Stanislaus & Tuolumne Rivers Groundwater Basin Association
Groundwater Sustainability Agency
1231 11th Street | Modesto, CA 95354
Email: strgba@mid.org

STRGBA GSA AGENDA

March 13, 2024 (1:30 p.m. – 3:00 p.m.)
Webinar Digital Platform or Phone Meeting
https://us02web.zoom.us/j/82844864384
By phone: 1-669-900-9128
Webinar ID: 828 4486 4384

PUBLIC PARTICIPATION
The public may participate in this meeting in the three ways described below.

Instructions for Participating in STRGBA GSA & Technical Advisory Meeting via Zoom Webinar or Phone

On your desktop/iPad or tablet/laptop:

1. To join the webinar, click the link published in the Agenda for the current meeting about 5 minutes before the webinar begins.
2. Follow the on-screen instructions to install and/or launch the Zoom application.
3. If prompted, enter the Webinar ID published in the Agenda.
4. All public attendees will enter the meeting muted.
5. If you wish to speak under Business from the Public, or after the Chairman calls for Public Comment, click on the "Raise Hand" button to request to speak.

On your phone:

1. To attend the meeting by phone, call the number published in the Agenda for the meeting.
2. Enter the Webinar ID published in the Agenda, then hit the # symbol.
3. All public attendees will enter the meeting muted.
4. If you wish to speak under Business from the Public, or after the Chairman calls for Public Comment, press *9 on your phone to "Raise Hand" or simply request to speak.

In person: Oakdale Irrigation District 1205 E. F Street, Oakdale

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1. Call to Order/Welcome and Introductions
   (Four agencies are needed for a quorum)

2. Business from the Public
   Who: Public
   Expected Outcome: Interested persons are welcome to introduce any topic within the Agency's jurisdiction. Matters presented under this heading may be discussed but no action will be taken by the Agency at this meeting.

3. Topic: Approve 2/14/2024 Meeting Minutes [Action Item]
   Who: Eric Thorburn, Committee
   Expected Outcome: Approval

4. Topic: WY 2023 Annual Report – Draft Results
   Who: Todd Groundwater/Woodard & Curran, Committee
   Expected Outcome: Discussion

5. Next Meeting
   March 27, 2024 at 1:30 p.m.
   In-person offered at Oakdale Irrigation District

6. Items too late for the agenda

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MEETING MINUTES

February 14, 2024 (1:30 p.m. – 3:00 p.m.)

The meeting was called to order at 1:31 p.m.

1. **Welcome and Introductions**

   The following members of the Stanislaus and Tuolumne Rivers Groundwater Basin Association Groundwater Sustainability Agency (STRGBA GSA) attended either in-person or via Zoom.

   In-Person Attendees:

Modesto Irrigation District (MID):	John Mauterer
Oakdale Irrigation District (OID):	Eric Thorburn
Stanislaus County:	Christy McKinnon
City of Modesto:	Tim Barahona
City of Waterford:	Michael Pitcock
City of Oakdale:	Ian Sather
City of Riverbank:	Darin Smallen

   Other Attendees:

Scot Moody	Alexis Stevens
Dimitri Lee	Gordon Enas
Juan Ochoa	Matthew Toste
Melissa Williams	Mike Day
Stacy Henderson	Jose McEra
Sean Hembree	David Avila
Liz Elliott	Arden Wells
Stacy Henderson	Bill Fogarty
Dominick Amador	

2. **Business from the Public**
   N/A

3. **Approve 10/11/2023 Meeting Minutes [Action item]**
   Pitcock moved, 2nd by Mauterer to approve the 10/11/2023 meeting minutes.

4. **Amend 2024 STRGBA GSA Budget [Action]**
   Sather moved, 2nd by Barahona to approve the 2024 STRGBA GSA Budget.

   - Avila asked if DWR requested an increase to change the budget to $330,000. Thorburn explained DWR has deemed the GSP incomplete, and the cost is to make the necessary changes.
   - Sean Hembree asked if the additional $330,000 is in addition to the recent sub agreement between Tuolumne and Stanislaus County. Thorburn explained that yes this is additional. Hembree stated that the agreement was passed as a consent item at a recent meeting. Further stated, this increase puts Tuolumne Co. in a situation with no ability to vote on how money is spent.

5. **Approve GSP Amendment Proposal from Todd Groundwater [Action]**
   Pitcock moved, 2nd by Mauterer to approve GSP Amendment Proposal from Todd Groundwater.

   - Stevens asked which member agencies are on the TAC committee and are they being noticed. Thorburn answered MID, OID and City of Modesto.

6. **Elect 2024 STRGBA GSA Chairman and Vice Chairman [Action]**
   Pitcock moved, 2nd by Smallen to Elect 2024 STRGBA GSA Chairman and Vice Chairman.
   *Thorburn abstained from voting.

7. **2022 STRGBA GSA GSP Incomplete Determination by DWR & Update on DWR Consultation Meeting**
   This item was discussed after item 4
   Elliot summarized the GSP determination letter from DWR and gave an update on the proposed approach for response. Thorburn discussed a meeting with DWR regarding the determination letter.
   - McKinnon asked for more information about where and why the Interim Milestones (IM) were established at the rivers. Elliott stated the IM's were established within OID and Non-District East (NDE). She explained the reason they were established in those two management areas is because we have seen historically declining groundwater levels.

- Day asked if DWR is asking the GSA to develop a well mitigation plan. Elliott stated DWR wants GSP to address the wells that may run dry.

8. **Fall 2023 Groundwater Level Analysis**
   Wells gave a presentation that can be reviewed at https://youtu.be/H33LENKzYno

9. **2023 Water Year Annual Report Schedule**
   Elliott discussed the schedule to complete the annual report due to DWR by April 1, 2024. The GSA will approve the final annual report at the March 27 meeting.

10. **Next Meeting**
    March 13 at 1:30 p.m. via Zoom or in-person at OID

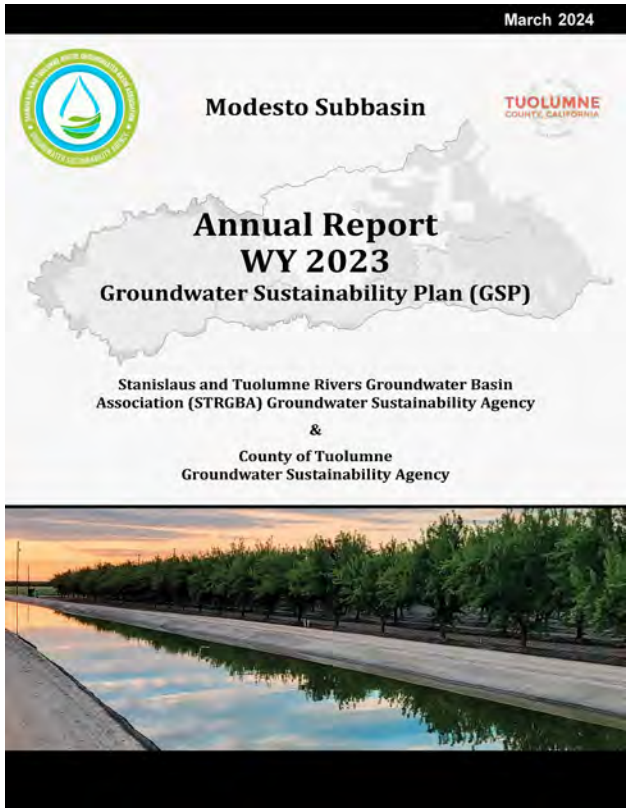
Modesto Subbasin GSP

WY 2023 Annual Report – Draft Results

STRGBA GSA Meeting
March 13, 2024

Agenda

- Schedule
- Water Quality Analysis
- Reported Dry Wells
- Subsidence Analysis



TODD GROUNDWATER

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Modesto Annual Report WY 2023 Schedule

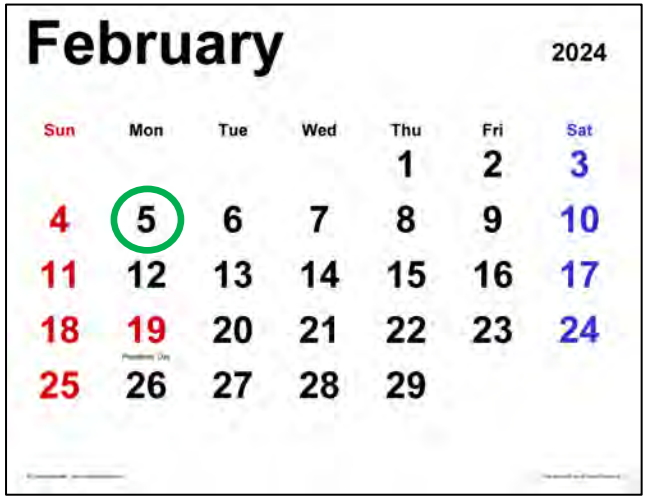
Red: Annual Report Deliverable Green: Planning Group Meeting Blue: GSA Meeting

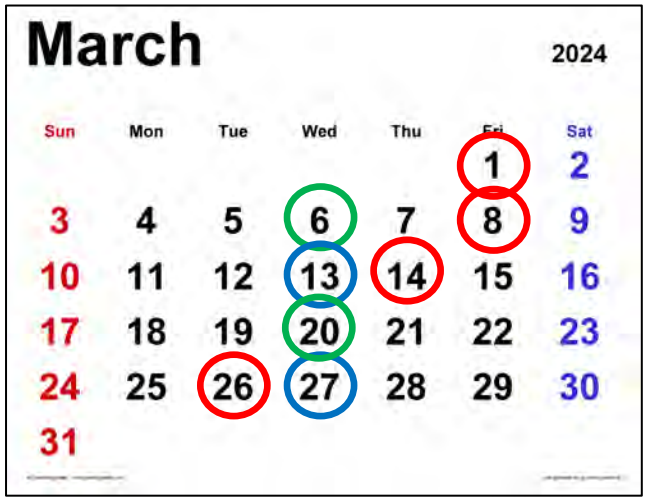
Report

- March 1: Admin Draft to GSA
- March 8: Comments from GSA
- March 14: Provide Draft for Public Review (comments due March 20)
- March 26: Final Report to GSA
- Submit to DWR after the March 27th GSA meeting

Meetings

- February 5: TAC Planning Group #1 – present available draft results (also discuss Fall 2023 water level analysis)
- March 6: TAC Planning Group #2 - review draft annual report
- March 13: GSA meeting #1 (in person) – review draft annual report, followed by team kickoff meeting
- March 20: TAC Planning Group #3 (if necessary) - review public comments
- March 27: GSA meeting #2 – GSA approval of final report





Water Quality Undesirable Results

from the Modesto Subbasin GSP:
"An undesirable result will occur when a Subbasin potable water supply well in the defined monitoring network reports a new (first-time) exceedance of an MT or an increase in concentration above the MT for a Modesto Subbasin constituent of concern that results in increased operational costs and is caused by GSA management activities as listed above."

Baseline monitoring network established in WY 2021 Annual Report

- 361 wells
- 7 constituents of concern: As, NO_3, U, TDS, 1,2,3-TCP, PCE, and DBCP
- Identified maximum concentration from WY 1991 to WY 2021
- Compared data to baseline wells, which were monitored for each constituent of concern in WY 2021

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Water Quality Analysis

- WY 2023 water quality data downloaded from GAMA database (GeoTracker)
- Compared to the WY 1991 to 2022 historical maximum to identify any new MCL exceedances or increases above the MCLs
- Potable water supply wells individually examined to determine if increased concentrations could be related to GSA management
- 7 maps for 7 constituents – wells with data during WY 2023

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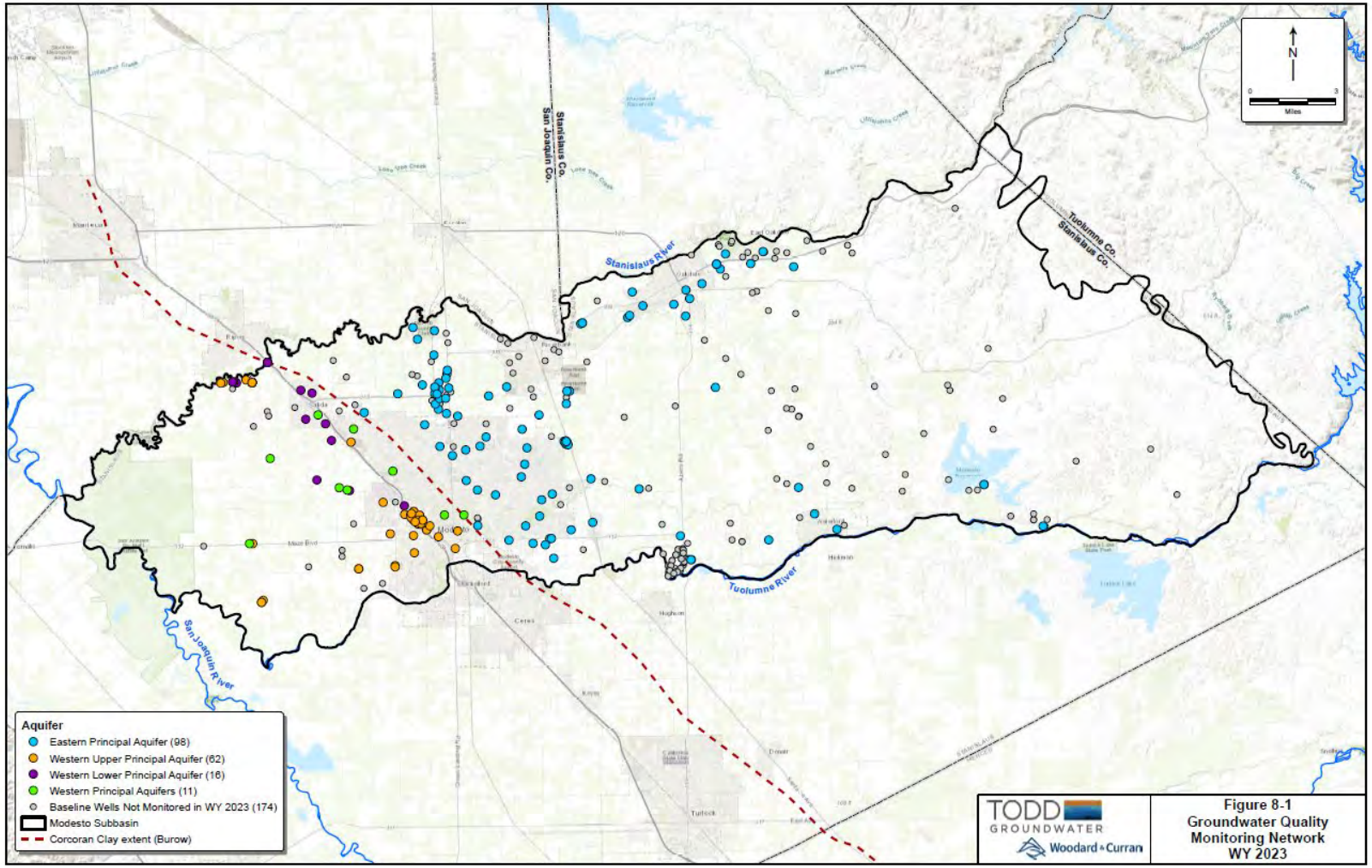
Water Quality Analysis



- 187 wells in WY 2023 monitoring network
  - 122 municipal
  - 2 domestic
  - 63 monitoring wells at regulated facilities

  (174 baseline wells not monitored during WY 2023)

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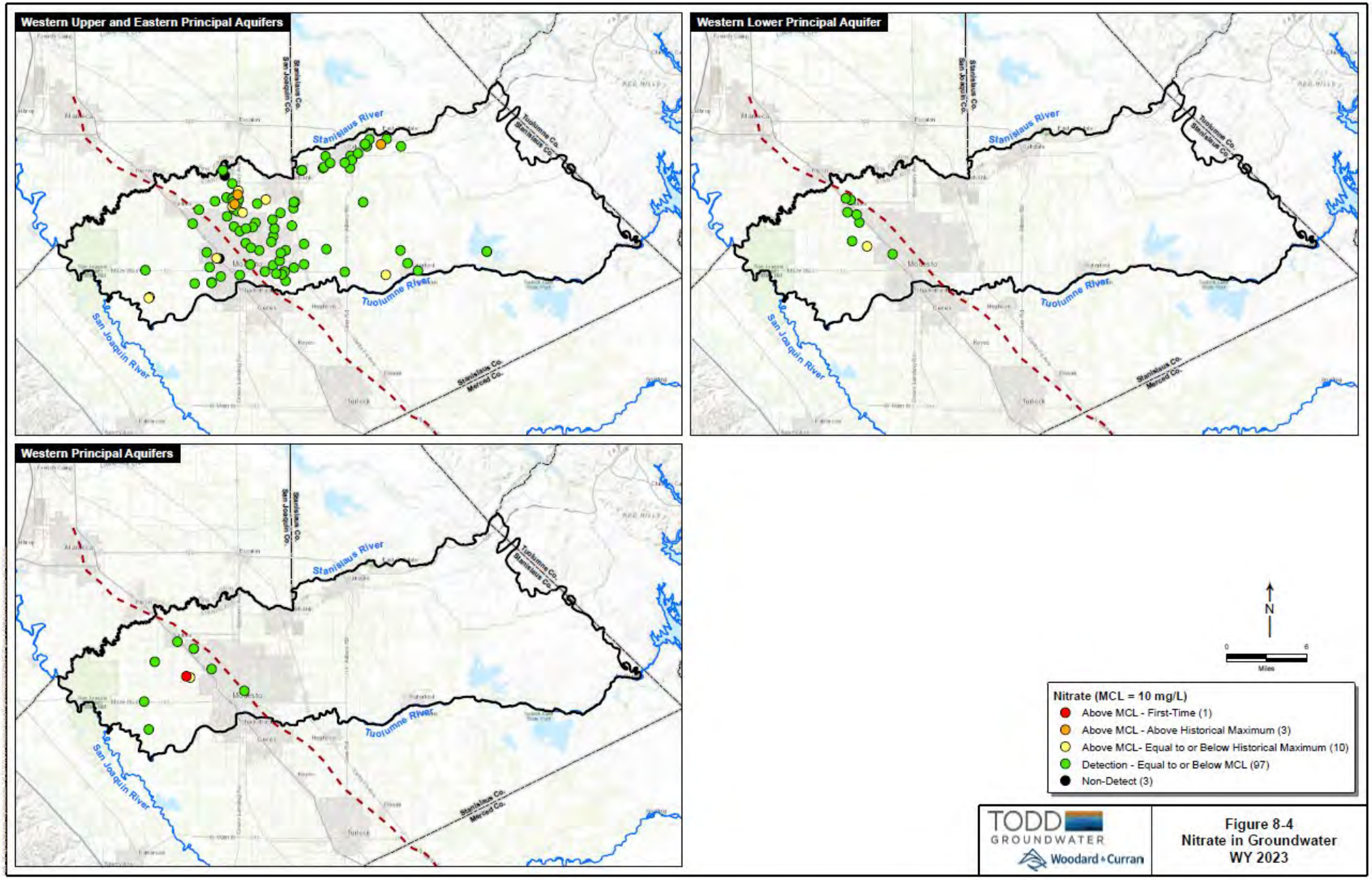
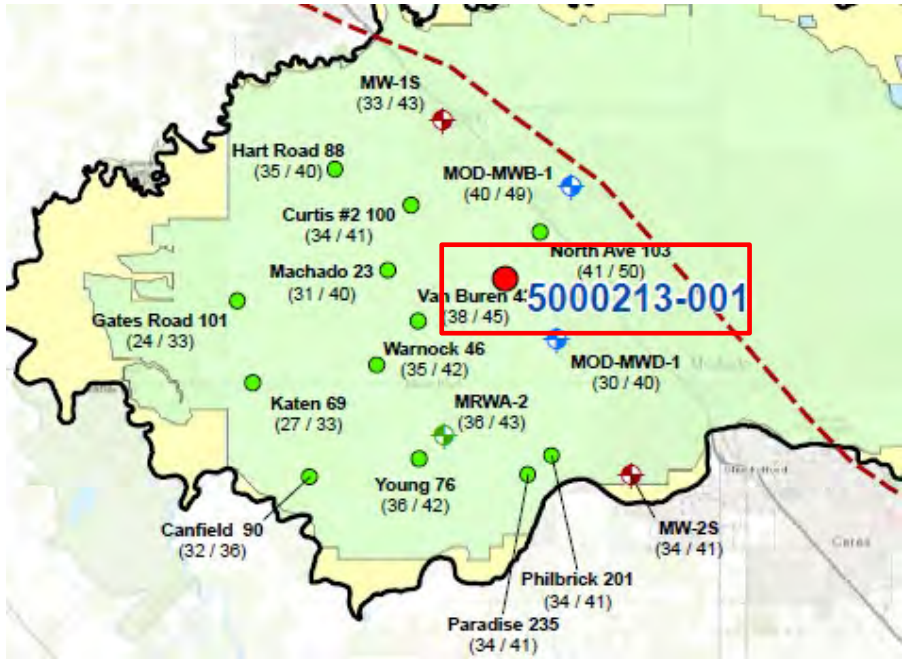
NITRATE

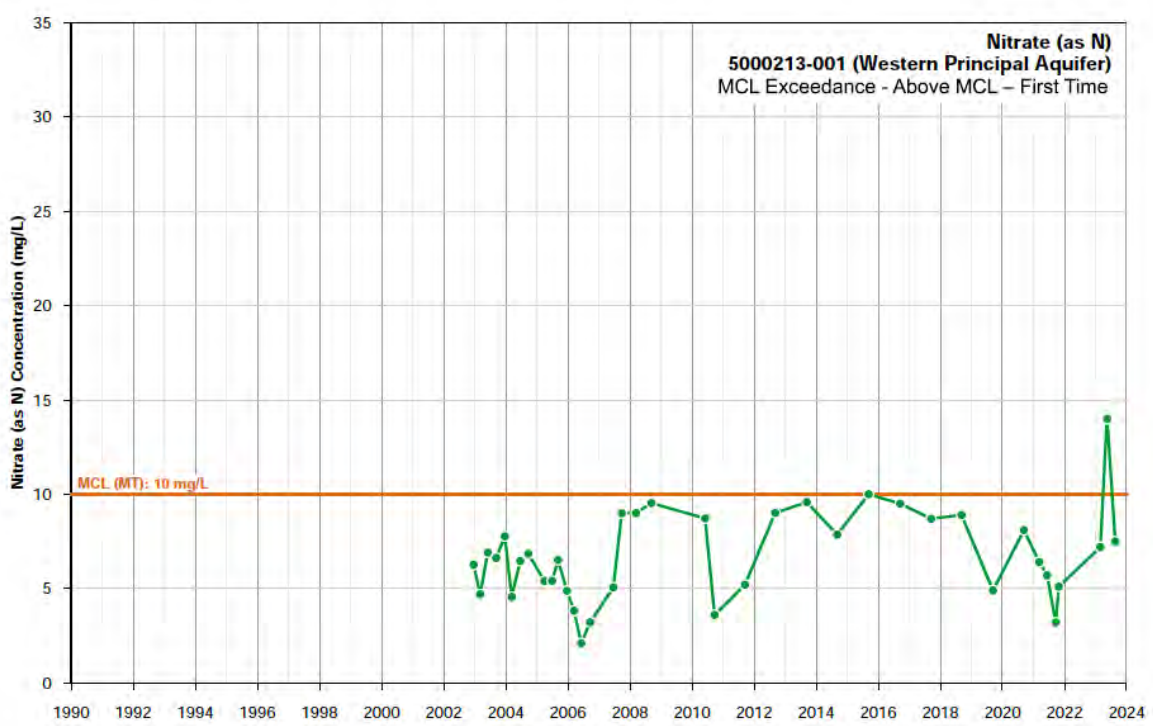
- Nitrate measured in 114 RMWs during WY 2023
- 1 potable water supply well reported first-time MCL exceedance
- 3 potable water supply wells reported further MCL exceedances



NITRATE: 5000213-001 (WESTERN PRINCIPAL AQUIFERS)

- Public supply well west of Modesto
- Construction unknown
- First-time exceedance of 10 mg/L MCL





