Merced GSP
Coordination Committee Meeting

March 20, 2024

Meeting will begin at 1:30 pm or a few minutes after – thank you for joining us!

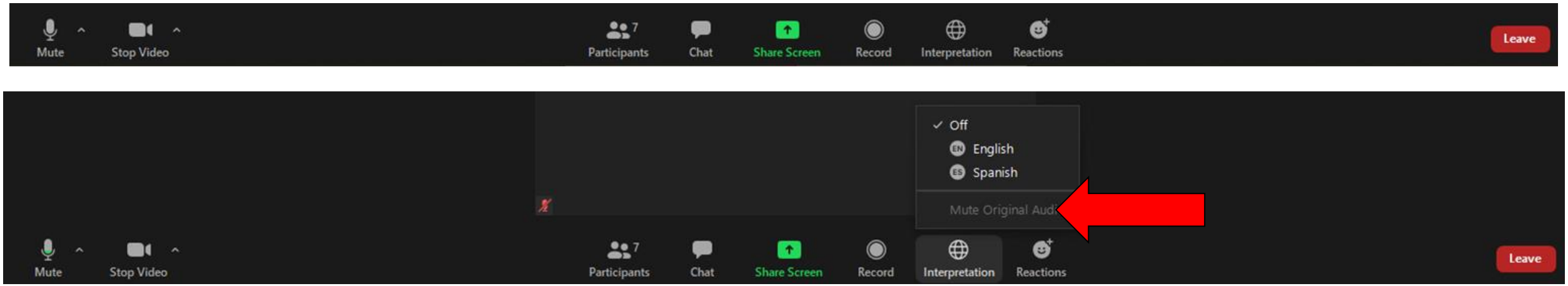
Merced Irrigation-Urban GSA
Merced Subbasin GSA
Turner Island Water District GSA-1

MERCED SGMA

Welcome, Instructions for Zoom
Bienvenidos, Instrucciones para Zoom

We have two language audio channels available. English only speakers, please select English.

Si solamente habla español, debe seleccionar un canal de idioma



The meeting will have simultaneous interpreting, so you are welcome to comment in your native language.
La junta será interpretada simultáneamente, así que le invitamos a que haga comentarios en su lenguaje nativo.

Agenda

1. Call to Order and Welcome
2. Roll Call
3. Approval of Meeting Minutes
4. Public Comment
5. Reports
6. Water Year 2023 Annual Report Overview
7. Updates on Basin Conditions and Sustainable Management Criteria for GSP Update
8. Next Steps
9. Adjourn

Image courtesy: Veronica Adrover/UC Merced

Coordination Committee Roll Call

Representative	GSA
Hicham ElTal	Merced Irrigation-Urban GSA
Scott McBride	Merced Irrigation-Urban GSA
Justin Vinson	Merced Irrigation-Urban GSA
Daniel Chavez	Merced Irrigation-Urban GSA
Ken Elwin *(alternate)*	Merced Irrigation-Urban GSA
Mike Gallo	Merced Subbasin GSA
Nic Marchini	Merced Subbasin GSA
Eric Swenson	Merced Subbasin GSA
George Park *(alternate)*	Merced Subbasin GSA
Kel Mitchel	Turner Island Water District GSA #1

Image courtesy: Veronica Adrover/UC Merced

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Approval of Meeting Minutes

Image courtesy: Veronica Adrover/UC Merced

Approval of Meeting Minutes

- January 24, 2024

Questions/Comments from Public:

For remote attendees, If you would like to make a comment, please type the comment in the chat or raise your hand to request to be taken off mute

Image courtesy: Veronica Adrover/UC Merced

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Reports

Image courtesy: Veronica Adrover/UC Merced

GSA Reports

- Updates from each GSA on activities within their own jurisdiction:
  - Merced Subbasin GSA
  - Merced Irrigation-Urban GSA
  - Turner Island Water District GSA #1

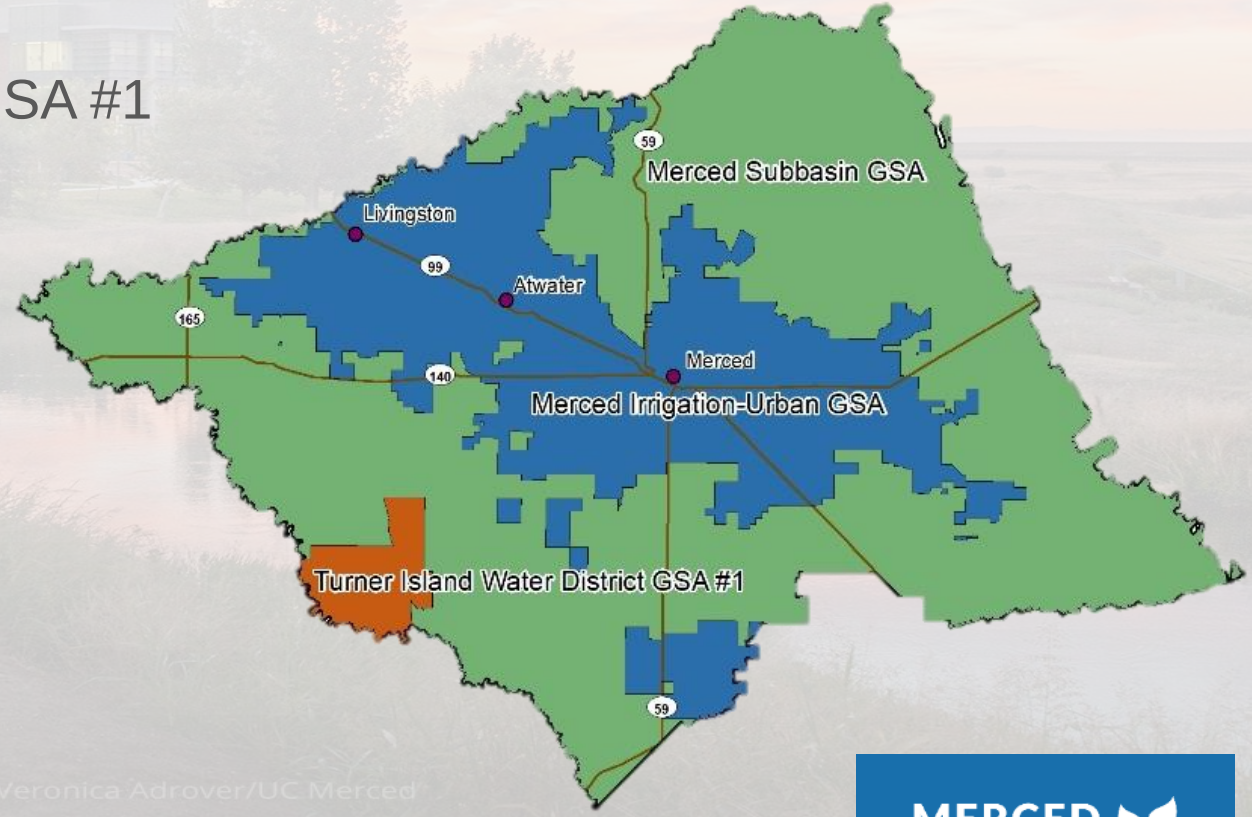

Image courtesy: Veronica Adrover/UC Merced

Other Reports

- Groundwater Export Policy
- Potential Creation of New GSA
- CIMIS Station Report
- Filling Data Gaps/Monitoring Wells
- Well Consistency Determination for Wells at Multiple GSAs

Image courtesy: Veronica Adrover/UC Merced

Groundwater Export Policy - Report

Image courtesy: Veronica Adrover/UC Merced

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Groundwater Export Policy - Background

- Merced County Board of Supervisors adopted Groundwater Ordinance Export Policy in 2015. Generally, does not allow groundwater to leave originating groundwater basin. Included exemptions to allow groundwater export under specific conditions.
- Merced County Board of Supervisors considered amending existing Groundwater Ordinance – Export Policy to add exemption allowing groundwater export in late 2023/early 2024.
- Largely placed responsibility for approving groundwater export activities on the GSAs directly impacted by the proposed export activity.
- Amendment postponed for 1 year, or until all GSPs in Merced County approved, whichever comes first.

