

Update on Groundwater Monitoring in the Virginia City Highlands and Highland Ranches, 2023-24

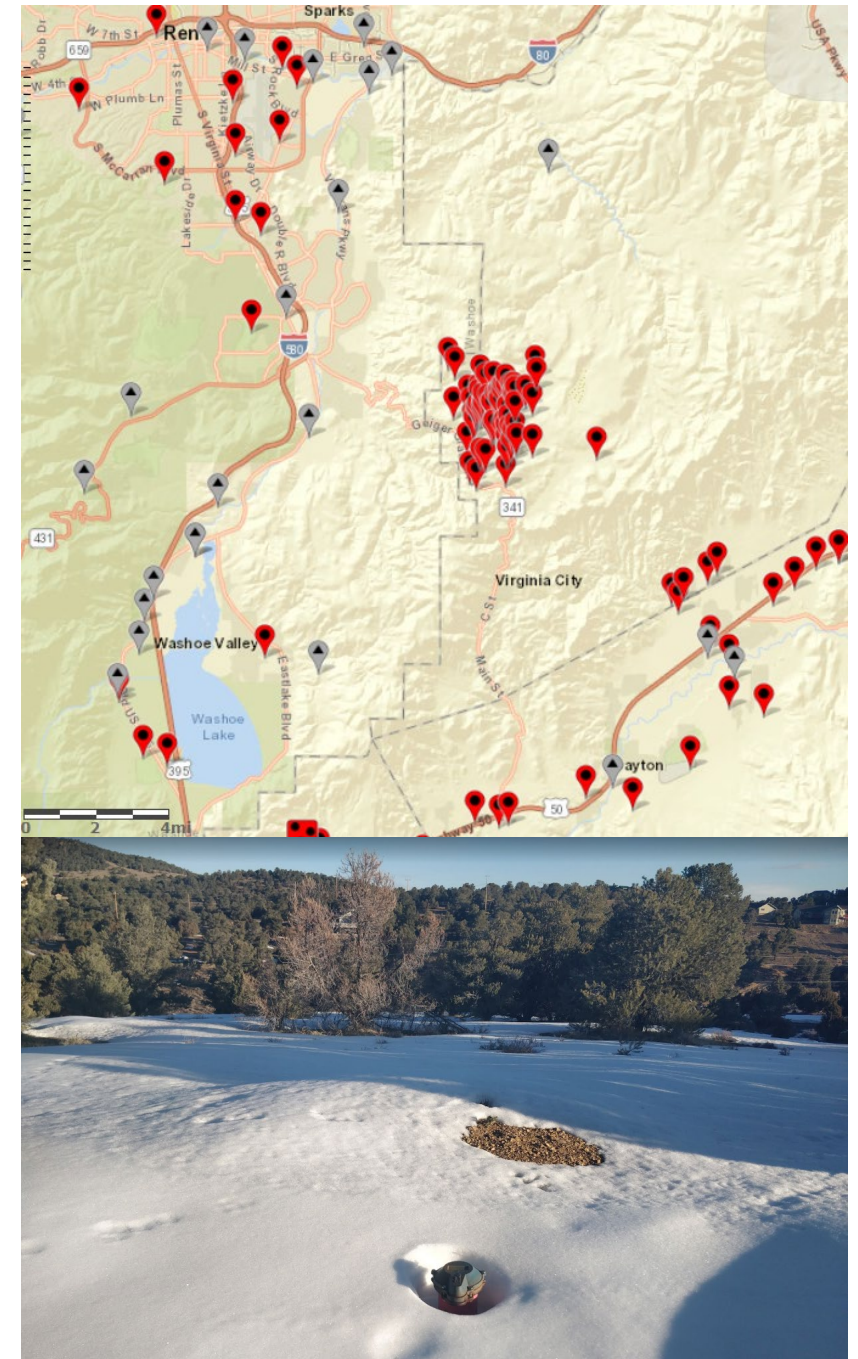
By David Smith - Hydrologist
U.S. Geological Survey

8/20/2024 – Storey County
Commissioner's Meeting



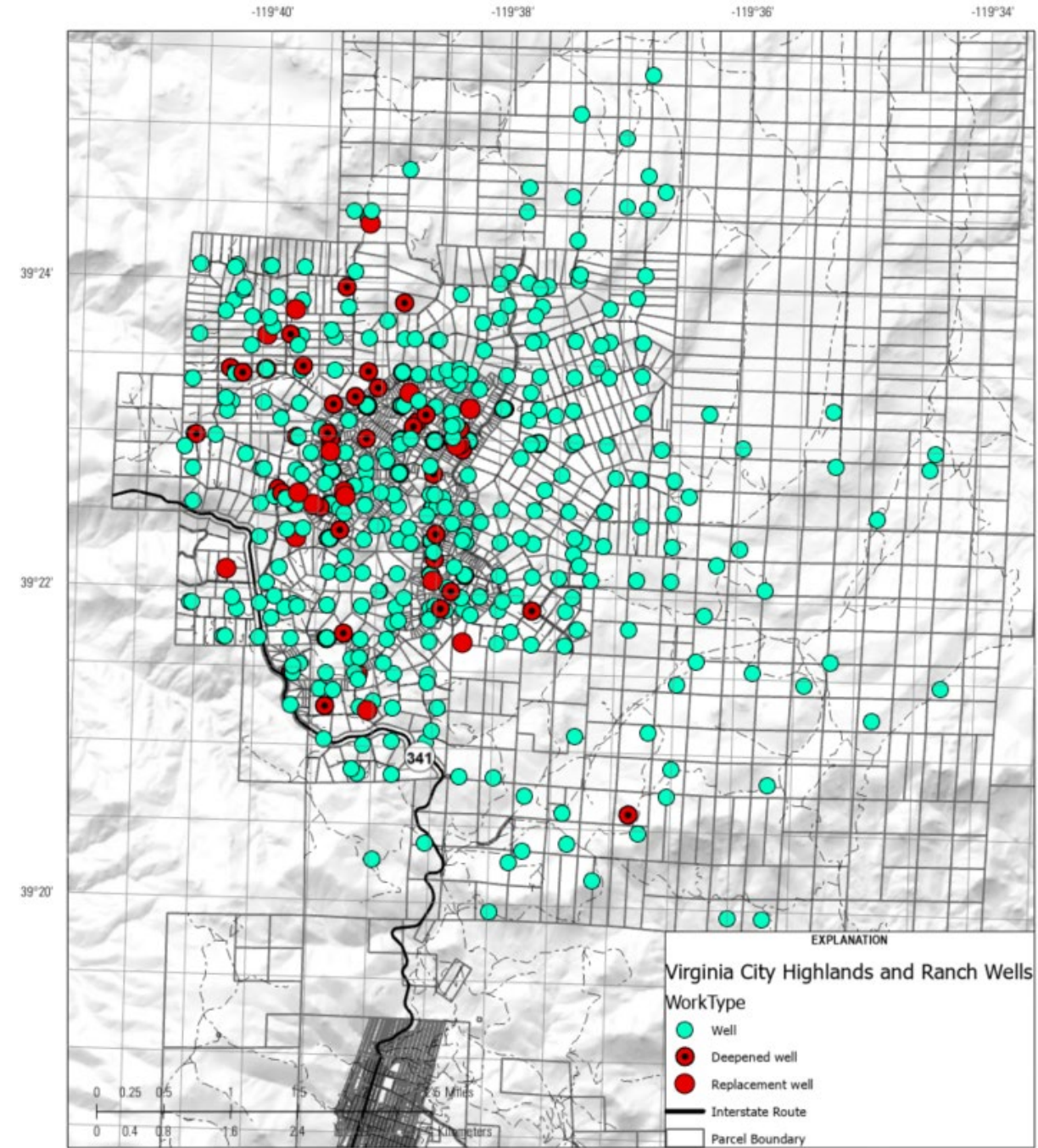
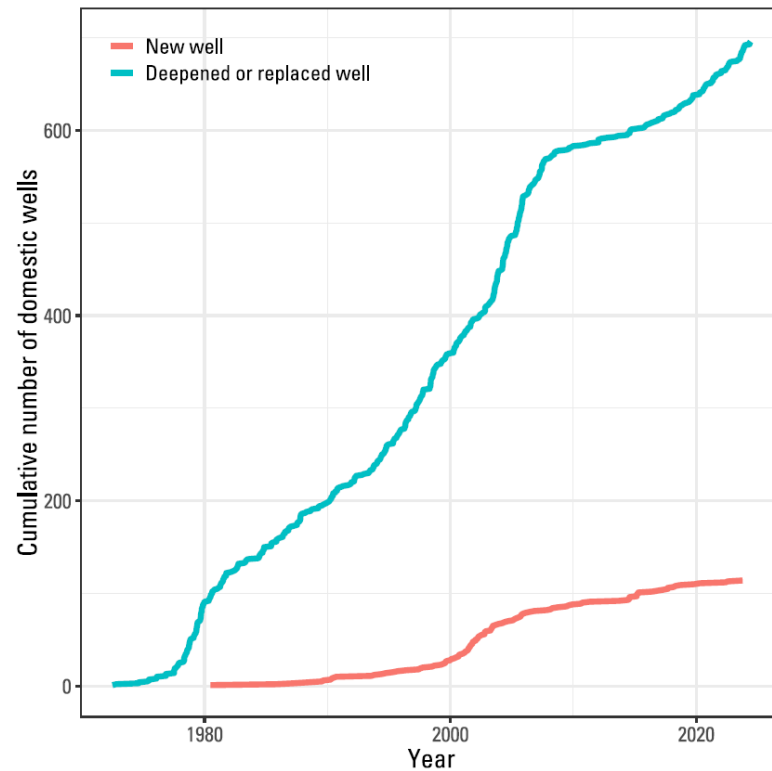
Background