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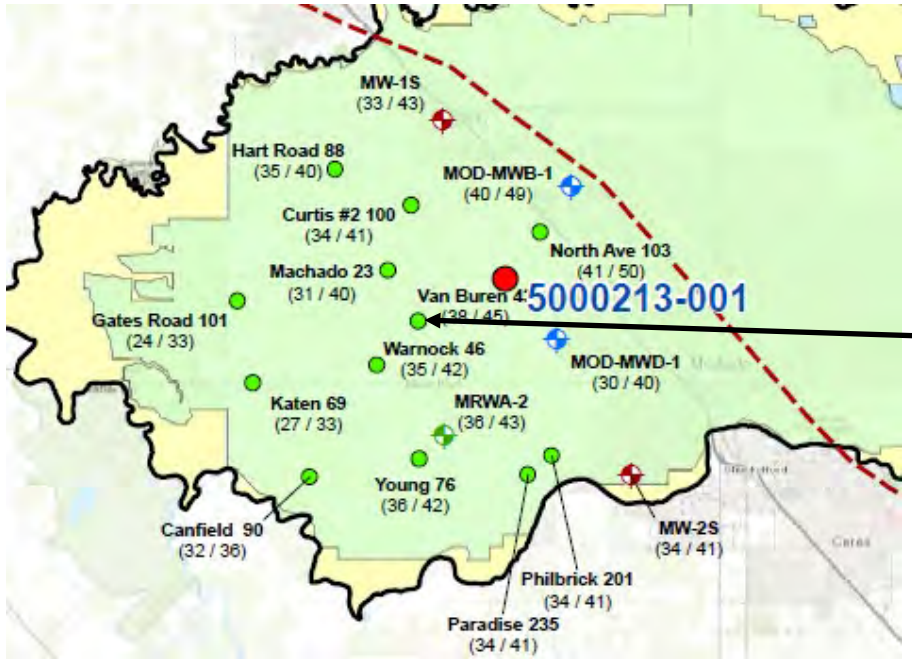
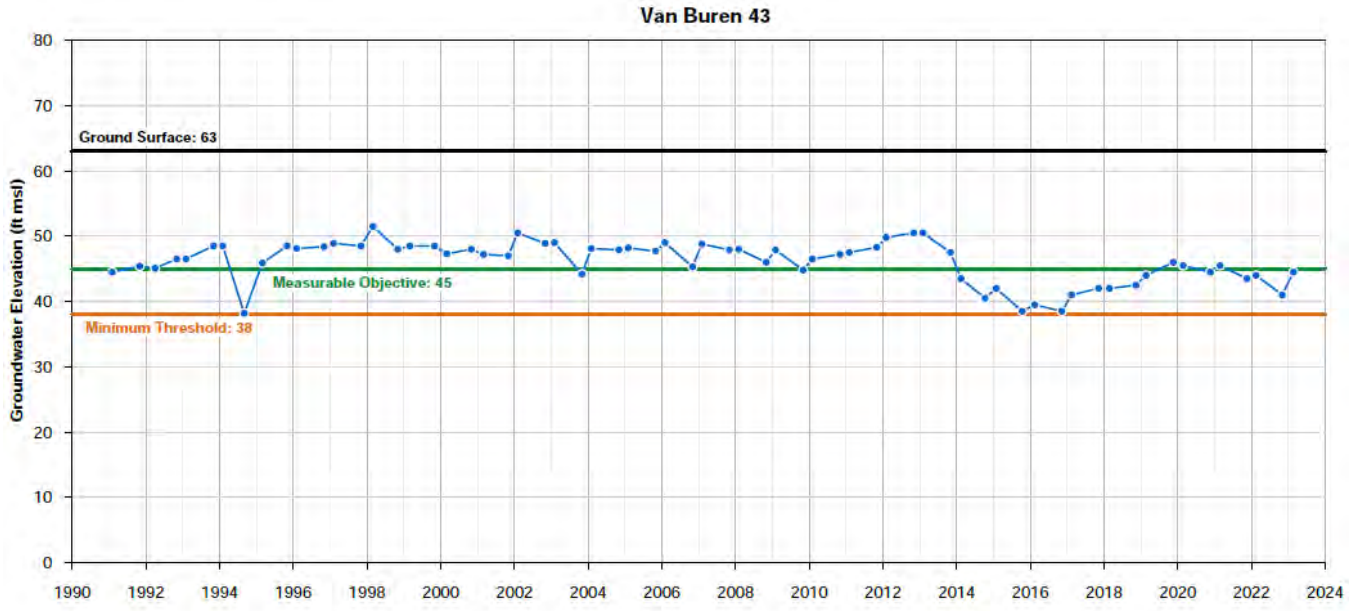
NITRATE: 5000213-001 (WESTERN PRINCIPAL AQUIFERS)

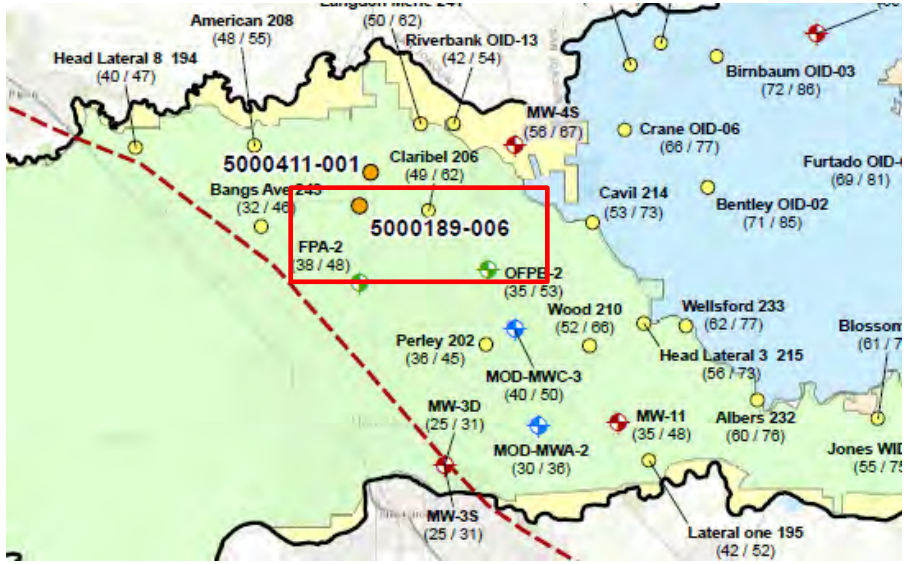
- Water levels at North Ave 103, Van Buren 54, and MOD-MWB-2 have water levels above the MT
- Water levels are stable
- Nitrate increase not due to GSA management

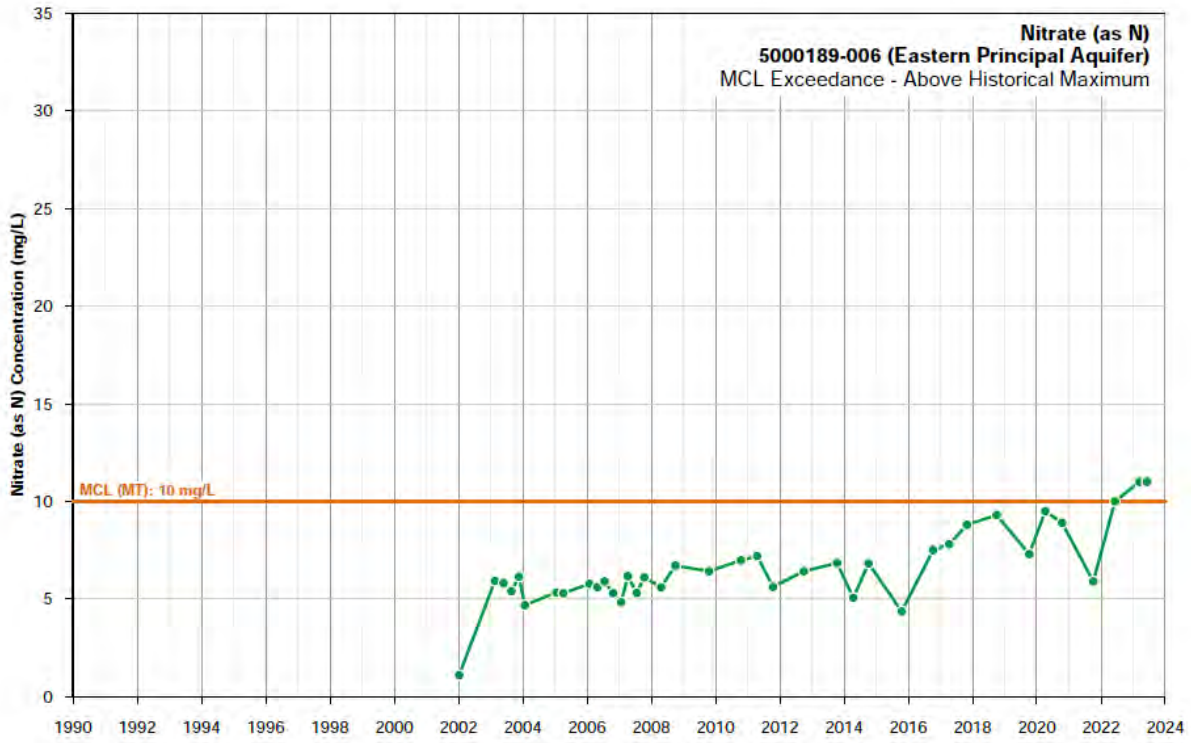




NITRATE: 5000189-006 (EASTERN PRINCIPAL AQUIFER)

- Public supply well
- Nitrate levels increasing since 2004, prior to SGMA Implementation
- Nitrate increase not due to GSA management





TODD GROUNDWATER

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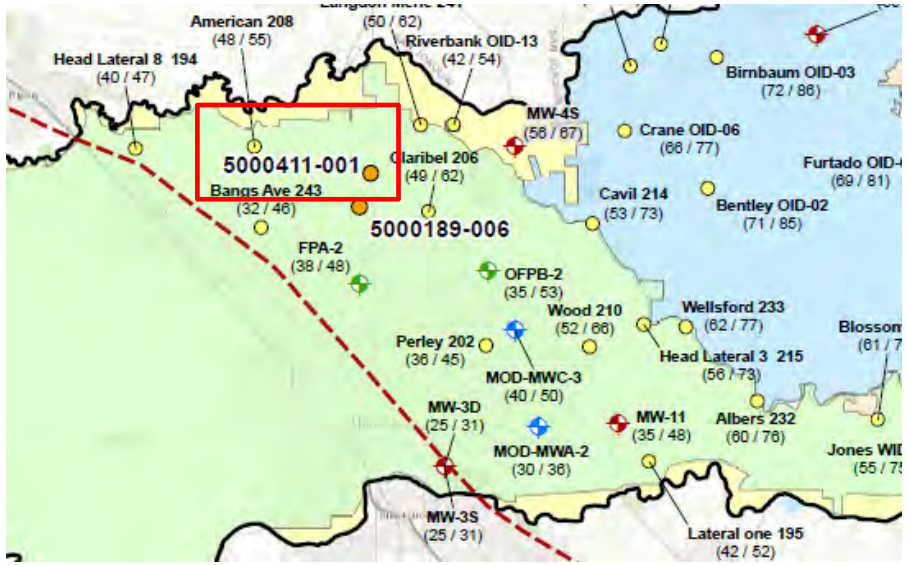
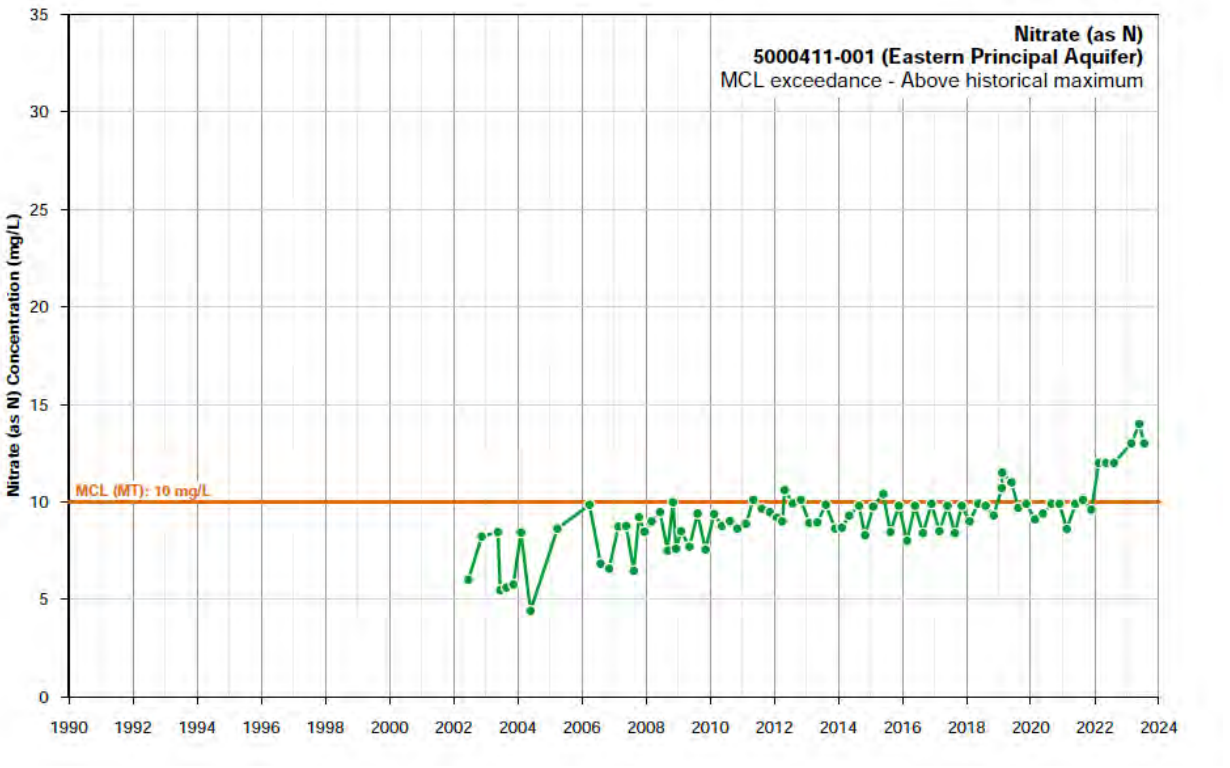
NITRATE: 5000411-001 (EASTERN PRINCIPAL AQUIFER)

- Public supply well
- Nitrate levels above MCL during WY 2022 and WY 2023





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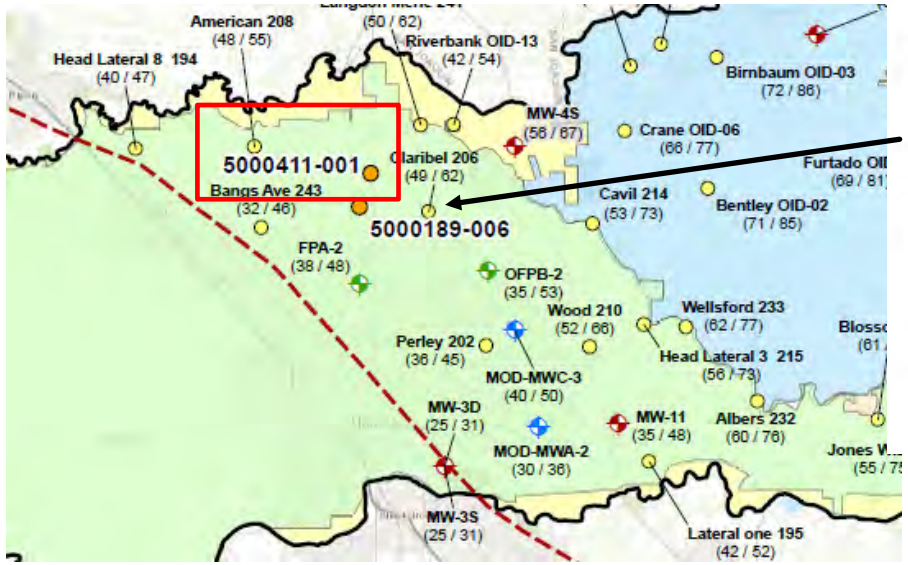
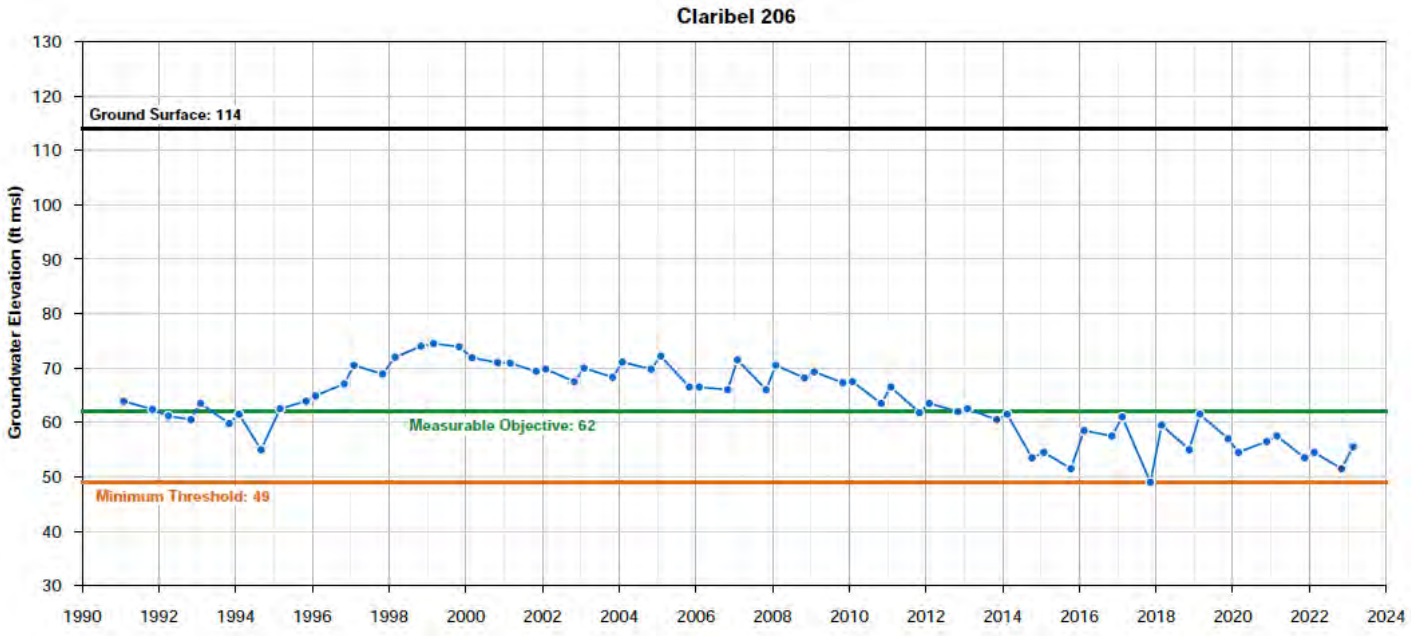
NITRATE: 5000411-001 (EASTERN PRINCIPAL AQUIFER)

- Water levels at Claribel 206 and Langdon Merle 241 are relatively stable and above the MT





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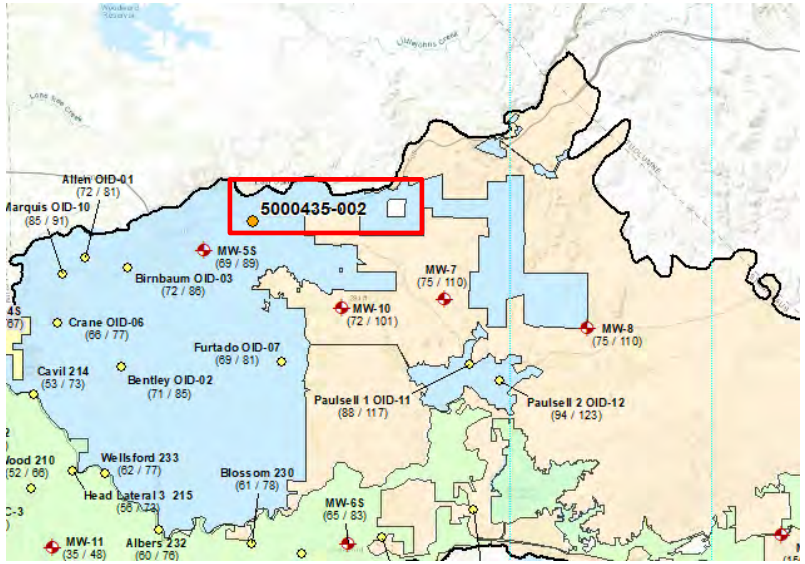
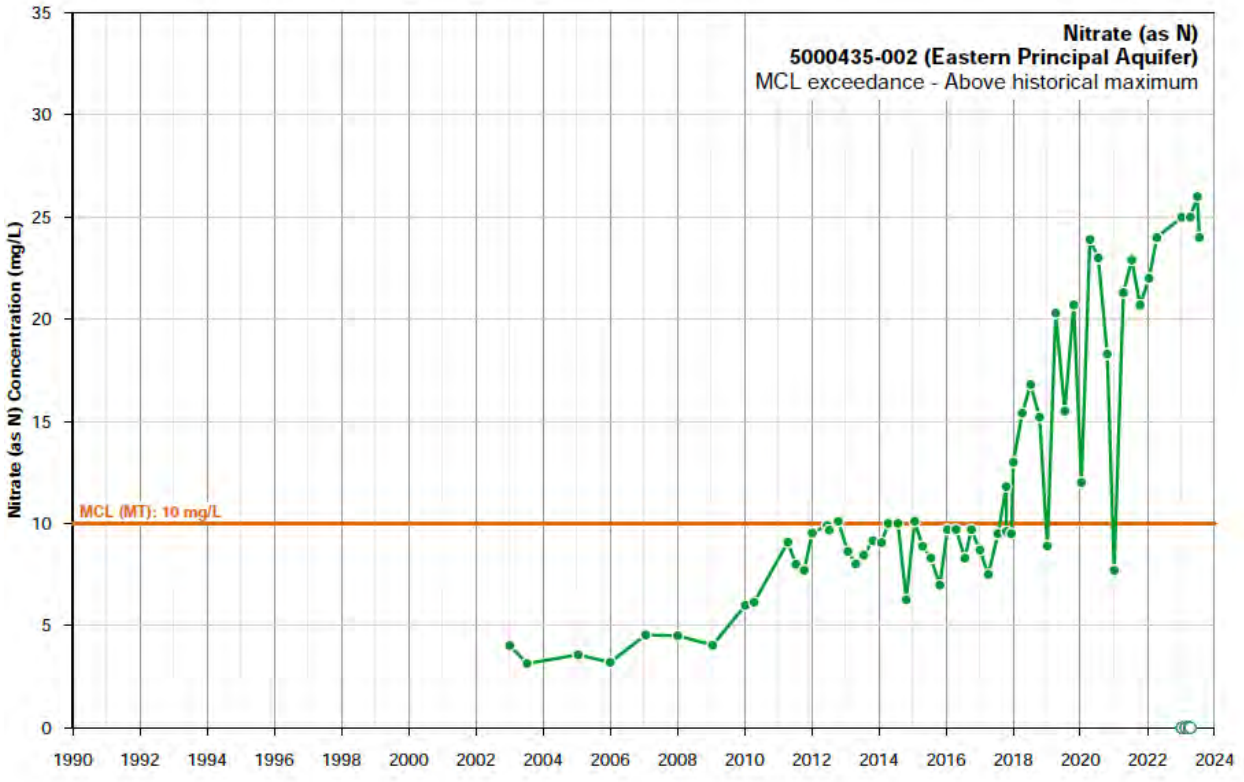
NITRATE: 5000435-002 (EASTERN PRINCIPAL AQUIFER)

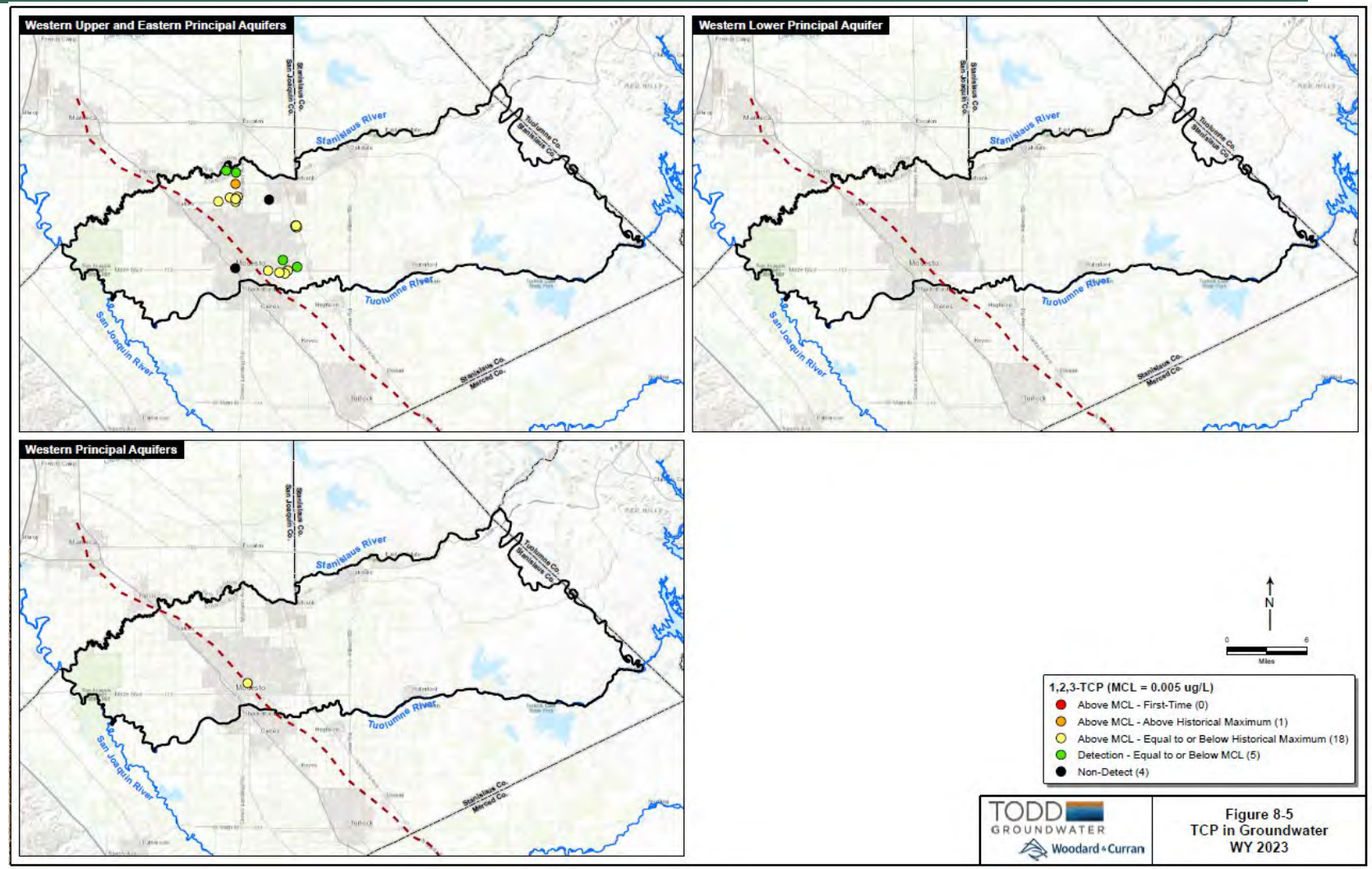
- Public supply well east of Oakdale
- Nitrate concentrations increasing since 2018
- Rapid increases suggest local source (septic tank failure?)





