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CORNING SUB-BASIN (5-021.51) GROUNDWATER SUSTAINABILITY PLAN ANNUAL REPORT – 2024

SUBMITTED BY

TEHAMA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT GROUNDWATER SUSTAINABILITY AGENCY

CORNING SUB-BASIN GROUNDWATER SUSTAINABILITY AGENCY

PREPARED BY

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LIST OF ACRONYMS AND ABBREVIATIONS

Acronym	Meaning
AEM	Airborne electromagnetic
AF	acre-feet
AFY	acre-feet per year
AMSL	above mean sea level
Tehama County GSA	Tehama County Flood Control and Water Conservation District Groundwater Sustainability Agency
CSGSA	Corning Sub-Basin Groundwater Sustainability Agency
DWR	Department of Water Resources
DMS	data management system
eWRIMS	Electronic Water Rights Information Management System
GDE	groundwater dependent ecosystem
GPS	global positioning system
GSP	groundwater sustainability plan
GSA	groundwater sustainability agency
InSAR	Interferometric Synthetic Aperture Radar
ISW	interconnected surface water
MO	measurable objective
MOU	memorandum of understanding
MT	minimum threshold
PMA	projects and management actions
RMP	representative monitoring point
RMSE	root-mean-squared error
SI	sustainability indicator
SGM	sustainable groundwater management
SGMA	Sustainable Groundwater Management Act
SMC	sustainable management criteria
Subbasin	Corning Subbasin
SWRCB	State Water Resources Control Board
TDS	total dissolved solids
TNC	The Nature Conservancy
UR	undesirable result
UWMP	Urban Water Management Plan
WY	water year

EXECUTIVE SUMMARY

The Corning Subbasin (Subbasin) (5-021.51) Annual Report was prepared on behalf of the Corning Sub-Basin Groundwater Sustainability Agency (CSGSA) and the Tehama County Flood Control and Water Conservation District GSA (Tehama County GSA) to fulfill the statutory requirements set by the Sustainable Groundwater Management Act (SGMA) legislation (§10728) and the Groundwater Sustainability Plan (GSP) regulations (§354.40 and §356.2) developed by the California Department of Water Resources (DWR). The regulations mandate the submission of an annual report to DWR by April 1st after the reporting year, which spans the water year (WY) from October 1st to September 30th. This Annual Report includes information from the recent WY 2024 for the Corning Subbasin, located within part of Tehama and Glenn Counties and shown in **Figure ES-1.**

Measured conditions in the Subbasin are in compliance with minimum thresholds (MTs) for all applicable sustainability indicators (SIs), with twelve exceptions, wells 22N03W12Q003M, 23N02W28N002M, 23N03W07F001M, 23N03W13C004M, 23N03W13C006M, 23N03W16H001M, 23N03W17R001M, 23N03W22Q001M, 23N03W24A003M, 23N03W25M002M, 23N03W25M004M, and 24N02W29N004M had water levels fall below the MTs in fall 2024. An MT is a quantitative value that represents the groundwater conditions measured at a representative monitoring point (RMP) that, when exceeded individually or in combination with MTs at other monitoring sites, may cause an undesirable result(s) (UR) in the Subbasin per DWR's definition. Whether the MT represents a minimum or maximum value is dependent on the SI. As an example of a minimum value, if groundwater levels are lower than the value of the measurable objectives (MO) for that site, they are moving in the direction of the MT. As an example of a maximum for the groundwater quality sustainable management criteria (SMC), as the value of the total dissolved solids (TDS) concentrations increase from the MO established for that site, it is moving in the direction of the MT. The SIs and SMC, including MTs, are summarized in **Table ES-1.** Note that seawater intrusion is not an applicable SI in this Subbasin. Each SI is measured at an RMP.

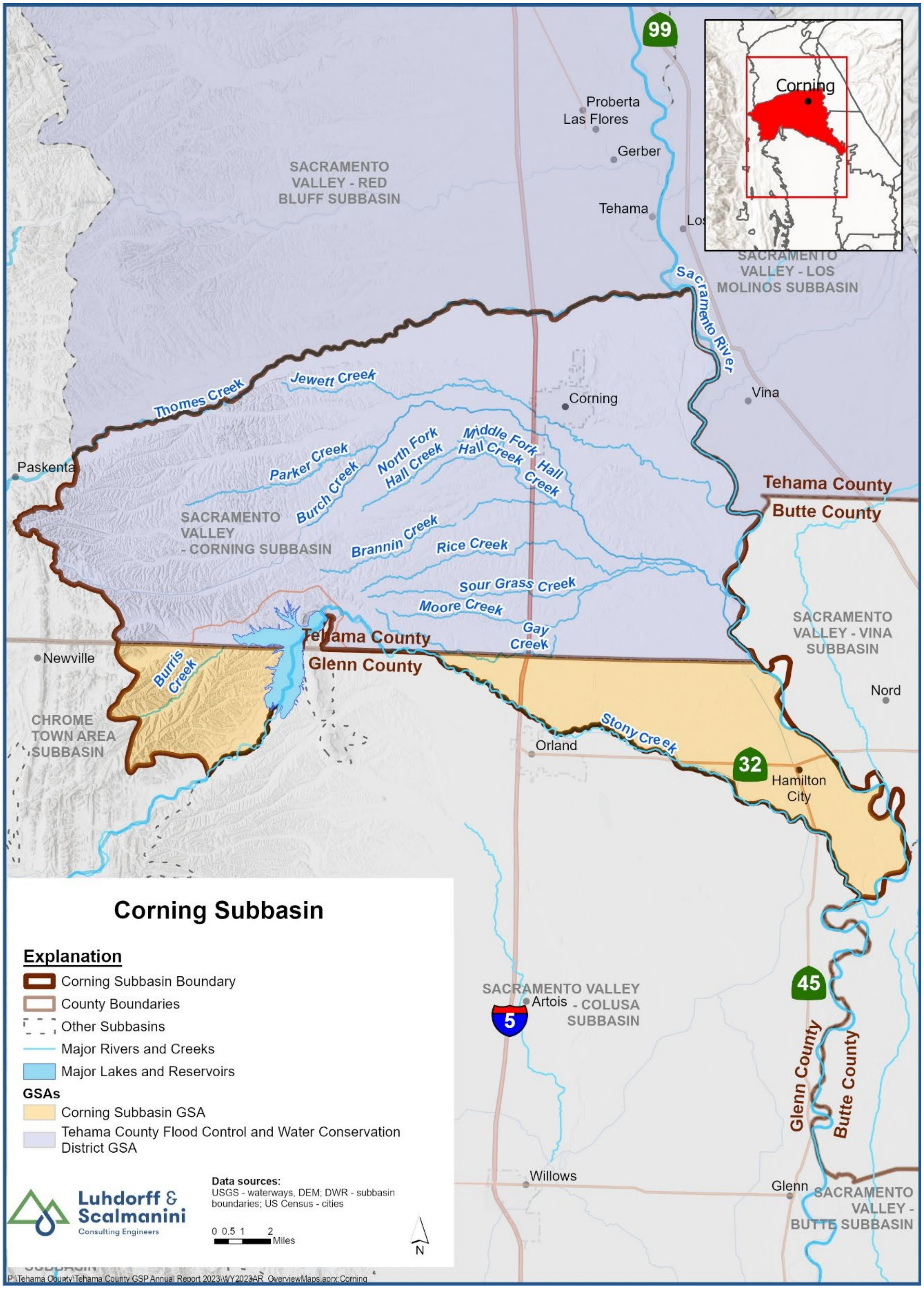

Figure ES-1. Corning Subbasin and Groundwater Sustainability Agency Boundaries

Table ES-1. Corning Subbasin Sustainability Indicator Summary			
2024 Status	**Undesirable Result Identification**	**MO Definition**	**MT Definition**
Chronic Lowering of Groundwater Levels			
No indication of undesirable results There were twelve RMPs with fall 2024 groundwater level measurements below the MT; however, no reports of dry wells or greater than a 7.5 ft water level decline occurred.	10 supply wells becoming dry (after the GSP revision) within a Thiessen Polygon established in the revised GSP, or when water levels at any RMP in the future decline 7.5 feet (ft) or more over a five (5) year period.	**Stable Wells:** Maximum fall groundwater elevations since 2012 **Declining Wells:** Maximum fall groundwater elevations since 2015	**Focus Areas:** Five (5) feet higher than MTs as published in the 2022 GSP***** **Outside Focus Areas:** MTs as published in the 2022 GSP*
Reduction of Groundwater Storage			
No indication of undesirable results There were 12 RMP wells with fall 2024 groundwater level measurements below the MT in WY 2024; however, only 2 out of 54 wells (approximately 4% of RMP wells) have fallen below the MT in the last two consecutive fall measurements (WY 2023 and WY2024). .	More than 20% of groundwater elevations measured at RMP wells drop below the associated MT during 2 consecutive years measured in the fall of each year.	Amount of groundwater in storage when groundwater elevations are at their MO – since groundwater levels are used as a proxy, same as chronic lowering of groundwater levels MOs.	Amount of groundwater in storage when groundwater elevations are at their MT– since groundwater levels are used as a proxy, same as chronic lowering of groundwater levels MTs.
Degraded Water Quality			
No indication of undesirable results There were no RMPs with TDS levels above their MTs.	At least 25% of RMPs exceed the MT for water quality for two consecutive years at each well, where it can be established that GSP implementation is the cause of the exceedance.	California lower limit SMCL concentration for TDS of 500 mg/L measured at public supply wells.	TDS concentration of 750 mg/L at public supply wells.

Table ES-1. Corning Subbasin Sustainability Indicator Summary			
2024 Status	**Undesirable Result Identification**	**MO Definition**	**MT Definition**
Land Subsidence			
No indication of undesirable results No InSAR pixel exceeded MT in WY 2024.	Any exceedance of an MT that is irreversible and caused by lowering groundwater elevations.	Zero inelastic subsidence, in addition to any measurement error. If InSAR data are used, the measurement error is 0.1 ft, and any measurement of 0.1 ft or less would not be considered inelastic subsidence.	No more than 0.5 foot of cumulative subsidence over a five-year period (beyond the measurement error), solely due to lowered groundwater elevations
Depletion of Interconnected Surface Water			
No indication of undesirable results There were no RMP with spring or fall 2024 groundwater level measurements below the MT.	Same as the reduction in groundwater storage.	Same as the chronic lowering of groundwater levels.	Same as the chronic lowering of groundwater levels.

Notes:

2022 GSP Undesirable Results for chronic lowering of GWL:* ***Stable Wells:* *Minimum fall groundwater elevation since 2012 minus 20-foot buffer.* ***Declining Wells:*** *Minimum fall groundwater elevation since 2012 minus 20% of minimum groundwater level depth.*

TDS is the primary water quality constituent of concern.

MO = Measurable Objective; MT = Minimum Threshold; RMP = representative monitoring point; mg/L = milligrams per liter; SMCL = Secondary Maximum Contaminant Level

Current Groundwater Level and Storage Conditions

The current groundwater conditions in the Subbasin are characterized by groundwater elevations that are near or below the MO. In WY 2024, twelve wells experienced a decline below the MT in fall 2024, while all remaining RMP wells remained above the MT. Although two wells remained below the MT for 24 consecutive months, a UR occurs when 10 supply wells become dry within a Thiessen Polygon (per the revised GSP) or when water levels at any RMP in the future decline 7.5 ft or more over a five (5) year period.

On average, groundwater elevations are about 10 ft above the MT throughout the Subbasin and 16 ft below the MOs in WY 2024. Elevations are mostly near or slightly higher than those observed in recent years. This positive trend is influenced by the above-normal hydrologic conditions experienced in WY 2024, which resulted in increased surface water supplies available for irrigation and decreased groundwater extractions, which contributed to the recovery of groundwater conditions relative to the dry period from WY 2020 to WY 2022.

Fluctuations in groundwater levels and storage within the Subbasin are influenced by the balance between aquifer recharge and extraction. Groundwater levels serve as a proxy for estimating changes in groundwater storage, with observed patterns closely mirroring those in the broader Sacramento Valley. In years characterized by drought and low precipitation, diminished surface water supplies lead to increased extraction and reduced recharge, causing a decline in groundwater storage.

WY 2024, classified as an above normal WY, marked an increase in groundwater storage, totaling approximately 20,900 acre-feet (AF) in the aquifer. For context, in the past 34 years, the largest decrease in groundwater storage is estimated to be -100,000 AF, and the highest increase was estimated to be 120,000 AF. **Figure ES-2** shows groundwater pumping, as well as annual and cumulative changes in groundwater storage from WY 1990 to WY 2024.

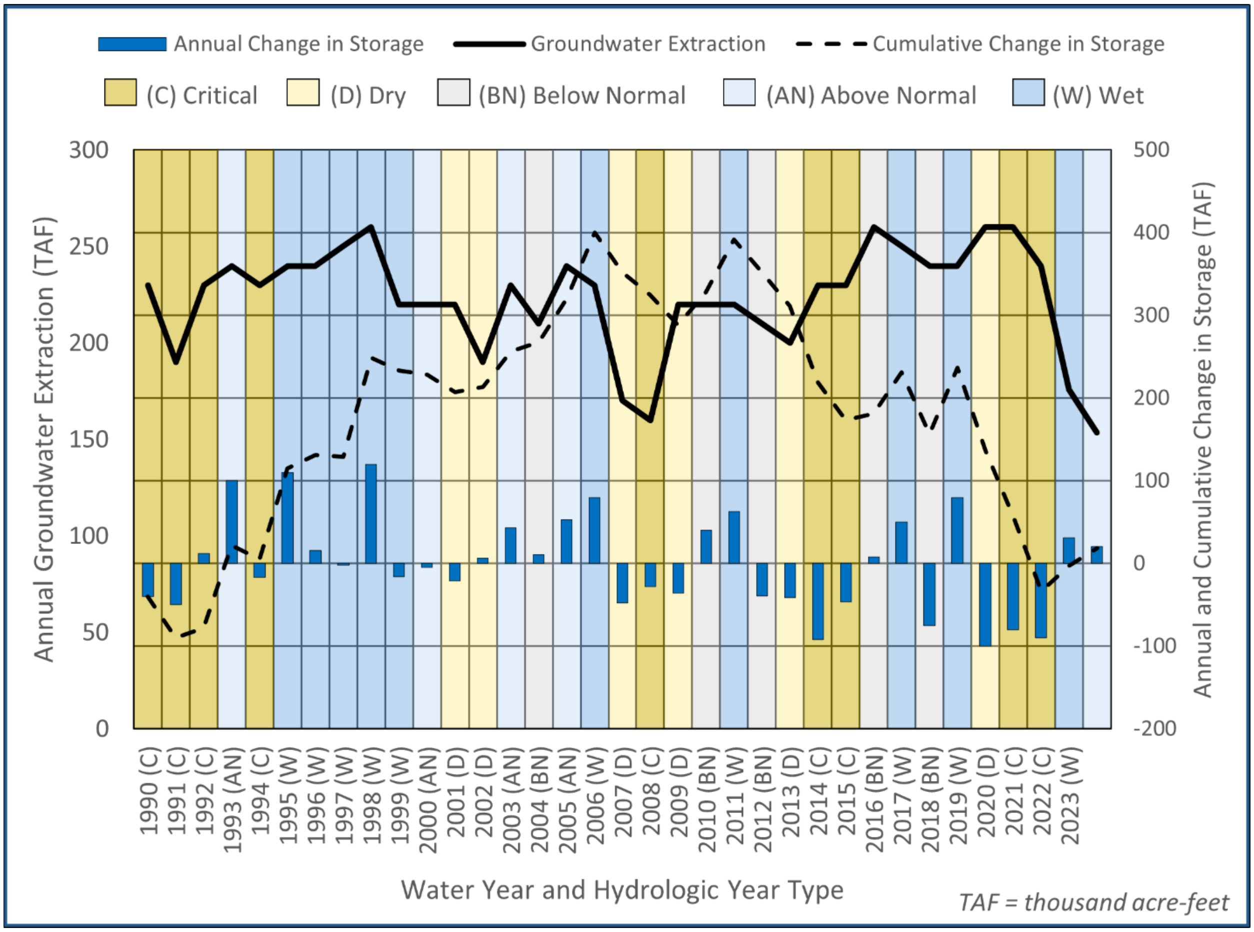

Figure ES-2. Corning Subbasin Groundwater Pumping, Annual and Cumulative Change in Storage from WY 1990 to WY 2024

Water Use

Groundwater extraction was approximately 153,600 AF in WY 2024, lower than the 175,000 AF extracted in WY 2023. The annual volume of surface water delivered to the Subbasin from surface water features such as Thomes Creek and Stony Creek was about 29,700 AF in WY 2024, higher than the 24,000 AF delivered in WY 2023. The decrease in groundwater estimates in WY 2024 compared to WY 2023 was influenced by a variety of factors, including increased surface water and effective precipitation in WY 2024 (relative to WY 2023). Additionally, in the Corning Subbasin, the irrigated acreage was reduced from 72,000 in WY 2023 to 61,000 acres in WY 2024. This decrease is due to the reclassification of “eucalyptus” from irrigated “citrus and subtropical” crops to a non-irrigated category. There is a large eucalyptus grove in the central portion of the Corning Subbasin that is not actively irrigated but was classified as such with other “citrus and subtropical” crops in prior years. Additionally, surface water use increased slightly in WY 2024 compared to WY 2023.

Groundwater provides the majority (83%) of the water for agriculture in the Subbasin, and surface water is the source for the remainder (17%). Groundwater also met the demand for municipal and rural residential users. The volume of groundwater and surface water used on an annual basis within the

Subbasin is summarized directly from measured and reported groundwater pumping and surface water diversions when available; however, a water budget approach has been used to estimate the remaining unmeasured volume of groundwater extraction. **Table ES-2** provides a summary of water use by water sector. Numbers are rounded to the nearest 100.

Table ES-2. Corning Subbasin Total Water Use by Water Use Sector

Sector	WY 2024 (AF)			
	Groundwater	Surface Water	Total	Total Irrigated Area (acres)
Agricultural	149,500	29,700	**179,200**	**61,000**
Municipal	2,300	0	**2,300**	**--**
Rural Residential	1,800	0	**1,800**	**--**
Total	**153,600**	**29,700**	**183,300**	**61,000**

GSP Implementation Progress

The main activities and updates since the previous annual report are as follows:

- The GSAs have engaged in public outreach in WY 2024.
- The GSAs received from DWR "incomplete" determination letters in October 2023; re-submitted GSP in April 2024; 2 major commitments to develop Groundwater Demand Management and Well Mitigation programs.
- The GSAs completed the WY 2023 Annual Report and other compliance tasks.
- In August 2023, the CSGSA approved a property-related service fee to fund GSA operations and implementation costs to comply with SGMA. Initial funding through the fee process was collected in WY 2024.
-
- All sustainability indicators (SIs) are in compliance with their MTs, except for the chronic lowering of groundwater levels SI (see summary **Table 5-1**).
- Progress has been made on 8 PMAs since the last annual report (see **Tables 5-5 and 5-6)**.

Several other actions continue in the Subbasin to fulfill the requirements of the GSP. These include:

- Monitoring and recording groundwater levels and groundwater quality.
- Maintaining and updating the data management system (DMS) with newly collected data.
- Annual reporting on Subbasin conditions and submission to DWR as required by SGMA.

Ongoing intra- and inter-basin coordination. Since 2023, the Tehama County GSA and the CSGSA in the Subbasin prepared to implement future projects to address recommended corrective actions, which will largely be funded by the SGM Implementation Grant Program. The ongoing implementation of PMAs, outlined in **Section 5**, aims to address these corrective actions effectively through the periodic evaluation of the GSP, which is due in January 2027.

1 GENERAL INFORMATION §356.2(A)

The Annual Report for the Corning Subbasin (Subbasin) (5-021.51) was prepared on behalf of the Tehama County Flood Control and Water Conservation District (Tehama County GSA) and the Corning Sub-Basin Groundwater Sustainability Agency (CSGSA) to fulfill the statutory requirements of the Sustainable Groundwater Management Act (SGMA) legislation (§10728) and regulatory requirements developed by the California Department of Water Resources (DWR) included in the Groundwater Sustainability Plan (GSP) regulations (§354.40 and §356.2). The regulations require the Groundwater Sustainability Agencies (GSAs) to submit an annual report to DWR by April 1st following the reporting year, which spans the water year (WY) from October 1st to September 30th. This Annual Report is the fourth annual report submitted on behalf of the Subbasin and includes data for the most recent WY 2024. Public seeking information on Corning Subbasin and GSP Implementation, meeting schedules, and other resources should visit the **Tehama County GSA** (https://tehamacountywater.org/gsa/) and the **Corning Sub-Basin GSA** (https://www.countyofglenn.net/corning-sub-basin-gsa) websites.

1.1 Report Contents

This report is the fourth annual report prepared for the Corning Subbasin GSP submitted in January 2022 (revisions submitted in April 2024). GSP references throughout this report refer to the Revised April 2024 Corning Subbasin GSP unless otherwise noted. The first annual report included data elements for the first reporting year, WY 2021, as well as a "bridge year," WY 2020. The second and third annual reports contain data only for the current reporting year, WY 2022 and WY 2023, respectively. Data elements presented in this report refer to WY 2024, the 12-month period spanning October 2023 through September 2024, unless otherwise noted. Pursuant to GSP regulations, this Annual Report includes:

- Groundwater Elevation Data
- Water Supply and Use
- Change in Groundwater Storage
- GSP Implementation Progress

1.2 Subbasin Setting

The Subbasin is a 324 square mile (207,342 acres) area on the southern side of Tehama County and the northern side of Glenn County. The Subbasin is managed by the Tehama County GSA and the CSGSA.

The Subbasin is shown in **Figure 1-1** and **Figure 1-2**. The Subbasin lies in the northeastern portion of the Sacramento Groundwater Basin, **Figure 1-1**. The Subbasin's northern boundary is the Red Bluff Subbasin, the western boundary is the Coastal Mountain Range, the southern boundary is the Colusa and Butte Subbasins, and the eastern boundary is the Los Molinos and Vina Subbasins (DWR, 2018), **Figure 1-2**. Several surface water features are located in the Subbasin, including the Sacramento River, Thomes Creek, and Stony Creek. Smaller local streams entering and traversing the Subbasin include Jewett Creek and Hall Creek. Groundwater generally flows from west/northwest to east/southeast.

The revised Corning Subbasin GSP recognizes that the updated annual groundwater storage is negative and constitutes overdraft. This value of -31,200 AFY will affect the sustainable yield calculation downward. The recalculation of the sustainable yield will also be conducted as part of the 5-year Periodic Evaluation. Until that time, the 2070 simulated sustainable yield is 141,000 AF. Water use in the Subbasin is dominated (98%) by agricultural uses, and municipal and household water use accounts for the remaining 2% of water used. Groundwater constitutes the majority (84%) of the Subbasin's water supplies, with surface water comprising the remaining portion (16%).

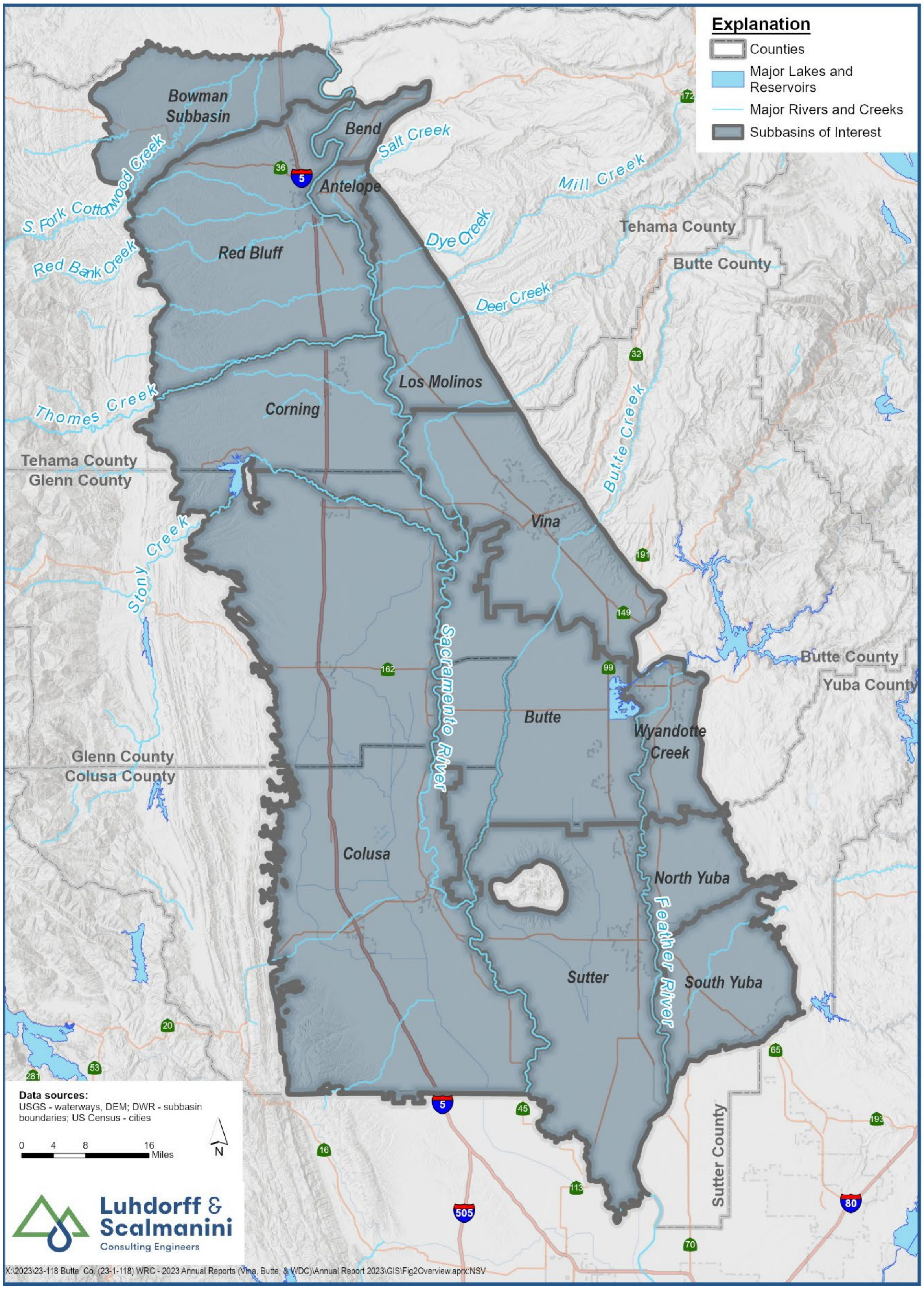

Figure 1-1. Subbasins in the Northern Sacramento Valley

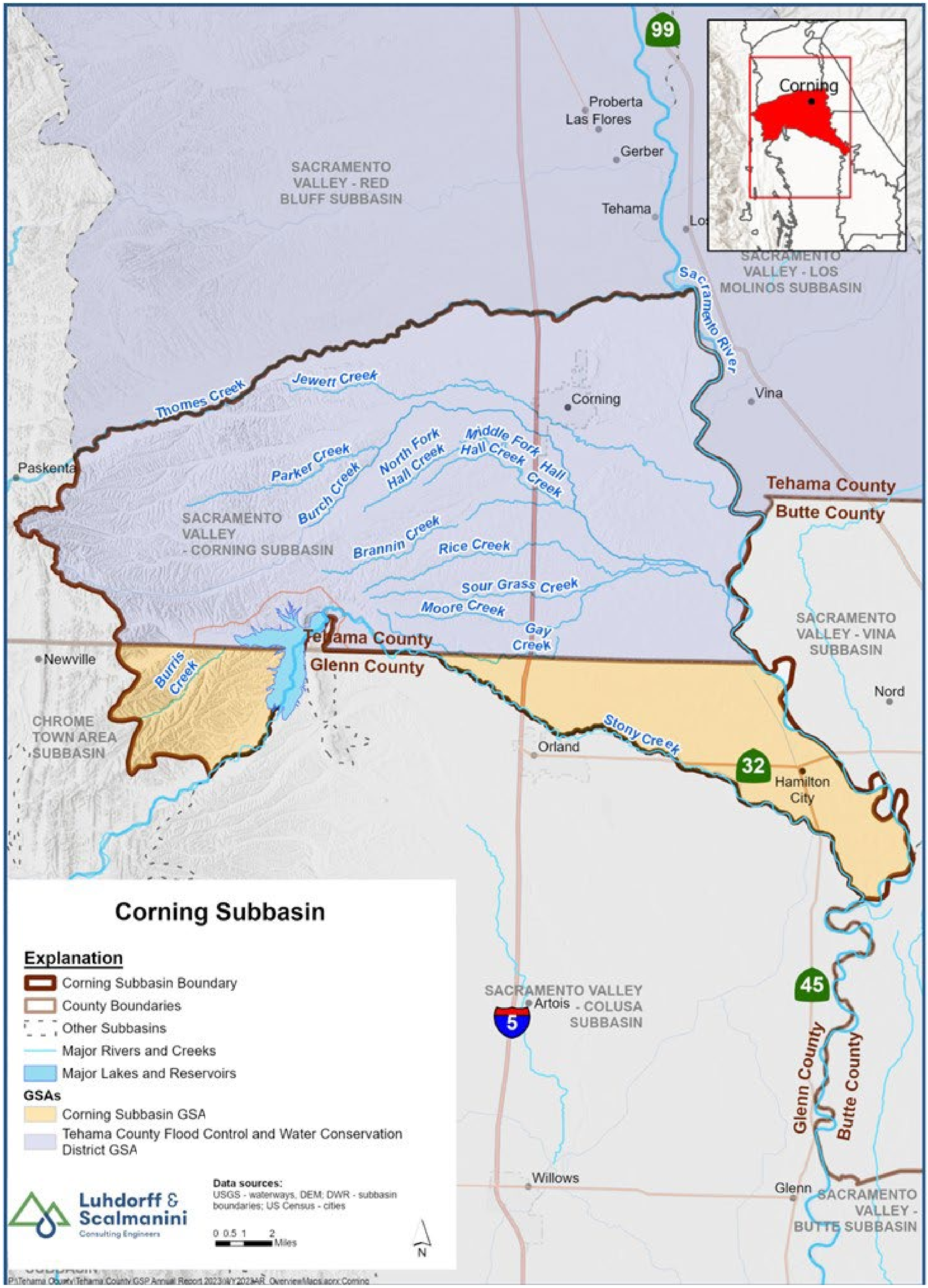

Figure 1-2. Corning Subbasin and Groundwater Sustainability Agency Boundaries

2 GROUNDWATER ELEVATIONS §356.2(B)(1)

Groundwater elevations in the Subbasin typically fluctuate seasonally between and within water years, particularly in groundwater-dependent areas or during drought years when groundwater is used to compensate for diminished surface water supplies. Seasonal fluctuations of groundwater levels occur in response to groundwater pumping and recovery, land and water use activities, recharge, and natural discharge. Sources of recharge into the groundwater system include precipitation, applied irrigation water, and seepage from local creeks and rivers.

Groundwater pumping for irrigation typically occurs from April to September, although depending on the timing of rainfall, it may shift earlier and/or later into the season. Consequently, groundwater levels are usually highest in the spring and lowest during the irrigation season in the summer months. Fall groundwater measurements (typically measured in October) provide an indication of groundwater conditions after the primary irrigation season.

Groundwater levels in the Subbasin are monitored in representative monitoring point (RMP) wells that were selected in the GSP to represent localized groundwater conditions for specified areas of the Subbasin. RMP wells include a mixture of domestic wells, irrigation wells, and dedicated observation wells. In total, 54 RMP wells are used to monitor conditions in the aquifer. **Appendix A** includes hydrographs showing groundwater elevations and the approximate locations of the RMP wells. Sustainable management criteria (SMC), described in **Appendix B**, are assigned to groundwater levels at the RMP wells.

Certain RMP wells measured by DWR and Tehama County are equipped with data loggers and pressure transducers, which continuously monitor and record hourly changes in groundwater levels. These and the remaining wells in the network are measured by hand at least two times each year in March and October. Data from groundwater level monitoring wells is available from DWR's online SGMA Data Viewer tool (https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer).

Spring and fall 2024 groundwater elevation measurements for RMP wells in the Subbasin are summarized in **Table 5-2**. The groundwater level monitoring methods are consistent with the protocols described in the Corning Subbasin GSP. Depending on the well, groundwater elevations are measured using steel tape, an electric sounder, or a pressure transducer. The accuracy of groundwater level measurements is typically either 0.01 ft or 0.1 ft, depending on the equipment used.

The following sub-sections provide a summary of groundwater elevations and conditions during WY 2024 through the presentation and description of groundwater elevation contours (**Section 2.1**) and hydrographs of groundwater elevations (**Section 2.2; Appendix A**).

2.1 Groundwater Elevation Contour Maps – §356.2(b)(1)(A)

Groundwater elevation contour maps for spring and fall 2024 were prepared for the aquifer, as shown in **Figures 2-1** and **2-2**. Spring contours are intended to generally represent seasonal high groundwater elevations (shallower depth to water), while fall contours are intended to generally represent seasonal low groundwater elevations (deeper depth to water). Groundwater elevation contours were developed by creating a continuous groundwater elevation surface based on available monitoring well data using the kriging interpolation method. Questionable groundwater elevation measurements were excluded, and minor adjustments to the contours were made based on professional judgment.

The contour maps of the aquifer (**Figures 2-1 and 2-2**) each show that groundwater elevations are generally higher in the northern areas of the Subbasin versus the southern and eastern areas, indicating a general gradient – and thus groundwater flow – from the west/northwest to the east/southeast. The contour maps illustrate several general features of the groundwater flow system in the Corning Subbasin, including:

- Overall, west/northwest to east/southeast groundwater flow is consistent with recharge from the Northern Coastal Mountain Ranges.
- Movement of water towards the Sacramento River in both the fall and the spring.
- The higher concentration of contours in the central portion of the Subbasin indicates a steeper gradient and could suggest higher groundwater flow. Nonetheless, the contours are consistent with the current understanding of recharge coming from the Northern Coastal Mountain Ranges foothills. New sources of information and data may improve understanding of this area.

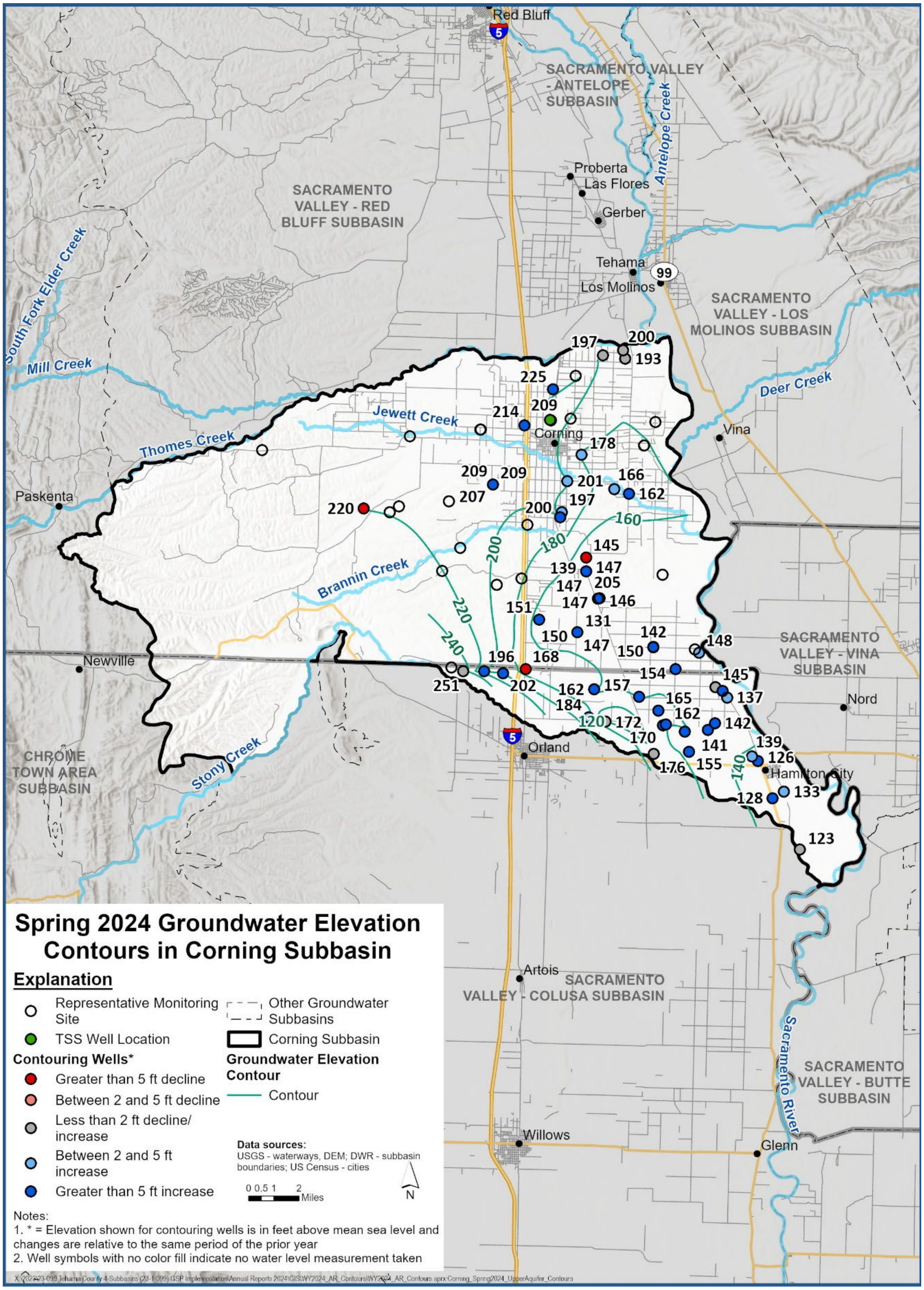

Figure 2-1. Corning Subbasin Contours of Equal Groundwater Elevation, Spring 2024 (Seasonal High)

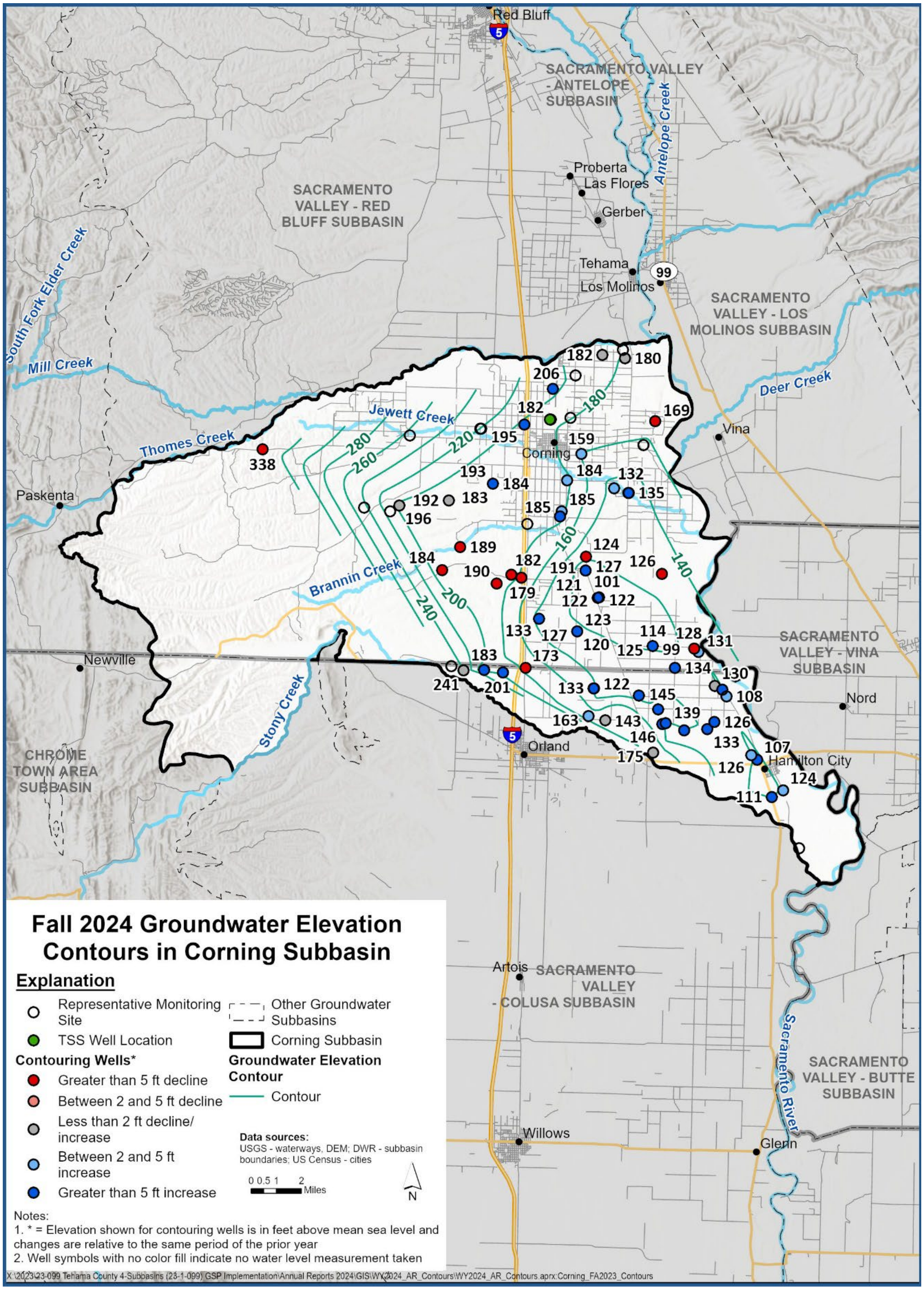

Figure 2-2. Corning Subbasin Contours of Equal Groundwater Elevation, Fall 2024 (Seasonal Low)

2.2 Hydrographs of Groundwater Elevations – §356.2(b)(1)(B)

Groundwater elevation hydrographs for each RMP well are presented in **Appendix A**. The pink trendline on each hydrograph illustrates general groundwater level changes during the spring months, a period typically free from groundwater pumping, thereby reflecting the least-influenced groundwater levels. Groundwater level records from recent spring seasons were used to calculate changes in groundwater levels, the average water level, and the average annual rate of change. The trendline was developed based on the available data and historical records for each specific monitoring site. While most sites have data spanning the past 21 years (Spring 2003 to Spring 2021), some long-established monitoring wells contain extended historical records (over 21 years), whereas newly installed wells have more limited datasets. **Appendix B** provides an explanation of the SMC terminology defined in Section 6 of the Corning Subbasin GSP (e.g., minimum threshold [MT], measurable objective [MO], and interim milestone [IM]). **Table 5-1** summarizes the MOs, MTs, and identification of undesirable results (URs) for WY 2024**,** and **Table 5-2** contains a summary of the spring 2024 (seasonal high) and fall 2024 (seasonal low) groundwater elevations measured at each well. **Table 5-2** also summarizes the established MO and MT for groundwater elevations, the changes in groundwater elevations from WY 2023 to WY 2024, and the differences between WY 2024 groundwater elevations and the MO.

Historically, groundwater levels have typically remained at or above their respective MOs in the Subbasin. The GSP also established IMs to provide numerical metrics for GSAs to track the Subbasin's conditions relative to the overall sustainability goal, ensuring that the groundwater management of the Subbasin remains sustainable.

Spring and fall 2024 groundwater elevations were generally near or slightly higher than seasonal groundwater elevations in WY 2023. In WY 2024, the average seasonal high was 167 feet (ft) above mean sea level (AMSL), and the average seasonal low was 153 ft AMSL. In WY 2023, the average seasonal high was 172 ft AMSL, and the average seasonal low was 158 ft AMSL. Increases in groundwater levels are generally expected to result from decreased groundwater extraction in WY 2024, as well as increased recharge due to above normal climate conditions.

Eight wells out of 54 fell below the MO in spring 2024. All but one well (22N01W29N003M) fell below the MO in fall 2024. Twelve of 54 measured groundwater elevations fell below the corresponding MT of that RMP well in fall 2024. However, this does not trigger URs as outlined in the GSP (summarized in **Table 5-1**) since a) no dry wells were reported and b) water levels at any RMP did not decline 7.5 ft or more over a five (5) year period. On average, groundwater levels measured in RMP wells were approximately 16 feet higher than MT elevations in spring 2024 and 4 ft higher than MT elevations in fall 2024. All measured groundwater levels remained within the Subbasin's margin of operational flexibility.

3 WATER SUPPLY AND USE

As required by §356.2, this section summarizes water supply and use in the Subbasin, categorized by groundwater extraction volumes, surface water supply, and total supply. The total water available for use in the Subbasin was tabulated from groundwater extraction volumes reported in **Table 3-1** and the surface water supply reported in **Table 3-2**. The total water available is summarized in **Table 3-3** for WY 2024. Groundwater extraction volumes are either based on measured data or are estimates from a water use analysis based on 2024 land use data and climate conditions. Water use data is available in **Appendix D**. The water use analysis methodology is discussed in **Appendix E**. Surface water use was estimated from historic deliveries when records were not available.

Table 3-1. Corning Subbasin Groundwater Use by Water Use Sector

Sector	WY 2024 (AF)
Agricultural	149,500
Municipal	2,300
Rural Residential	1,800
Total	**153,600**

3.1 Groundwater Extraction – §356.2(b)(2)

Groundwater extraction in the Subbasin is summarized in **Table 3-1**. Groundwater extraction is reported from pumping records where available, while the remaining groundwater extraction is estimated through the water use analysis approach described in the previous section and in **Appendix E**.

The majority of the Subbasin relies on groundwater supplies for agricultural irrigation, although portions of the Subbasin rely on surface water supplies. In years characterized by drought and low precipitation, diminished surface water supplies lead to increased groundwater extraction and reduced recharge, causing a decline in groundwater storage. Contrastingly, in wet years, such as WY 2023, wet climate conditions help to increase recharge and bolster groundwater storage.

Municipal water users extracted approximately 2,300 AF in the Subbasin in WY 2024. Municipal water supplies are measured and provided by the City of Corning and Hamilton City (CalWater). The record of municipal supplies does not distinguish between urban and industrial water uses.

Rural residential water users rely on private domestic wells to meet their household water needs. Rural residential groundwater extraction was quantified based on average per capita water use and estimated population. The average per capita water use reported in the California Water Service Chico-Hamilton City District 2020 Urban Water Management Plan 2020 (Cal Water Chico, 2020) is considered to be representative of the area. Water use in 2020 was 181 gallons per capita per day. Population estimates were based on average household sizes from the US census and aggregated to those living outside city water district boundaries. Population estimates from the 2020 Census were used to estimate residential groundwater pumping.

The total estimated groundwater extraction was approximately 153,600 AF in WY 2024, the majority of which was used to meet agricultural water demands (approximately 149,500 AF). The total groundwater extraction is about 69,500 AF less than the historical groundwater pumping average (223,100 AFY; **Table 4-1**) and 78,900 AF less than the average annual extraction of the last four above normal WYs on record, 232,500 AF (1993, 2000, 2003, and 2005). The decrease in groundwater extraction in WY 2024 is attributed to an above normal WY 2024, where above normal precipitation was able to meet a larger portion of evapotranspiration demands. Additionally, in the Corning Subbasin, the irrigated acreage was reduced from 72,000 in WY 2023 to 61,000 acres in WY 2024. This decrease is due to the reclassification of “eucalyptus” from irrigated “citrus and subtropical” crops to a non-irrigated category. There is a large eucalyptus grove in the central portion of the Corning Subbasin that is not actively irrigated but was classified as such with other “citrus and subtropical” crops in prior years. Any estimated demands for this area beyond what can be met by precipitation have not been included in total estimated groundwater extraction and are a contributing factor in the decrease in groundwater extraction in WY 2024. **Figure 3-1** shows the general areas where groundwater is applied in the Subbasin. About 97% of the total groundwater extraction was used by the agricultural sector, while the remaining 3% was used for municipal and rural residential water needs.

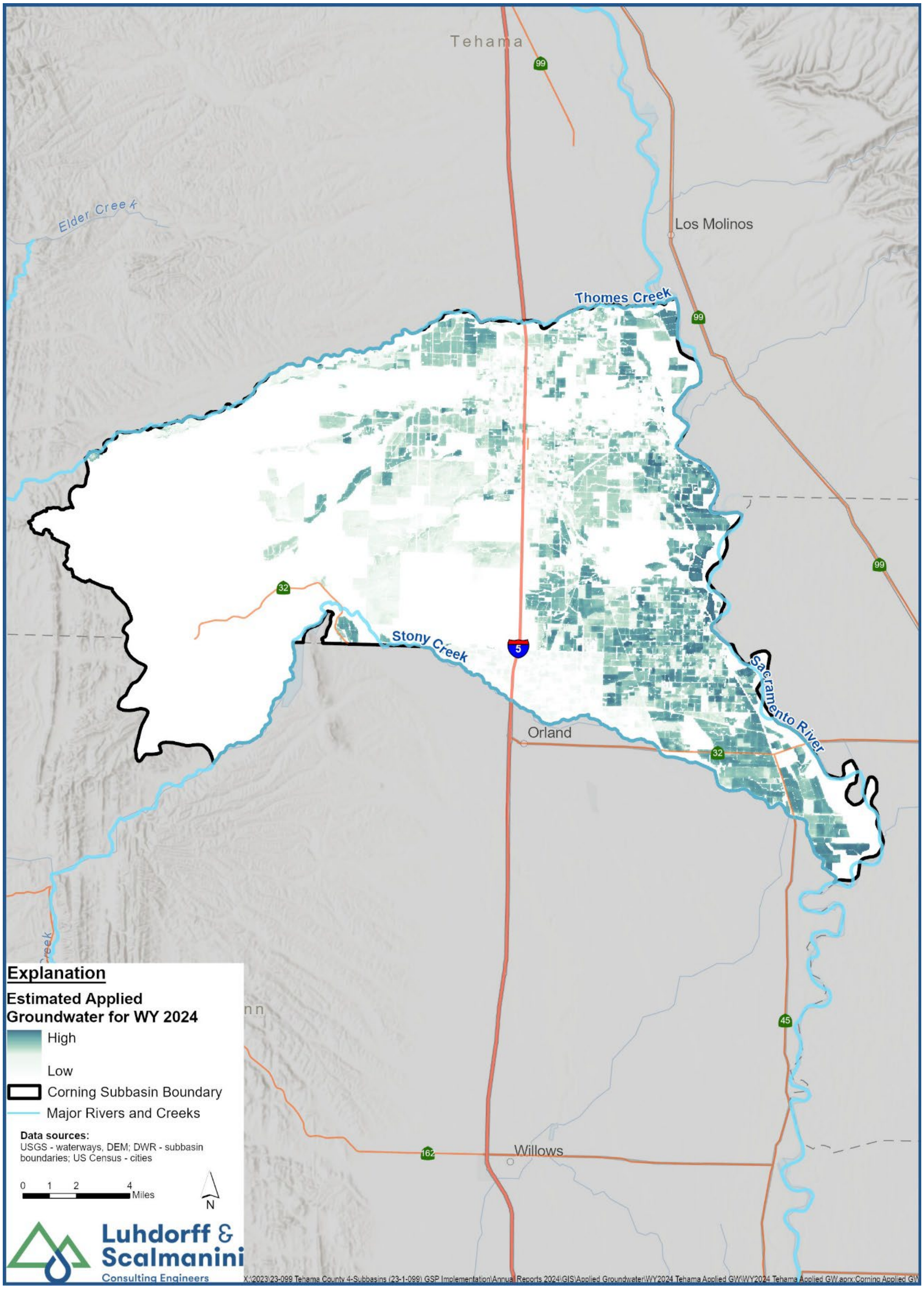

Figure 3-1. Corning Subbasin Estimated Applied Groundwater – WY 2024

3.2 Surface Water Supply – §356.2(b)(3)

Surface water supplies used or available for use in the Subbasin are summarized in **Table 3-2.** Surface water supplies are reported directly from water supplier records or collected from publicly available sources (water rights diversion records, etc.) where available. Missing surface water supply data was estimated based on available historical diversions data in similar water years.

Surface water provided about 17% of the agricultural water demand in the Subbasin for WY 2024. Diversions from surface water features such as Thomes Creek and Stony Creek were accessed from the State Water Resource Control Board's (SWRCB) Electronic Water Rights Information Management System (eWRIMS; SWRCB, 2023a). Data from eWRIMS on surface water delivery indicated which water rights holders in the Subbasin had made diversions during WY 2024. There are currently no surface water supplies for municipal use in the Corning Subbasin. Total surface water diversions and deliveries for the Corning Subbasin are estimated to be about 33,800 AF and 29,700 AF, respectively.

WY 2024 was an above normal WY, indicating less overall precipitation than the wet hydrologic conditions in WY 2023. Despite receiving less precipitation in WY 2024, surface water use increased in WY 2024 compared to WY 2023.

Table 3-2. Corning Subbasin Surface Water Use by Water Use Sector for WY 2024

Sector	Diverted (AF)	Applied (AF)
Agricultural	33,800	29,700
Total	**33,800**	**29,700**

3.3 Total Water Use by Sector – §356.2(b)(4)

Total water demand in the subbasin for WY 2024 was divided between surface water (16%) and groundwater (84%). The total water available for use in the Subbasin was tabulated from groundwater extraction volumes reported in **Table 3-1** and the surface water supply reported in **Table 3-2**. The total water available is summarized in **Table 3-3** for WY 2024. The results are either based on measured data or estimates, as described in the previous two sections.

In WY 2024, approximately 11,000 acres that were classified as irrigated "citrus and subtropical" land in prior years were reclassified to non-irrigated "eucalyptus" land based on a review of available data and coordination with local stakeholders. This land use reclassification reduced the irrigated acreage in the Corning Subbasin from 72,000 to 61,000 acres, resulting in lower groundwater extraction estimates, as reflected in **Table 4-1.**

Table 3-3. Corning Subbasin Total Water Use by Water Use Sector				
Sector	WY 2024 (AF)			
	Groundwater	Surface Water	Total	Total Irrigated Area (acres)
Agricultural	149,500	29,700	**179,200**	**61,000**
Municipal	2,300	0	**2,300**	--
Rural Residential	1,800	0	**1,800**	--
Total	**153,600**	**29,700**	**183,300**	**61,000**

3.4 Uncertainties in Water Use Estimates

Estimated uncertainties in the water budget components are presented in **Table 3-4**. The uncertainty of these water budget components is based on typical accuracies given in technical literature and the cumulative estimated accuracy of all inputs used to calculate the components.

Table 3-4. Corning Subbasin Estimated Uncertainty in Water Use Estimates			
Water Budget Component	Data Source	Estimated Uncertainty (%)	Source
Groundwater Water			
Agricultural	Measurement	20%	Typical uncertainty from water balance calculation.
Municipal/Industrial	Measurement /Estimate	5%	Typical accuracy of municipal water system reporting.
Rural Residential	Calculation	15%	Estimated from per capita water use and census information.
Surface Water			
Agricultural	Calculation	10%[1]	Estimated from Senate Bill 88 measurement accuracy standards.

[1] *Higher uncertainty of 10-20% is typical for estimated surface water inflows, including un-gaged inflows from small watersheds into creeks that enter the Basin.*

4 GROUNDWATER STORAGE

Long-term fluctuations in groundwater levels and groundwater in storage occur when there is an imbalance between the volume of water recharged into the aquifer and the volume of water removed from the aquifer, either by extraction or natural discharge to surface water bodies. If, over a period of years, the amount of water recharged to the aquifer exceeds the amount of water removed from the aquifer, then groundwater levels will increase and groundwater storage increases (i.e., positive change in storage). Conversely, if, over time, the amount of water removed from the aquifer exceeds the amount of water recharged, then groundwater levels decline, and groundwater storage decreases. These long-term changes can be linked to various factors, including increased or decreased groundwater extraction or variations in recharge associated with wet or dry hydrologic cycles.

A review of the RMP well hydrographs (**Appendix A**) indicates that groundwater elevations are either relatively stable or show a declining trend over time. Declines may be influenced by the significant percentage of water years since 2006 that have been dry (i.e., characterized as below normal, dry, or critical). Since groundwater storage is closely related to groundwater levels, measured changes in groundwater levels can serve as a proxy for and be utilized to estimate changes in groundwater storage. Changes in groundwater storage in the Subbasin follow a pattern typically seen in the majority of the Sacramento Valley. During normal-to-wet years, groundwater is withdrawn during the summer for irrigation and replenished during the winter through recharge of precipitation and surface water inflows, allowing groundwater storage to potentially rebound by the following spring. During dry years and drought conditions, this pattern is disrupted when more groundwater may be pumped to meet irrigation demand and less recharge may occur due to reduced precipitation, diminished or curtailed surface water supplies, and lower stream levels.

In WY 2024 (an above-normal WY), groundwater storage increased by approximately 20,900 AF. Decreased groundwater extraction in WY 2024 relative to WY 2023 contributed to the increase in groundwater storage, as well as increased recharge due to wet climate conditions. These and related factors, such as flood irrigation with surface water and increased stream flows, resulted in higher groundwater levels in spring 2024 compared to spring 2023.

The following sections present a summary of groundwater use and change in storage over time, along with a description of the uncertainty in storage change estimates.

4.1 Change in Groundwater Storage – §356.2(b)(5)(B)

Annual groundwater pumping, groundwater storage changes, and the cumulative change in storage over time are presented for WY 1990 through WY 2024 in **Table 4-1** and **Figure 4-1**. In contrast to WY 2023, WY 2024 was an above normal WY and saw a marked increase in groundwater storage, totaling approximately 20,900 AF. For context, in the past 34 years, the largest decrease in groundwater storage is estimated to be -100,000 AF, and the highest increase was estimated to be 120,000 AF.

Changes in storage values for WY 1990-2020 and groundwater pumping for WYs 1990-2021 come from the Corning Subbasin GSP (Tehama County GSA and CSGSA, 2022). It should be noted that the groundwater model was not used to estimate storage changes for WY 2021 through WY 2024. Therefore, future updates to the model may result in different estimates for WY 2021 through WY 2024 groundwater storage changes. The approach of using measured groundwater elevation changes to estimate storage changes is considered reasonable and cost-effective for the purposes of the annual report. **Table 4-1** includes estimates of annual groundwater pumping, annual storage change, and cumulative storage change for WYs 1990-2024. Estimates of annual groundwater pumping for WYs 2022-2024 are described in **Section 3** and **Appendix E.** The change in annual storage and cumulative change in storage for WYs 2021-2024 was estimated based on the method described in **Section 4.2**. Groundwater extractions for the entire period include pumping for agricultural, municipal, and rural residential purposes.

The annual and cumulative changes in groundwater storage for the period from WY 2021 through WY 2024 were based on the methodology described in **Section 4.2**. This methodology differs from the methodology reported in the GSP; however, it is anticipated that the methodology described in **Section 4.2** will be utilized for future annual reports.

