

FEBRUARY ADVISORY COMMITTEE MEETINGS

Butte Valley Groundwater Advisory Committee Meeting



LARRY WALKER
ASSOCIATES
science | policy | solutions



Topics

- GSP Determination and Next Steps
- Annual Report Updates (Water Year 2023)
- Monitoring data review, network expansion, and data gaps
- Model Updates
- Implementation Projects and Schedule Updates
- DMS Introduction and Summary

GSP Determination and Next Steps

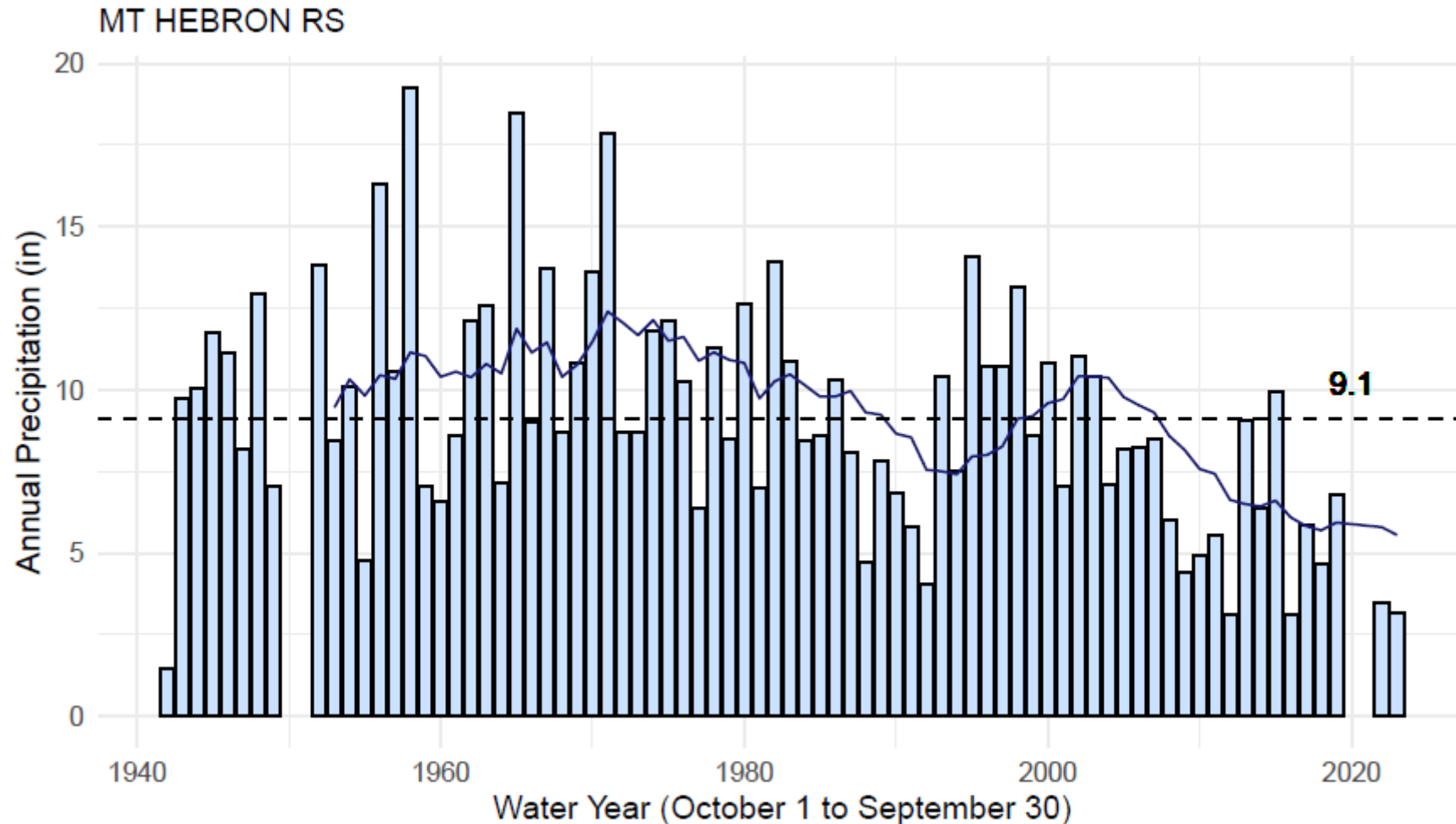
- Two corrective actions required for GSP approval
- **Corrective Action 1** - Reconduct the assessment of overdraft conditions and describe management actions to mitigate overdraft.
 - Refine the water budget, and better understand overdraft/no overdraft
 - Provide “reasonable means” to mitigate overdraft (describe feasible management actions)
- **Corrective Action 2** - Further justify the SMCs set for water levels, and quantitatively describe the effects of the criteria on users of groundwater.
 - Describe the specific, quantitative undesirable results that are planned to be avoided
 - MTs should be set at a level where depletion of supply across the Basin may lead to undesirable results

GSP Determination and Next Steps

- Monthly meetings with DWR
- Refinement of water budget
- Review of model results and boundary conditions
- Quantitative description of undesirable results for users of groundwater

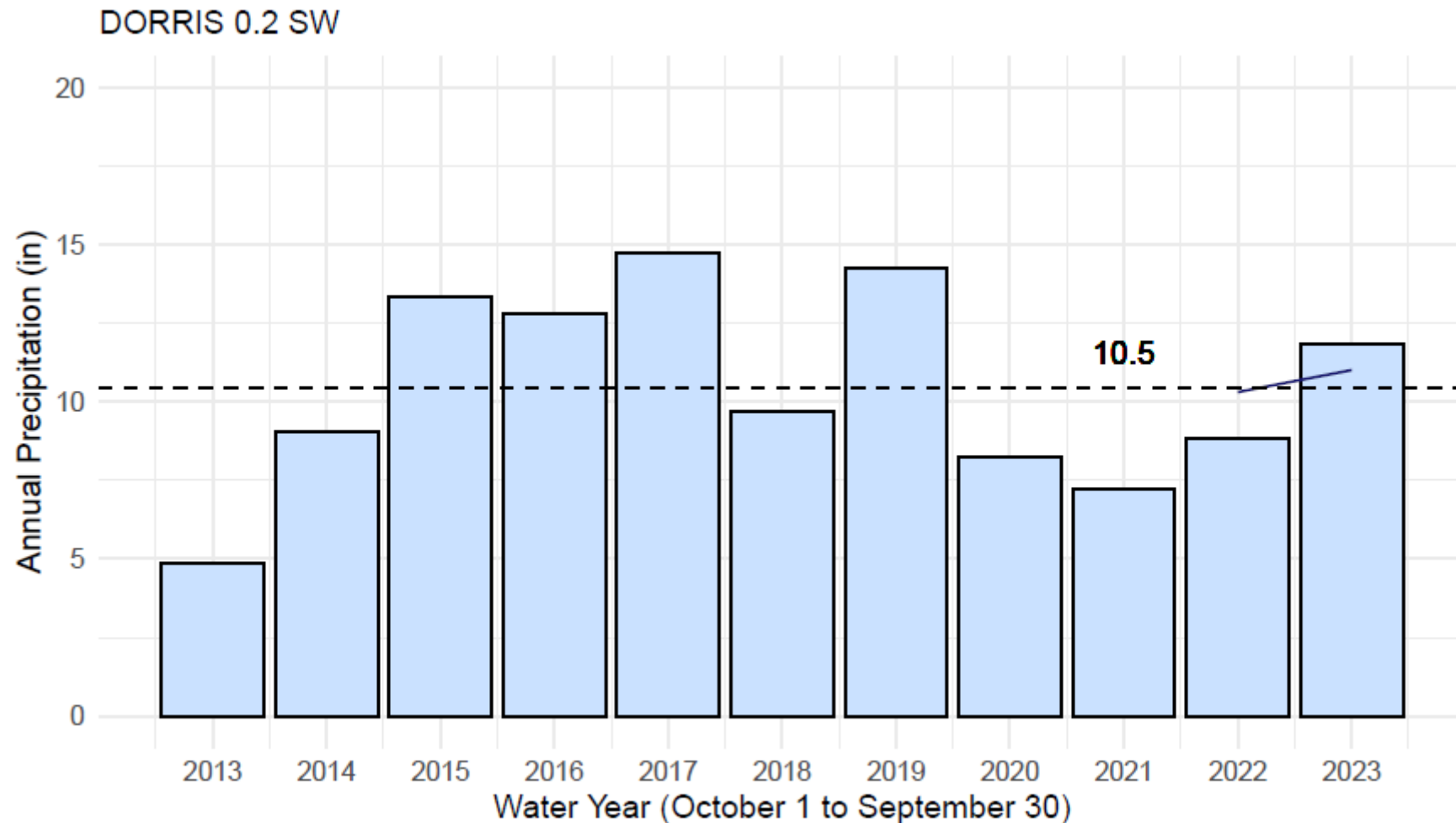
Annual Report Updates

Hydrologic Conditions-Precipitation



Annual Report Updates

Hydrologic Conditions-Precipitation



Annual Report Updates

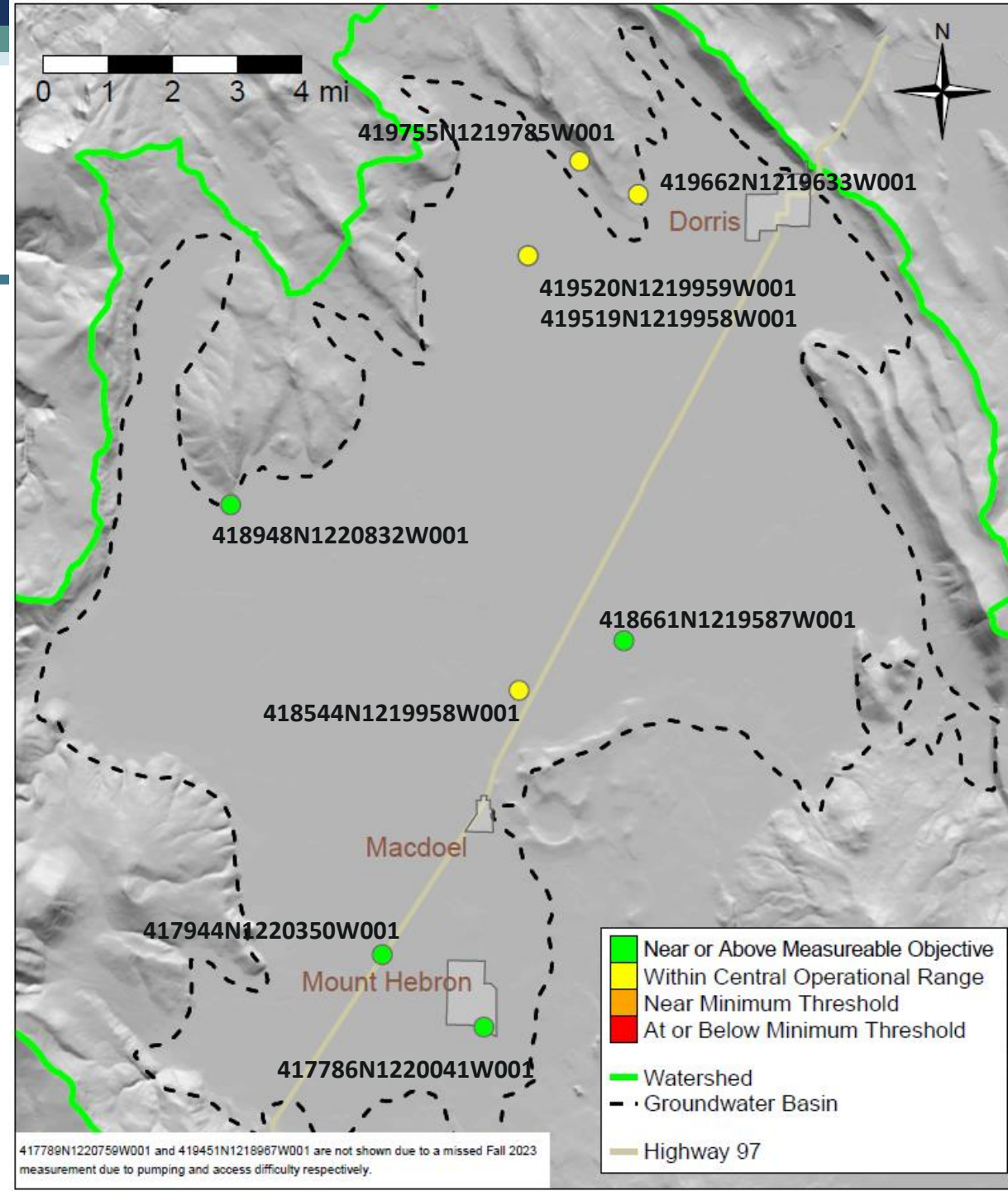
WY 2023 RMP Status

Representative Monitoring Point/Well	WY 2023 Minimum (ft)	WY 2023 Maximum (ft)	Measurable Objective Minimum (ft)	Measurable Objective Maximum (ft)	First Management Action Trigger (ft)	Soft Landing Trigger (ft)	Extended Minimum Threshold (ft)
417786N1220041W001	4177.83	4186.33	4181	4225	4163.0	4145	4130
417789N1220759W001	4192.91	4212.51	4213	4237	4208.0	4203	4188
417944N1220350W001	4211.33	4229.83	4190	4225	4187.5	4185	4170
418512N1219183W001	NA	NA	4193	4214	4187.0	4181	4166
418544N1219958W001	4206.32	4206.82	4211	4224	4203.0	4195	4180
418661N1219587W001	4184.50	4184.50	4186	4214	4174.5	4163	4148
418948N1220832W001	NA	NA	4193	4216	4181.5	4170	4155
419021N1219431W001	NA	NA	4203	4216	4196.0	4189	4174
419451N1218967W001	4142.23	4149.03	4129	4158	4126.5	4124	4109
419519N1219958W001	4224.44	4224.84	4229	4237	4226.0	4223	4208
419520N1219959W001	4228.64	4228.84	4231	4242	4228.5	4226	4211
419662N1219633W001	4152.76	4176.46	4161	4199	4150.0	4139	4124
419755N1219785W001	4170.40	4188.90	4187	4217	4179.0	4171	4156