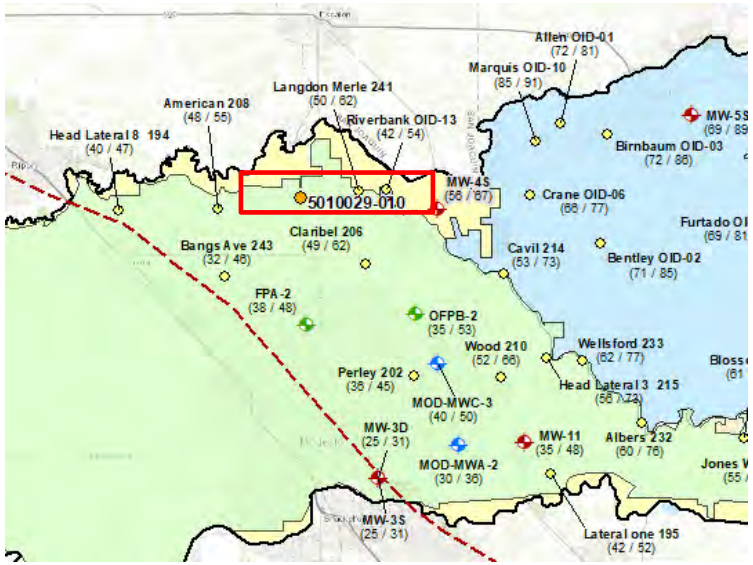
1,2,3 - TCP

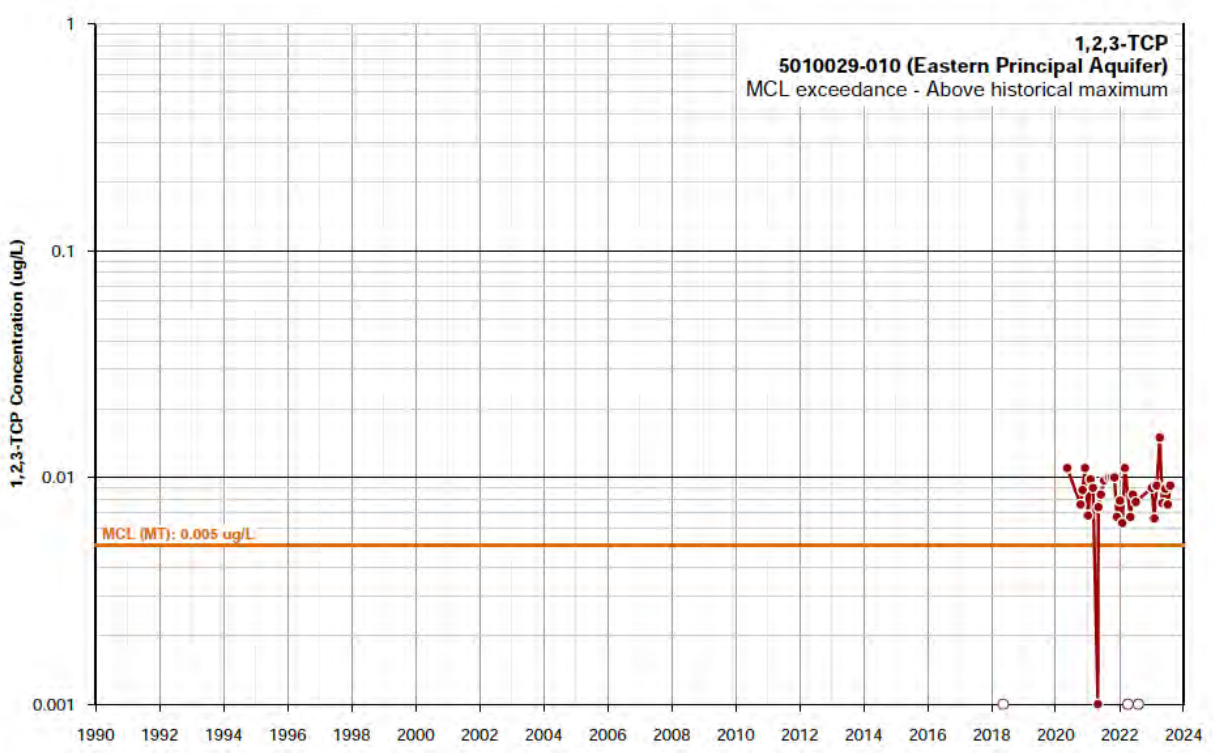
- TCP measured in 28 RMWs during WY 2023
- Most wells measured were in Eastern Principal Aquifer
- 1 potable water supply well reported a further MCL exceedance



TCP: 5010029-010 (Eastern Principal Aquifer)

- Public supply well north of Modesto and west of Riverbank
- Maximum TCP concentration of 0.015 ug/L in WY 2023





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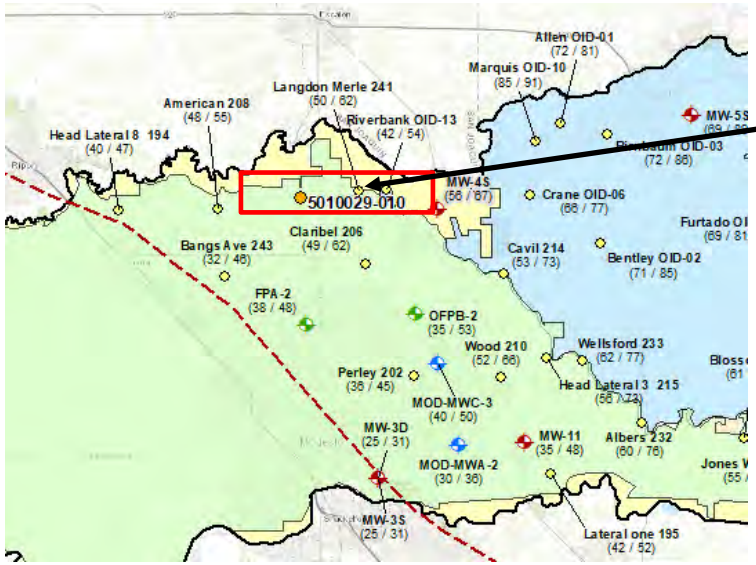
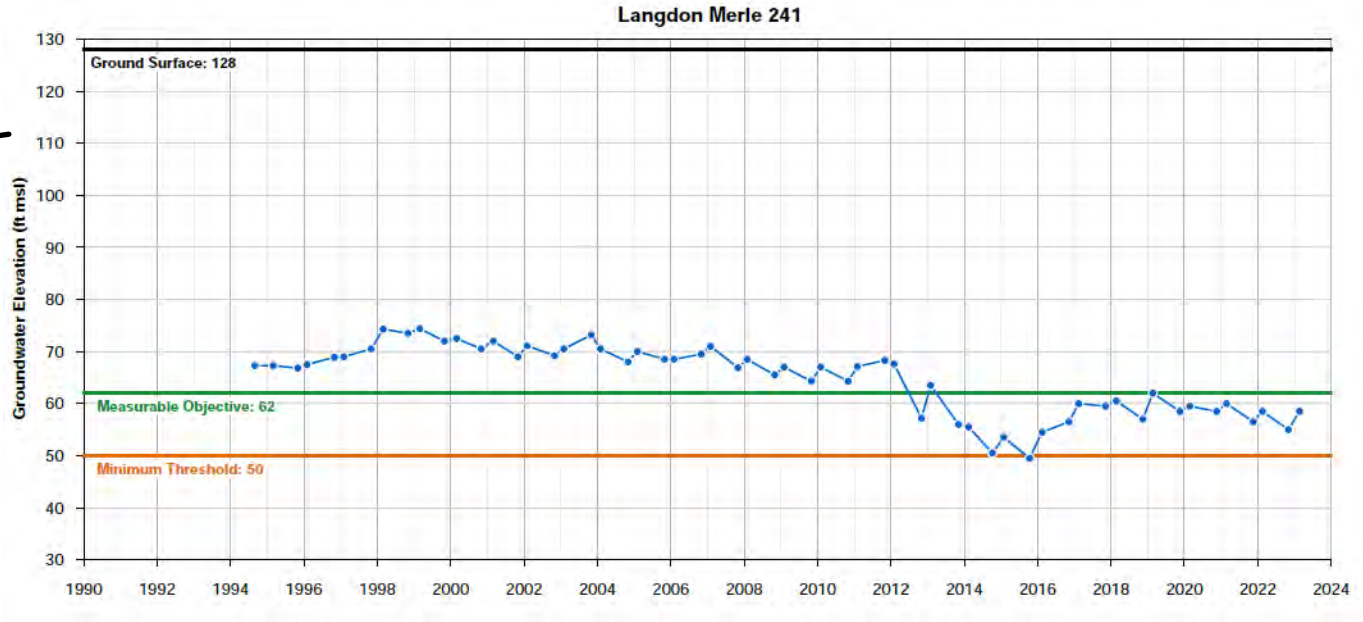
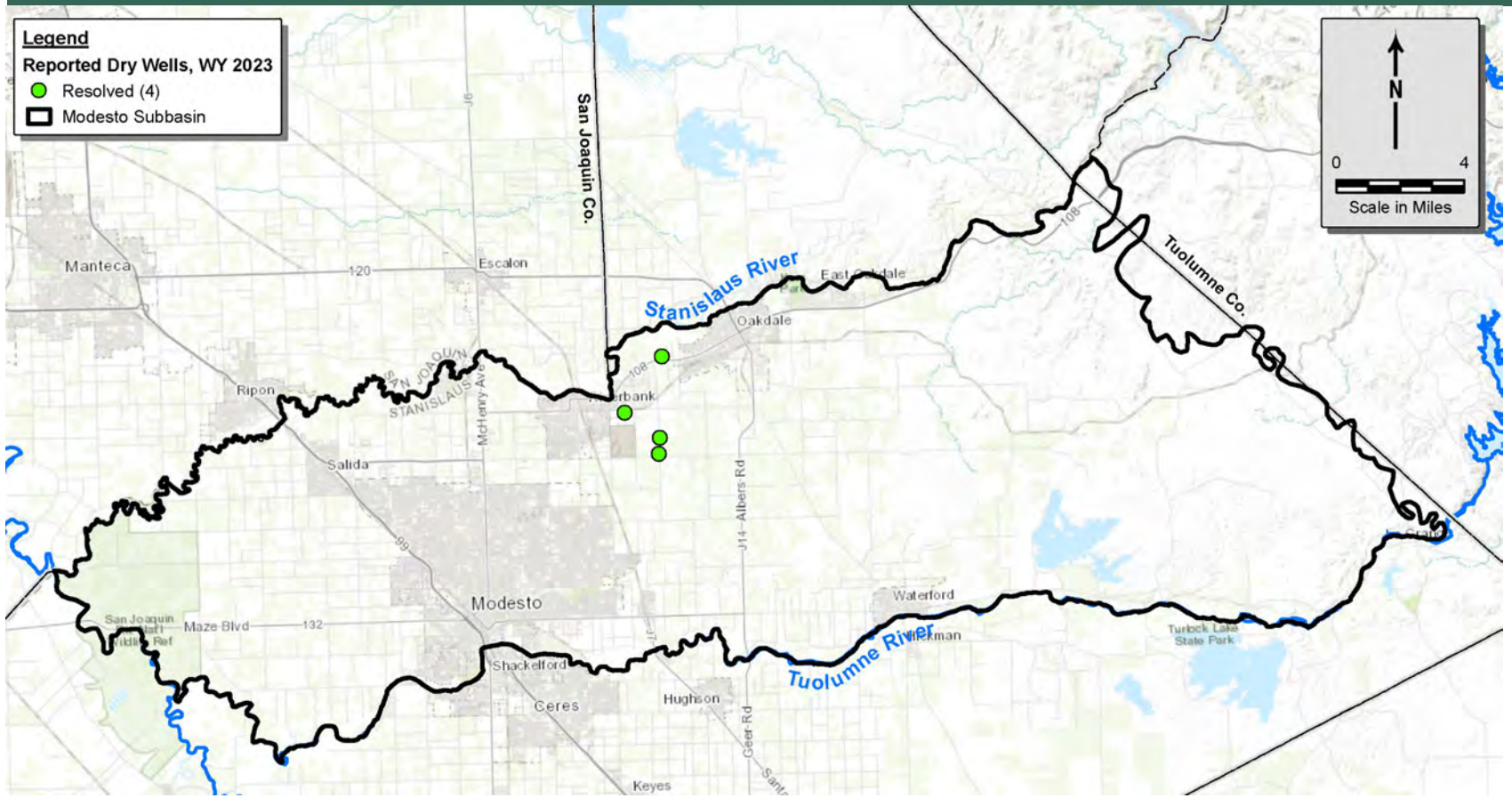
TCP: 5010029-010 (Eastern Principal Aquifer)

- Water levels in nearby monitoring wells (Langdon Merle 241 and American 208) are stable and not below the MT during WY 2023





Reported Dry Wells During WY 2023



- Four reports of dry wells during WY 2023
- All cases were resolved
- Well depths range from 65 to 130 feet
- One well reported sand and muddy water (possible well casing problem)

Source: DWR Dry Well Reporting System

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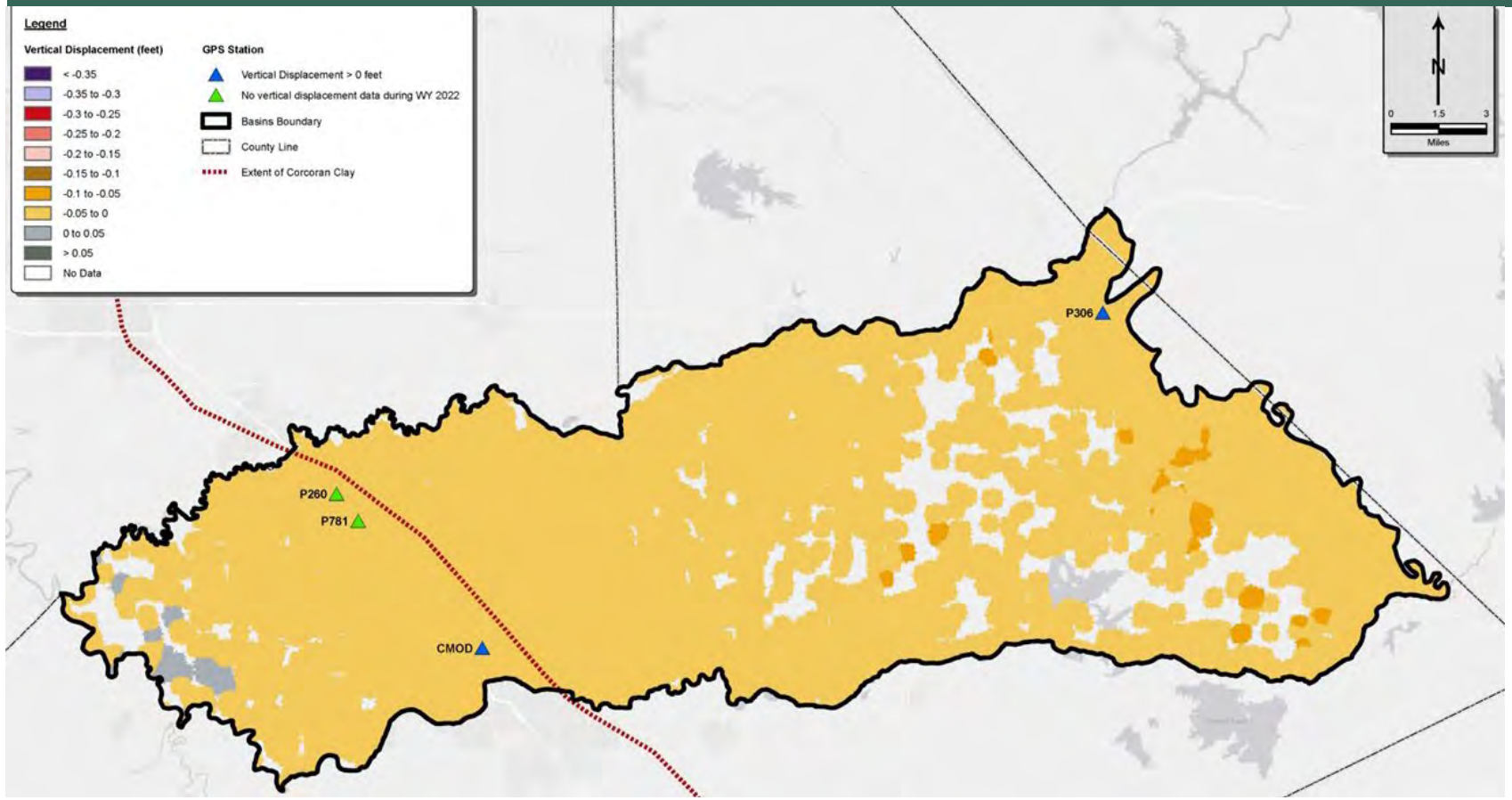
SUBSIDENCE, WY 2023



- WY 2023 land subsidence based on DWR InSAR vertical displacement data
- Vertical ground displacement indicated throughout most of the Subbasin between 0 and -0.05 feet (-0.6 inches)
- Localized areas in eastern Subbasin between -0.1 and -0.05 feet (-1.2 to -0.6 inches)
- Ground surface rise in western Subbasin along San Joaquin River

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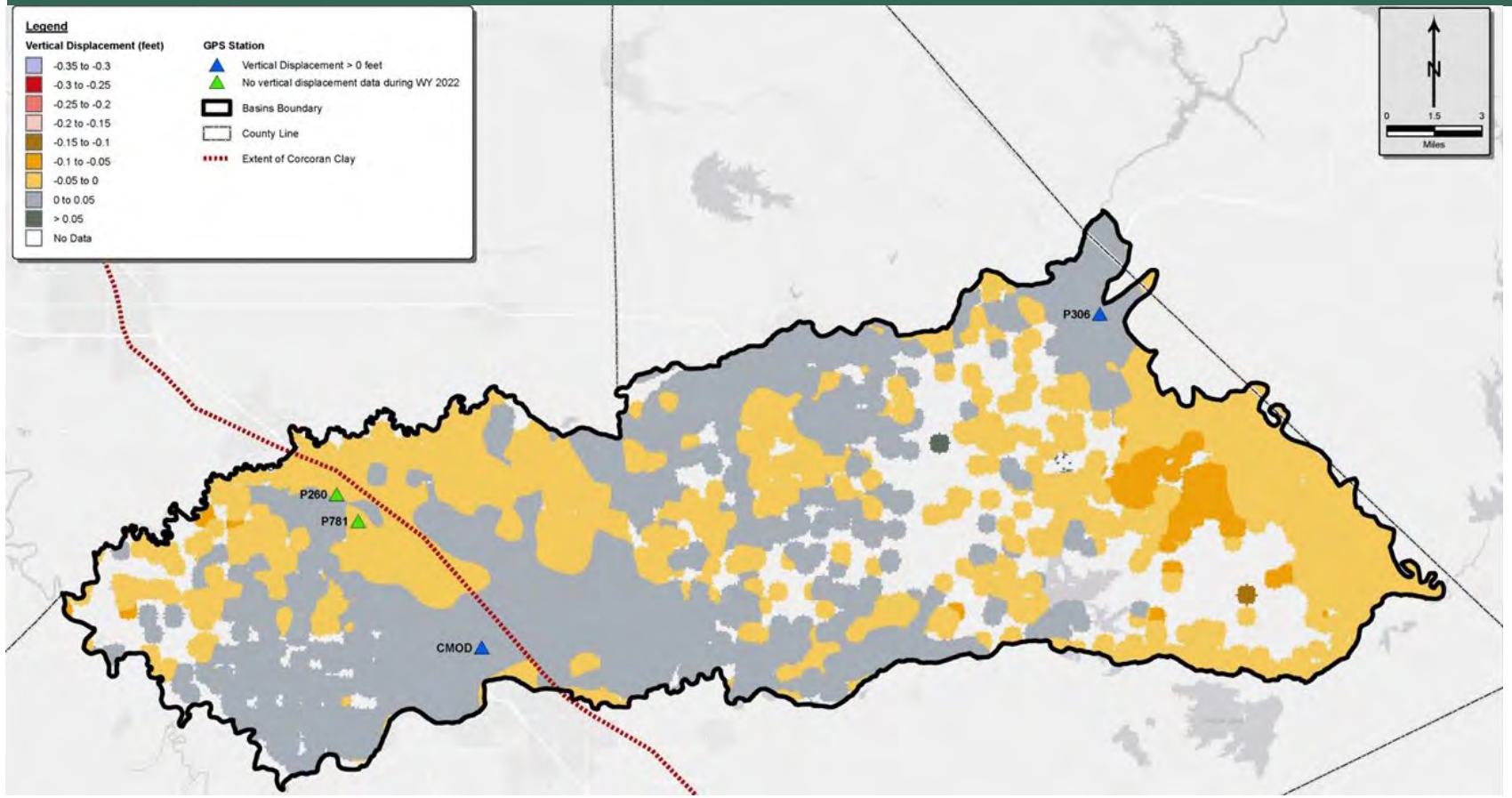
Subsidence, June 2015 to September 2023



- Vertical ground displacement within margin of error (±0.05 feet) in most Subbasin.
- Areas in western Subbasin and north of Modesto Reservoir show cumulative negative vertical ground displacement of -0.1 to -0.05 feet (-1.2 to -0.6 inches)
- Highest rates of subsidence in eastern Subbasin indicated in areas with water level declines.