Table 4-1. Corning Subbasin Annual Groundwater Extraction and Change in Storage

Water Year (Hydrologic Year Type)	Groundwater Extraction[1] (AF)	Annual Change in Storage (AF)	Cumulative Change in Storage (AF)
1990 (C)	230,000	-40,000	-40,000
1991 (C)	190,000	-50,000	-90,000
1992 (C)	230,000	12,000	-78,000
1993 (AN)	240,000	100,000	22,000
1994 (C)	230,000	-17,000	5,000
1995 (W)	240,000	110,000	115,000
1996 (W)	240,000	16,000	131,000
1997 (W)	250,000	-2,000	129,000
1998 (W)	260,000	120,000	249,000
1999 (W)	220,000	-16,000	233,000
2000 (AN)	220,000	-5,000	228,000
2001 (D)	220,000	-21,000	207,000
2002 (D)	190,000	6,500	213,500
2003 (AN)	230,000	43,000	256,500
2004 (BN)	210,000	11,000	267,500
2005 (AN)	240,000	53,000	320,500
2006 (W)	230,000	80,000	400,500
2007 (D)	170,000	-48,000	352,500
2008 (C)	160,000	-28,000	324,500
2009 (D)	220,000	-36,000	288,500
2010 (BN)	220,000	40,000	328,500
2011 (W)	220,000	63,000	391,500
2012 (BN)	210,000	-39,000	352,500
2013 (D)	200,000	-41,000	311,500
2014 (C)	230,000	-92,000	219,500
2015 (C)[2]	230,000	-46,000	173,500
2016 (BN)	260,000	8,000	181,500
2017 (W)	250,000	50,000	231,500

Table 4-1. Corning Subbasin Annual Groundwater Extraction and Change in Storage

Water Year (Hydrologic Year Type)	Groundwater Extraction[1] (AF)	Annual Change in Storage (AF)	Cumulative Change in Storage (AF)
2018 (BN)	240,000	-75,000	156,500
2019 (W)	240,000	80,000	236,500
2020 (D)	260,000	-100,000	136,500
2021 (C) [2]	260,000	-80,000	56,500
2022 (C) [2]	240,000	-90,000	-33,500
2023 (W)	175,000	31,000	-2,500
2024 (AN)	153,600	20,900	18,400
Historic Averages (1990-2023) [3]			
1990-2023 (33 years)	223,100	-70	
W (9 years)	232,600	53,200	
AN (4 years)	232,500	47,800	
BN (5 years)	228,000	-11,000	
D (6 years)	210,000	-39,900	
C (9 years)	222,200	-47,900	

Notes:

Positive values indicate inflows to the groundwater system, and negative values indicate outflows from the groundwater system.

AF = Acre-feet

Water Year Types Classified According to the Sacramento Valley Water Year Index: AN = Above Normal, BN = Below Normal, C = Critical; D = Dry, W = Wet

[1] *Groundwater extraction for WY 1990 through WY 2021 are from the Corning GSP Appendix 4D (Historical water budget tables; estimated using a numerical model); values for WY 2022 through WY 2024 were estimated using a water use analysis (presented in* ***Section 3; Appendix E****). Annual Change in Storage for WY 1990 through WY 2015 are from the Corning Subbasin GSP Appendix 4D (Historical water budget tables; estimated using a numerical model); values for WY 2016 through WY 2020 are from the Corning Subbasin Annual Report – 2021; values for WY 2021 though WY 2024 were estimated using measured groundwater elevation changes and average aquifer storage coefficient. Pumping and uptake data are reported in previous Annual Reports for WY 1990 through WY 2023, while only pumping data is reported for WY 2024.*

[2] *Indicated cutback year with reduced surface water supply availability.*

[3] *The historical average calculation covers the period from 1990 to 2023, excluding the current water year.*

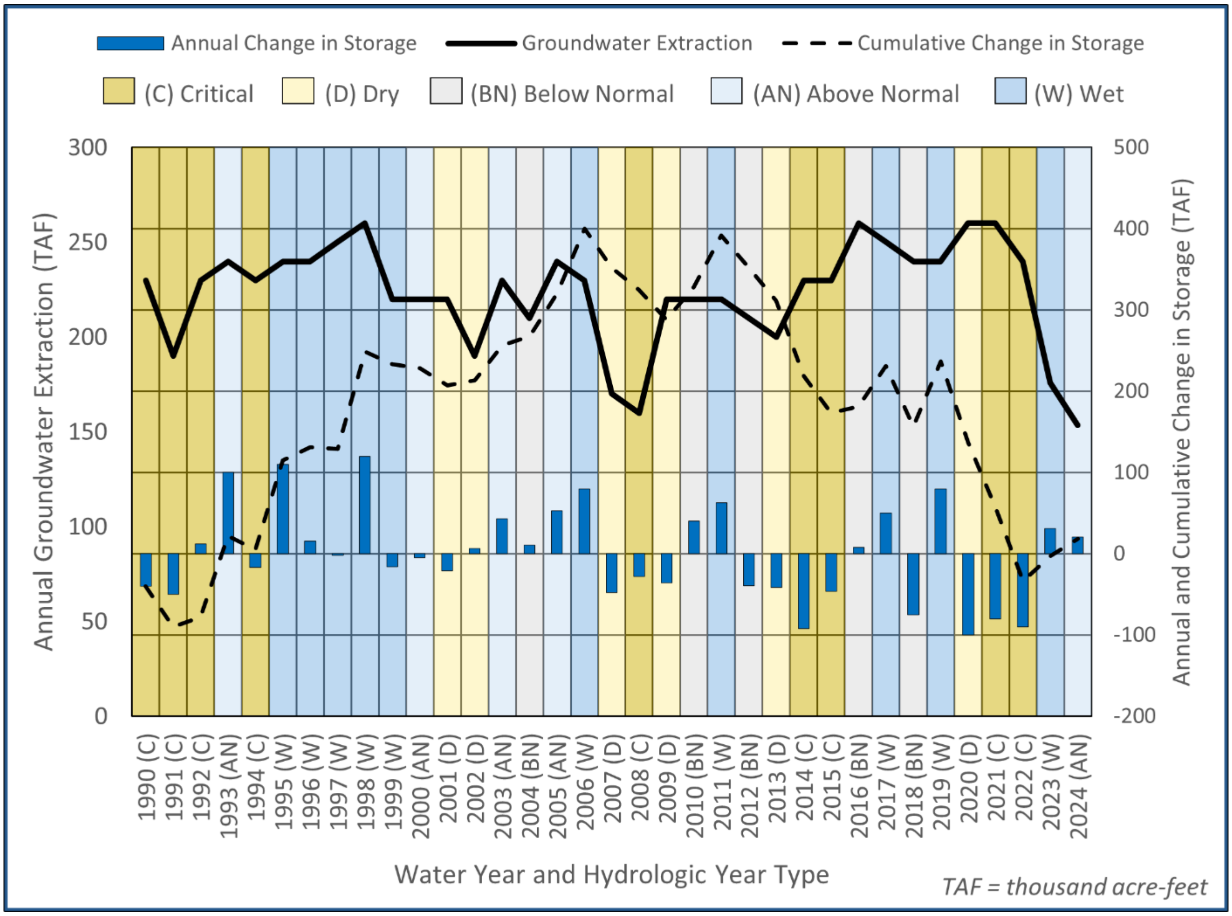

Figure 4-1. Corning Subbasin Groundwater Extraction and Change in Groundwater Storage from WY 1990 to WY 2024

4.2 Groundwater Storage Maps – §356.2(b)(5)(A)

The spatial distribution of estimated changes in groundwater storage for the period from spring 2023 to spring 2024 are shown in **Figure 4-2.** Since groundwater storage is closely related to groundwater levels, measured changes in groundwater levels can serve as a proxy for and be utilized to estimate changes in groundwater storage. Groundwater level data obtained from the DWR Water Data Library (DWR, 2025) were generally recorded on a monthly to quarterly basis. For Water Year 2023–2024, a raster surface representing seasonal high groundwater level changes was generated by spatially interpolating (kriging) data from selected wells across the subbasin. These seasonal high changes were calculated by subtracting groundwater levels recorded in the spring of 2023 from those recorded in the spring of 2024.

The selected wells represent sites with groundwater level records that are considered representative of subbasin conditions. In areas—mostly near the subbasin boundaries—where polygon-specific groundwater data were unavailable, interpolated raster pixel values from the selected wells were used for groundwater storage change calculations. In cases where multiple groundwater level records existed within a single polygon, an average groundwater level was assigned to that polygon. Groundwater storage change was then calculated by multiplying the change in seasonal high groundwater level (2024 minus 2023) by the specific yield (Sy) value assigned to each polygon, and by the polygon area (in acres), resulting in groundwater storage changes from 2023 to 2024 expressed in acre-feet.

It should be noted that the groundwater model as described in the GSP was not used to estimate storage changes for WY 2021 through WY 2024. The approach of using measured groundwater elevation changes to estimate storage changes is considered reasonable and cost-effective for the purposes of the annual report.

Negative changes in storage values indicate lowering groundwater levels and depletion of groundwater storage, whereas positive changes in storage values represent rising groundwater levels and accretion of groundwater storage. As shown in **Figure 4-2**, change in storage within each polygon ranged between negative (-160 AF) and positive (1,400 AF) values. When compiled, the total change in storage in the aquifer is approximately 20,900 AF between spring 2023 and spring 2024. The central portion of the Subbasin had the smallest positive change in storage, while the surrounding portions, especially the southeastern and northwestern portions of the Subbasin, experienced the largest positive change in storage.

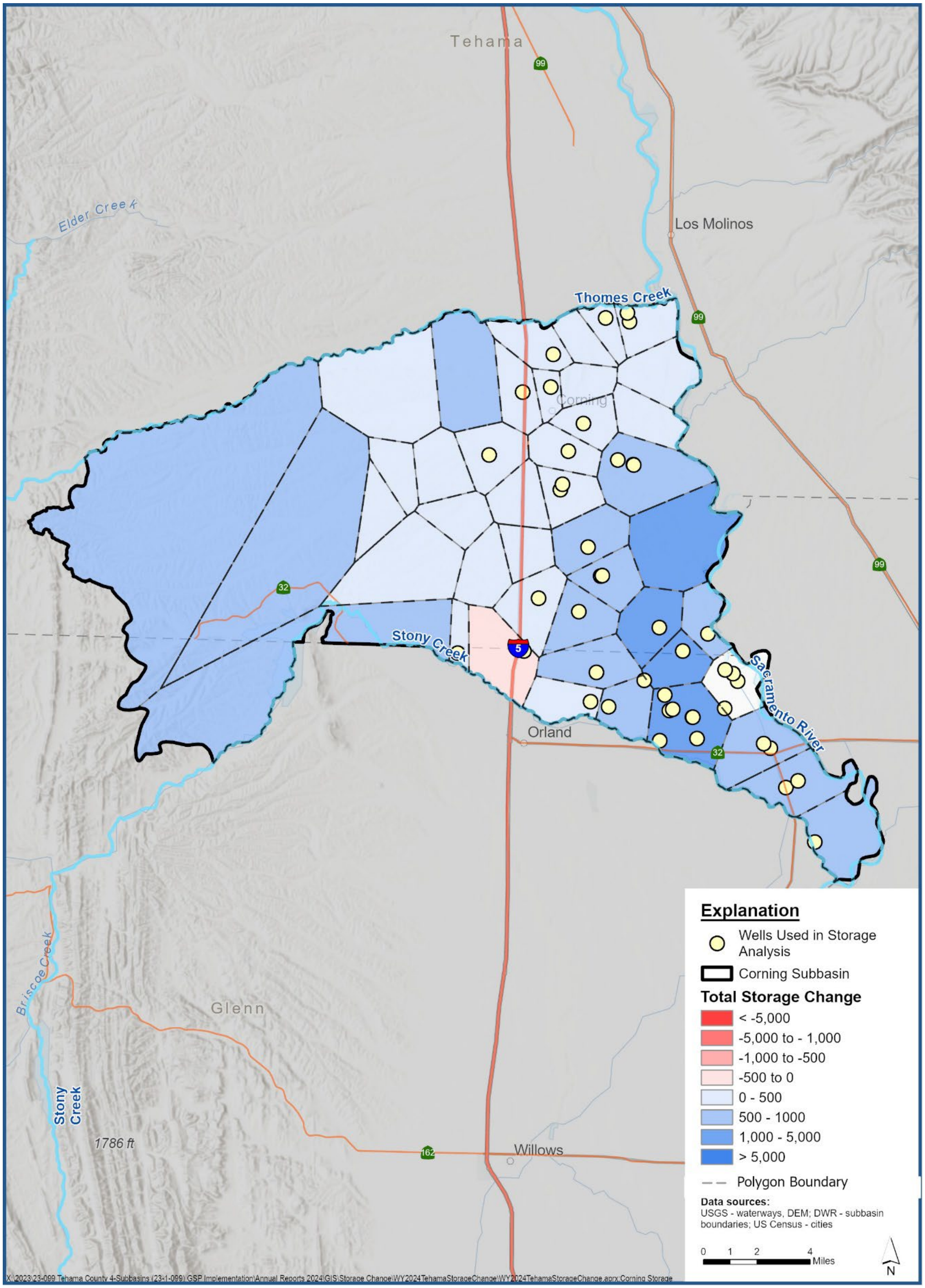

Figure 4-2. Corning Subbasin Change in Groundwater Storage from Spring 2023 to Spring 2024

4.3 Uncertainty in Groundwater Storage Estimates

The uncertainty associated with the change in groundwater storage estimates depends in part on the underlying uncertainty of the groundwater level data, the representative area, and the calibrated storage coefficient parameter used to calculate the change in groundwater storage. As described in **Section 4.2**, the calibrated storage coefficient (0.0061 - 0.0557) from the TIHM was used to calculate the change in storage for this WY. Based on a comparison of storage change estimates from the C2VSim model for similar water year types, the calculated storage change is reasonable. Further, the uncertainty of the estimated change in groundwater storage is typically 20-30% for integrated hydrologic models; therefore, the approach described in **Section 4.2** is considered to have similar uncertainty.

5 GSP IMPLEMENTATION PROGRESS – §356.2(B)(5)(C)

5.1 Main Activities of Water Year 2024

- The GSAs have engaged in public outreach in WY 2024.
- The GSAs received from DWR "incomplete" determination letters in October 2023; re-submitted GSP in April 2024; 2 major commitments to develop Groundwater Demand Management and Well Mitigation programs.
- The GSAs completed the WY 2023 Annual Report and other compliance tasks.
- In August 2023, the CSGSA approved a property-related service fee to fund GSA operations and implementation costs to comply with SGMA. Initial funding through the fee process was collected in WY 2024.
- All sustainability indicators (SIs) are in compliance with their MTs, except for the chronic lowering of groundwater levels SI (see summary **Table 5-1**).
- Progress has been made on 8 PMAs since the last annual report (see **Tables 5-5 and 5-6)**.

Several other actions continue in the Subbasin to fulfill the requirements of the GSP. These include:

- Monitoring and recording groundwater levels and groundwater quality.
- Maintaining and updating the data management system (DMS) with newly collected data.
- Annual reporting on Subbasin conditions and submission to DWR as required by SGMA.
- Ongoing intra- and inter-basin coordination.

DWR proposed two recommended corrective actions that will enhance the GSP. The GSAs revised the GSP accordingly and resubmitted it in April 2024. The process involved in making these revisions included the following:

1) In October 2023, the GSAs were notified by DWR via a determination letter that the GSP required revisions to correct deficiencies identified in the plan, which included the assessment of overdraft conditions in the Sub-basin, and explanation and justification of sustainable management criteria.

Revisions to the GSP would be required to be developed, adopted, and submitted for review within 180 days, or before April 23, 2024.

2) In response to the letter, the GSAs worked quickly to address the identified deficiencies in the GSP. Given the abbreviated timeline, the GSAs prioritized the portions of the GSP specifically described in the DWR determination letter for review and revision. Multiple meetings were held throughout the GSP revision process that were open to the public and input received at these meetings was considered. Additionally, representatives from the GSAs and their technical team met with the DWR on multiple occasions to review initial feedback and discuss strategies for revising the plan to address DWR's concerns.

3) Since the revisions are focused on the deficiencies identified in the determination letter, the GSAs acknowledge that there are portions of the Revised GSP which do not take into account changes to conditions since the submittal of the original GSP in January 2022. It is expected that additional updates to the GSP will be made during the five-year periodic evaluation (if not sooner) due in January 2027, as is consistent with adaptive management of the subbasin. For instance, the numerical groundwater model developed and described in the original GSP to predict future conditions in the subbasin was not updated as a part of the revision process due to time and resource limitations. However, every effort was made to update portions of the GSP which directly relate to the deficiencies detailed in the DWR determination letter. Additionally, while public input was encouraged, and efforts were made to solicit feedback from all stakeholders and the public during the GSP revision process, the GSAs acknowledge that the short timeline to develop and adopt the revised GSP limited the ability to hold targeted public workshops. The GSAs value public input and are committed to continuing outreach efforts to inform the management of the subbasin and updates to the plan during periodic evaluations.

4) Despite the constraints, the GSAs were committed to addressing the deficiencies identified in the determination letter. This Revised GSP contains significant updates and additions which will positively contribute to the sustainable management of the Subbasin. These changes include revisions to the Subbasin’s Sustainable Management Criteria that are protective of beneficial uses and users of groundwater. The GSAs have projects and management actions identified to proactively address impacts to beneficial users. Additionally, the GSAs have passed resolutions with a strong commitment to develop and implement both Demand Management and Well Mitigation Programs, by January 2027 and January 2026, respectively.

5.2 Progress Toward Achieving Interim Milestones

All SIs are in compliance with their MTs with the exception of the chronic lowering of groundwater levels SI (see summary **Table 5-1**). An MT is the quantitative value that represents the groundwater conditions at an RMP site that, when exceeded individually or in combination with MTs at other monitoring sites, may cause a UR in the subbasin per DWR’s definition. If groundwater levels are lower than the value of the MO for that site, they are moving in the direction of the MT. On the contrary, for the groundwater quality SMC, as the value of the total dissolved solids (TDS) concentrations increase from the MO established for that site, they are moving in the direction of the MT. Seawater Intrusion is not an applicable SI.

Groundwater elevations in eight wells fell below the MO in spring 2024 and 42 wells fell below the MOs in fall 2024 (**Tables 5-2 and 5-3**). Zero wells fell below their MT in spring 2024, while twelve wells fell below their MTs in fall 2024. However, no URs occurred since no dry wells were reported and water levels at any RMP in the subbasin did not decline 7.5 ft or more over a five (5) year period. The wells that fell below the MT are expected to rebound in spring 2025. Well water level elevation recoveries are attributed to the ongoing overall recovery in groundwater conditions throughout the Subbasin, facilitated by increased precipitation to meet evapotranspiration demands in WY 2023 and WY 2024.

Table 5-1. Corning Subbasin Sustainability Indicator Summary			
2024 Status	**Undesirable Result Identification**	**MO Definition**	**MT Definition**
Chronic Lowering of Groundwater Levels			
No indication of undesirable results There were twelve RMPs with fall 2024 groundwater level measurements below the MT; however, no reports of dry wells or greater than a 7.5 ft water level decline occurred.	10 supply wells becoming dry (after the GSP revision) within a Thiessen Polygon established in the revised GSP, or when water levels at any RMP in the future decline 7.5 feet (ft) or more over a five (5) year period.	**Stable Wells:** Maximum fall groundwater elevations since 2012 **Declining Wells:** Maximum fall groundwater elevations since 2015	**Focus Areas:** Five (5) feet higher than MTs as published in the 2022 GSP* **Outside Focus Areas:** MTs as published in the 2022 GSP*
Reduction of Groundwater Storage			
No indication of undesirable results There were 12 RMP wells with fall 2024 groundwater level measurements below the MT in WY 2024; however, only 2 of the 54 wells (approximately 4% of RMP wells) have fallen below the MT in the last two consecutive fall measurements (WY 2023 and WY2024). .	More than 20% of groundwater elevations measured at RMP wells drop below the associated MT during 2 consecutive years measured in the fall of each year.	Amount of groundwater in storage when groundwater elevations are at their MO – since groundwater levels are used as a proxy, same as chronic lowering of groundwater levels MOs.	Amount of groundwater in storage when groundwater elevations are at their MT– since groundwater levels are used as a proxy, same as chronic lowering of groundwater levels MTs.
Degraded Water Quality			
No indication of undesirable results There were no RMPs with TDS levels above their MTs.	At least 25% of RMPs exceed the MT for water quality for two consecutive years at each well, where it can be established that GSP implementation is the cause of the exceedance.	California lower limit SMCL concentration for TDS of 500 mg/L measured at public supply wells.	TDS concentration of 750 mg/L at public supply wells.

Table 5-1. Corning Subbasin Sustainability Indicator Summary			
2024 Status	**Undesirable Result Identification**	**MO Definition**	**MT Definition**
Land Subsidence			
No indication of undesirable results No InSAR pixel exceeded MT in WY 2024.	Any exceedance of an MT that is irreversible and caused by lowering groundwater elevations.	Zero inelastic subsidence, in addition to any measurement error. If InSAR data are used, the measurement error is 0.1 ft, and any measurement of 0.1 ft or less would not be considered inelastic subsidence.	No more than 0.5 foot of cumulative subsidence over a five-year period (beyond the measurement error), solely due to lowered groundwater elevations
Depletion of Interconnected Surface Water			
No indication of undesirable results There were no RMS with spring or fall 2024 groundwater level measurements below the MT..	Same as the reduction in groundwater storage.	Same as the chronic lowering of groundwater levels.	Same as the chronic lowering of groundwater levels.

Notes:

2022 GSP Undesirable Results for chronic lowering of GWL:* ***Stable Wells:* *Minimum fall groundwater elevation since 2012 minus 20-foot buffer.* ***Declining Wells:*** *Minimum fall groundwater elevation since 2012 minus 20% of minimum groundwater level depth.*

TDS is the primary water quality constituent of concern.

MO = Measurable Objective; MT = Minimum Threshold; RMP = representative monitoring point; mg/L = milligrams per liter; SMCL = Secondary Maximum Contaminant Level

5.2.1 Chronic Lowering of Groundwater Levels and Reduction in Groundwater Storage SMC

The reduction in groundwater storage SMC utilizes the chronic lowering of groundwater levels SMC as a proxy (**Tables 5-1**). Thus, groundwater conditions related to storage and chronic lowering of groundwater levels are discussed together. Groundwater conditions in the Subbasin are on track to meet the first 5-year 2027 IMs for groundwater levels at each of the RMP wells. In spring 2024, all groundwater elevations were above the established MTs. In fall 2024, groundwater elevations at twelve wells were below the established MT (22N03W12Q003M, 23N02W28N002M, 23N03W07F001M, 23N03W13C004M, 23N03W13C006M, 23N03W16H001M, 23N03W17R001M, 23N03W22Q001M, 23N03W24A003M, 23N03W25M002M, 23N03W25M004M, and 24N02W29N004M, as indicated in **Table 5-2**). Groundwater elevations at 23N03W22Q001M and 23N03W13C004M remained below the MT in fall 2023 and 2024, or 24 consecutive months. **Table 5-2** shows measurements from WY 2024 for spring seasonal highs and fall seasonal lows, along with MOs and MTs. It also compares the WY 2024 measurements to those from WY 2023 and to the MOs. While groundwater storage increased in WY 2024, lower water levels were observed in fall 2024 compared to fall 2023 due to dryer conditions, which has contributed to a less recharge and increased extraction in WY 2024 compared to WY 2023. These conditions led to a total annual change in groundwater storage that was less in WY 2024 with an annual change in storage of 20,900 AF compared to WY 2023 in which the annual change in storage was 31,000.

Table 5-3 shows the original 2022 GSP MO/MT measurements for RMP wells and compares them to the revised 2024 GSP MO/MT measurements. Additionally, **Table 5-3** shows that in WY 2023, approximately 24 wells were below the MOs in spring 2023 and 41 wells were below their MOs in fall 2023. Approximately zero wells were below the MTs in spring 2023 and two wells (23N03W22Q001M and 23N03W13C004M) fell below the MT in fall 2023. In comparison, approximately 8 wells fell below the MO in spring 2024 while 42 wells fell below the MOs in fall 2024. Approximately zero wells fell below the MTs in spring 2024, however 12 wells fell below the MT in fall 2024. Of those 12 wells, 23N03W13C004M and 23N03W22Q001M, fell below their MTs in more than two consecutive fall measurements, but rebounded above their MTs in each springtime. The SMC for groundwater storage states that an undesirable result occurs when more than 20% of wells drop below their MT in two consecutive fall measurements. With only two wells below their MT in two consecutive fall measurements, which is approximately 4% of the total number of RMP wells, no undesirable results have occurred for groundwater storage in WY 2024. Further, groundwater levels in all wells are expected to rebound in spring 2025.

Table 5-2. Corning Subbasin Measurable Objectives, Minimum Thresholds, and Seasonal Groundwater Elevations of Representative Monitoring Point Wells

State Well Number /Representative Monitoring Point (RMP) ID	Groundwater Elevation (feet above mean sea level)				Spring 2024 vs. MO	Fall 2024 vs. MO	Spring 2024 vs. Spring 2023 (seasonal high)	Fall 2024 vs. Fall 2023 (seasonal low)
	2024 Measurements		MO	MT				
	Spring (seasonal high)	Fall (seasonal low)						
21N01W04N001M	123.48	--	116.1	89.3	7.38	--	1.8	--
22N01W19E003M	138.79	125.59	128.1	97.7	10.69	-2.51	3.5	--
22N01W29N002M	127.53	111.48	121.9	77.2	5.63	-10.42	5.85	-0.6
22N01W29N003M	130.09	123.55	123.4	91.7	6.69	0.15	4.07	0.55
22N02W01N002M	140.04	107.26	134.7	74.5	5.34	-27.44	12.21	-2.49
22N02W01N003M	144.6	125.85	136.5	99.3	8.1	-10.65	10.9	-2.31
22N02W15C002M	126.89	89.35	121.6	57.7	5.29	-32.25	7.065	-13.72
22N02W15C004M	152.85	131.2	144.1	84	8.75	-12.9	20.87	1.75
22N02W18C001M	106.64	81.34	90.4	68.5	16.24	-9.06	12.61	1.94
22N02W18C003M	171.78	142.84	148.4	136.6	23.38	-5.56	10.04	-5.8
22N03W01R001M	157.12	122.22	135.2	121.6	21.92	-12.98	15.51	-7.95
22N03W01R002M	162.31	133.23	143.9	128.6	18.41	-10.67	15.9	-1
22N03W05F002M	196.09	182.79	204.5	177.9	-8.41	-21.71	--	0.5
22N03W06B001M	250.9	240.9	264.1	238	-13.2	-23.2	0.3	1
22N03W12Q003M[2]	183.94	162.94	174.8	168.2	9.14	-11.86	3	-8
23N02W16B001M	--	126.13	135.3	98.4	--	-9.17	--	2.5
23N02W28N002M[2]	141.92	99.37	133.9	105	8.02	-34.53	14.7	--
23N02W28N004M	150.38	124.96	142.7	109.3	7.68	-17.74	10.43	-8.62
23N02W34A003M	--	128.41	135.5	109.2	--	-7.09	--	-1.4
23N02W34N001M	153.92	133.92	145.9	116.8	8.02	-11.98	14.8	1.8
23N03W04H001M[1]	--	--	194	185.4	--	--	--	--
23N03W07F001M[2]		189.4	209.9	193.4	--	-20.5	--	-0.4
23N03W13C004M[2]	140.73	102.08	131.1	112.2	9.63	-29.02	9.65	-4.22
23N03W13C006M[2]	146.82	126.61	145.6	128.1	1.22	-18.99	13.13	2.72
23N03W16H001M[2]	--	178.58	193.4	179.3	--	-14.82	--	--
23N03W17R001M[2]	--	190.4	207.7	192.3	--	-17.3	--	0.8
23N03W22Q001M[2]	150.75	133.15	152.7	134.9	-1.95	-19.55	8.1	5.87
23N03W24A003M[2]	146.44	121.74	137.4	123.6	9.04	-15.66	11	2.8
23N03W25M002M[2]	149.58	108.22	151.5	116.6	-1.92	-43.28	10.52	-13.91

Table 5-2. Corning Subbasin Measurable Objectives, Minimum Thresholds, and Seasonal Groundwater Elevations of Representative Monitoring Point Wells

State Well Number /Representative Monitoring Point (RMP) ID	Groundwater Elevation (feet above mean sea level)				Spring 2024 vs. MO	Fall 2024 vs. MO	Spring 2024 vs. Spring 2023 (seasonal high)	Fall 2024 vs. Fall 2023 (seasonal low)
	2024 Measurements		MO	MT				
	Spring (seasonal high)	Fall (seasonal low)						
23N03W25M004M[2]	147.03	127.35	150.3	127.7	-3.27	-22.95	1.54	0.26
23N04W13G001M	--	183.9	198.6	159.7	--	-14.7	--	-0.5
24N02W17A001M	--	169.45	170.9	150.9	--	-1.45	--	-0.25
24N02W20B001M[1]	--	--	173.4	150.3	--	--	--	--
24N02W29N003M	161.96	134.66	158.1	123.2	3.86	-23.44	3.12	-6.61
24N02W29N004M[2]	164.51	124.8	155.5	124.9	9.01	-30.7	5.66	-9.37
24N03W02R001M	--	--	188.6	177.6	--	--	--	--
24N03W03R002M	225.25	206.48	207.3	197.8	17.95	-0.82	15.59	3.42
24N03W14B001M[1]	--	--	195.3	180.5	--	--	--	--
24N03W16A001M	214.37	195.47	200.7	187.6	13.67	-5.23	11.9	2.7
24N03W17M001M	--	--	216.3	195.5	--	--	--	--
24N03W17M002M	--	--	196.8	177.8	--	--	--	--
24N03W24E001M	178.15	159.25	169.2	141.7	8.95	-9.95	4.8	-6.3
24N03W26K001M	200.96	183.66	191.1	177.6	9.86	-7.44	4.5	--
24N03W29Q001M	207.46	193.23	211.6	184.3	-4.14	-18.37	6.52	1.01
24N03W29Q002M	209.21	184.43	212.6	179.9	-3.39	-28.17	5.73	2.67
24N03W35P005M	200.25	185.31	192	185.1	8.25	-6.69	9.42	1.45
24N04W14N002M	--	--	247.4	226.8	--	--	--	--
24N04W33P001M	219.76	--	240	188.5	-20.24	--	-199.8	--
24N04W34K001M	--	195.6	223.9	184.4	--	-28.3	--	-1
24N04W34P001M	--	--	214.3	183.5	--	--	--	--
24N04W36G001M	--	191.6	214.4	183.2	--	-22.8	--	1.2
24N05W23L001M	--	337.7	345.8	312	--	-8.1	--	-6
25N02W31G002M	199.9	--	191.4	169.3	8.5	--	1.9	--
25N03W36H001M	196.9	182.1	183.3	160.9	13.6	-1.2	1.4	--

MO = Measurable Objective, MT = Minimum Threshold, -- = Indicates missing or questionable measurements

[1] No longer monitored by DWR. Wells have been removed by the GSAs from the groundwater monitoring network.

[2] *Water level elevation fell below MT in WY 2024*

Table 5-3. Corning Subbasin Measurable Objectives, Minimum Thresholds, and Seasonal Groundwater Elevations of Representative Monitoring Point Wells for WY 2023 and WY 2024 - Groundwater Storage SMC																
State Well Number /Representative Monitoring Point (RMP) ID	WY 2023 SMC		WY 2024 SMC		Groundwater Elevation (feet above mean sea level)				Spring 2023 vs. MO	Fall 2023 vs. MO	Spring 2023 vs. MT	Fall 2023 vs. MT	Spring 2024 vs. MO	Fall 2024 vs. MO	Spring 2024 vs. MT	Fall 2024 vs. MT
					2023 Measurements		2024 Measurements									
	MO	MT	MO	MT	Spring (seasonal high)	Fall (seasonal low)	Spring (seasonal high)	Fall (seasonal low)								
21N01W04N001M	116.1	89.3	116.1	89.3	121.68	116.08	123.48	--	5.58	-0.02	32.38	26.78	7.38	--	34.18	--
22N01W19E003M	128.1	97.7	128.1	97.7	135.29	--	138.79	125.59	7.19	--	37.59	--	10.69	-2.51	41.09	27.89
22N01W29N002M	121.9	77.2	121.9	77.2	117.69	109.82	127.53	111.48	-4.21	-12.08	40.49	32.62	5.63	-10.42	50.33	34.28
22N01W29N003M	123.4	91.7	123.4	91.7	126.02	123	130.09	123.55	2.62	-0.4	34.32	31.3	6.69	0.15	38.39	31.85
22N02W01N002M	134.7	74.5	134.7	74.5	127.83	109.75	140.04	107.26	-6.87	-24.95	53.33	35.25	5.34	-27.44	65.54	32.76
22N02W01N003M	136.5	99.3	136.5	99.3	133.7	128.16	144.6	125.85	-2.8	-8.34	34.4	28.86	8.1	-10.65	45.3	26.55
22N02W15C002M	121.6	57.7	121.6	57.7	115.18	98.27	126.89	89.35	-6.42	-23.33	57.48	40.57	5.29	-32.25	69.19	31.65
22N02W15C004M	144.1	84	144.1	84	131.98	129.45	152.85	131.2	-12.12	-14.65	47.98	45.45	8.75	-12.9	68.85	47.2
22N02W18C001M	90.4	63.5	90.4	68.5	94.03	79.4	106.64	81.34	3.63	-11	30.53	15.9	16.24	-9.06	38.14	12.84
22N02W18C003M	148.4	131.6	148.4	136.6	151.35	144.11	171.78	142.84	2.95	-4.29	19.75	12.51	23.38	-5.56	35.18	6.24
22N03W01R001M	135.2	116.6	135.2	121.6	141.61	130.17	157.12	122.22	6.41	-5.03	25.01	13.57	21.92	-12.98	35.52	0.62
22N03W01R002M	143.9	123.6	143.9	128.6	146.41	134.23	162.31	133.23	2.51	-9.67	22.81	10.63	18.41	-10.67	33.71	4.63
22N03W05F002M	204.5	177.9	204.5	177.9	--	182.29	196.09	182.79	--	-22.21	--	4.39	-8.41	-21.71	18.19	4.89
22N03W06B001M	264.1	238	264.1	238	250.6	239.9	250.9	240.9	-13.5	-24.2	12.6	1.9	-13.2	-23.2	12.9	2.9
22N03W12Q003M	174.8	163.2	174.8	168.2	180.94	170.94	183.94	162.94	6.14	-3.86	17.74	7.74	9.14	-11.86	15.74	-5.26
23N02W16B001M	135.3	98.4	135.3	98.4	130.63	123.63	--	126.13	-4.67	-11.67	32.23	25.23	--	-9.17	--	27.73
23N02W28N002M	133.9	100	133.9	105	127.22	--	141.92	99.37	-6.68	--	27.22	--	8.02	-34.53	36.92	-5.63
23N02W28N004M	142.7	104.3	142.7	109.3	139.95	--	150.38	124.96	-2.75	--	35.65	--	7.68	-17.74	41.08	15.66
23N02W34A003M	135.5	109.2	135.5	109.2	143.11	129.81	--	128.41	7.61	-5.69	33.91	20.61	--	-7.09	--	19.21
23N02W34N001M	145.9	111.8	145.9	116.8	139.12	132.12	153.92	133.92	-6.78	-13.78	27.32	20.32	8.02	-11.98	37.12	17.12
23N03W04H001M	194	180.4	194	185.4	--	--	--	--	--	--	--	--	--	--	--	--
23N03W07F001M	209.9	188.4	209.9	193.4	199.9	189.8	--	189.4	-10	-20.1	11.5	1.4	--	-20.5	--	-4
23N03W13C004M	131.1	107.2	131.1	112.2	131.08	106.3	140.73	102.08	-0.02	-24.8	23.88	**-0.9**	9.63	-29.02	28.53	**-10.12**
23N03W13C006M	145.6	123.1	145.6	128.1	133.69	123.89	146.82	126.61	-11.91	-21.71	10.59	0.79	1.22	-18.99	18.72	-1.49
23N03W16H001M	193.4	174.3	193.4	179.3	184.08	--	--	178.58	-9.32	--	9.78	--	--	-14.82	--	-0.72
23N03W17R001M	207.7	187.3	207.7	192.3	199	189.6	--	190.4	-8.7	-18.1	11.7	2.3	--	-17.3	--	-1.9
23N03W22Q001M	152.7	129.9	152.7	134.9	142.65	127.28	150.75	133.15	-10.05	-25.42	12.75	**-2.62**	-1.95	-19.55	15.85	**-1.75**
23N03W24A003M	137.4	118.6	137.4	123.6	135.44	118.94	146.44	121.74	-1.96	-18.46	16.84	0.34	9.04	-15.66	22.84	-1.86
23N03W25M002M	151.5	111.6	151.5	116.6	139.06	122.13	149.58	108.22	-12.44	-29.37	27.46	10.53	-1.92	-43.28	32.98	-8.38
23N03W25M004M	150.3	122.7	150.3	127.7	145.49	127.09	147.03	127.35	-4.81	-23.21	22.79	4.39	-3.27	-22.95	19.33	-0.35
23N04W13G001M	198.6	159.7	198.6	159.7	192.4	184.4	--	183.9	-6.2	-14.2	32.7	24.7	--	-14.7	--	24.2
24N02W17A001M	170.9	150.9	170.9	150.9	178.35	169.7	--	169.45	7.45	-1.2	27.45	18.8	--	-1.45	--	18.55

24N02W20B001M[1]	173.4	150.3	173.4	150.3	--	--	--	--	--	--	--	--	--	--	--	--
24N02W29N003M	158.1	123.2	158.1	123.2	158.84	141.27	161.96	134.66	0.74	-16.83	35.64	18.07	3.86	-23.44	38.76	11.46
24N02W29N004M	155.5	124.9	155.5	124.9	158.85	134.17	164.51	124.8	3.35	-21.33	33.95	9.27	9.01	-30.7	39.61	-0.1
24N03W02R001M	188.6	172.6	188.6	177.6	--	--	--	--	--	--	--	--	--	--	--	--
24N03W03R002M	207.3	192.8	207.3	197.8	209.66	203.06	225.25	206.48	2.36	-4.24	16.86	10.26	17.95	-0.82	27.45	8.68
24N03W14B001M[1]	195.3	175.5	195.3	180.5	--	--	--	--	--	--	--	--	--	--	--	--
24N03W16A001M	200.7	182.6	200.7	187.6	202.47	192.77	214.37	195.47	1.77	-7.93	19.87	10.17	13.67	-5.23	26.77	7.87
24N03W17M001M	216.3	190.5	216.3	195.5	--	--	--	--	--	--	--	--	--	--	--	--
24N03W17M002M	196.8	172.8	196.8	177.8	210.8	190.9	--	--	14	-5.9	38	18.1	--	--	--	--
24N03W24E001M	169.2	136.7	169.2	141.7	173.35	165.55	178.15	159.25	4.15	-3.65	36.65	28.85	8.95	-9.95	36.45	17.55
24N03W26K001M	191.1	172.6	191.1	177.6	196.46	--	200.96	183.66	5.36	--	23.86	--	9.86	-7.44	23.36	6.06
24N03W29Q001M	211.6	179.3	211.6	184.3	200.94	192.22	207.46	193.23	-10.66	-19.38	21.64	12.92	-4.14	-18.37	23.16	8.93
24N03W29Q002M	212.6	174.9	212.6	179.9	203.48	181.76	209.21	184.43	-9.12	-30.84	28.58	6.86	-3.39	-28.17	29.31	4.53
24N03W35P005M	192	180.1	192	185.1	190.83	183.86	200.25	185.31	-1.17	-8.14	10.73	3.76	8.25	-6.69	15.15	0.21
24N04W14N002M	247.4	221.8	247.4	226.8	245.02	234.72	--	--	-2.38	-12.68	23.22	12.92	--	--	--	--
24N04W33P001M	240	183.5	240	188.5	419.56	--	219.76	--	179.56	--	236.06	--	-20.24	--	31.26	--
24N04W34K001M	223.9	184.4	223.9	184.4	--	196.6	--	195.6	--	-27.3	--	12.2	--	-28.3	--	11.2
24N04W34P001M	214.3	183.5	214.3	183.5	--	--	--	--	--	--	--	--	--	--	--	--
24N04W36G001M	214.4	183.2	214.4	183.2	--	190.4	--	191.6	--	-24	--	7.2	--	-22.8	--	8.4
24N05W23L001M	345.8	312	345.8	312	358.2	343.7	--	337.7	12.4	-2.1	46.2	31.7	--	-8.1	--	25.7
25N02W31G002M	191.4	169.3	191.4	169.3	198	191	199.9	--	6.6	-0.4	28.7	21.7	8.5	--	30.6	--
25N03W36H001M	183.3	160.9	183.3	160.9	195.5	--	196.9	182.1	12.2	--	34.6	--	13.6	-1.2	36	21.2

Notes:

*RMP Wells and their water level measurements in **bold red** indicate wells that have fallen below their respective MTs in consecutive fall measurements for the last two years.*

5.2.2 Degraded Water Quality SMC

The degraded water quality MT and MO are summarized in **Table 5-1**. TDS is the main constituent of concern in the Subbasin. TDS is measured at public supply wells throughout the Subbasin, and data was collected and reported by public agencies in WY 2024 and retrieved through the Groundwater Ambient Monitoring and Assessment (GAMA) (available at: https://www.waterboards.ca.gov/gama/). A summary of groundwater quality monitoring data is available in **Appendix F**. Groundwater conditions are on track to avoid URs related to water quality.

5.2.3 Land Subsidence SMC

The land subsidence MT and MO are summarized in **Table 5-1**. Interferometric Synthetic Aperture Radar (InSAR) data provided by DWR (DWR, 2024) was analyzed from October 2023 to October 2024 to track annual changes and from October 2019 to October 2024 to track 5-year net changes. A positive change corresponds to a higher land surface elevation, and a negative change corresponds to a lower land surface elevation relative to a reference elevation. In this subbasin, the MT is reached if subsidence rates exceed 0.5 ft beyond the measurement error over a 5-year period. Subsidence measured by InSAR in WY 2024 (**Figure 5-1)** ranged from -0.026 feet of subsidence to 0.039 feet of uplift. Subsidence measured by InSAR for WY2019 to WY2024 (**Figure 5-2**) ranged from -0.211 ft of subsidence to 0.06 ft of uplift. Groundwater conditions in the Subbasin are on track to meet the first 5-year 2027 IMs and avoid URs for land subsidence. Conditions indicate that there has not been any inelastic land subsidence during the reporting periods.

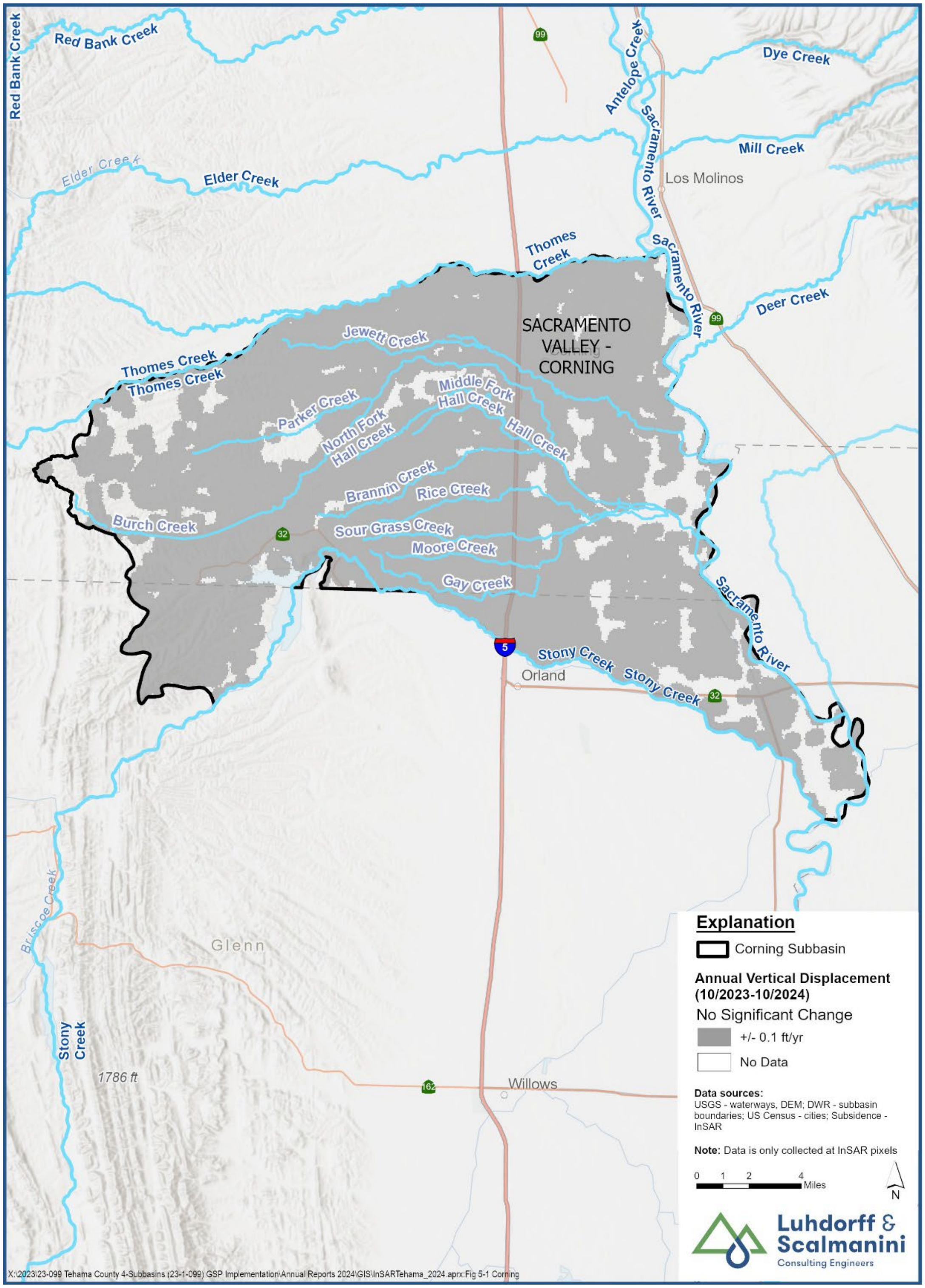

Figure 5-1. Corning Subbasin Change in Subsidence from 10/2023 to 10/2024

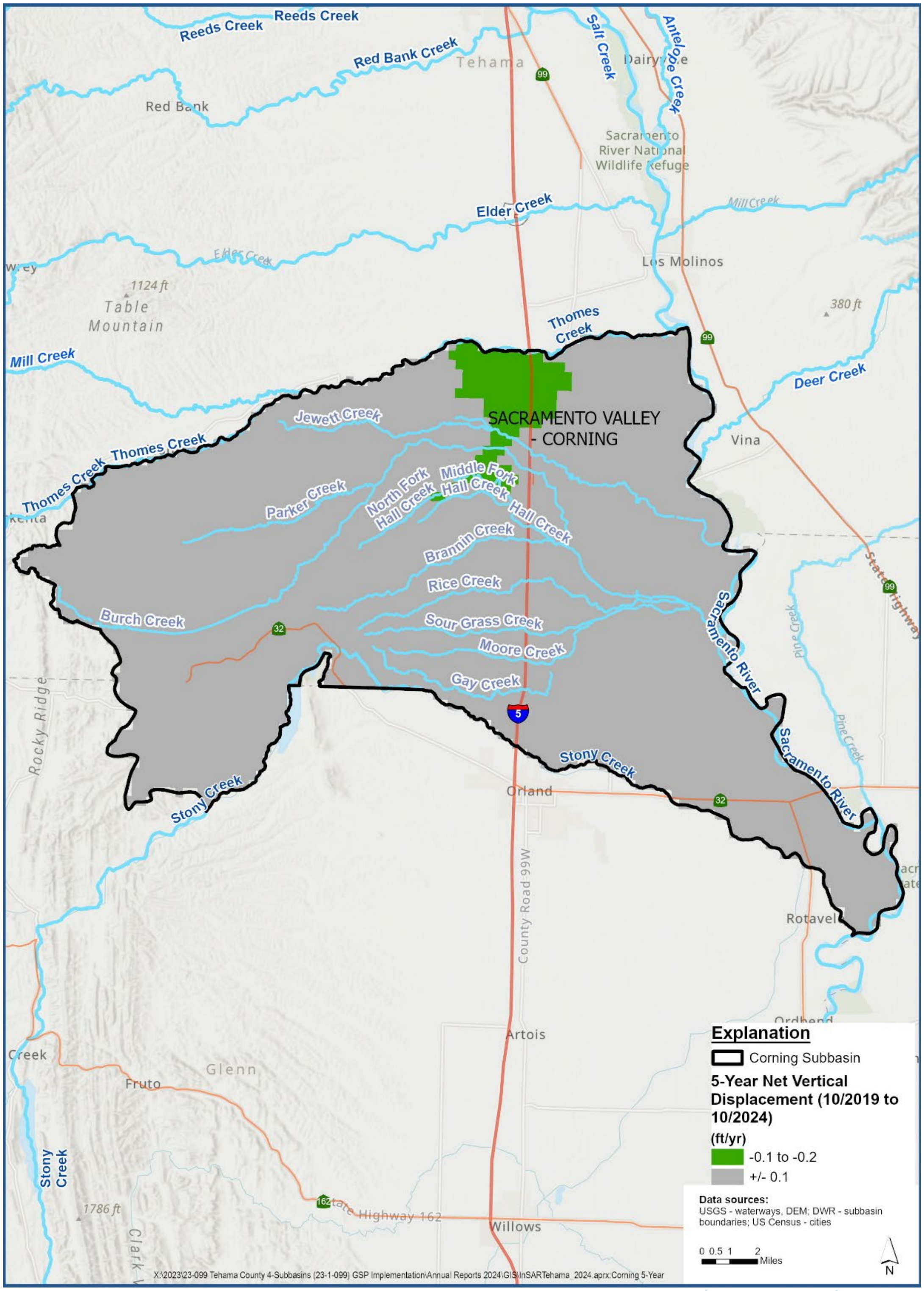

Figure 5-2. Corning Subbasin Change in Subsidence from 10/2019 to 10/2024

5.2.4 Depletion of Interconnected Surface Water SMC

The groundwater level measurements at the Interconnected Surface Water (ISW) RMP during WY 2024 were all higher than their corresponding MTs, as summarized in **Table 5-4**. Groundwater conditions in the Subbasin are on track to meet the first 5-year 2027 IMs and to avoid URs for groundwater levels at each RMP.

Table 5-4. Corning Subbasin Measurable Objectives, Minimum Thresholds, Undesirable Results for Depletion of Interconnected Surface Water

State Well Number /Representative Monitoring Point (RMP) ID	Groundwater Elevation (feet above mean sea level)				Spring 2024 vs. MO	Fall 2024 vs. MO
	2024 Measurements		MO	MT		
	Spring (seasonal high)	Fall (seasonal low)				
22N01W29N003M	130.09	123.55	123.4	91.7	6.69	0.15
22N02W01N003M	144.6	125.85	136.5	99.3	8.1	-10.65
22N02W15C004M	152.85	131.2	144.1	84	8.75	-12.9
22N02W18C003M	171.78	142.84	148.4	136.6	23.38	-5.56
22N03W01R002M	162.31	133.23	143.9	128.6	18.41	-10.67
23N02W28N004M	150.38	124.96	142.7	109.3	7.68	-17.74
24N02W29N003M	161.96	134.66	158.1	123.2	3.86	-23.44

MO = Measurable Objective, MT = Minimum Threshold, -- = Indicates missing or questionable measurements

5.3 Progress Toward PMA Implementation

The following sections summarize the GSAs' progress towards implementing PMAs that were developed to manage groundwater conditions in the Subbasin and achieve the groundwater sustainability objectives described in the GSP. Projects as outlined in the GSP are provided below and summarized in **Table 5-5**. Updates to the status of management actions are described below in **Table 5-6**.

Groundwater users in the Subbasin benefit from generally stable groundwater levels in the Subbasin. Surface water supplies available to diverters in the Subbasin are used, when available, for irrigation and for the benefit of other recharge efforts and projects described in the GSP. Ongoing access to surface water supplies is crucial to preserving the sustainability of the Subbasin.

Table 5-5. Corning Subbasin Summary of Project Implementation Status			
GSP Section Reference	Project (Proponent)	Current Status	Notable Progress Since Last Annual Report
3.2.8	Ongoing Monitoring, Data Gaps, and Enhancements	Funded	Advancements have been made in multi-completion monitoring wells, ISW site identification, domestic monitoring, synoptic gaging, and groundwater dependent ecosystem (GDE) surveys.
7.2	GSP Implementation, Outreach, and Compliance Activities	Funded	Development of the WY2023 Annual Report, community outreach, monitoring well construction, and GSP revisions which resulted in DWR approval in February 2025.
7.4.1	Recharge and Conjunctive Use Focused Projects	Funded	Projects are in various phases of completion - from planning to implementation.
7.4.4.4	California Olive Ranch	In Design Phase	Project is in the design phase; a completed review of designs have been sent to the Bureau of Reclamation as part of the project permit submittal.

Table 5-6. Corning Subbasin Summary of Management Actions			
GSP Section Reference	**Management Action**	**Current Status**	**Notable Progress Since Last Annual Report**
7.3.1.1	Well Management Program: Well Inventory	In Progress	Tehama County Well Registration Program is in its third year; well inventory updates are in progress from both the Tehama GSA and Glenn County (covering the CSGSA portion of the basin) to improve well inventory data accuracy for use in developing groundwater management programs and policies that help to achieve groundwater sustainability metrics.
7.3.1.1	Well Management Program: Well Mitigation	In Progress	Initial planning efforts underway for development of Well Mitigation program to assist owners with dry well incidences.
7.3.1.1	Well Management Program: Well Incident Reporting System	In Progress	System is in place, collecting dry well and related incidents (Glenn County).
7.3.1.3	Policy and Ordinances that Control Pumping Growth	In Progress	The Tehama GSA and CSGSA are both developing Demand Management Programs as part of the 2024 GSP revision implementation efforts. The goal of these programs is help achieve groundwater sustainability metrics. Both GSAs are beginning to develop a work plan to develop these policies by 2027. Program is in effect; well permitting process has been re-evaluated; permits are issued on a 3 tier basis (Glenn County).

5.4 GSP Project Implementation Progress

5.4.1 Ongoing Monitoring, Data Gaps, and Enhancements (GSP Section 3.2.8)

Monitoring, data gaps, and enhancements have been advanced since the 2023 annual report. Advancements have included:

- Sites for five (5) new multi-completion monitoring wells were identified, and construction began with anticipated completion in early 2025.
- Twelve (12) new potential interconnected surface water (ISW) monitoring well locations have been identified to be refined to ten (10) final locations. Construction specifications for nested

wells at these locations have been drafted and construction is anticipated to begin in Spring 2025.

- Public outreach for participation in a community domestic well monitoring program has been conducted. This outreach was intended to collect contact information for parties interested in having telemetered acoustic sounders installed on their domestic wells. Contact information for these interested parties for community domestic monitoring has been collected, and the monitoring equipment has been selected and tested. Selection of the participants and installation of the equipment is anticipated to occur in early 2025.
- A draft work plan for synoptic stream gaging has been developed, and initial stream measurements have been collected. Additional stream gaging measurements will be collected in 2025 during both high and low flow conditions.
- Initial GDE field surveys have been conducted at three (3) sites. Access has been granted for surveys at an additional four (4) sites scheduled for 2025. Additional analyses to identify GDE are anticipated to be added to the surveys in 2025 including isotope sampling of plant water and high-resolution aerial imagery mapping.
- Development of an isotopic sampling plan for the expansion of water quality data and to assess the vertical connectivity of the aquifer material in the Subbasin began in 2024. Implementation of this plan is anticipated after the new multi-completion wells have been installed in early 2025.
- A study to compare the recent DWR acquired AEM data with the hydrogeologic conceptual model and the numerical model inputs was initiated. This study is scheduled to be completed with recommendations for model updates in 2025.
- Using data acquired from the AEM surveys, 4 aquifer pump tests are planned in 2025 to establish real-world aquifer properties for the purpose of updating the hydrogeologic conceptual and numeric models.

5.4.2 GSP Implementation, Outreach, and Compliance Activities (GSP Section 7.2)

Advancements since the last annual report include securing funding from the DWR SGM Grant Program application submitted in December 2022. This project is currently active and includes the preparation of the WY 2023 Annual Report, outreach to the community, construction of additional monitoring wells, assessment of groundwater recharge projects, and GSP revisions resulting in DWR approval of the GSP in February 2025.

5.4.3 Recharge and Conjunctive Use Focused Projects (GSP Section 7.4.1.1 & GSP Section 7.4.1.2)

Advancements made on these projects since 2022, includes securing funding from the DWR SGMA Grant Program application submitted in December 2022 to Tehama County on behalf of the Corning Subbasin. These projects are in various phases from planning to implementation. Both recharge and conjunctive use focused projects are discussed together for this annual report.

USBR Pond South of Corning: The USBR Pond project involves utilizing an existing 10-acre stormwater pond connected to the Corning Canal for recharge. Water would be diverted from the Corning Canal into the stormwater pond for recharge. Additional water could be recharged by adding flows to Brannin Creek. Conveyance infrastructure for this site is already in place and planning for funding of water has commenced. There is potential to recharge a maximum of 1,000 AFY at this site. This site was pilot tested in May 2024, with 45 AF of water being diverted into the pond from the Corning Canal. Transducers and meteorological equipment were used to conduct a water balance analysis. The water balance yielded very low seepage rates, leading to the conclusion that the site was not a viable option for recharge activities. Modifications to this pond to increase percolation are not possible due to the pond being owned by the Bureau of Reclamation. Therefore, this project has concluded with no further activities planned for this pond.

Stony Creek Diversion to Gay Creek: This project would involve recharging water through Gay Creek by diverting water into the creek from Stony Creek. Gay Creek is unlined and dry during the irrigation season when recharge would occur. The conveyance infrastructure between the two creeks is already in place. The main challenge at this site involves the availability of water. There is no water right in place at the site of the water diversion and funding for water purchases would be required to conduct recharge. Potential recharge amounts are estimated to be a maximum of 400 AFY. The potential for recharge was evaluated at this site. However, due to the lack of a water right and the flows in Gay Creek during storm season, no viable project was identified at this site. In lieu of this project, a 180-day temporary permit application was submitted on December 23, 2024, for water diversions from Stony Creek and was approved on January 31, 2025. Temporary pumps and conveyance pipelines were installed at two locations in the subbasin in preparation for diversions under the provisions of the approved permit through March 31, 2025.

Burch Creek: This project would involve diverting water from the Corning Canal into Burch Creek. Potential recharge amounts are estimated to be a maximum of 164 AFY. A pilot project to assess the potential for recharge within Burch Creek is also planned for the first half of 2025.

Thomes Creek- Multi Benefit: This project would involve pumping water from Thomes Creek directly onto the habitat area within the Subbasin. Potential recharge amounts are estimated to be a maximum of 50 AFY. No water rights have been identified that could be utilized for this potential project. Instead, the Simpson Rd project was piloted as a multi-benefit recharge project.

Simpson Rd: This project would involve conveying water from an outlet in the Corning Water District to farmland within the Subbasin. This project was piloted in June 2024 and again from September to November 2024. The first pilot was conducted to assess the viability of this site for recharge. The second pilot was conducted in conjunction with The Nature Conservancy (TNC) to establish shorebird habitat. TNC supplied funding for the purchase of water for the second pilot. During the first pilot, 15 AF of water was recharged. During the second pilot, an additional 271 AF was recharged, for a total of 286 AF. Following the successful second pilot test, a towed Transient Electromagnetic (tTEM) survey of the site was completed. Additionally, a 5-year temporary permit to divert water from Thomes Creek during high flow time periods is in progress. Pending water availability and funding from TNC to purchase water, the project is anticipated to operate again in 2025.

Fishman Recharge Pond: This project would involve conveying water to a recharge pond within the Subbasin. Potential recharge amounts are estimated to be a maximum of 34 AFY. A site visit confirmed no water right at this site. Therefore, the project is no longer being pursued.

Rice Creek: This project would involve conveying water from an outlet on the Tehama Colusa Canal to an on-farm pipe and then to Rice Creek. Potential recharge amounts have not been quantified. A pilot project at this site is planned for the first half of 2025 to assess recharge potential.

Middle Fork Hall Creek: This project would involve conveying water from an outlet in the Corning Water District to an on-farm unlined ditch to the Middle Fork Hall Creek. Potential recharge amounts have not been quantified. A pilot project for this site is planned for the first half of 2025.

Duck Ponds: This project would involve conveying water from an outlet on the Corning Water District to farmland within the Subbasin. Potential recharge amounts have not been quantified. No water rights have been identified that could be utilized for this potential project, so this project is no longer being considered.

