Annual Report Covering Water Year 2023

# Ojai Valley Groundwater Basin

**FEBRUARY 2024**

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# Signature Page

This water year 2023 annual report for the Ojai Valley Groundwater Basin Groundwater Sustainability Plan was prepared under the direction of a Professional Geologist licensed in the State of California consistent with professional standards of practice.

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Trevor Jones, PhD

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# Acronyms and Abbreviations

| Acronym/Abbreviation | Definition |
|---|---|
| AF | acre-feet |
| bgs | below ground surface |
| Board | Ojai Basin Groundwater Management Agency Board of Directors |
| CASGEM | California Statewide Groundwater Elevation Monitoring |
| cfs | cubic feet per second |
| CIMIS | California Irrigation Management Information System |
| CMWD | Casitas Municipal Water District |
| County | County of Ventura |
| DWR | California Department of Water Resources |
| DDMWs | depth-discrete monitoring wells |
| ETo | reference evapotranspiration |
| GPM | gallons per minute |
| MSL | mean sea level |
| NOAA | National Oceanic and Atmospheric Administration |
| OBGM | Ojai Basin Groundwater Model |
| OBGMA | Ojai Basin Groundwater Management Agency |
| OVGB | Ojai Valley Groundwater Basin |
| GSA | Groundwater Sustainability Agency |
| GSP | Groundwater Sustainability Plan |
| RMP | Representative Monitoring Point |
| SGMA | Sustainable Groundwater Management Act |
| SACSGRP | San Antonio Creek Spreading Grounds Rehabilitation Project |
| SWN | State Well Number |
| VCWPD | Ventura County Watershed Protection District |

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# Executive Summary

This annual report for the Ojai Valley Groundwater Basin (OVGB; DWR Basin No. 4-002) was prepared for submittal to the California Department of Water Resources (DWR) per Article 7, Section 356.2—Annual Reports, of the California Code of Regulations.[1] This report was prepared for the Ojai Basin Groundwater Management Agency (OBGMA), the Groundwater Sustainability Agency for the OVGB (Figure 1). OBGMA adopted a Groundwater Sustainability Plan (GSP) for the OVGB on January 6, 2022, and DWR approved the GSP on October 26, 2023. SGMA regulations require an annual report be submitted to the DWR by April 1 of each year following the adoption of the GSP. This annual report provides an update on the groundwater conditions in the OVGB for water year 2023 (October 1, 2022, through September 30, 2023). Key findings of this annual report are:

## Groundwater Conditions

- In water year 2023, the OVGB received approximately 47.4 inches of precipitation, which is approximately 200% of the long-term historical average annual precipitation rate.
- In response to the wetter-than-average conditions, seasonal high groundwater elevations increased at all representative monitoring points (RMPs) by approximately 8 to 77 feet over water year 2023.
- Groundwater in storage was estimated to have increased over water year 2023 by approximately 7,400 acre-feet (AF). Since spring 2014, groundwater in storage in the OVGB has increased approximately 12,000 AF.
- Groundwater elevations at representative monitoring points (RMPs) remained above established minimum thresholds in water year 2023.

## Total Water Use

- Groundwater extraction totaled approximately 3,351 AF in water year 2023, with the agriculture sector accounting for approximately 50% of total extractions and the municipal/industrial sector accounting for approximately 41% of total extractions. Of the total municipal/industrial extractions, the majority was for Ojai Water System, owned and operated by Casitas Municipal Water District (CMWD).
- Surface water use (Lake Casitas water provided by CMWD) totaled approximately 1,093 AF in water year 2023.
- Total water use was approximately 4,444 AF in water year 2023.

## Projects and Management Actions

- The OBGMA developed a framework for reviewing and evaluating well permits in water year 2023.
- The OBGMA passed Ordinance No. 12 to protect the southwest upper saturated zone from groundwater extraction and depletion in water year 2023.
- The OBGMA started and is currently implementing several projects and management actions including development of a new data management system, preparation of a groundwater sampling and analysis plan,

1 Title 23, Division 2, Chapter 1.5, Subchapter 2 of the California Code of Regulations, which is commonly referred to as the Groundwater Sustainability Plan Regulations (GSP Regulations).

review and improvement of the existing extraction metering program, continued monthly monitoring of surface and groundwater conditions, and identification of future GSP funding opportunities.

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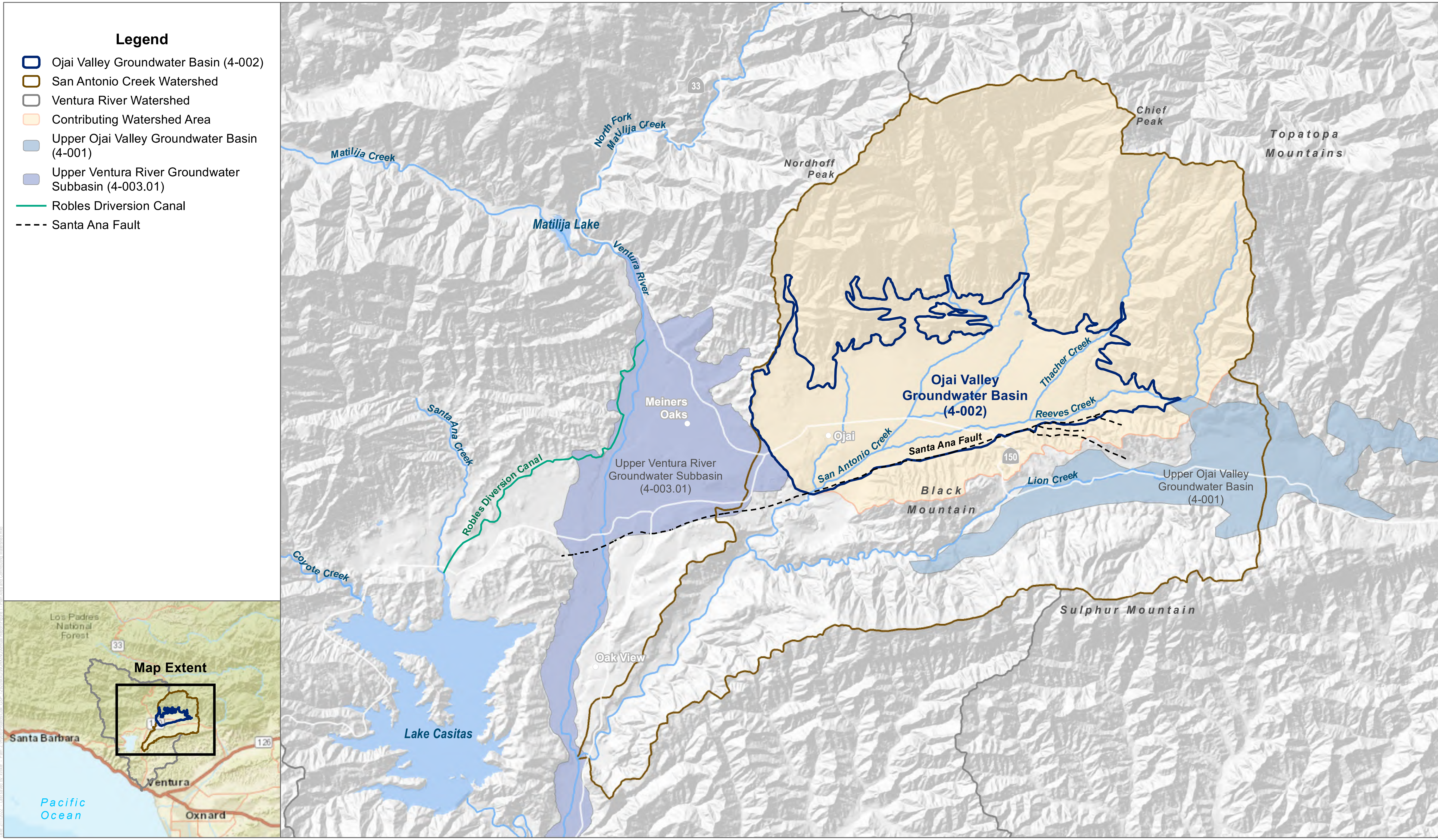


DATUM: NAD 1983 DATA SOURCE: ESRI; DWR; USGS

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**FIGURE 1**

Plan Area and Contributing Watershed

Annual Report for the Ojai Valley Groundwater Basin

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# 1 Introduction

The Ojai Basin Groundwater Management Agency (OBGMA), acting as the Groundwater Sustainability Agency (GSA) for the Ojai Valley Groundwater Basin (OVGB; DWR Basin No. 4-002), developed a Groundwater Sustainability Plan (GSP) in compliance with the 2014 Sustainable Groundwater Management Act (SGMA) (California Water Code Section 10720–10737.8, et al.) and the California Department of Water Resources (DWR) GSP Regulations (California Code of Regulations, Title 23, Section 350 et seq.). The OBGMA submitted the Draft Final GSP to the DWR on January 31, 2022. The Draft Final GSP for the OVGB was approved by DWR on October 26, 2023. Information regarding the GSP, including the stakeholder process, is available from the OBGMA website:

http://obgma.com/

SGMA regulations require an annual report be submitted to DWR by April 1 following GSP adoption. The OBGMA submitted the first annual report to DWR on April 1, 2022, which documented groundwater conditions in the basin over the 2020 and 2021 water years. This is the third annual report for the OVGB since GSP adoption and documents groundwater conditions for the 2023 water year (October 1, 2022, through September 30, 2023).

For the purposes of this annual report, the plan area is defined as the OVGB (Figure 1), which has a surface area of approximately 5,913.4 acres, or 9.2 square miles, and underlies the City of Ojai in the western part of Ventura County (County). The OVGB's boundaries are formed by Tertiary age consolidated rocks associated with the Topa Topa Mountains of California's Transverse Ranges to the north and east, the Upper Ojai Valley Groundwater Basin (DWR Basin No. 4-001) to the east, the Santa Ana Fault and Black Mountain to the south, and the Upper Ventura River Groundwater Subbasin (DWR Basin No. 4-003.01) to the west (Figure 1) (DWR 2004).[2] The eastern and western boundaries of the OVGB correspond to recognized bedrock highs that limit groundwater exchange flow between the OVGB and adjacent basins. The potential flow of groundwater between the OVGB and Upper Ventura River Subbasin is considered likely to be very small due to the low hydraulic conductivity of the geologic materials (bedrock) that form the boundary between the two groundwater basins (DWR 2004; Kear 2005).

This report is organized to provide all of the required components of an annual report as per Article 7, Section 356.2—Annual Reports, including groundwater elevation, groundwater extraction, and surface water supply data, and an evaluation of change in groundwater in storage. A discussion of the monitoring network and implementation progress is also provided.

2 Geologic period from 66 million to 2.6 million years ago. The geologic timescale classifies this time period as the Cenozoic Era that includes the Paleogene and Neogene Periods.

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# 2 Hydrogeologic Setting

The following subsections describe climate conditions, including precipitation, temperature, evapotranspiration, surface water and drainage features, and principal aquifer and aquitard characteristics in the OVGB.

## 2.1 Precipitation

The climate of the OVGB is Mediterranean, with warm, dry summers and cool, wet, winters. Precipitation is highly variable in the OVGB—seasonally, and from year to year. Precipitation typically occurs in just a few significant storms each year, which can come any time between October and April, with over 90% of the precipitation occurring between November and April (WCVC 2019). The Parameter-Elevation Regressions on Independent Slopes Model (PRISM) 30-year (1991–2020) digital elevation model precipitation data shows that the average annual precipitation in the OVGB ranges from about 22 inches per year in the southwestern part of the OVGB to nearly 26 inches per year in the northernmost parts of the OVGB along the southern flank of the Topa Topa Mountains (Figure 2).

Precipitation in the OVGB is monitored by four weather stations, three of which are maintained by the Ventura County Watershed Protection District (VCWPD) and one by the National Oceanic and Atmospheric Administration (NOAA). Five additional VCWPD precipitation stations and one California Irrigation Management Information System (CIMIS) reference evapotranspiration (ETo) station located outside of the OVGB, but in the vicinity, provide additional climate data (Table 1 and Figure 2).

**Table 1. Weather Stations in the Vicinity of the OVGB**

| Station Name (Station No.) | Latitude | Longitude | Elevation (feet MSL) | Period of Record |
|---|---|---|---|---|
| National Oceanic and Atmospheric Administration | | | | |
| Ojai, California, US (USC00046399) | 34.4477 | -119.2275 | 745 | 5/1/1905 – Present |
| Ventura County Watershed Protection District | | | | |
| Ojai-County Fire Station (030D) | 34.44806 | -119.2313 | 760 | 10/1/1980 – Present |
| Ojai-Thacher School (059) | 34.46664 | -119.1804 | 1,440 | 10/1/1915 – Present |
| Upper Ojai-Happy Valley (064B) | 34.43722 | -119.1899 | 1,320 | 10/1/1970 – Present |
| Ojai-Bower Tree Farm (153A) | 34.44139 | -119.2219 | 780 | 10/1/1977 – 9/30/2023 |
| Ojai-Stewart Canyon (165) | 34.46053 | -119.2486 | 970 | 10/1/1956 – Present |
| Meiners Oaks-County Fire Station (218) | 34.44461 | -119.2852 | 730 | 10/1/1964 – Present |
| Senior Gridley Canyon - Type B (300) | 34.48192 | -119.2088 | 2,514 | 10/1/1992 – Present |
| Nordhoff Ridge - Type C (303) | 34.50989 | -119.2308 | 4,112 | 10/1/1997 – Present |
| California Irrigation Management Information System | | | | |
| Santa Paula (198)[a] | 34.324639 | -119.10488 | 218 | 3/30/2005 -06/29/2023 |

**Source:** NOAA 2024; CIMIS 2024; VCWPD 2024.
**Notes:** MSL = mean sea level.
[a] Station 198 is listed as inactive on the CMIS data server after 06/29/2023 as of the date of this report.

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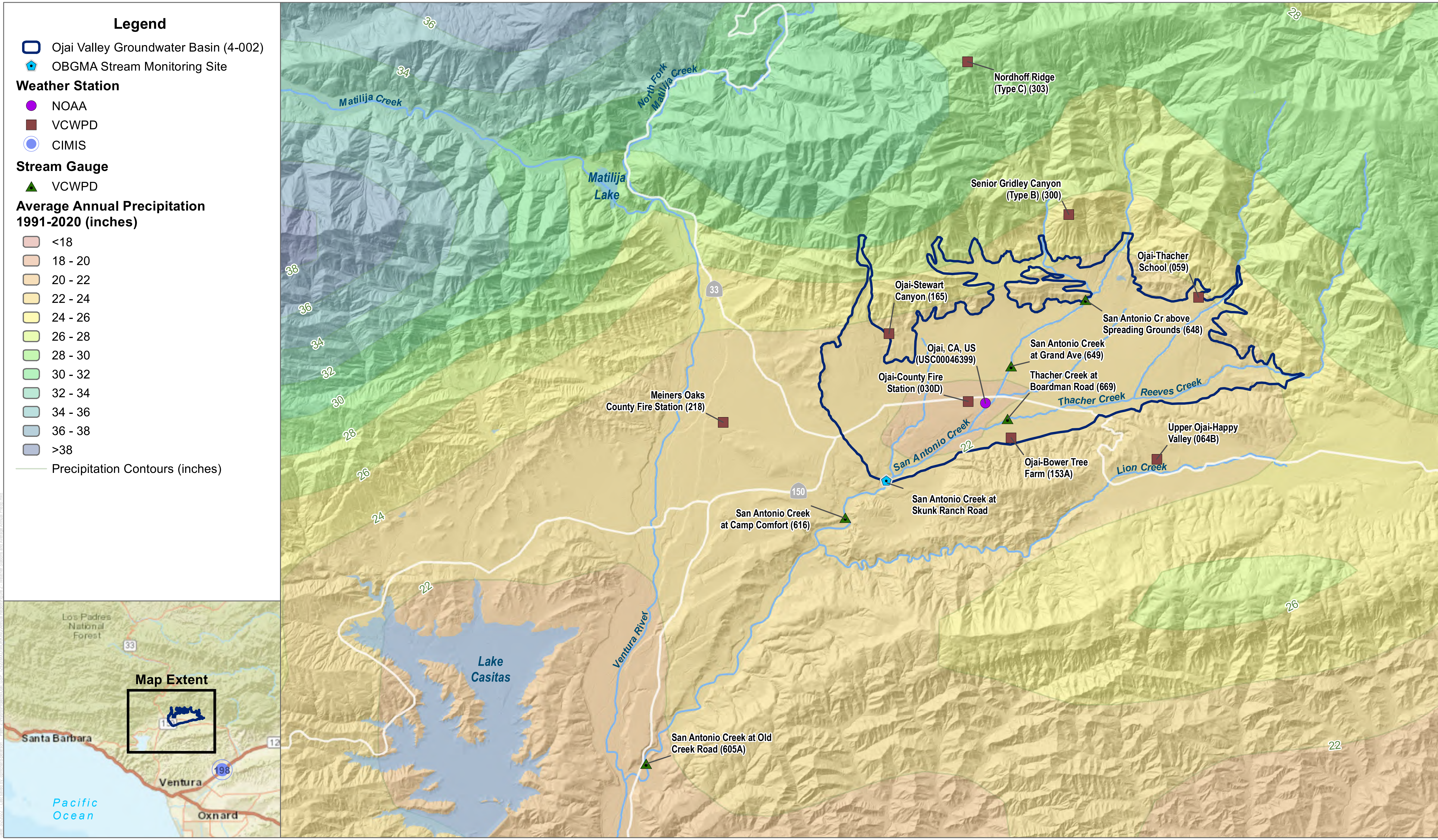


DATUM: NAD 1983 DATA SOURCE: ESRI; DWR; USGS; NOAA; VCWPD; PRISM

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0 1 2 Miles

**FIGURE 2**

Weather Stations and Average Annual Precipitation

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The weather station with the longest and most complete data record is the NOAA Ojai, California, US (USC00046399) station (herein abbreviated as the “Ojai station”) located near the center of the OVGB at an elevation of 745 feet mean sea level (MSL). The period of record for the Ojai station extends from May 1, 1905, to the present. Total water year precipitation at the Ojai station for water years with a complete data record ranges from a low of 5.46 inches, measured in 2021, to a high of 48.58 inches, measured in 1998.[3] The average precipitation over the period from water year 1906 to 2023 was 20.71 inches (Figure 3) (NOAA 2024). Since water year 1906, 46 of the years were dry, 56 were average, and 16 were wet.[4] Wet years highly influence the long-term average precipitation.

Measurements collected at the Ojai station indicate the OVGB received approximately 47.41 inches of precipitation in the 2023 water year. This is approximately 200% higher than the 1906–2023 historical average annual precipitation rate.

## 2.2 Temperature

Temperatures within the OVGB fluctuate on a seasonal basis from warm summers to cool winters. August and September are typically the hottest months in the OVGB. Based on the Ojai station, the average annual temperature in the OVGB over the period from May 1, 1905, to September 30, 2023, was 61°F, ranging from an average low of 45°F in the winter to an average high of 78°F in the summer. The historical all-time minimum and maximum temperature recorded at the Ojai station are 13°F and 119°F, respectively (NOAA 2024).

3 Of the 118 water years with precipitation data, 100 years have a complete data record, which is defined for purposes of this report as having no more than 30 days missing in any given water year.

4 Water years were classified as dry if precipitation was less than 75% of the average precipitation, average if precipitation was between 75% and 150% of the average precipitation, and wet if precipitation was greater than 150% of the average precipitation.

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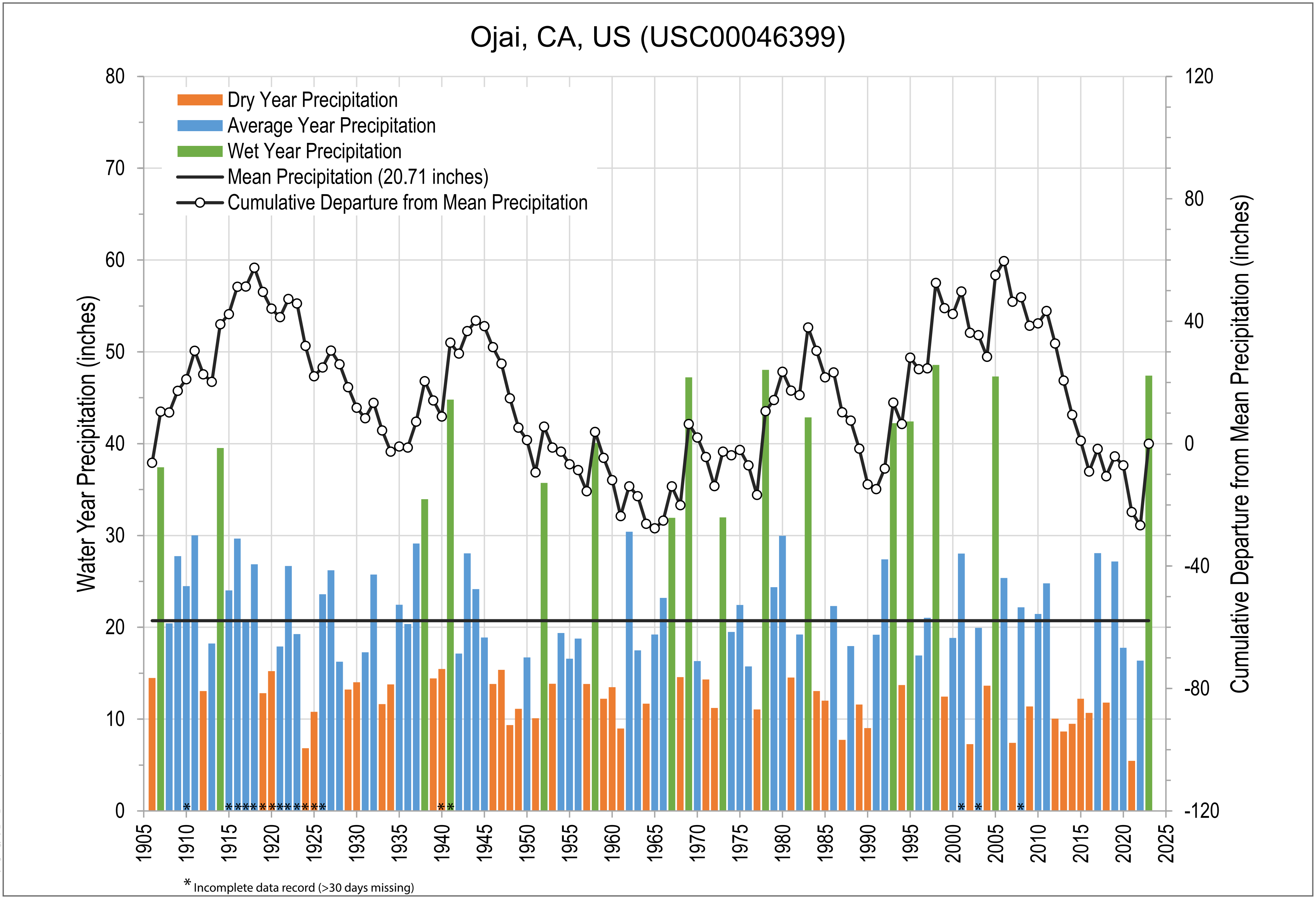


SOURCE: NOAA

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**FIGURE 3**

Water Year Precipitation

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## 2.3 Evapotranspiration

Reference evapotranspiration in the OVGB was calculated from the data collected at CIMIS Station 198 (located approximately 10 miles south-southeast of the southern basin boundary in Santa Paula, California) on a daily basis from April 2005 to June 2023 (Table 1). Since June 2023, Station 198 has been listed as inactive and no data has been collected as of the date of this report. The average ETo measured at CIMIS Station 198 between 2005 and 2022 is 53.07 inches per year (Table 2). In contrast, the average annual precipitation in the OVGB, based on the Ojai station (Figure 3), is 20.71 inches per year. The ETo values calculated from the CIMIS data reflect the amount of water theoretically transpired by grass or alfalfa if supplied by irrigation, but do not represent the actual transpiration from any specific crop or native vegetation. To calculate the evapotranspiration rate for a specific crop or native vegetation, the ETo is multiplied by a crop coefficient to adjust the water consumption for each crop relative to the water consumption for alfalfa.

