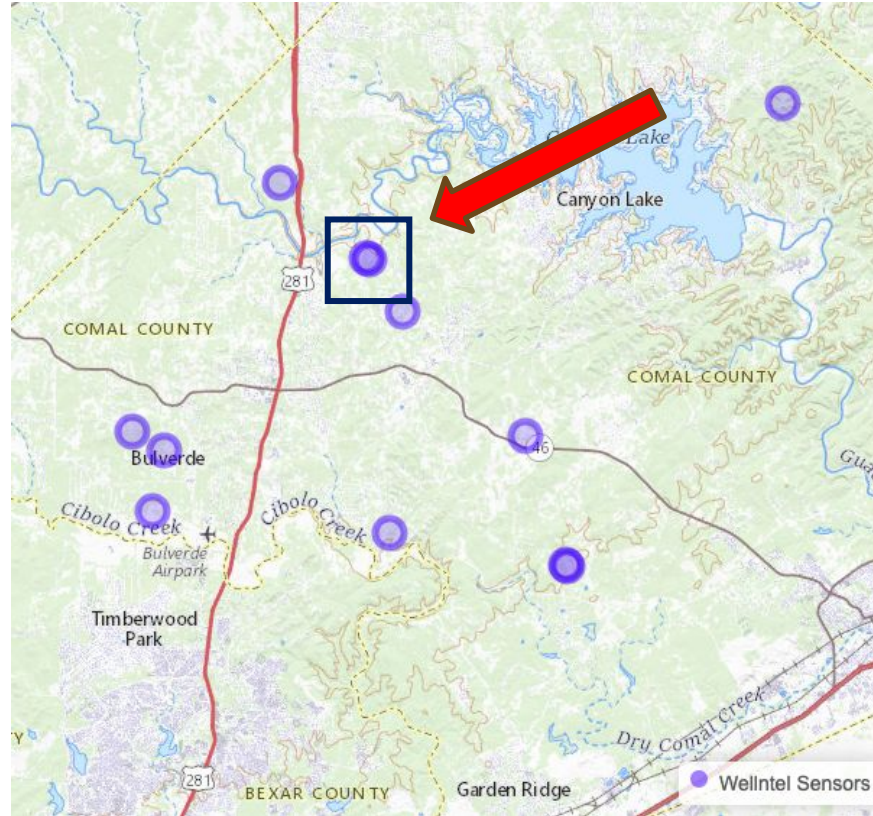


Multi-decade trends



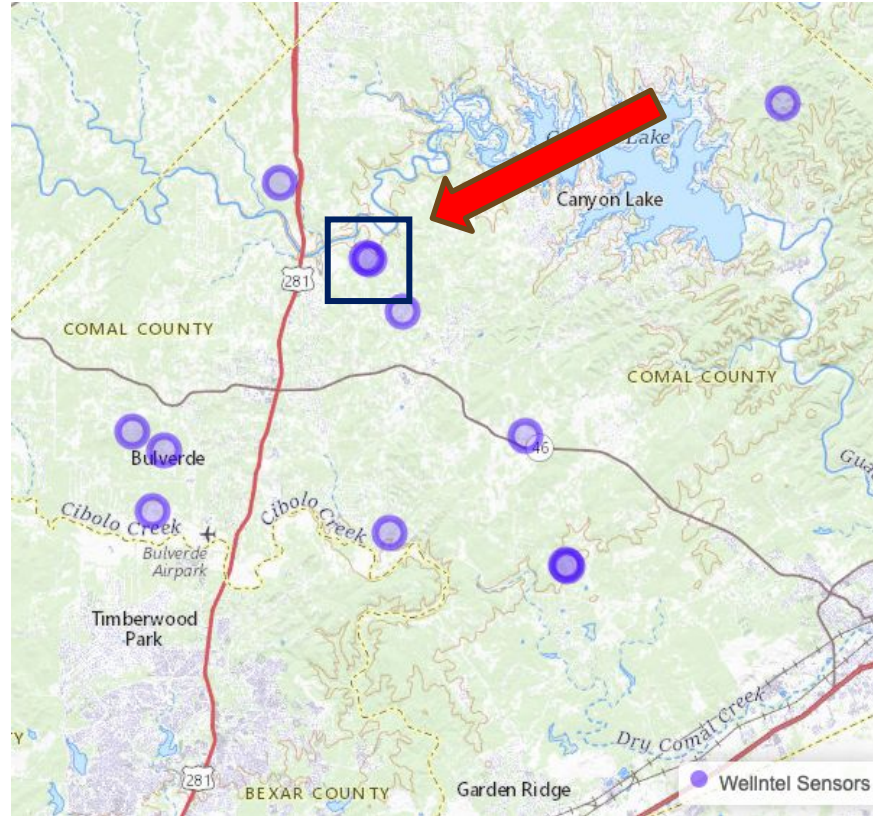
Pumping dynamics

Single-Well Analysis



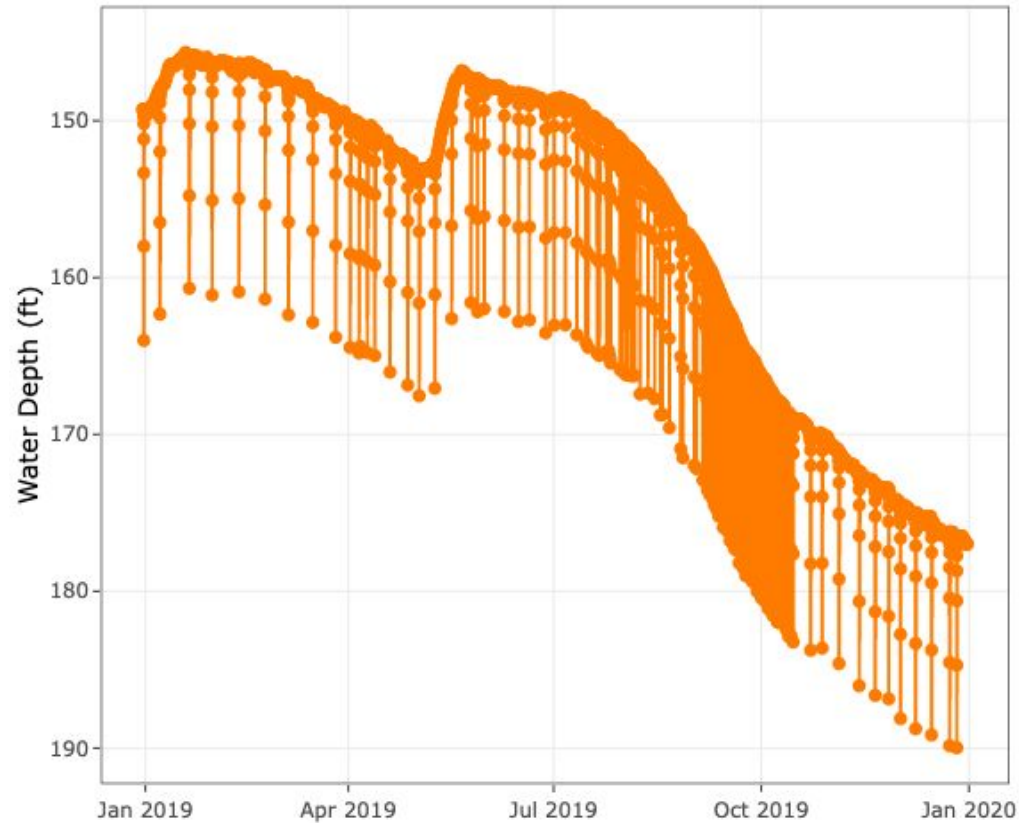
Pumping dynamics

Single-Well Analysis



Pumping dynamics

Single-Well Analysis





Level hydrographs

Plot as:
Depth to water

Normalize to:
☒ None
☐ Period Well Average
☐ Network Average

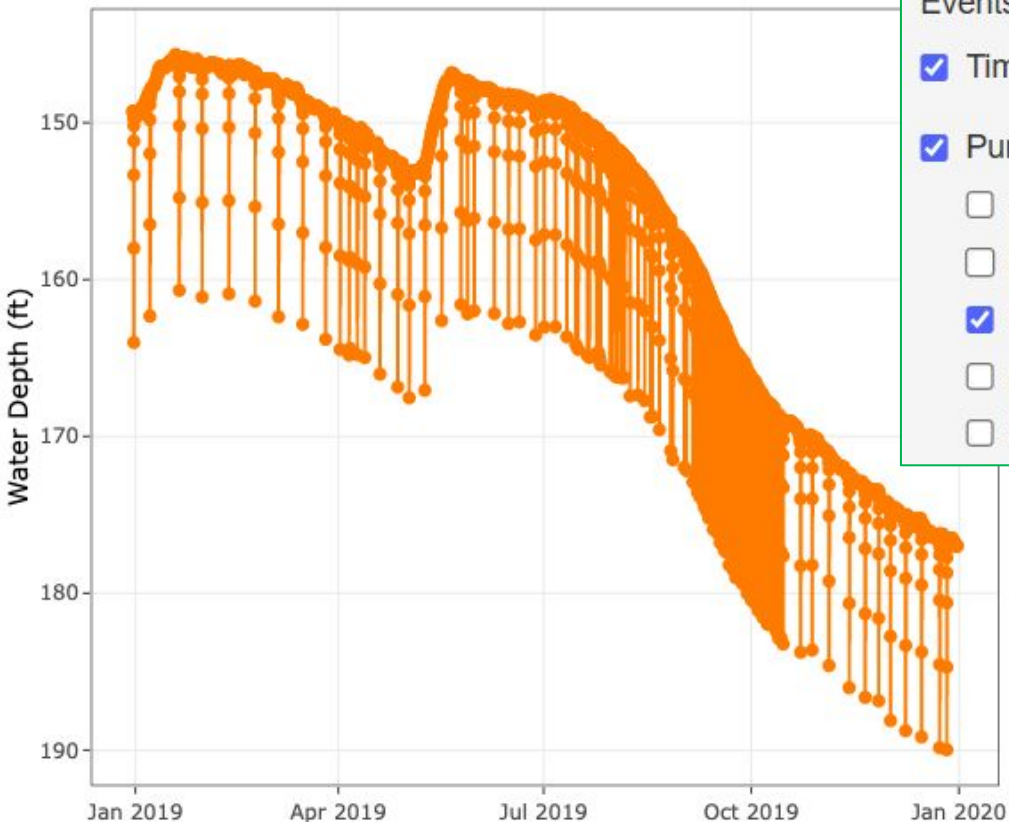
Set Units:
feet (ft)

Plot with
☐ Lines
☐ Points
☒ Lines and Points
☐ Show Map
☐ Reverse plot y-axis
☐ Show plot gridlines

Y-axis range:
Min Max
145 190
Reset Axes

Date Range: 2011
Presets: One year

Download Plot Download Data



Events:

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



- ☐ Comal County WellIntel #24
- ☐ Comal County WellIntel #25
- ☐ Comal County WellIntel #26
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- ☐ Comal County WellIntel #100