Rolling Hills Casino: This project would involve conveying water to Brannin Creek from the Corning Canal. Potential recharge amounts have not been quantified. An initial pilot test and water quality sampling was conducted at Brannin Creek. A total of 2 AF was discharged into the Creek. The pilot study indicated that natural recharge through the creek bed is low. The project has since been modified to include a series of dry wells along the creek to increase recharge. The project is intended for implementation in tandem with a road and bridge project across the creek planned by the Casino. Technical specifications for the dry wells and turnout structures are in development with construction planned for late 2025 or early 2026.

Wolf Ranch (North Thomas Creek): This project would involve conveying water pumped from Thomas Creek directly into a recharge area plus a ditch. Potential recharge amounts are estimated to be a maximum of 40 AFY for the recharge area plus additional recharge that would occur along the 3-mile ditch. A site assessment was conducted for this project and a 5-year temporary permit application is being developed for this site.

5.4.4 California Olive Ranch (GSP Section 7.4.4.4)

This project involves diverting water from the Tehama-Colusa Canal through existing irrigation canals into existing unlined basins, where it can percolate to groundwater and be used for direct recharge. Progress since 2023 includes investigating potential water sources, one of which could be utilizing Section 215 flood flows which are defined as un-storable irrigation water to be released due to flood control criteria or un-managed flows under Section 215 of the Federal Reclamation Reform Act. By identifying the possible sources, magnitude, and frequency of recharge, the design and construction plans can be developed with the goal of getting needed infrastructure in place in 2026. Multiple site visits were conducted at this site in 2024. After evaluating the site, 30% of design specifications were developed for a turnout to be added to the Tehama-Colusa Canal. These designs are currently under review. by the USBR as part of the project permit approval process. A Memorandum of Understanding (MOU) was also developed, distributed and executed by the involved parties which includes Kirkwood Water District and the California Olive Ranch. The project design review process is complete, and the project permit application has been filed with the

Bureau of Reclamation for the water infrastructure improvements including a turnout on the Tehama Colusa Canal.

5.5 GSP Management Action Implementation Progress

Below are Management Action Updates and their progress in implementation since the last Annual Report.

5.5.1 Well Management Program: Well Inventory (GSP Section 7.3.1.1)

Tehama County is in its third year of administering a well registration program that provides information about the location, number, and construction of wells. It will also eventually provide a source of funding for GSP implementation and a future well mitigation program.

Glenn County continues to maintain its well completion report database.

5.5.2 Well Management Program: Well Mitigation (GSP Section 7.3.1.1)

Initial planning is underway to develop a well management program(s) in accordance with the revised GSP. This Program will provide assistance to well owners adversely impacted by declining groundwater levels caused by GSA management that interfere with groundwater production. Assistance efforts would benefit well owners, including domestic and municipal well users, and disadvantaged communities and underrepresented communities, experiencing adverse impacts as a result of overdraft conditions caused by GSA management.

5.5.3 Well Management Program: Well Incident Reporting System (GSP Section 7.3.1.1)

Glenn County developed a robust Well Incident Reporting System, within the Glenn County portion of the Subbasin. The system records reported water supply issues due to wells running dry or other related well maintenance issues. Data from this system would allow for analysis of areas with declining groundwater elevations; communication could then be targeted to owners/drillers of wells in impacted areas. The GSAs also refer to DWR's My Dry Well platform for additional information. Tehama County has begun their own monitoring and reporting system through a Tehama County Well Registration Program and Well Inventory Database Update Program.

5.5.4 Policy and Ordinances that Control Pumping Growth (GSP Section 7.3.1.3)

Glenn County Environmental Health (Glenn County), in coordination with CSGSA and the revised GSP, has revised the well permitting process, which impacts the Glenn County portion of the Subbasin. The revised well permitting process evaluates proposed non-exempt wells (ex: non-domestic wells: agricultural, municipal, etc.) based on predicted impacts to various sustainability criteria. Wells are evaluated based on a 3-Tiered analysis. Wells with lower predicted impacts are approved at Tier 1, while those with greater predicted impacts are subject to a Tier 2 or Tier 3 Well Impact Analysis to ensure they do not adversely impact neighboring domestic wells. All non-exempt wells permitted since the approval of the revised permitting process in June of 2023 have been subject to this analysis prior to a permit being issued.

The Corning Subbasin, with the Tehama GSA managing the portion within Tehama County and the CSGSA managing the portion within Glenn County, is working to develop policy updates pertaining to demand management programs that the GSAs committed to as part of the GSP 2024 revision process. While each GSA may approve their own version of demand management program measures, both GSA intend to sustainably manage groundwater supplies within the safe yield of the Subbasin while maintaining compliance with SGMA regulations. These programs are expected to be developed and implemented by January 1, 2027, consistent with the commitments included in the 2024 GSP revision.

6 CONCLUSIONS

The Tehama County GSA and CSGSA adopted and submitted the GSP to DWR in January 2022, with a revised GSP submitted in April 2024, and continue to actively work on sustainable groundwater management in the Subbasin directly with their partners. As presented in **Section 5** of this report, recent progress made on activities applicable to the GSAs demonstrates the commitment of the GSAs to implement the GSP by allocating the necessary time and resources to achieve long-term sustainable management of the groundwater resources in the Corning Subbasin.

7 REFERENCES

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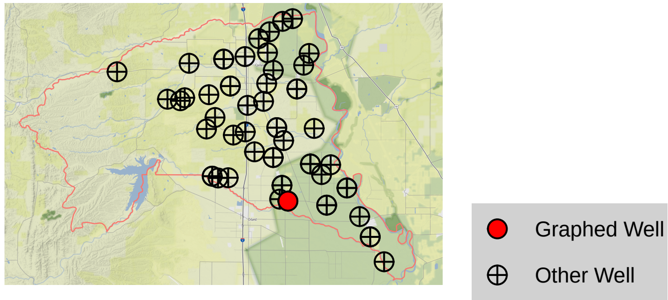
Water Year 2024 Annual Report

Appendix A

Characteristics and Hydrographs of Representative Monitoring Points (RMP) Wells

Corning Subbasin − State Well Number (SWN) 22N02W18C003M

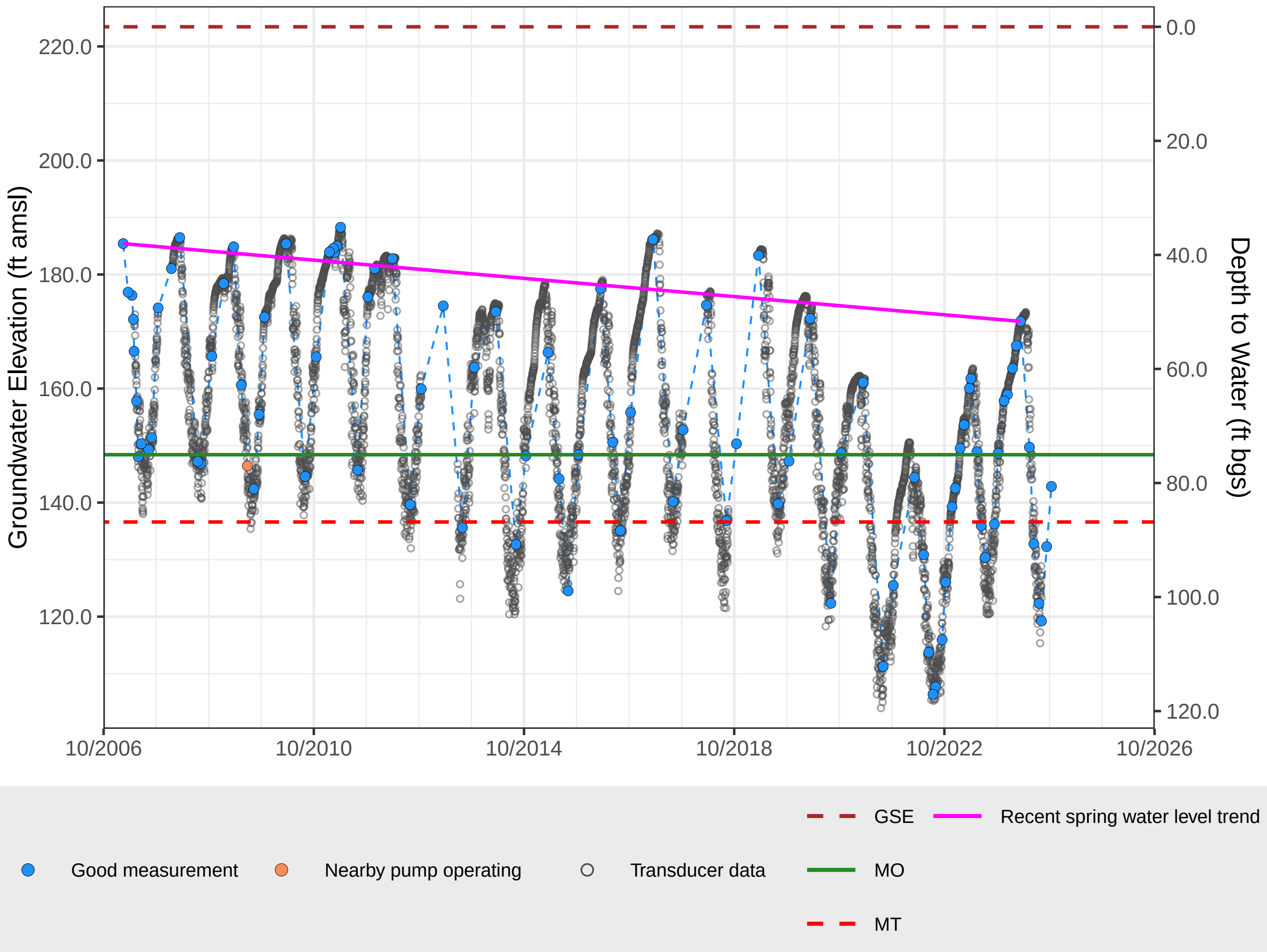
(Shallow Zone)   Well Depth: 188 ft. Perforation top & bottom: 165 − 175 ft bgs

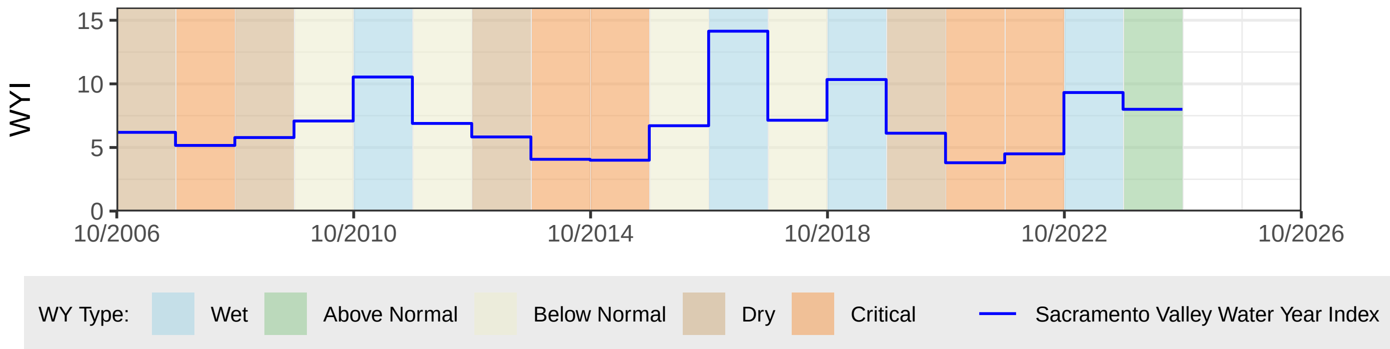


MO GWE: 148.4 ft amsl
MT GWE: 136.6 ft amsl

Area: Within Special Zone
(Reference: GSP, 2024)

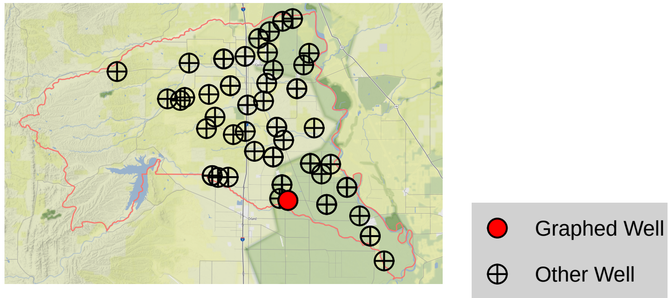
Statistics of spring water levels for past 17 years (2007 to 2024):
Change = −13.64 ft
Avg. rate of change = −0.8 ft/yr
Avg. water level = 175.58 ft amsl





Corning Subbasin − State Well Number (SWN) 22N02W18C001M

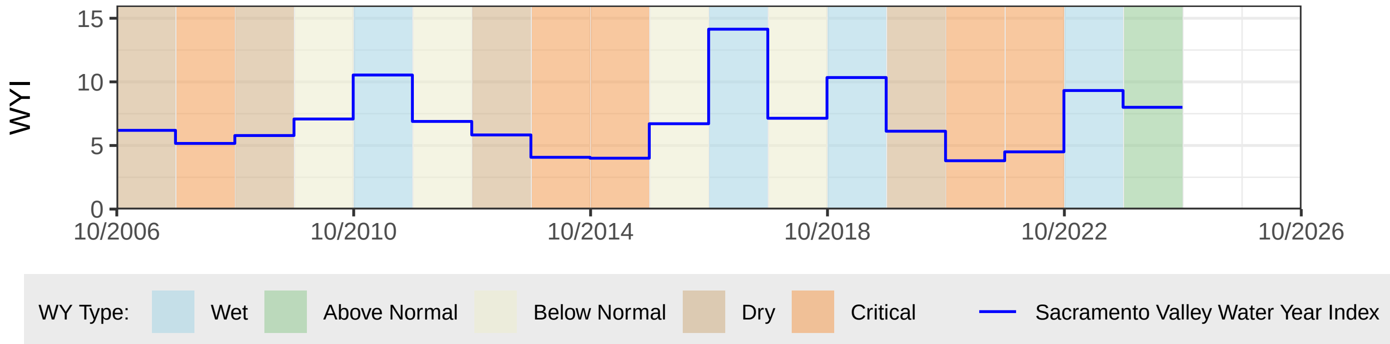
(Deep Zone)   Well Depth: 1062 ft. Perforation top & bottom: 841 − 1029 ft bgs

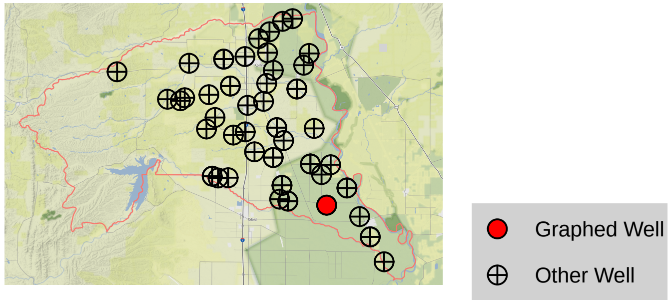


MO GWE: 90.4 ft amsl
MT GWE: 68.5 ft amsl

Area: Within Special Zone
(Reference: GSP, 2024)

Statistics of spring water levels for past 17 years (2007 to 2024):
Change = −33.7 ft
Avg. rate of change = −1.98 ft/yr
Avg. water level = 115.42 ft amsl





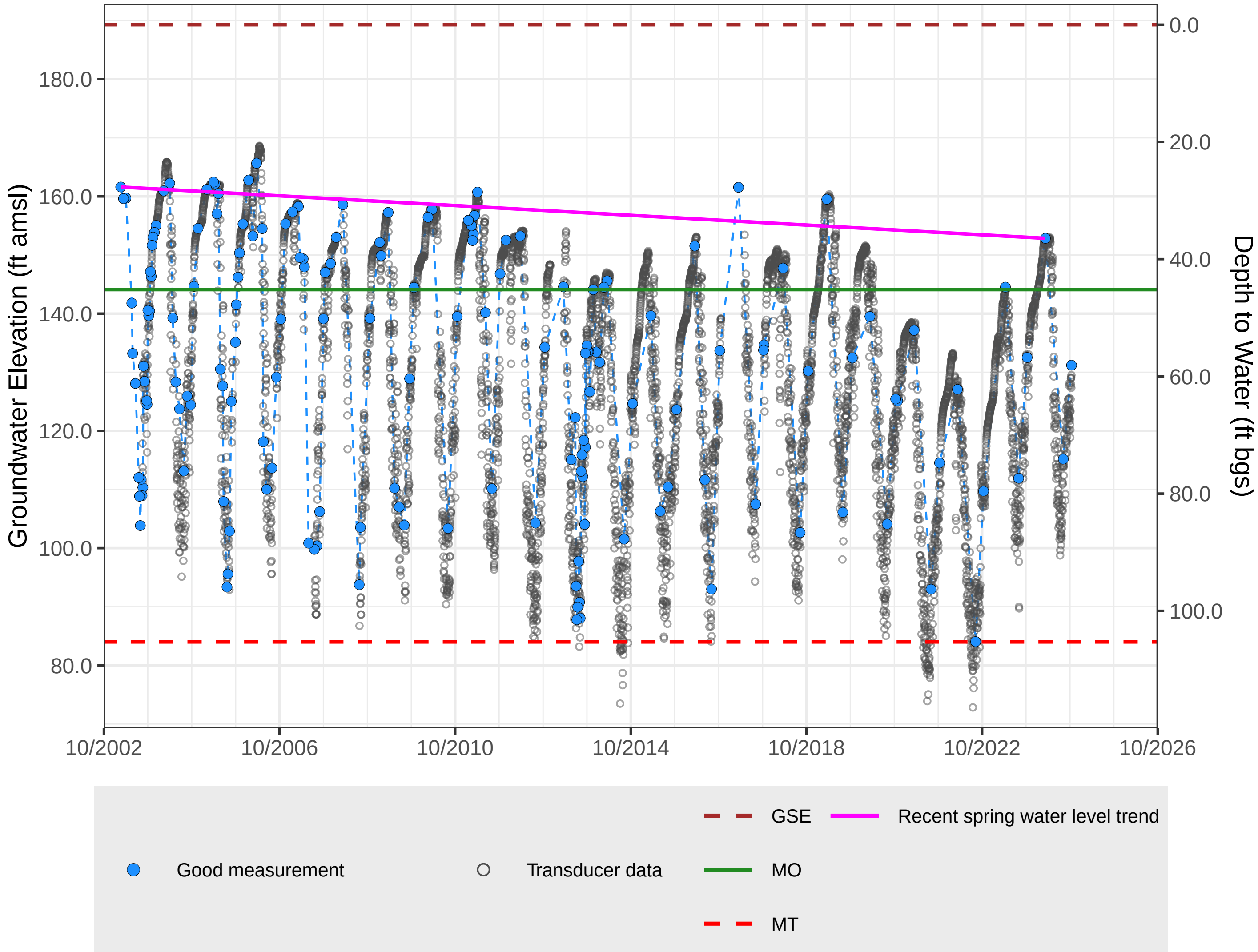
MO GWE: 144.1 ft amsl
MT GWE: 84 ft amsl

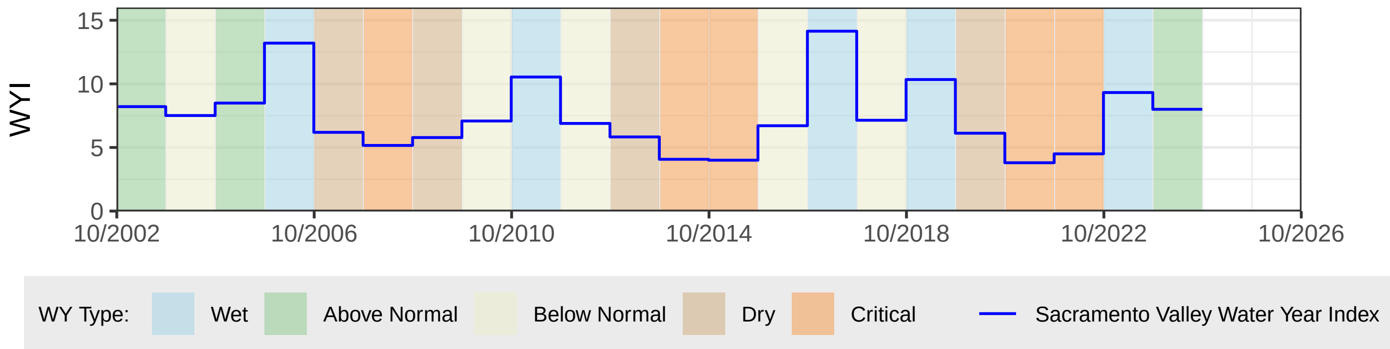
Area: Outside of Special Zone
(Reference: GSP, 2024)

Statistics of spring water levels for past 21 years (2003 to 2024):
Change = −8.75 ft
Avg. rate of change = −0.42 ft/yr
Avg. water level = 152.23 ft amsl

Corning Subbasin − State Well Number (SWN) 22N02W15C004M

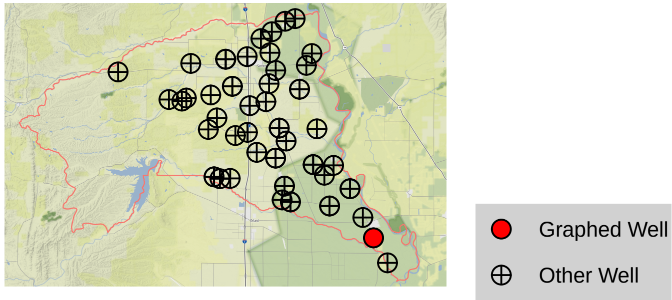
(Shallow Zone) Well Depth: 258 ft. Perforation top & bottom: 210 − 220 ft bgs





Corning Subbasin − State Well Number (SWN) 22N01W29N003M

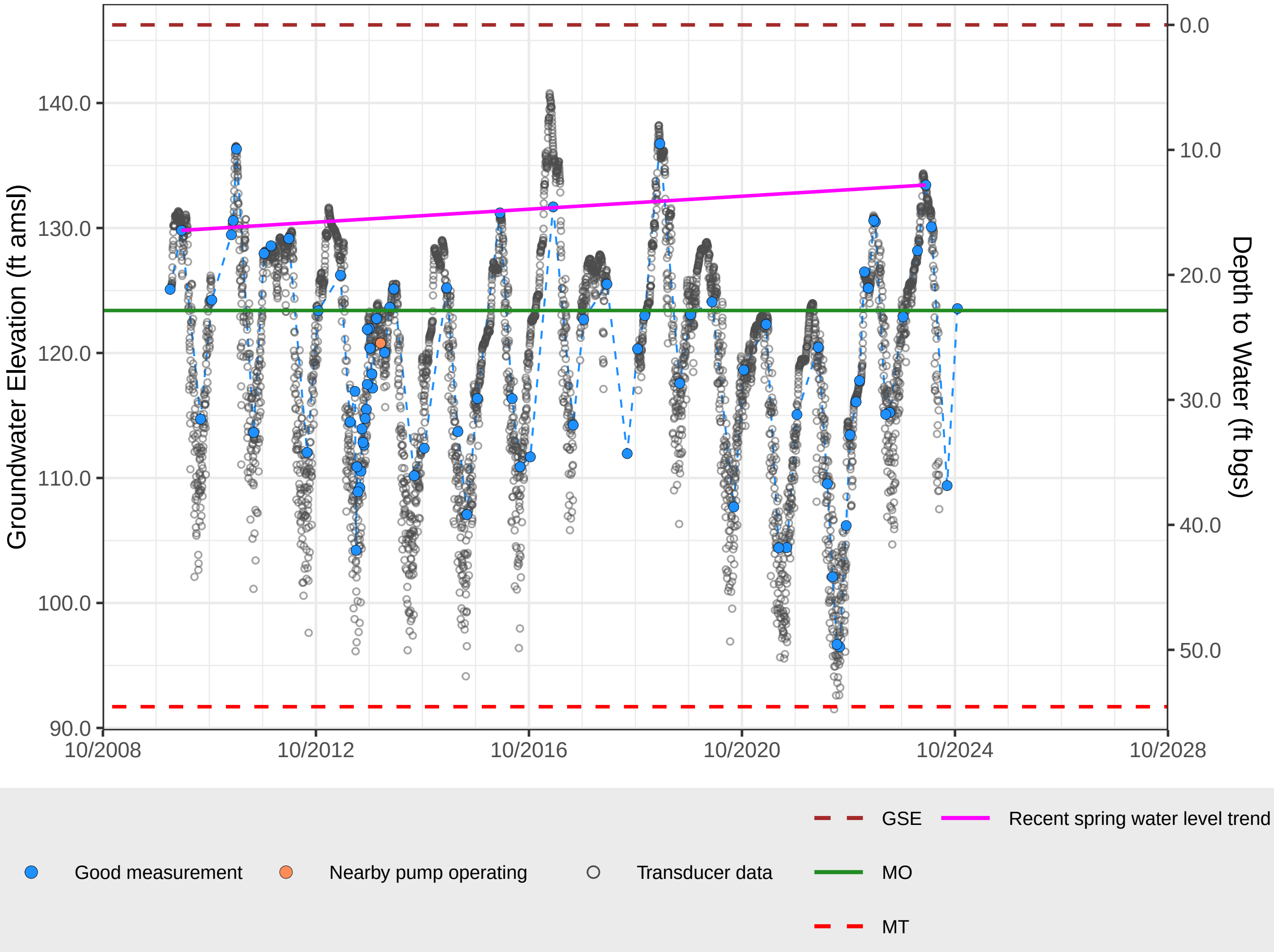
(Shallow Zone) Well Depth: 400 ft. Perforation top & bottom: 189 − 380 ft bgs

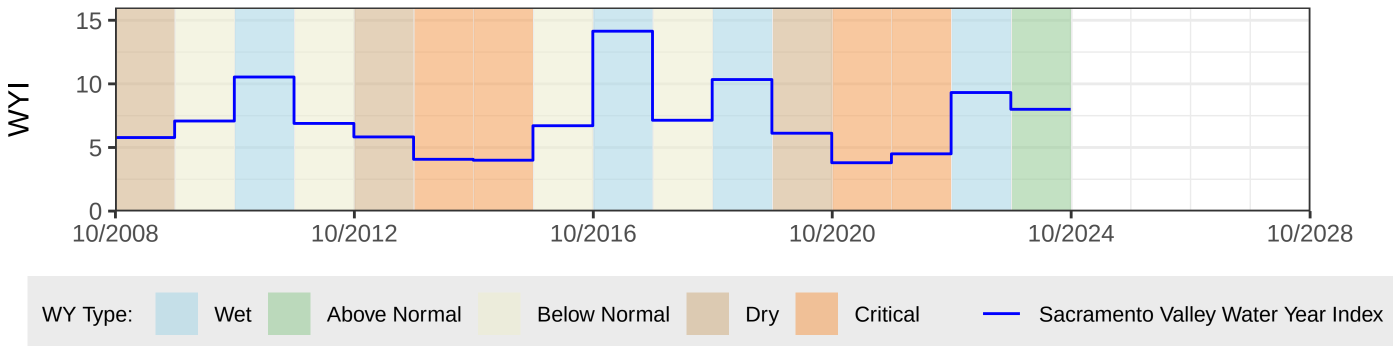


MO GWE: 123.4 ft amsl
MT GWE: 91.7 ft amsl

Area: Outside of Special Zone
(Reference: GSP, 2024)

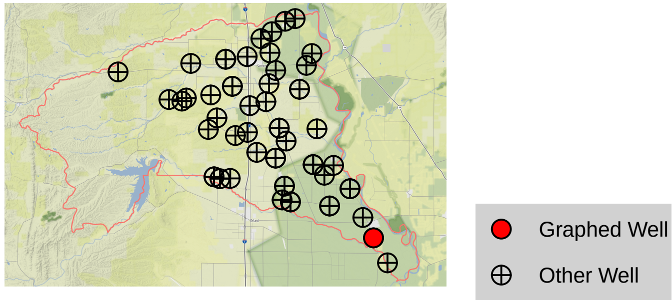
Statistics of spring water levels for past 14 years (2010 to 2024):
Change = 3.63 ft
Avg. rate of change = 0.26 ft/yr
Avg. water level = 128.52 ft amsl





Corning Subbasin – State Well Number (SWN) 22N01W29N002M

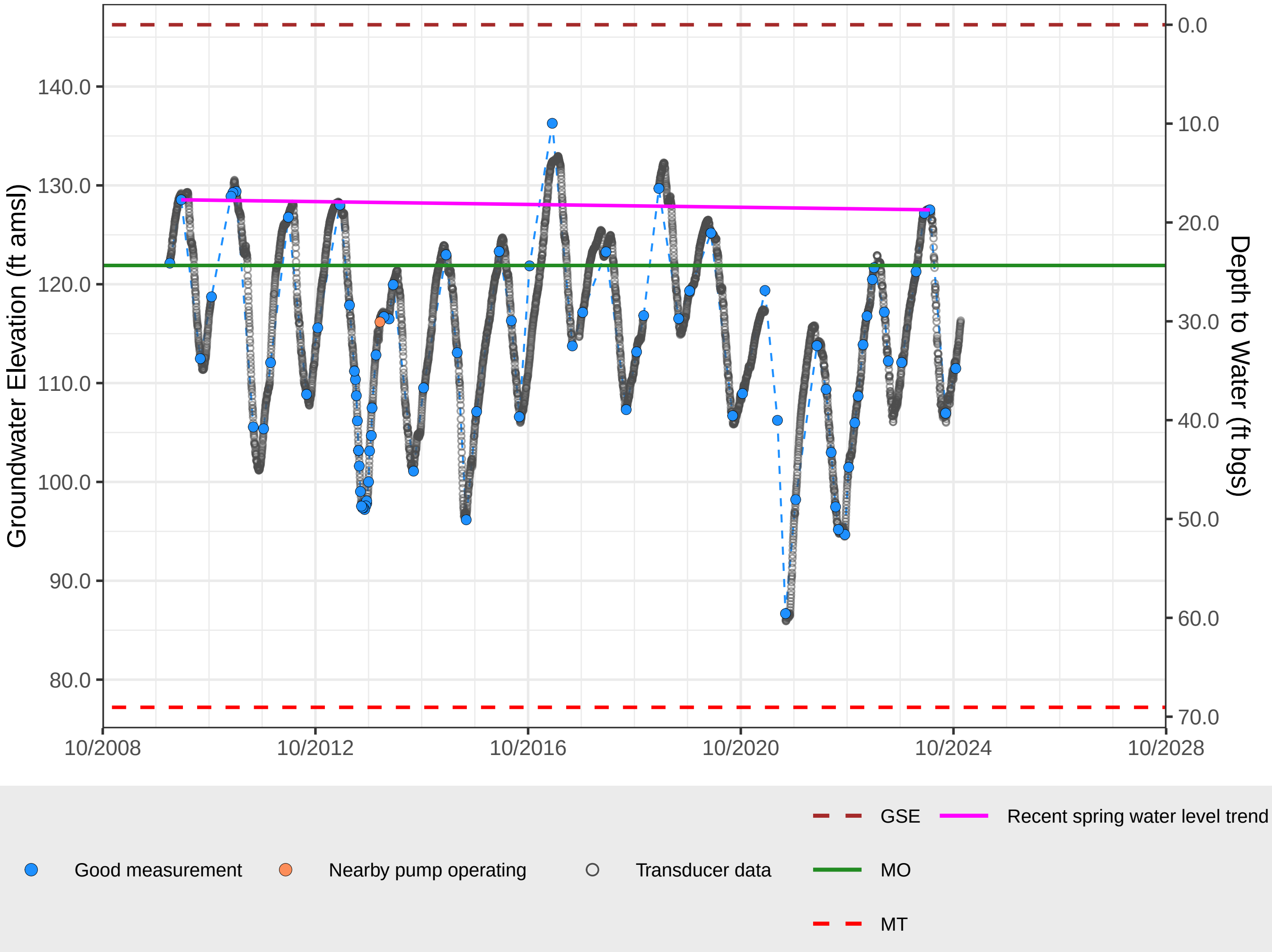
(Deep Zone) Well Depth: 670 ft. Perforation top & bottom: 549 – 641 ft bgs

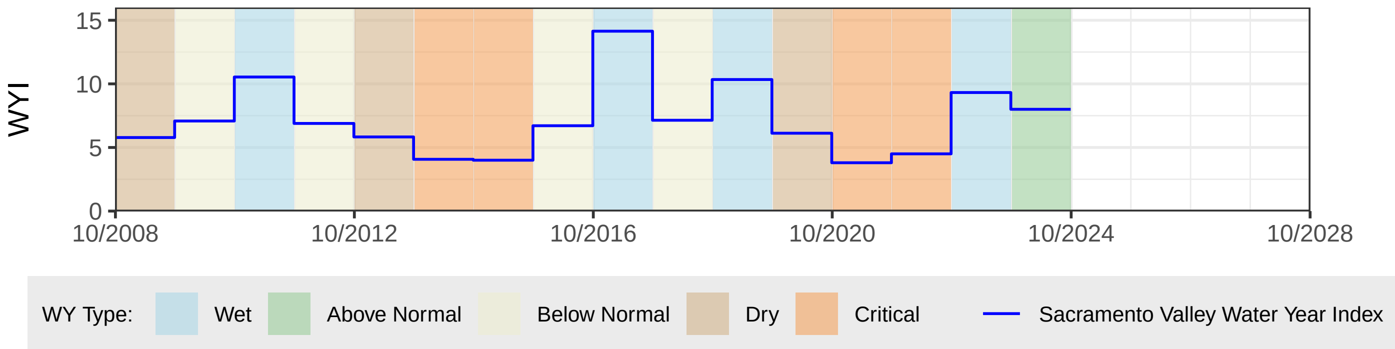


MO GWE: 121.9 ft amsl
MT GWE: 77.2 ft amsl

Area: Outside of Special Zone
(Reference: GSP, 2024)

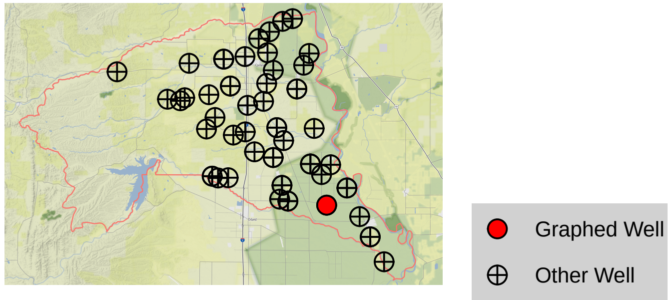
Statistics of spring water levels for past 14 years (2010 to 2024):
Change = −1.01 ft
Avg. rate of change = −0.07 ft/yr
Avg. water level = 125.05 ft amsl





Corning Subbasin − State Well Number (SWN) 22N02W15C002M

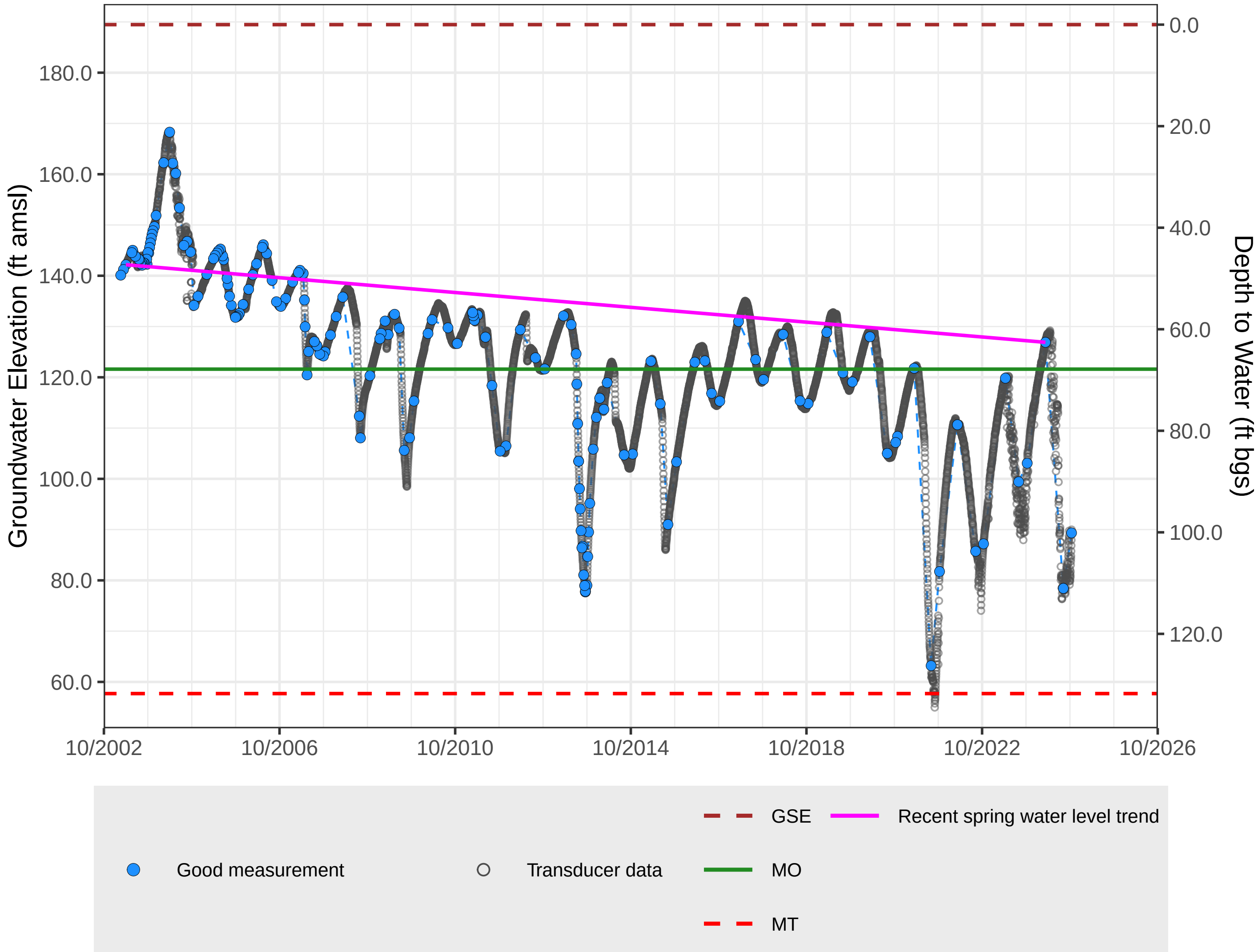
(Deep Zone) Well Depth: 825 ft. Perforation top & bottom: 760 − 781 ft bgs

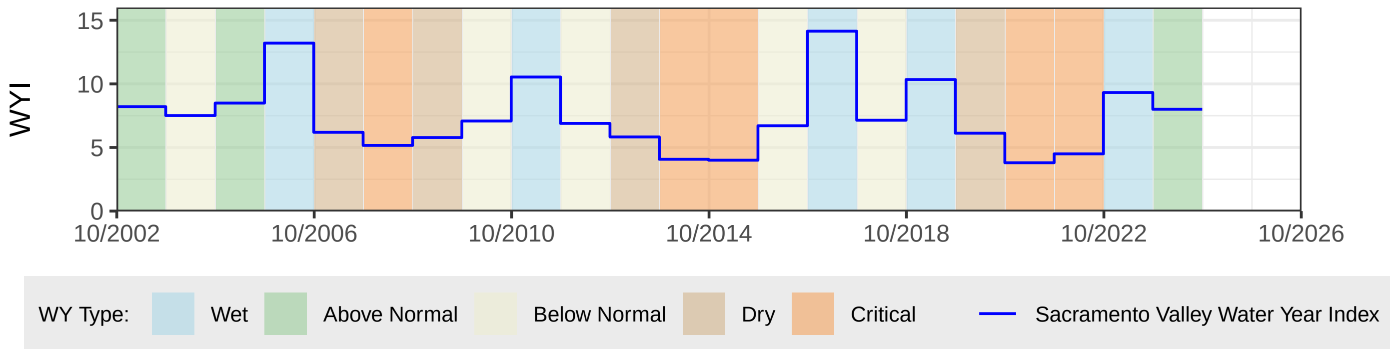


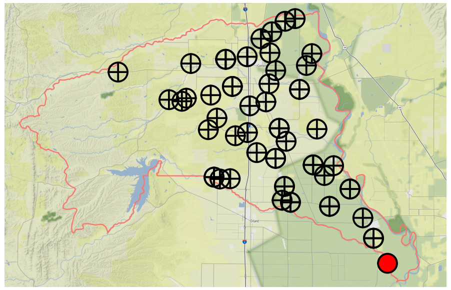
MO GWE: 121.6 ft amsl
MT GWE: 57.7 ft amsl

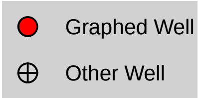
Area: Outside of Special Zone
(Reference: GSP, 2024)

Statistics of spring water levels for past 21 years (2003 to 2024):
Change = −15.29 ft
Avg. rate of change = −0.73 ft/yr
Avg. water level = 131.42 ft amsl





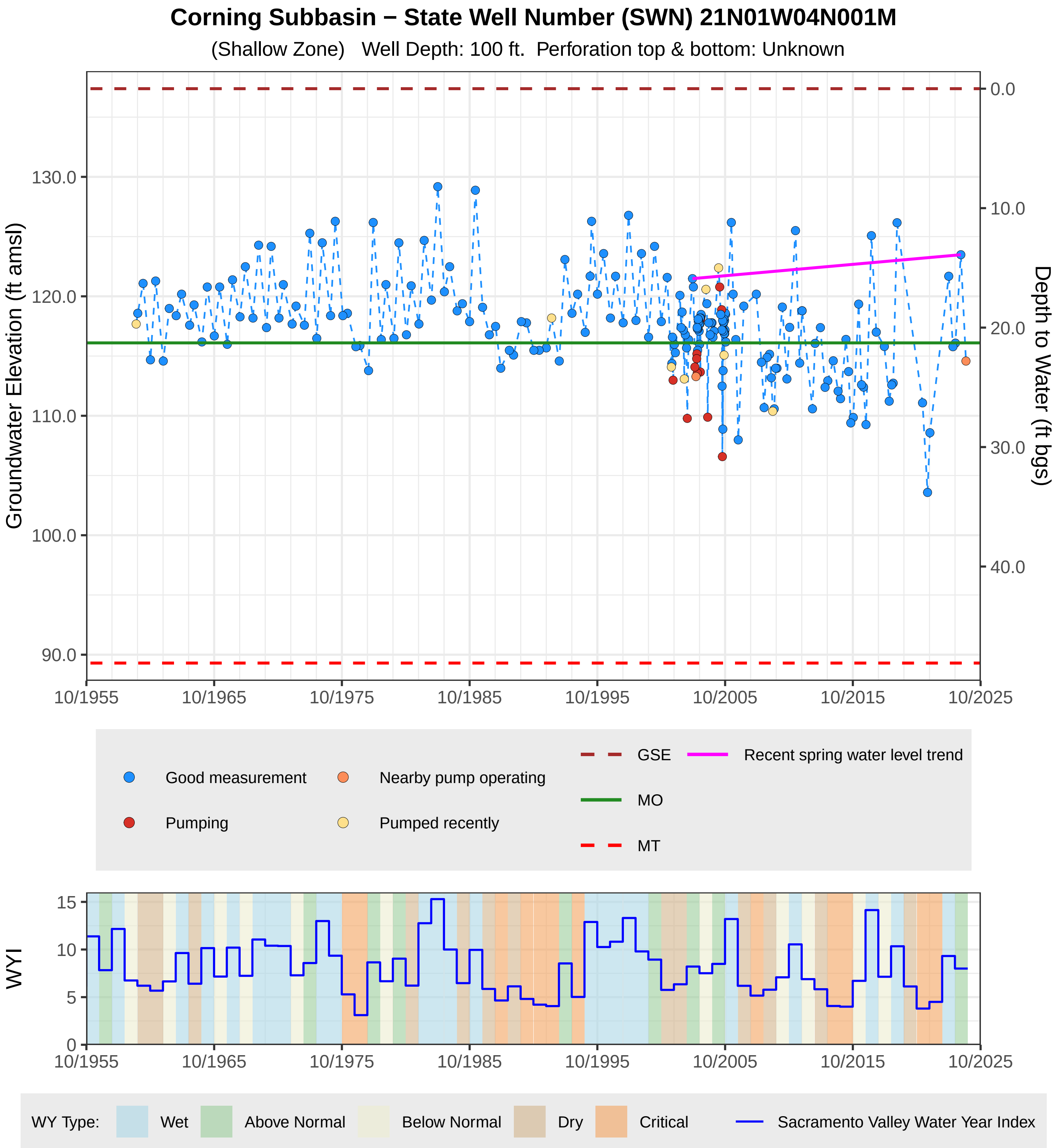


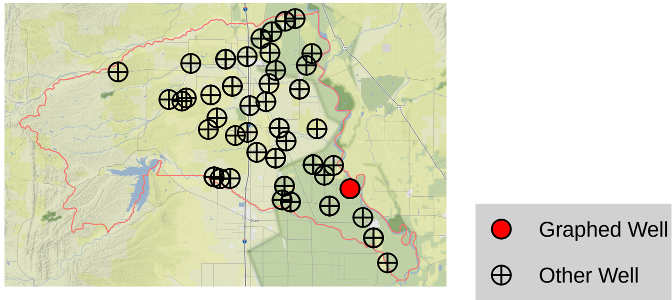


MO GWE: 116.1 ft amsl
MT GWE: 89.3 ft amsl

Area: Outside of Special Zone
(Reference: GSP, 2024)

Statistics of spring water levels for
past 21 years (2003 to 2024):
Change = 2 ft
Avg. rate of change = 0.1 ft/yr
Avg. water level = 121.16 ft amsl

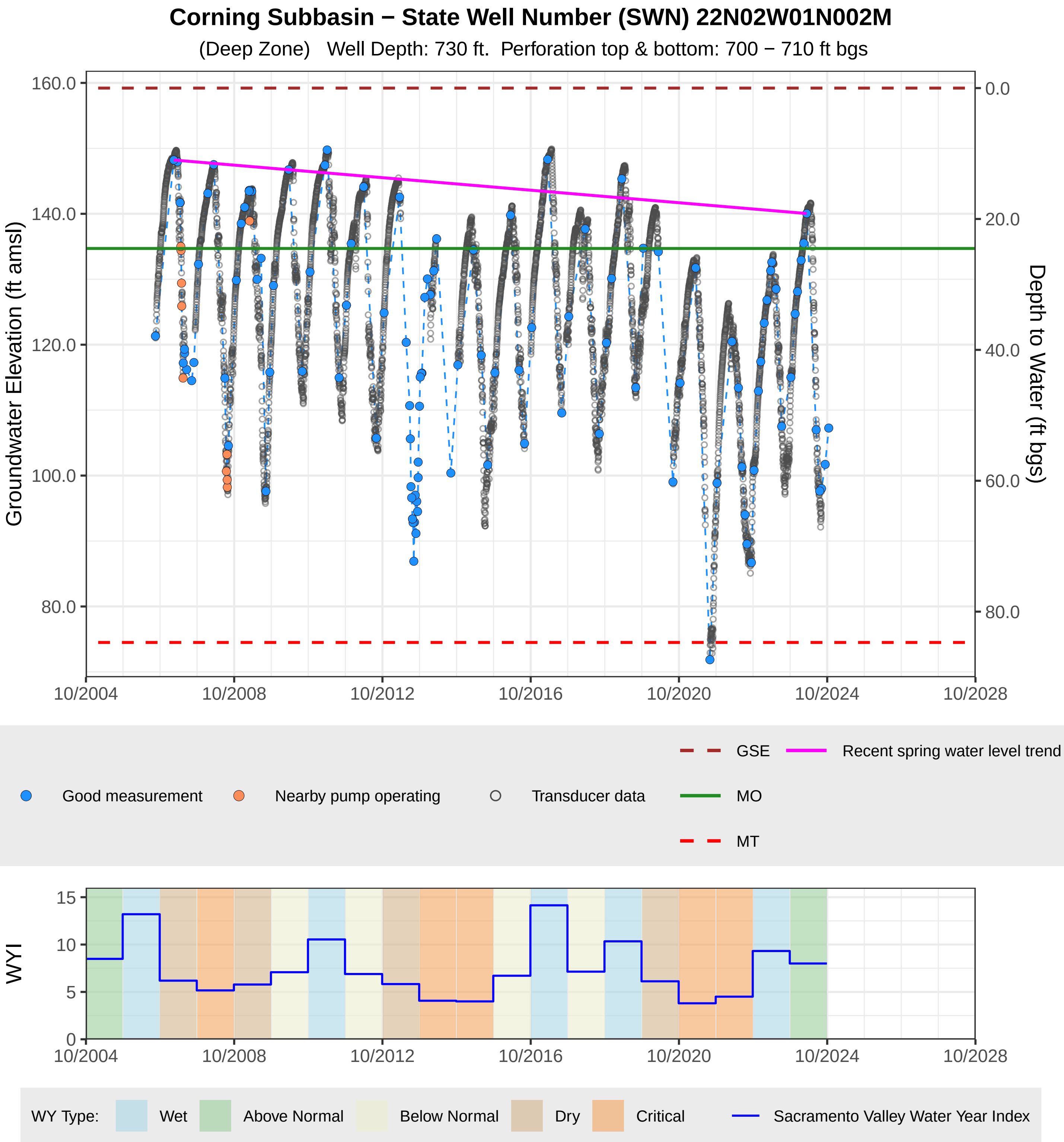




MO GWE: 134.7 ft amsl
MT GWE: 74.5 ft amsl

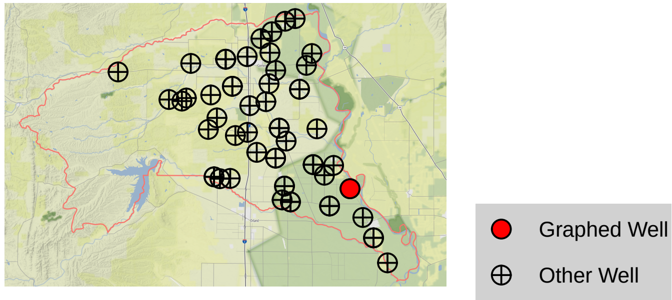
Area: Outside of Special Zone
(Reference: GSP, 2024)

Statistics of spring water levels for past 17 years (2007 to 2024):
Change = −8.18 ft
Avg. rate of change = −0.48 ft/yr
Avg. water level = 140.18 ft amsl



Corning Subbasin − State Well Number (SWN) 22N02W01N003M

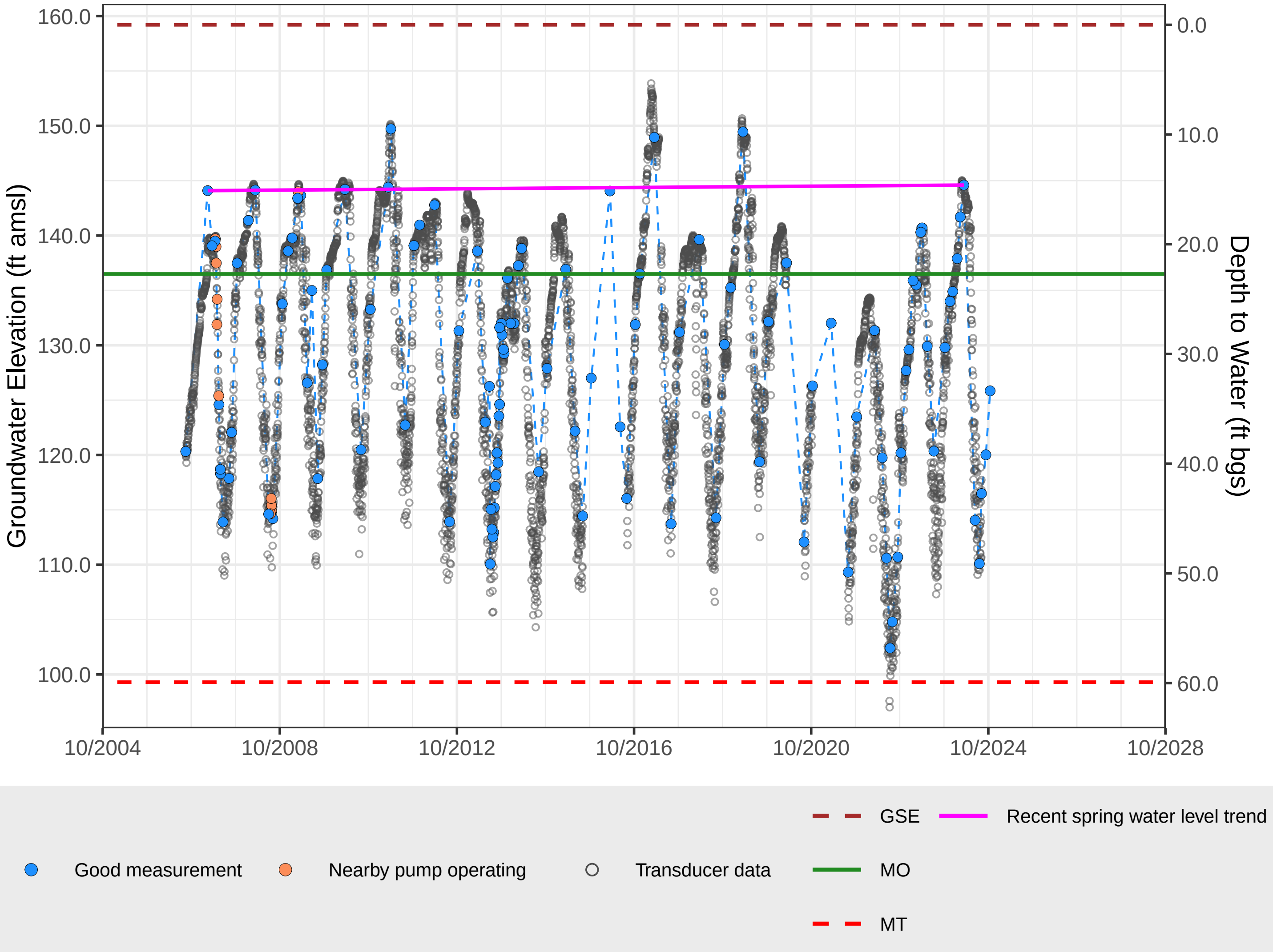
(Shallow Zone) Well Depth: 440 ft. Perforation top & bottom: 210 − 370 ft bgs

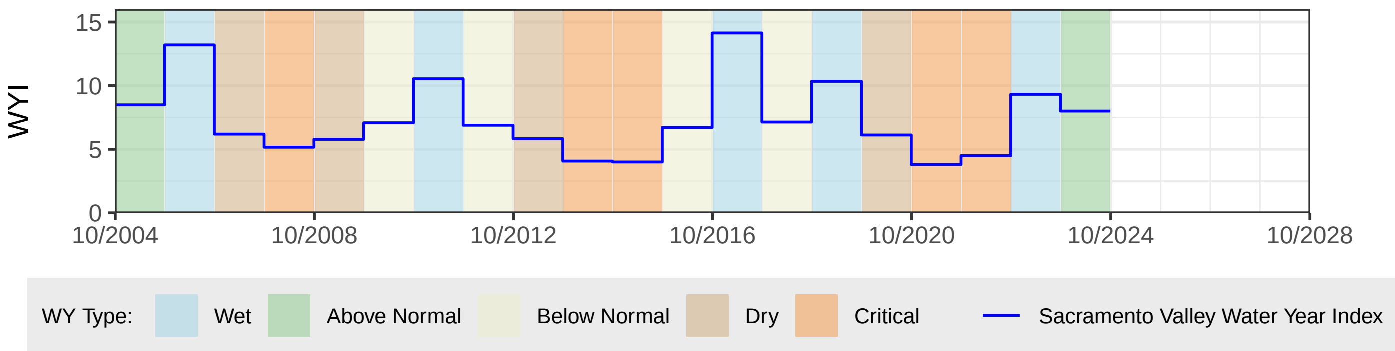


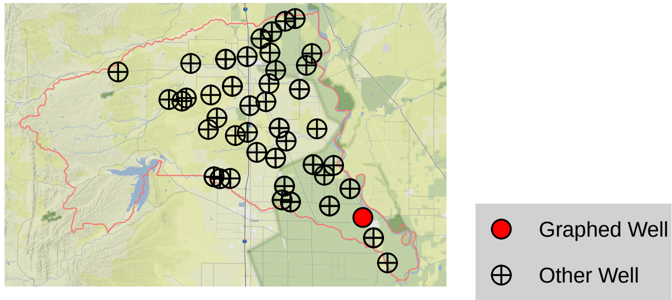
MO GWE: 136.5 ft amsl
MT GWE: 99.3 ft amsl

Area: Outside of Special Zone
(Reference: GSP, 2024)

Statistics of spring water levels for past 17 years (2007 to 2024):
Change = 0.5 ft
Avg. rate of change = 0.03 ft/yr
Avg. water level = 141.74 ft amsl