**Table 2. Reference Evapotranspiration Totals for Station 198**

| Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2005 | — | — | — | 3.03 | 8.56 | 8.63 | 7.32 | 5.66 | 4.74 | 3.53 | 3.07 | 2.32 | — |
| 2006 | 3.15 | 3.43 | 3.13 | 3.53 | 4.59 | 5.49 | 5.58 | 5.67 | 4.56 | 3.74 | 3.01 | 3.01 | 48.89 |
| 2007 | 2.74 | 2.74 | 4.21 | 4.13 | 5.06 | 5.80 | 6.00 | 5.50 | 4.51 | 4.40 | 2.55 | 2.60 | 50.24 |
| 2008 | 2.52 | 2.69 | 4.94 | 5.69 | 5.47 | 6.56 | 6.20 | 5.76 | 4.87 | 4.73 | 3.17 | 2.13 | 54.73 |
| 2009 | 3.81 | 2.60 | 4.27 | 4.8 | 5.57 | 5.18 | 6.71 | 5.62 | 4.97 | 4.04 | 3.21 | 2.17 | 52.95 |
| 2010 | 2.45 | 2.34 | 4.71 | 4.86 | 6.39 | 5.85 | 5.80 | 6.20 | 4.88 | 2.98 | 3.01 | 1.78 | 51.25 |
| 2011 | 3.40 | 3.12 | 3.95 | 4.93 | 6.14 | 5.16 | 6.06 | 5.55 | 4.11 | 3.70 | 2.96 | 2.65 | 51.73 |
| 2012 | 3.33 | 3.53 | 3.99 | 4.76 | 6.19 | 5.88 | 6.03 | 6.31 | 4.92 | 3.79 | 2.38 | 1.72 | 52.83 |
| 2013 | 3.20 | 3.16 | 4.03 | 4.92 | 6.26 | 5.88 | 5.87 | 5.99 | 5.03 | 4.26 | 2.93 | 3.10 | 54.63 |
| 2014 | 3.39 | 2.74 | 4.48 | 5.57 | 6.72 | 6.12 | 6.24 | 5.73 | 4.88 | 4.11 | 3.04 | 1.52 | 54.54 |
| 2015 | 2.09 | 2.48 | 4.08 | 4.92 | 5.08 | 5.29 | 5.90 | 6.38 | 5.35 | 4.11 | 3.47 | 2.71 | 51.86 |
| 2016 | 2.16 | 4.19 | 4.19 | 5.59 | 5.29 | 6.00 | 6.90 | 6.08 | 5.11 | 3.57 | 2.72 | 2.40 | 54.2 |
| 2017 | 1.88 | 1.69 | 4.71 | 5.80 | 5.87 | 6.07 | 6.65 | 5.86 | 4.68 | 4.83 | 2.59 | 3.52 | 54.15 |
| 2018 | 2.87 | 3.12 | 3.52 | 5.31 | 4.92 | 6.11 | 6.87 | 6.58 | 4.70 | 4.12 | 3.39 | 2.48 | 53.99 |
| 2019 | 2.25 | 2.12 | 4.18 | 5.16 | 5.36 | 4.53 | 6.52 | 6.44 | 5.17 | 5.25 | 2.94 | 2.52 | 52.44 |
| 2020 | 2.50 | 3.61 | 3.26 | 4.52 | 6.61 | 5.77 | 6.80 | 6.19 | 4.66 | 4.08 | 2.89 | 3.16 | 54.05 |
| 2021 | 3.06 | 3.47 | 4.53 | 5.27 | 5.71 | 6.53 | 6.56 | 6.00 | 4.62 | 4.16 | 3.06 | 1.53 | 54.50 |
| 2022 | 3.24 | 3.69 | 4.59 | 5.34 | 5.87 | 6.33 | 6.38 | 6.26 | 5.12 | 3.47 | 3.26 | 1.73 | 55.28 |
| 2023[a] | 2.03 | 2.79 | 3.17 | 4.59 | 3.83 | 3.93 | — | — | — | — | — | — | — |
| Average | 2.78 | 2.97 | 4.11 | 4.88 | 5.76 | 5.85 | 6.36 | 5.99 | 4.83 | 4.05 | 2.98 | 2.39 | 53.07 |

**Source:** CIMIS 2024.
**Note:** All values are in inches; — = not available.
[a] Station 198 is listed as inactive on the CMIS data server after 06/29/2023 as of the date of this report.

## 2.4 Surface Water and Drainage Features

The OVGB is within the San Antonio Creek watershed which is one of the largest sub-watersheds of the Ventura River watershed. The San Antonio Creek watershed is approximately 32,743.1 acres, or 51.2 square miles and completely encompasses the OVGB (Figure 1). The portion of the San Antonio Creek watershed contributing recharge to the OVGB is approximately 20,340.8 acres, or 31.8 square miles. The San Antonio Creek watershed is characterized by tectonically active mountains dominated by chaparral and exposed bedrock with narrow ephemeral and intermittent streams. There are no major surface water reservoirs within the San Antonio Creek watershed. San Antonio Creek is the largest stream in the San Antonio Creek watershed and is fed by four primary tributary streams including McNell Creek, Thacher Creek, Reeves Creek, and Lion Creek, the last-mentioned being located outside of the OVGB. A number of small named and unnamed ephemeral drainages also contribute flow to San Antonio Creek. Recharge to the OVGB occurs through percolation of surface waters through alluvial channels, infiltration of precipitation that falls directly on the valley floor, subsurface flow, and septic and irrigation return flow (DWR 2004).

## 2.5 Stream Flow Measurements

Streamflow records are available for four active stream gaging stations on San Antonio Creek, in addition to one active gaging station on Thacher Creek (Table 3 and Figure 2). The stream gage with the longest and most complete data record is the San Antonio Creek at Old Creek (605A) station located at the outlet of San Antonio Creek near the confluence with the Ventura River.[5] The period of record for station 605A extends from October 1, 1949, to September 30, 2023. Peak flow at the outlet of San Antonio Creek typically occurs between December and April of any given water year and baseflow generally falls to 0 cubic feet per second (cfs) between June and October. There are some exceptions, particularly in 1969, 1978, 1983, 1993, 1995, 1998, 2005, and 2023 when flow continued through the summer months. The highest gaged flow was 10,405 cfs in January 1969. The water year with the lowest recorded stream discharge was 1951, where reportedly no flow occurred, and the water year with the highest recorded stream discharge was 1969 at 78,403 acre-feet (AF). The average water year stream discharge for the period of record is 11,258 AF (Figure 4). Wet years highly influence the long-term average stream discharge.

In water year 2023, the highest daily average flow measured at gage 605A was approximately 2,900 cfs. A total of approximately 41,700 AF of flow was measured at gage 605A in water year 2023.

The OBGMA has measured streamflow in San Antonio Creek at the outflow of the OVGB since July 2019. Stream discharge measurements consist of manual readings collected on a monthly frequency at Skunk Ranch Road (Figure 2). Between July 2019 and September 2022, stream discharges measured at the OVGB outflow averaged approximately 0.8 cfs. During this period, stream discharge during the summer ranged from approximately 0.01 to 1 cfs and during the winter ranged from approximately 1 to 3 cfs (Figure 5).

In water year 2023, stream discharge at the OVGB outflow averaged approximately 13 cfs and ranged from a low of 0.15 cfs in December 2022 to a high of 50.69 cfs in April 2023 (Figure 5). The relatively high stream discharge reflects the wetter than average conditions experienced in the OVGB.

5 The San Antonio Creek at Old Creek (605A) station was installed just upstream of the inactive San Antonio Creek at Hwy 33 (605) station. Together these stations provide daily stream discharge at the outlet of San Antonio Creek for the period from October 1, 1949 to September 30, 2023.

### Table 3. Stream Gages in the Vicinity of the OVGB

| Station Name (Station No.) | Latitude | Longitude | Elevation (feet MSL) | Period of Record |
|---|---|---|---|---|
| Ventura County Watershed Protection District | | | | |
| San Antonio Creek at Camp Comfort (616)[a] | 34.42703 | -119.2585 | 577 | 10/1/2018 – 10/1/2019 |
| San Antonio Cr above Spreading Grounds (648)[a] | 34.46636 | -119.2053 | — | 10/1/2013 – 10/1/2014 |
| San Antonio Creek at Grand Ave (649)[a] | 34.45436 | -119.2218 | — | 10/1/2013 – 10/1/2016 |
| Thacher Creek at Boardman Road (669)[ab] | 34.44481 | -119.2227 | — | 10/1/2002 – 10/1/2008 |
| San Antonio Creek at Old Creek Road (605A)[ac] | 34.38256 | -119.3027 | — | 10/1/1949 – 10/1/2023 |
| Ojai Basin Groundwater Management Agency | | | | |
| San Antonio Creek at Skunk Ranch Road[d] | 34.43373 | -119.249434 | — | 7/29/2019 - Present |

**Source:** VCWPD 2024.
**Notes:** MSL = mean sea level; — = data are not available.
[a] Site listed as active on the VCWPD Hydrologic Data Server but period of record does not extend to present.
[b] Peak event only site.
[c] Site located near inactive San Antonio Creek at Hwy 33 (605) station. The period of record for station 605 extends from October 1, 1949 to September 30, 2014.
[d] The OBGMA measurements at San Antonio Creek at Skunk Ranch Road include manual stream flow measurements and automated data logger readings.

## 2.6 Principal Aquifer and Aquitards

Water-bearing units of the OVGB include alluvial deposits and fractures and interstices of underlying Tertiary rocks. The alluvium is composed of units of sand, gravel, and clay up to 50 to 100 feet thick that pinch out toward the lateral edges of the OVGB (Figure 6) (Kear 2005; DBS&A 2011, 2020). The alluvial deposits are the most productive units in the OVGB, with well yields ranging from 100 to 600 gallons per minute (GPM) (DWR 2004). The weathered Tertiary rocks are typically consolidated and yield minor amounts of poor-quality water, with well yields typically between 2 to 5 GPM, but reaching a maximum of about 50 GPM (DWR 2004). The contact of the alluvial unconsolidated deposits of Pleistocene to Holocene age with the Tertiary rocks define the base of the OVGB. The primary storage units for groundwater are approximately four discrete sand and gravel units on the order of up to 100 feet thick each, which are sourced near the alluvial fan heads in the northeast side of the Ojai Valley (Kear 2005; OBGMA 2018). The individual coarse-grained sand and gravel aquifer units comprising the primary production aquifer are thickest in the northern and eastern areas of the OVGB and thinnest in the southern and western areas of the OVGB where fine grained lacustrine and floodplain deposits of up to approximately 100 feet thick predominate as confining layers creating a multi-layered aquifer system (DBS&A 2011; Kear 2005; OBGMA 2018). The uppermost confining clay unit, which generally extends from approximately 30 to 130 feet below ground surface (bgs), is the thickest and most extensive aquitard and separates the primary production aquifer from a shallow perched aquifer (Kear 2005, 2021; OBGMA 2018). The shallow perched aquifer generally extends from approximately 15 to 30 feet bgs and is present in the southwestern portion of the OVGB (Figures 6 and 7) (Kear 2005, 2021). Groundwater within the primary production aquifer is predominantly under unconfined conditions near the alluvial fan heads and semi-confined to mostly confined in the central, southern, and western portions of the OVGB (Kear 2005, 2021). The alluvial deposits are deepest in the central and southern areas of the OVGB (Kear 2005; DBS&A 2011, 2020). The maximum total thickness of the alluvial deposits is approximately 900 feet (DBS&A 2011, 2020).

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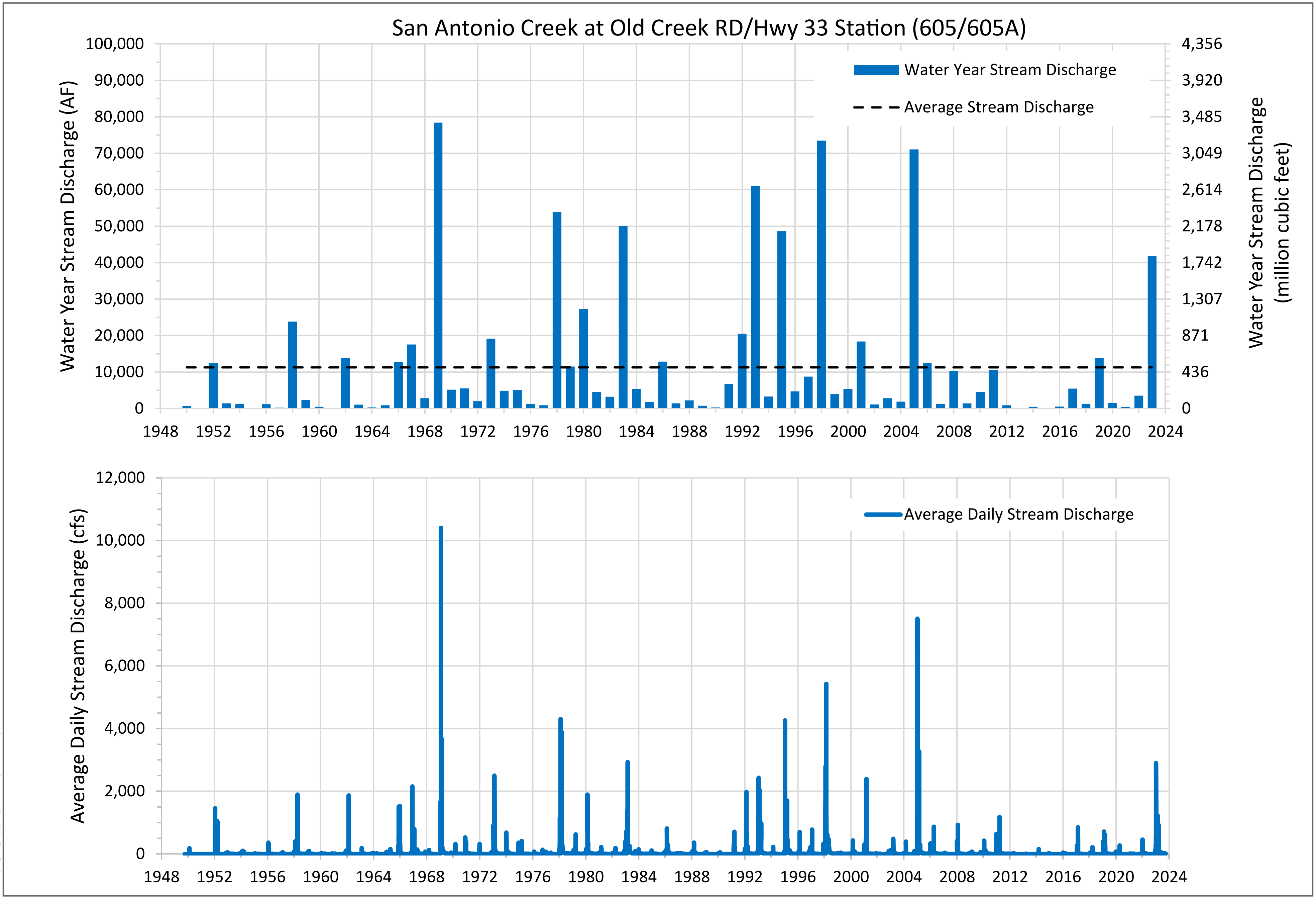


SOURCE: VCWPD

**FIGURE 4**

San Antonio Creek Stream Discharge at Confluence with Ventura River

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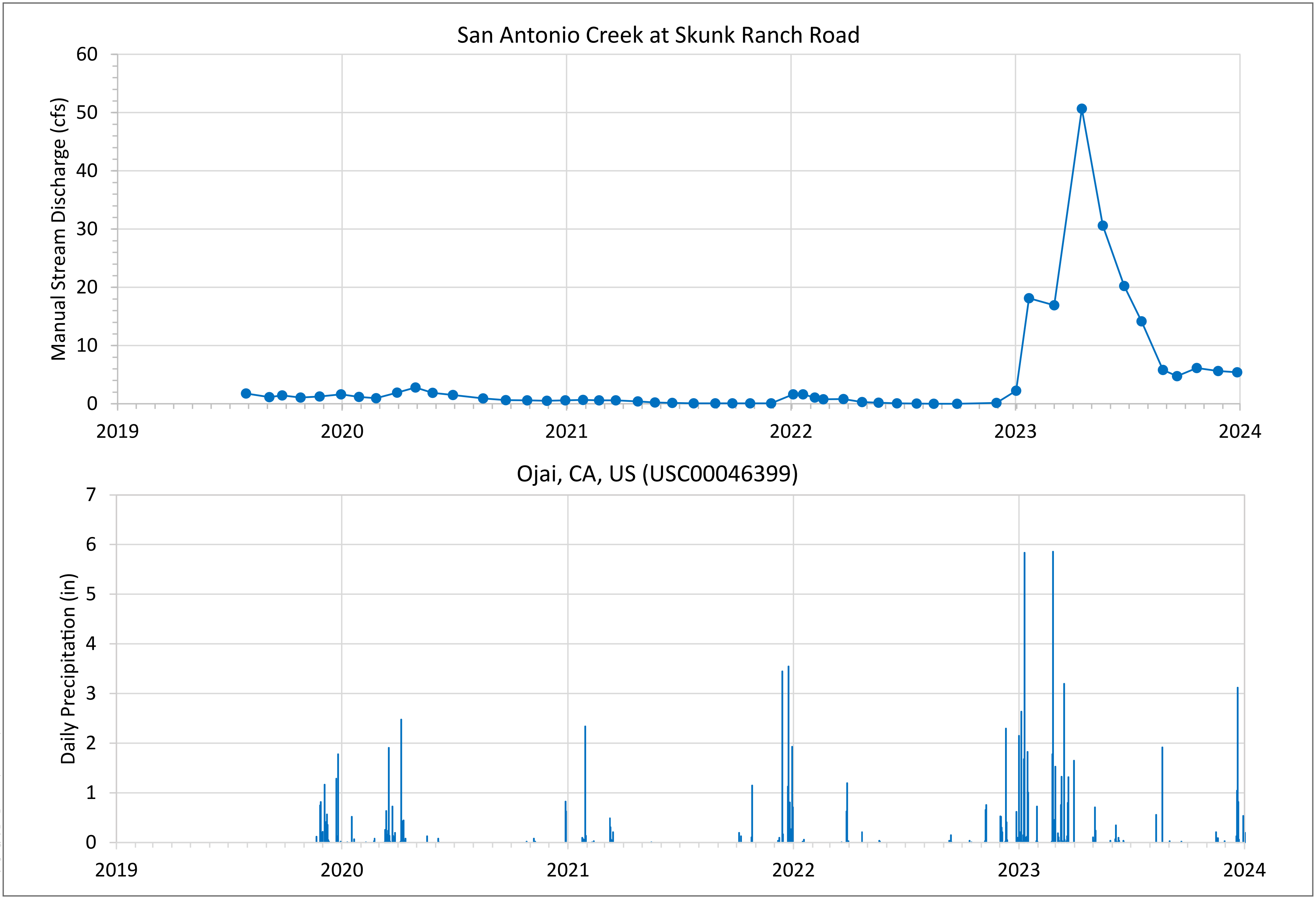


SOURCE: OBGMA; NOAA

**FIGURE 5**

San Antonio Creek Stream Discharge at Ojai Valley Groundwater Basin Outflow

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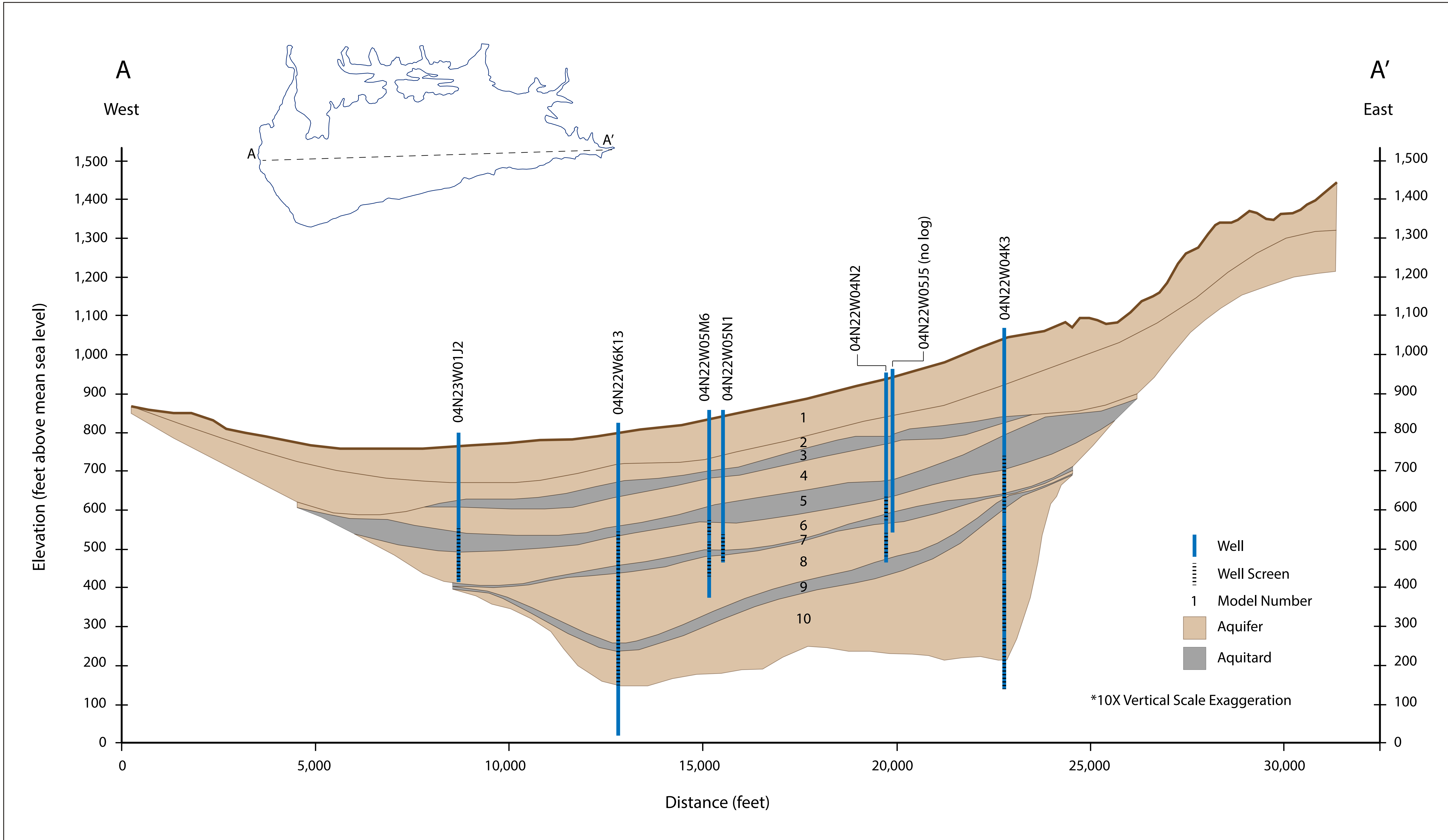


SOURCE: Adopted from DBS&A

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**FIGURE 6**

A - A' Geologic Cross-Section

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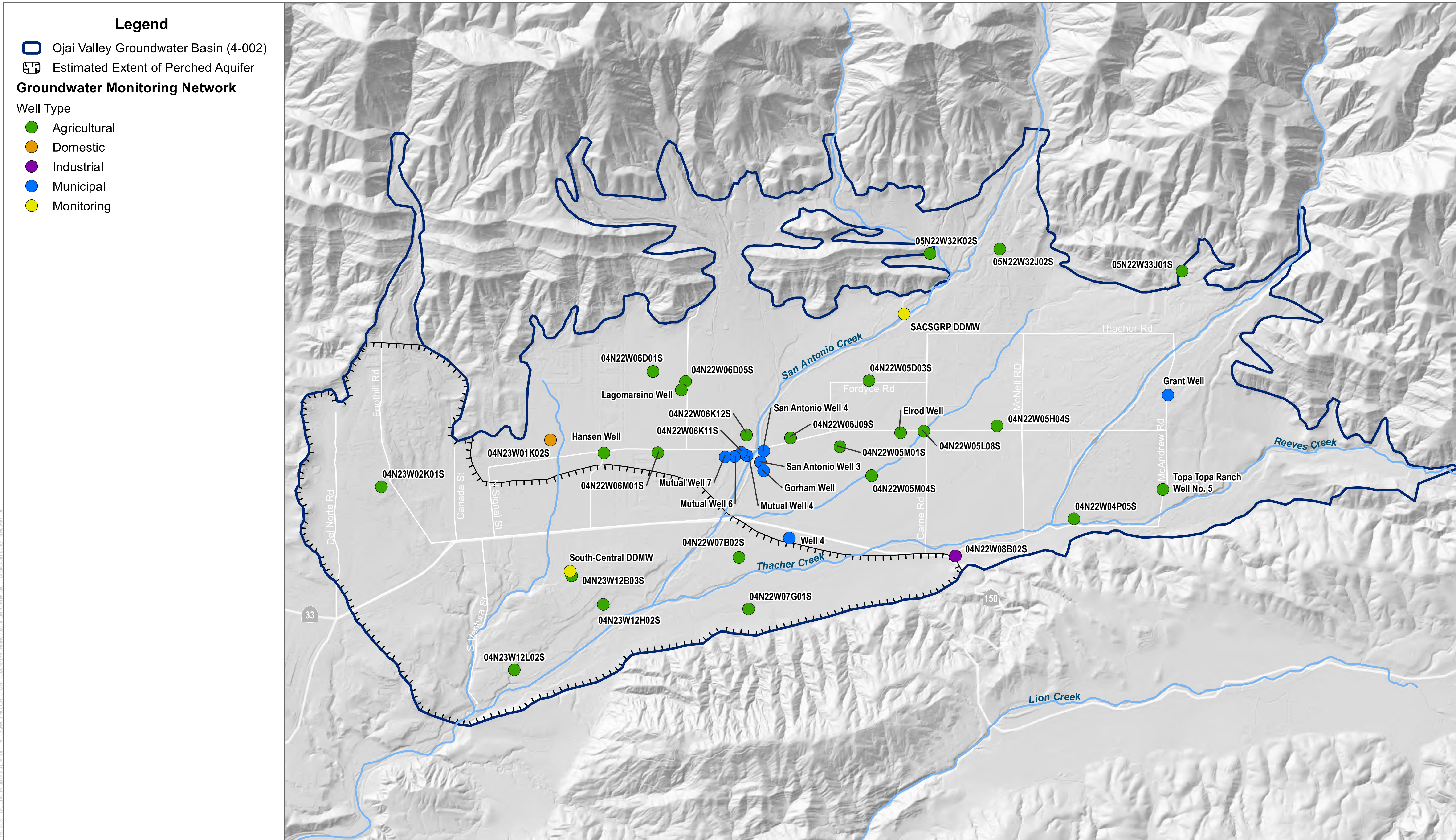


DATUM: NAD 1983 DATA SOURCE: ESRI; DWR; USGS; VCWPD; OBGMA

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0 0.5 1 Miles

**FIGURE 7**

Groundwater Monitoring Network

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# 3 Groundwater Monitoring

The following subsections describe the OVGB groundwater monitoring network and frequency of monitoring.