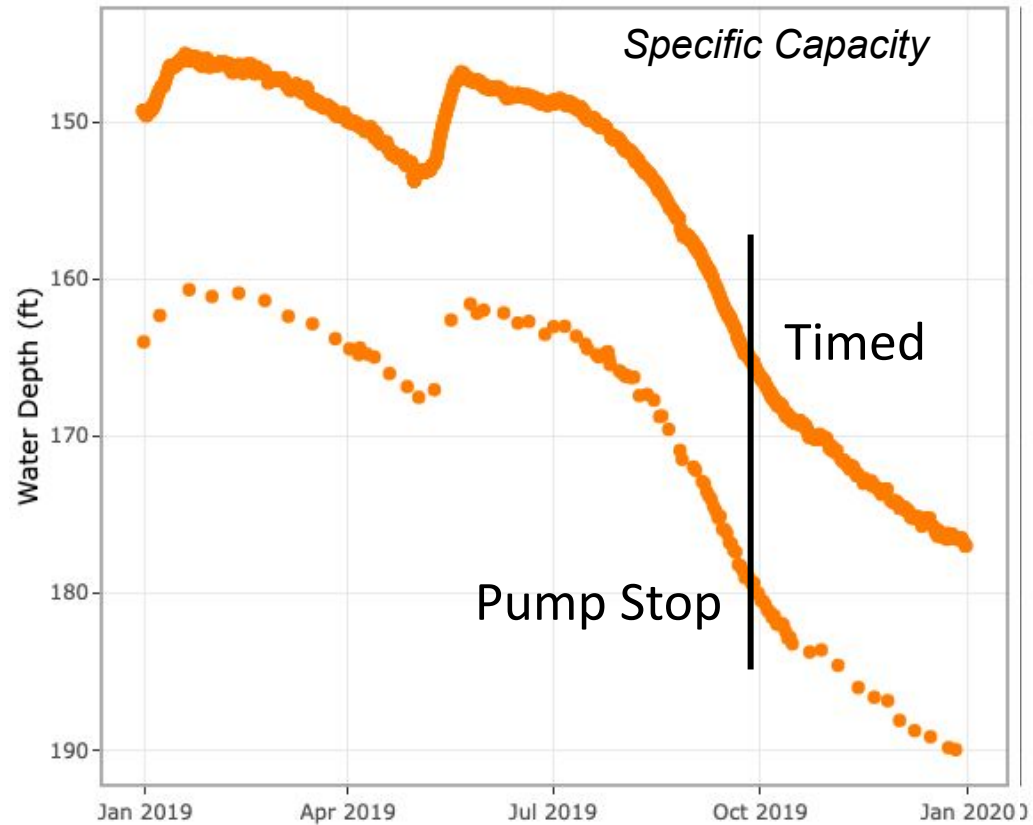
- Events:
- ☒ Timed
 - ☒ Pumping related
 - ☒ Pump start
 - ☒ Pump run
 - ☒ Pump stop
 - ☒ Pump recovery
 - ☒ Pump influence



