

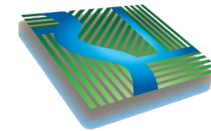
# Vina Subbasin WY 2023 Annual Report Update

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Jeff Davids, PhD, PE (DE)**

April 10th, 2024







**Luhdorff &  
Scalmanini**  
Consulting Engineers



**DAVIDS**  
ENGINEERING, INC

# Where are We Headed Today?

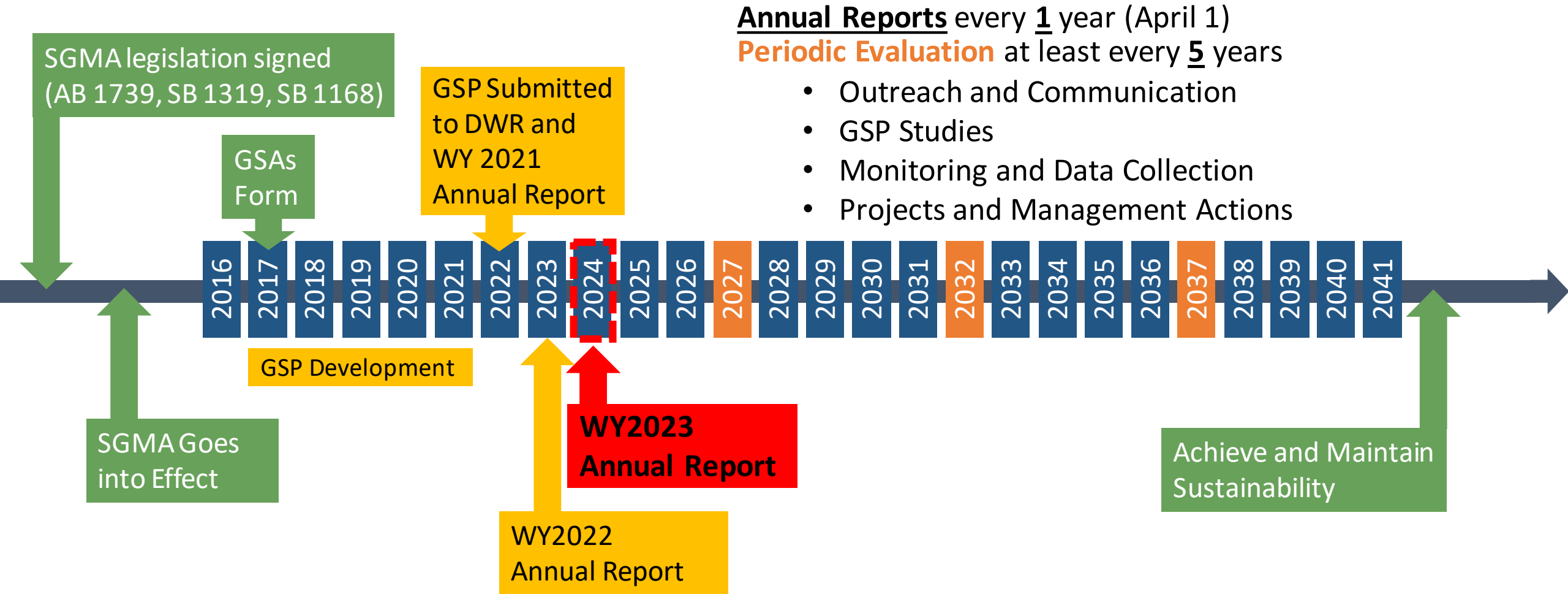
-  **Overview / Hydrological and Water Supply Conditions**
-  **Groundwater Conditions**
-  **Water Supply and Water Use (Water Budget)**
-  **Progress Towards GSP Implementation**