TODD GROUNDWATER

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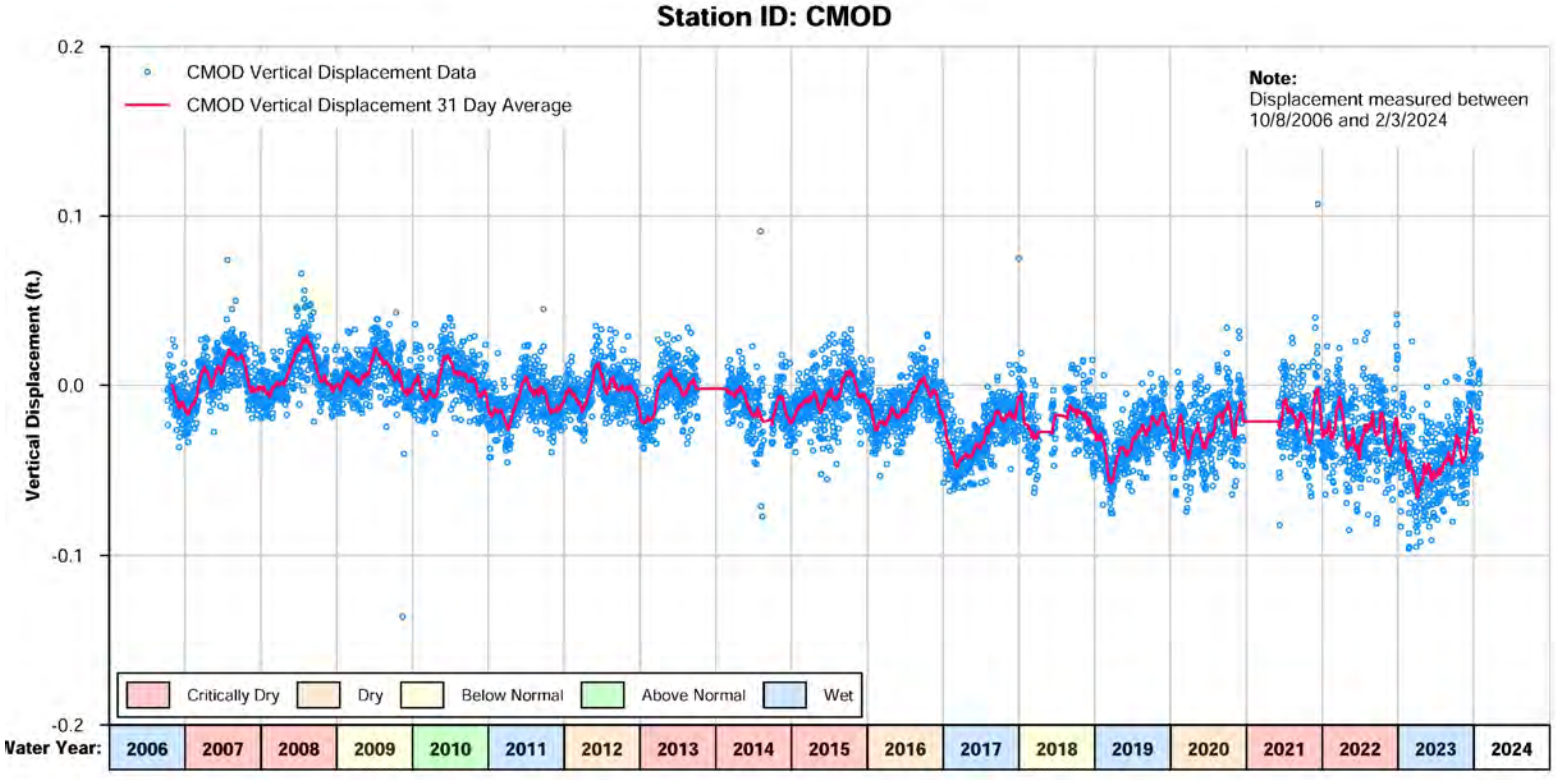
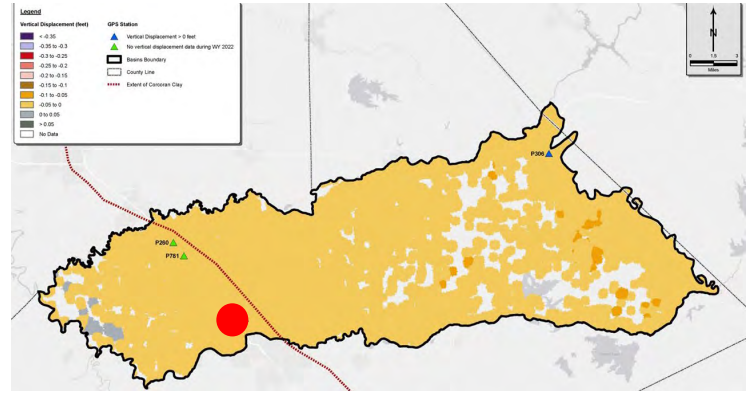
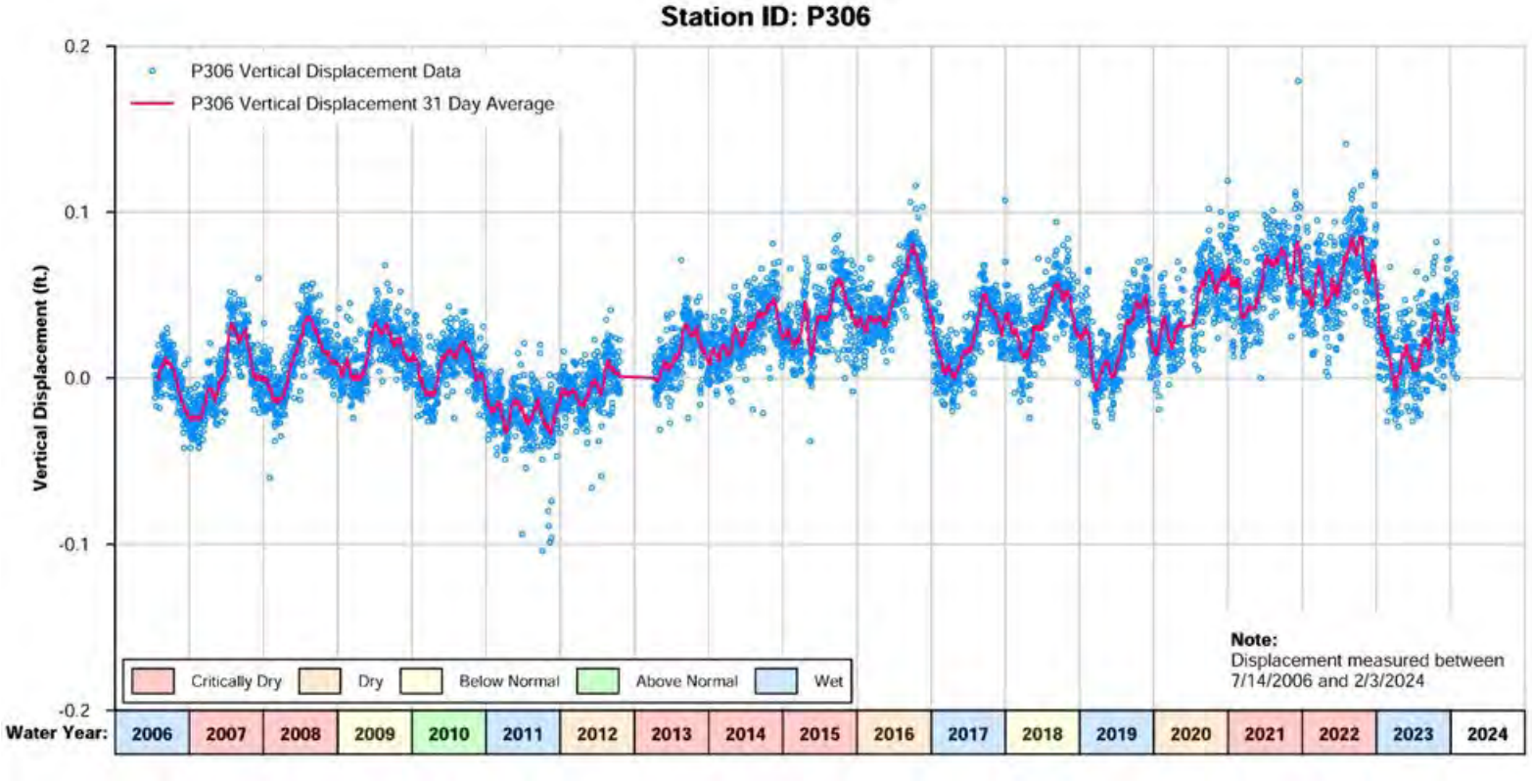
Subsidence, GPS Station CMOD



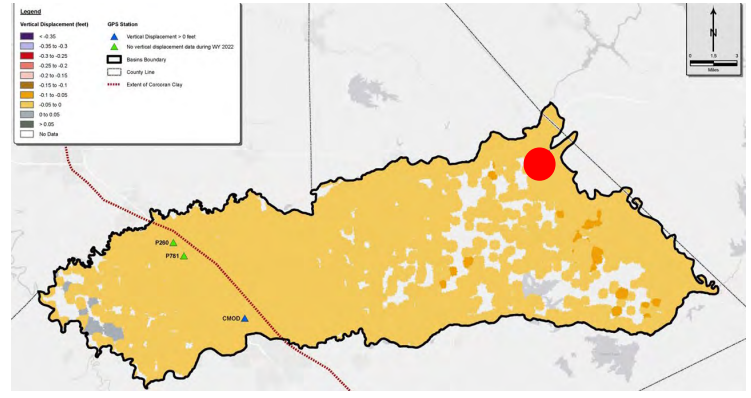
- WY 2023: net vertical displacement of -0.12 inches
- October 2006 to Sept 2023: net vertical displacement of -0.78 inches.
- Ground surface elevation relatively stable



Subsidence, GPS Station P306



- WY 2023: net vertical displacement of -0.89 inches
- July 2006 to Sept 2023: net positive vertical displacement of 0.36 inches.
- Ground surface elevation relatively stable



STANISLAUS AND TUOLUMNE RIVERS GROUNDWATER BASIN ASSOCIATION
GROUNDWATER SUSTAINABILITY AGENCY

QUESTIONS?

Modesto Subbasin SGMA:

2023 Annual Report: C2VSimTM Model Update

STRGBA GSA TAC Meeting

March 13, 2024

Modesto GSP: 2023 Annual Report

Project Tasks

- **Compile Data**
  - Precipitation
  - Evapotranspiration
  - Stream Flow & Boundary Conditions
  - Land Use & Cropping Patterns
  - Surface Water Operations
  - Groundwater Operations
- **Update C2VSimTM**
  - Water Use Budgets
  - Groundwater Budgets
  - Pumping & Change in Storage Maps
  - Stream & Groundwater Hydrographs
- **Prepare 2023 Annual Report**

Modesto GSP: 2023 Annual Report

- The Modesto GSP was due to DWR on January 31, 2022.
- The third Annual Report is due to DWR on April 1, 2024.
  - The third Annual Report covers the 2023 water year (Oct 2022 – Sept 2023).
  - Annual Reports are due to DWR "by April 1 of each year following the adoption of the Plan" (§356.2).
  - Annual Report regulations require that water budget analyses (i.e., change in storage) use "historical data to the greatest extent available, including from January 1, 2015, to the current reporting year" (§356.2 (b)(1)(B) and §356.2 (b)(5)(B)).

Model Update

- **Goals:** Support the Annual Report by developing:
  - Subbasin-wide water budgets
  - Temporal and spatial estimates of groundwater production
  - Temporal and spatial estimates of change in storage by aquifer

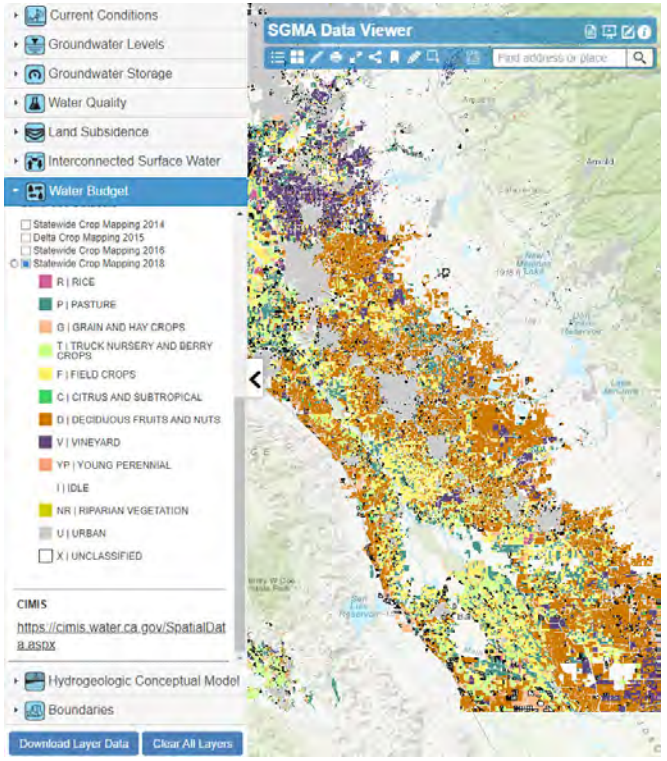
- **Approach:** Update the Modesto Groundwater Model for WY 2023
  - Extend all time-series input files with the best available data.
  - A verification of the model performance will be performed.
  - No changes to the model structure or parameters will be made.

Publicly Available Data

State, Federal, & Other Resources:

- Precipitation — PRISM
- Evapotranspiration — CIMIS
- Land Use Data — DWR
- Riparian Diversions — eWRIMS
- Stream Flow Data — CDEC & USGS
- Groundwater Levels — CASGEM & WDL

DWR SGMA Data Viewer



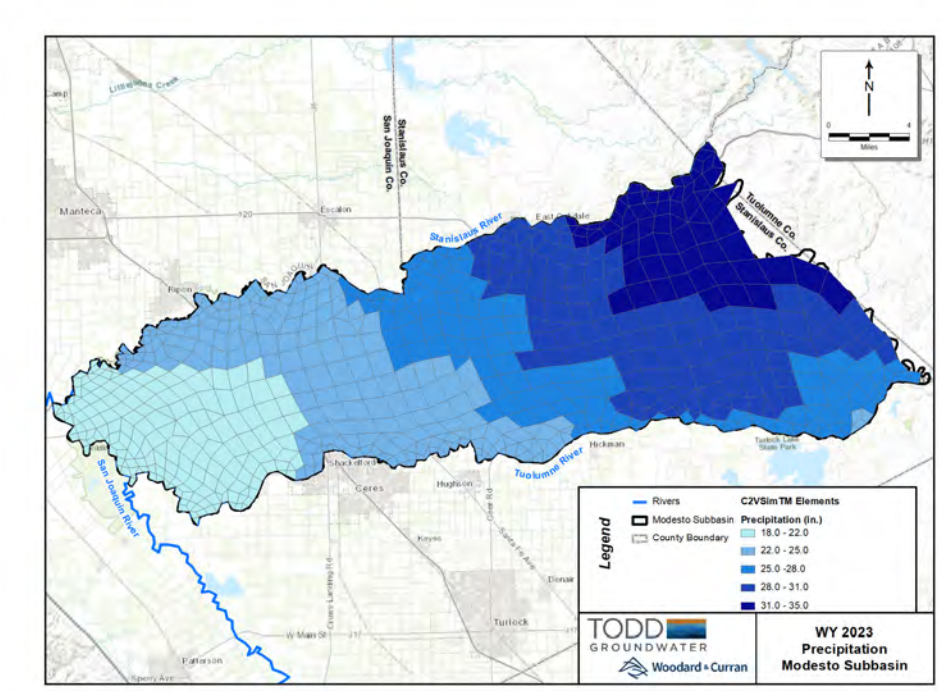
Local Data

- Agricultural Operations
  - River diversions
  - Farm-gate deliveries
  - Municipal deliveries
  - Reservoir seepage
  - Conveyance seepage
  - Groundwater production
- Urban/Municipal Operations
  - Population of service area
  - Groundwater production
  - Recycled water deliveries

Agricultural Agencies:
Modesto Irrigation District
Oakdale Irrigation District

Municipal Agencies:
City of Modesto
City of Oakdale
City of Riverbank
City of Waterford

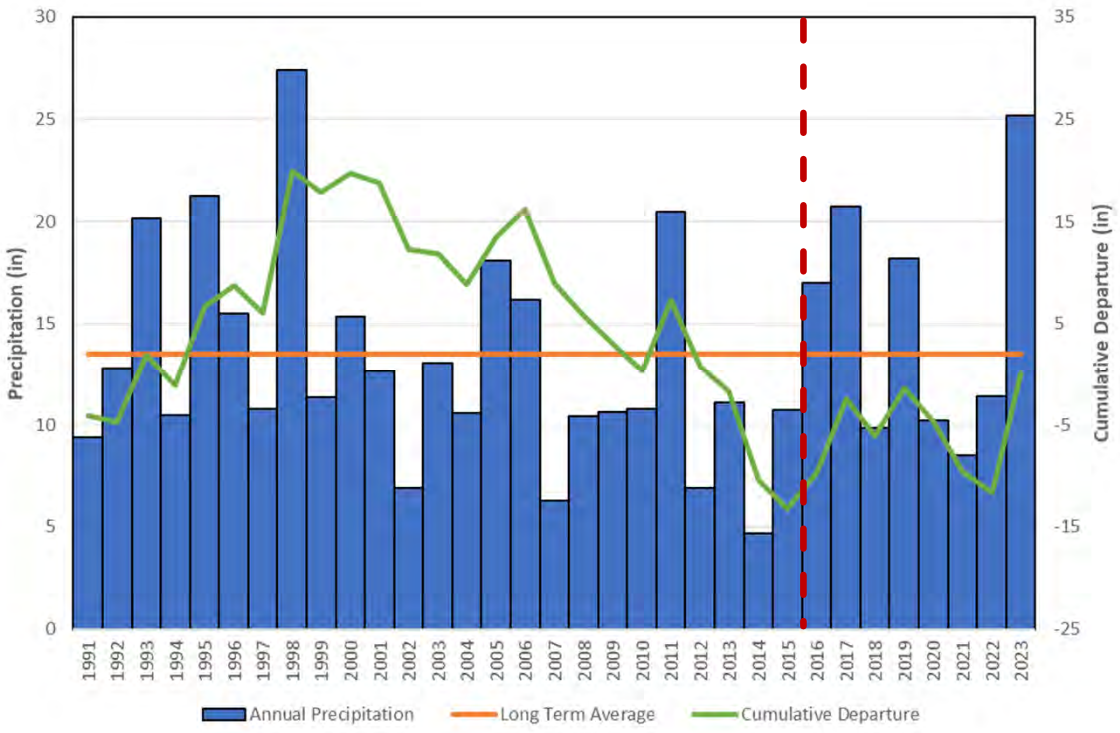
PRECIPITATION



Data Source: PRISM

2016 (D)	17.01 in
2017 (W)	20.73 in
2018 (BN)	9.88 in
2019 (W)	18.19 in
2020 (D)	10.23 in
2021 (C)	8.51 in
2022 (C)	11.41 in
2023 (W)	25.15 in
Average	**13.49 in**

PRECIPITATION



Data Source: PRISM

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2021 (C)	8.51 in
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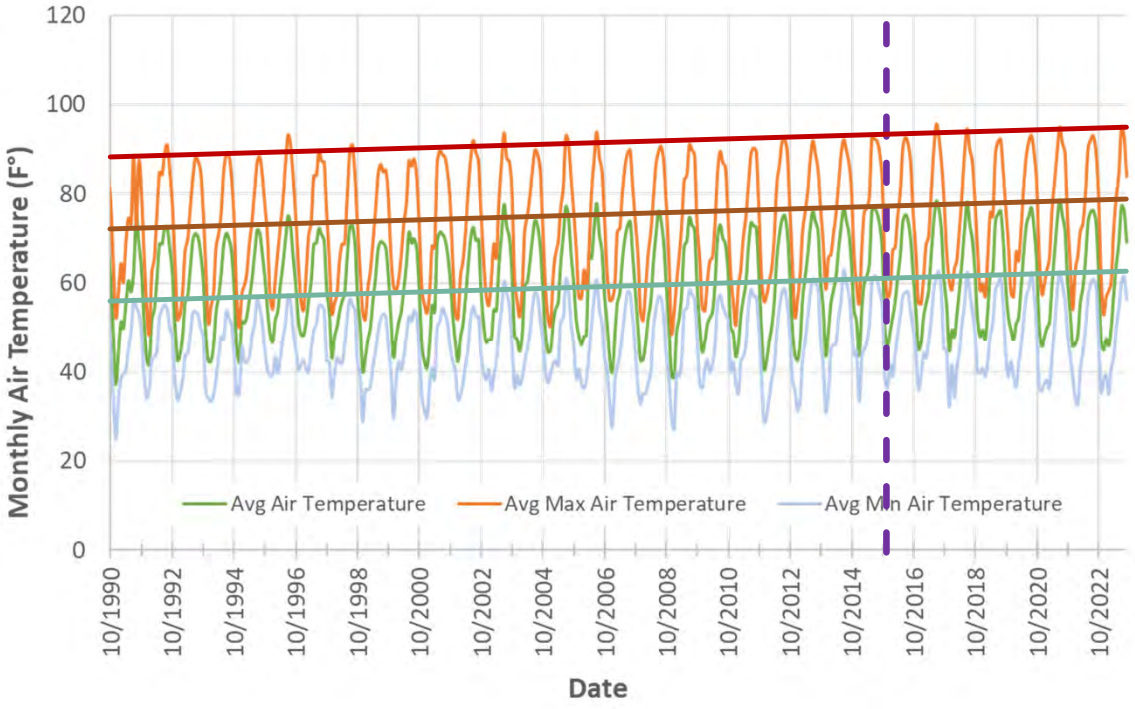
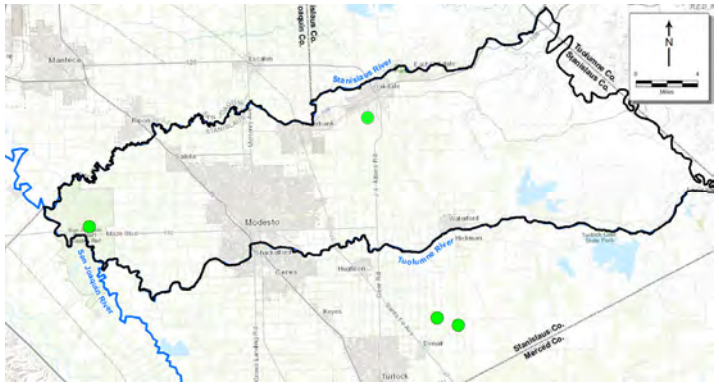
TEMPERATURE

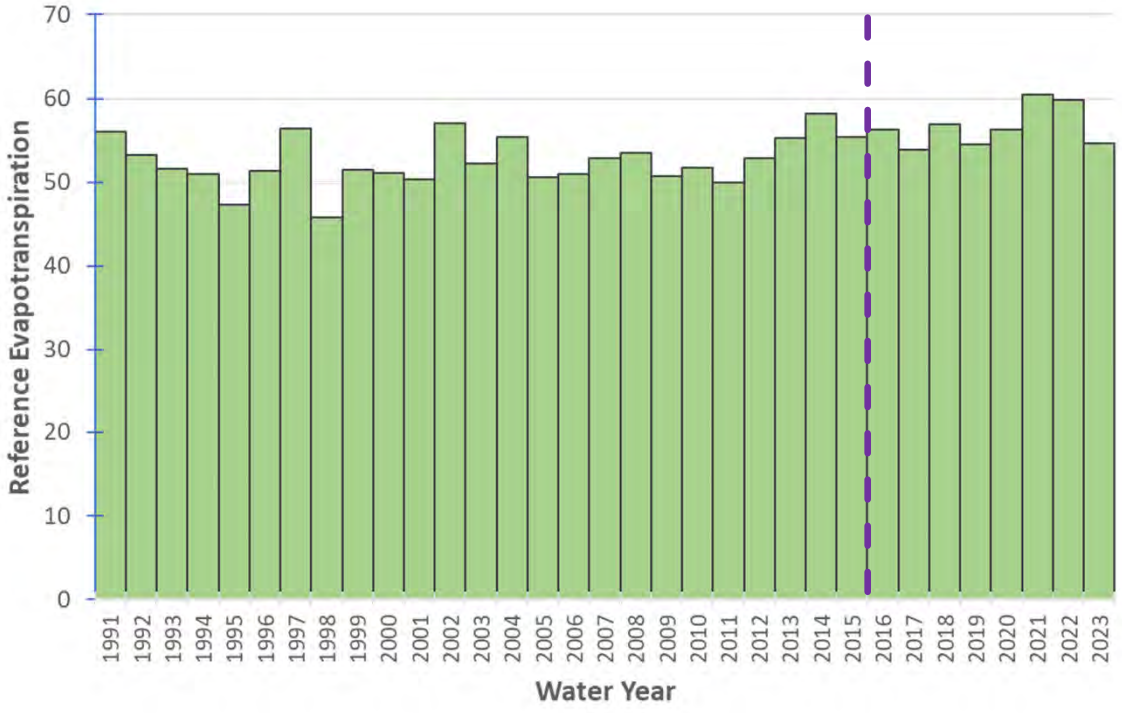


Data Source: CIMIS

- #71 (Modesto)
- #168 (Denair)
- #206 (Denair II)
- #194 (Oakdale)

