APRIL 2023

SISKIYOU COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT

Shasta Valley Groundwater Sustainability Plan – WY 2022 Annual Report

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Abbreviation	Explanation
AF	Acre-feet
AFY	Acre-feet per year
amsl	above mean sea level
AT	Action Trigger
bgs	Below ground surface
CASGEM	California Statewide Groundwater Elevation Monitoring Program
CCR	California Code of Regulations
CDEC	California Data Exchange Center
DTW	Depth to Water
DWR	California Department of Water Resources
ET	Evapotranspiration
ft	Foot/feet
GAMA	Groundwater Ambient Monitoring and Assessment Program
gpm	Gallons per minute
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
HCM	Hydrogeologic conceptual model
in	Inch/inches
IND	Industrial Service Supply (acronym used to describe beneficial use)
InSAR	Interferometric Synthetic Aperture Radar
km	Kilometer/kilometers
LLNL	Lawrence Livermore National Laboratory
m	Meter/meters
MCL	Maximum contaminant level
mg/L	Milligrams per liter
mi	Mile/miles
mm	Millimeter
MO	Measurable Objective
MT	Minimum Threshold
MW	Monitoring well
NOAA	United States National Oceanic and Atmospheric Administration
OSWCR	Online Systems for Well Completion Reports
PMA	Projects and Management Actions
ppb	Parts per billion

(continued)

Abbreviation	Explanation
ppm	Parts per million
RMP	Representative Monitoring Point
SGMA	Sustainable Groundwater Management Act
SI	Sustainability Indicator
sq	Square
SSWD	Scott Valley and Shasta Valley Watermaster District
SWGM	Shasta Watershed Groundwater Model
SWRCB	California State Water Resources Control Board
TAF	Thousand acre-feet
TMDL	Total Maximum Daily Load
U.S.	United States
UCD	University of California, Davis
ug/L	Micrograms per liter
UL	Upper level
umhos/cm	Micromhos per centimeter
USGS	United States Geological Survey
WQO	Water quality objective

Executive Summary

California Water Code (CWC) §356.2 requires the submission of an annual report to DWR by April 1 of each year following the adoption of the GSP. The annual report includes information for the proceeding water year. This report is the second annual report submitted to DWR and provides an update on Basin conditions and plan implementation progress within the Shasta Valley Basin for Water Year 2022 (October 1, 2021 – September 30, 2022). It also includes changes in conditions that have occurred between the baseline year assessed in the GSP (2018) and the conditions in Water Year 2022. CWC §356.2 requires annual reports to include general information about the Basin and GSP, groundwater elevation data (contour maps and hydrographs), groundwater extraction, surface water supply, changes in groundwater storage, and a description of progress towards implementation of the GSP since the adoption of the previous annual report. The summary table defines undesirable results and the compliance with sustainable management criteria included in Chapter 3 of the adopted GSP Table 2.

In May 2021, Governor Gavin Newsom declared a drought emergency for 41 counties in California, including Siskiyou County. In August 2021, the State Water Resources Control Board (SWRCB) adopted drought Emergency Regulations, regarding the Scott and Shasta Rivers which were readopted, with amendments, in July 2022[1]. These Emergency Regulations authorized curtailments of surface water diversions when flows did not meet SWRCB approved drought emergency minimum monthly flow targets. It is unknown at this time the impacts curtailment of surface water diversions had on the underlying aquifer, however impacts to rural residential and groundwater dependent ecosystem (GDE) water use are still being evaluated.

Table 2: Summary of Sustainable Management Criteria.

Sustainability Indicator	Minimum/Maximum Threshold (MT)	Measurable Objective (MO)	WY 2022 Annual Report Status
Groundwater Levels	Historic low (10% of max historic depth to water or 10 ft, whichever is less)	Water levels > 25% of historic record	In WY2022, 2 RMPs did not have measurements in CASGEM, 5 RMPs exceeded their MT and 6 RMPs did not exceed the MT.

[1] https://www.waterboards.ca.gov/drought/scott_shasta_rivers/

Table 2: Summary of Sustainable Management Criteria. *(continued)*

Sustainability Indicator	Minimum/Maximum Threshold (MT)	Measurable Objective (MO)	WY 2022 Annual Report Status
Groundwater Storage	Groundwater levels used as a proxy for this sustainability indicator.		Groundwater levels used as a proxy for this sustainability indicator.
Seawater Intrusion	This sustainability indicator is not applicable in the Subbasin.		
Degraded Water Quality	Nitrate = 10 mg/L, Specific Conductivity = 900 umhos/cm (Title 22 Limits)	Maintain groundwater quality at a minimum of 90% of wells monitored for water quality within the range of the water quality levels measured over the past 30 years	No RMPs exceeded the MT.
Land Subsidence	<0.01 ft		
Depletions of Interconnected Surface Waters	Baseflow = 100 cfs to maintain recent conditions	Baseflow = 145 cfs	Not completed for 2022, awaiting model update

Groundwater Levels

This section describes general observations of groundwater level declines or increases in the reporting water year. This summary includes quantified changes observed during the water year and refer to hydrographs and contour maps of groundwater elevation, to be included as Appendix A and Appendix B, respectively.

Groundwater Storage

This section provides quantified changes observed in groundwater storage based on groundwater levels and aquifer properties (i.e., specific yield) in the reporting water year. This summary includes a map of change in groundwater level between the current and previous WY and a time series plot of change in groundwater storage by water year.

Land Subsidence

This section describes the status of land subsidence as a concern and frequency of monitoring for the reporting year. This summary will includes available subsidence values from InSAR data for the entire Basin during the water year 2022.

Groundwater Quality

This section describes compliance with sustainable management criteria (SMC), which include Maximum Threshold (MT) and Measurable Objective (MO) values. It also includes a summary of any water quality coordination and communication activities performed by GSAs.

Plan Implementation Progress

This section describes progress made in the implementation of the GSP, including implementation of projects and management actions, and any additional implementation support actions. This section also includes a brief overview of plan implementation activities anticipated for the coming year.

Chapter 1

Introduction

1.1 Purpose

This section describes the purpose of the annual report.

Brief description of annual report production schedule:

- October 1: day after end of water year for preceding reporting period.
- November 1: all data for preceding water year input is into the DMS.
- November to January (3 months): produce draft report.
- February 1: produce annual report draft.
- February to March (2 months): review report and gain GSA approval.
- April 1: submit finalized report to DWR.

1.2 Shasta Valley GSA

The Siskiyou County Flood Control and Water Conservation District is the sole GSA for the Basin. The Siskiyou County Flood Control and Water Conservation District Act (Cal Uncod. Water Deer, Act 1240 §§ 1-38) was adopted by the State Legislature in 1959. This Act established a special district of the same name, and of limited powers that could provide flood protection, water conservation, recreation and aesthetic enhancement within its boundaries. At the time of its creation, the jurisdictional boundaries of the Flood District were smaller than those of the County. In 1983, following County of Siskiyou Local Agency Formation Commission (LAFCO) action, the balance of the County was annexed into the District, making its jurisdictional boundaries coincide with the County. The District is governed by a Board of Directors that is composed of the Board of Supervisors; however, the District is a separate legal entity from the County, with independent rights and limited powers set forth in its originating act. The District's purpose is the conservation and control of storm, flood, and other waters and ensuring beneficial use thereof.

The Siskiyou County Flood Control and Water Conservation District approved the GSP for Shasta Valley Groundwater Basin in December 2021 and submitted the GSP to the DWR in January 2022. The District will submit an annual report to the DWR documenting the progress in achieving groundwater sustainability, by April 1st, for each preceding water year. The monitoring data for the preceding water year will be compiled to present the most current groundwater conditions to identify whether the SMCs were met. Additionally, all progress in project management action implementation will be presented.

1.3 Basin Description

The Watershed is located in central Siskiyou County in north-central California and is bounded by Mount Shasta to the south, the Klamath Mountains to the west, and the Cascade Range to the east. The Basin covers approximately 800 square miles (sq mi; about 2,000 square kilometers [sq km]) and consists of a north dipping and topographically rough valley floor surrounded by mountain terrain (Figure 1). The topography of the Basin ranges in elevation from just over 2,000 feet (ft; ~610 meters [m]) above mean sea level (amsl) near the confluence of the Shasta River with the Klamath River (the hydrologic terminus for the Watershed) to over 14,100 ft (~4,300 m) amsl near the volcanic peak of Mount Shasta. The valley floor transitions sharply to the mountains bordering the valley, all of which are either part of the Klamath or Cascade Mountain Ranges.

The Basin contains one principle aquifer with various water-bearing geologic formations consisting of a mixture of alluvial and volcanic formations, with the latter consisting of water-laden lava tubes to water-sediment-filled pockets within the cracks and crevices in the volcanic deposits. The connection of structurally differing water-bearing formations result in a multitude of springs or diffuse wetlands where groundwater more easily discharges to the surface than into less-conductive water-bearing units or where head levels are close to or exceed the ground level. The discharge levels of the springs can vary over many orders of magnitude from one spring to the next and can also significantly vary seasonally at the same spring as well as year-to-year averages.

Vegetation on the mountains to the east, south, and west of the Basin mainly consists of evergreen tree species, with lower flank elevations containing shrub and scrub vegetation (MRLC 2019). The remaining lower-lying areas in the Basin core are vegetated by shrub and scrub, grasslands, wetland, pasture, small forested pockets, and cultivated crops (mainly alfalfa).

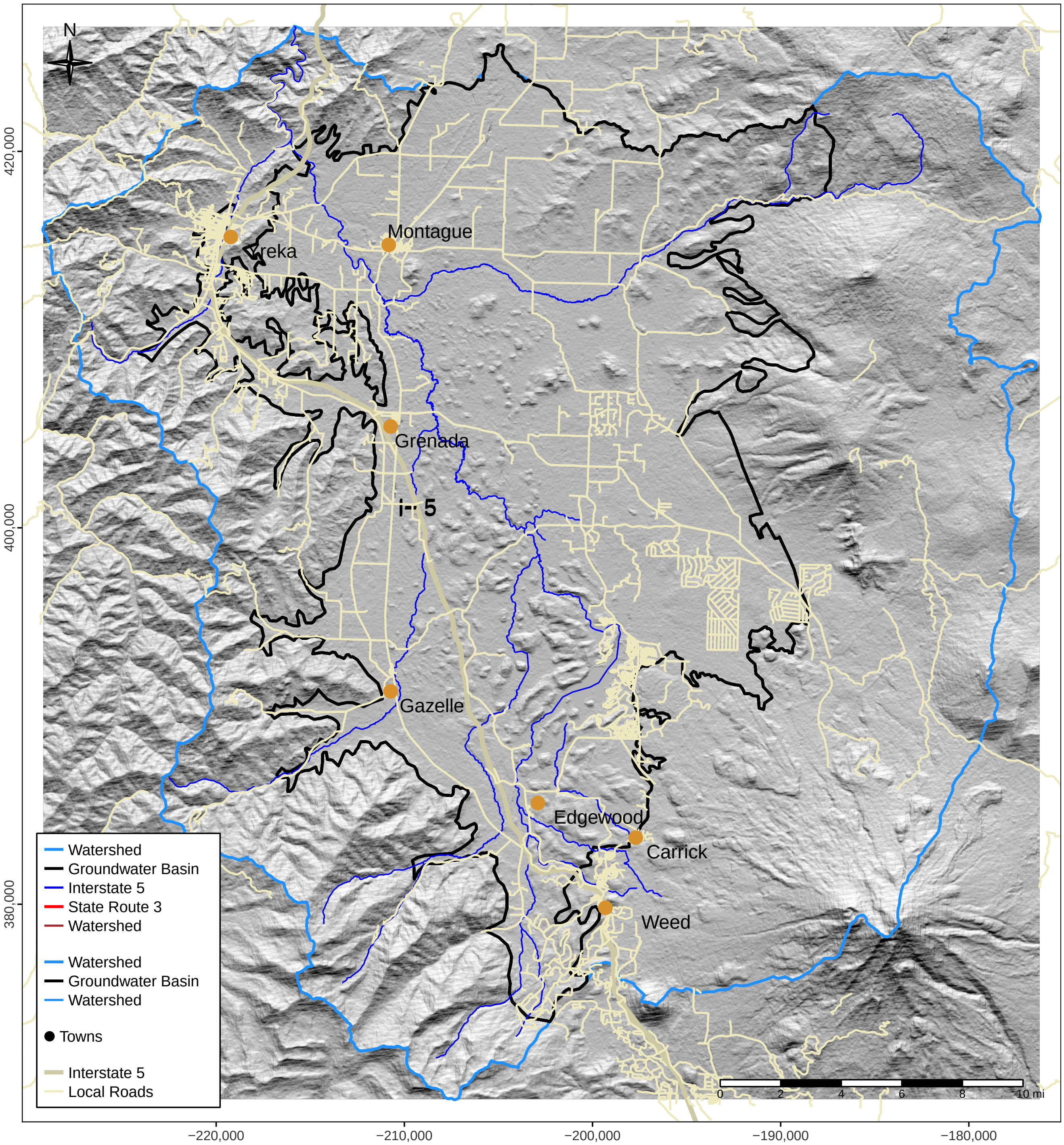


Figure 1: Topography of the Basin and surrounding Watershed.

1.3.1 Climate

Annual precipitation for the City of Yreka is presented in Figure 2, where annual precipitation averages range from 19 to 21 inches (48–53 cm). Water Year 2022 had similarly low total rainfall as Water Year 2021. The rainy season, which generally begins in October and lasts through April, accounts for about 80 percent of total annual rainfall.

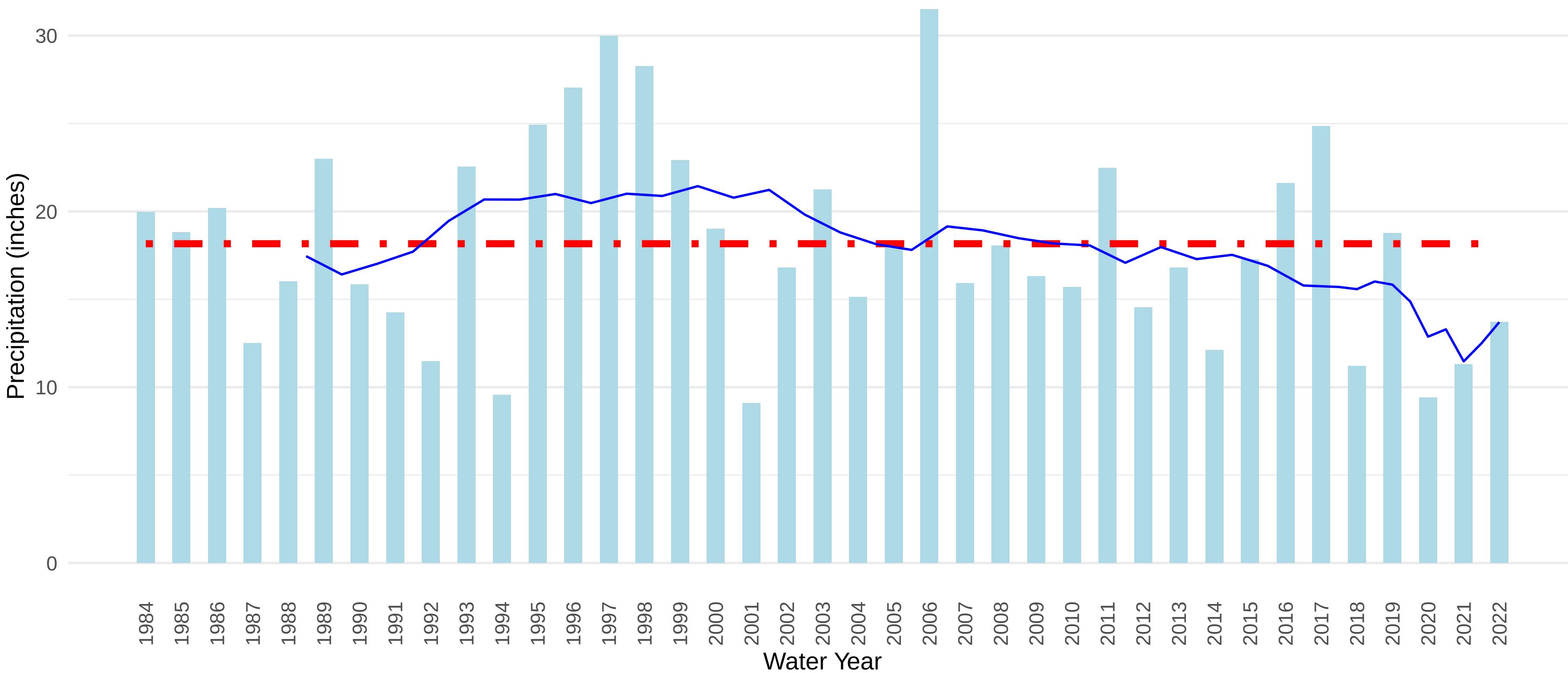


Figure 2: Yreka annual precipitation from 1983 to 2022, according to CDEC data. The long term mean (18 in) shown as a red dashed line, and the ten year rolling mean is the blue trendline.

Chapter 2

Groundwater Basin Conditions

2.1 Groundwater Elevations

This section describes the change in groundwater elevations in the subject water year and shows groundwater elevations at representative monitoring wells. The groundwater level monitoring network is discussed in Section 3, including any changes to the network including addition or reduction of monitoring wells.

Groundwater elevation contours for the seasonal high and low groundwater conditions (i.e., spring and fall) are shown in Figure 3 and 4). Data gaps prevent the contour map to cover the entire Basin. Figure 5 and *Appendix A* show hydrographs of groundwater elevations and water year type using historical data to the greatest extent available, including from January 1, 2015 to the current reporting year.

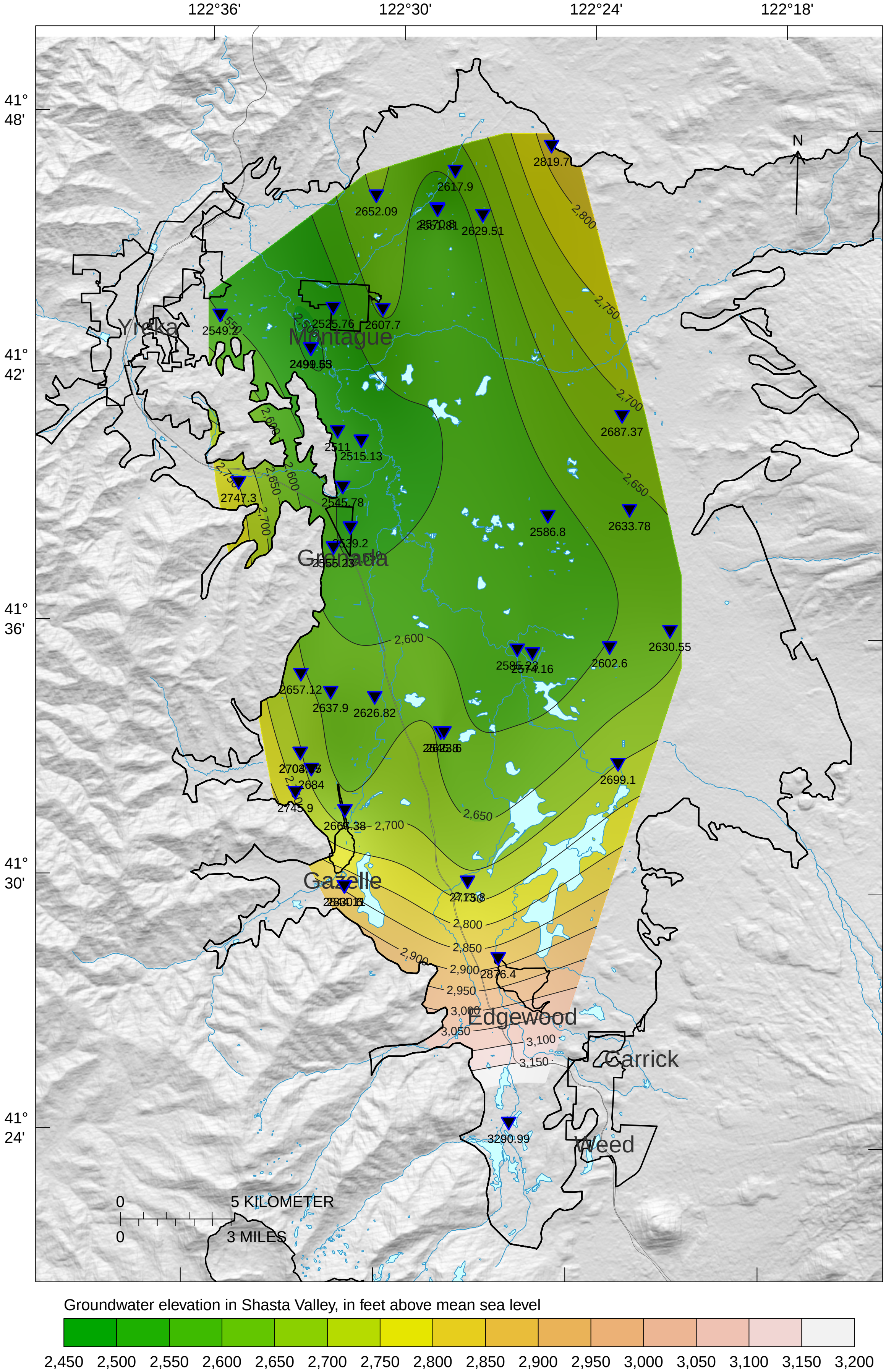


Figure 3: Interpolated representation of Spring 2022 Shasta Valley Groundwater Elevations

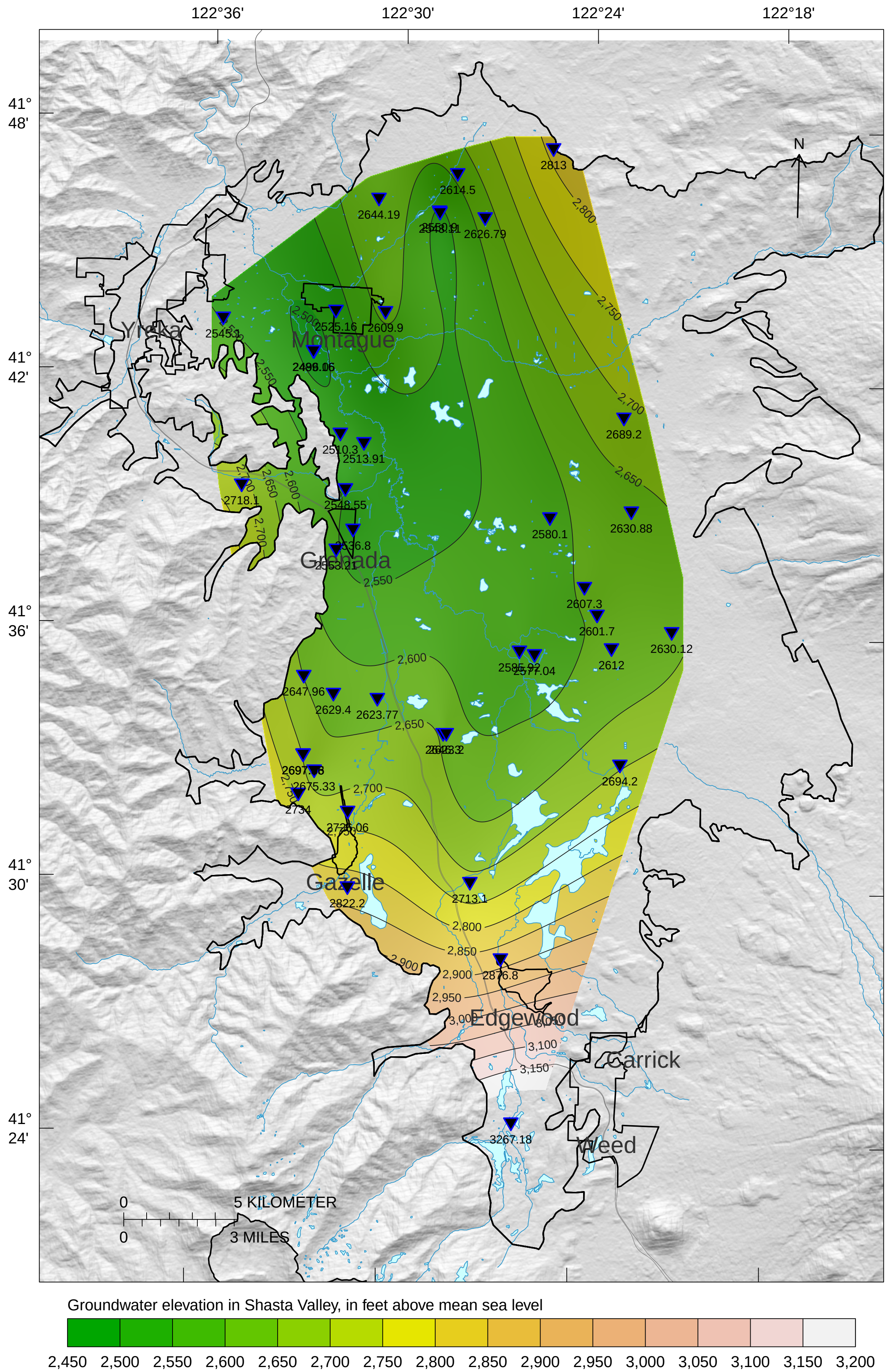


Figure 4: Interpolated representation of Fall 2022 Shasta Valley Groundwater Elevations

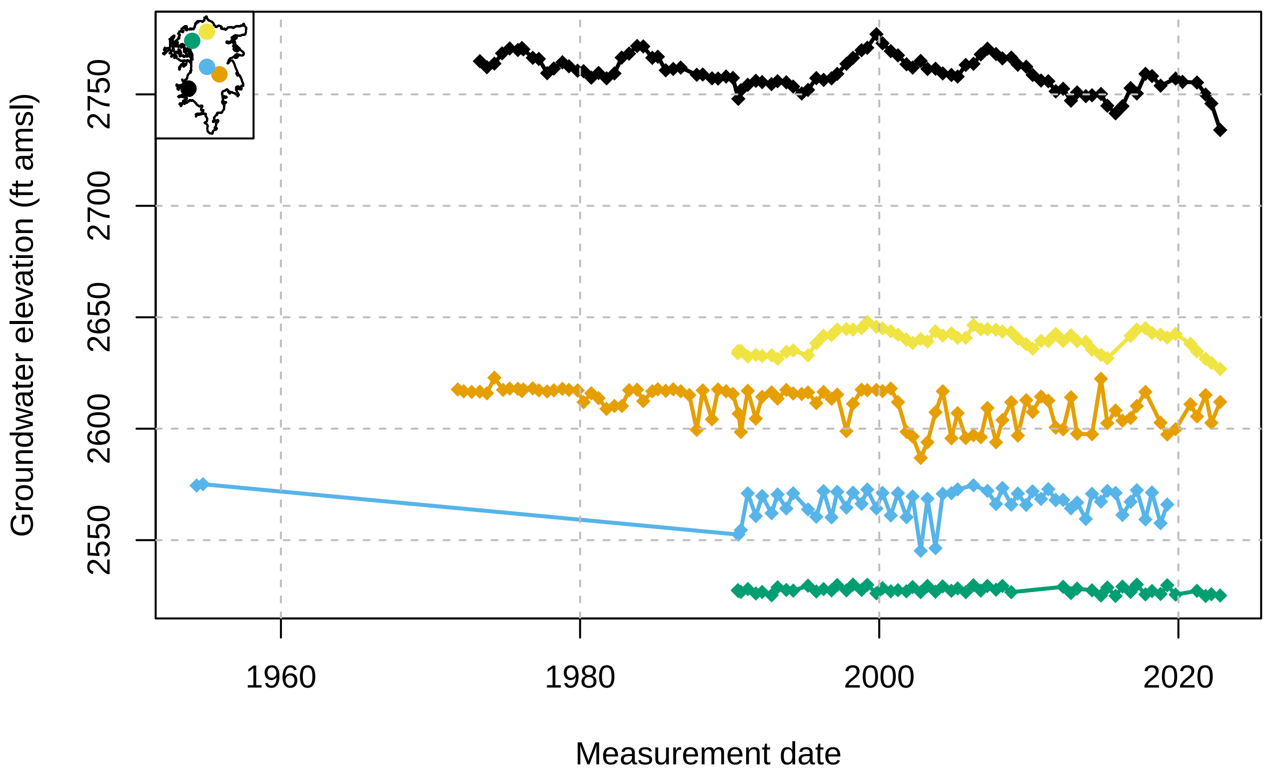


Figure 5: Groundwater elevation measurements over time in five wells, one located in each hydrogeologic zone.

2.2 Groundwater Extractions

This section summarizes monthly groundwater extractions for the preceding water year with the data available and defines the method of measurement by water use sector (Table 3). The best method available to estimate groundwater extraction in Shasta Valley is land-use, which is applied in the Shasta Watershed Groundwater Model (SWGM) (Figure 6). The SWGM spans WY1990-WY2018 thus it cannot directly calculate WY2022 groundwater extraction, but the groundwater extraction from WY2012 is an appropriate estimate for WY2022 given similar water year types, additionally this amount will be adjusted to account for the 30% curtailment regulation by the State Water Resources Control Board. The mean annual groundwater extraction (1990-2018) due to agricultural use is 39 TAF in the Basin, the WY2012 groundwater extraction was 41.2 TAF which is 33[1] TAF after accounting for an expected 20% extraction reduction. There is an additional 3.5[2] TAF of urban groundwater extraction based on population[3]. The amount of groundwater sold

[1]Rounded to 33 TAF for spreadsheet rules

[2]Rounded to 4 TAF for spreadsheet rules

[3]Population data from (https://gis.water.ca.gov/app/bp-dashboard/final/), groundwater extraction assumes 1 AF per 3.5 persons/year.

by Big Springs Irrigation District (BSID) is 1.478 TAF, a substantial drop compared to historical groundwater extraction due to the WY 2022 curtailments. This gives a total groundwater extraction of 38 TAF for WY2022.

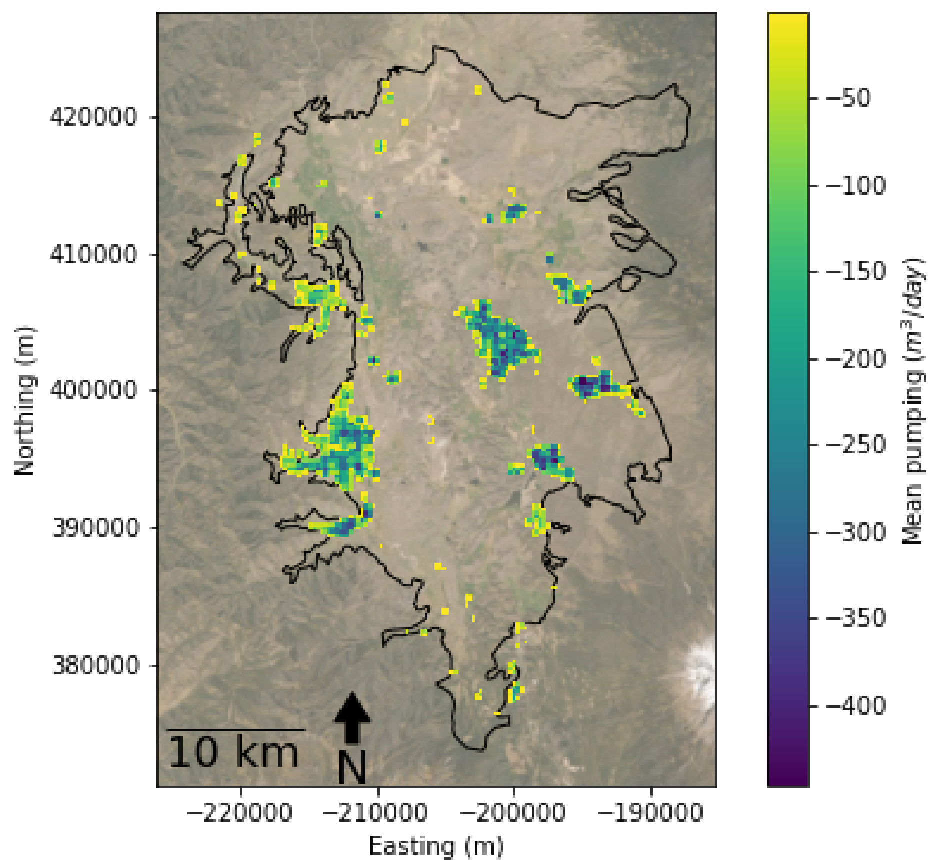


Figure 6: Approximate spatial distribution of average groundwater extraction estimate for WY2022 based on WY2018 pumping data.

Table 3: Groundwater Extraction in WY 2022 by water use sector.

Water Use Sector	Applied Groundwater (AF)	Method	Accuracy
Urban / Domestic	3500	Estimate	70-80%
Industrial	0	Estimate	80-90%
Agricultural	34500	Estimate	60-70%
Managed Wetlands	0	Estimate	90-100%
Managed Recharge	0	Estimate	80-90%
Native Vegetation	Data Gap		

2.3 Surface Water Supply Used for Groundwater Recharge or In-Lieu Use

SGMA requires that the GSP annual report tabulate "Surface water supply used or available for use" (CCR §356.2 [b] [3]). For WY2022 the surface water supply data was provided by the Scott Valley and Shasta Valley Watermaster District (SSWD) and is 50.416 TAF.

2.4 Total Water Use

This section summarizes groundwater use and surface water available for use for the reporting period (Table 4). For WY2022 the total water use combines the surface water supply data provided by the Scott Valley and Shasta Valley Watermaster District and estimated groundwater extraction. This totals to 88.4 TAF.

Table 4: Total Water Use in WY 2022 by water use sector.

Category	Water Use Type/Sector	Applied Water (AF)	Method	Accuracy
WY 2022 Total	Total Water Use	88400	Estimate	60-70%
Water Source Type	Groundwater	38000	Estimate	60-70%
	Surface Water	50400	Direct	90-100%
	Recycled Water	0	Estimate	90-100%
	Reused Water	0	Estimate	90-100%
	Other	0	Estimate	90-100%
Water Use Sector	Urban / Domestic	3500	Estimate	80-90%
	Industrial	0	Estimate	90-100%
	Agricultural	84900	Estimate	60-70%
	Managed Wetlands	0	Estimate	90-100%
	Managed Recharge	0	Estimate	90-100%
	Native Vegetation	Data Gap		
	Other	0	Estimate	60-70%

2.5 Change in Groundwater Storage

The change in groundwater storage for the Basin is calculated based on the change in groundwater levels between Fall of the report water year and previous water year (Figure 7). The groundwater contours are cropped to the extent of the groundwater level monitoring points to avoid low accuracy contours, thus the groundwater storage change is only calculated for the portion of the Basin where there is sufficient groundwater level data. Additionally, groundwater level stations are only used if they exist in both the current and previous year to avoid discrepancies in groundwater contour due to a lack of historic data. As more groundwater level monitoring stations are installed during plan implementation the groundwater contours will cover more of the Basin producing more accurate change in groundwater storage estimates. Additionally, when the Shasta Watershed Groundwater Model is extended to present day it may be used to estimate groundwater storage change for the Basin and watershed.

For the current water year there are still data gaps in the groundwater level network that may significantly impact the accuracy of the groundwater contours thus there is still uncertainty in the calculated change in storage. This is important to note because an erroneous depth to water measurement at one of the monitoring points can estimate a much larger change in groundwater level that in reality and this error is multiplied because that change in groundwater level is used over a large spatial distance due to data gaps in the basin.

Figure 8 depicts water year type and the annual change in groundwater in storage, and the cumulative change in groundwater in storage for the Basin based on historical data to the greatest extent available, including from January 1, 2015, to the current reporting year.

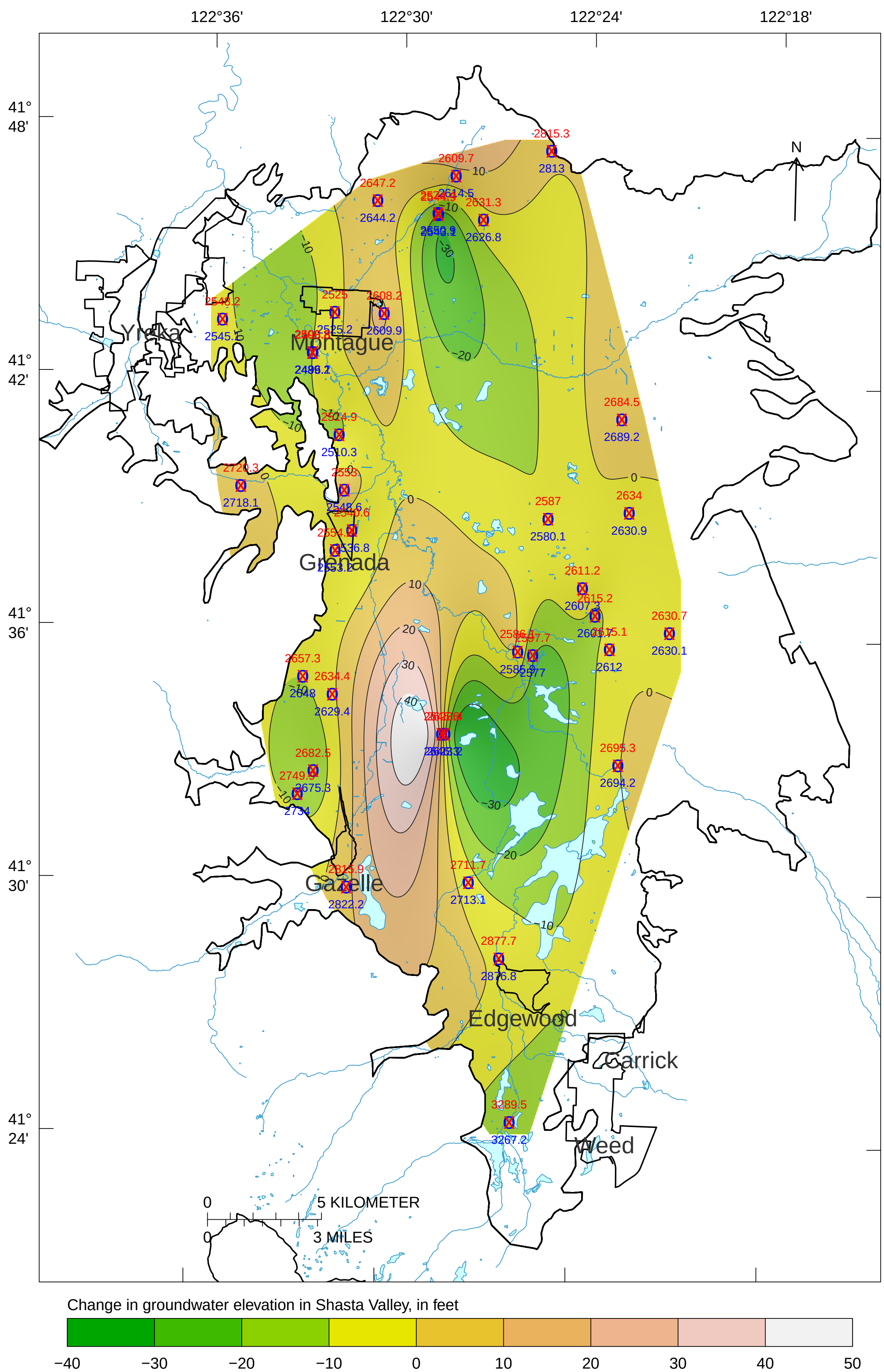


Figure 7: Groundwater elevation change between water years. WY 2022 is represented with blue text and WY 2021 is red.