Pumping dynamics

Single-Well Analysis

Q
Drawdown



Pumping dynamics

Multiple-Well Analysis

NE Wisconsin
5000-head
Dairy CAFO

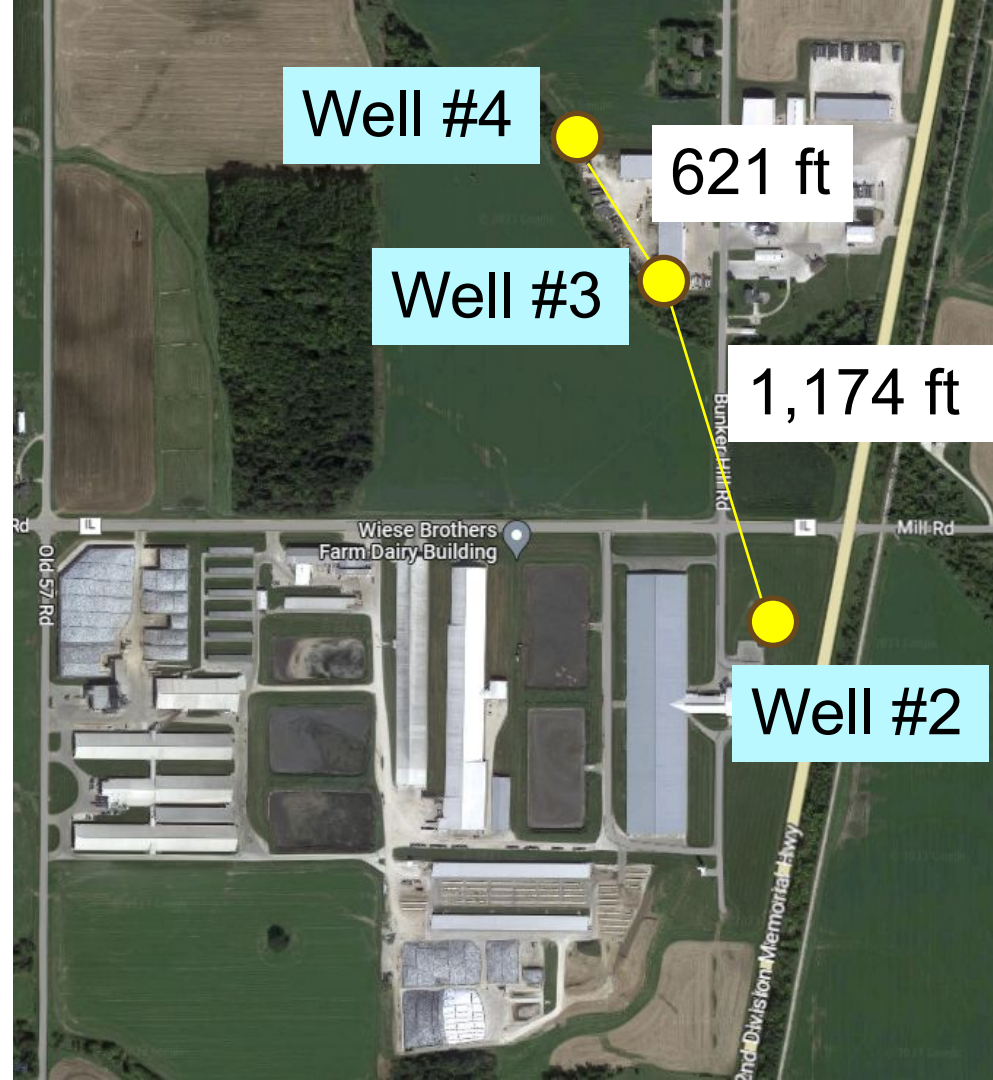


Pumping dynamics

Single-Well Analysis

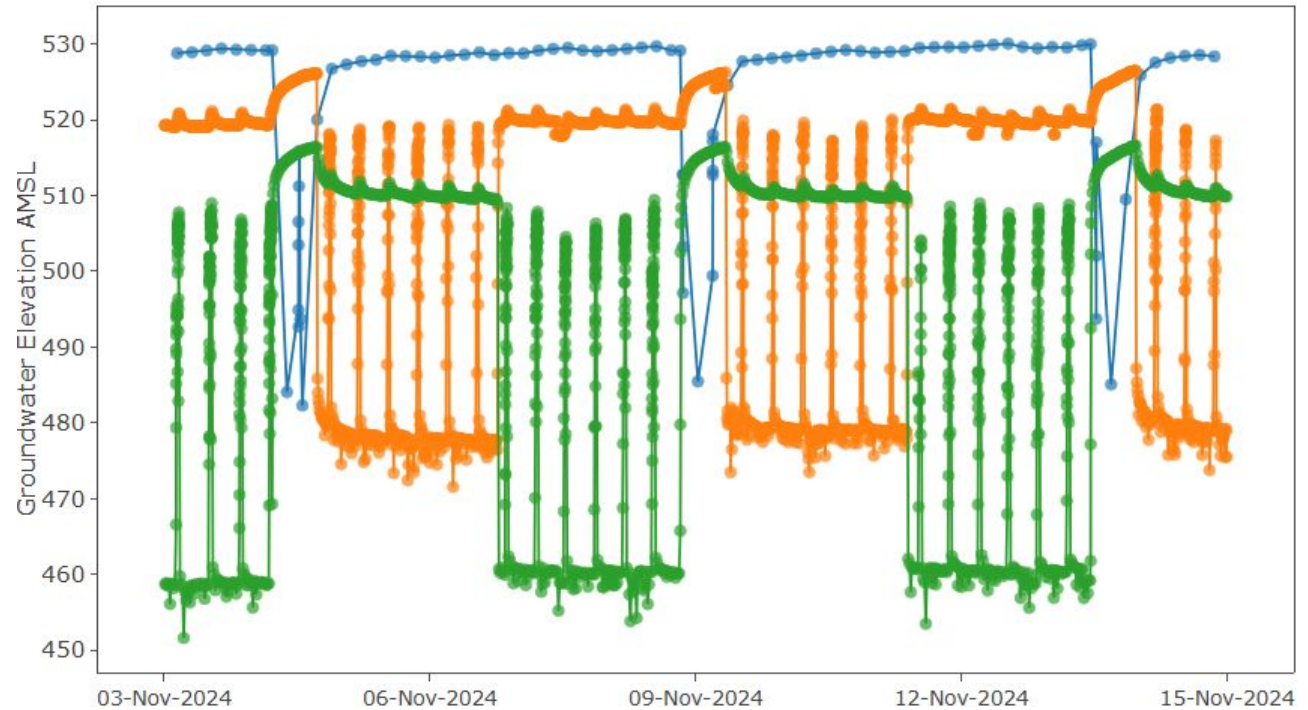
Water for all dairy operations comes from three wells that are pumped with the following schedule in rotation:

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



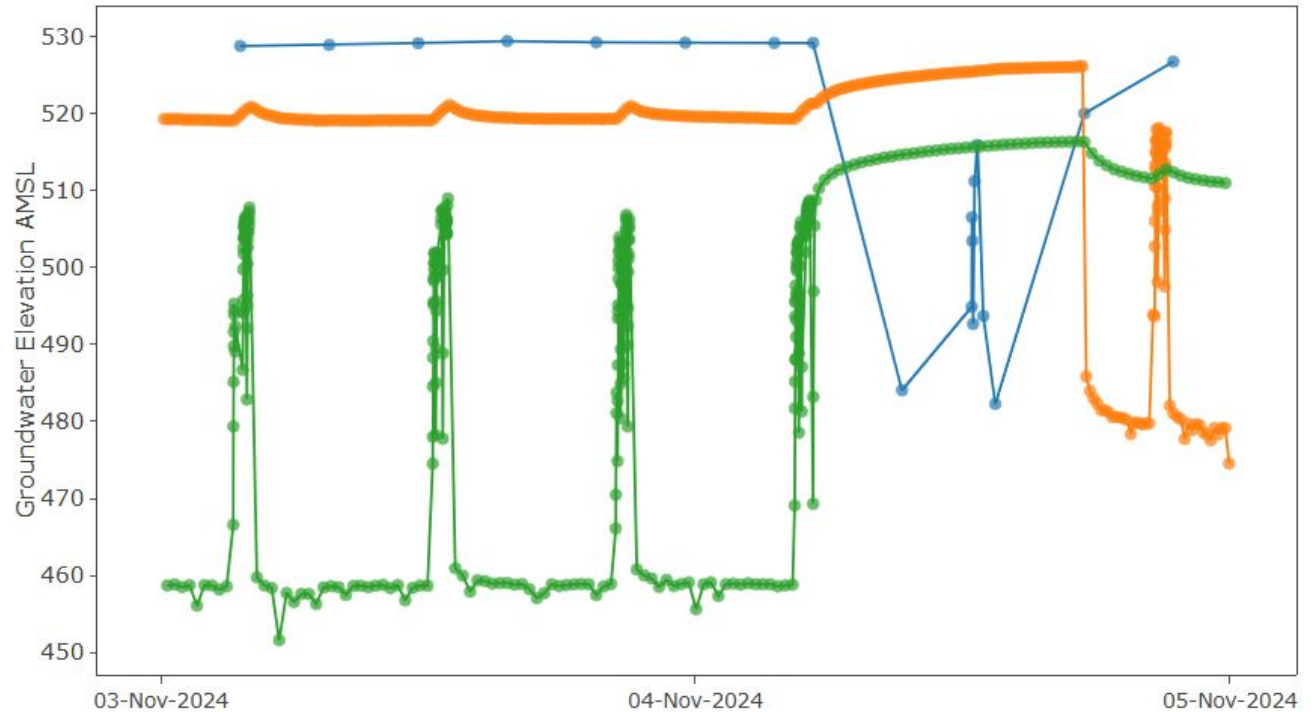
Pumping dynamics

Single-Well Analysis

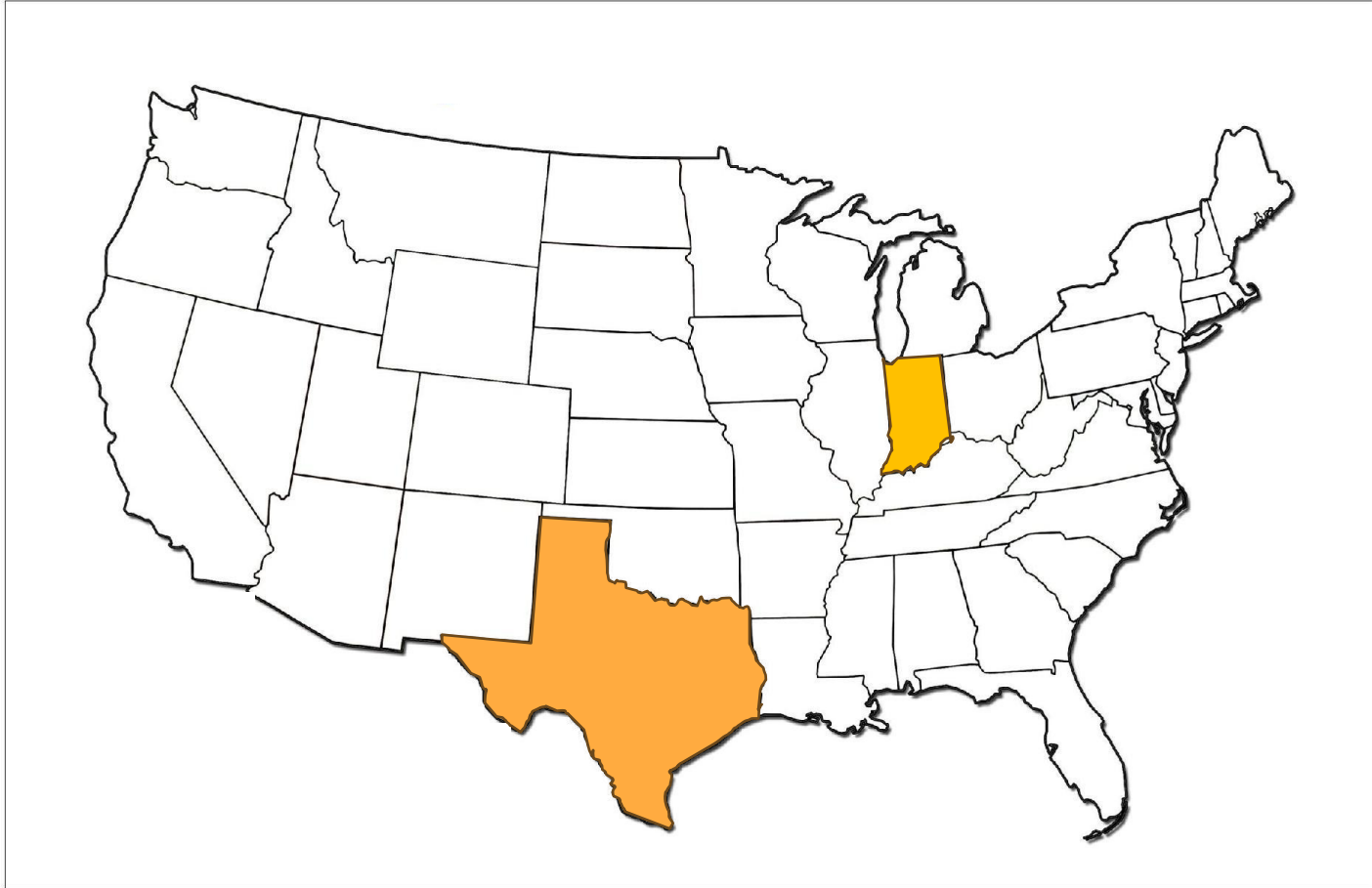


Pumping dynamics

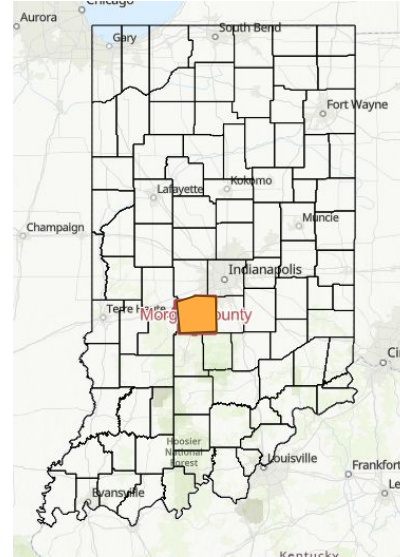
Single-Well Analysis



Local/regional insight to improve management