# Annual Report Requirements

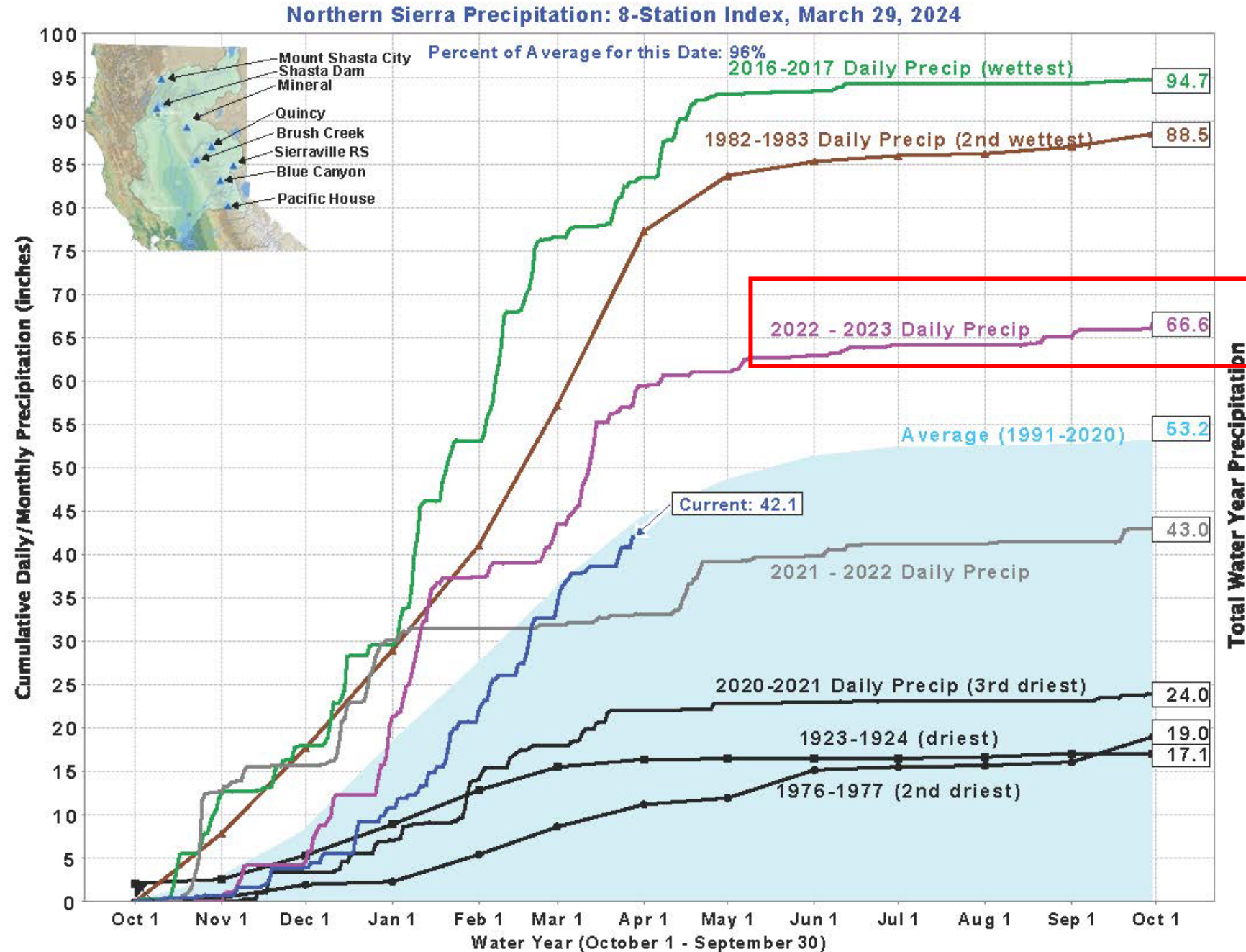
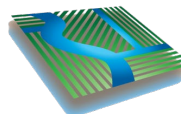
- **Updates on Groundwater Conditions**
  - **Groundwater Elevation (Hydrographs, Contour Maps)**
  - **Change in Groundwater Storage**
- **Water Supply and Water Use**
  - **Groundwater Extraction**
  - **Surface Water Supplies**
  - **Total Water Use**
- **Progress Toward Plan Implementation**  
(e.g., implementation of planned projects and management actions)

# Overview – SGMA Implementation Timeline



# 2023 WY Conditions

- Classified as a “Wet Year”
  - Above average precipitation (CDEC, DWR graph)
  - WY 2023 Cumulative Precipitation 66.6 inches
  - WY 2022 Cumulative Precipitation 43.0 inches
  - Avg Cumulative Precipitation 53.2 inches