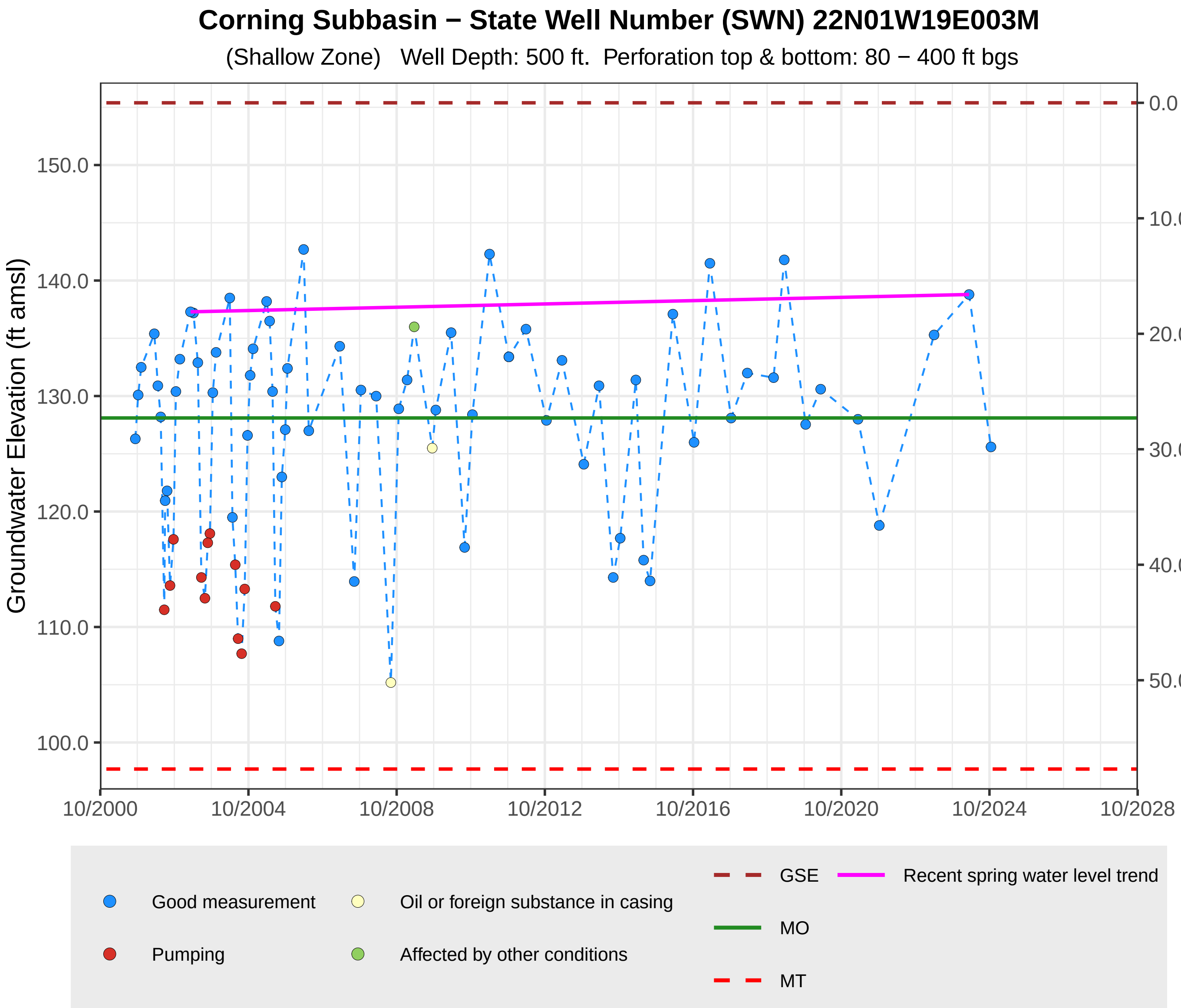


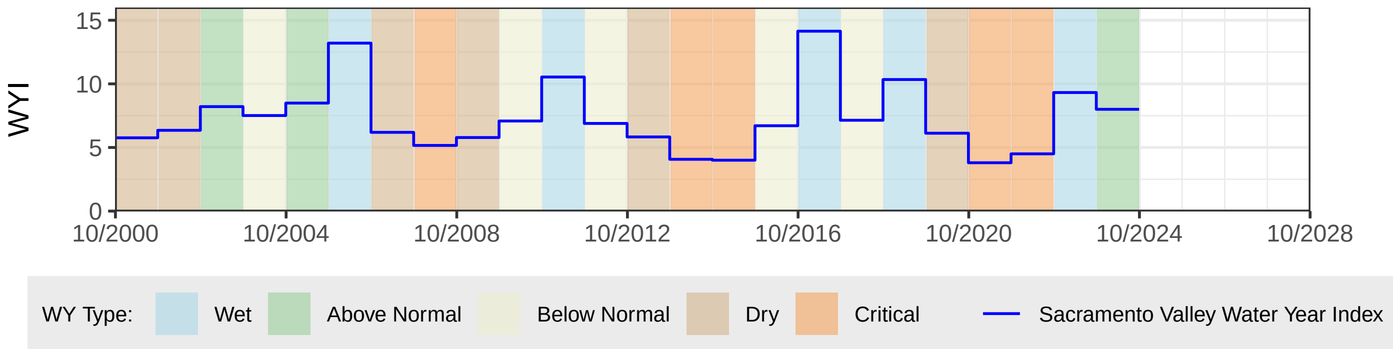


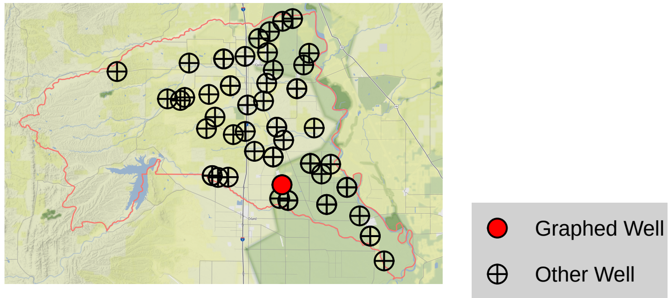
MO GWE: 128.1 ft amsl
MT GWE: 97.7 ft amsl

Area: Outside of Special Zone
(Reference: GSP, 2024)

Statistics of spring water levels for past 21 years (2003 to 2024):
Change = 1.5 ft
Avg. rate of change = 0.07 ft/yr
Avg. water level = 135.74 ft amsl







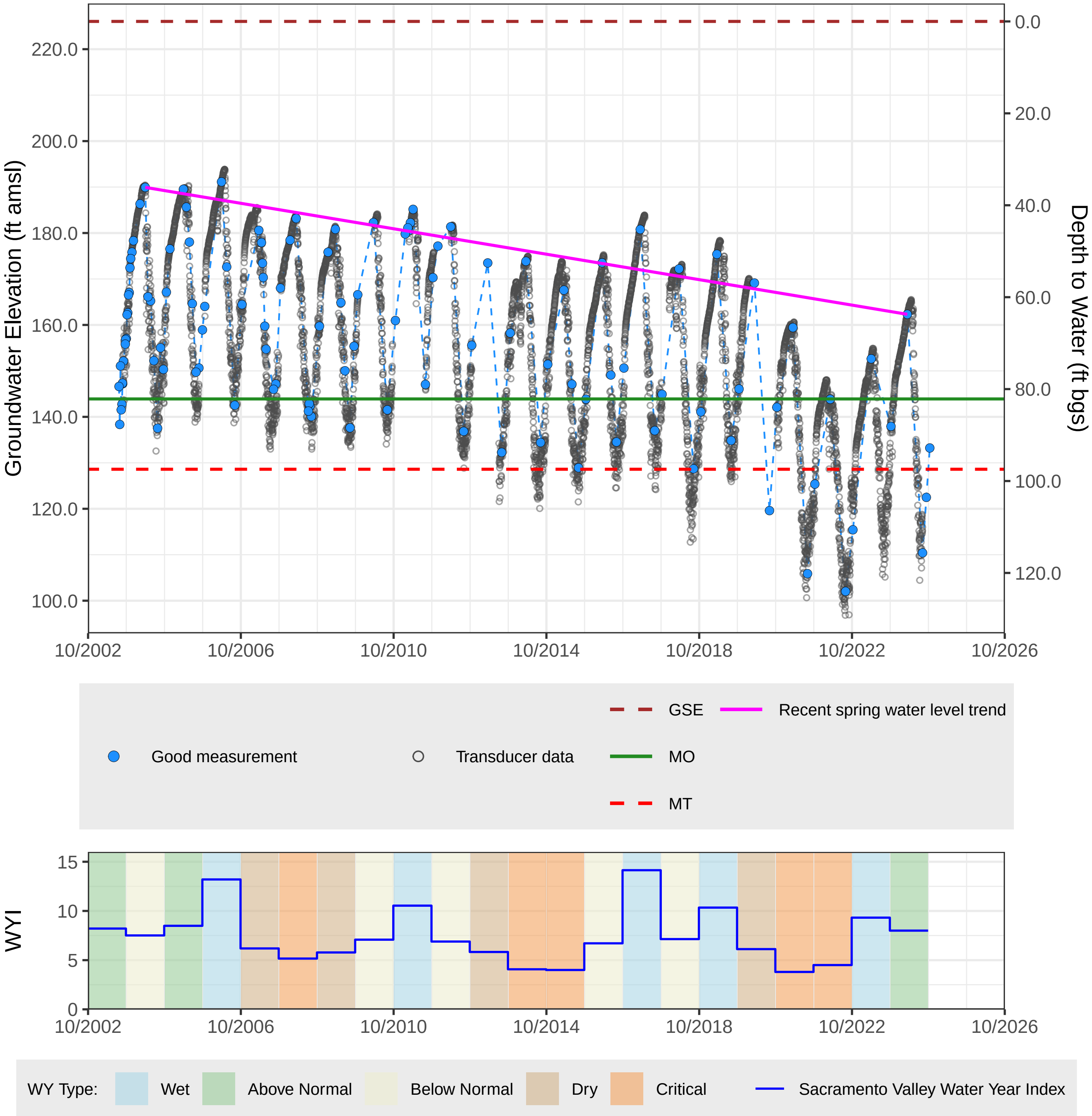
MO GWE: 143.9 ft amsl
MT GWE: 128.6 ft amsl

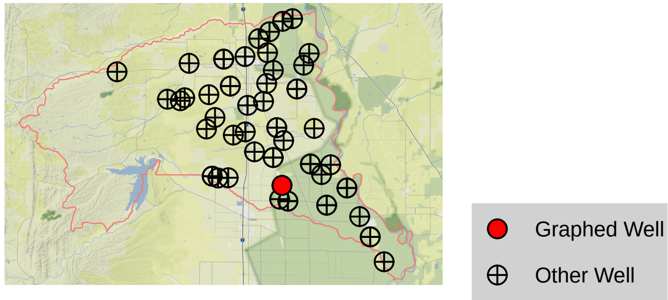
Area: Within Special Zone
(Reference: GSP, 2024)

Statistics of spring water levels for
past 20 years (2004 to 2024):
Change = −27.62 ft
Avg. rate of change = −1.38 ft/yr
Avg. water level = 174.67 ft amsl

Corning Subbasin − State Well Number (SWN) 22N03W01R002M

(Shallow Zone) Well Depth: 314 ft. Perforation top & bottom: 270 − 280 ft bgs





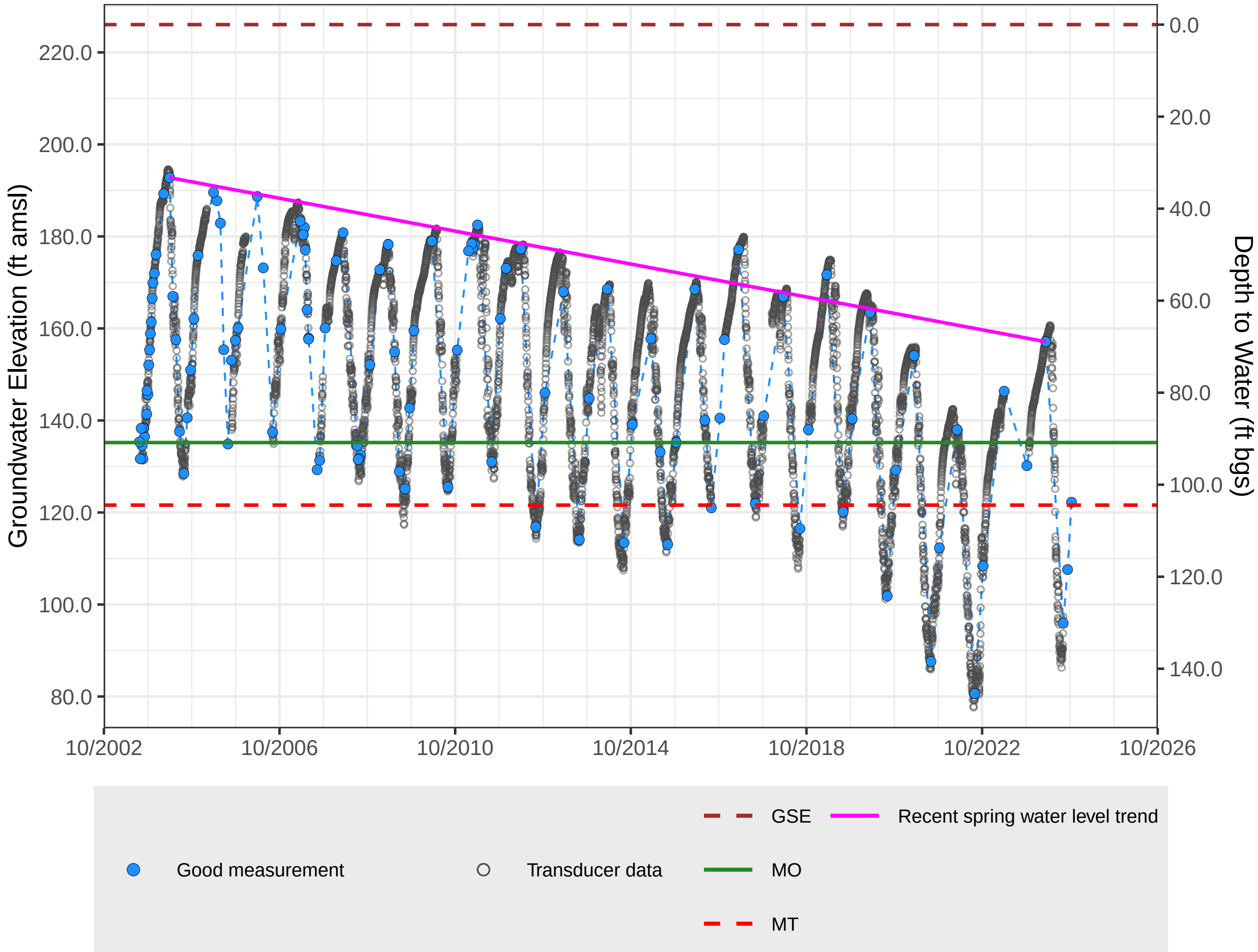
MO GWE: 135.2 ft amsl
MT GWE: 121.6 ft amsl

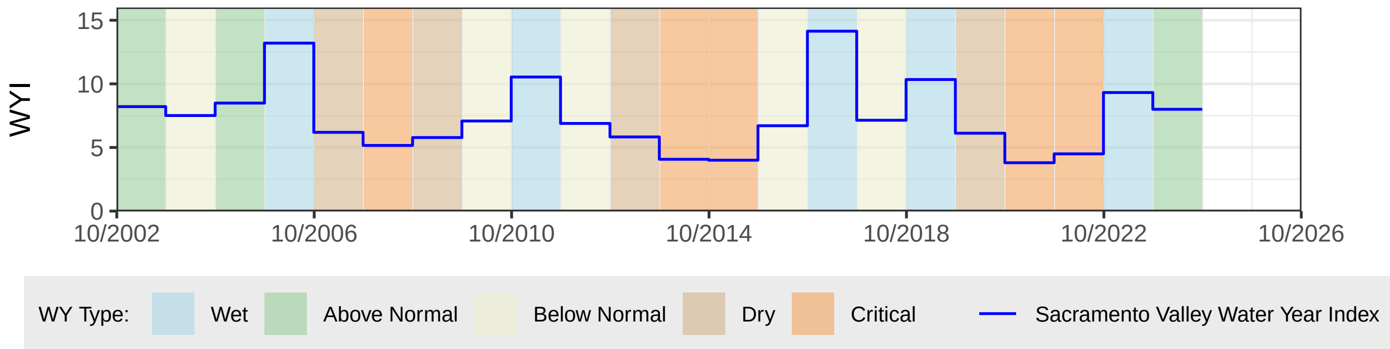
Area: Within Special Zone
(Reference: GSP, 2024)

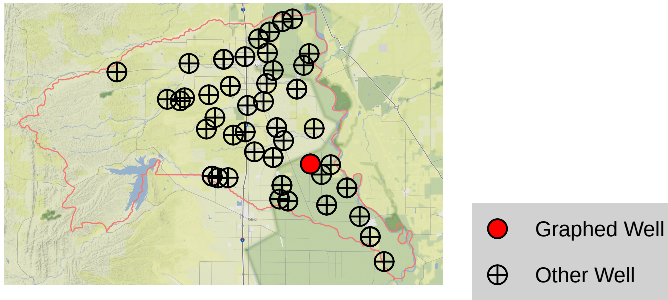
Statistics of spring water levels for past 20 years (2004 to 2024):
Change = −35.65 ft
Avg. rate of change = −1.78 ft/yr
Avg. water level = 170.94 ft amsl

Corning Subbasin − State Well Number (SWN) 22N03W01R001M

(Deep Zone) Well Depth: 515 ft. Perforation top & bottom: 470 − 480 ft bgs







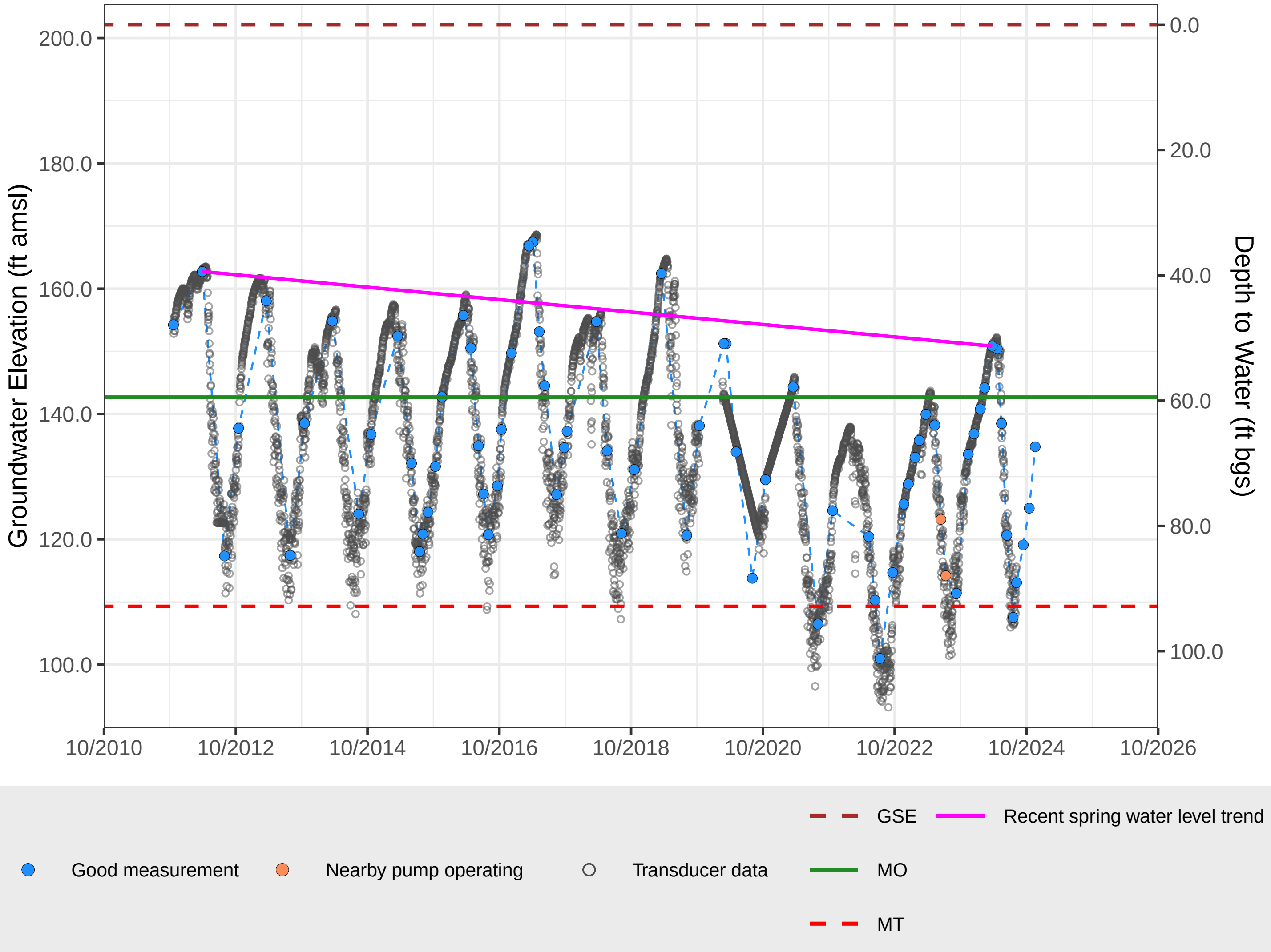
MO GWE: 142.7 ft amsl
MT GWE: 109.3 ft amsl

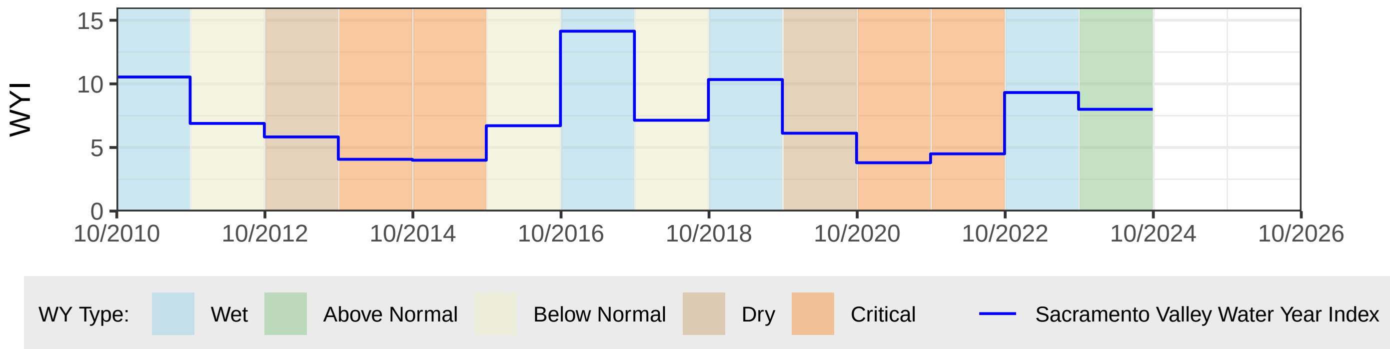
Area: Within Special Zone
(Reference: GSP, 2024)

Statistics of spring water levels for past 12 years (2012 to 2024):
Change = −11.9 ft
Avg. rate of change = −0.99 ft/yr
Avg. water level = 154.56 ft amsl

Corning Subbasin − State Well Number (SWN) 23N02W28N004M

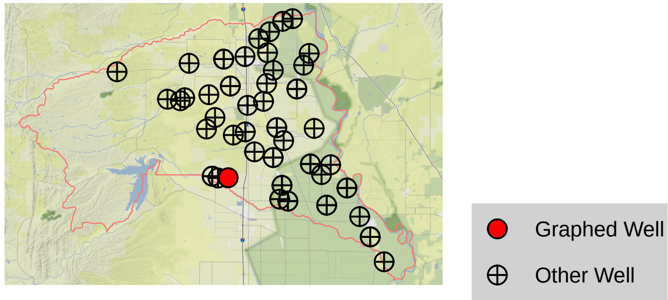
(Shallow Zone) Well Depth: 205 ft. Perforation top & bottom: 100 − 170 ft bgs





Corning Subbasin – State Well Number (SWN) 22N03W05F002M

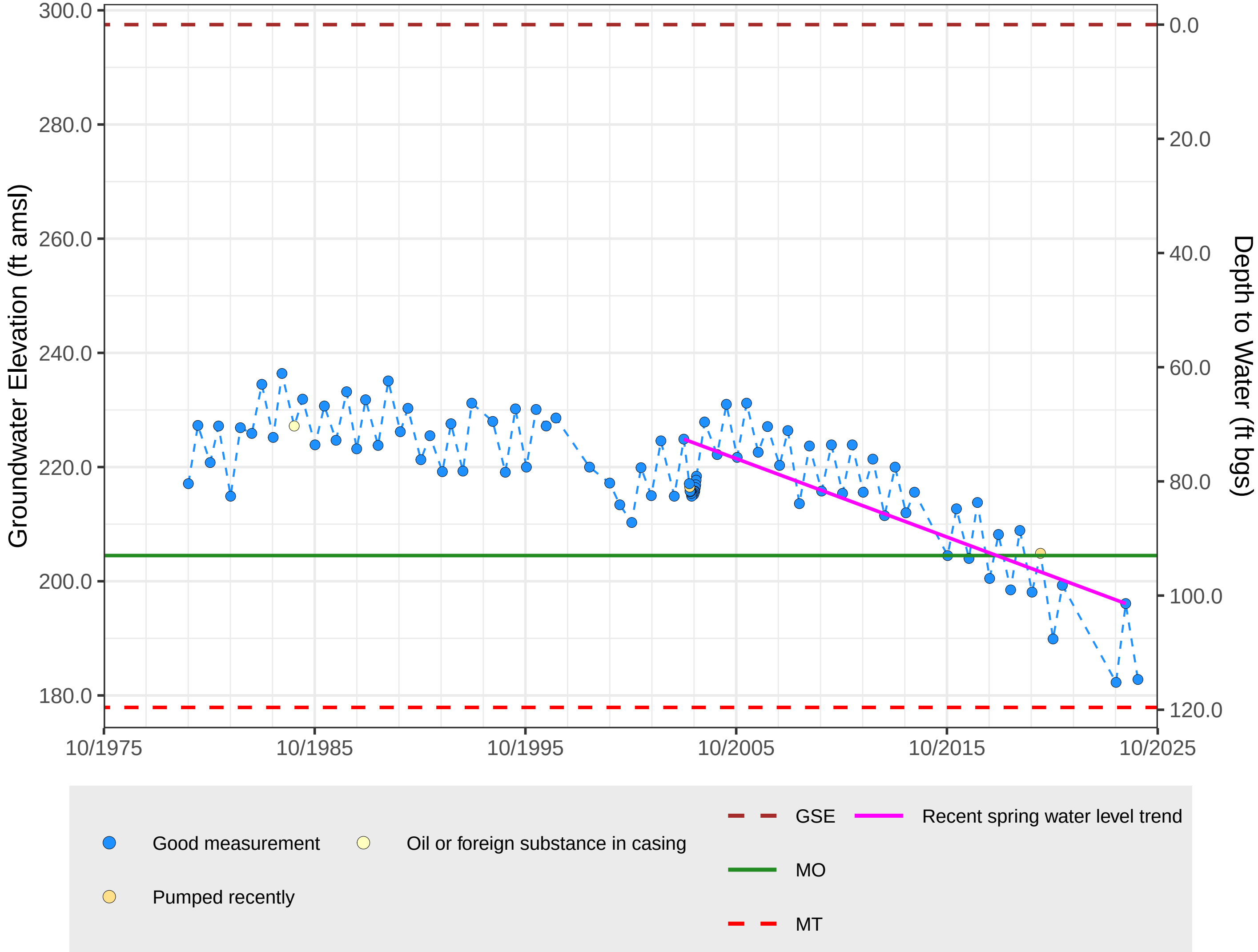
(Shallow Zone) Well Depth: 218 ft. Perforation top & bottom: 188 − 218 ft bgs

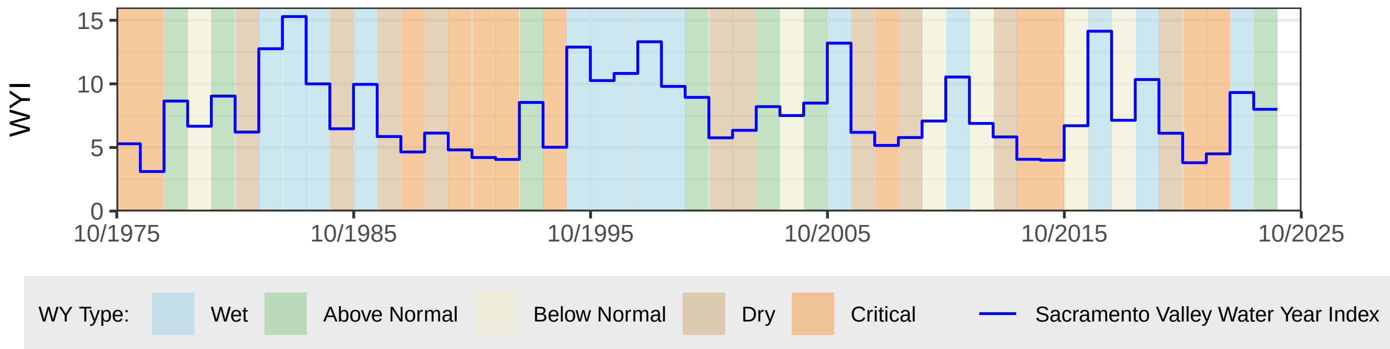


MO GWE: 204.5 ft amsl
MT GWE: 177.9 ft amsl

Area: Outside of Special Zone
(Reference: GSP, 2024)

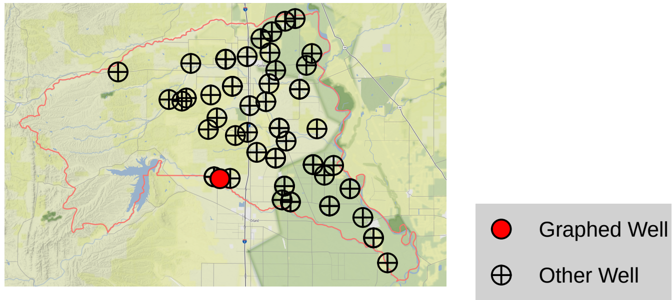
Statistics of spring water levels for past 21 years (2003 to 2024):
Change = −28.8 ft
Avg. rate of change = −1.37 ft/yr
Avg. water level = 224.1 ft amsl





Corning Subbasin − State Well Number (SWN) 22N03W06B001M

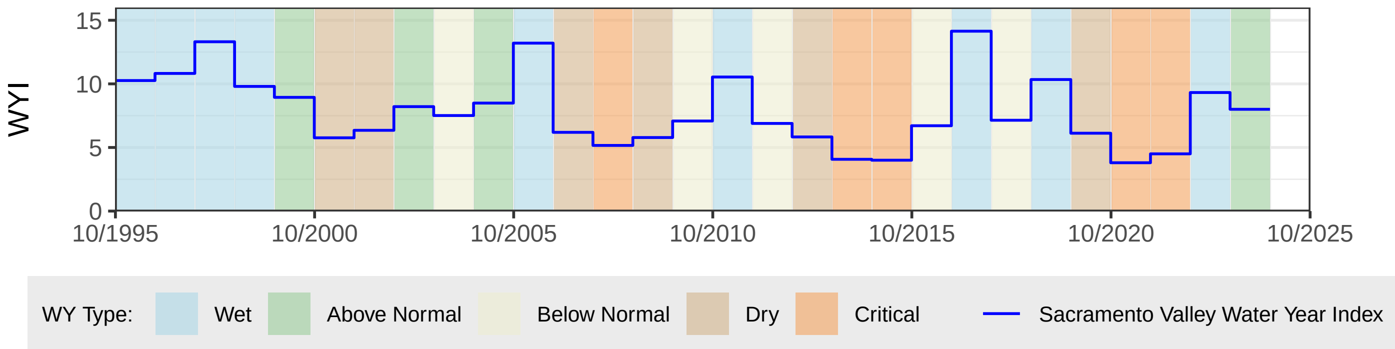
(Shallow Zone) Well Depth: 210 ft. Perforation top & bottom: 195 − 210 ft bgs



MO GWE: 264.1 ft amsl
MT GWE: 238 ft amsl

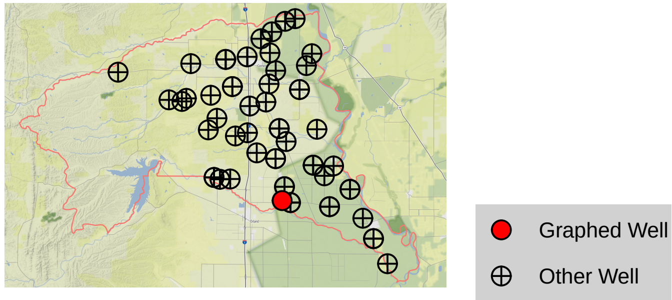
Area: Outside of Special Zone
(Reference: GSP, 2024)

Statistics of spring water levels for
past 21 years (2003 to 2024):
Change = −25 ft
Avg. rate of change = −1.19 ft/yr
Avg. water level = 265.84 ft amsl



Corning Subbasin − State Well Number (SWN) 22N03W12Q003M

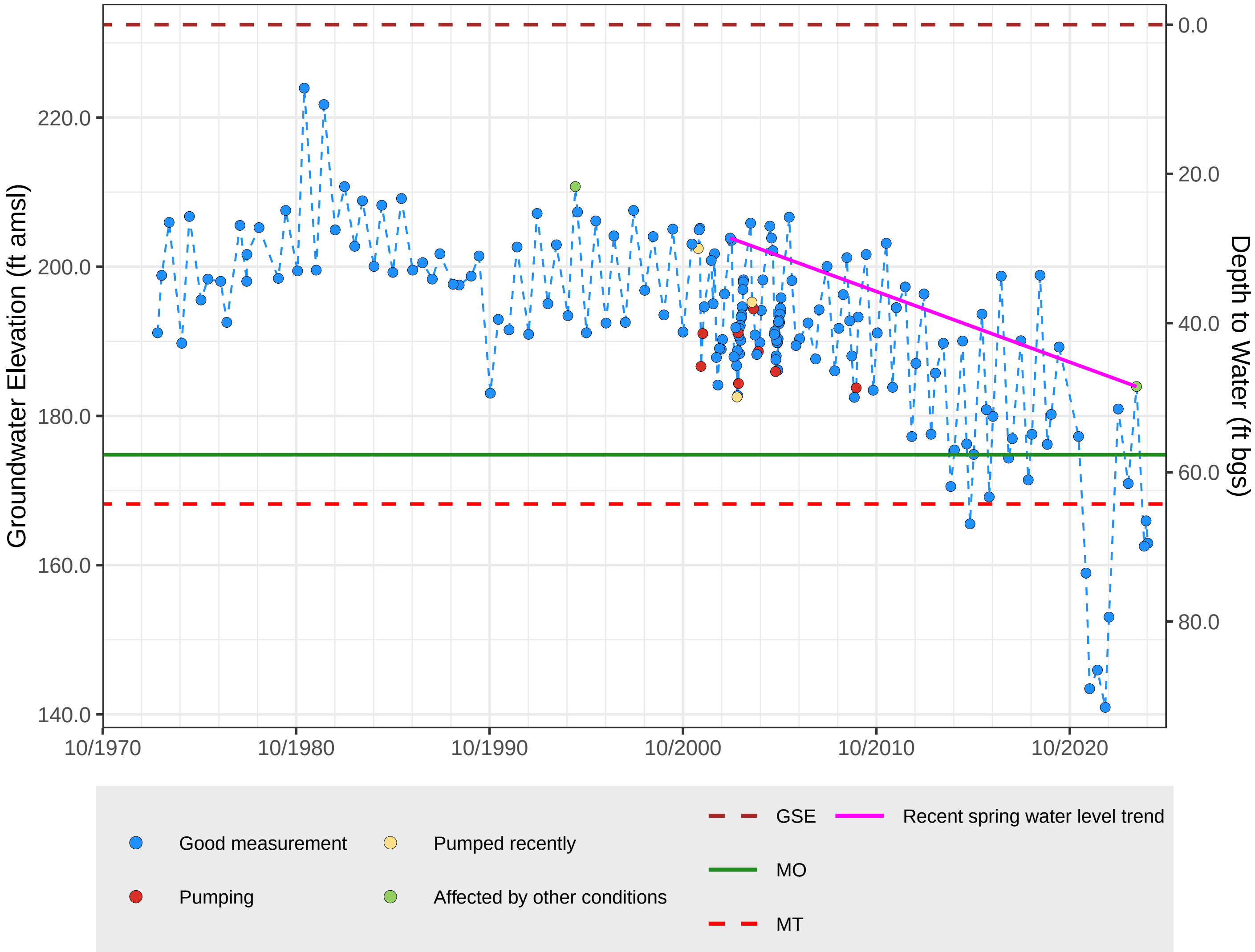
(Shallow Zone) Well Depth: 124 ft. Perforation top & bottom: 112 − 123 ft bgs

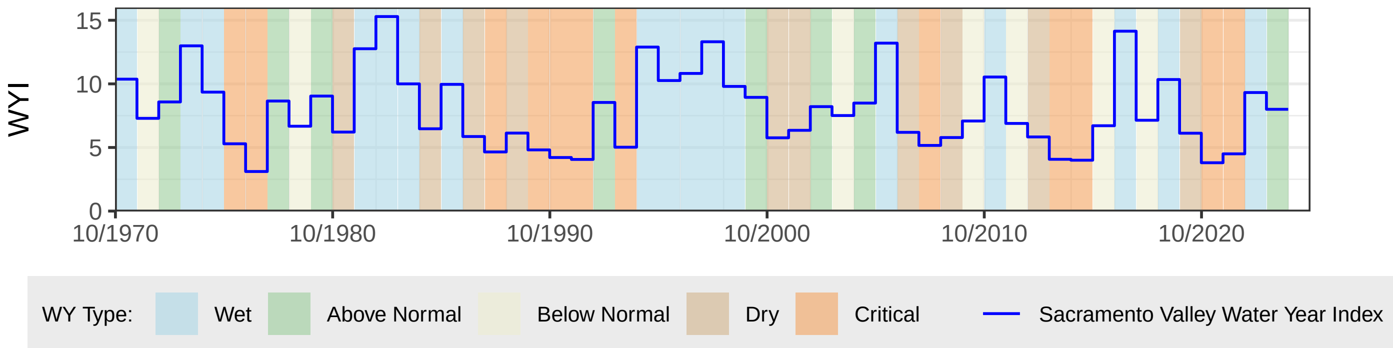


MO GWE: 174.8 ft amsl
MT GWE: 168.2 ft amsl

Area: Within Special Zone
(Reference: GSP, 2024)

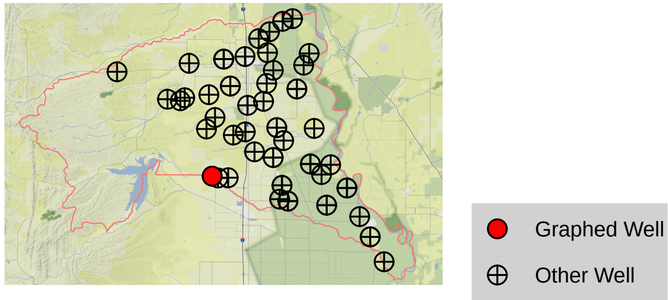
Statistics of spring water levels for past 21 years (2003 to 2024):
Change = −19.9 ft
Avg. rate of change = −0.95 ft/yr
Avg. water level = 199.92 ft amsl





Corning Subbasin – State Well Number (SWN) 22N04W01A002M

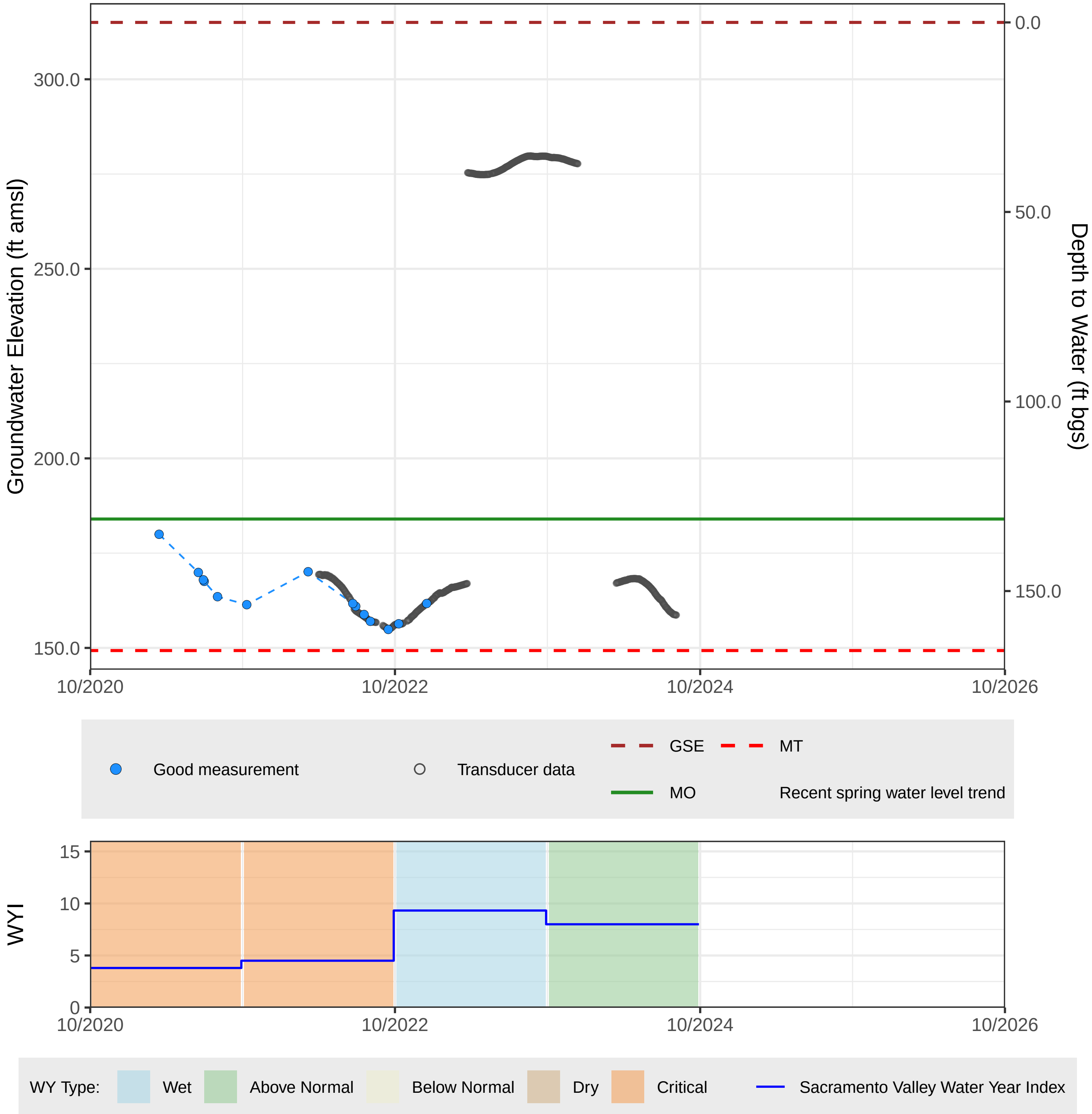
(Deep Zone) Well Depth: 550 ft. Perforation top & bottom: 520 – 530 ft bgs



MO GWE: 184 ft amsl
MT GWE: 149.3 ft amsl

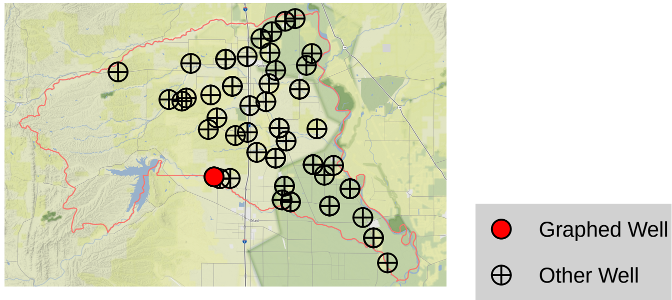
Area: Outside of Special Zone
(Reference: GSP, 2024)

Insufficient spring GW level data to calculate statistics for 3 years



Corning Subbasin – State Well Number (SWN) 22N04W01A004M

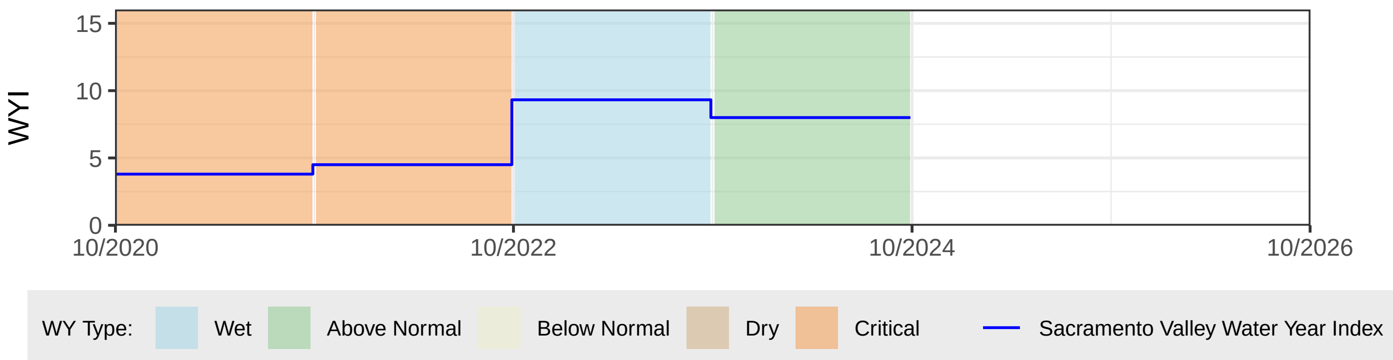
(Shallow Zone) Well Depth: 70 ft. Perforation top & bottom: 40 – 50 ft bgs



MO GWE: 262.8 ft amsl
MT GWE: 237.5 ft amsl

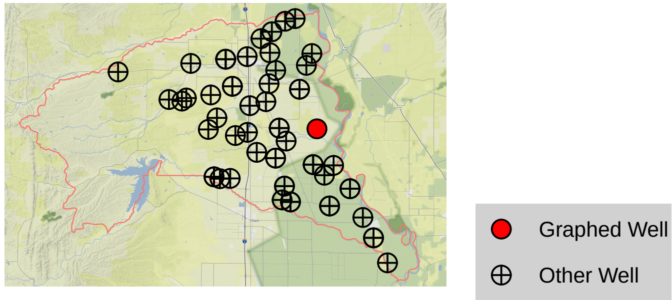
Area: Outside of Special Zone
(Reference: GSP, 2024)

Insufficient spring GW level data to calculate statistics for 3 years



Corning Subbasin − State Well Number (SWN) 23N02W16B001M

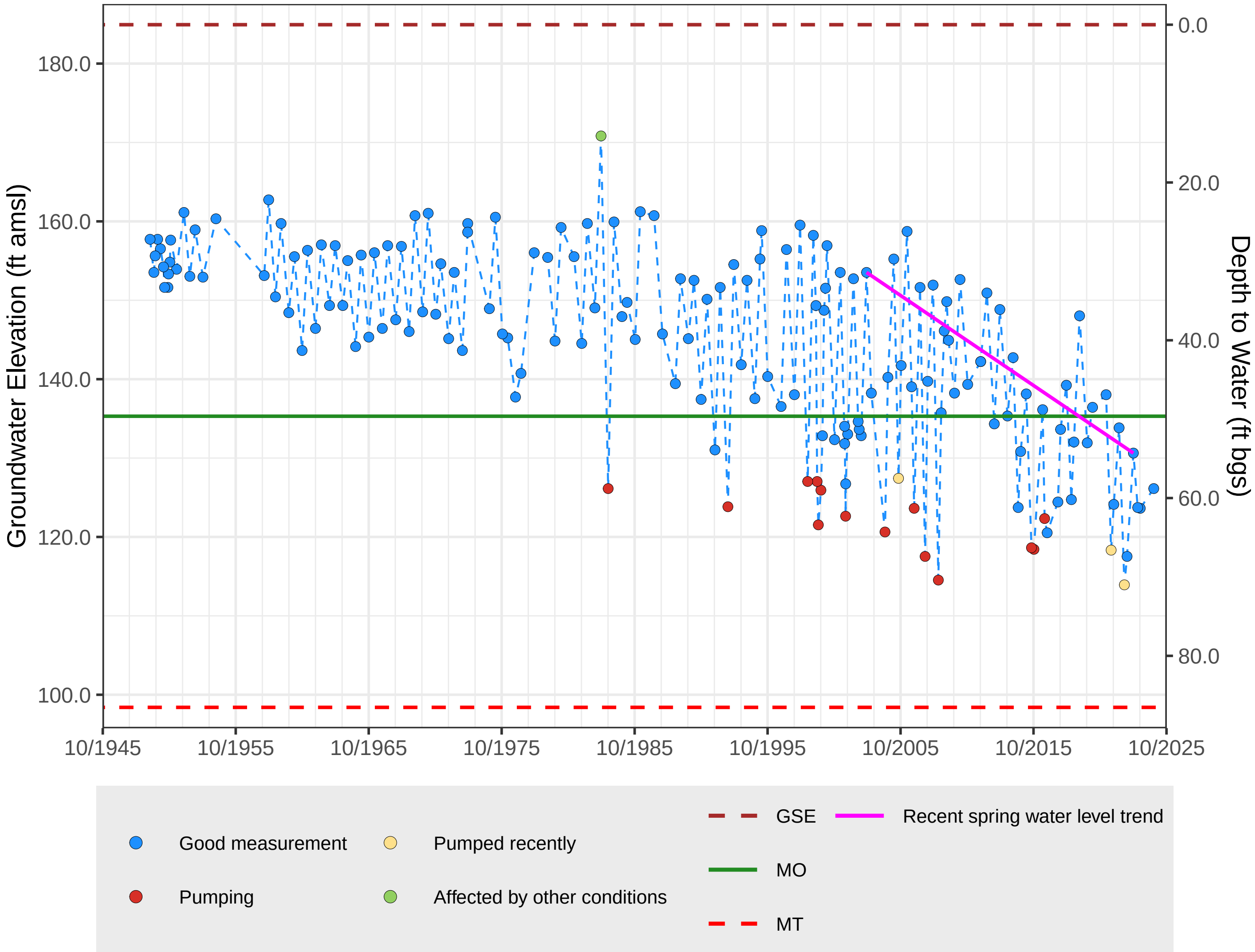
(Shallow Zone) Well Depth: 120 ft. Perforation top & bottom: 100 − 120 ft bgs

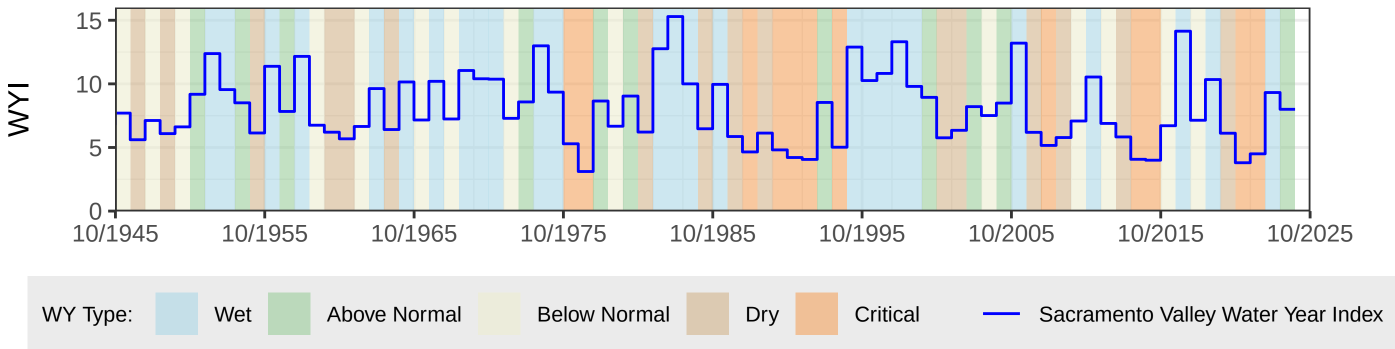


MO GWE: 135.3 ft amsl
MT GWE: 98.4 ft amsl

Area: Outside of Special Zone
(Reference: GSP, 2024)

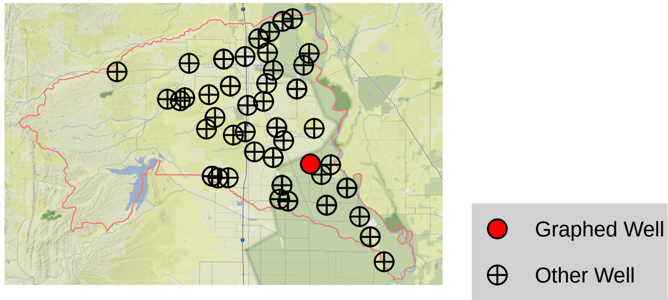
Statistics of spring water levels for past 20 years (2003 to 2023):
Change = −22.9 ft
Avg. rate of change = −1.15 ft/yr
Avg. water level = 153.51 ft amsl





Corning Subbasin − State Well Number (SWN) 23N02W28N002M

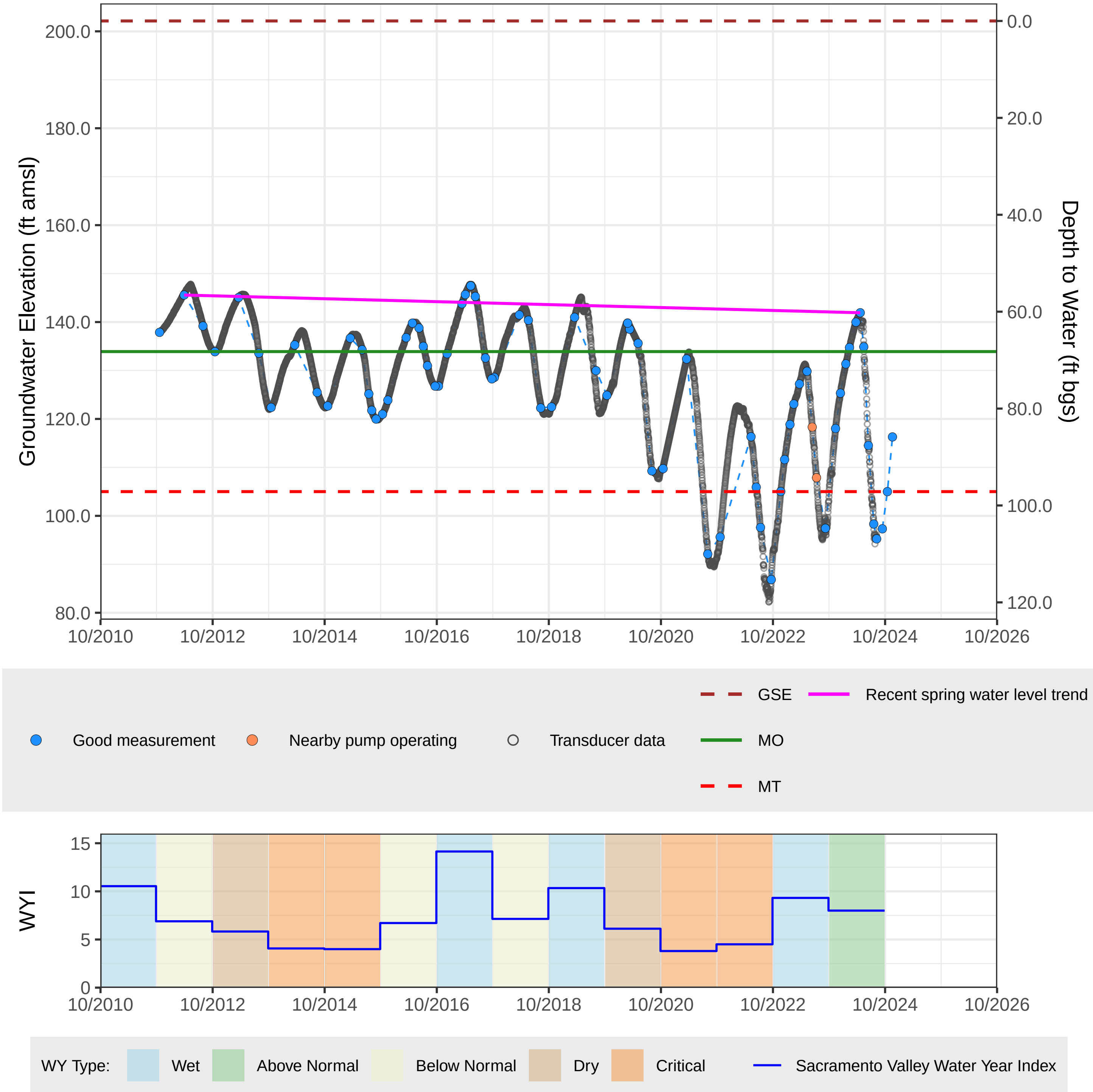
(Deep Zone) Well Depth: 580 ft. Perforation top & bottom: 550 − 570 ft bgs



MO GWE: 133.9 ft amsl
MT GWE: 105 ft amsl

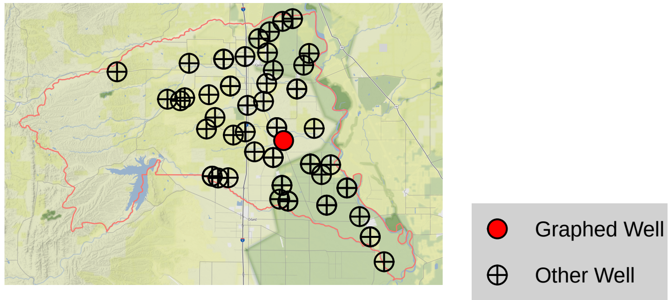
Area: Within Special Zone
(Reference: GSP, 2024)

Statistics of spring water levels for past 12 years (2012 to 2024):
Change = −3.65 ft
Avg. rate of change = −0.3 ft/yr
Avg. water level = 139.31 ft amsl



Corning Subbasin – State Well Number (SWN) 23N03W24A003M

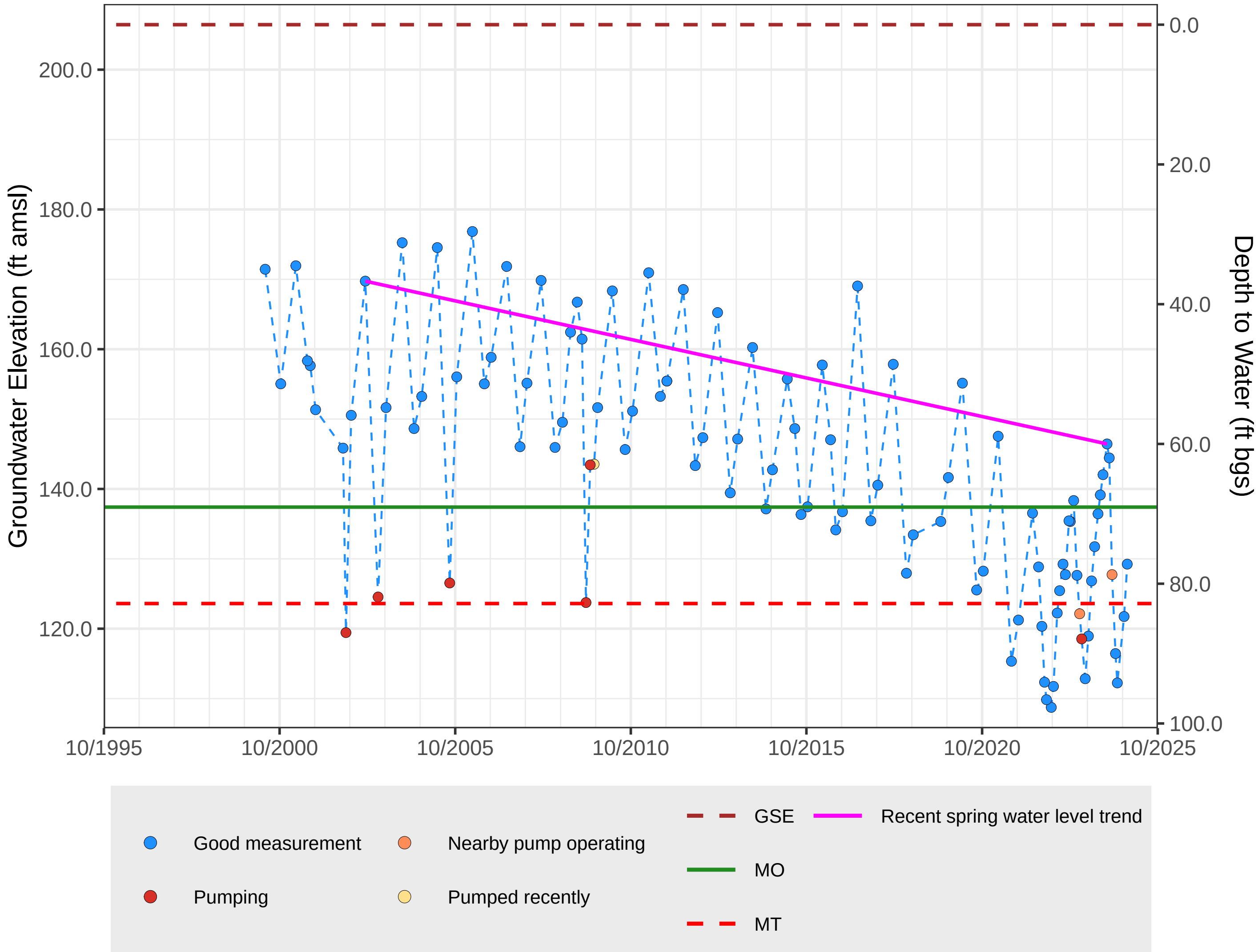
(Shallow Zone) Well Depth: 199 ft. Perforation top & bottom: 180 − 199 ft bgs

