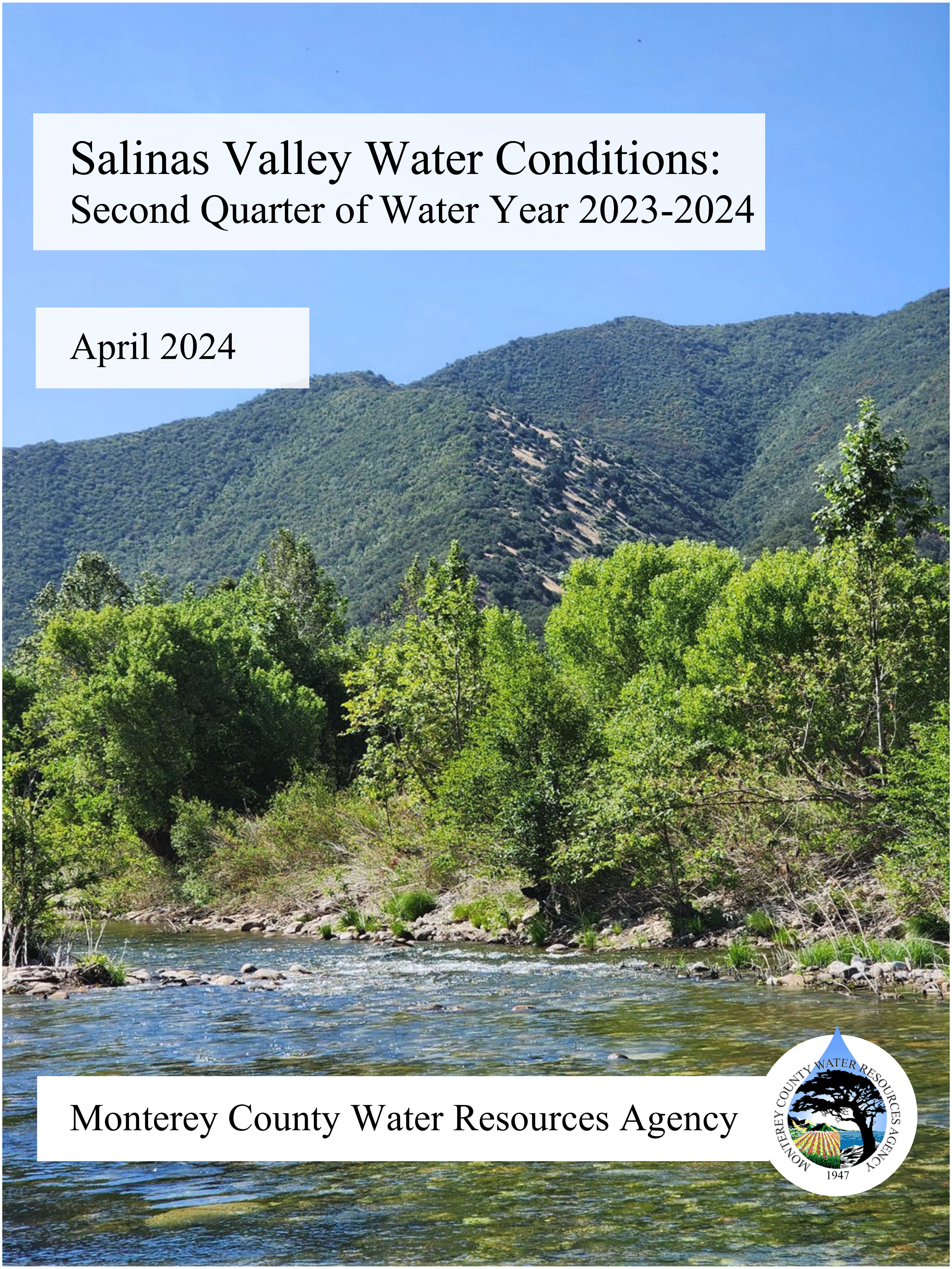
Salinas Valley Water Conditions:
Second Quarter of Water Year 2023-2024

April 2024



Monterey County Water Resources Agency

MONTEREY COUNTY WATER RESOURCES AGENCY
Salinas Valley Water Conditions
Quarterly Update for Second Quarter of Water Year 2023-2024
April 2024

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Introduction

This report covers the second quarter of Water Year 2024 (WY24), consisting of January through March 2024. It provides a brief overview and discussion of hydrologic conditions in the Salinas Valley including precipitation, reservoir storage, streamflow, and groundwater level trends (Figure 1).

Data for the second quarter of Water Year 2023-2024 indicate higher than normal levels of precipitation, and storage in Nacimiento Reservoir is slightly lower than in March 2023 and higher in San Antonio Reservoir compared to March 2023. Over the second quarter of WY24, groundwater elevations increased across most of the subareas and aquifers, though some are starting to experience a seasonal decline.