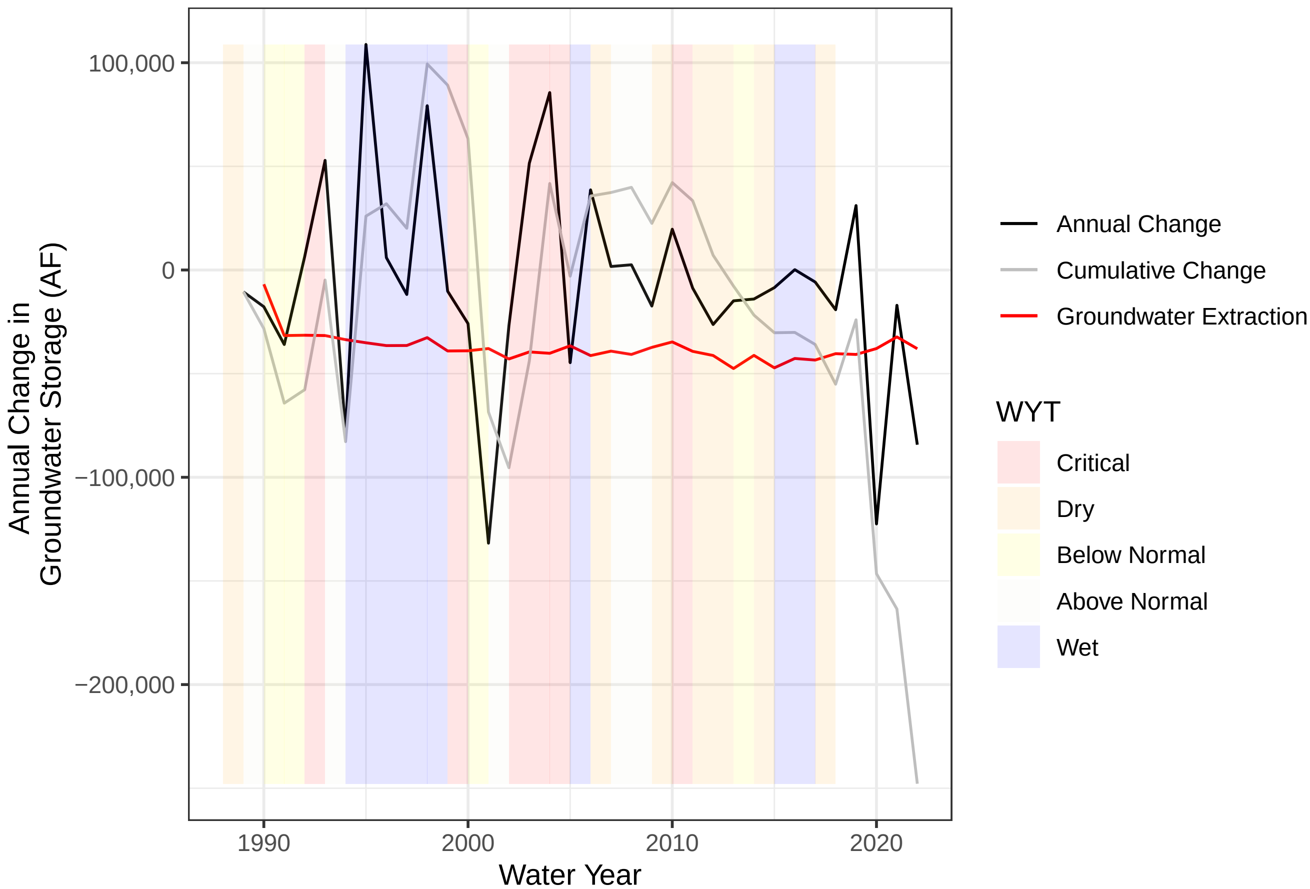


Figure 8: Groundwater storage change based on difference in fall groundwater contours between years.

Chapter 3

Monitoring Network

A subset of the full GSP monitoring network will be used to evaluate SMCs for individual sustainability indices for the Basin and will be used to demonstrate the sustainability of the Basin through 2042. Continuous monitoring offers the best data coverage while periodic monitoring is generally completed twice a year (spring and fall). A subset of the monitoring wells is instrumented with continuous datalogger (temperature and water level measured every 15 minutes) with telemetry, while for the rest of the California Statewide Groundwater Elevation Monitoring (CASGEM) Program wells, by-annual measurements have been collected. The continuous monitoring network developed during the first four years of GSP development and one year of implementation is undergoing continued maturation and data collection. During 2022, 19 continuous groundwater monitoring stations were active in the Shasta Valley basin. None of these wells have sufficient history for use as RMPs, however they may be included during a future GSP update.

With the exceptions of streamflow, land subsidence, and stream depletion due to groundwater pumping, monitoring is performed using wells. Some wells are monitored for water level, some for water quality, some for both.

3.1 Groundwater Level Monitoring Network

The groundwater level (GWL) monitoring network consist of thirteen CASGEM wells in the Basin. Four wells are located within the fractured basalt aquifer, seven in the alluvial aquifer, and three in various other geologic material. The distribution of monitoring wells is shown in Figure 9. The currently designed network satisfies DWR requirements with respect to spatial distribution and can be expanded using recently installed new instruments that will be evaluated over the first five years of implementation.

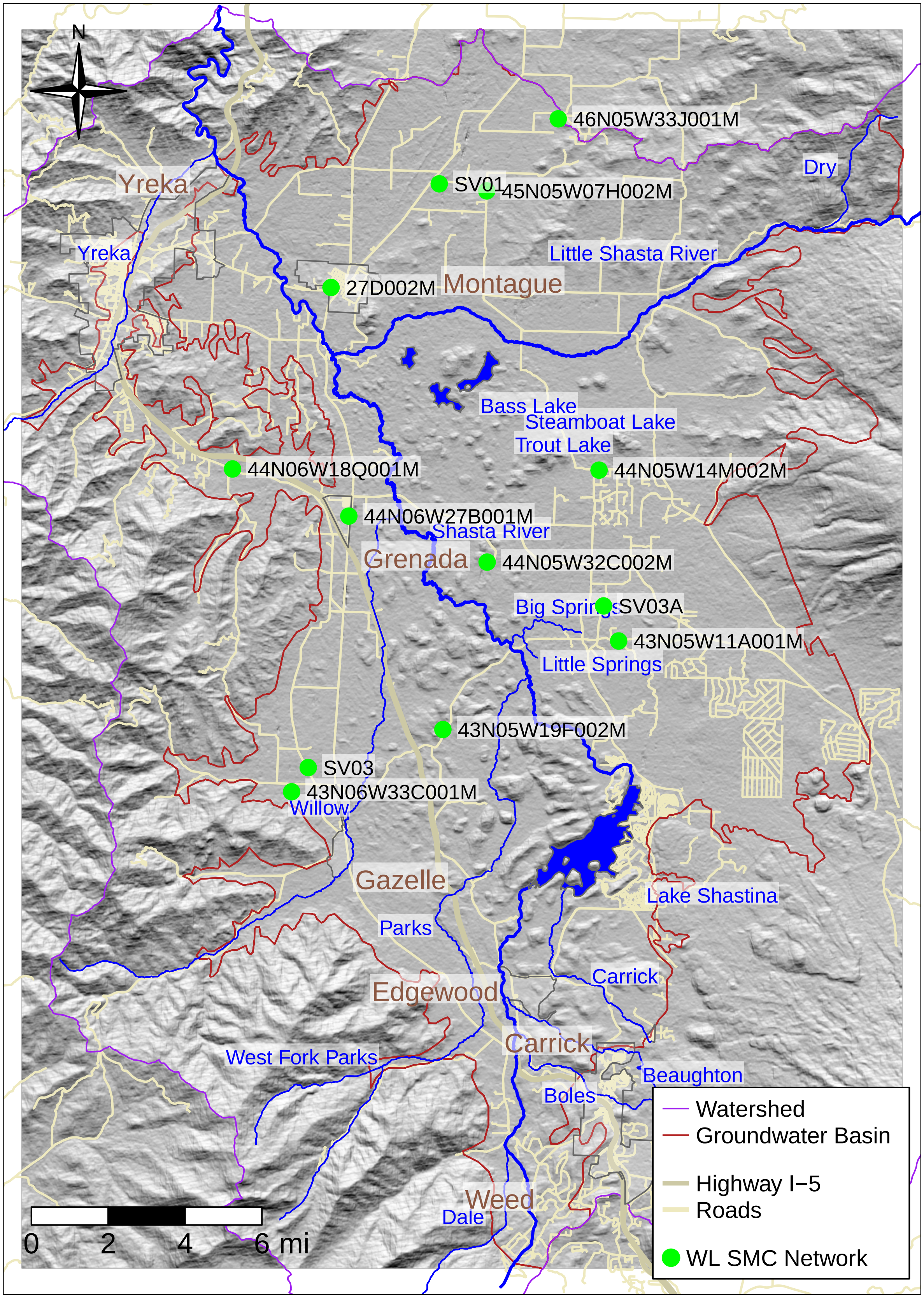


Figure 9: Water Level Monitoring Network.

3.2 Groundwater Quality Monitoring Network

Existing wells used for monitoring groundwater quality in the Basin include public water supply wells and monitoring wells, which are shown in Figure 10. Initially, the groundwater quality monitoring network is based on wells that are regularly sampled as part of existing monitoring programs for the constituents for which SMCs are set: nitrate and specific conductivity.

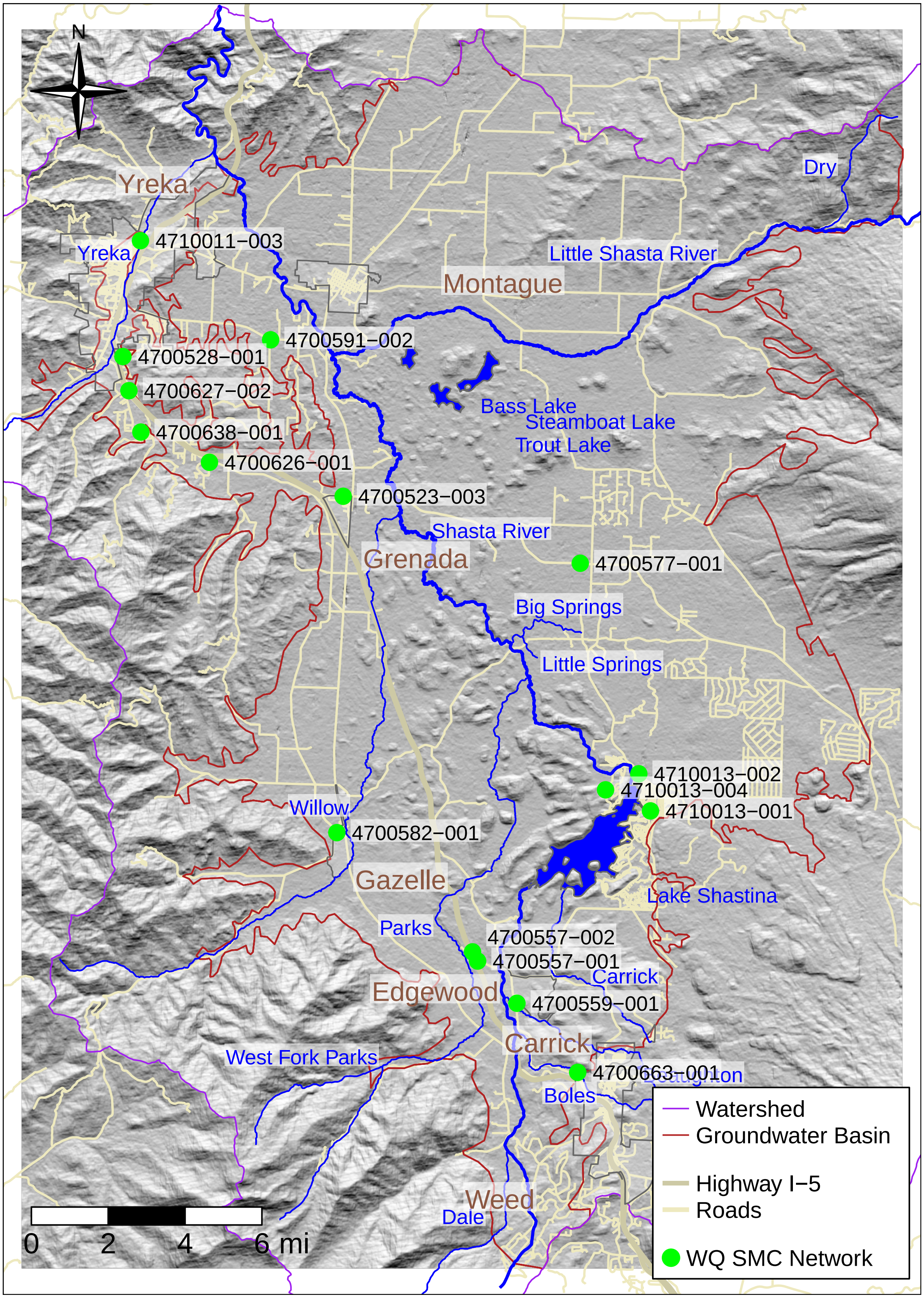


Figure 10: Water Quality Monitoring Network.

Chapter 4

Sustainable Management Criteria

The SV GSP defines Sustainable Management Criteria with respect to quantifiable impacts to beneficial users of groundwater that if exceeded, would lead to the identification of undesirable results. Here, we report on impacts to shallow wells, interconnected surface water (ISW), and groundwater dependent ecosystems (GDEs). Results suggest that groundwater conditions in Water Year 2022 did not result in impacts to beneficial users that are considered to be significant and unreasonable.

4.1 Interim Milestones

This section provides a list of interim milestones identified in Chapter 3 (Sustainable Management Criteria) of the GSP for all Sustainability Indicators. These Interim Milestones are anticipated to be achieved over the course of GSP implementation in increments of five years, pursuant to the CCR definition “Target values representing measurable groundwater conditions, in increments of five years, set by Agency as part of a Plan” [CCR Title 23, Division 2 §351(q)]. Progress toward achieving Interim Milestones since submitting the GSP are provided in Section 1. Further updates are expected in the first Five Year Assessment for the Shasta Valley GSP, with status checks provided in future annual reporting.

4.2 Chronic Lowering of Groundwater Levels

Table 5 compares WY2022 groundwater levels to last WY’s measurements and SMCs. The WY2022 status of the wells in relation to their SMCs are shown in Figure 11. The column “Status” notes whether the maximum depth to water for the current WY exceed the minimum threshold and whether a measurement was not recorded. Detailed hydrographs for each RMP with their SMC’s can be found in the Water Level Data Appendix A. For the current WY, five RMPs exceeded the MT which coincides with the dry to below normal water years that have reduced recharge to the Basin.

Table 5: Groundwater level SMC values

Well Code	Well Name	Station ID	MT (ft bgs)	AT (ft bgs)	MO (ft bgs)	WY Min (ft bgs)	WY Max (ft bgs)	Status
415952N1223848W001	43N05W11A001M	22370	166.5	156.5	144.1	128.30	140.80	Above MT
415351N1225474W001	43N06W33C001M	22373	79.1	71.9	61.0	63.50	79.40	Below MT
416595N1223971W001	44N05W14M002M	22375	65.8	59.8	56.5	NA	NA	No measurement
417638N1224574W001	45N05W07H002M	24045	30.7	27.9	22.3	29.45	34.01	Below MT
417258N1225337W001	27D002M	24067	8.7	7.9	6.8	7.10	7.90	Above MT
416237N1224524W001	44N05W32C002M	36753	73.0	66.4	51.3	NA	NA	No measurement
417916N1224217W001	46N05W33J001M	36892	45.2	41.1	34.4	38.10	44.80	Above MT
416397N1225224W001	44N06W27B001M	36999	22.2	20.2	17.4	22.70	26.50	Below MT
417660N1224811W001	SV01	37001	53.4	48.5	24.2	40.50	64.00	Below MT
415444N1225387W001	SV03	49002	88.1	80.1	76.0	86.92	95.59	Below MT
415601N1224718W001	43N05W19F002M	49294	13.3	12.1	10.0	10.20	10.70	Above MT
416563N1225813W001	44N06W18Q001M	49295	33.3	30.3	27.1	3.70	32.90	Above MT
416083N1223932W001	SV03A	50631	69.0	62.7	47.3	45.60	59.10	Above MT

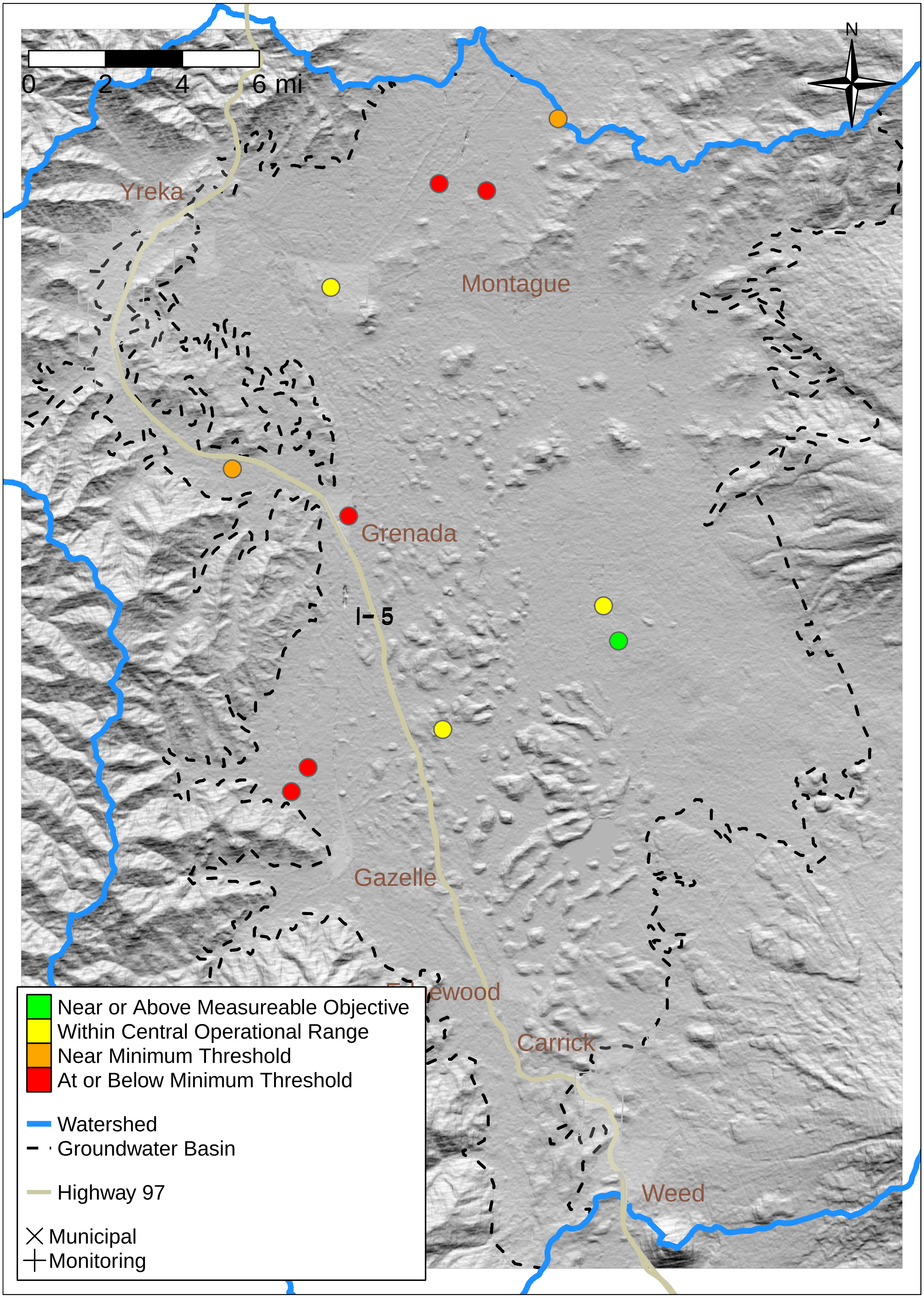


Figure 11: Status of the groundwater level RMP networks for Fall 2022.

4.3 Reduction of Groundwater Storage

Groundwater levels is the proxy for groundwater storage and the sustainability management criteria (SMCs) are identical. According to the United States Geologic Survey, estimates of groundwater storage rely on groundwater level data and sufficiently accurate knowledge of hydrogeologic properties of the aquifer. Direct measurements of groundwater levels can be used to estimate changes in groundwater storage. As groundwater levels fall or rise, the volume of groundwater storage changes accordingly, where unacceptable groundwater decline indicates unacceptable storage loss. The hydrogeologic model outlined in Chapter 2 of the GSP provides the needed hydrogeologic properties of the aquifer.

4.4 Seawater Intrusion

This sustainability indicator is not applicable in this Basin.

4.5 Groundwater Quality

This section compares water quality monitoring to the GSP's sustainable management criteria and provides a summary of any ongoing water quality coordination activities being conducted by the GSAs. Water quality data sampled within WY 2022 is shown in Table 6. All samples are below the SMCs set in the GSP.

Table 6: Water quality data from WY2022 in the RMP network.

Well ID	Result	Analyte	Date	Units
CA4700528_001_001	1.72	Nitrate as N	2022-07-25	MG/L
CA4700557_001_001	0.74	Nitrate as N	2021-10-14	MG/L
CA4700557_002_002	1.15	Nitrate as N	2021-12-09	MG/L
CA4700559_001_001	3.05	Nitrate as N	2021-11-09	MG/L
CA4700559_001_001	3.94	Nitrate as N	2022-02-08	MG/L
CA4700559_001_001	2.01	Nitrate as N	2022-05-10	MG/L
CA4700559_001_001	3.48	Nitrate as N	2022-08-09	MG/L
CA4700577_001_001	3.6	Nitrate as N	2021-11-04	MG/L
CA4700577_001_001	2.47	Nitrate as N	2022-01-06	MG/L
CA4700577_001_001	2.55	Nitrate as N	2022-04-07	MG/L
CA4700577_001_001	<0.5	Benzene	2022-08-04	UG/L
CA4700582_001_001	2.4	Nitrate as N	2022-02-10	MG/L
CA4700591_002_002	<0.4	Nitrate as N	2022-02-10	MG/L
CA4700627_002_002	3.05	Nitrate as N	2022-06-02	MG/L
CA4700638_001_001	1.33	Nitrate as N	2022-07-07	MG/L
CA4700663_001_001	0.66	Nitrate as N	2022-08-09	MG/L
CA4710011_003_003	<50	Iron	2022-08-30	UG/L
CA4710011_003_003	<2	Arsenic	2022-08-30	UG/L
CA4710011_003_003	<0.5	Manganese	2022-08-30	UG/L
CA4710011_003_003	2.67	Nitrate as N	2022-08-30	MG/L
CA4710011_003_003	562	Specific Conductivity	2022-08-30	UMHOS/CM

4.6 Subsidence

To monitor subsidence, the Basin relies on data provided by DWR based on Interferometric Synthetic Aperture Radar (InSAR), a satellite-based remote sensing technique that measures vertical ground surface displacement changes at high degrees of measurement resolution and spatial detail. This data is made available through the DWR SGMA Data Viewer [1] and shows overall subsidence less than 0.1 feet for the entire Basin during the water year 2022 (Figure 12).

[1] https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer#currentconditions

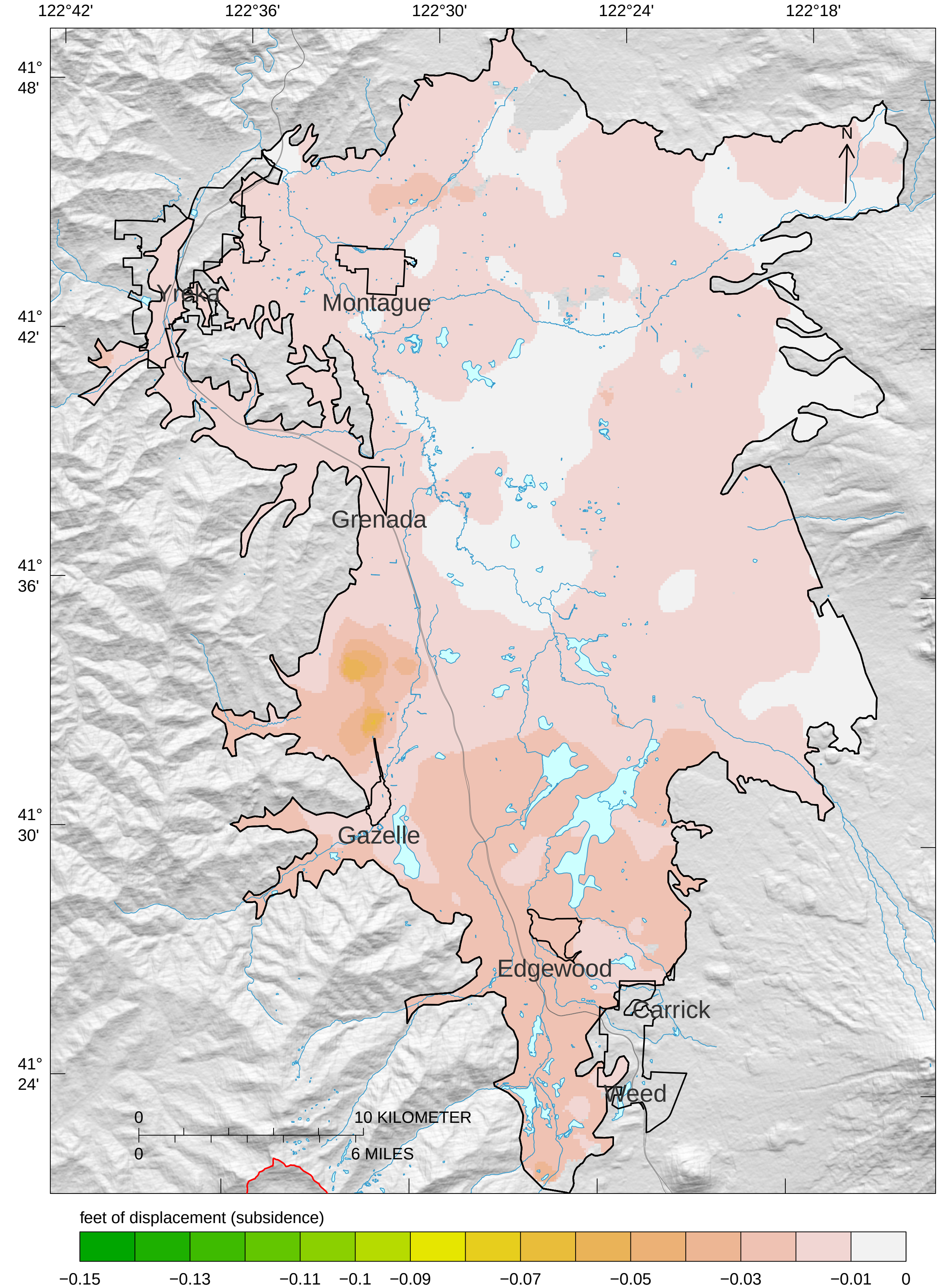


Figure 12: InSAR satellite measured total vertical subsidence (feet) in WY 2022. Note that the processed InSAR instrument and GIS conversion error is roughly +/-0.1 feet (https://gis.water.ca.gov/arcgisimg/rest/services/SAR).

4.7 Interconnected Surface Water

Interconnected surface waters in the Basin are not determined for WY2022 because the updated method using the Shasta Watershed Groundwater Model (SWGM) will be ready following additional model calibration in later 2023. A component of the grant proposal submitted to DWR's SGM Implementation Grant Program for Shasta Valley is conducting a groundwater-surface water study to better characterize groundwater-surface water interaction in the Basin. From WY2023 and on the annual report will use the SWGM to determine the location, timing and rate of interconnected surface waters in the Basin.

Chapter 5

Project Implementation and Management Actions

The GSA continued activities (e.g. RMP data collection) necessary to implement the GSP and put the Basin on a path toward sustainable management. The GSA has continued public outreach by visiting local well owners who report concerns about groundwater levels in their wells. The GSA continued the installation of continuous groundwater level monitoring sites to improve the representation of groundwater levels throughout the Basin and improve representation of different hydrogeologic units. The surface water-groundwater transect monitoring was continued by Shasta Valley Resource Conservation District. Lawrence Livermore National Lab completed a project that utilized the Shasta Groundwater Model to integrate isotope data to understand flow paths in Shasta Valley, the project supported a temporary extension of the SWGM to 2021 and an updated calibration.

5.1 Coordination

State Water Resources Control Board – GSA staff meets biweekly with SWRCB staff to discuss updates and activities related to SWRCB's Emergency Regulation Curtailments. The two parties discuss updates to curtailment actions in place, including Local Cooperative Extensions (LCS) and activities that may have impacts on groundwater management.

Karuk Tribe – The GSA is in the process of finalizing the next phase of a Memorandum of Understanding (MOU) with the Karuk Tribe regarding coordinating on aspects of the GSP implementation in the Scott and Shasta basins.

5.2 Activities Anticipated for the Coming Year

Project Implementation

The GSA intends to continue activities (e.g. RMP data collection) necessary to implement the GSP and put the Basin on a path toward sustainable management. The GSA plans to continue the installation of continuous groundwater level and surface water monitoring sites to support the implementation of planned projects and management actions. These new monitoring sites will improve the representation of groundwater levels throughout the Basin and improve representation of different hydrogeologic units. The GSA submitted a grant proposal to DWR's *Sustainable Groundwater Management (SGM) SGMA Implementation Program (SGM Implementation Grant Program)* with components covering a wide range of PMA's including additional surface water-groundwater characterization and recharge pilot projects. The proposal submitted to DWR's SGM Implementation Grant Program includes plans to help achieve groundwater sustainability by increasing groundwater availability, reducing water losses, improving understanding of surface water-groundwater interaction, and creating an inventory of all wells in the basin.

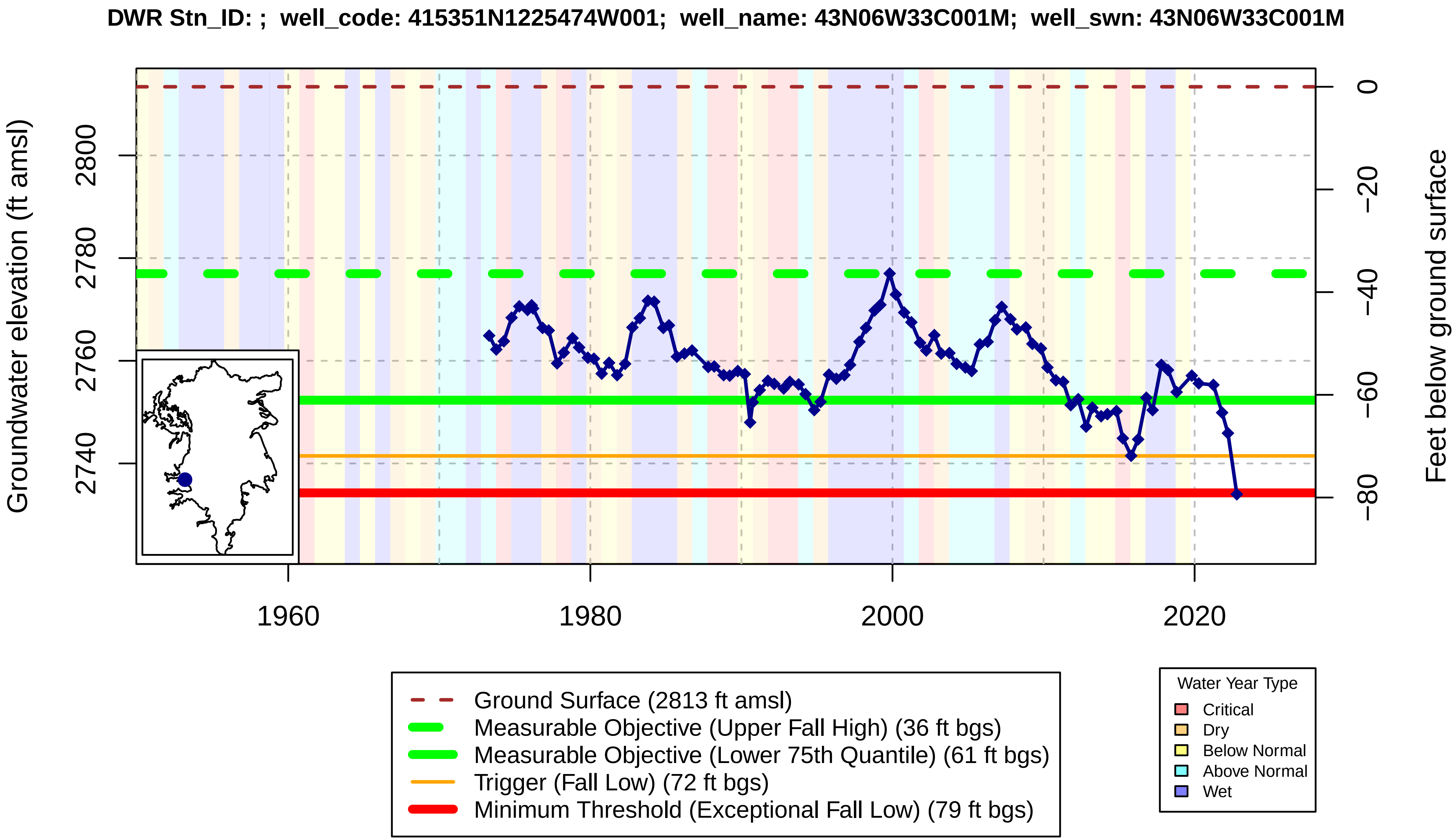
County Ordinances

Well Permitting The GSA is working with Siskiyou County Environmental Health Department's well permitting staff to develop a new "Well Permitting Guidance Document" that will update the county well permitting policies, along with complying with the Governors Executive Order (N-7-22, which language specific to well permitting is now under EO N-3-23).

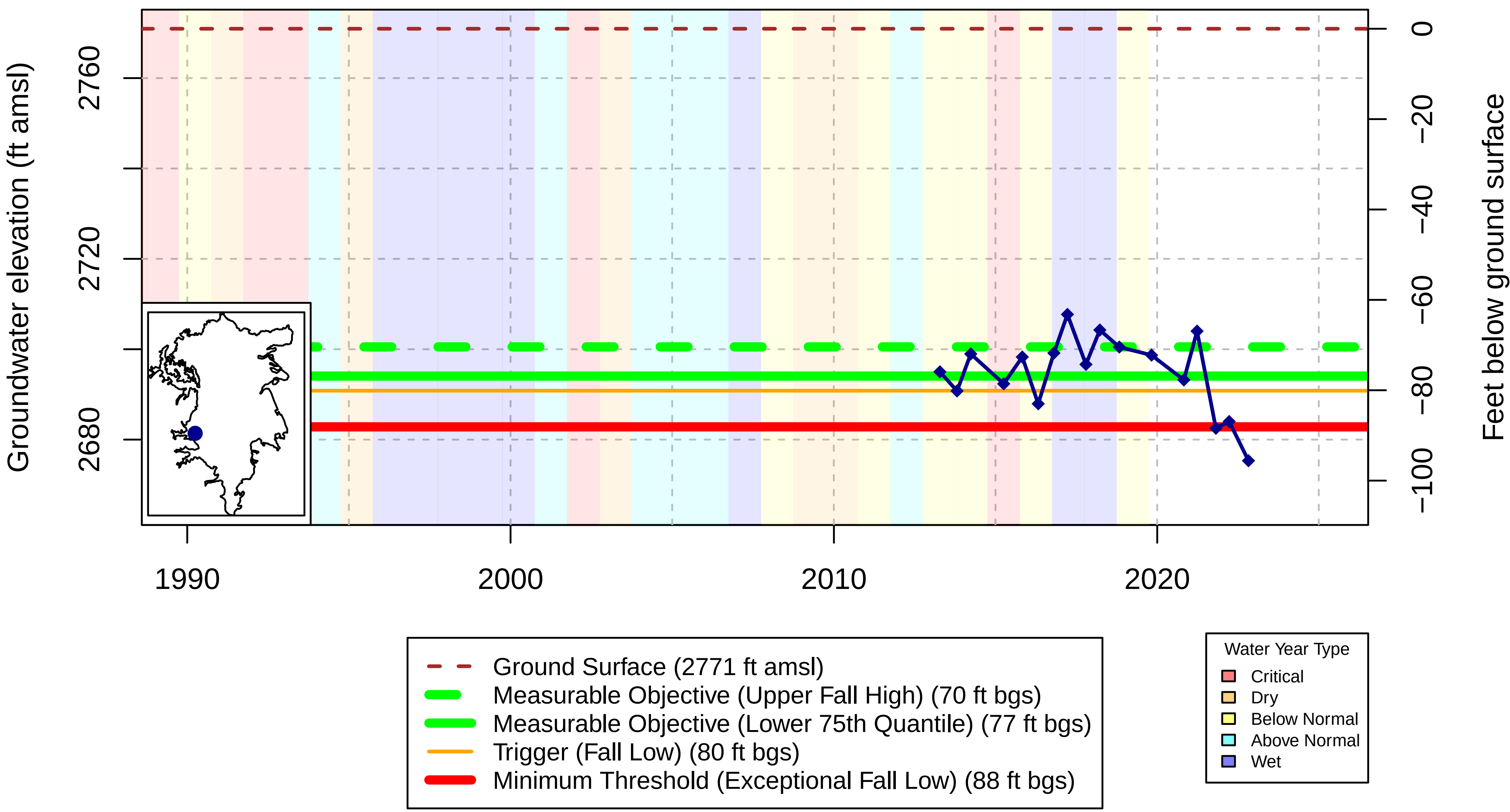
Appendix A - Water Level Sustainability Management Criteria Hydrographs

This appendix contains groundwater level hydrographs to document the Groundwater Elevation and Storage Sustainability Management Criteria. The historical hydrographs were used to set the minimum thresholds and measurable objectives that are included on all annual report hydrographs for the representative monitoring points. The hydrographs used to set the minimum thresholds and measurable objectives for each representative monitoring point are shown in the following figures.