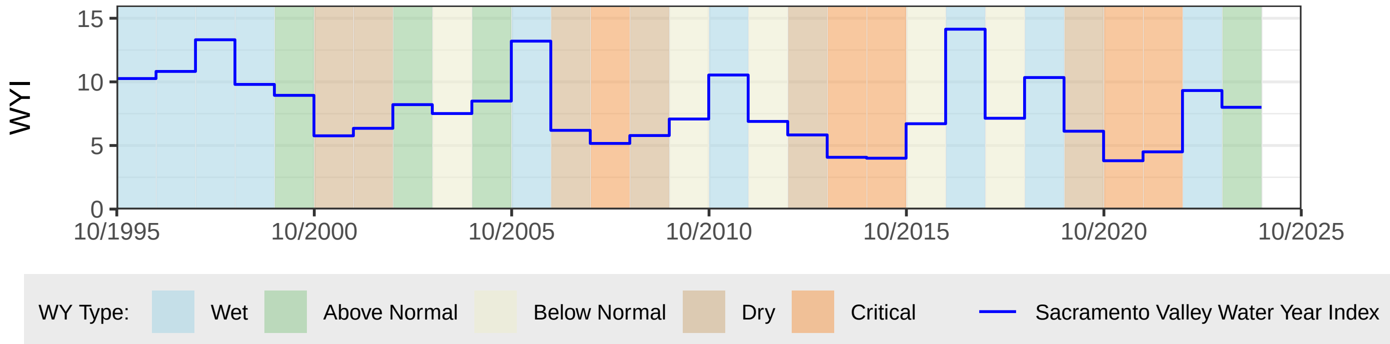


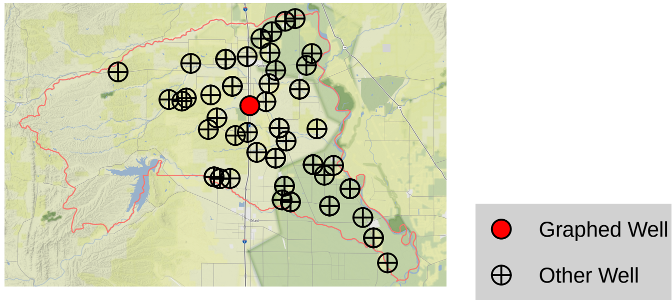
MO GWE: 137.4 ft amsl
MT GWE: 123.6 ft amsl

Area: Within Special Zone
(Reference: GSP, 2024)

Statistics of spring water levels for past 21 years (2003 to 2024):
Change = −23.3 ft
Avg. rate of change = −1.11 ft/yr
Avg. water level = 162.34 ft amsl







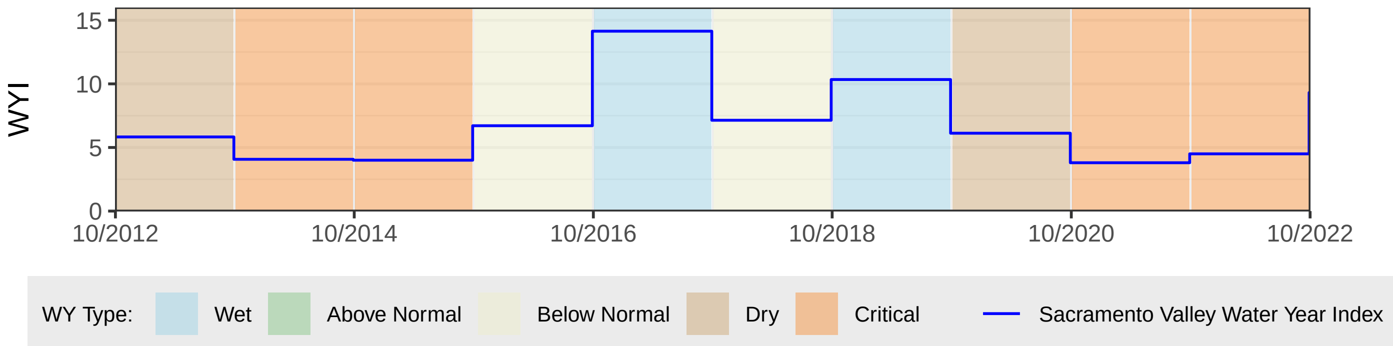
MO GWE: 194 ft amsl
MT GWE: 185.4 ft amsl

Area: Within Special Zone
(Reference: GSP, 2024)

Statistics of spring water levels for past 5 years (2015 to 2020):
Change = −4.05 ft
Avg. rate of change = −0.81 ft/yr
Avg. water level = 213.8 ft amsl

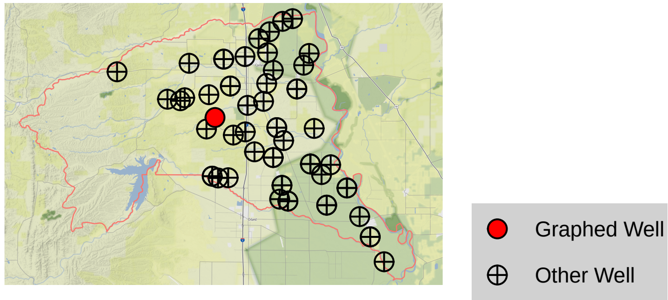
Corning Subbasin – State Well Number (SWN) 23N03W04H001M

(Shallow Zone) Well Depth: 270 ft. Perforation top & bottom: 200 – 260 ft bgs



Corning Subbasin − State Well Number (SWN) 23N03W07F001M

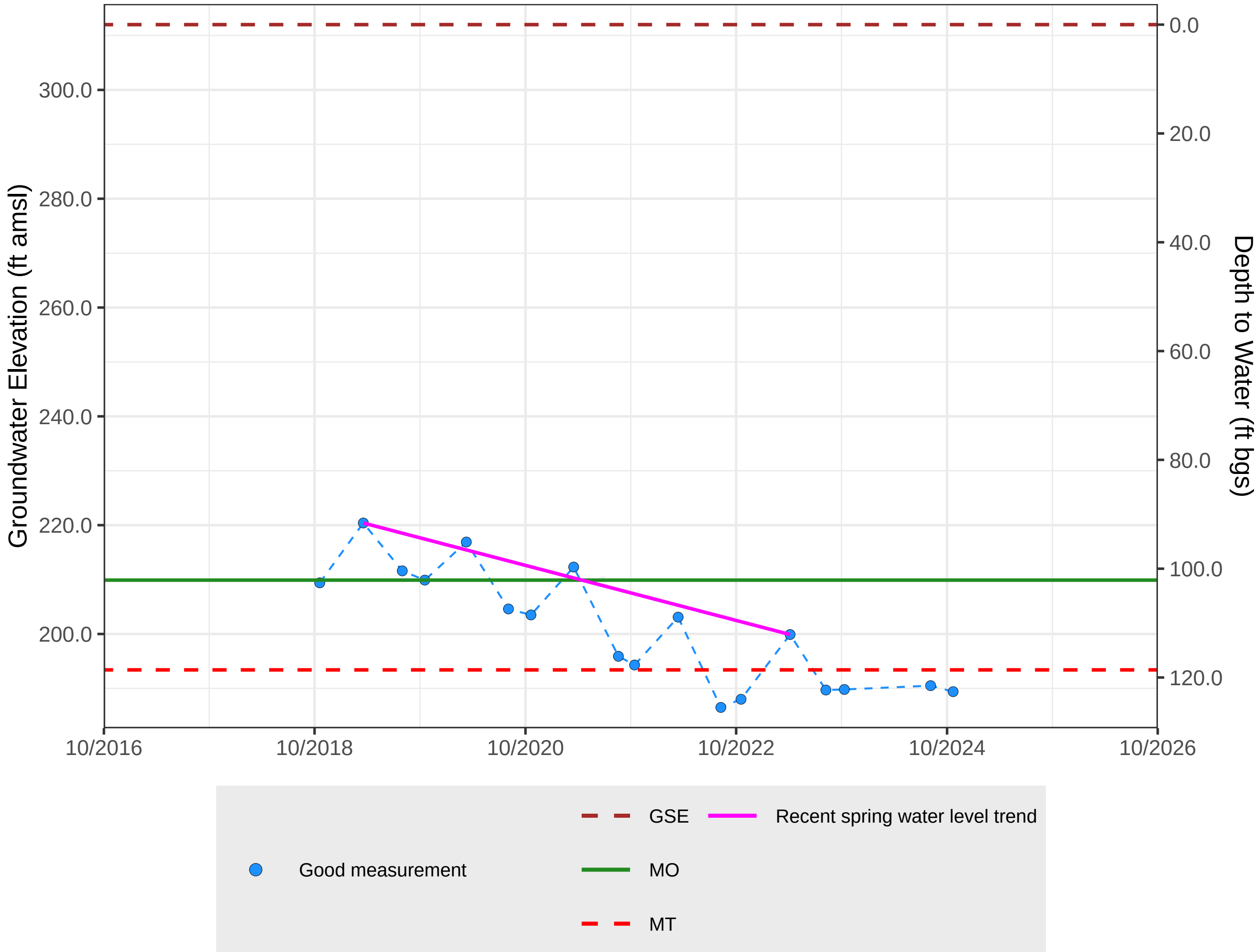
(Deep Zone) Well Depth: 790 ft. Perforation top & bottom: 240 − 790 ft bgs

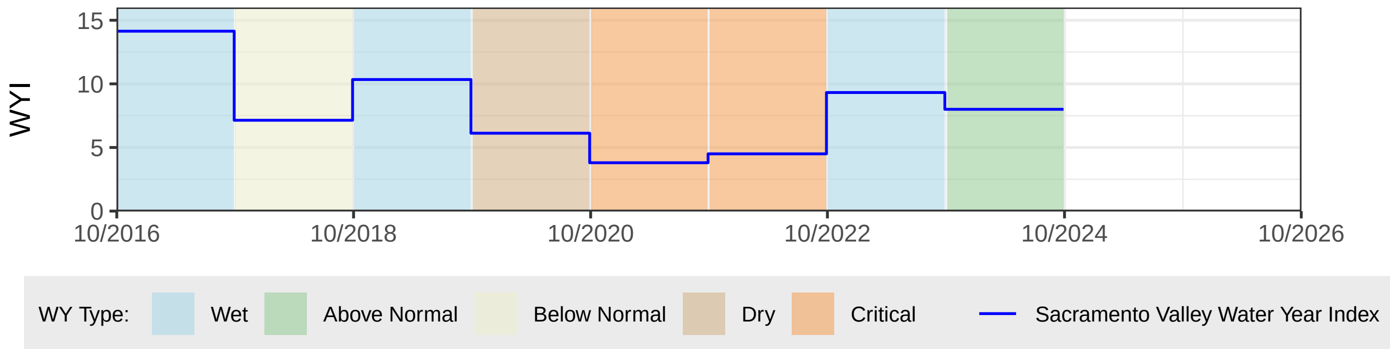


MO GWE: 209.9 ft amsl
MT GWE: 193.4 ft amsl

Area: Within Special Zone
(Reference: GSP, 2024)

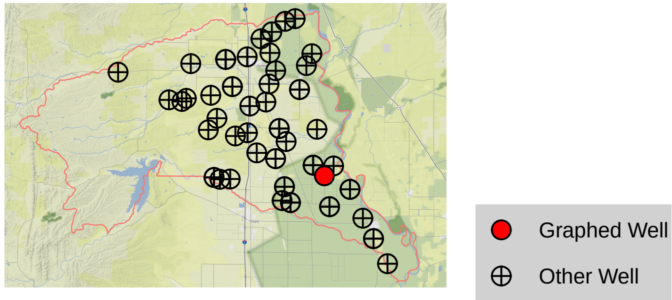
Statistics of spring water levels for past 4 years (2019 to 2023):
Change = −20.5 ft
Avg. rate of change = −5.12 ft/yr
Avg. water level = 210.52 ft amsl





Corning Subbasin − State Well Number (SWN) 23N02W34N001M

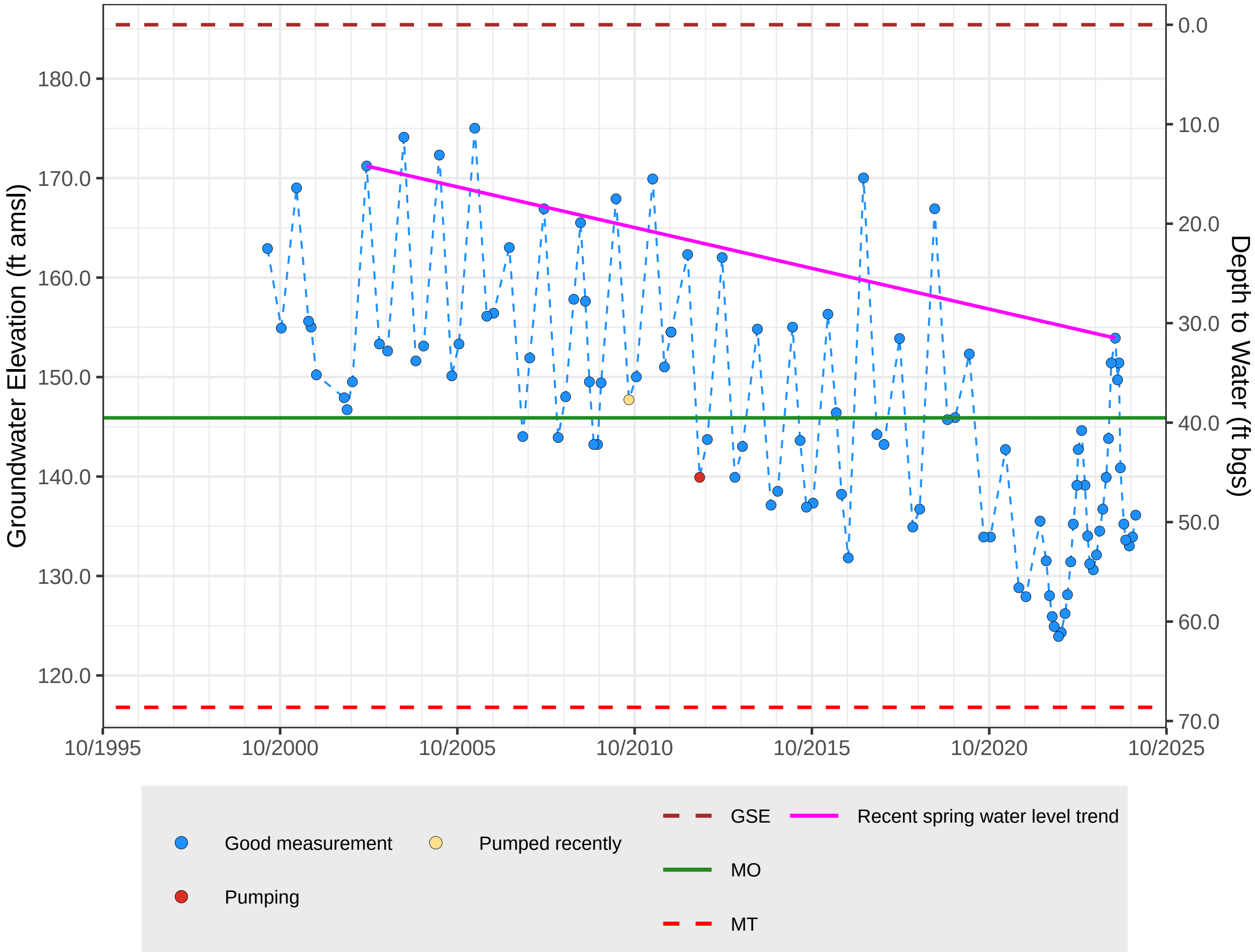
(Shallow Zone) Well Depth: 100 ft. Perforation top & bottom: 70 − 100 ft bgs

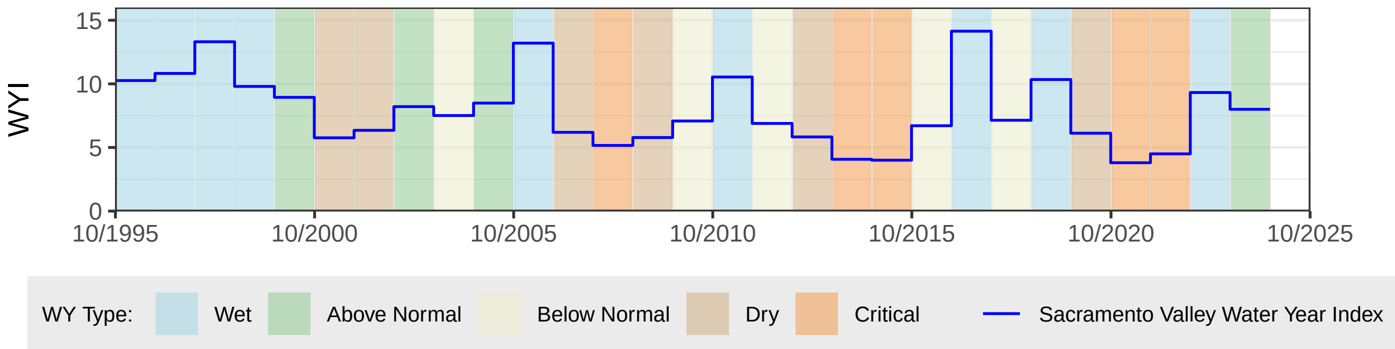


MO GWE: 145.9 ft amsl
MT GWE: 116.8 ft amsl

Area: Within Special Zone
(Reference: GSP, 2024)

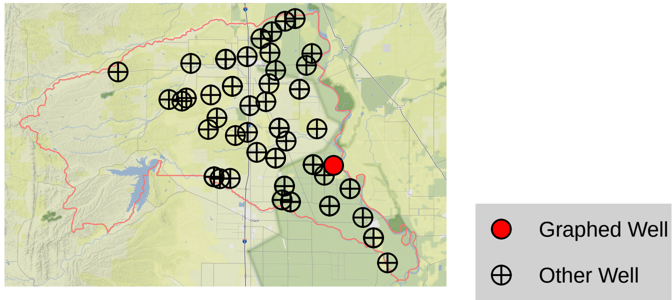
Statistics of spring water levels for past 21 years (2003 to 2024):
Change = −17.3 ft
Avg. rate of change = −0.82 ft/yr
Avg. water level = 161.02 ft amsl





Corning Subbasin − State Well Number (SWN) 23N02W34A003M

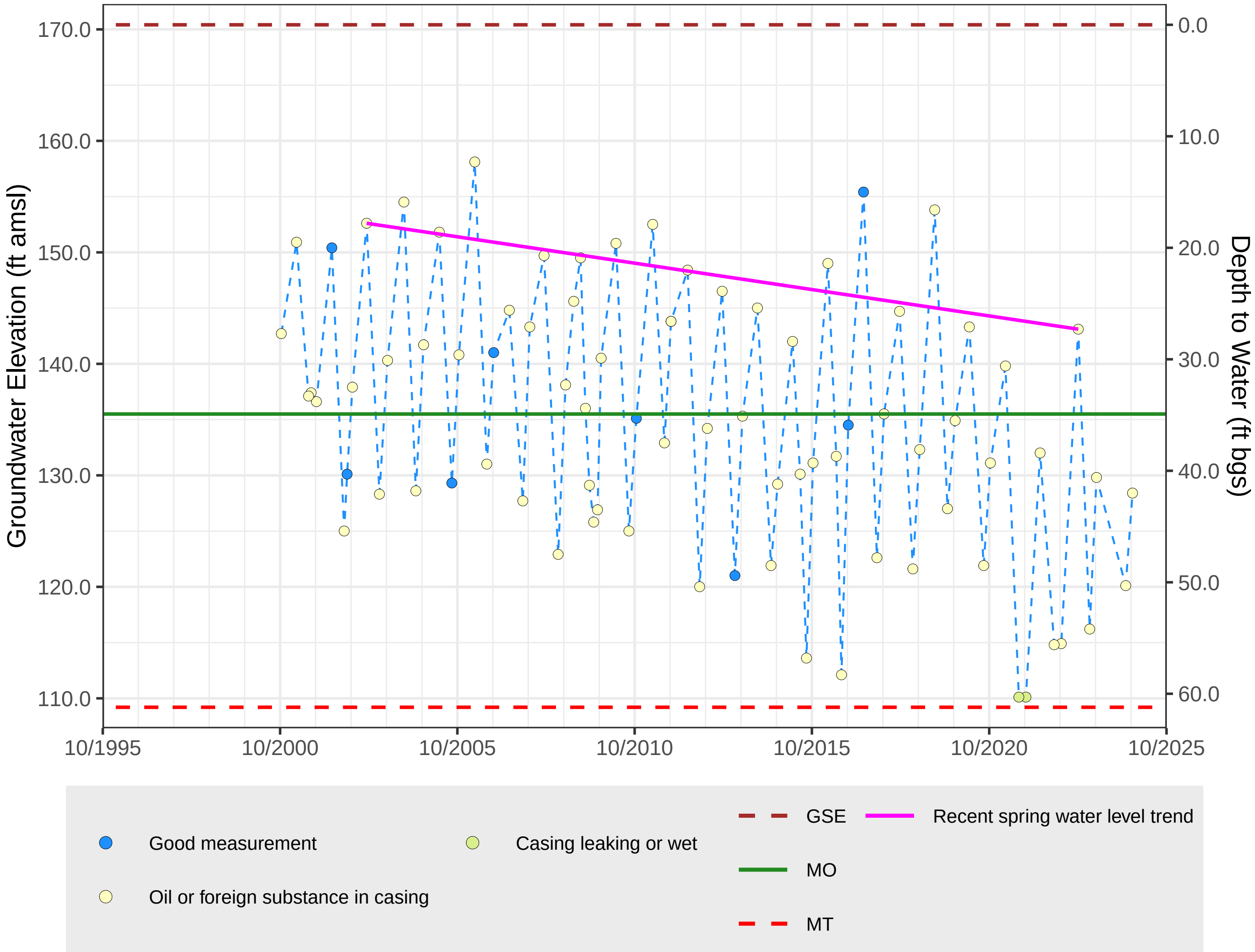
(Shallow Zone) Well Depth: 125 ft. Perforation top & bottom: 104 − 124 ft bgs

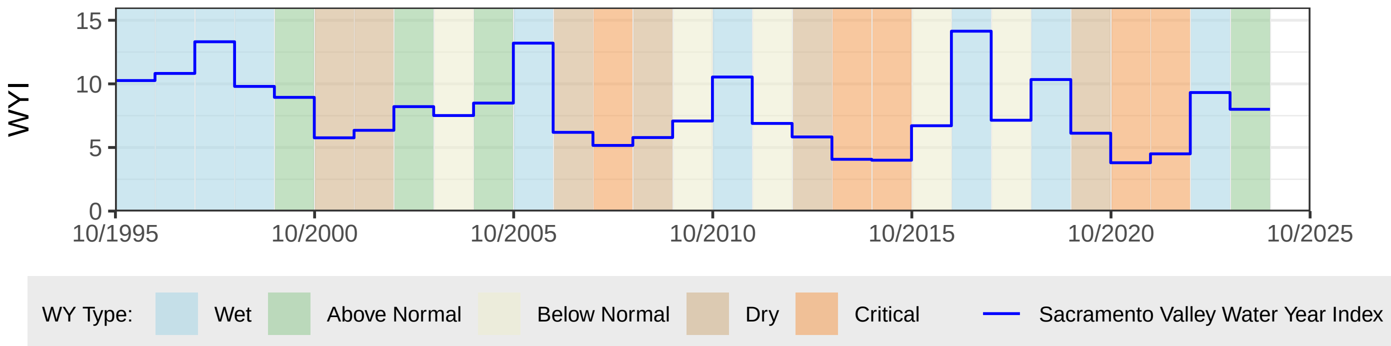


MO GWE: 135.5 ft amsl
MT GWE: 109.2 ft amsl

Area: Outside of Special Zone
(Reference: GSP, 2024)

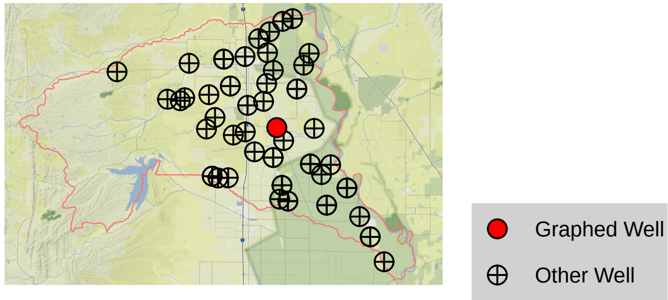
Statistics of spring water levels for past 20 years (2003 to 2023):
Change = −9.5 ft
Avg. rate of change = −0.48 ft/yr
Avg. water level = 148.21 ft amsl





Corning Subbasin − State Well Number (SWN) 23N03W13C004M

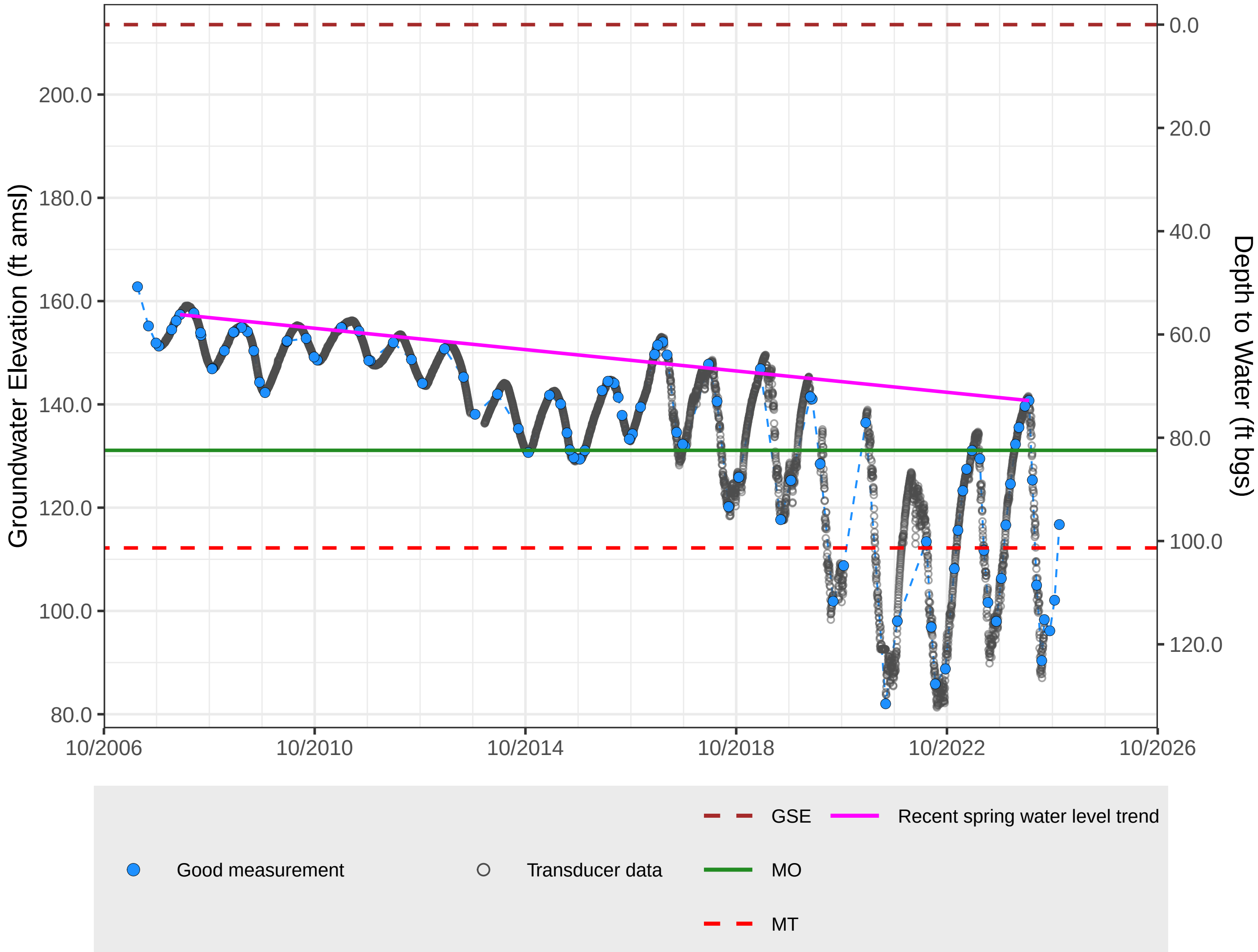
(Deep Zone) Well Depth: 835 ft. Perforation top & bottom: 815 − 825 ft bgs

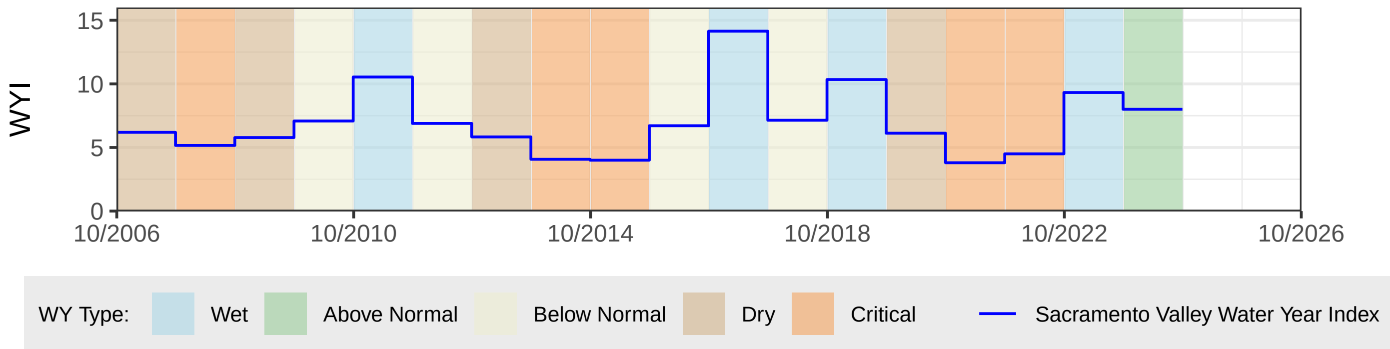


MO GWE: 131.1 ft amsl
MT GWE: 112.2 ft amsl

Area: Within Special Zone
(Reference: GSP, 2024)

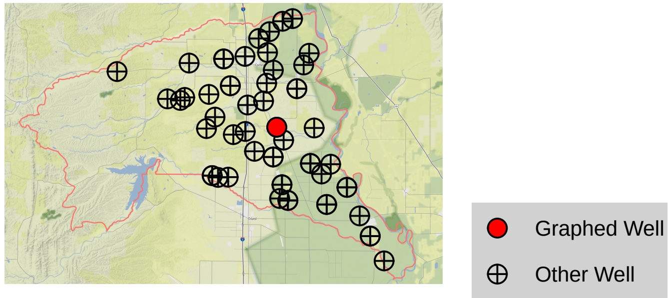
Statistics of spring water levels for past 16 years (2008 to 2024):
Change = −16.65 ft
Avg. rate of change = −1.04 ft/yr
Avg. water level = 146.59 ft amsl





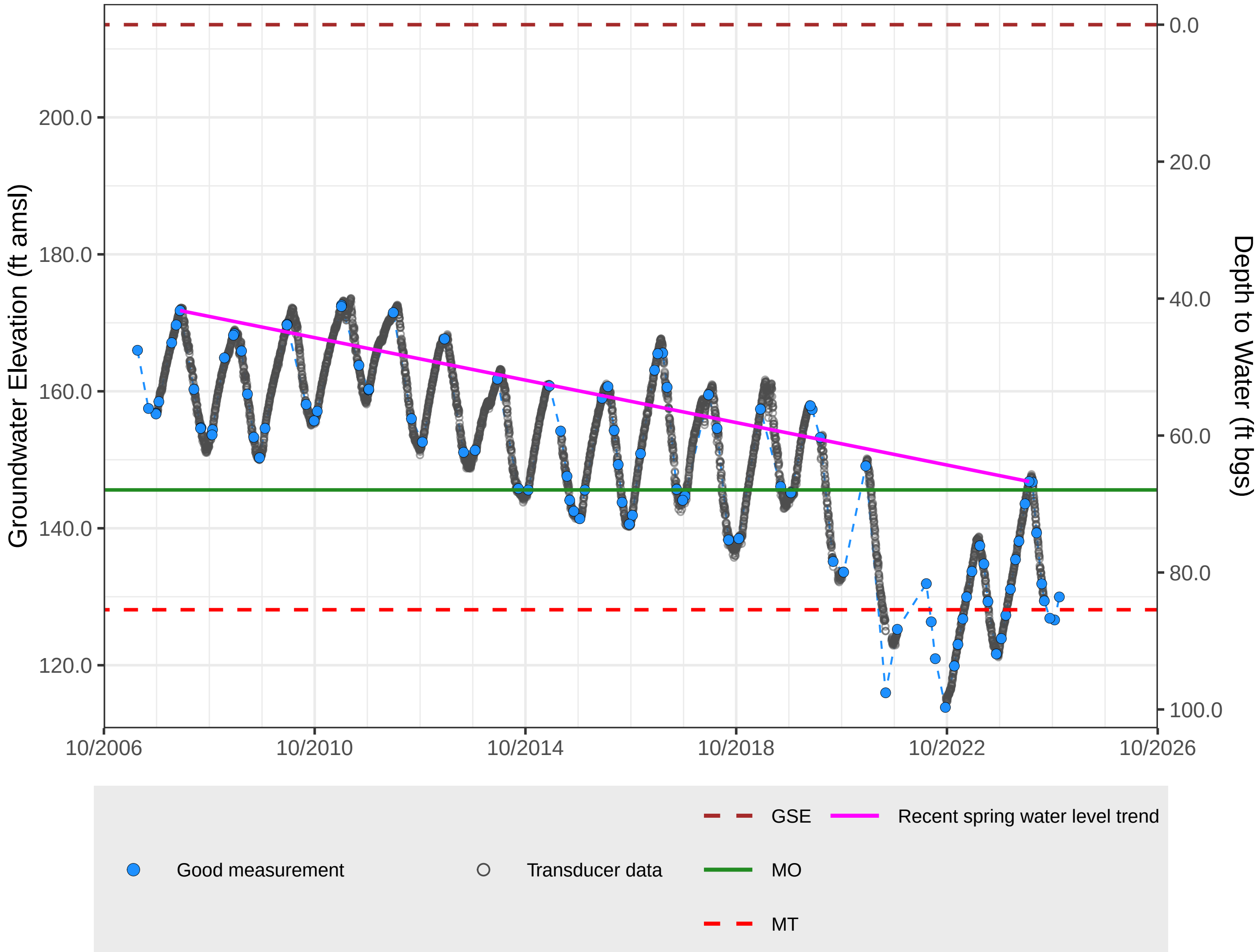
Corning Subbasin − State Well Number (SWN) 23N03W13C006M

(Shallow Zone) Well Depth: 182 ft. Perforation top & bottom: 95 − 135 ft bgs

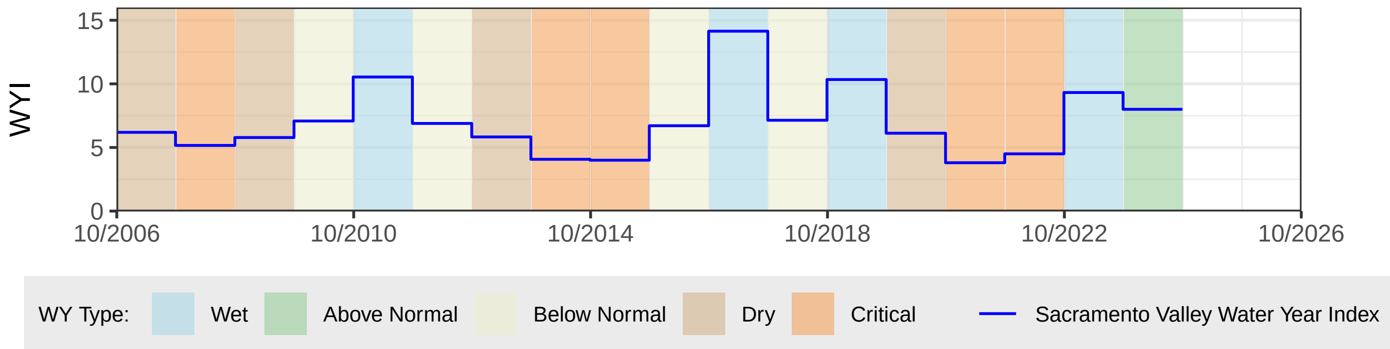


MO GWE: 145.6 ft amsl
MT GWE: 128.1 ft amsl

Area: Within Special Zone
(Reference: GSP, 2024)

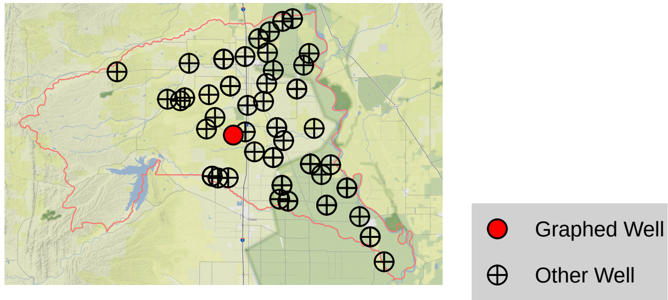


Statistics of spring water levels for past 16 years (2008 to 2024):
Change = −24.97 ft
Avg. rate of change = −1.56 ft/yr
Avg. water level = 160.93 ft amsl



Corning Subbasin − State Well Number (SWN) 23N03W17R001M

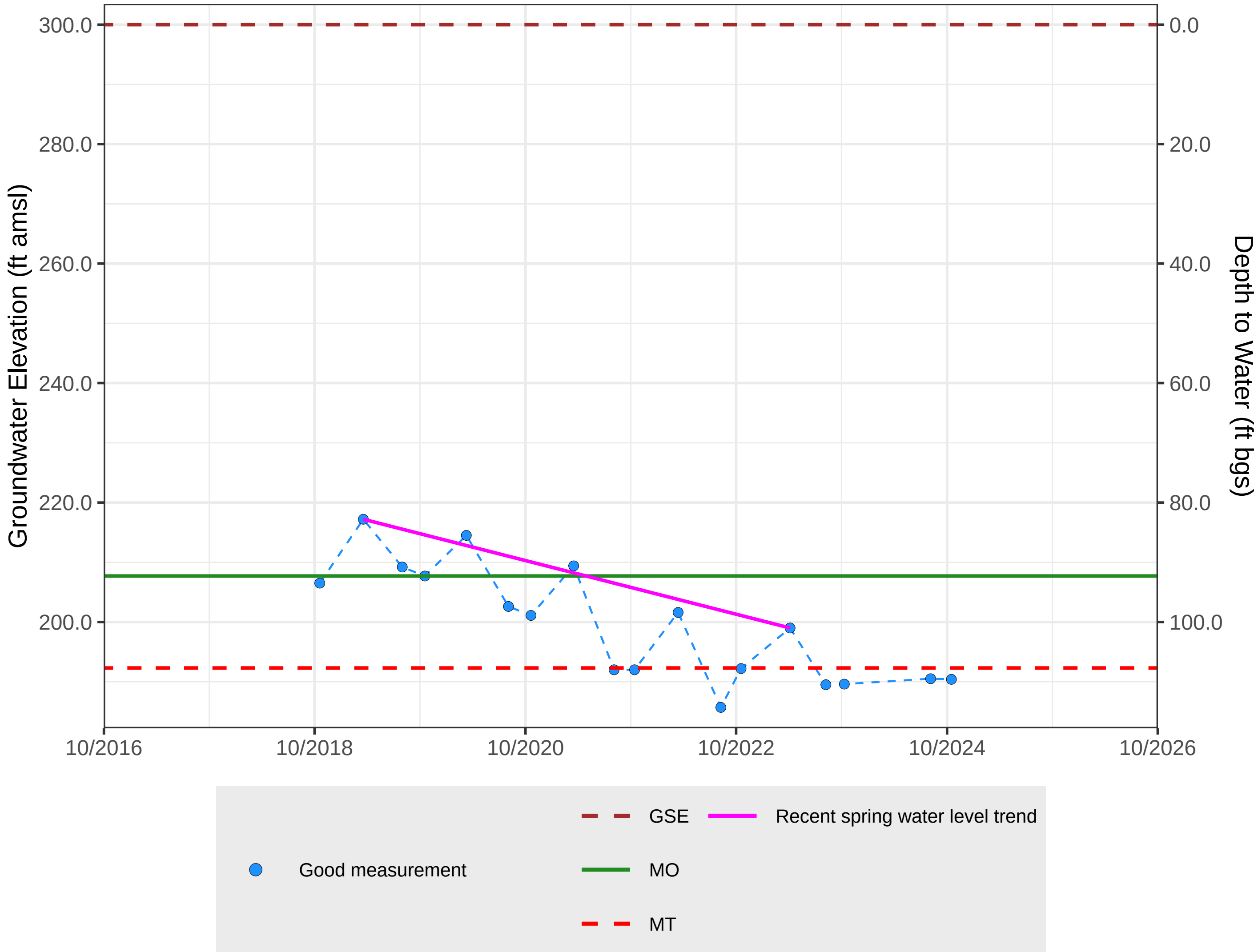
(Deep Zone) Well Depth: 720 ft. Perforation top & bottom: 360 − 720 ft bgs

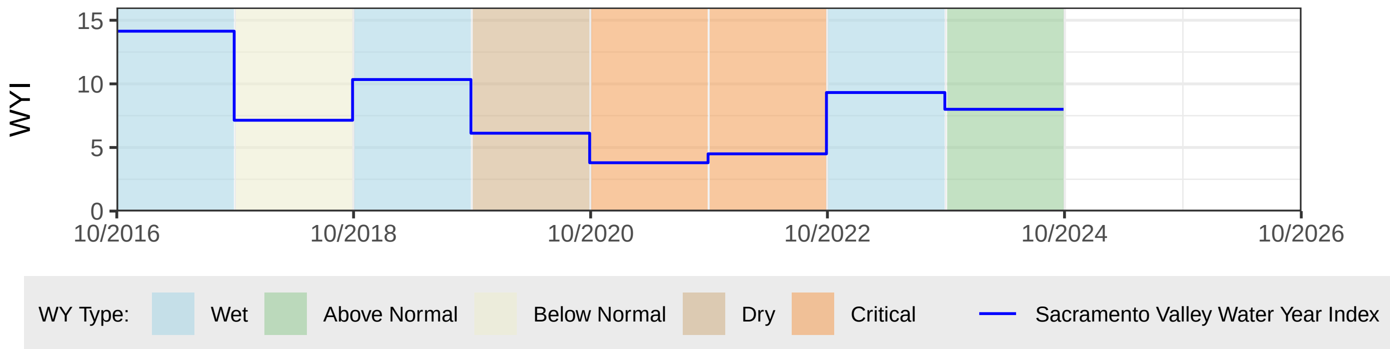


MO GWE: 207.7 ft amsl
MT GWE: 192.3 ft amsl

Area: Within Special Zone
(Reference: GSP, 2024)

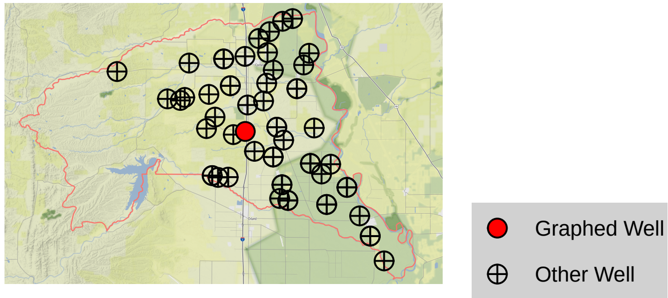
Statistics of spring water levels for past 4 years (2019 to 2023):
Change = −18.2 ft
Avg. rate of change = −4.55 ft/yr
Avg. water level = 208.34 ft amsl





Corning Subbasin − State Well Number (SWN) 23N03W16H001M

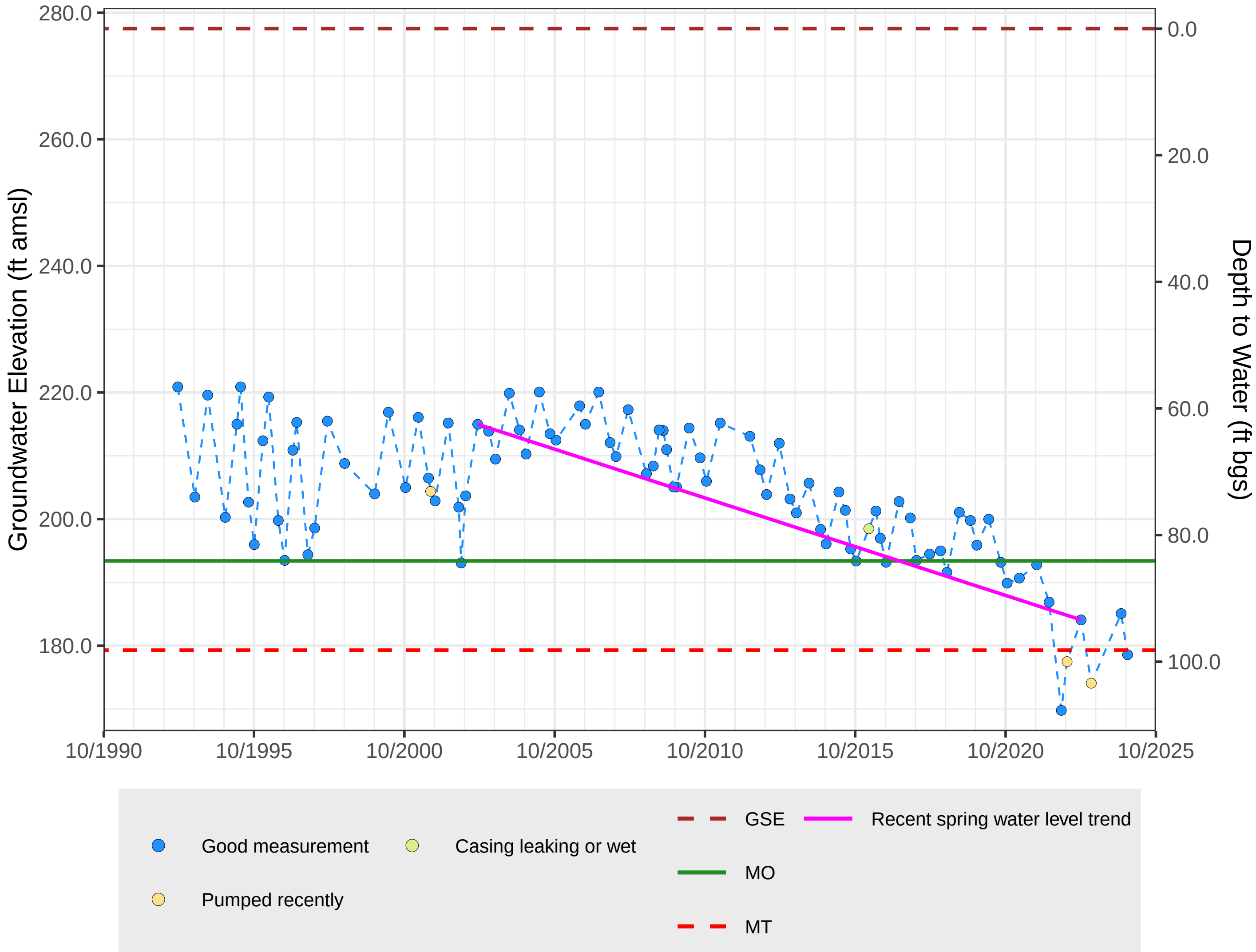
(Shallow Zone)   Well Depth: 150 ft. Perforation top & bottom: 144 − 150 ft bgs

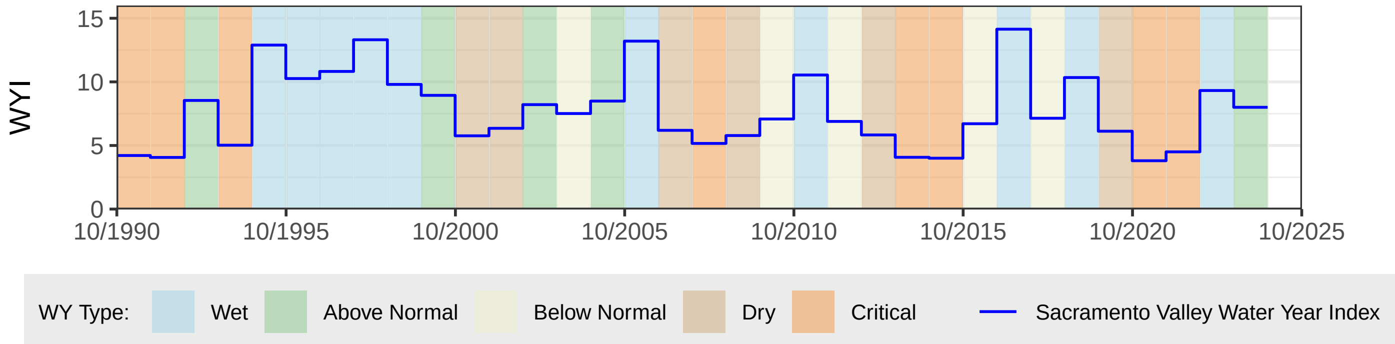


MO GWE: 193.4 ft amsl
MT GWE: 179.3 ft amsl

Area: Within Special Zone
(Reference: GSP, 2024)

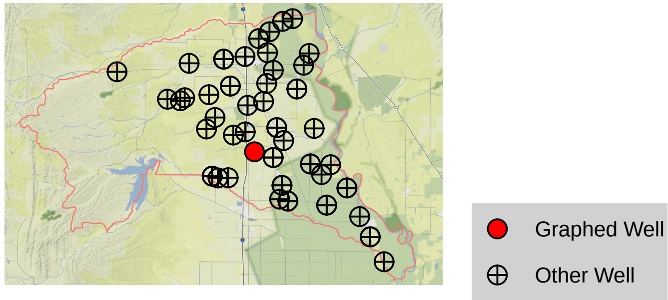
Statistics of spring water levels for past 20 years (2003 to 2023):
Change = −30.9 ft
Avg. rate of change = −1.54 ft/yr
Avg. water level = 209.96 ft amsl





Corning Subbasin − State Well Number (SWN) 23N03W22Q001M

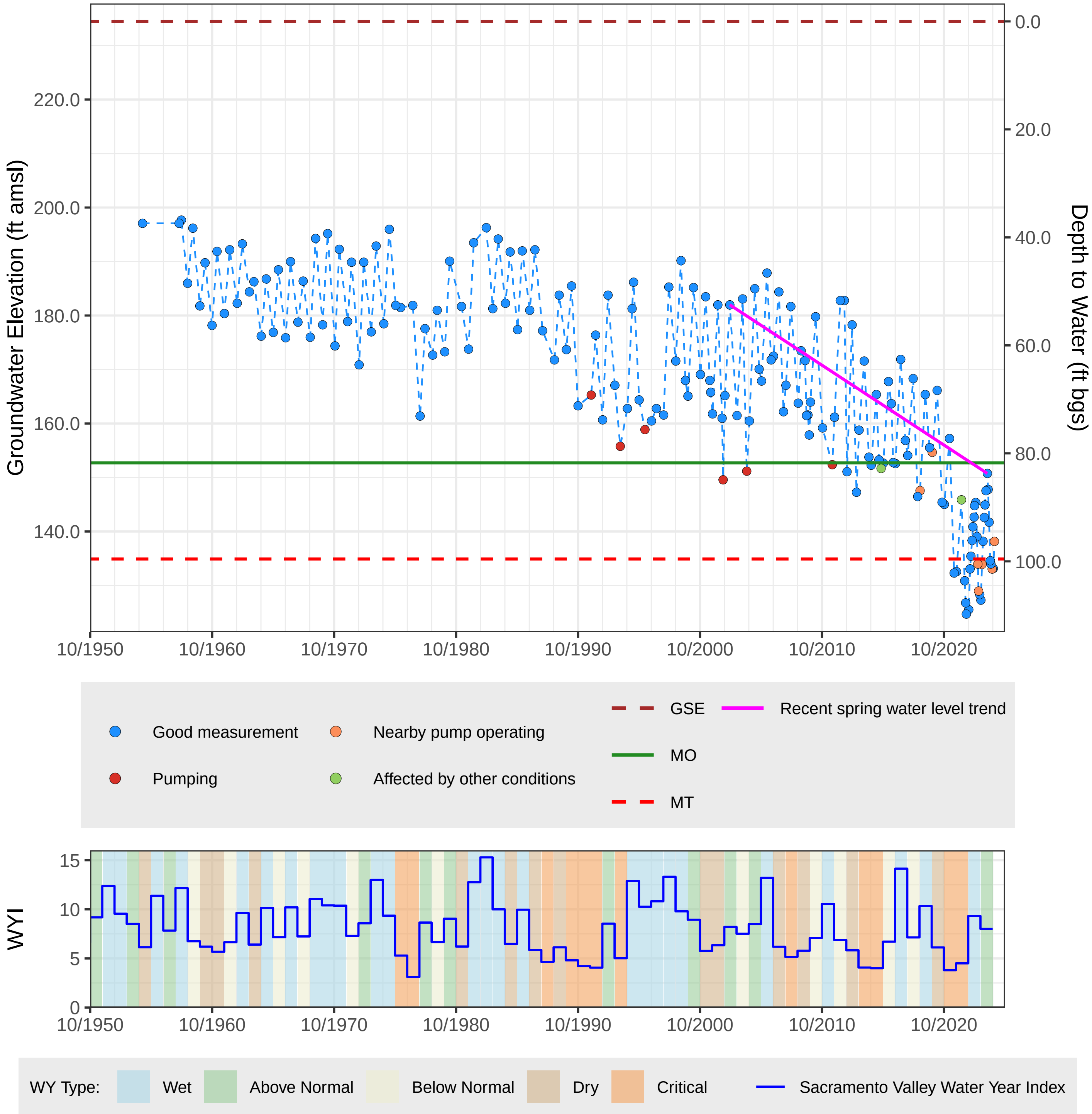
(Shallow Zone)   Well Depth: 380 ft. Perforation top & bottom: Unknown



MO GWE: 152.7 ft amsl
MT GWE: 134.9 ft amsl

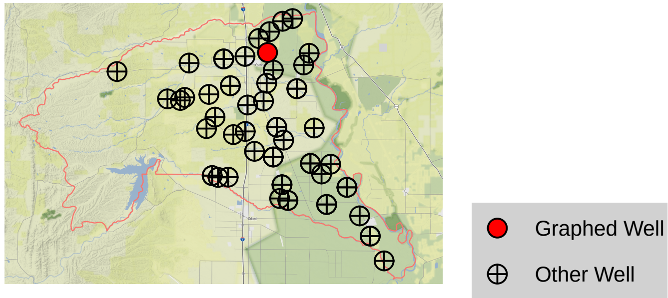
Area: Within Special Zone
(Reference: GSP, 2024)

Statistics of spring water levels for past 21 years (2003 to 2024):
Change = −31.22 ft
Avg. rate of change = −1.49 ft/yr
Avg. water level = 182.49 ft amsl



Corning Subbasin – State Well Number (SWN) 24N03W14B001M

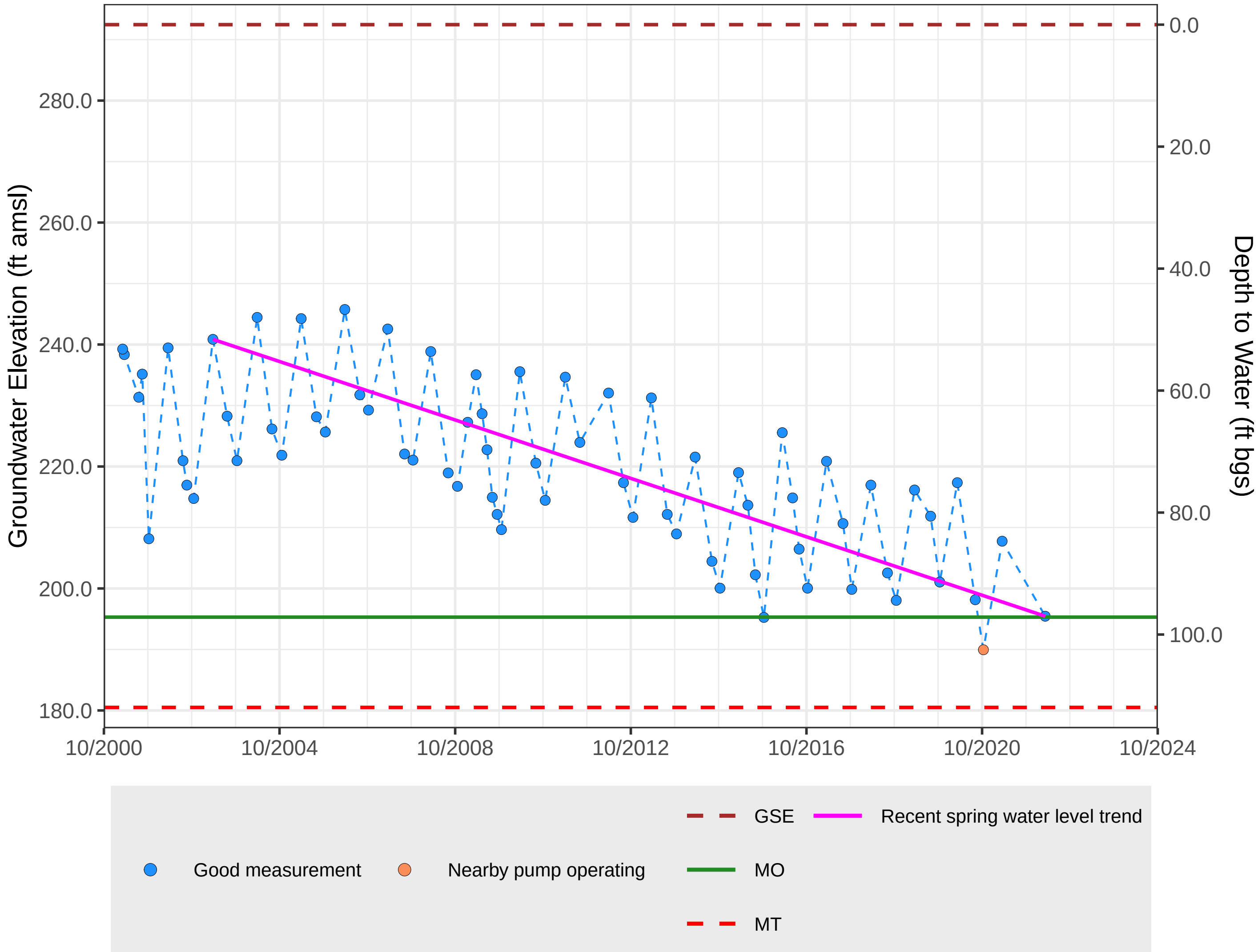
(Shallow Zone) Well Depth: 140 ft. Perforation top & bottom: 130 − 140 ft bgs

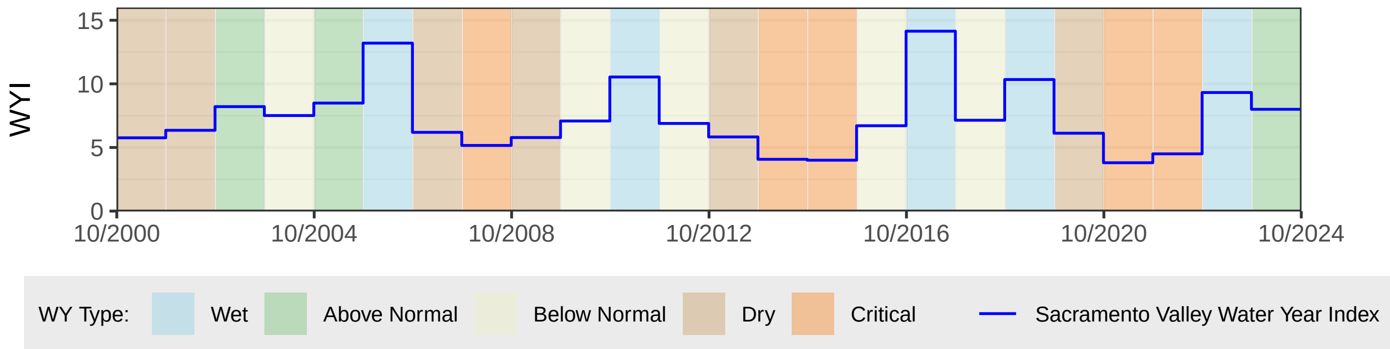


MO GWE: 195.3 ft amsl
MT GWE: 180.5 ft amsl

Area: Within Special Zone
(Reference: GSP, 2024)