## 3.1 Monitoring Network

The VCWPD and OBGMA are the two primary entities who monitor groundwater levels in the OVGB. The VCWPD previously acted as the California Statewide Groundwater Elevation Monitoring umbrella monitoring entity for Ventura County and continues to routinely monitor groundwater levels in 18 wells (the number of wells monitored by VCWPD is based on accessibility) in the OVGB. In addition, OBGMA monitors groundwater levels in seven wells, several of which have automated data loggers for continuous measurement of groundwater levels. The wells monitored by OBGMA include five privately-owned production wells and two depth-discrete monitoring wells (DDMWs). The two depth-discrete monitoring wells include the San Antonio Creek Spreading Grounds Rehabilitation Project (SACSGRP) DDMW located in the northern part of the OVGB and the South-Central DDMW located in the southern part of the OVGB in an easement granted to the OBGMA by the City of Ojai (Figure 7). Each depth-discrete monitoring well consists of four casings with various completion depths that are used to evaluate groundwater elevation trends by aquifer zone. Wells that are routinely monitored for groundwater levels are shown in Figure 7 and Table 4. Available data from these 23 wells are uploaded to the SGMA Portal Monitoring Network Module by the OBGMA.

## Table 4. Current Groundwater Monitoring Network

| Well Name | SWN | CASGEM ID | Well Use | Representative Monitoring Point | Monitoring Entity | Groundwater Monitoring Networks | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Elevation | Quality | Production |
| South Central DDMW | — | — | Monitoring | Yes[a] | OBGMA | Yes | Yes | No |
| SACSGRP DDMW | 05N22W32P002S–006S | — | Monitoring | Yes | OBGMA | Yes | Yes | No |
| Elrod Well | 04N22W05L003S | — | Agricultural | Yes | OBGMA | Yes | No | Yes |
| Lagomarsino Well | 04N22W06E006S | — | Agricultural | Yes[b] | OBGMA, VCWPD | Yes | Yes | Yes |
| Hansen Well | 04N23W01J003S | — | Agricultural | Yes | OBGMA, VCWPD | Yes | Yes | Yes |
| Topa Topa Ranch Well No. 5 | 04N22W04Q001S | 2813 | Agricultural | Yes | OBGMA, VCWPD | Yes | Yes | Yes |
| — | 04N22W05L008S | 2816 | Agricultural | Yes | VCWPD | Yes | No | Yes |
| Mutual Well 4 | 04N22W06K003S | — | Municipal | Yes | OBGMA, SWRCB, VCWPD | Yes | Yes | Yes |
| Mutual Well 5 | 04N22W06K011S | — | Municipal | No | SWRCB | No | Yes | Yes |
| Mutual Well 6 | 04N22W06K015S | — | Municipal | No | SWRCB | No | Yes | Yes |
| Mutual Well 7 | — | — | Municipal | No | SWRCB | No | Yes | Yes |
| Gorham Well | 04N22W06K013S | — | Municipal | No | SWRCB | No | Yes | Yes |
| Well 4 | 04N22W07A005S | — | Municipal | No | SWRCB | No | Yes | Yes |
| Grant Well | — | — | Municipal | No | SWRCB | No | Yes | Yes |
| San Antonio Well 3 | 04N22W06K010S | — | Municipal | No | SWRCB, VCWPD | No | Yes | Yes |
| San Antonio Well 4 | 04N22W06K014S | — | Municipal | No | SWRCB, VCWPD | No | Yes | Yes |
| — | 05N22W32K002S | — | Agricultural | No | VCWPD | No | Yes | Yes |
| — | 04N23W12B003S | — | Agricultural | No | VCWPD | No | Yes | Yes |
| — | 04N22W06J009S | — | Agricultural | No | VCWPD | No | Yes | Yes |
| — | 04N22W05M004S | — | Agricultural | No | VCWPD | No | Yes | Yes |
| — | 04N22W04P005S | — | Agricultural | No | VCWPD | No | Yes | Yes |
| — | 05N22W33J001S | — | Agricultural | No | VCWPD | No | Yes | Yes |
| — | 04N22W06D001S | 2818 | Agricultural | No | VCWPD | Yes | No | Yes |

## Table 4. Current Groundwater Monitoring Network

| Well Name | SWN | CASGEM ID | Well Use | Representative Monitoring Point | Monitoring Entity | Groundwater Monitoring Networks | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Elevation | Quality | Production |
| — | 04N23W01K002S | 2837 | Domestic | No | VCWPD | Yes | Yes | Yes |
| — | 04N22W07G001S | 2826 | Agricultural | No | VCWPD | Yes | No | Yes |
| — | 04N22W08B002S | 26333 | Industrial | No | VCWPD | Yes | No | Yes |
| — | 04N22W05H004S | 39777 | Agricultural | No | VCWPD | Yes | Yes | Yes |
| — | 04N22W05M001S | 2817 | Agricultural | No | VCWPD | Yes | No | Yes |
| — | 04N22W07B002S | 2824 | Agricultural | No | VCWPD | Yes | No | Yes |
| — | 04N22W05D003S | 2814 | Agricultural | No | VCWPD | Yes | Yes | Yes |
| — | 04N22W06M001S | 2822 | Agricultural | No | VCWPD | Yes | No | Yes |
| — | 04N23W02K001S | 46068 | Agricultural | No | VCWPD | Yes | No | Yes |
| — | 05N22W32J002S | 38094 | Agricultural | No | VCWPD | Yes | No | Yes |
| — | 04N23W12L002S | 26381 | Agricultural | No | VCWPD | Yes | No | Yes |
| — | 04N22W06K012S | 26330 | Agricultural | No | VCWPD | Yes | No | Yes |
| — | 04N23W12H002S | 26380 | Agricultural | No | VCWPD | Yes | Yes | Yes |
| — | 04N22W06D005S | 46108 | Agricultural | No | VCWPD | Yes | No | Yes |

**Notes:** — = not available or not applicable; SWN = state well number; CASGEM = California Statewide Groundwater Elevation Monitoring Program; OBGMA = Ojai Basin Groundwater Management Agency; VCWPD = Ventura County Watershed Protection District; SWRCB = State Water Resources Control Board.

[a] The South Central DDMW well was constructed in 2021. Because this well is new and monitoring began in June 2021, minimum thresholds and measurable objectives will be established as part of the 5-year GSP update.

[b] The pressure transducer and data logger in Lagomarsino Well had the cable cut by a contractor in January 2019. A new pressure transducer and data logger was installed in March 2023. Minimum thresholds and measurable objectives will be established as part of the 5-year GSP update.

## 3.2 Frequency of Monitoring

VCWPD monitors groundwater levels on a quarterly basis and compiles this data with groundwater level measurements taken by other agencies. Similarly, OBGMA monitors groundwater levels a minimum of two times per year in the spring and fall.

# 4 Groundwater Conditions

The following subsections provide a description of the OVGB groundwater elevation contour maps and hydrographs developed using groundwater level data collected at monitoring wells in water year 2023.

## 4.1 Groundwater Elevation Contour Maps

Groundwater elevation data for wells in the monitoring network were compiled and reviewed for accuracy and completeness to ensure data are representative of static groundwater conditions. Groundwater level measurements for extraction wells were not taken while actively pumping to ensure the contours generated are generally representative of static conditions (i.e., not influenced by active pumping of a water well). Groundwater elevation data representative of the seasonal high and seasonal low groundwater conditions were then selected for contouring. In the OVGB, the seasonal high typically occurs between March and June and the seasonal low typically occurs between September and December, although the seasonal high/low varies from year to year and by well (Appendix A). As described in Section 3.2, groundwater levels are measured on a quarterly basis, typically in the months of March, June, October, and December. For purposes of generating groundwater elevation contour maps to illustrate the change in seasonal high and seasonal low groundwater conditions in the primary production aquifer for the 2023 water year, March 2023 groundwater level measurements were used to show the seasonal high and October 2022 groundwater level measurements were used to show the seasonal low (Figures 8 and 9).[6] Additionally, October 2022 represents the start of the 2023 water year, and March 2023 represents the mid-point of the water year.

Historically, and in water year 2023, groundwater elevations were highest in the northern and eastern portions of the OVGB, adjacent to the Topa Topa Mountains, and lowest in the southwestern part of the OVGB in the vicinity of San Antonio Creek. In October 2022, the predominant direction of groundwater flow was towards the southwest and the hydraulic gradient was approximately 0.026 feet/feet, as measured between wells 05N22W32J002S, 04N23W01K002S, and 04N23W12H002S. Groundwater elevations ranged from a high of approximately 1,052 feet MSL in the northeastern part of the OVGB to a low of approximately 649 feet MSL in the central part of the OVGB (Figure 8). The October 2022 groundwater elevation contour map shows a slight pumping depression in the central part of the OVGB (Figure 8). In March 2023, the predominant direction of groundwater flow was towards the southwest and the hydraulic gradient was approximately 0.029 feet/feet, as measured between wells 05N22W32J002S, 04N23W01K002S, and 04N22W07G001S. Groundwater elevations ranged from a high of approximately 1,093 feet MSL in the northeastern part of the OVGB to a low of approximately 686 feet MSL in the southwestern part of the OVGB (Figure 9).

## 4.2 Groundwater Elevation Hydrographs

Groundwater elevation hydrographs were produced for each well in the groundwater elevation monitoring network. Available data for each well were plotted through 2023 (Appendix A).

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6 As shown in the hydrographs in Appendix A, in water year 2023 the seasonal high groundwater level was in June 2023; however, to maintain consistency with groundwater elevation contour maps created for previous water years the March data was used.

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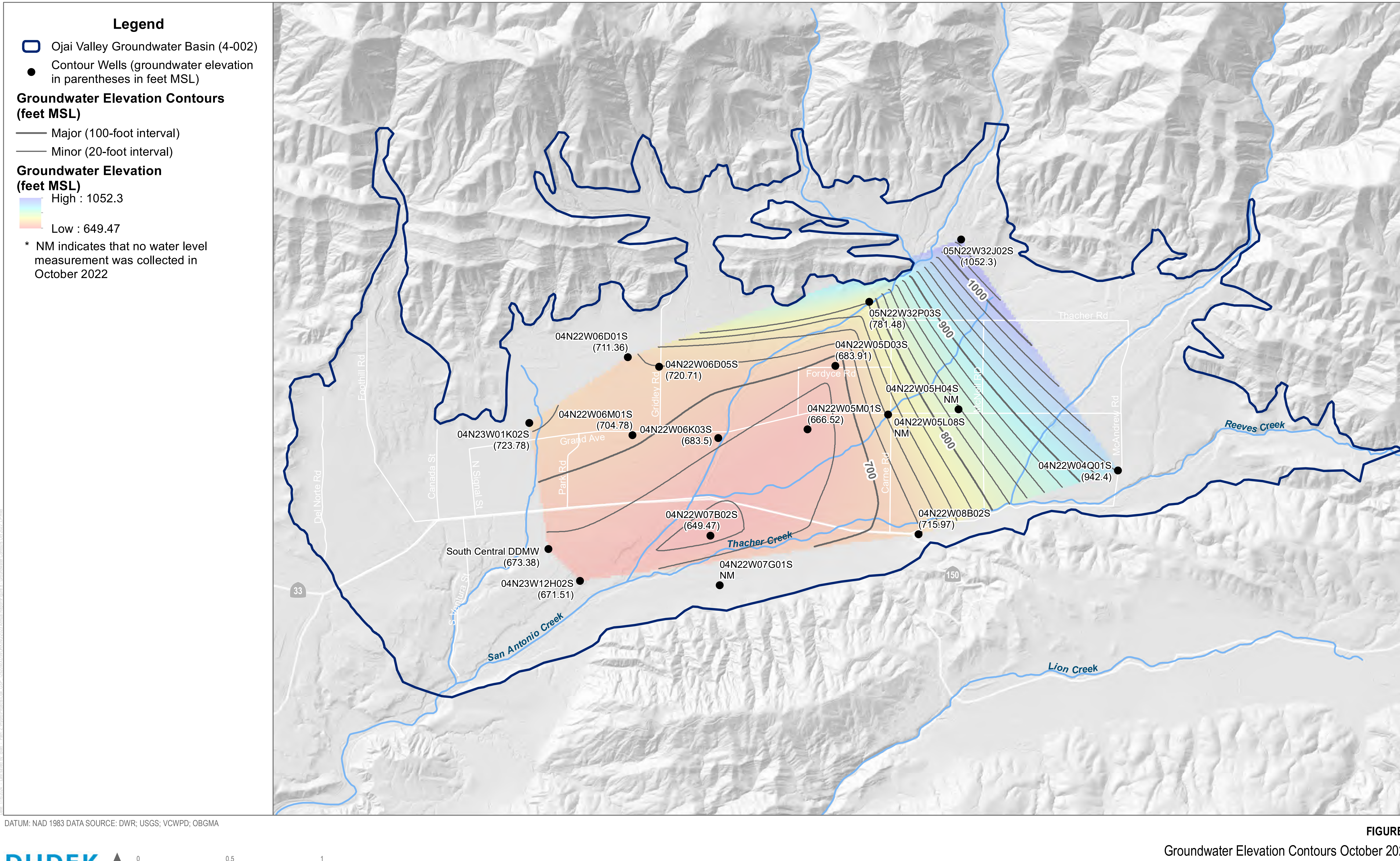


DATUM: NAD 1983 DATA SOURCE: DWR; USGS; VCWPD; OBGMA

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**FIGURE 8**

Groundwater Elevation Contours October 2022

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**Legend**

Ojai Valley Groundwater Basin (4-002)

Contour Wells (groundwater elevation in parentheses in feet MSL)

**Groundwater Elevation Contours (feet MSL)**

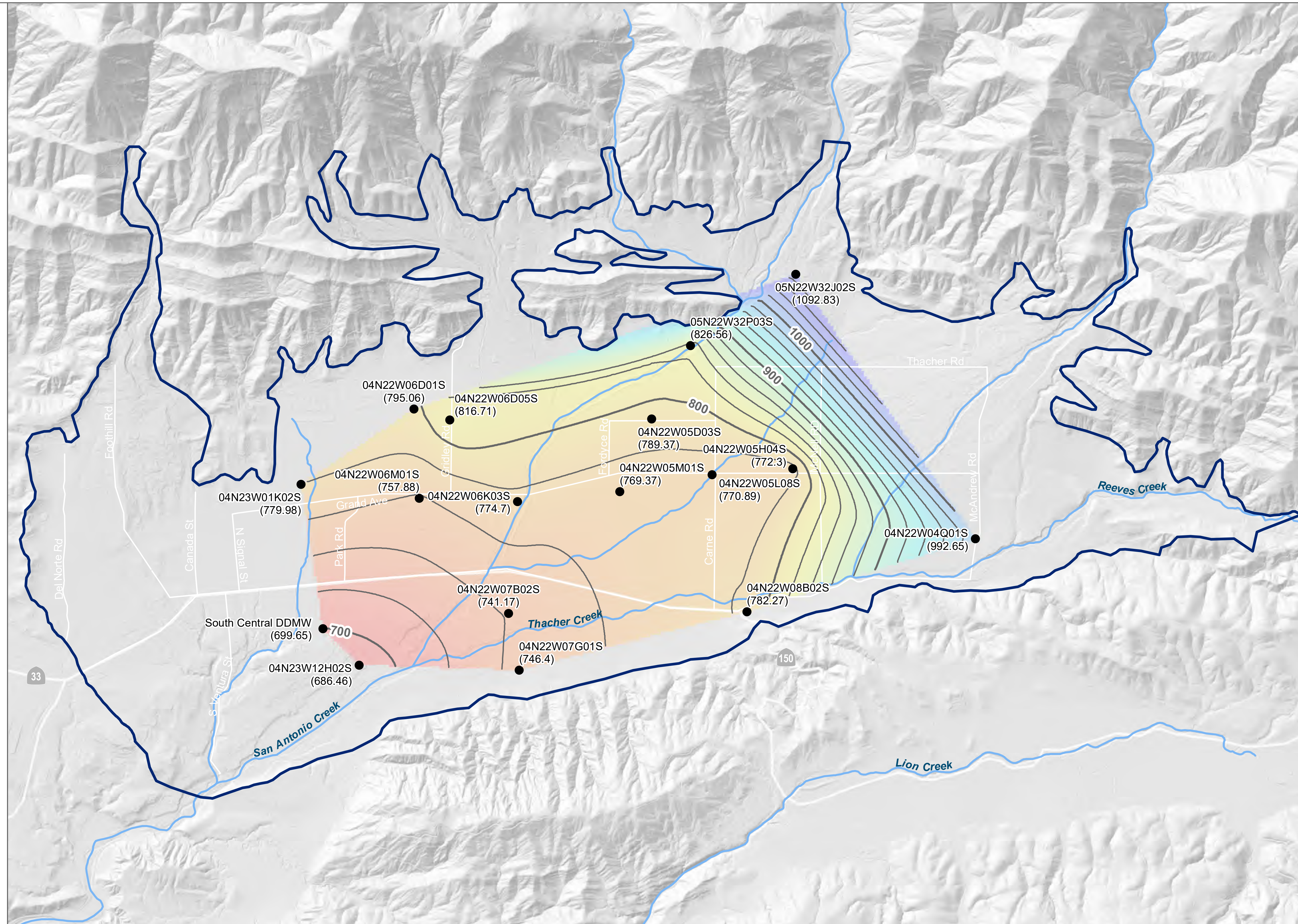
Major (100-foot interval)

Minor (20-foot interval)

**Groundwater Elevation (feet MSL)**

High : 1092.83

Low : 686.46




DATUM: NAD 1983 DATA SOURCE: DWR; USGS; VCWPD; OBGMA

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0 0.5 1 Miles

**FIGURE 9**

Groundwater Elevation Contours March 2023

Annual Report for the Ojai Valley Groundwater Basin

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## 4.3 Representative Monitoring Points

The key indicator well in the OVGB has historically been well 04N22W05L008S located near the center of the basin. Six additional wells were identified in the GSP as representative monitoring points (RMPs) where groundwater level minimum thresholds were established. The six RMPs include Elrod Well, Topa Topa Ranch Well No. 5, Lagomarsino Well, Hansen Well, Mutual Well 4, and SACSGRP DDMW.[7] The recently installed South Central DDMW is also included as an RMP, although a minimum threshold for groundwater levels is not yet established for the well. The minimum threshold and measurable objectives for this well will be evaluated during the first five-year GSP evaluation. The location of each RMP is shown in Figure 10. The minimum threshold established at each RMP, as well as the groundwater elevation measured in October 2022 (i.e., seasonal low), is included in Table 5.

Groundwater elevation changes between fall 2022 and fall 2023 varied geographically across the OVGB (Table 5). Groundwater elevation declines between fall 2022 and fall 2023 were largest at the Elrod well and Hansen well where groundwater levels declined by approximately -13 and -19 feet, respectively. Over this same period, the groundwater elevation measured at Mutual Well 4 increased by approximately 24 feet. The remaining wells experienced groundwater elevation changes of less than 10 feet. These groundwater conditions are reflective of the average precipitation during the 2022 water year.

Precipitation during the winter months of the 2023 water year supported groundwater elevation recoveries throughout the OVGB. In the eastern portion of the OVGB, the spring 2023 groundwater elevations measured at well 04N22W05L008S, Elrod Well, and Topa Topa Ranch Well No. 5 were approximately 34 to 77 feet higher than spring 2022. Farther west, in the central part of the OVGB, spring 2023 groundwater elevations were approximately 8 to 96 feet higher than spring 2022 (Table 5). As shown in Table 5, groundwater elevations at RMPs remained above established minimum thresholds in water 2023.

The groundwater elevation data shown in Table 5 for Elrod Well, Lagomarsino Well, Hansen Well, SACSGRP DDMW, and South Central DDMW relies in part on provisional pressure transducer data that is subject to revision. The OBGMA continues to evaluate opportunities to improve the groundwater monitoring program to remain consistent with best management practices (DWR 2016); as described in Section 7 of this annual report, the OBGMA is in the process of preparing a sampling and analysis plan and quality assurance plan for data collection and monitoring of sustainability indicators. Groundwater level minimum thresholds at RMPs are to be further developed based on additional data collection and as part of the 5-year GSP update.

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[7] Groundwater levels in Elrod Well and Well 04N22W05L008S are closely correlated. Due to reported access issues at well 04N22W05L008S, Elrod Well was selected as a RMP. The minimum threshold established at the Elrod Well is based on the historical groundwater level record of well 04N22W05L008S. Both wells are monitored on a regular basis.

## Table 5. Representative Monitoring Points Groundwater Elevations and Minimum Thresholds

| Well Name | SWN | Well Use | Fall Groundwater Conditions | | Spring Groundwater Conditions | | Minimum Threshold (feet MSL) | Current Operational flexibility (feet)[b] |
|---|---|---|---|---|---|---|---|---|
| | | | October 2022 (feet MSL) | Change from 2021 (feet)[a] | March 2023 (feet MSL) | Change from 2022 (feet)[a] | | |
| Elrod Well | 04N22W05L003S | Agricultural | 685.39 | -13.45 | 793.08 | 76.6 | 576.3 | +109.1 |
| — | 04N22W05L008S | Agricultural | NM | — | 770.89 | 66.8 | 576.3 | — |
| Topa Topa Ranch Well No. 5 | 04N22W04Q001S | Agricultural | 942.4 | 2.15 | 992.65 | 34.35 | 915.9 | +26.5 |
| Lagomarsino Well | 04N22W06E006S | Agricultural | NM | — | 698.49 | — | TBD[c] | — |
| Hansen Well | 04N23W01J003S | Agricultural | 640.96 | -19.17 | 744.92 | 54.69 | 567.5 | +73.5 |
| Mutual Well 4 | 04N22W06K003S | Municipal | 683.5 | 24.36 | 774.7 | 96.2 | 556.5 | +127 |
| SACSGRP DDMW | 05N22W32P003S | Monitoring | 781.48 | 0.56 | 826.56 | 28.66 | 771.6 | +9.9 |
| South Central DDMW | — | Monitoring | 673.38 | -8.25 | 699.65 | 7.98 | TBD[d] | — |

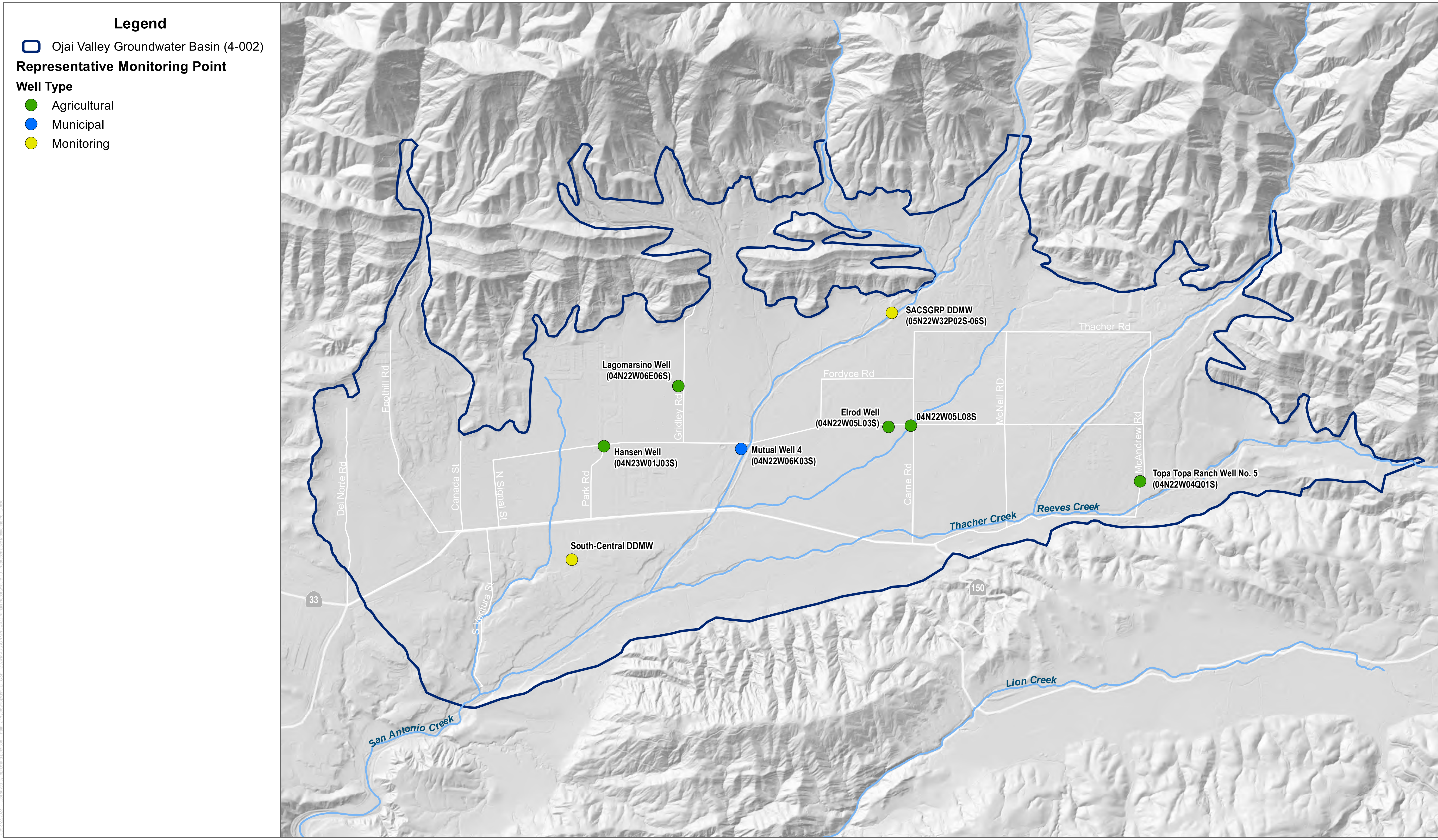
**Notes:** SWN = state well number; bgs = below ground surface; MSL = mean sea level; — = not available; TBD = to be determined; NM = not measured.

