

Addressing Groundwater Goals of the Missouri Regional Planning Area: Phase 2 Progress Report

March 21, 2024

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Phase 2 Objectives

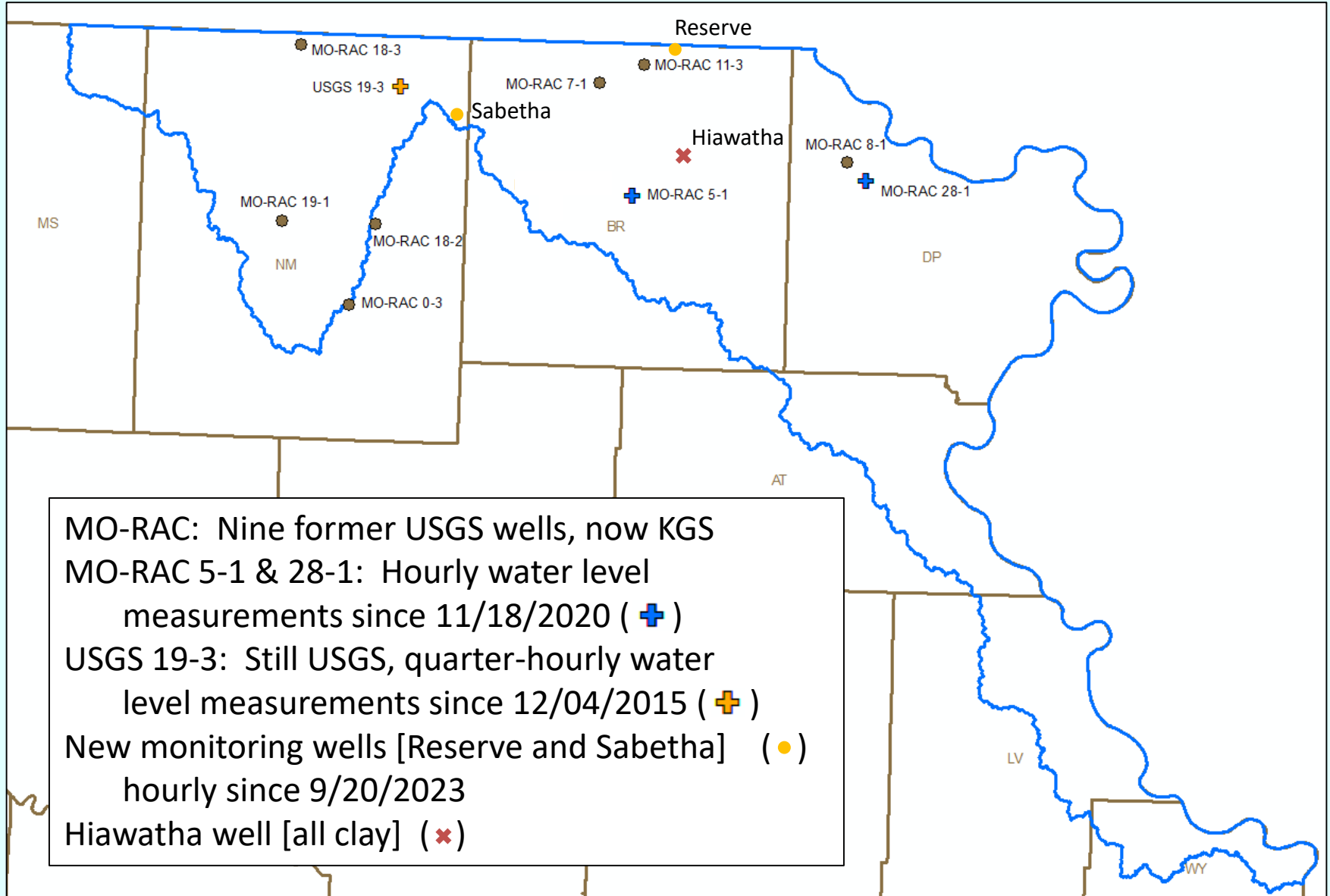
- Establish a groundwater level and groundwater quality monitoring network in the Missouri Regional Planning Area (MRPA)
- Provide improved estimates of safe yield* and establish a groundwater quality baseline