Image courtesy: Veronica Adrover/UC Merced

Groundwater Export Policy – Next Steps

- Merced GSAs should collectively agree on protocol and safeguards for Merced Groundwater Subbasin prior to reconsideration of amendment to Groundwater Export Policy by Merced County Board of Supervisors.
  - Protection of local groundwater supplies
  - Groundwater Sustainability Plan compliance/success
  - Monitoring and enforcement
  - Other (TBD)
- Consider executing agreement to memorialize

Image courtesy: Veronica Adrover/UC Merced

CIMIS Station Report

Image courtesy: Veronica Adrover/UC Merced

CIMIS Background

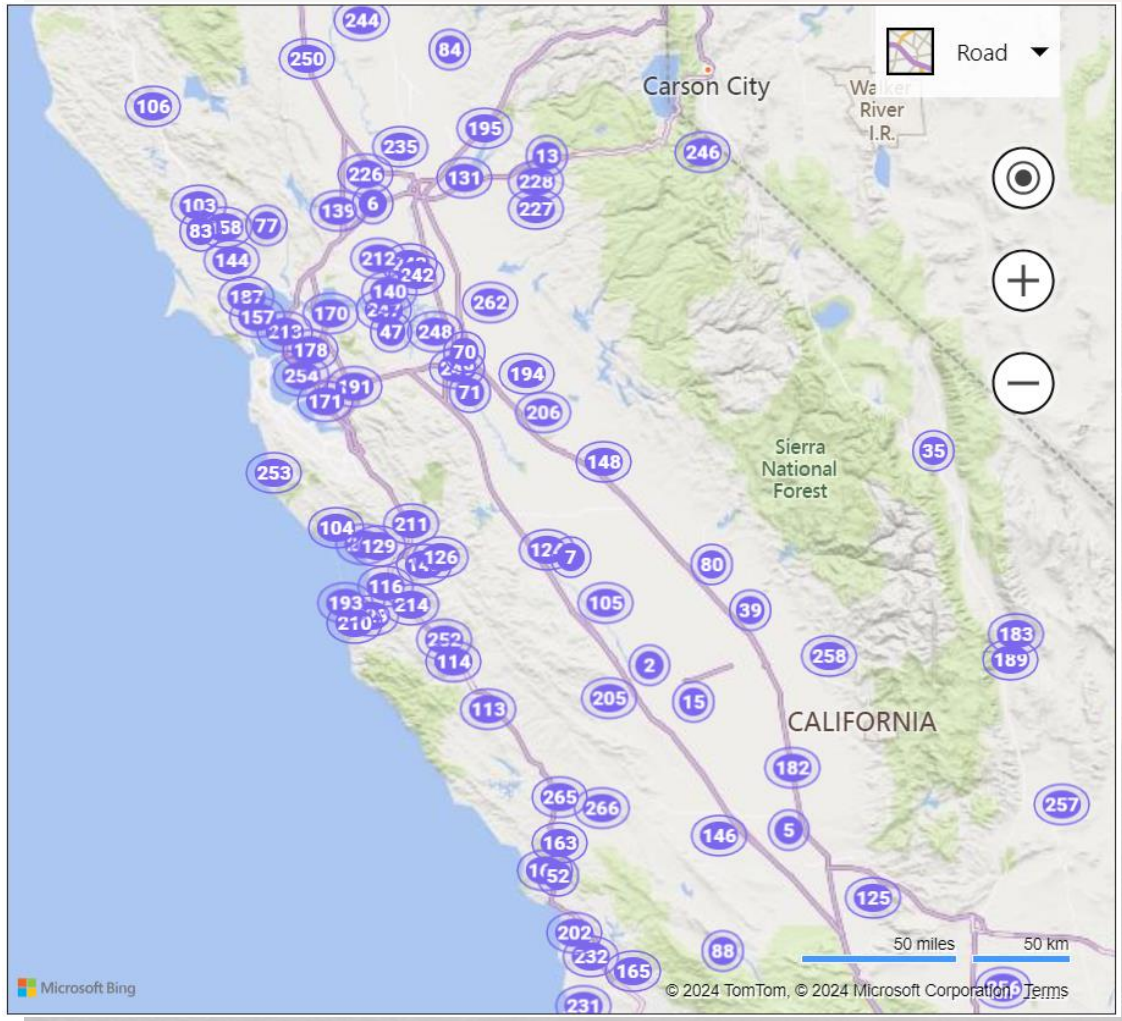
- California Irrigation Management Information System (CIMIS) is a California DWR program that manages a network of over 145 automated weather stations in California.
- Developed in 1982 by DWR and UC Davis to assist irrigators in managing their water resources more efficiently.
- Automatically collects, processes, and analyzes, and publishes data over the internet.

Image courtesy: Veronica Adrover/UC Merced

General Siting Requirements

- 8 square
- Irrigated pasture/grass used to establish baseline for Reference Evapotranspiration
- Additional setback requirements from bodies of water, trees, windbreaks, houses, etc.

Active CIMIS Stations



CIMIS Station 148 Only active site in Merced County…

Merced CIMIS Station #148

- CIMIS Station #148 operated for approx. 25 years by Merced Irrigation District and California Department of Water Resources.
- Located on private property historically used as pasture.
- Recent changes in land use have impacted the performance of the station—most recently, Merced Irrigation District staff were notified that corn will be planted in 2024.
- As a result of land use change, anticipate decommissioning site in the coming months.