Annual Report Updates

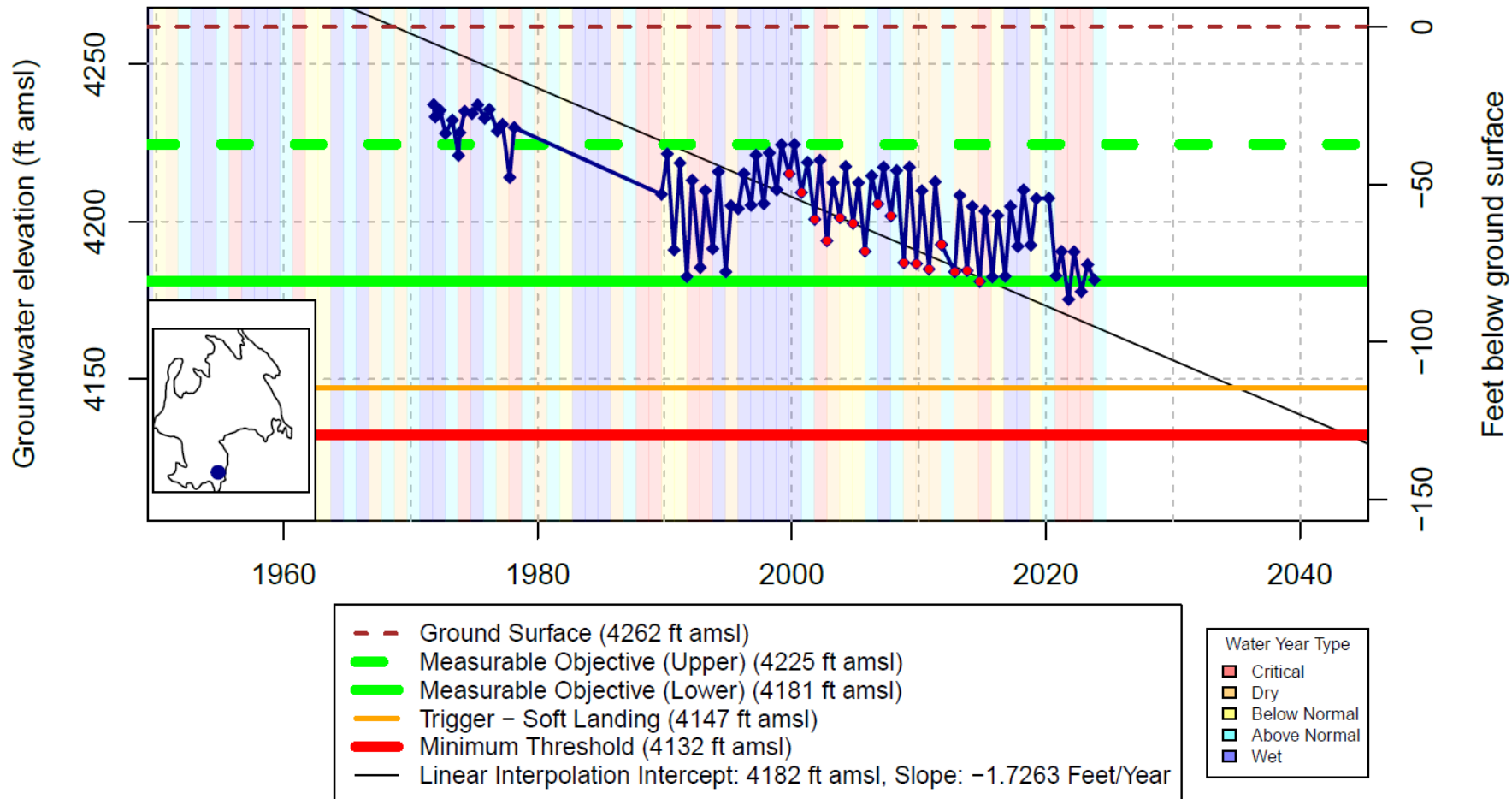
Status of Water Level RMPs

- Fall 2023



Groundwater Level Updates

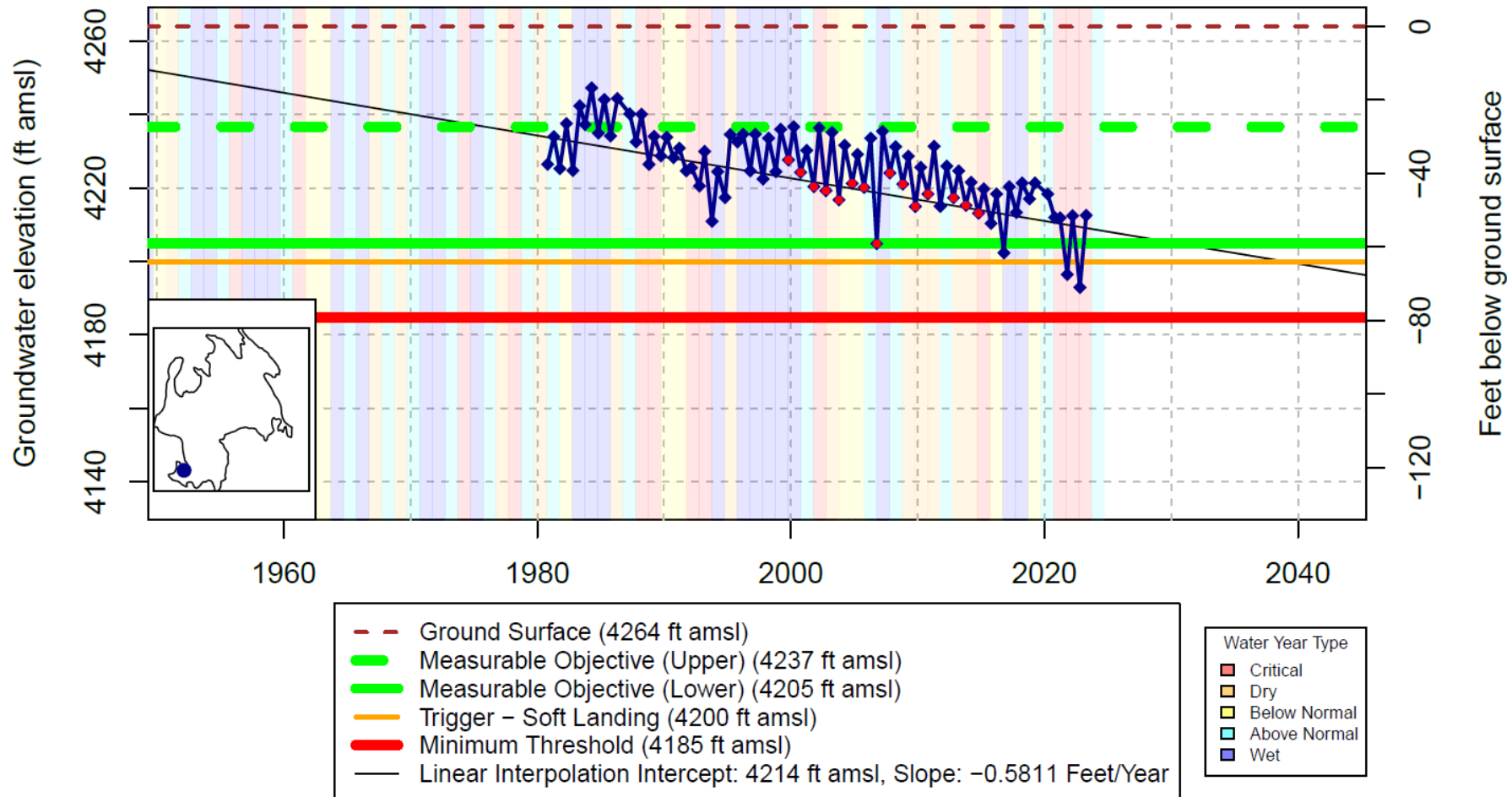
DWR Stn_ID: ; well_code: 417786N1220041W001; well_name: 45N01W06A001M; well_swn: 45N01W06A001M



Water Year Types from WY 2019–2023 are preliminary results calculated based on SGMA Water Year Type Dataset Development Report. The results will be finalized once DWR updates the water year type dataset for these years.

Groundwater Level Updates

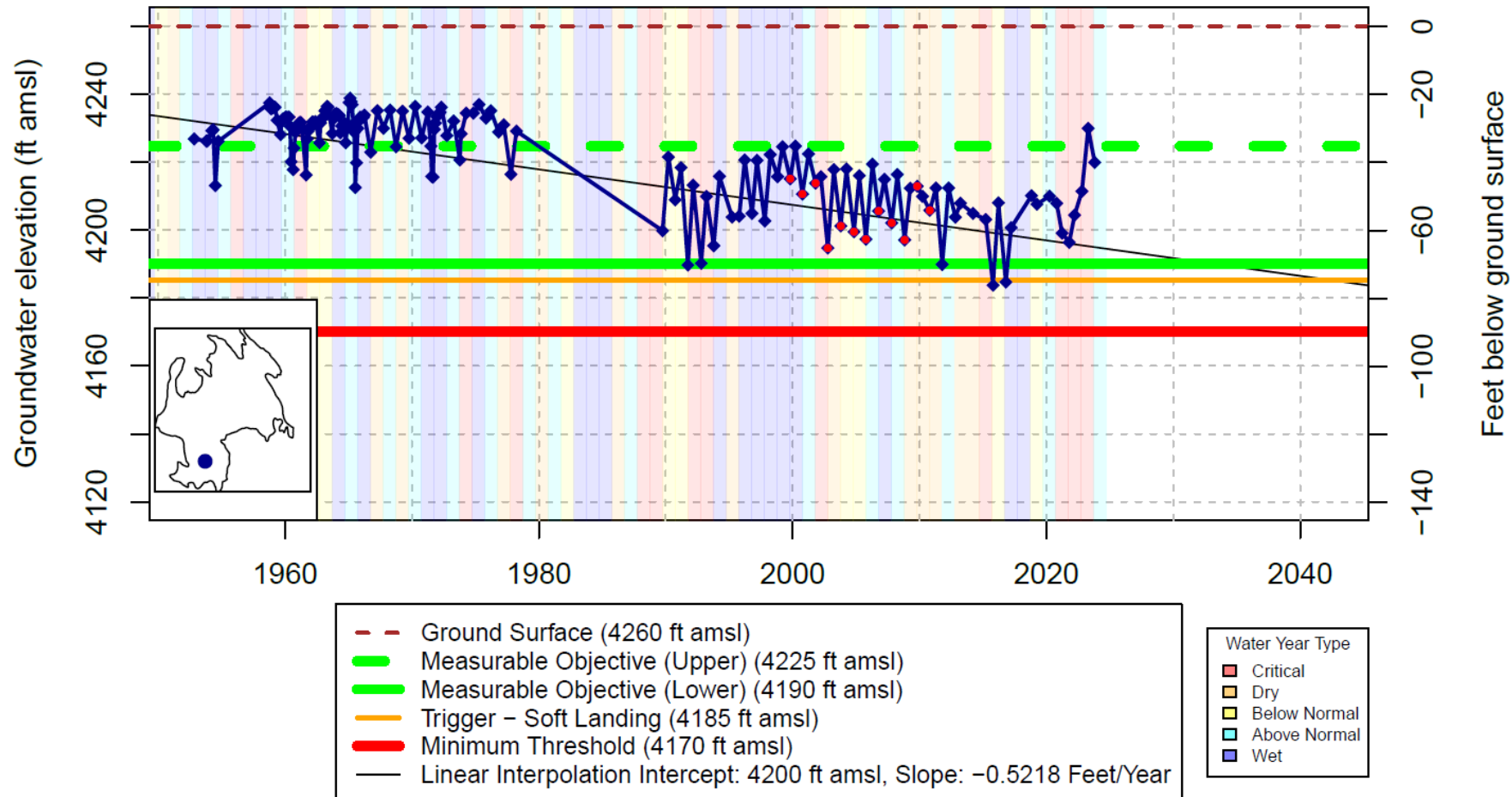
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Water Year Types from WY 2019–2023 are preliminary results calculated based on SGMA Water Year Type Dataset Development Report. The results will be finalized once DWR updates the water year type dataset for these years.