[a] Represents change in groundwater elevation measured at each key well between October 2021 and October 2022 or March 2022 and March 2023. Negative (-) values denote single year decline in groundwater elevation. Positive (+) values denote single year increase in groundwater elevation.

[b] Current Operational Flexibility is defined as the difference between the seasonal low groundwater elevation (i.e., fall 2022) and the minimum threshold groundwater elevation. Positive (+) values denote that current groundwater elevations are higher than the minimum threshold.

[c] The pressure transducer and data logger in Lagomarsino Well had the cable cut by a contractor in January 2019 and monitoring was recovered in March 2023. Minimum thresholds and measurable objectives will be established as part of the 5-year GSP update.

[d] The South Central DDMW well was constructed in 2021. Because this well is new and monitoring began in June 2021, minimum thresholds and measurable objectives will be established as part of the 5-year GSP update.




DATUM: NAD 1983 DATA SOURCE: ESRI; DWR; USGS; VCWPD; OBGMA

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0 0.5 1 Miles

FIGURE 10

Representative Monitoring Points

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# 5 Water Use

The following subsections describe water use in the OVGB including groundwater extraction, imported surface water, and total water use,

## 5.1 Groundwater Extraction

The OBGMA is mandated by its enabling act (Senate Bill No. 534) to monitor groundwater extractions from all active wells within the OVGB. The OBGMA requires well operators to accurately measure and report extractions as precisely as possible, regardless of volume extracted, using flow meters and a standardized Groundwater Extraction Form in January, April, July, and October of each year. The number of active wells varies from year to year due to construction and destruction of wells, well owners not pumping due to changes in agricultural use, or well owners obtaining water from other sources. Currently, there are approximately 180 active wells in the OVGB.

Groundwater extraction categories can be broken into four primary sectors: 1) agricultural use; 2) domestic use; 3) municipal/industrial use; and 4) Ojai Water System (Casitas Municipal Water District). In water year 2023, the total volume of groundwater extracted from the OVGB was approximately 3,351 AF, of which approximately 1,664 AF (50%) was for agriculture, 292 AF (9%) was for domestic, and 1,395 AF (41%) was for municipal/industrial (Table 6). Of the total municipal/industrial extractions, approximately 1,360 AF was for Ojai Water System (Table 6). The 2023 water year total extraction of approximately 3,351 AF is approximately 750 AF lower than the estimated basin sustainable yield of 4,100 AF (OBGMA 2022), and 600 AF less than reported total groundwater extraction in the previous water year. Figure 11 illustrates the general location and volume of groundwater extractions. The decrease in groundwater extraction from water year 2022 to water year 2023 is due in part to the fact that water year 2023 was a wet water year. Groundwater extraction reporting for water year 2023 is preliminary and there may be additional reporting from pumpers after this report is due. Additionally, it should be noted that the groundwater extractions reported in Table 6 include approximately 15 wells that are located within the OBGMA boundary but outside of the OVGB boundary. These wells are however estimated to only account for 1% or less of total extractions and so have historically been included in basin groundwater extraction summaries. The OBGMA is currently working to update and improve the groundwater extraction metering program and will revise the groundwater extraction volumes reported herein as appropriate.

### Table 6. Reported Groundwater Extractions

| | Groundwater Extraction (AF) | | | |
|---|---|---|---|---|
| Groundwater User Type | Water Year 2020 | Water Year 2021 | Water Year 2022 | Water Year 2023 |
| Agriculture | 2,661 | 2,784 | 2,282 | 1,664 |
| Domestic | 399 | 251 | 324 | 292 |
| Municipal/Industrial | 57 | 80 | 85 | 35 |
| Ojai Water System | 1,340 | 1,246 | 1,283 | 1,360 |
| **Total** | **4,456** | **4,361** | **3,974** | **3,351** |

**Source:** OBGMA 2024.
**Note:** AF = acre-feet.

## 5.2 Surface Water Use

There is currently no surface water extracted for use in the OVGB. Water from Lake Casitas is imported to the OVGB by Casitas Municipal Water District (CMWD) and used to meet agricultural and domestic demands (OBGMA 2018). Water from Lake Casitas is also blended with poorer quality groundwater by some water purveyors in the OVGB to improve water quality (OBGMA 2018). Lake Casitas has a total capacity of approximately 238,000 AF.

In water year 2023, approximately 1,093 AF of Lake Casitas water was consumed in the OVGB, of which approximately 70 AF was used by customers within the Ojai Water System and 1,023 AF was used by customers outside of the Ojai Water System (Table 7). The Ojai Water System service area boundary is shown in Figure 11.

**Table 7. Estimated Lake Casitas Water Consumption in OVGB**

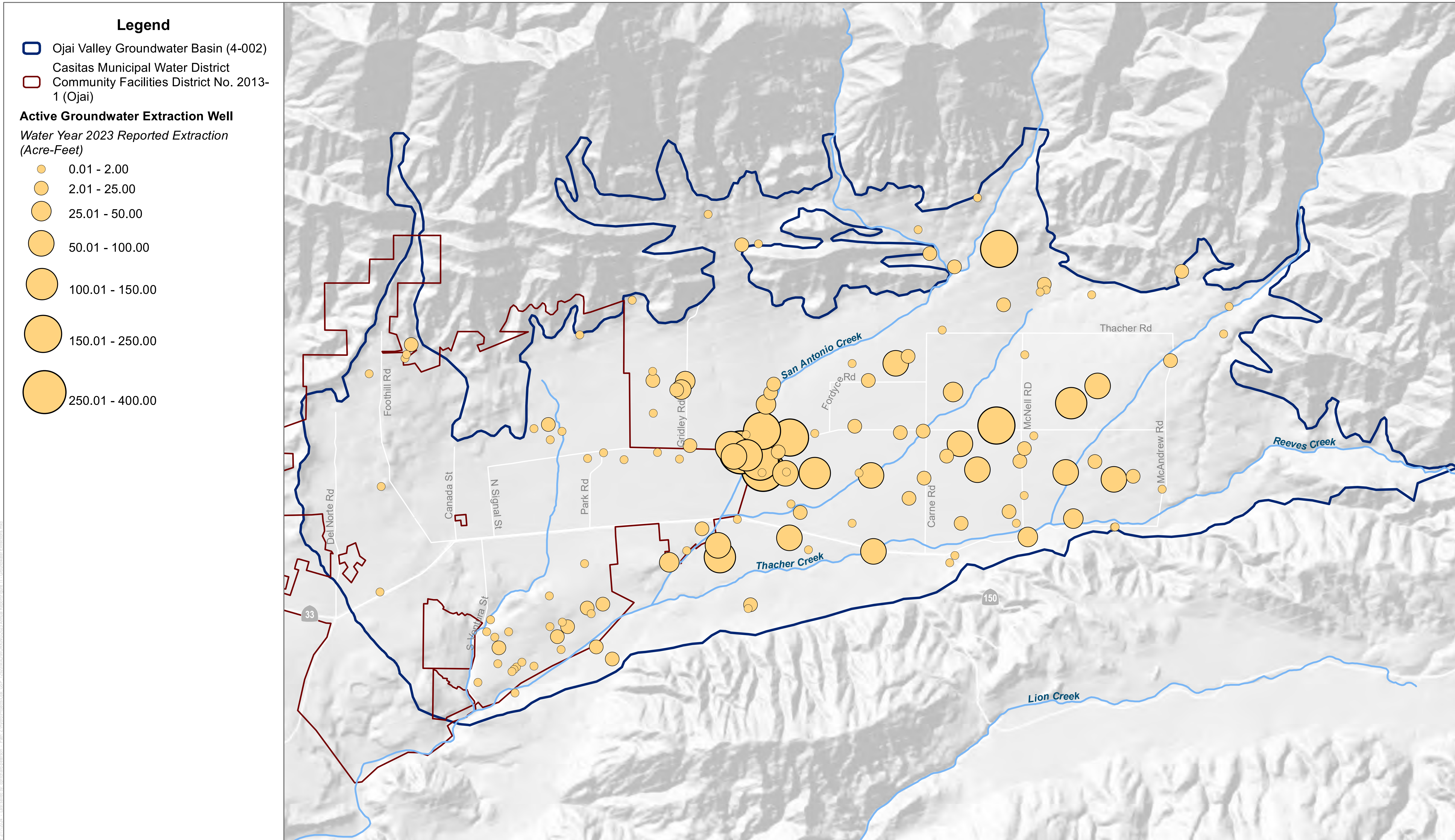
| Water Year | Lake Casitas Water Use in OVGB within Ojai Water System (AF) | Lake Casitas Water Use in OVGB outside Ojai Water System (AF) | Total (AF) |
|---|---|---|---|
| 2020 | 218 | 2,002 | 2,220 |
| 2021 | 439 | 2,745 | 3,183 |
| 2022 | 325 | 2,253 | 2,578 |
| 2023 | 70 | 1,023 | 1,093 |

**Source:** CMWD 2024.
**Notes:** AF = acre-feet.

In addition, the County of Ventura conducted a brief testing of the San Antonio Creek Spreading Grounds in April 2023. During this test, the County diverted approximately 3 AF of San Antonio Creek water for spreading and recharge via the ponds and recharge wells. The duration and scale of testing was influenced by the relatively high volume of groundwater in storage in the basin, which limited the available infiltration capacity. Additional field work is anticipated for water year 2024 to better identify feasibility and optimization of the system.

## 5.3 Total Water Use

Total water use in the OVGB is equivalent to the sum of groundwater extractions and surface water supplied by CMWD from Lake Casitas. The total water use in water year 2023 was approximately 4,444 AF.




DATUM: NAD 1983 DATA SOURCE: ESRI; DWR; USGS; VCWPD; OBGMA

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0 0.5 1 Miles

FIGURE 11

Groundwater Extractions

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# 6 Change in Groundwater Storage

The water year 2023 change in groundwater in storage in the OVGB was calculated using a linear regression model to correlate spring (i.e., March) groundwater elevations measured at well 04N22W05L008S (Figure 12) to simulated cumulative change in groundwater storage extracted from the Ojai Basin Groundwater Model (OBGM) (DBS&A 2020). This linear regression model provides an estimate of the cumulative change in storage since the spring of 1971. While this method does not capture the spatial variability in groundwater storage change that results from local hydrologic, hydrogeologic, and operational conditions, the strong correlation between the OBGM cumulative change in storage and spring groundwater elevations measured at well 04N22W05L008S ($R^2$ = 0.88; Figures 12 and 13) indicates this simple correlation provides a reasonable estimate of net change in groundwater storage across the entirety of the OVGB.

Annual and cumulative change in storage for water year 2023 is summarized in Table 8 and presented in Figures 14 and 15. Results from the linear regression model indicate groundwater in storage increased by approximately 7,427 AF in water year 2023 (Table 8 and Figure 14). This increase is attributable to the climate conditions in the 2023 water year in which precipitation in the OVGB was approximately 200% higher than the long-term average and approximately 98% of the maximum recorded precipitation. The increase in storage in water year 2023 reflects the strong correlation between climate and groundwater conditions in the OVGB. Since spring 2014, groundwater in storage in the OVGB has increased approximately 11,968 AF (Table 8 and Figure 15). Annual change in storage for water year 2023 is shown in map view in Figure 16.

### Table 8. Annual and Cumulative Change in Storage in the OVGB

| Water Year | Water Year Type | Spring Groundwater Elevation (ft MSL) | Change in Spring Groundwater Elevation (ft) | Estimated Annual Change in Storage (AF) | Cumulative Change in Storage Since Spring 2014 (AF) |
|---|---|---|---|---|---|
| 2020 | Average | 749.19 | 17.20 | 1,912 | 9,555 |
| 2021 | Dry | 695.69 | -53.50 | -5,948 | 3,607 |
| 2022 | Average | 704.09 | 8.40 | 934 | 4,541 |
| 2023 | Wet | 770.89 | 66.80 | 7,427 | 11,968 |

**Notes:** MSL = mean sea level; ft = feet; AF = acre-feet.

[a] Spring groundwater elevation measured at well 04N22W05L008S.

[b] Annual change in storage calculated from spring to spring. For example, water year 2023 storage change represents storage change between March 2022 and March 2023.

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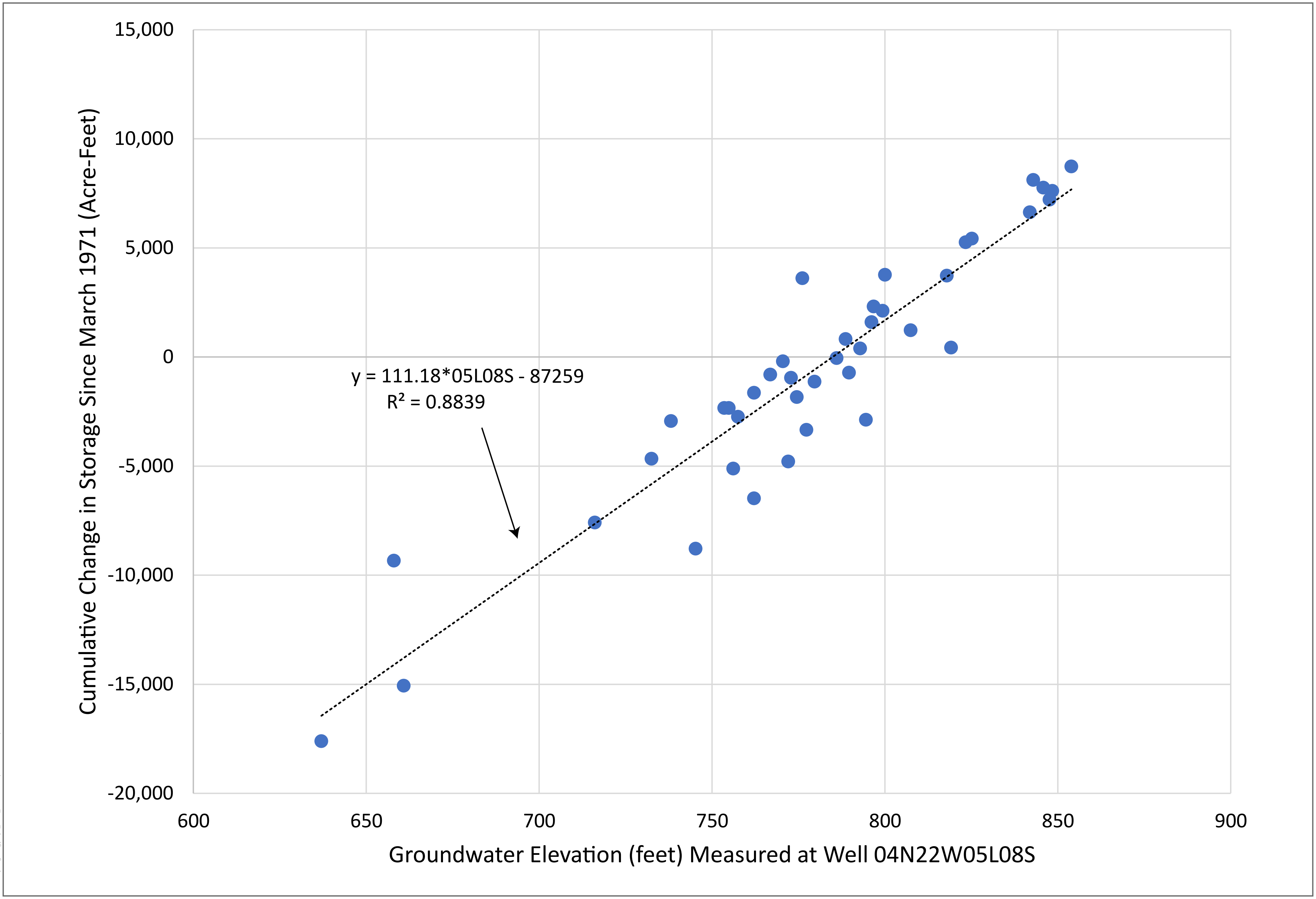


SOURCE: DBS&A 2020

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**FIGURE 12**

Linear Regression Model Developed using Well 04N22W05L008S and the OBGM

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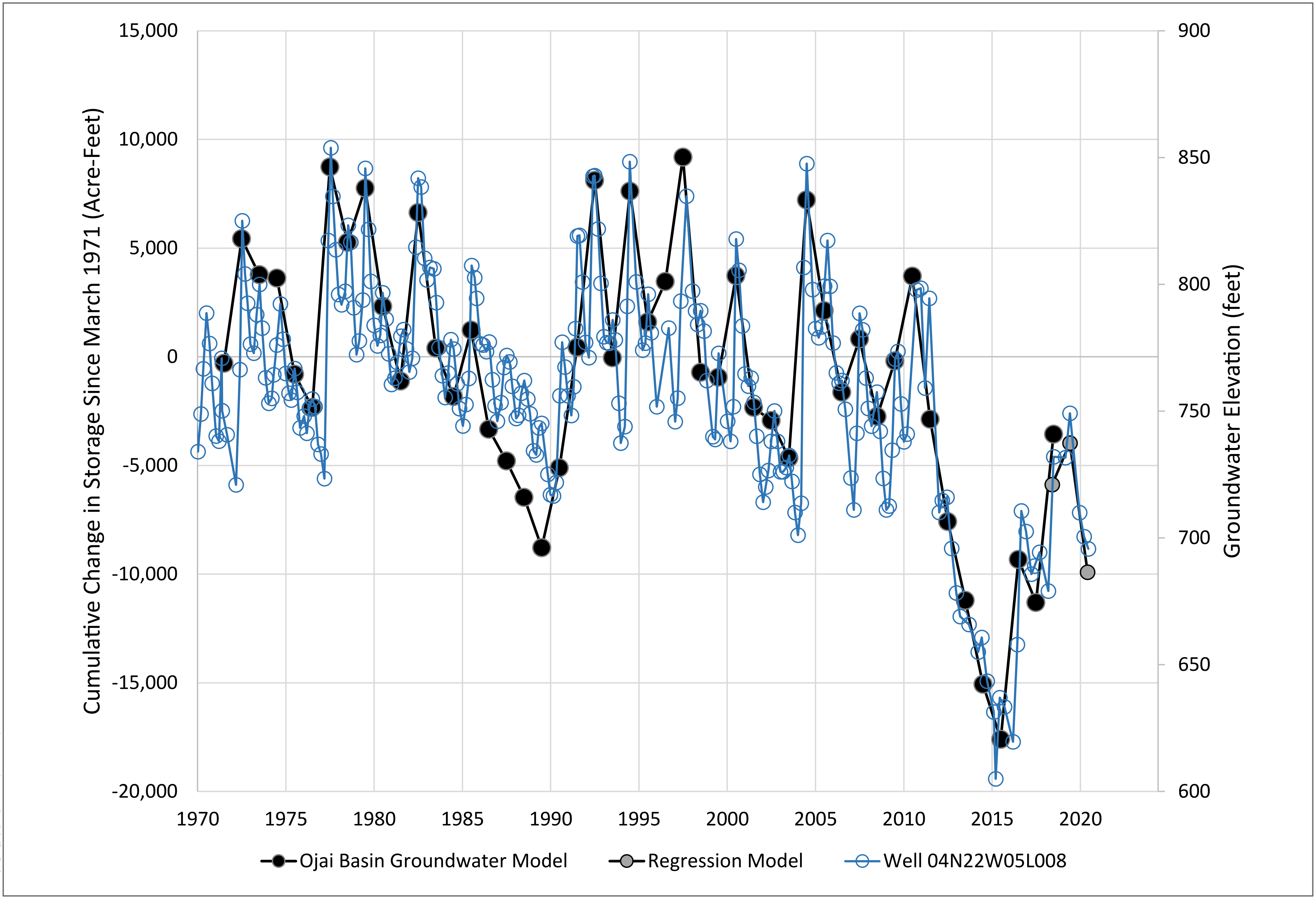


SOURCE: DBS&A 2020

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**FIGURE 13**

Validation of Linear Regression Model Developed using Well 04N22W05L008S and the OBGM

Annual Report for the Ojai Valley Groundwater Basin

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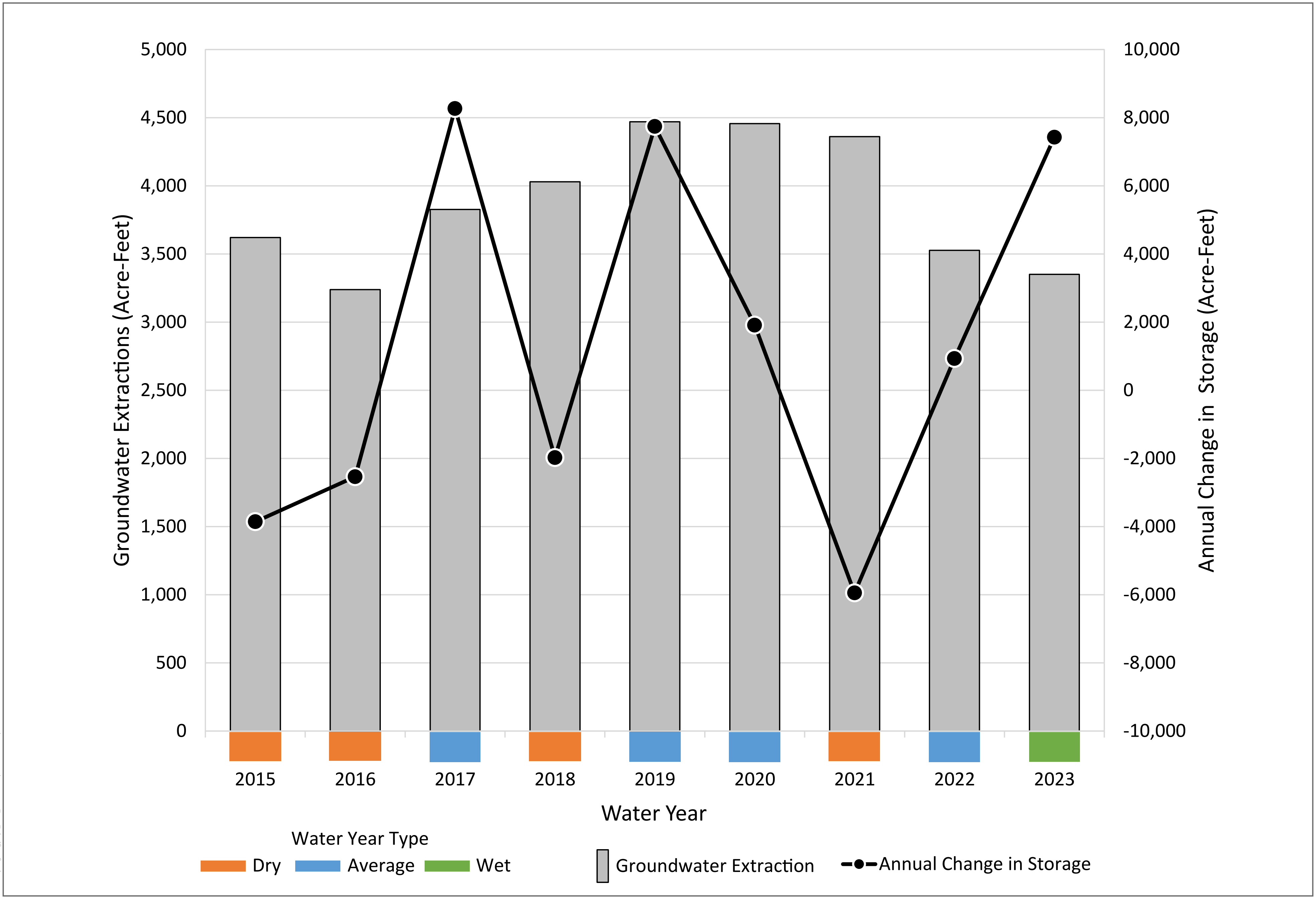