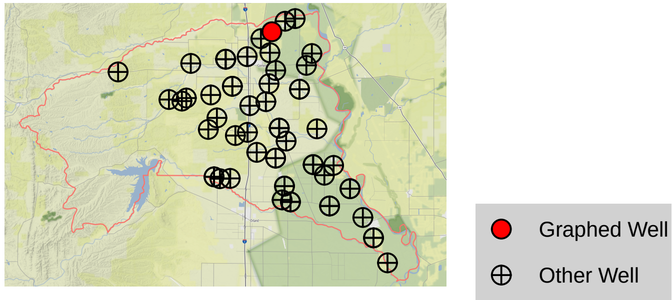
Statistics of spring water levels for past 19 years (2003 to 2022):
Change = −45.4 ft
Avg. rate of change = −2.39 ft/yr
Avg. water level = 229.3 ft amsl





Corning Subbasin – State Well Number (SWN) 24N03W02R001M

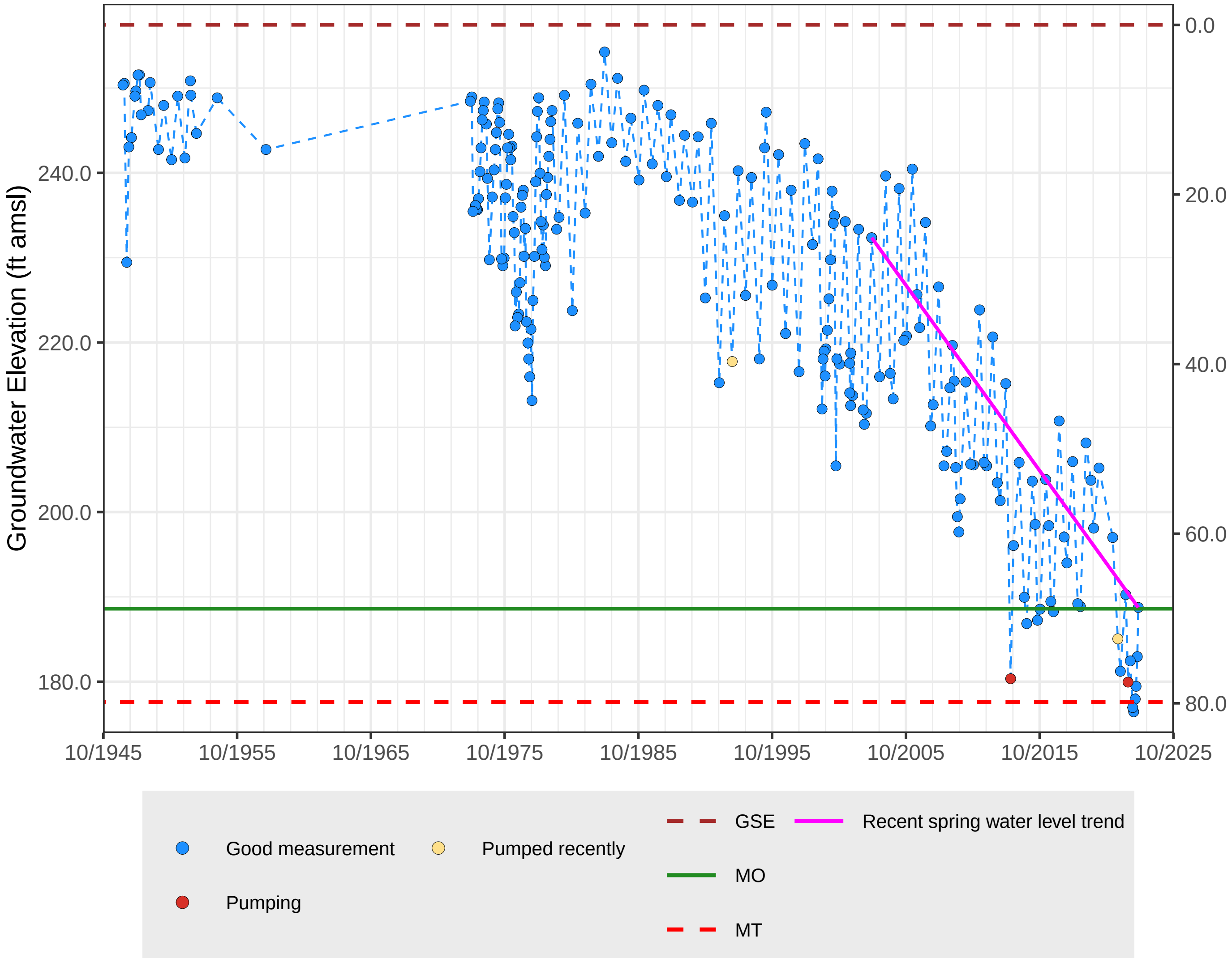
(Shallow Zone)   Well Depth: 270 ft. Perforation top & bottom: Unknown

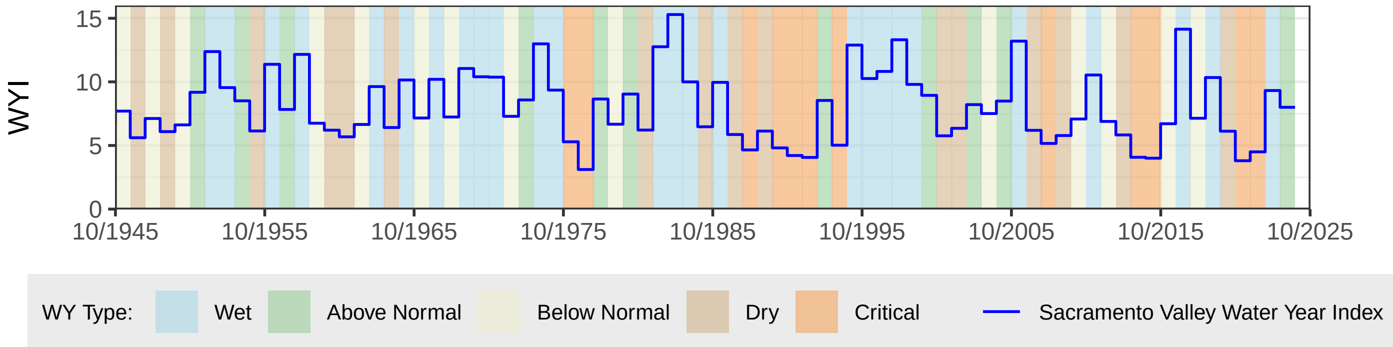


MO GWE: 188.6 ft amsl
MT GWE: 177.6 ft amsl

Area: Within Special Zone
(Reference: GSP, 2024)

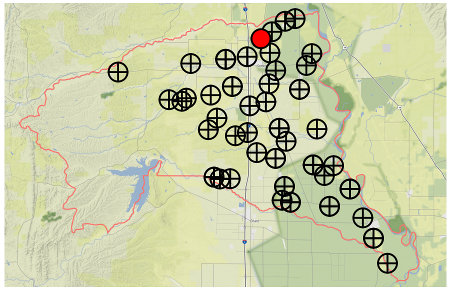
Statistics of spring water levels for past 20 years (2003 to 2023):
Change = −43.6 ft
Avg. rate of change = −2.18 ft/yr
Avg. water level = 234.59 ft amsl





Corning Subbasin − State Well Number (SWN) 24N03W03R002M

(Shallow Zone)   Well Depth: 132 ft. Perforation top & bottom: 112 − 132 ft bgs

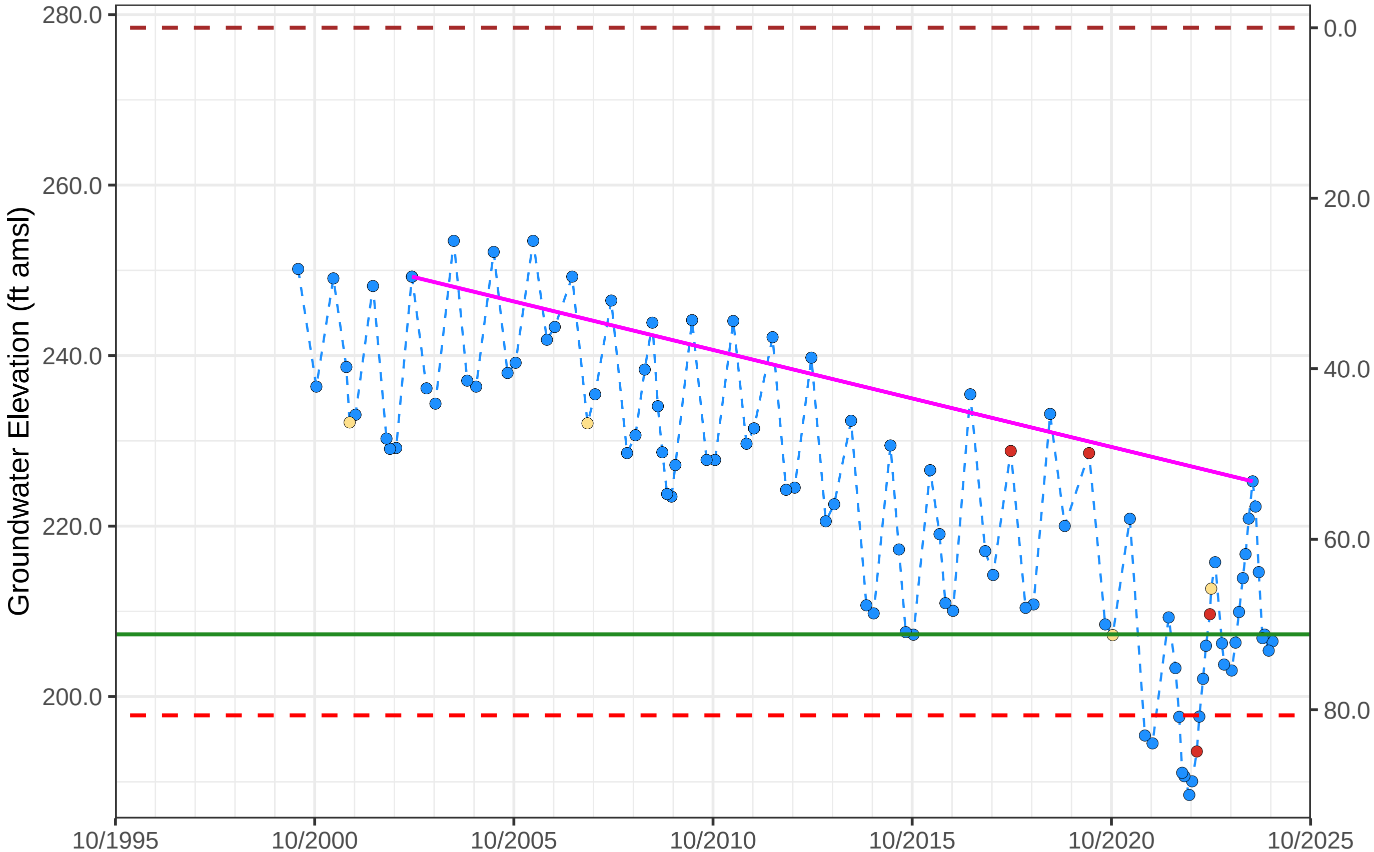


Graphed Well
Other Well

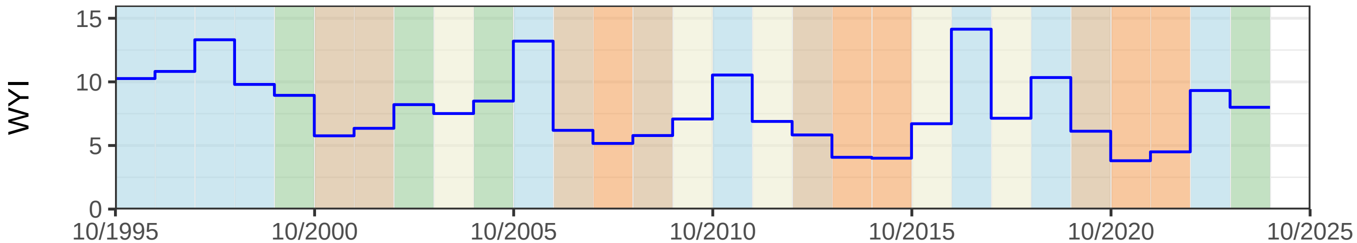
MO GWE: 207.3 ft amsl
MT GWE: 197.8 ft amsl

Area: Within Special Zone
(Reference: GSP, 2024)

Statistics of spring water levels for
past 21 years (2003 to 2024):
Change = −24.01 ft
Avg. rate of change = −1.14 ft/yr
Avg. water level = 237.89 ft amsl



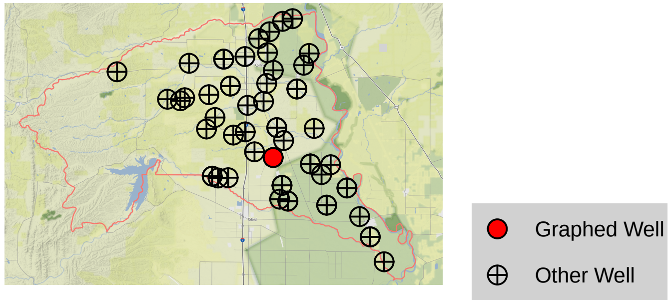
Good measurement
Pumped recently
Pumping
GSE
Recent spring water level trend
MO
MT



WY Type: Wet Above Normal Below Normal Dry Critical Sacramento Valley Water Year Index

Corning Subbasin − State Well Number (SWN) 23N03W25M004M

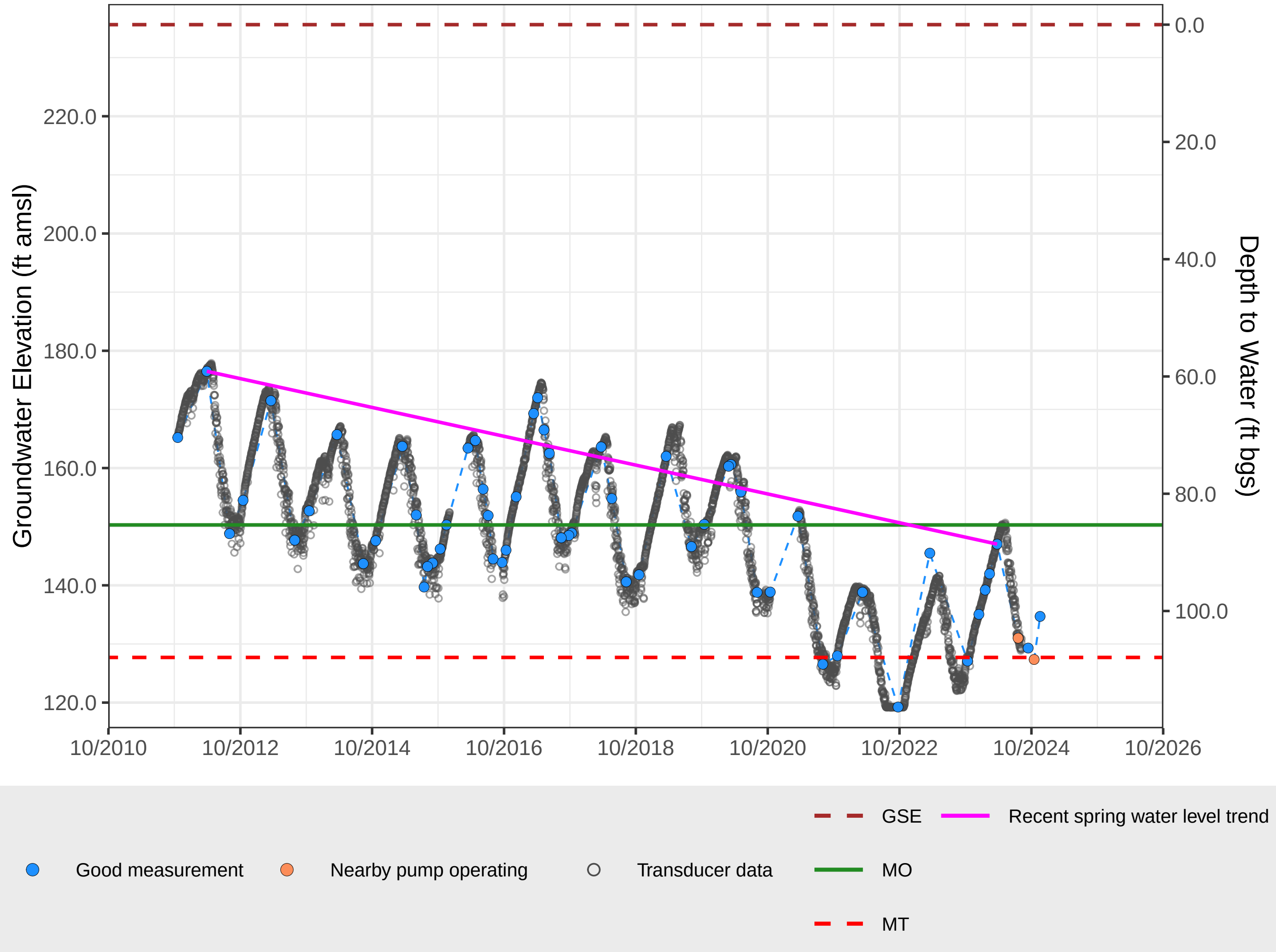
(Shallow Zone)   Well Depth: 155 ft. Perforation top & bottom: 120 − 130 ft bgs

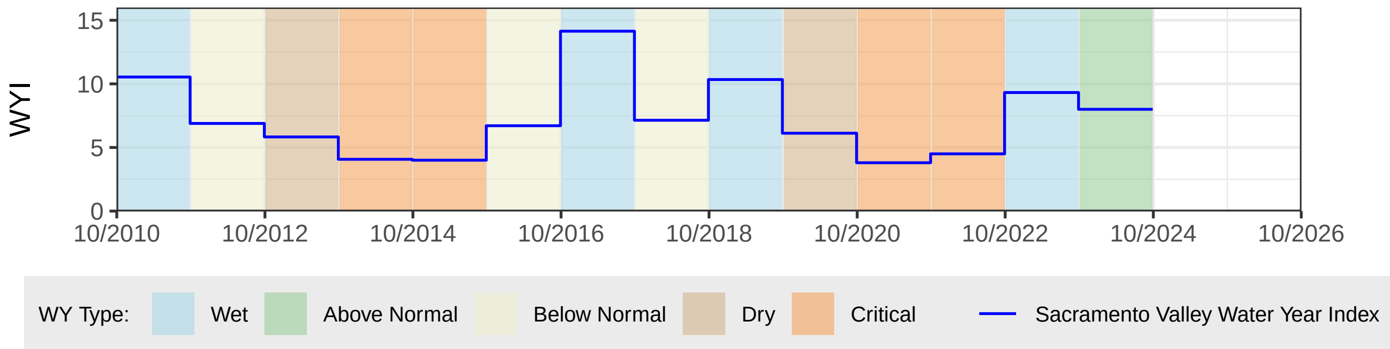


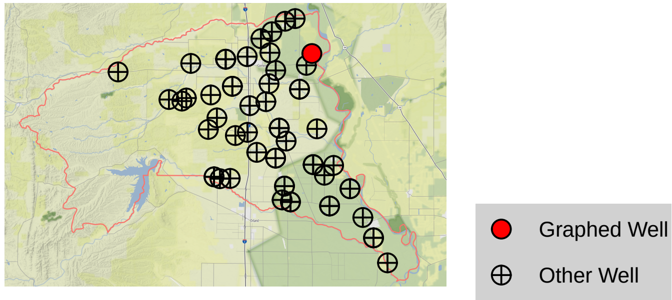
MO GWE: 150.3 ft amsl
MT GWE: 127.7 ft amsl

Area: Within Special Zone
(Reference: GSP, 2024)

Statistics of spring water levels for past 12 years (2012 to 2024):
Change = −29.47 ft
Avg. rate of change = −2.46 ft/yr
Avg. water level = 160.26 ft amsl







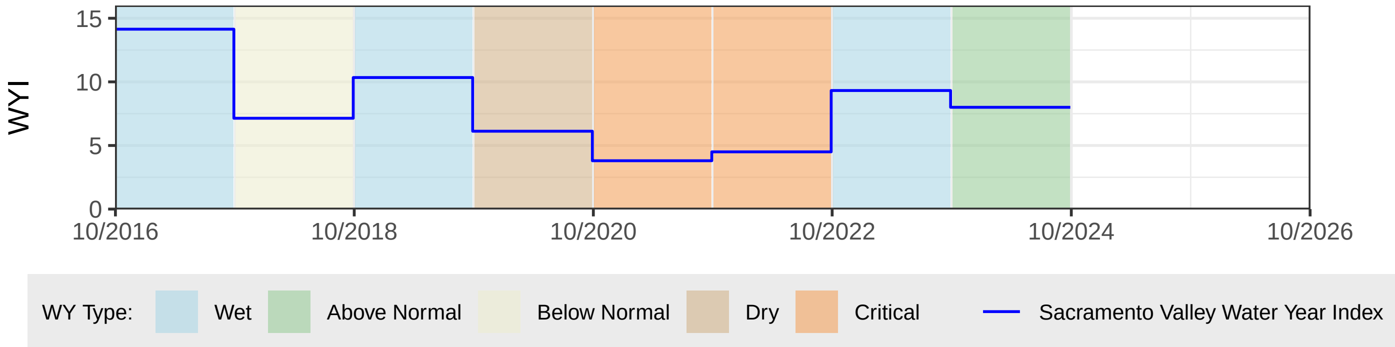
MO GWE: 170.9 ft amsl
MT GWE: 150.9 ft amsl

Area: Outside of Special Zone
(Reference: GSP, 2024)

Statistics of spring water levels for
past 4 years (2019 to 2023):
Change = −2.9 ft
Avg. rate of change = −0.73 ft/yr
Avg. water level = 177.83 ft amsl

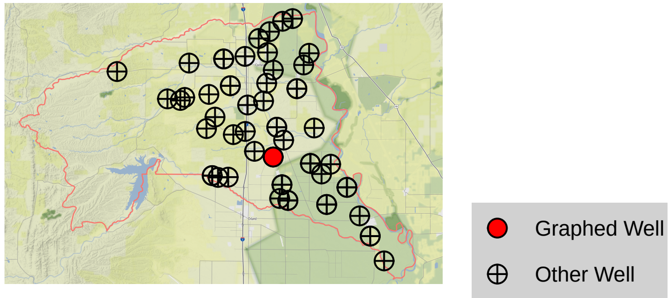
Corning Subbasin − State Well Number (SWN) 24N02W17A001M

(Shallow Zone) Well Depth: 140 ft. Perforation top & bottom: 120 − 140 ft bgs



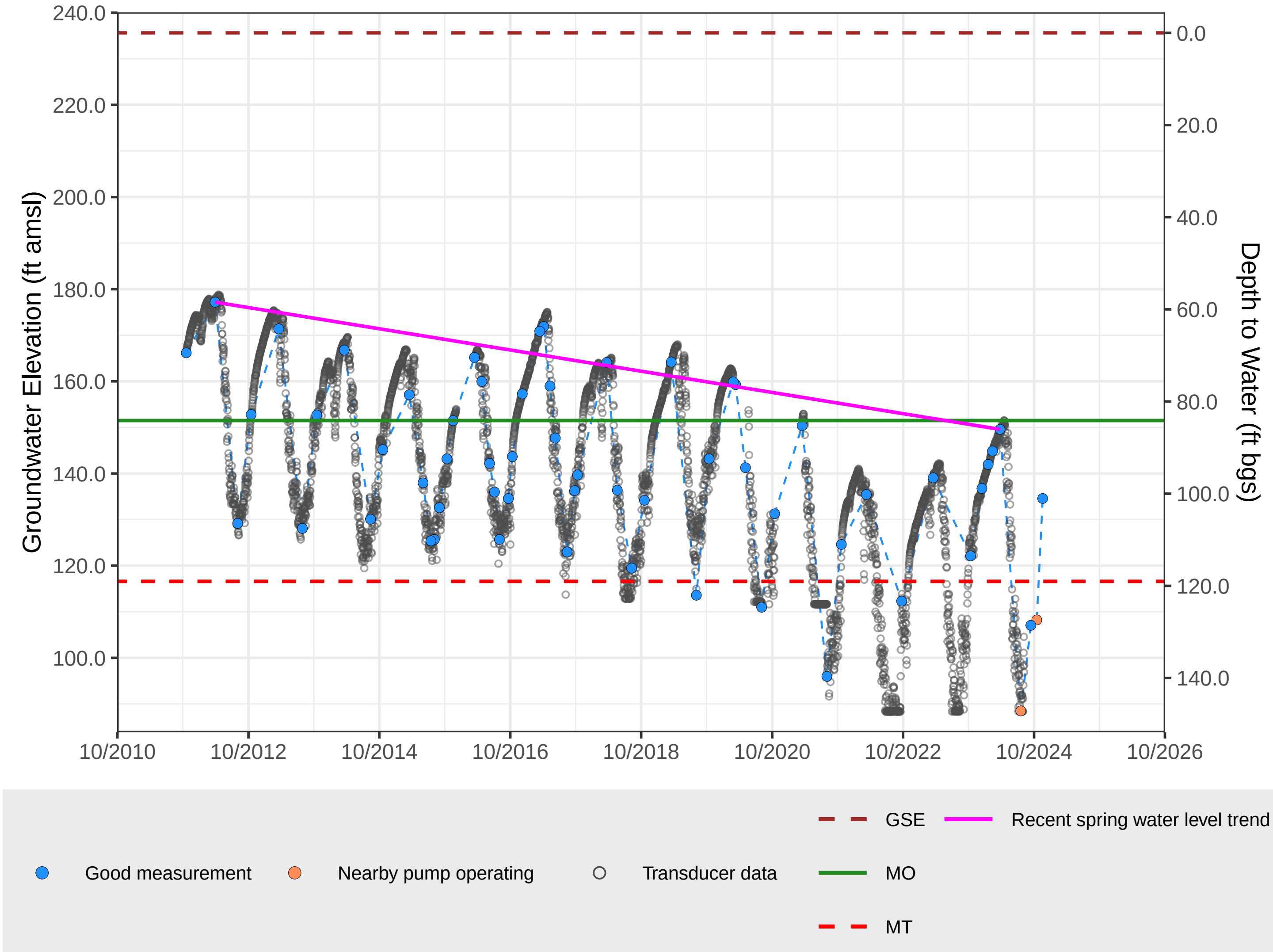
Corning Subbasin − State Well Number (SWN) 23N03W25M002M

(Deep Zone) Well Depth: 513 ft. Perforation top & bottom: 470 − 500 ft bgs

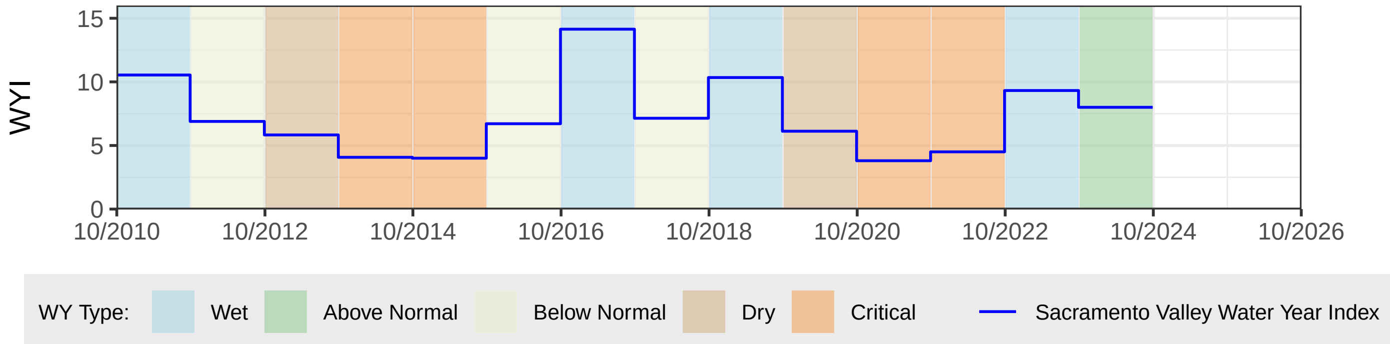


MO GWE: 151.5 ft amsl
MT GWE: 116.6 ft amsl

Area: Within Special Zone
(Reference: GSP, 2024)

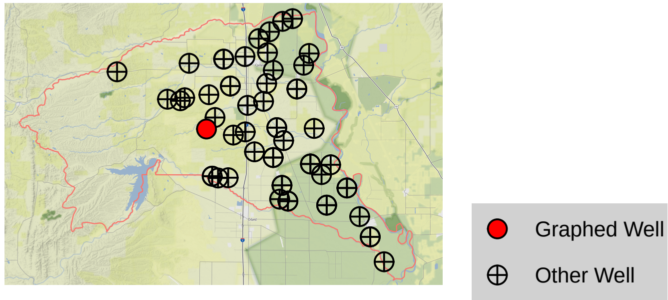


Statistics of spring water levels for
past 12 years (2012 to 2024):
Change = −27.6 ft
Avg. rate of change = −2.3 ft/yr
Avg. water level = 159.39 ft amsl



Corning Subbasin – State Well Number (SWN) 23N04W13G001M

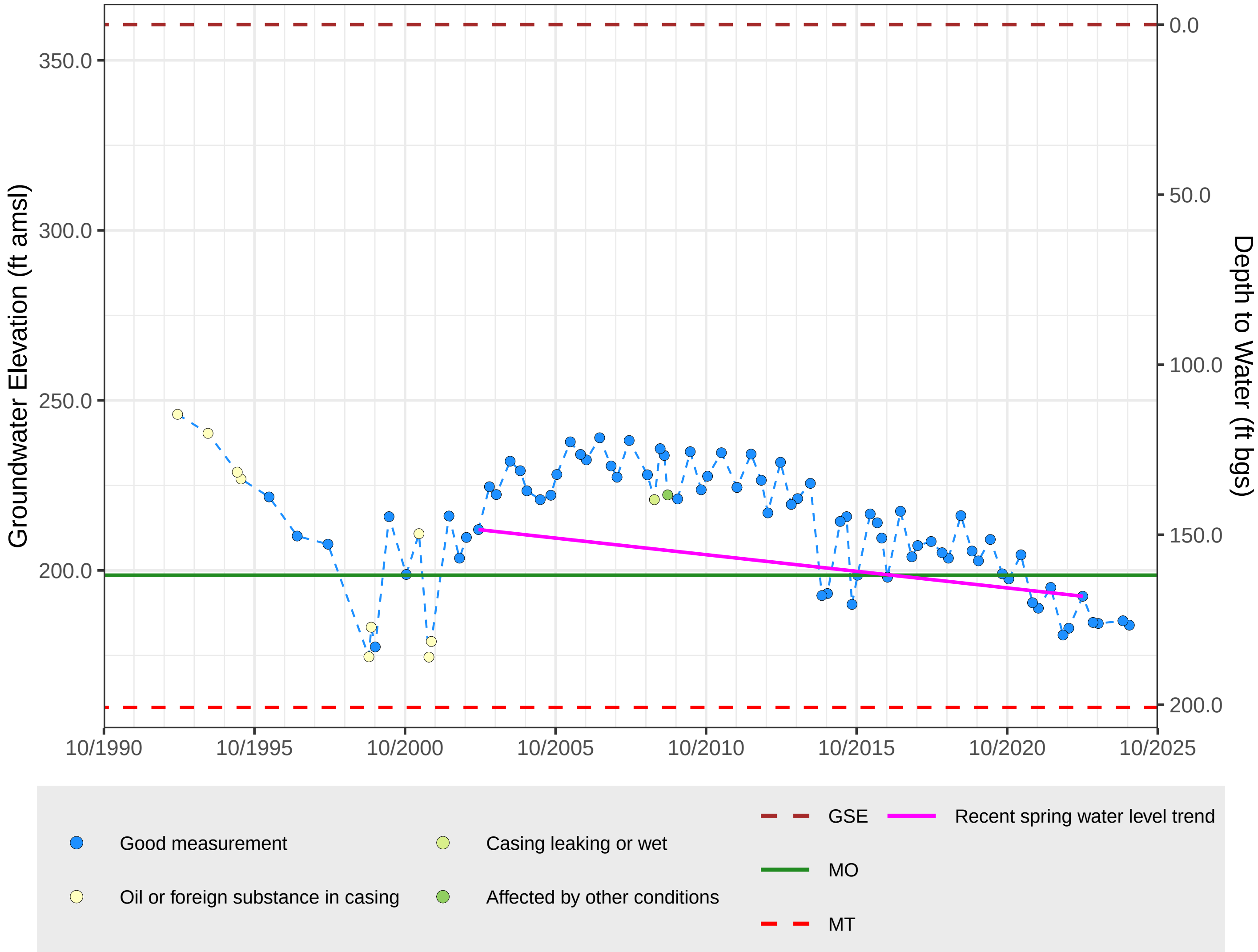
(Deep Zone)   Well Depth: 560 ft. Perforation top & bottom: Unknown

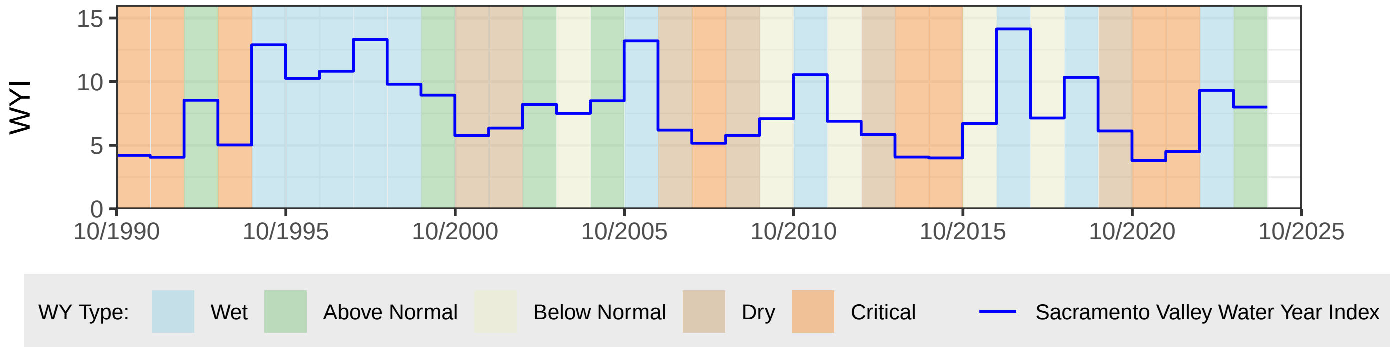


MO GWE: 198.6 ft amsl
MT GWE: 159.7 ft amsl

Area: Outside of Special Zone
(Reference: GSP, 2024)

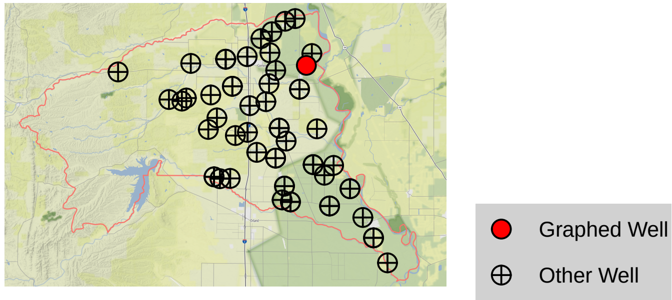
Statistics of spring water levels for past 20 years (2003 to 2023):
Change = −19.61 ft
Avg. rate of change = −0.98 ft/yr
Avg. water level = 221.61 ft amsl





Corning Subbasin − State Well Number (SWN) 24N02W20B001M

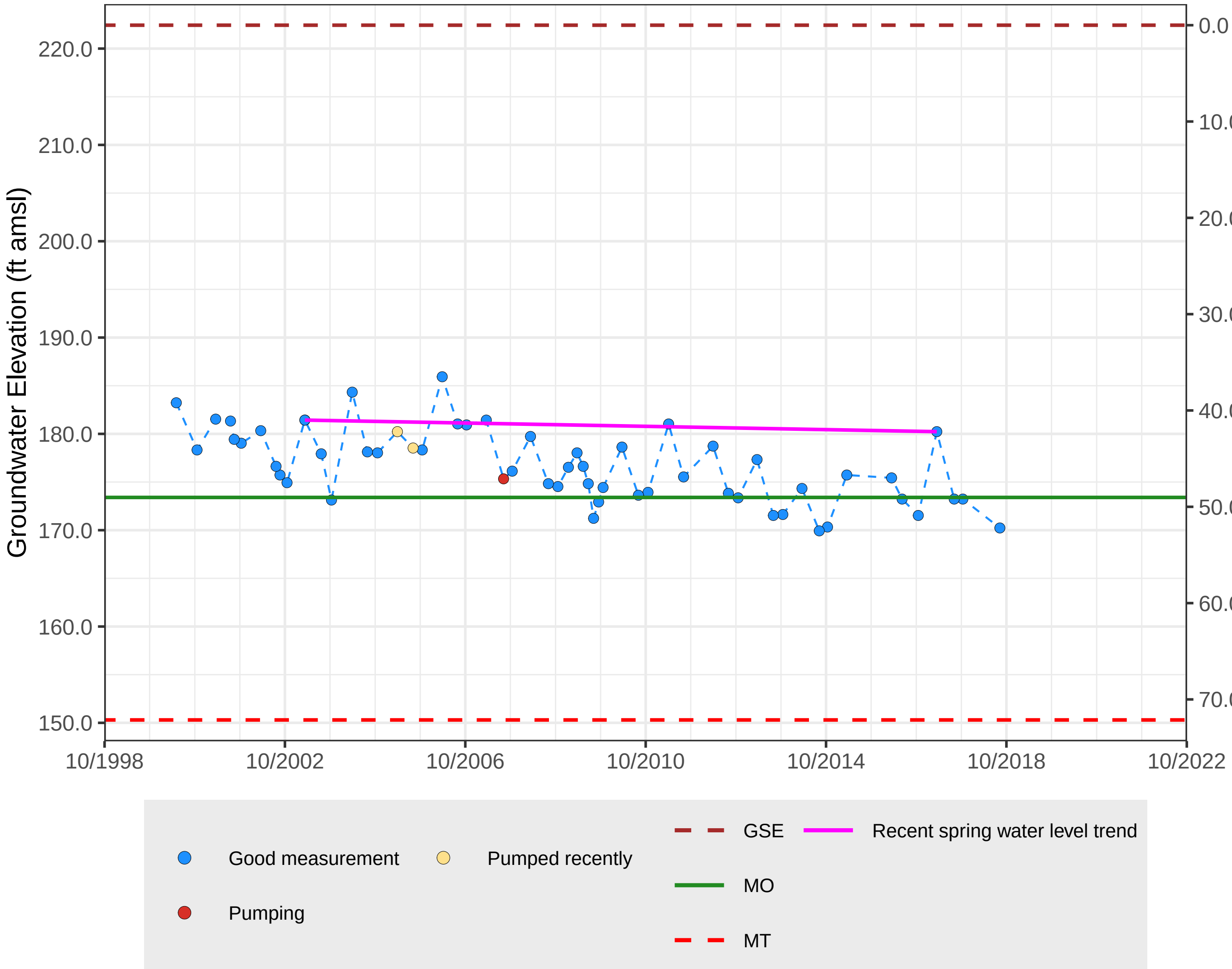
(Shallow Zone) Well Depth: 120 ft. Perforation top & bottom: 100 − 120 ft bgs

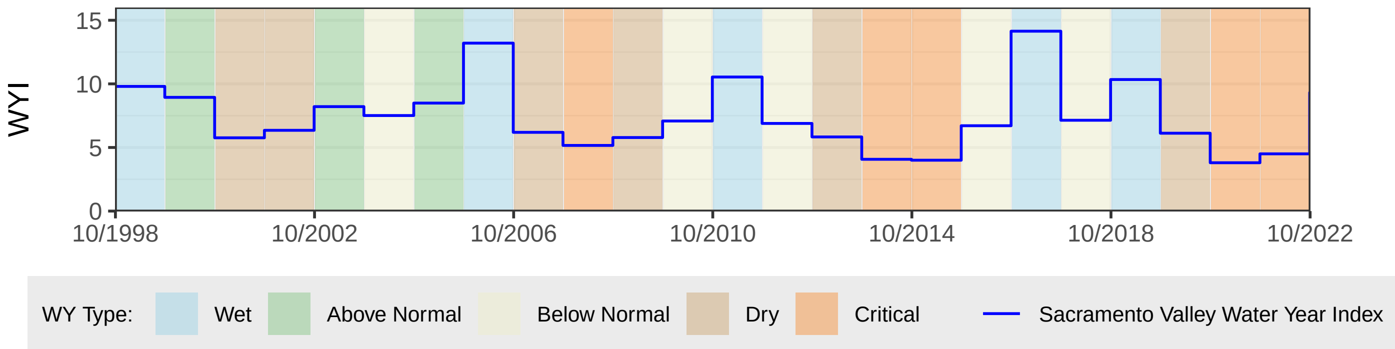


MO GWE: 173.4 ft amsl
MT GWE: 150.3 ft amsl

Area: Outside of Special Zone
(Reference: GSP, 2024)

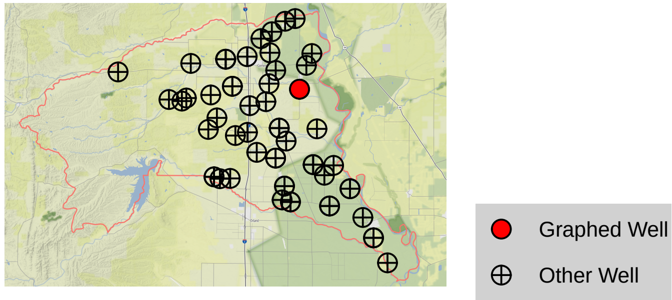
Statistics of spring water levels for past 14 years (2003 to 2017):
Change = −1.2 ft
Avg. rate of change = −0.09 ft/yr
Avg. water level = 179.64 ft amsl





Corning Subbasin − State Well Number (SWN) 24N02W29N003M

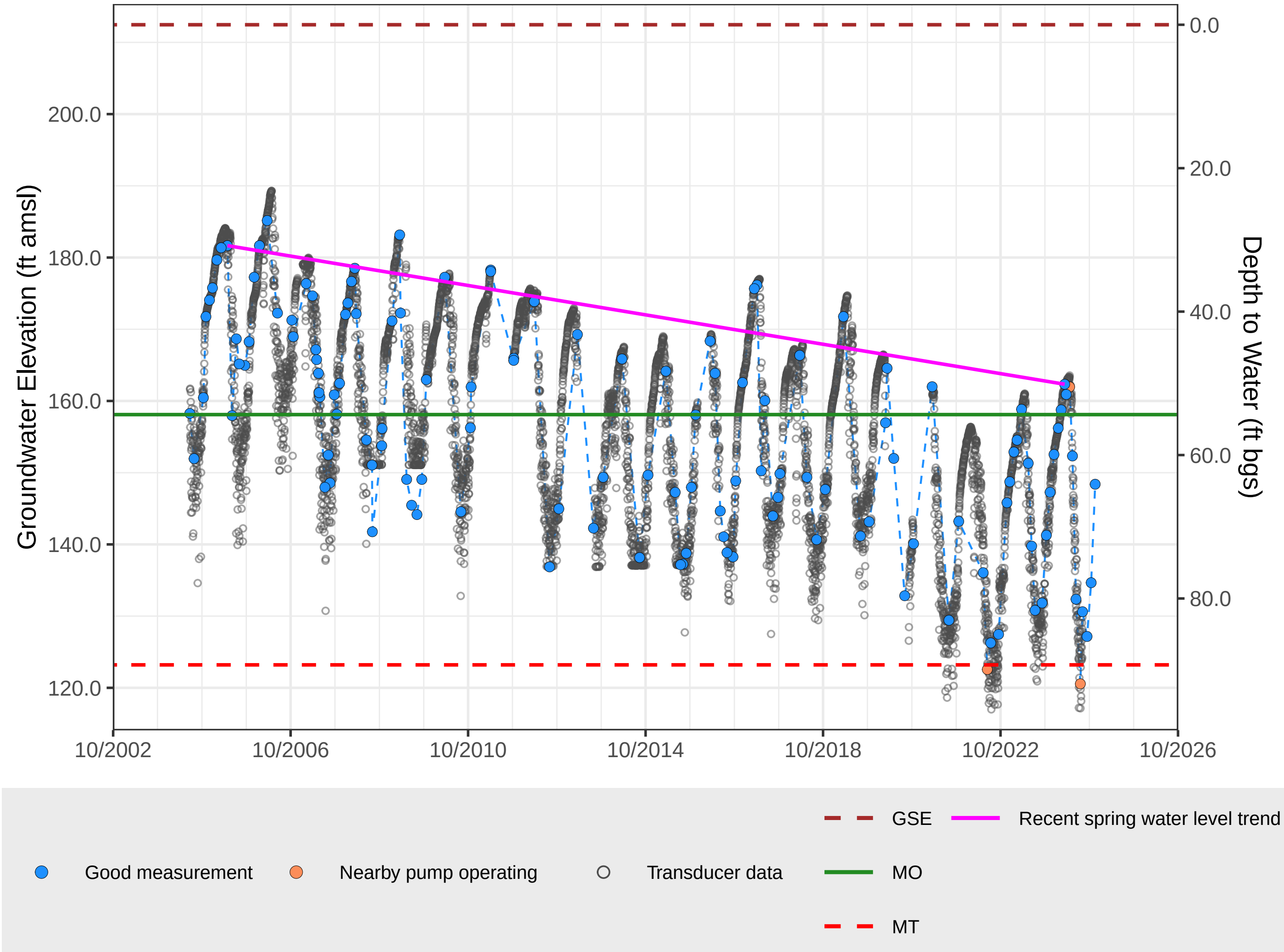
(Shallow Zone) Well Depth: 388 ft. Perforation top & bottom: 200 − 290 ft bgs

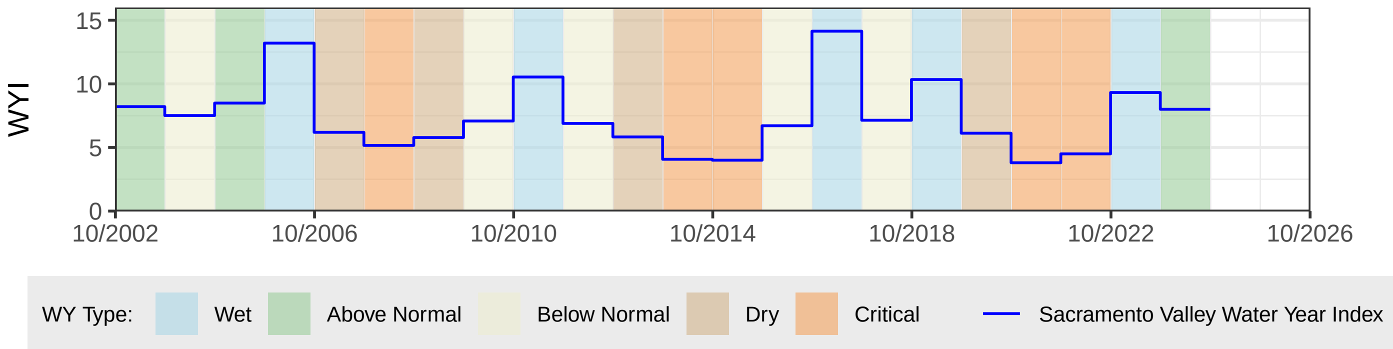


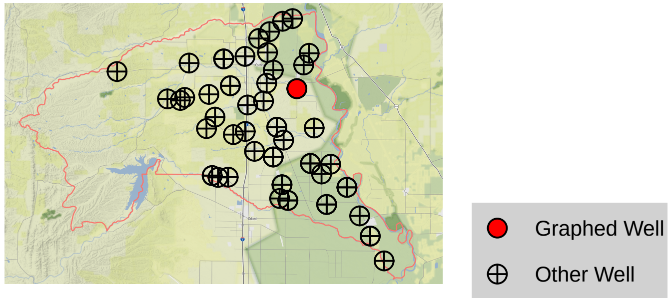
MO GWE: 158.1 ft amsl
MT GWE: 123.2 ft amsl

Area: Outside of Special Zone
(Reference: GSP, 2024)

Statistics of spring water levels for past 19 years (2005 to 2024):
Change = −19.33 ft
Avg. rate of change = −1.02 ft/yr
Avg. water level = 171.78 ft amsl







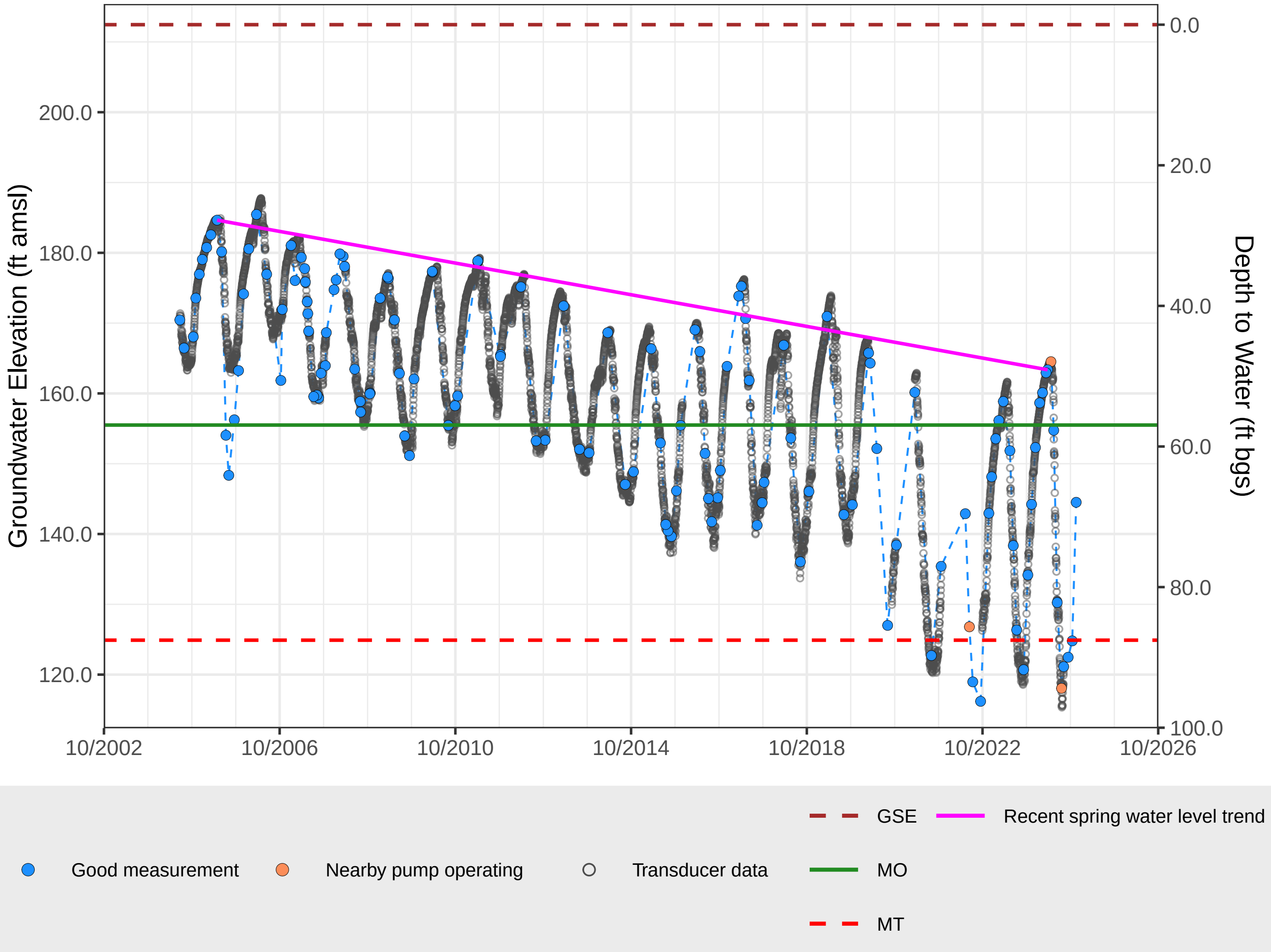
MO GWE: 155.5 ft amsl
MT GWE: 124.9 ft amsl

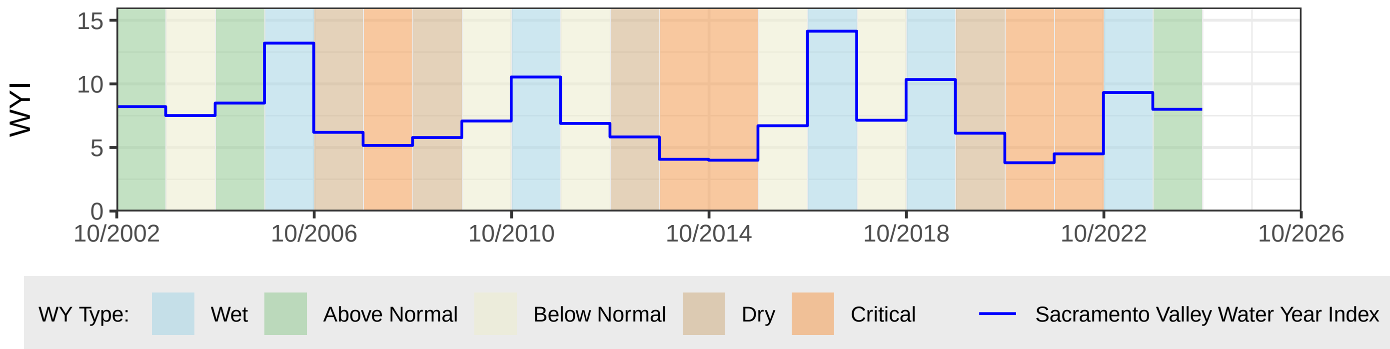
Area: Outside of Special Zone
(Reference: GSP, 2024)

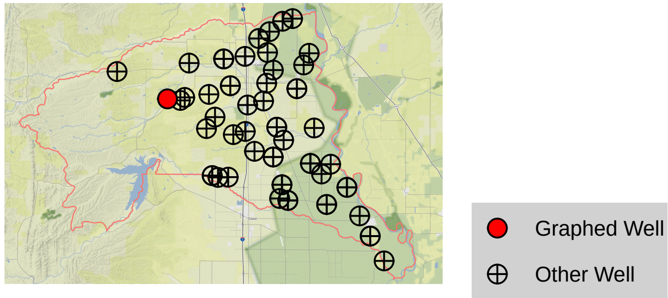
Statistics of spring water levels for past 19 years (2005 to 2024):
Change = −21.29 ft
Avg. rate of change = −1.12 ft/yr
Avg. water level = 172.45 ft amsl

Corning Subbasin − State Well Number (SWN) 24N02W29N004M

(Deep Zone) Well Depth: 741 ft. Perforation top & bottom: 590 − 710 ft bgs







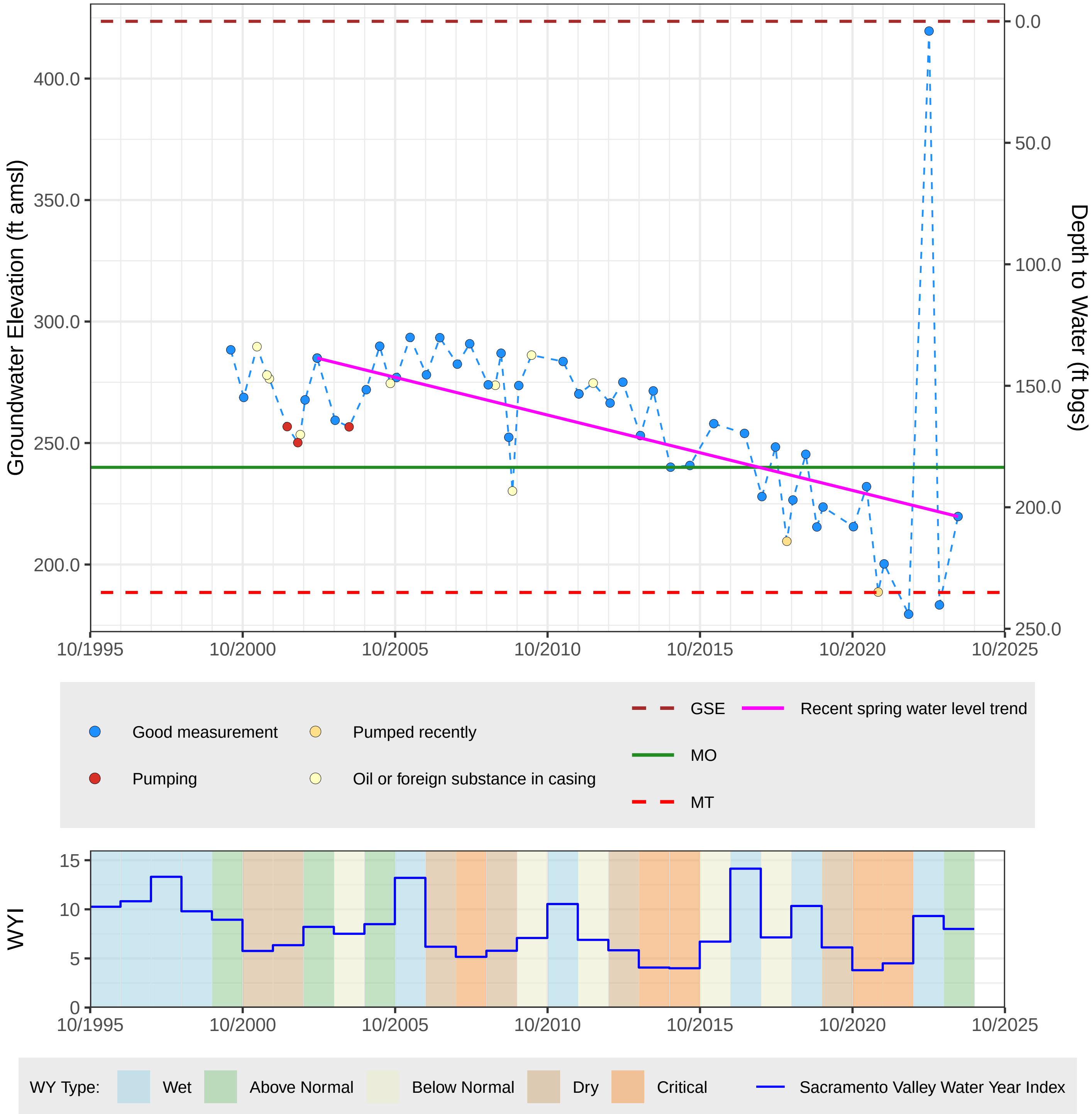
MO GWE: 240 ft amsl
MT GWE: 188.5 ft amsl

Area: Within Special Zone
(Reference: GSP, 2024)

Statistics of spring water levels for past 21 years (2003 to 2024):
Change = −65.2 ft
Avg. rate of change = −3.1 ft/yr
Avg. water level = 278.79 ft amsl

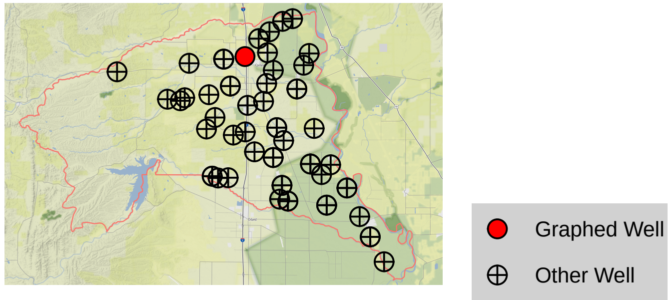
Corning Subbasin − State Well Number (SWN) 24N04W33P001M