# Overview of 2023 Regional Water Supplies

- **Statewide conditions at end of WY**
  - **Total Annual Precipitation: ~ 34" or 141% of historical average**
  - **Total Reservoir Storage: 27.4 MAF or 128% of historical average**
  - **Snowpack at 247% historical average annual max**
- **Sacramento River Region unimpaired runoff, 136% of average (24.1 million acre-feet; DWR, 2023)**
- **Sacramento River Settlement Contractors - 100% allocation from the Central Valley Project**

# Groundwater Conditions

- **Groundwater Elevations**
  - **17 Representative Monitoring Site (RMS) Wells**
  - **Domestic, irrigation, and observation wells**
- **Groundwater Storage**
  - **Calculated utilizing RMS wells**



Lowering  
Groundwater Levels

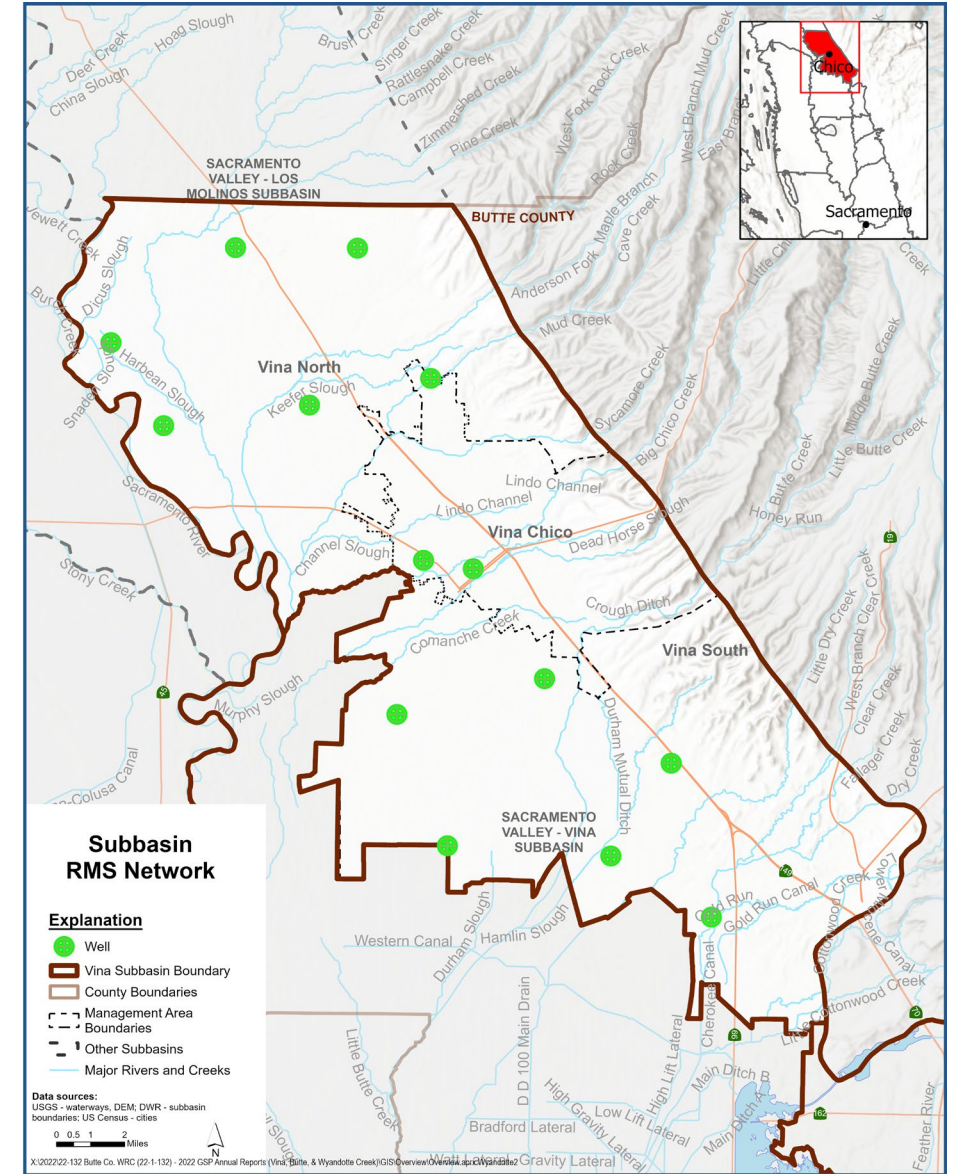


Reduction of Storage

# Groundwater Conditions – Groundwater Elevations

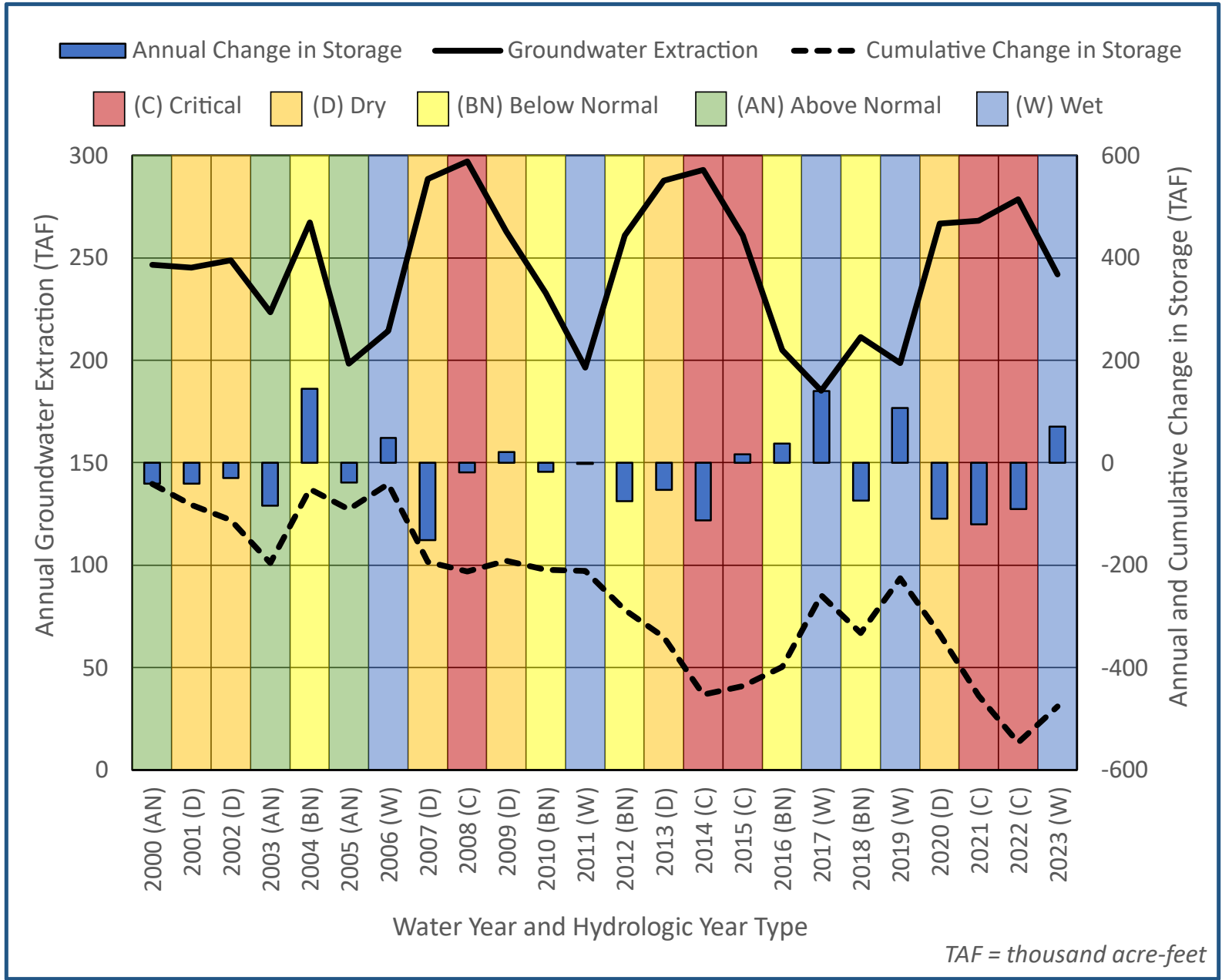
## Groundwater Elevations

- **17 Representative Monitoring Sites (RMS) Wells**
  - **6 – Vina North Management Area**
  - **5 – Vina Chico Management Area**
  - **6 RMS wells in the South Management Area**
- **No wells had Spring or Fall measurements below the MO**