Groundwater Level Updates

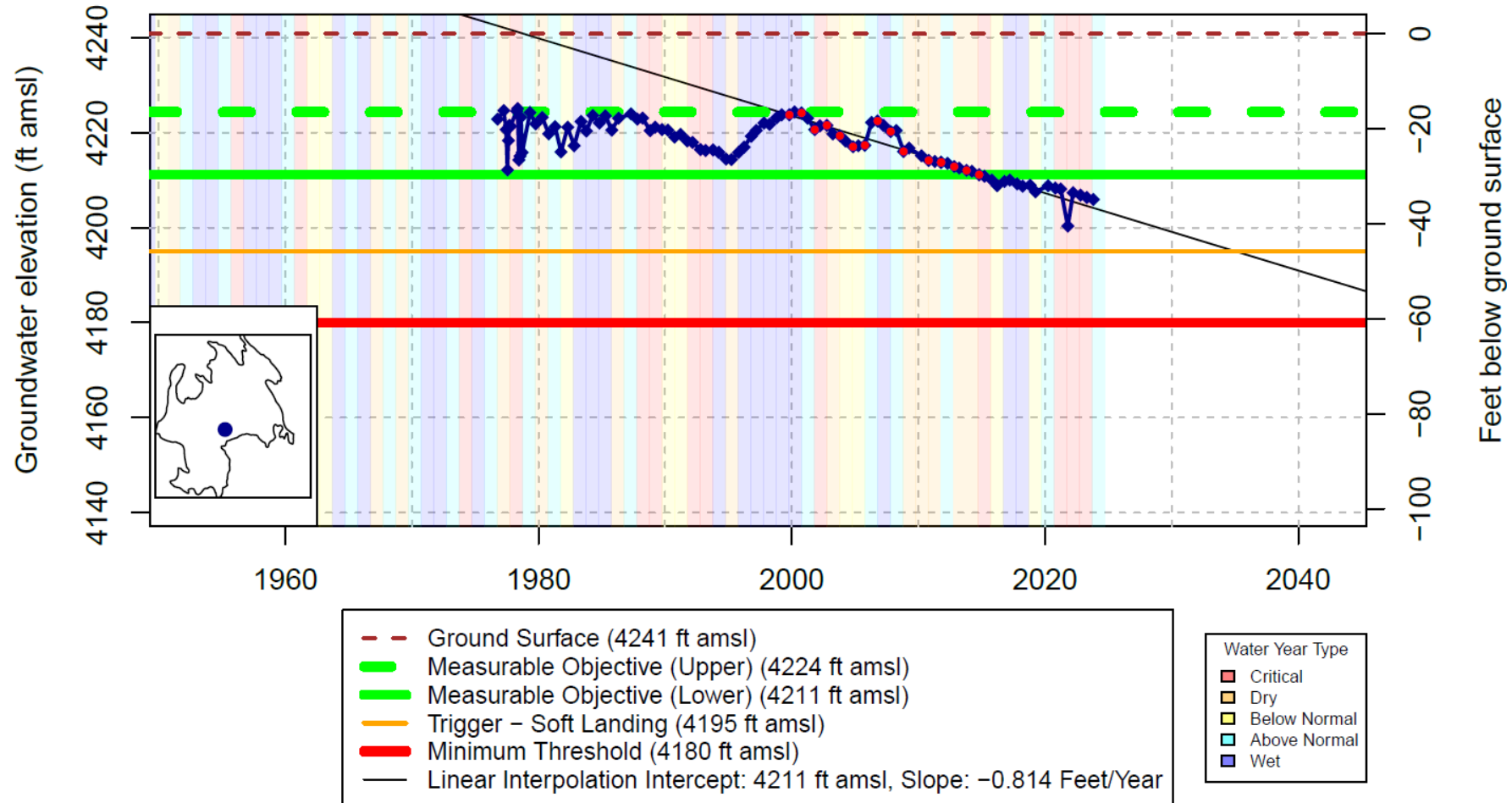
DWR Stn_ID: ; well_code: 417944N1220350W001; well_name: 46N02W25R002M; well_swn: 46N02W25R002M



Water Year Types from WY 2019-2023 are preliminary results calculated based on SGMA Water Year Type Dataset Development Report. The results will be finalized once DWR updates the water year type dataset for these years.

Groundwater Level Updates

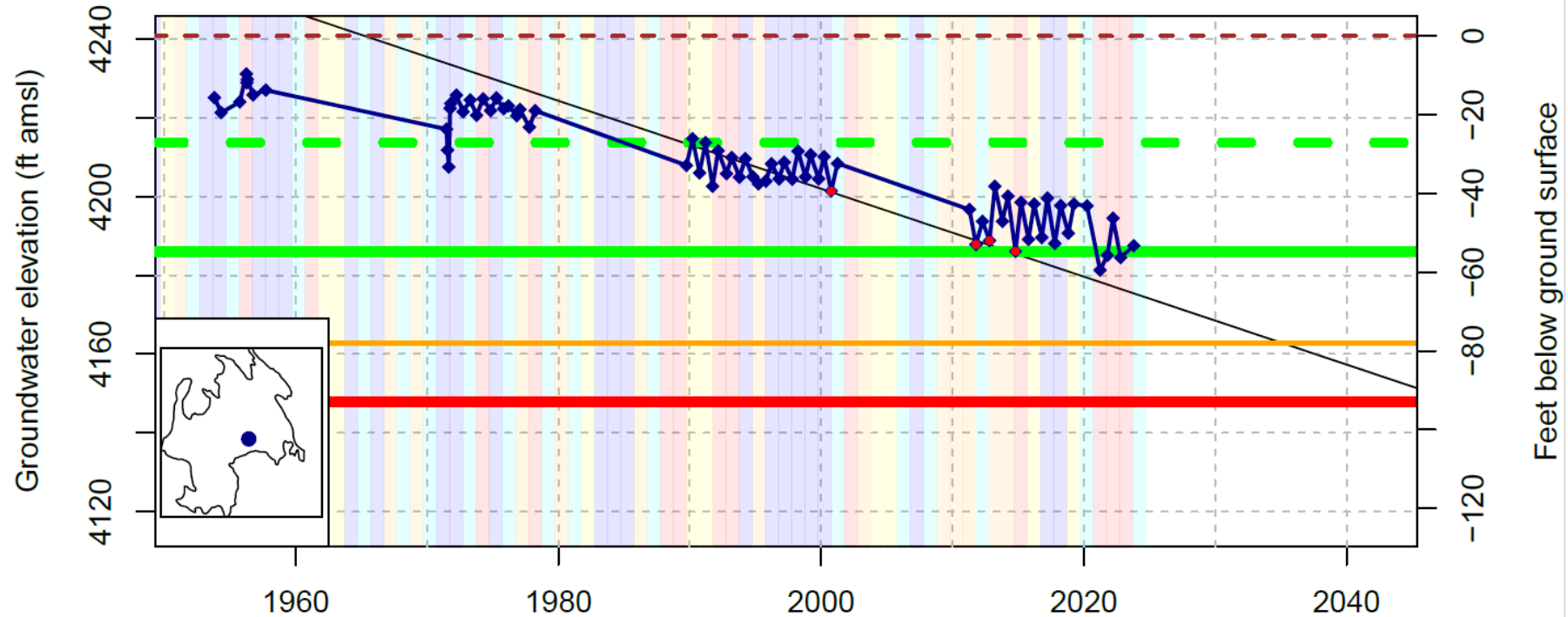
DWR Stn_ID: ; well_code: 418544N1219958W001; well_name: 46N01W04N002M; well_swn: 46N01W04N002M



Water Year Types from WY 2019–2023 are preliminary results calculated based on SGMA Water Year Type Dataset Development Report. The results will be finalized once DWR updates the water year type dataset for these years.

Groundwater Level Updates

DWR Stn_ID: ; well_code: 418661N1219587W001; well_name: 47N01W34Q001M; well_swn: 47N01W34Q001M



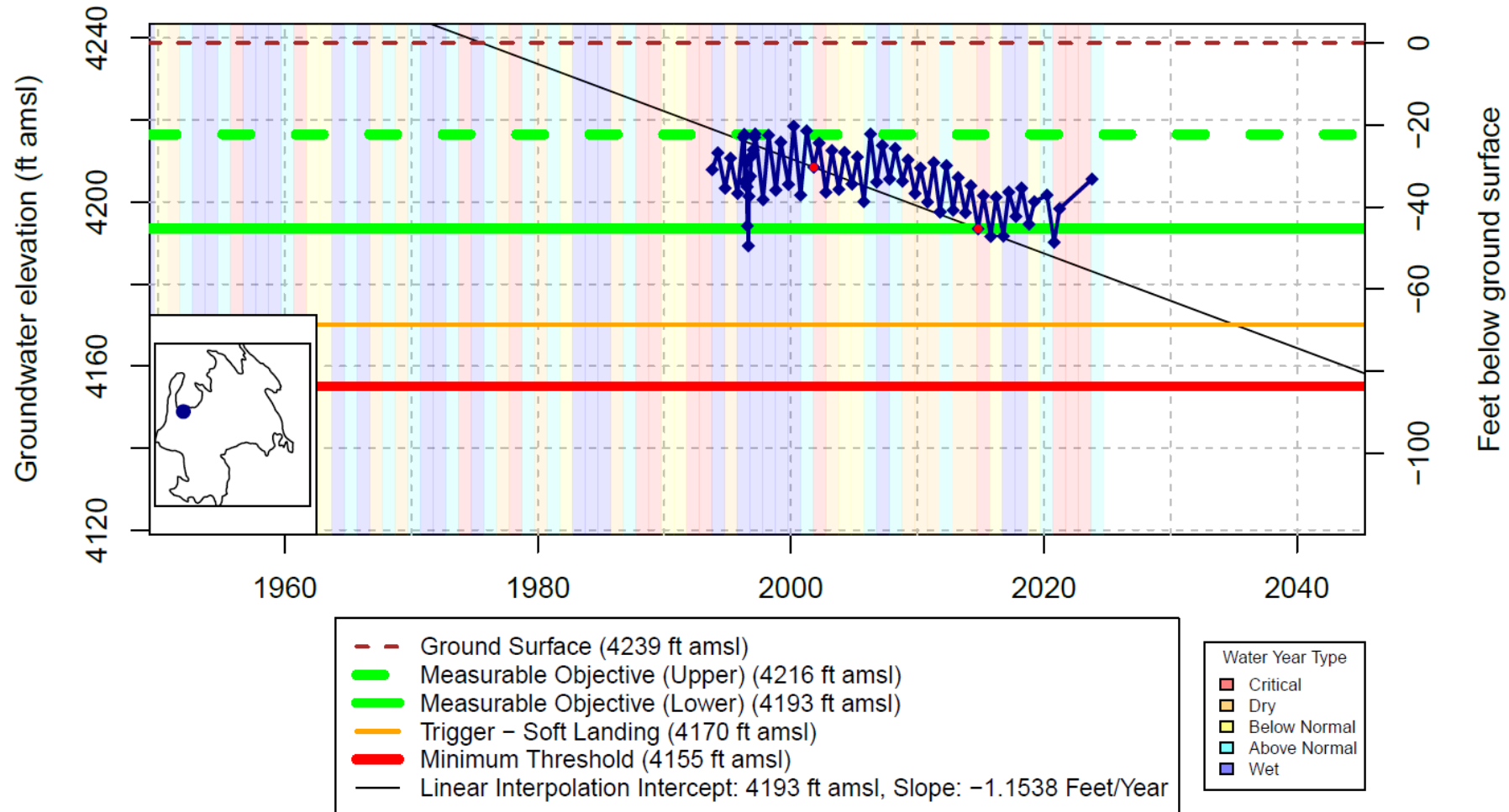
- - - Ground Surface (4241 ft amsl)
- Measurable Objective (Upper) (4214 ft amsl)
- Measurable Objective (Lower) (4186 ft amsl)
- Trigger - Soft Landing (4163 ft amsl)
- Minimum Threshold (4148 ft amsl)
- Linear Interpolation Intercept: 4185 ft amsl, Slope: -1.1154 Feet/Year

- Water Year Type
- Critical
 - Dry
 - Below Normal
 - Above Normal
 - Wet

Water Year Types from WY 2019-2023 are preliminary results calculated based on SGMA Water Year Type Dataset Development Report. The results will be finalized once DWR updates the water year type dataset for these years.