Filling Data Gaps/Monitoring Wells

Image courtesy: Veronica Adrover/UC Merced

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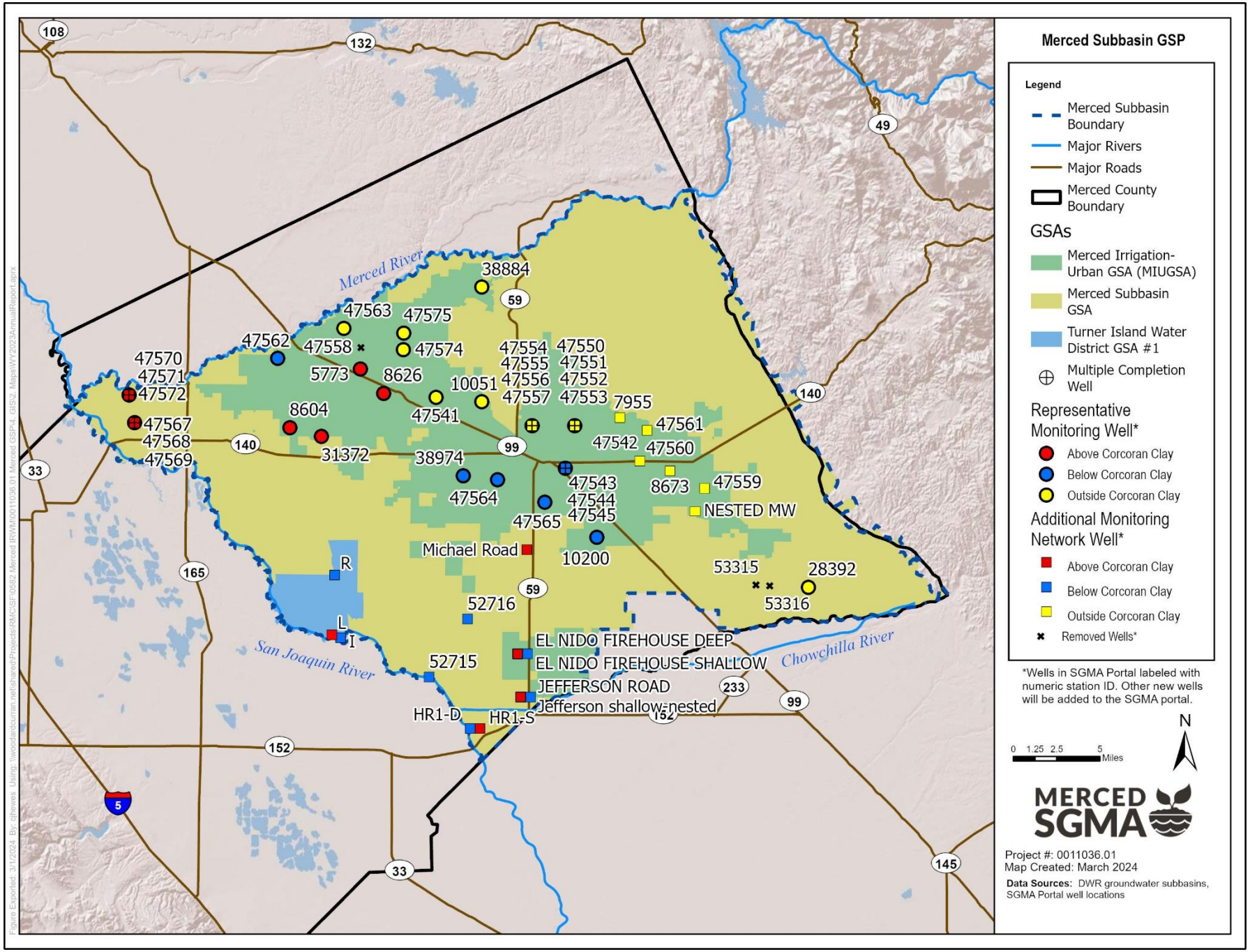
Merced Subbasin GSP
Legend
Merced Subbasin Boundary
Major Rivers
Major Roads
Merced County Boundary
GSAs
Merced Irrigation-Urban GSA (MIUGSA)
Merced Subbasin GSA
Turner Island Water District GSA #1
Multiple Completion Well
Representative Monitoring Well*
Above Corcoran Clay
Below Corcoran Clay
Outside Corcoran Clay
Additional Monitoring Network Well*
Above Corcoran Clay
Below Corcoran Clay
Outside Corcoran Clay
Removed Wells*
*Wells in SGMA Portal labeled with numeric station ID. Other new wells will be added to the SGMA portal.
0 1.25 2.5 5 Miles
N
MERCED SGMA
Project #: 0011036.01
Map Created: March 2024
Data Sources: DWR groundwater subbasins, SGMA Portal well locations
Merced River
San Joaquin River
Chowchilla River
38884
47563
47575
47562
47558
47574
47554
47550
47555
47551
47570
47571
47572
5773
8626
10051
47556
47552
47557
47553
7955
8604
47541
47561
47567
47568
47569
31372
38974
47542
47560
47543
8673
47559
47564
47544
47545
NESTED MW
47565
10200
Michael Road
R
53315
28392
53316
52716
L
I
EL NIDO FIREHOUSE DEEP
EL NIDO FIREHOUSE SHALLOW
52715
JEFFERSON ROAD
Jefferson shallow-nested
HR1-D
HR1-S
108
132
49
140
99
33
165
59
233
152
5
145

Other Reports

- Groundwater Export Policy
- Potential Creation of New GSA
- CIMIS Station Report
- Filling Data Gaps/Monitoring Wells
- Well Consistency Determination for Wells at Multiple GSAs

Image courtesy: Veronica Adrover/UC Merced

Water Year 2023 Annual Report Overview

Image courtesy: Veronica Adrover/UC Merced

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The WY2023 GSP Annual Report was recently drafted and is under review by GSA staff

- Required report on basin conditions and plan implementation, by April 1
- Includes:
  - **Basin Conditions**
    - Model update
    - Pumping and surface water diversions
    - Levels, storage, quality, subsidence
  - **Implementation Status**
    - Projects & Management Actions
    - Grant funding
    - Other support activities