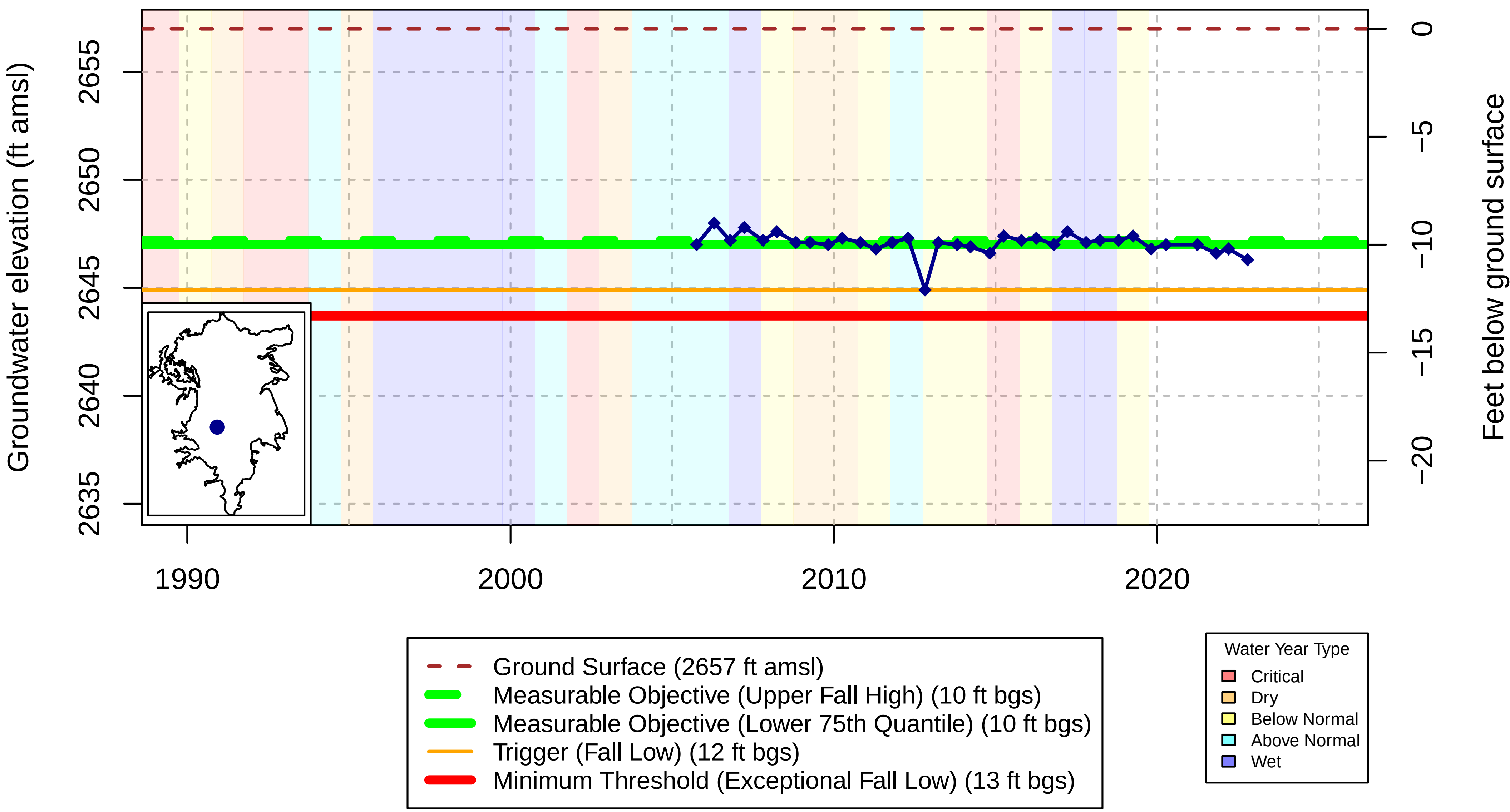
Appendix A.1 - Water Level Sustainability Management Criteria Hydrographs

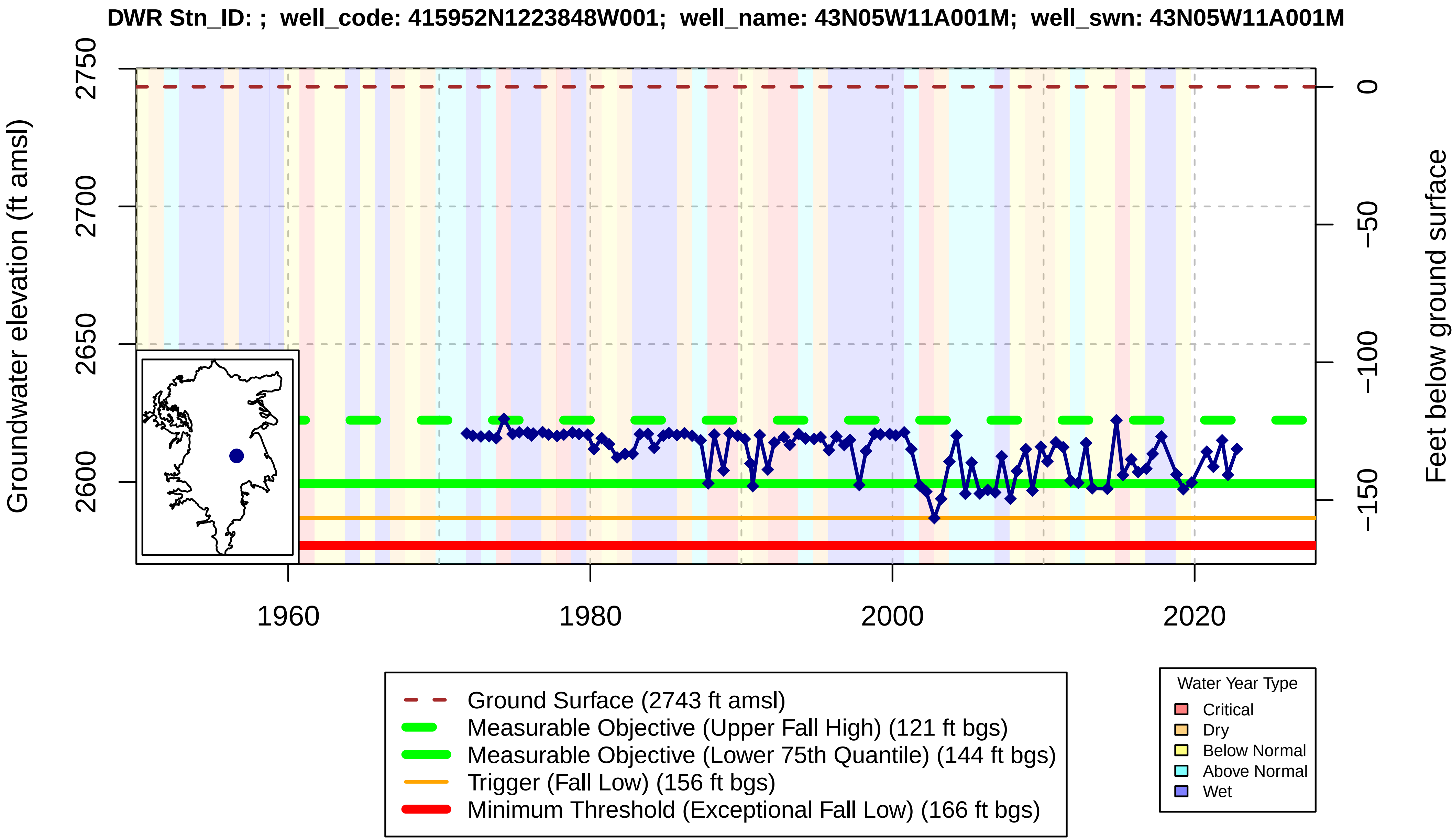

DWR Stn_ID: ; well_code: 415351N1225474W001; well_name: 43N06W33C001M; well_swn: 43N06W33C001M
Groundwater elevation (ft amsl)
2740
2760
2780
2800
Feet below ground surface
0
−20
−40
−60
−80
1960
1980
2000
2020
Ground Surface (2813 ft amsl)
Measurable Objective (Upper Fall High) (36 ft bgs)
Measurable Objective (Lower 75th Quantile) (61 ft bgs)
Trigger (Fall Low) (72 ft bgs)
Minimum Threshold (Exceptional Fall Low) (79 ft bgs)
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet

DWR Stn_ID: ; well_code: 415444N1225387W001; well_name: SV03; well_swn: NA

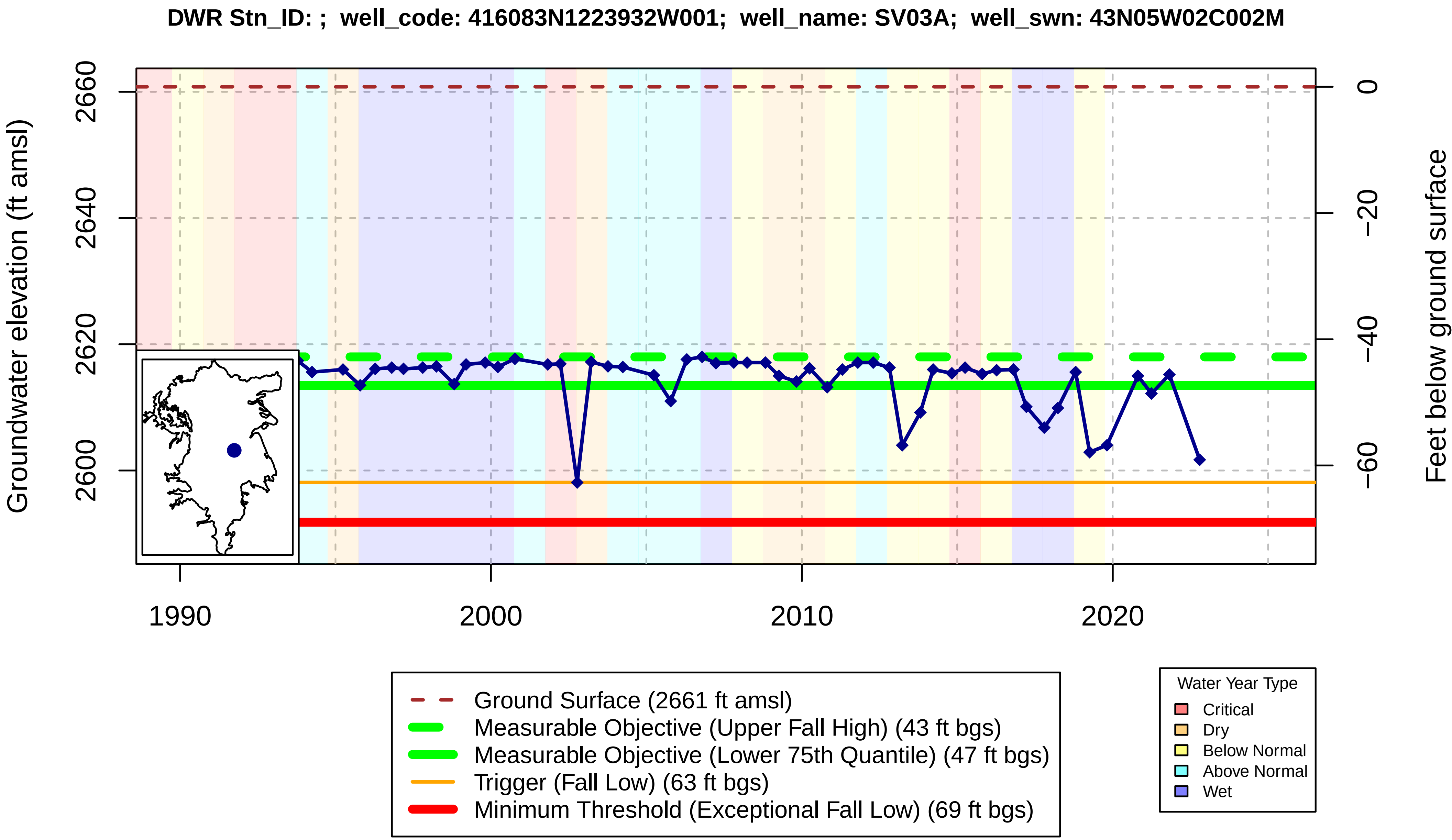


DWR Stn_ID: ; well_code: 415601N1224718W001; well_name: 43N05W19F002M; well_swn: 43N05W19F002M

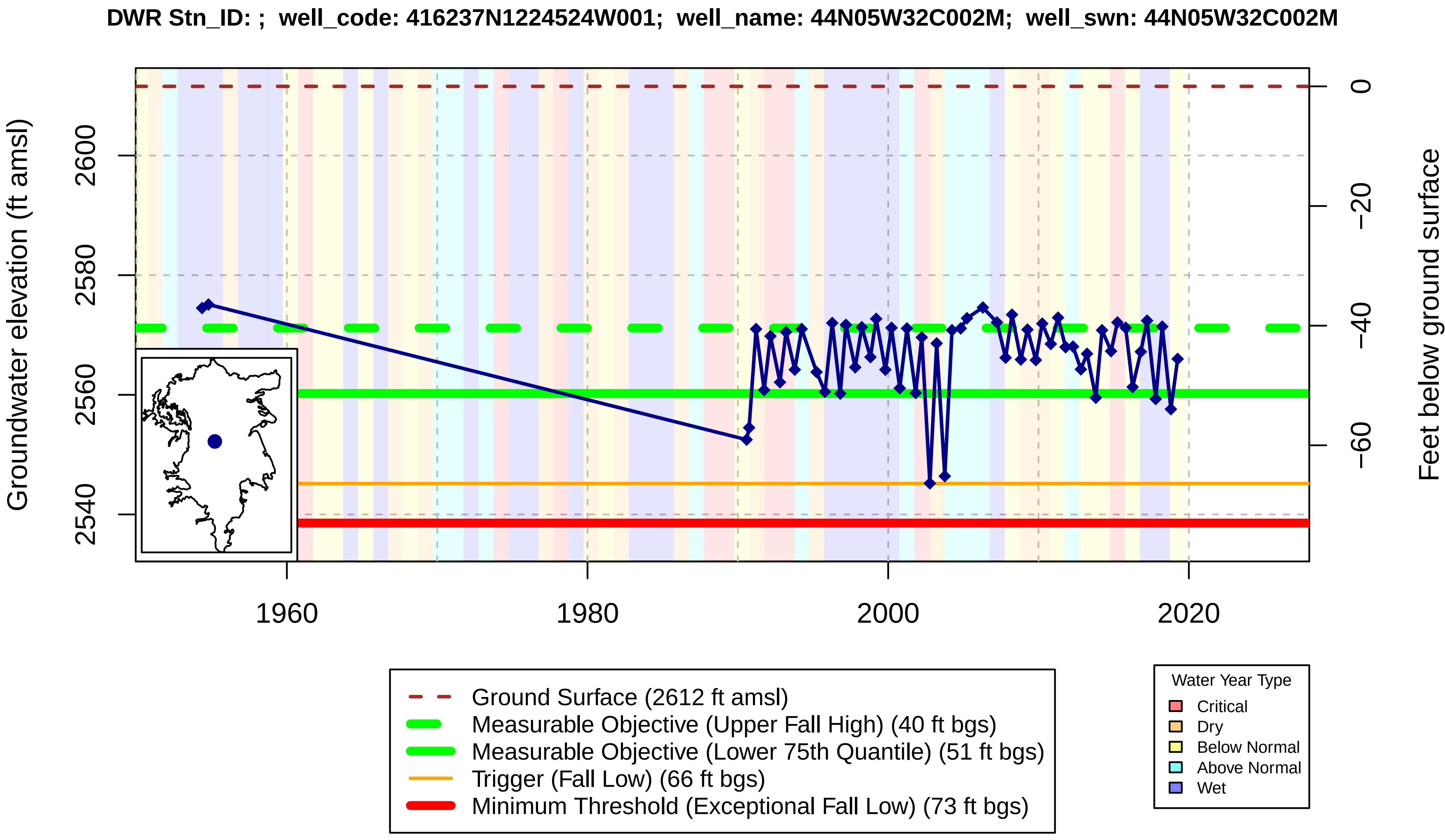




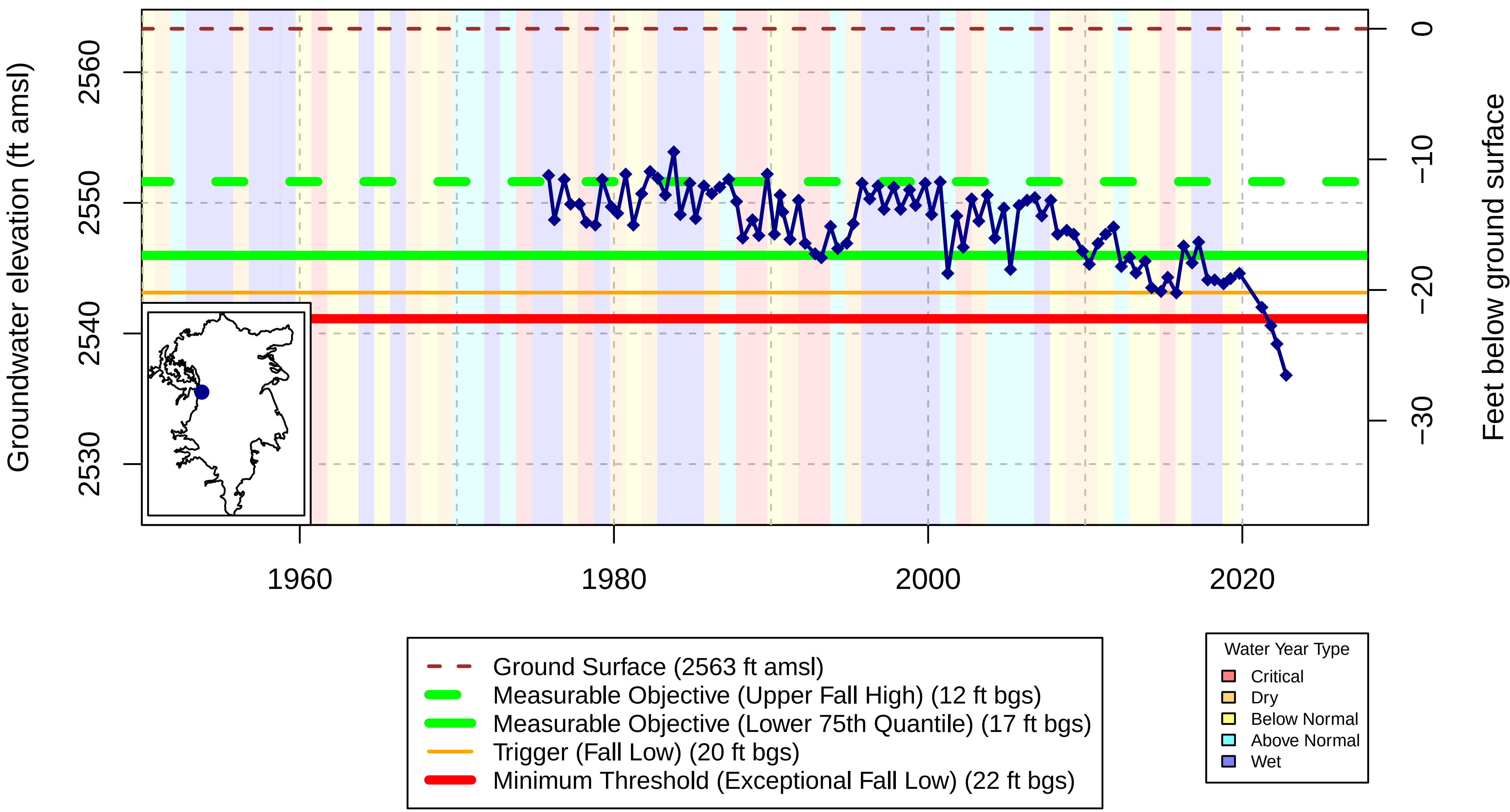
DWR Stn_ID: ; well_code: 415952N1223848W001; well_name: 43N05W11A001M; well_swn: 43N05W11A001M
Groundwater elevation (ft amsl)
Feet below ground surface
2600
2650
2700
2750
0
−50
−100
−150
1960
1980
2000
2020
Ground Surface (2743 ft amsl)
Measurable Objective (Upper Fall High) (121 ft bgs)
Measurable Objective (Lower 75th Quantile) (144 ft bgs)
Trigger (Fall Low) (156 ft bgs)
Minimum Threshold (Exceptional Fall Low) (166 ft bgs)
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet

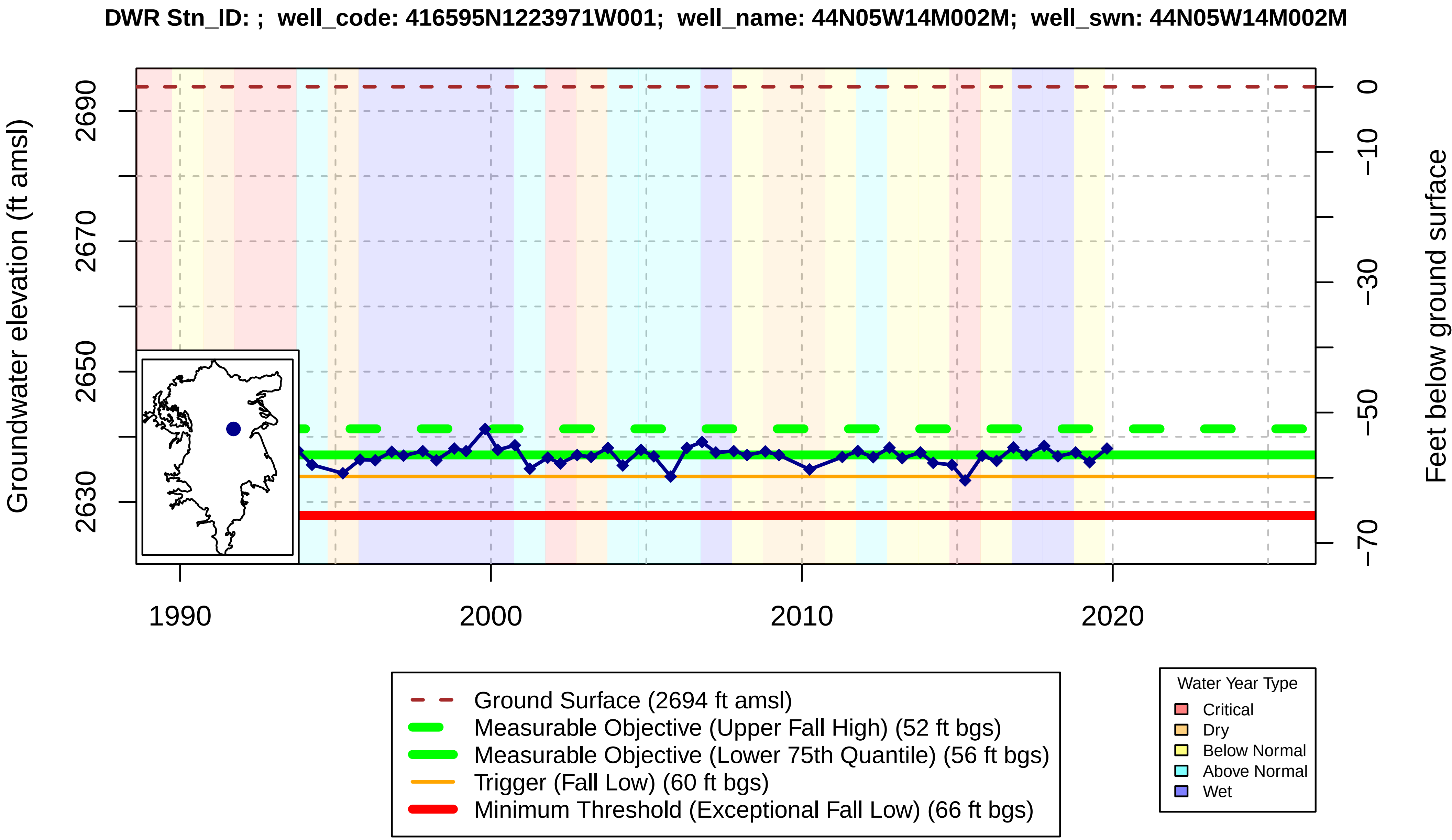


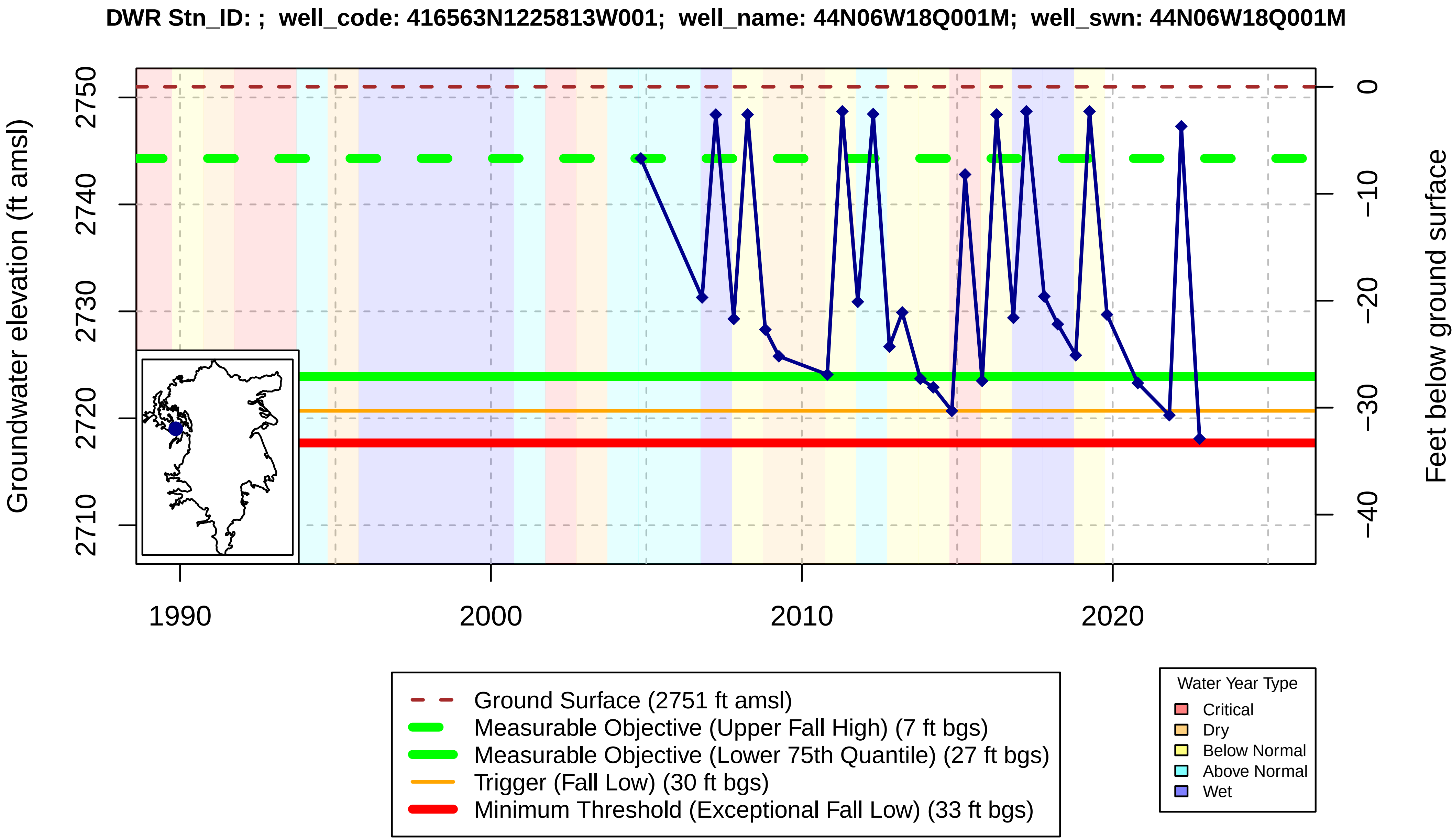
DWR Stn_ID: ; well_code: 416083N1223932W001; well_name: SV03A; well_swn: 43N05W02C002M
Groundwater elevation (ft amsl)
Feet below ground surface
2600
2620
2640
2660
0
−20
−40
−60
1990
2000
2010
2020
Ground Surface (2661 ft amsl)
Measurable Objective (Upper Fall High) (43 ft bgs)
Measurable Objective (Lower 75th Quantile) (47 ft bgs)
Trigger (Fall Low) (63 ft bgs)
Minimum Threshold (Exceptional Fall Low) (69 ft bgs)
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet

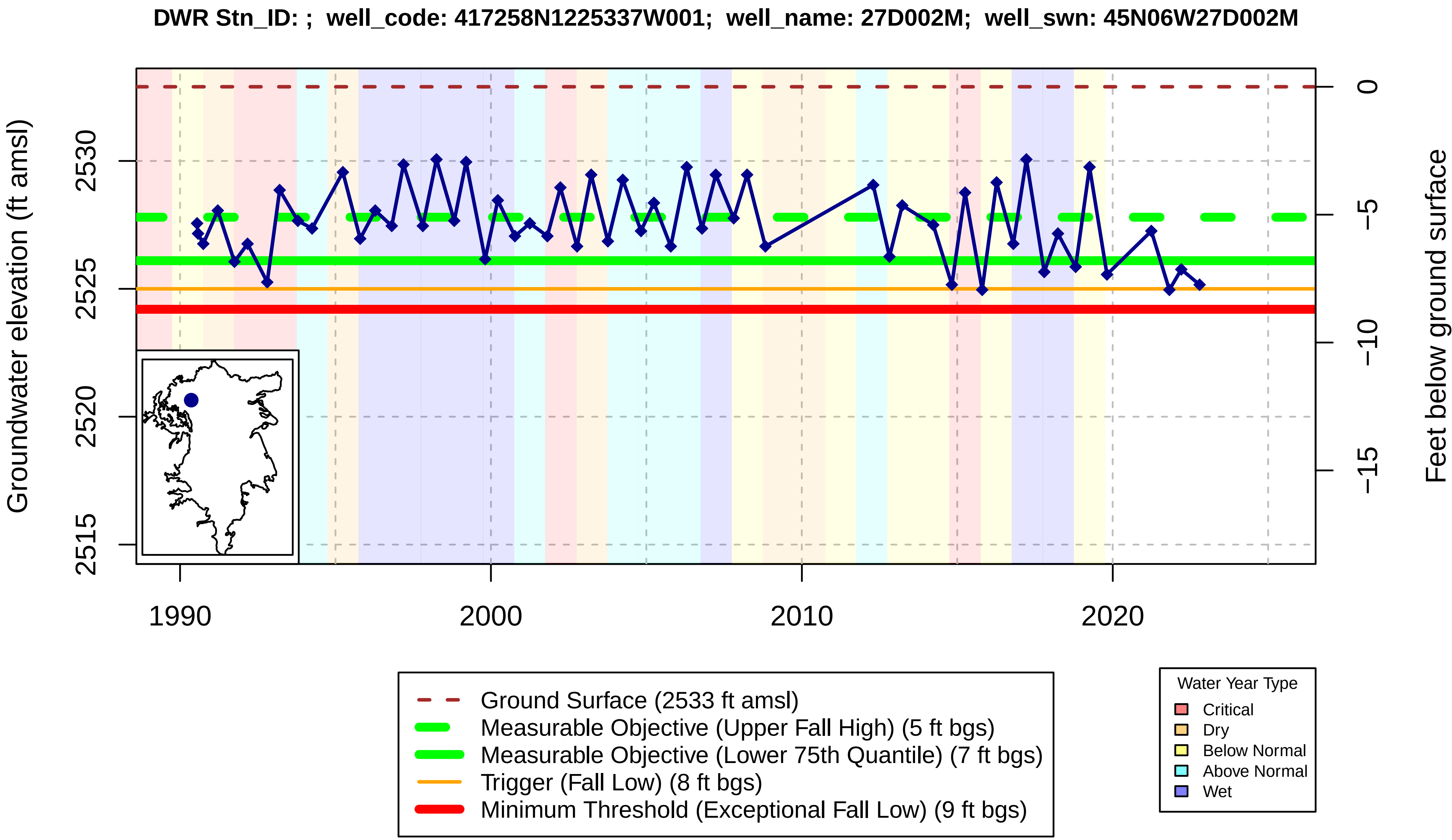

DWR Stn_ID: ; well_code: 416237N1224524W001; well_name: 44N05W32C002M; well_swn: 44N05W32C002M
Groundwater elevation (ft amsl)
Feet below ground surface
2540
2560
2580
2600
0
−20
−40
−60
1960
1980
2000
2020
Ground Surface (2612 ft amsl)
Measurable Objective (Upper Fall High) (40 ft bgs)
Measurable Objective (Lower 75th Quantile) (51 ft bgs)
Trigger (Fall Low) (66 ft bgs)
Minimum Threshold (Exceptional Fall Low) (73 ft bgs)
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet

DWR Stn_ID: ; well_code: 416397N1225224W001; well_name: 44N06W27B001M; well_swn: 44N06W27B001M

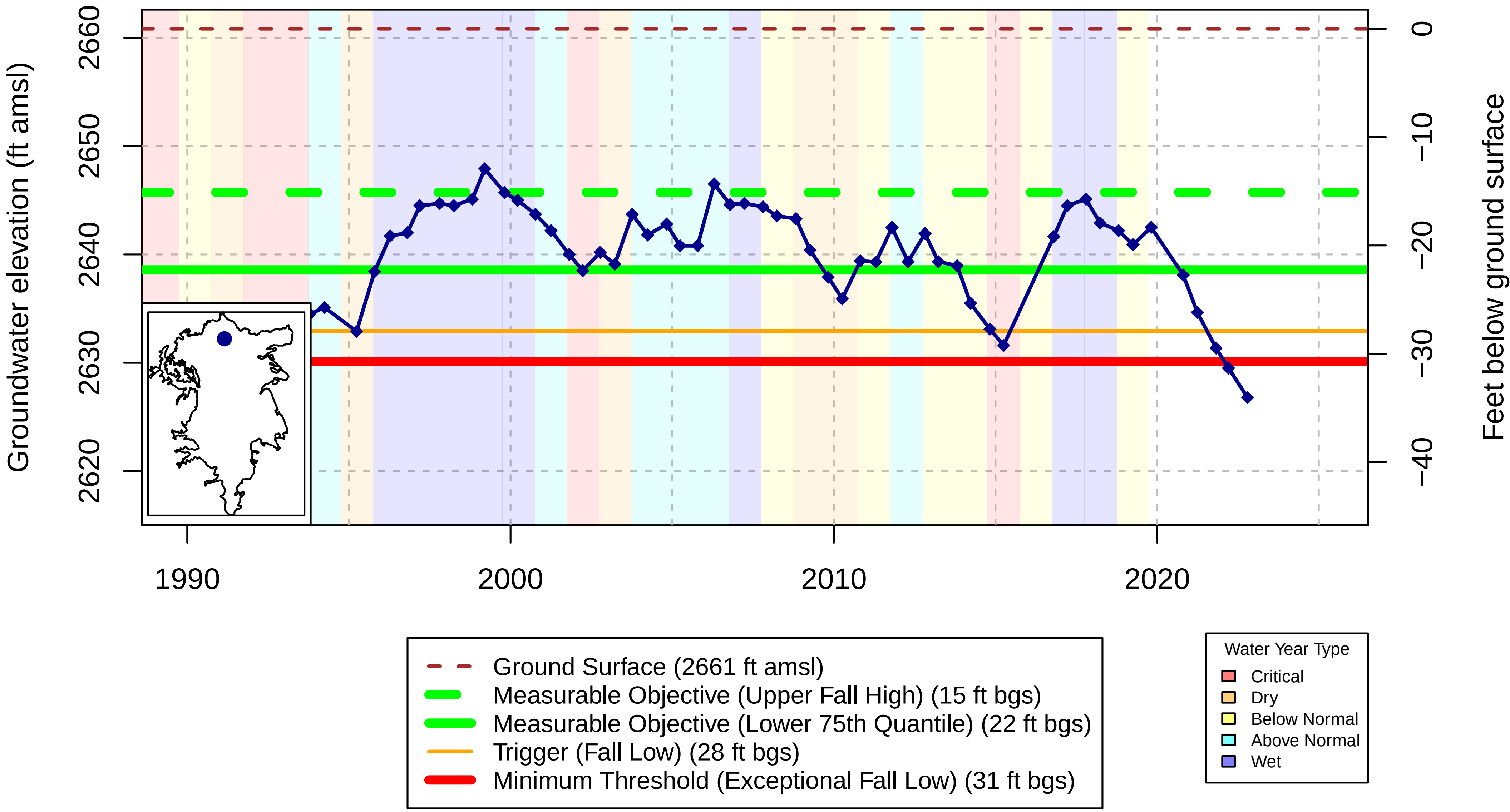


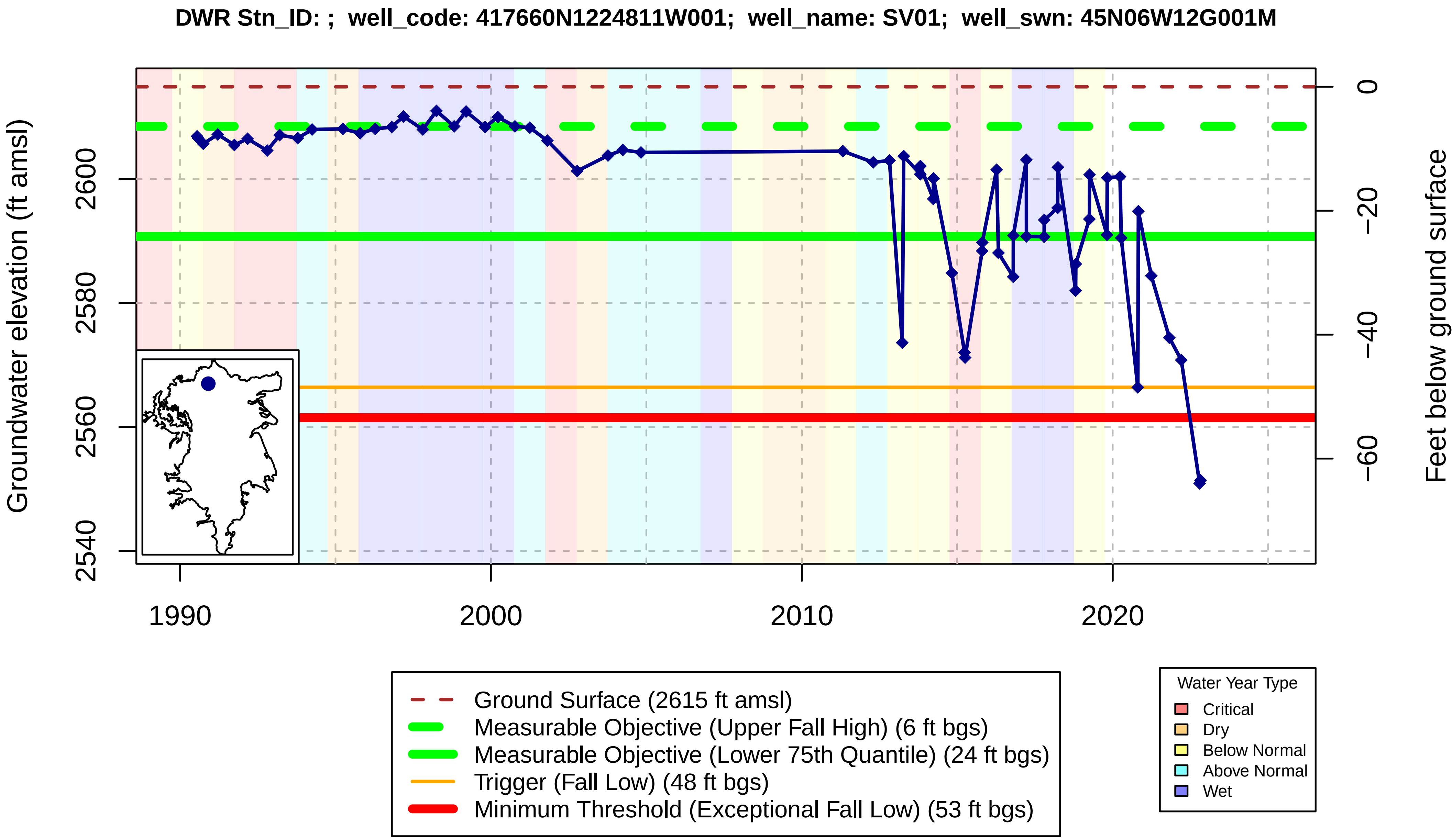

DWR Stn_ID: ; well_code: 416595N1223971W001; well_name: 44N05W14M002M; well_swn: 44N05W14M002M
Groundwater elevation (ft amsl)
2630
2650
2670
2690
Feet below ground surface
0
−10
−30
−50
−70
1990
2000
2010
2020
Ground Surface (2694 ft amsl)
Measurable Objective (Upper Fall High) (52 ft bgs)
Measurable Objective (Lower 75th Quantile) (56 ft bgs)
Trigger (Fall Low) (60 ft bgs)
Minimum Threshold (Exceptional Fall Low) (66 ft bgs)
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet

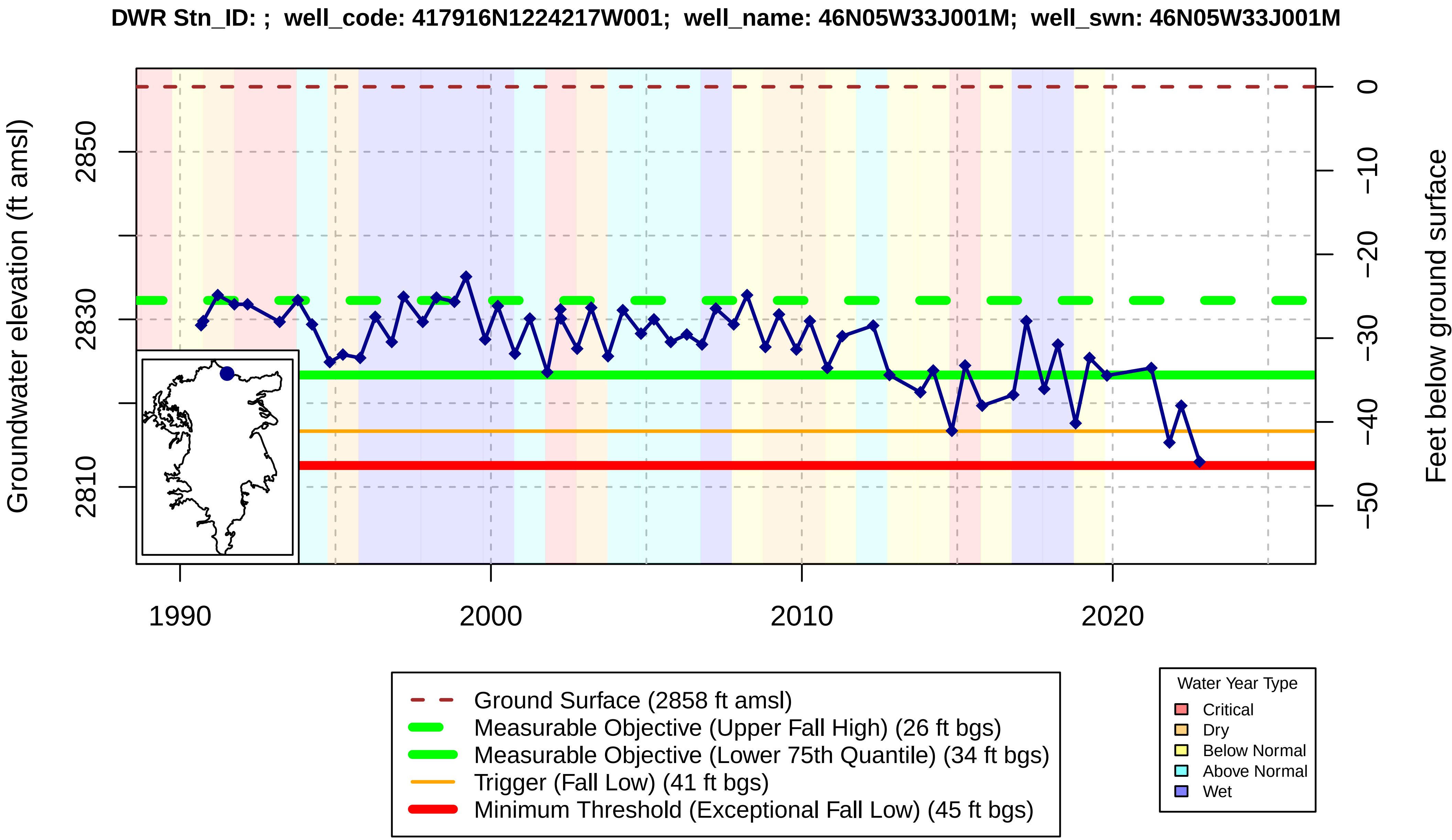

DWR Stn_ID: ; well_code: 416563N1225813W001; well_name: 44N06W18Q001M; well_swn: 44N06W18Q001M
Groundwater elevation (ft amsl)
2750
2740
2730
2720
2710
Feet below ground surface
0
−10
−20
−30
−40
1990
2000
2010
2020
Ground Surface (2751 ft amsl)
Measurable Objective (Upper Fall High) (7 ft bgs)
Measurable Objective (Lower 75th Quantile) (27 ft bgs)
Trigger (Fall Low) (30 ft bgs)
Minimum Threshold (Exceptional Fall Low) (33 ft bgs)
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet


DWR Stn_ID: ; well_code: 417258N1225337W001; well_name: 27D002M; well_swn: 45N06W27D002M
Groundwater elevation (ft amsl)
Feet below ground surface
2515
2520
2525
2530
0
−5
−10
−15
1990
2000
2010
2020
Ground Surface (2533 ft amsl)
Measurable Objective (Upper Fall High) (5 ft bgs)
Measurable Objective (Lower 75th Quantile) (7 ft bgs)
Trigger (Fall Low) (8 ft bgs)
Minimum Threshold (Exceptional Fall Low) (9 ft bgs)
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet

DWR Stn_ID: ; well_code: 417638N1224574W001; well_name: 45N05W07H002M; well_swn: 45N05W07H002M

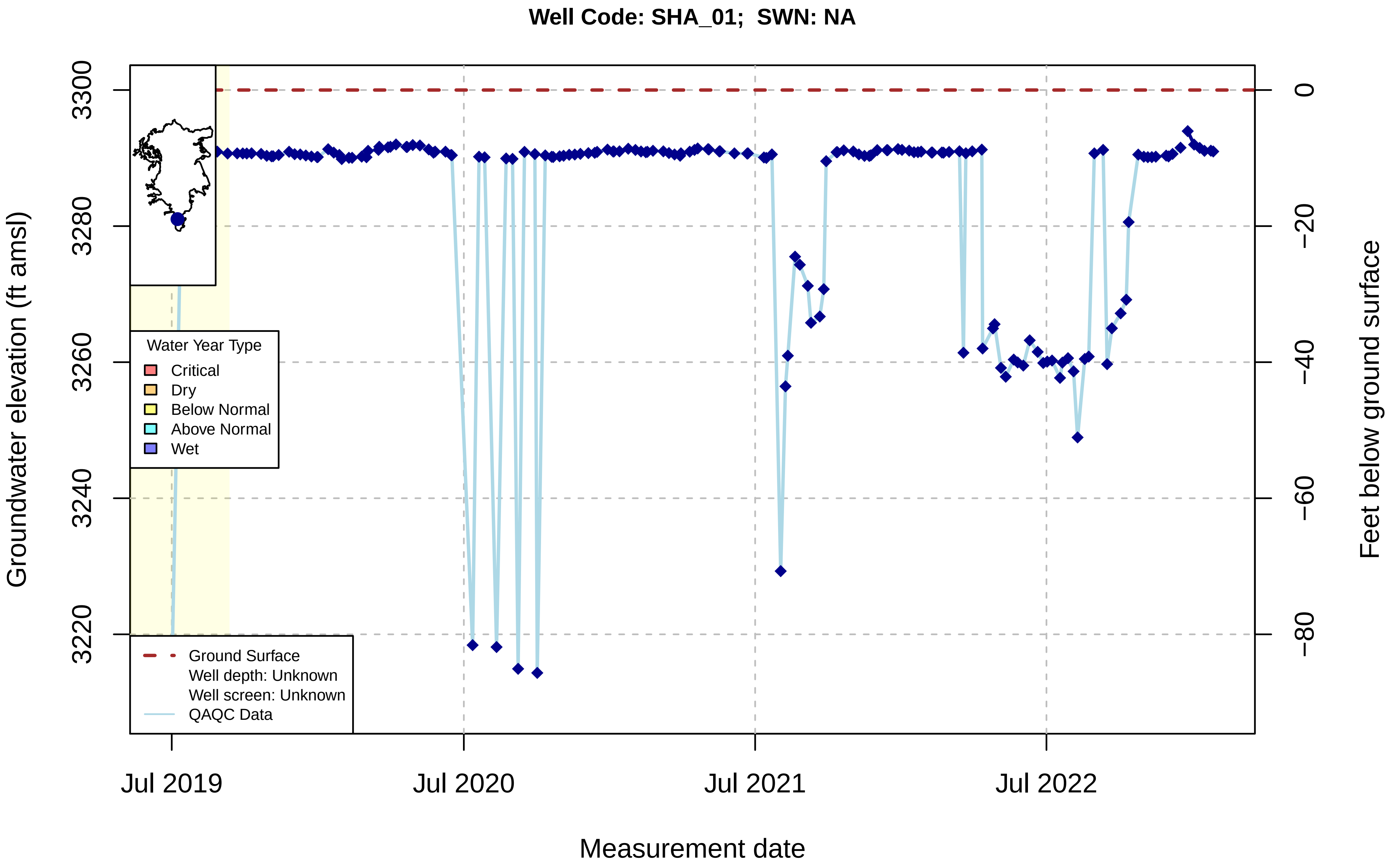



DWR Stn_ID: ; well_code: 417660N1224811W001; well_name: SV01; well_swn: 45N06W12G001M
Groundwater elevation (ft amsl)
Feet below ground surface
2540
2560
2580
2600
0
−20
−40
−60
1990
2000
2010
2020
Ground Surface (2615 ft amsl)
Measurable Objective (Upper Fall High) (6 ft bgs)
Measurable Objective (Lower 75th Quantile) (24 ft bgs)
Trigger (Fall Low) (48 ft bgs)
Minimum Threshold (Exceptional Fall Low) (53 ft bgs)
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet

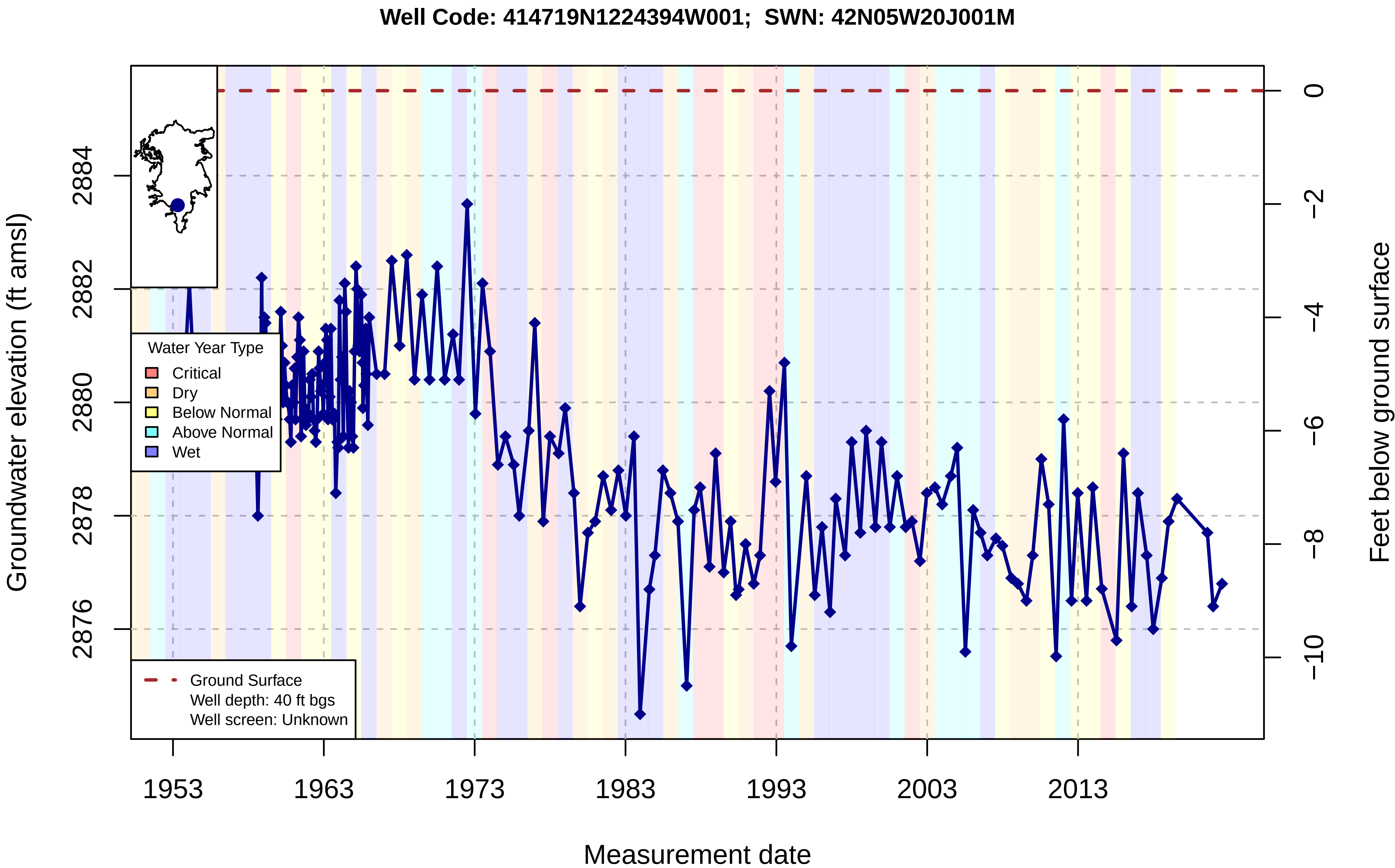


DWR Stn_ID: ; well_code: 417916N1224217W001; well_name: 46N05W33J001M; well_swn: 46N05W33J001M
Groundwater elevation (ft amsl)
Feet below ground surface
2810
2830
2850
0
−10
−20
−30
−40
−50
1990
2000
2010
2020
Ground Surface (2858 ft amsl)
Measurable Objective (Upper Fall High) (26 ft bgs)
Measurable Objective (Lower 75th Quantile) (34 ft bgs)
Trigger (Fall Low) (41 ft bgs)
Minimum Threshold (Exceptional Fall Low) (45 ft bgs)
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet

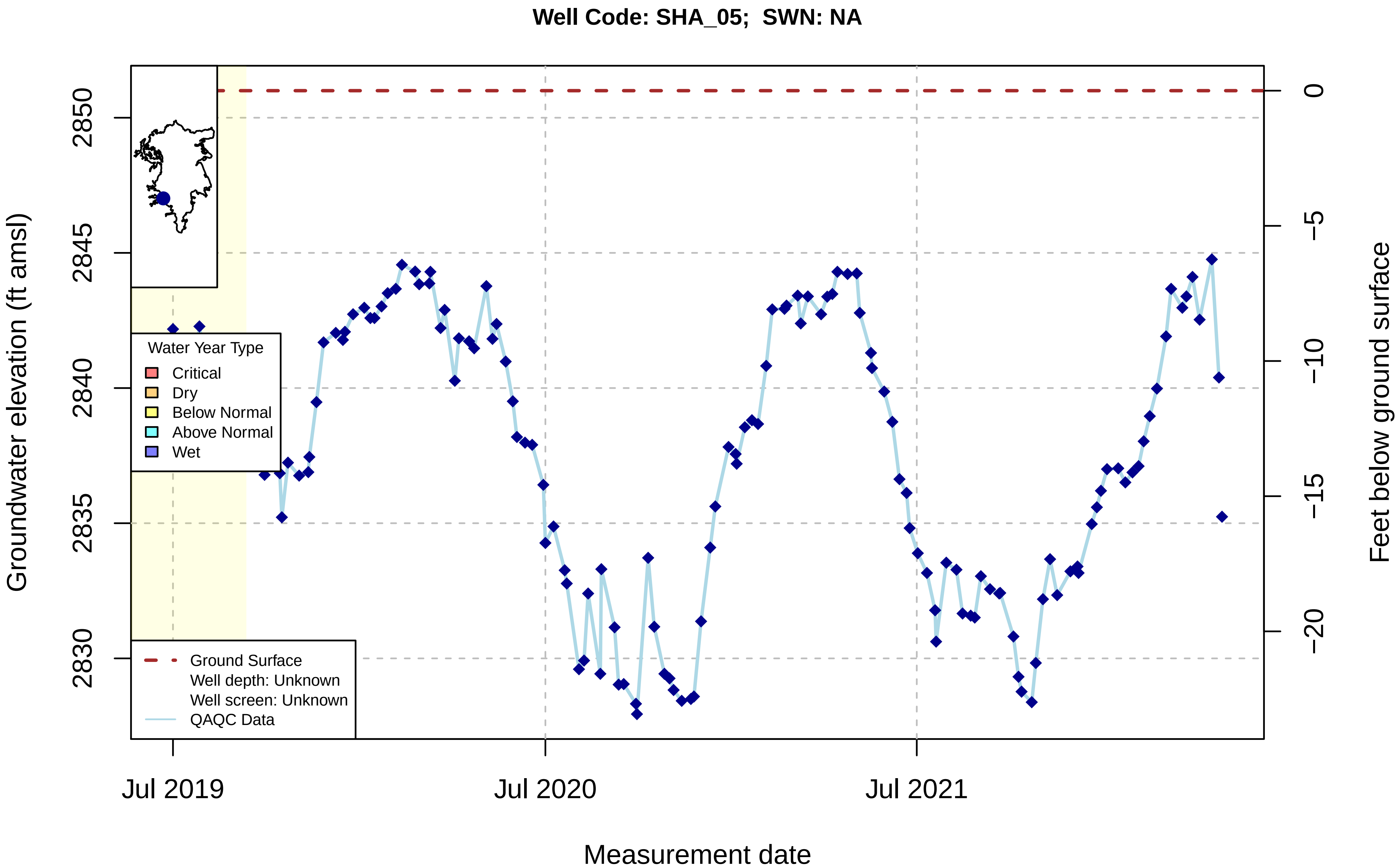
Appendix A.2 - Water Level Hydrographs

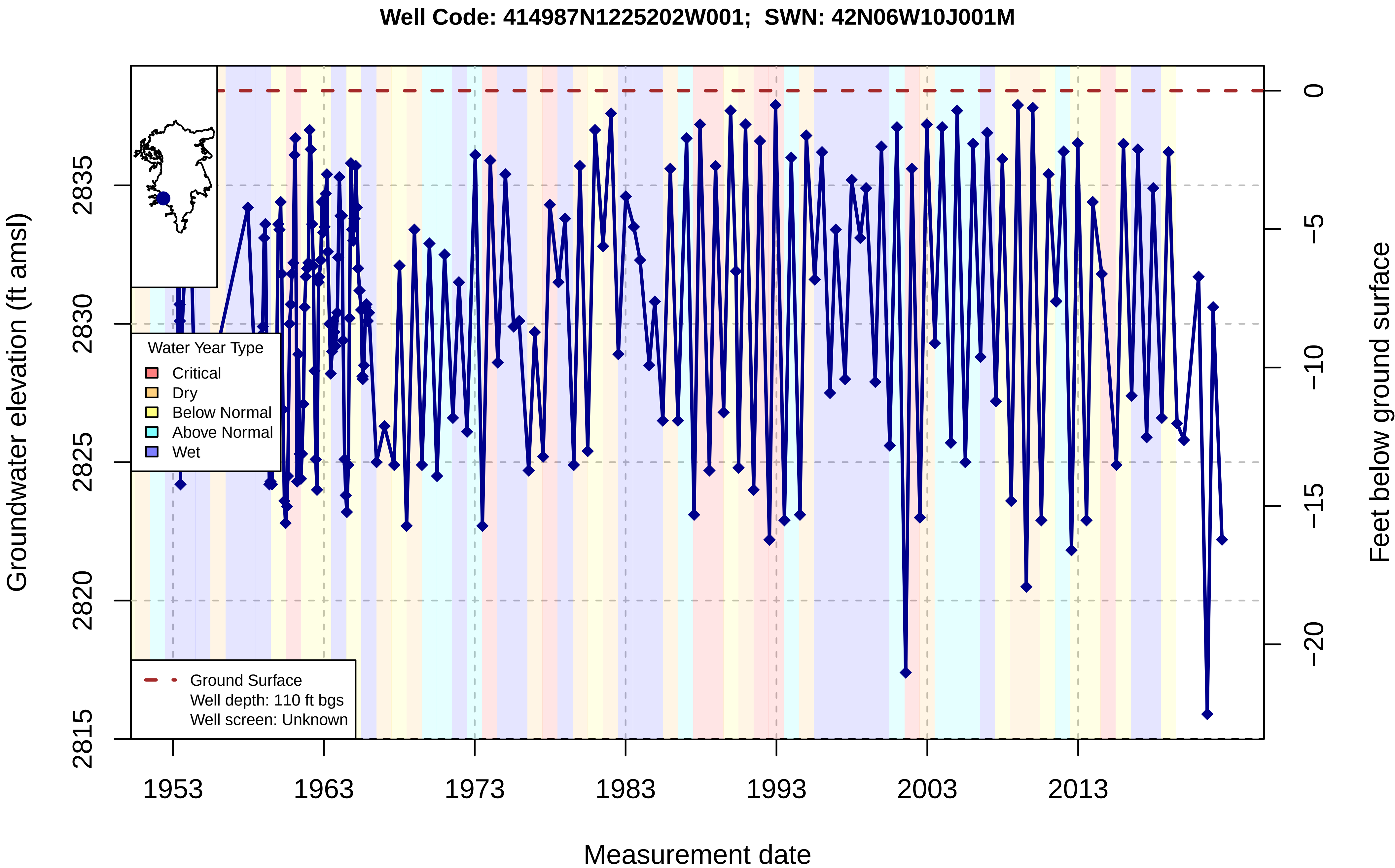


Well Code: SHA_01; SWN: NA
Groundwater elevation (ft amsl)
Feet below ground surface
Measurement date
3300
3280
3260
3240
3220
0
−20
−40
−60
−80
Jul 2019
Jul 2020
Jul 2021
Jul 2022
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: Unknown
Well screen: Unknown
QAQC Data

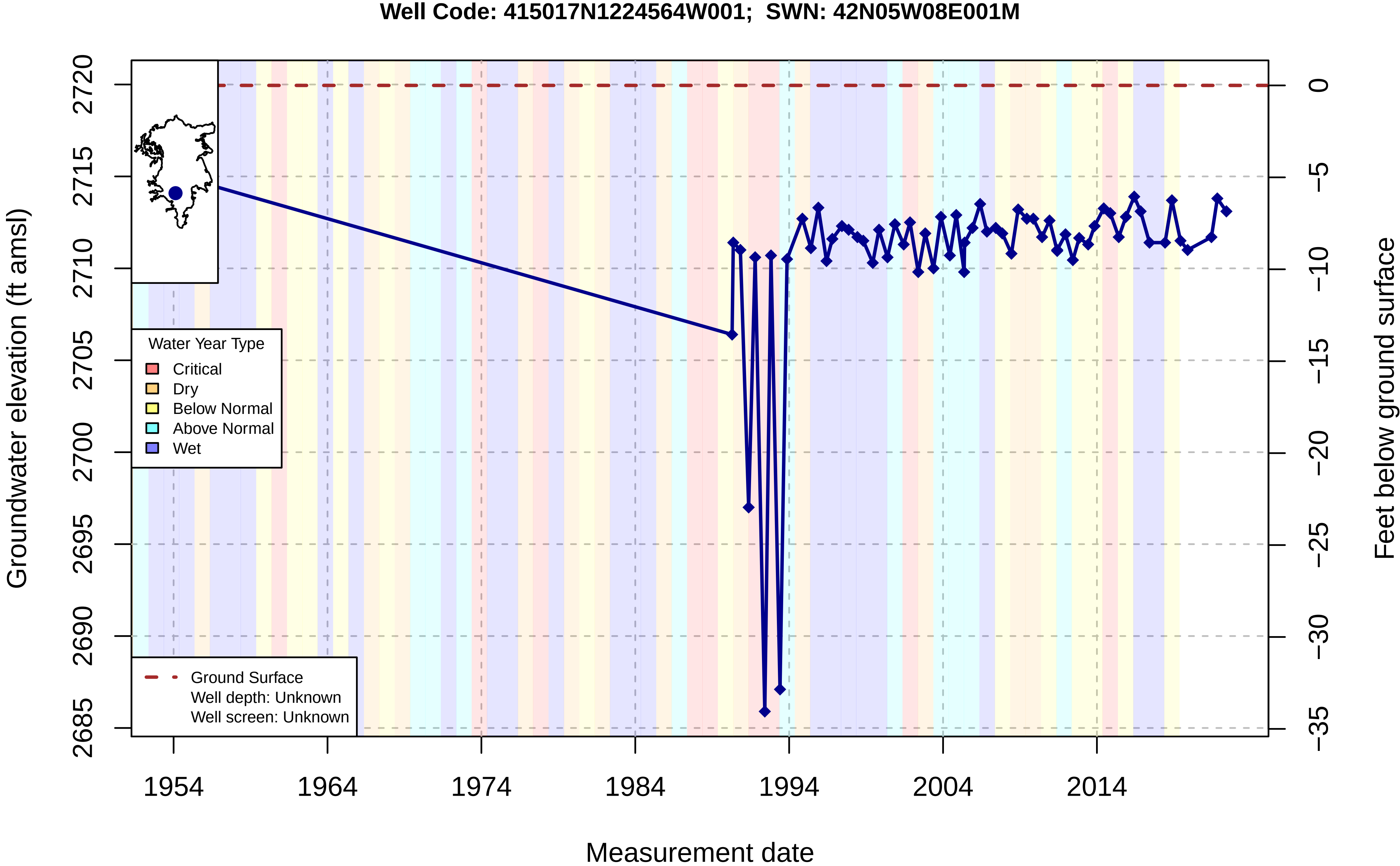


Well Code: 414719N1224394W001; SWN: 42N05W20J001M
Groundwater elevation (ft amsl)
Feet below ground surface
Measurement date
2876
2878
2880
2882
2884
0
−2
−4
−6
−8
−10
1953
1963
1973
1983
1993
2003
2013
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: 40 ft bgs
Well screen: Unknown


Well Code: SHA_05; SWN: NA
Groundwater elevation (ft amsl)
2830
2835
2840
2845
2850
Feet below ground surface
0
−5
−10
−15
−20
Measurement date
Jul 2019
Jul 2020
Jul 2021
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: Unknown
Well screen: Unknown
QAQC Data

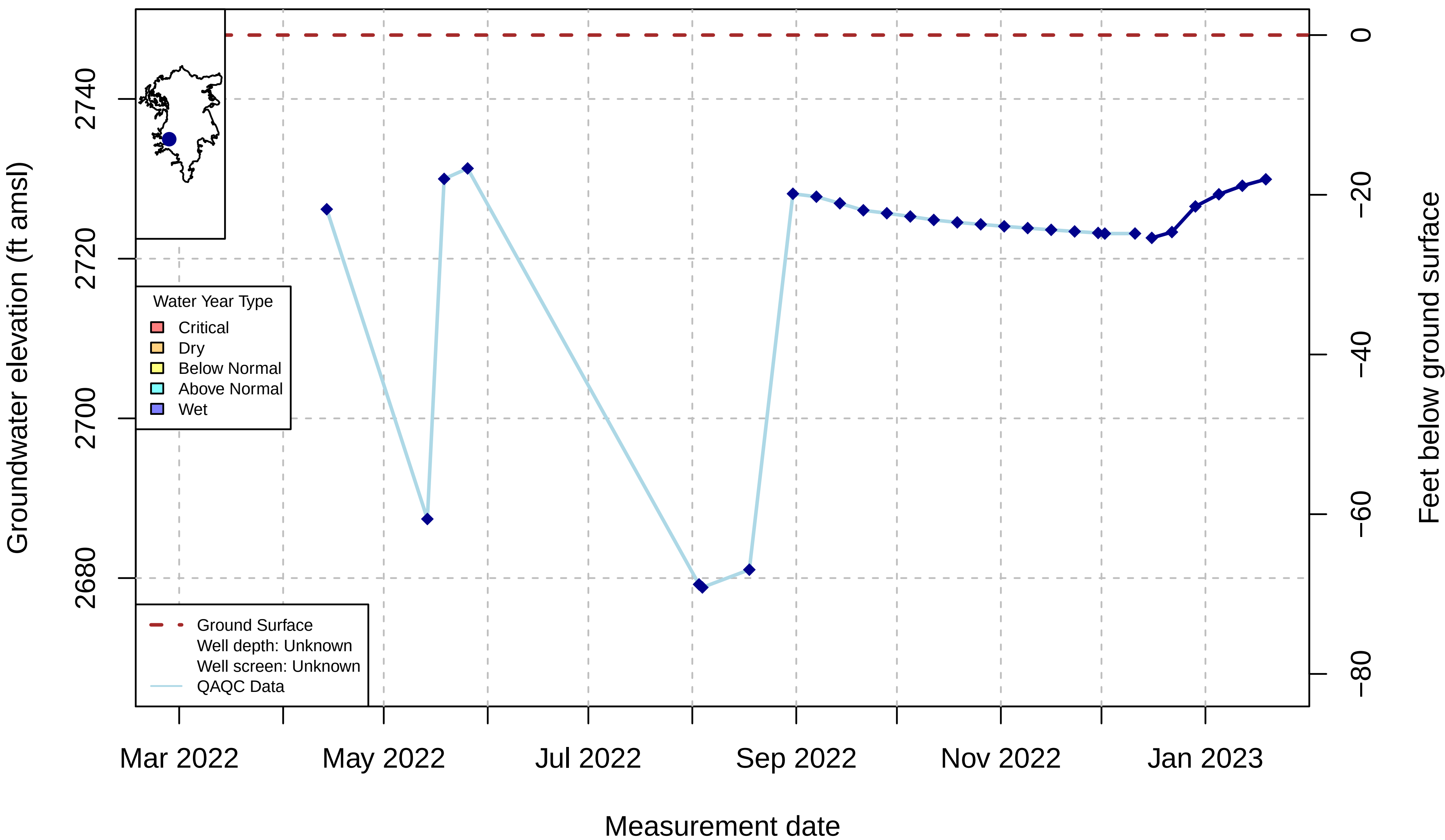


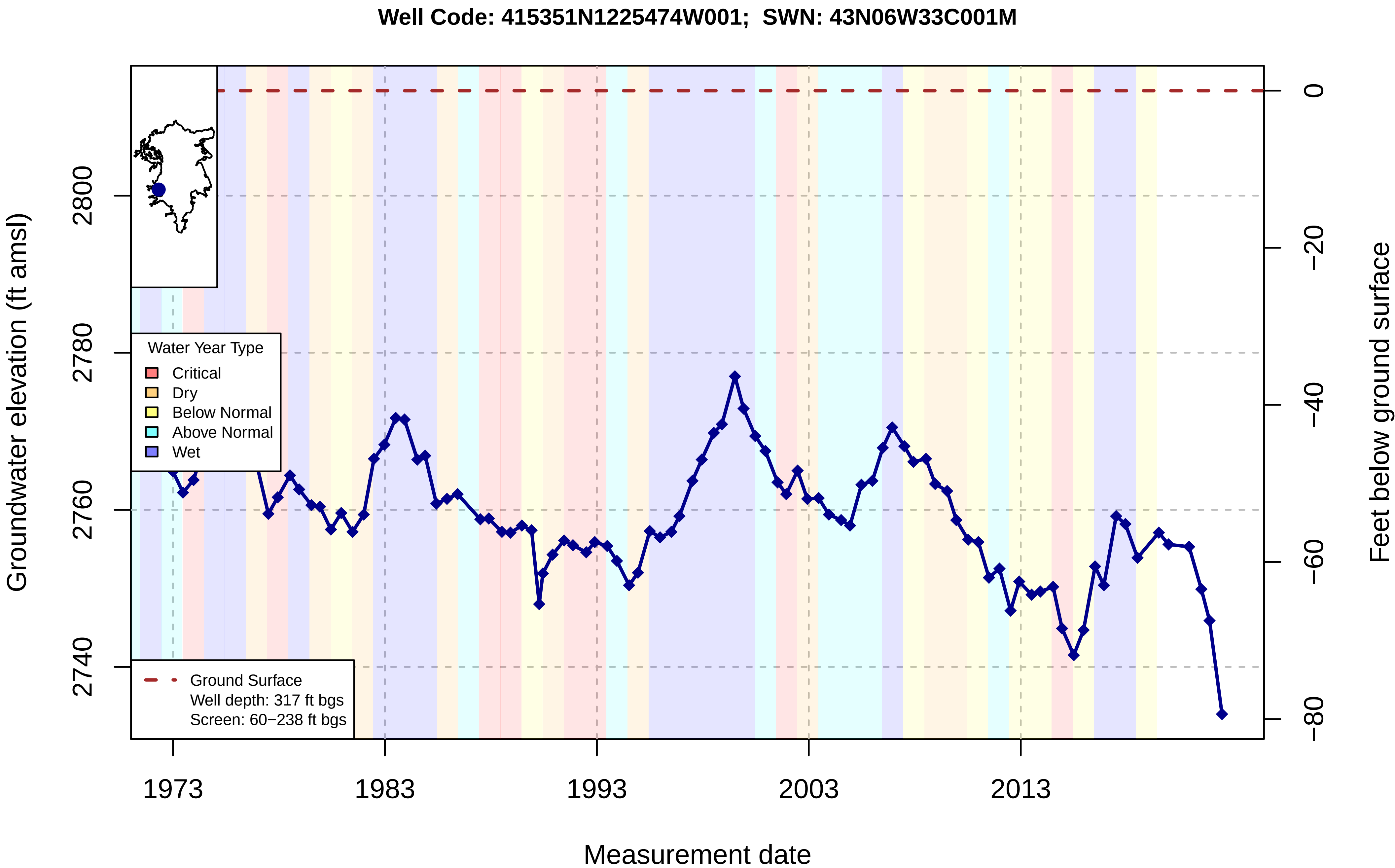
Well Code: 414987N1225202W001; SWN: 42N06W10J001M
Groundwater elevation (ft amsl)
2815
2820
2825
2830
2835
Feet below ground surface
0
−5
−10
−15
−20
Measurement date
1953
1963
1973
1983
1993
2003
2013
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: 110 ft bgs
Well screen: Unknown



Well Code: 415017N1224564W001; SWN: 42N05W08E001M
Groundwater elevation (ft amsl)
2685
2690
2695
2700
2705
2710
2715
2720
Feet below ground surface
0
−5
−10
−15
−20
−25
−30
−35
1954
1964
1974
1984
1994
2004
2014
Measurement date
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: Unknown
Well screen: Unknown

