TURLOCK SUBBASIN GSP
WY 2023 WATER LEVEL ANALYSIS

JOINT MEETING – TURLOCK SUBBASIN TECHNICAL ADVISORY COMMITTEES

JANUARY 9, 2024

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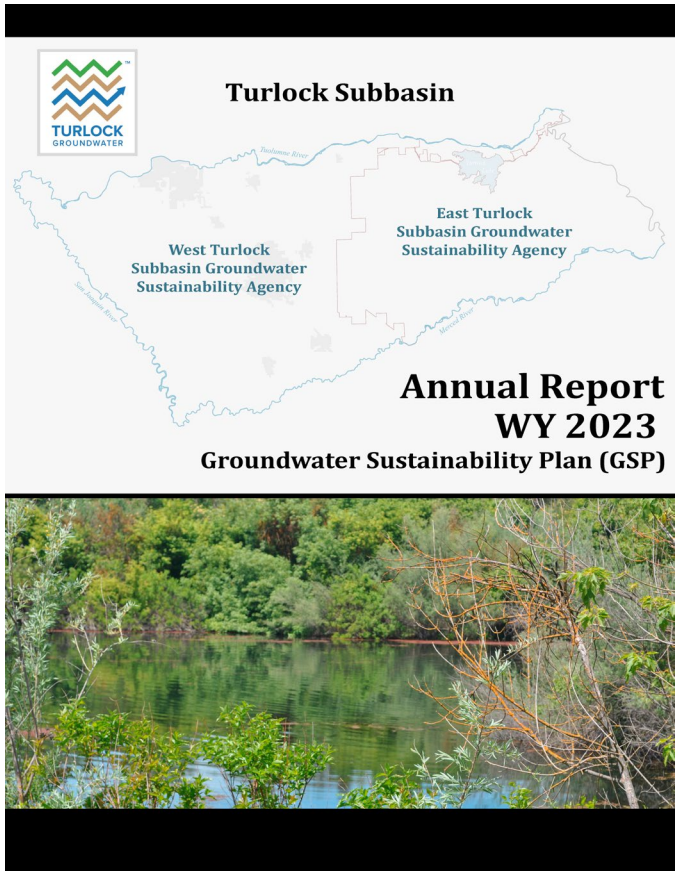
AGENDA

- WY 2023 Monitoring Events
- Water Level Analysis – Draft Results
  - Sustainable Management Criteria
  - Hydrographs
  - Contour Maps
- Putting these results into perspective
- What's next?



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WY 2023 GSP Monitoring Events

- Fall 2022, seasonal lows (2nd GSP monitoring event)
  - Water levels measured end October / early November
- Spring 2023, seasonal highs (3rd GSP monitoring event)
  - Water levels measured end March / early April
- Several RMWs not measured because wells were pumping
- WTSGSA gained access to USGS wells
- ETSGSA replaced ETSGSA-12, added several SGMA wells
- Water levels uploaded to DWR

WTS-1 Shallow and WTS-1 Deep

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ETSGSA Survey – Spring 2023

- ETSGSA surveyed monitoring wells (RP & GSE)
- RP changes expected, but some were significant
- Changes were mostly negative (lower elevation)
- Groundwater elevation data uploaded to the portal and used in this analysis are based on the new RPs starting in Spring 2023
- In Spring 2023, three wells were below MTs and two wells were below IMs because of the RP changes

Local Well Name	RP Elevation		
	Fall 2022	Spring 2023	Change
SGMA Representative Wells			
ETSGSA-01	199.00	197.52	-1.5
ETSGSA-02	262.00	249.18	-12.8
ETSGSA-04	258.80	252.23	-6.6
ETSGSA-05	196.00	193.89	-2.1
ETSGSA-06	195.90	195.20	-0.7
ETSGSA-08	274.00	257.87	-16.1
ETSGSA-09	308.20	309.02	0.8
ETSGSA-12	299.40	297.86	-1.5
ETSGSA-13	183.70	176.34	-7.4
ETSGSA-14	225.80	223.72	-2.1
ETSGSA-17	221.10	220.02	-1.1
ETSGSA-20 [3]	205.70	205.70	0.0
ETSGSA-21	312.20	304.73	-7.5
ETSGSA-23	178.10	178.00	-0.1
EW3	164.10	163.73	-0.4
MW-68A	150.00	148.94	-1.1
MW-68B	198.00	205.05	7.1
MW-68C	199.00	201.89	2.9
Olam R2-4	256.00	254.29	-1.7

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Definition of Undesirable Results

Chronic Lowering of Water Levels 

An undesirable result for each principal aquifer will occur when at least 33% of representative monitoring wells exceed the MT for that Principal Aquifer in three (3) consecutive Fall monitoring events.

Interconnected Surface Water 

An undesirable result will occur on one of the three monitored rivers when 50% of the representative monitoring sites for that river exceed the MT in two (2) consecutive Fall monitoring events.

Minimum Thresholds (MTs)

Chronic Lowering of Water Levels

	Fall 2022	Spring 2023
Western Upper Principal Aquifer		
Above	8	9
Below	7	5
Not Measured	1	2
No MT	2	2
% Below (includes measured wells)	47%	36%
Western Lower Principal Aquifer		
Above	1	3
Below	2	2
Not Measured	2	0
No MT	3	3
% Below (includes measured wells)	67%	40%
Eastern Principal Aquifer		
Above	2	4
Below	13	10
Not Measured	0	1
No MT	3	3
% Below (includes measured wells)	87%	71%

Interconnected Surface Water

	Fall 2022	Spring 2023
San Joaquin River		
Above	2	3
Below	0	0
Not Measured	1	0
% Below (includes measured wells)	0%	0%
Tuolumne River		
Above	0	1
Below	3	2
Not Measured	0	0
% Below (includes measured wells)	100%	67%
Merced River		
Above	1	2
Below	4	3
Not Measured	0	0
% Below (includes measured wells)	80%	60%

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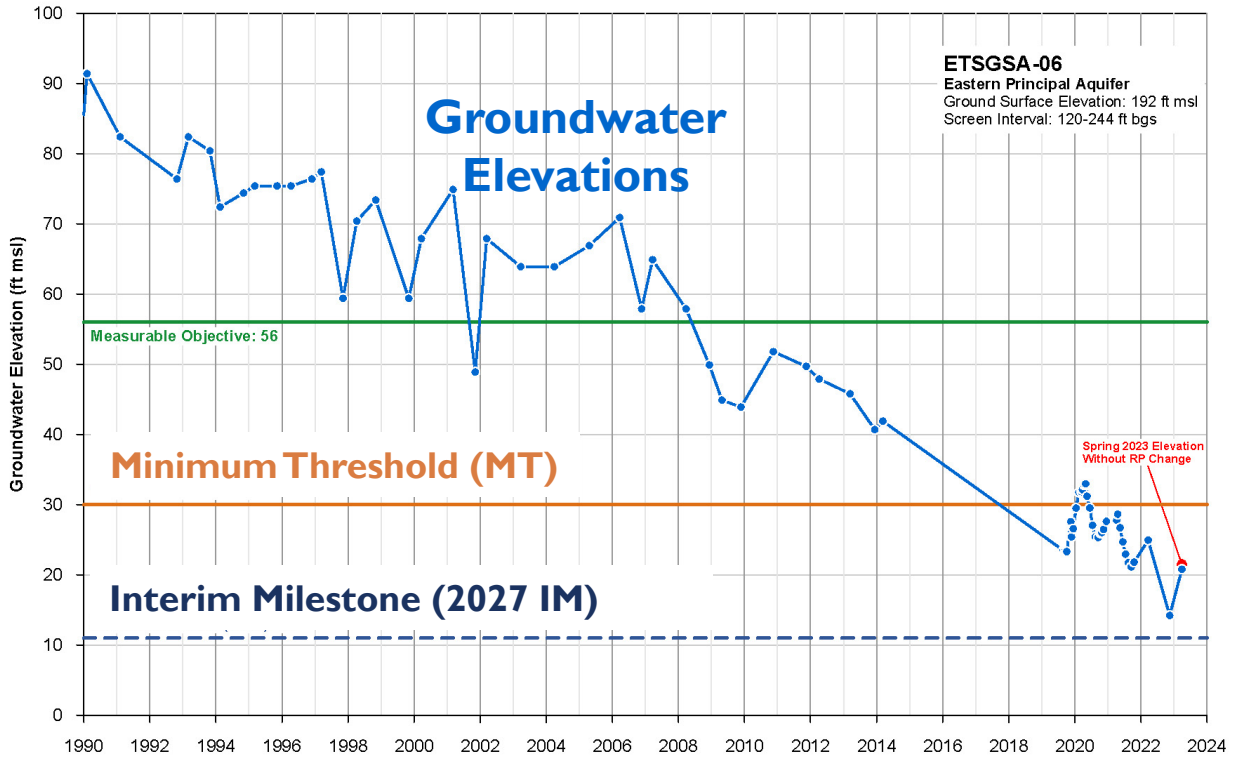
Interim Milestones (IMs)

- Chronic Lowering of Water Levels
  - 18 wells with IMs
  - 5 wells below IM in Fall 2022
  - 3 wells below IM in Spring 2023 (2 because of RP change)
- Interconnected Surface Water
  - 7 wells with IMs
  - 1 well below IM in Fall 2022
  - 1 well below IM in Spring 2023 (because of RP change)



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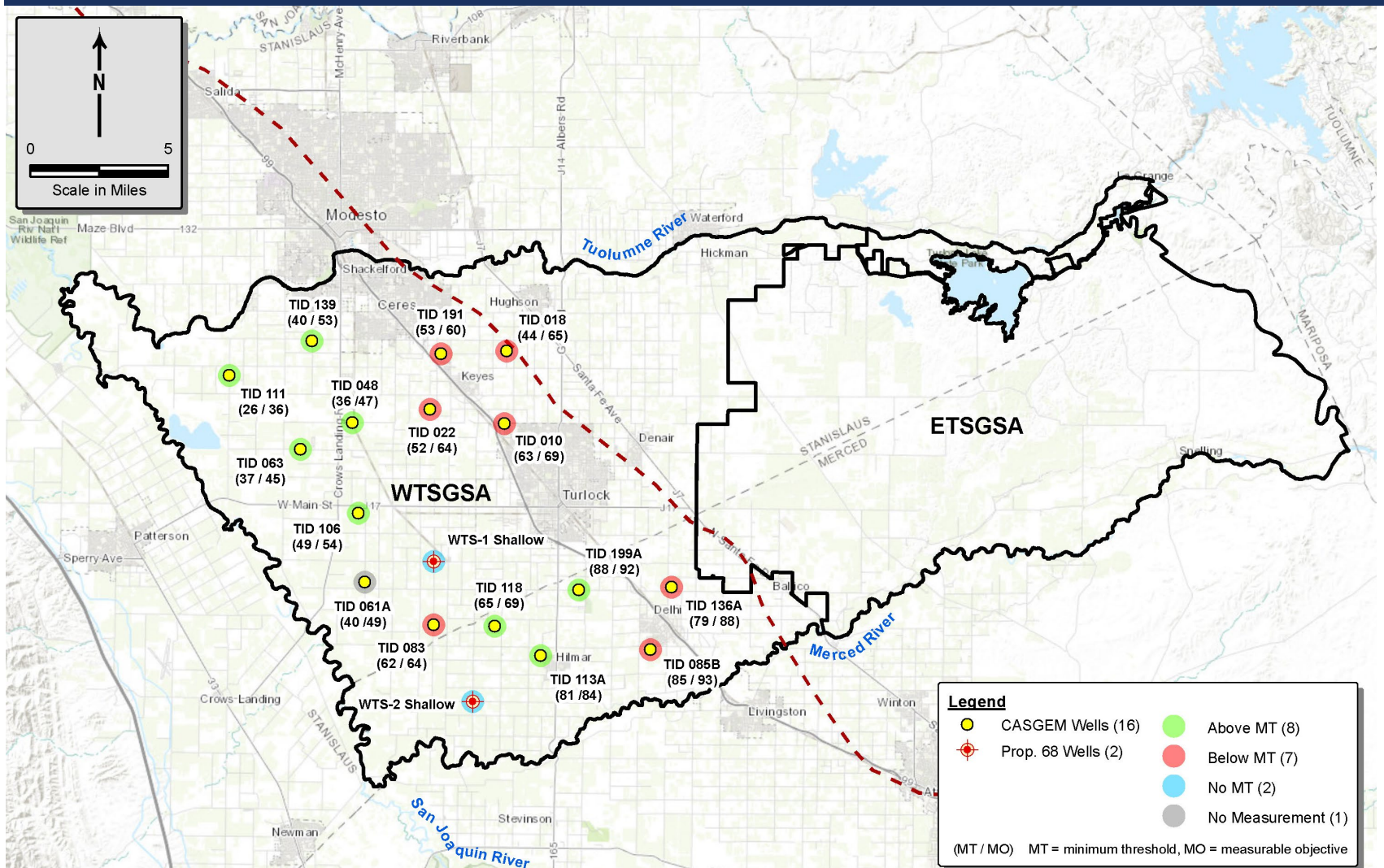
Fall 2022
Western Upper Principal Aquifer



- 47% of RMWs below MT
  - 8 wells > MT
  - 7 wells < MT
- 1 well not measured (pumping)
- 2 Prop 68 RMWs do not have an MT yet (not enough data)