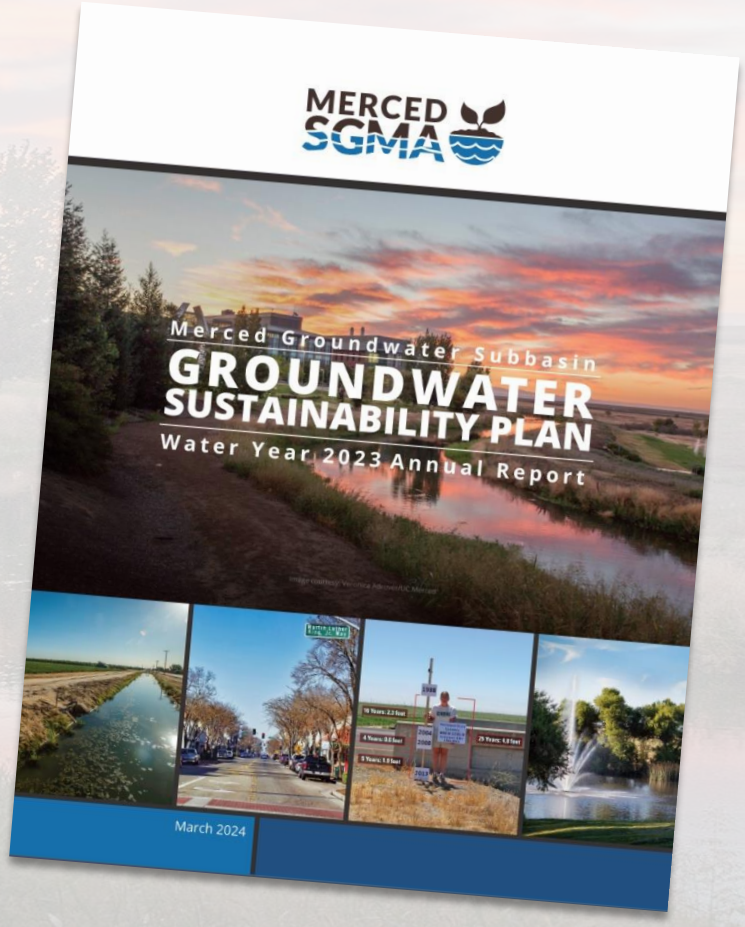


Image courtesy: Veronica Adrover/UC Merced

Sustainable Management Criteria Status

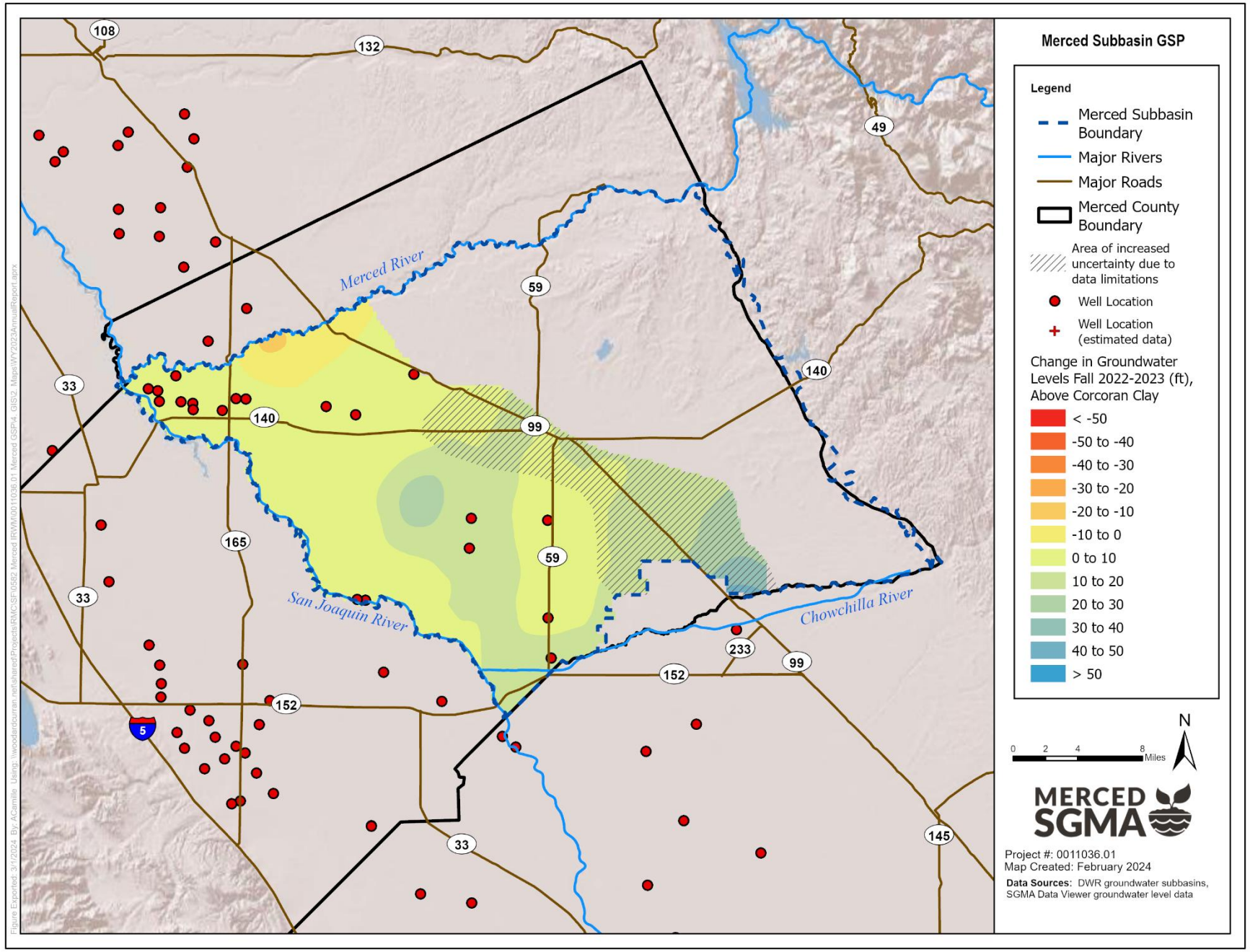
Sustainability Indicator	Minimum Threshold (MT)	Interim Milestone (IM)	Measurable Objective (MO)	Undesirable Result	WY 2023 Annual Report Status
Groundwater Levels	Fall 2015 groundwater elevation	Based on range of projected values that account for hydrologic uncertainty	November or October 2011 groundwater elevation (measured, or estimation if historical record not available)	Greater than 25% of representative wells fall below MT in 2 consecutive years	12/19 wells (63%) fell below MT. 18/19 wells fell below MO. 18/19 are above 2025 IM. 2 wells not measured.
Groundwater Storage	Not applicable - not present and not likely to occur in the Subbasin due to the significant volumes of freshwater in storage				
Seawater Intrusion	Not applicable - not present and not likely to occur due to the distance between the Subbasin and the Pacific Ocean (and Sacramento-San Joaquin Delta)				
Degraded Water Quality	1,000 mg/L TDS	1,000 mg/L TDS	500 mg/L TDS	At least 25% representative wells exceed MT for 2 consecutive years	No wells exceeded MT. 3 wells exceeded MO.
Land Subsidence	0 ft/year, subject to uncertainty of +/-0.16 ft/year	2025: -0.75 ft/year 2030: -0.5 ft/year 2035: -0.25 ft/year	0 ft/year	Exceedance of MT at 3 or more representative sites for 2 consecutive years	All sites showed positive elevation change.
Depletions of Interconnected Surface Waters	Groundwater levels used as a proxy for this sustainability indicator				

2nd year with new thresholds where >25% are below MT.
All but one well still above 2025 IM.

10 wells (out of 23 representative wells) sampled in WY 2023.