* not sure this is meaningful on a region-wide basis, since pumping is from isolated patches of permeable material, not a regionally extensive aquifer

Progress since last report

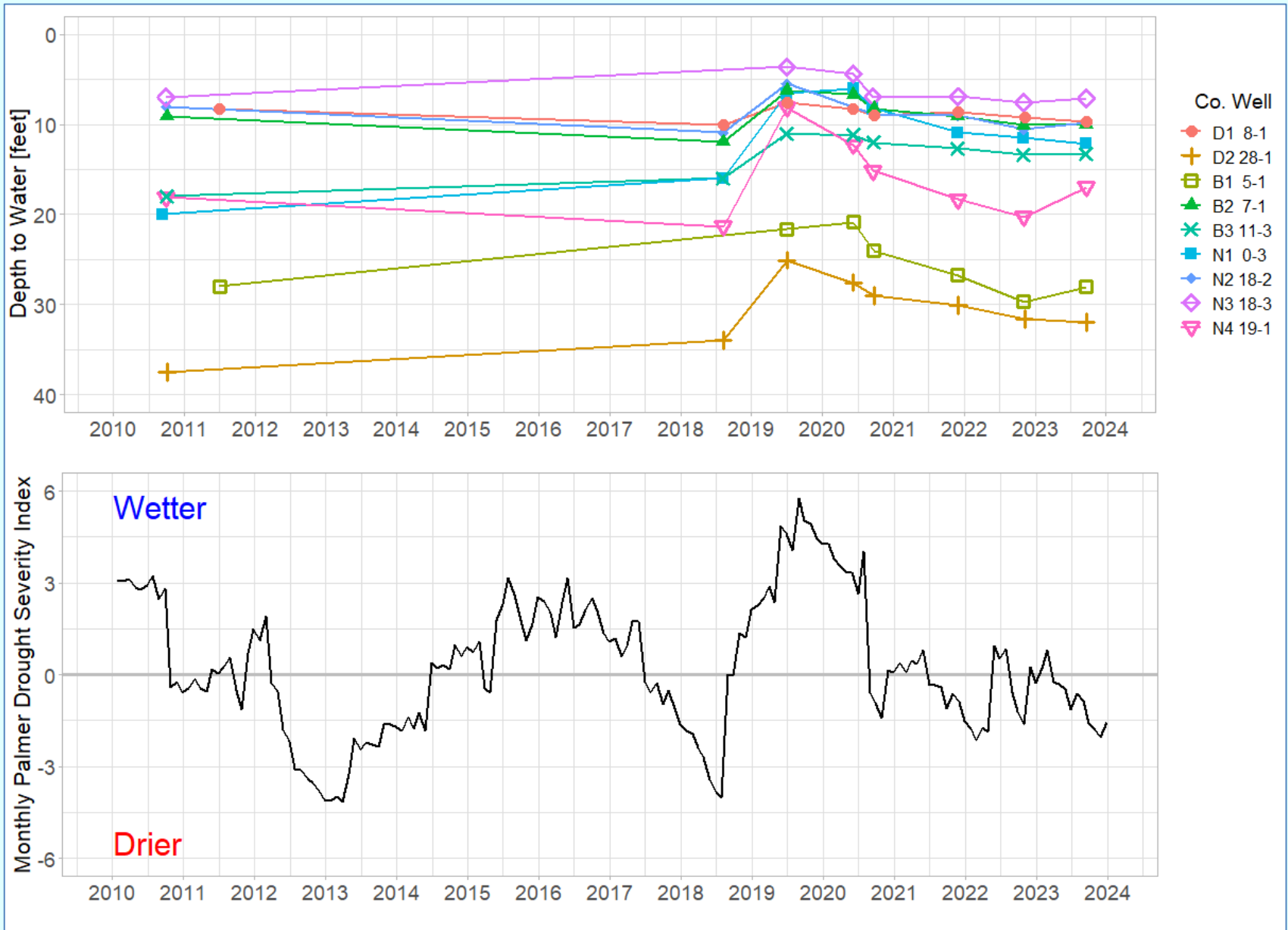
1. Continued continuous water level monitoring in two of the former USGS wells
2. Added two new, deeper, continuous monitoring wells (Reserve and Sabetha)
3. Manually measured water levels in all nine former USGS wells; failed to collect samples
4. Finalized budget, plan for next three project years (2024-2026), including switching to twice-yearly measurement & sampling
5. Erin Seybold succeeding Don Whittemore on chemistry side of project