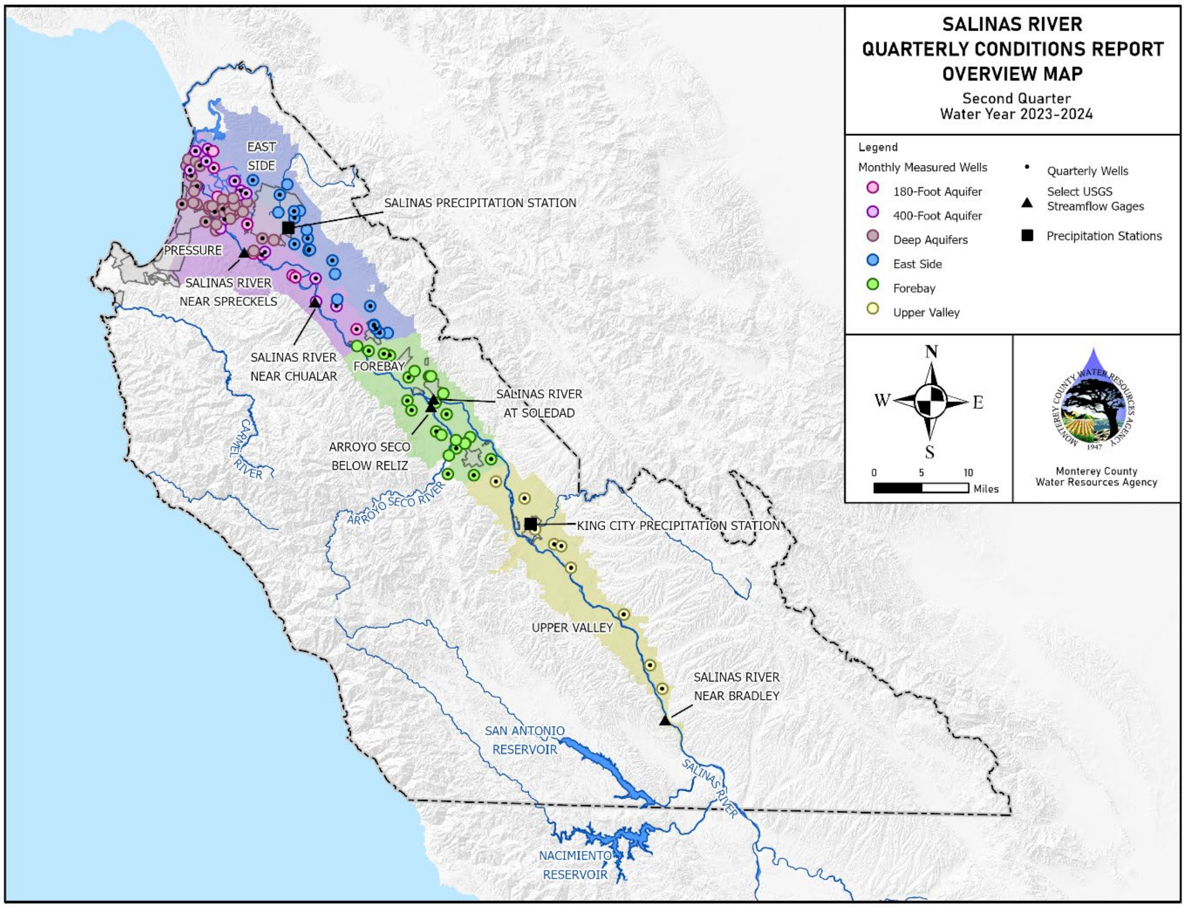
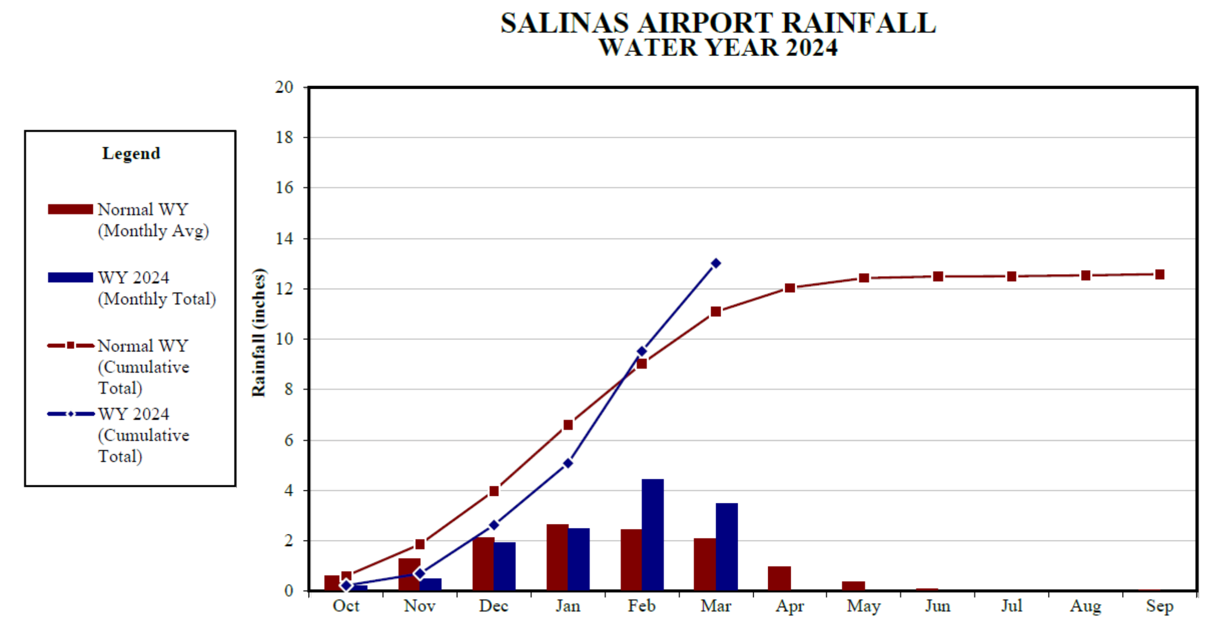


Figure 1: Geographic extent of the area covered by this report and supporting data sources.

Precipitation

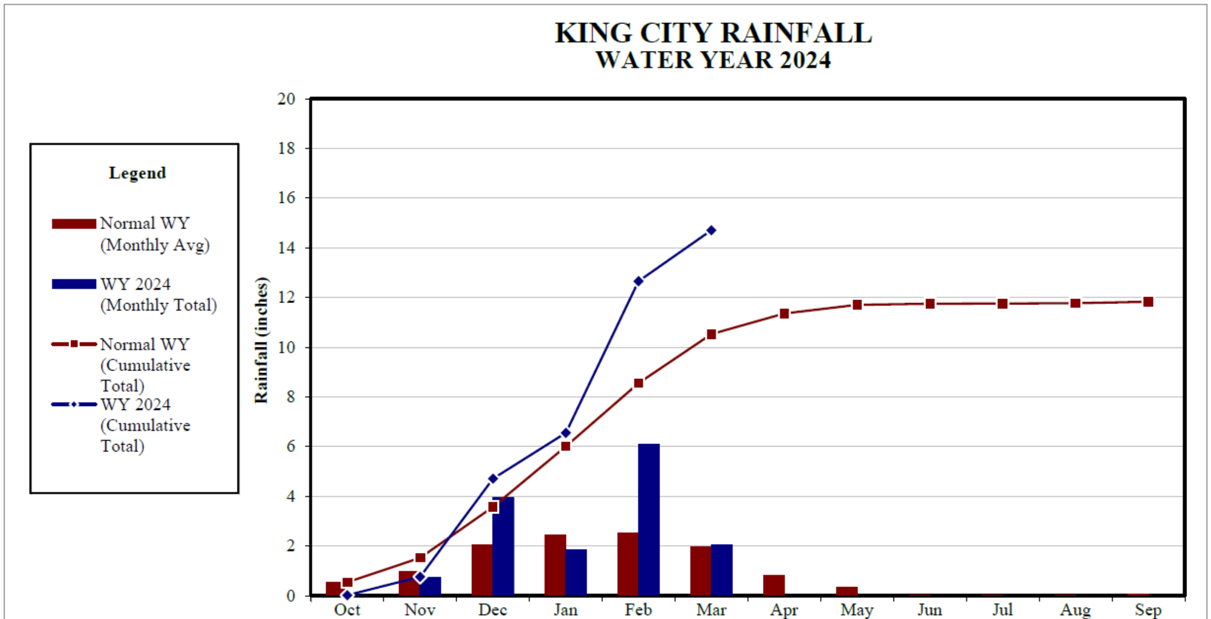
Preliminary National Weather Service rainfall data indicates that the second quarter of WY24 brought above normal rainfall to both Salinas and King City. Totals for the quarter were 13.01 inches at the Salinas Airport (117% of normal rainfall of 11.09 inches for the quarter) and 14.71 inches in King City (140% of normal rainfall of 10.53 inches for the quarter).

Figure 2 and Figure 3 show monthly and cumulative precipitation data for the current water year and for a "normal" water year, based on long-term monthly precipitation averages, for the Salinas Airport and King City sites, respectively. Included below each graph is a table showing the numeric values for precipitation as well as percent of "normal" precipitation. For the purposes of these graphs, a "normal" water year is the average precipitation over the most recent 30-year period ending in a decade. Currently, the period from 1991 to 2020 is used for this calculation.