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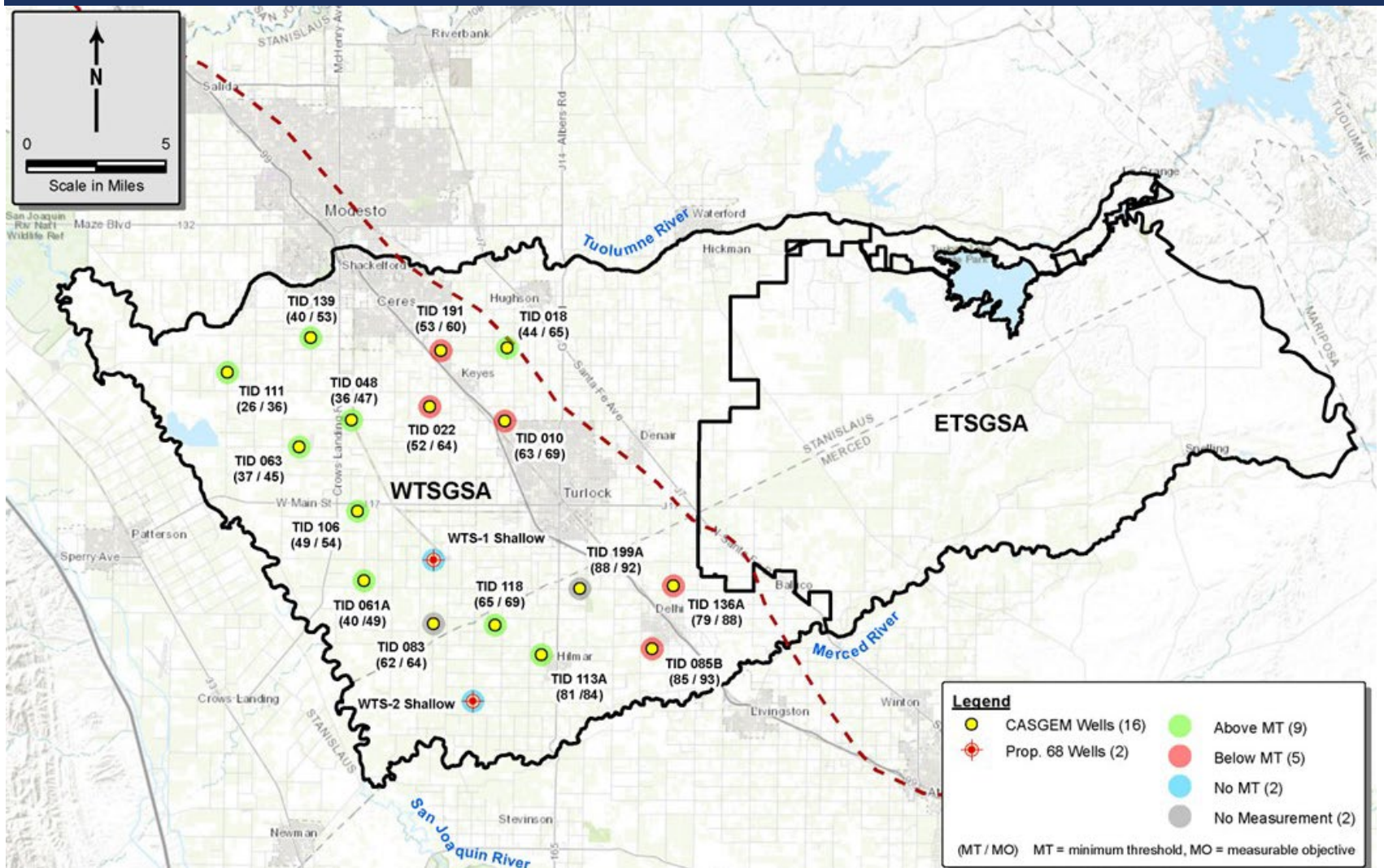
Spring 2023
Western Upper Principal Aquifer



- 36% of RMWs below MT
  - 9 wells > MT
  - 5 wells < MT
- 2 well not measured (pumping)
- 2 Prop 68 RMWs do not have an MT yet

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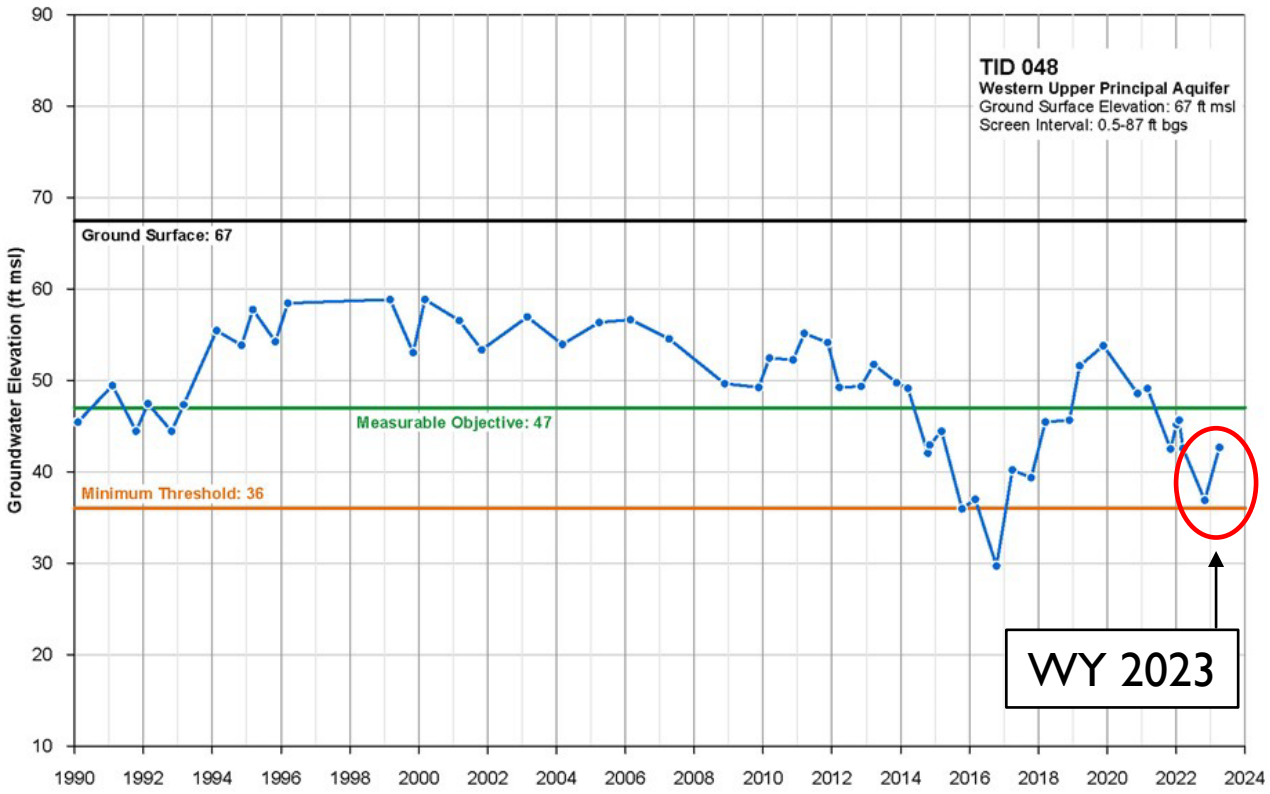
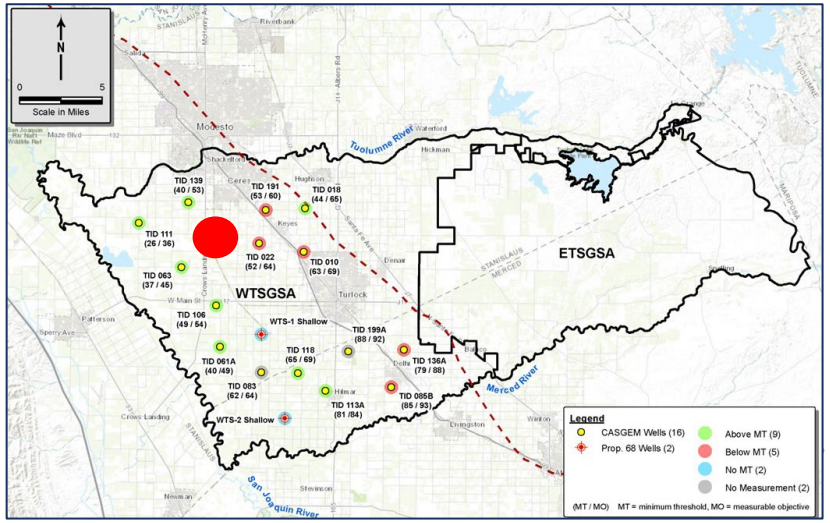
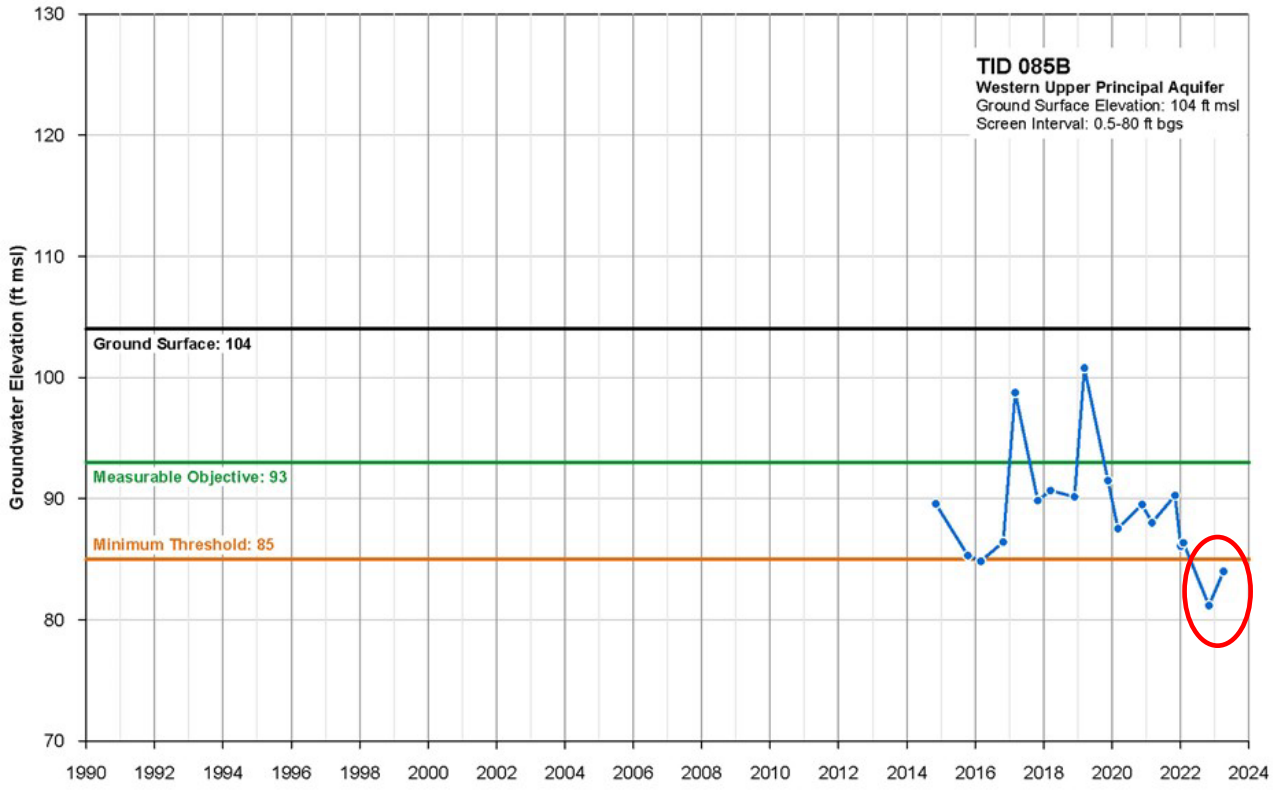
Hydrographs
Western Upper Principal Aquifer



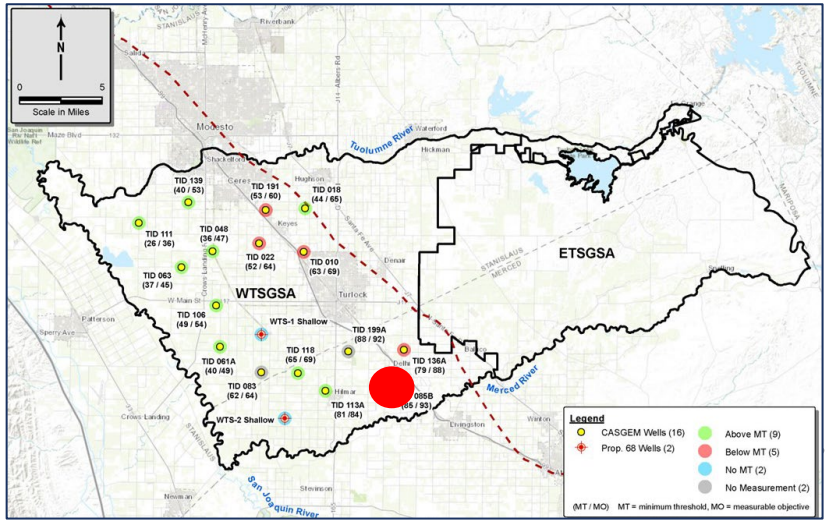
- WY 2023 water levels are above the MT
- Decline and recovery of approximately 6 feet