Well Locations

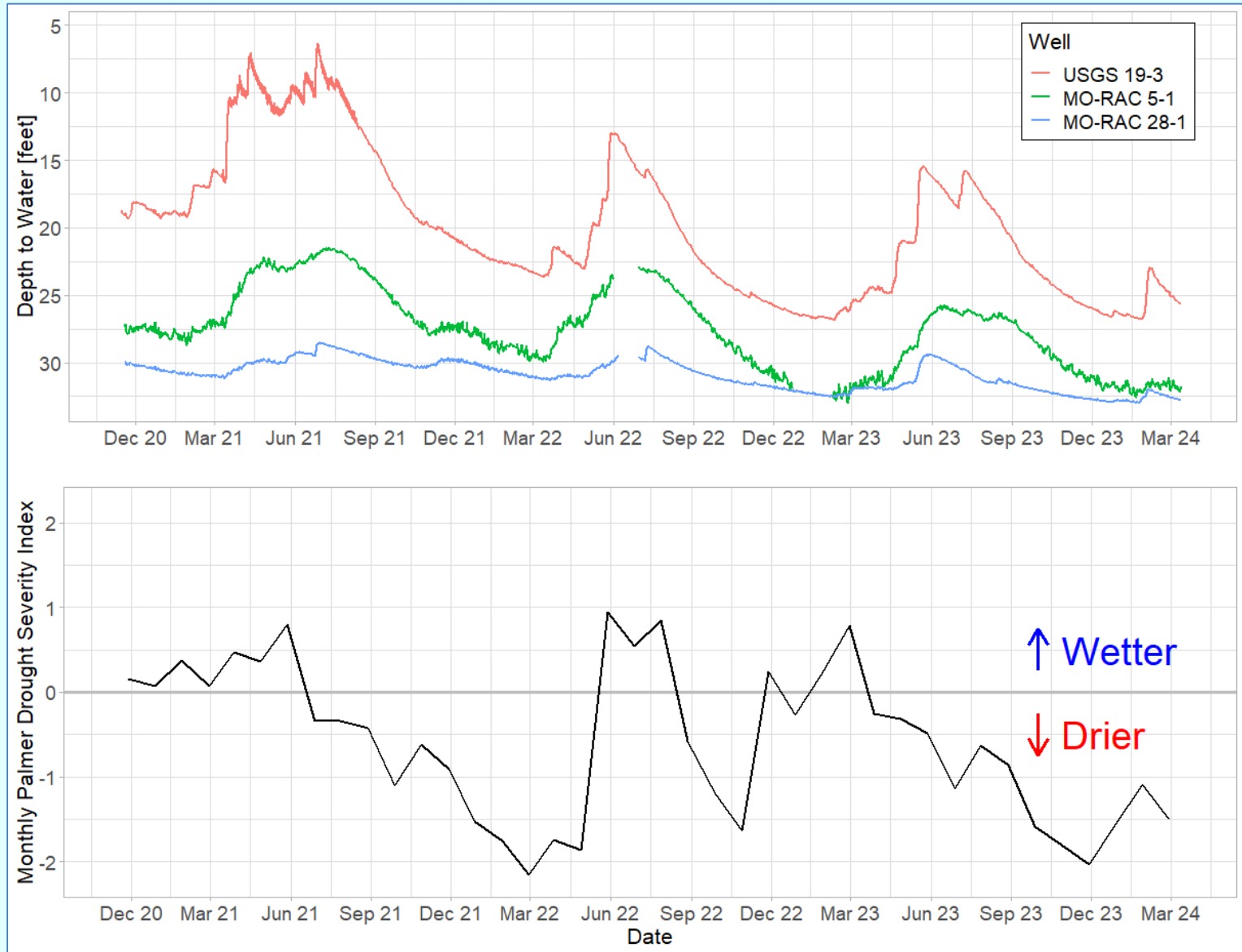


MO-RAC: Nine former USGS wells, now KGS
MO-RAC 5-1 & 28-1: Hourly water level measurements since 11/18/2020 (+)
USGS 19-3: Still USGS, quarter-hourly water level measurements since 12/04/2015 (+)
New monitoring wells [Reserve and Sabetha] (•) hourly since 9/20/2023
Hiawatha well [all clay] (×)