- U.S. Geological Survey (USGS) started a groundwater investigation with Storey County in 10/2018 due to declining water-levels and reports of wells going dry, replaced, or deepened.
 - Extended two years (ends in 2024) to measure water-level change in response to below average (2022) and above average (2023) winters
 - Report of findings to be published this year
- In July of 2023, the USGS and Storey County started a 5-year program to continue monitoring groundwater resources
- This presentation is a summary of 2023-24 data collection
 - 63 wells currently in network



Domestic well status

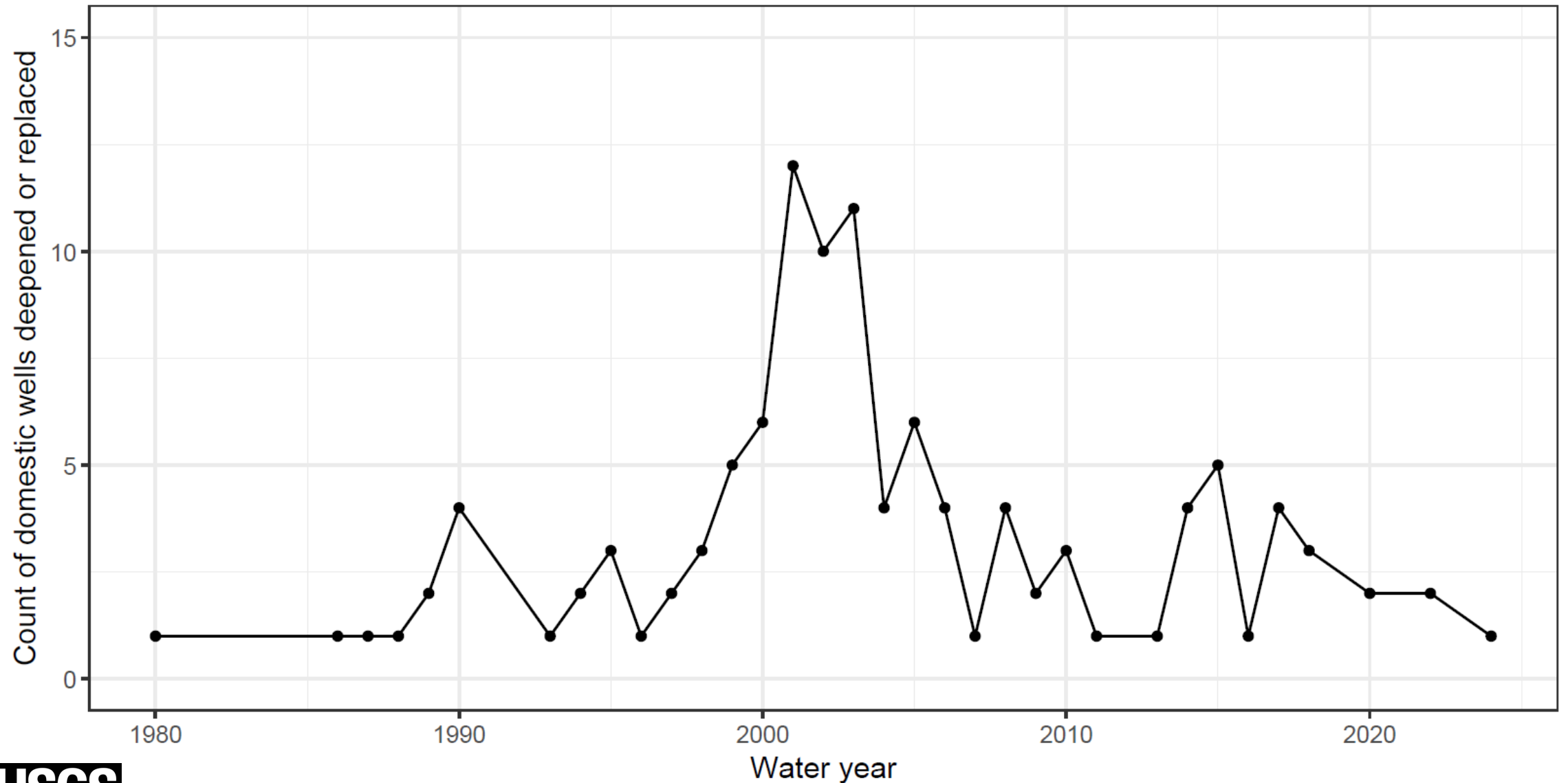
- Nevada Division of Water Resources (2024)
 - 1,848 total parcels
 - *728 wells in the VC Highlands + Ranches
 - *114 wells (16 percent) deepened or replaced