SOURCE: DBS&A 2020

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**FIGURE 14**

Groundwater Extractions and Annual Change in Storage in the OVGB

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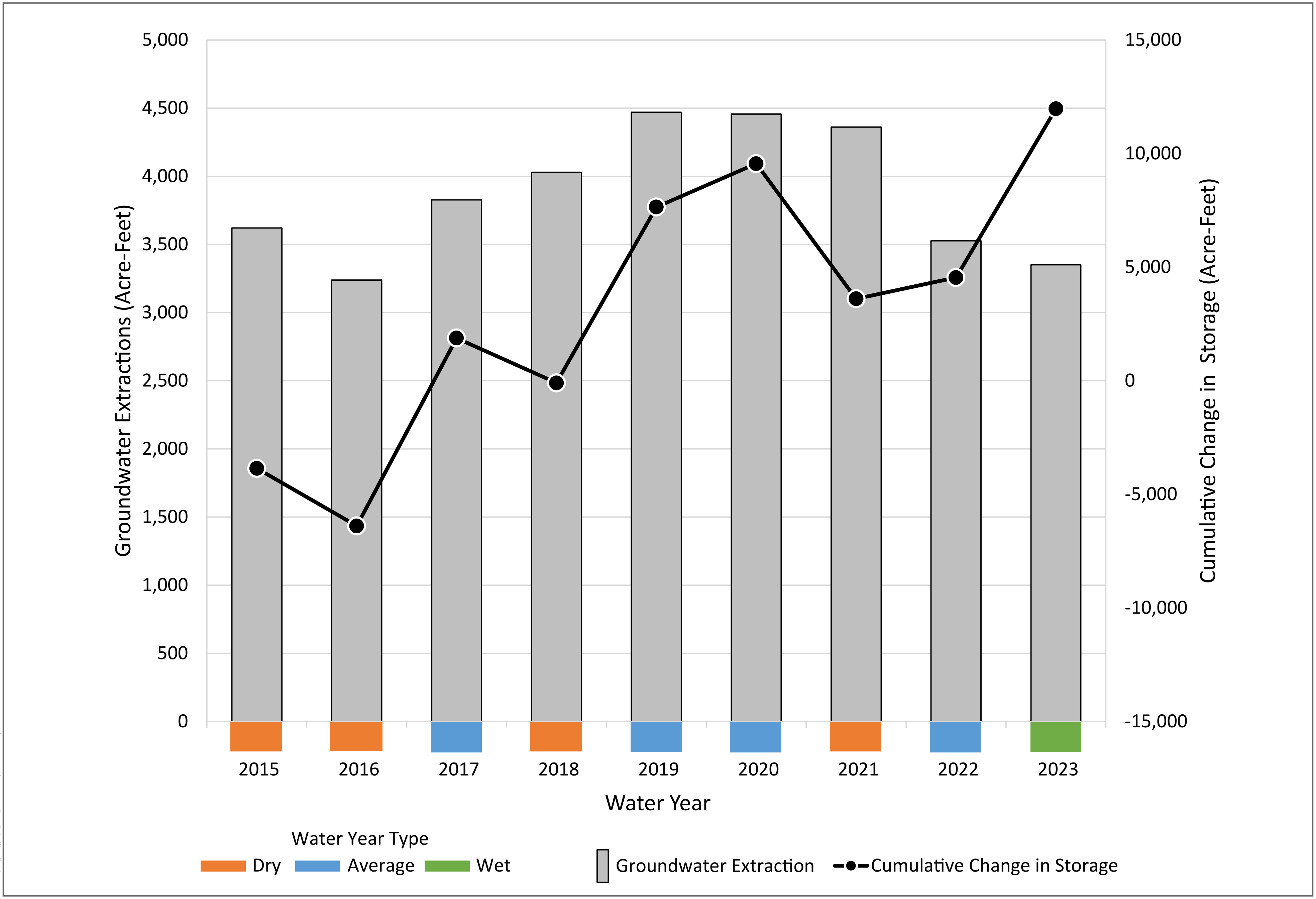


SOURCE: DBS&A 2020

**DUDEK**

**FIGURE 15**

Groundwater Extractions and Cumulative Change in Storage in the OVGB

Annual Report for the Ojai Valley Groundwater Basin

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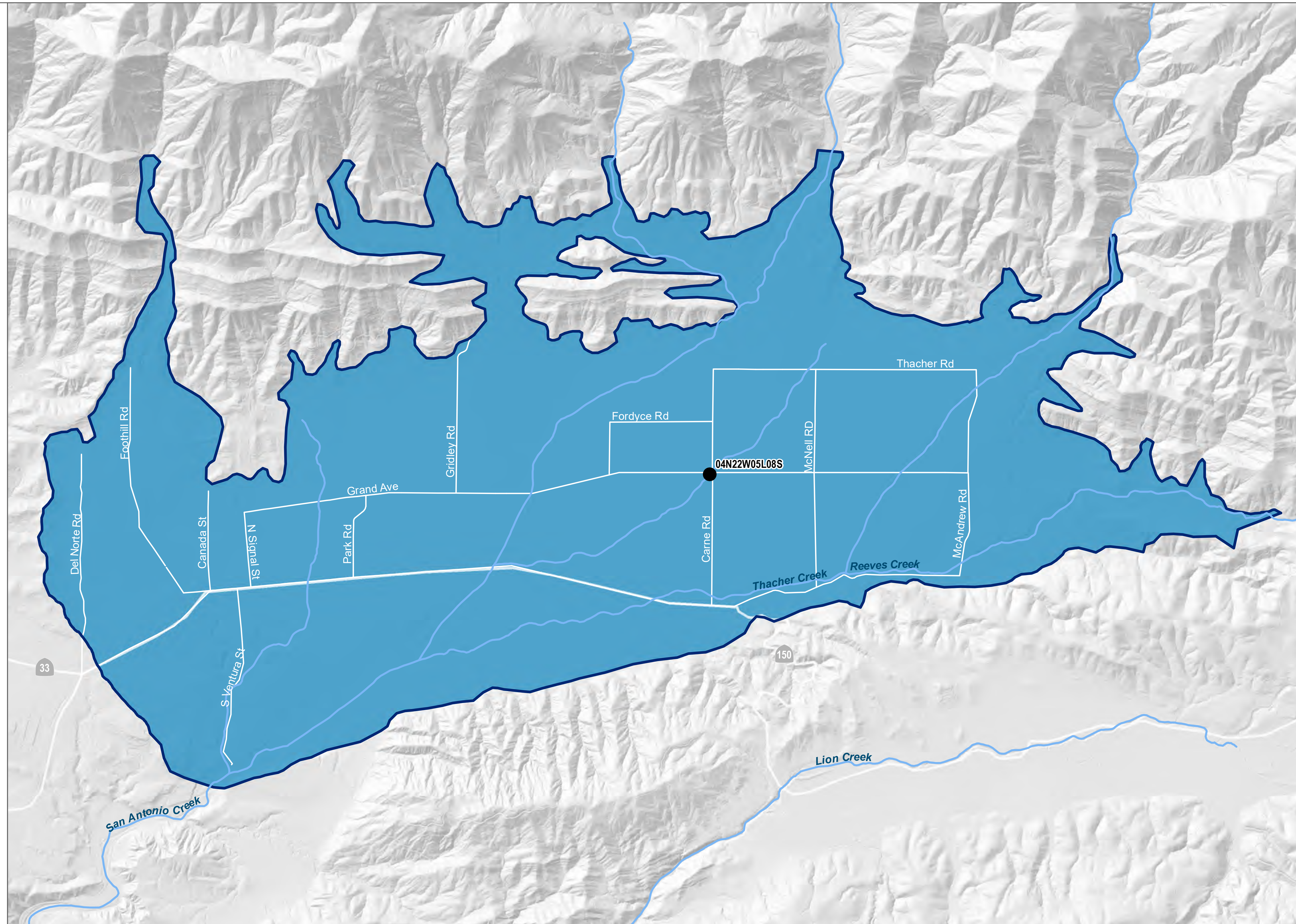
**Legend**

- Ojai Valley Groundwater Basin (4-002)
- Storage Change Correlation Well

**Annual Change in Storage (Acre-Feet)**

- < -6,000
- -5,999 to -4,000
- -3,999 to -2,000
- -1,999 to 0
- 1 to 2,000
- 2,001 to 4,000
- 4,001 to 6,000
- > 6,000

Note: Change in storage calculated at the basin-wide scale based on a corerlation between spring groundwater elevations measured at well 04N22W05L08S and simulated change in storage extracted from the Ojai Basin Groundwater Model




DATUM: NAD 1983 DATA SOURCE: DWR; USGS; VCWPD; OBGMA

DUDEK

0 0.5 1 Miles

**FIGURE 16**

Water Year 2023 Annual Change in Storage

Annual Report for the Ojai Valley Groundwater Basin

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# 7 GSP Implementation Progress

The GSP for the OVGB was submitted to DWR on January 31, 2022, and approved by DWR on October 26, 2023. DWR staff evaluated the GSP and determined that it conforms with the specified statutory requirements, complies with the GSP Regulations, is likely to achieve the sustainability goal for the basin within 20 years of the implementation of the plan, and will not adversely affect the ability of an adjacent basin to implement its GSP or impede achievement of sustainability goals in an adjacent basin. With the approval, DWR also provided recommended corrective actions that DWR believes will enhance the GSP and facilitate future evaluation by DWR. DWR recommends the OBGMA address the corrective actions by the first periodic evaluation of the GSP, which is due to DWR by January 31, 2027. The recommended corrective actions generally include the following:

- Update the hydrogeologic conceptual model section of the GSP to better describe the basin's geologic conditions,
- Update the groundwater conditions section of the GSP to more fully describe the basin's groundwater conditions and dynamics,
- Update the sustainable management criteria for the chronic lowering of groundwater levels,
- Update the sustainable management criteria for degraded water quality, and
- Incorporate DWR's forthcoming guidance related to depletions of interconnected surface water in order to establish specific sustainable management criteria.

Over the past year, the OBGMA has continued to make significant progress towards GSP implementation and sustainable management of the basin, as described in greater detail below.

The OBGMA continued their ongoing project prioritization and implementation process in the water year 2023. This included developing revised GSA fees to fund near-term projects that support groundwater sustainability. The projects and management actions currently being implemented include:

- Development of a new data management system to store and visualize all groundwater-related data collected in the basin,
- Preparation of a sampling and analysis plan for monitoring of groundwater and surface water conditions in the basin,
- Review and improvement of the existing extraction metering program,
- Continued monthly monitoring of surface and groundwater conditions in the basin,
- Identification of future GSP funding opportunities, and
- Compliance with general SGMA reporting and submittal deadlines.

In addition to implementation of these projects and management actions, the OBGMA developed a framework for reviewing and evaluating well permits and passed Ordinance No. 12 to protect the southwest upper saturated zone from groundwater extraction and depletion.[8]

Pursuant to Executive Order N-3-23, the OBGMA developed a well verification process that includes a standardized form that well owners/operators must fill out to prior to construction or modification of a groundwater well in the

[8] https://www.obgma.com/ordinances

OVGB. This form ensures that operation of the proposed well or well modification is not inconsistent with the sustainable groundwater management program established in the GSP and would not decrease the likelihood of achieving the sustainability goal for the basin covered by the GSP.

The OBGMA adopted Ordinance No. 12 on September 25, 2023, to protect the southwest upper saturated zone from groundwater extraction and depletion. The ordinance limits extraction from the shallow perched aquifer and introduces well construction guidelines to ensure that operation of wells screened in deeper production units do not cause dewatering of the shallow perched aquifer that likely sustains surface flows and groundwater dependent ecosystems in the southwestern part of the OVGB.

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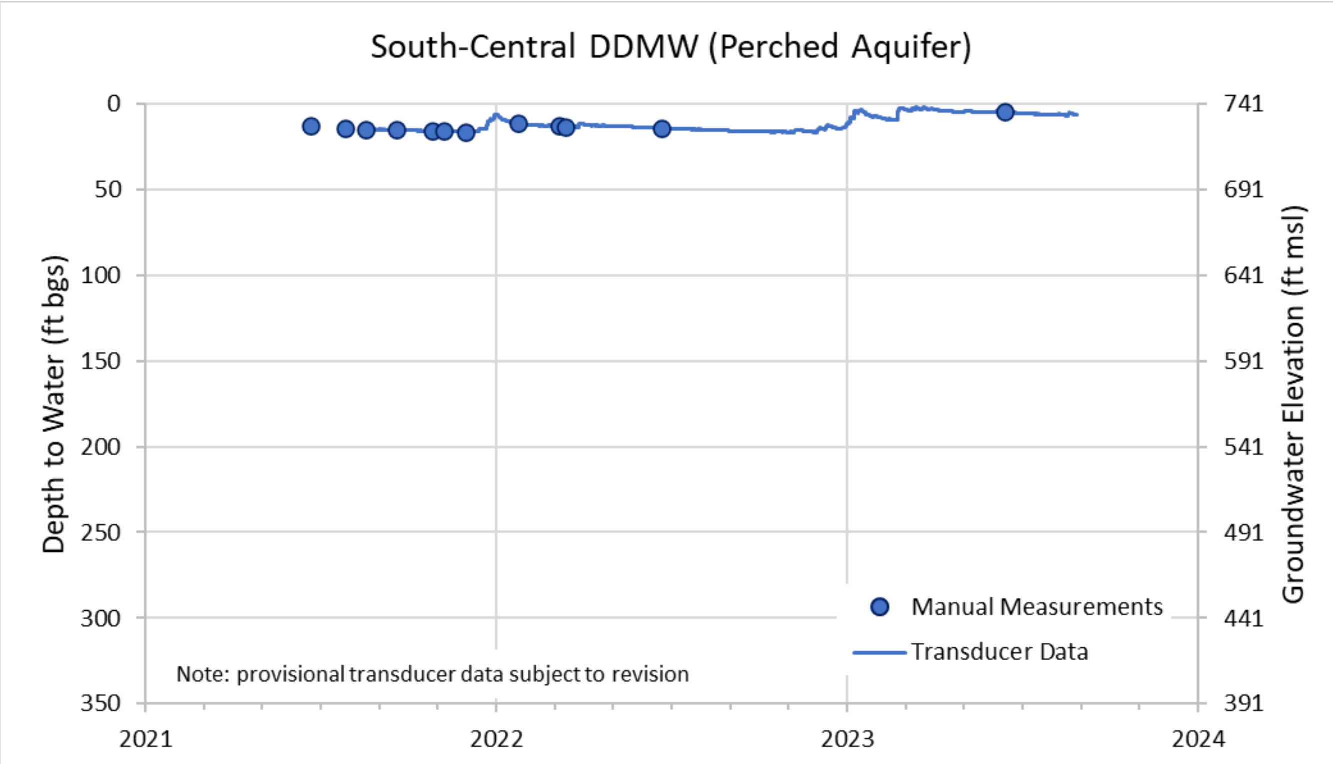
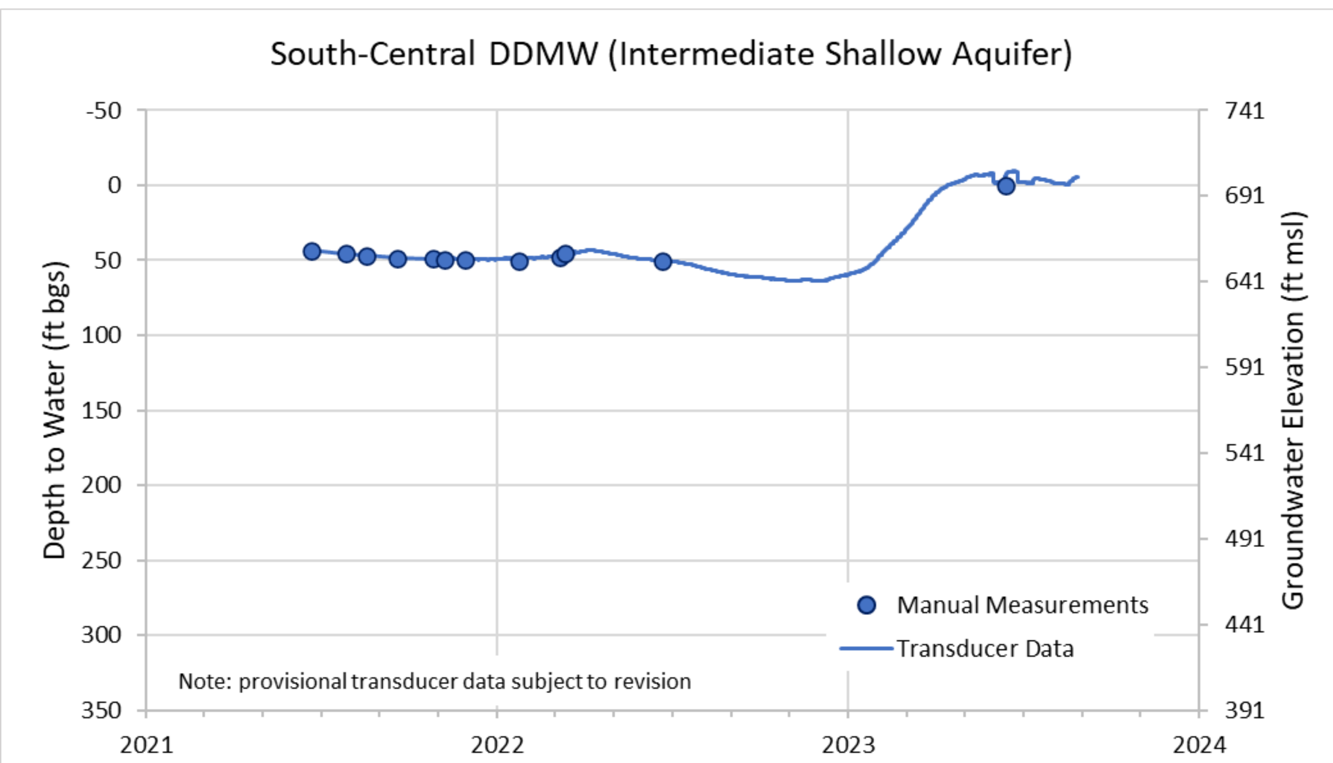
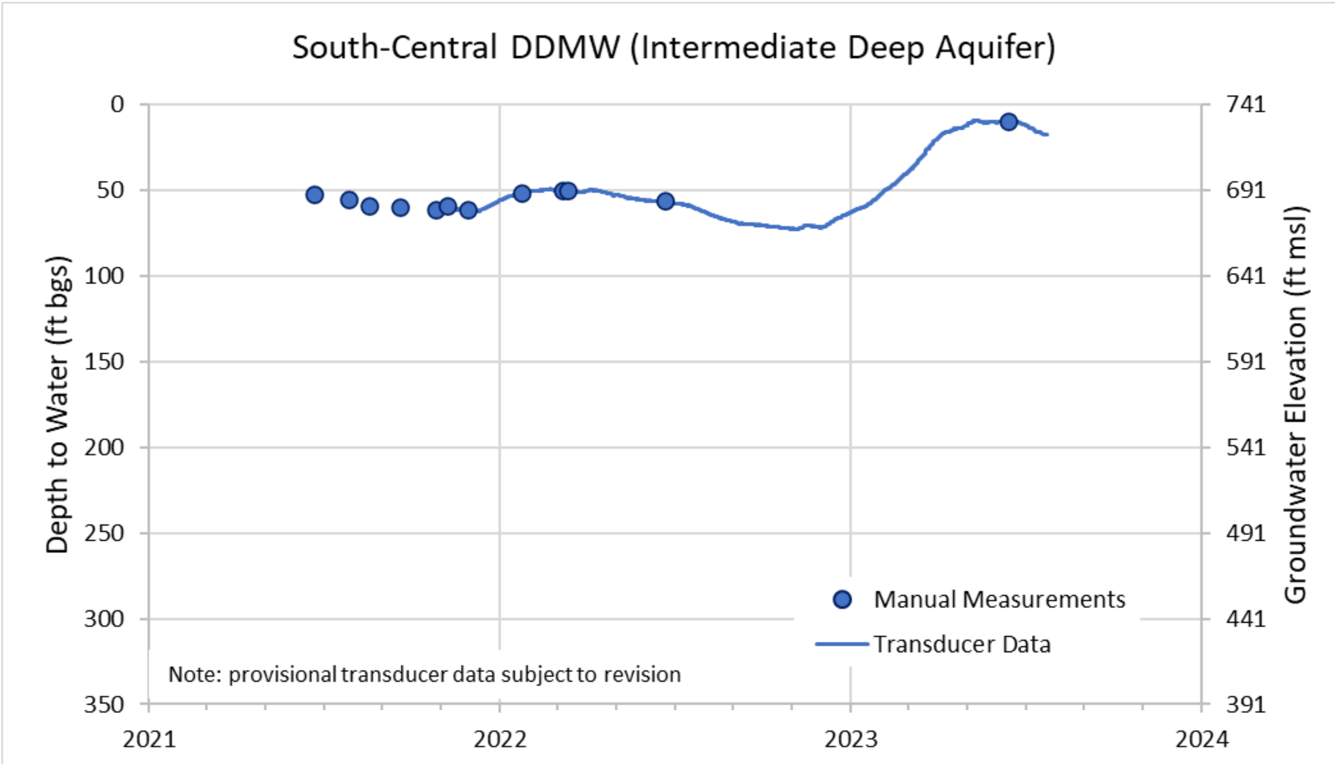
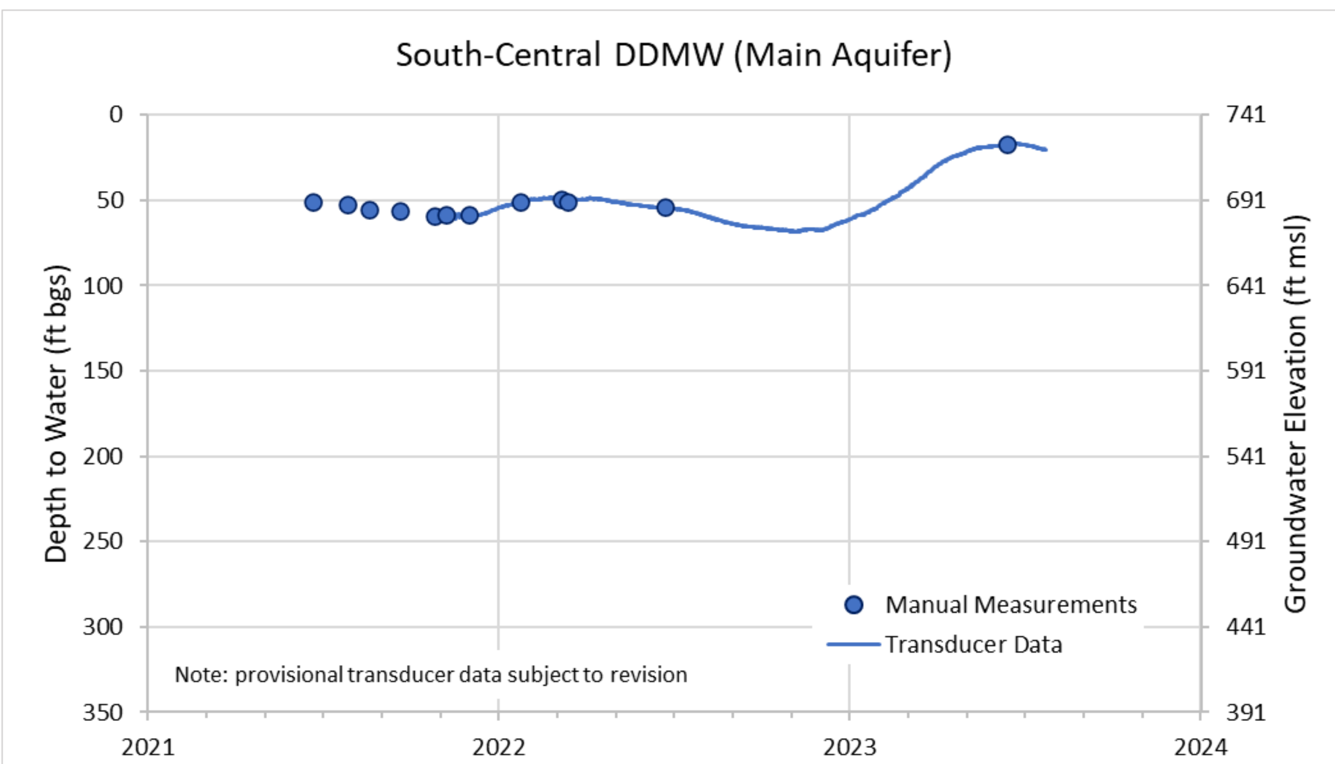
# Appendix A