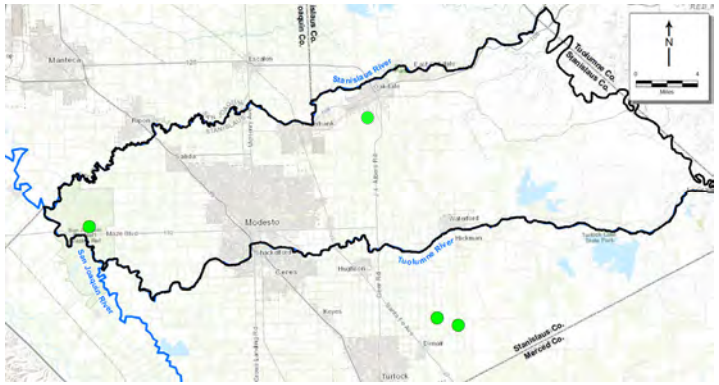


EVAPOTRANSPIRATION

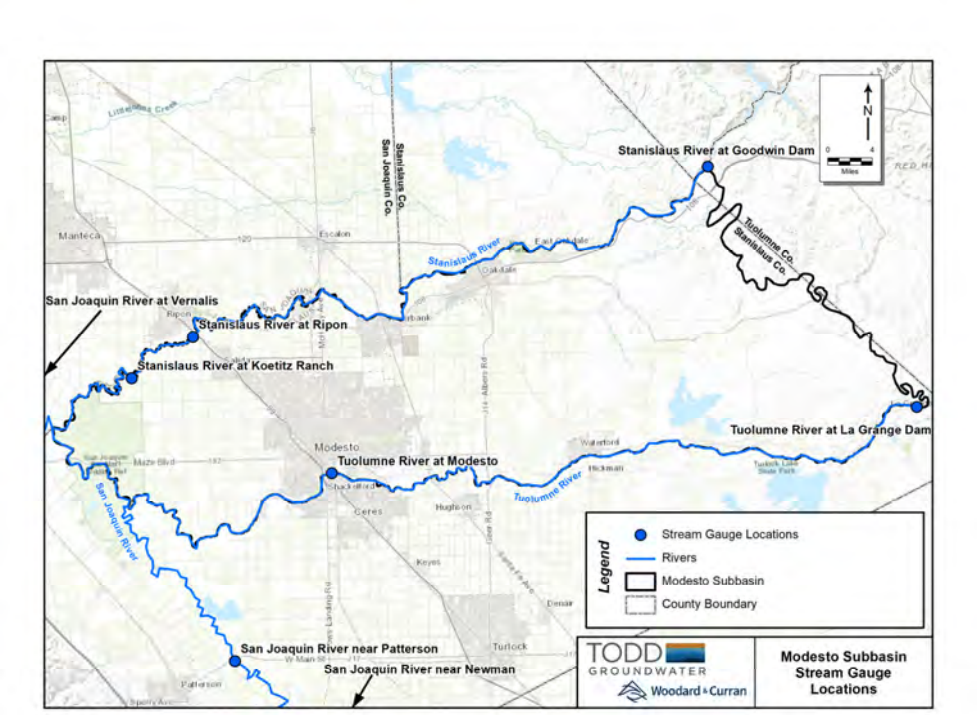


Data Source: CIMIS

- #71 (Modesto)
- #168 (Denair)
- #206 (Denair II)
- #194 (Oakdale)



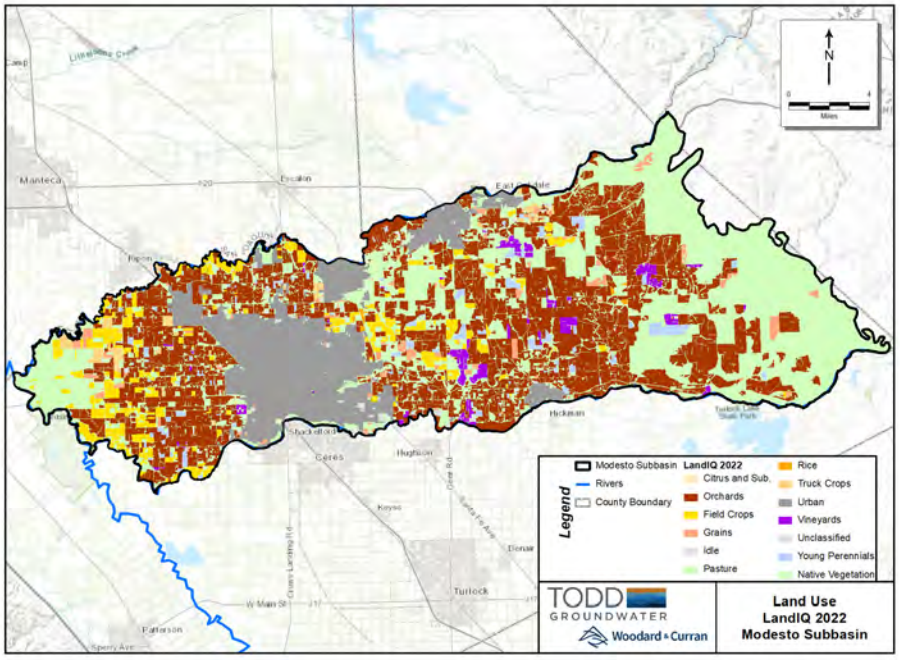
Observed Streamflow and GWL Data



Data Source:

- Stanislaus River
  - CDEC: Goodwin Dam
  - USGS: at Ripon
  - CDEC: at Koetitz Ranch
- Tuolumne River
  - MID: La Grange Dam
  - USGS: at Modesto
- San Joaquin River
  - USGS: near Newman
  - USGS: at Vernalis
  - CDEC: near Patterson

Land Use & Cropping Patterns

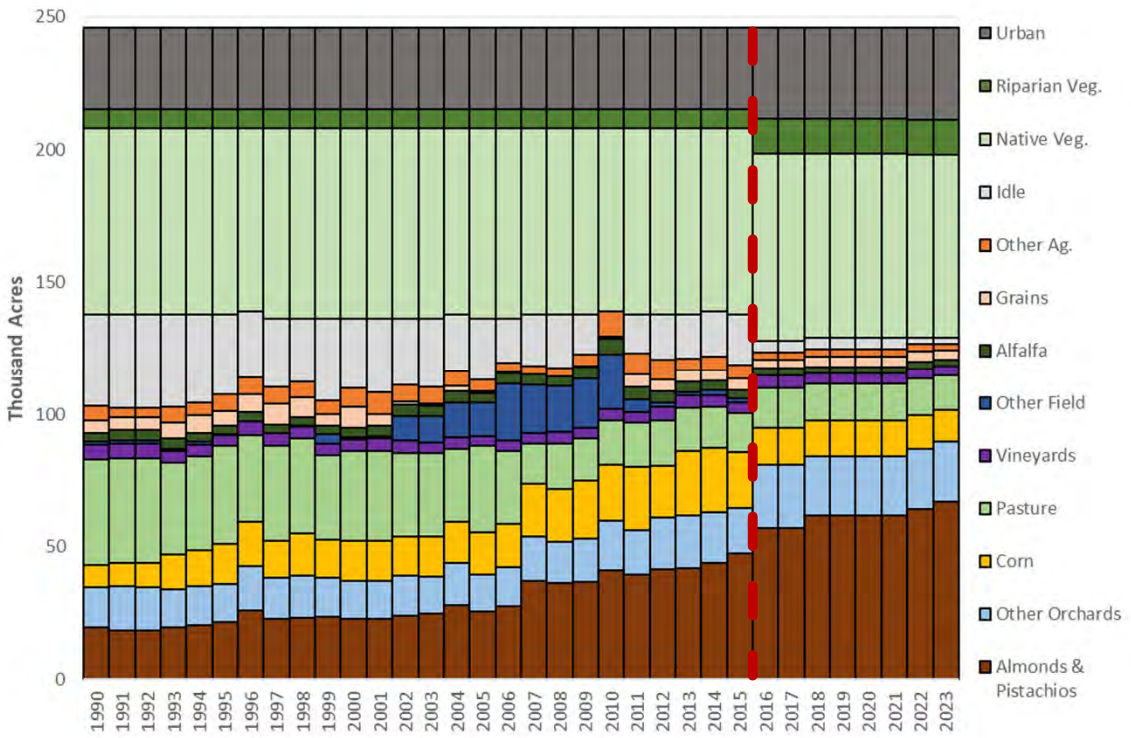


Data Source: DWR

Urban	35,000
Native Veg.	69,000
Riparian Veg.	13,000
Idle	2,000
Other Ag.	2,000
Grains	4,000
Alfalfa	2,000
Vineyards	4,000
Pasture	13,000
Corn	12,000
Other Orchards	23,000
Almonds & Pistachios	67,000
Total	246,000

Units: acres

Land Use & Cropping Patterns



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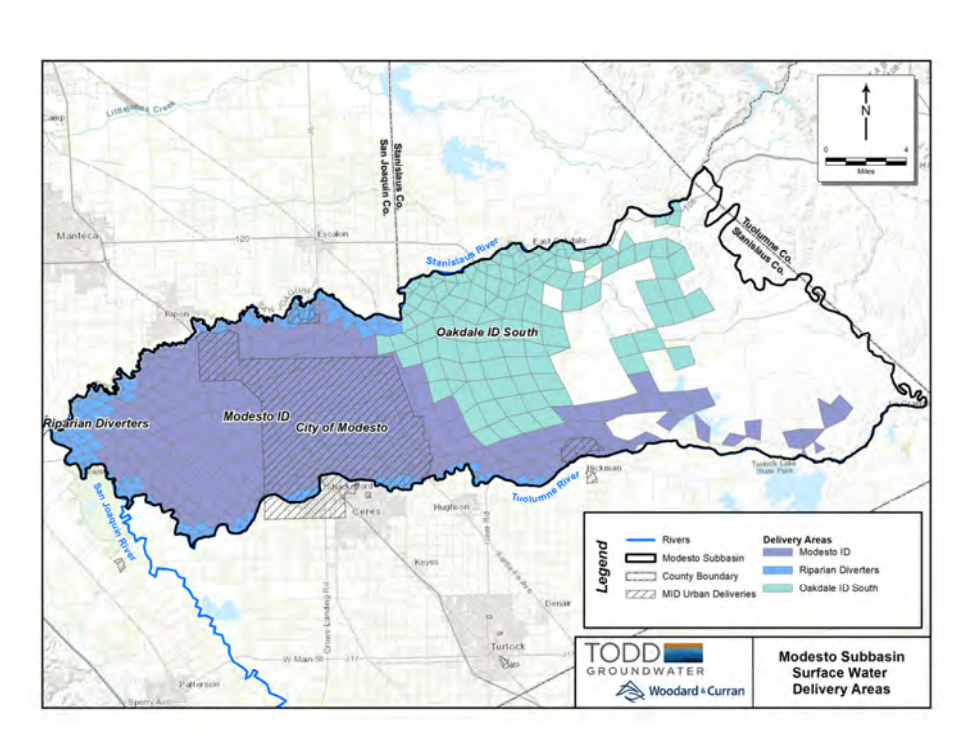
Units: acres

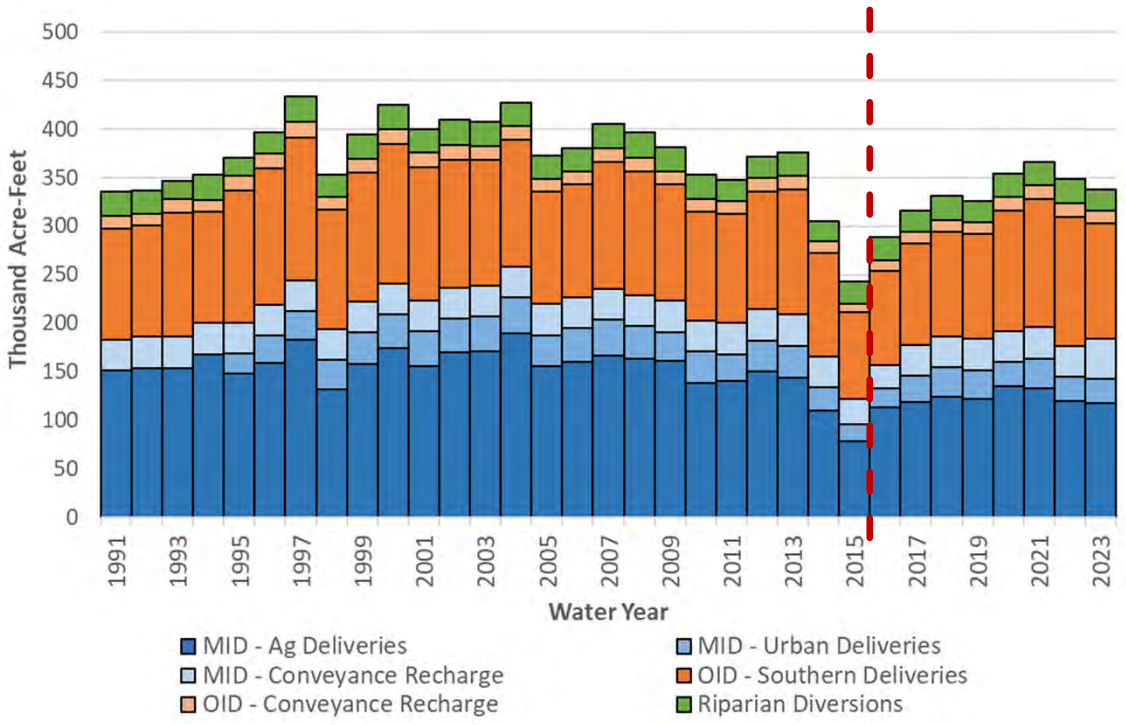
Surface Water Operations



Data Source:

- Modesto ID
  - Ag Deliveries
  - M&I Deliveries
  - Modesto Res. Recharge
  - Conveyance Recharge
- Oakdale ID
  - Southern Deliveries
  - Conveyance Recharge
- Riparian Diversions

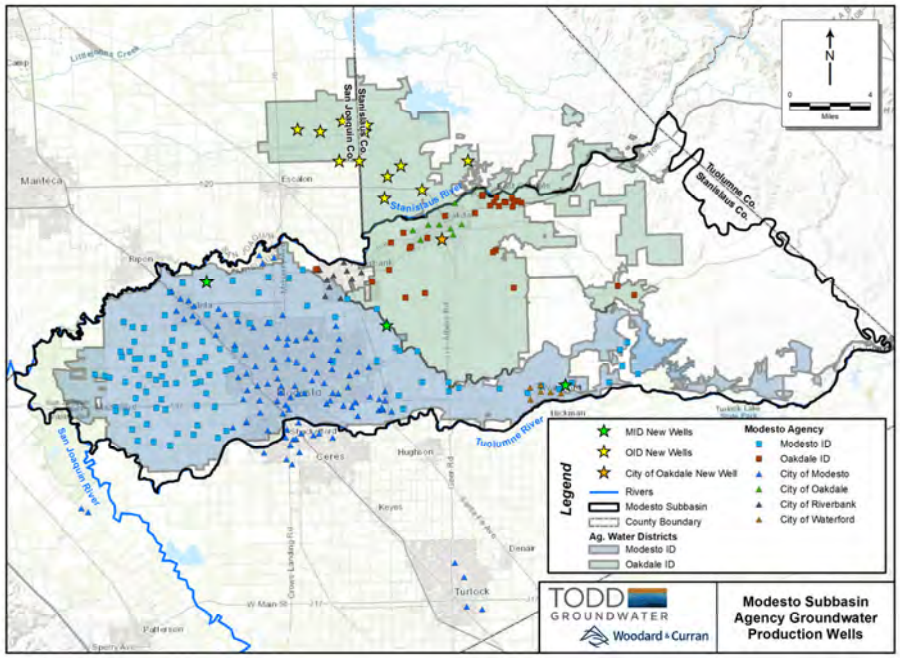
Surface Water Operations



Data Source:

- Modesto ID
  - Ag Deliveries
  - M&I Deliveries
  - Modesto Res. Recharge
  - Conveyance Recharge
- Oakdale ID
  - Southern Deliveries
  - Conveyance Recharge
- Riparian Diversions

Groundwater Operations

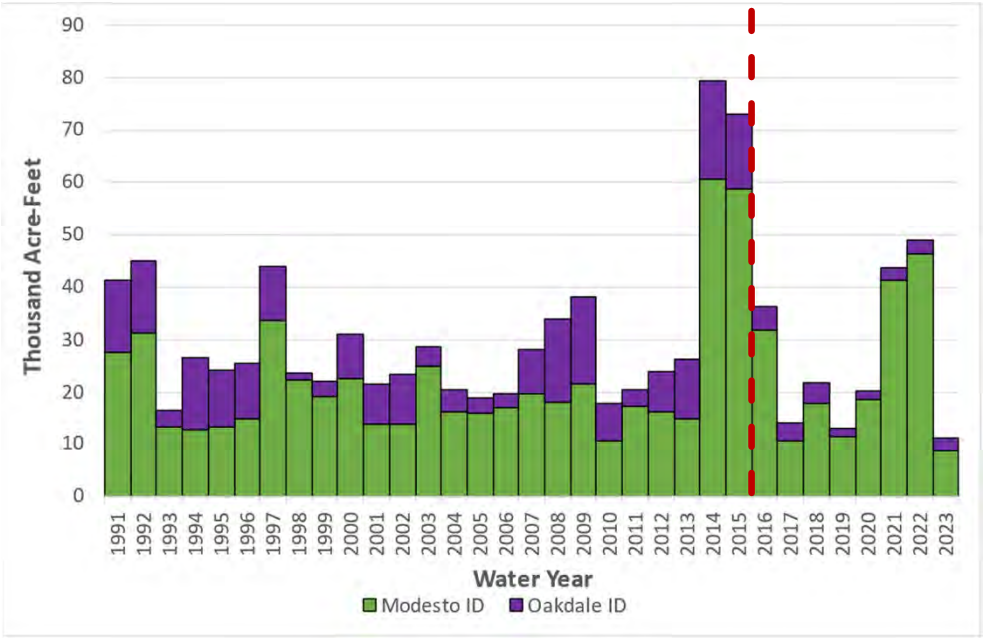


Data Source:

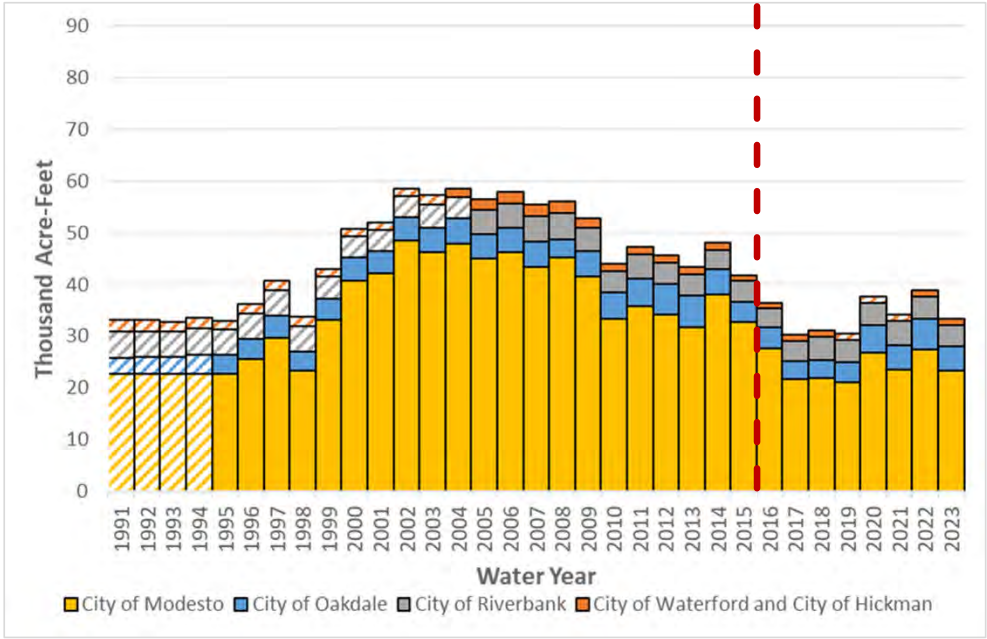
- Modesto ID
- Oakdale ID
- Modesto, City of
- Oakdale, City of
- Riverbank, City of
- Waterford, City of