Groundwater Level Updates

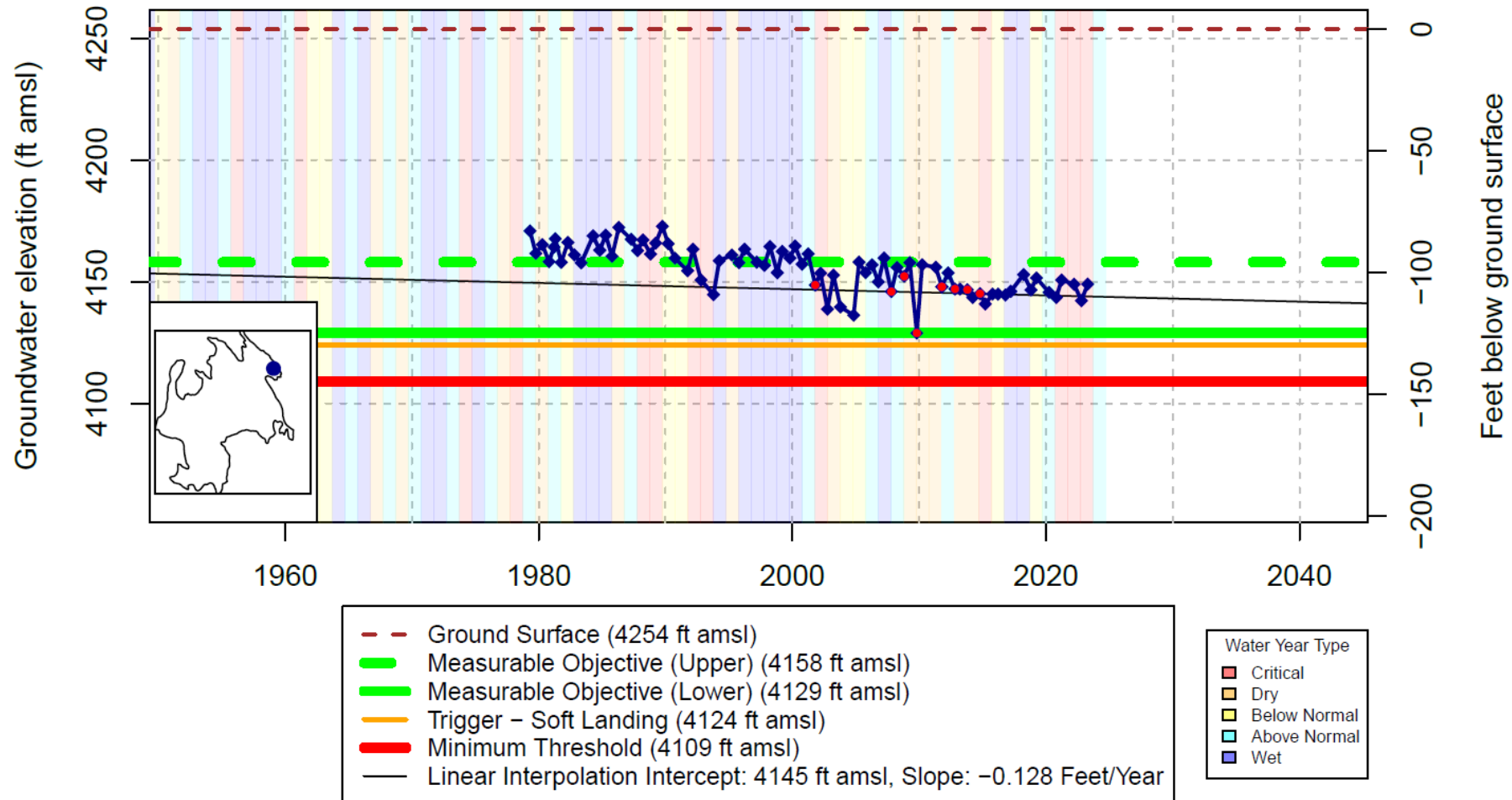
DWR Stn_ID: ; well_code: 418948N1220832W001; well_name: 47N02W27C001M; well_swn: 47N02W27C001M



Water Year Types from WY 2019–2023 are preliminary results calculated based on SGMA Water Year Type Dataset Development Report. The results will be finalized once DWR updates the water year type dataset for these years.

Groundwater Level Updates

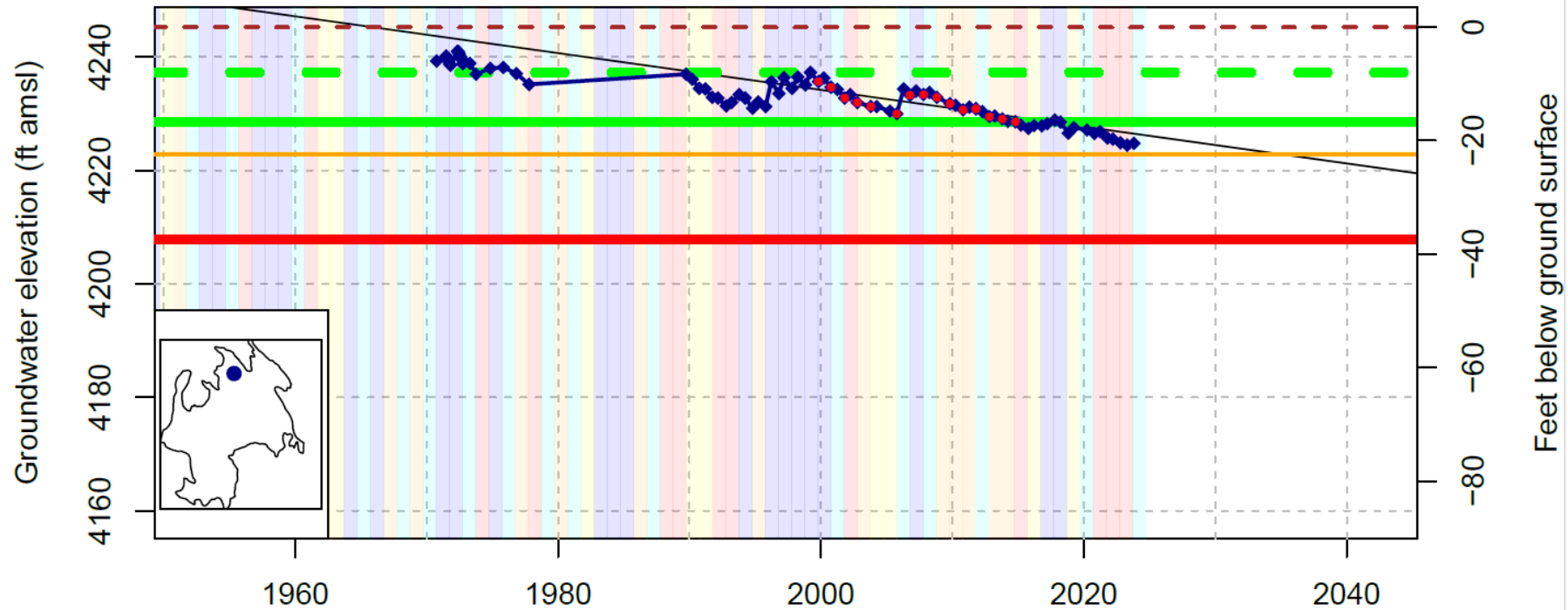
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Water Year Types from WY 2019–2023 are preliminary results calculated based on SGMA Water Year Type Dataset Development Report. The results will be finalized once DWR updates the water year type dataset for these years.

Groundwater Level Updates

DWR Stn_ID: ; well_code: 419519N1219958W001; well_name: 47N01W04D002M; well_swn: 47N01W04D002M



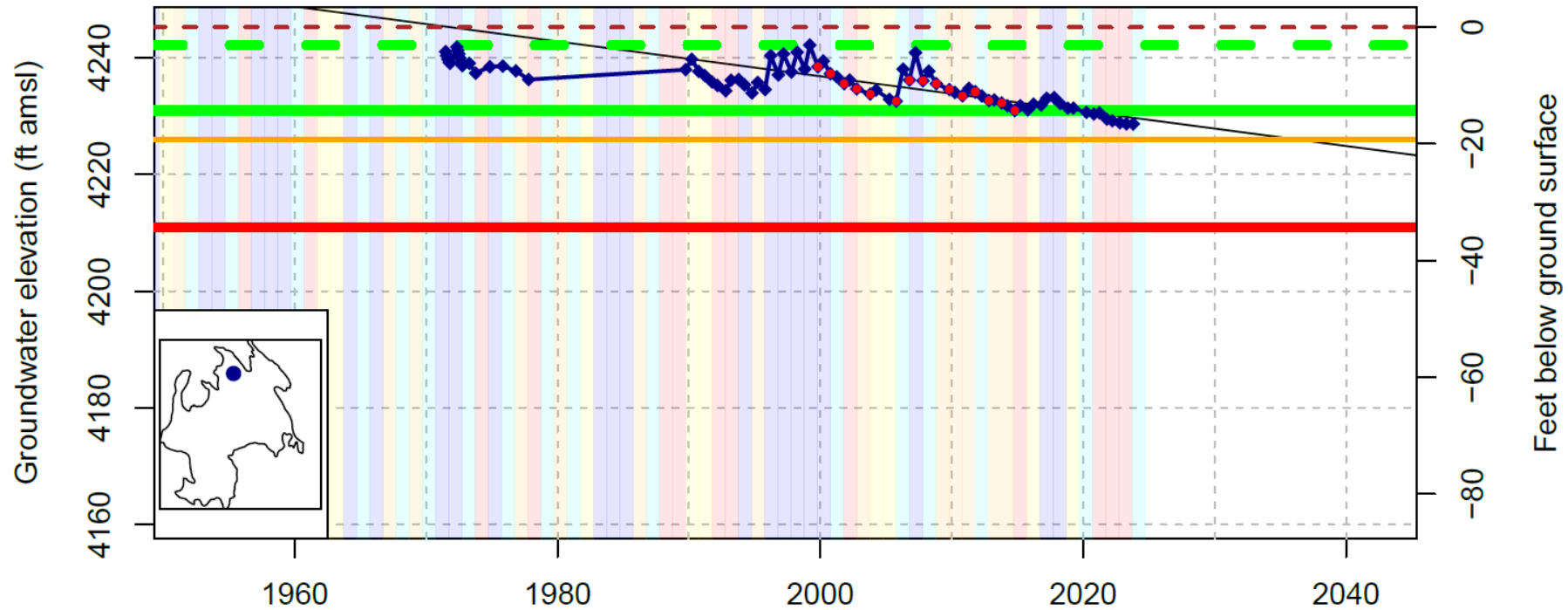
- - - Ground Surface (4245 ft amsl)
- Measurable Objective (Upper) (4237 ft amsl)
- Measurable Objective (Lower) (4229 ft amsl)
- Trigger - Soft Landing (4223 ft amsl)
- Minimum Threshold (4208 ft amsl)
- Linear Interpolation Intercept: 4229 ft amsl, Slope: -0.3238 Feet/Year

- Water Year Type
- Critical
 - Dry
 - Below Normal
 - Above Normal
 - Wet

Water Year Types from WY 2019–2023 are preliminary results calculated based on SGMA Water Year Type Dataset Development Report. The results will be finalized once DWR updates the water year type dataset for these years.

Groundwater Level Updates

DWR Stn_ID: ; well_code: 419520N1219959W001; well_name: 47N01W04D001M; well_swn: 47N01W04D001M