Local/regional insight to improve management



Morgan County Water Study

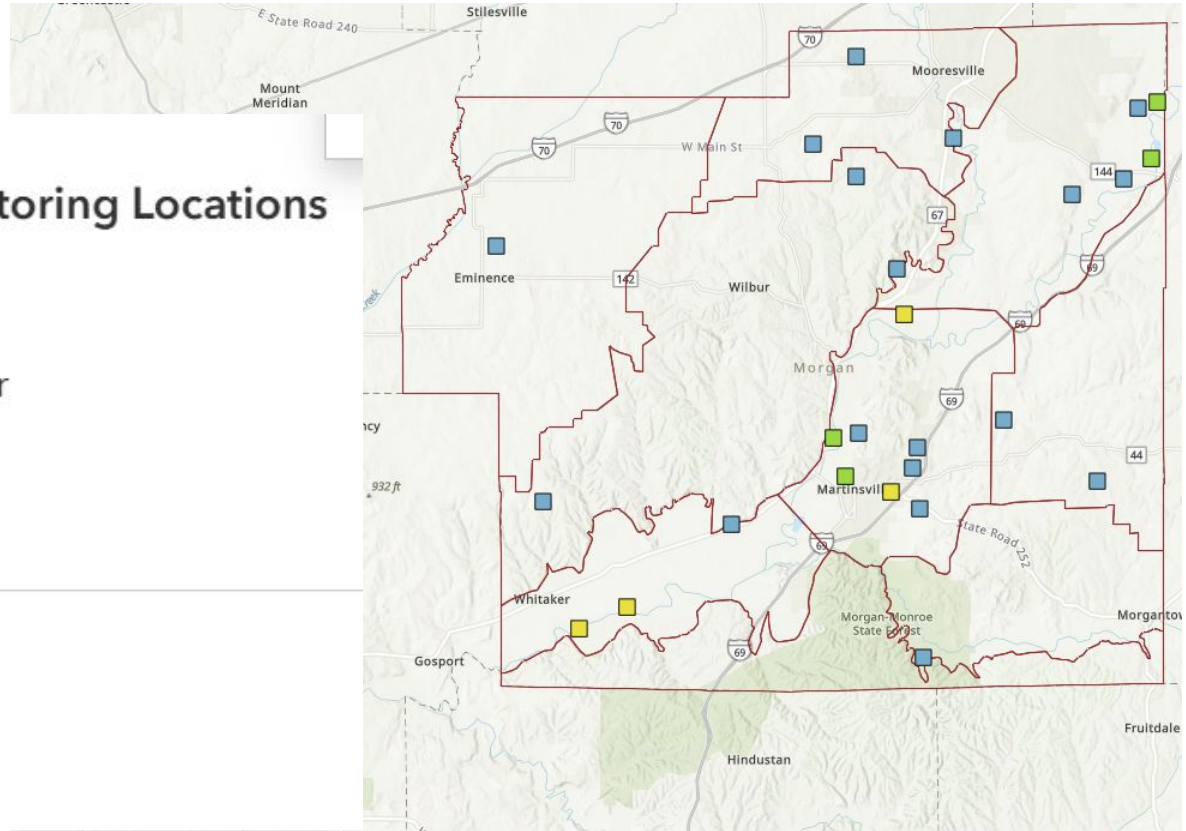


Local/regional insight to improve management

Groundwater Monitoring Locations

-  Homeowner
-  Non-homeowner
-  Utility

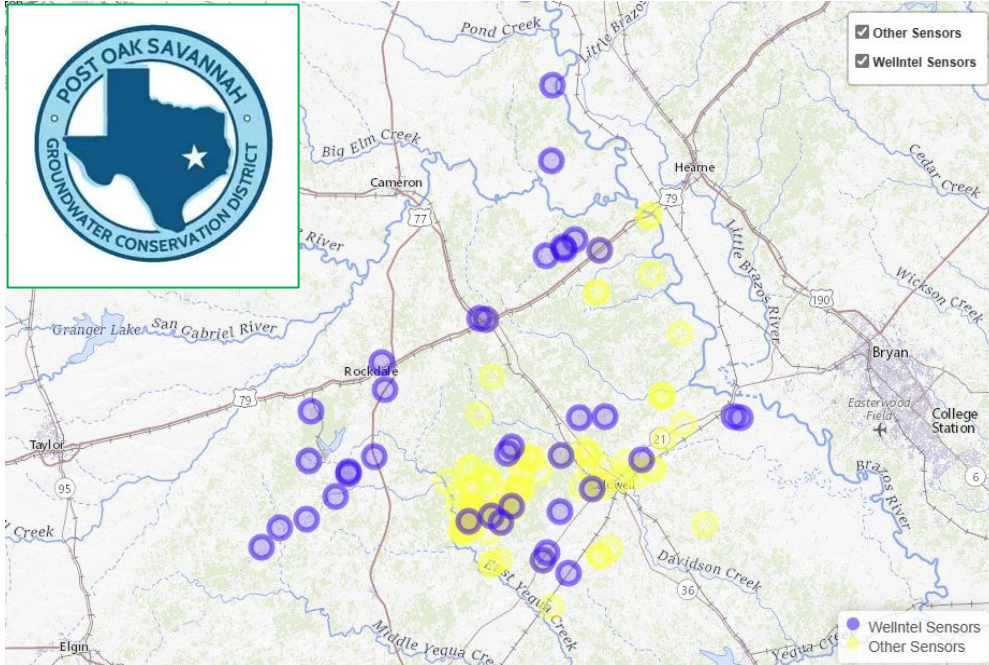
Study Regions