	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Monthly Rainfall (WY 2024)	0.22	0.48	1.92	2.46	4.44	3.49						
Monthly Rainfall (Normal WY*)	0.60	1.26	2.12	2.63	2.42	2.06	0.95	0.38	0.07	0.01	0.03	0.05
Percent of Normal for Month	37%	38%	91%	94%	183%	169%	0%	0%	0%	0%	0%	0%
Cumulative Rainfall (WY 2024)	0.22	0.70	2.62	5.08	9.52	13.01						
Cumulative Rainfall (Normal WY*)	0.60	1.86	3.98	6.61	9.03	11.09	12.04	12.42	12.49	12.50	12.53	12.58
Percent of Cumulative Normal	37%	38%	66%	77%	105%	117%						

Figure 2: Salinas Airport Rainfall for Water Year 2024



	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Monthly Rainfall (WY 2024)	0.02	0.74	3.95	1.84	6.11	2.05						
Monthly Rainfall (Normal WY*)	0.54	0.98	2.05	2.44	2.54	1.98	0.83	0.35	0.04	0.01	0.01	0.06
Percent of Normal for Month	4%	76%	193%	75%	241%	104%	0%	0%	0%	0%	0%	0%
Cumulative Rainfall (WY 2024)	0.02	0.76	4.71	6.55	12.66	14.71						
Cumulative Rainfall (Normal WY*)	0.54	1.52	3.57	6.01	8.55	10.53	11.36	11.71	11.75	11.76	11.77	11.83
Percent of Cumulative Normal	4%	50%	132%	109%	148%	140%						

Figure 3: King City Rainfall for Water Year 2024

Reservoir Storage

At the end of the second quarter of WY24, storage at Nacimiento Reservoir on March 31, 2024 was 350,940 acre-feet, which is 2,725 acre-feet lower than in March 2023. Storage in San Antonio Reservoir on March 31, 2024 was 266,760 acre-feet, which is 53,850 acre-feet higher than at the same time in March 2023.

Reservoir	**March 31, 2024 (WY24) Storage in acre-feet**	**March 31, 2023 (WY23) Storage in acre-feet**	**Difference in acre-feet**
Nacimiento	350,940	353,665	-2,725
San Antonio	266,760	213,180	53,850

Graphs showing daily reservoir storage for the last five water years, along with 30-year average daily storage for comparison, are included as Figure 4 and Figure 5.

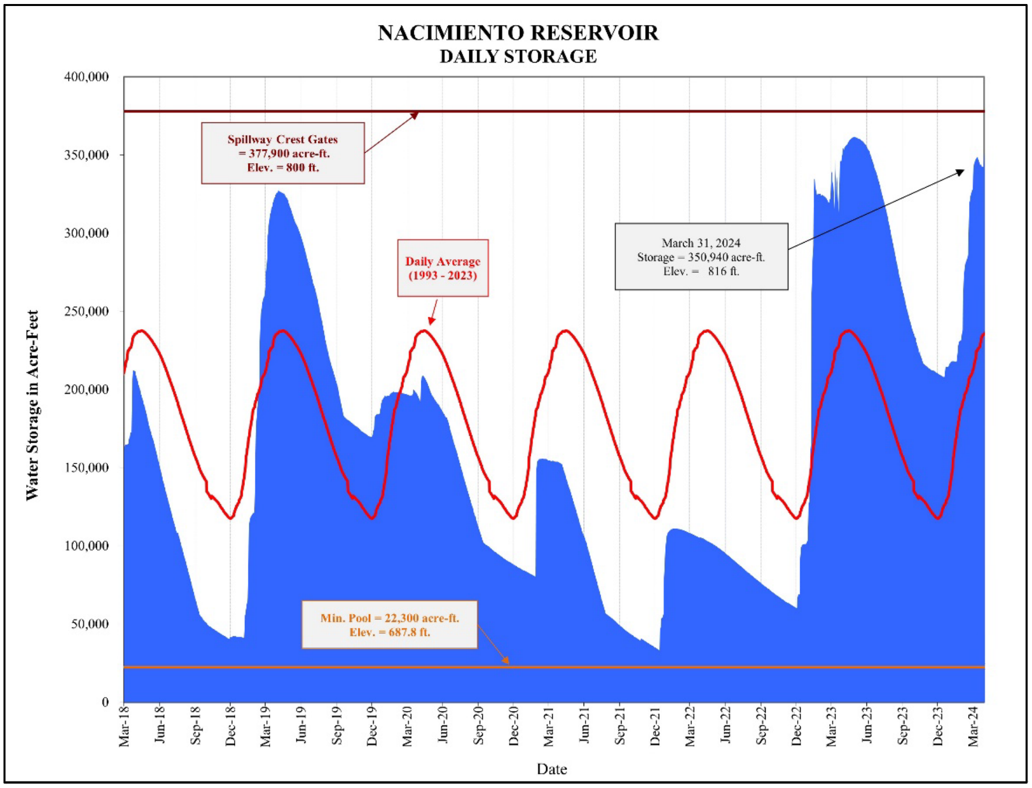


Figure 4: Nacimiento Reservoir Storage

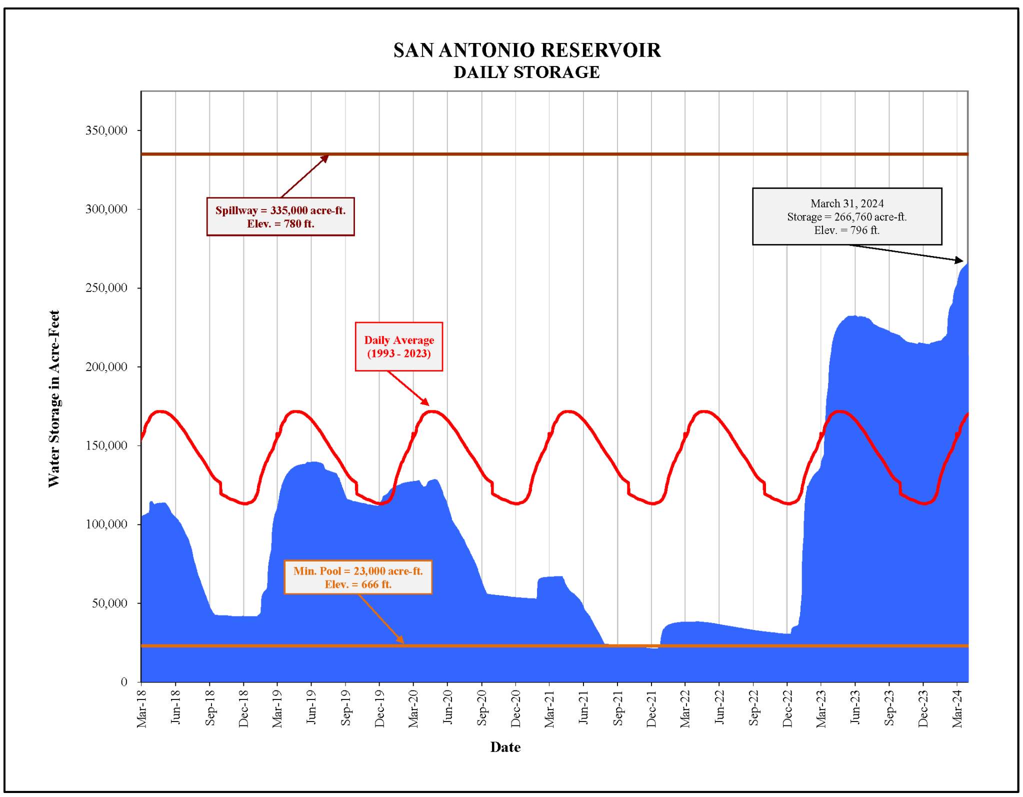


Figure 5: San Antonio Reservoir Storage

Streamflow

The Salinas River is predominately a losing stream, meaning streamflow moves from the streambed into the underlying aquifers. The U.S. Geological Survey maintains several streamflow gages throughout the Salinas River watershed that continuously measure discharge or flow in the river (Figure 1). Figure 6 shows mean daily flow, in cubic feet per second, from select gages on the Salinas River and Arroyo Seco for the last five years (WY 2020-2024) and the current water year (WY 2024).