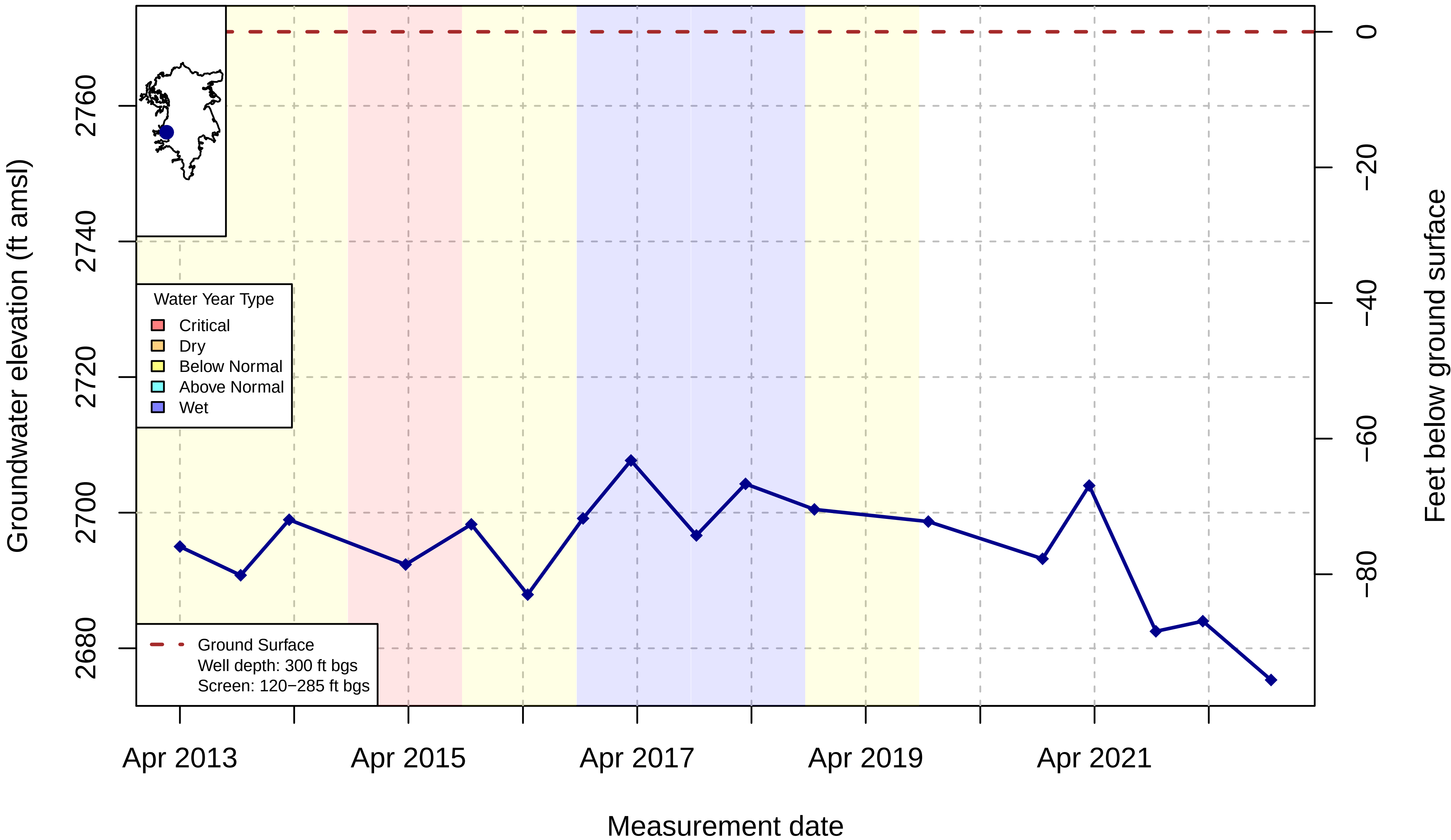
Well Code: SHA_180; SWN: NA



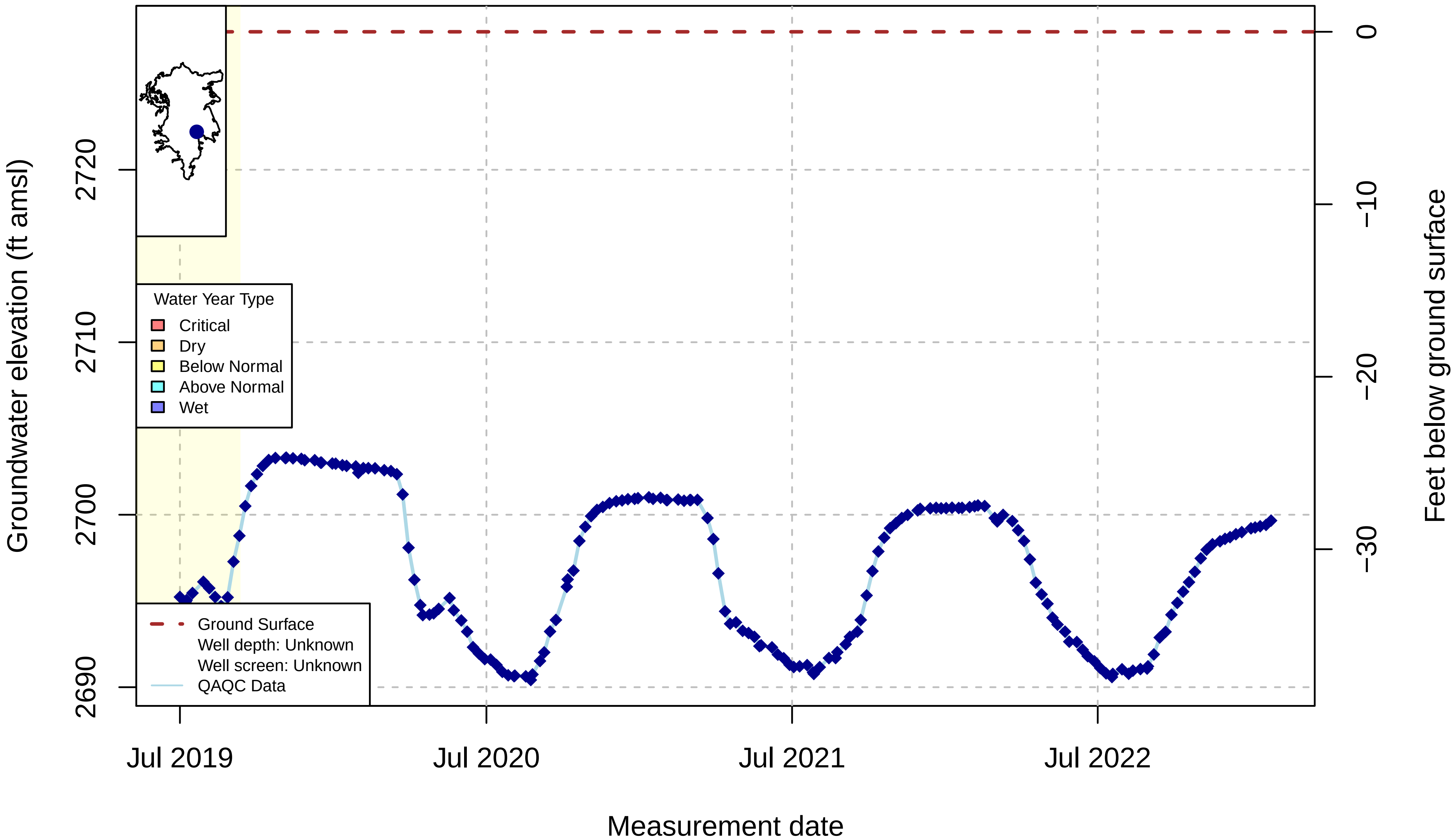


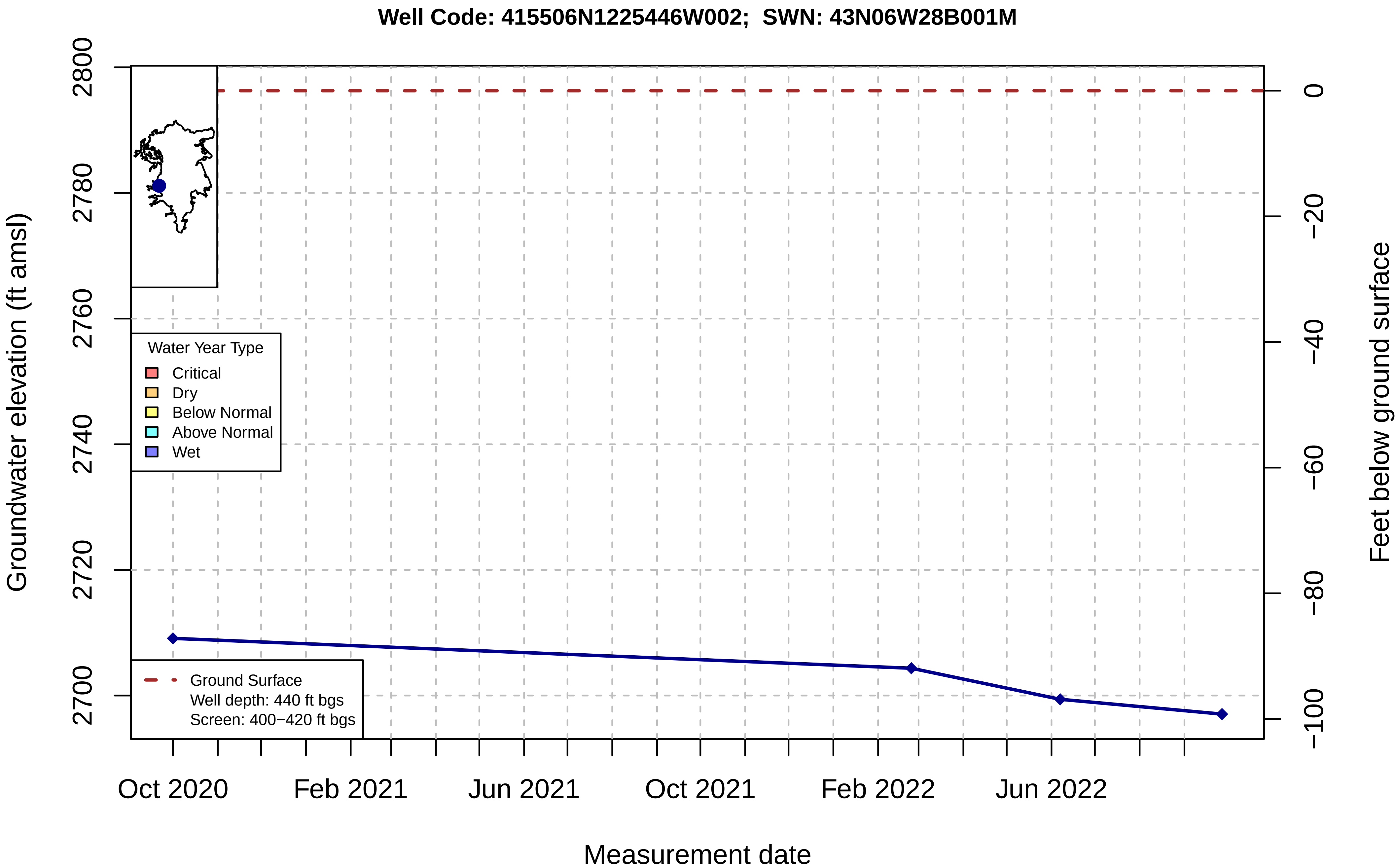
Well Code: 415351N1225474W001; SWN: 43N06W33C001M
Groundwater elevation (ft amsl)
2740
2760
2780
2800
Feet below ground surface
0
−20
−40
−60
−80
Measurement date
1973
1983
1993
2003
2013
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: 317 ft bgs
Screen: 60−238 ft bgs

Well Code: 415444N1225387W001; SWN: NA

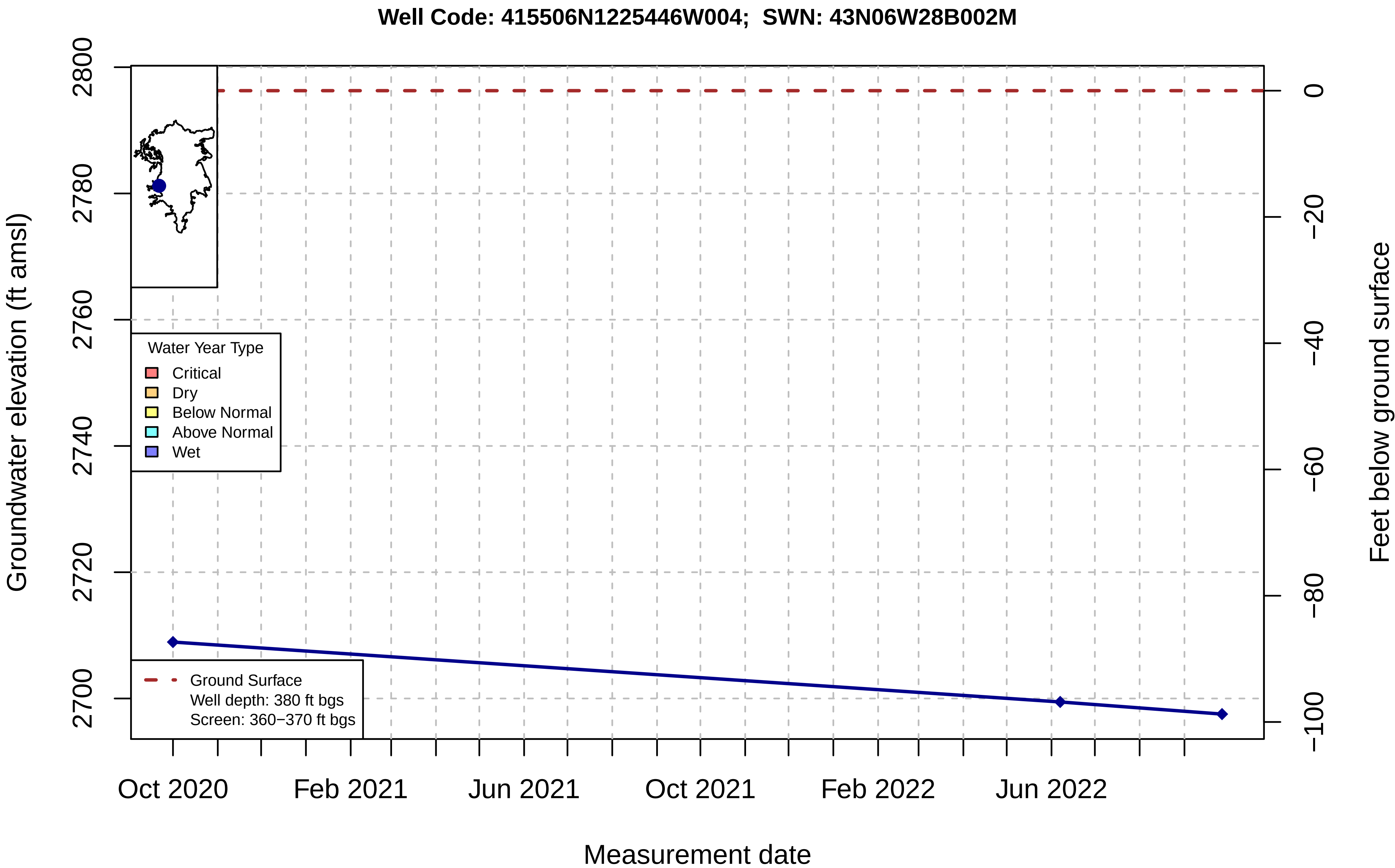


Well Code: SHA_06; SWN: NA

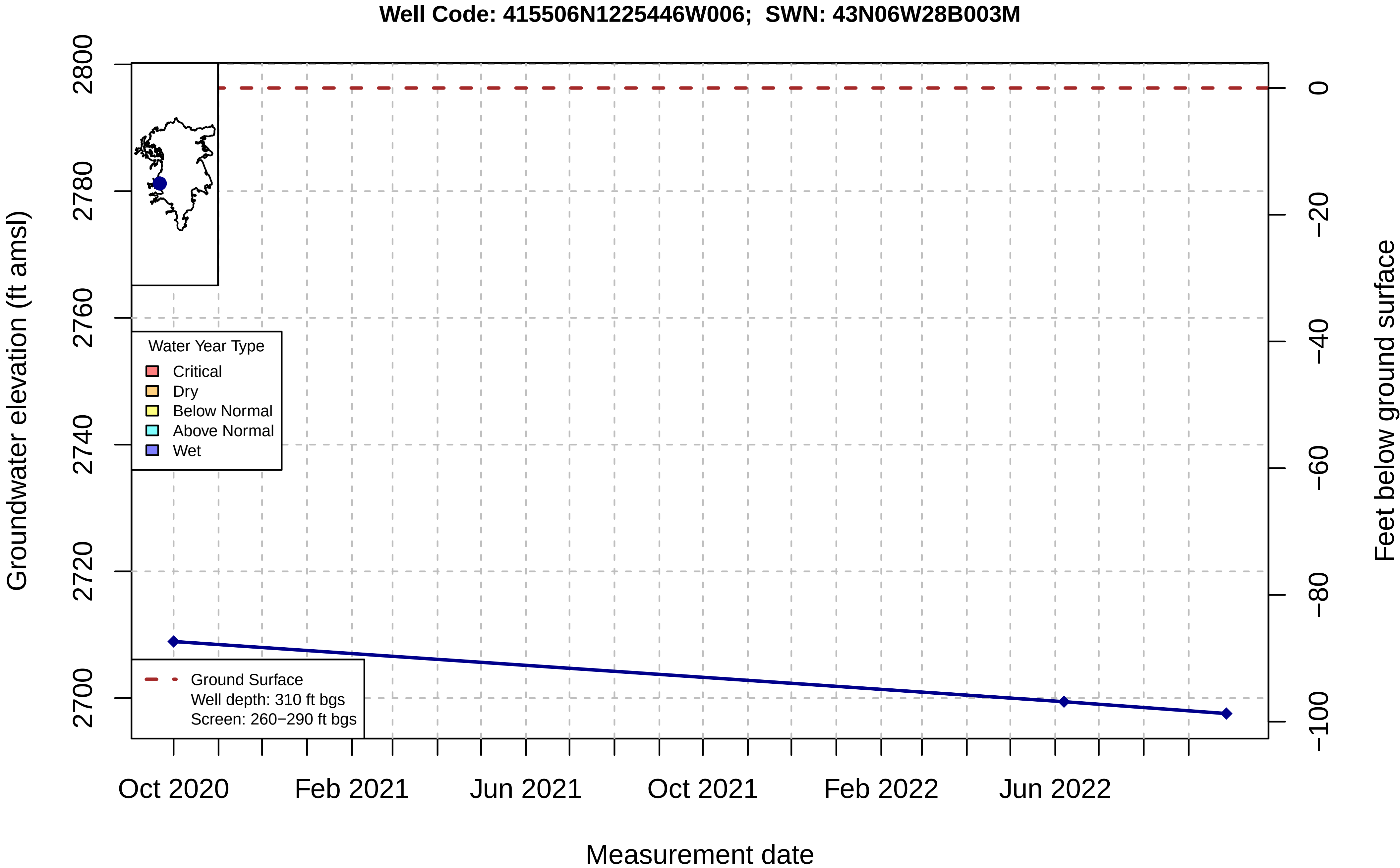




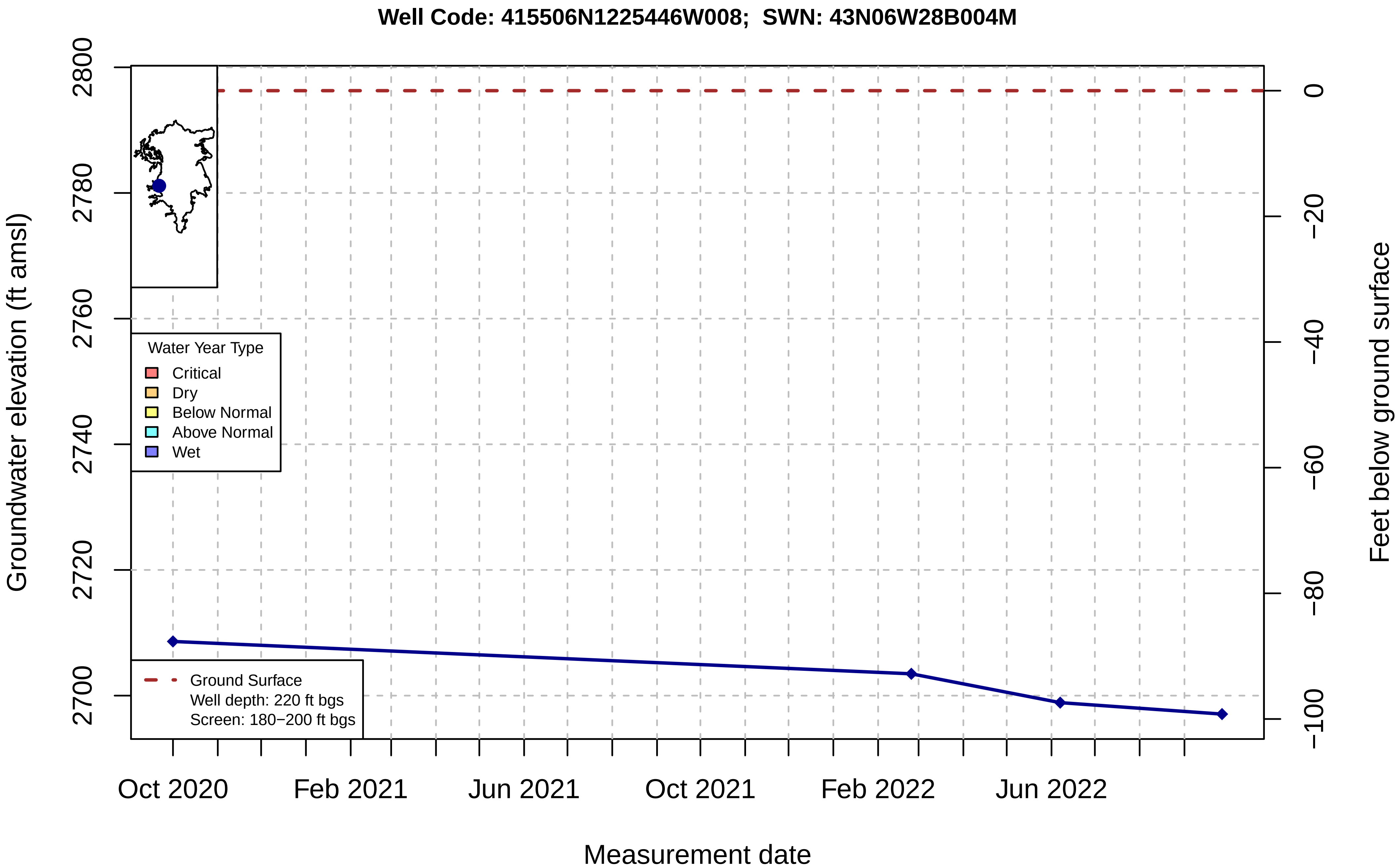
Well Code: 415506N1225446W002; SWN: 43N06W28B001M
Groundwater elevation (ft amsl)
2800
2780
2760
2740
2720
2700
Feet below ground surface
0
−20
−40
−60
−80
−100
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: 440 ft bgs
Screen: 400−420 ft bgs
Oct 2020
Feb 2021
Jun 2021
Oct 2021
Feb 2022
Jun 2022
Measurement date



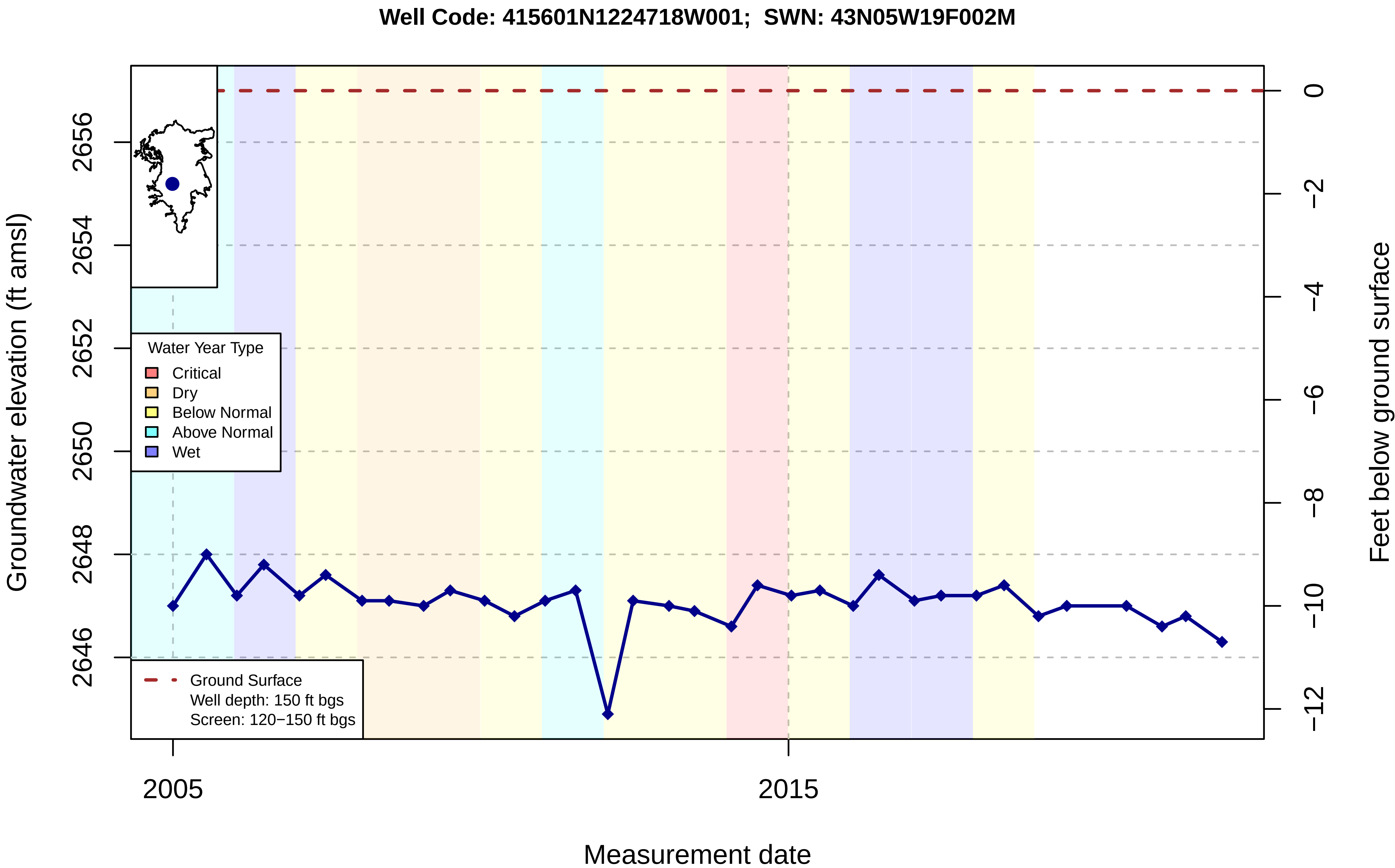
Well Code: 415506N1225446W004; SWN: 43N06W28B002M
Groundwater elevation (ft amsl)
2800
2780
2760
2740
2720
2700
Feet below ground surface
0
−20
−40
−60
−80
−100
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: 380 ft bgs
Screen: 360−370 ft bgs
Oct 2020
Feb 2021
Jun 2021
Oct 2021
Feb 2022
Jun 2022
Measurement date



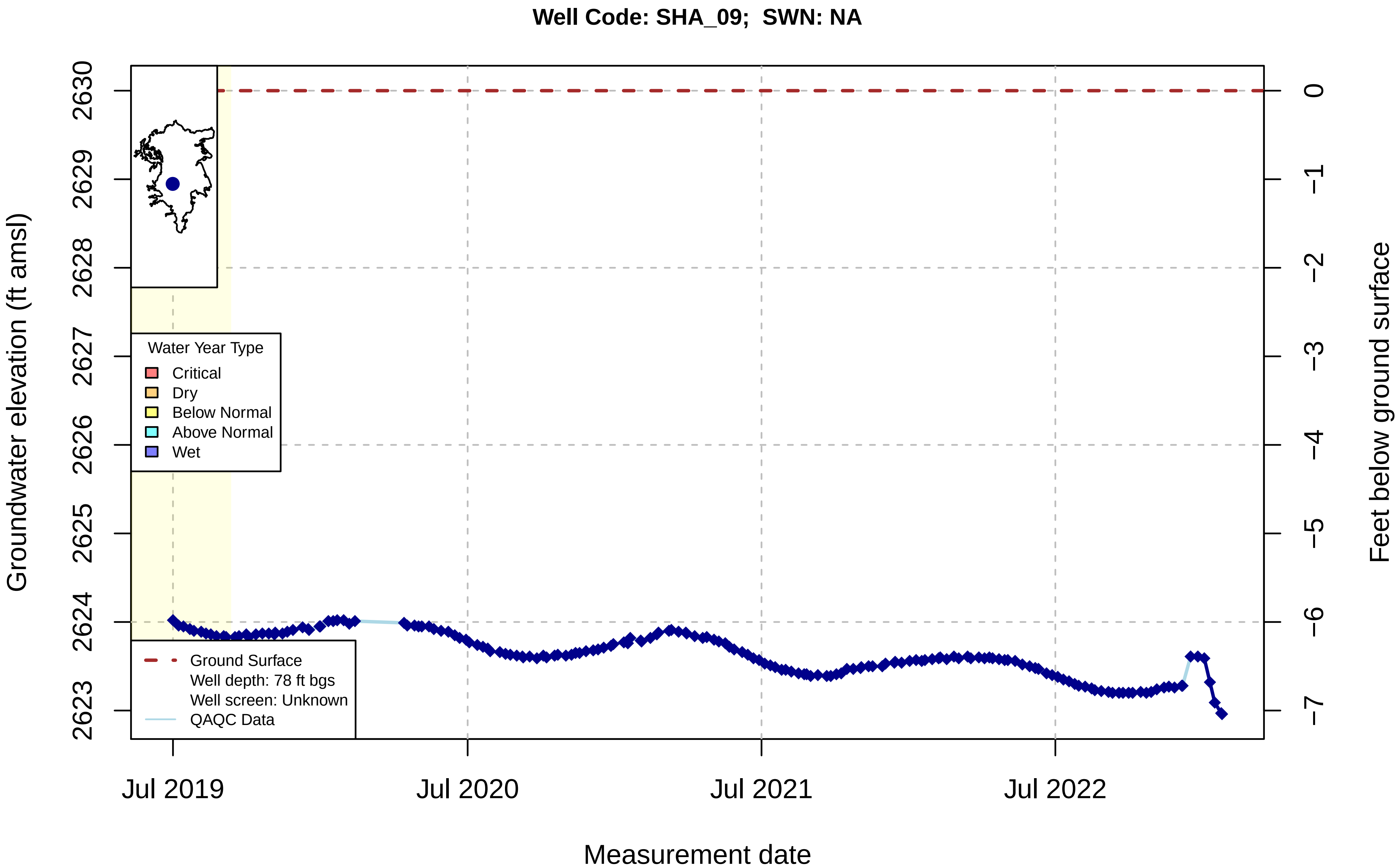
Well Code: 415506N1225446W006; SWN: 43N06W28B003M
Groundwater elevation (ft amsl)
2800
2780
2760
2740
2720
2700
Feet below ground surface
0
−20
−40
−60
−80
−100
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: 310 ft bgs
Screen: 260−290 ft bgs
Oct 2020
Feb 2021
Jun 2021
Oct 2021
Feb 2022
Jun 2022
Measurement date

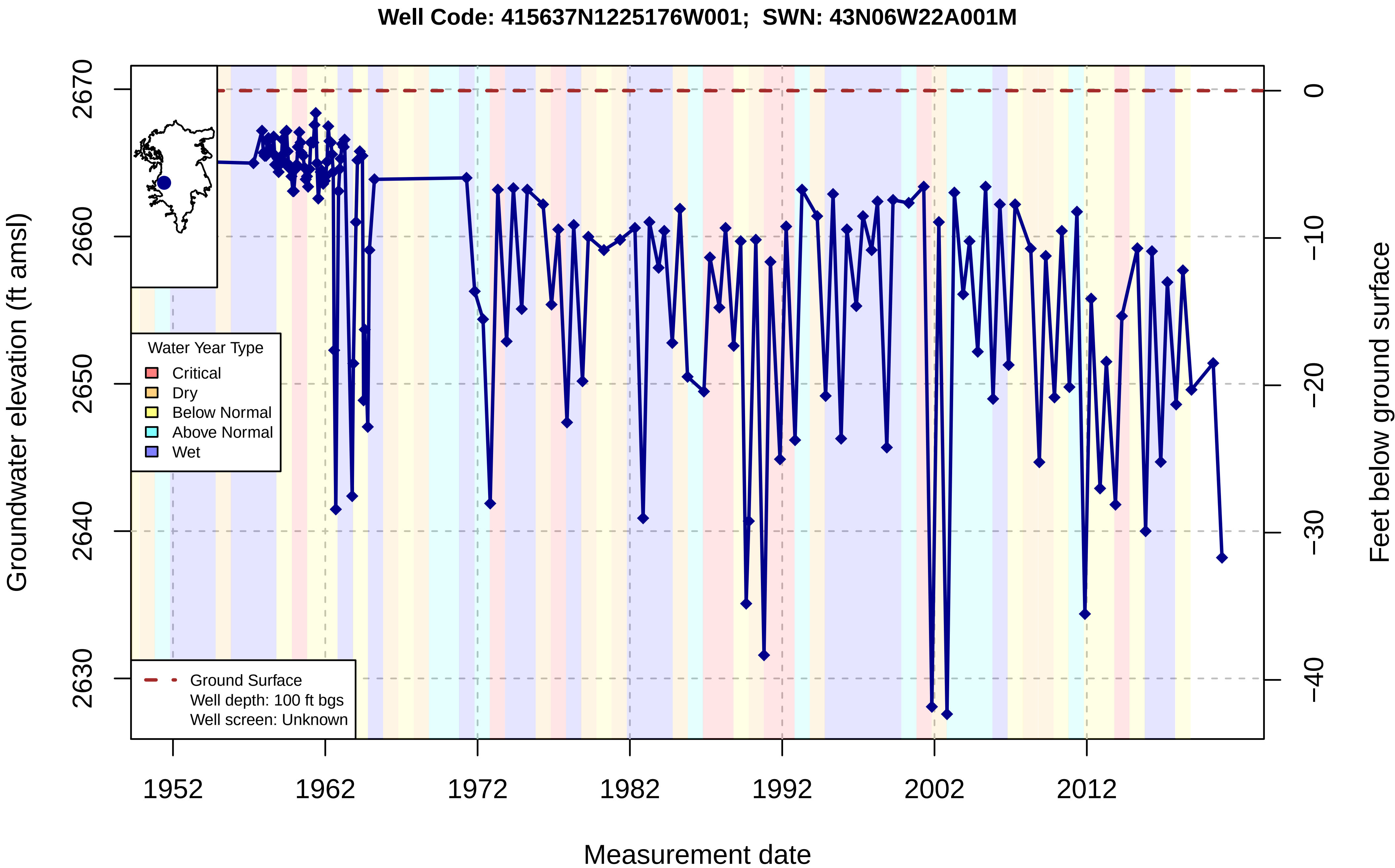


Well Code: 415506N1225446W008; SWN: 43N06W28B004M
Groundwater elevation (ft amsl)
2800
2780
2760
2740
2720
2700
Feet below ground surface
0
−20
−40
−60
−80
−100
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: 220 ft bgs
Screen: 180−200 ft bgs
Oct 2020
Feb 2021
Jun 2021
Oct 2021
Feb 2022
Jun 2022
Measurement date

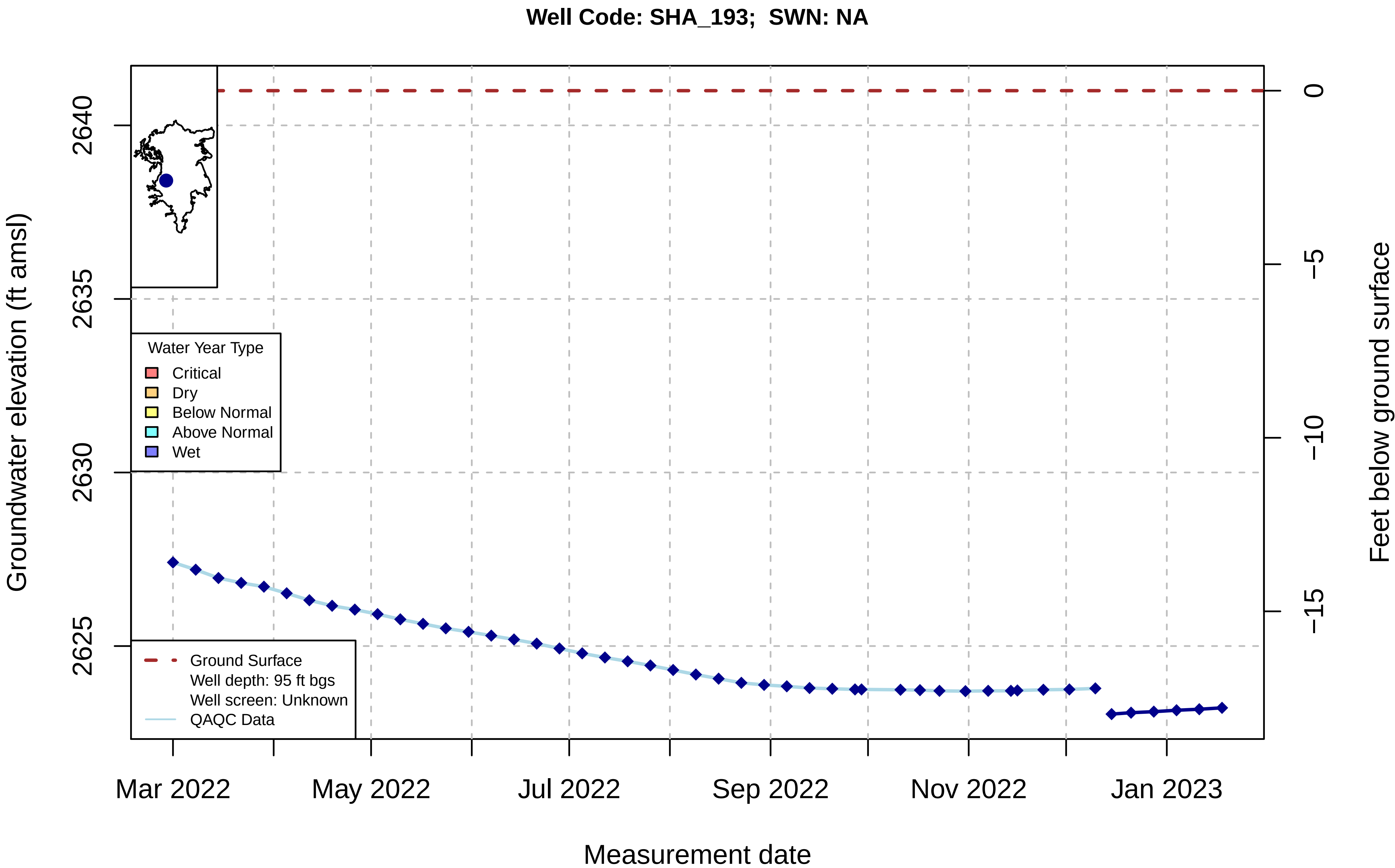


Well Code: 415601N1224718W001; SWN: 43N05W19F002M
Groundwater elevation (ft amsl)
2646
2648
2650
2652
2654
2656
Feet below ground surface
0
−2
−4
−6
−8
−10
−12
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: 150 ft bgs
Screen: 120−150 ft bgs
2005
2015
Measurement date