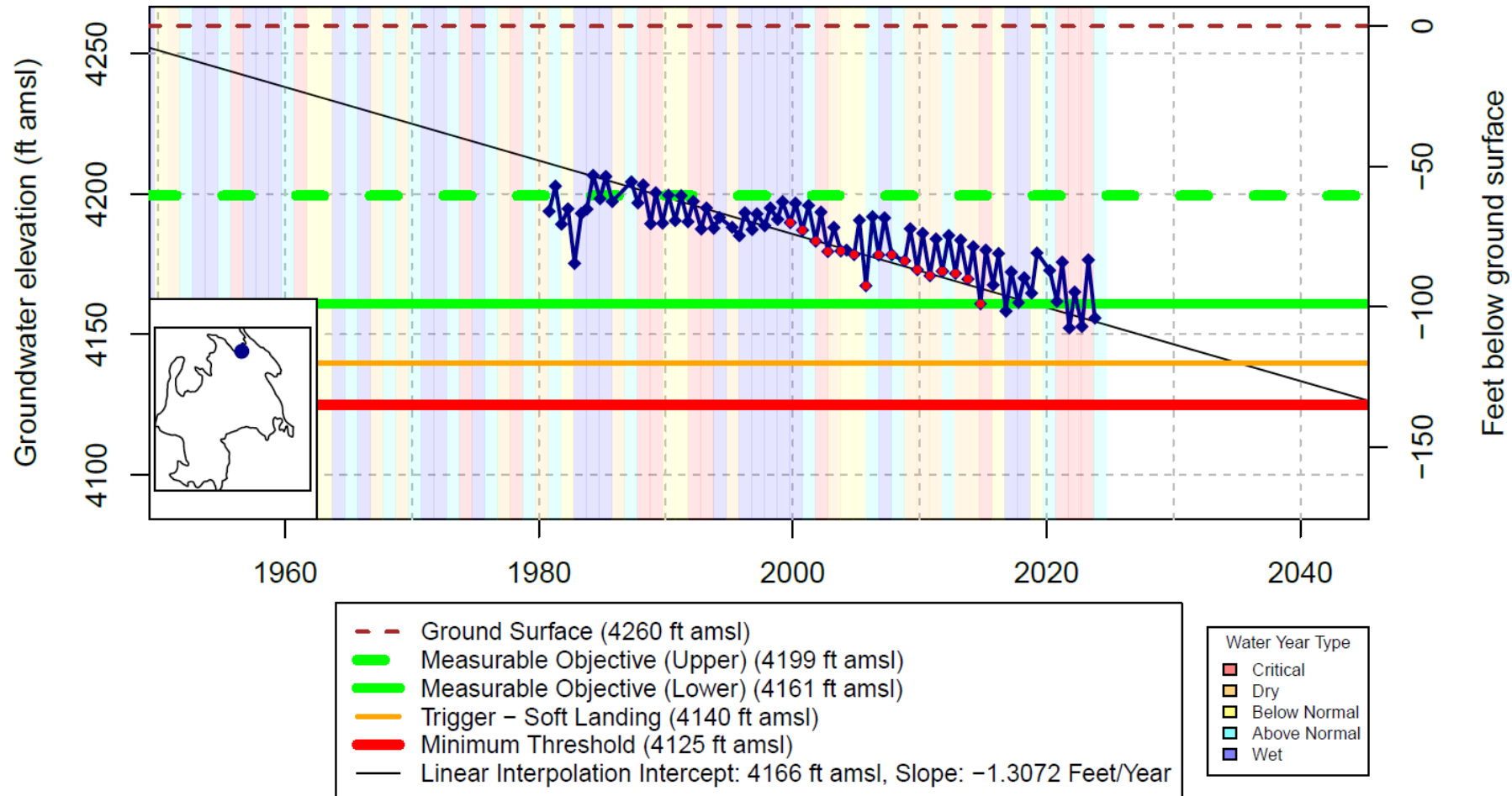
- - Ground Surface (4245 ft amsl)
- Measurable Objective (Upper) (4242 ft amsl)
- Measurable Objective (Lower) (4231 ft amsl)
- Trigger - Soft Landing (4226 ft amsl)
- Minimum Threshold (4211 ft amsl)
- Linear Interpolation Intercept: 4232 ft amsl, Slope: -0.2984 Feet/Year

- Water Year Type
- Critical
- Dry
- Below Normal
- Above Normal
- Wet

Water Year Types from WY 2019–2023 are preliminary results calculated based on SGMA Water Year Type Dataset Development Report. The results will be finalized once DWR updates the water year type dataset for these years.

Groundwater Level Updates

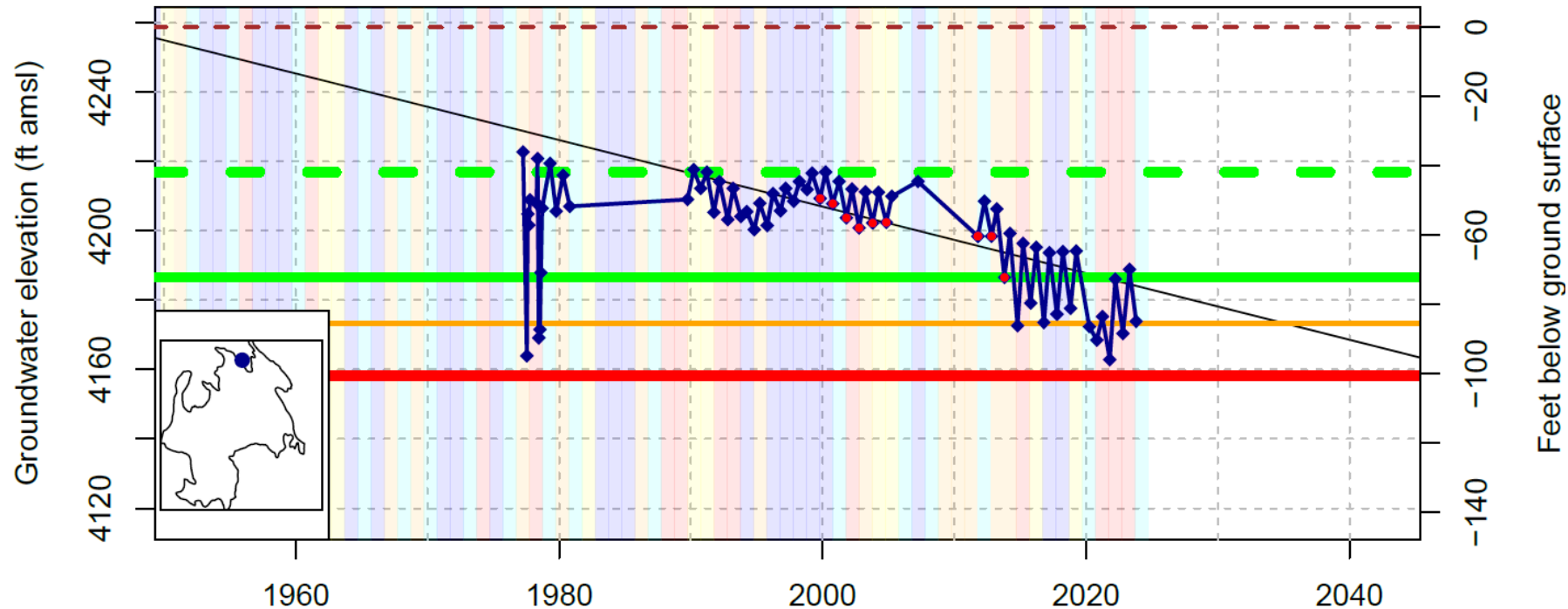
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Water Year Types from WY 2019–2023 are preliminary results calculated based on SGMA Water Year Type Dataset Development Report. The results will be finalized once DWR updates the water year type dataset for these years.

Groundwater Level Updates

DWR Stn_ID: ; well_code: 419755N1219785W001; well_name: 48N01W28J001M; well_swn: 48N01W28J001M



- - Ground Surface (4259 ft amsl)
- Measurable Objective (Upper) (4217 ft amsl)
- Measurable Objective (Lower) (4187 ft amsl)
- Trigger - Soft Landing (4173 ft amsl)
- Minimum Threshold (4158 ft amsl)
- Linear Interpolation Intercept: 4193 ft amsl, Slope: -0.9592 Feet/Year

- Water Year Type
- Critical
 - Dry
 - Below Normal
 - Above Normal
 - Wet

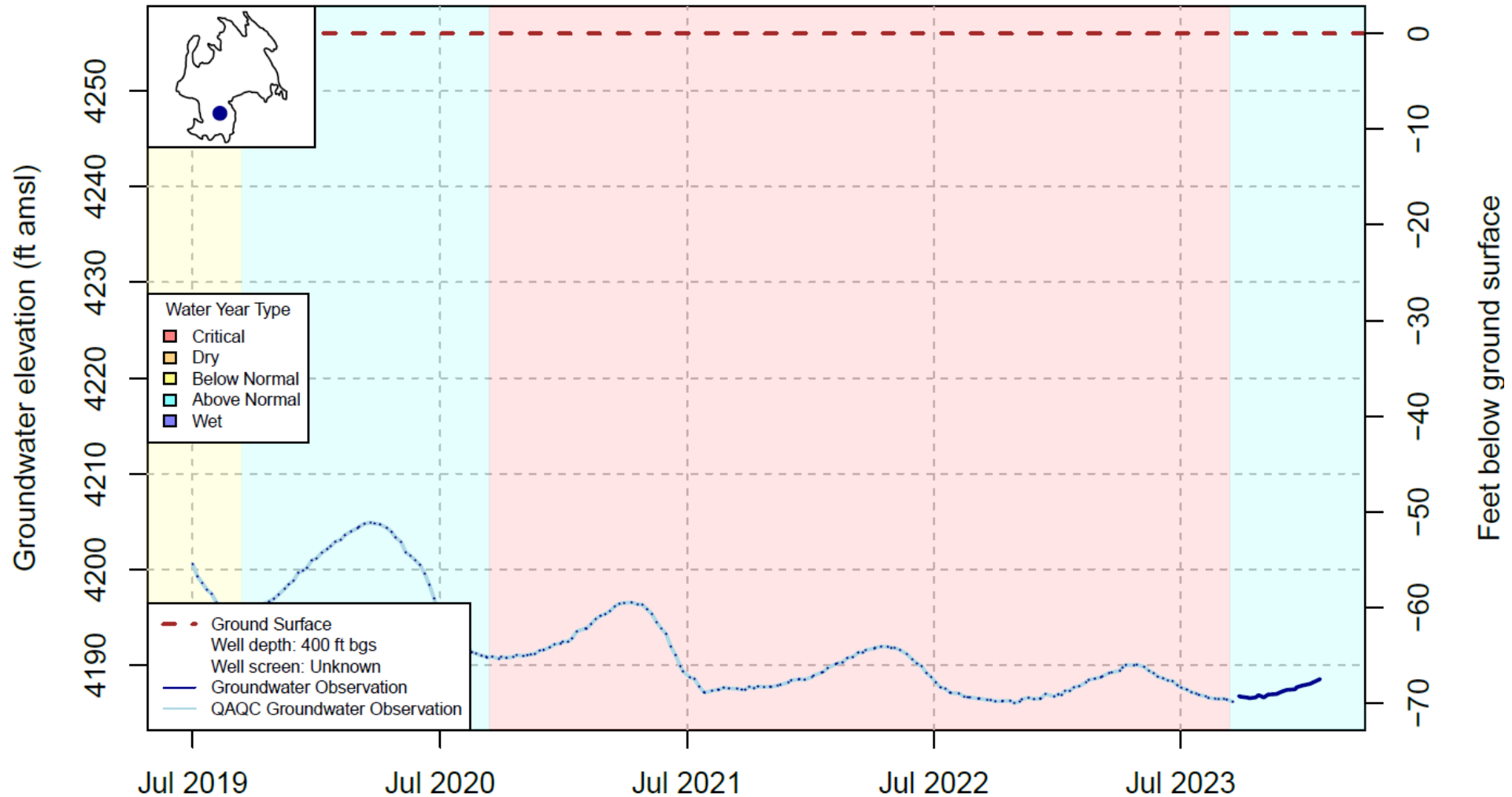
Water Year Types from WY 2019-2023 are preliminary results calculated based on SGMA Water Year Type Dataset Development Report. The results will be finalized once DWR updates the water year type dataset for these years.