USGS The National Map: 3D Elevation Program. USGS Earth Resources Observation & Science (EROS) Center: GMTED2010. Data refreshed March, 2021.
Parcel data from Storey County, 2022, Well data from Nevada Division of Water Resources 2024

* Data are considered estimates due to delayed in reporting

Domestic well status

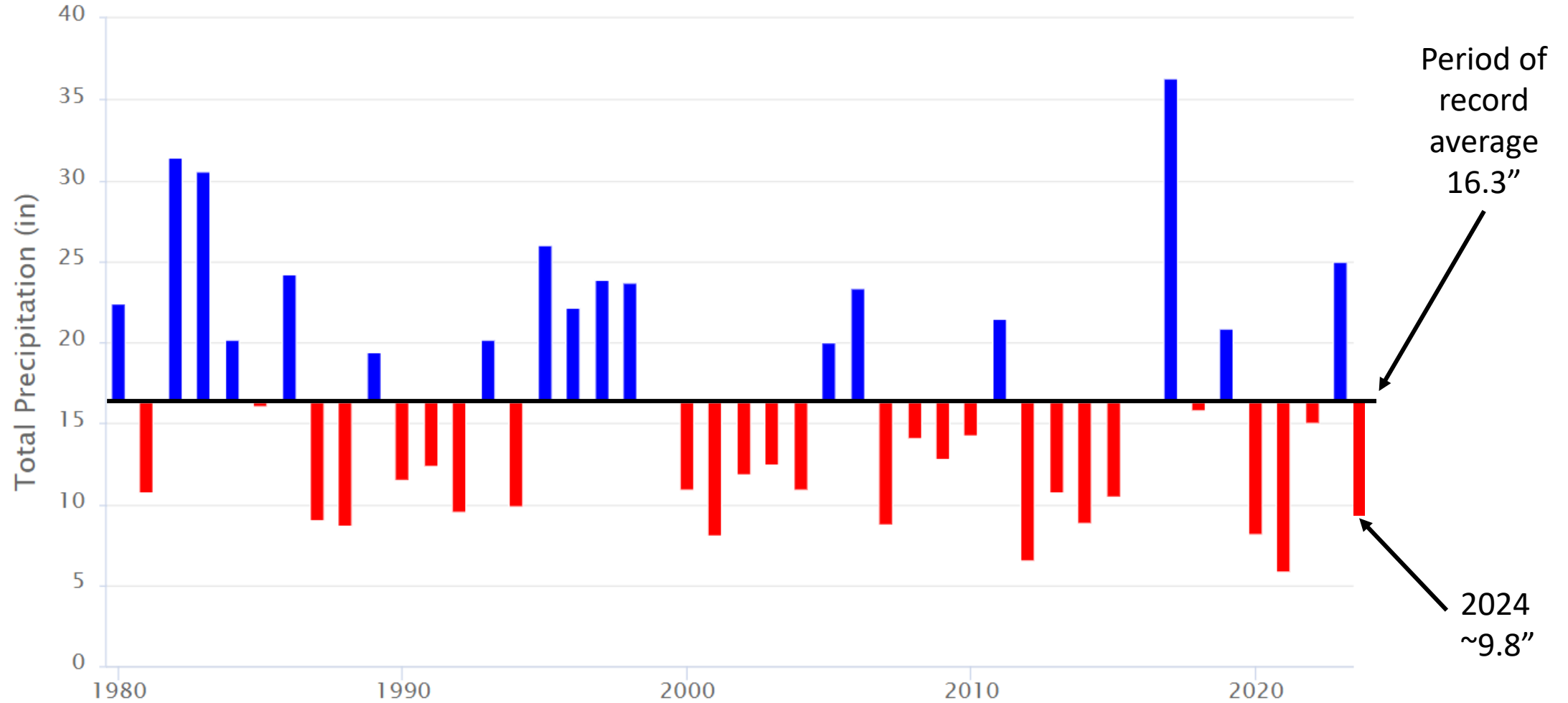


Precipitation

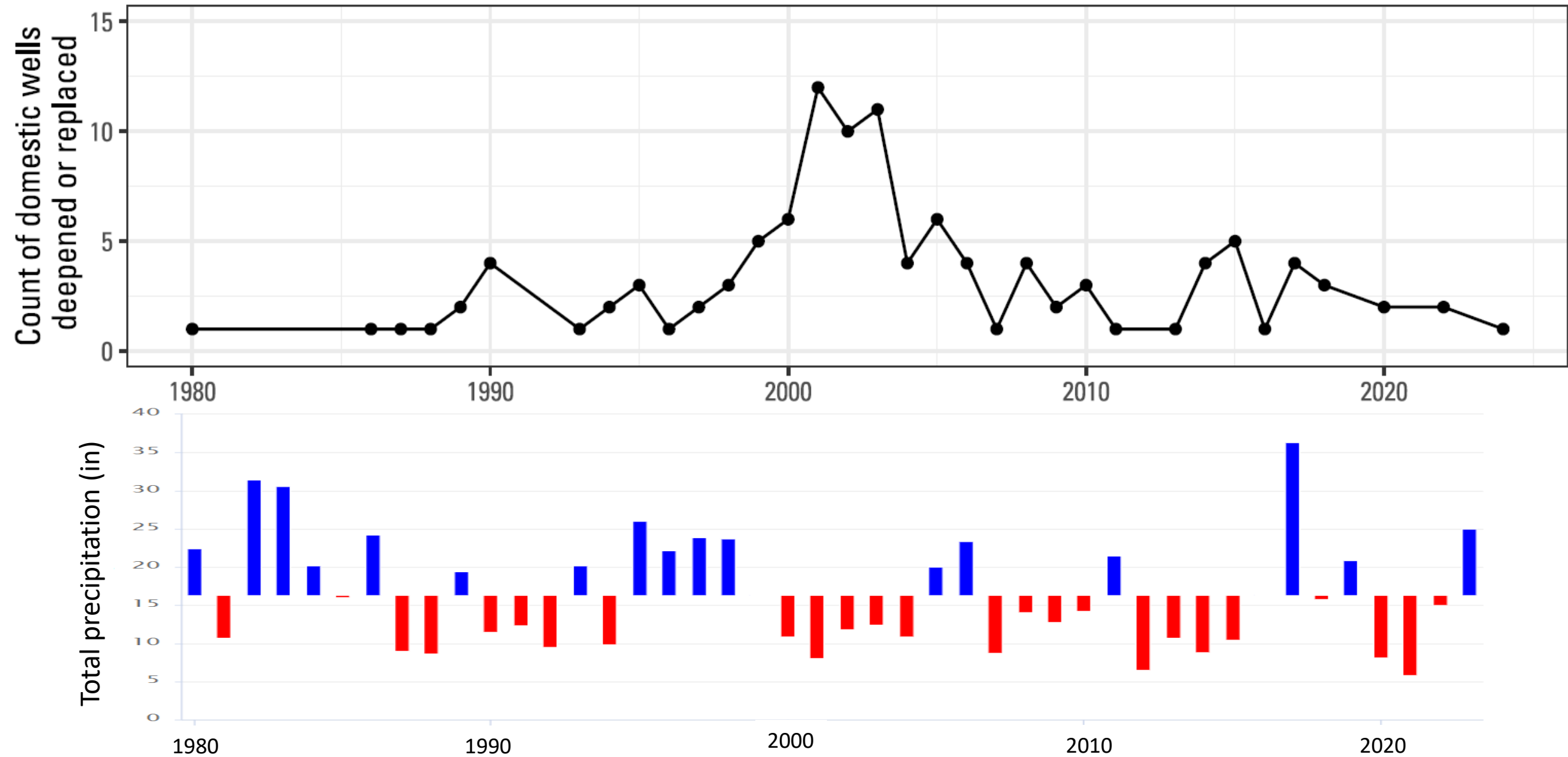
Deviations from 16.30 in

Precipitation (gridMET)

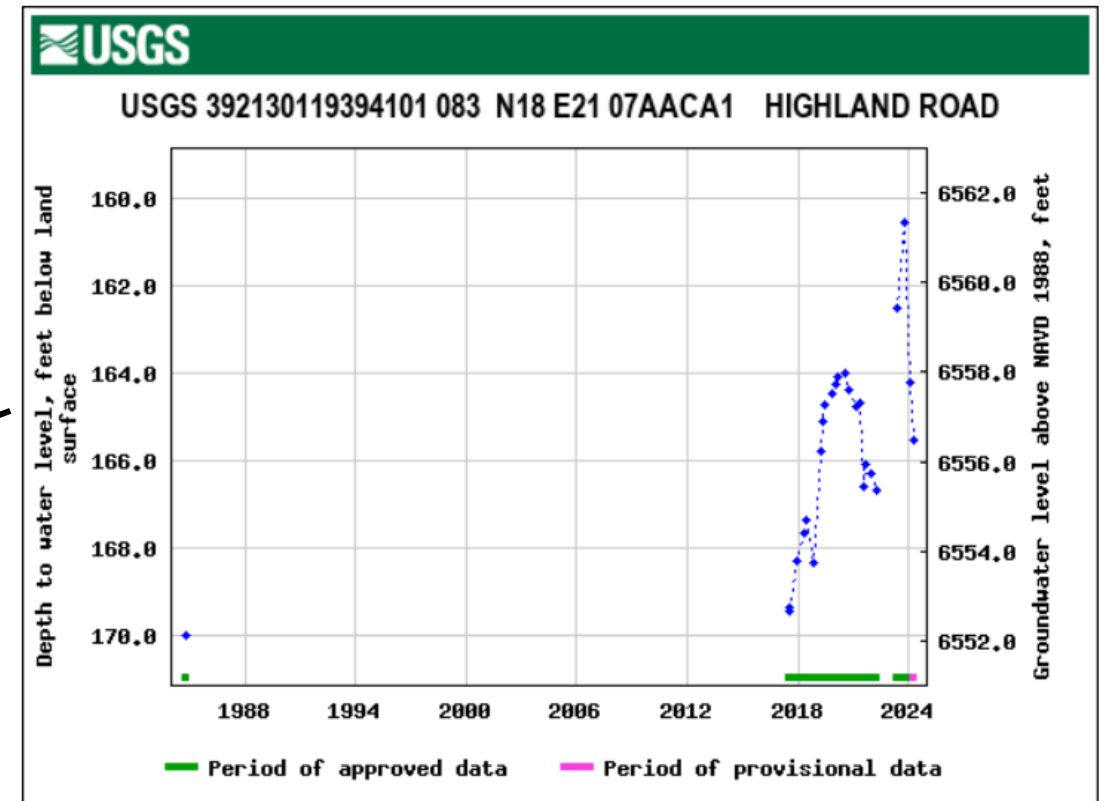
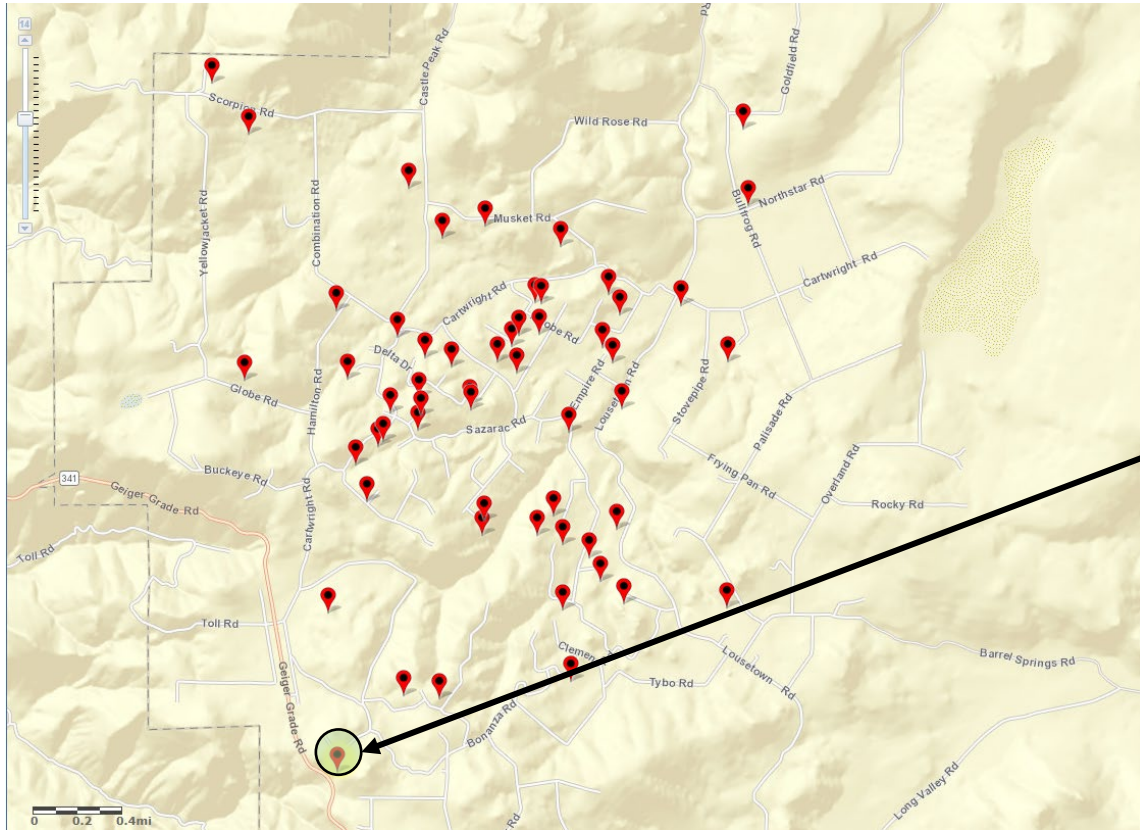
Annual Total for Oct 1 to Sep 30 at Virginia City Highlands