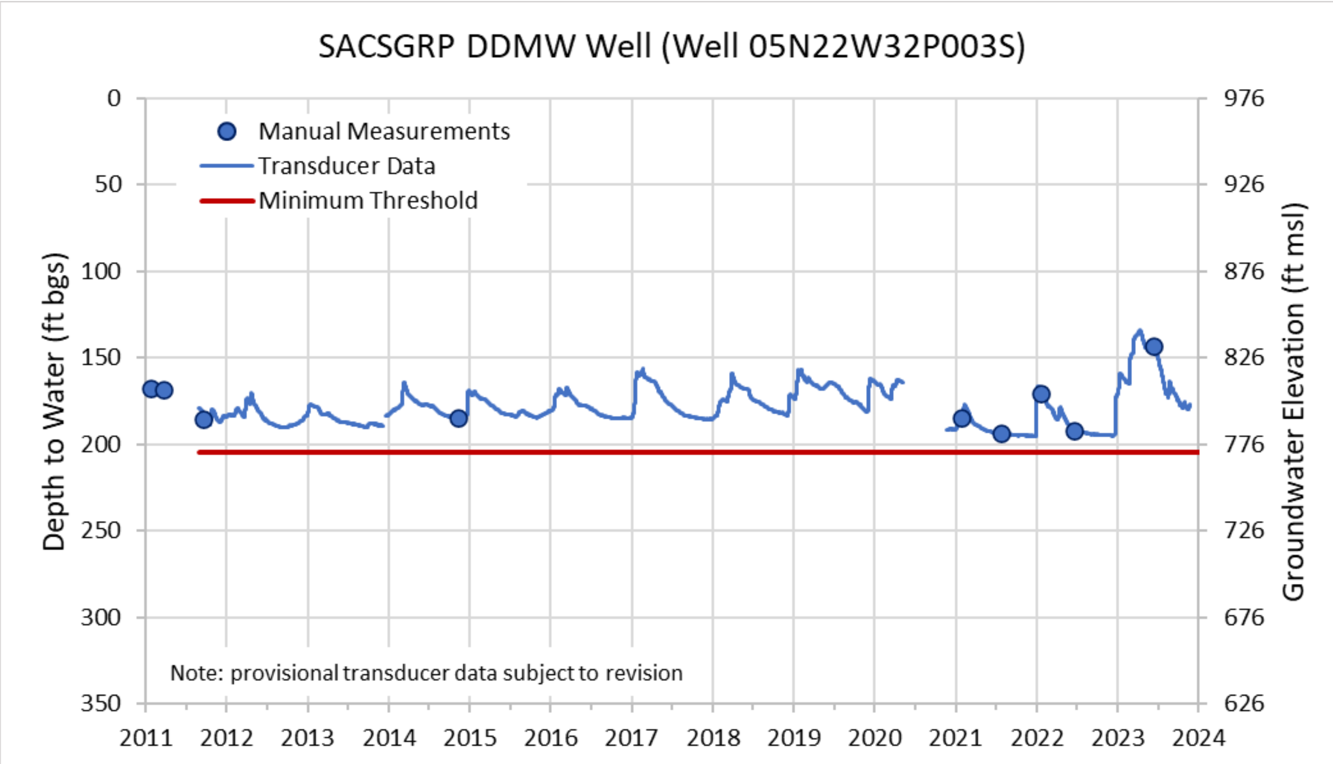
Groundwater Elevation Monitoring Well Hydrographs

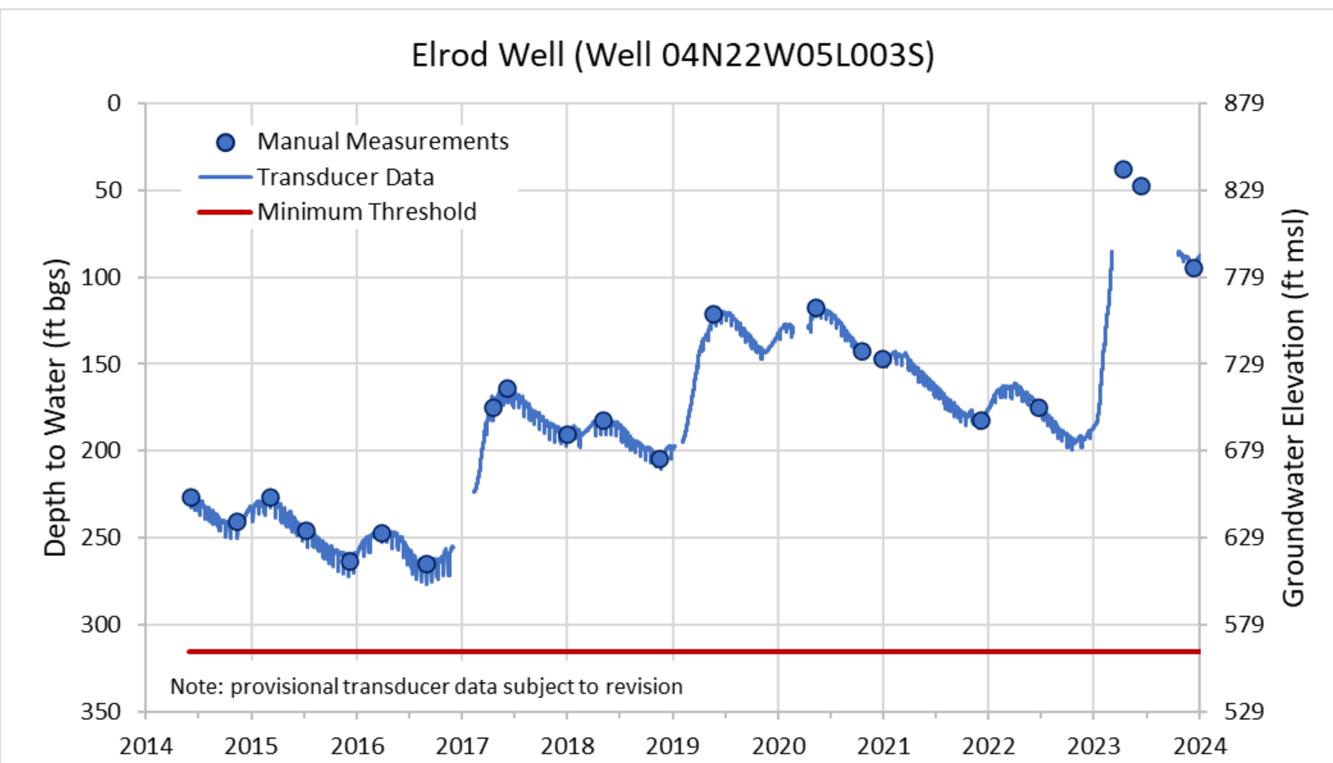

South-Central DDMW (Perched Aquifer)
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
741
691
641
591
541
491
441
391
2021
2022
2023
2024
Manual Measurements
Transducer Data
Note: provisional transducer data subject to revision

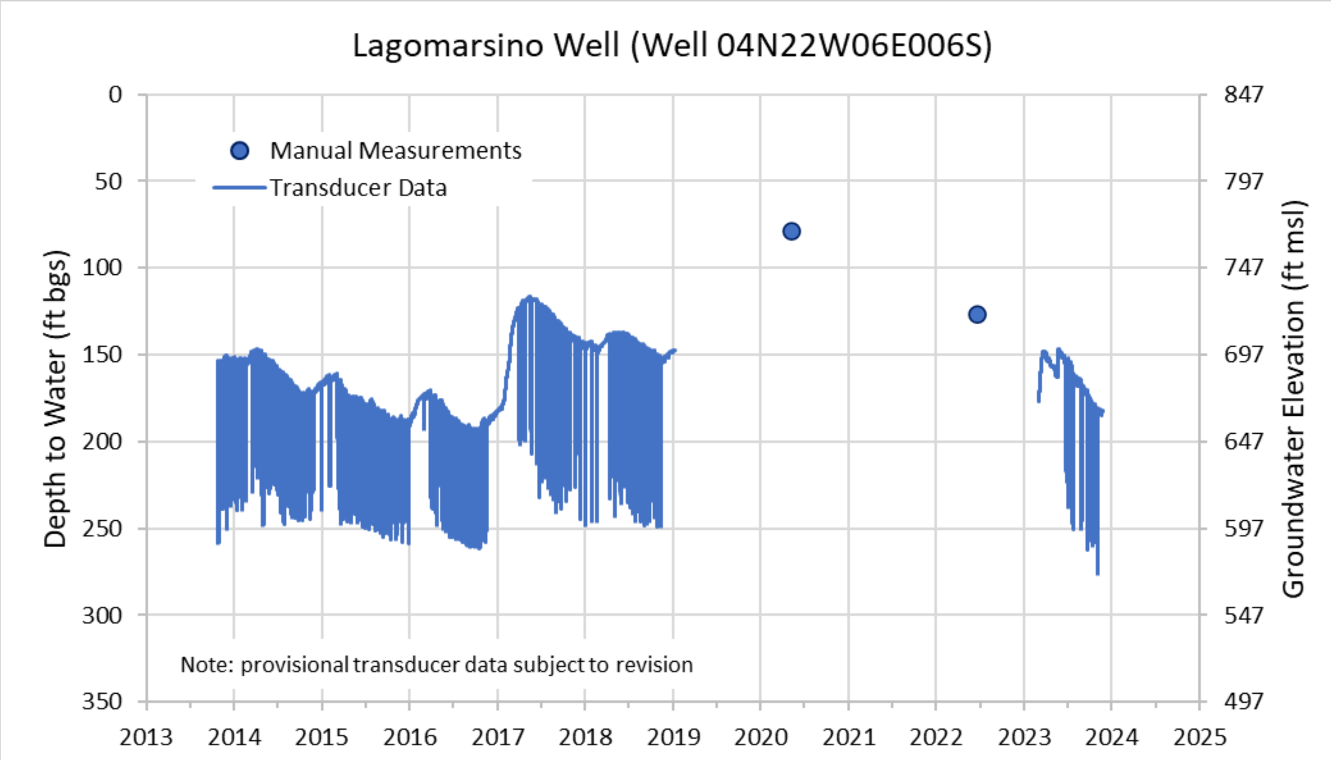

South-Central DDMW (Intermediate Shallow Aquifer)
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
-50
0
50
100
150
200
250
300
350
741
691
641
591
541
491
441
391
2021
2022
2023
2024
Manual Measurements
Transducer Data
Note: provisional transducer data subject to revision

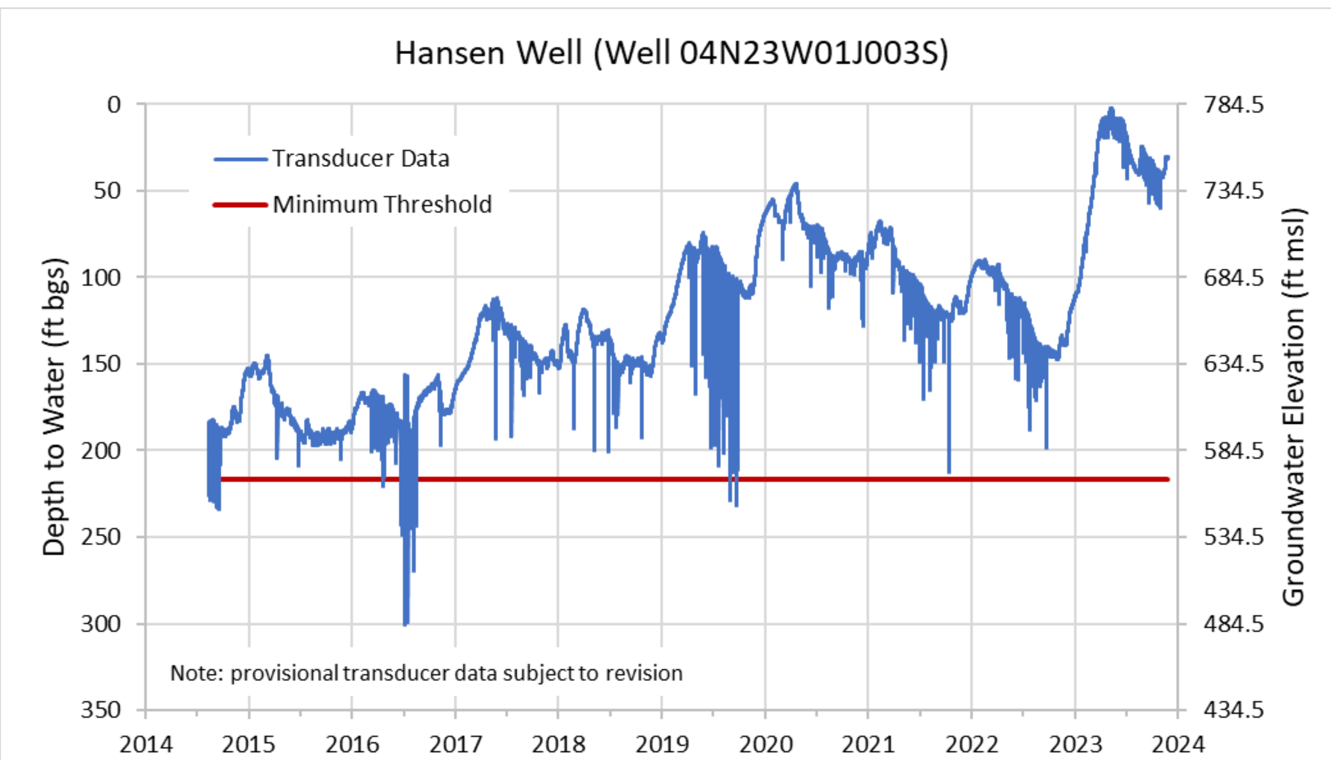

South-Central DDMW (Intermediate Deep Aquifer)
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
741
691
641
591
541
491
441
391
2021
2022
2023
2024
Manual Measurements
Transducer Data
Note: provisional transducer data subject to revision

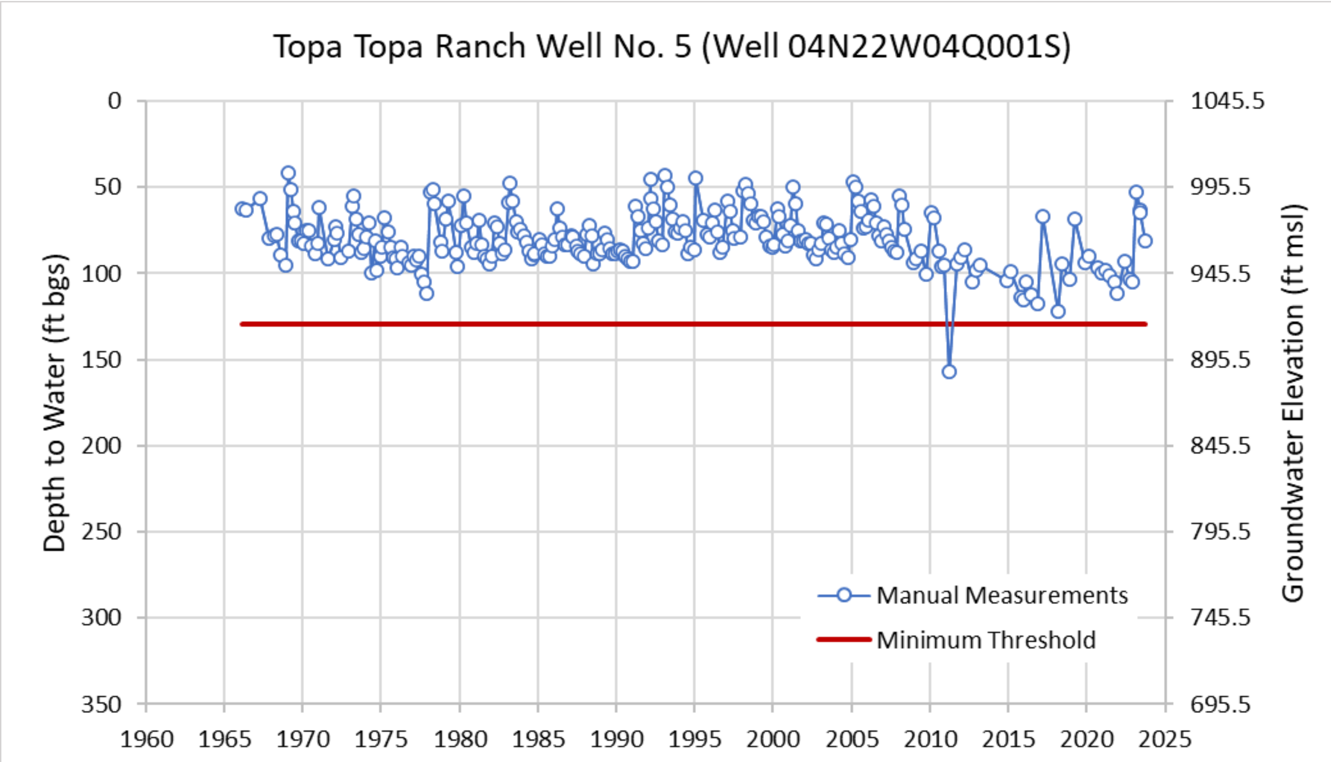

South-Central DDMW (Main Aquifer)
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
741
691
641
591
541
491
441
391
2021
2022
2023
2024
Manual Measurements
Transducer Data
Note: provisional transducer data subject to revision

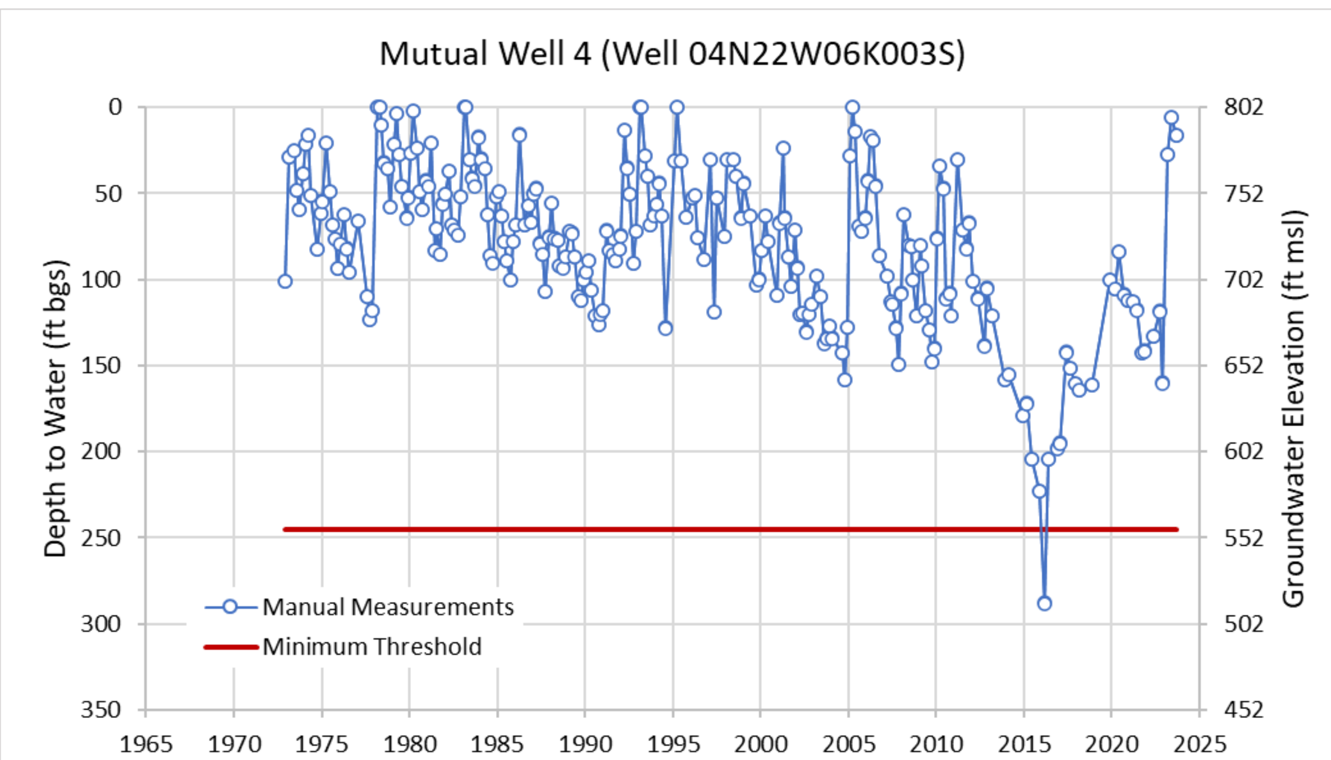

SACSGRP DDMW Well (Well 05N22W32P003S)
Manual Measurements
Transducer Data
Minimum Threshold
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
976
926
876
826
776
726
676
626
2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024
Note: provisional transducer data subject to revision

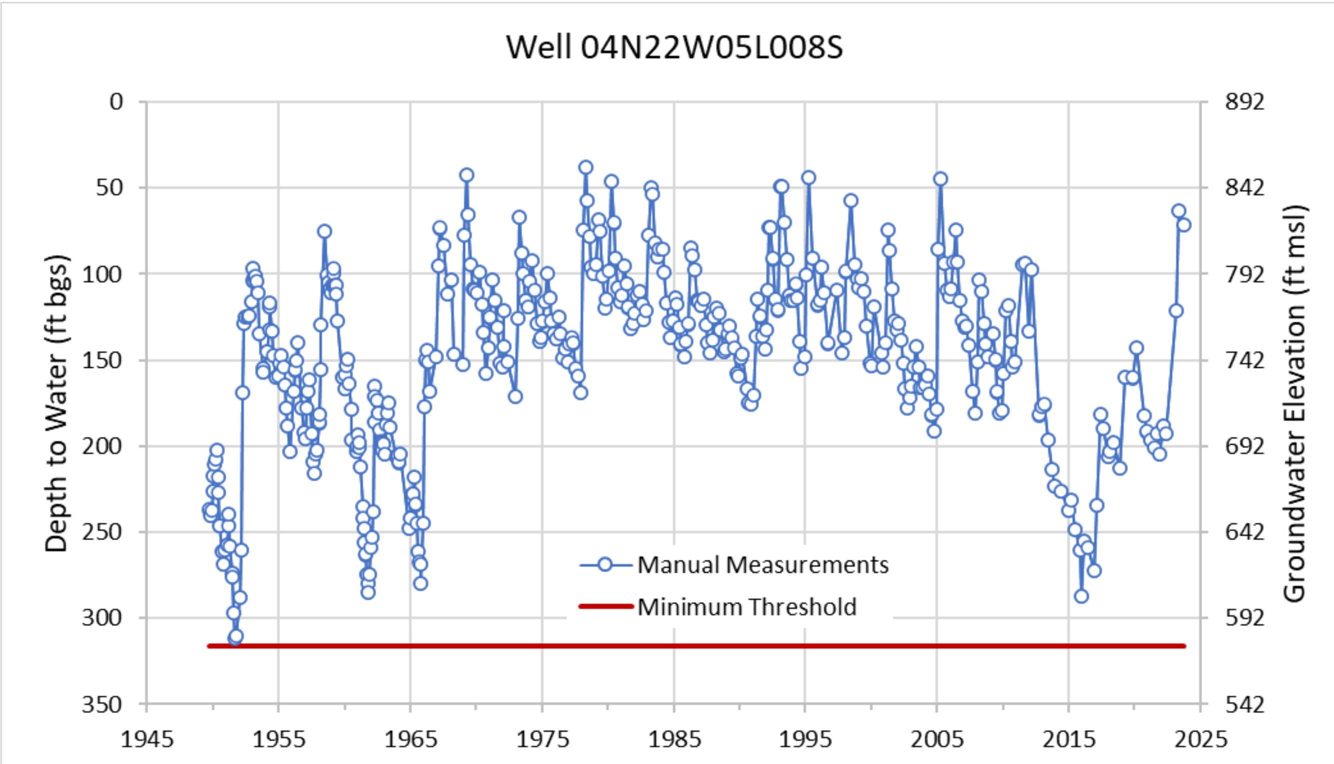

Elrod Well (Well 04N22W05L003S)
Manual Measurements
Transducer Data
Minimum Threshold
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
879
829
779
729
679
629
579
529
2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024
Note: provisional transducer data subject to revision