Additional Continuous Hydrographs

Annual Report Water Year 2023

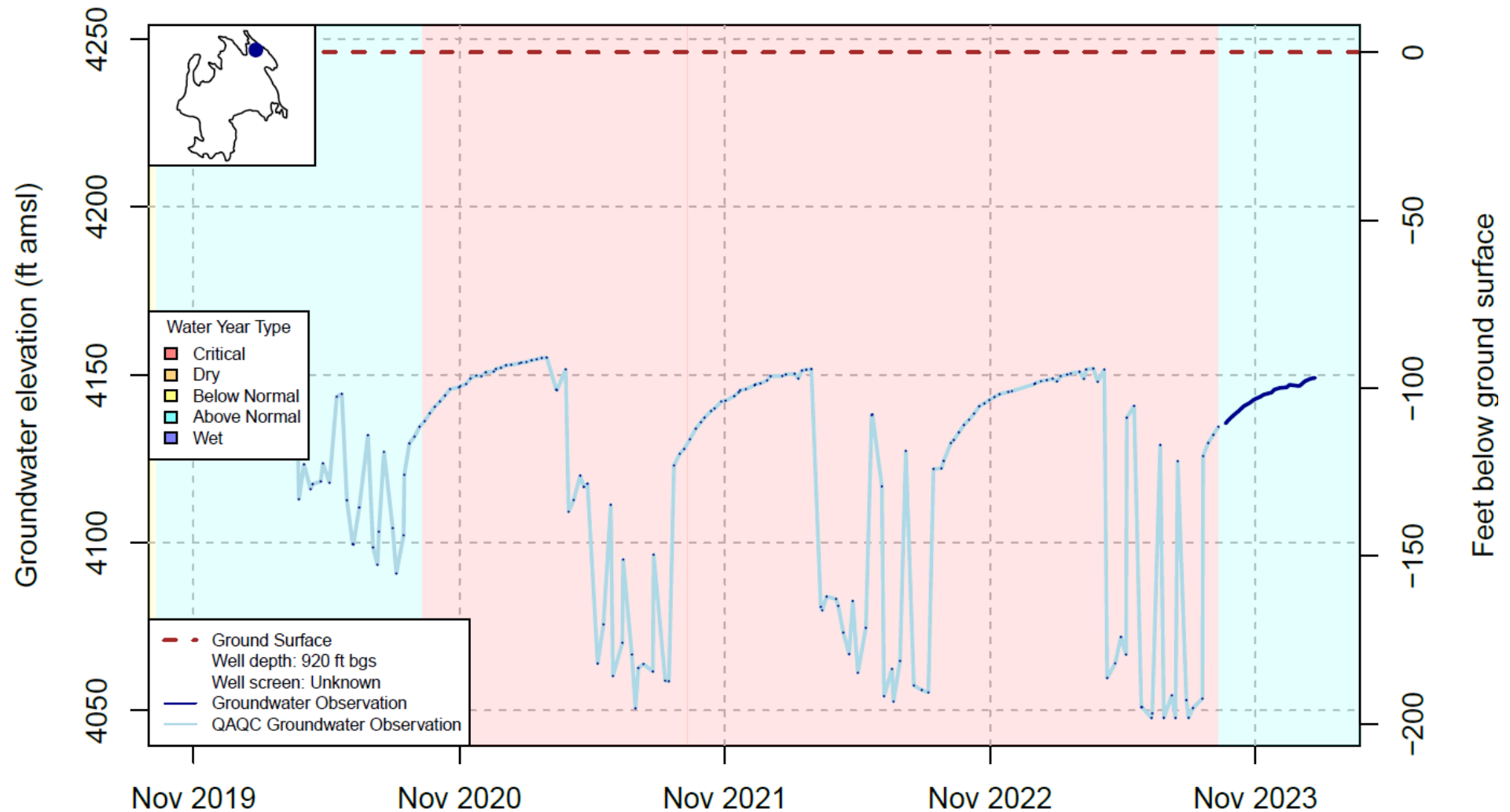
Groundwater Level Updates

Well Code: BUT_07; SWN: NA



Groundwater Level Updates

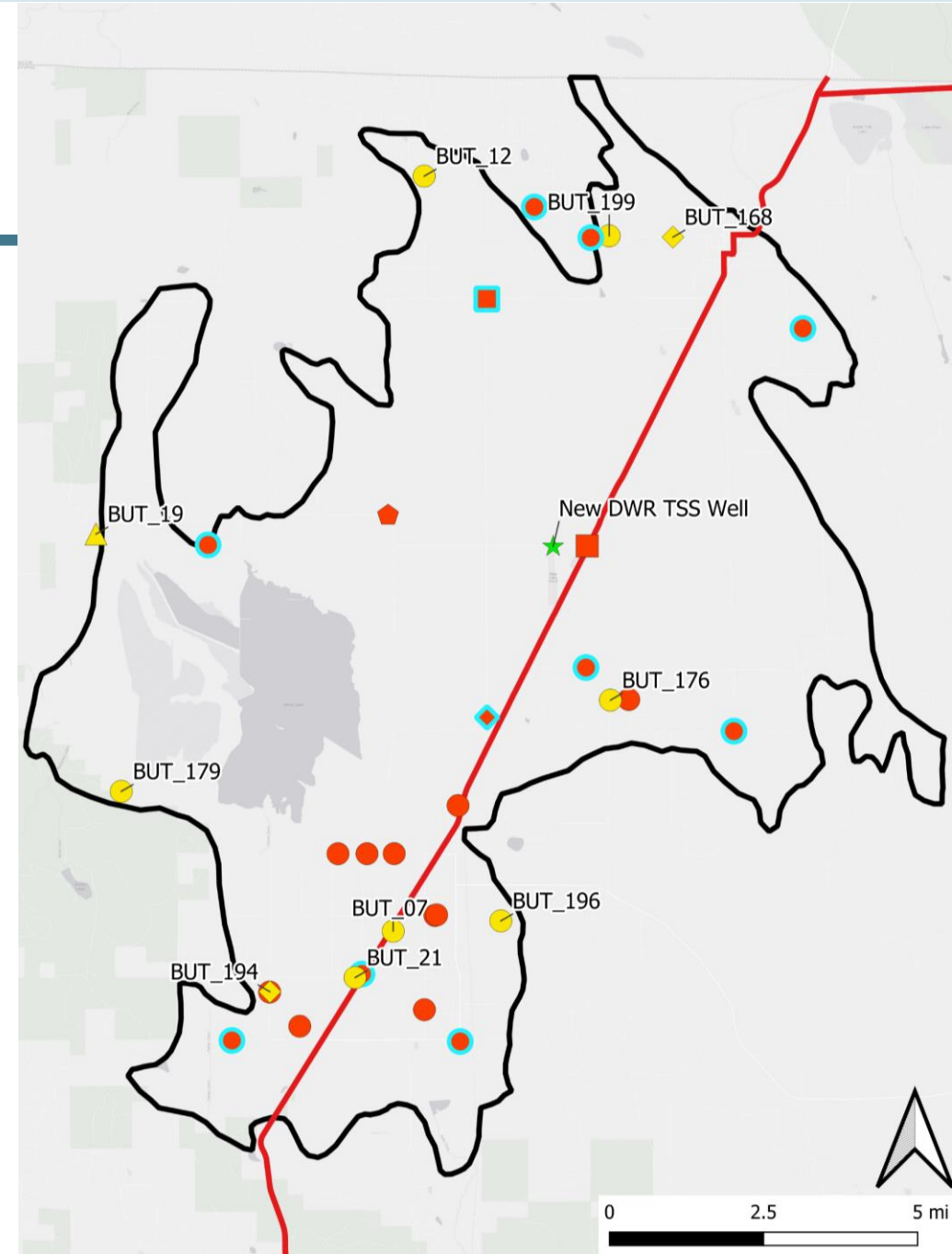
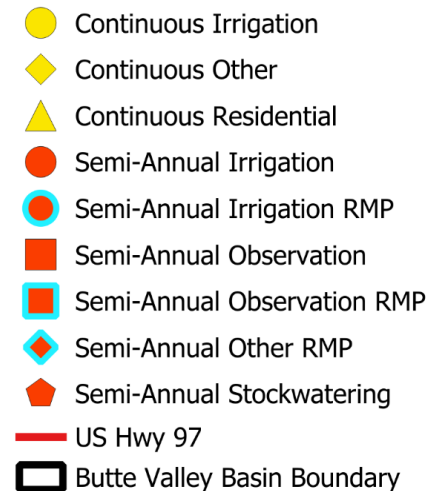
Well Code: BUT_168; SWN: NA



Groundwater Level Monitoring

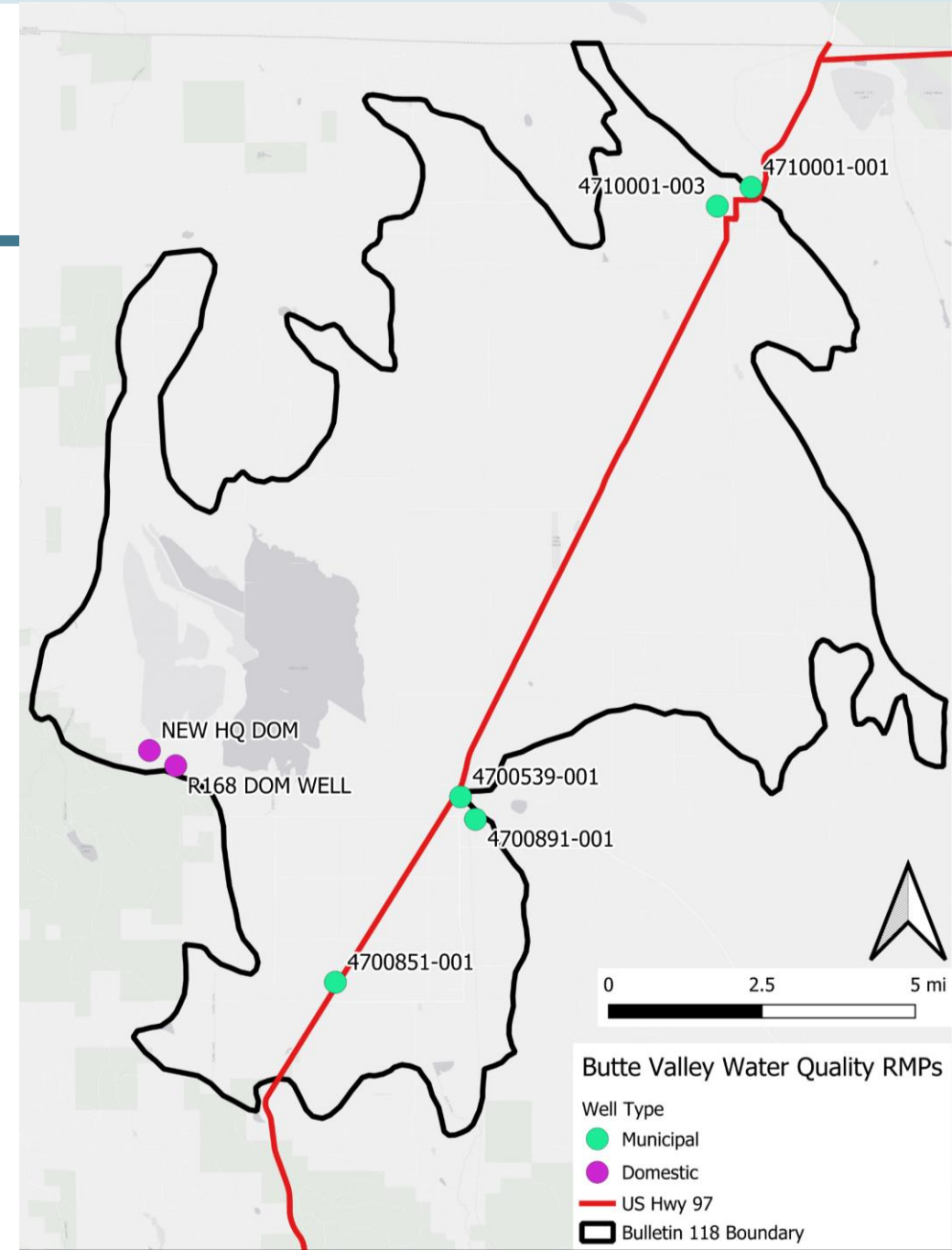
- 10 LWA wells
 - Measured continuously
 - 7 irrigation
 - 1 residential
 - 2 other
- 24 CASGEM Wells
 - Measured twice per year
 - 19 irrigation
 - 3 observation
 - 1 stockwatering
 - 1 other
- 1 New DWR TSS Well

Butte Basin Groundwater Level Monitoring Network



Groundwater Quality Monitoring

- 5 Municipal Wells
- 2 Domestic Wells
- SMCs set for:
 - Arsenic
 - Specific conductivity
 - Nitrate



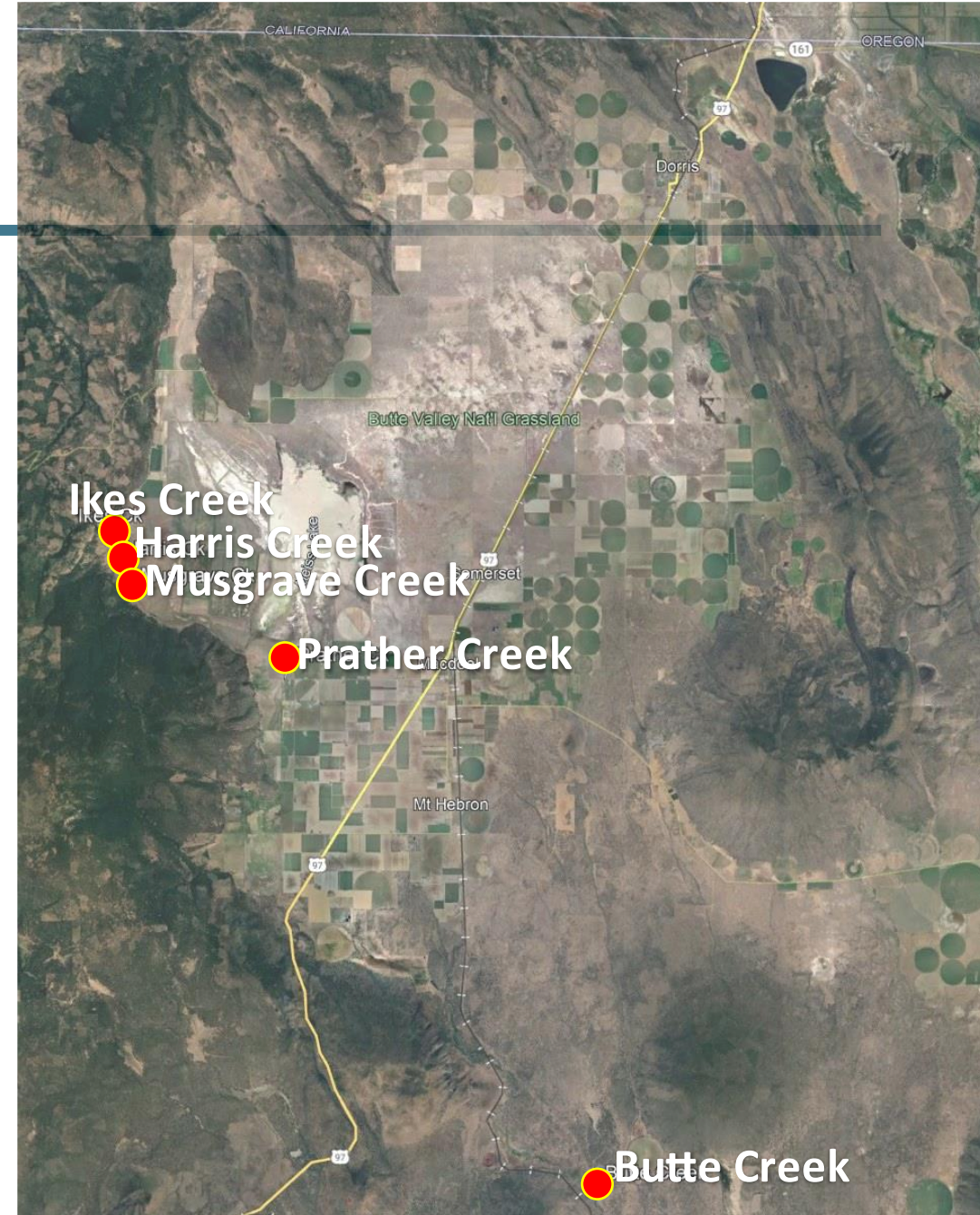
Monitoring data, monitoring network expansion, data gaps

Data Gap Work Group Meeting Outcomes

- High Priority
 - Snow station
 - Stream gage additions
- Medium
 - Expanded isotope and noble gas sampling
- Low
 - GDE identification and ground truth evaluation
- Pesticide sampling: two-time sampling of wells for pesticides
- Surface flows and interconnected surface water
- Addition of water quality RMPs

New Flow Stations

- New flow stations
 - Operating on Harris and Butte Creeks
 - Planned on Ikes, Musgrave, and Prather Creeks
- Will require more field work to develop rating curves
 - Rating curves convert stage height (feet) to stream flow (gallons per minute...)