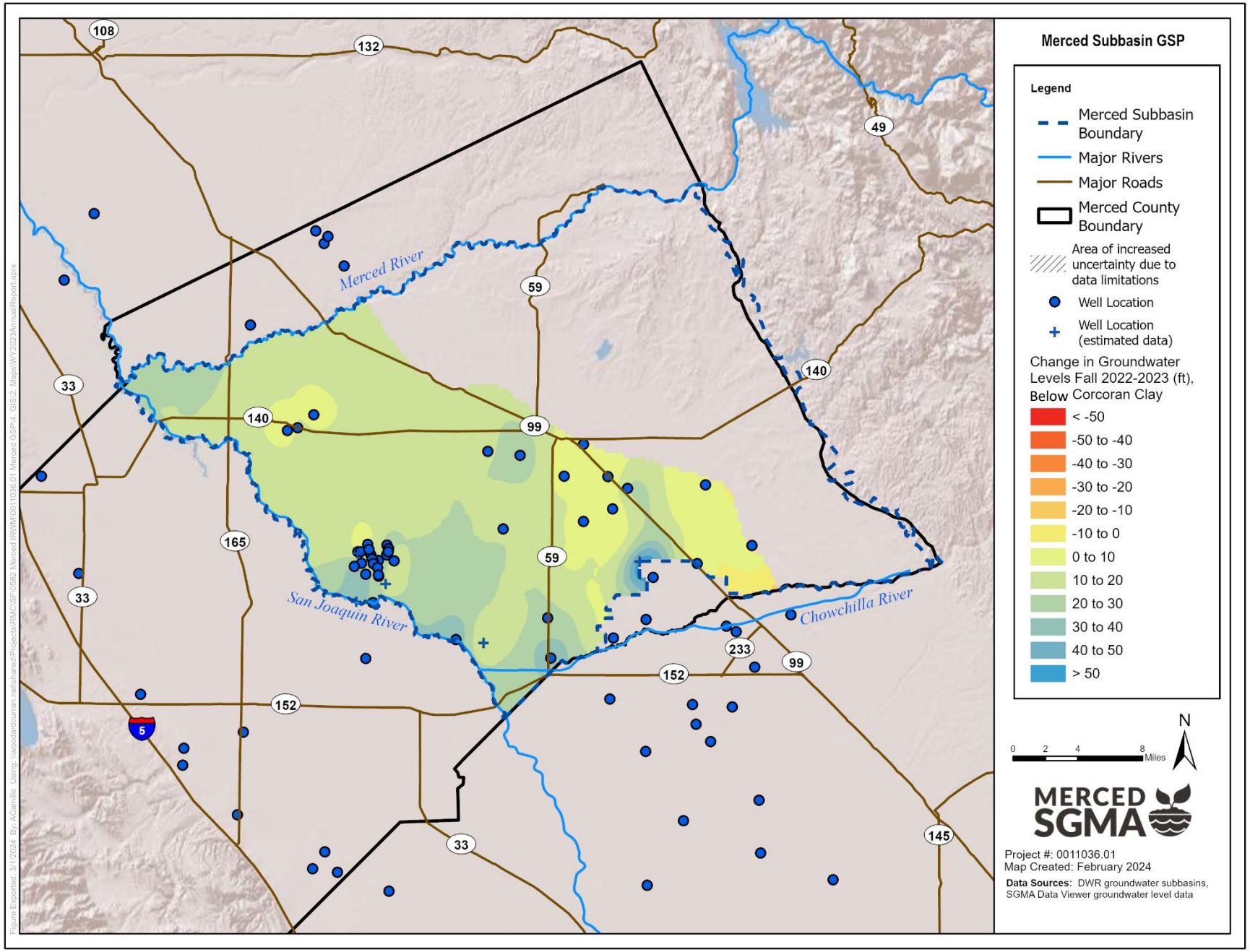
Change in Groundwater Levels

Above Corcoran Clay



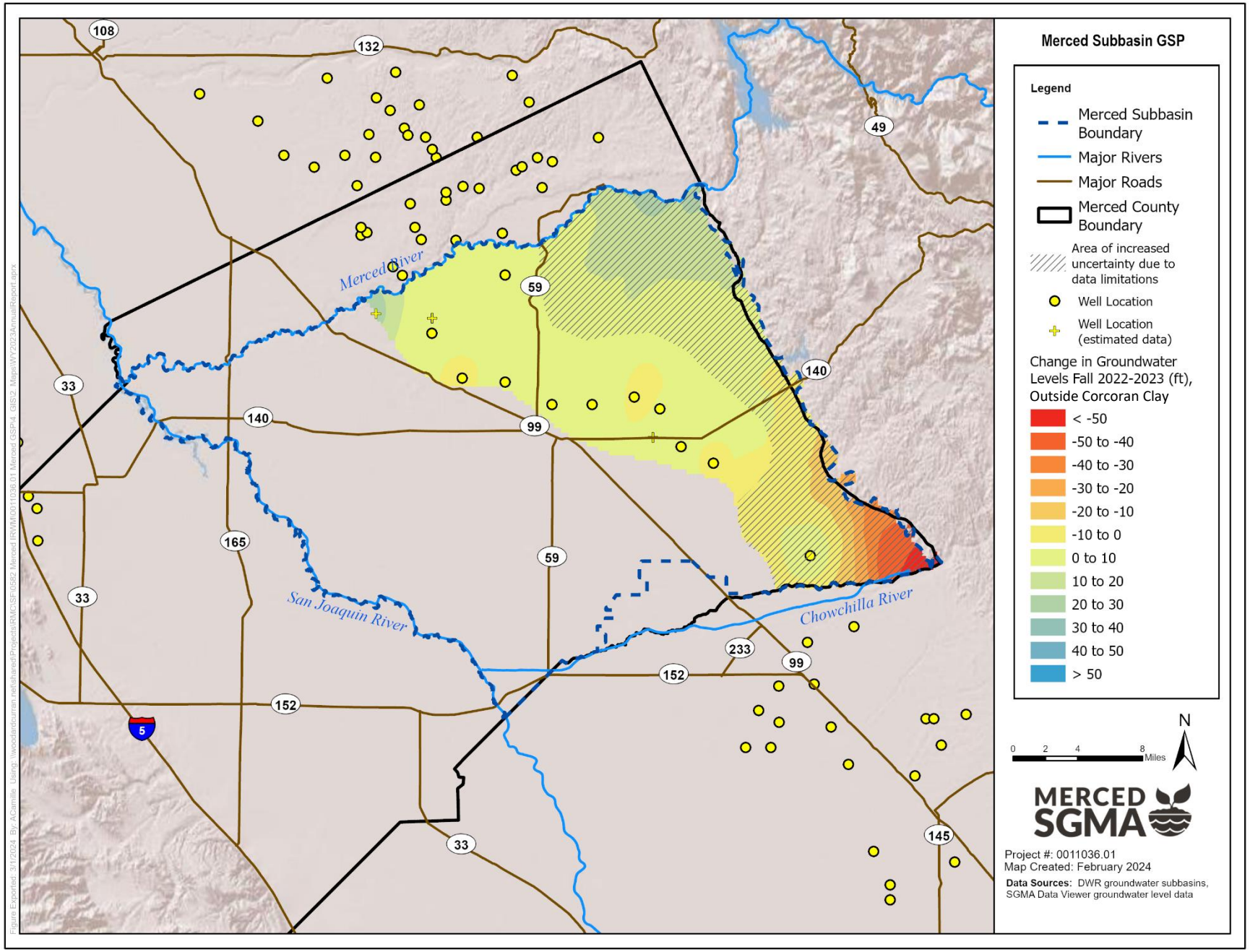
Change in Groundwater Levels

Below Corcoran Clay



Change in Groundwater Levels

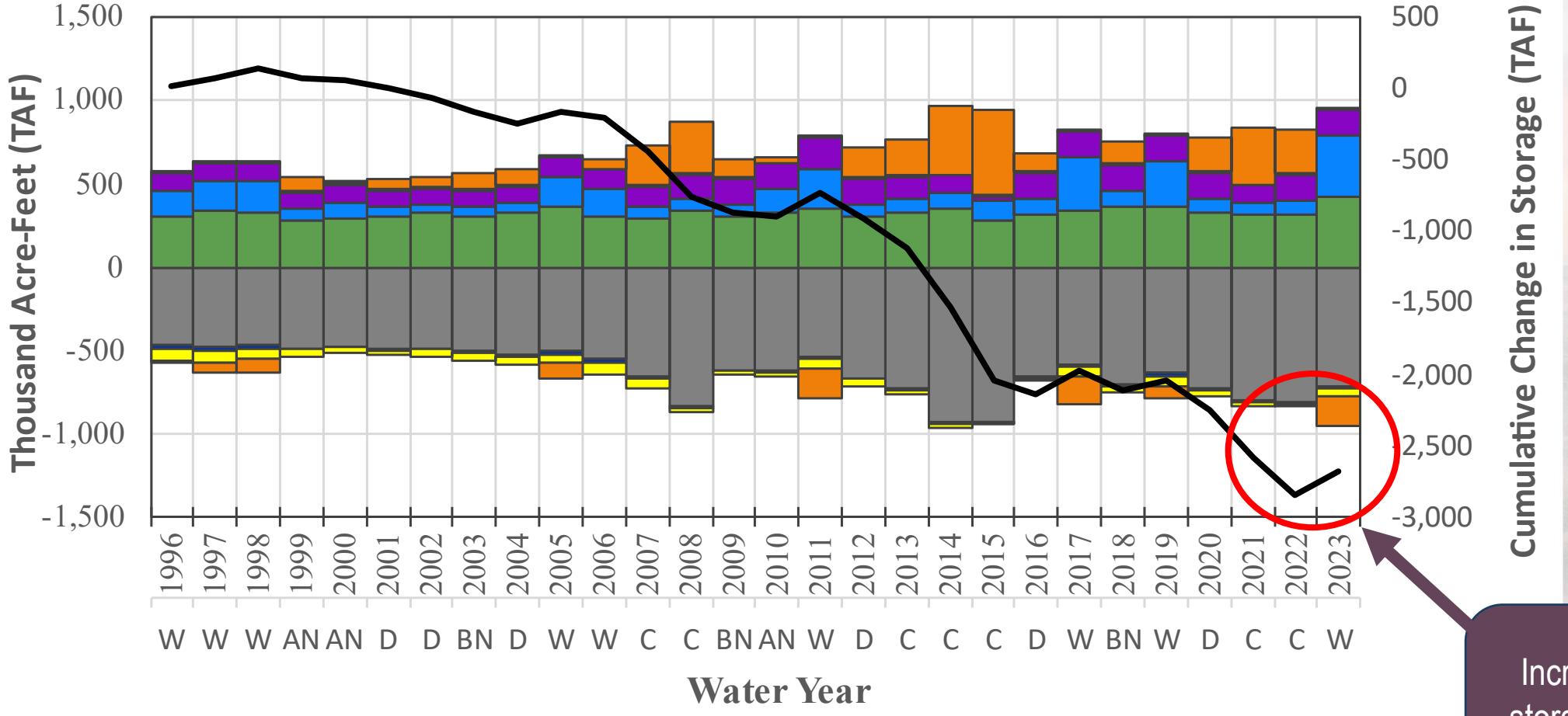
Outside Corcoran Clay



Change in Storage

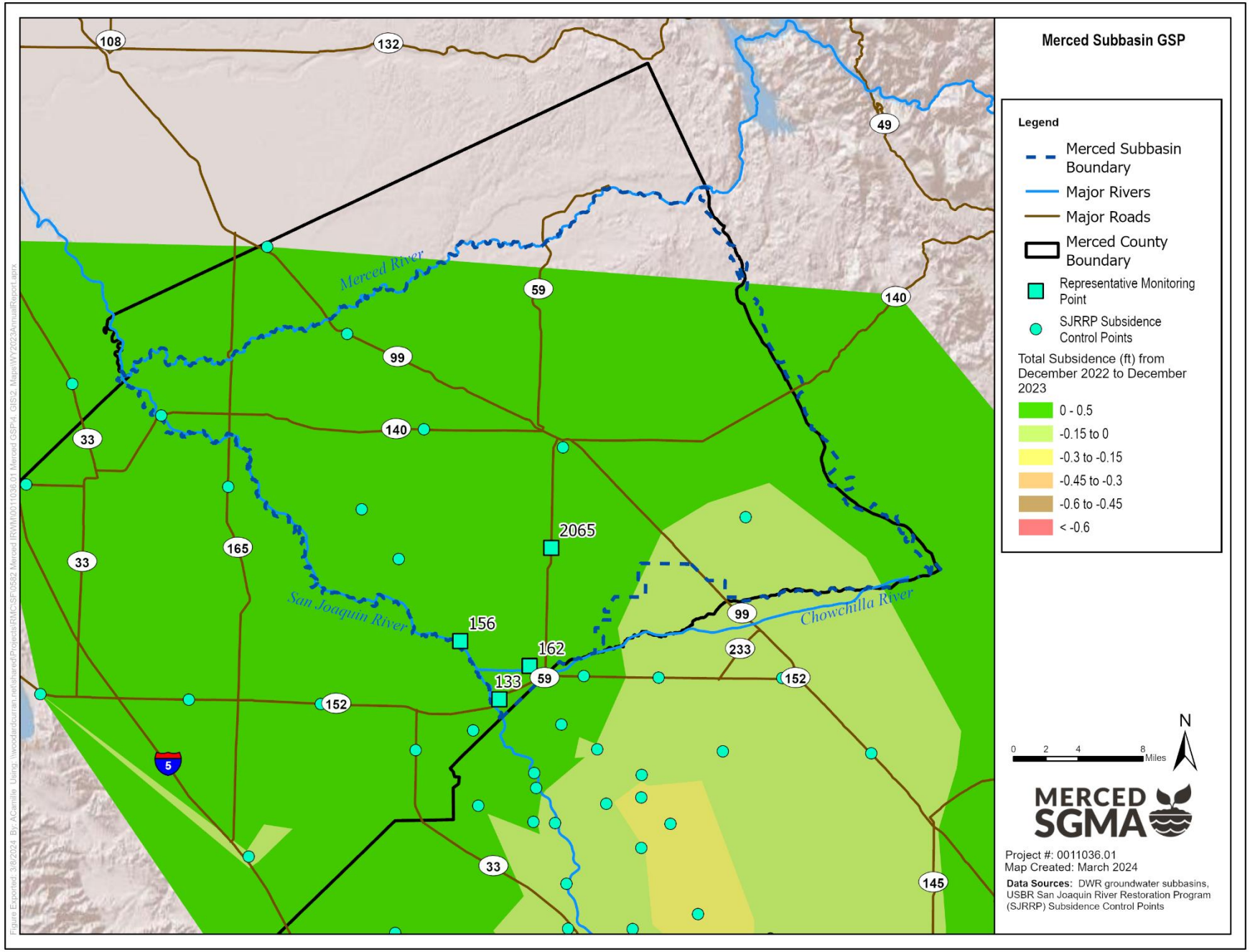
Water Entering Subbasin