Streamflow recorded during the second quarter of WY24 was predominantly the result of multiple rain events that occurred throughout February and March.

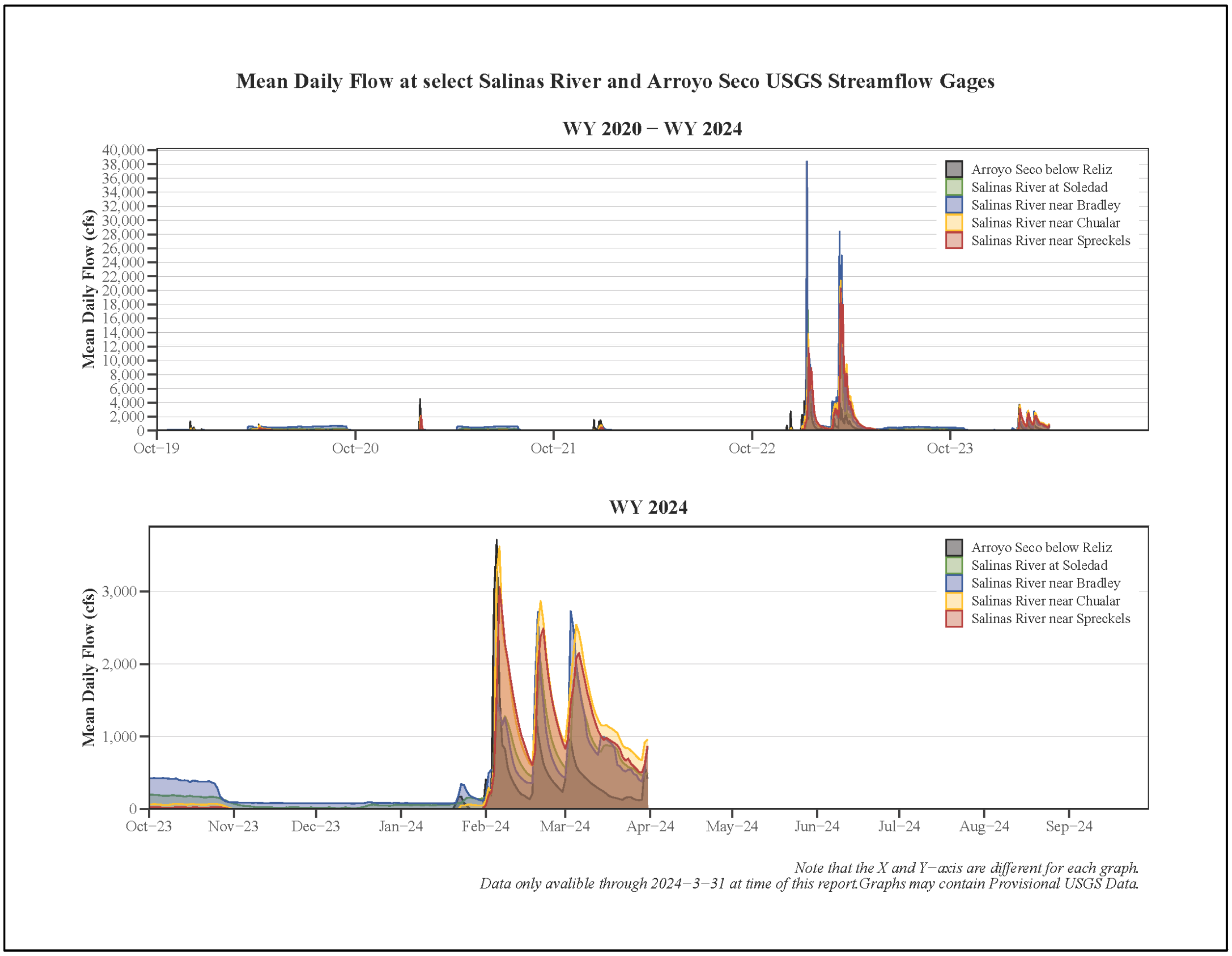


Figure 6: Mean Daily Flow at Selected Stream Gages

Groundwater Elevations

Groundwater elevation data provides insight into how an aquifer or subarea responds to hydrologic conditions over time, such as changes in precipitation and reservoir releases. A one-year comparison can show the short-term effects of a single wet or dry year while a long-term comparison will help provide information on general trends in groundwater storage and demonstrate effects that occur on a longer time scale as surface hydrology interacts with the underlying geology. Subareas or aquifers will respond differently to these hydrologic conditions. For example, groundwater elevations in shallower aquifers may respond more quickly to a wet season while aquifers that are confined, deeper, or more depleted may take longer to show a response to hydrologic conditions.

More than 130 wells are measured monthly throughout the Salinas Valley to monitor seasonal groundwater elevation fluctuations. Data from approximately 50 of these wells are used in the preparation of this report (Figure 1). The measurements are grouped by hydrologic subarea, averaged, and a single value for the wells within each subarea is graphed to compare current groundwater elevations (WY24) with past conditions. Graphs for individual subareas, showing the current year's water level conditions, last year's conditions (WY23) and dry conditions (WY15) are found in the following sections.

For comparison to long term conditions, a curve showing monthly water levels averaged over the most recent 30 years (WY1994-WY2023) is included on each graph. The Deep Aquifers graph (Figure 9) does not include a 30-year average because there is not yet a 30-year period of record to make that comparison. Table 1 provides a summary of the groundwater elevation trends for March 2024, with additional detail provided on Figures 7-12.

Table 1: Groundwater Elevation Trends Summary for March 2024

Subarea/Aquifer	March 2024 Groundwater Elevation (ft-msl)	Change during Second Quarter	One Year Change	Difference from 30-Year Average Elevation
180-Foot Aquifer	17 feet	Up 6 feet	Up 2 feet	Up 2 feet
400-Foot Aquifer	7 feet	Up 5 feet	Up 2 feet	Up 4 feet
Deep Aquifers	-16 feet	Up 8 feet	Up 1 foot	Not applicable
East Side	1 foot	Up 5 feet	Down <1 foot	Down 4 feet
Forebay	169 feet	Up 6 feet	Up 3 feet	Up 6 feet
Upper Valley	320 feet	Up 2 feet	Down <1 foot	Up 3 feet

180-Foot Aquifer

Over the last quarter, groundwater elevation levels increased six feet in the 180-Foot Aquifer (Figure 7). Groundwater elevations have increased two feet compared to March 2023 and are up two feet from the 30-year average.