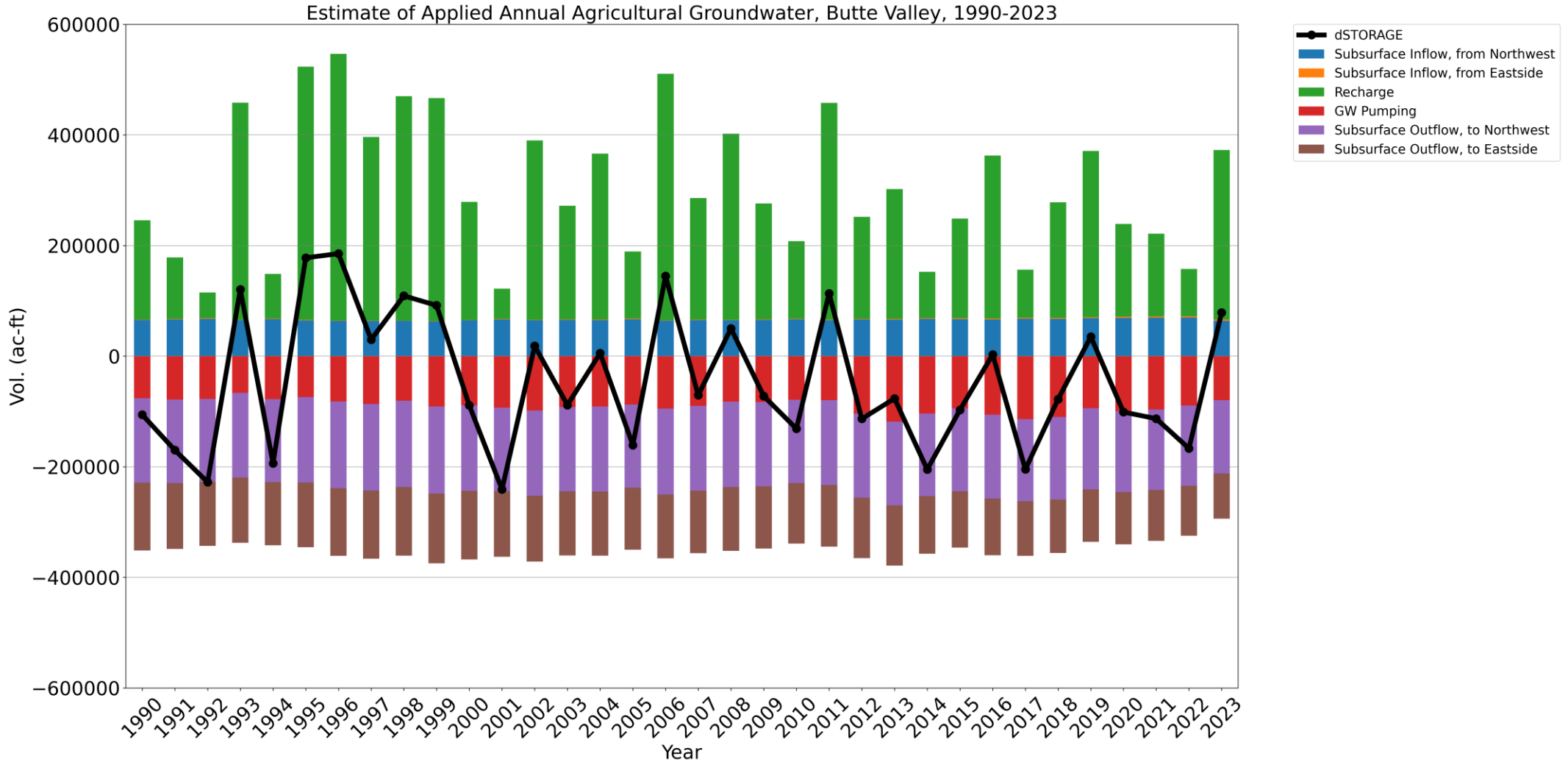


 <i>In Progress</i>	 <i>Added to Backlog</i>
 <i>Complete</i>	 <i>Blocked</i>

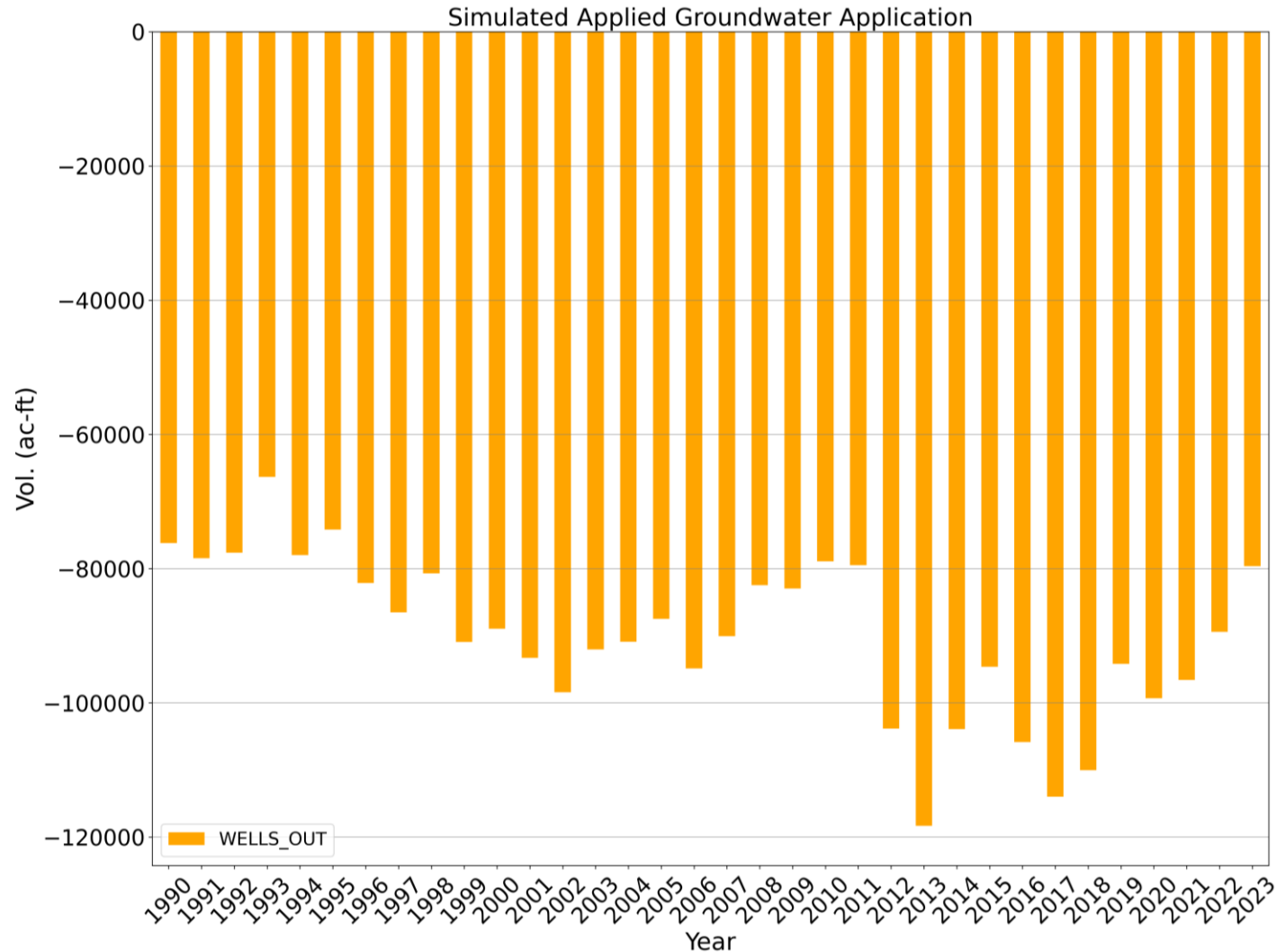
Model Priority Backlog *Through February 2024*

#	Feature	Description	Status
1	Extend model to 2023	Extend all MODFLOW packages to 2023 and run model	Complete
2	Update head observations	Update head observation data in HOB package	Complete
3	Update geology	Update geology with newly available AEM from DWR	Complete
4	Update recharge	Incorporate updated PRMS recharge into MODFLOW model	In Progress
5	Update pumping	Incorporate soil water budget to estimate MODFLOW pumping	In Progress
6	Incorporate new geology	Incorporate new geology into MODFLOW model	Not Started
7	Update boundary conditions	Convert constant head boundary conditions to general head boundaries	Not Started
8	Remove steady state	Replace first stress period from steady state to transient	Not Started
9	Calibration	Recalibrate hydraulic parameters	Not Started

Butte Model Update



Butte Model Update: applied groundwater



Butte Model Update: change in land use

Acres by Crop Type in BVHIM

Crop Type	2000	2010	2014	2020
Alfalfa	20,756	22,861	22,033	14,566
Grain and Hay	10,205	8,730	8,905	7,795
Idle	2,233	4,373	7,919	6,739
Managed Wetlands	5,230	4,665	4,785	4,785
Misc. Truck	875	312	743	698
Pasture	4,480	5,163	4,979	9,551
Strawberries	1,764	3,783	3,031	2,434
Total Acres	45,544	49,887	52,394	46,567

Note:

During modeling period (WY 1990-2023), crop type for each field is based on the county land use survey from 2000, 2010, 2014, 2020.

In years without available survey data, crop type of the nearest year in time was used.