Morgan County Water Study Dashboard

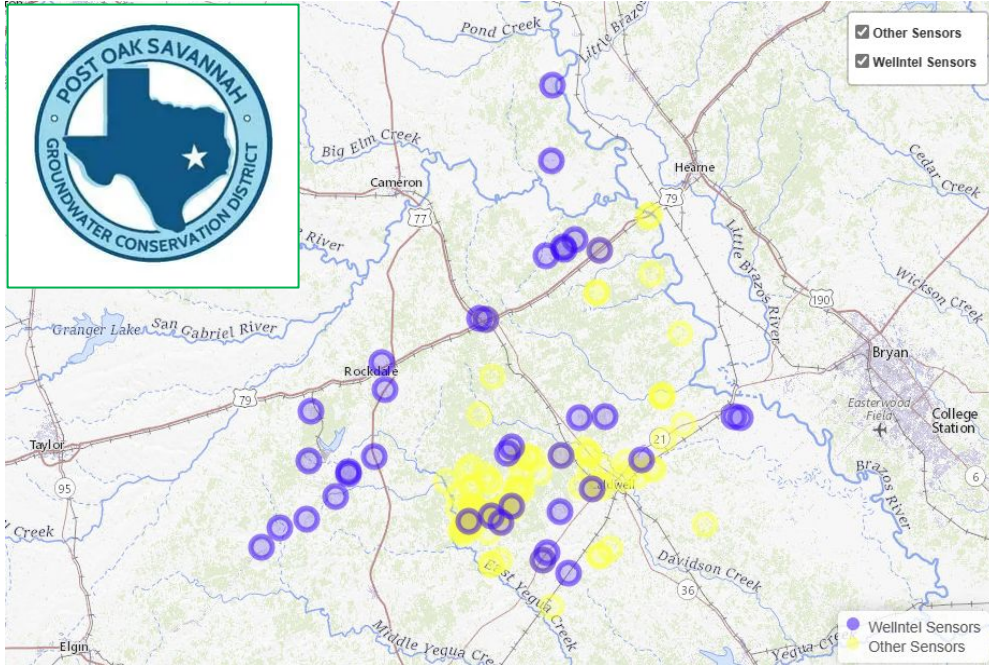


Local/regional insight to improve management



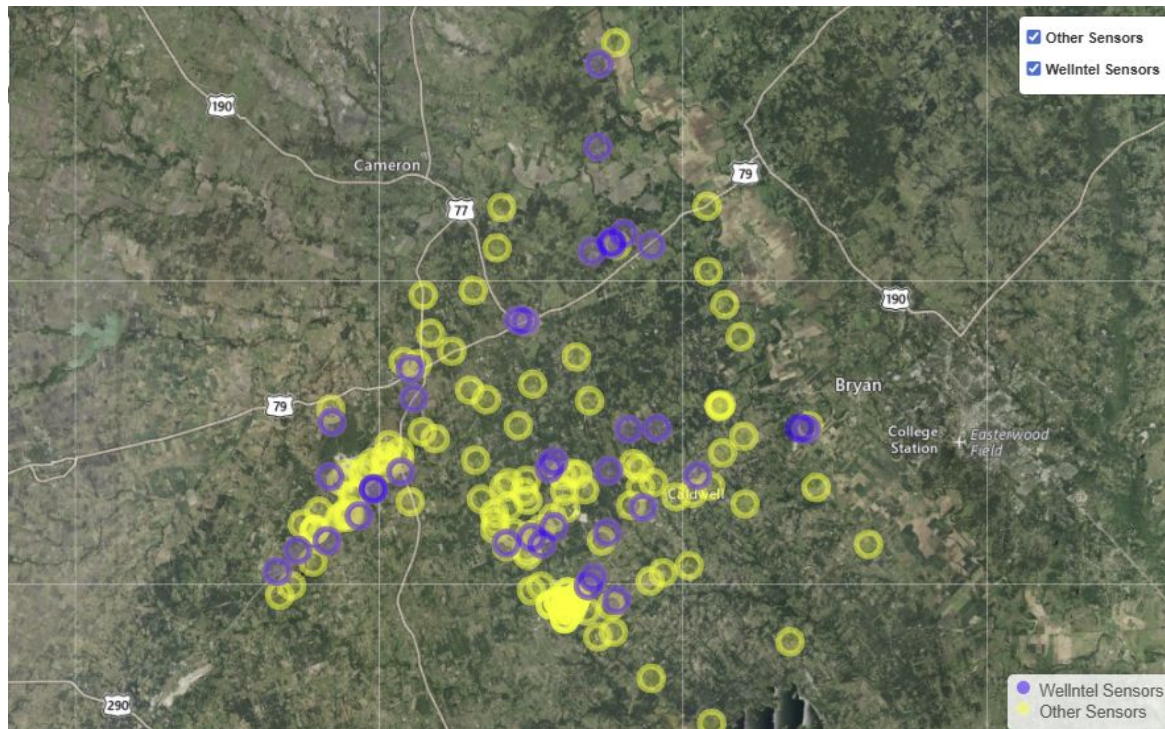
- Challenge: Texas *Major Aquifer* - diversion of water 142 miles to San Antonio, measuring and monitoring local impacts near well field