Manual Water Level Measurements



Continuous Measurements 11/18/20 – 03/12/24



A Tale of Two (or Three) Wells

- After failed attempts to install a monitoring well NE of Hiawatha with direct push, we contracted with a driller from Omaha to install a well there and near Reserve
- Got those installed June 2023
- Hiawatha well turned out to be all clay (bad for monitoring); Reserve is basically all sand
- While working on Reserve well, landowner from Sabetha drove by and volunteered an unused well on his property (lithology unknown)
- Installed monitoring/telemetry equipment in Reserve & Sabetha Sept. 2023

Reserve Well

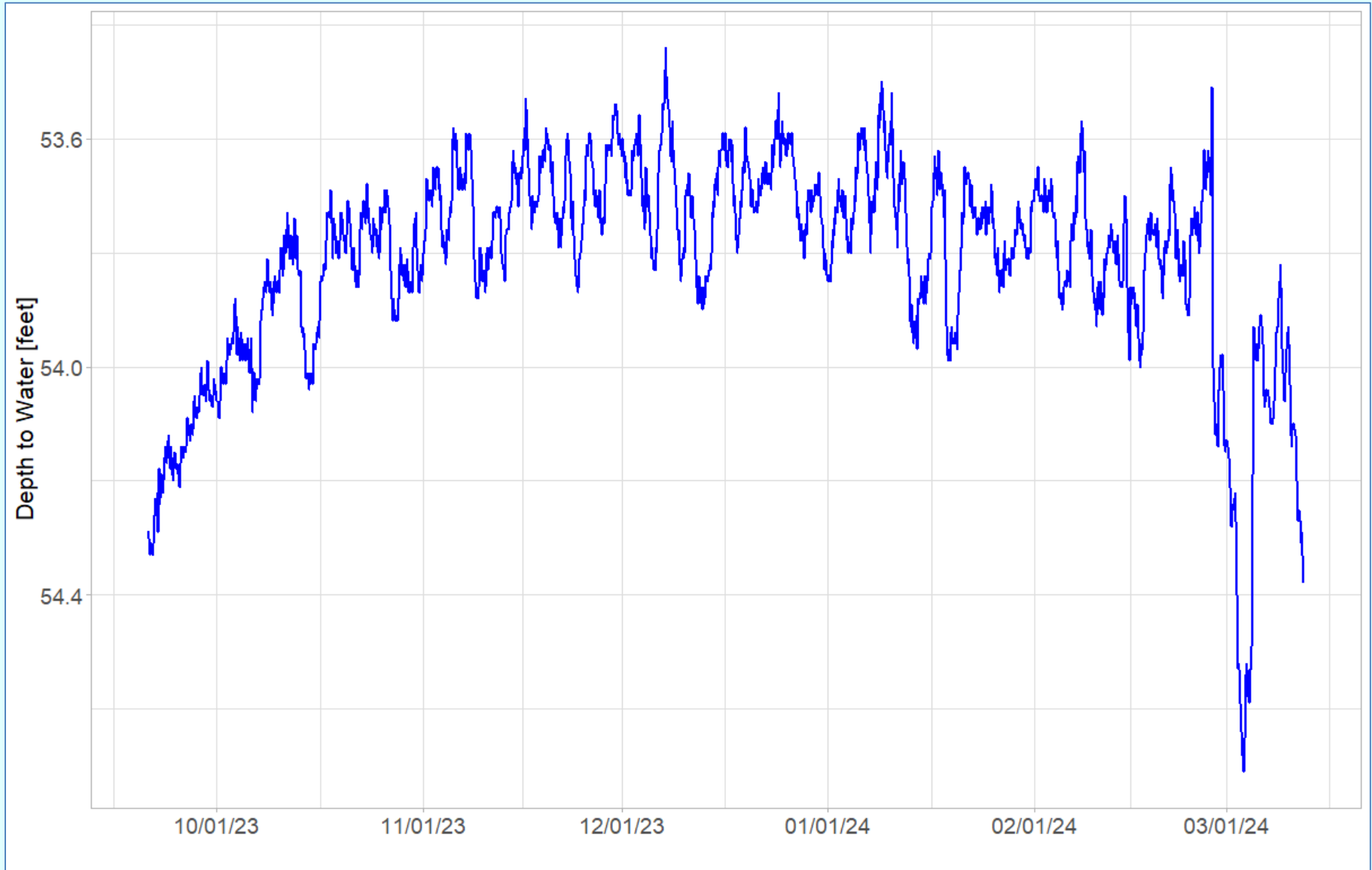
Blue pentagon is
monitoring well

Circles are irrigation
wells that were active
between 2017 &
2021 (45-81 AF/yr)