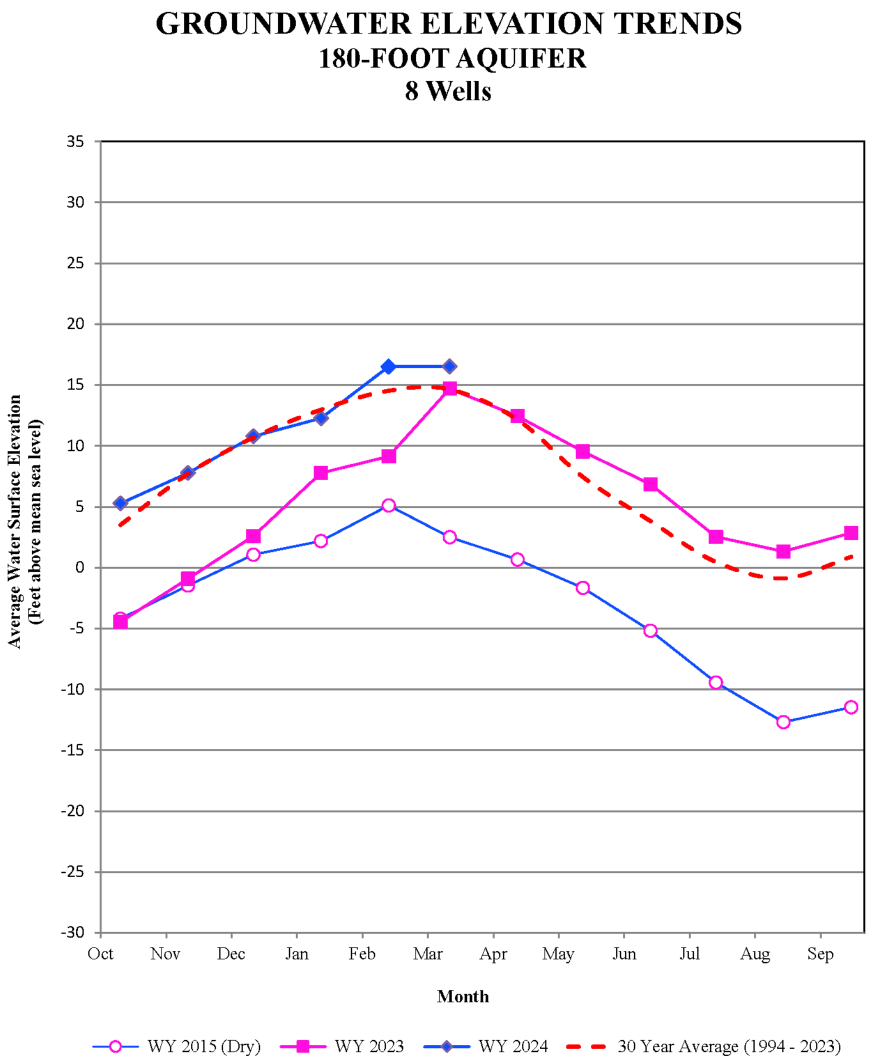


Figure 7: Groundwater Elevation Trends for the 180-Foot Aquifer

400-Foot Aquifer

Over the last quarter, groundwater elevation levels increased 5 feet in the 400- Foot Aquifer (Figure 8). Groundwater levels are up two feet compared to March 2023 and up four feet from the 30-year average.

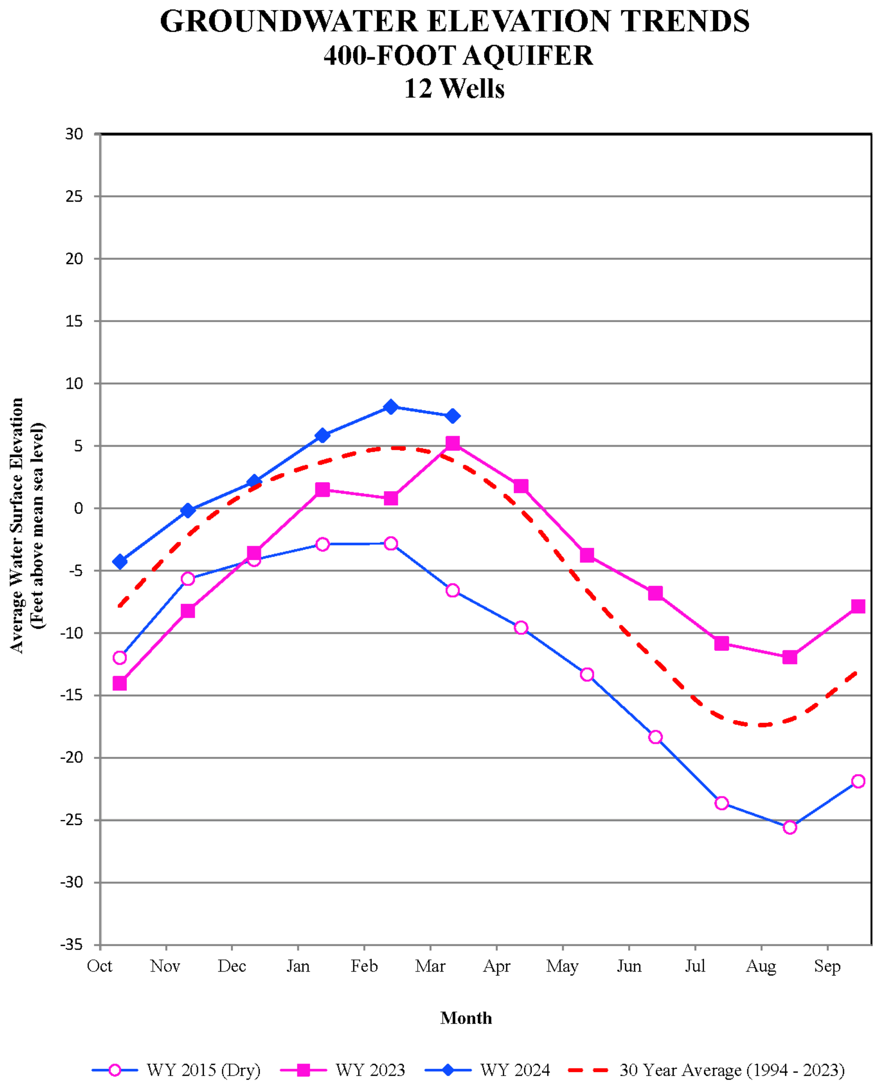


Figure 8: Groundwater Elevation Trends in the 400-Foot Aquifer

Deep Aquifers

Over the last quarter, groundwater elevations increased eight feet in the Deep Aquifers (Figure 9). Groundwater elevation levels are up one foot compared to March 2023. Given the shorter period of record available for some of the wells monitored in the Deep Aquifers, a 30-year average cannot yet be calculated. To represent the long-term trends in the Deep Aquifers, Figure 9 also includes a 30-year time series graph with groundwater elevation level data from the eleven wells to show the seasonal and long-term trends in these wells.