(Deep Zone) Well Depth: 780 ft. Perforation top & bottom: 250 − 780 ft bgs



Corning Subbasin – State Well Number (SWN) 24N03W16A001M

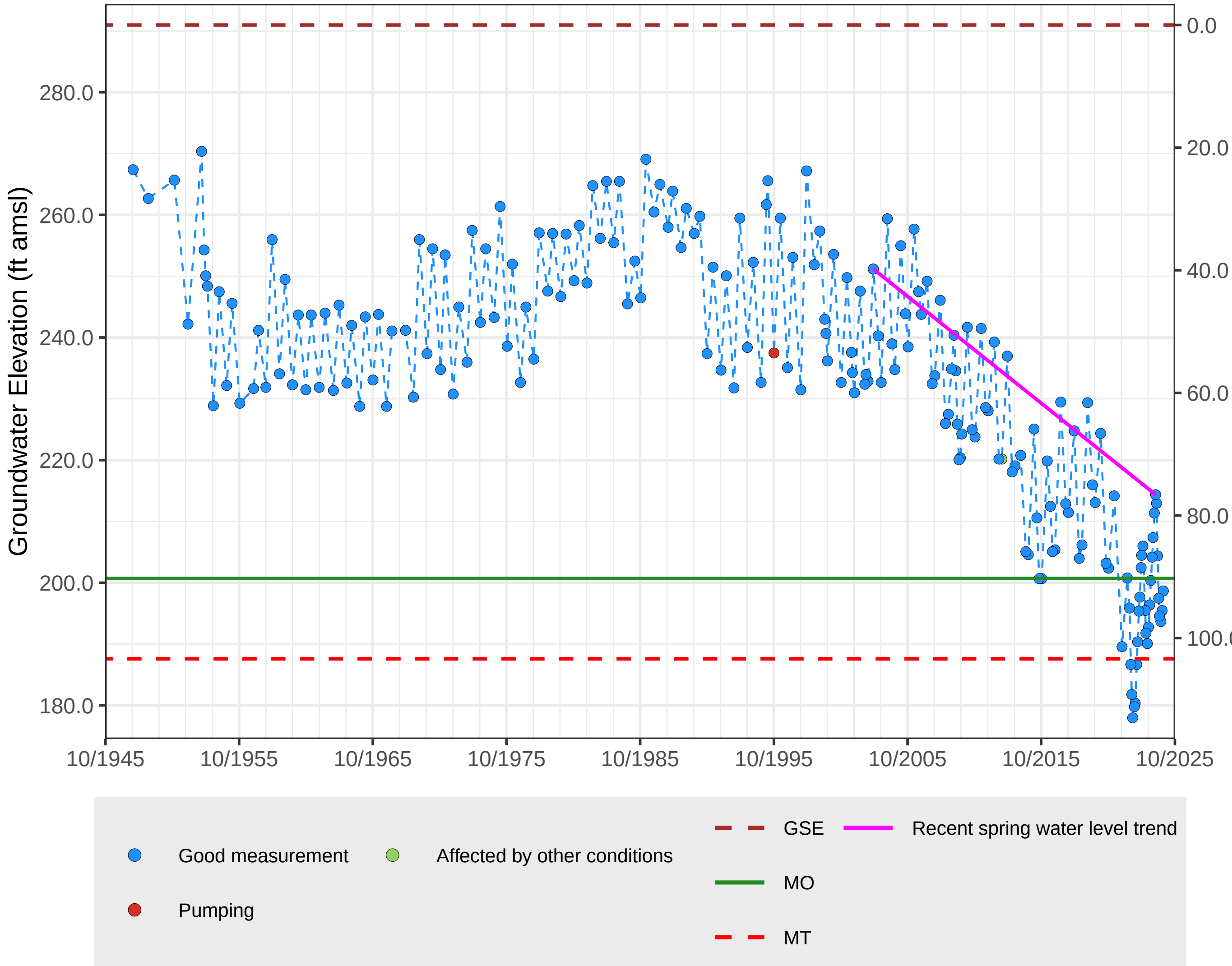
(Shallow Zone)   Well Depth: 195 ft. Perforation top & bottom: 85 − 195 ft bgs

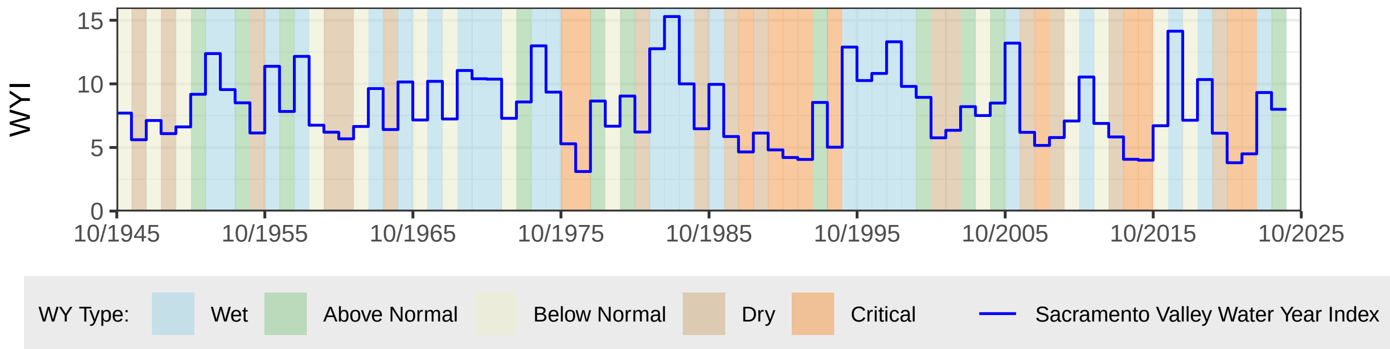


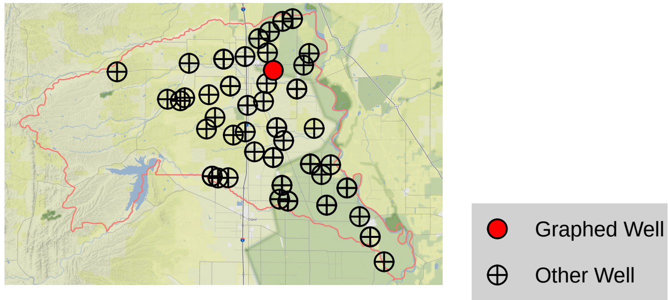
MO GWE: 200.7 ft amsl
MT GWE: 187.6 ft amsl

Area: Within Special Zone
(Reference: GSP, 2024)

Statistics of spring water levels for past 21 years (2003 to 2024):
Change = −36.8 ft
Avg. rate of change = −1.75 ft/yr
Avg. water level = 247.1 ft amsl







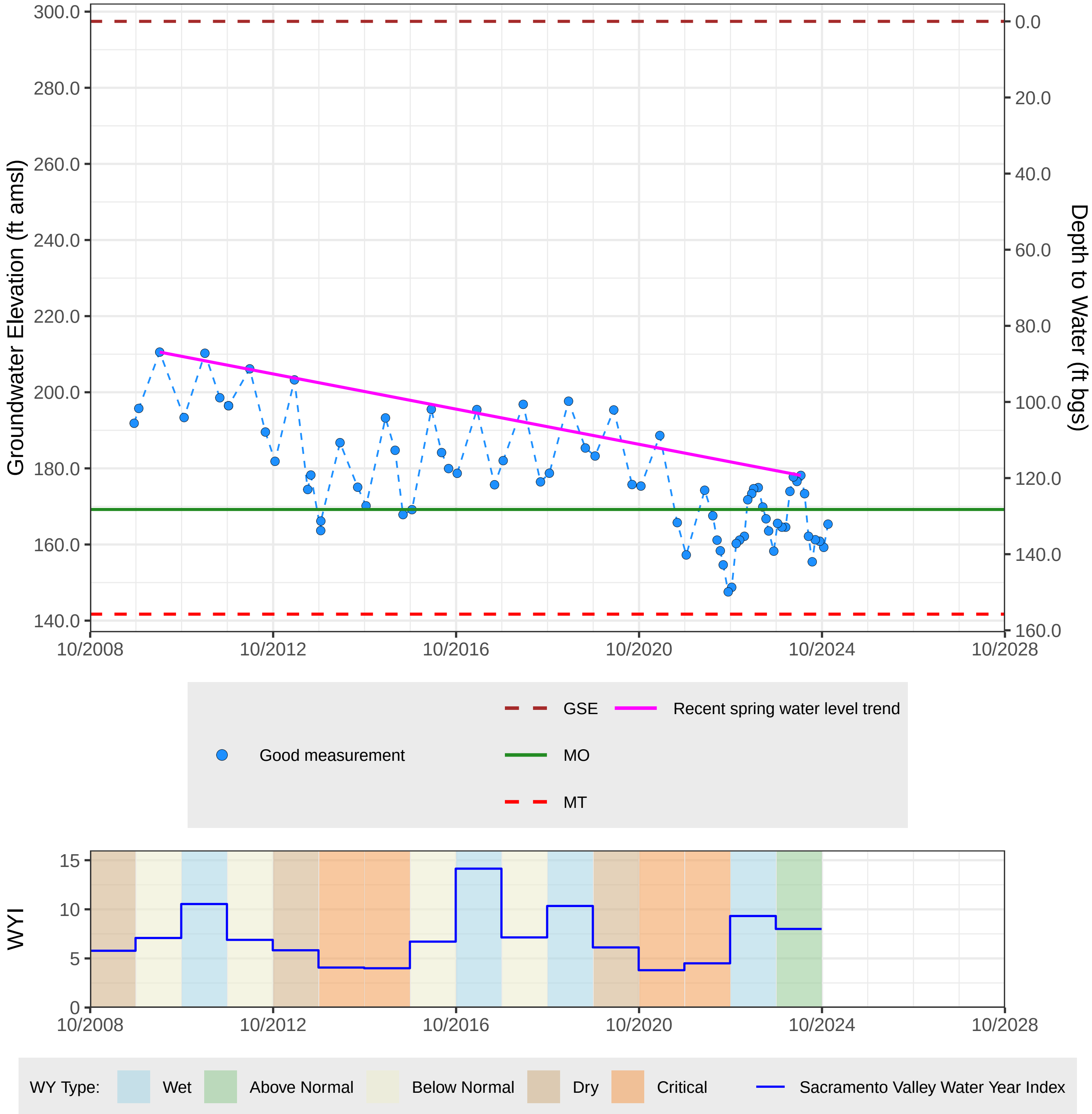
MO GWE: 169.2 ft amsl
MT GWE: 141.7 ft amsl

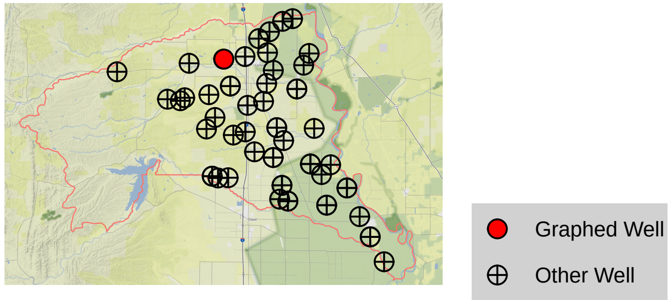
Area: Within Special Zone
(Reference: GSP, 2024)

Statistics of spring water levels for past 14 years (2010 to 2024):
Change = −32.4 ft
Avg. rate of change = −2.31 ft/yr
Avg. water level = 193.78 ft amsl

Corning Subbasin − State Well Number (SWN) 24N03W24E001M

(Shallow Zone) Well Depth: 224 ft. Perforation top & bottom: 212 − 220 ft bgs





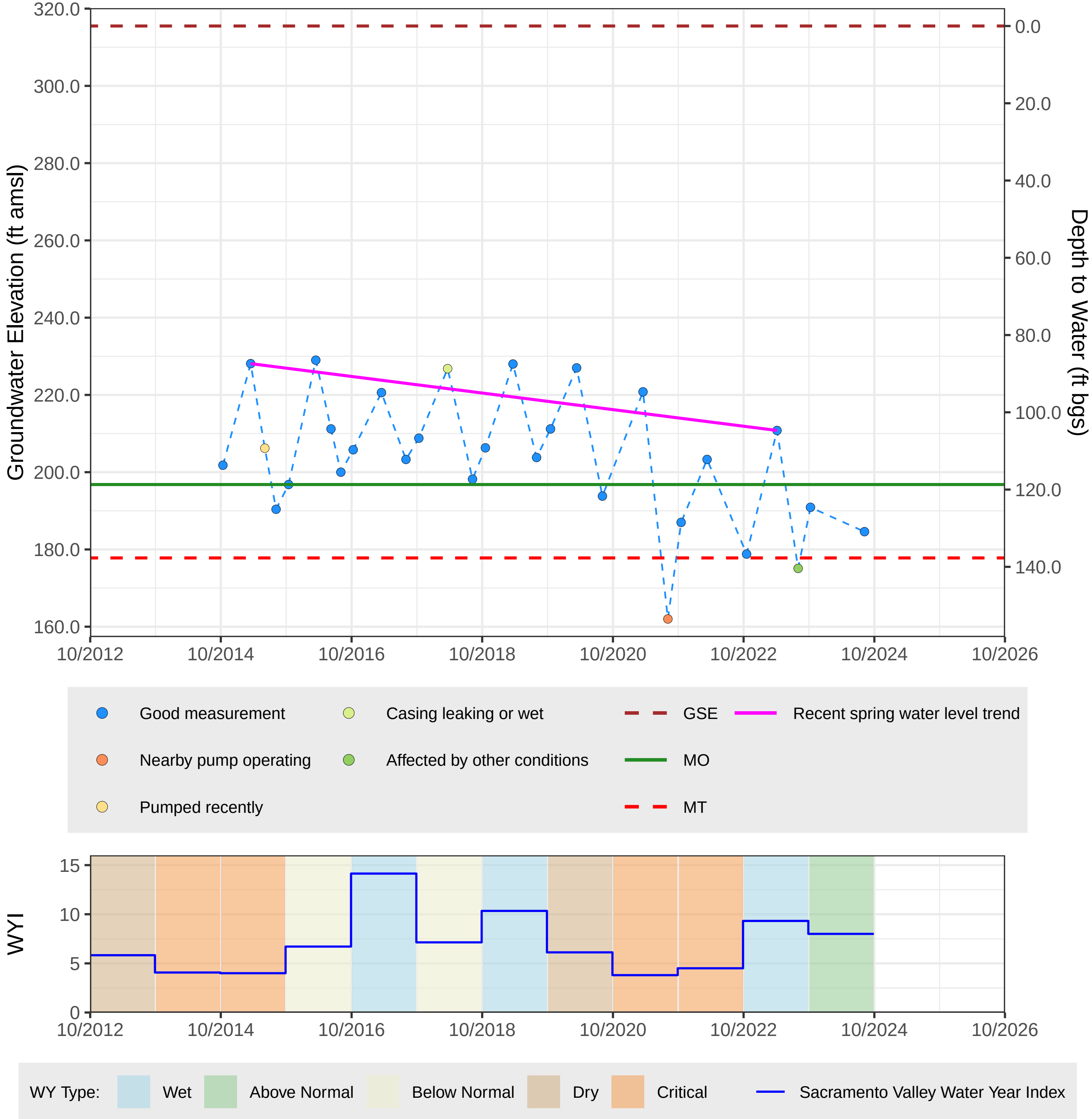
MO GWE: 196.8 ft amsl
MT GWE: 177.8 ft amsl

Area: Within Special Zone
(Reference: GSP, 2024)

Statistics of spring water levels for
past 8 years (2015 to 2023):
Change = −17.3 ft
Avg. rate of change = −2.16 ft/yr
Avg. water level = 221.6 ft amsl

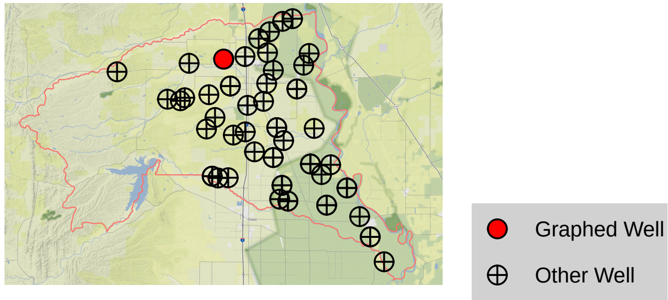
Corning Subbasin − State Well Number (SWN) 24N03W17M002M

(Deep Zone) Well Depth: 505 ft. Perforation top & bottom: 315 − 495 ft bgs



Corning Subbasin – State Well Number (SWN) 24N03W17M001M

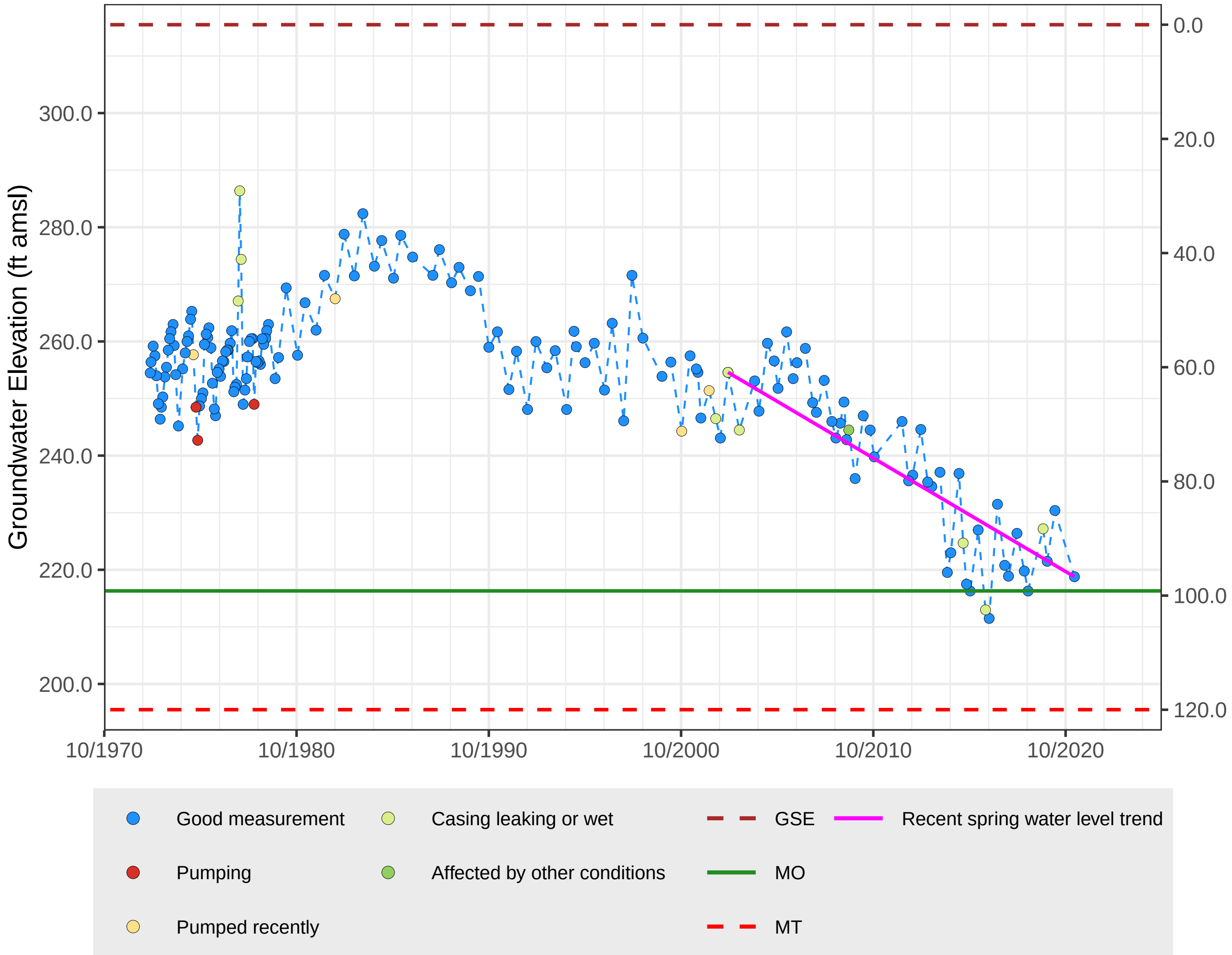
(Shallow Zone)   Well Depth: 108 ft. Perforation top & bottom: 100 − 108 ft bgs

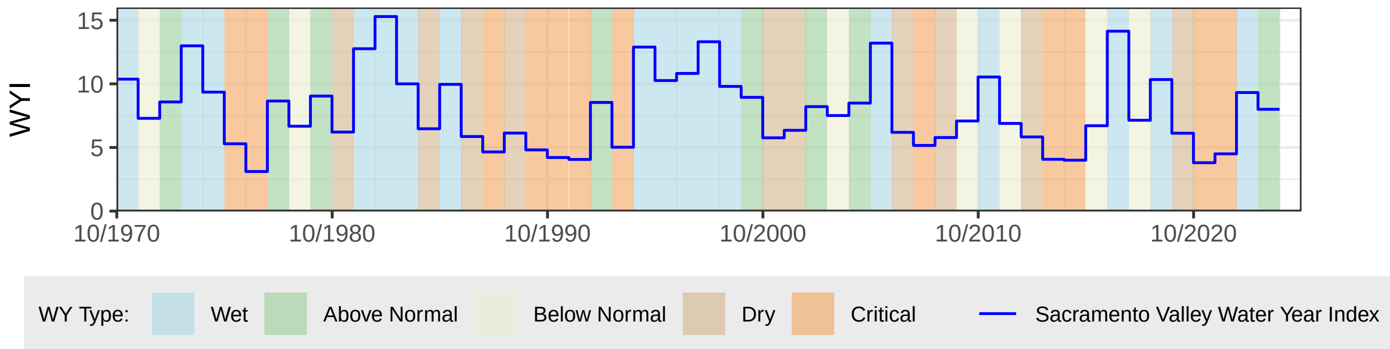


MO GWE: 216.3 ft amsl
MT GWE: 195.5 ft amsl

Area: Within Special Zone
(Reference: GSP, 2024)

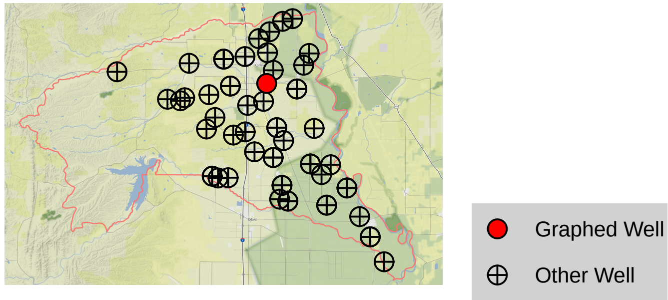
Statistics of spring water levels for past 18 years (2003 to 2021):
Change = −35.8 ft
Avg. rate of change = −1.99 ft/yr
Avg. water level = 257.42 ft amsl

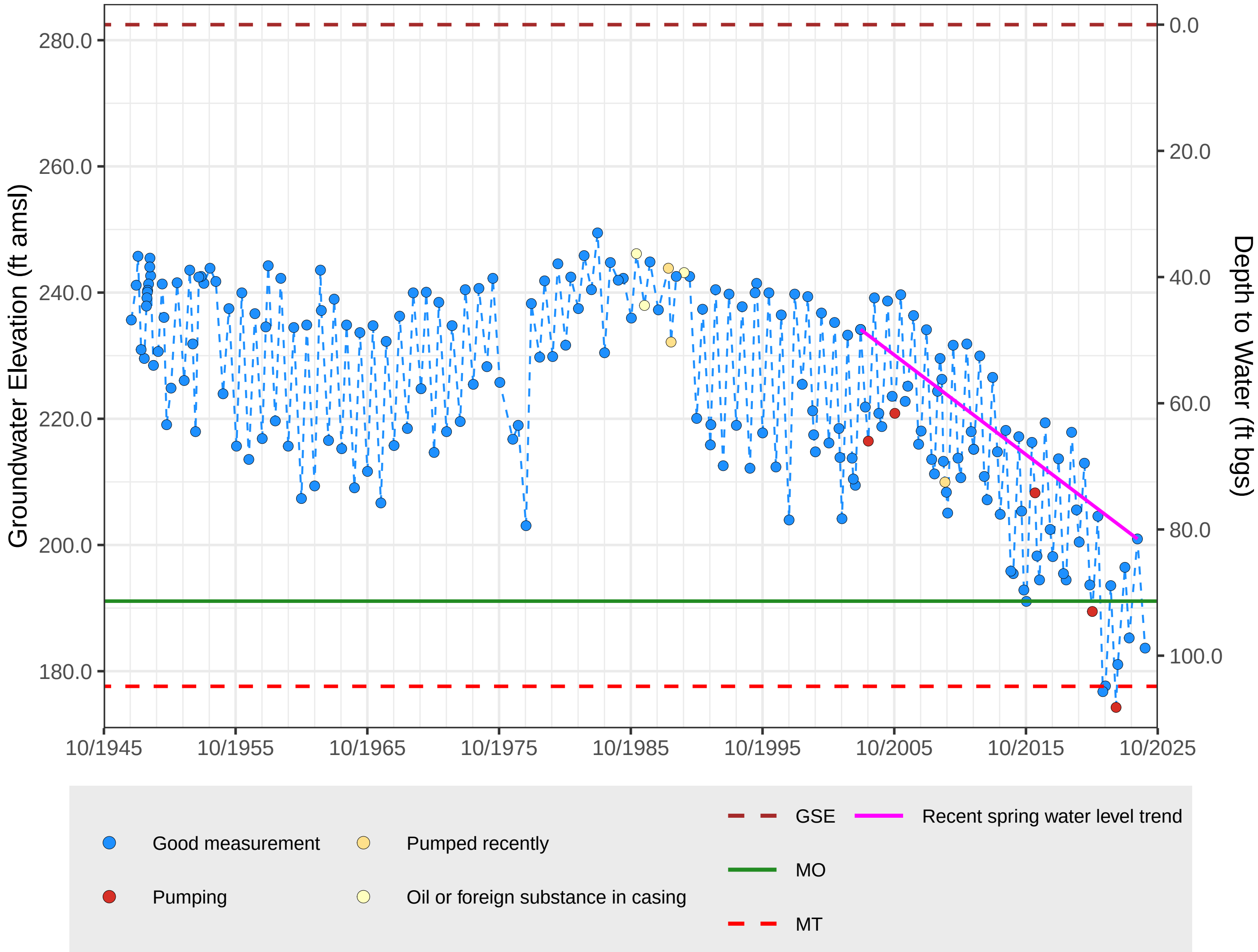




Corning Subbasin − State Well Number (SWN) 24N03W26K001M

(Shallow Zone)   Well Depth: 245 ft. Perforation top & bottom: 103 − 175 ft bgs

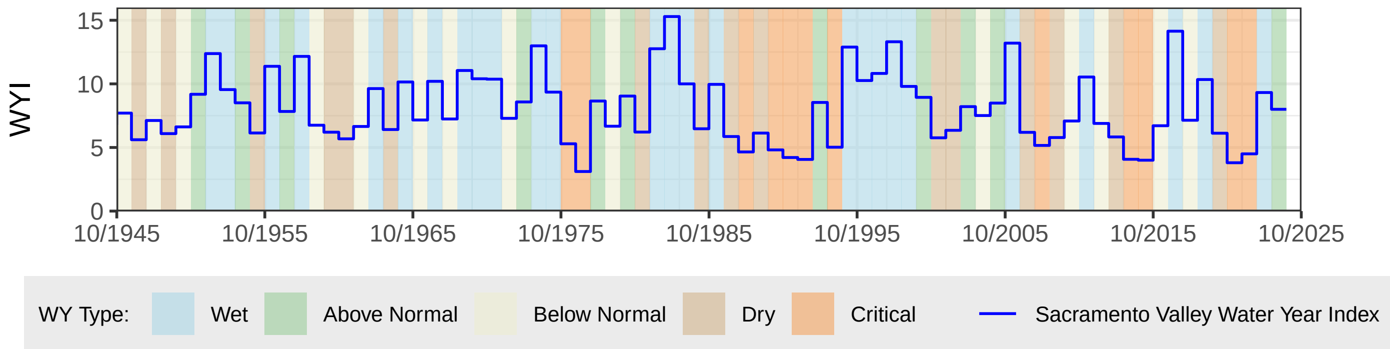




MO GWE: 191.1 ft amsl
MT GWE: 177.6 ft amsl

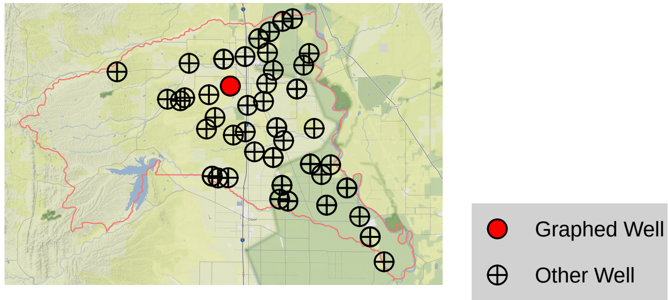
Area: Within Special Zone
(Reference: GSP, 2024)

Statistics of spring water levels for past 21 years (2003 to 2024):
Change = −33.2 ft
Avg. rate of change = −1.58 ft/yr
Avg. water level = 234.44 ft amsl



Corning Subbasin − State Well Number (SWN) 24N03W29Q002M

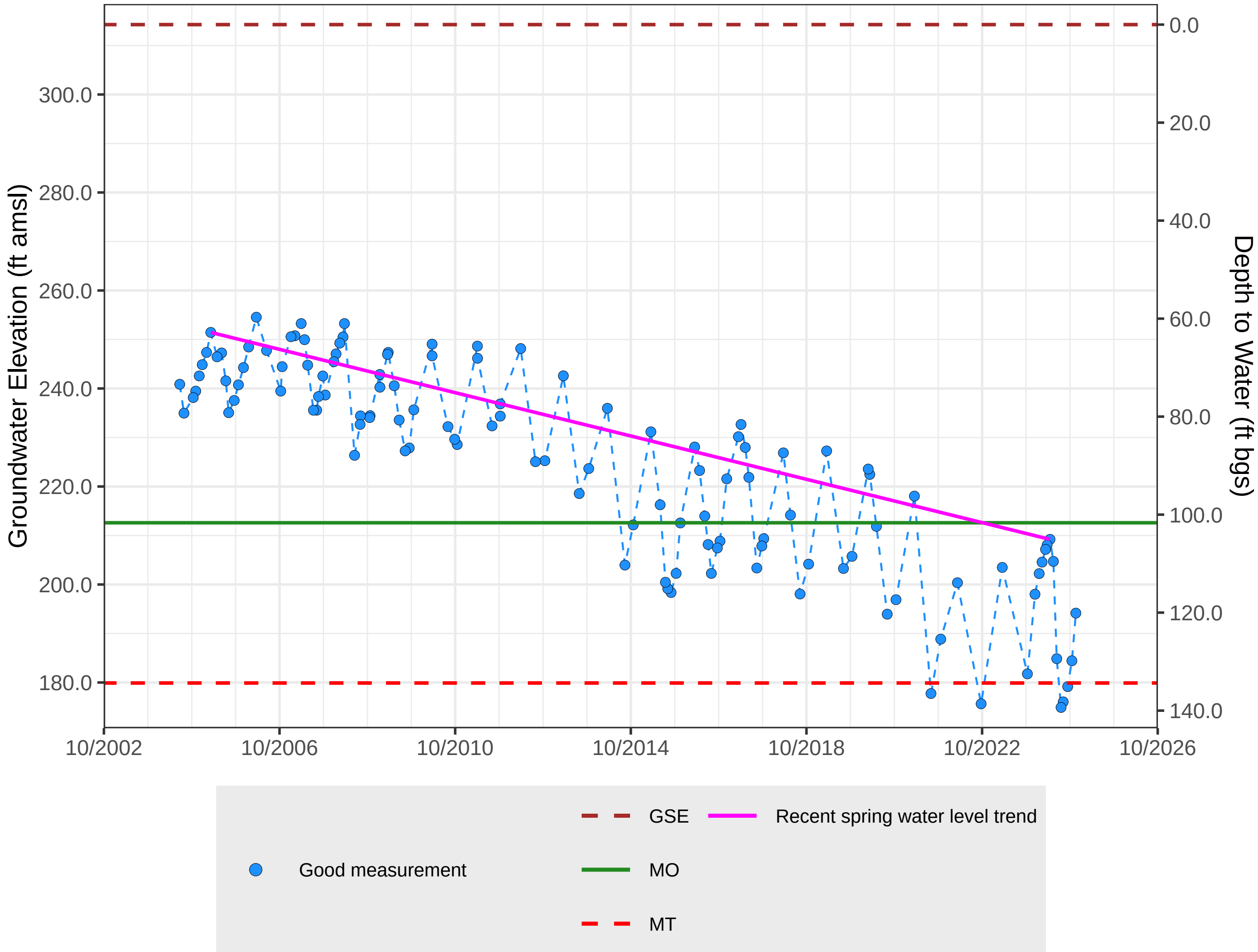
(Deep Zone) Well Depth: 575 ft. Perforation top & bottom: 490 − 550 ft bgs

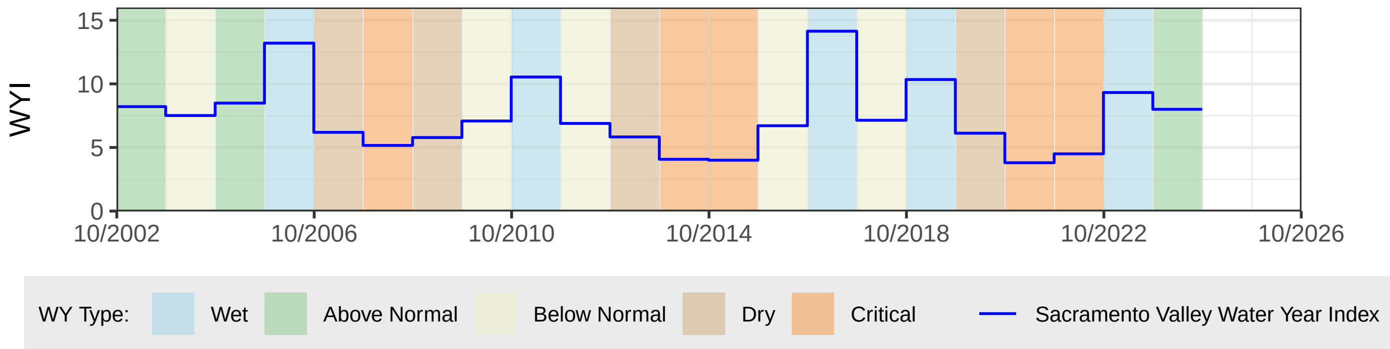


MO GWE: 212.6 ft amsl
MT GWE: 179.9 ft amsl

Area: Within Special Zone
(Reference: GSP, 2024)

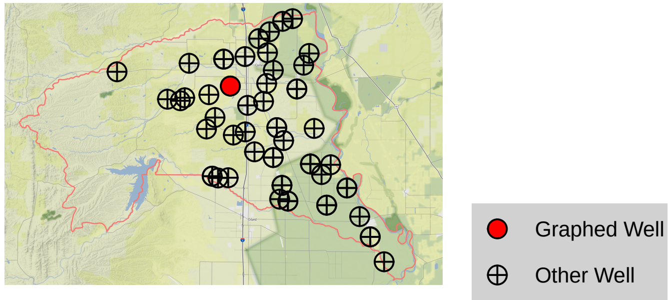
Statistics of spring water levels for past 19 years (2005 to 2024):
Change = −42.24 ft
Avg. rate of change = −2.22 ft/yr
Avg. water level = 234.25 ft amsl





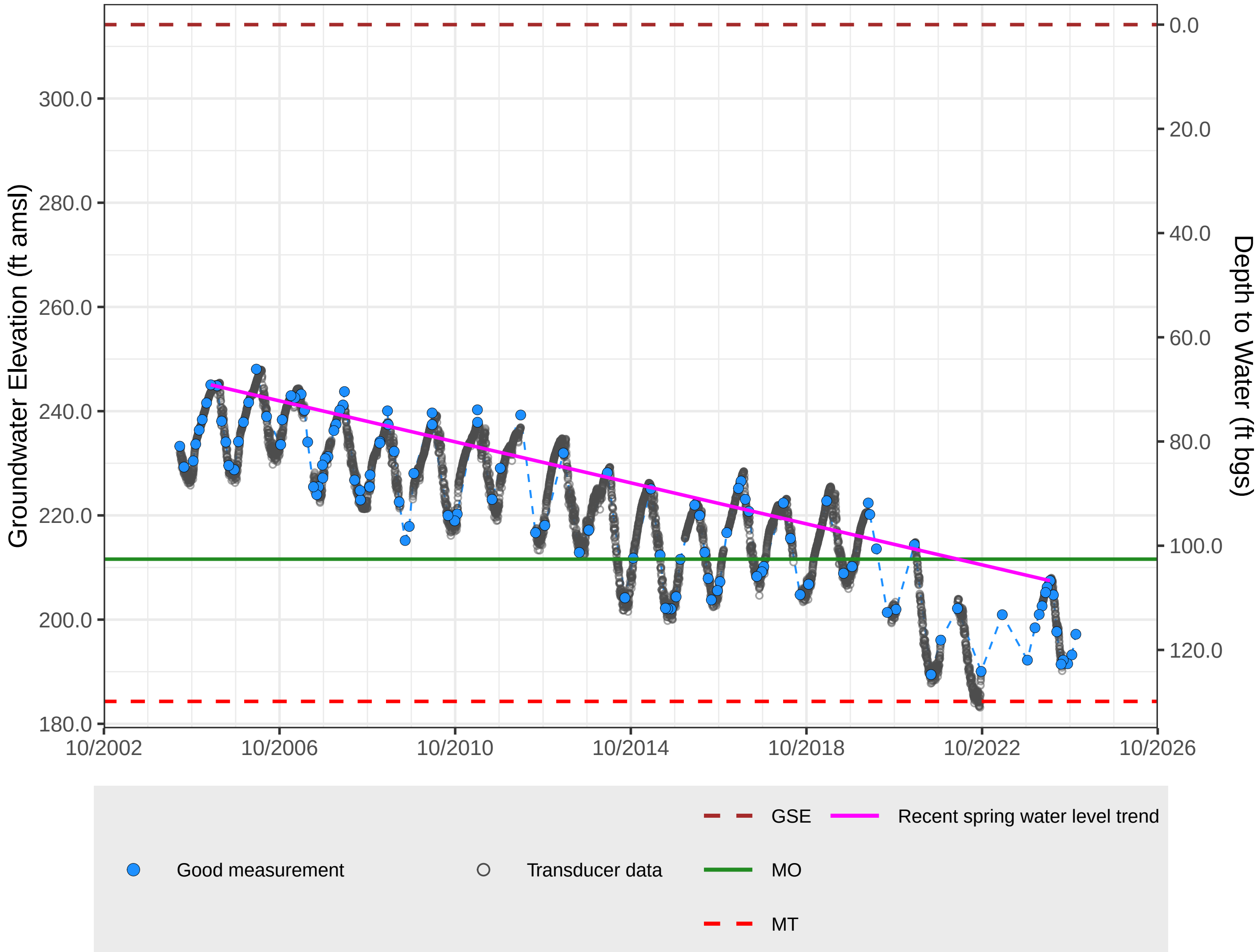
Corning Subbasin − State Well Number (SWN) 24N03W29Q001M

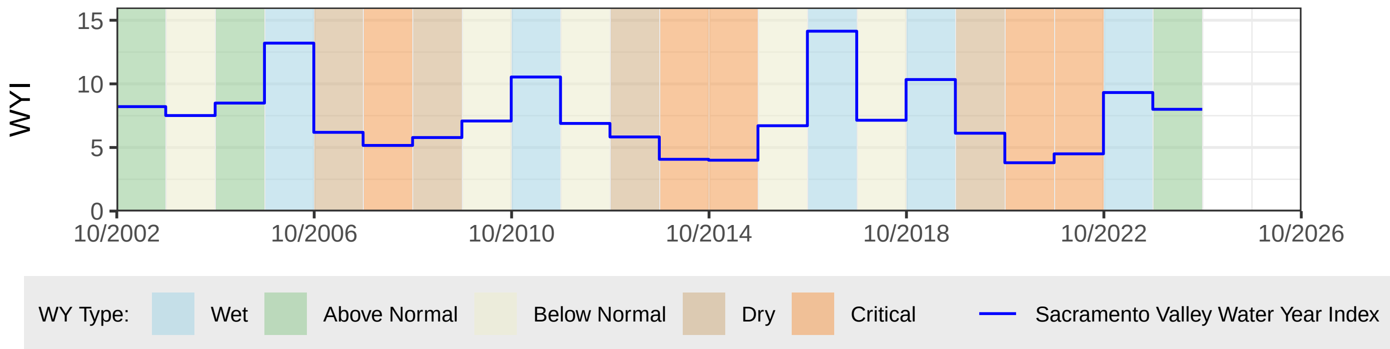
(Shallow Zone)   Well Depth: 372 ft. Perforation top & bottom: 130 − 360 ft bgs



MO GWE: 211.6 ft amsl
MT GWE: 184.3 ft amsl

Area: Within Special Zone
(Reference: GSP, 2024)

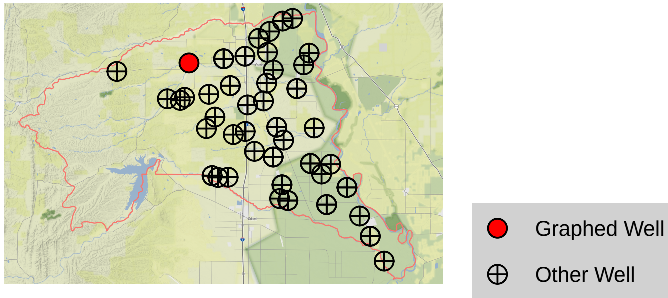




Statistics of spring water levels for
past 19 years (2005 to 2024):
Change = −37.6 ft
Avg. rate of change = −1.98 ft/yr
Avg. water level = 228.28 ft amsl

Corning Subbasin − State Well Number (SWN) 24N04W14N002M

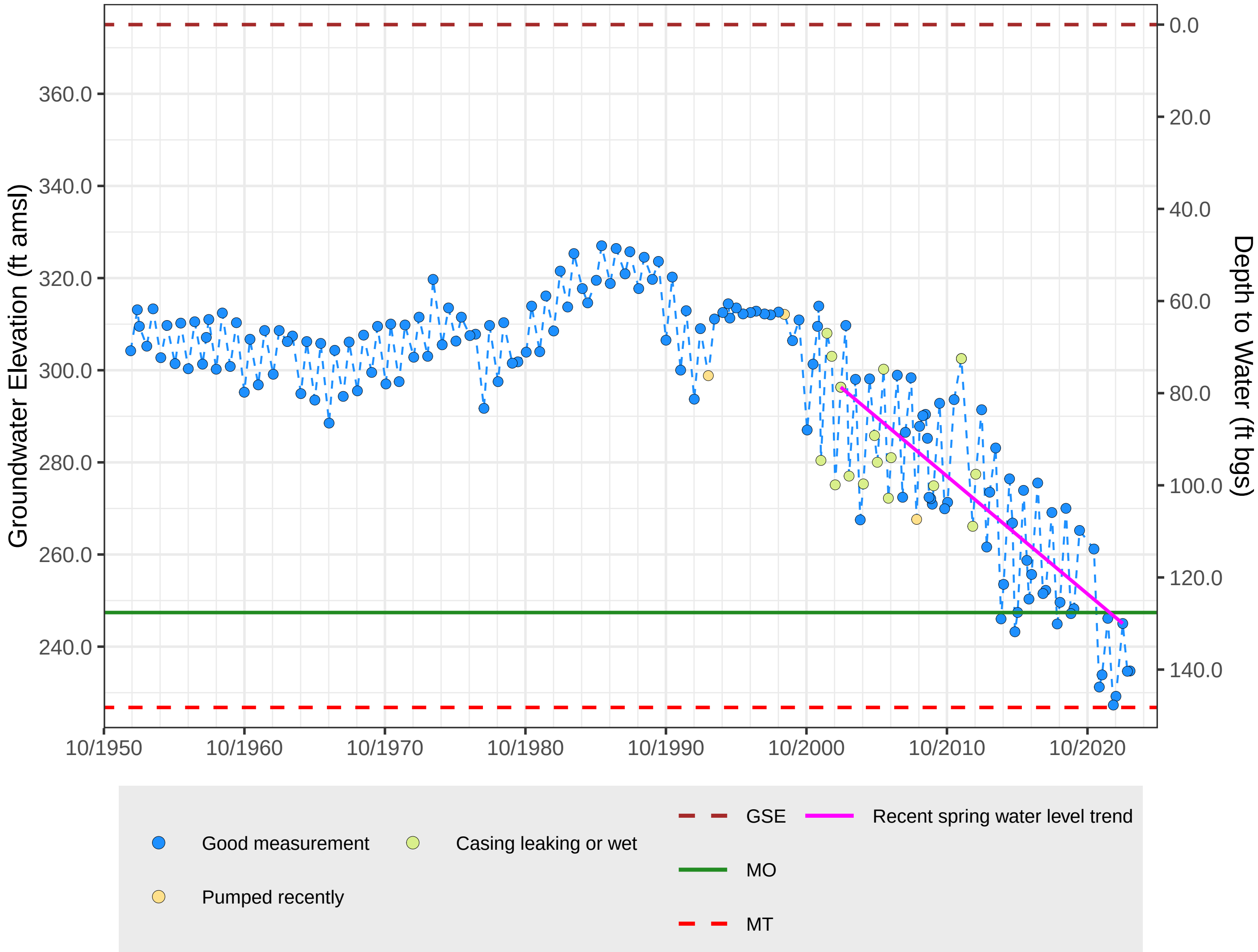
(Shallow Zone) Well Depth: 180 ft. Perforation top & bottom: Unknown

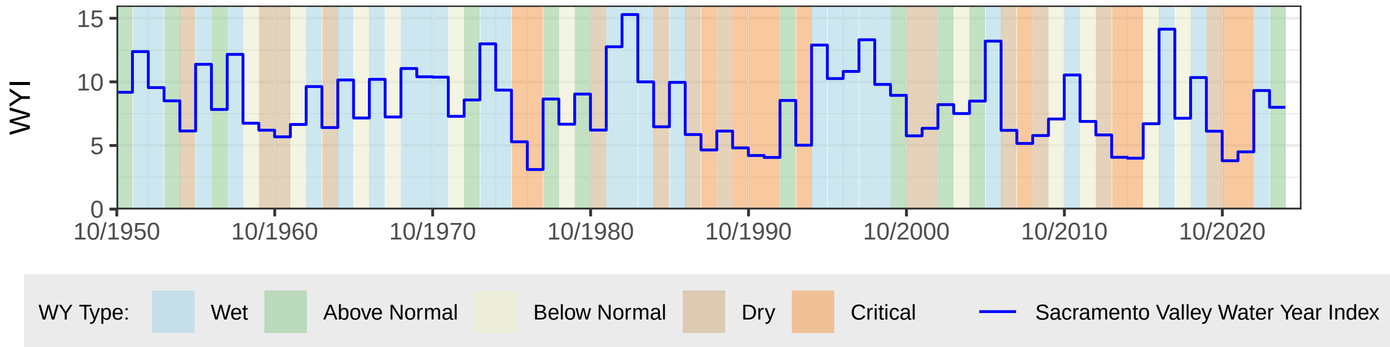


MO GWE: 247.4 ft amsl
MT GWE: 226.8 ft amsl

Area: Within Special Zone
(Reference: GSP, 2024)

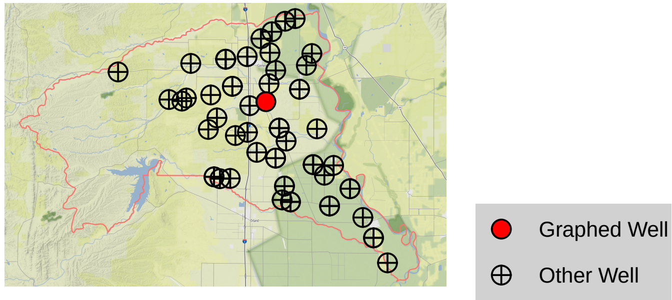
Statistics of spring water levels for past 20 years (2003 to 2023):
Change = −51.3 ft
Avg. rate of change = −2.56 ft/yr
Avg. water level = 303.41 ft amsl





Corning Subbasin − State Well Number (SWN) 24N03W35P005M

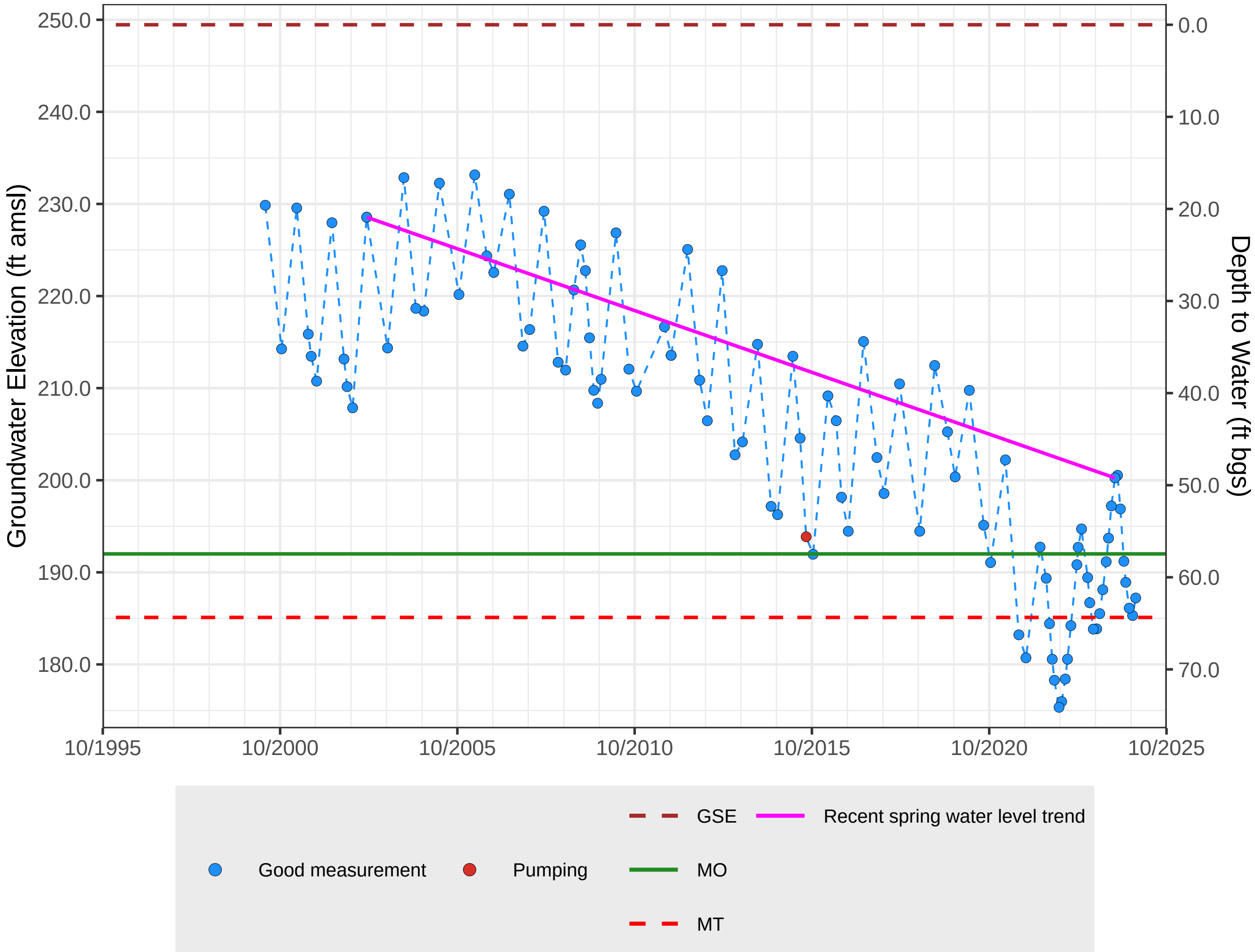
(Shallow Zone) Well Depth: 120 ft. Perforation top & bottom: 100 − 120 ft bgs

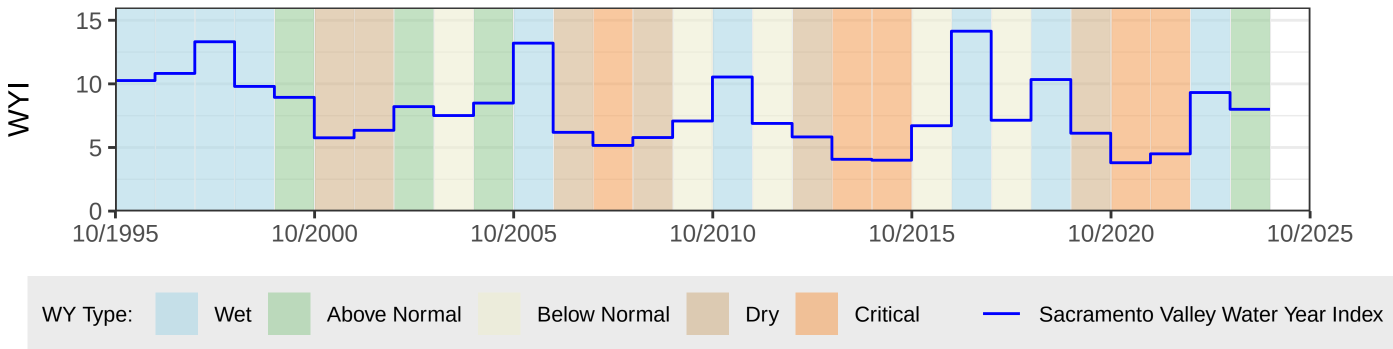


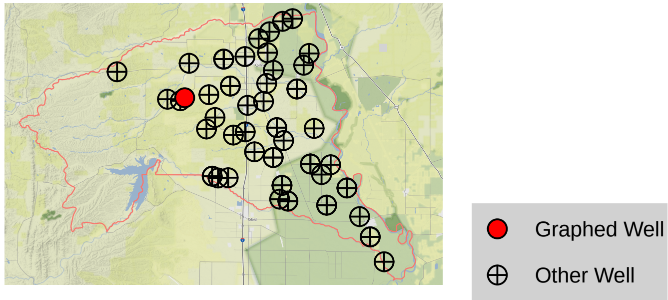
MO GWE: 192 ft amsl
MT GWE: 185.1 ft amsl

Area: Within Special Zone
(Reference: GSP, 2024)

Statistics of spring water levels for past 21 years (2003 to 2024):
Change = −28.31 ft
Avg. rate of change = −1.35 ft/yr
Avg. water level = 218.17 ft amsl



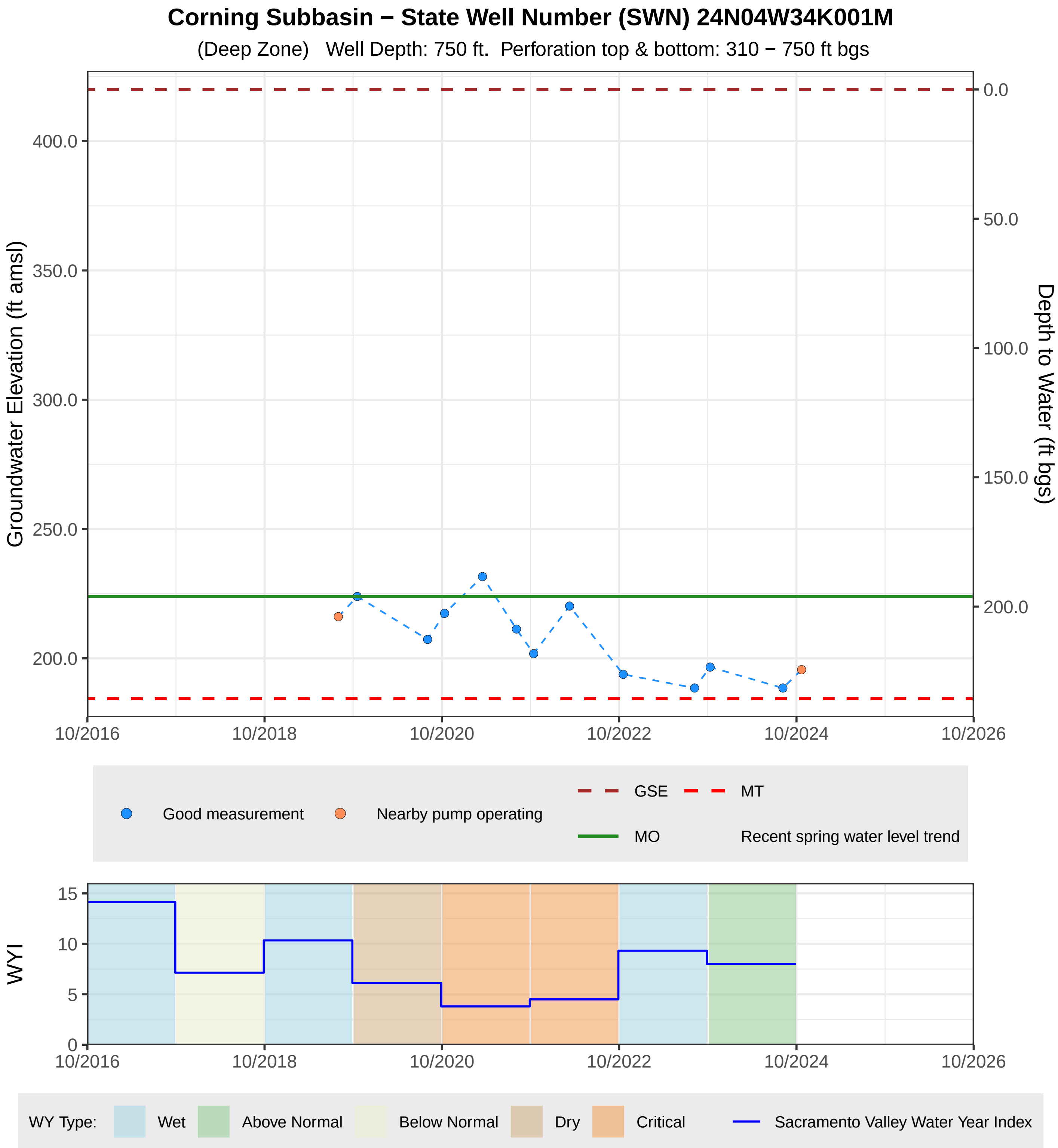




MO GWE: 223.9 ft amsl
MT GWE: 184.4 ft amsl

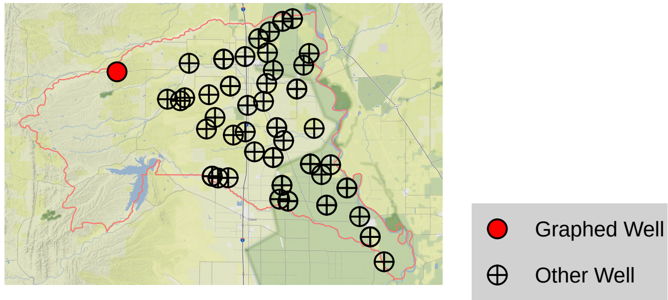
Area: Outside of Special Zone
(Reference: GSP, 2024)