Monitoring well:
Total depth: 99 ft
Screen: 79-99 ft
Sensor depth: 90.5 ft



Reserve Well 9/20/2023 – 3/12/2024

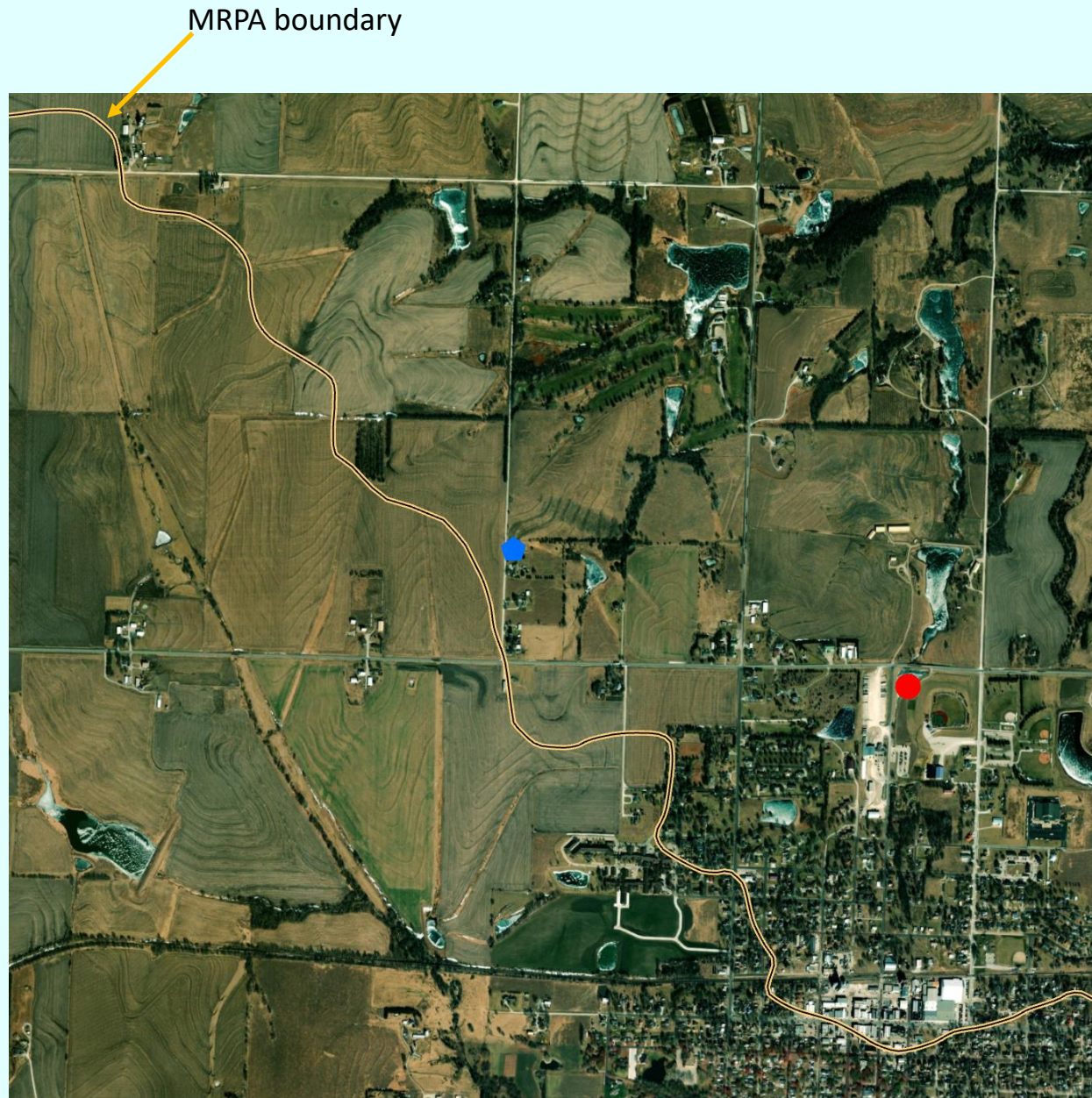


Sabetha Well