Precipitation and well replacement

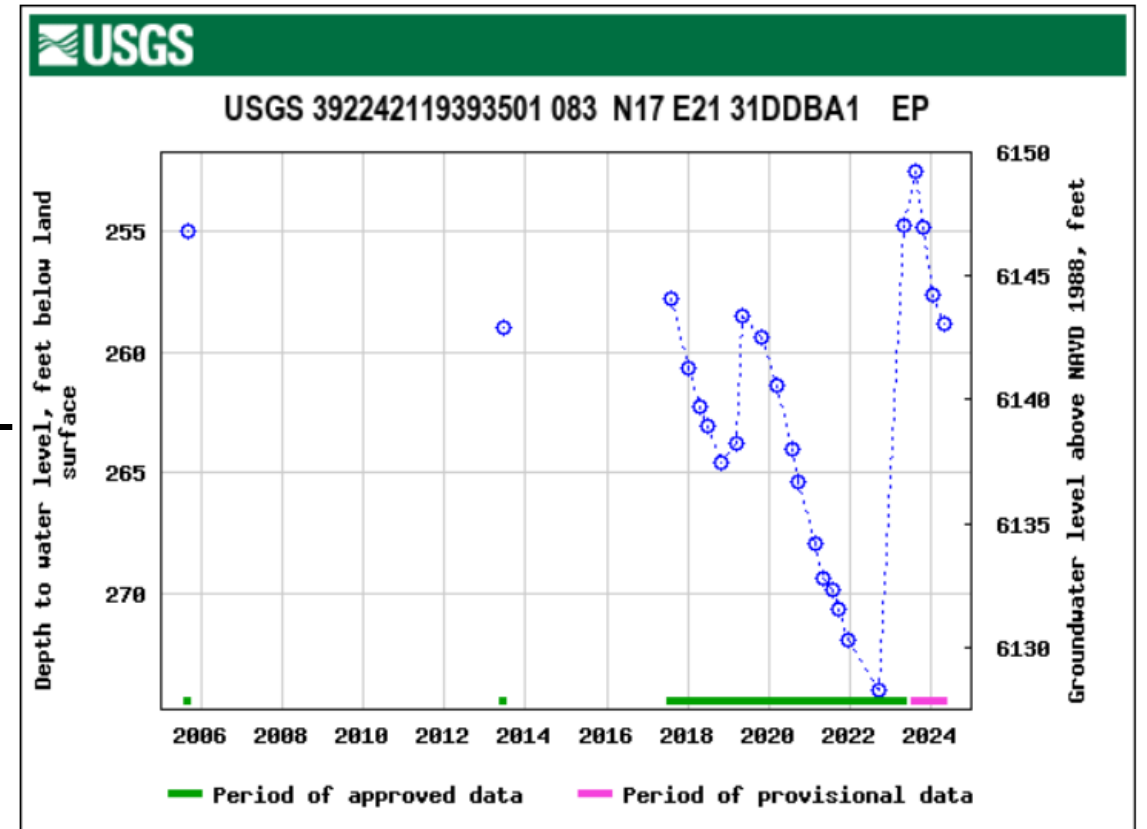
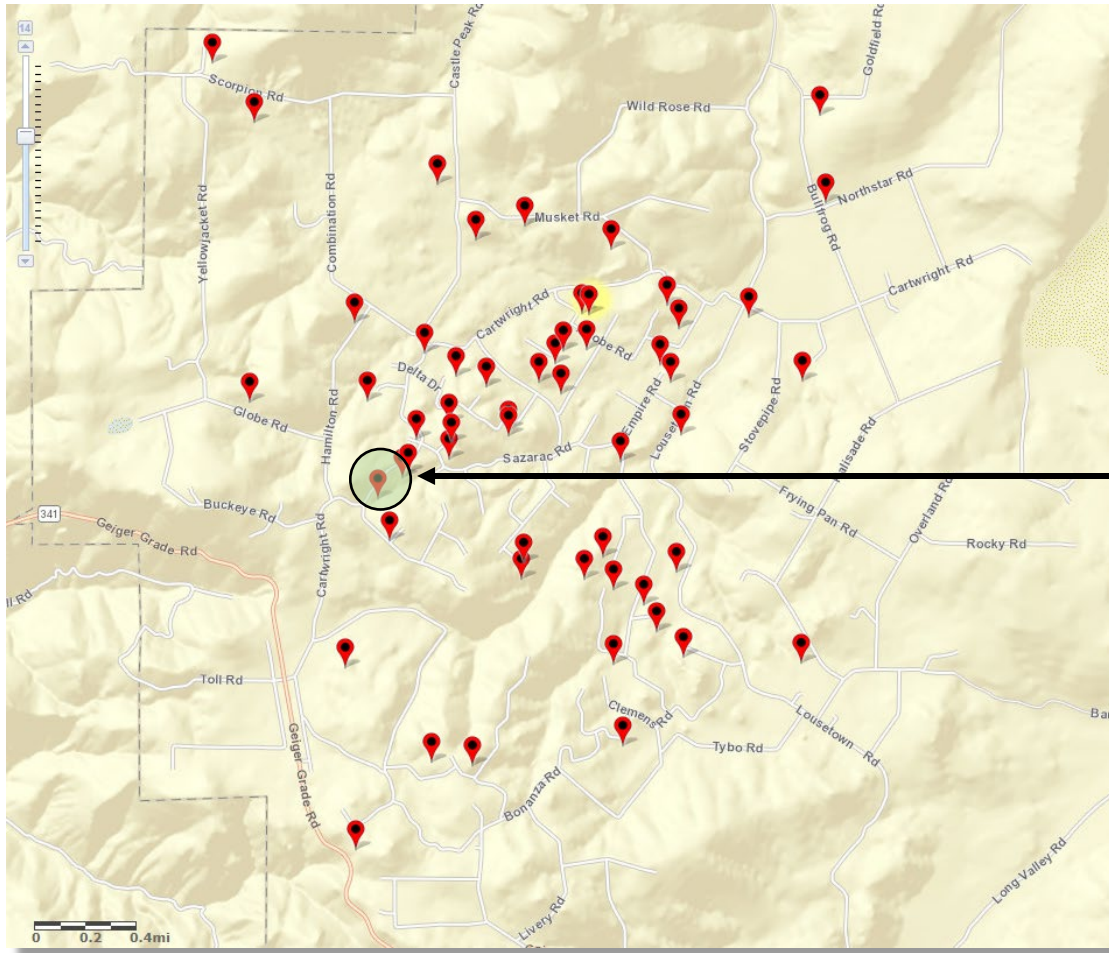