Insufficient spring GW level data to calculate statistics for 3 years



Corning Subbasin – State Well Number (SWN) 24N05W23L001M

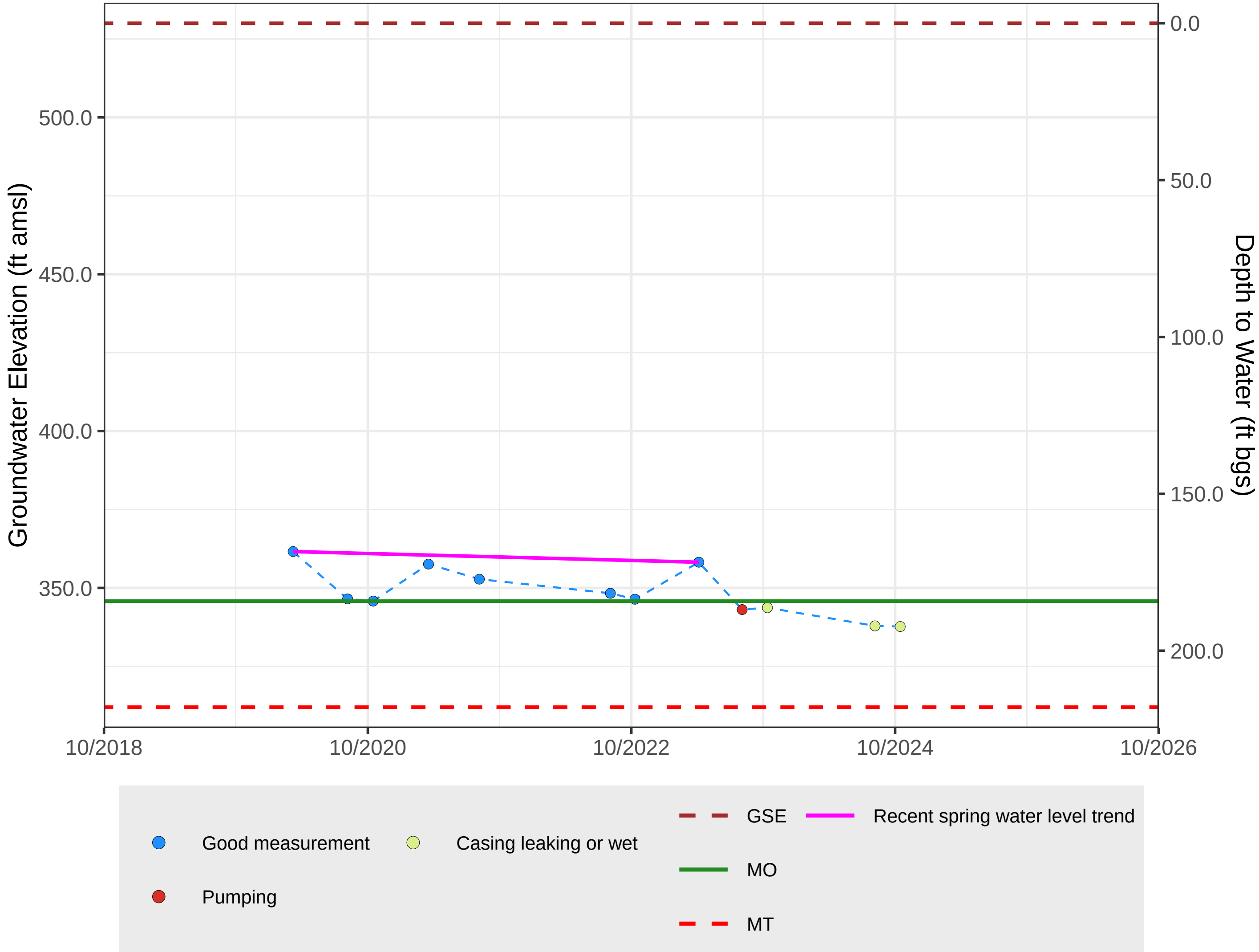
(Shallow Zone) Well Depth: 235 ft. Perforation top & bottom: Unknown

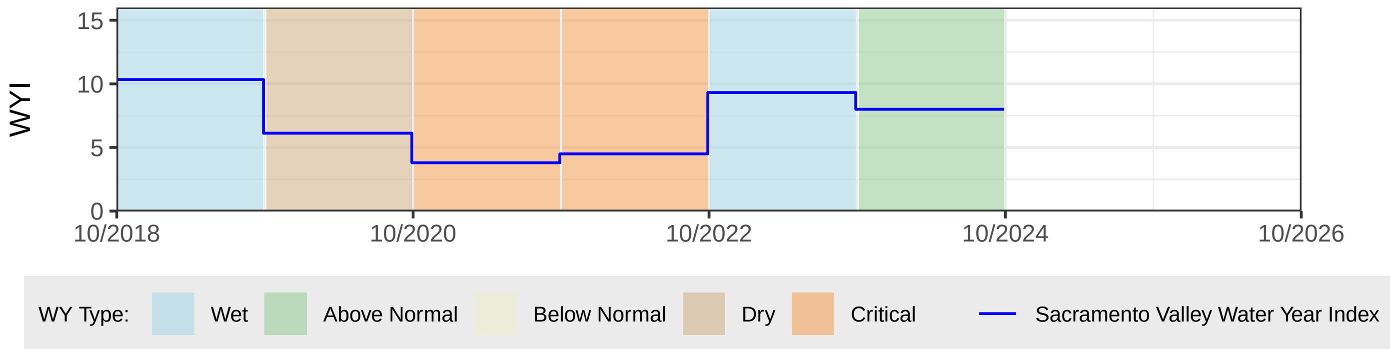


MO GWE: 345.8 ft amsl
MT GWE: 312 ft amsl

Area: Outside of Special Zone
(Reference: GSP, 2024)

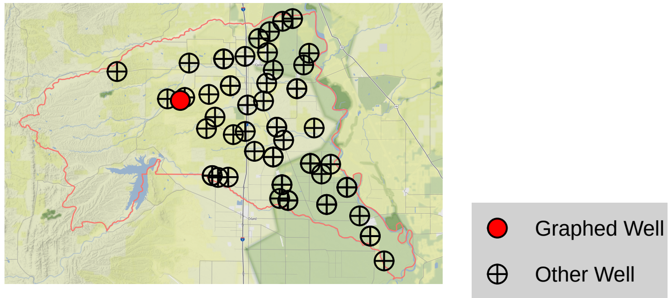
Statistics of spring water levels for past 3 years (2020 to 2023):
Change = −3.4 ft
Avg. rate of change = −1.13 ft/yr
Avg. water level = 359.13 ft amsl





Corning Subbasin − State Well Number (SWN) 24N04W34P001M

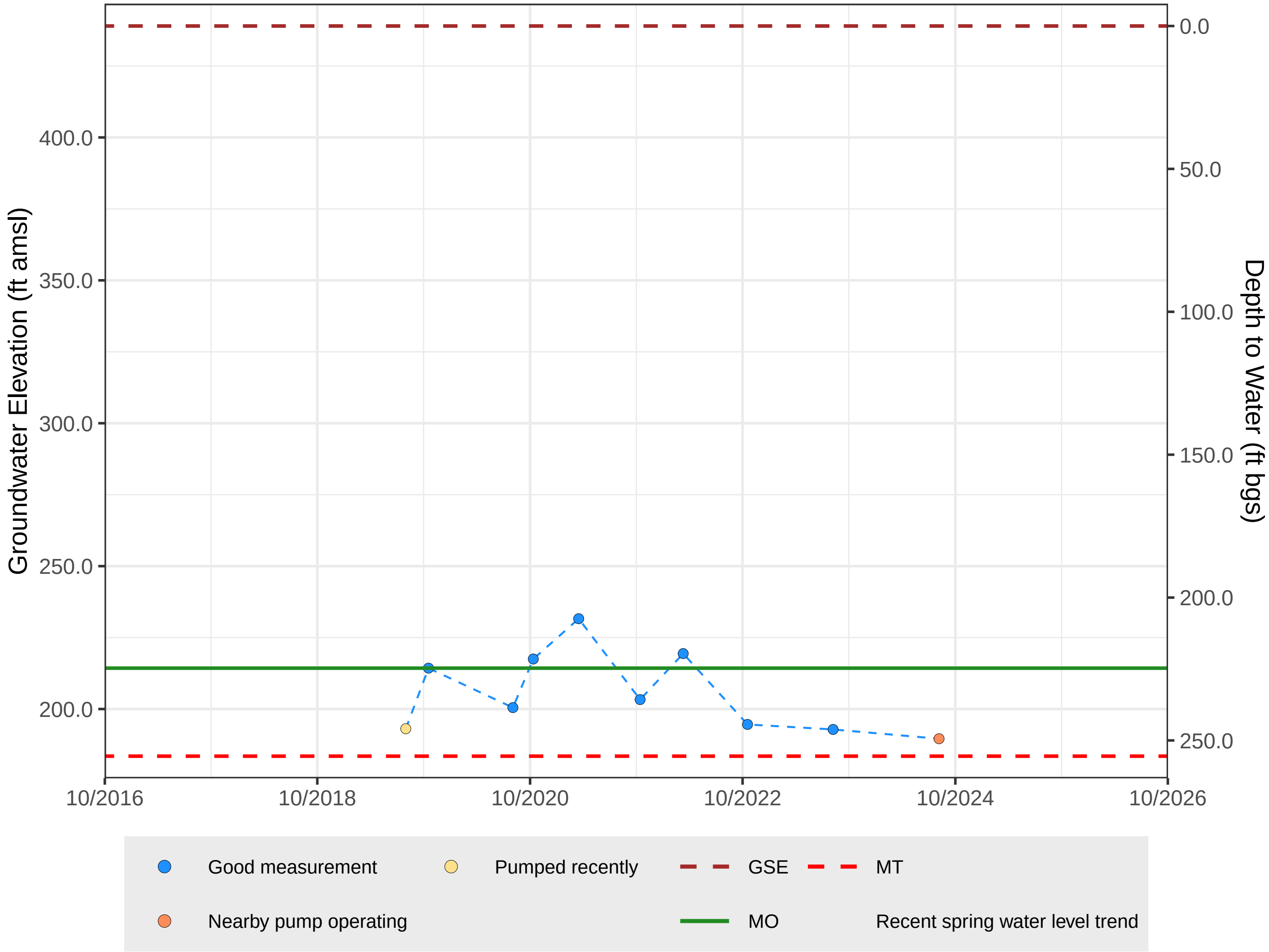
(Deep Zone) Well Depth: 535 ft. Perforation top & bottom: 290 − 475 ft bgs

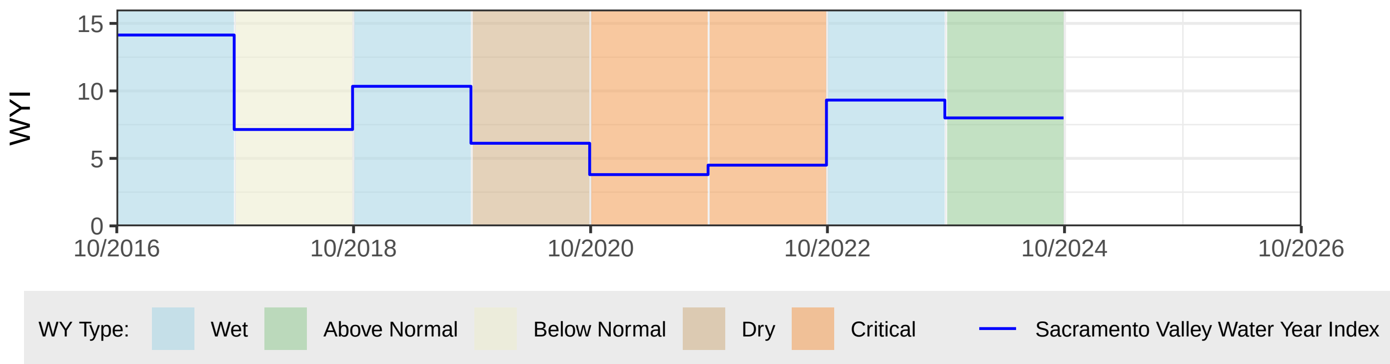


MO GWE: 214.3 ft amsl
MT GWE: 183.5 ft amsl

Area: Outside of Special Zone
(Reference: GSP, 2024)

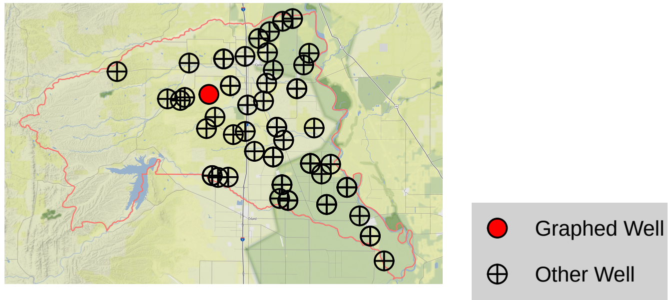
Insufficient spring GW level data to calculate statistics for 3 years





Corning Subbasin − State Well Number (SWN) 24N04W36G001M

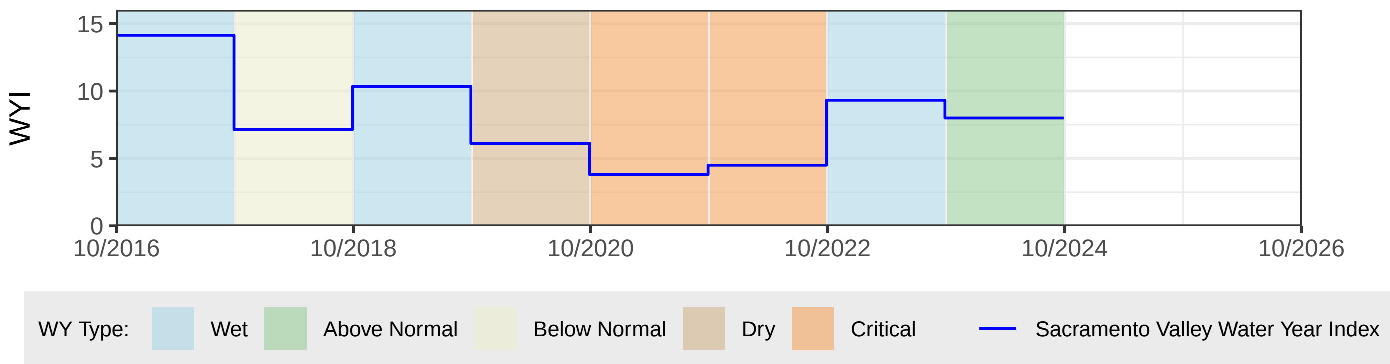
(Deep Zone) Well Depth: 750 ft. Perforation top & bottom: 320 − 750 ft bgs

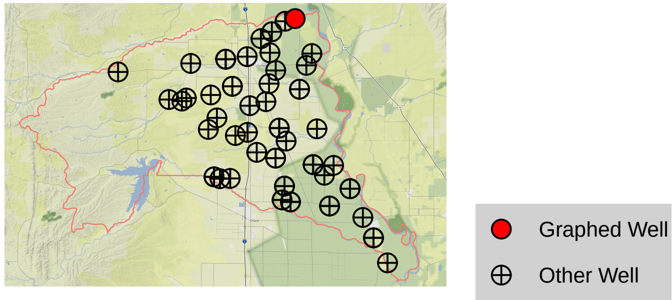


MO GWE: 214.4 ft amsl
MT GWE: 183.2 ft amsl

Area: Outside of Special Zone
(Reference: GSP, 2024)

Insufficient spring GW level data to calculate statistics for 3 years





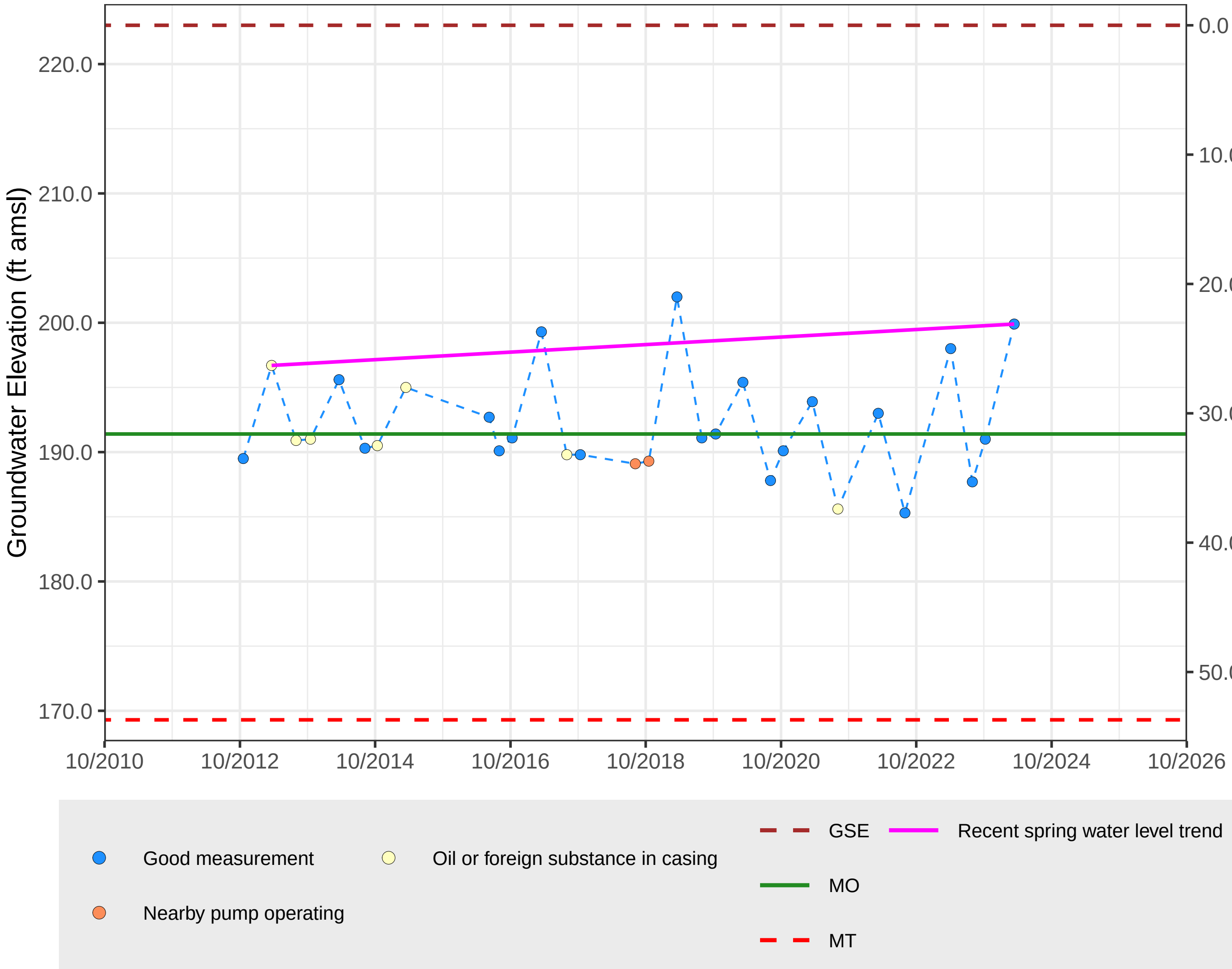
MO GWE: 191.4 ft amsl
MT GWE: 169.3 ft amsl

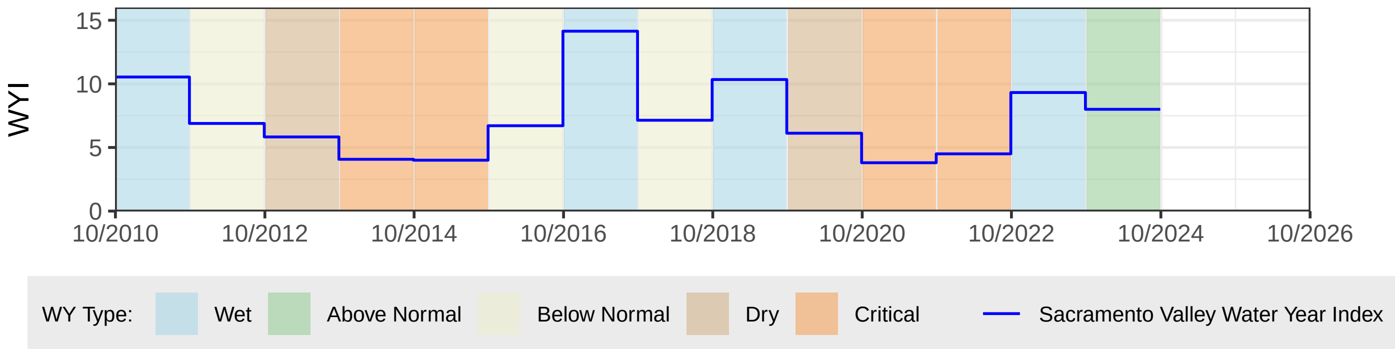
Area: Outside of Special Zone
(Reference: GSP, 2024)

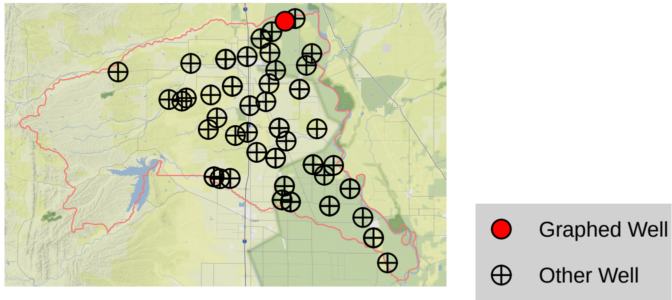
Statistics of spring water levels for past 11 years (2013 to 2024):
Change = 3.2 ft
Avg. rate of change = 0.29 ft/yr
Avg. water level = 196.88 ft amsl

Corning Subbasin − State Well Number (SWN) 25N02W31G002M

(Shallow Zone) Well Depth: 115 ft. Perforation top & bottom: 93 − 113 ft bgs



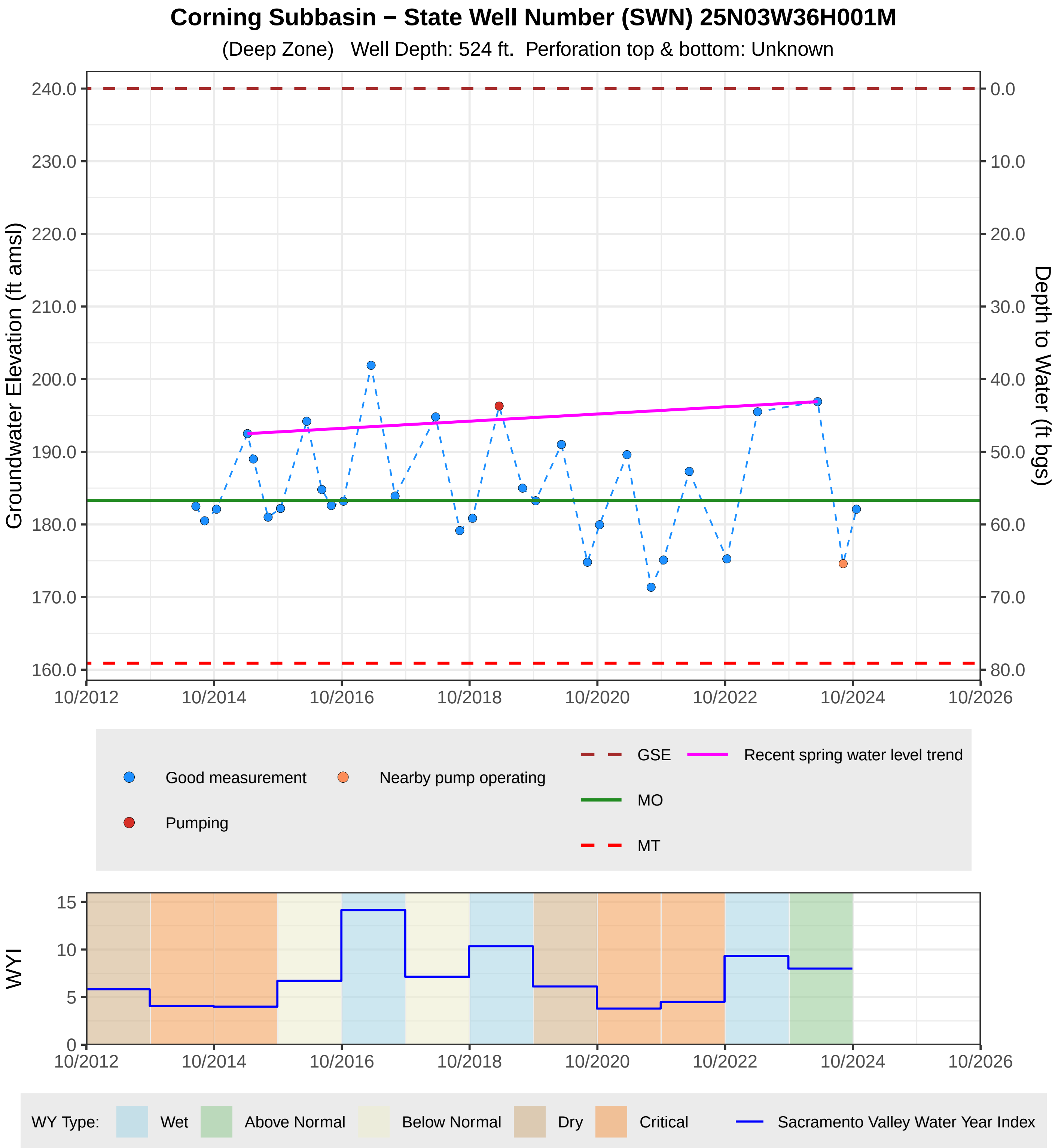




MO GWE: 183.3 ft amsl
MT GWE: 160.9 ft amsl

Area: Outside of Special Zone
(Reference: GSP, 2024)

Statistics of spring water levels for past 9 years (2015 to 2024):
Change = 4.4 ft
Avg. rate of change = 0.49 ft/yr
Avg. water level = 193.74 ft amsl



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Appendix B

Explanation of Sustainable Management Criteria

Appendix B: Explanation of Sustainable Management Criteria

The Sustainable Groundwater Management Act (SGMA) requires a Groundwater Sustainability Plan (GSP) to define Sustainable Management Criteria (SMC) for the groundwater subbasin. The SMC offer guideposts and guardrails for groundwater managers seeking to achieve sustainable groundwater management. SGMA defines sustainable groundwater management as "the management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results," where the planning and implementation horizon is 50 years with the first 20 years spent working toward achieving sustainable groundwater management and the following 30 years (and beyond) spent maintaining it (California Water Code §10721).

"Undesirable Results" are associated with up to six Sustainability Indicators (SI), including groundwater levels, groundwater storage, water quality, seawater intrusion, land subsidence, and interconnected surface water. SGMA defines undesirable results as those having significant and unreasonable negative impacts. Failure to avoid undesirable results on the part of the GSAs may lead to intervention by the State. Once the sustainability goal and undesirable results have been locally identified, projects and management actions are formulated to achieve the sustainability goal and avoid undesirable results.

SI and associated undesirable results, if significant and unreasonable

The associated undesirable results for each SI have been defined similarly across the Butte Subbasin. In turn, the rationale and approach for determining Minimum Thresholds and Measurable Objectives for each SI are the same across the Butte Subbasin.

The terminology for describing SMC is defined as follows:

Undesirable Results – Significant and unreasonable negative impacts associated with each SI.

Minimum Threshold (MT) – Quantitative threshold for each SI used to define the point at which undesirable results may begin to occur.

Measurable Objective (MO) – Quantitative target that establishes a point above the MT that allows for a range of active management to prevent undesirable results.

Margin of Operational Flexibility – The range of active management between the MT and the MO.

Interim Milestones (IMs) – Targets set in increments of five years over the implementation period of the GSP offering a path to sustainability.

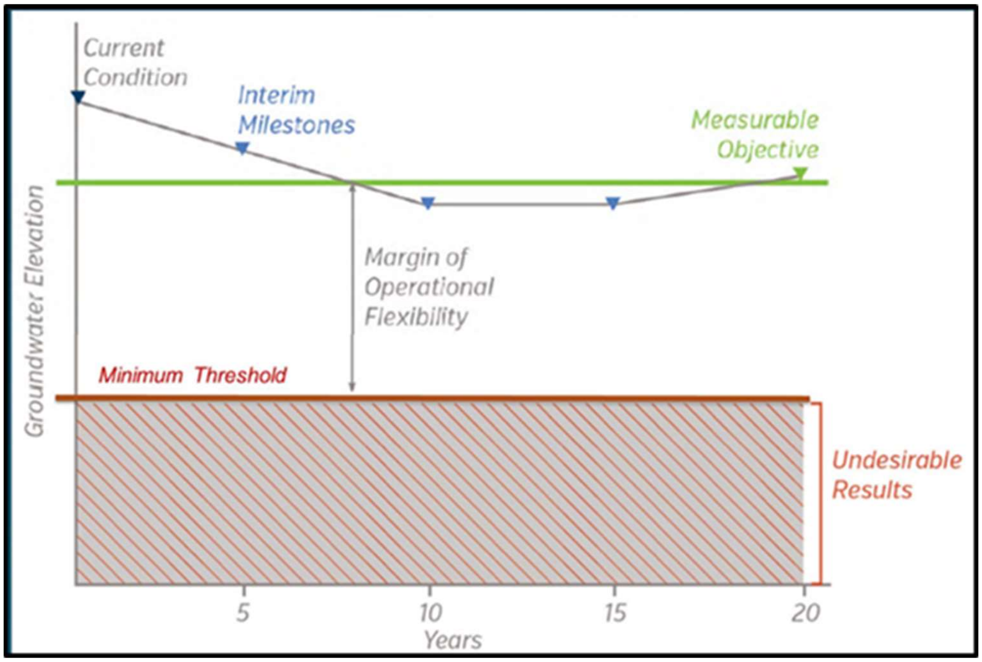

Illustration of Terms Used for Describing Sustainable Management Criteria Using the Groundwater Level SI

The Figure above illustrates these terms for the groundwater level SI.

SI are intended to be measured and compared against quantifiable SMC throughout a monitoring framework of Representative Monitoring Site (RMS) wells. Ongoing monitoring of SI can:

Determine compliance with the adopted GSP

Offer a means to evaluate the effectiveness of projects and management actions over time

Allow for course correction and adaptation in five-year updates

Facilitate understanding among diverse stakeholders

Support decision-making on the part of the GSAs into the future

The SMC for the Corning Subbasin is fully explained and defined in Section 3 of the

GSP available here: https://sgma.water.ca.gov/portal/gsp/preview/94

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Appendix C

GSP Annual Reporting Elements Guide

Groundwater Sustainability Plan Annual Report Elements Guide

Basin Name	Corning		
GSP Local ID	5-021.51		
California Code of Regulations - GSP Regulation Sections	***Groundwater Sustainability Plan Elements***	**Document *page number(s) that address the applicable GSP element.***	***Notes: Briefly describe the GSP element does not apply.***
Article 5	**Plan Contents**		
Subarticle 4	***Monitoring Networks***		
§ 354.40	**Reporting Monitoring Data to the Department**		
	Monitoring data shall be stored in the data management system developed pursuant to Section 352.6. A copy of the monitoring data shall be included in the Annual Report and submitted electronically on forms provided by the Department.	38-47; 130-132	
	Note: Authority cited: Section 10733.2, Water Code. Reference: Sections 10728, 10728.2, 10733.2 and 10733.8, Water Code.		
Article 7	**Annual Reports and Periodic Evaluations by the Agency**		
§ 356.2	**Annual Reports**		
	Each Agency shall submit an annual report to the Department by April 1 of each year following the adoption of the Plan. The annual report shall include the following components for the preceding water year:		
	(a) General information, including an executive summary and a location map depicting the basin covered by the report.	5-12	
	(b) A detailed description and graphical representation of the following conditions of the basin managed in the Plan:		
	(1) Groundwater elevation data from monitoring wells identified in the monitoring network shall be analyzed and displayed as follows:		
	(A) Groundwater elevation contour maps for each principal aquifer in the basin illustrating, at a minimum, the seasonal high and seasonal low groundwater conditions.	17-20	
	(B) Hydrographs of groundwater elevations and water year type using historical data to the greatest extent available, including from January 1, 2015, to current reporting year.	21; 56-112	
	(2) Groundwater extraction for the preceding water year. Data shall be collected using the best available measurement methods and shall be presented in a table that summarizes groundwater extractions by water use sector, and identifies the method of measurement (direct or estimate) and accuracy of measurements, and a map that illustrates the general location and volume of groundwater extractions.	22-24	
	(3) Surface water supply used or available for use, for groundwater recharge or in-lieu use shall be reported based on quantitative data that describes the annual volume and sources for the preceding water year.	25	
	(4) Total water use shall be collected using the best available measurement methods and shall be reported in a table that summarizes total water use by water use sector, water source type, and identifies the method of measurement (direct or estimate) and accuracy of measurements. Existing water use data from the most recent Urban Water Management Plans or Agricultural Water Management Plans within the basin may be used, as long as the data are reported by water year.	25-26	
	(5) Change in groundwater in storage shall include the following:		
	(A) Change in groundwater in storage maps for each principal aquifer in the basin.	30-32	
	(B) A graph depicting water year type, groundwater use, 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.	30	
	(c) A description of progress towards implementing the Plan, including achieving interim milestones, and implementation of projects or management actions since the previous annual report.	33-54	

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Appendix D

DWR Upload Tables

A. Groundwater Extractions

Total Groundwater Extractions (AF)	Water Use Sector Urban (AF)	Water Use Sector Industrial (AF)	Water Use Sector Agricultural (AF)	Water Use Sector Managed Wetlands (AF)	Water Use Sector Managed Recharge (AF)	Water Use Sector Native Vegetation (AF)	Water Use Sector Other (AF)	Water Use Sector Other Description
153,600	2,300	0	149,500		0	-	1,800	Rural Residential

B. Groundwater Extraction Methods

Meters Volume (AF)	Meters Description	Meters Type	Meters Accuracy (%)	Meters Accuracy Description	Electrical Records Volume (AF)	Electrical Records Description	Electrical Records Type	Electrical Records Accuracy (%)	Electrical Records Accuracy Description	Land Use Volume (AF)	Land Use Description	Land Use Type	Land Use Accuracy (%)	Land Use Accuracy Description	Groundwater Model Volume (AF)	Groundwater Model Description	Groundwater Model Type	Groundwater Model Accuracy (%)	Groundwater Model Accuracy Description	Other Method(s) Volume (AF)	Other Method(s) Description	Other Method(s) Type	Other Method(s) Accuracy (%)	Other Method(s) Accuracy Description
2,300	Metered Municipal Wells	Direct	5%	Metered connection maintained by City of Corning, Hamilton City, and the Corning Water District	0					149,500	Land use estimates were derived from crop mapping and CropScape survey results	Estimate	20%	Typical uncertainty for water balance calculation	0					1,800	Rural residential groundwater extraction is estimated based on City of Red Bluff's 2020 Urban Water Management Plan 2020 usage of an average per capita water use of 253 gallons per capita per day. Population data from the 2020 census was coupled with water district boundary data to identify total population not serviced by municipal supplies	Estimate	15%	Uncertainties are from population estimates and gallon per capita per day estimates

C. Surface Water Supply

Total Surface Water Supply (AF)	Methods Used To Determine	Water Source Type Central Valley Project (AF)	Water Source Type State Water Project (AF)	Water Source Type Colorado River Project (AF)	Water Source Type Local Supplies (AF)	Water Source Type Local Imported Supplies (AF)	Water Source Type Recycled Water (AF)	Water Source Type Desalination (AF)	Water Source Type Other (AF)	Water Source Type Other Description
29,700	Diversions for local supplies are estimated based on historic State Water Resource Control Board eWRIMS (Electronic Water Rights Information Management System) data for total diversions. Surface water delivery estimates are based on historic deliveries in the area that have occurred in dry and critical years	0	0	0	29,700	0	0	0	0	

D. Total Water Use

Total Water Use (AF)	Methods Used To Determine	Water Source Type Groundwater (AF)	Water Source Type Surface Water (AF)	Water Source Type Recycled Water (AF)	Water Source Type Reused Water (AF)	Water Source Type Other (AF)	Water Source Type Other Description	Water Use Sector Urban (AF)	Water Use Sector Industrial (AF)	Water Use Sector Agricultural (AF)	Water Use Sector Managed Wetlands (AF)	Water Use Sector Managed Recharge (AF)	Water Use Sector Native Vegetation (AF)	Water Use Sector Other (AF)	Water Use Sector Other Description
183,300	Methods used are a combination of estimates based on land use and population/ per capita water use, metered municipal water use, and estimates based on historic water rights data for dry and critical years	153,600	29,700	0	0	0		2,300	0	179,200	-	0	-	1,800	Rural Residential

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Appendix E

Water Use Analysis Methodology

TECHNICAL MEMORANDUM

To: Luhdorff and Scalmanini Consulting Engineers

From: Davids Engineering, Inc.

Date: March 3, 2025

Subject: **Water Use Analysis Methodology**

1 Introduction

Pursuant to the Groundwater Sustainability Plan (GSP) regulations (23 CCR[1] Section 356.2), the GSP Annual Report for the Corning Subbasin (Subbasin) includes quantification of water supplies and water uses in the reporting year, including groundwater extraction by water use sector[2]. Water supplies and water uses in the Subbasin have been quantified based on the best available data sources and information, either collected from measured records or estimated where necessary.

While some groundwater extraction in the Subbasin is measured, most groundwater extraction is unmeasured, including extraction from privately owned wells. For the Corning Subbasin Annual Report (Annual Report), the approach used to estimate unmeasured groundwater extraction for the agricultural water use sector is referred to as the Groundwater Extraction Estimates from Earth Observations (GEEEO) process. In this approach, a spatial water use analysis is computed on a monthly basis using current land use data, climate conditions (e.g., precipitation and evapotranspiration), crop water demands, and other local information, allowing for estimation of total water use and estimated groundwater extraction, after accounting for the use of other available water supplies.

This approach differs from the water budget methodology used in GSP development, where a C2VSim-Fine Grid (C2VSim-FG) model application was used to generate historical, current, and projected water budgets for the Subbasin. The shift toward the GEEEO process is due to the time and cost constraints associated with updating the GSP groundwater model annually. Despite this change, key inputs and results from the GEEEO process have been compared with those of the GSP groundwater model to ensure consistency in the water use analyses.

This technical memorandum (TM) describes the methodology and data sources used in the GEEEO process. Results of the GEEEO process are documented in the Annual Report.

[1] California Code of Regulations, Title 23, Division 2, Chapter 1.5, Subchapter 2. Groundwater Sustainability Plans.
[2] Water use sectors are identified in the GSP Regulations as “categories of water demand based on the general land uses to which the water is applied, including urban, industrial, agricultural, managed wetlands, managed recharge, and native vegetation” (23 CCR Section 351(al)).

2 GEEEO Process and Computational Approach

2.1 Computational Approach

The GEEEO process utilizes available geospatial data and information to quantify water use, including groundwater extraction volumes, spatially across the Subbasin:

1. First, geospatial evapotranspiration (ET) information at a pixel-scale is used to quantify the total consumptive water use and total applied water requirements during a given time period in a given area of the Subbasin, and geospatial land use information is used to help identify where irrigation water may have been applied (i.e., whether the area in question features irrigated agricultural land, versus idled land or undeveloped vegetation).
2. After quantifying total applied water requirements, available surface water supply and groundwater extraction data is incorporated into the GEEEO process by distributing that water out to specific regions where that water is applied (e.g., irrigated lands in surface water supplier service areas).
3. The remaining groundwater extraction needed to meet applied water demands is then calculated based on the difference between total applied water requirements and available water supply information, with consideration for effective precipitation.
4. Finally, the pixel-scale results can then be aggregated to the desired spatial or temporal domains of interest.

The result is a spatially distributed water use analysis calculated with a finer spatial resolution than was possible in the GSP water budgets. The pixel-scale water budget results provide greater insight into where water use occurs in the Subbasin and are configurable to create water use summaries for any region of the Subbasin. Additional details about the GEEEO computational approach are provided in Attachment A, generally following the process described in Hessels et al. (2022).

2.2 Spatial Resolution

GEEEO quantifies water use and groundwater extraction volumes with pixel-scale resolution (30 meters (m) x 30 m), corresponding to the spatial resolution of satellite imagery used in developing many of the GEEEO inputs. For those inputs that are not available at the 30 m x 30 m resolution, available data and information is distributed as averages over the area where that information is applicable (e.g., district-reported surface water deliveries are distributed as an average acre-feet per acre (AF/ac) over irrigated lands in that district's service area[3]). Additional information about the spatial resolution of specific data sources is provided in Section 3.

The fine spatial resolution of the GEEEO inputs and computations allows for highly configurable GEEEO results summaries. For the Annual Report, results are summarized by subregions that are defined to roughly correspond with the boundaries of the water budget regions in the GSP groundwater model, with distinction between water districts, managed wetlands and refuge areas, and out-of-district lands.

[3] Future refinements to the GEEEO process could potentially incorporate field-scale surface water delivery records to improve spatial detail of results rather than equally distributing surface water deliveries across the irrigated lands within the district's service area.

2.3 Period and Timestep

For each Annual Report, the GEEEO process operates from 2016 through the current reporting year[4] on a monthly timestep, although only the results from the current reporting year are included in the Annual Report. The period and timestep are set according to data availability and reporting needs. However, the GEEEO process is configurable to operate on different timescales (e.g., daily or weekly). The start year is currently limited by the availability of geospatial ET information from OpenET, although further historical ET information is expected to be available in the near future.

3 Data Sources

The GEEEO process uses data sources and information that capture the unique, local conditions within the Subbasin to the extent available. Details about the data and information used in the GEEEO process are described below.

3.1 Evapotranspiration

ET, or consumptive water use, is the major driver of water use in the Subbasin, particularly agricultural use. In this context, consumptive water use is defined as "*the part of water withdrawn that is evaporated, transpired, incorporated into products or crops, consumed by humans or livestock, or otherwise removed from the immediate water environment*" (ASCE, 2016). Unlike surface runoff or infiltration of water into the groundwater system (through seepage, deep percolation, managed recharge, or other means), ET is water that cannot be recovered or directly reused in the Subbasin.

In the GEEEO process, ET is quantified from satellite-based remote sensing analyses available from OpenET. OpenET is a multi-agency web-based geospatial information system (GIS) utility that quantifies ET over time with a spatial resolution of 30 m x 30 m (approximately 0.22 acres). OpenET information is available in raster coverages of the Subbasin on both a daily and monthly timestep from 2016 through present.[5] The GEEEO process utilizes monthly rasters of the ensemble ET from OpenET to calculate total water use for the Annual Report.

While OpenET is a new utility, the underlying methodologies to quantify ET apply a variety of well-established modeling approaches that are widely used in government and research applications. The OpenET modeling approaches are also similar to the approaches used to quantify ET in the GSP groundwater model. Additional information about the OpenET team, data sources, and methodologies are available at: https://openetdata.org/.

3.2 Land Use

Areas in each water use sector in the Subbasin were identified using the most recent and reliable spatial land use data in the region, including:

1. Statewide crop mapping, available from the California Department of Water Resources (DWR) (DWR, 2024)

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[4] Annual Reports are required to be submitted by April 1 each year following the adoption of the GSP. The current reporting year for each Annual Report is the preceding water year (i.e., October 1 through September 30)

[5] OpenET raster information is typically available within about one month after the period has ended.

2. CropScape Cropland Data Layer coverage, available from the United States Department of Agriculture (USDA, 2024).

Land use data from these sources were compiled into 30 m x 30 m raster coverages of the Subbasin. To prepare the GEEEO process inputs, DWR data, which includes extensive ground-truthing review of results, is preferentially used to identify agricultural land (including irrigated and non-irrigated lands) and urban areas, and then USDA data is utilized to back-fill gaps of non-irrigated, idled, and non-developed land in the Subbasin. Local refinements are also applied, as needed, to account for local land use information.

These land use data sources and applications were similar to those used in development of the GSP water budgets. Comparisons were made to evaluate the consistency of the datasets and with earlier land use analyses; good correspondence was found for the major land use classes found in the Subbasin.

DWR data is typically available in provisional form approximately two years after a given year has passed. USDA data is typically available for the prior year in early- to mid-February. When data for the current reporting year is not yet available, raster coverages of the Subbasin are generally assembled utilizing land use data from the most recent, hydrologically similar year (i.e., similar water supply conditions and similar cropping patterns, to the extent possible). Idling of annual and ponded crops in a given year may also be locally refined through comparison with USDA data for the current reporting year or through an analysis of vegetation coverage in the current reporting year. However, it is noted that land use data is only used in the GEEEO process to identify areas in each water use sector where water is applied. The total water use for lands in the agricultural and managed wetlands water use sectors are determined through an analysis of OpenET data, regardless of the precise land use classification.

3.3 Precipitation

Spatial precipitation estimates were extracted from the Parameter-elevation Regressions on Independent Slopes Model (PRISM), developed by the PRISM Climate Group at Oregon State University. PRISM quantifies spatial precipitation estimates, among other climate parameters, based on available weather station data and modeled spatial relationships with topography and other factors influencing weather and climate.

PRISM data is available in raster coverages of the Subbasin on both a daily and monthly timestep, with a spatial resolution of 4 kilometer (km) x 4 km. The GEEEO process utilizes monthly rasters for the Annual Report analysis, and the precipitation results for each 4 km pixel are applied to each of the 30 m pixels within it (i.e., downscaled) for which ET and land use data are available. Additional information about the PRISM data and methodologies are available at: https://prism.oregonstate.edu. PRISM precipitation data is consistent with the historical precipitation inputs to the GSP groundwater model.

To calculate effective precipitation and, subsequently, evapotranspiration from precipitation (ETPR), PRISM precipitation data, estimated crop rooting depths, and soil property information are used as inputs. Estimated rooting depths are taken from the ranges listed in Appendix B of ASCE 70 (2016). For crops not listed in ASCE 70, rooting depths are based on the rooting depths of similar crops and professional judgement. Relevant soil properties include total soil depth, depth to restrictive layer, and available water holding capacity. Estimated soil properties are aggregated from the USDA soil survey geographic database (SSURGO) (Soil Survey Staff, 2025). ETPR is computed using the input parameters (soil, precipitation, and rooting depth) and either the U.S. Bureau of Reclamation (USBR) method (Stamm, 1967) or the National Engineering Handbook Part 623 method (USDA, 1993), depending on local data availability, results, and conditions. For the USBR method, the effective precipitation bins have been modified from the original bins outlined in the USBR method documentation to match regional hydrology patterns..

3.4 Local Water Supply Data

As described in Section 2, available surface water supply and groundwater extraction data is incorporated into the GEEEO process to quantify the amount of known water supply available, prior to estimating the remaining groundwater extraction needed to meet demand. Where field-scale delivery measurements are available, the water supply volume delivered was distributed evenly across all irrigated areas of that field. Where field-scale delivery measurements are not available and only diversion volumes or aggregated delivery volumes for a larger area are available, water supply data is distributed evenly over the area where that water can be delivered for irrigation (e.g., average AF/ac over lands where that water is available for use).

Surface water supply and groundwater extraction data are collected from both publicly available and local sources. Information gathered may include, where applicable:

1. Water supply contract delivery records, from the United States Bureau of Reclamation (USBR), State Water Project (SWP), or other publicly available sources as applicable.
2. Water rights diversions records, from the State Water Resources Control Board (SWRCB) through the Electronic Water Rights Information Management System (eWRIMS)
3. Data requests to local water agencies and water users, requesting surface water diversions, surface water deliveries, surface water outflows, groundwater pumping records, or other available water use data. At the most detailed possible level, these include field-scale volumetric delivery measurements taken by Water or Irrigation District water operators, as required per the Water Conservation Act of 2009.

In cases where current surface water data is not available, general information on surface water inflows and outflows may be gathered from other local sources as available (e.g., Agricultural Water Management Plan water budgets). More information about surface water data sources is described in the Annual Report.

While groundwater extraction data is not available in many parts of the Subbasin, local data is requested each year so that new data can be incorporated into the GEEEO process as it becomes available. It is noted that while groundwater extraction for municipal water supply systems is generally reported for urban areas in the Annual Report based on SWRCB and locally provided data, groundwater extraction for municipal areas is not directly included in the GEEEO process due to underlying differences in how the majority of water is used in urban areas. This also applies to estimates of rural residential groundwater use (e.g., domestic water use pumped through private domestic wells) outside of urban areas. The data sources and approaches used to quantify municipal and rural residential groundwater extraction are described in the Annual Report.

3.5 Other Agronomic Data

Other agronomic and climate-related data that is incorporated into the GEEEO process includes:

1. Representative consumptive use fractions for crops (i.e., fraction of total applied water that is consumed through ET). Values are based on typical irrigation methods and efficiencies for crops.
2. Conveyance system fractions for subregions (i.e., fraction of diverted water that is delivered, accounting for losses).
3. Reuse fractions for subregions (i.e., fraction of delivered water that is reused).

Information gathered from local sources is used where available, otherwise representative values for agronomic practices in the region are used.

4 References

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Attachment A. GEEEO Computational Approach Details

Figures A-1 and A-2, below, present a schematic of the GEEEO computational approach as it has been developed and is being generally applied to support Annual Report Development.

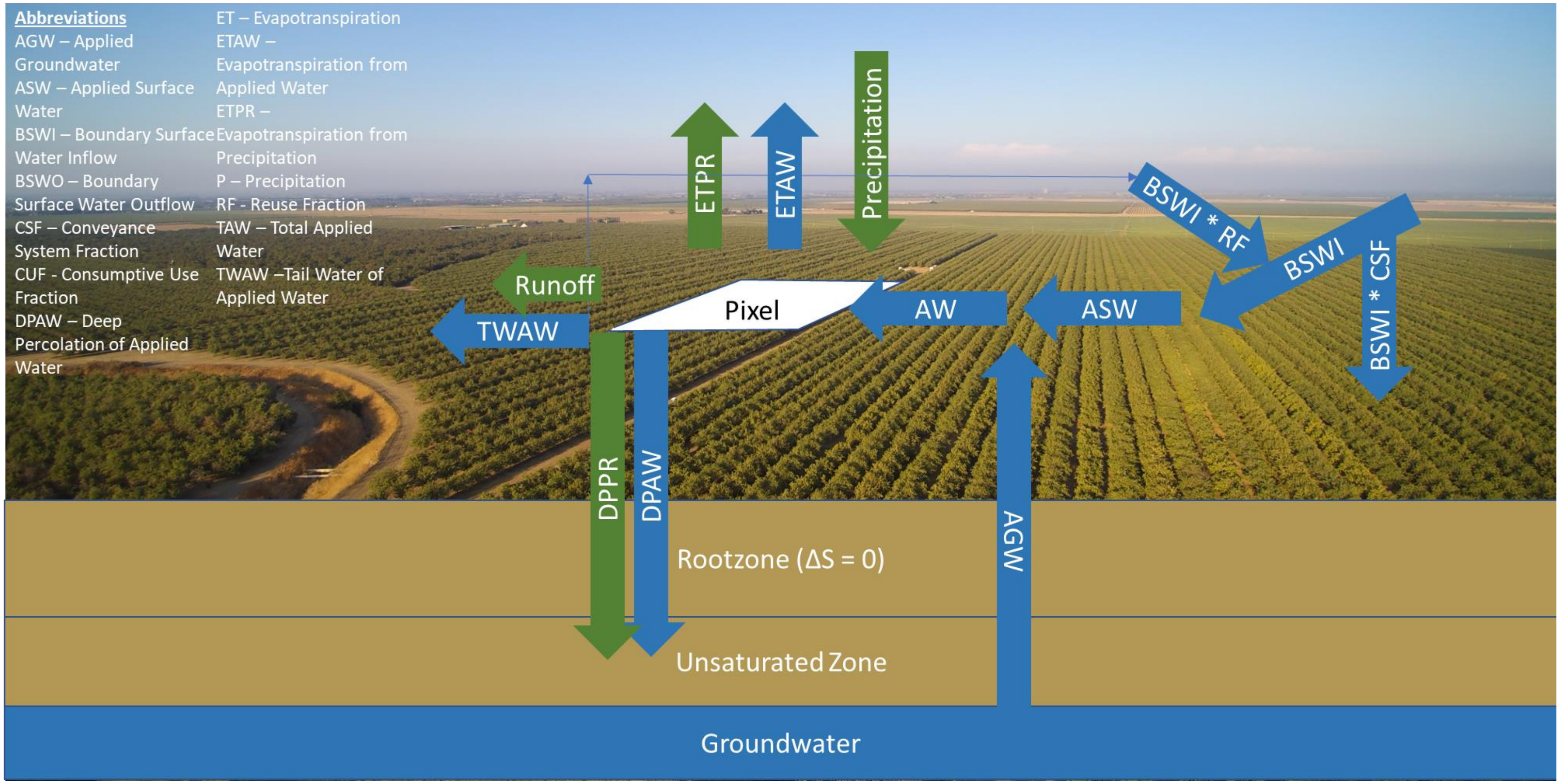

Figure A-1. Inflows and Outflows to Each 30 m x 30 m Pixel in the GEEEO Process.

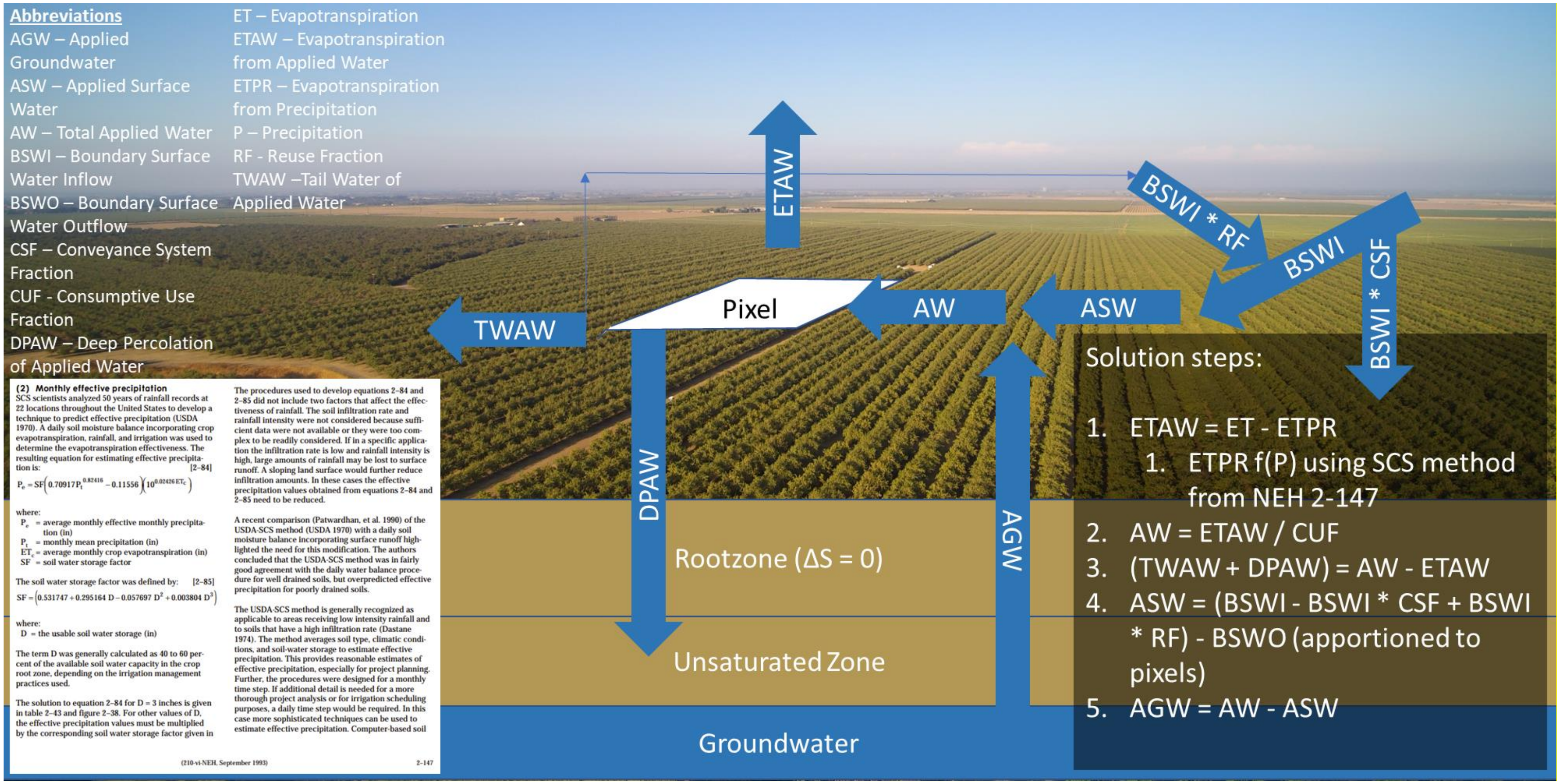

Figure A-2. Solution Steps for Calculating Applied Groundwater (AGW) in Each 30 m x 30 m Pixel in the GEEEO Process.

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Appendix F

Water Quality

Measurable Objectives, Minimum Thresholds, and Water Quality of Representative Monitoring Site Wells					
Well ID	Alternate/New Well ID	TDS (mg/L)			
		MO	MT	2024	Exceed MT?
22N01W29N001M	--	500	750	N/A	--
22N01W29N002M	--	500	750	N/A	--
22N01W29N003M	--	500	750	N/A	--
22N01W29N004M	--	500	750	N/A	--
22N02W01N001M	--	500	750	N/A	--
22N02W01N002M	--	500	750	N/A	--
22N02W01N003M	--	500	750	N/A	--
22N02W01N004M	--	500	750	N/A	--
22N02W15C003M	--	500	750	N/A	--
22N02W15C004M	--	500	750	N/A	--
22N02W15C005M	--	500	750	N/A	--
22N02W18C001M	--	500	750	N/A	--
22N02W18C002M	--	500	750	N/A	--
22N02W18C003M	--	500	750	N/A	--
22N02W18C004M	--	500	750	N/A	--
22N03W01R001M	--	500	750	N/A	--
22N03W01R002M	--	500	750	N/A	--
22N03W01R003M	--	500	750	N/A	--
24N02W29N003M	--	500	750	N/A	--
24N03W29Q001M	--	500	750	N/A	--
24N03W29Q002M	--	500	750	N/A	--
24N03W29Q003M	--	500	750	N/A	--
SVWQC00020	--	500	750	16	No
5201083-001	--	500	750	--	--
5200670-001	CA5200670_001_001	500	750	N/A	--
5200672-001	CA5200672_001_001	500	750	N/A	--
5201142-002	CA5201142_002_002	500	750	N/A	--
1110002-001	CA1110002_001_001	500	750	N/A	--
1110002-002	CA1110002_002_002	500	750	240	No
1110002-003	CA1110002_003_003	500	750	N/A	--
1100527-001	CA1100527_001_001	500	750	N/A	--
5210001-001	CA5210001_001_001	500	750	N/A	--
5210001-002	CA5210001_002_002	500	750	N/A	--
5210001-003	CA5210001_003_003	500	750	N/A	--
5210001-005	--	500	750	--	--
5210001-008	CA5210001_008_008	500	750	N/A	--
5210001-009	CA5210001_009_009	500	750	N/A	--
5210001-010	CA5210001_01_010	500	750	N/A	--
5210001-019	CA5210001_019_019	500	750	N/A	--
5200255-001	CA5200255_001_001	500	750	N/A	--
5200541-001	CA5200541_001_001	500	750	N/A	--

1110300-001	CA1110300_001_001	500	750	N/A	--
5200338-001	CA5200338_001_001	500	750	N/A	--
5200520-001	--	500	750	--	--
1100440-001	CA1100440_001_001	500	750	N/A	--
5200516-001	--	500	750	--	--
5200865-001	CA5200865_001_001	500	750	N/A	--
5200556-001	CA5200556_001_001	500	750	N/A	--
5200565-001	CA5200565_001_001	500	750	N/A	--
5201055-001	CA5201055_001_001	500	750	N/A	--
5200551-001	CA5200551_001_001	500	750	N/A	--