Water Leaving Subbasin



Increase in storage after wet winter

Subsidence Dec 2022 – Dec 2023



Updates on Basin Conditions and Sustainable Management Criteria for GSP Update

Image courtesy: Veronica Adrover/UC Merced

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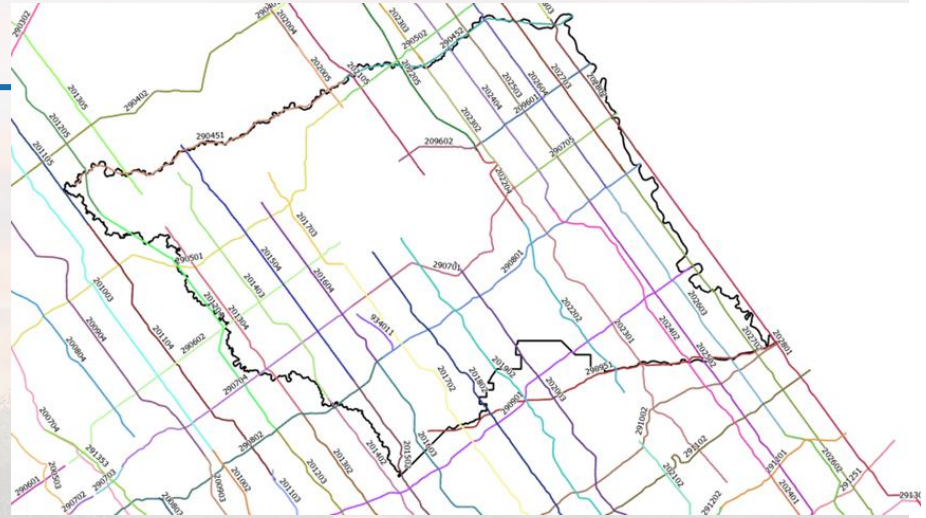
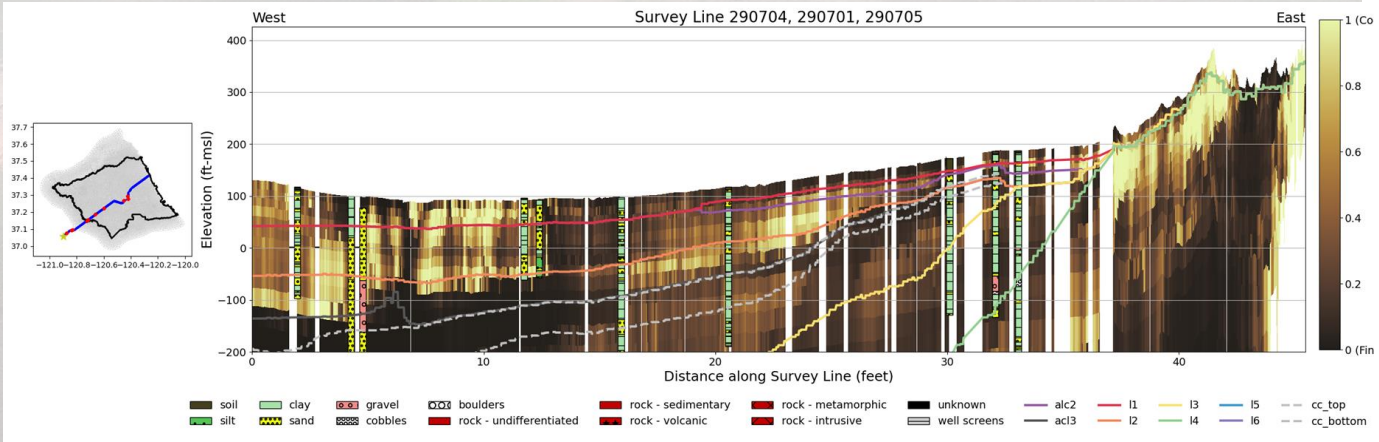
AEM