Local/regional insight to improve management



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

POSGCD Data Networks – after centralization



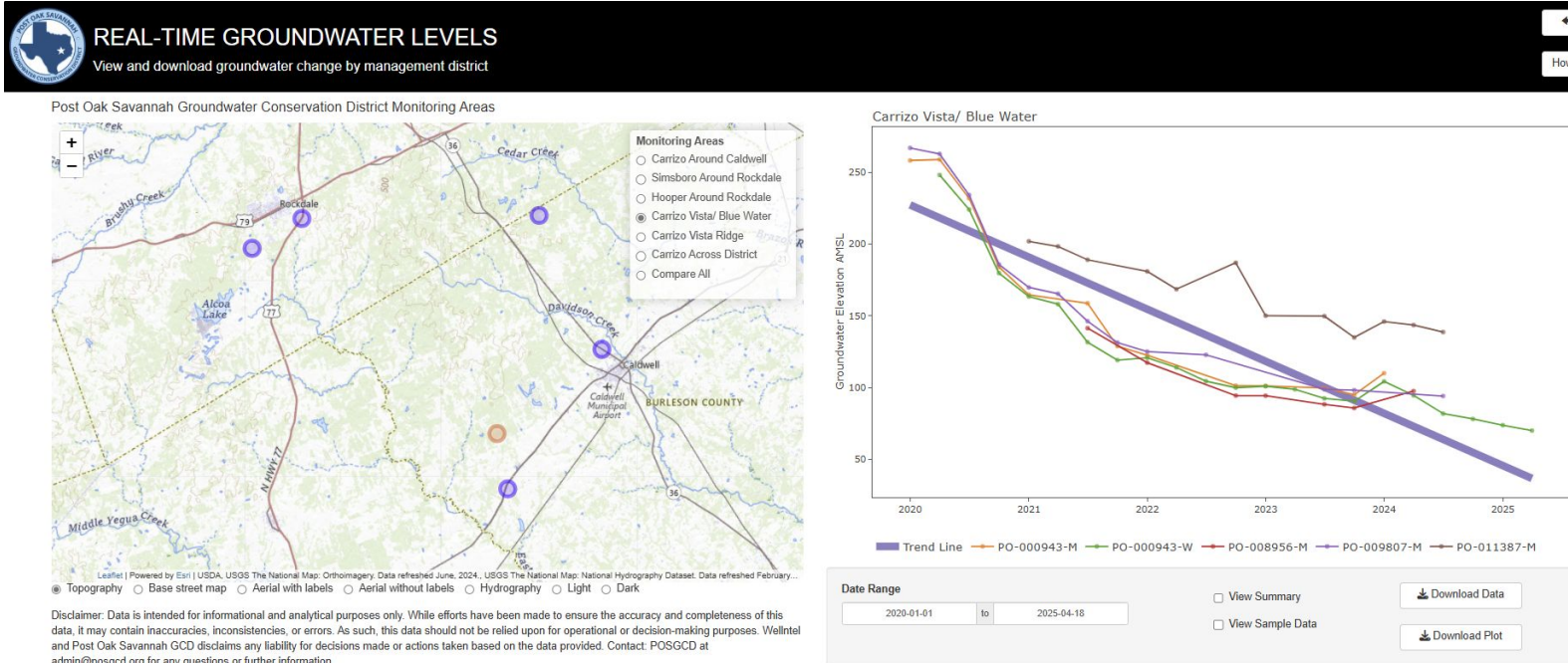
- POSGCD WellIntel sites
- POSGCD Manual sites
- POSGCD PT sites
- Permitted - Sandow Lakes Ranch
- Permitted - Vista Ridge

Solution to data challenge:

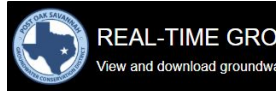
- Centralized data
- 160 key monitoring wells and growing
- Access provided to stakeholders at different levels



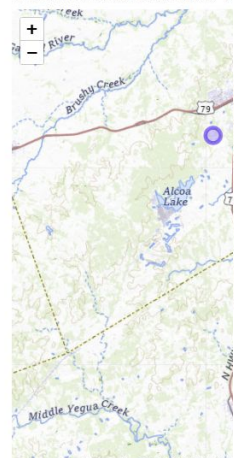
Local/regional insight to improve management



Local/regional insight to improve management

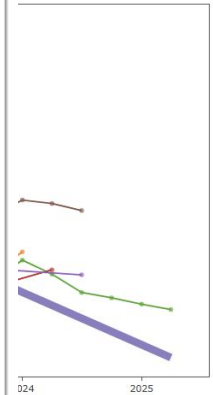
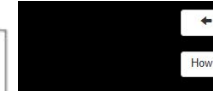
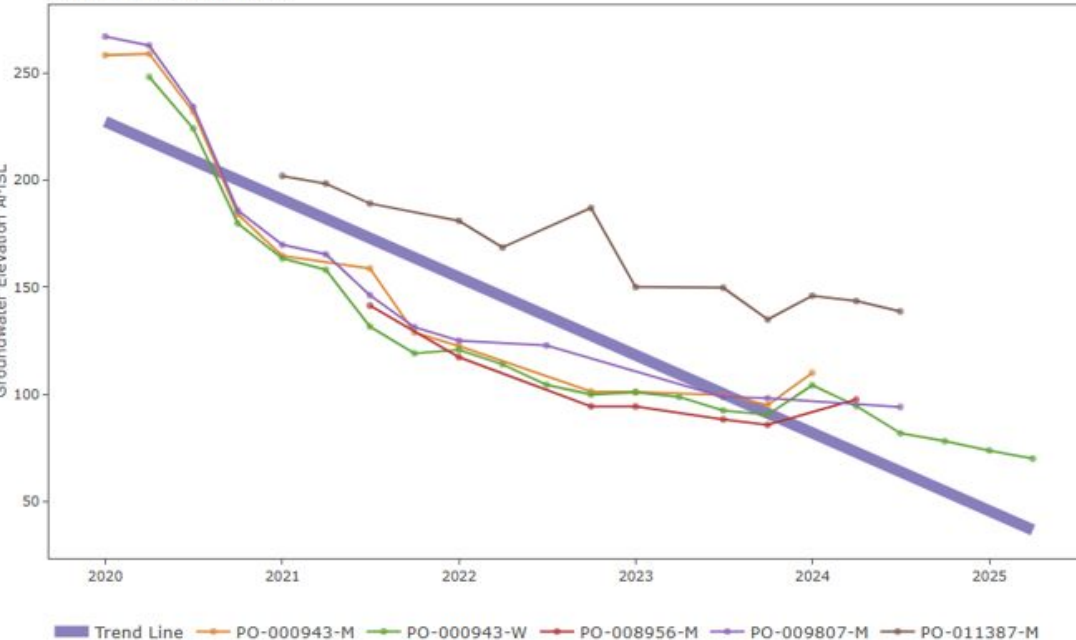


Post Oak Savannah Groundwater District



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

Carrizo Vista/ Blue Water



9807-M PO-011387-M

Download Data

Download Plot





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