Groundwater levels



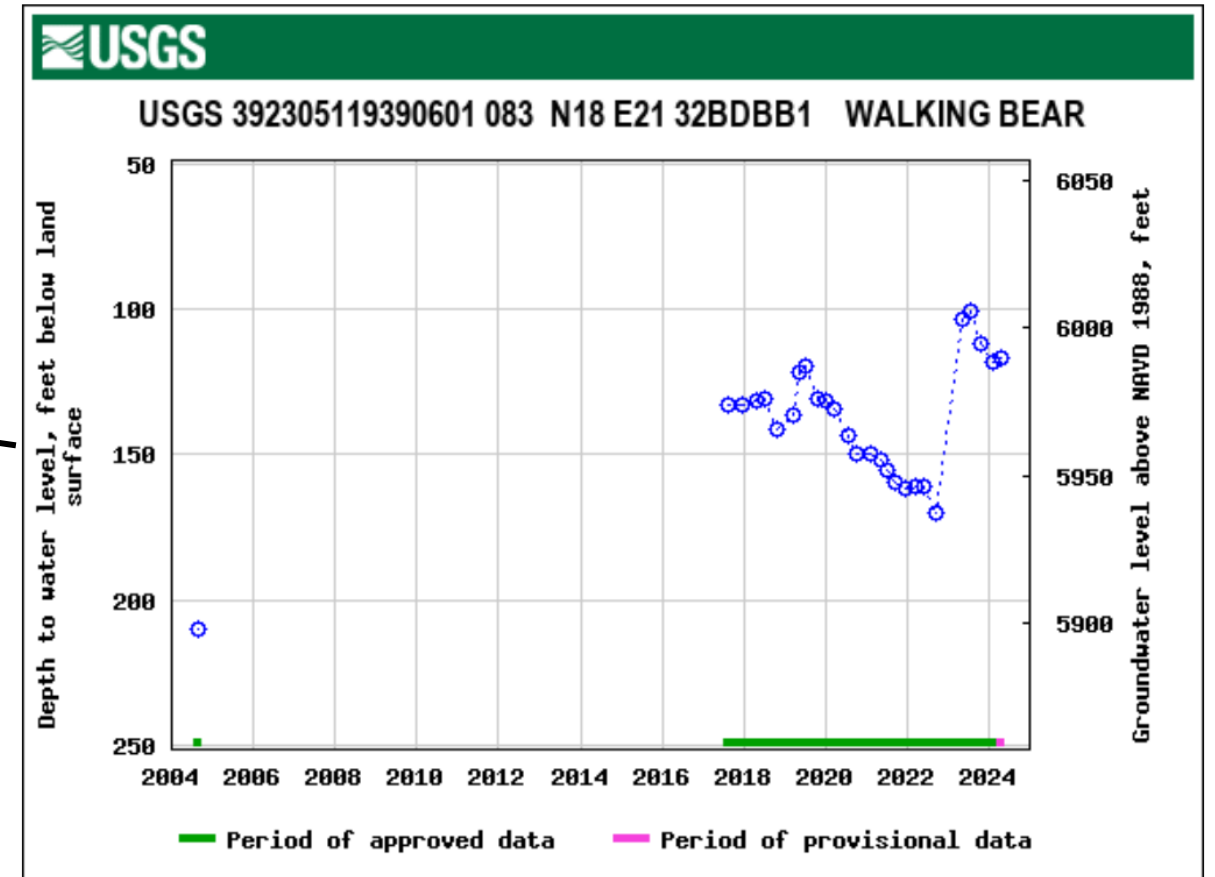
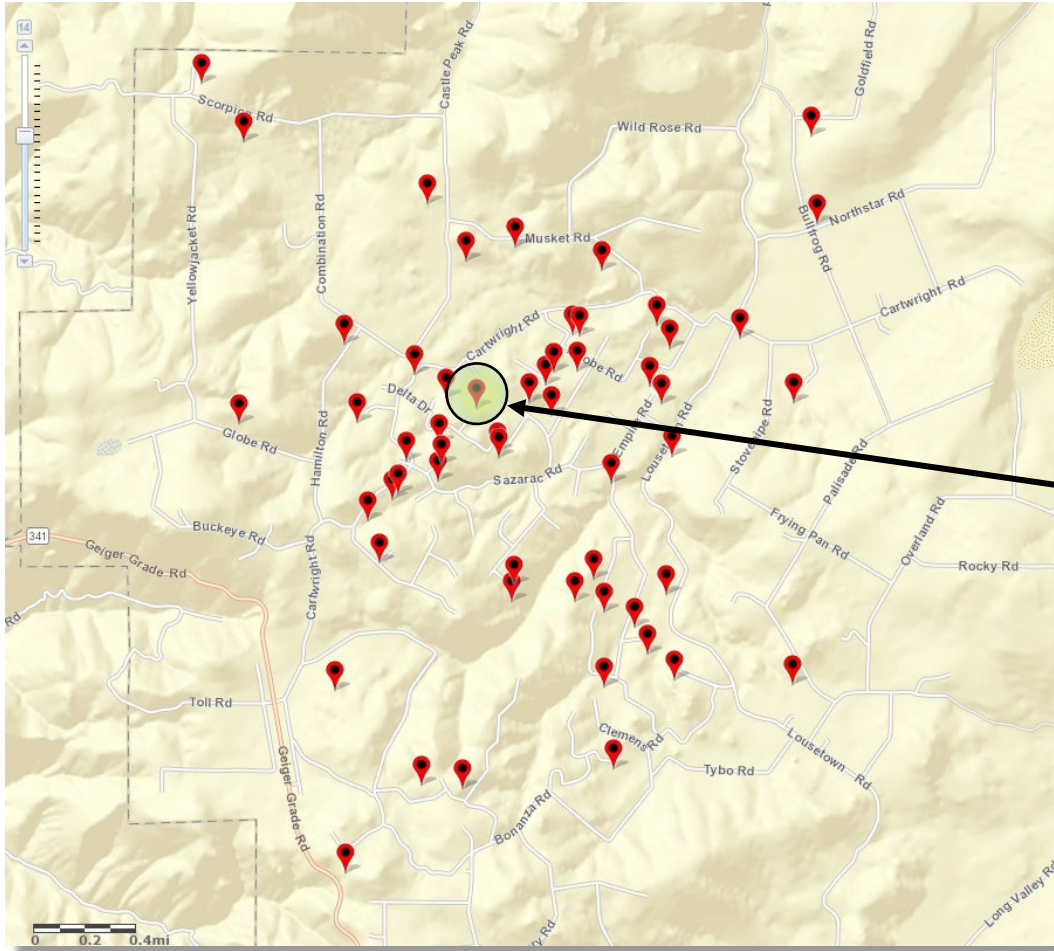
Near summit of VC Highlands, 220 ft below land surface (bls)