- Airborne electromagnetic (AEM) surveying is a geophysical technique that measures electrical properties of subsurface materials to characterize different geological strata
- AEM surveys were conducted in Merced between March and April 2022; results were published by DWR in April 2023
- Data was refined to generate cross-sections which will be used to update the Subbasin's Hydrogeological Conceptual Model



AEM Survey Flight Lines in Merced Subbasin
DWR Data Report for Survey Area 5

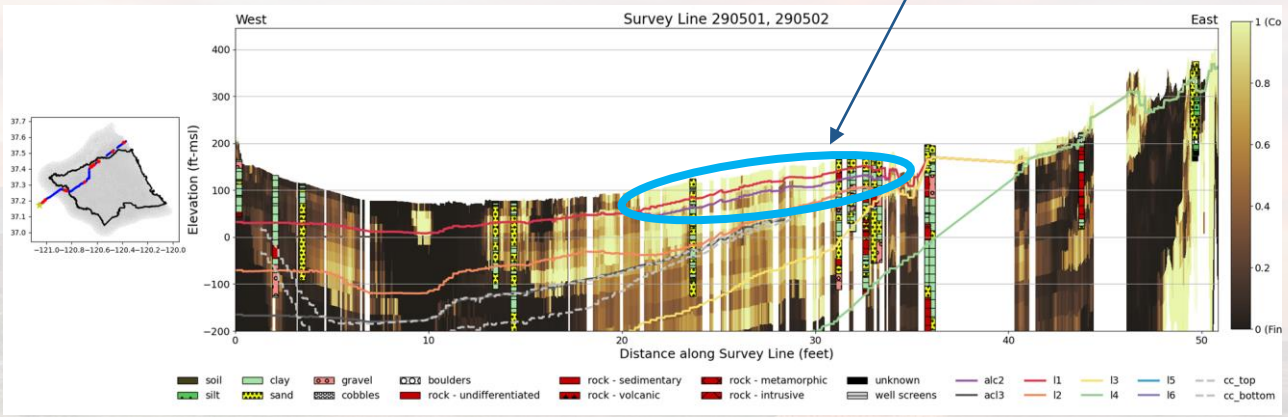


Geologic cross-section generated from AEM data

AEM (cont.)

- Initially, the MercedWRM estimated shallow clays extended north through the Subbasin
- Following the AEM data analysis, these clays may not be present and the lithology is likely coarser grained material
- Potential implications are increased recharge potential in this area

MercedWRM's shallow clays, beneath coarse deposit



Updated MercedWRM

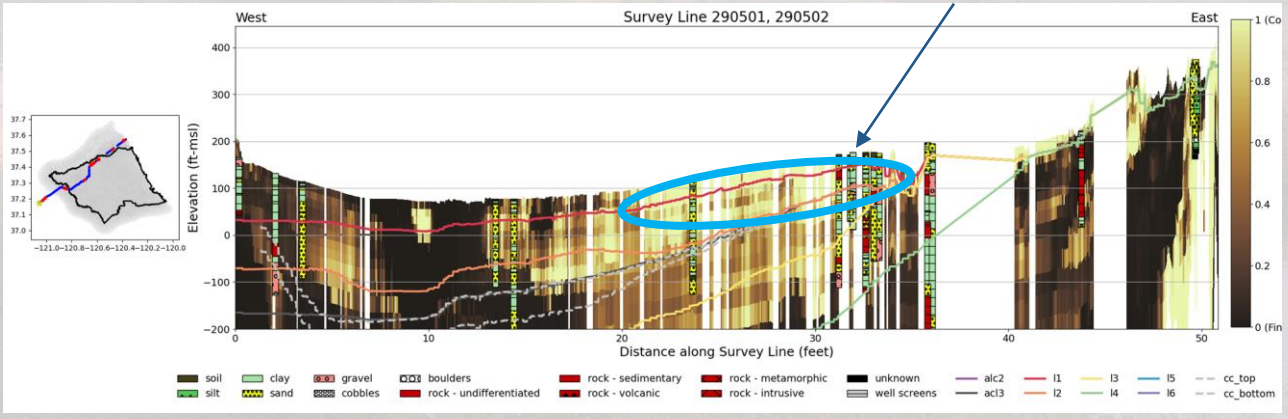


Image courtesy: Veronica Adrover/UC Merced

Water Quality + Groundwater Level Trends

- Corrective action 6(a): *The GSAs should provide additional justification and explanation for how water quality constituents of concern, other than TDS, will be managed and monitored, and how impacts to beneficial uses and users will be addressed should there be degradation of water quality during plan implementation when the Subbasin expects to lower groundwater elevations. The GSAs should consider developing sustainable management criteria for additional water quality constituents.*
- Performed statistical analysis that calculates trends in groundwater quality measurements between two periods of time:
  - 2012-2016: consistent decreases in groundwater levels
  - 2016-2020: groundwater levels were more stable, on average

Image courtesy: Veronica Adrover/UC Merced

Data Sources & Analysis Methodology

Pull all water quality data from GAMA

Remove data from regulated, contaminated sites

Exclude wells with <8 measurements of a particular constituent

Image courtesy: Veronica Adrover/UC Merced

Data sources used:

- DDW
- DPR
- DWR
- GAMA_DOM
- GAMA_USGS
- USGS_NWIS
- WB_ILRP

Run Mann-Kendall Trend Test

- Statistical test
- Identifies positive or negative trends over time

Summarize results as:

- % wells with positive trend
- % wells with negative trend
- % wells with no trend