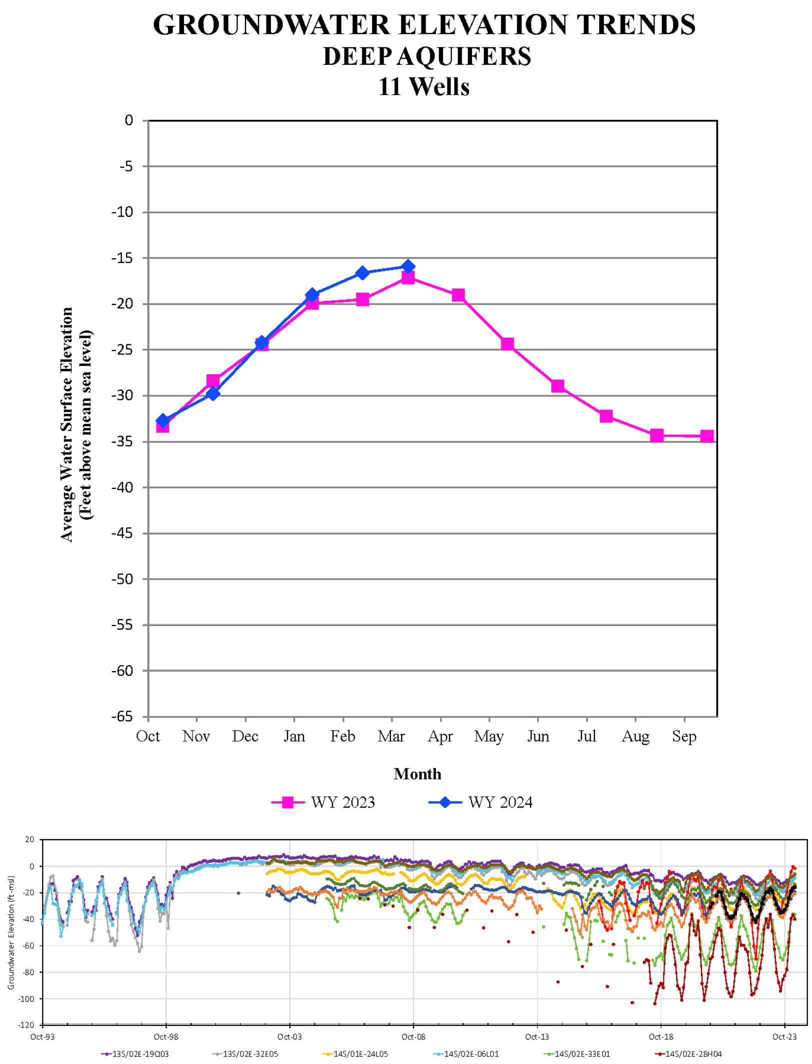


Figure 9: Groundwater Elevation Trends in the Deep Aquifers

East Side Subarea

East Side groundwater elevation levels increased five feet over the last quarter (Figure 10). Groundwater elevation levels are down less than one foot from March 2023 levels and down four feet from the 30-year average.

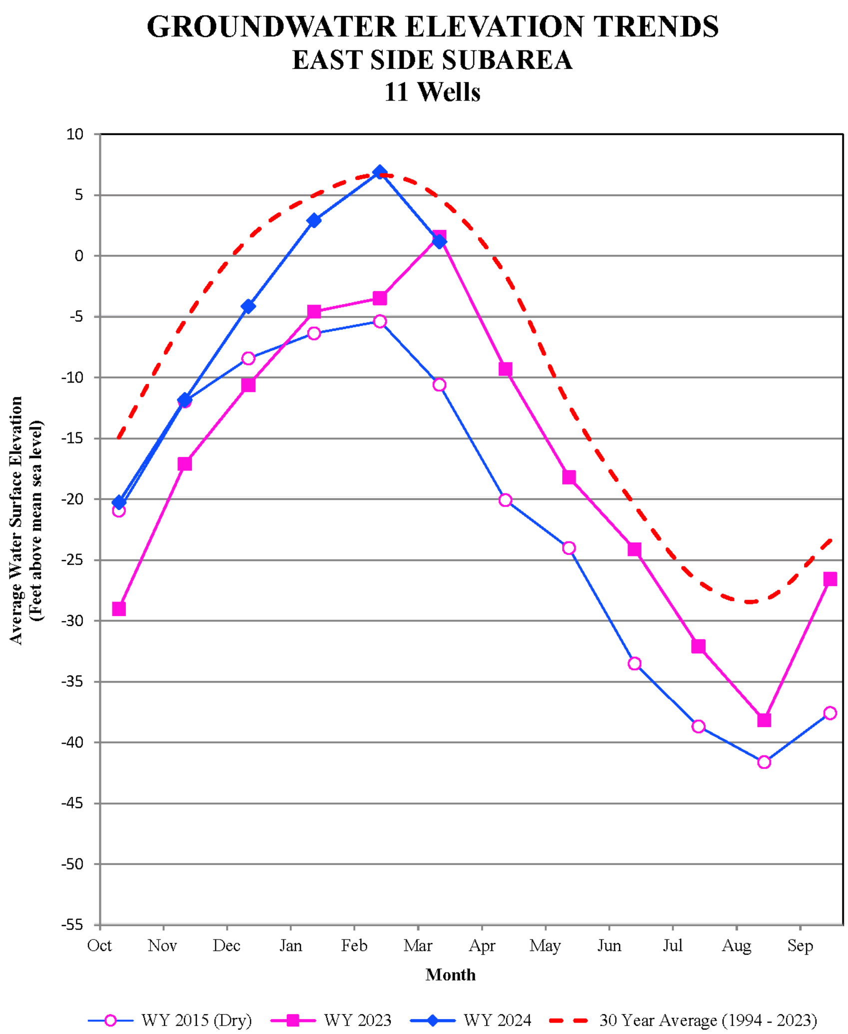


Figure 10: Groundwater Elevation Trends in the East Side Subarea

Forebay Subarea

Over the last quarter, groundwater elevation levels have increased six feet in the Forebay (Figure 11). Groundwater elevation levels are up three feet from March 2023 levels and are up six feet from the 30-year average.

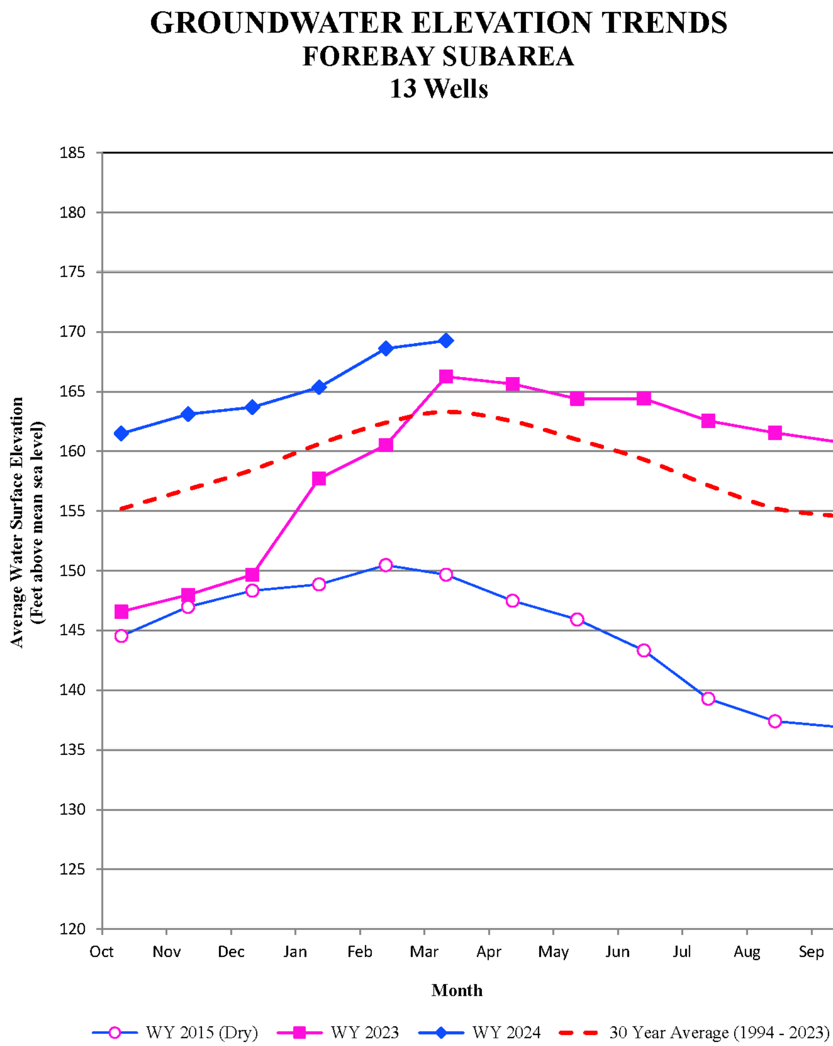


Figure 11: Groundwater Elevation Trends in the Forebay Subarea

Upper Valley Subarea

Upper Valley groundwater elevation levels have increased two feet over the last quarter (Figure 12). Groundwater elevation levels are down less than one foot from March 2023 levels and up three feet from the 30-year average.