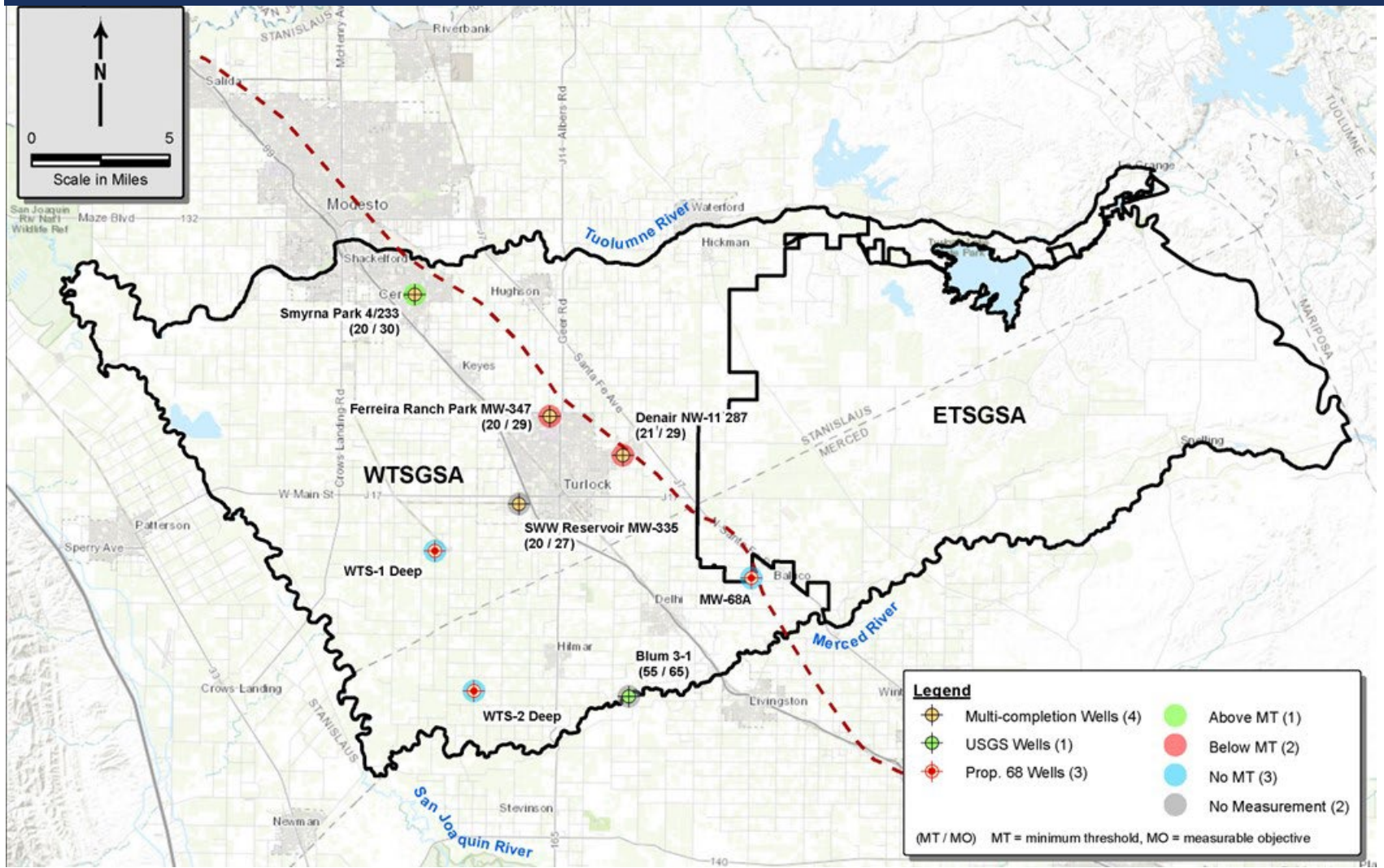
Hydrographs
Western Upper Principal Aquifer



- Water levels below MT in WY 2023 for the first time
- Spring 2023 recovery, slightly below MT



Fall 2022
Western Lower Principal Aquifer



- 67% of RMWs below MT
  - 1 wells > MT
  - 2 wells < MT
- 2 well not measured
- 3 Prop 68 RMWs do not have an MT yet

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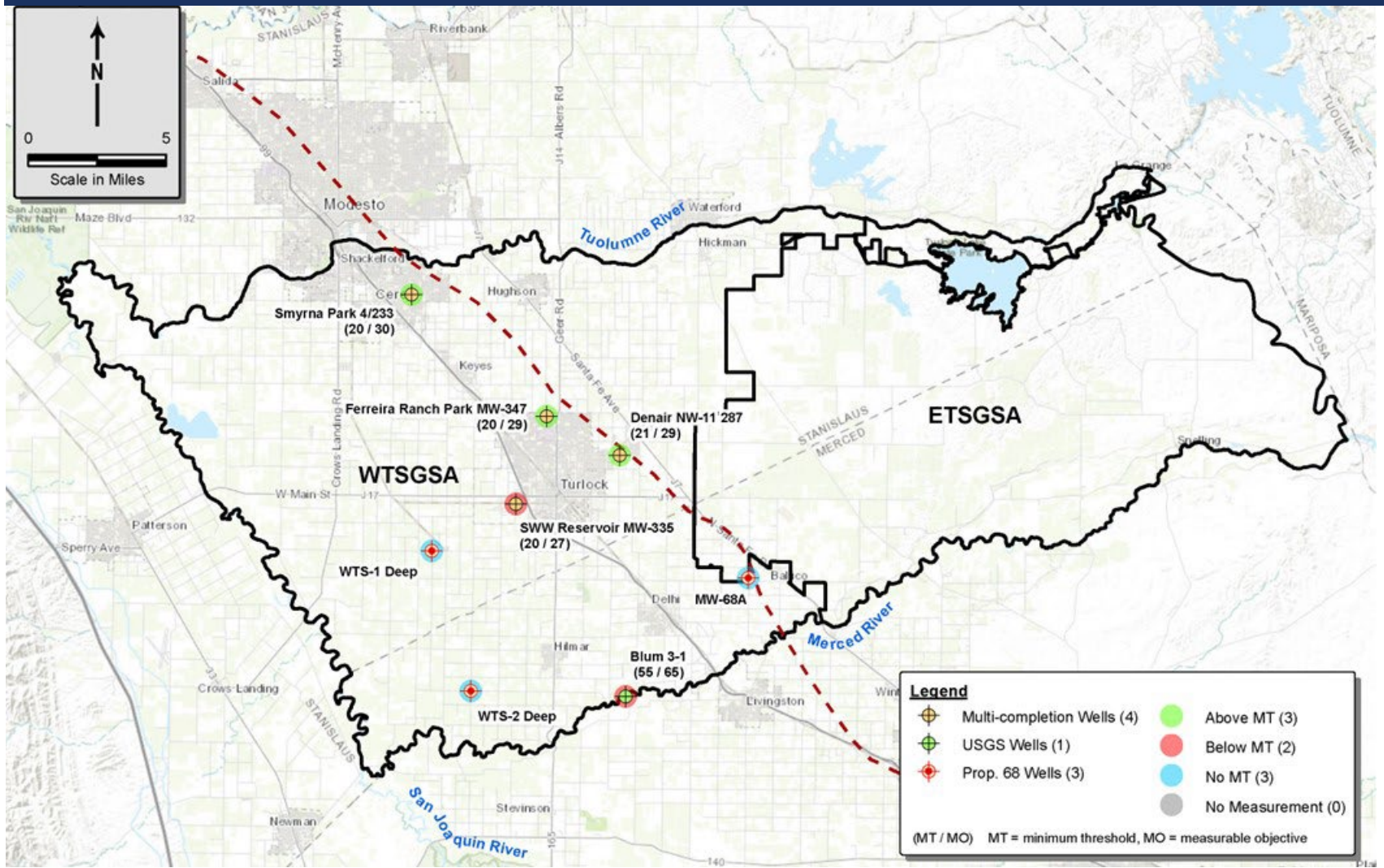
Spring 2023
Western Lower Principal Aquifer



- 40% of RMWs below MT
  - 3 wells > MT
  - 2 wells < MT
- 3 Prop 68 RMWs do not have an MT yet

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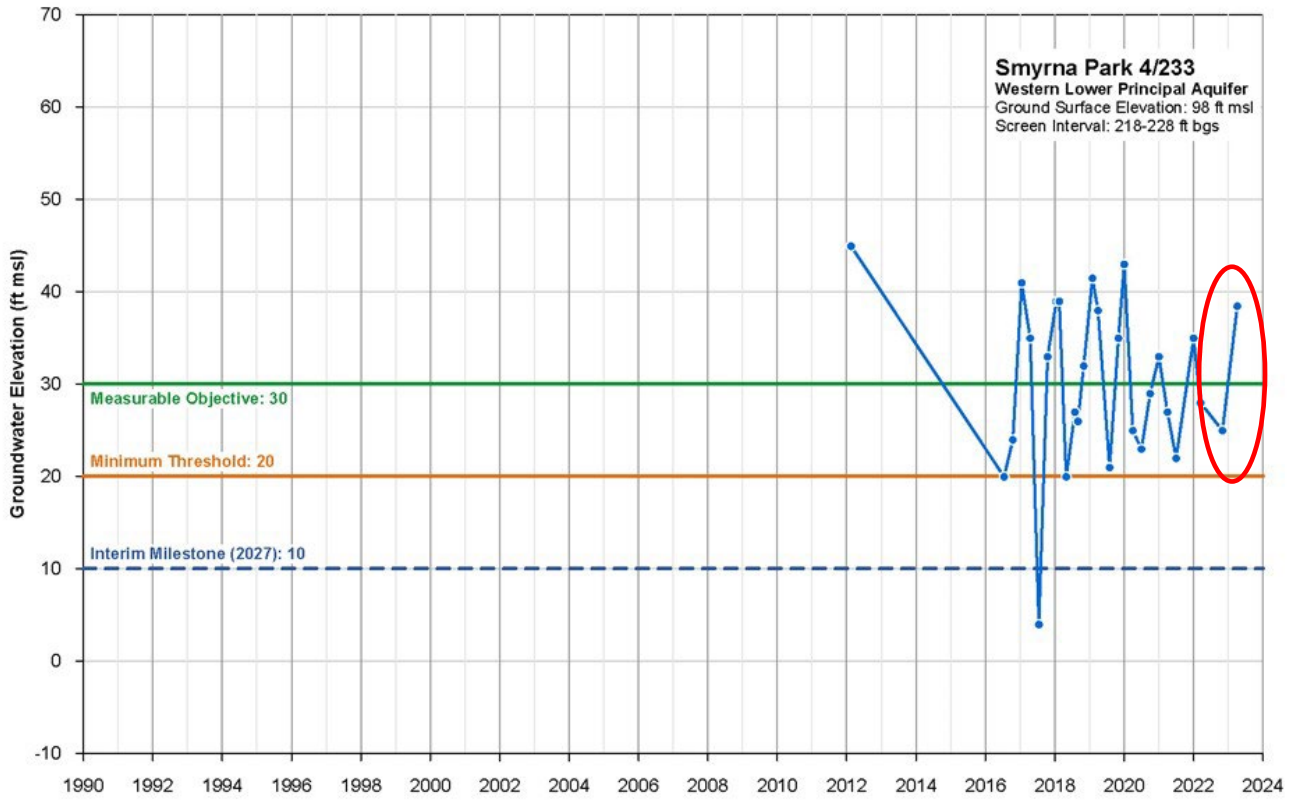
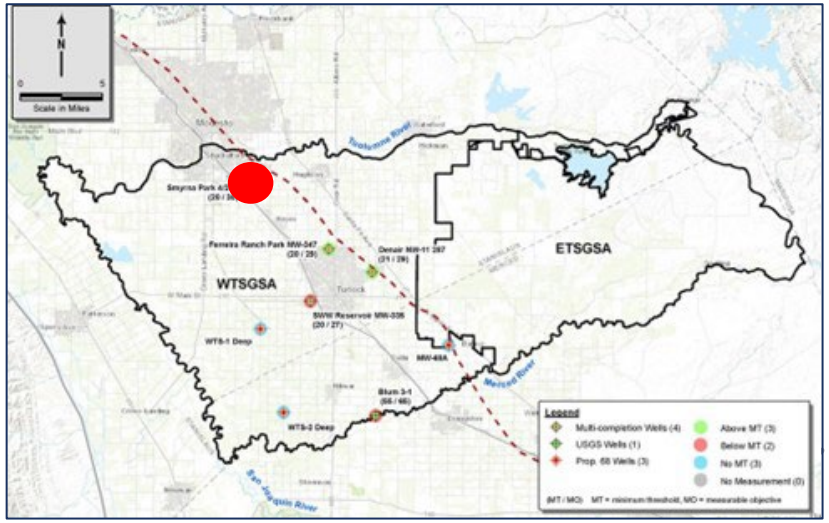
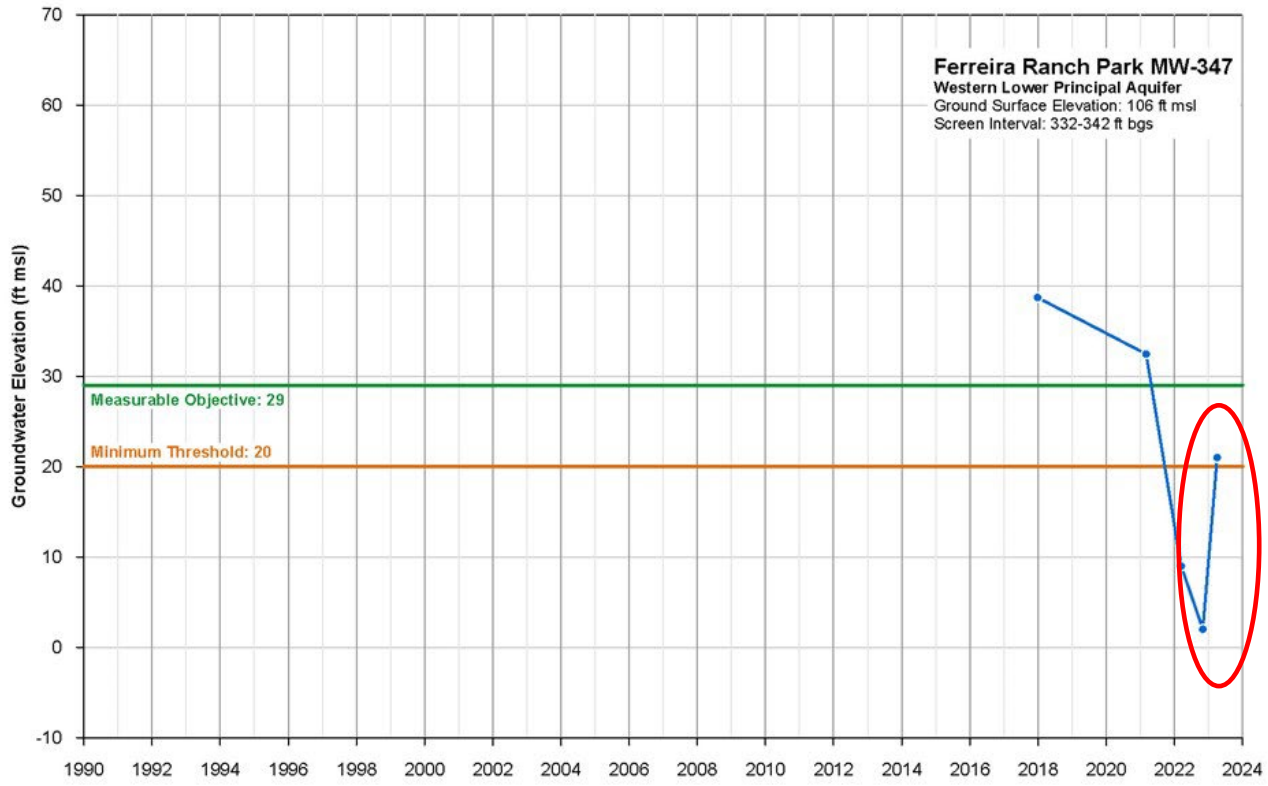
Hydrographs
Western Lower Principal Aquifer