Groundwater levels



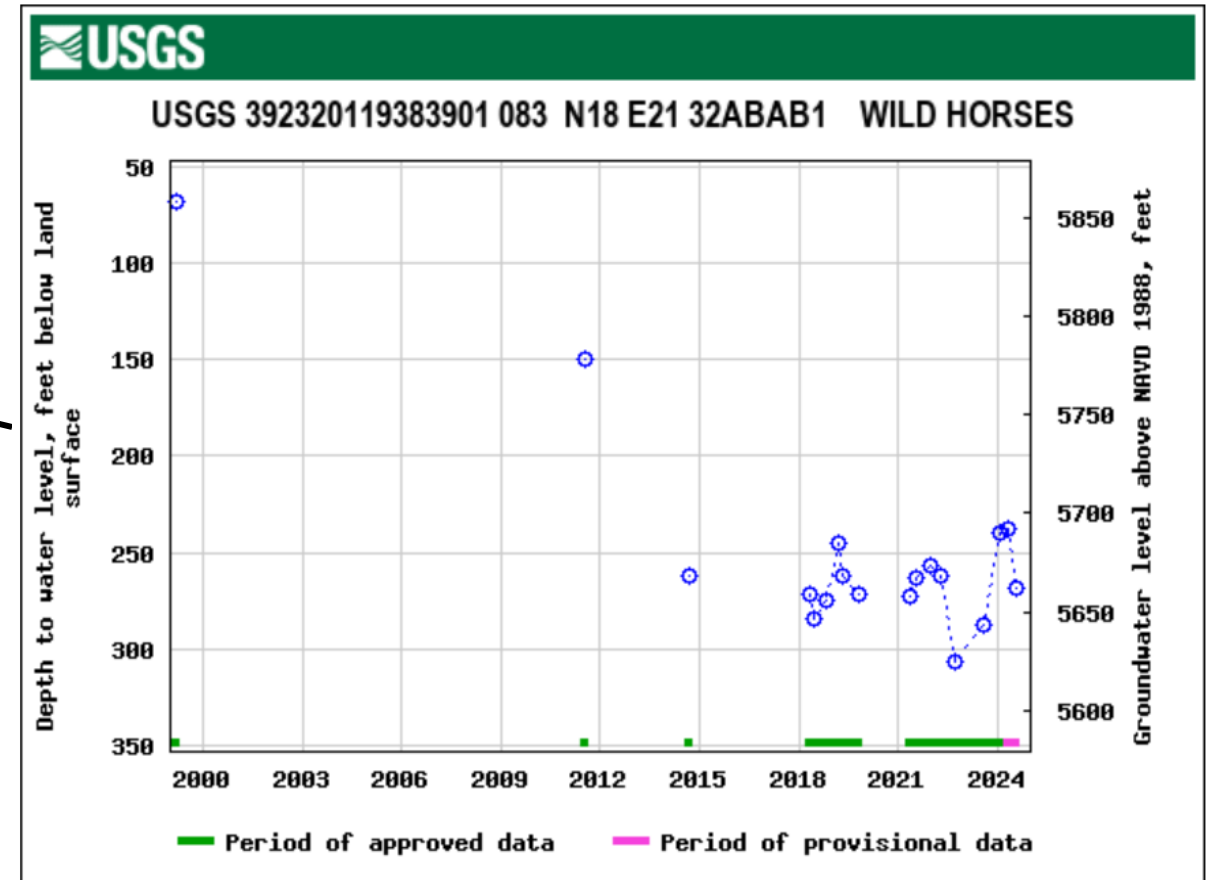
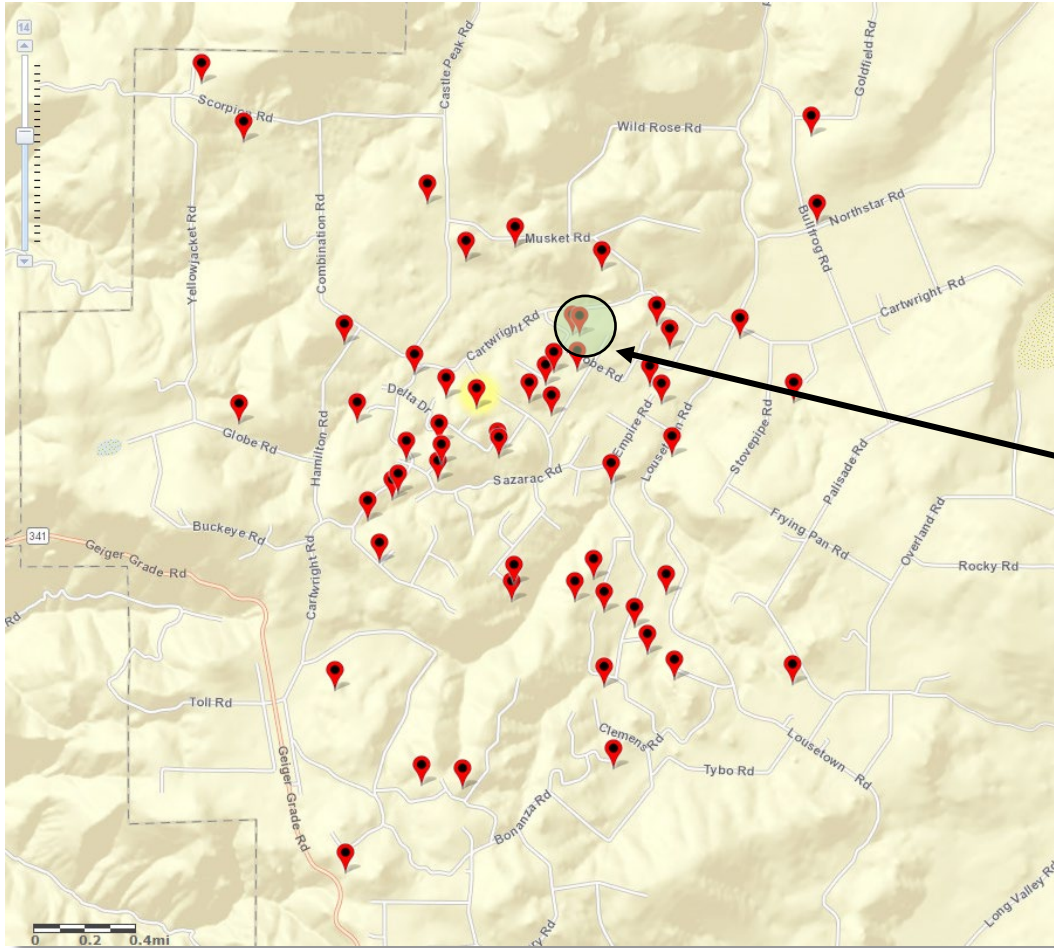
Central VC Highlands, ~20 ft increase from 2023 winter, 358 ft bls