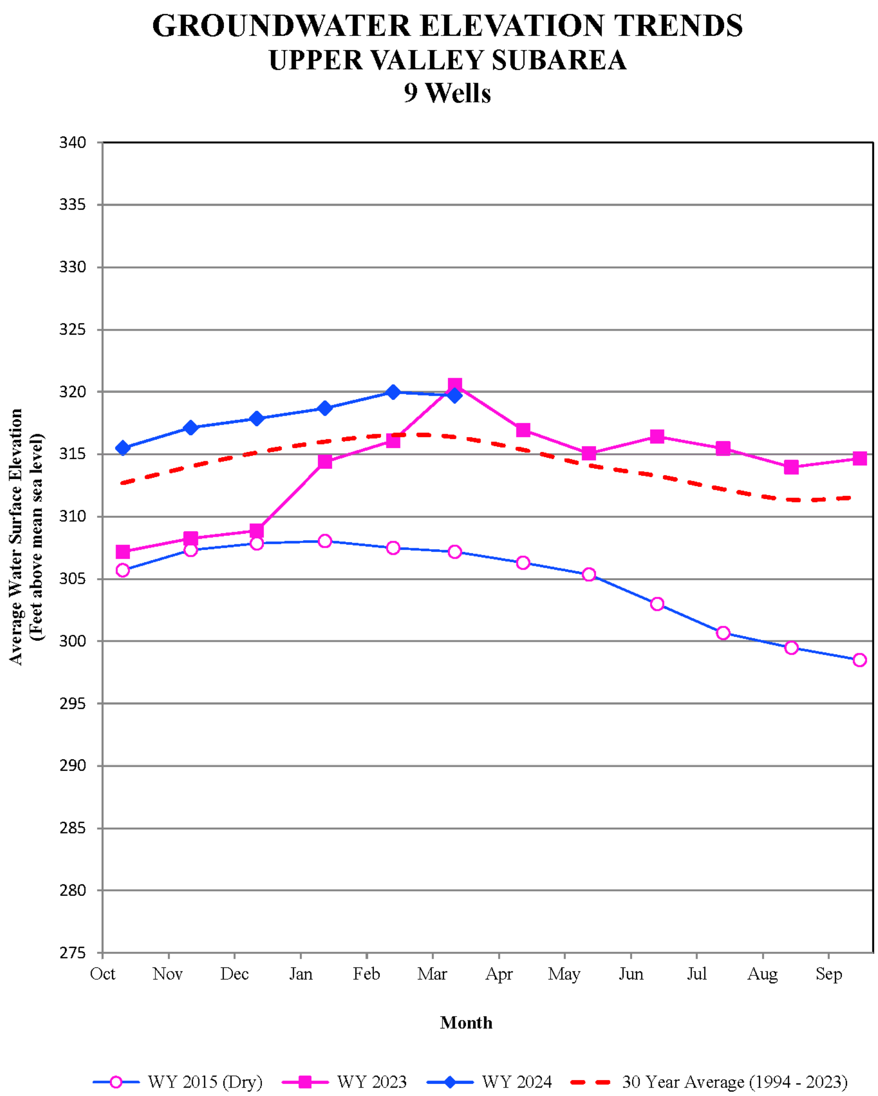


Figure 12: Groundwater Elevation Trends in the Upper Valley Subarea

Figure 13 shows the spatial distribution of changes in groundwater elevation levels from March 2023 to March 2024. Over the last Water Year, most of the wells in all hydrologic subareas experienced no significant change in groundwater elevation, though localized variability, with some wells in the East Side, Forebay and Upper Valley aquifers showing signs of either increased or decreased groundwater elevations.