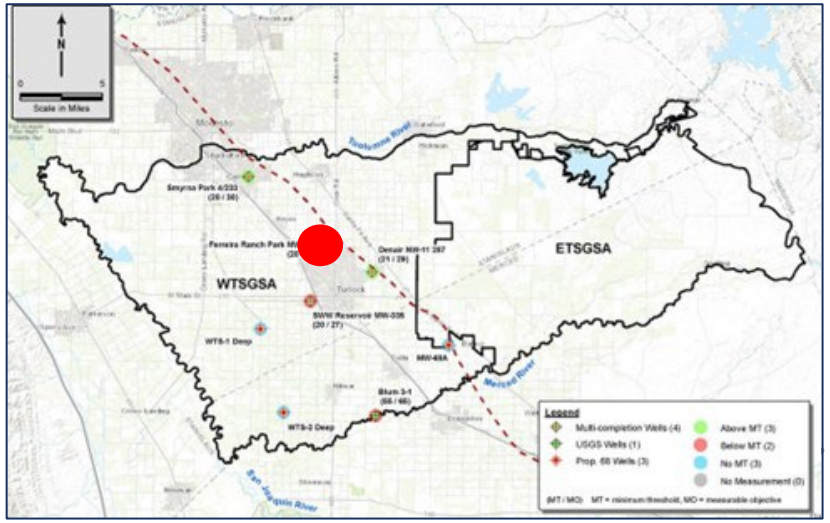
- WY 2023 water levels are above the MT
- Spring 2023 rebound higher than the last two years



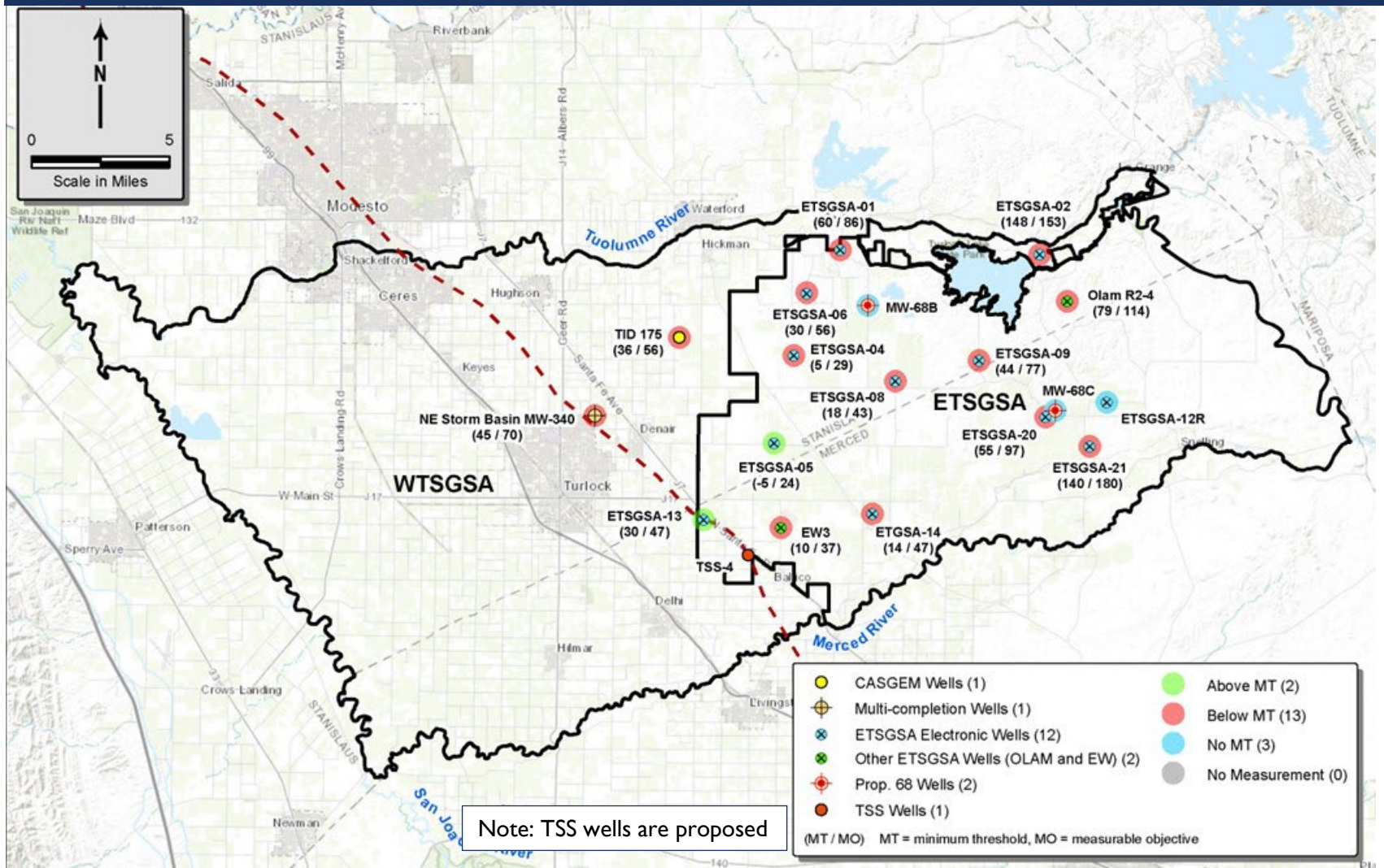
Hydrographs
Western Lower Principal Aquifer



- Fall 2022 is below MT, Spring 2023 rebounded above MT
- Spring 2023 water level is about 12 feet higher than Spring 2022



Fall 2022
Eastern Principal Aquifer



- 87% of RMWs below MT
  - 2 wells > MT
  - 13 wells < MT
- 3 Prop 68 RMWs do not have an MT yet

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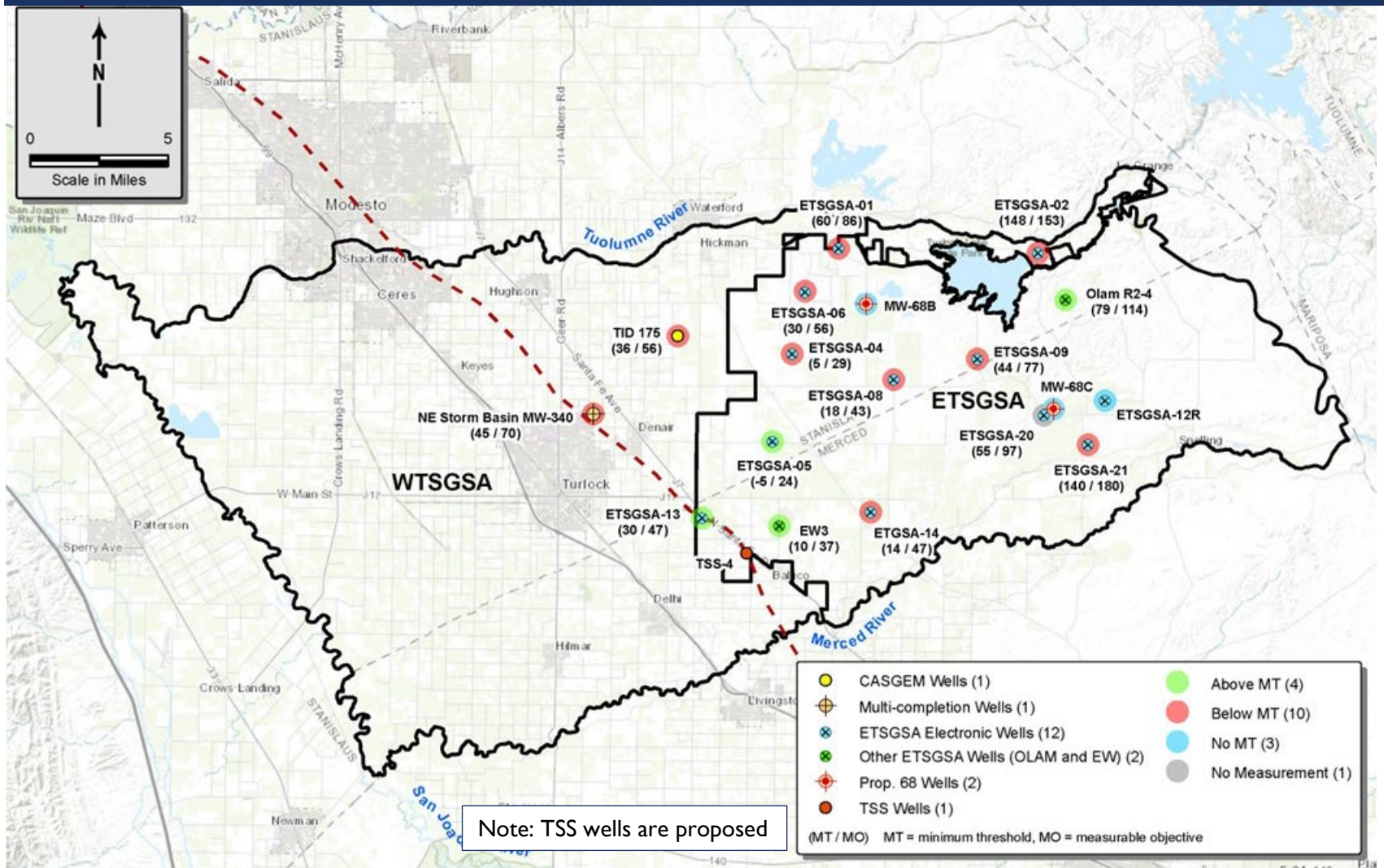
Spring 2023
Eastern Principal Aquifer



- 71% of RMWs below MT
  - 4 wells > MT
  - 10 wells < MT
- 1 well not measured (inaccessible)
- 3 Prop 68 RMWs do not have an MT yet