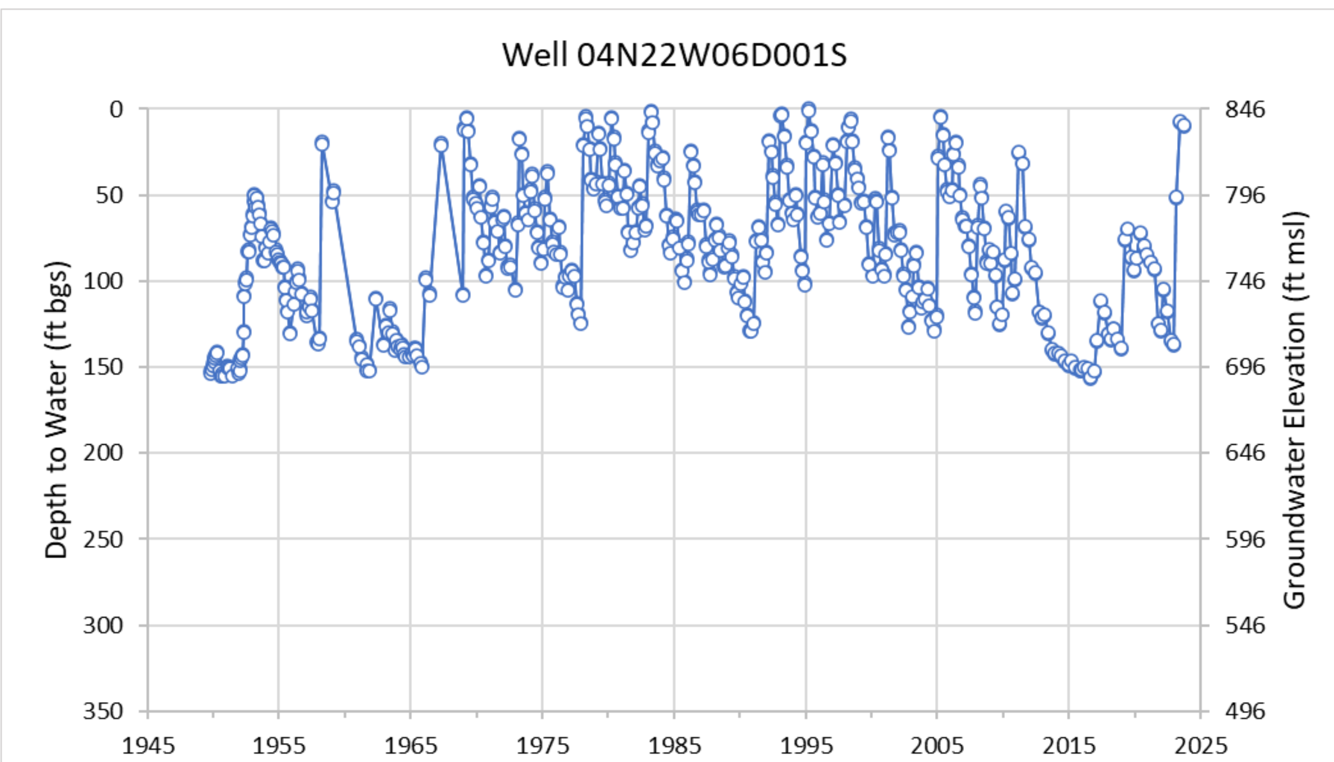

Lagomarsino Well (Well 04N22W06E006S)
Manual Measurements
Transducer Data
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
847
797
747
697
647
597
547
497
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
Note: provisional transducer data subject to revision


Hansen Well (Well 04N23W01J003S)
Transducer Data
Minimum Threshold
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
784.5
734.5
684.5
634.5
584.5
534.5
484.5
434.5
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Note: provisional transducer data subject to revision


Topa Topa Ranch Well No. 5 (Well 04N22W04Q001S)
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
1045.5
995.5
945.5
895.5
845.5
795.5
745.5
695.5
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025
Manual Measurements
Minimum Threshold


Mutual Well 4 (Well 04N22W06K003S)
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
802
752
702
652
602
552
502
452
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025
Manual Measurements
Minimum Threshold


Well 04N22W05L008S
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
Manual Measurements
Minimum Threshold
0
50
100
150
200
250
300
350
892
842
792
742
692
642
592
542
1945
1955
1965
1975
1985
1995
2005
2015
2025


Well 04N22W06D001S
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
846
796
746
696
646
596
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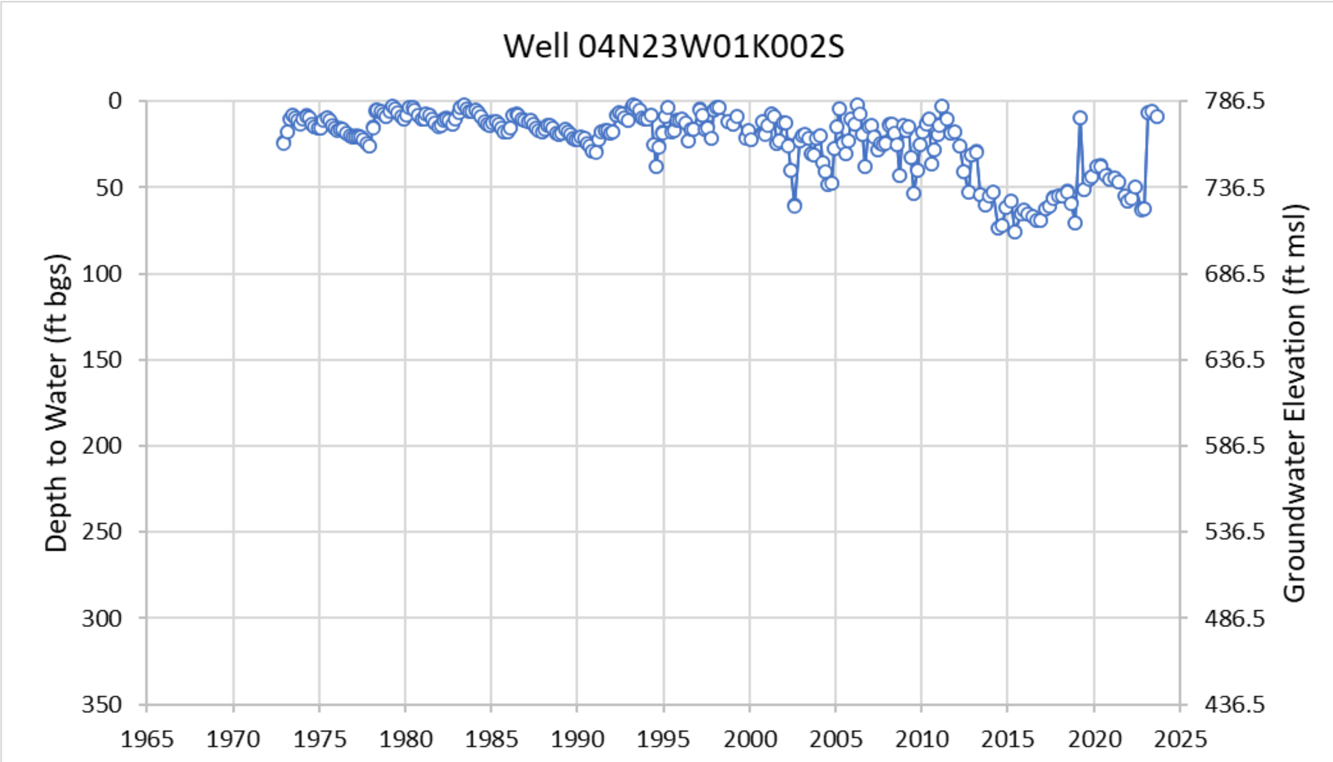
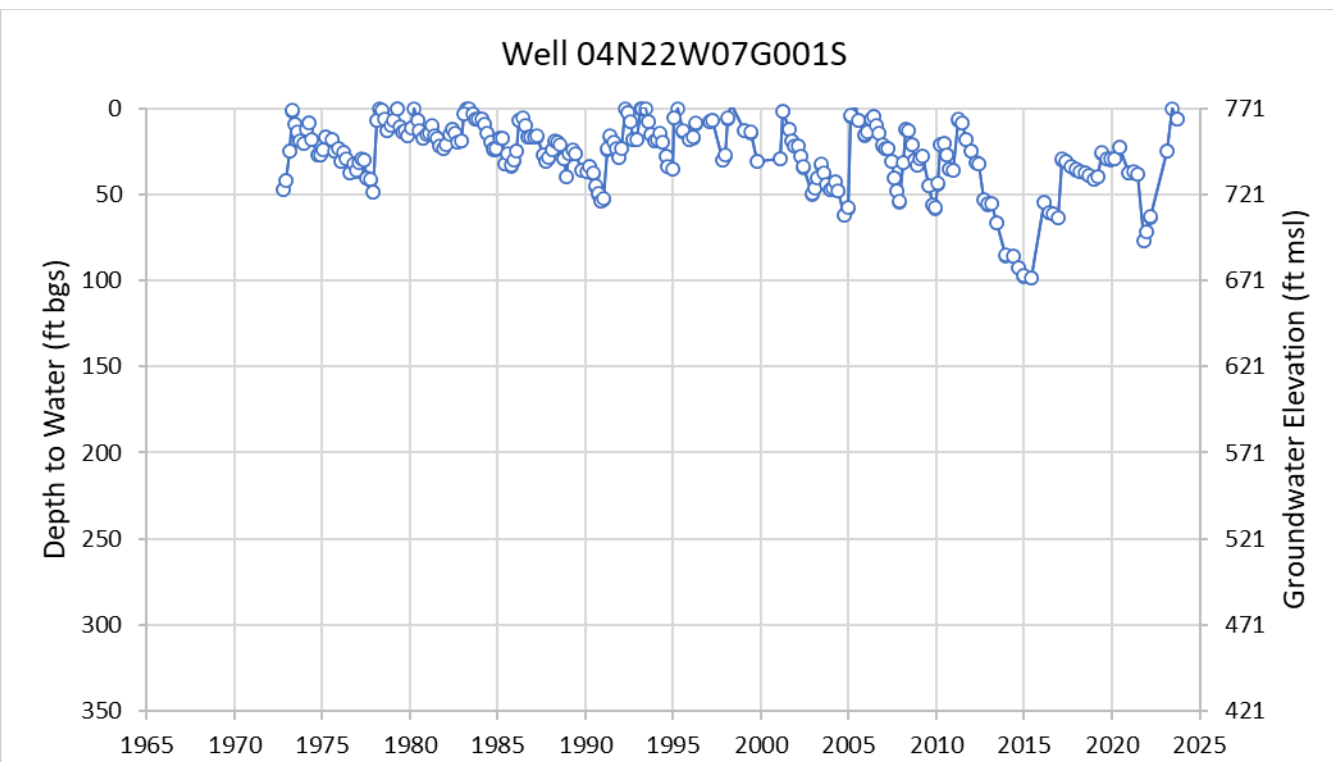
496
1945
1955
1965
1975
1985
1995
2005
2015
2025



Well 04N23W01K002S
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
786.5
736.5
686.5
636.5
586.5
536.5
486.5
436.5
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025

Well 04N22W07G001S
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
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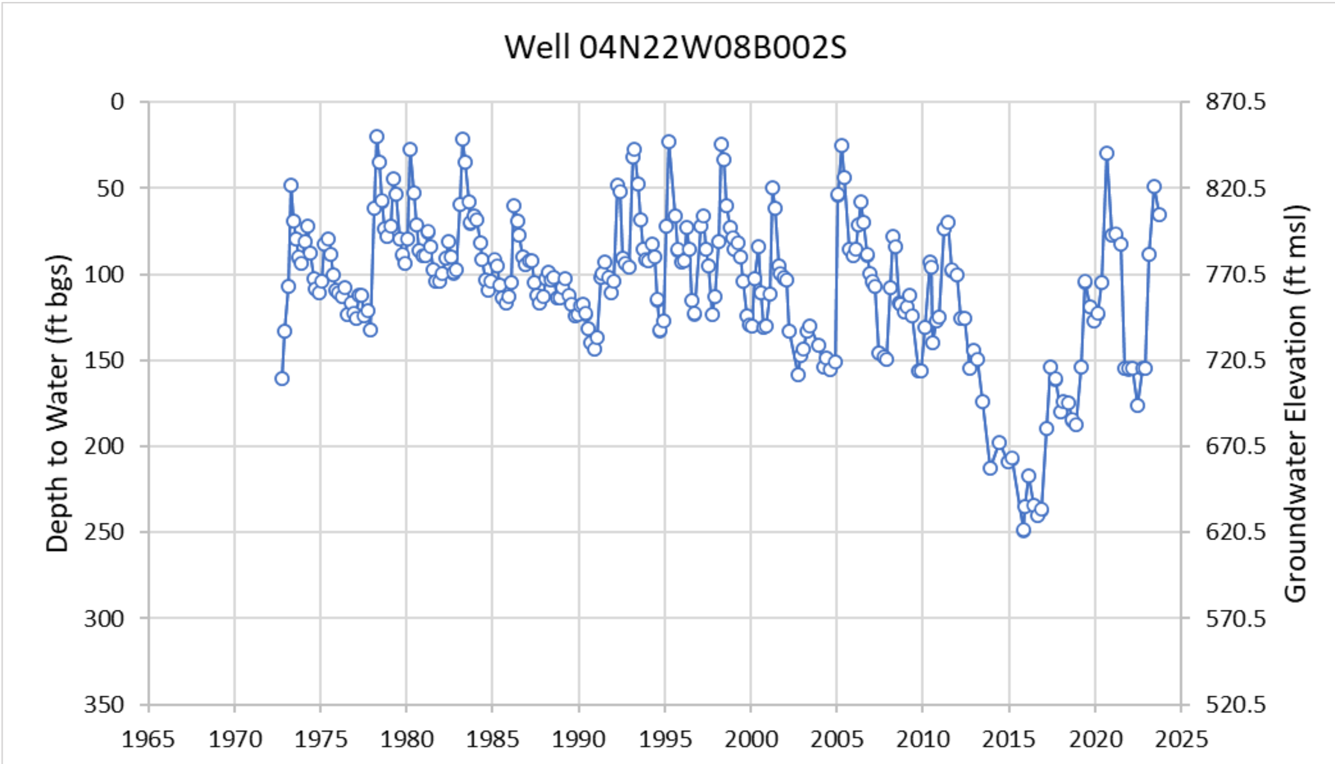
50
100
150
200
250
300
350
771
721
671
621
571
521
471
421
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025



Well 04N22W08B002S
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
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50
100
150
200
250
300
350
870.5
820.5
770.5
720.5
670.5
620.5
570.5
520.5
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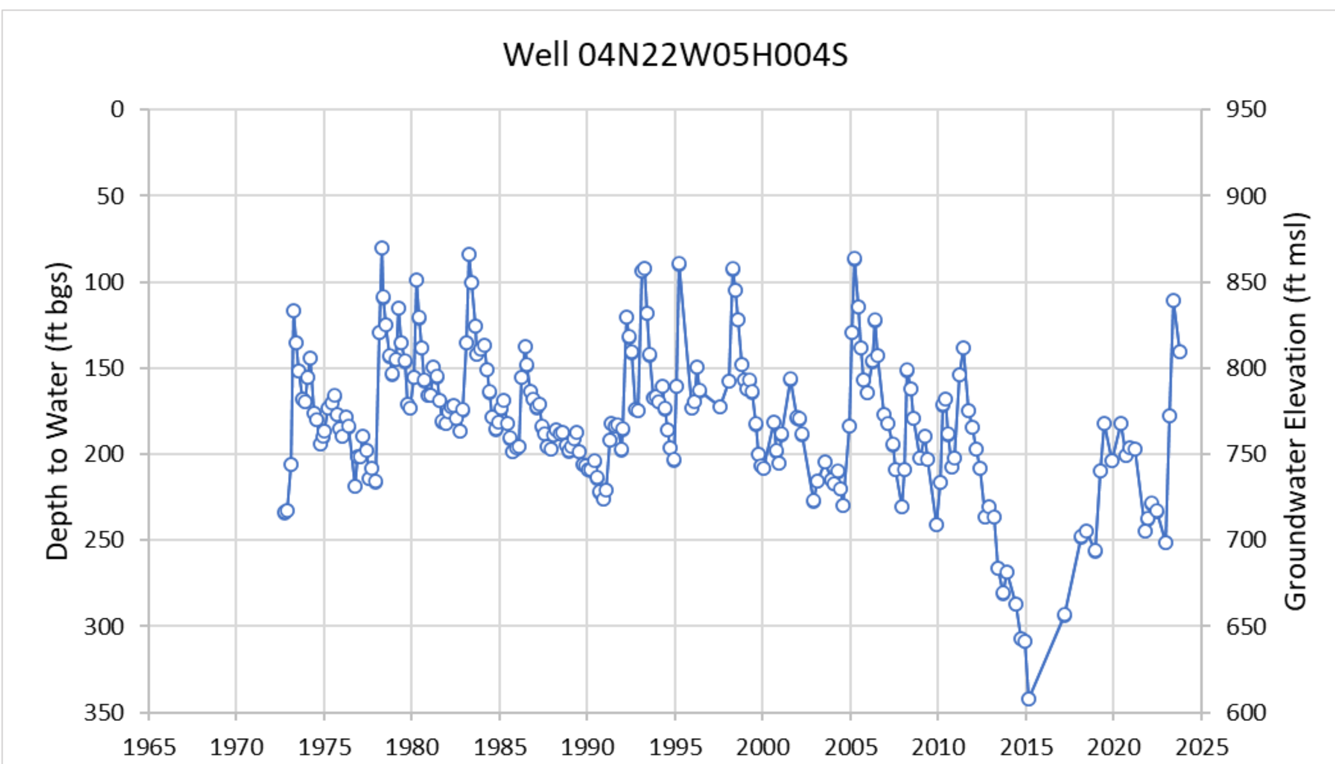
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025

Well 04N22W05H004S
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
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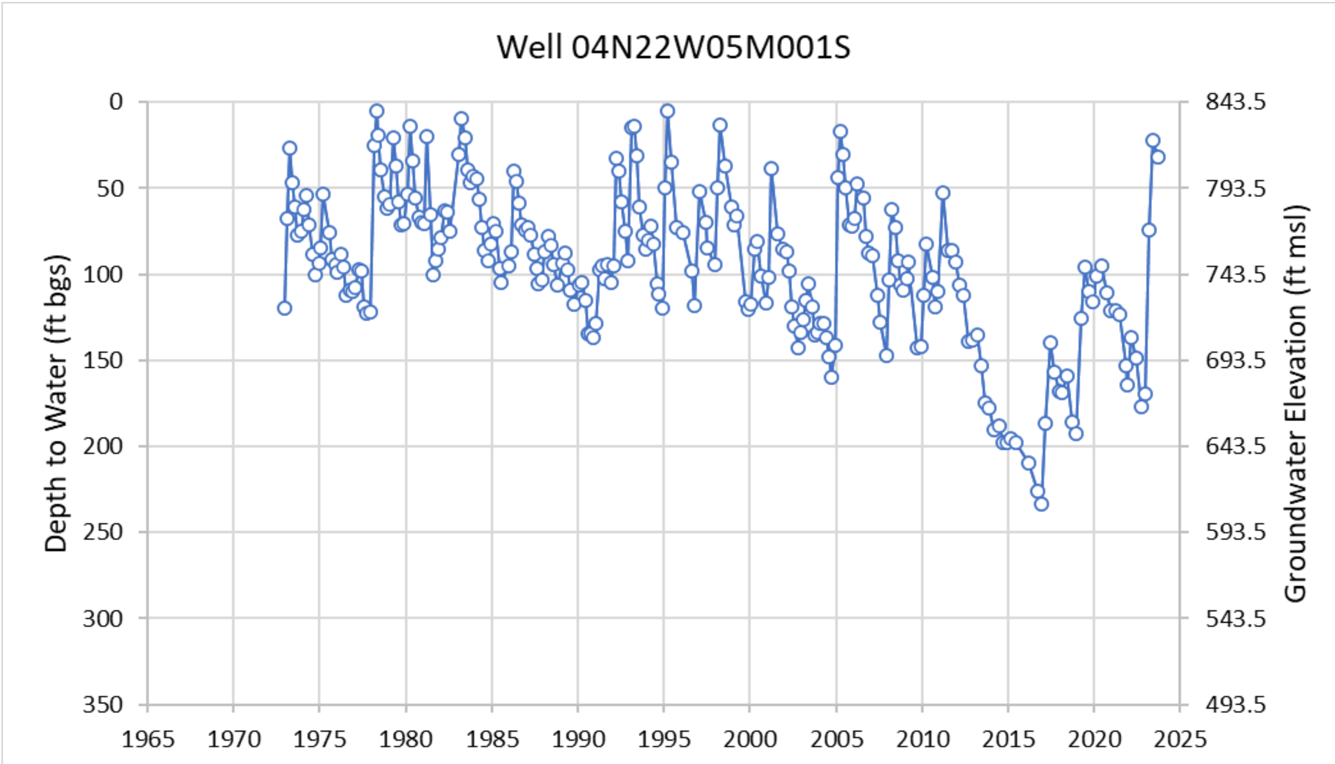
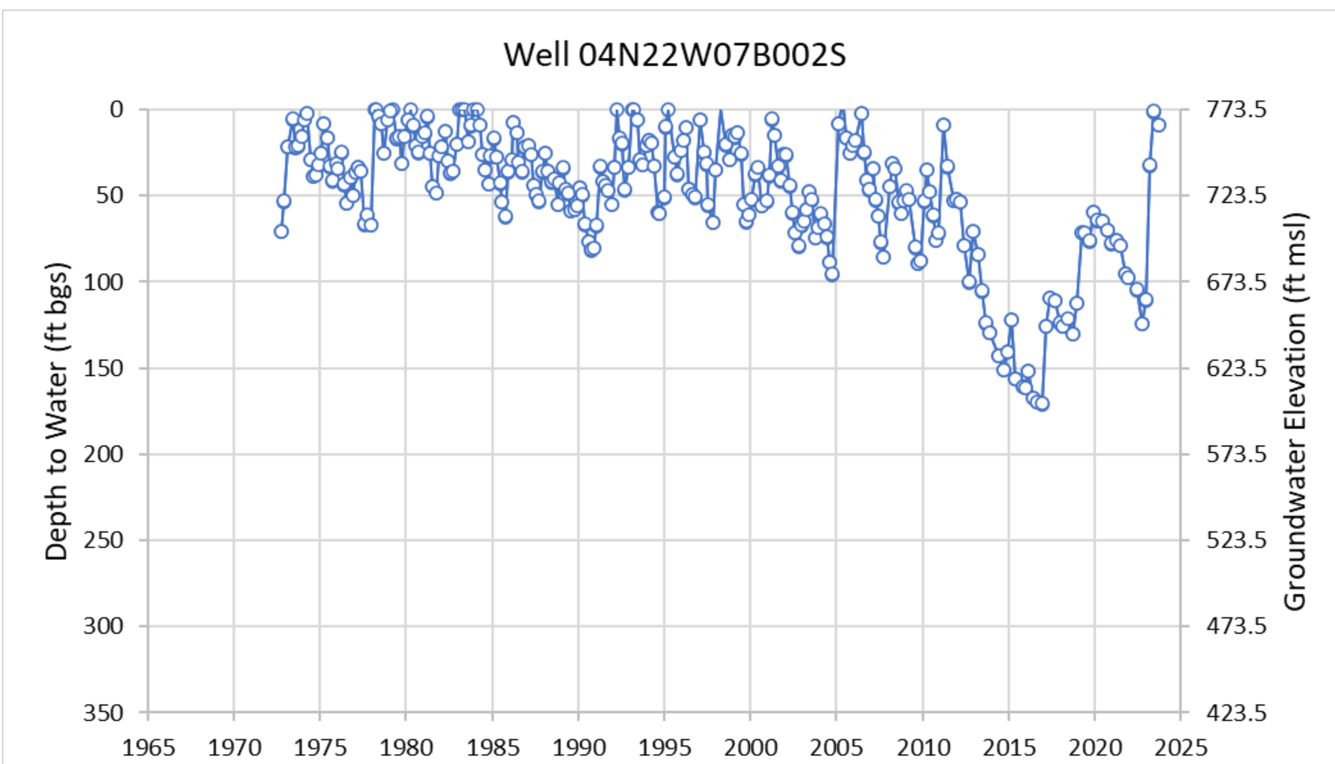
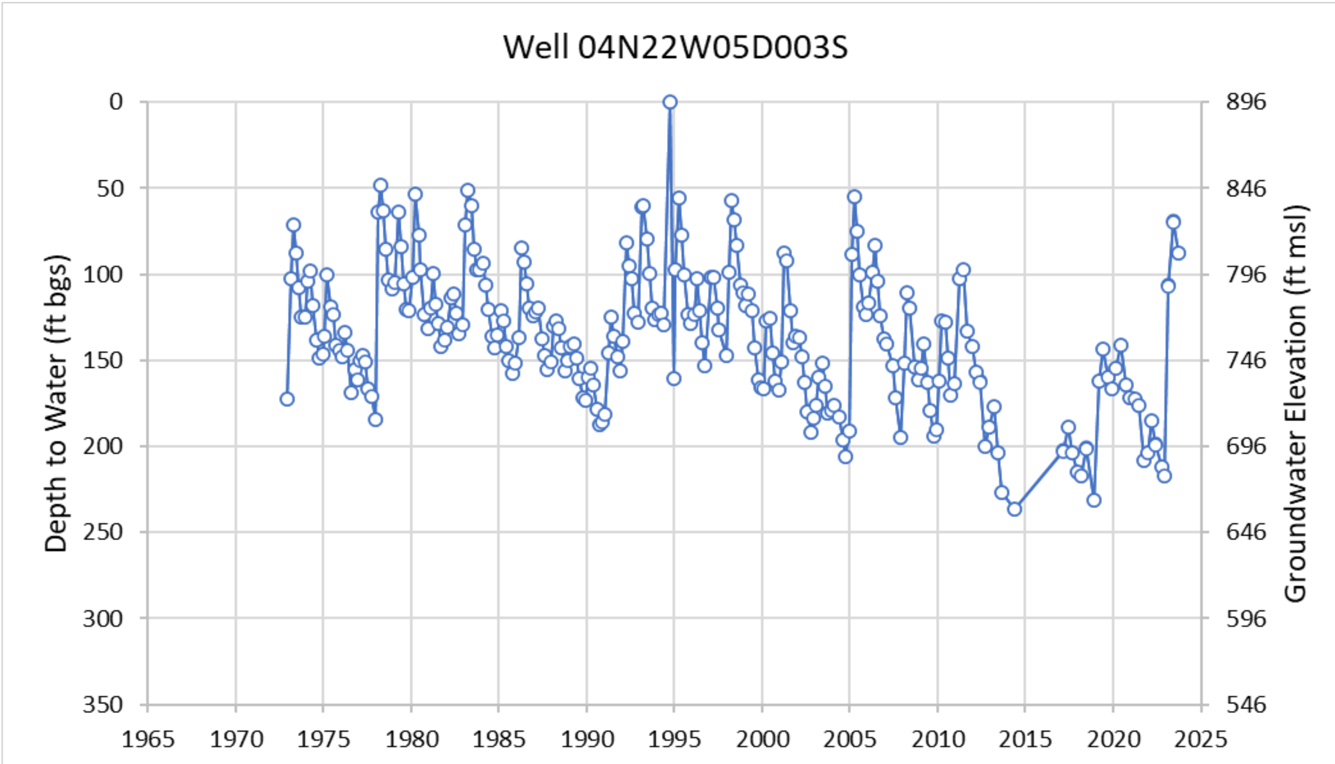
50
100
150
200
250
300
350
950
900
850
800
750
700
650
600
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025