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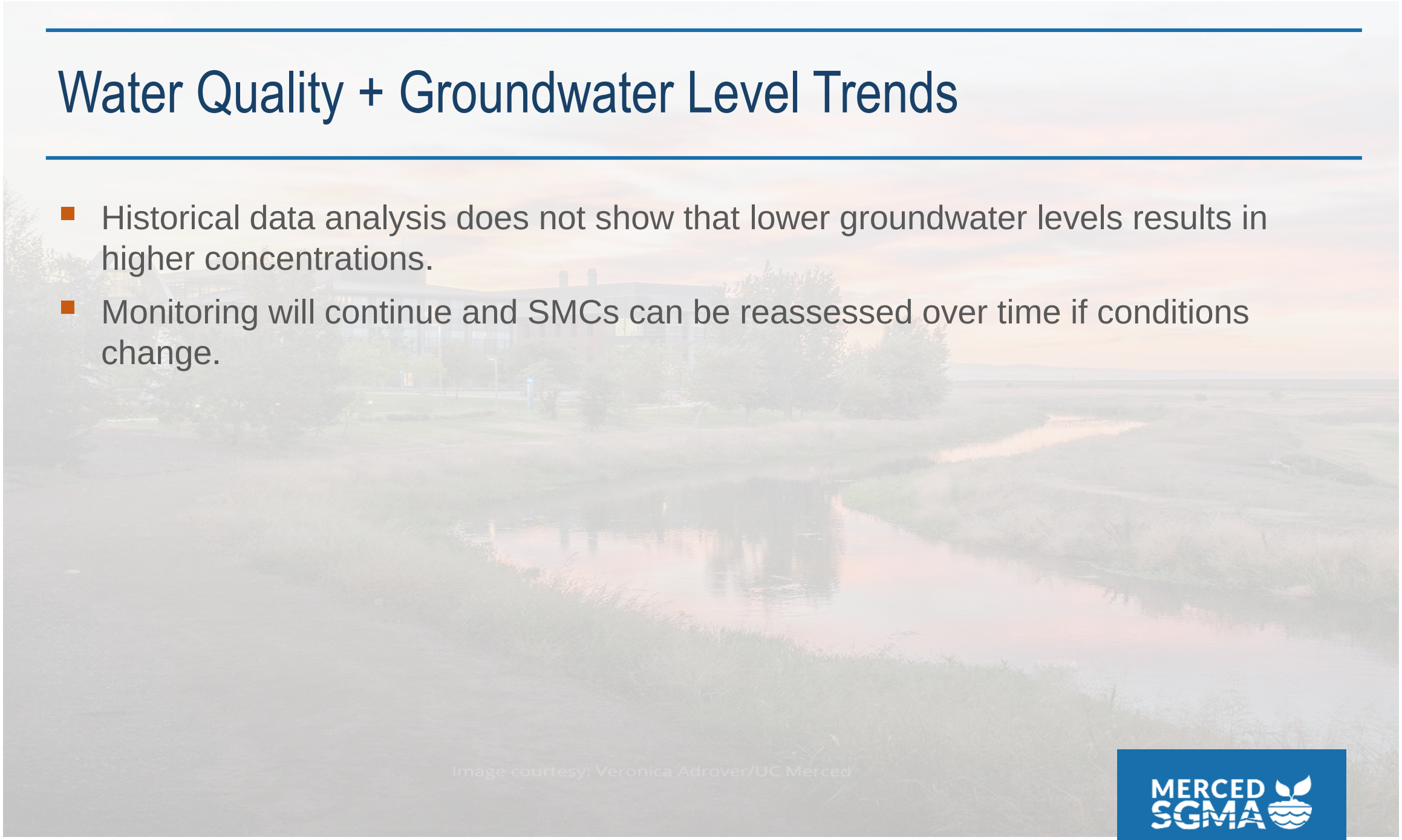
Results

Constituent	2012-2016 (decreasing groundwater levels)				2016-2020 (more stable groundwater levels)			
	Increasing	Decreasing	No Trend	Count of Wells	Increasing	Decreasing	No Trend	Count of Wells
Nitrate	2.9%	2.9%	94.3%	35	2.5%	0.0%	97.5%	40
Total Dissolved Solids				0				0
Chlorine				0				0
Arsenic	0.0%	0.0%	100.0%	13	0.0%	0.0%	100.0%	13
Iron				0	0.0%	0.0%	100.0%	1
Manganese	0.0%	0.0%	100.0%	1	0.0%	0.0%	100.0%	2
Chromium-6				0				0
Benzene	0.0%	0.0%	100.0%	12	0.0%	0.0%	100.0%	11
123 TCP	7.7%	15.4%*	76.9%	13	0.0%	2.0%	98.0%	50
DBCP	0.0%	0.0%	100.0%	10	0.0%	7.1%	92.9%	14
MTBE	0.0%	0.0%	100.0%	12	0.0%	0.0%	100.0%	12
111 TCA	0.0%	0.0%	100.0%	12	0.0%	0.0%	100.0%	11
PCE	8.3%	0.0%	91.7%	12	0.0%	0.0%	100.0%	11
TCE	0.0%	0.0%	100.0%	12	0.0%	0.0%	100.0%	11
Boron				0				0
Sodium				0				0
Specific Conductivity	100.0%	0.0%	0.0%	1				0
EDB	0.0%	0.0%	100.0%	2	0.0%	0.0%	100.0%	3

*Likely not a real trend; influenced by reduction in the detection limit (e.g. could be better lab technology through time)

Water Quality + Groundwater Level Trends

- Historical data analysis does not show that lower groundwater levels results in higher concentrations.
- Monitoring will continue and SMCs can be reassessed over time if conditions change.



Subsidence SMC

SMC remains the same, but responds to 2 corrective actions (discussed in previous meeting in detail).

The GSAs should identify the **total cumulative subsidence tolerable by critical infrastructure**.
Reiterate previous outreach to Reclamation. Reach out to Reclamation and other flood managers and transportation managers for comment.

The Plan should also include additional details describing measures that consider and disclose the current and potentially lasting impacts of subsidence on land uses and groundwater beneficial uses and users.

Include additional information on the observed impacts of subsidence on the Eastside Bypass (and El Nido, if information is available). Discuss potential future subsidence impacts.

Provide further discussion on how groundwater level SMC will reduce long-term subsidence.

Image courtesy: Veronica Adrover/UC Merced

Subsidence SMC

SMC remains the same, but responds to 2 corrective actions (discussed in previous meeting in detail).

The GSAs should **revise its application of the level of uncertainty** as it relates to subsidence measurements according to standard professional practices. Establishment of sustainable management criteria should not allow for subsidence in perpetuity.

Provide additional information on the Plan's rationale for establishing the measurement uncertainty as 0.16 ft/yr

Include examples in amended Plan demonstrating how the uncertainty is incorporated into the minimum threshold

Image courtesy: Veronica Adrover/UC Merced

Change in Storage SMC

- Approach: establish SMC for reduction of groundwater storage using groundwater levels as a proxy (most common method used in other GSPs)
- Will involve demonstration in text that significant correlation exists between levels and storage

Image courtesy: Veronica Adrover/UC Merced

Next Steps

Image courtesy: Veronica Adrover/UC Merced

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What's coming up next?

- Adjourn to next meeting, proposed May 22, 2024 at 1:30pm
- Anticipated topics:
  - Updates to water budgets and modeling assumptions
  - Review of sustainable management criteria for new groundwater level monitoring wells.

Image courtesy: Veronica Adrover/UC Merced

What's coming up next – Modeling preview

- MercedWRM is a key component of the GSP process
  - Assists in quantifying water budget components
  - Assists in identifying needs and potential benefits from Projects & Management Actions (PMAs)
- Being updated as part of the periodic evaluation
  - Incorporate newer data, additional functionality, and newer understanding of the basin
  - Incorporate more recent hydrology
  - Recalibrate
- Includes a scenario to simulate current and planned PMAs
- Some output values may change somewhat
- Overall need and management approach is not expected to change – Management is ultimately to the Sustainability Indicators

Image courtesy: Veronica Adrover/UC Merced

Merced GSP
Coordination Committee Meeting

March 20, 2024

Merced Irrigation-Urban GSA
Merced Subbasin GSA
Turner Island Water District GSA-1

Image courtesy: Veronica Adrover/UC Merced

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