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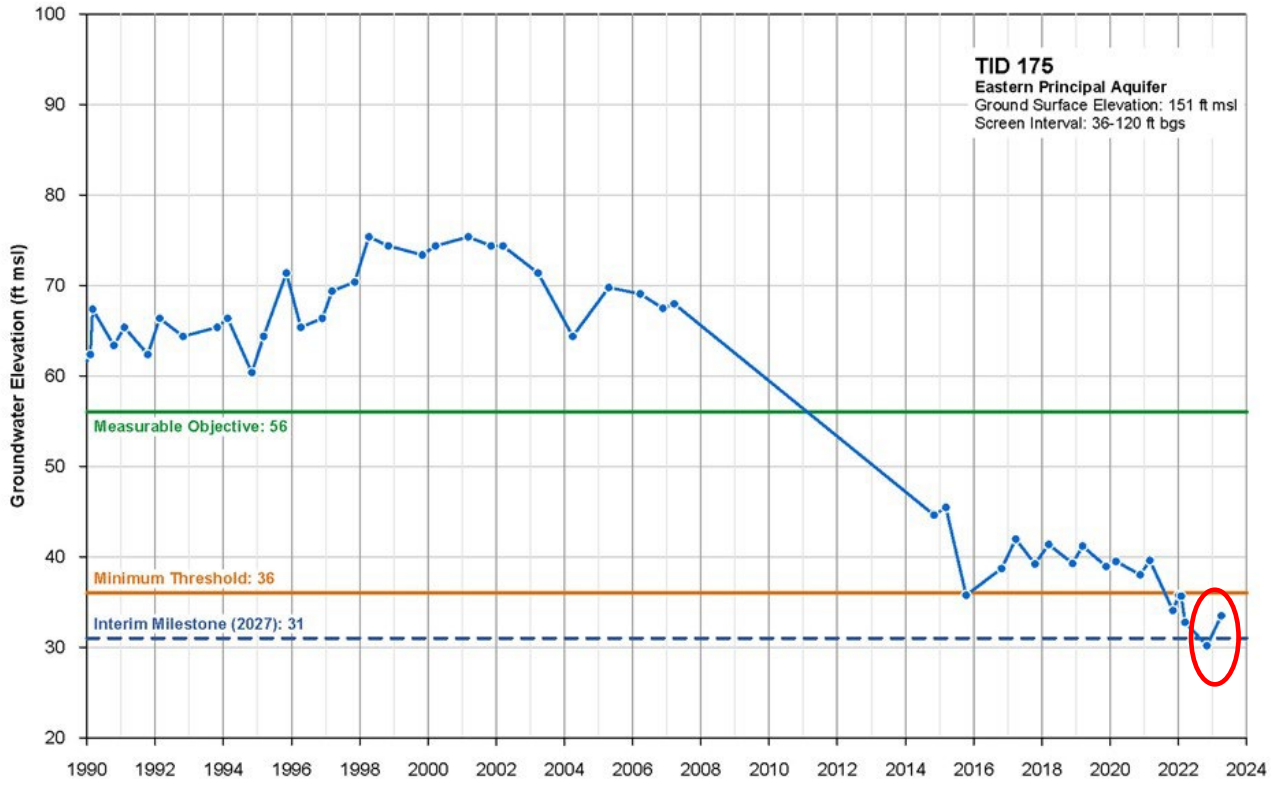
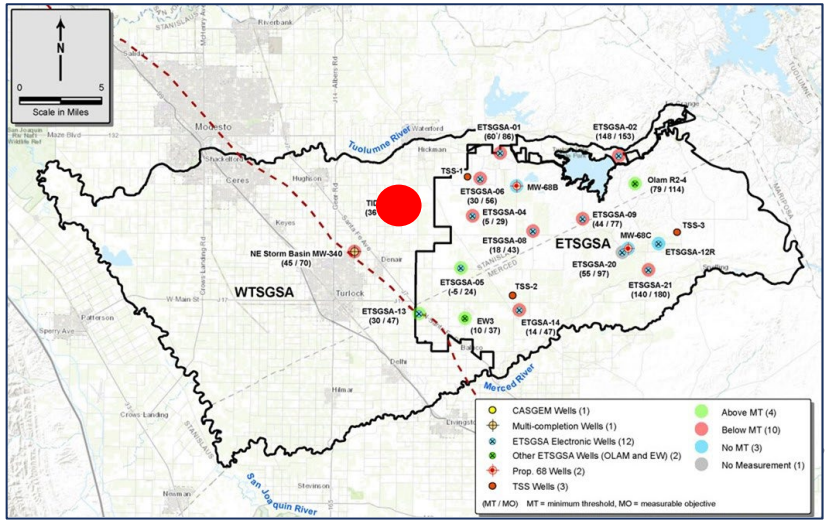
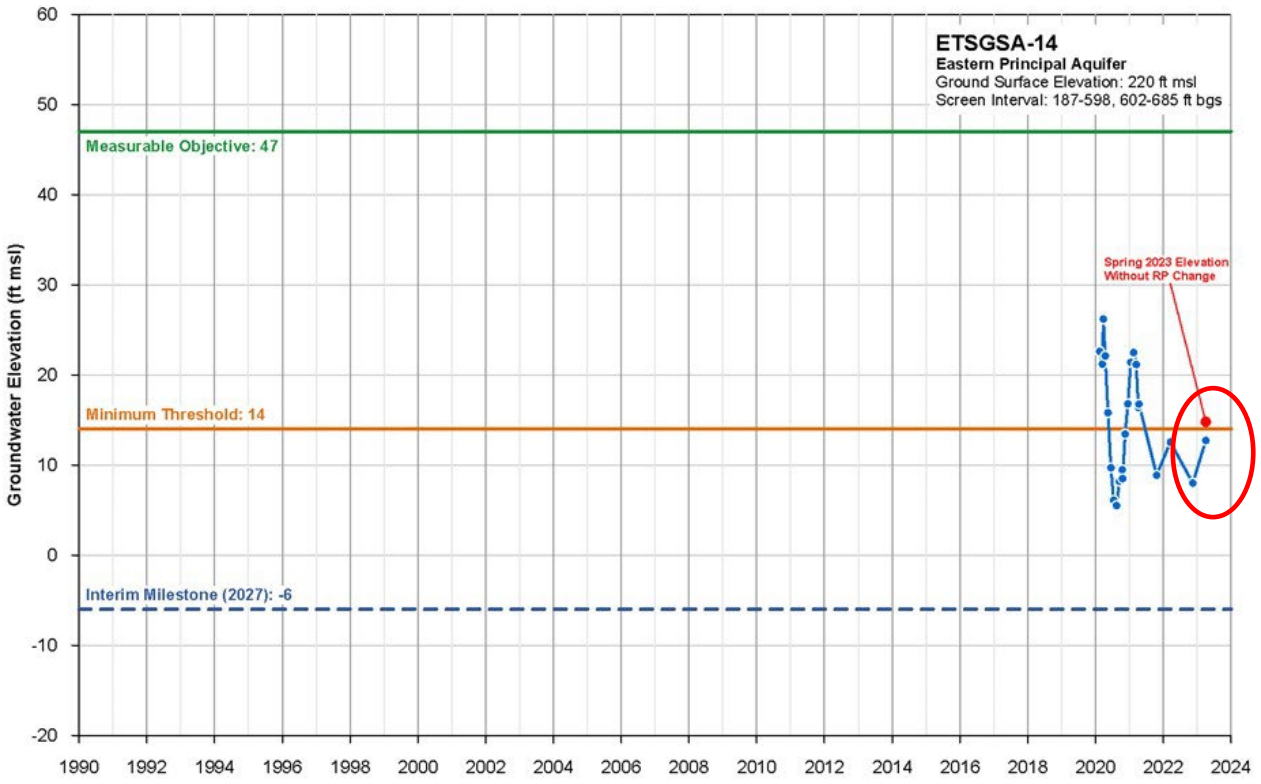
Hydrographs
Eastern Principal Aquifer



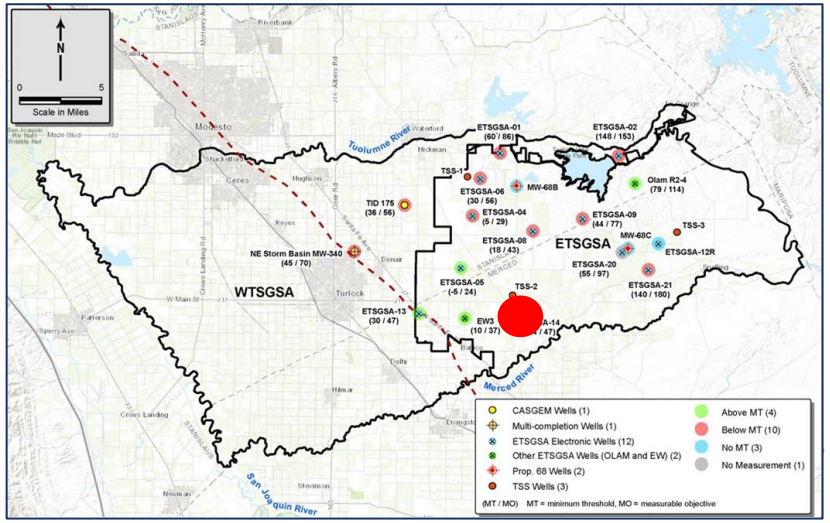
- Fall 2022 below IM
- Spring 2023 rebounded above IM, below MT



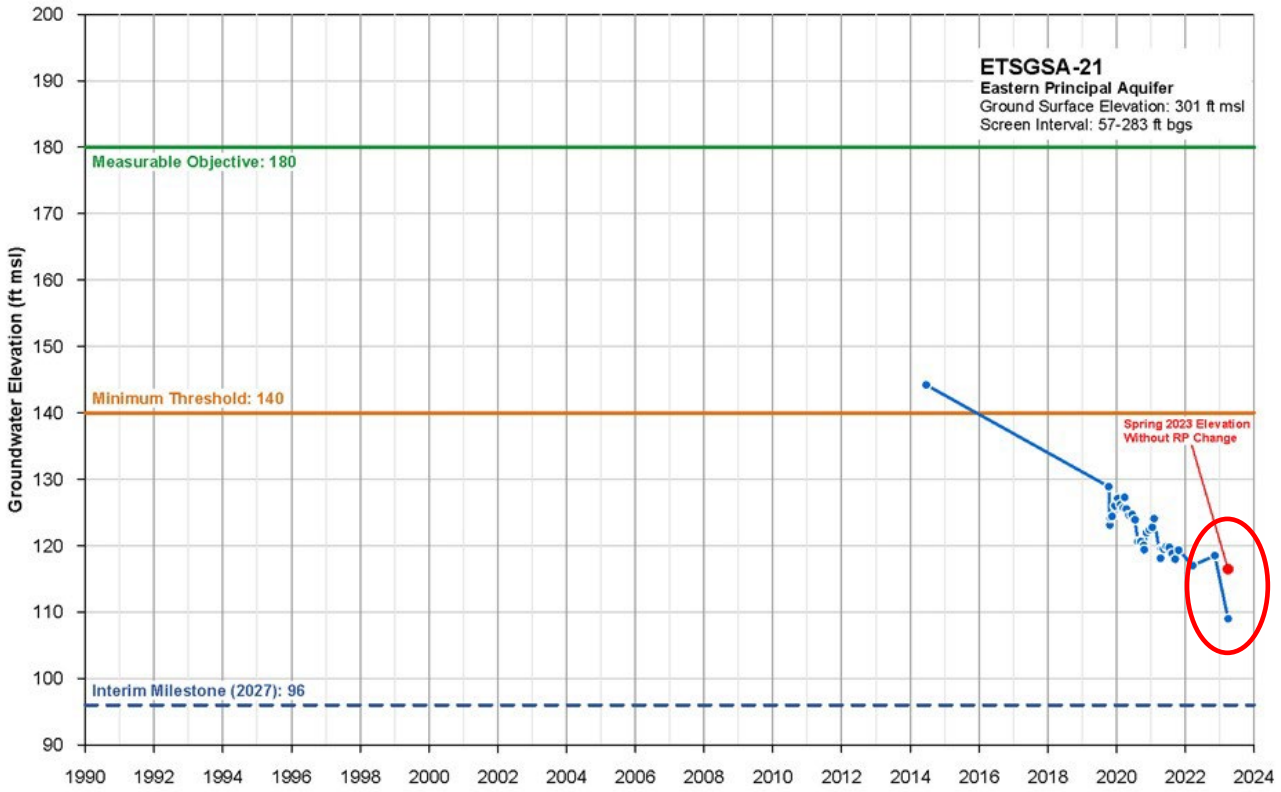
Hydrographs
Eastern Principal Aquifer



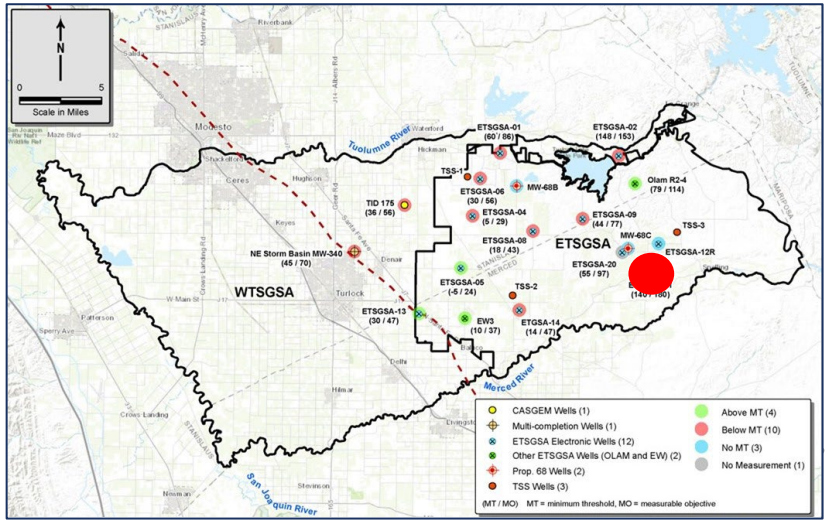
- Seasonal fluctuations
- WY 2023 water levels below the MT
- Without RP change, Spring 2023 would be slightly above MT