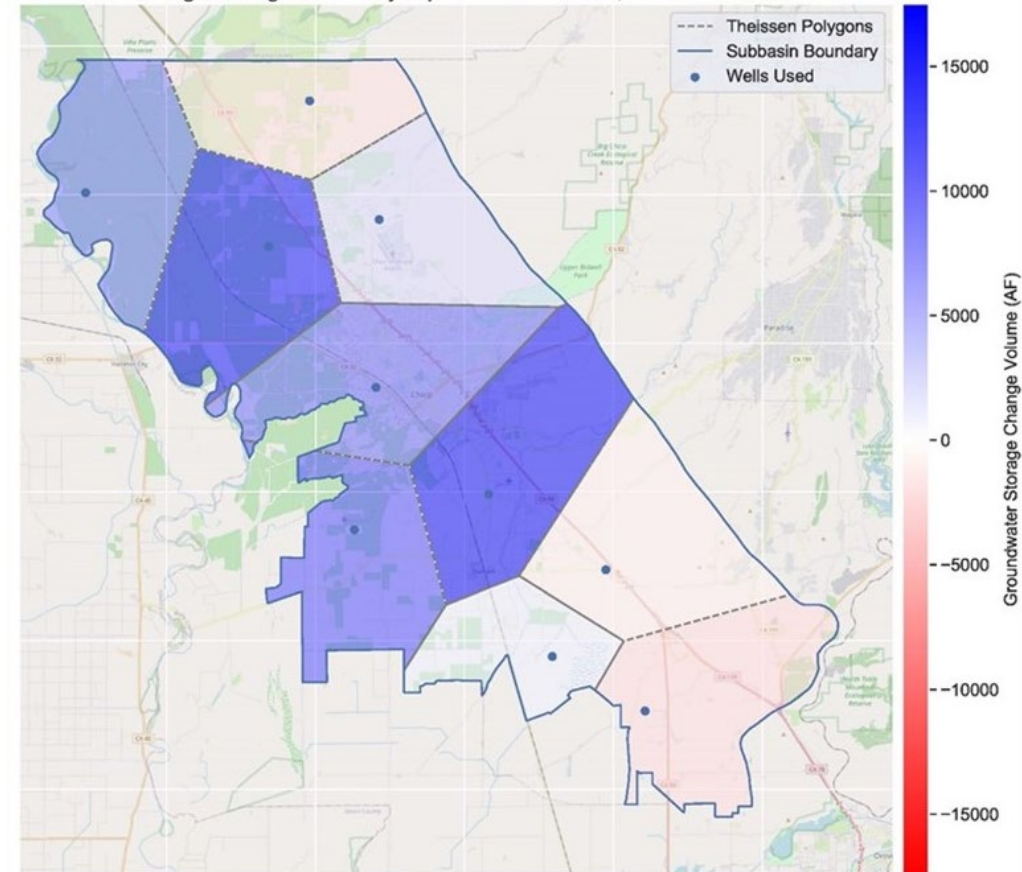
# Groundwater Conditions – Groundwater Storage



TAF = thousand acre-feet

## Groundwater Conditions & Change in Storage Summary

- Total groundwater pumping in 2023 was slightly less than historical (2000-2022) average ~245 TAF and higher than the average of last four Wet years ~199 TAF
- Annual Groundwater Storage Change: ~ 70 TAF
- Cumulative Groundwater Storage Change: ~ -475 TAF since 2000
- 2022 vs. 2023 groundwater elevations higher
  - Spring ~ 5.5' increase
  - Fall ~ 4' increase
  - Durham depression less prominent in WY 2023 due to increased precipitation compared to WY 2022.