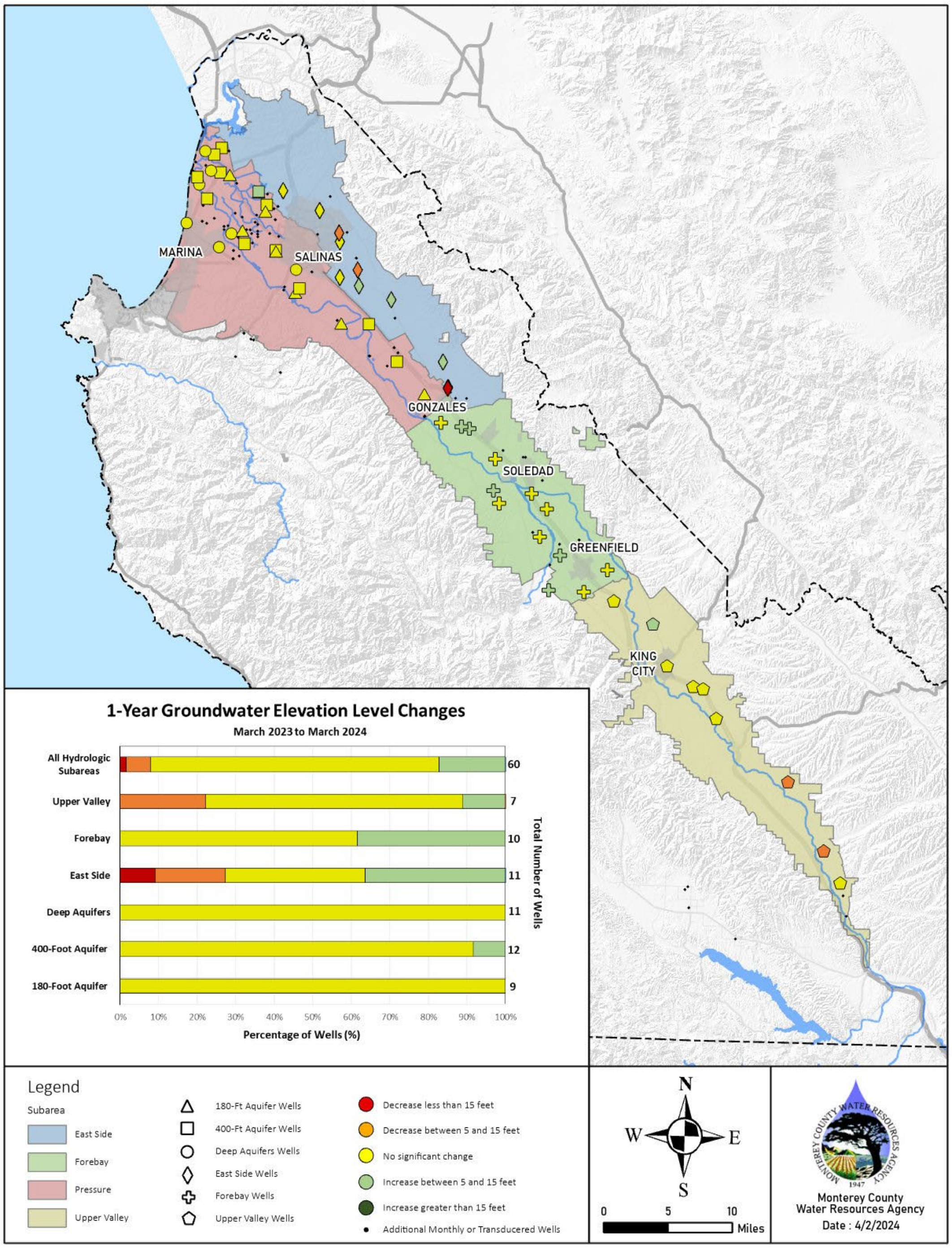


Figure 13: One-Year Groundwater Elevation Changes

Depth to Groundwater vs Groundwater Elevation

Most of the figures in this report use groundwater elevation as a means of describing where groundwater was observed in a well. Figure 14 shows the method for determining depth to groundwater and groundwater elevation in each well.[1] The depth to groundwater is measured from a reference point that is unique to each well. Groundwater elevation is calculated from the measured depth to groundwater using the reference point elevation and ground surface elevation.

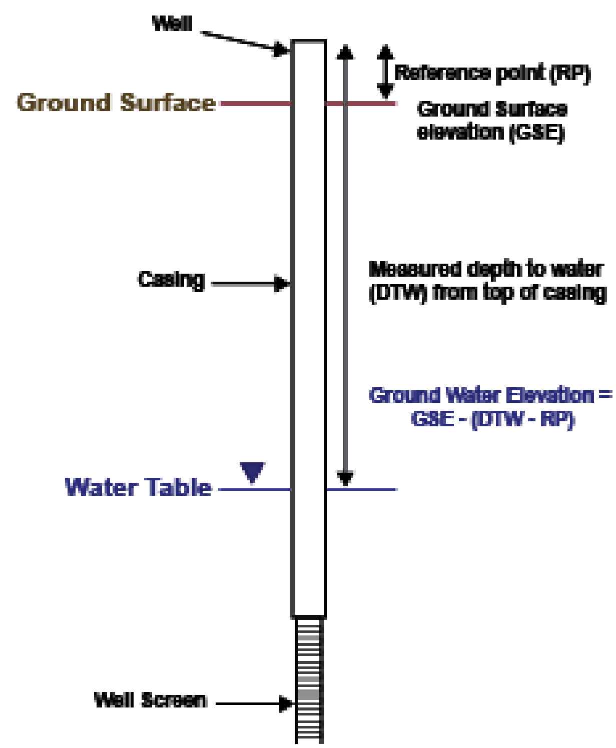


Figure 14: Determining Depth to Groundwater.[1]

Figure 15 shows the depth to groundwater that was measured in each of the wells, within a given subarea, that is used for developing this quarterly water conditions report. As shown on Figure 15, there is a range of depth to water values within each subarea with some, like the East Side Subarea, having a wider range of measured values than others, like the 180-Foot Aquifer. The black line on each of the subarea graphs in Figure 15 is the average depth to groundwater for each set of wells. This value is converted from "depth to groundwater" to "groundwater elevation" and graphed as the "2024 WY" line on each of the preceding subarea-specific graphs (Figures 7-12).

[1] Figure 14 is modified from the Idaho Department of Environmental Quality.

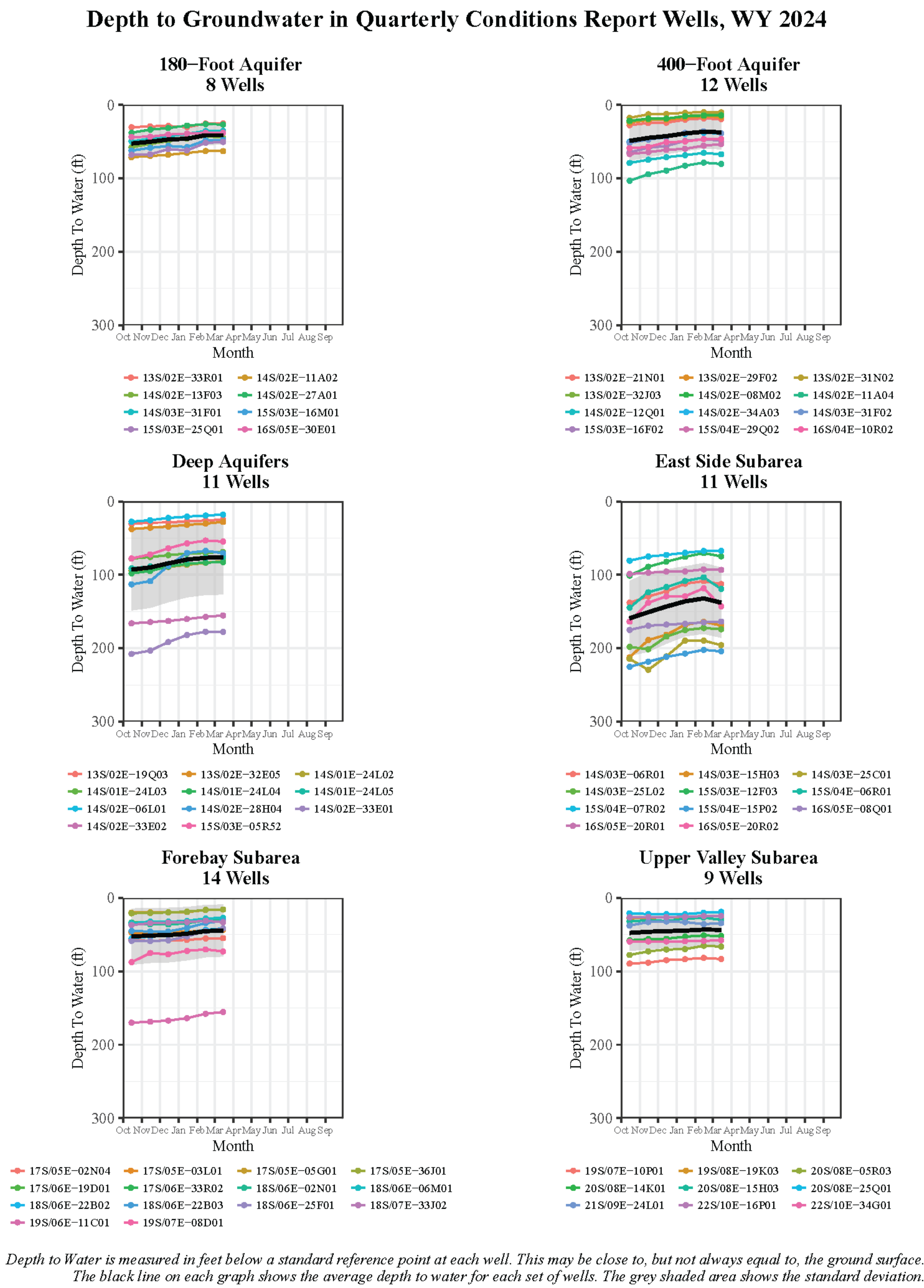


Figure 15: Depth to Groundwater in Wells Used for Quarterly Conditions Report, WY 2024