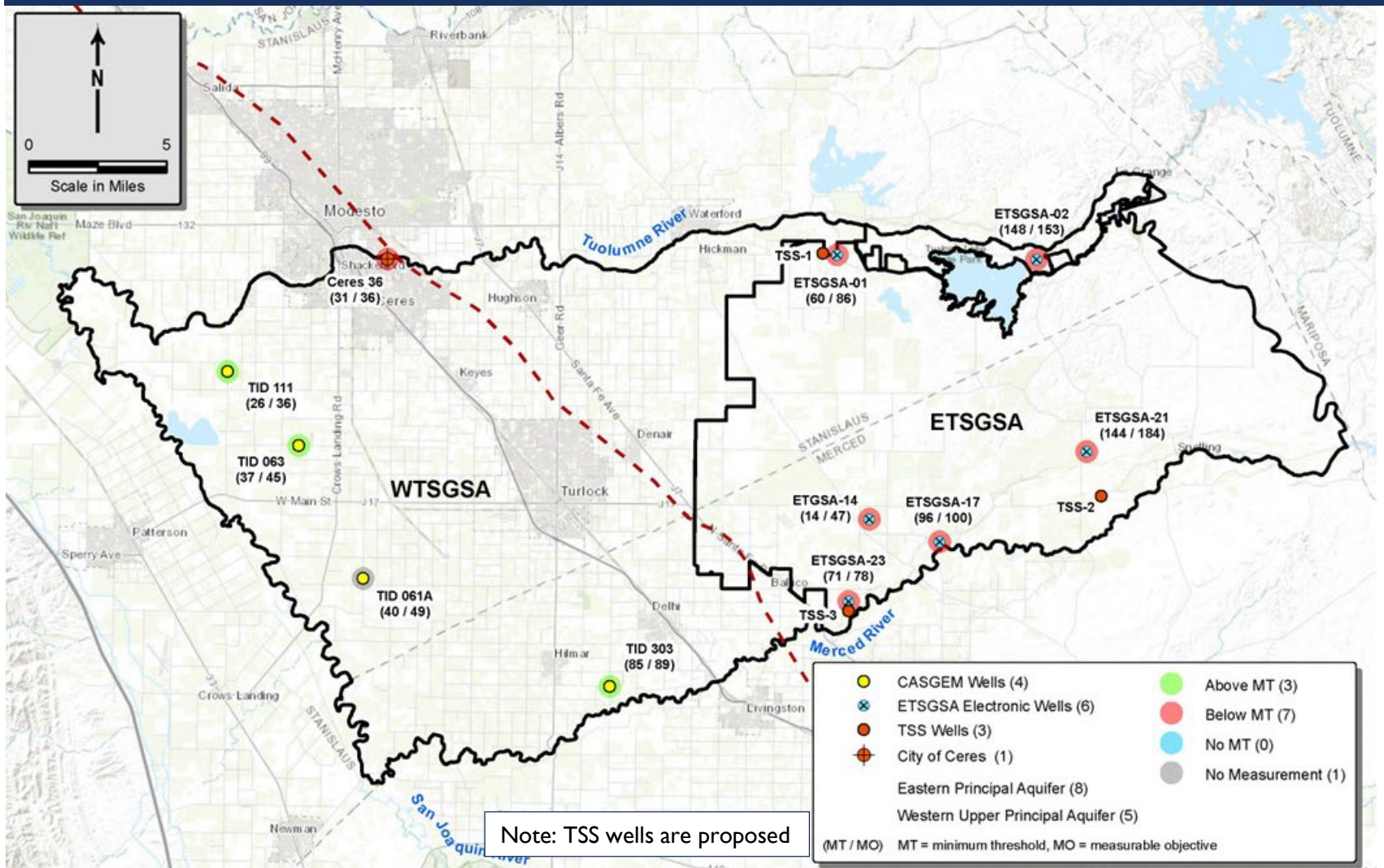
Hydrographs
Eastern Principal Aquifer



- Water levels measured since June 2014
- Declining trends with seasonal fluctuations
- Below MT in WY 2023



Fall 2022
Interconnected Surface Water



San Joaquin River

- 0 of 2 below MT (0% exceed MT)
- 1 not measured (pumping)

Tuolumne River

- 3 of 3 below MT (100% exceed MT)

Merced River

- 4 of 5 below MT (80% exceed MT)

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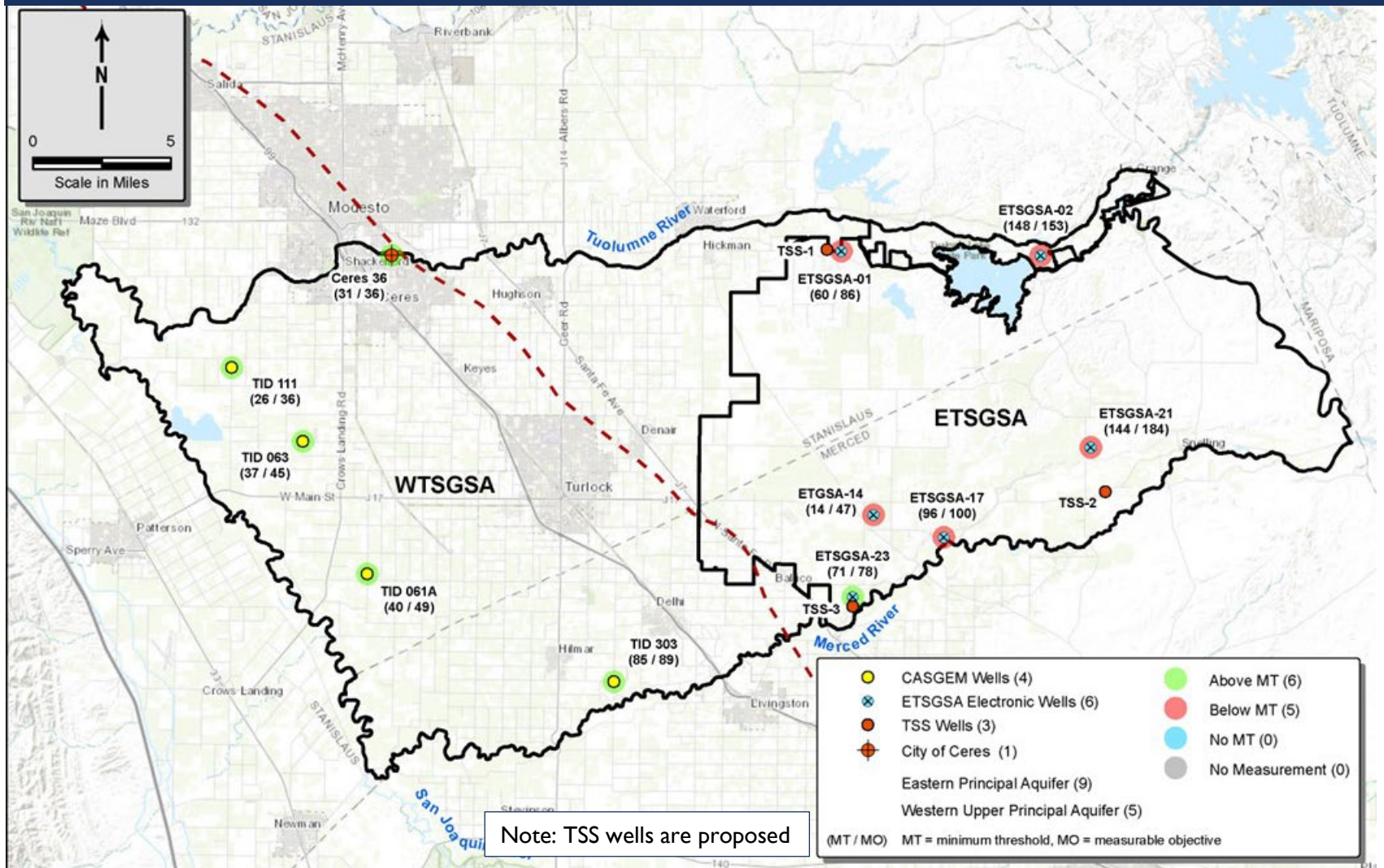
Spring 2023 Interconnected Surface Water



San Joaquin River

- 0 of 3 below MT (0% exceed MT)

Tuolumne River

- 2 of 3 below MT (67% exceed MT)

Merced River

- 3 of 5 below MT (60% exceed MT)

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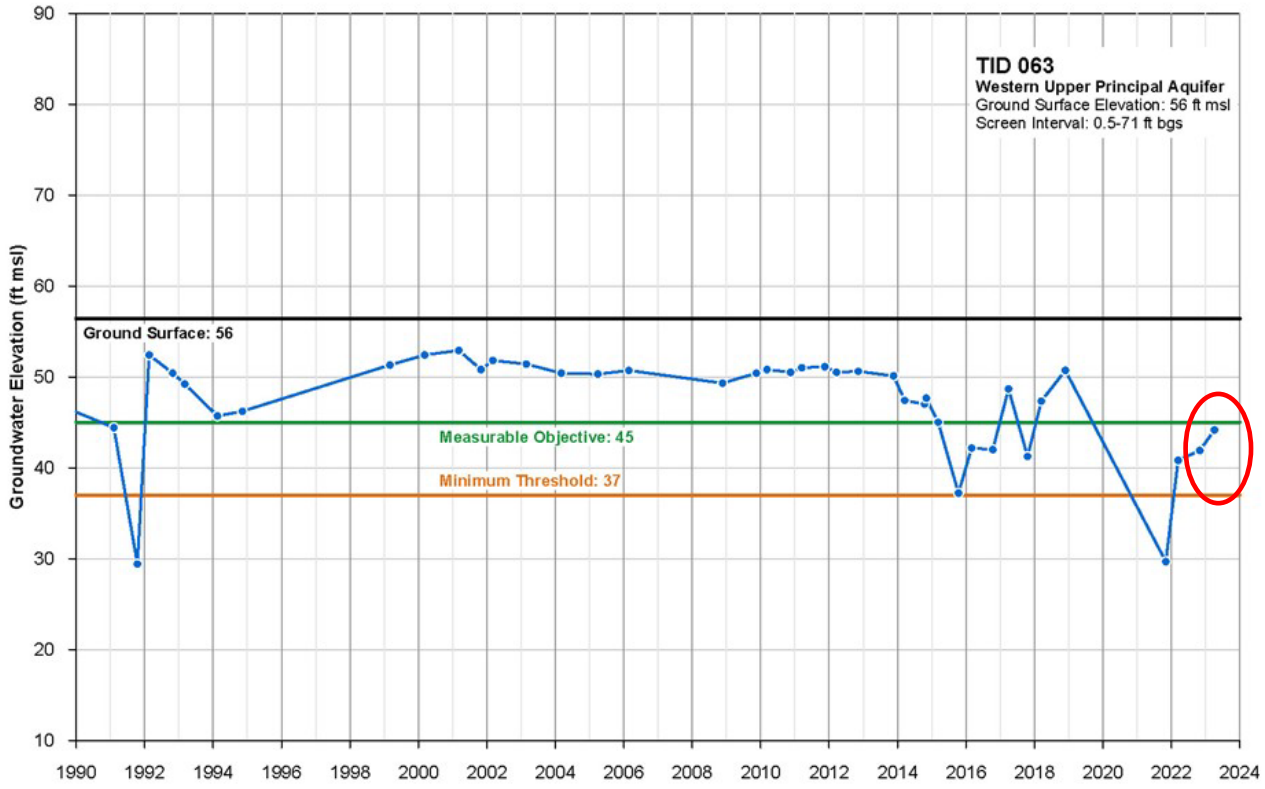
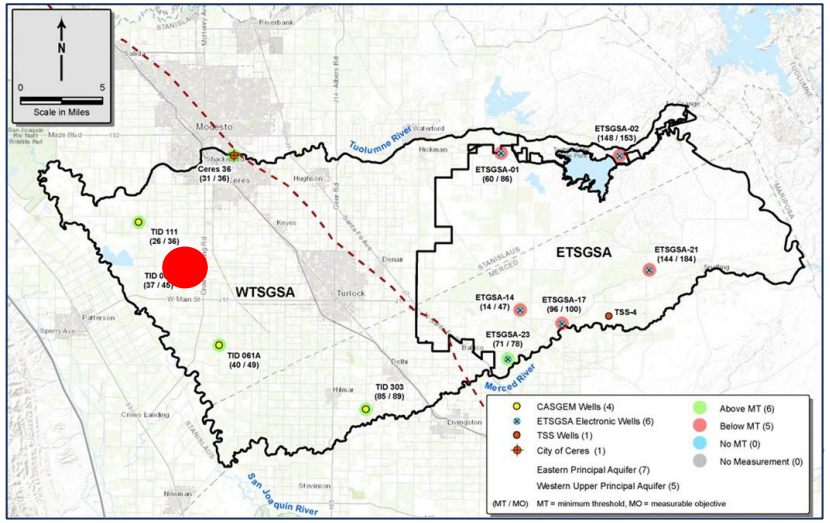
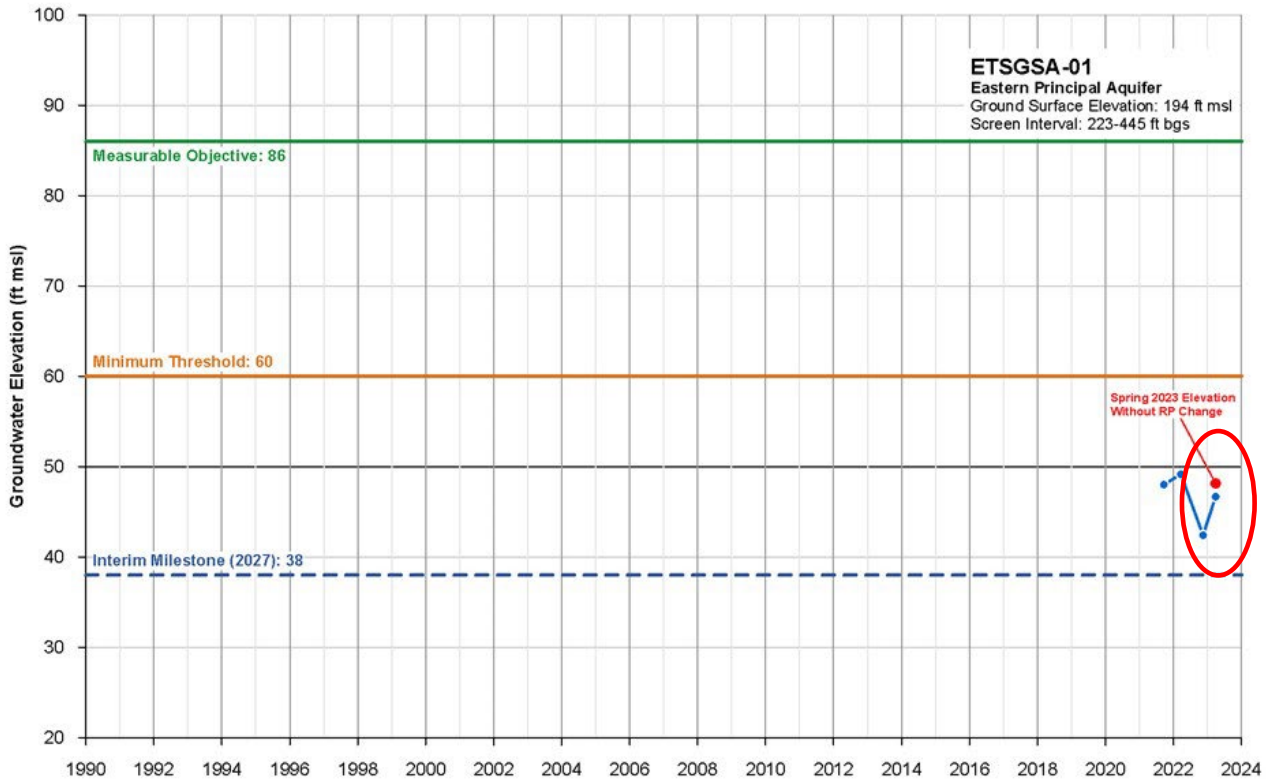
Hydrographs Interconnected Surface Water