# Groundwater Conditions – Surface Water Depletion

In 2023, all groundwater elevations were above the established MO

**Table 5-2. Measurable Objectives, Minimum Thresholds, and Seasonal Groundwater Elevations of Representative Monitoring Site Wells**

State Well Number <sup>1</sup>	Spring 2023 vs. MO (ft)	Fall 2023 vs. MO (ft)
<u>23N02W25C001M</u>	10.8	4.1
<u>23N01W10E001M</u>	22.7	--
<u>23N01E07H001M</u>	27.6	25.7
<u>22N01W05M001M</u>	23.1	--
<u>23N01W36P001M</u>	21	7.2
<u>23N01E33A001M</u>	12.7	8.6
<u>CWSCH01b</u>	11	4
<u>CWSCH02</u>	13	6
<u>CWSCH03</u>	12	7
<u>CWSCH07</u>	14	7
<u>22N01E28J003M</u>	17.4	11.4
<u>21N01E21C001M</u>	30.4	22.9
<u>21N02E18C003M</u>	37.3	30.7
<u>20N01E10C002M</u>	--	--
<u>20N02E24C001M</u>	25.7	14.4
<u>20N02E09L001M</u>	20.7	14.8
<u>21N02E26E005M</u>	16	9.3



Water Supply and Water Use (Water Budget)

**Table 3-3. Total Water Use by Water Use Sector**

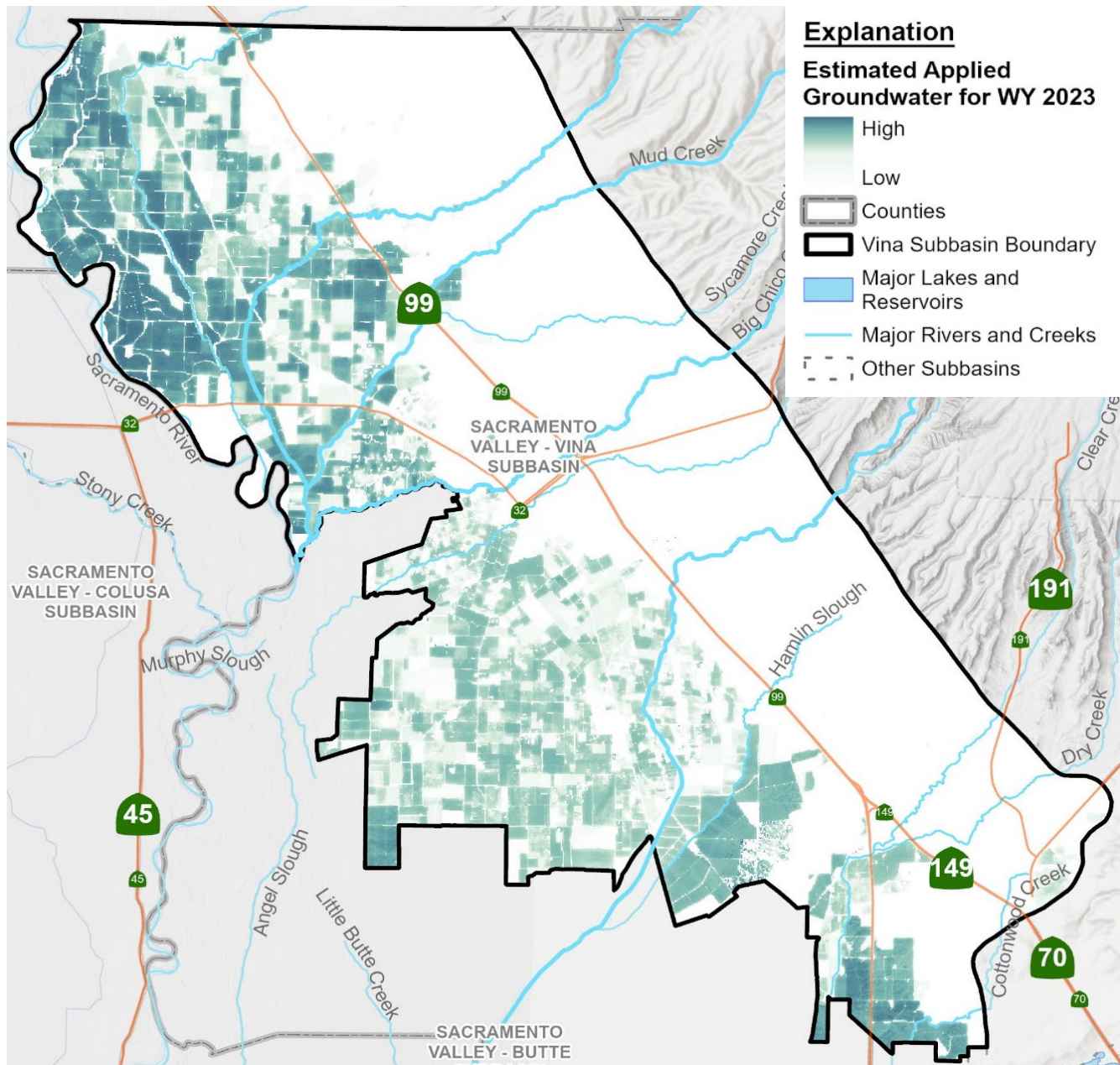
Sector	WY 2023 (AF)			Total Area (acres)
	Groundwater	Surface Water	Total	
<b>Agricultural</b>	<b>218,600</b>	<b>27,200</b>	<b>245,800</b>	<b>74,900</b> (irrigated acreage)
<b>Municipal</b>	<b>21,900</b>	<b>0</b>	<b>21,900</b>	<b>19,669</b>
<b>Rural Residential</b>	<b>1,500</b>	<b>0</b>	<b>1,500</b>	--
<b>Total</b>	<b>242,000</b>	<b>27,200</b>	<b>269,200</b>	<b>94,569</b>