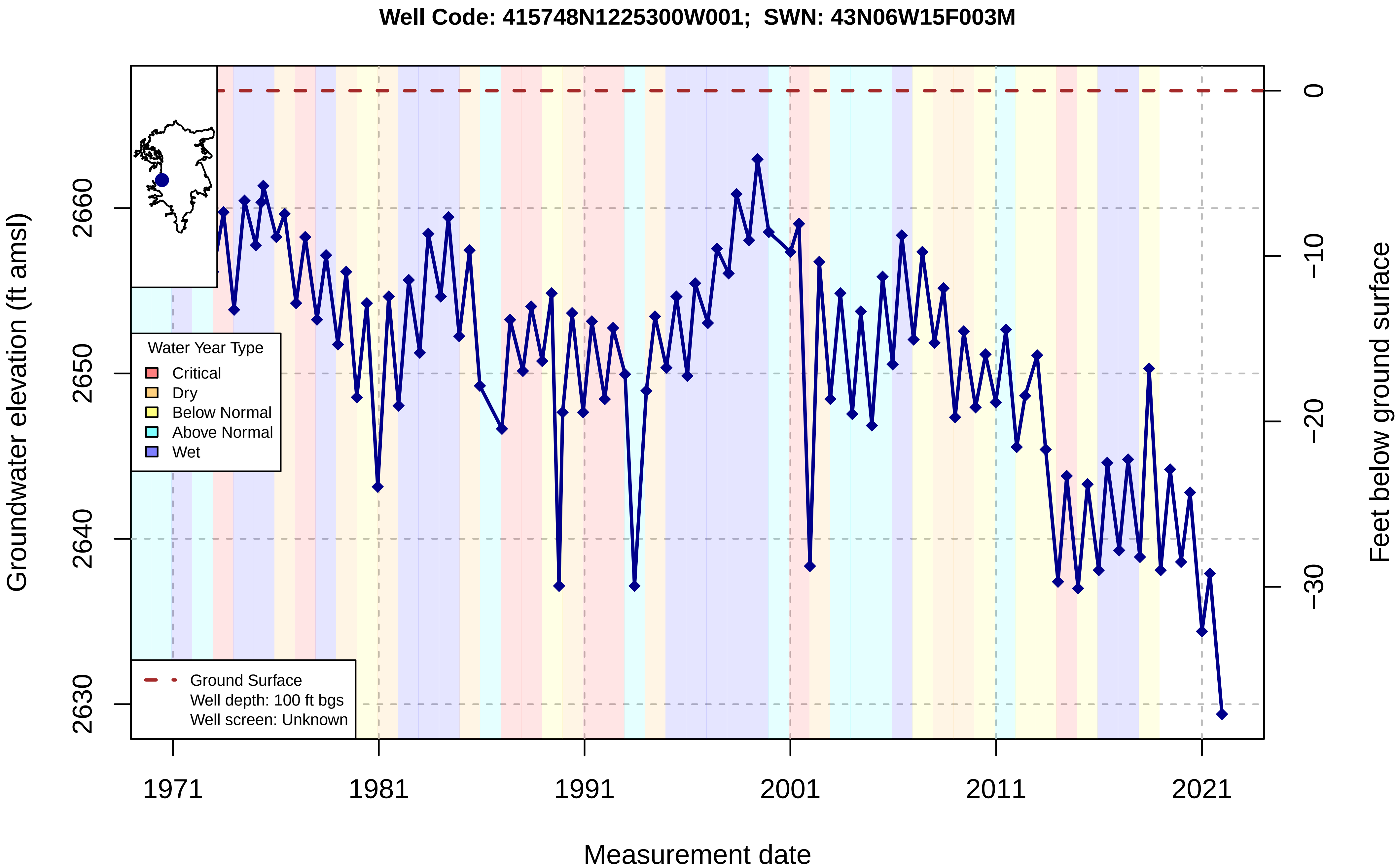

Well Code: SHA_09; SWN: NA
Groundwater elevation (ft amsl)
2630
2629
2628
2627
2626
2625
2624
2623
Feet below ground surface
0
−1
−2
−3
−4
−5
−6
−7
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: 78 ft bgs
Well screen: Unknown
QAQC Data
Jul 2019
Jul 2020
Jul 2021
Jul 2022
Measurement date



Well Code: 415637N1225176W001; SWN: 43N06W22A001M
Groundwater elevation (ft amsl)
Feet below ground surface
Measurement date
2630
2640
2650
2660
2670
0
−10
−20
−30
−40
1952
1962
1972
1982
1992
2002
2012
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: 100 ft bgs
Well screen: Unknown

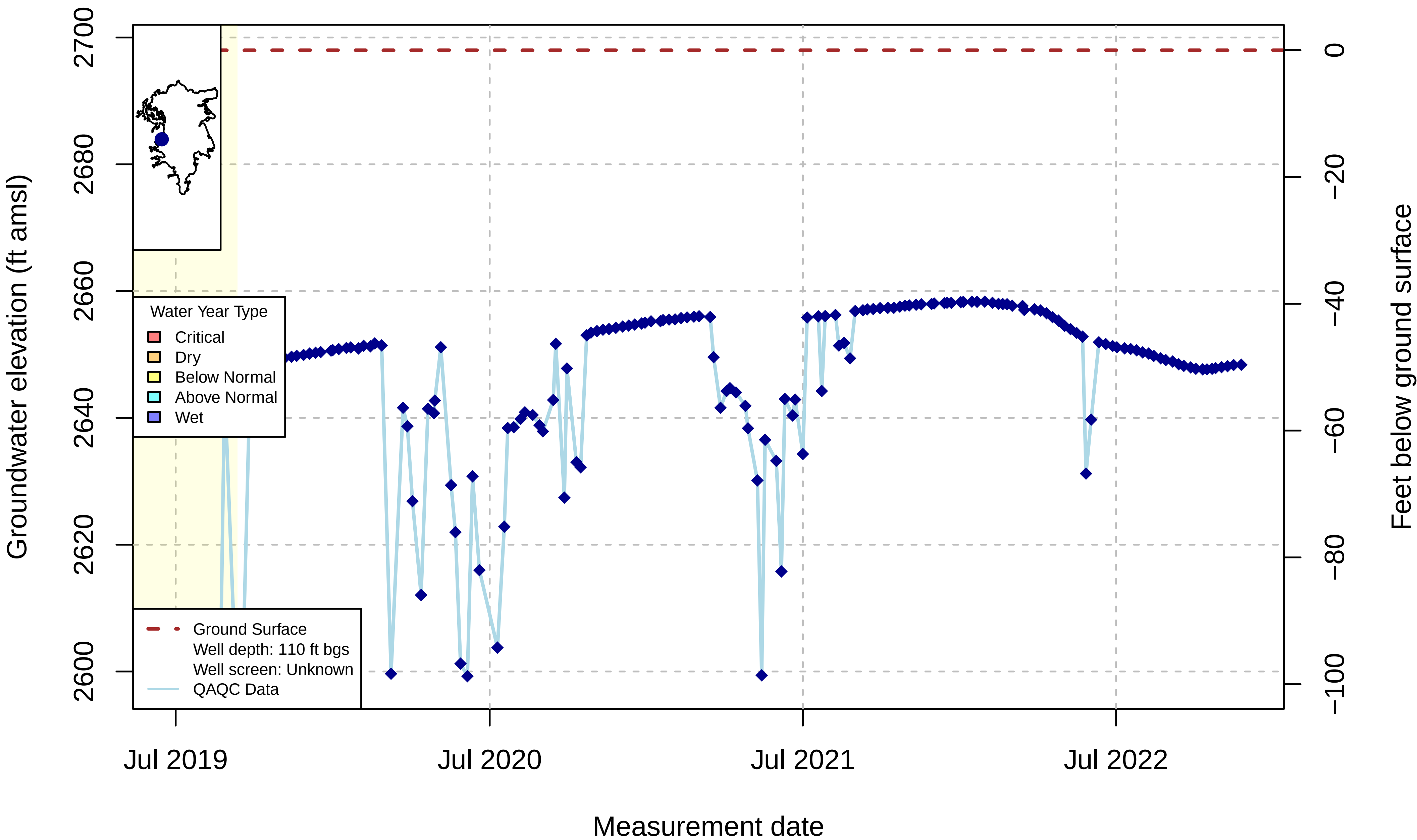


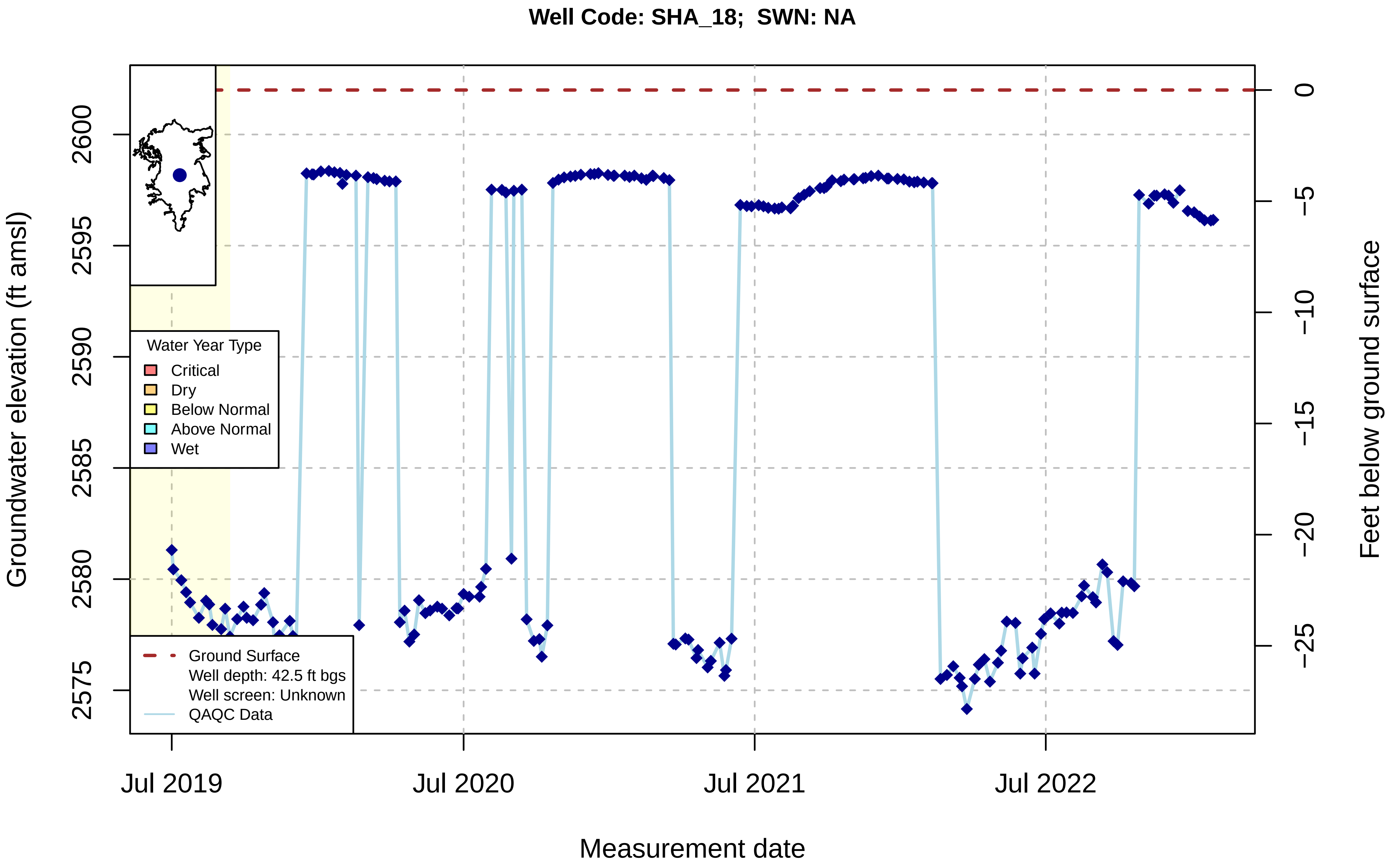
Well Code: SHA_193; SWN: NA
Groundwater elevation (ft amsl)
2640
2635
2630
2625
Feet below ground surface
0
−5
−10
−15
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: 95 ft bgs
Well screen: Unknown
QAQC Data
Mar 2022
May 2022
Jul 2022
Sep 2022
Nov 2022
Jan 2023
Measurement date



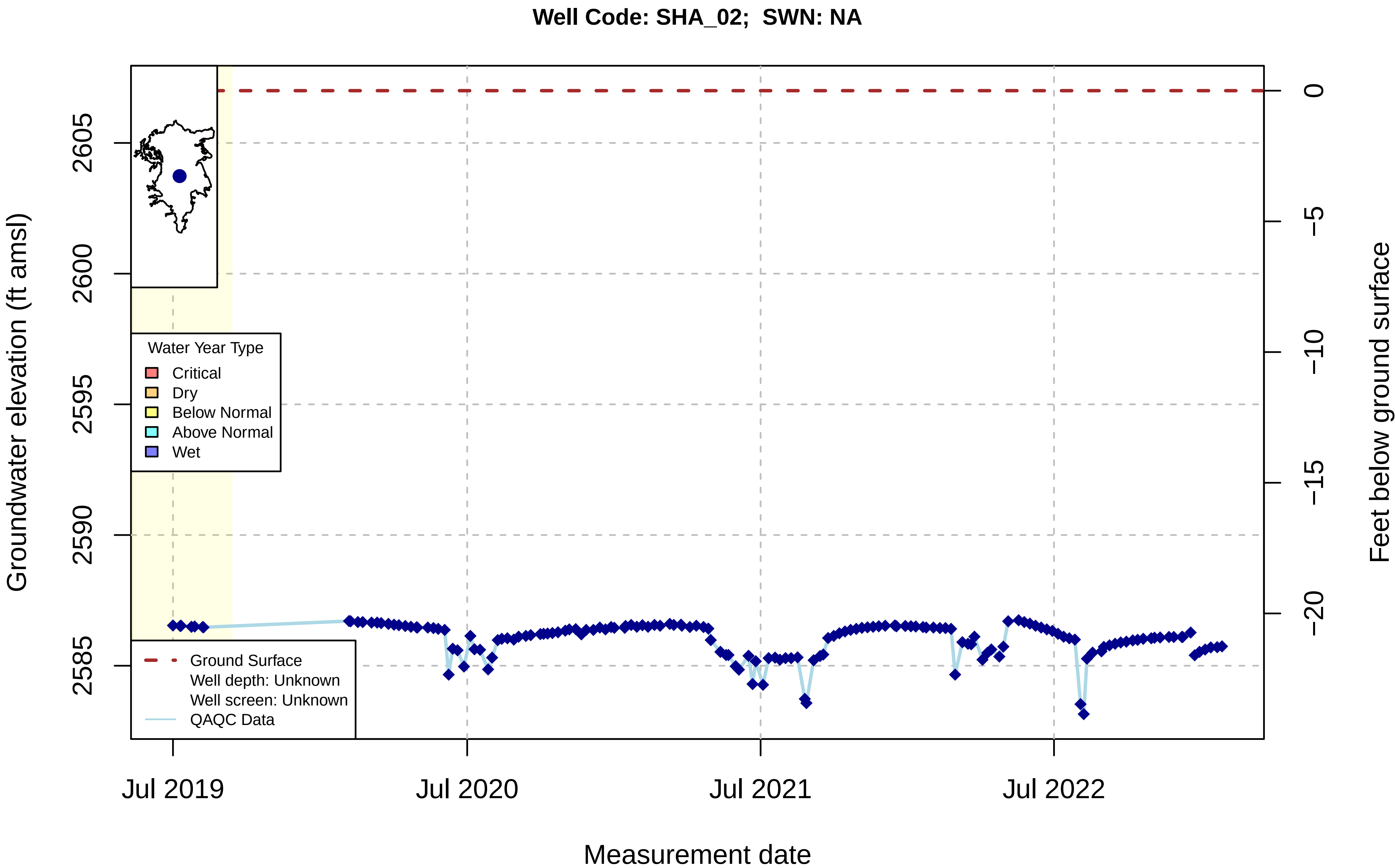
Well Code: 415748N1225300W001; SWN: 43N06W15F003M
Groundwater elevation (ft amsl)
2630
2640
2650
2660
Feet below ground surface
0
−10
−20
−30
1971
1981
1991
2001
2011
2021
Measurement date
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: 100 ft bgs
Well screen: Unknown

Well Code: SHA_17; SWN: NA

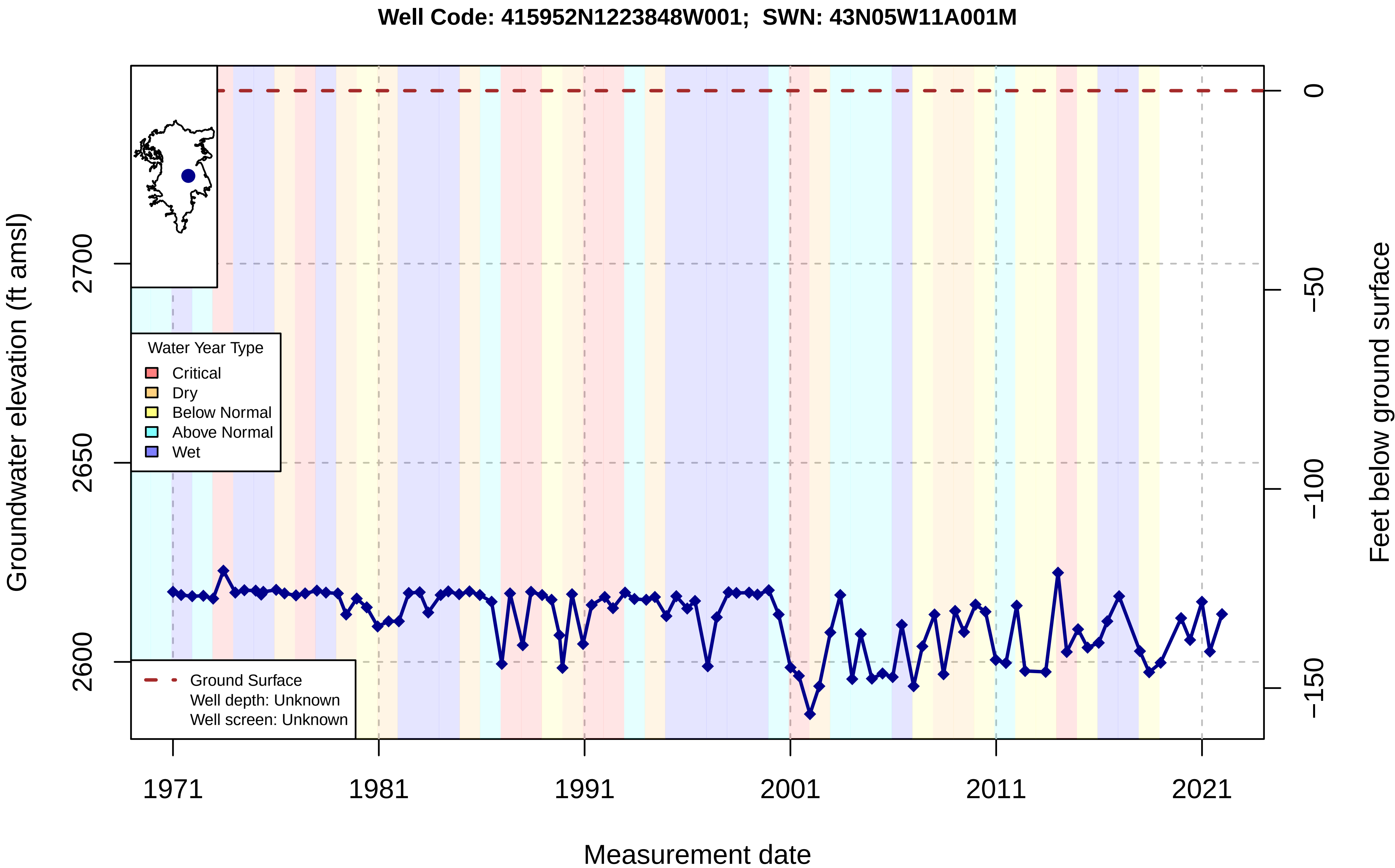




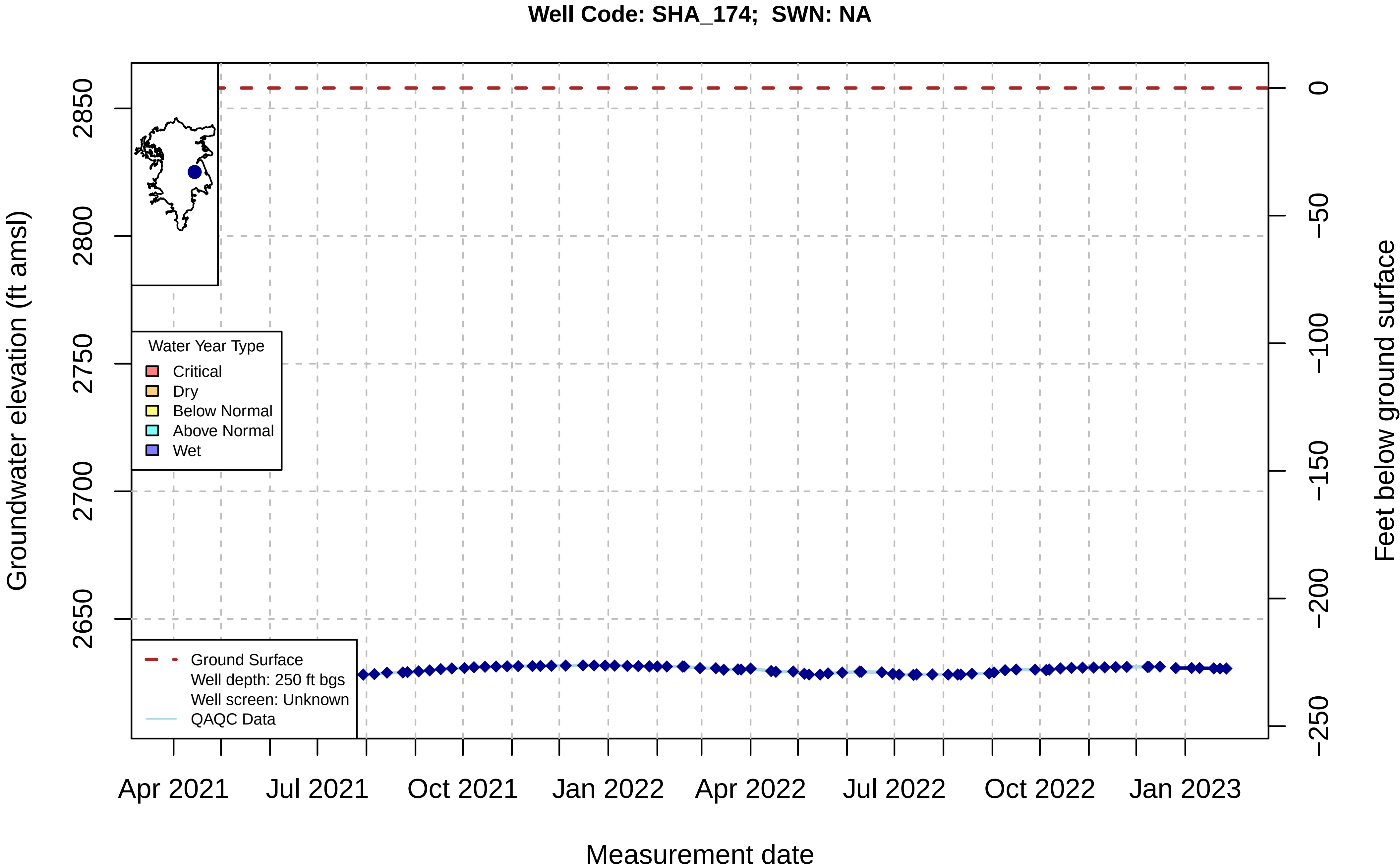
Well Code: SHA_18; SWN: NA
Groundwater elevation (ft amsl)
2575
2580
2585
2590
2595
2600
Feet below ground surface
0
−5
−10
−15
−20
−25
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: 42.5 ft bgs
Well screen: Unknown
QAQC Data
Jul 2019
Jul 2020
Jul 2021
Jul 2022
Measurement date



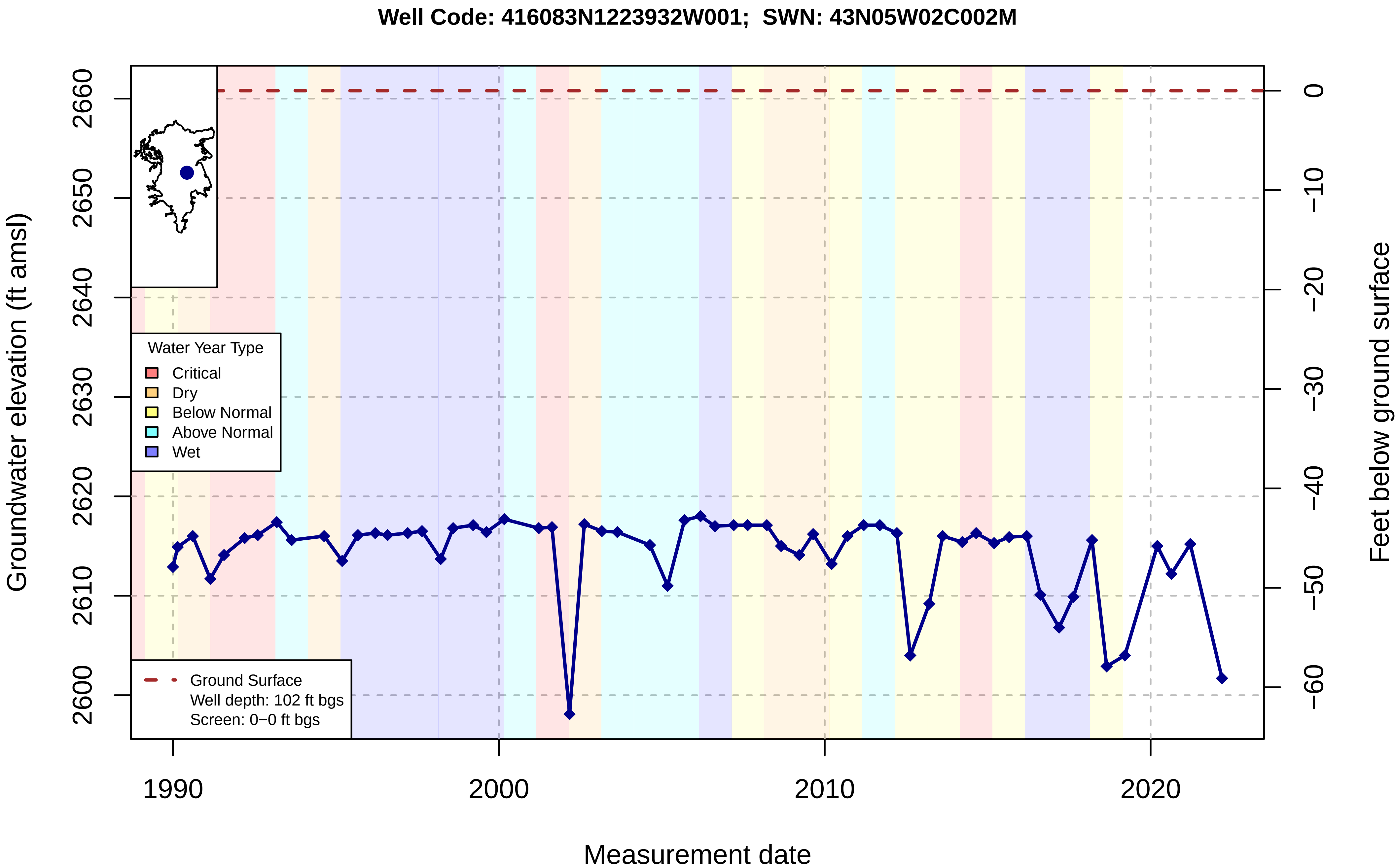
Well Code: SHA_02; SWN: NA
Groundwater elevation (ft amsl)
Feet below ground surface
Measurement date
2585
2590
2595
2600
2605
0
−5
−10
−15
−20
Jul 2019
Jul 2020
Jul 2021
Jul 2022
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: Unknown
Well screen: Unknown
QAQC Data



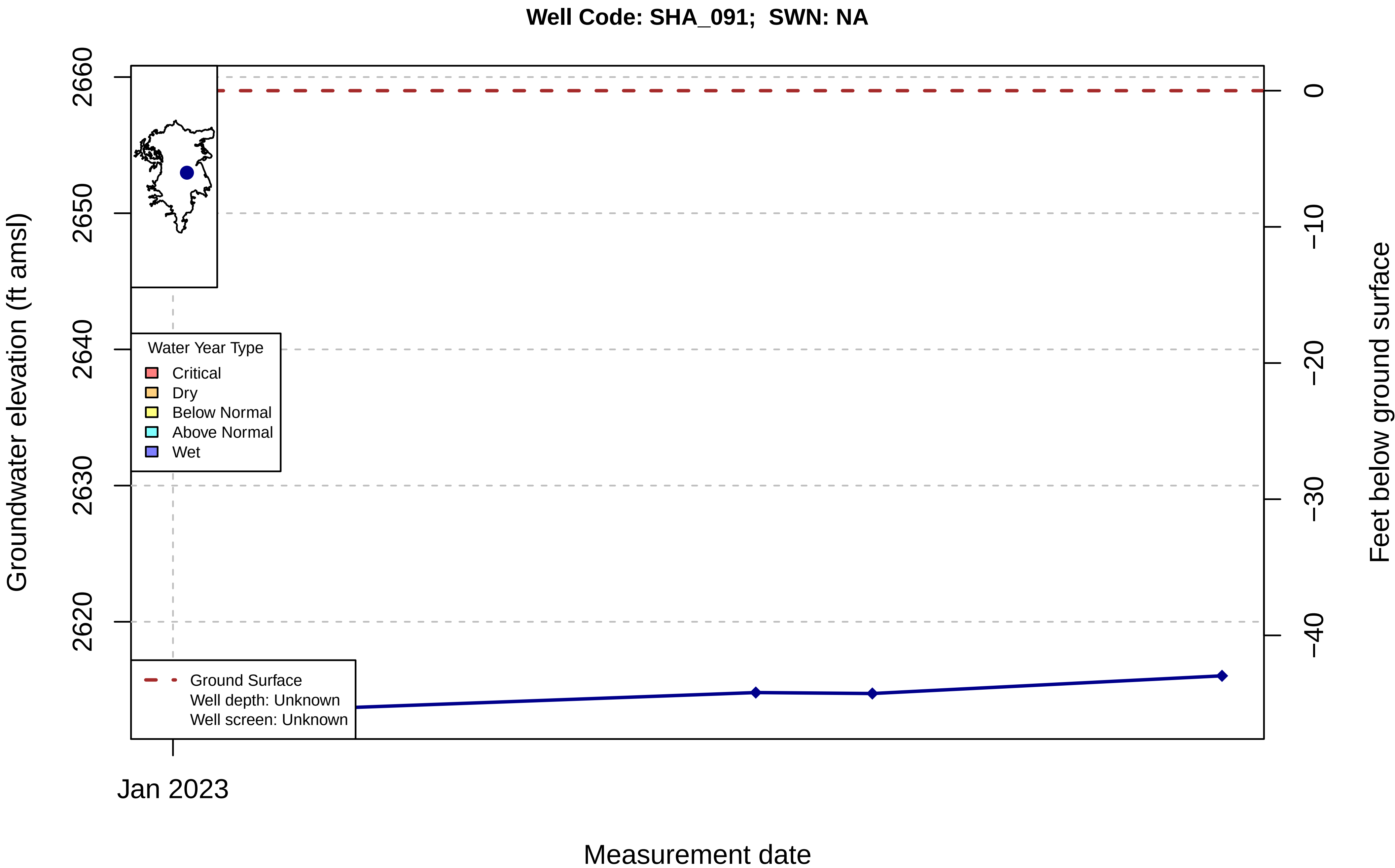
Well Code: 415952N1223848W001; SWN: 43N05W11A001M
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: Unknown
Well screen: Unknown
Groundwater elevation (ft amsl)
2600
2650
2700
Feet below ground surface
0
−50
−100
−150
1971
1981
1991
2001
2011
2021
Measurement date



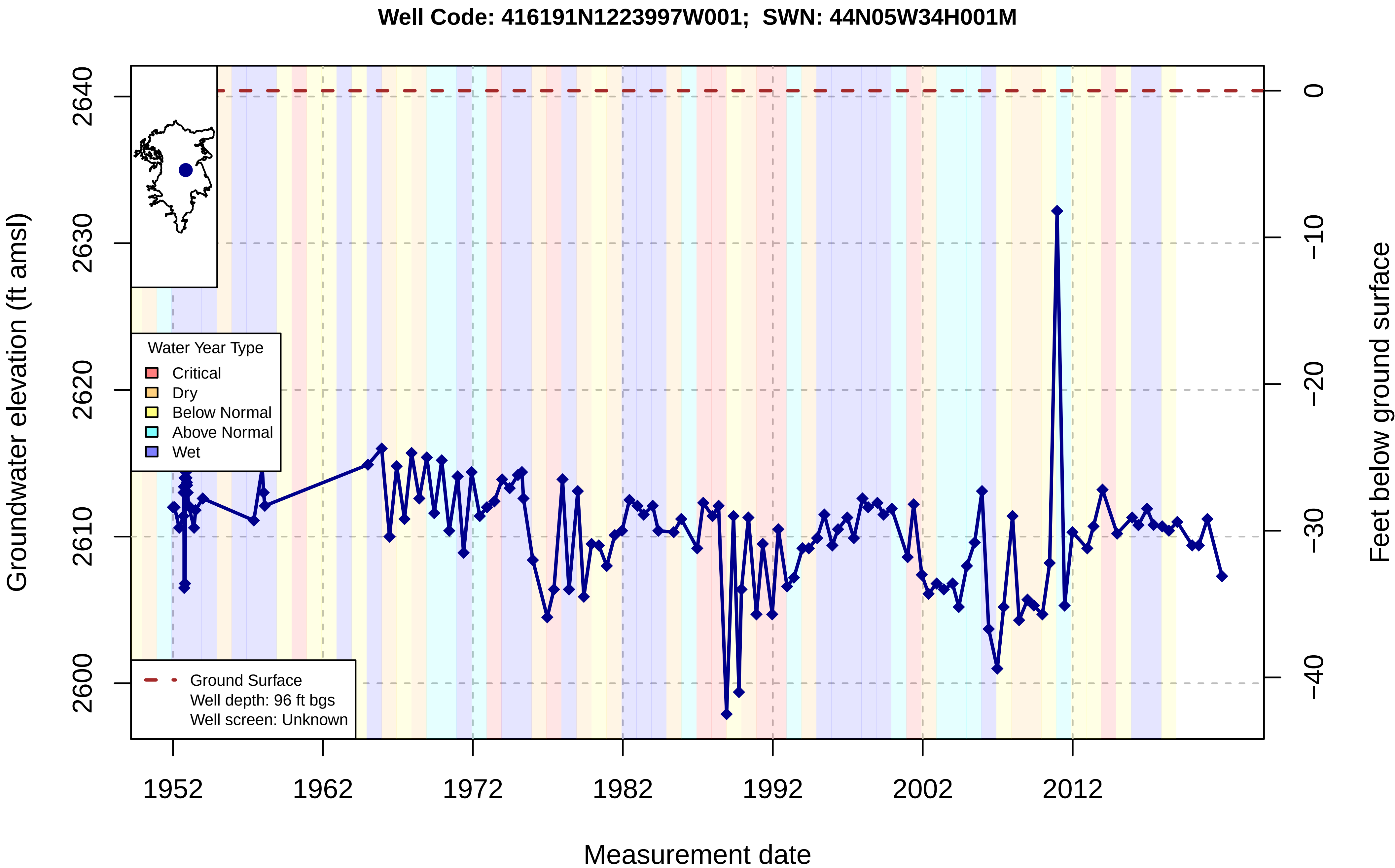
Well Code: SHA_174; SWN: NA
Groundwater elevation (ft amsl)
2850
2800
2750
2700
2650
Feet below ground surface
0
−50
−100
−150
−200
−250
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: 250 ft bgs
Well screen: Unknown
QAQC Data
Apr 2021
Jul 2021
Oct 2021
Jan 2022
Apr 2022
Jul 2022
Oct 2022
Jan 2023
Measurement date

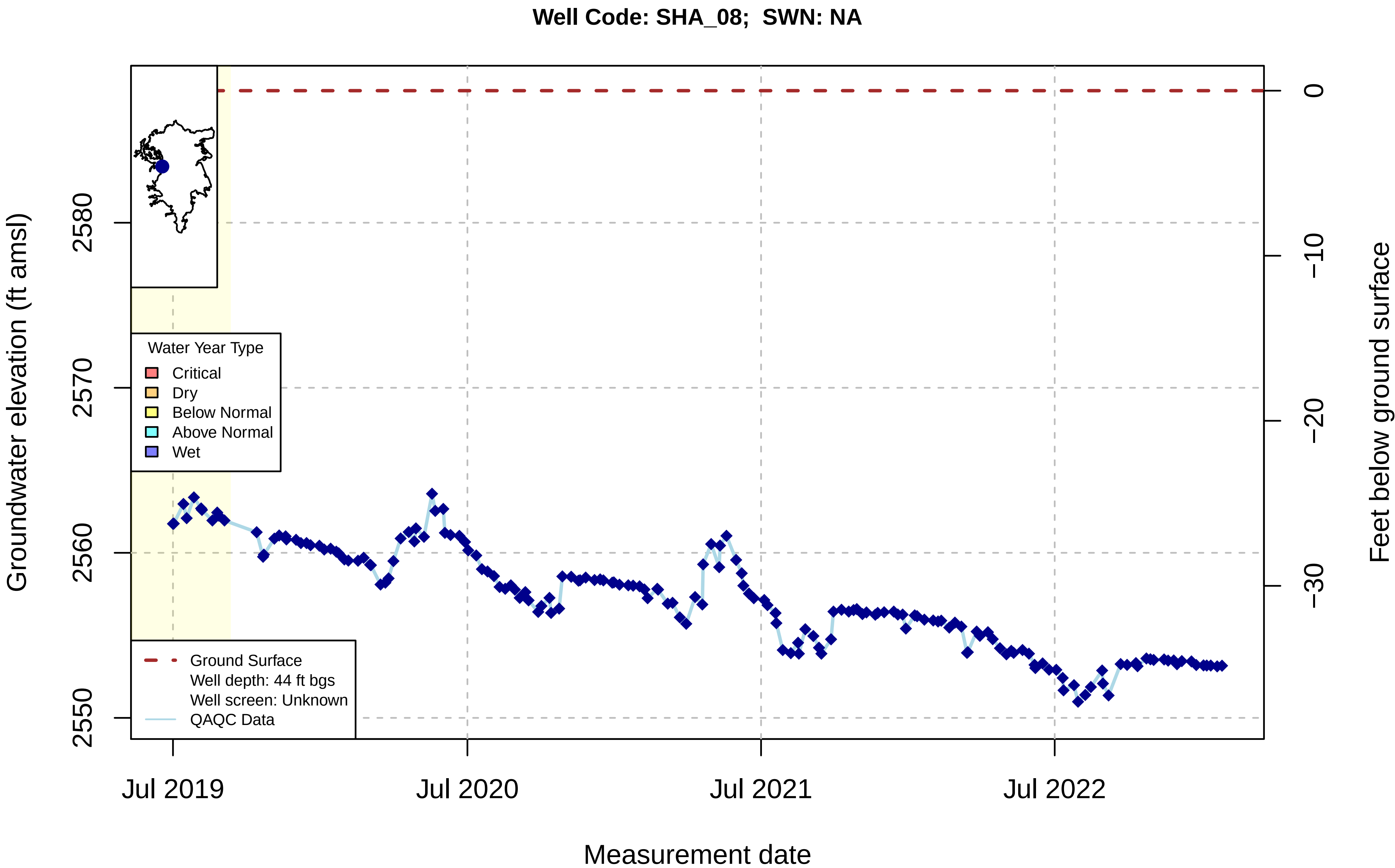


Well Code: 416083N1223932W001; SWN: 43N05W02C002M
Groundwater elevation (ft amsl)
Feet below ground surface
Measurement date
2600
2610
2620
2630
2640
2650
2660
0
−10
−20
−30
−40
−50
−60
1990
2000
2010
2020
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: 102 ft bgs
Screen: 0−0 ft bgs