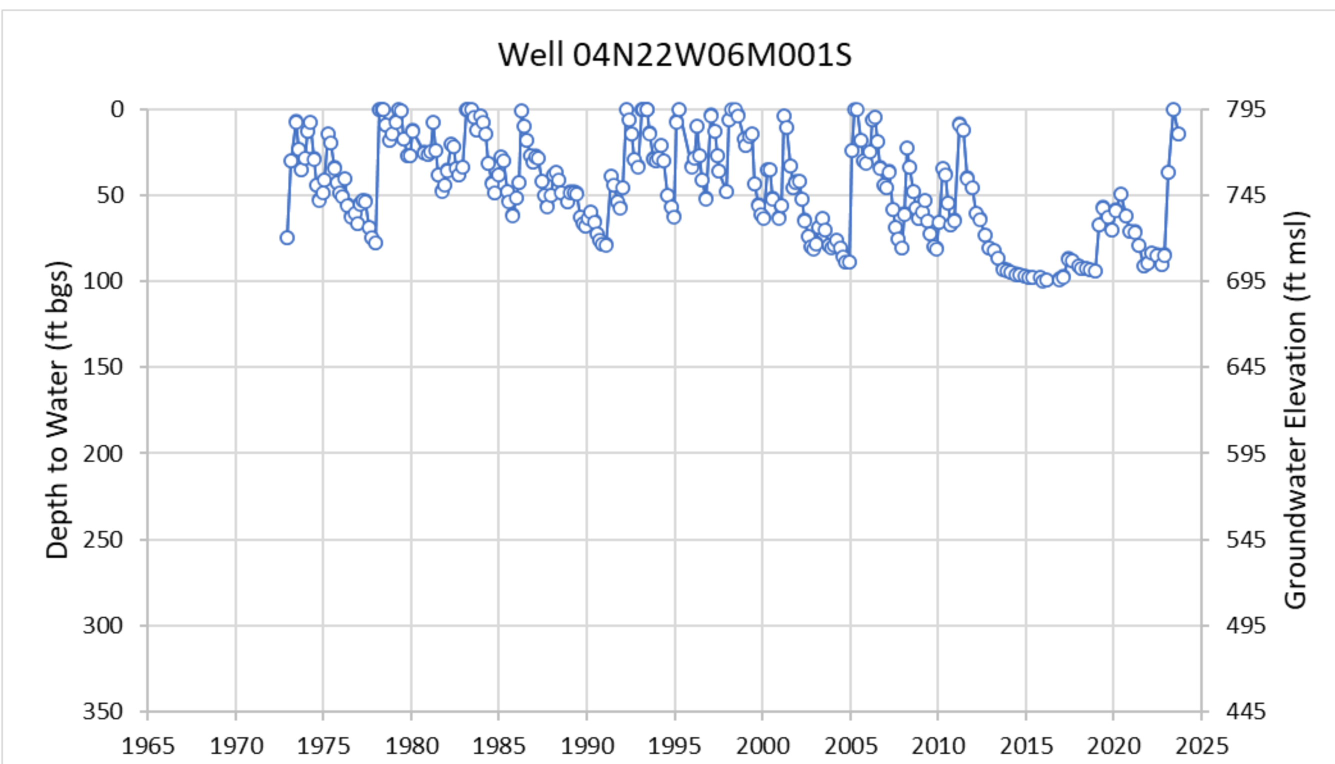


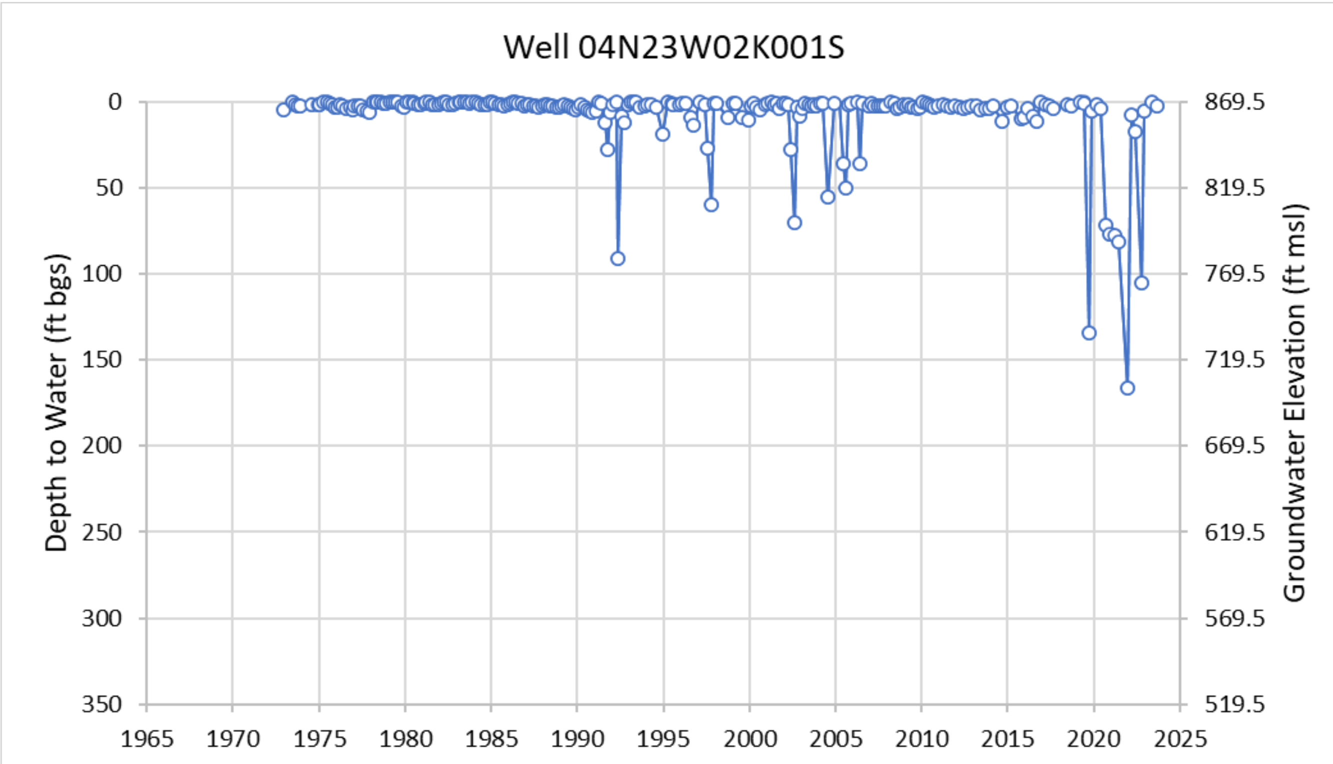
Well 04N22W05M001S
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
843.5
793.5
743.5
693.5
643.5
593.5
543.5
493.5
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025

Well 04N22W07B002S
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
773.5
723.5
673.5
623.5
573.5
523.5
473.5
423.5
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025


Well 04N22W05D003S
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
896
846
796
746
696
646
596
546
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025


Well 04N22W06M001S
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
795
745
695
645
595
545
495
445
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025



Well 04N23W02K001S
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
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50
100
150
200
250
300
350
869.5
819.5
769.5
719.5
669.5
619.5
569.5
519.5
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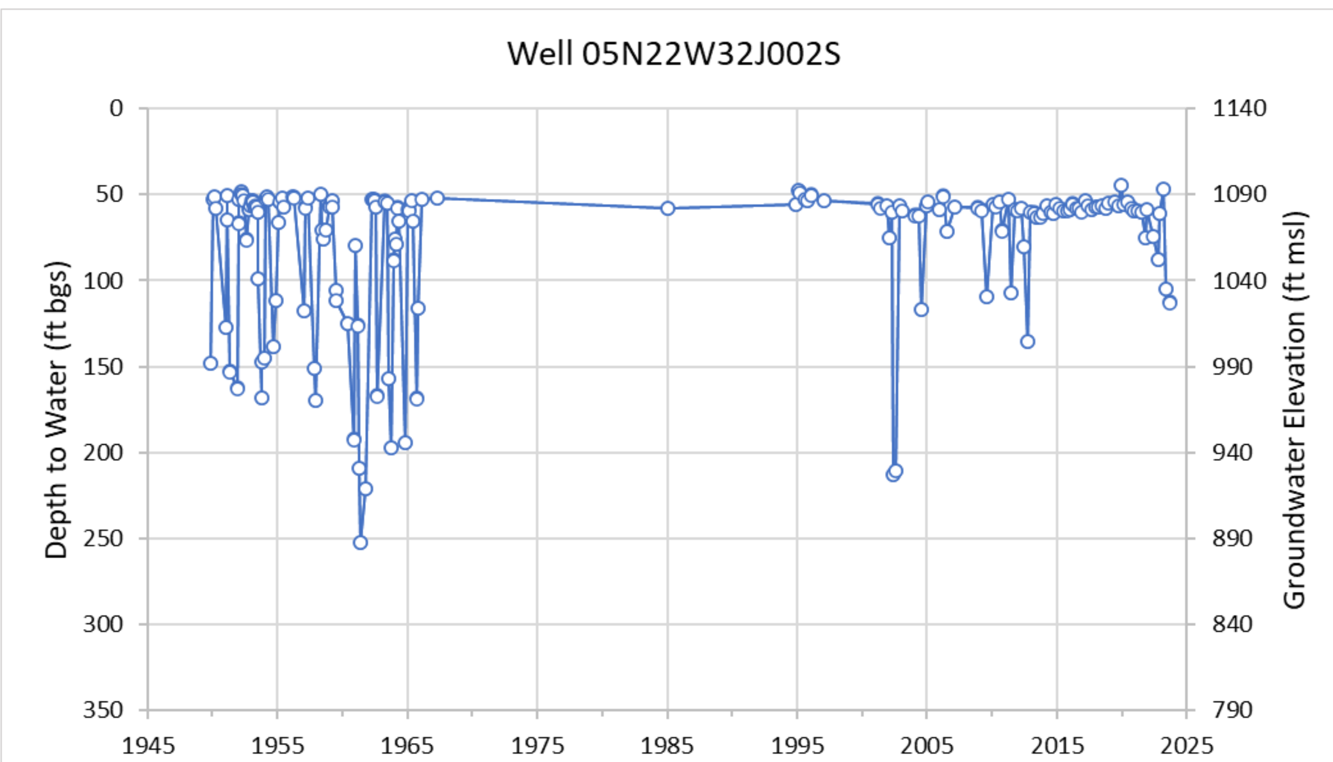
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025

Well 05N22W32J002S
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
1140
1090
1040
990
940
890
840
790
1945
1955
1965
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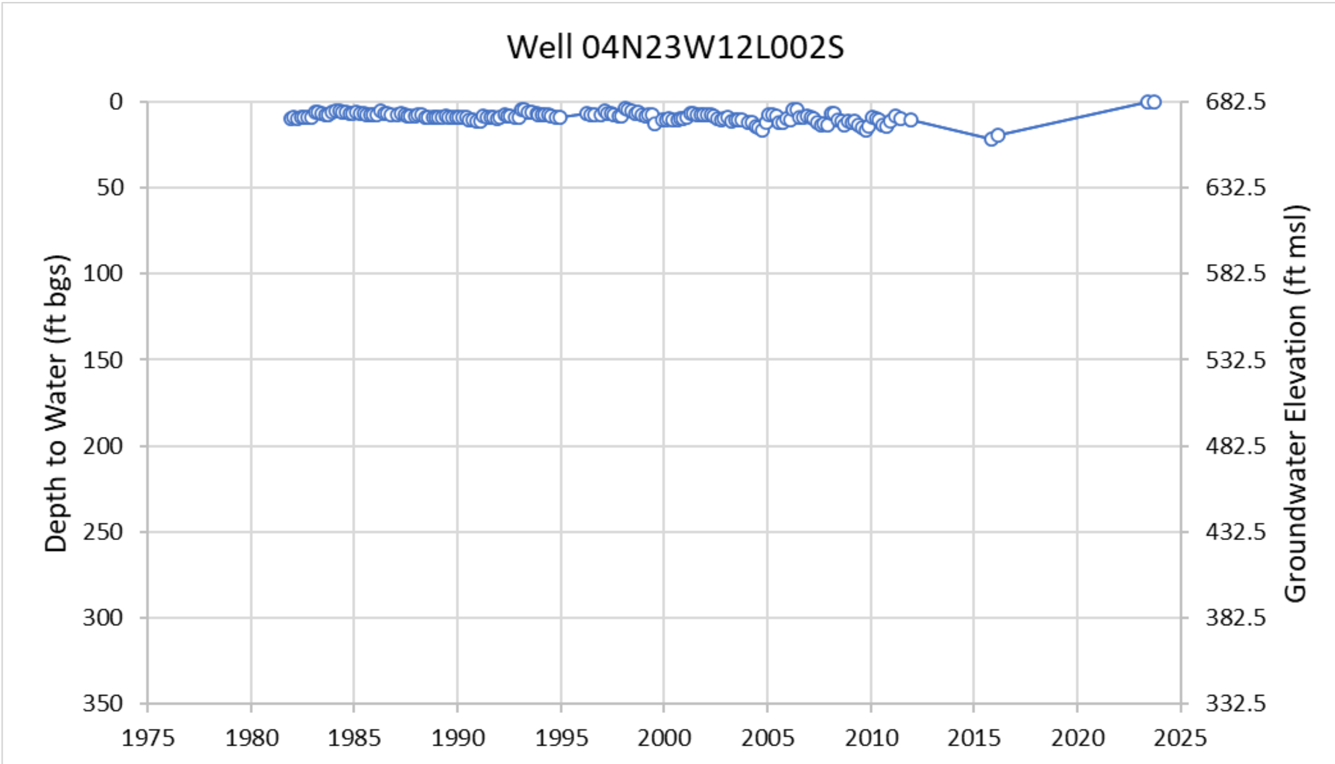
1995
2005
2015
2025


Well 04N23W12L002S
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
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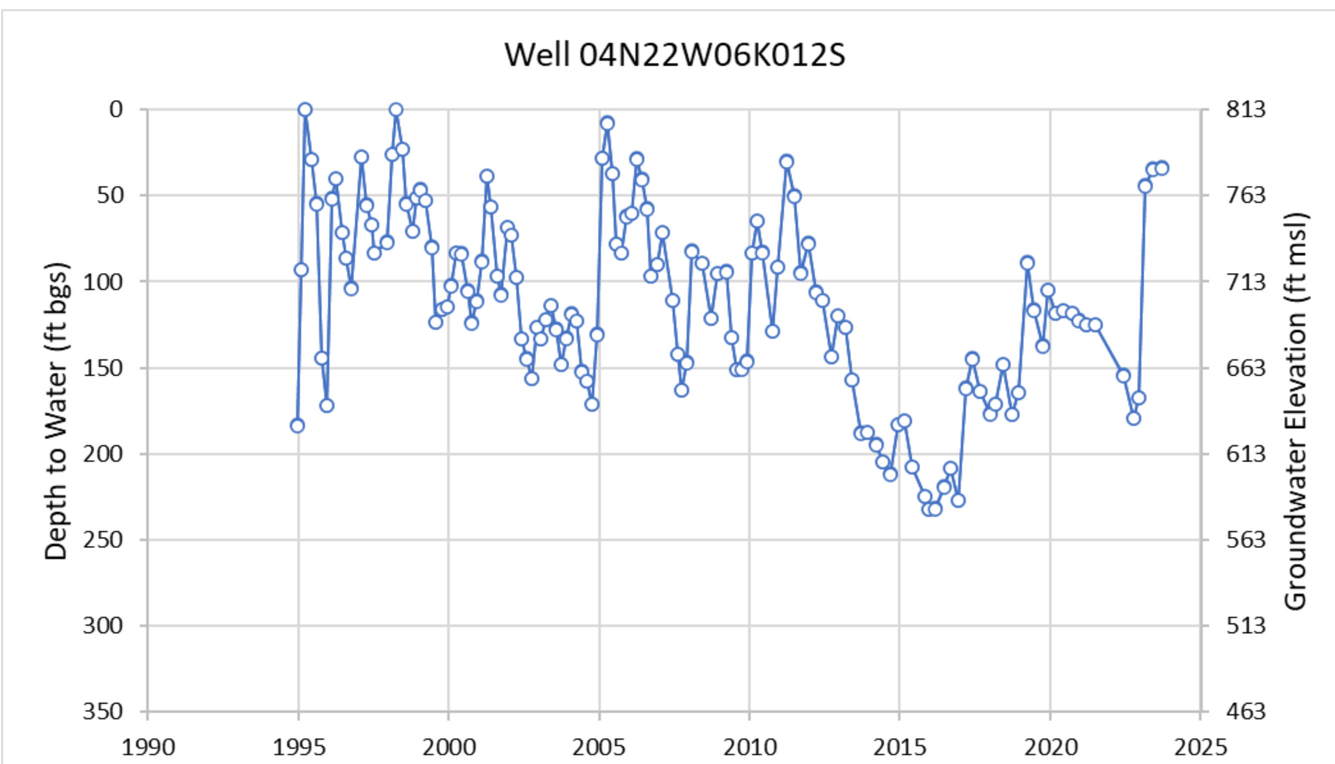
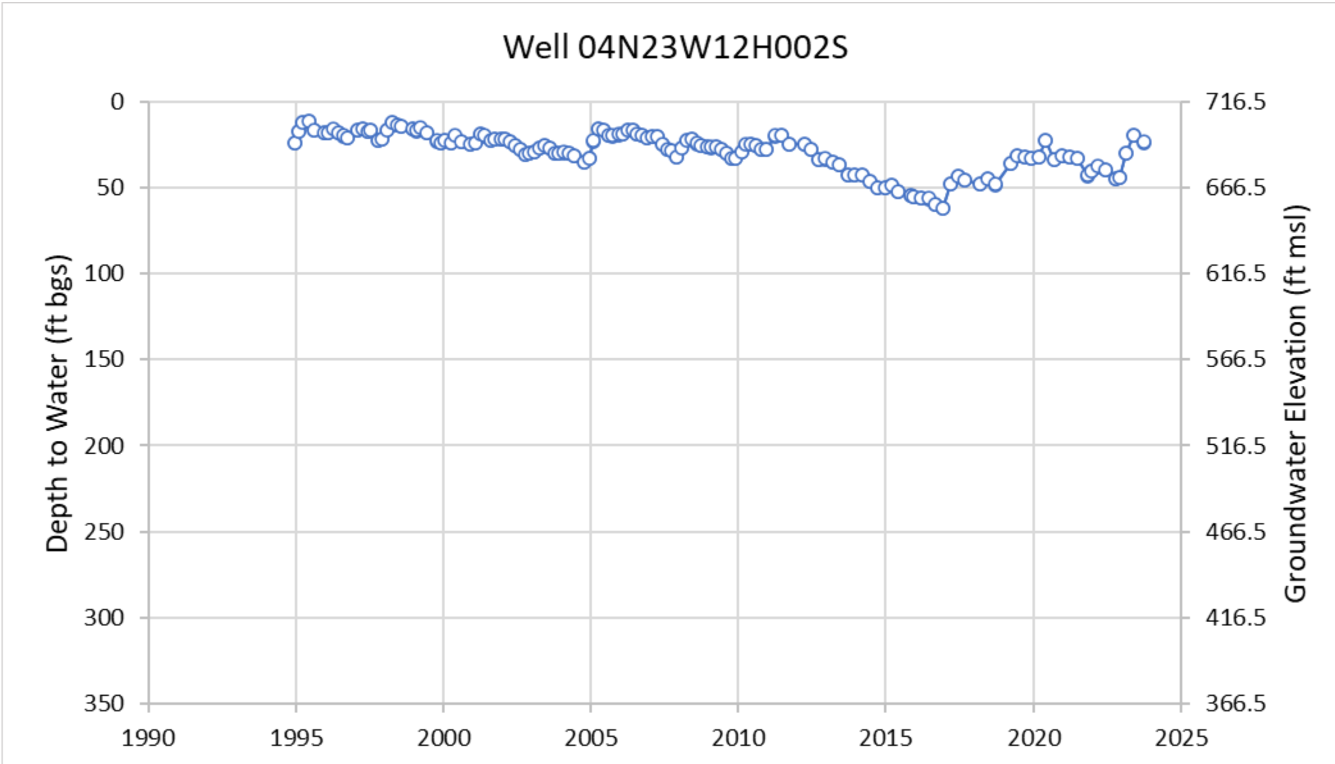
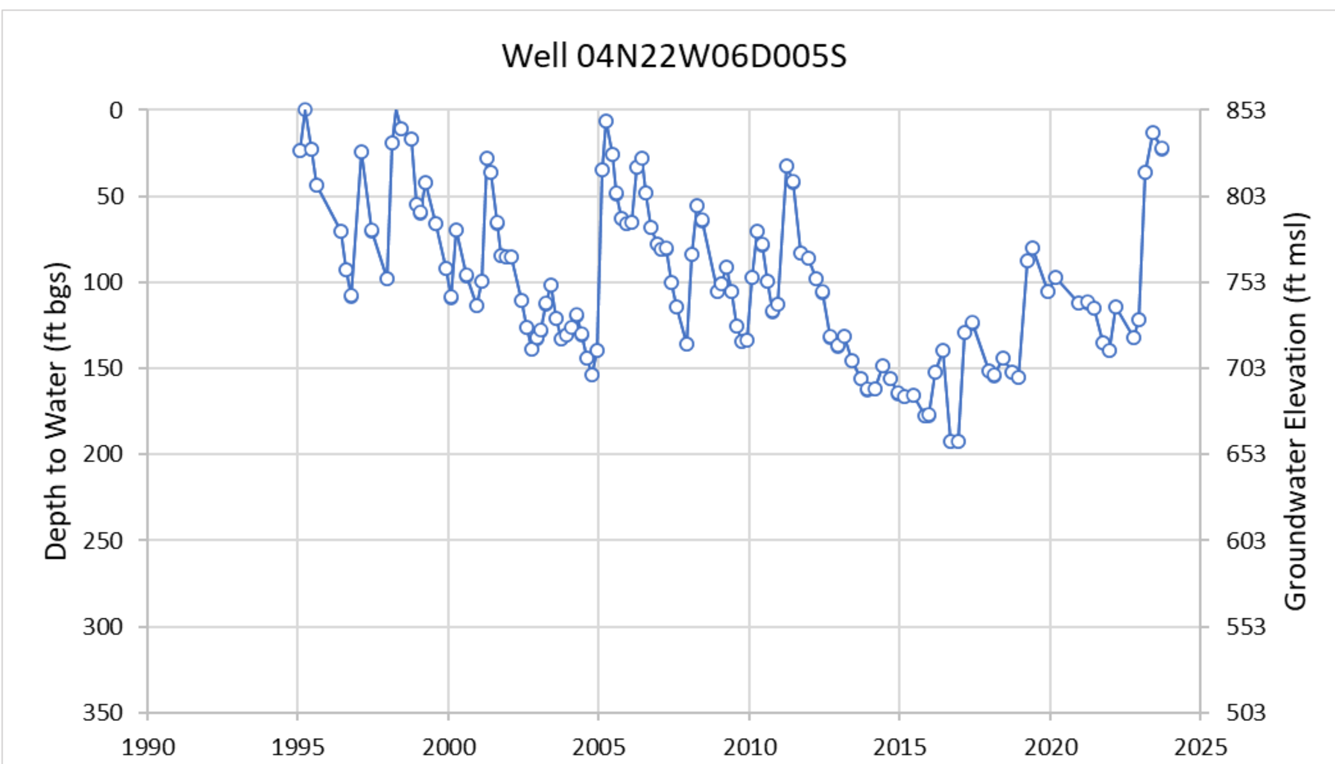
50
100
150
200
250
300
350
682.5
632.5
582.5
532.5
482.5
432.5
382.5
332.5
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025


Well 04N22W06K012S
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
813
763
713
663
613
563
513
463
1990
1995
2000
2005
2010
2015
2020
2025



Well 04N23W12H002S
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
716.5
666.5
616.5
566.5
516.5
466.5
416.5
366.5
1990
1995
2000
2005
2010
2015
2020
2025

Well 04N22W06D005S
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
853
803
753
703
653
603
553
503
1990
1995
2000
2005
2010
2015
2020
2025