Groundwater Operations

Agricultural Agency Pumping



Urban Agency Pumping



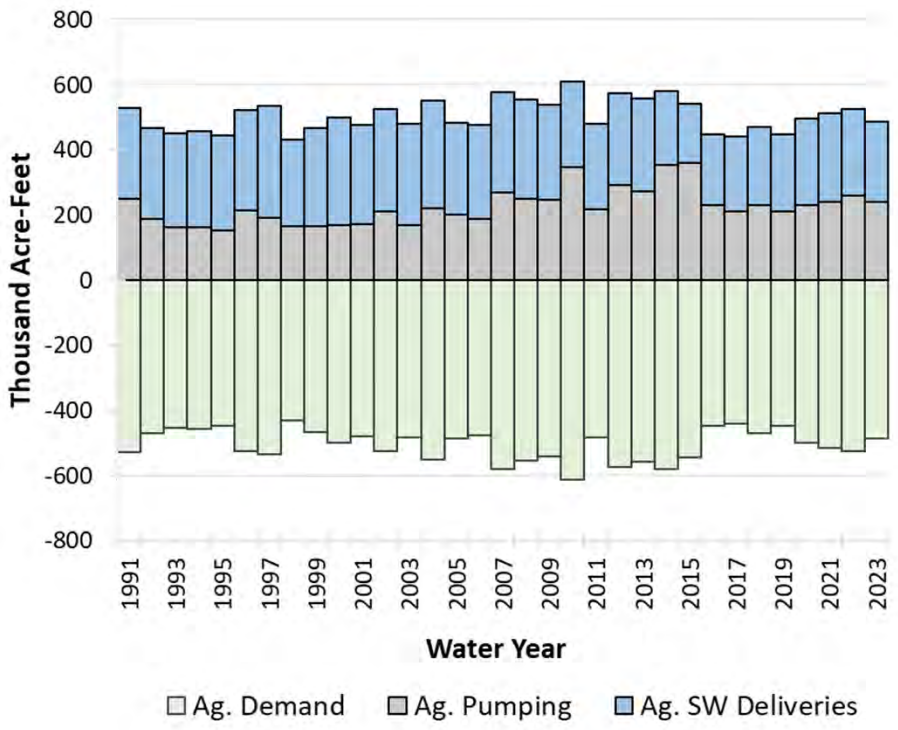
MODEL RESULTS

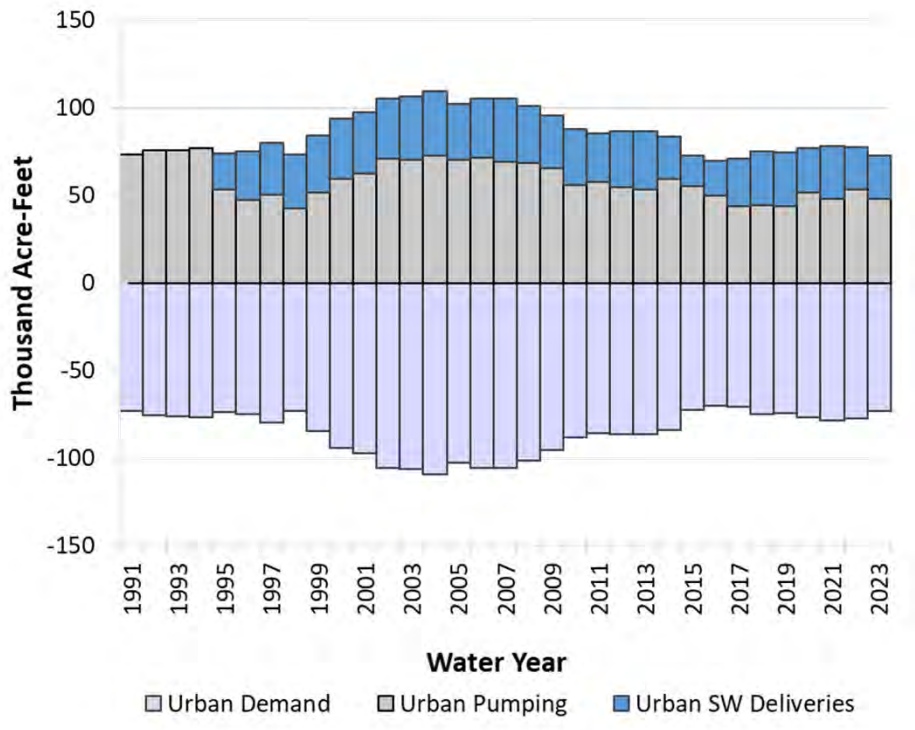
WATER BUDGETS

WOODARD &CURRAN

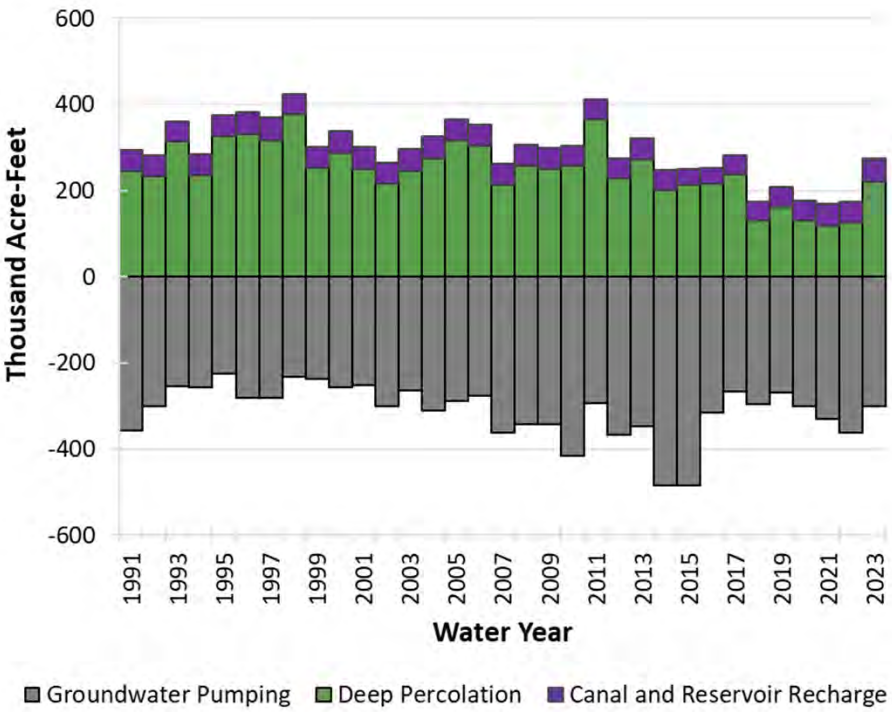
TODD GROUNDWATER

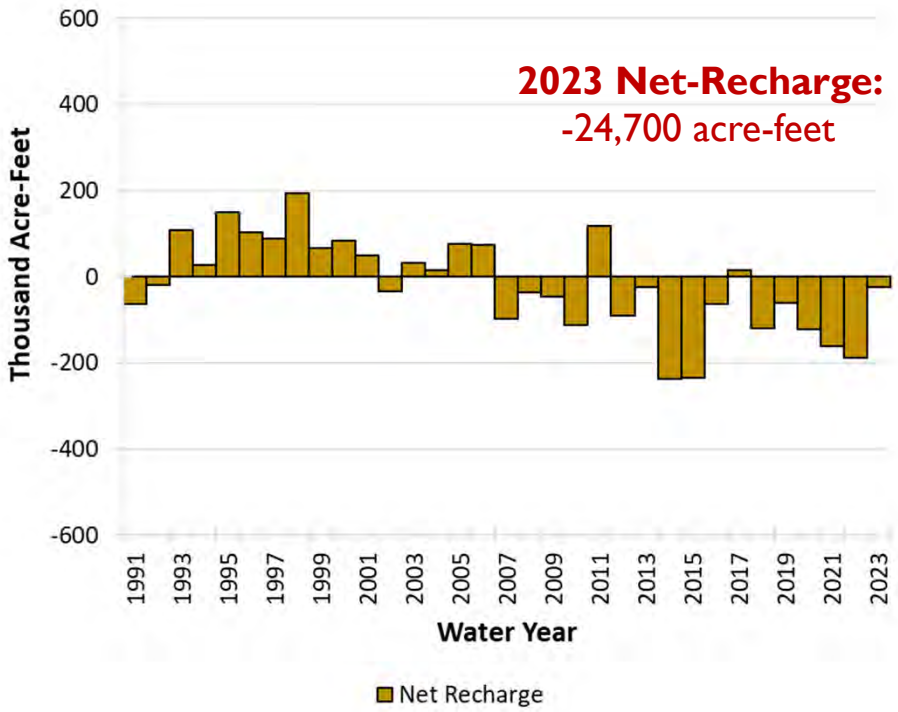
Modesto Subbasin: Land and Water Use



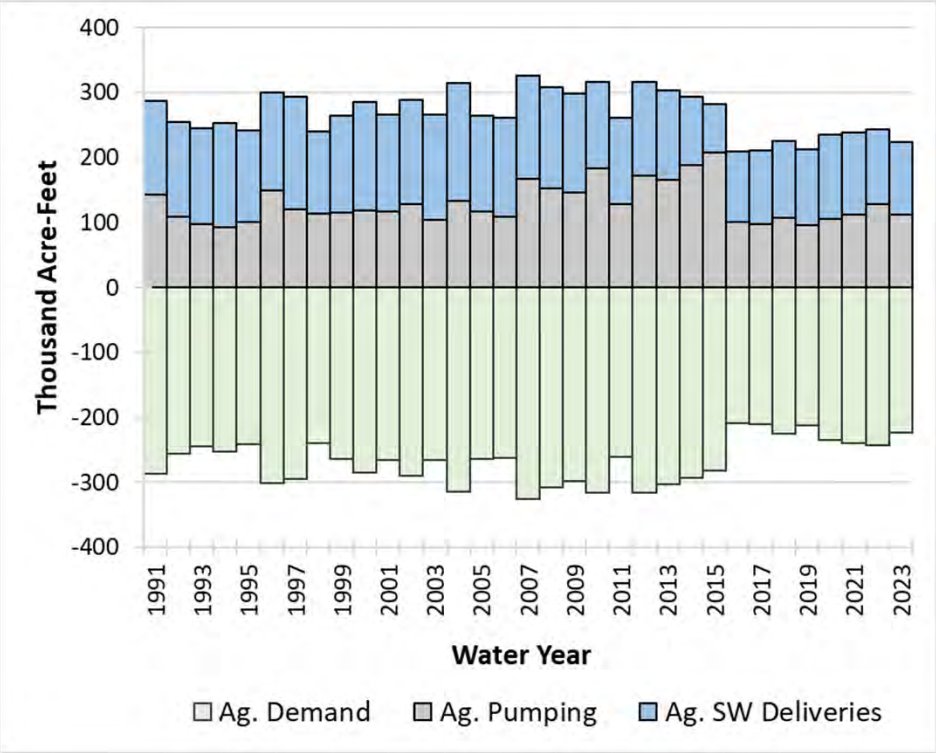


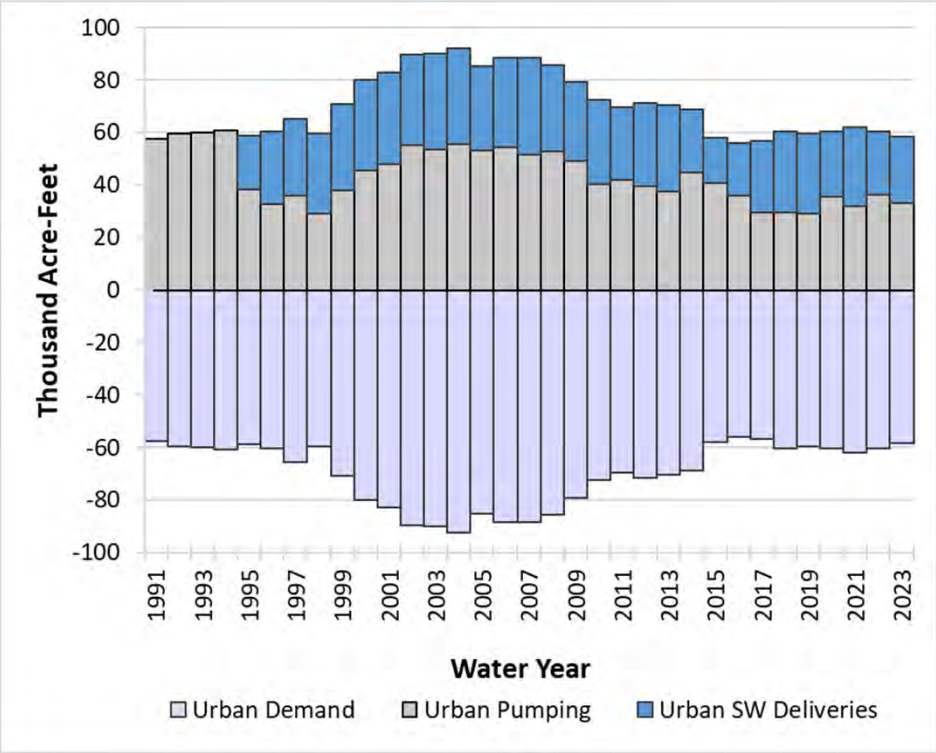
Modesto Subbasin: Operational Budget



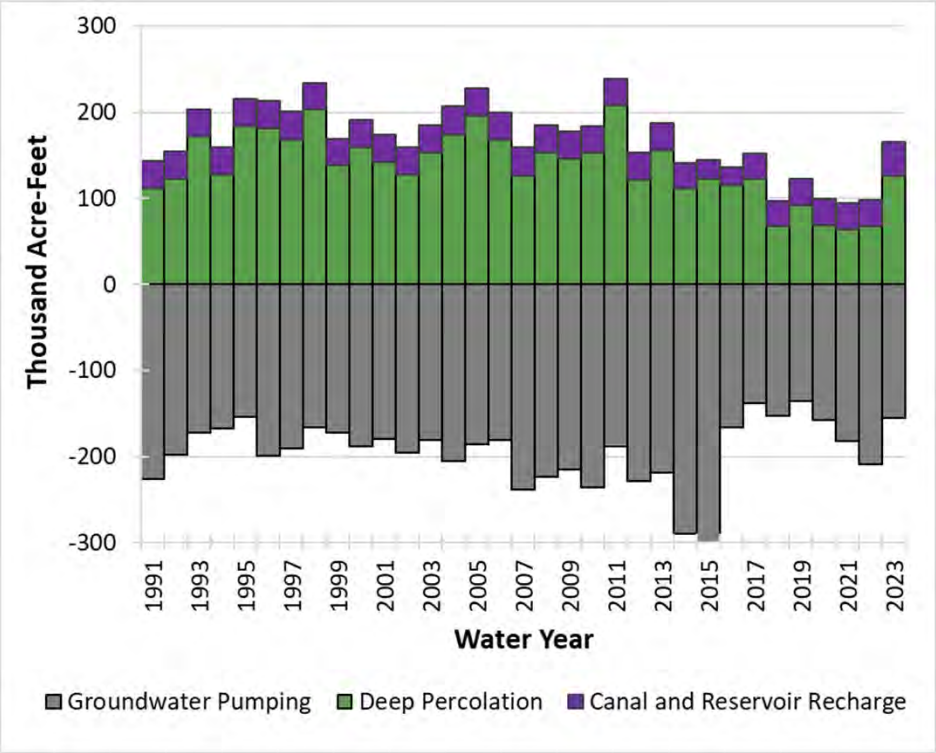


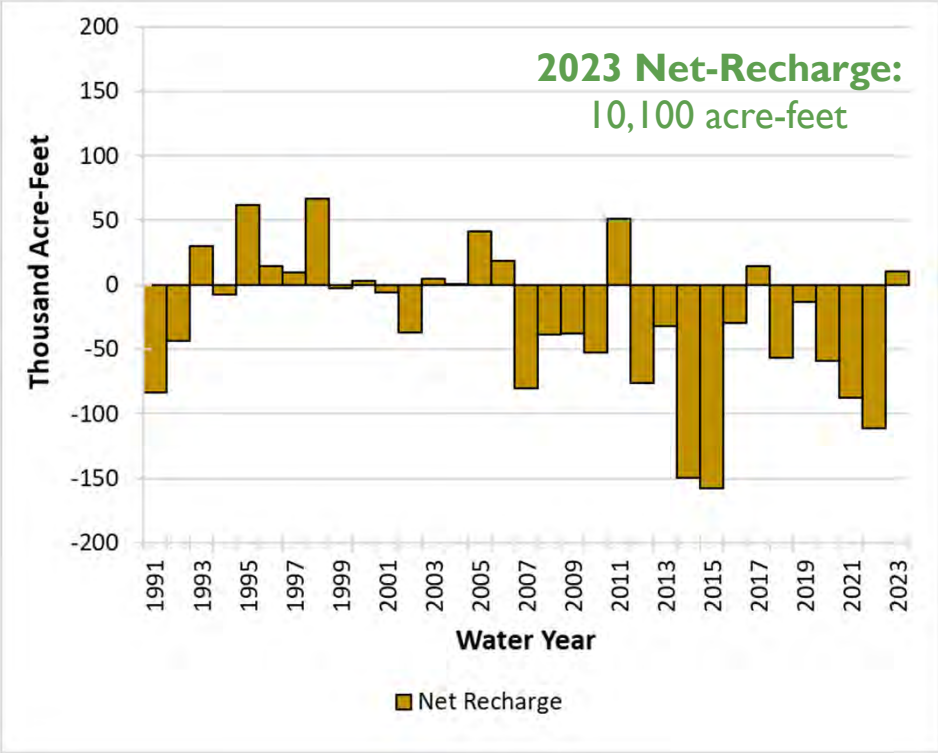
Modesto Area: Land and Water Use



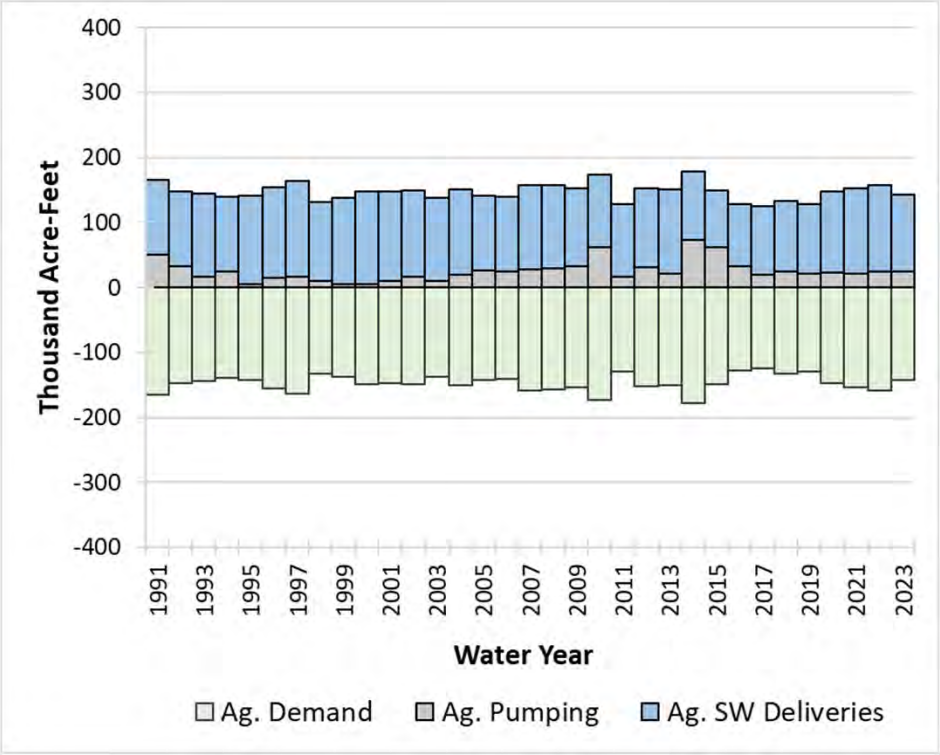


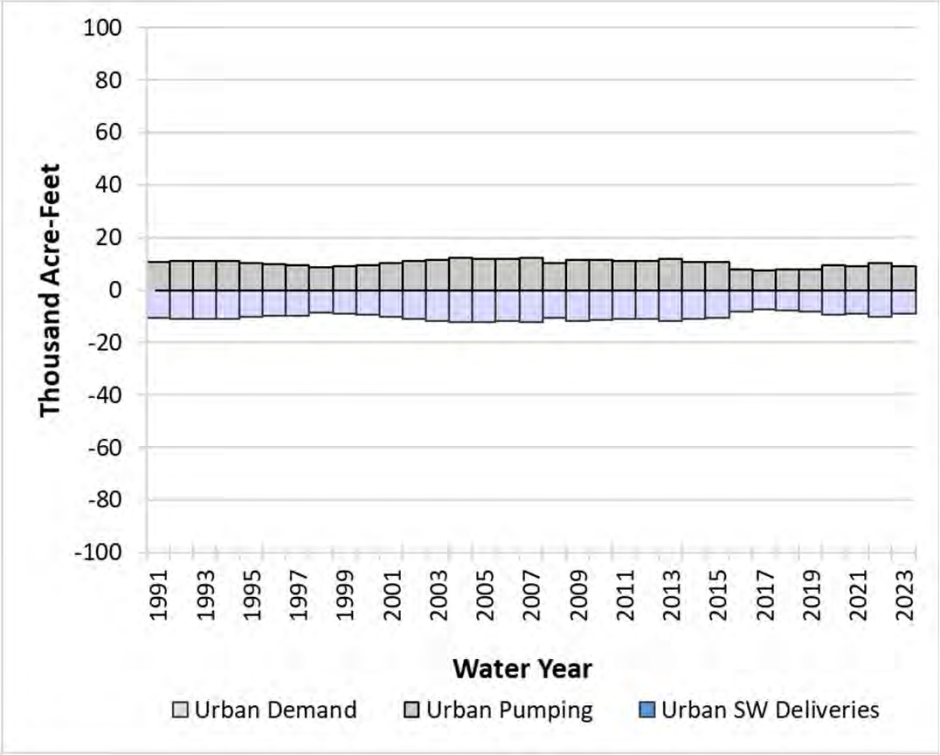
Modesto Area: Operational Budget



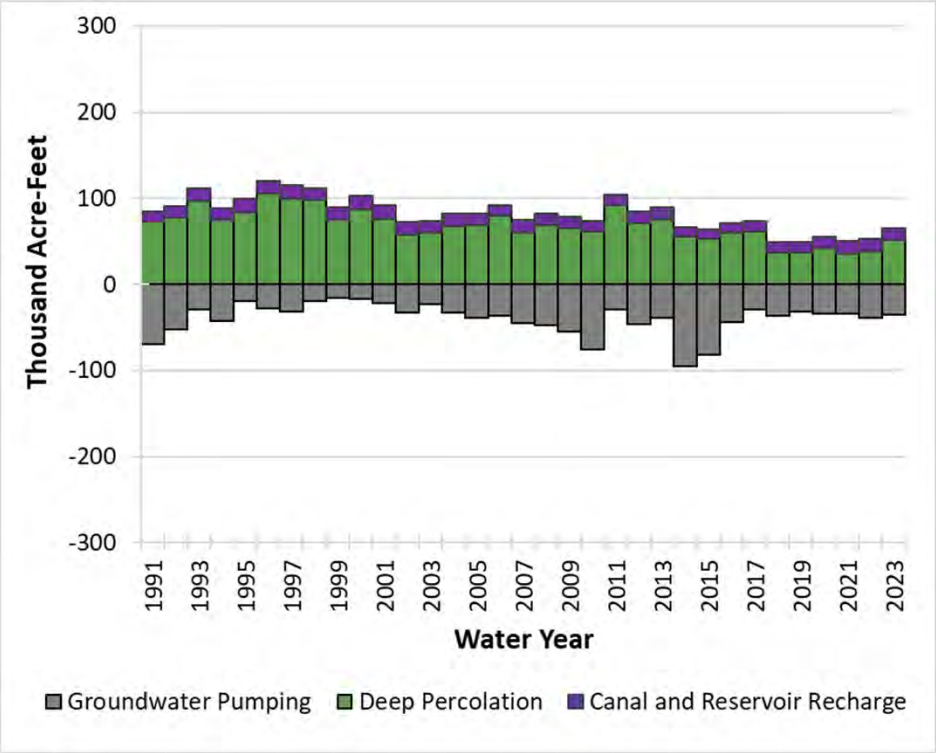


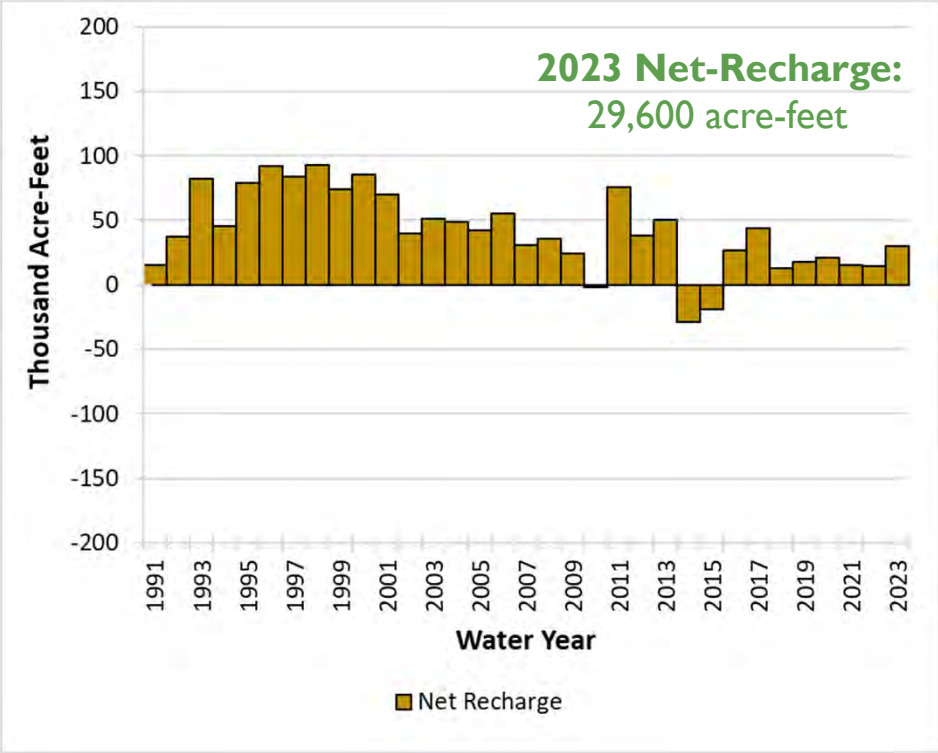
OAKDALE AREA: LAND AND WATER USE



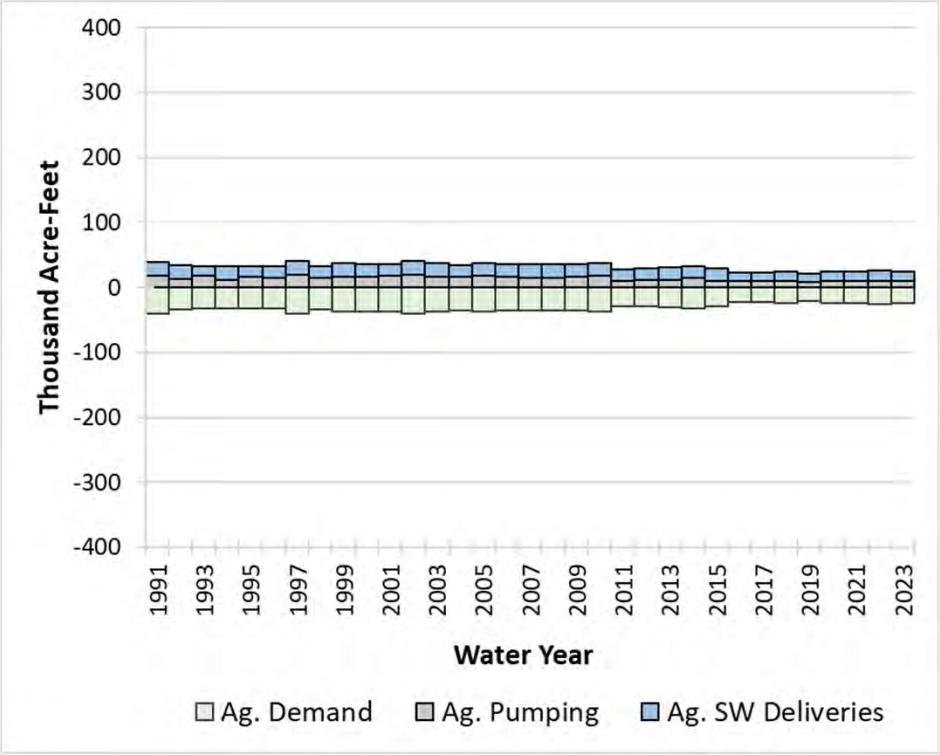


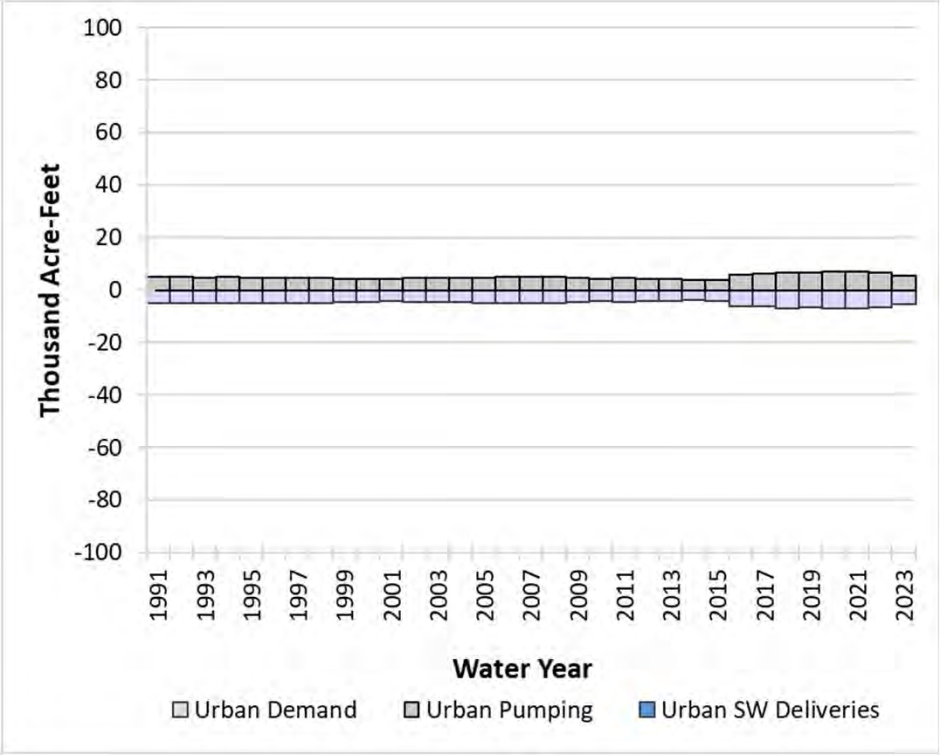
Oakdale Area: Operational Budget



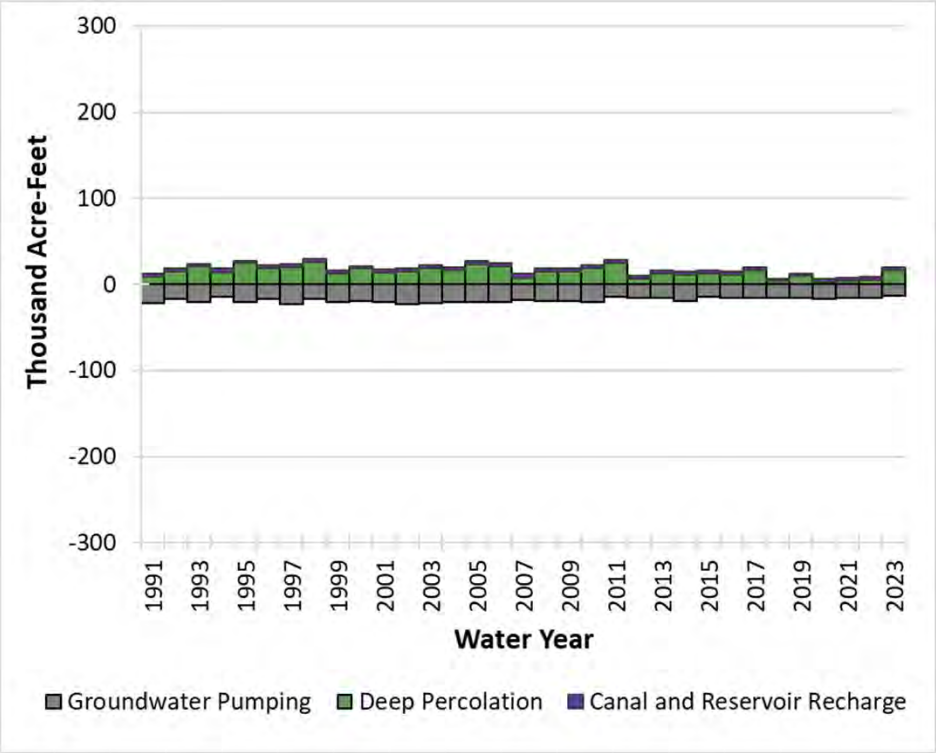


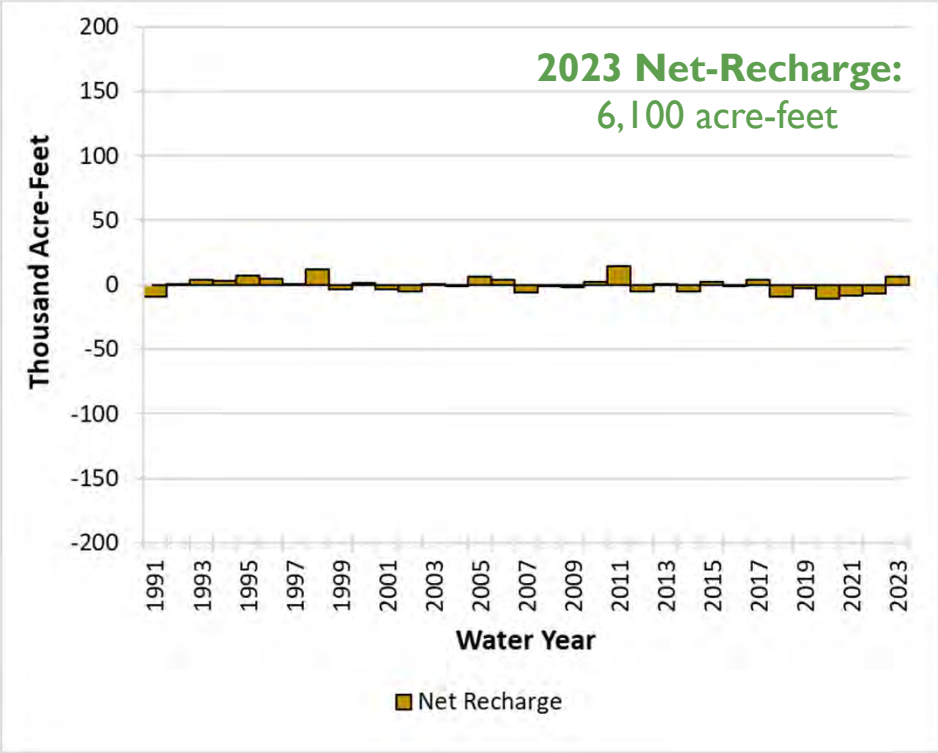