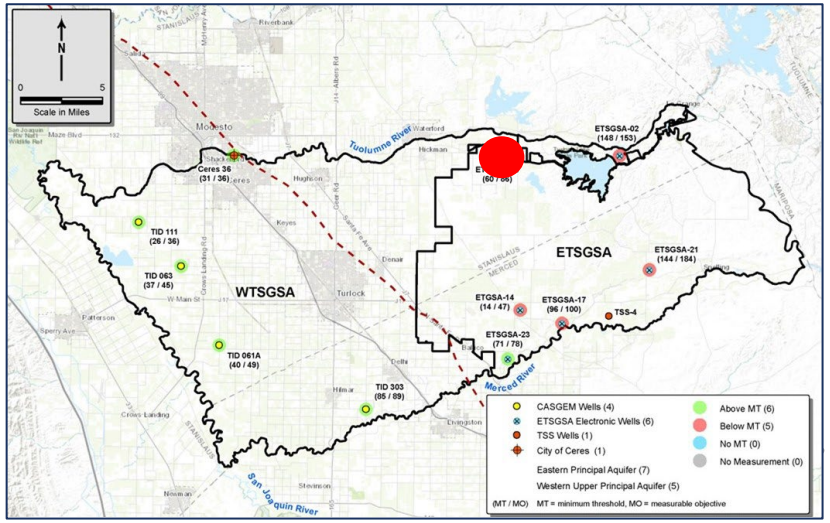
- Water levels above MT in WY 2023
- Water level rise since Fall 2021



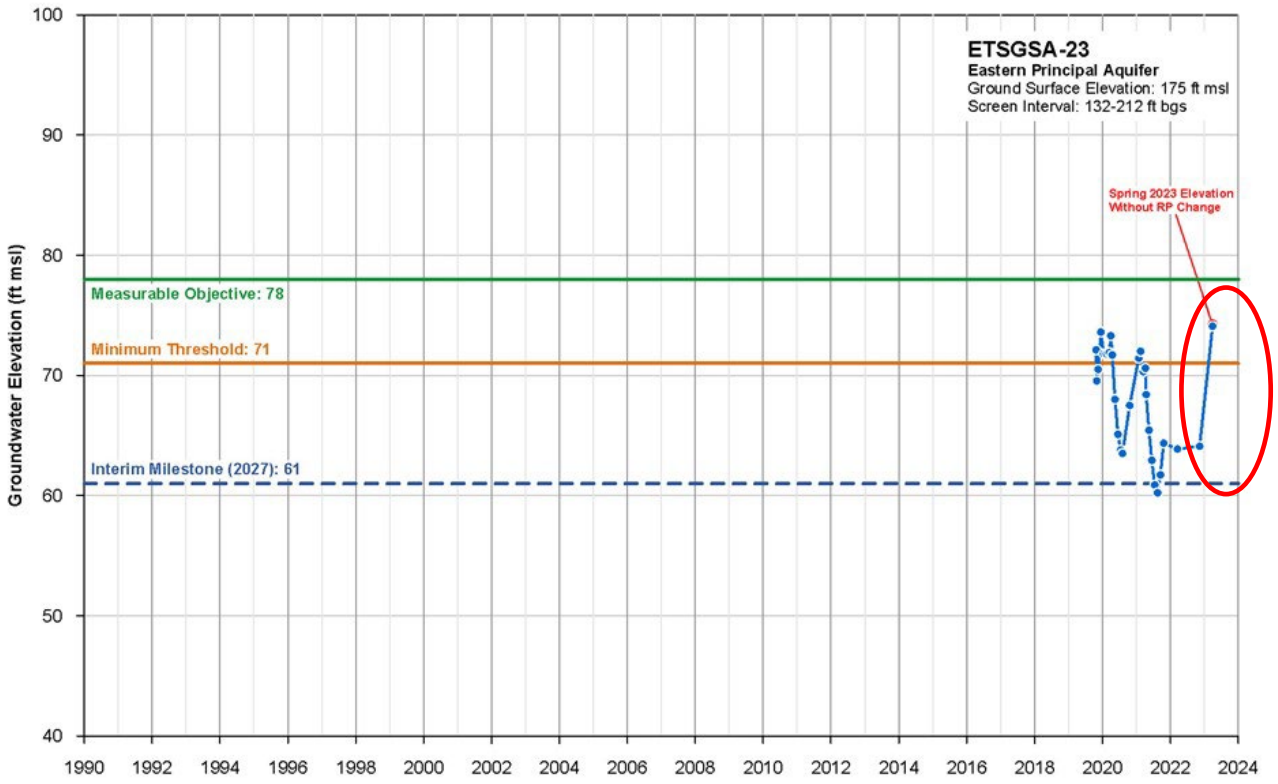
Hydrographs
Interconnected Surface Water



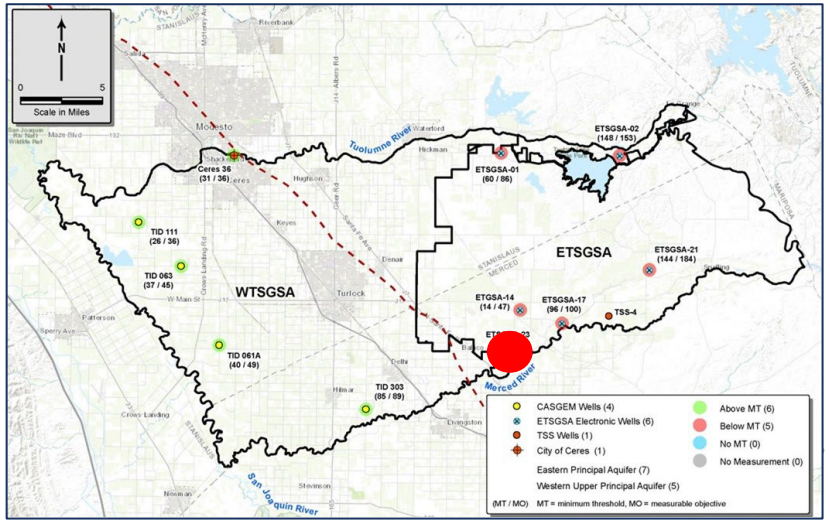
- Water levels below MT during WY 2023
- Water level dropped in Fall 2022 and recovered in Spring 2023



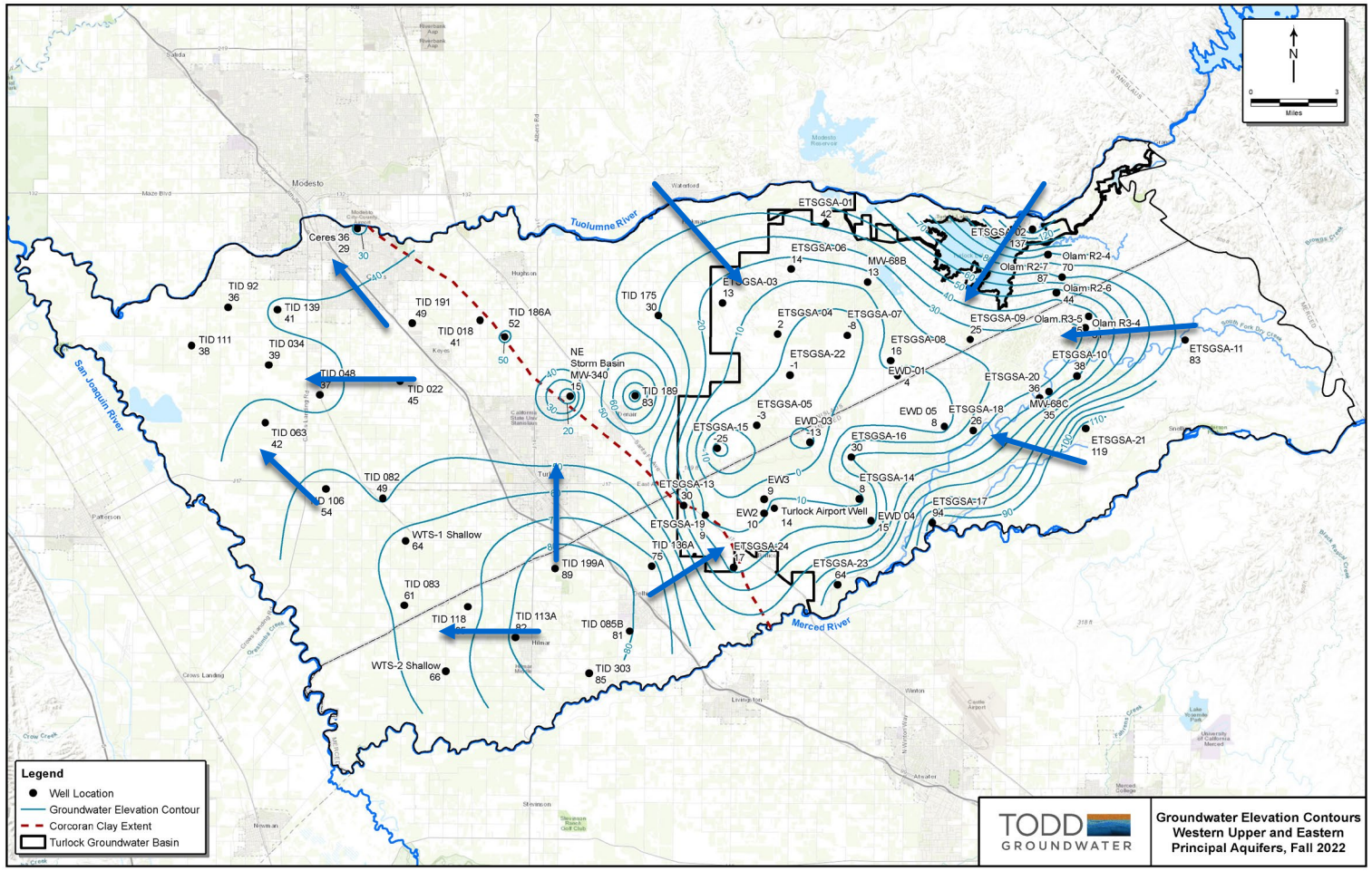
Hydrographs
Interconnected Surface Water



- Water levels measured since October 2019
- Spring 2023 water level rebounded ~10 feet (above MT)