2020 land use survey is used during the model update period (WY 2019-2023)

Implementation Grant Funded Projects

SGMA Compliance and
GSP Updates

Fee Study and Economic
Analysis

Well Inventory

Monitoring Network

Implementation Approach



Work group formation



Work groups will oversee project design, progress, and evaluation of results



Updates for each project will be provided to the larger group at quarterly advisory committee meetings

Timeline

2023 Q3

- Formation of work groups in August AC Meetings
- Work groups approve draft project scope and schedule
- Final grant awards expected in September

2023 Q4

- October AC Meetings- review of final funding awards
- Detailed scope and schedule for funded projects provided to Advisory Committee

2024 Q1

- February AC Meetings- updates from project work groups, updates depend on individual project schedules

Jan 1 Feb 1 Mar 1 Apr 1 May 1 Jun 1 Jul 1 Aug 1 Sept 1 Oct 1 Nov 1 Dec 1 Dec 31



 In Progress	 Added to Backlog
 Complete	 Blocked

Implementation Grant Progress *Through February 2024*

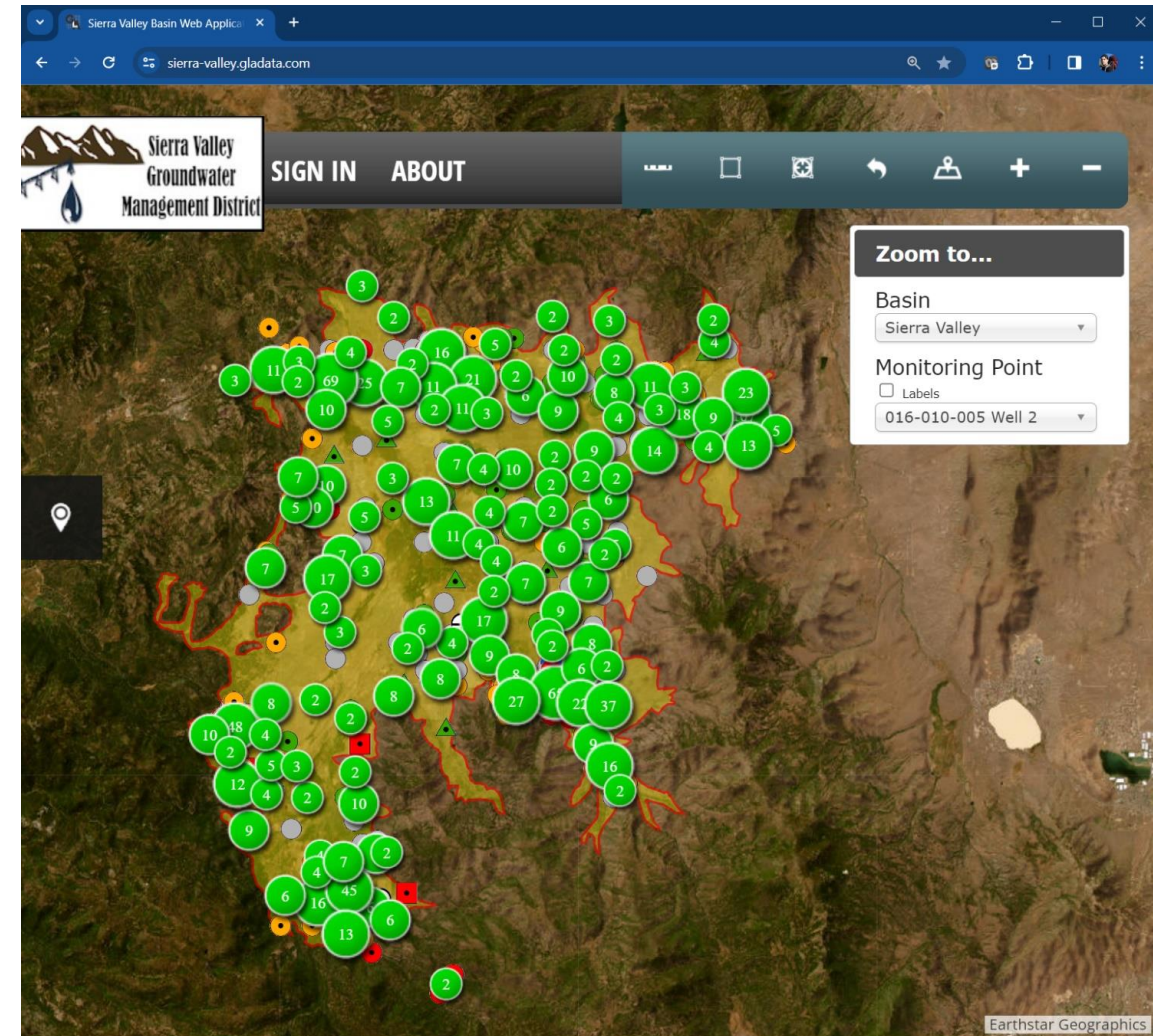
#	Component	Notes	Status
1	SGMA Compliance and GSP Updates		
1.1	GSP Revisions	Due January 2027	In Progress
1.2	Reporting (Data and Annual Report)	Annual Reports due April 1 of each year	In Progress
1.3	Model Updates and Scenario Evaluation		In Progress
1.4	Data Gaps and Monitoring Expansion and DMS		In Progress
2	Fee Study and Economic Analysis		
2.1	Evaluation of Fee/Rate Options and Schedule Development		Not Started
2.2	Parcel scale groundwater use estimate		In Progress
2.3	Economic Analysis and Water Market Analysis		Not Started
3	Well Inventory		
3.1	Database Development and Well Risk Assessment		In Progress
3.2	Monitoring Well Construction or Well Instrumentation		Not Started
4	Monitoring Network		
4.1	Upper watershed monitoring	Locate snow monitoring stations, secure permissions	In Progress
4.2	Voluntary well metering	ID wells to instrument, goal of 40 wells.	Not Started
4.3	Monitoring network expansion	Water quality wells, install two stream gauges	In Progress
4.4	Improve GDE Analysis	Review GDEs identified in GSP. Collect monitoring data	Not Started

City of Dorris Well Deepening Project

- Funded by Small Community Drought Relief Program (DWR)
- Surveys mailed, posted on City website and at Macdoel and Dorris post offices in March 2023
- Survey responses identified 10 wells needing replacement or repair.
- Site visits in June 2023 identified 5 wells needing repair
- Contract for drilling of 4 wells (based on available grant funds) finalized in February 2024
- Well replacement/installation scheduled for May/June 2024

Data Management System (DMS)

- SGMA DMS
- Automated management of reporting and monitoring data.
- Provides an effective and affordable option for storing, visualizing, and managing their basin data.
- Web accessible, map-based user interface (front end).
- SQL-server relational database (backend).



Data Management System (DMS)

The screenshot displays the Sierra Valley Basin Web Application interface. The browser address bar shows the URL `sierra-valley.gladata.com`. The page header includes the Sierra Valley Groundwater Management District logo and navigation links for `SIGN IN` and `ABOUT`. The main map area shows a satellite view of the basin with numerous green circular markers representing wells, many of which are clustered. A `Zoom to...` panel is open on the right, showing a search for well names and a list of results including `DMW 2s`, `DMW 3d`, `DMW 3i`, `DMW 3s`, `DMW 4d`, `DMW 4i`, `DMW 4s`, `DMW 5d`, `DMW 5i`, and `DMW 5c`. The `DMW 3s` entry is selected. A `Map Layers Pane` is visible on the left side of the map. A `Map tools` toolbar is located at the top right of the map area. The interface also includes a `Wells (clustered)` label pointing to the green markers and a `Click on points for associated data` label pointing to a specific well marker.

Sierra Valley Basin Web Application

sierra-valley.gladata.com

Sierra Valley Groundwater Management District

SIGN IN ABOUT

Map tools (hover over for description)

Zoom to...

Basin

Sierra Valley

Monitoring Point

Labels

DMW 2s

DMW

DMW 2s

DMW 3d

DMW 3i

DMW 3s

DMW 4d

DMW 4i

DMW 4s

DMW 5d

DMW 5i

DMW 5c

Map Layers Pane

Wells (clustered)

Can Zoom in/out on map using mouse wheel

Click and drag to pan map

Search for well name and zoom to on map

Click on points for associated data

Earthstar Geographics

Data Management System (DMS)

The screenshot displays the DMS interface with several key components highlighted by callouts:

- Well Construction Info**: A callout pointing to the 'General Info' tab of the 'Expanded Details' window.
- Water Quality Results**: A callout pointing to the 'Analytical Results' tab.
- Groundwater Levels**: A callout pointing to the 'Levels' tab.
- Pumping Volumes**: A callout pointing to the 'Production' tab.
- Document library (e.g., well logs)**: A callout pointing to the 'Documents' tab.
- Plot water level elevation or depth from surface**: A callout pointing to the 'Depth' tab of the hydrograph plot.
- Interactive plots (hover for values, zoom in, export to multiple formats)**: A callout pointing to the hydrograph plot area.

The 'Expanded Details - 04N20W25B03S' window shows the following data table:

Date	Depth from RP	RP Elev	Depth from Surface	GW Elev	Note
2010-11-03	51	438	51.09	387	
2014-07-29	68.17	439.1	67.16	370.93	Source: UWCD TM, RP +1.1ft above land surface including Trans cap, install Trans on 120' DRC, RT=85.68 @09:25
2014-09-29	71.34	439.1	70.33	367.76	
2014-10-22	72.7	439.1	71.69	366.4	Source: 2014 min from UWCD Transducer, Fall low, WLE= 366.40
2015-06-06	66.87	439.1	65.86	372.23	
2015-03-11	62.65	439.1	61.64	376.45	Source: 2015 max from UWCD Transducer, Spring high, WLE=376.45
2015-03-24	64.06	439.1	63.05	375.04	
2015-06-30	70.32	439.1	69.31	368.78	
2015-09-29	75.14	439.1	74.13	363.96	
2015-10-29	76.39	439.1	75.38	362.71	Source: 2015 min from UWCD Transducer, Fall low by date, WLE= 362.71

The hydrograph plot shows 'Groundwater Elevation (ft)' on the y-axis (ranging from 340 to 440) and 'Date' on the x-axis (ranging from 2012 to 2022). A data point is highlighted for Sunday, Mar 24, 2019, with a GW Elevation of 399.57. The plot includes a legend for 'Water Level Measurement' (blue dots) and 'Questionable Result' (red dots).

Data Management System (DMS)

Active Data SGMA DMS

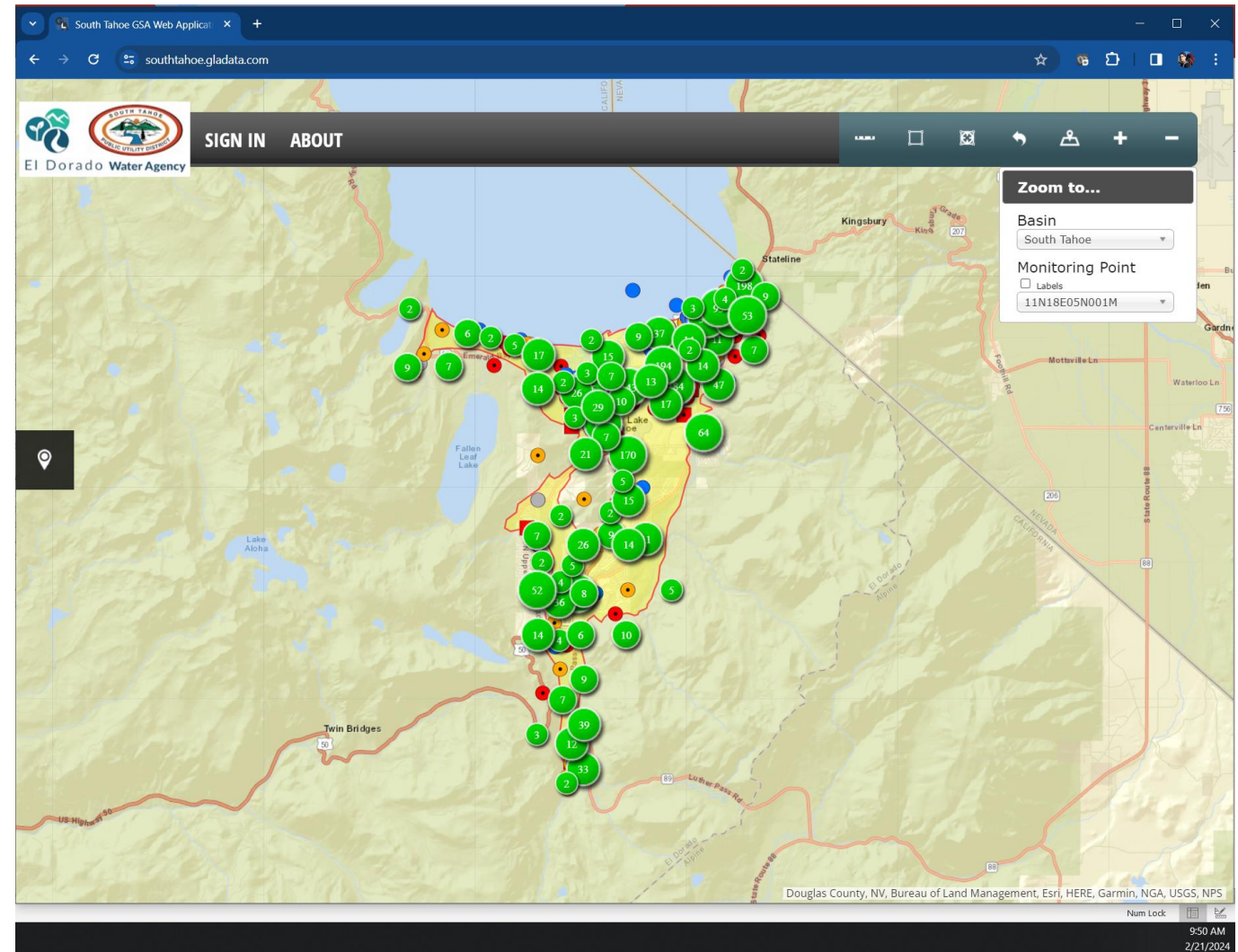
<https://sierra-valley.gladata.com>

<https://fillmore-piru.gladata.com>

<https://owens.gladata.com>

<https://bigvalley.gladata.com>

<https://southtahoe.gladata.com>



Upcoming Irrigation Efficiency Workshop

- “Workshop on Efficient Water Management for Forage Crops”
- Thursday March 14th , 9am-1pm, UC ANR Intermountain Research & Extension Center
 - 2816 Havlina Road, Tulelake CA
- UC Davis, UC ANR, Tehama County RCD, LWA, Siskiyou County, Tulelake Irrigation District
- Free Registration: <https://mailchi.mp/2296d441d13c/march14>



Thank You