NON-DISTRICT WEST: LAND AND WATER USE



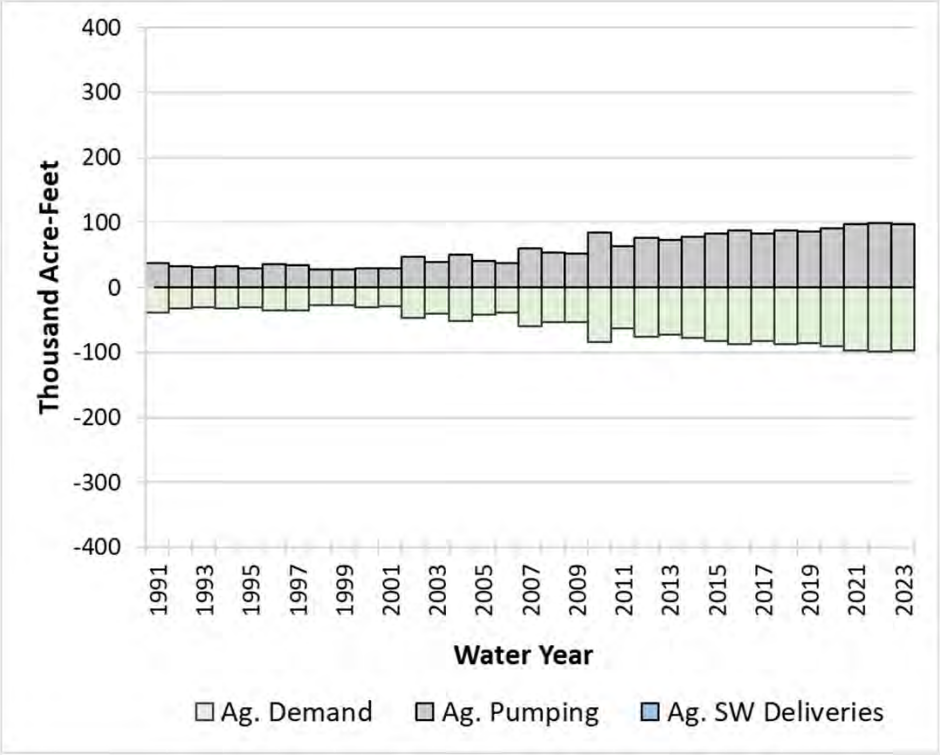


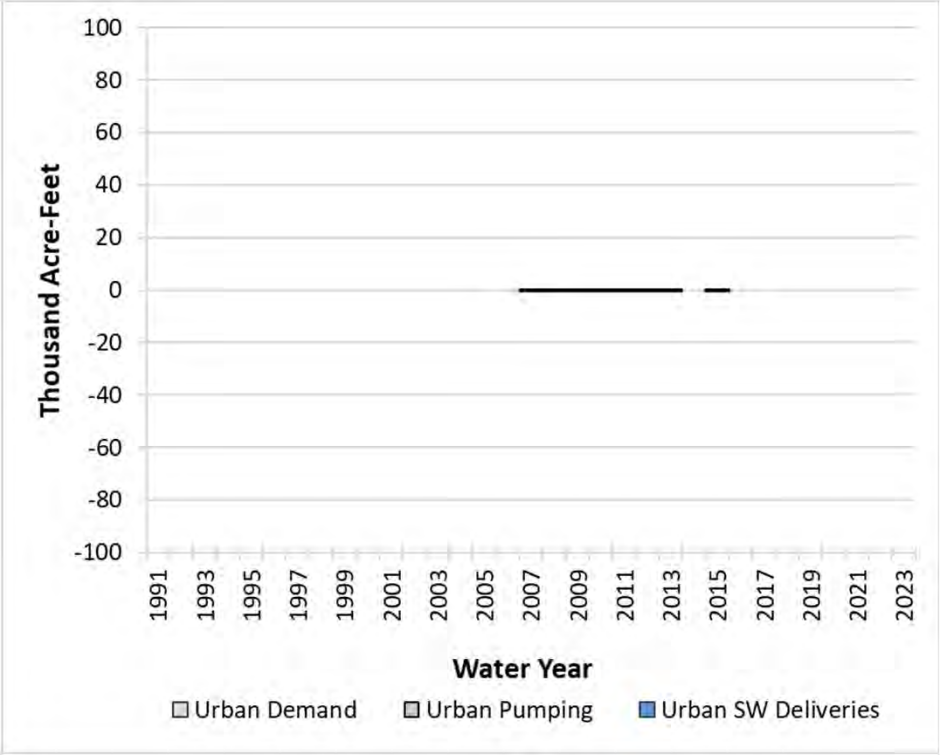
NON-DISTRICT WEST: OPERATIONAL BUDGET



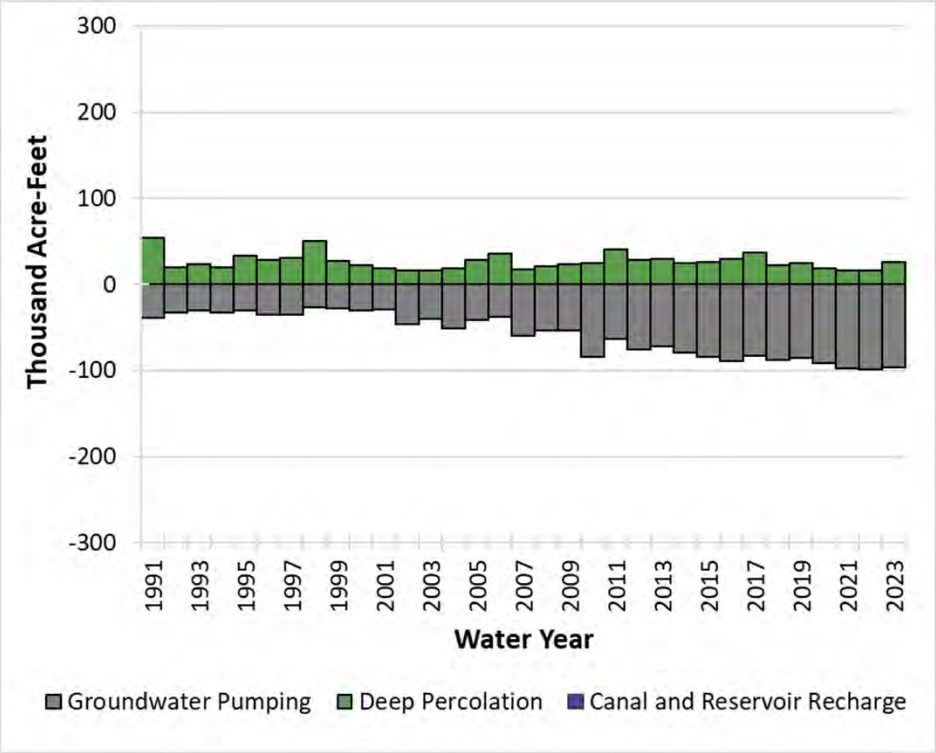


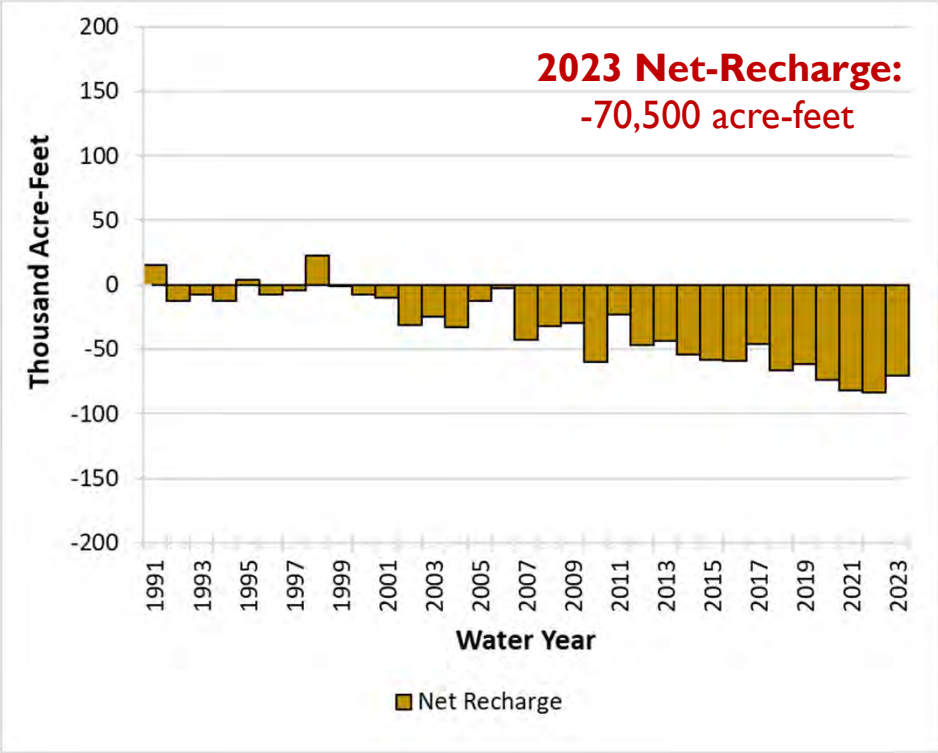
NON-DISTRICT EAST: LAND AND WATER USE



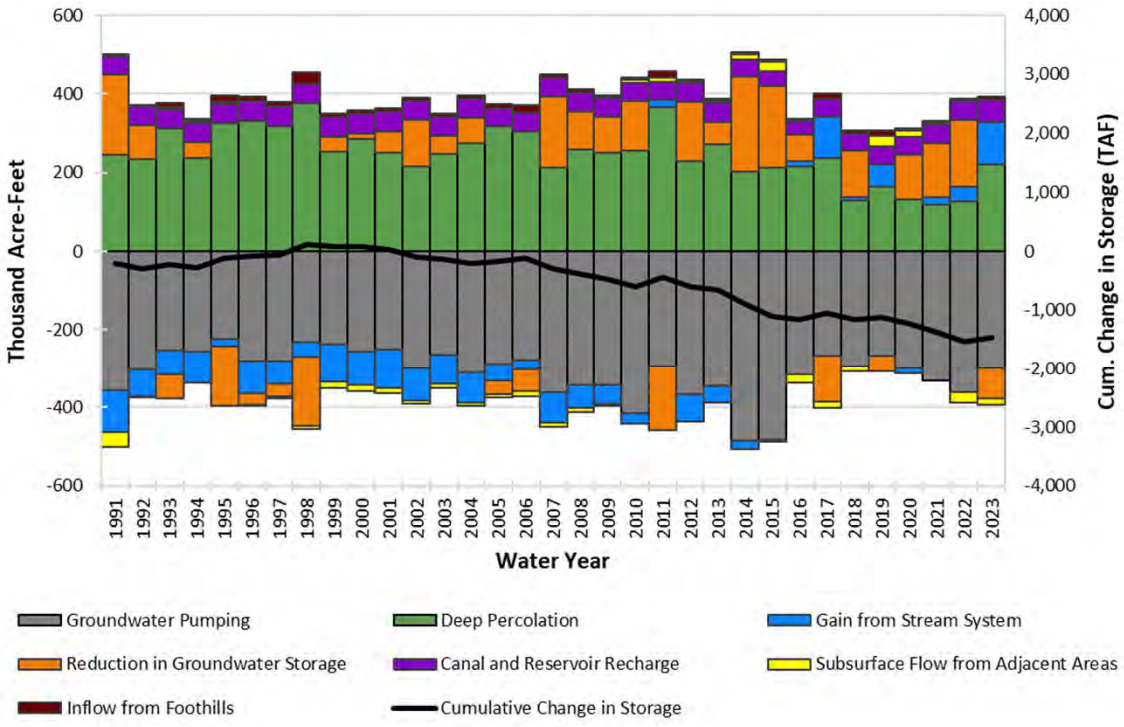


Non-District East: Operational Budget





Modesto Subbasin: Groundwater Budget



Water Year 2023

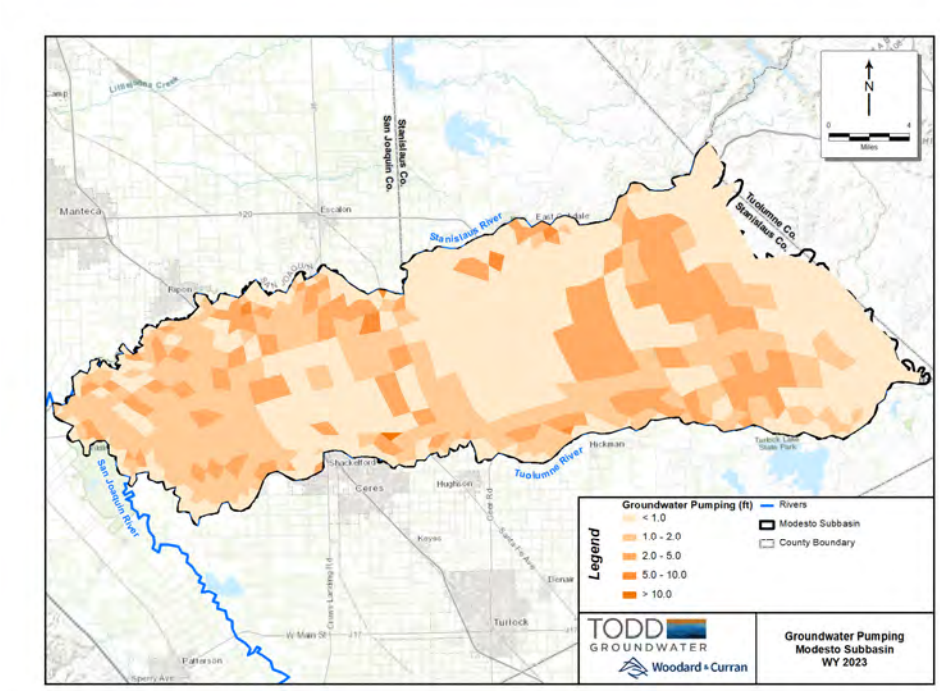
- Groundwater Budget
  - Pumping -300,300
  - Deep percolation 220,600
  - Canal recharge 55,000
  - Gain from stream 108,400
  - Subsurface inflow -16,100
  - Foothill inflow 10,200

  - Δ Storage +77,800

MODEL RESULTS

Pumping and Storage Heat Maps

Groundwater Pumping – Subbasin

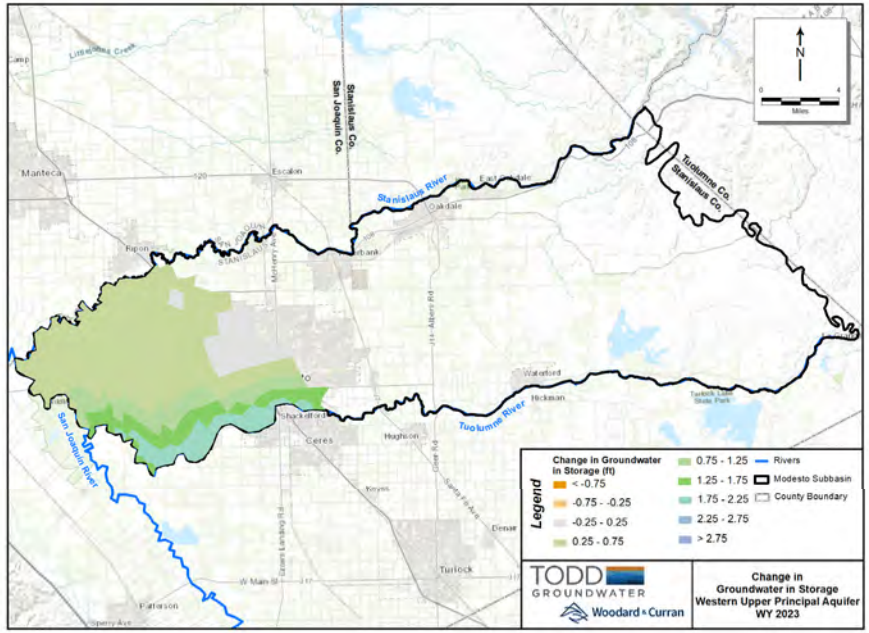


Water Year 2023

- Pumping
  - Ag Agency 10,500 AF
  - Ag Private 241,700 AF
  - Urban Agency 31,600 AF
  - Urban Private 16,500 AF
  - **Total 300,300 AF**

1.2 ft

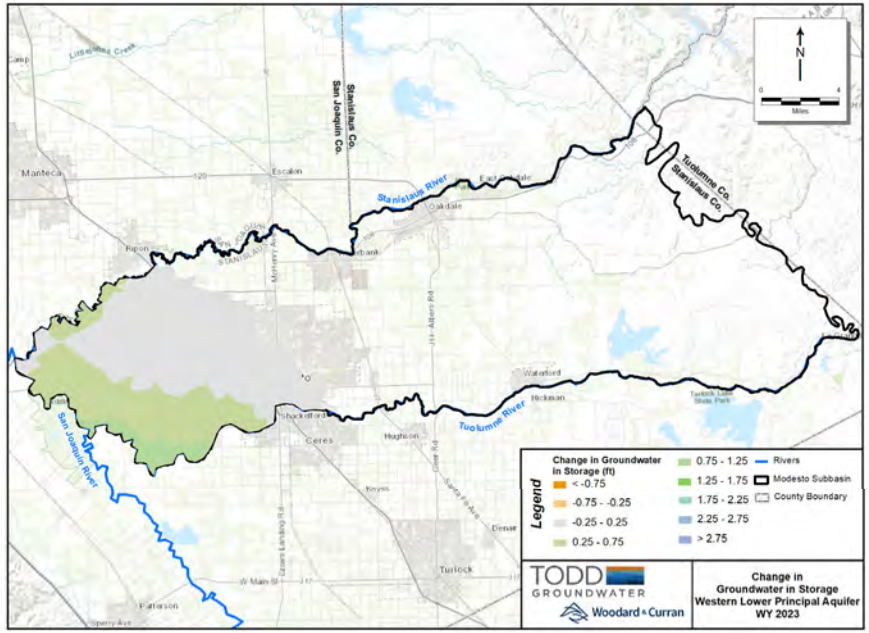
Change in Storage – Western Upper Principal Aquifer