Fall 2022
Western Upper and Eastern Principal Aquifers



- GWE ranges from 36 ft msl (west) to 137 ft msl (east)
- Center of pumping depression -25 ft msl
- Flow is towards the pumping depression in the eastern and central Subbasin
- Groundwater mound in vicinity of Hilmar & Delhi
- Flow to the west and northwest in western Subbasin
- NE Storm Basin water level more consistent with Western Lower Principal Aquifer

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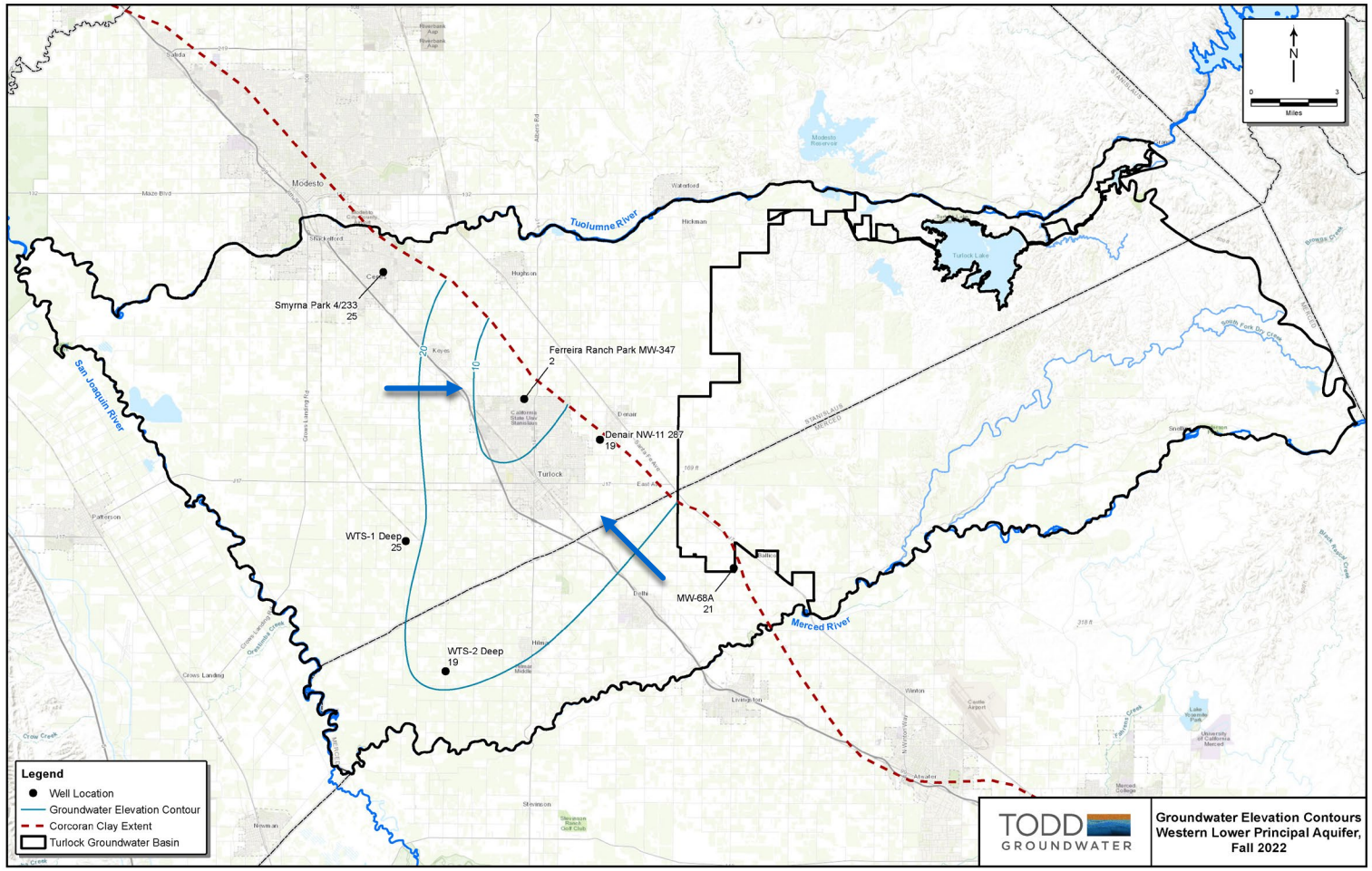
Fall 2022
Western Lower Principal Aquifer



- GWE ranges from 2 to 25 ft msl
- Pumping depression within the City of Turlock
- Data gap in western and northwestern aquifer

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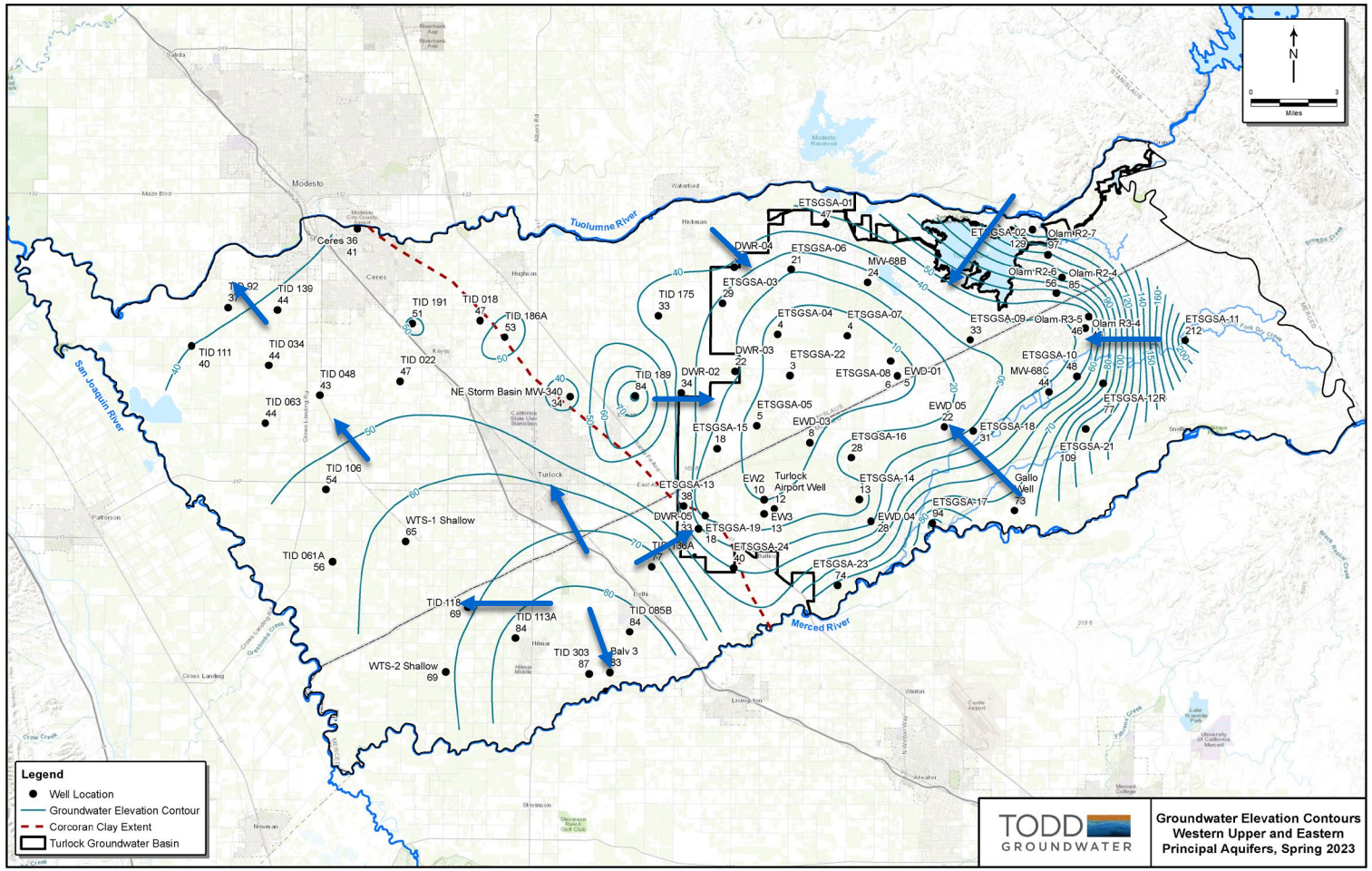
Spring 2023
Western Upper and Eastern Principal Aquifers



- Similar flow pattern as Fall 2022
- Elevations range from 37 ft msl (west) to 212 ft msl (east)
- Center of pumping depression 3 ft msl
- ETSGSA-11 (easternmost MW)
  - Groundwater elevation increased ~130 ft from Fall 2022
  - Evidence of recharge from Dry Creek?

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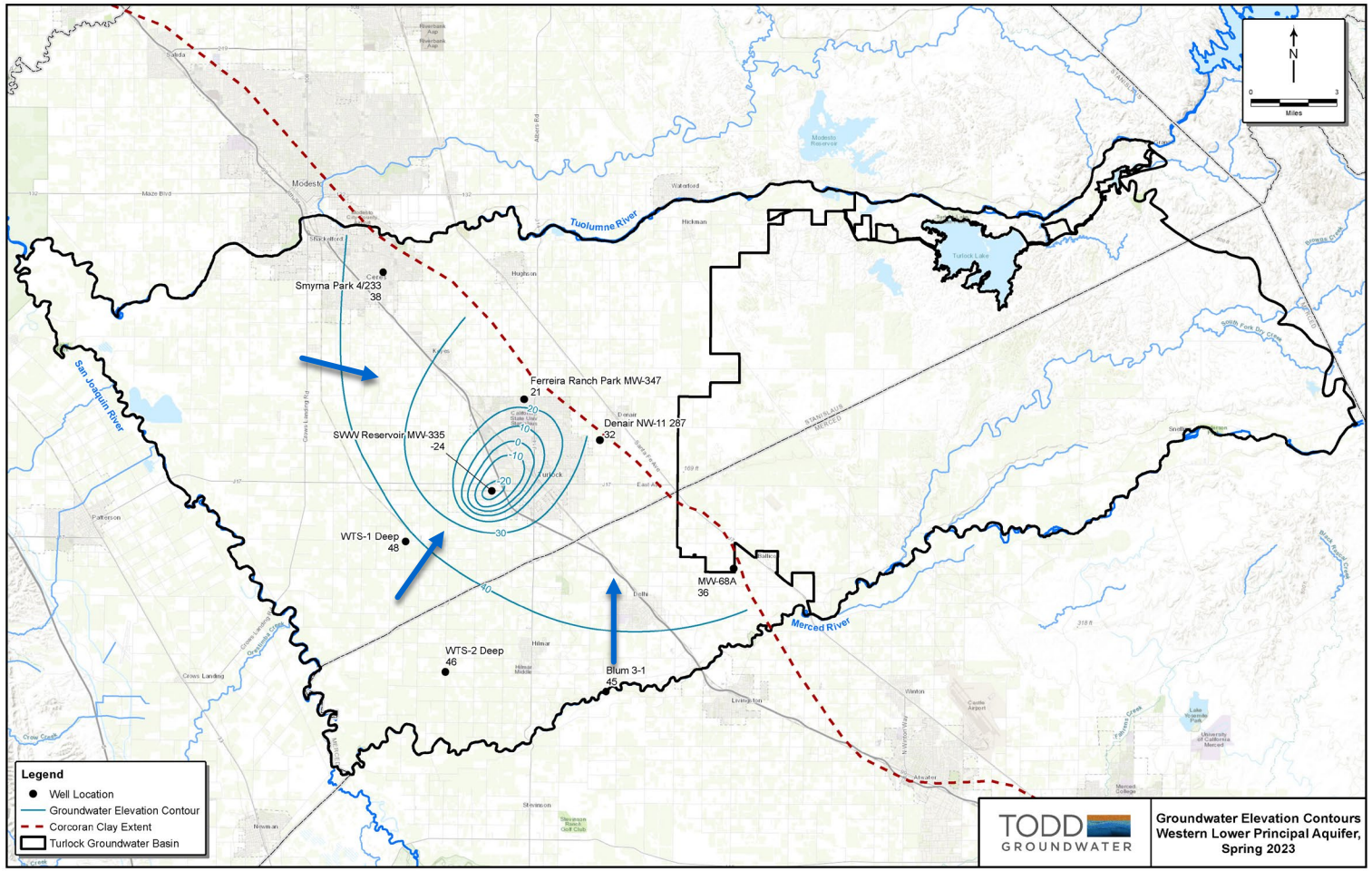
Spring 2023
Western Lower Principal Aquifer



- GWE ranges from -24 to 48 ft msl
- Pumping depression within the City of Turlock is more pronounced than in Fall 2022

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Putting These Results in Perspective

- Significant number of MT exceedances in Fall 2022
- Some IM exceedances
- Fall 2022 monitoring event occurred after two consecutive critically dry years (WY 2021 and WY 2022). Observed water level declines are not surprising.
- Fall 2022 monitoring event is the first Fall event that counts towards undesirable results.
- Undesirable results have not been triggered.
- Spring 2023 water levels show signs of recovery, but likely do not not fully reflect affect of wet year

What's Next

- Third Annual Report – due April 1, 2024 (underway)
- DWR assessment by end of January 2024. Two options:
  - Approved
  - Incomplete: 180 days to revise GSP based on DWR's comments

QUESTIONS