Groundwater levels



Middle of VC Highlands, 67' increase in a 1-acre parcel well, 675 ft bls

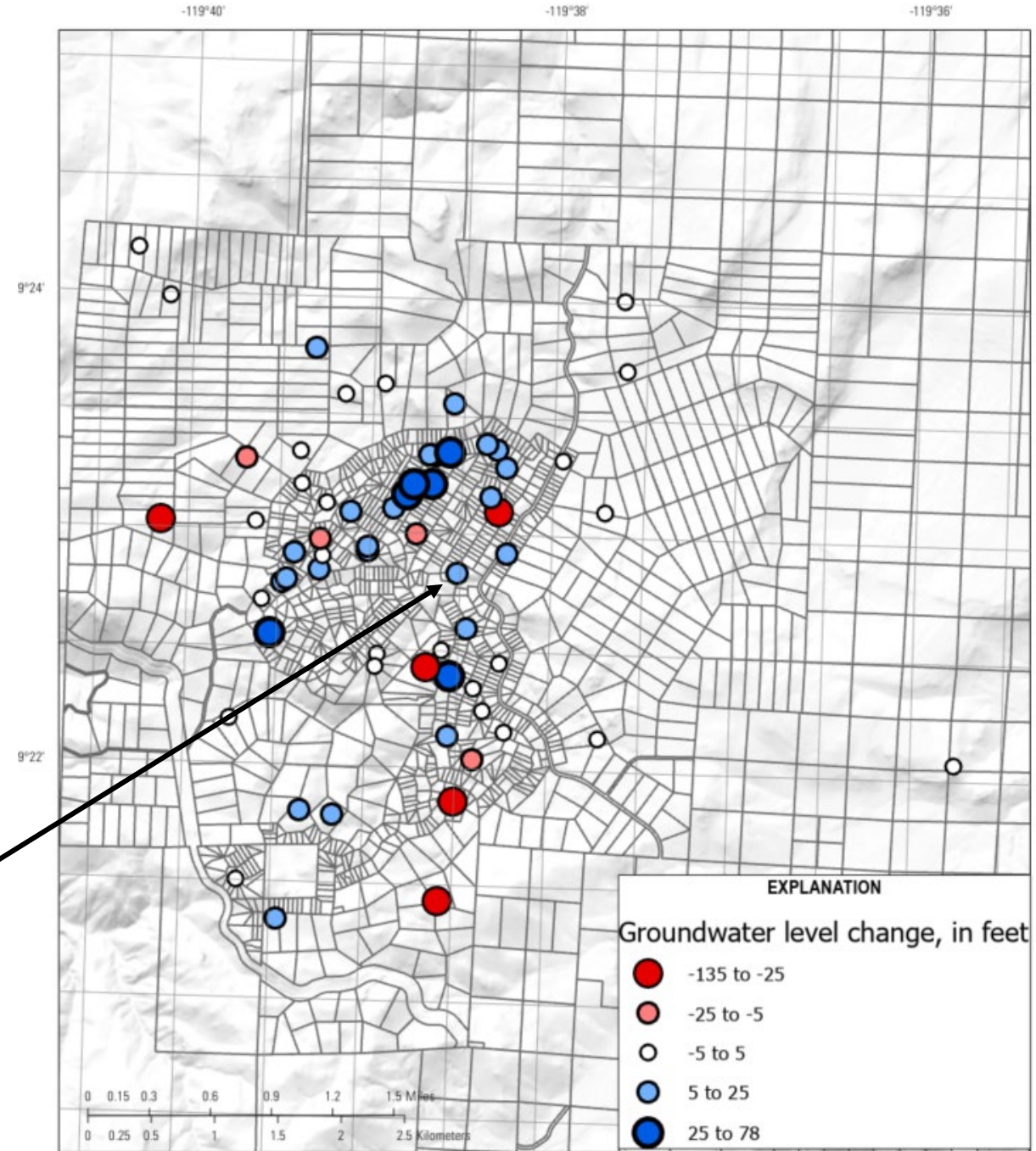
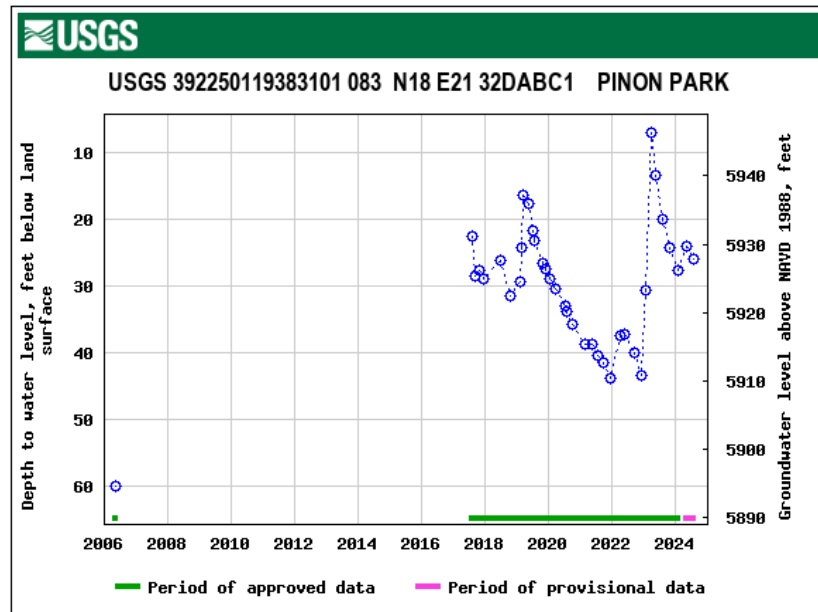
Groundwater levels



Middle of VC Highlands, 200' decline from a 1-acre parcel, 472' ft bls

Groundwater level change: 2018-2024

- Groundwater-level change from 2018-2024
 - 51 wells have increased from 2018
 - 12 wells have declined from 2018
 - Large changes in water-levels generally indicates limited aquifer storage
- Most water-levels increased after the above normal precipitation during the winter of 2023.



USGS The National Map: 3D Elevation Program. USGS Earth Resources Observation & Science (EROS) Center: GMTED2010. Data refreshed March, 2021.
Parcel data from Storey County, 2022. Well data from U.S. Geological Survey, 2024

Planned work

- Next measurements in September 2024 (quarterly measurements)
- Complete peer-review of report send to Storey County for courtesy review
- Present findings to Commissioner's and at the VC Highlands Community Center after report publication
- Continue to answer questions related to groundwater in Virginia City Highlands
- **Request – if any homeowner's well is going dry or having issues, we want to hear about it. Please reach out (details on next slide)**

Questions

- Email questions to David Smith dwsmith@usgs.gov
- Project webpage and link
 - <https://www.usgs.gov/centers/nevada-water-science-center/science/evaluation-water-level-decline-and-aquifer-properties>
 - [Groundwater network map link](#)

Project webpage



How to access groundwater data

- Want to access USGS data? Follow these tips below.
- Visit <https://maps.waterdata.usgs.gov/mapper/index.html>
 - On the left menu select “Groundwater sites”
 - Check box for “Active Sites”
 - Groundwater monitoring sites will show up as red pins, select pin for data