**89% Groundwater Dependent in 2023**



# Water Budget Results



# GSP Implementation

- **Highlights in 2023:**

- WY 2023 Annual Report completed
- Property-related service fees adopted by the GSAs
- DWR's SGM Grant Program proposal
  - planning and refining, evaluating and ranking PMAs
  - submitting the grant application which was fully funded
- Airborne electromagnetic (AEM) survey by DWR in the summer of 2022
- All sustainability indicators (SIs) are in compliance, no indication of undesirable results
- Progress has been made on 10 PMAs since the last annual report.

# GSP Implementation (Continued)

**GSP approved in July of 2023 with six recommended corrective actions by 2027 by DWR including requests for more information on:**

- Historical and current groundwater quality conditions
- Model inputs/outputs regarding stream loss and gains
- Criteria to ID potential impacts to beneficial uses/users related to groundwater level MTs
- How degradation during dry-years will be managed / removal of dry year condition
- Sustainable management criteria for land subsidence and,
- Filling data gaps, collecting additional monitoring data, and implementing the current strategy to manage depletions of interconnected surface water.

**Projects funded by the SGM Implementation program will address these.**



# GSP Implementation (Continued)

## Project Implementation

Project (Proponent)	Current Status	Notable Progress Since Last Annual Report
Rangeland Management and Water Retention Project	Funded	Grant awarded in December 2023
Removal of Invasive Species	Funded	Grant awarded in Fall 2023
Rangeland Management and Water Retention Project	Funded	Grant awarded in December 2023
Residential Water Conservation Project	Ongoing	Conservation programs saved ~400 acre-feet per year of water
Scoping for Flood Managed Aquifer Recharge (FloodMAR)/Surface Water Supply and Recharge	Funded	<b>DWR SGM Grant Program application submitted in December 2022 was funded to advance these projects.</b>
Streamflow Augmentation Projects	Funded	
Community Monitoring Program	Funded	
Surface Water Supply and Recharge Project	Funded	
Extend Orchard Replacement Program	Funded	



# Annual Report Summary

- **WY 2023 had above average precipitation and streamflow.**
- **Groundwater levels increased in Spring and Fall from last year and stayed above the MOs.**
- **WY 2023 groundwater extraction was less than the 22-year average pumping (2000-2022) but more than the average of last four wet years.**
- **Cumulative groundwater storage is –475 TAF from 2000**
- **Subbasin is on track to meet Interim Milestones for Sustainable Management Criteria for all Sustainability Indicators and there have been no indications of undesirable results for any Sustainability Indicators.**

# Annual Report Summary

**Work is needed in areas with groundwater level declines and impacts to shallow wells through:**

- 1. Reducing groundwater demand and increasing conservation activities**
  - 2. Increasing groundwater recharge**
  - 3. Increasing surface water supplies**
  - 4. Land use management**
- GSA is proactive in GSP implementation (grants, outreach, funding)**

# Acknowledgements

- **Participating Butte County Well Owners**
- **Technical support from Davids Engineering, Inc. and Luhdorff and Scalmanini Consulting Engineers**
- **Groundwater Sustainability Agency Managers**
- **Technical Advisory Committee to the Butte County Water Commission**
- **Butte County Water and Resource Conservation Department**

*Thank you!*



# Discussions / Questions?