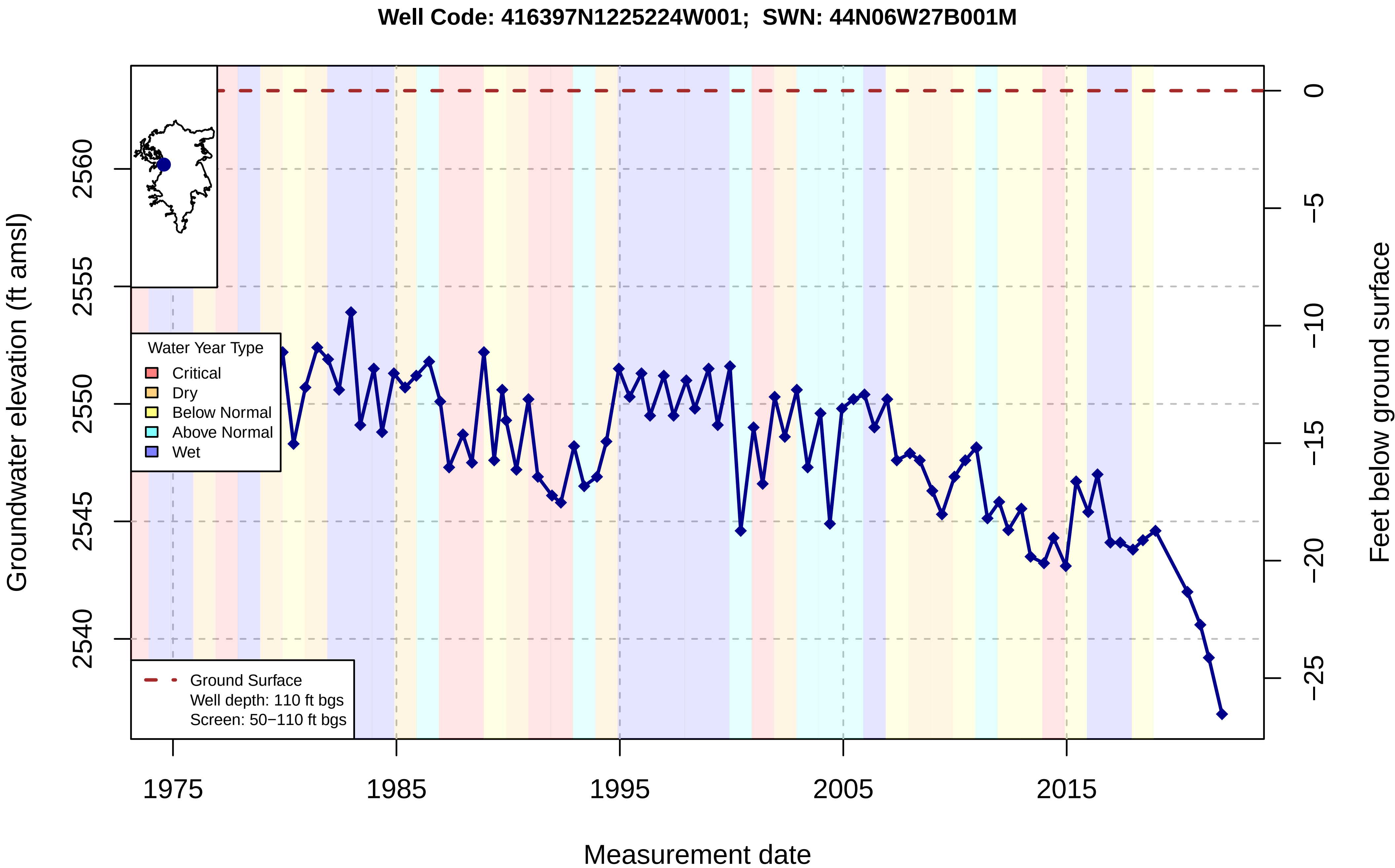


Well Code: SHA_091; SWN: NA
Groundwater elevation (ft amsl)
2660
2650
2640
2630
2620
Feet below ground surface
0
−10
−20
−30
−40
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: Unknown
Well screen: Unknown
Jan 2023
Measurement date


Well Code: 416191N1223997W001; SWN: 44N05W34H001M
Groundwater elevation (ft amsl)
2600
2610
2620
2630
2640
Feet below ground surface
0
−10
−20
−30
−40
Measurement date
1952
1962
1972
1982
1992
2002
2012
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: 96 ft bgs
Well screen: Unknown

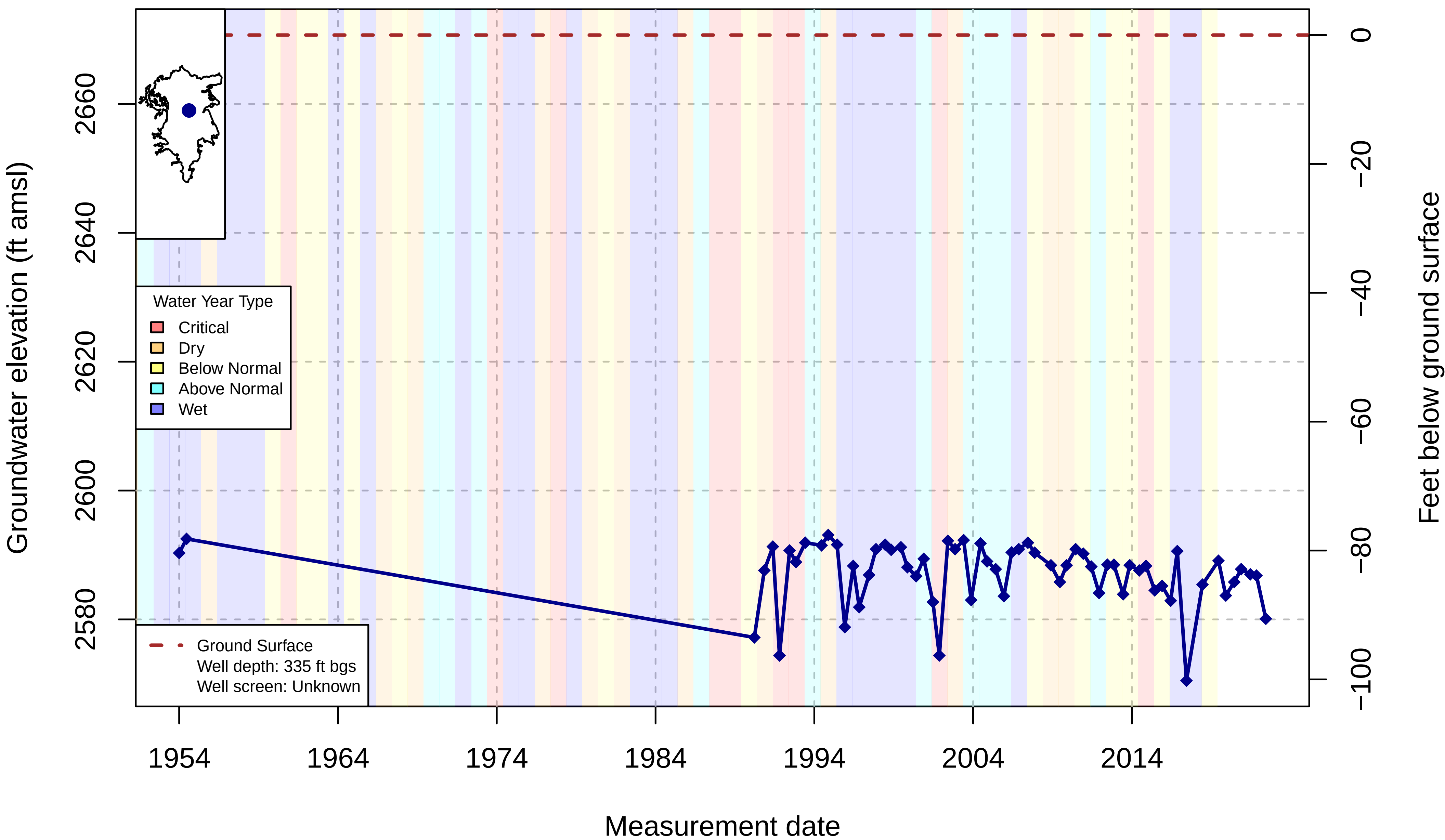


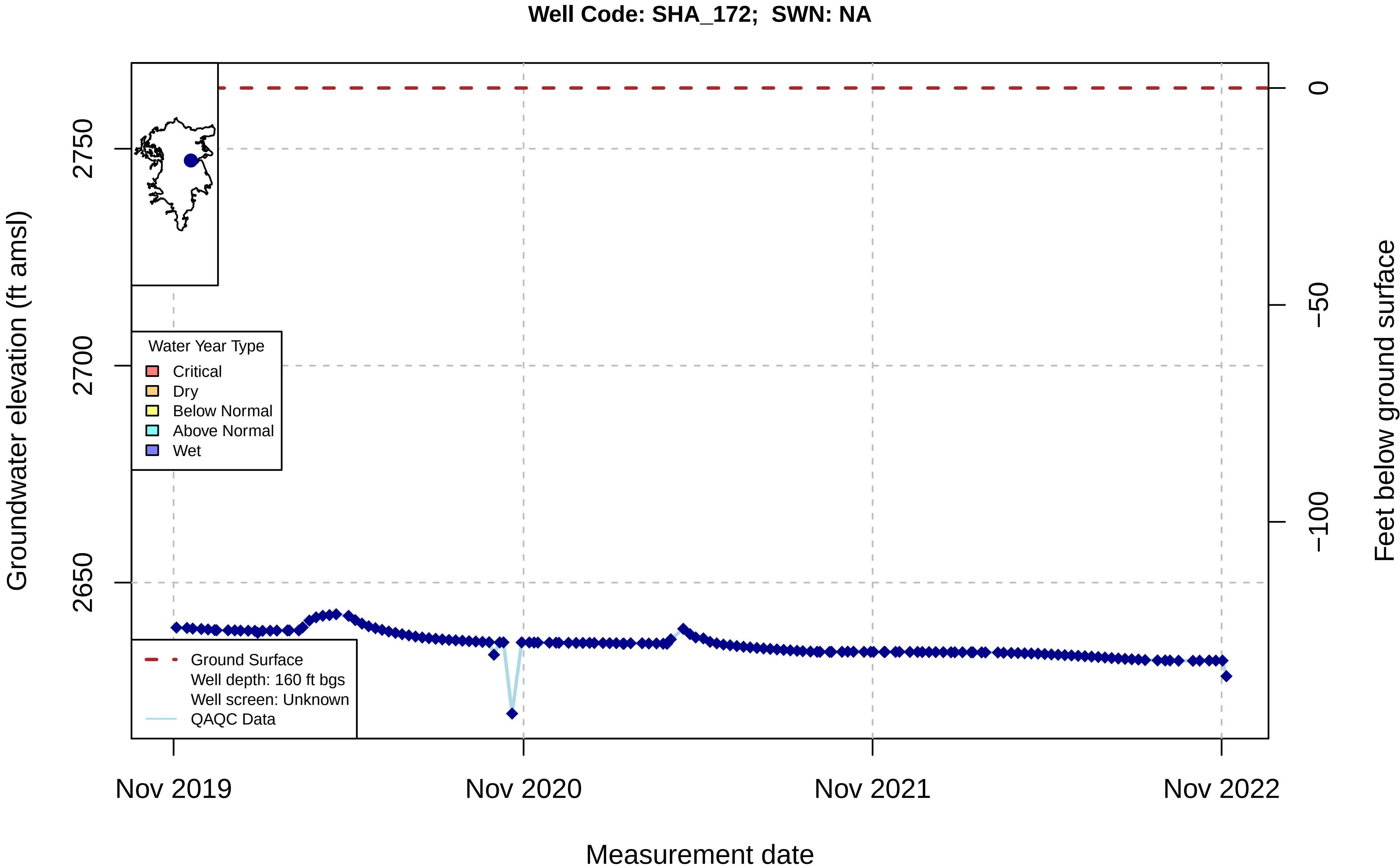
Well Code: SHA_08; SWN: NA
Groundwater elevation (ft amsl)
2550
2560
2570
2580
Feet below ground surface
0
−10
−20
−30
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: 44 ft bgs
Well screen: Unknown
QAQC Data
Jul 2019
Jul 2020
Jul 2021
Jul 2022
Measurement date



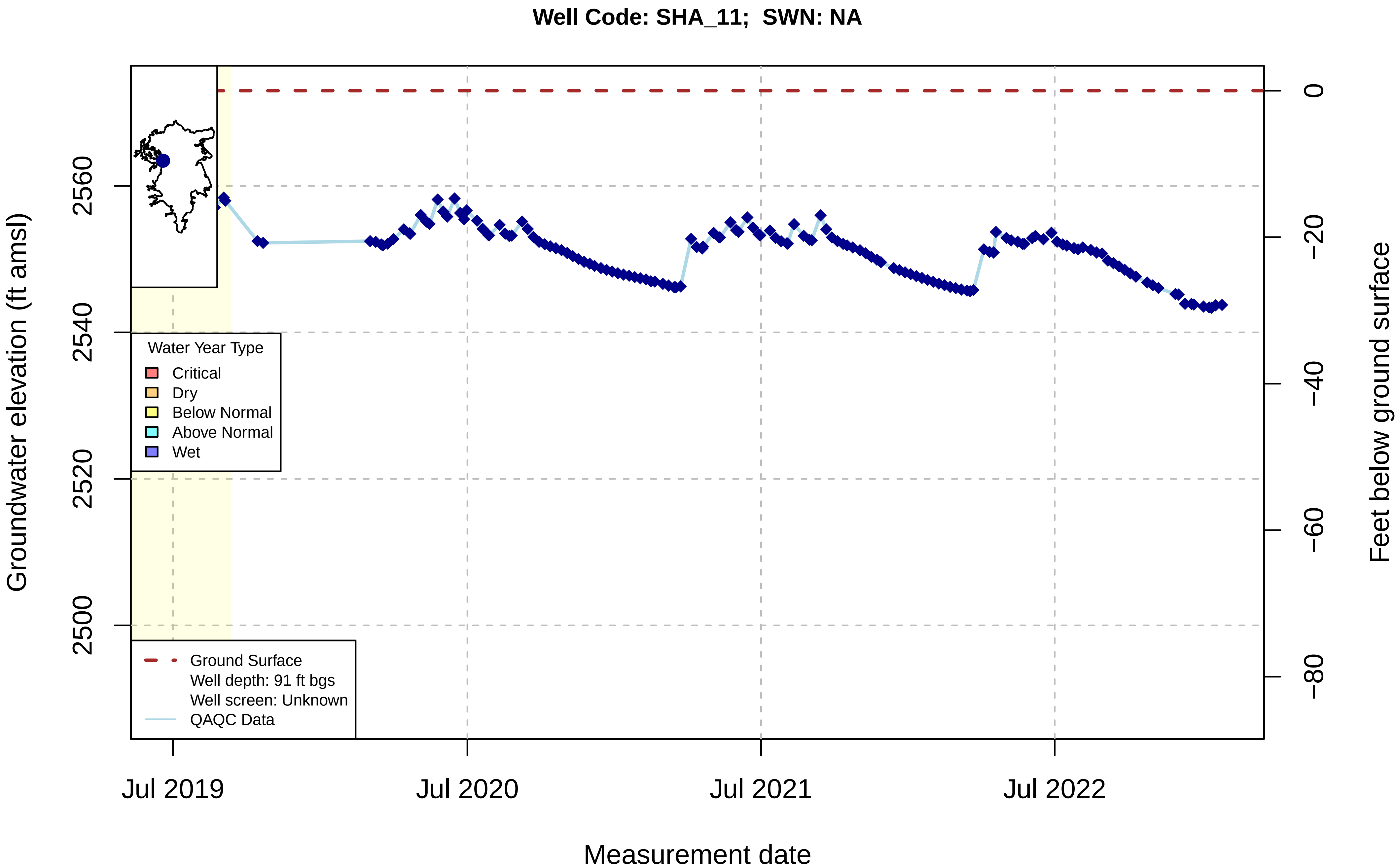
Well Code: 416397N1225224W001; SWN: 44N06W27B001M
Groundwater elevation (ft amsl)
Feet below ground surface
Measurement date
2540
2545
2550
2555
2560
0
−5
−10
−15
−20
−25
1975
1985
1995
2005
2015
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: 110 ft bgs
Screen: 50−110 ft bgs

Well Code: 416462N1224190W001; SWN: 44N05W21H001M

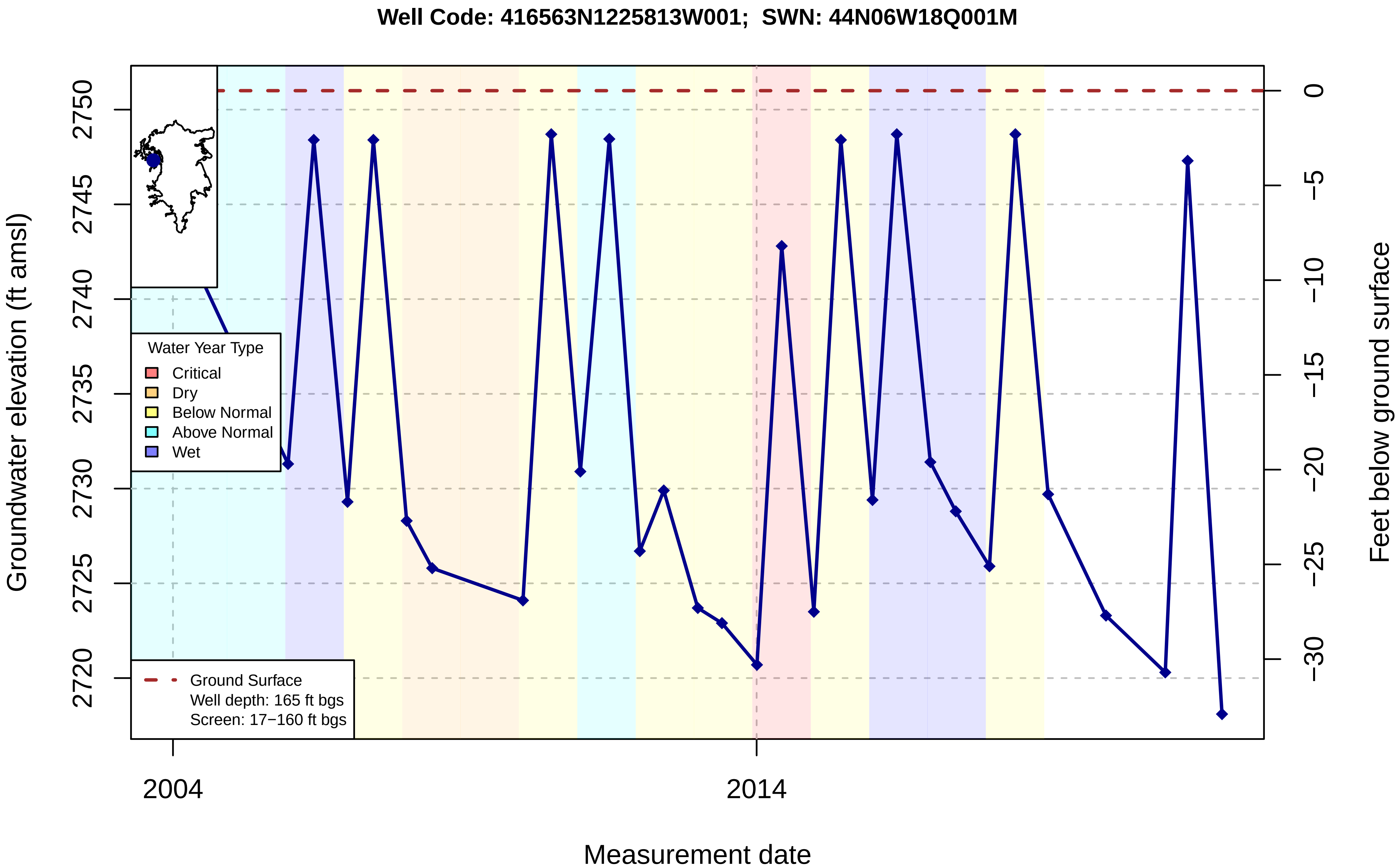




Well Code: SHA_172; SWN: NA
Groundwater elevation (ft amsl)
2750
2700
2650
Feet below ground surface
0
−50
−100
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: 160 ft bgs
Well screen: Unknown
QAQC Data
Nov 2019
Nov 2020
Nov 2021
Nov 2022
Measurement date

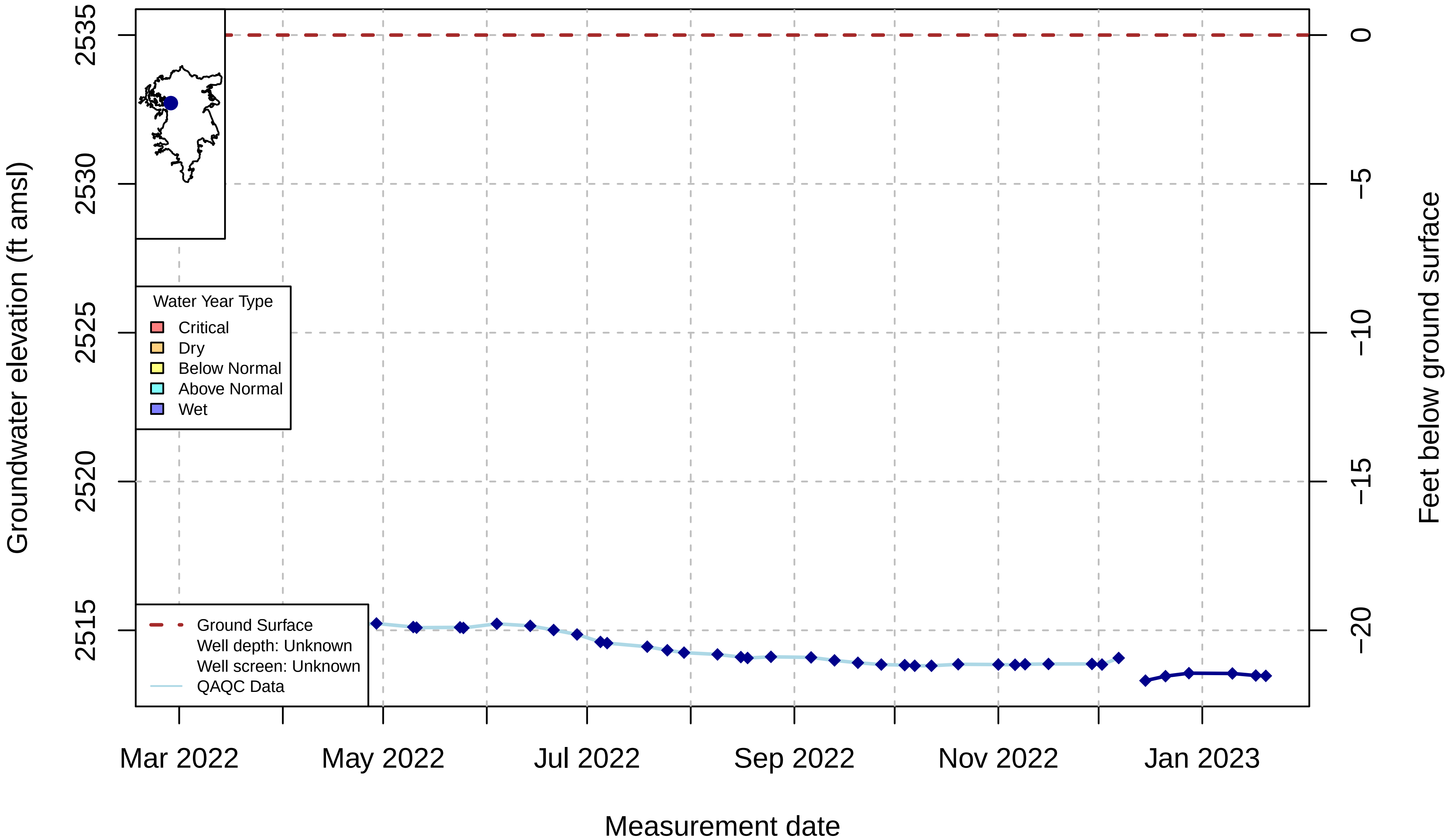


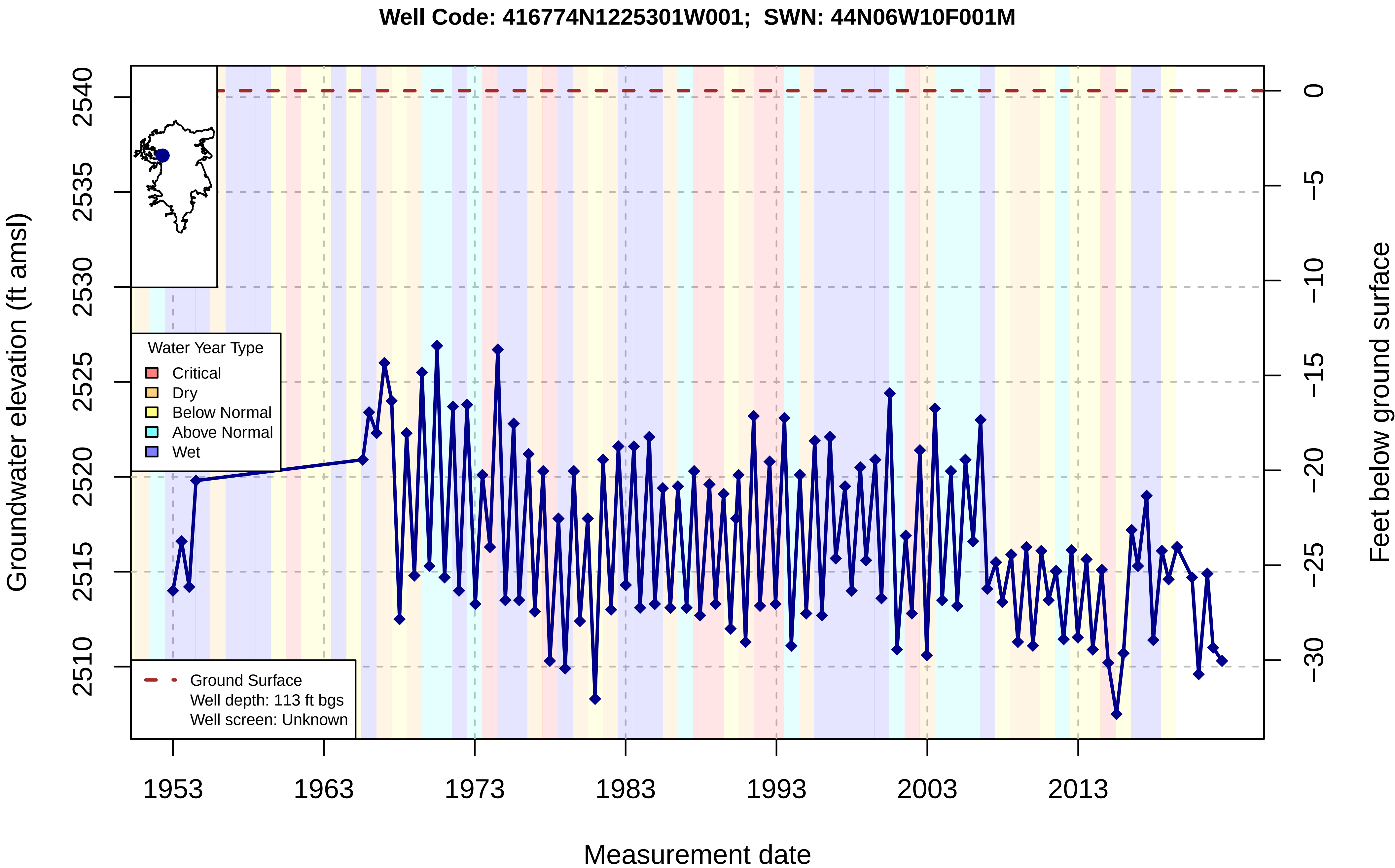
Well Code: SHA_11; SWN: NA
Groundwater elevation (ft amsl)
2500
2520
2540
2560
Feet below ground surface
0
−20
−40
−60
−80
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: 91 ft bgs
Well screen: Unknown
QAQC Data
Jul 2019
Jul 2020
Jul 2021
Jul 2022
Measurement date



Well Code: 416563N1225813W001; SWN: 44N06W18Q001M
Groundwater elevation (ft amsl)
2750
2745
2740
2735
2730
2725
2720
Feet below ground surface
0
−5
−10
−15
−20
−25
−30
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: 165 ft bgs
Screen: 17−160 ft bgs
2004
2014
Measurement date

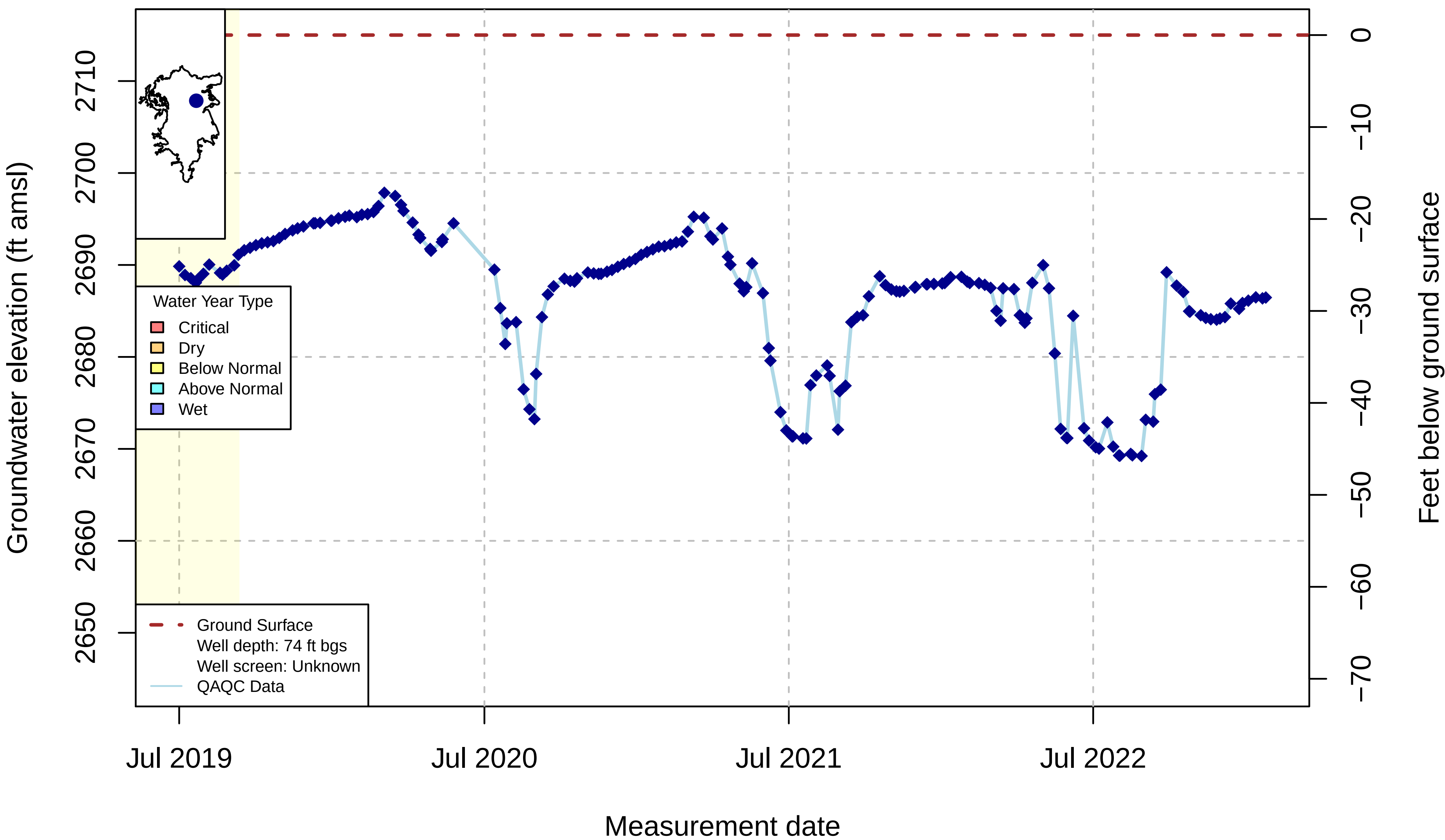
Well Code: SHA_187; SWN: NA

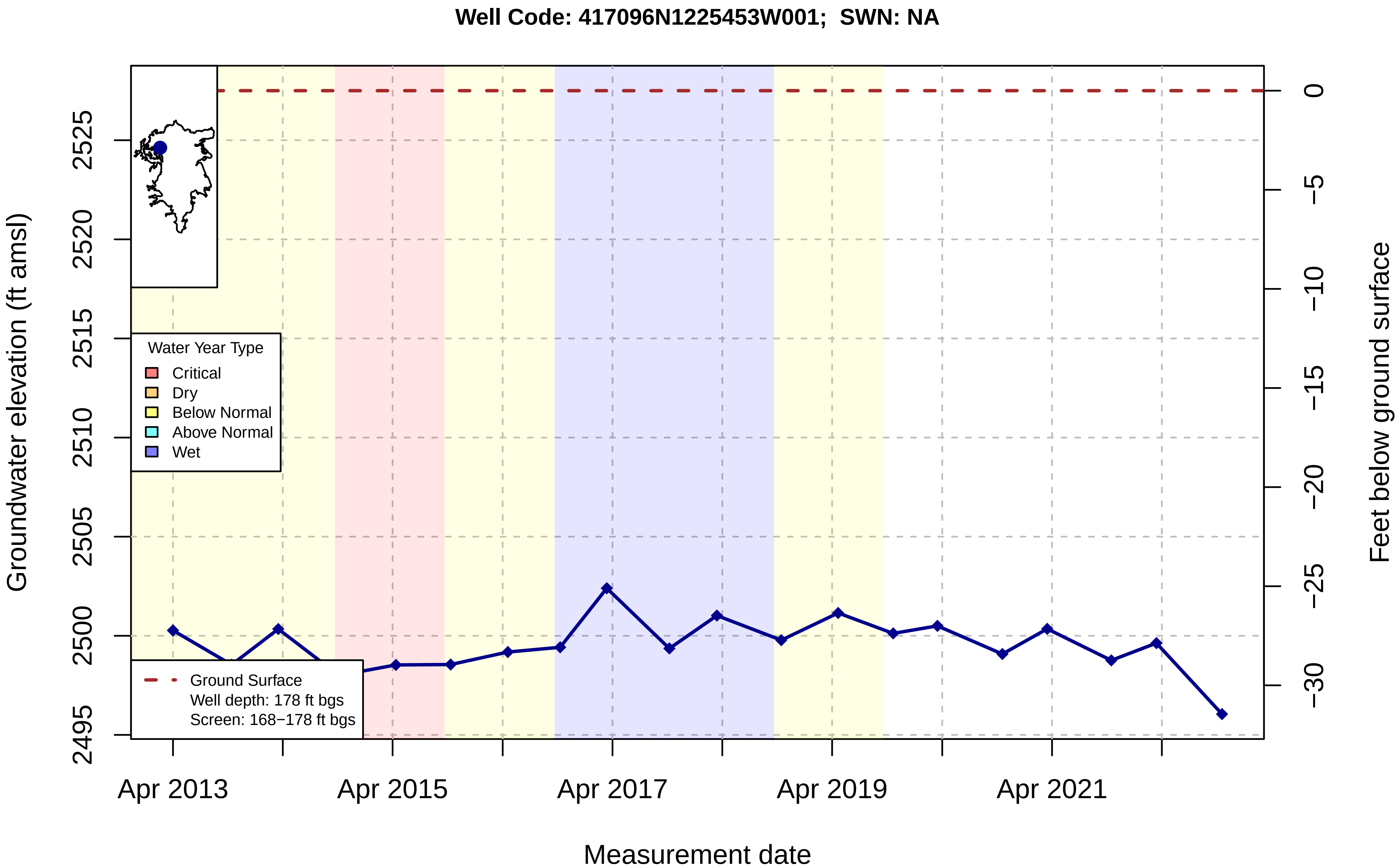




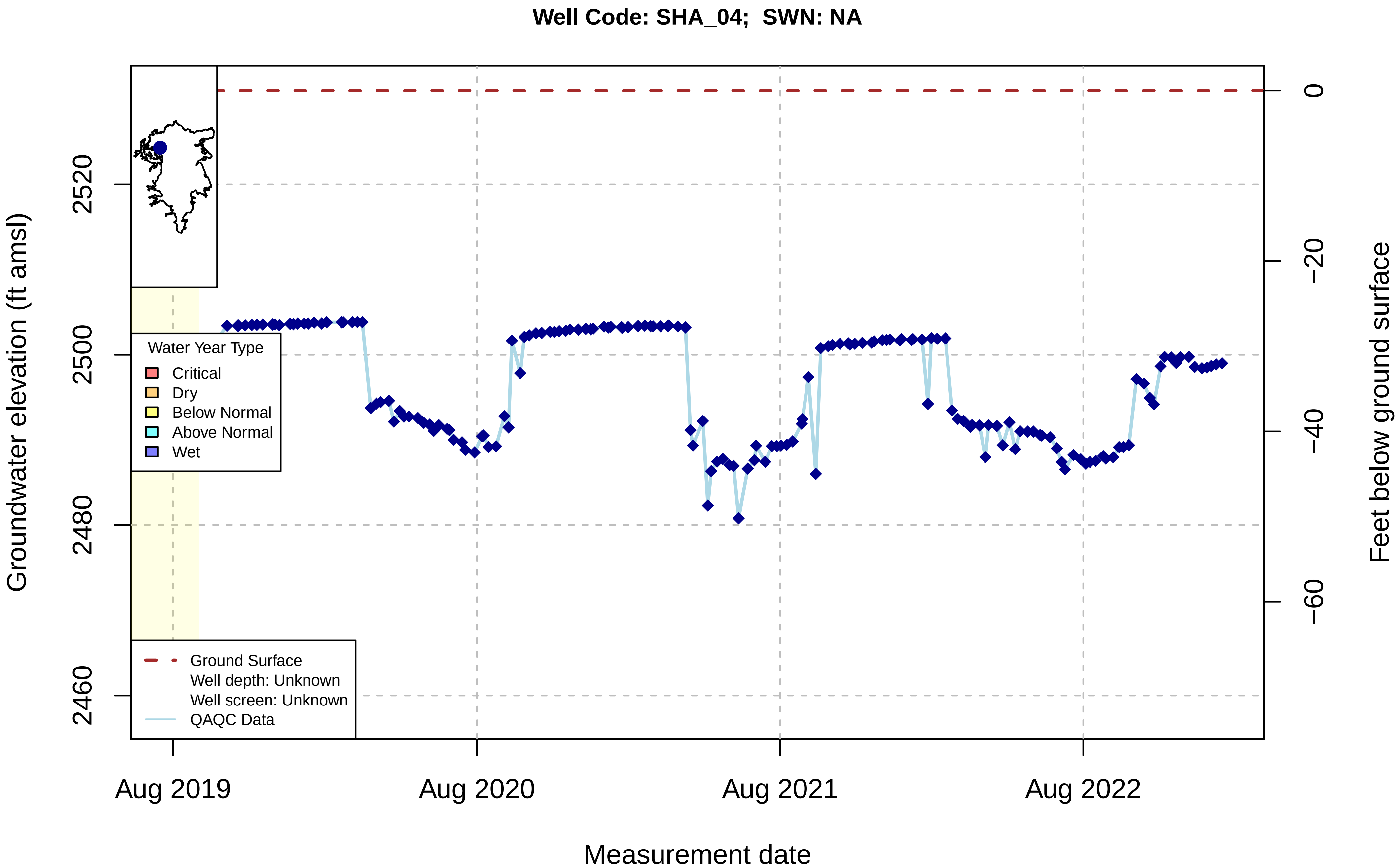
Well Code: 416774N1225301W001; SWN: 44N06W10F001M
Groundwater elevation (ft amsl)
Feet below ground surface
Measurement date
2510
2515
2520
2525
2530
2535
2540
0
−5
−10
−15
−20
−25
−30
1953
1963
1973
1983
1993
2003
2013
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: 113 ft bgs
Well screen: Unknown