Water Year 2023

- Change in Storage (acre-feet)
  - Western Upper Aquifer +42,800
  - Western Lower Aquifer +12,200
  - Eastern Aquifer +22,800
  - Subbasin +77,800
- Change in Storage (feet)
  - Western Upper Aquifer +0.7
  - Western Lower Aquifer +0.2
  - Eastern Aquifer +0.1
  - Subbasin +0.3

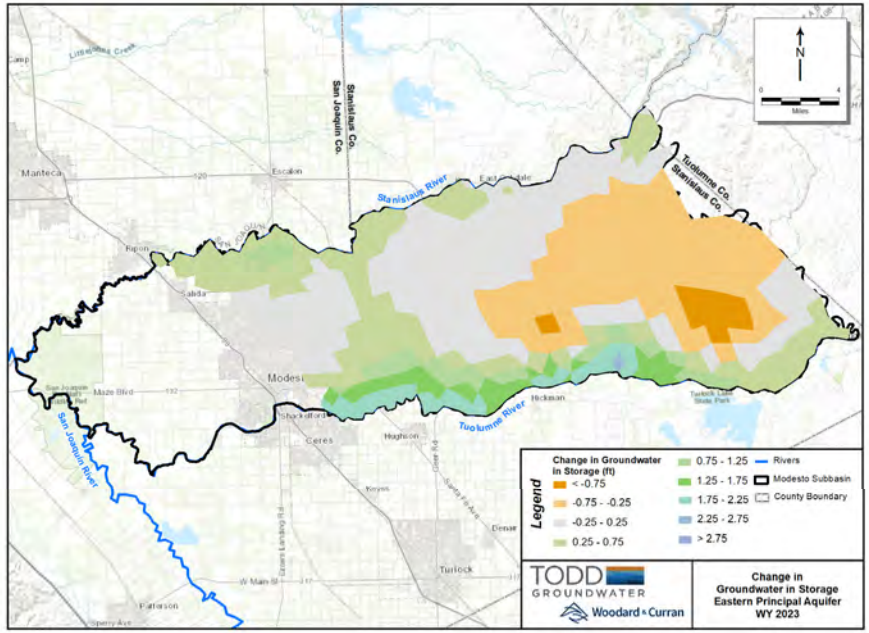
Change in Storage – Western Lower Principal Aquifer



Water Year 2023

- Change in Storage (acre-feet)
  - Western Upper Aquifer +42,800
  - Western Lower Aquifer +12,200
  - Eastern Aquifer +22,800
  - Subbasin +77,800
- Change in Storage (feet)
  - Western Upper Aquifer +0.7
  - Western Lower Aquifer +0.2
  - Eastern Aquifer +0.1
  - Subbasin +0.3

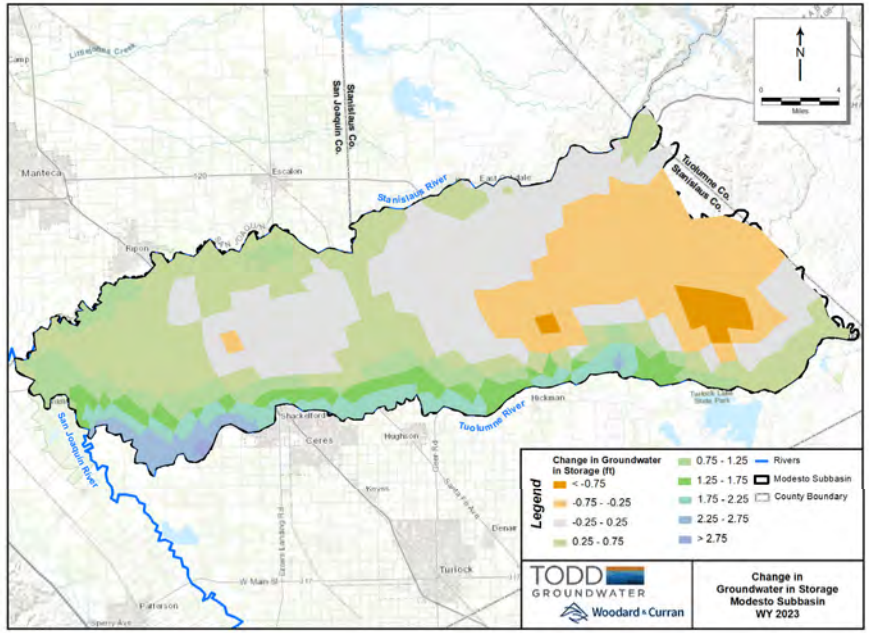
Change in Storage – Eastern Principal Aquifer



Water Year 2023

- Change in Storage (acre-feet)
  - Western Upper Aquifer +42,800
  - Western Lower Aquifer +12,200
  - Eastern Aquifer +22,800
  - Subbasin +77,800
- Change in Storage (feet)
  - Western Upper Aquifer +0.7
  - Western Lower Aquifer +0.2
  - Eastern Aquifer +0.1
  - Subbasin +0.3

Change in Storage – Subbasin



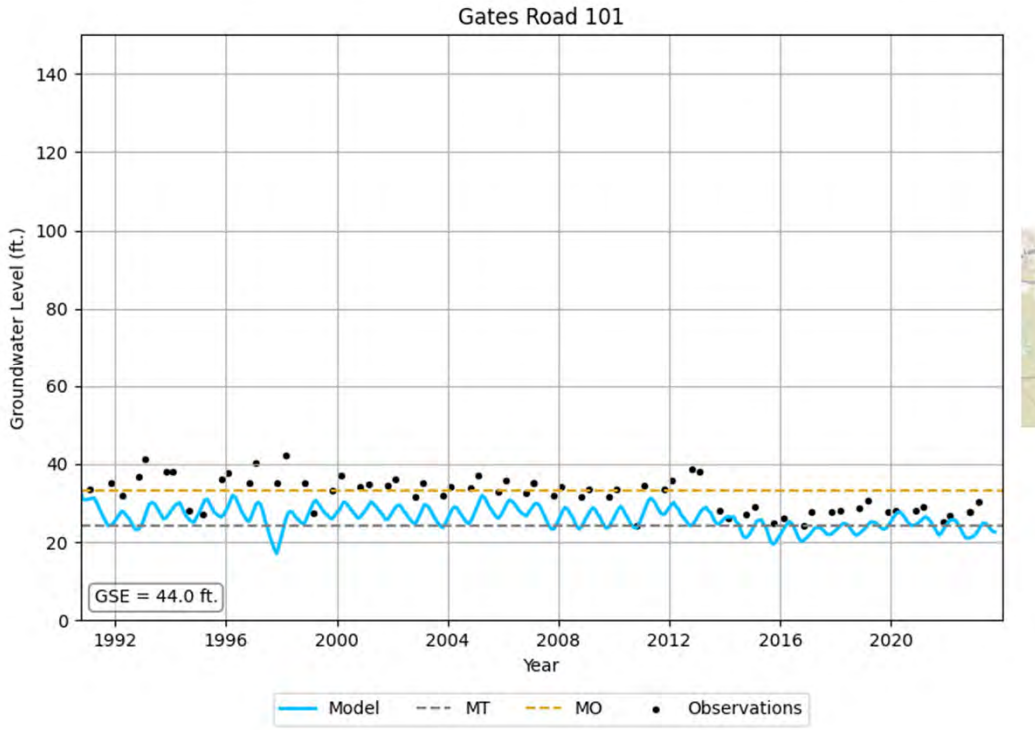
Water Year 2023

- Change in Storage (acre-feet)
  - Western Upper Aquifer +42,800
  - Western Lower Aquifer +12,200
  - Eastern Aquifer +22,800
  - Subbasin +77,800
- Change in Storage (feet)
  - Western Upper Aquifer +0.7
  - Western Lower Aquifer +0.2
  - Eastern Aquifer +0.1
  - Subbasin +0.3

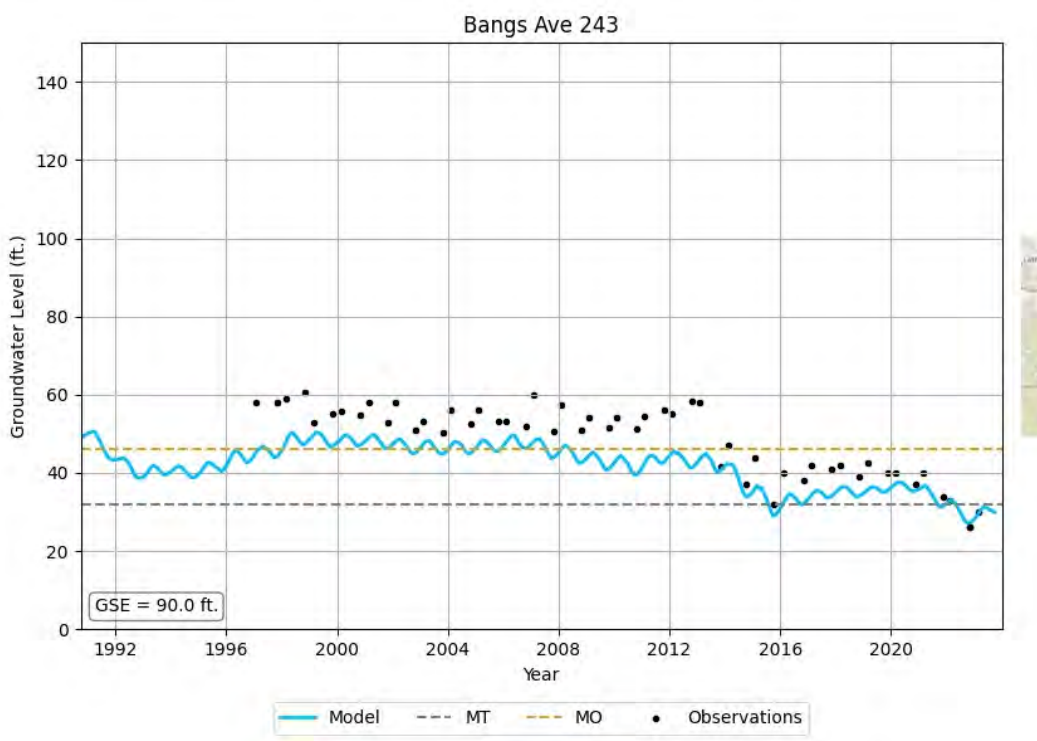
MODEL RESULTS

HYDROGRAPHS

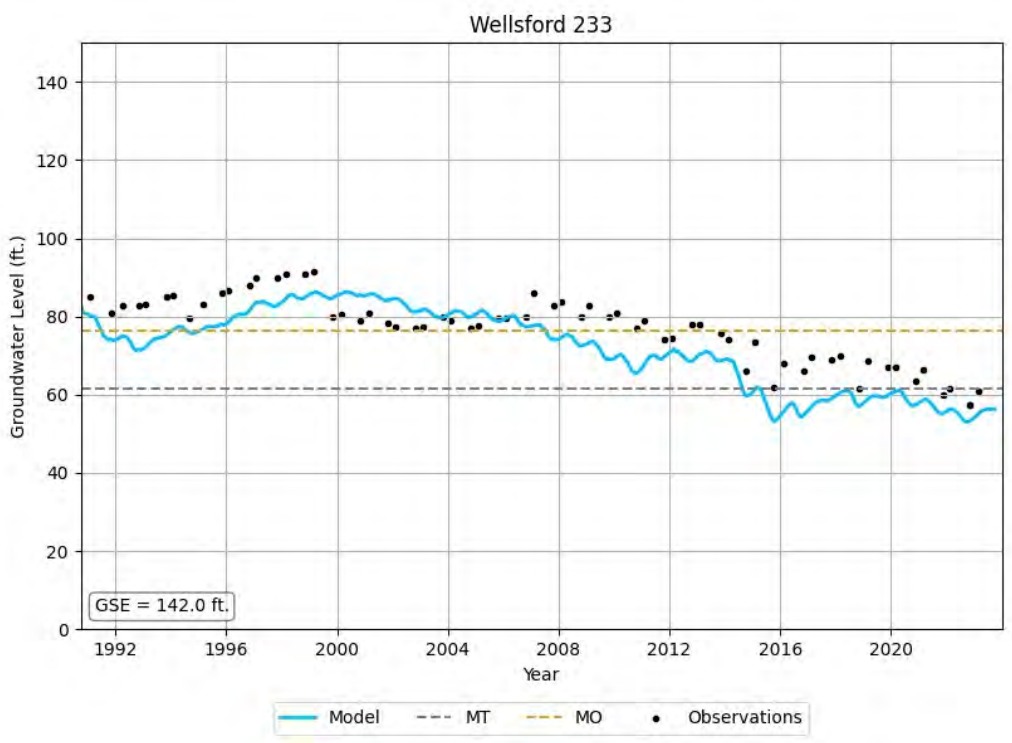
Groundwater Level Hydrographs



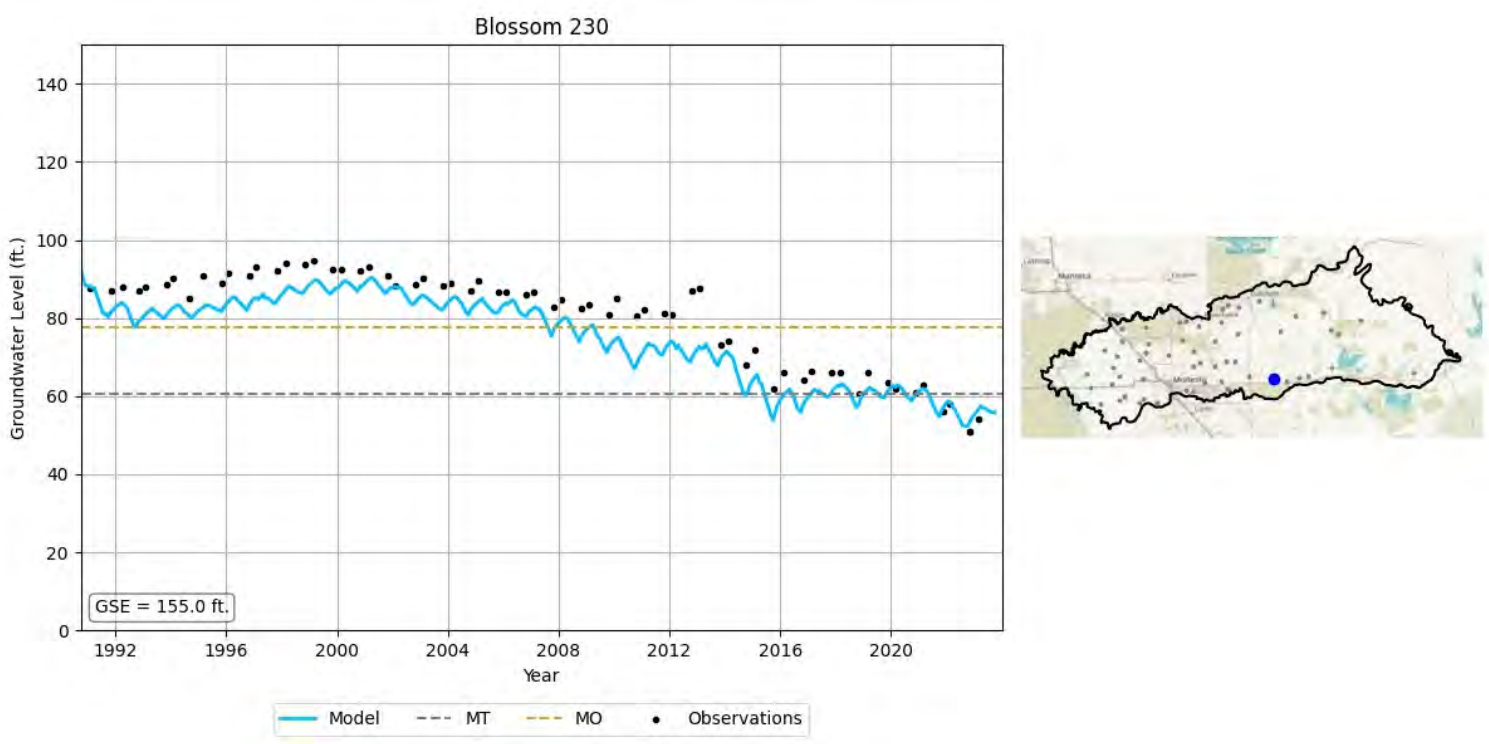
Groundwater Level Hydrographs



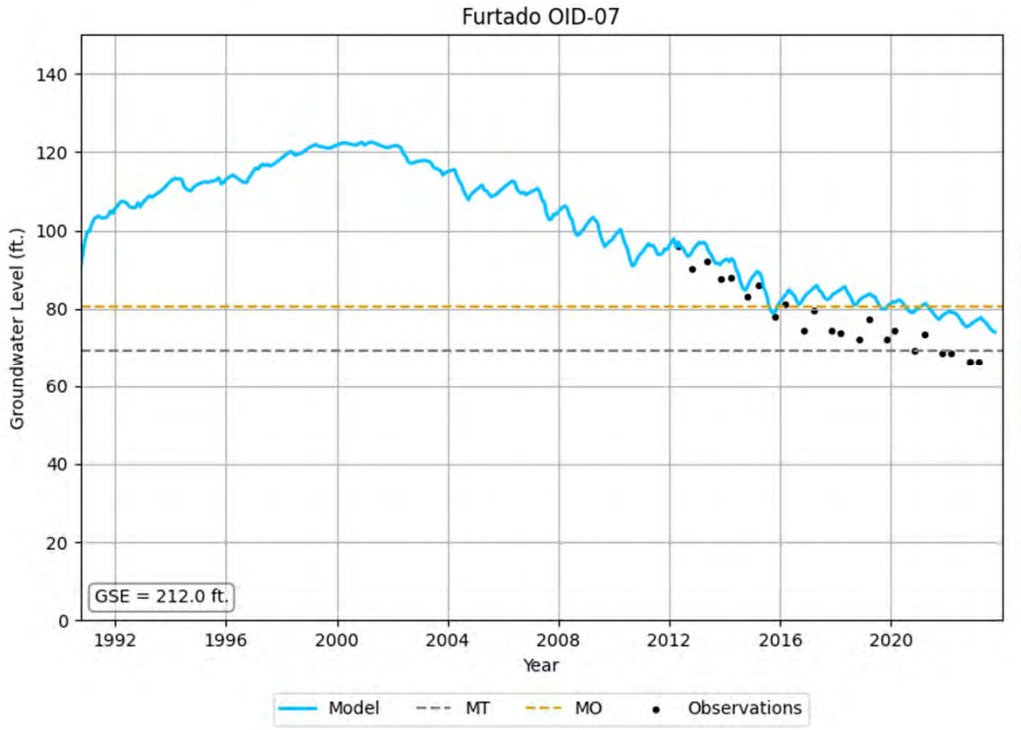
Groundwater Level Hydrographs



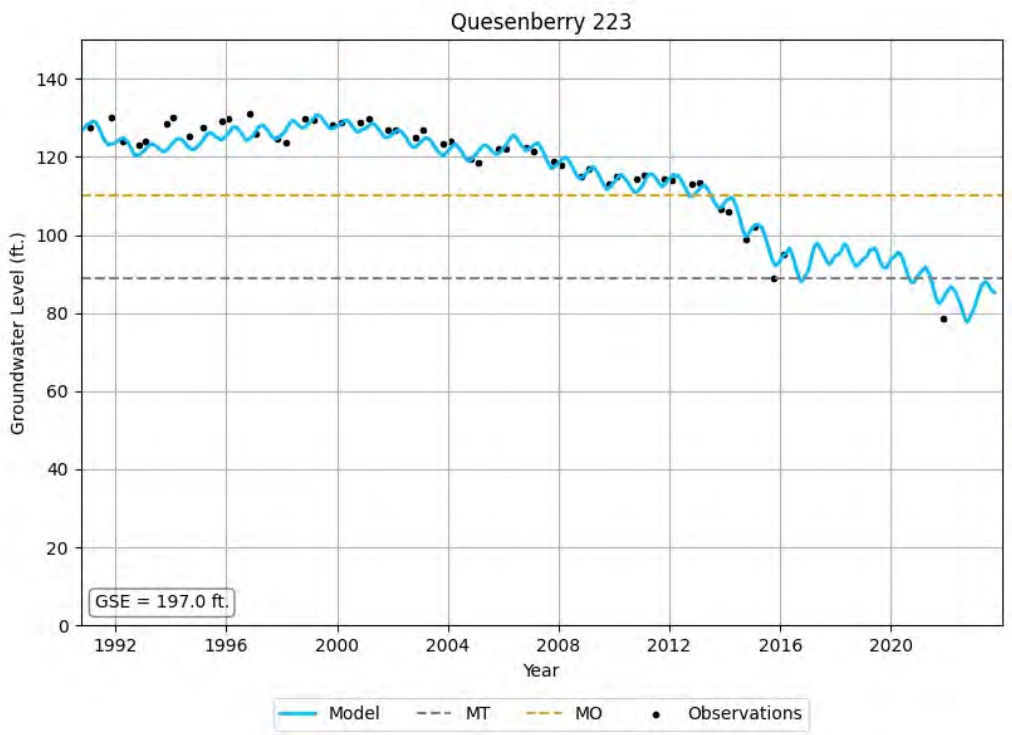
Groundwater Level Hydrographs



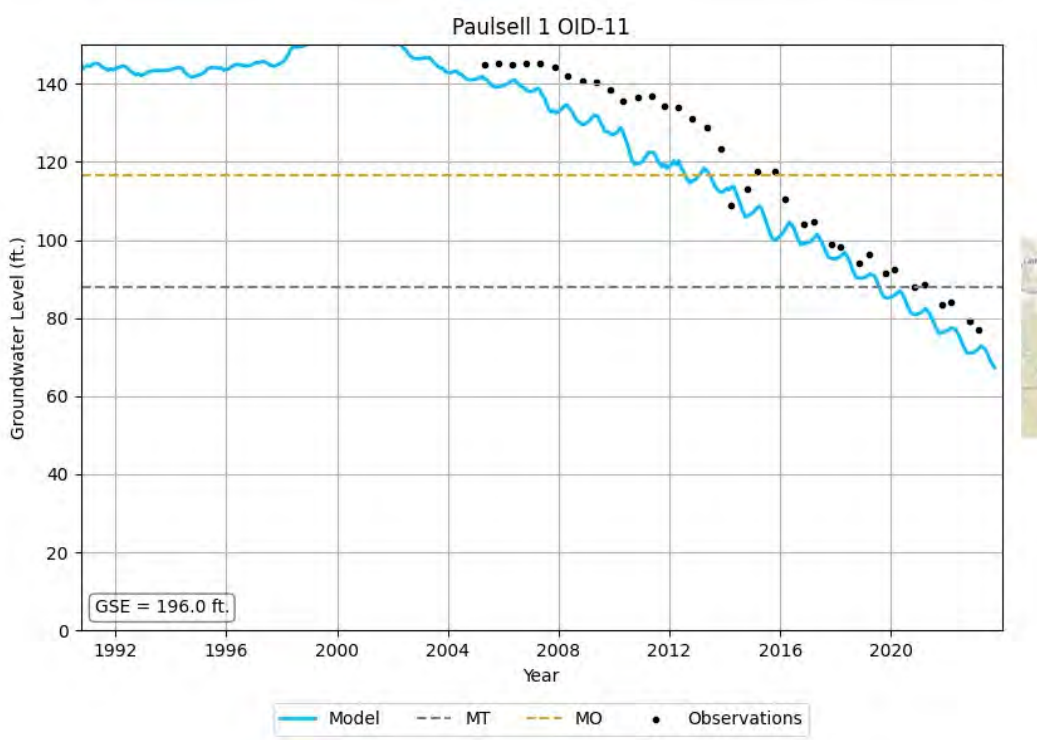
Groundwater Level Hydrographs



Groundwater Level Hydrographs



Groundwater Level Hydrographs



QUESTIONS?