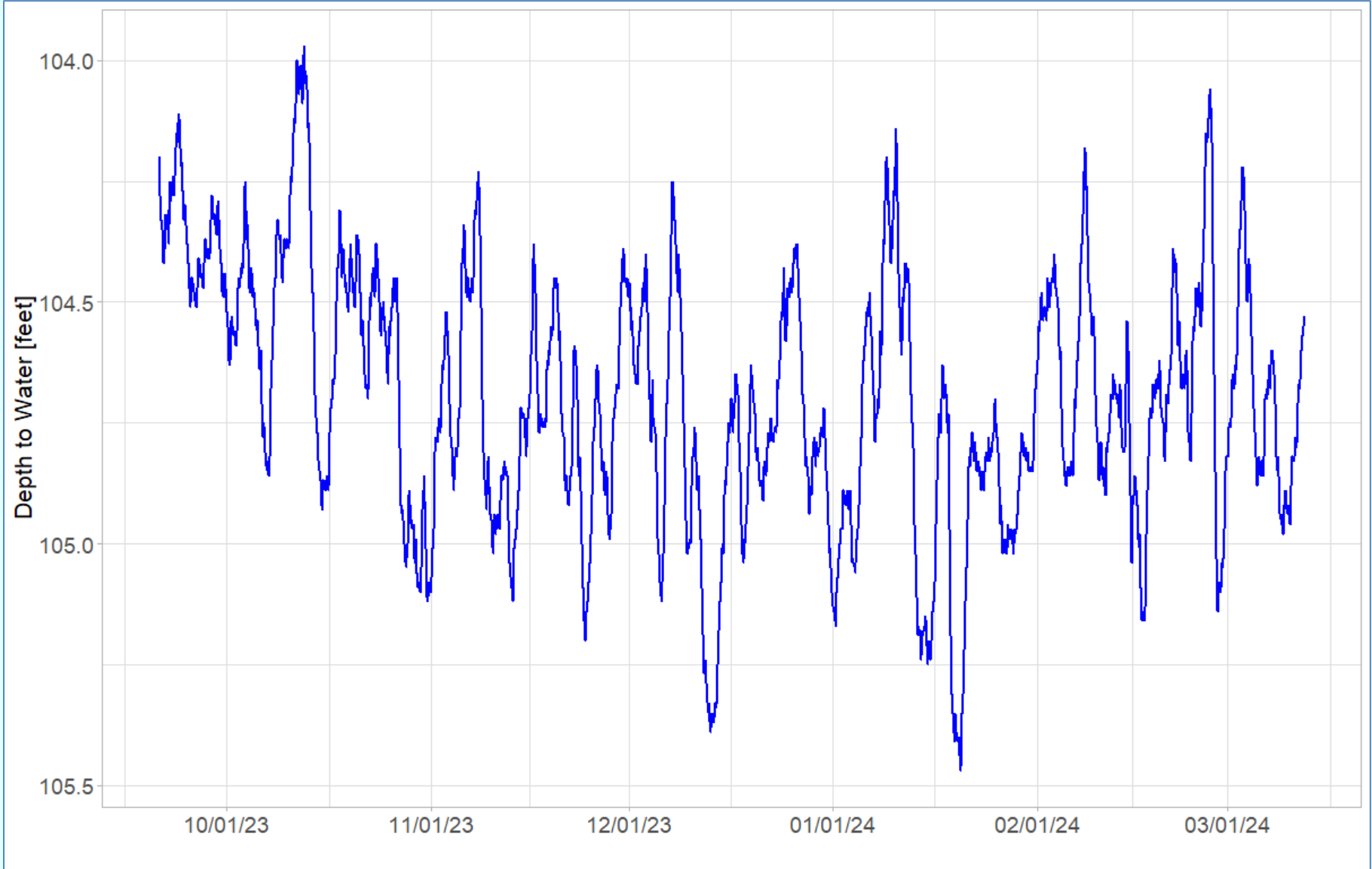
Nearest “irrigation” well* (circle) is ~4600 feet away and averaged 6 AF/yr from 2017-2021; seems to be for baseball diamond