Well Code: SHA_10; SWN: NA

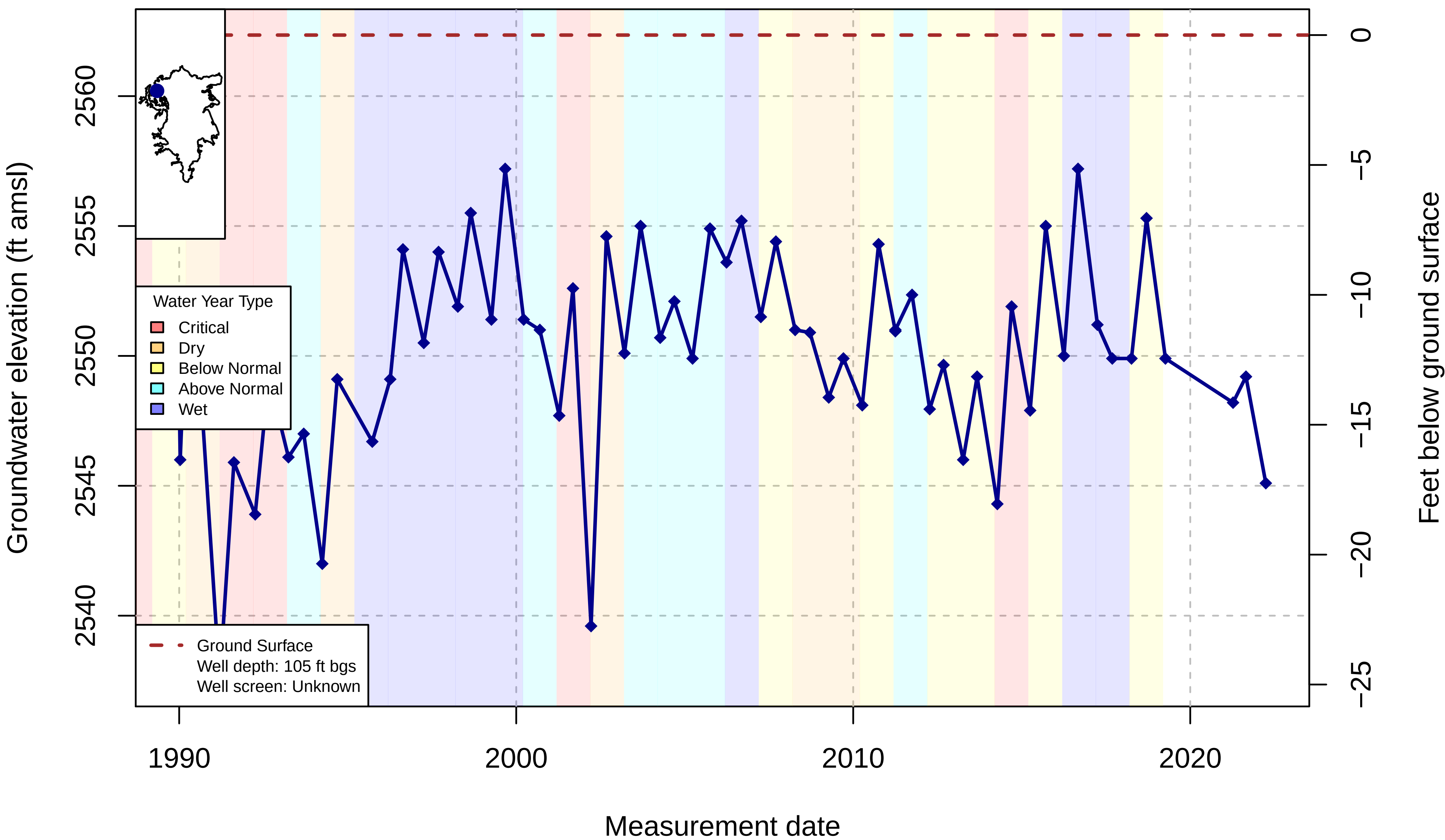


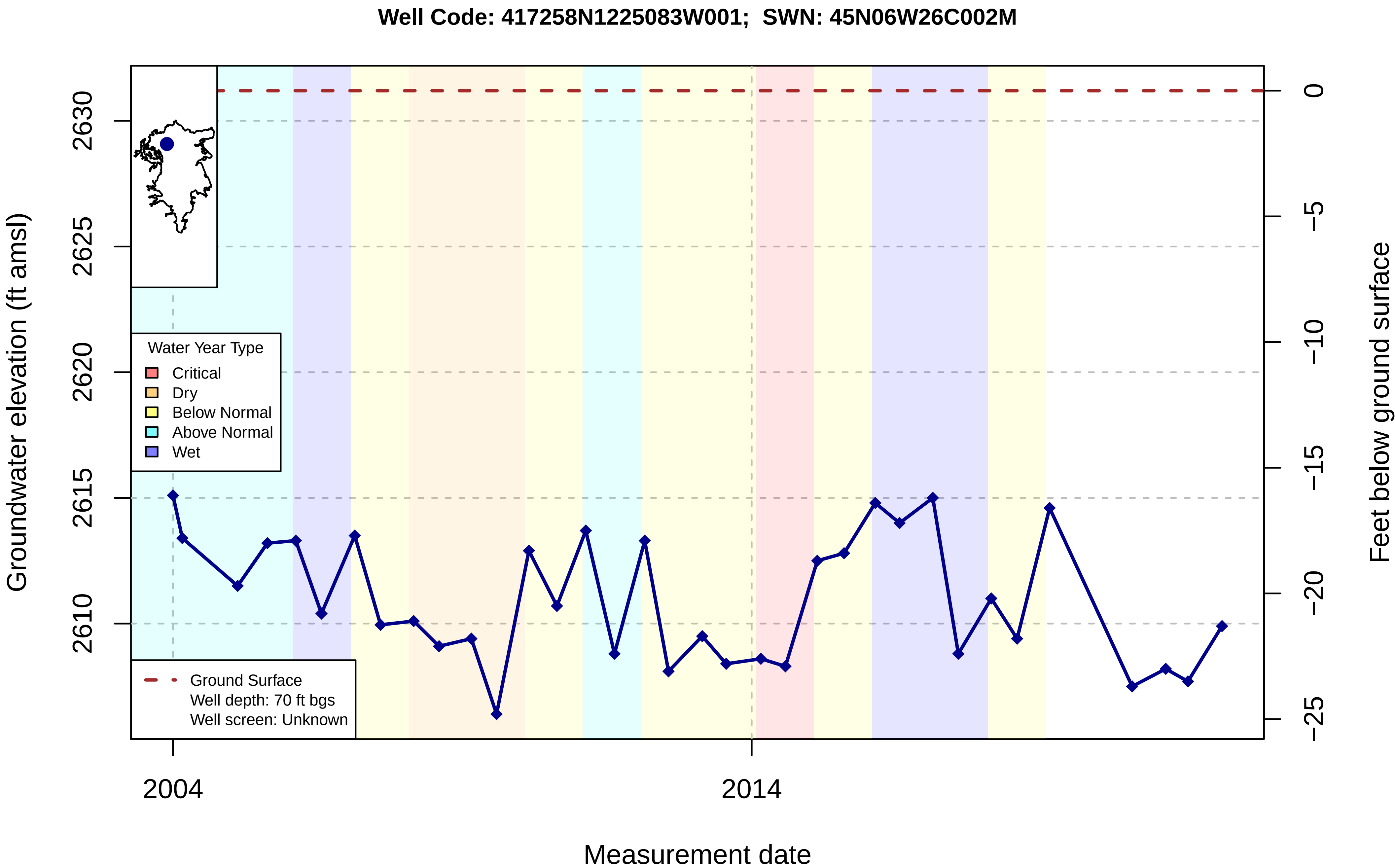


Well Code: 417096N1225453W001; SWN: NA
Groundwater elevation (ft amsl)
Feet below ground surface
Measurement date
2495
2500
2505
2510
2515
2520
2525
0
−5
−10
−15
−20
−25
−30
Apr 2013
Apr 2015
Apr 2017
Apr 2019
Apr 2021
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: 178 ft bgs
Screen: 168−178 ft bgs

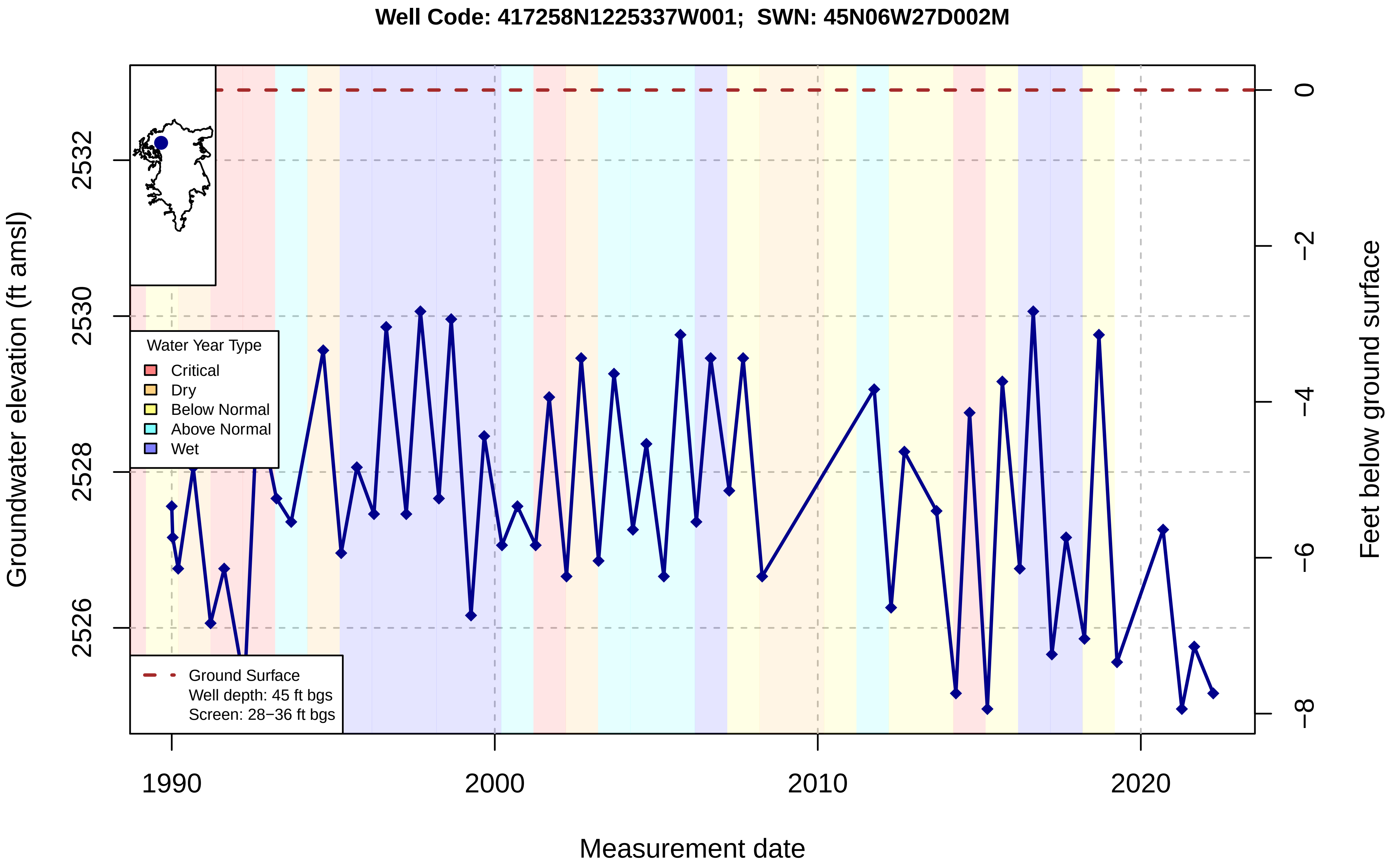

Well Code: SHA_04; SWN: NA
Groundwater elevation (ft amsl)
2460
2480
2500
2520
Feet below ground surface
0
−20
−40
−60
Aug 2019
Aug 2020
Aug 2021
Aug 2022
Measurement date
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: Unknown
Well screen: Unknown
QAQC Data

Well Code: 417220N1225928W001; SWN: 45N06W30E001M



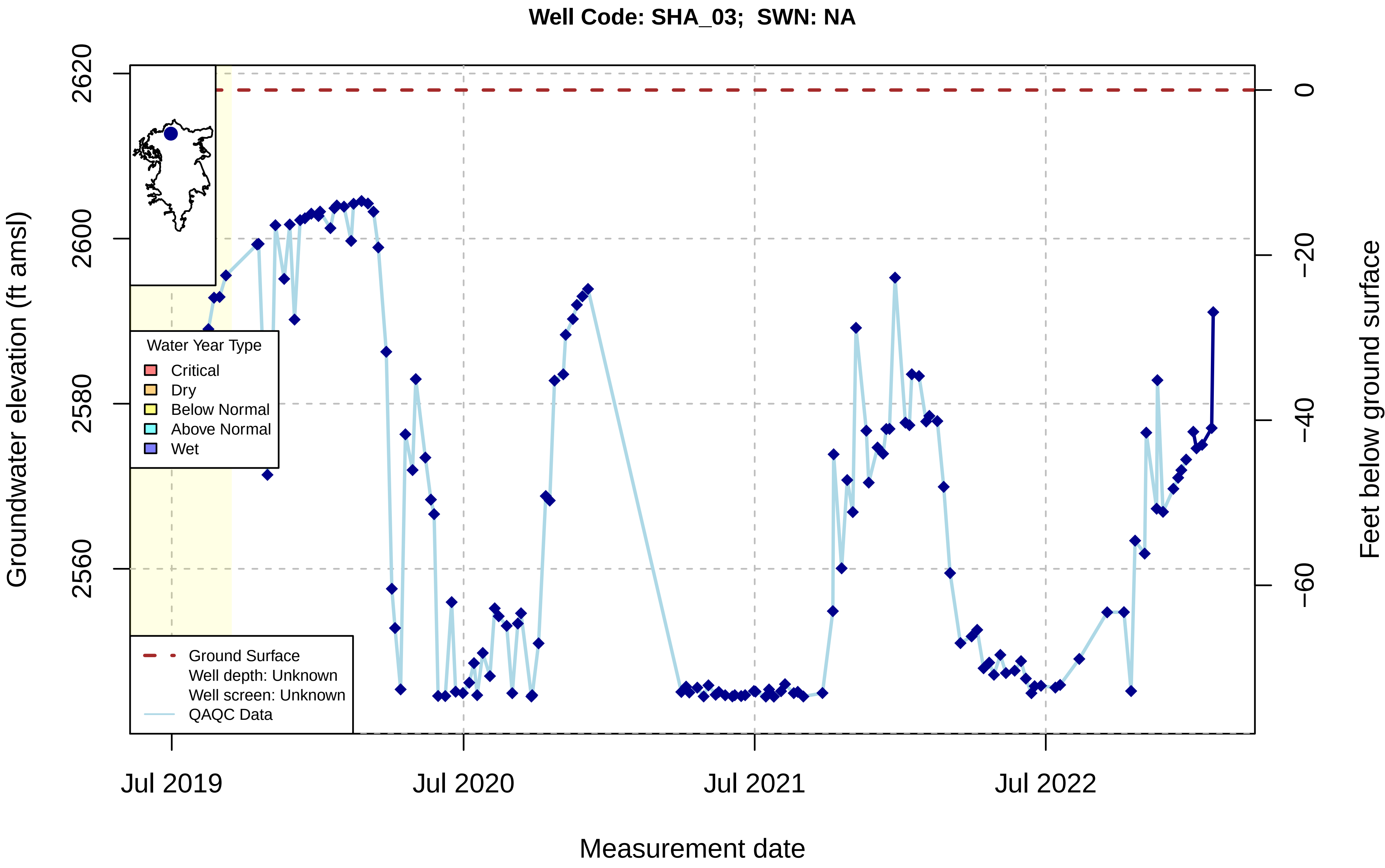


Well Code: 417258N1225083W001; SWN: 45N06W26C002M
Groundwater elevation (ft amsl)
2610
2615
2620
2625
2630
Feet below ground surface
0
−5
−10
−15
−20
−25
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: 70 ft bgs
Well screen: Unknown
2004
2014
Measurement date

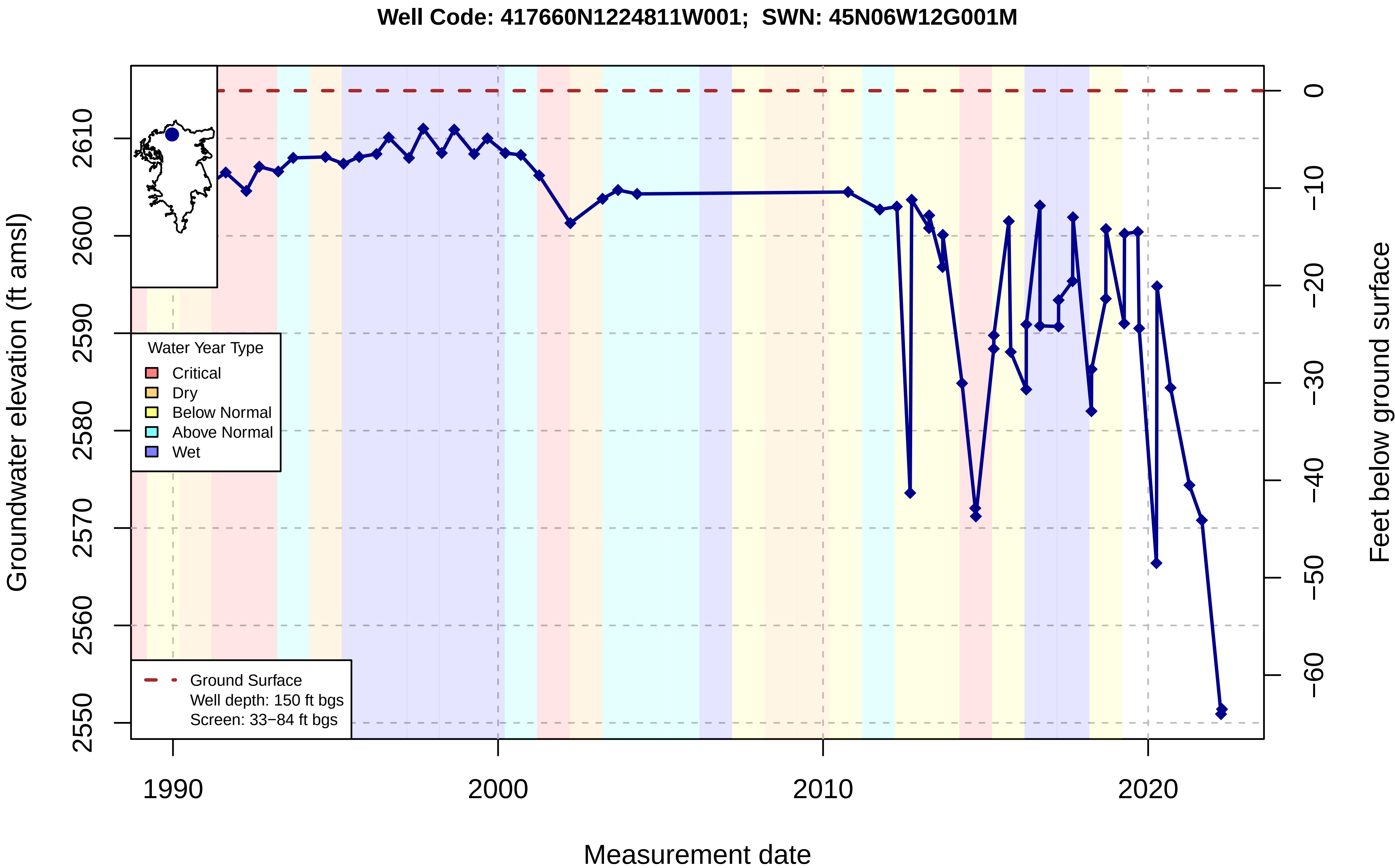


Well Code: 417258N1225337W001; SWN: 45N06W27D002M
Groundwater elevation (ft amsl)
Feet below ground surface
Measurement date
2526
2528
2530
2532
0
−2
−4
−6
−8
1990
2000
2010
2020
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: 45 ft bgs
Screen: 28−36 ft bgs

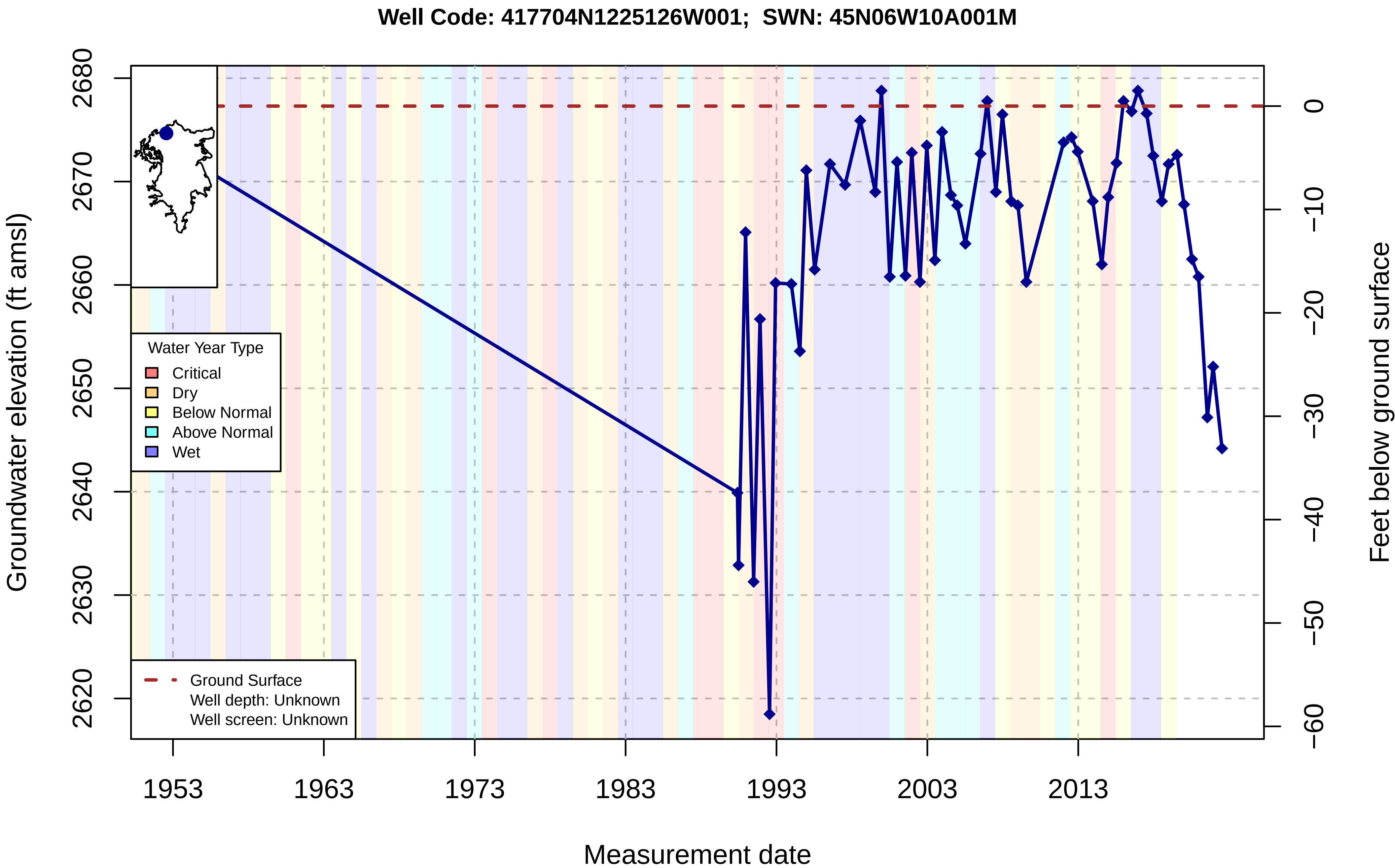
Well Code: 417638N1224574W001; SWN: 45N05W07H002M

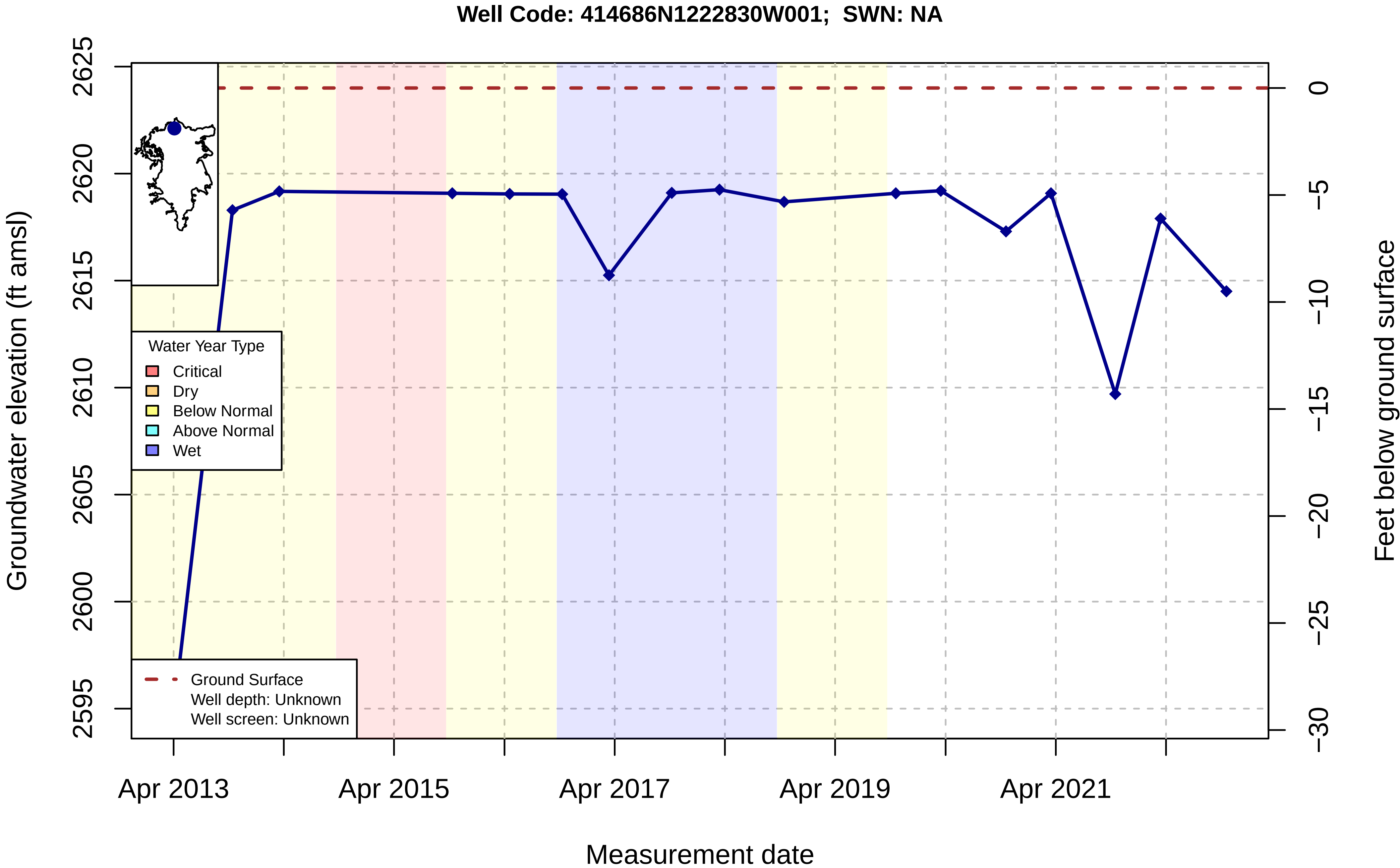


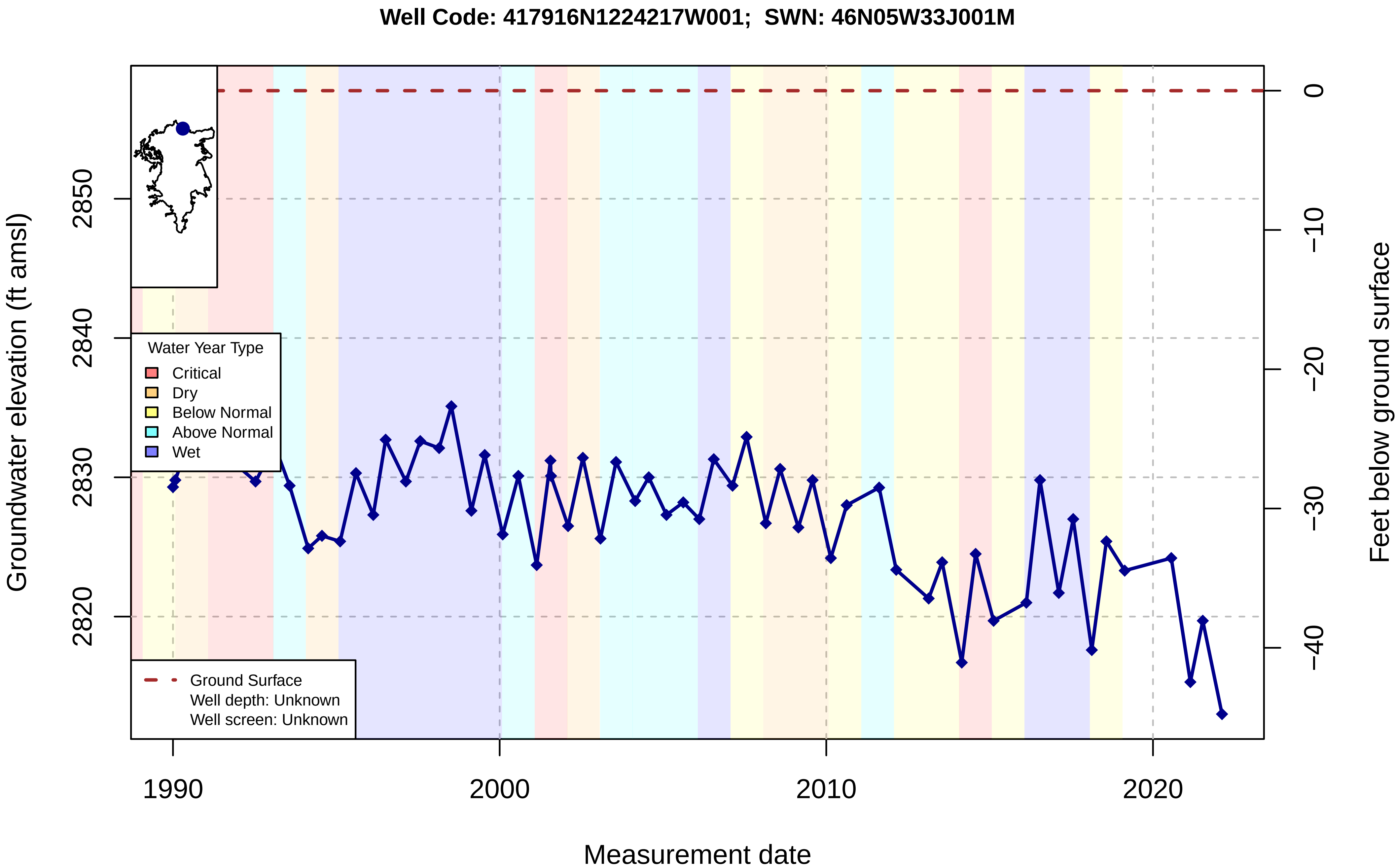
Well Code: SHA_03; SWN: NA
Groundwater elevation (ft amsl)
2560
2580
2600
2620
Feet below ground surface
0
−20
−40
−60
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: Unknown
Well screen: Unknown
QAQC Data
Jul 2019
Jul 2020
Jul 2021
Jul 2022
Measurement date

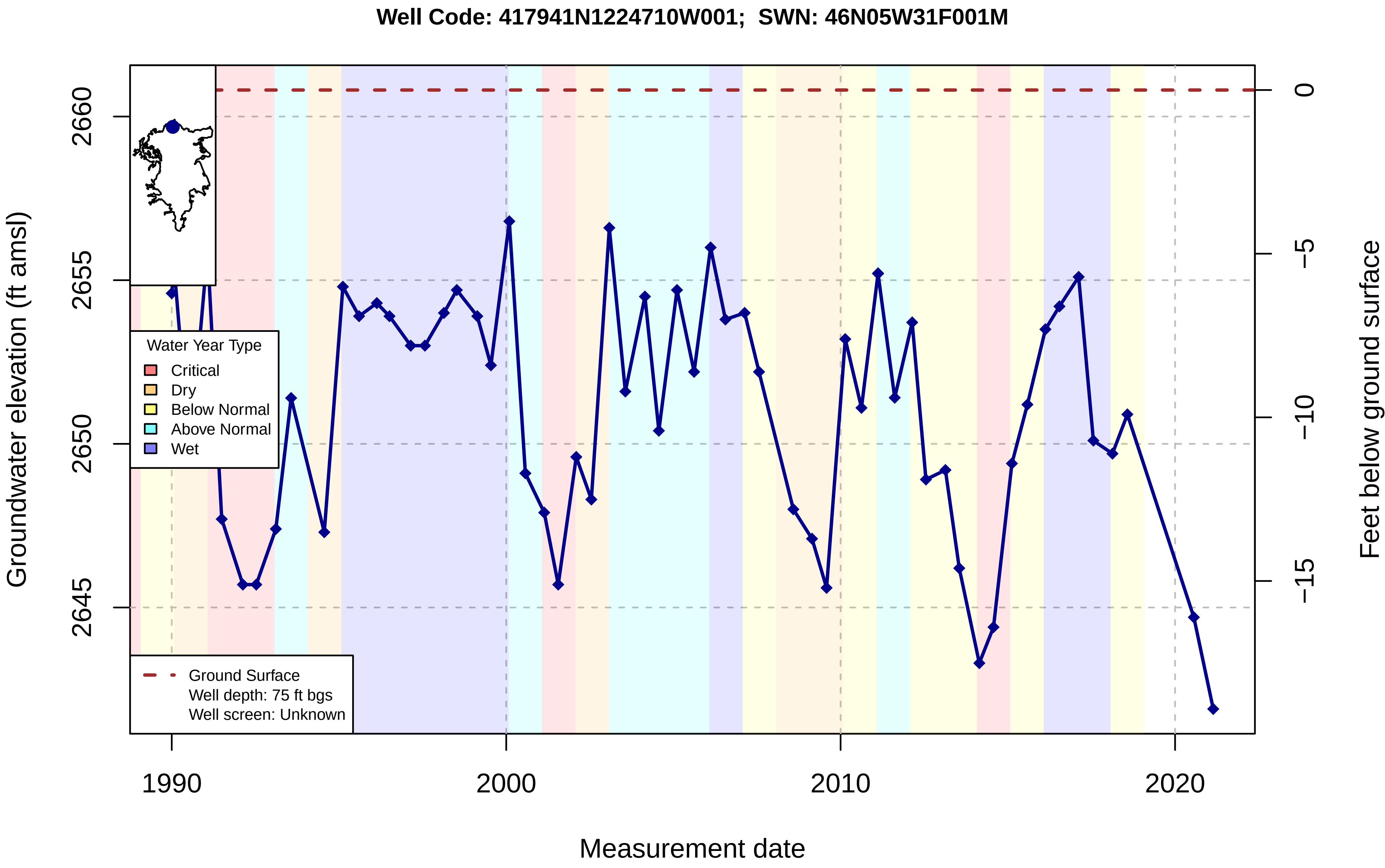


Well Code: 417660N1224811W001; SWN: 45N06W12G001M
Groundwater elevation (ft amsl)
Feet below ground surface
Measurement date
1990
2000
2010
2020
2550
2560
2570
2580
2590
2600
2610
0
−10
−20
−30
−40
−50
−60
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: 150 ft bgs
Screen: 33−84 ft bgs


Well Code: 417704N1225126W001; SWN: 45N06W10A001M
Groundwater elevation (ft amsl)
Feet below ground surface
Measurement date
2620
2630
2640
2650
2660
2670
2680
0
−10
−20
−30
−40
−50
−60
1953
1963
1973
1983
1993
2003
2013
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: Unknown
Well screen: Unknown


Well Code: 414686N1222830W001; SWN: NA
Groundwater elevation (ft amsl)
Feet below ground surface
Measurement date
2595
2600
2605
2610
2615
2620
2625
0
−5
−10
−15
−20
−25
−30
Apr 2013
Apr 2015
Apr 2017
Apr 2019
Apr 2021
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: Unknown
Well screen: Unknown


Well Code: 417916N1224217W001; SWN: 46N05W33J001M
Groundwater elevation (ft amsl)
2820
2830
2840
2850
Feet below ground surface
0
−10
−20
−30
−40
1990
2000
2010
2020
Measurement date
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: Unknown
Well screen: Unknown



Well Code: 417941N1224710W001; SWN: 46N05W31F001M
Groundwater elevation (ft amsl)
Feet below ground surface
Measurement date
2645
2650
2655
2660
0
−5
−10
−15
1990
2000
2010
2020
Water Year Type
Critical
Dry
Below Normal
Above Normal
Wet
Ground Surface
Well depth: 75 ft bgs
Well screen: Unknown

References

MRLC. 2019. "2019 National Land Cover Database." Multi-Resolution Land Characteristics (MRLC) Consortium. https://www.mrlc.gov/viewer/.