Monitoring well:
Total depth: 151.3 ft
Screen: 116 – 142 ft
Sensor depth: 143.3 ft

* inside MRPA boundary; need to check outside



Sabetha Well 9/20/2023 – 3/12/2024



Phase II Project Tasks

- Water Quantity
 1. Assess robustness of existing (Phase I) data interpretation
 2. Improve location accuracy for some wells
 3. Identify and equip existing wells for continuous water level monitoring
 4. Install new monitoring wells in critical locations
 5. *Interpret groundwater level surface* and estimate aquifer storage and safe yield
- Water Quality
 1. Interpret existing water-quality data and trends
 2. Select groundwater quality monitoring locations *and collect samples*
 3. *Analyze samples*
 4. *Interpret new data and plan for future sampling*
- Information Dissemination
 1. Make information publicly available through project website

Focus for Next Few Months

- Start twice yearly measurement and sampling this spring (April 2024)
- Keep looking for monitoring wells *of opportunity*
- Interpret water level and chemical data
- Update website

Schedule

We finally finished “Year 2”!

Task	Year 1	Year 2	Year 3	Year 4	Year 5
Water Quantity 1	✓				
Water Quantity 2	✓				
Water Quantity 3		✓			
Water Quantity 4		✓			
Water Quantity 5	✓	✓			
Water Quality 1	✓	✓			
Water Quality 2	✓	✓			
Water Quality 3	✓	✓			
Water Quality 4		✓			
Info. Dissemination	✓	✓			

Project web site:

<http://www.kgs.ku.edu/Hydro/Missouri/index.html>

Water Level Data Page

<https://www.kgs.ku.edu/Hydro/Missouri/mrpa/index.html>

“Wizard well page” leads to manual measurements (in Wizard database)

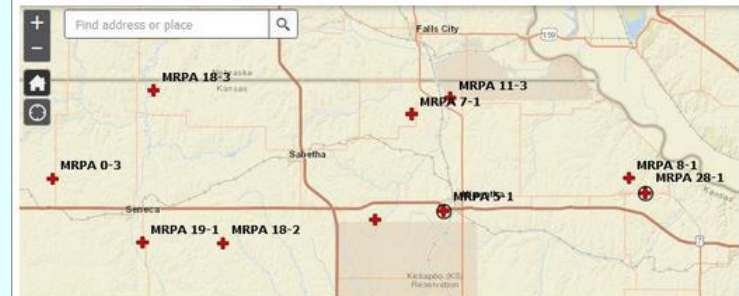
“Continuous measurements” leads to continuous measurements

Missouri River Monitoring Well Network

In 2018, the KGS took over ownership of a network of wells, originally installed by the USGS in 2011, in the Missouri Regional Planning Area (MRPA) to help better understand the groundwater resources in the Missouri River basin within Kansas. Depth-to-water measurements are taken periodically throughout the year and several of the sites have been equipped to provide continuously recorded water levels in near real-time. Funding for the project is through the [Kansas Water Plan Fund](#).

Interactive Map

Use our interactive map to explore the data received, or use the data links below.



Data

- Site 18-3**, Nemaha County north of Baileyville
[Wizard well page](#)
- Site 0-3**, Northern Nemaha County along stateline
[Wizard well page](#)
- Site 19-1**, Nemaha County south of Seneca
[Wizard well page](#)
- Site 18-2**, Nemaha County southeast of Seneca
[Wizard well page](#)
- Site 7-1**, Brown County northwest of Hiawatha
[Wizard well page](#)
- Site 11-3**, Brown County north of Hiawatha
[Wizard well page](#)
- Site 31-1**, Brown County between Fairview and Hiawatha
[Wizard well page](#)
- Site 5-1**, Brown County west of Hiawatha
[Wizard well page](#)
[Continuous Measurements](#)
- Site 8-1**, Doniphan County north of Highland
[Wizard well page](#)
- Site 28-1**, Doniphan County east of Highland
[Wizard well page](#)
[Continuous Measurements](#)