



Tulare Irrigation District

2023 Groundwater Recharge – Above, Below, and Beyond



Aaron Fukuda

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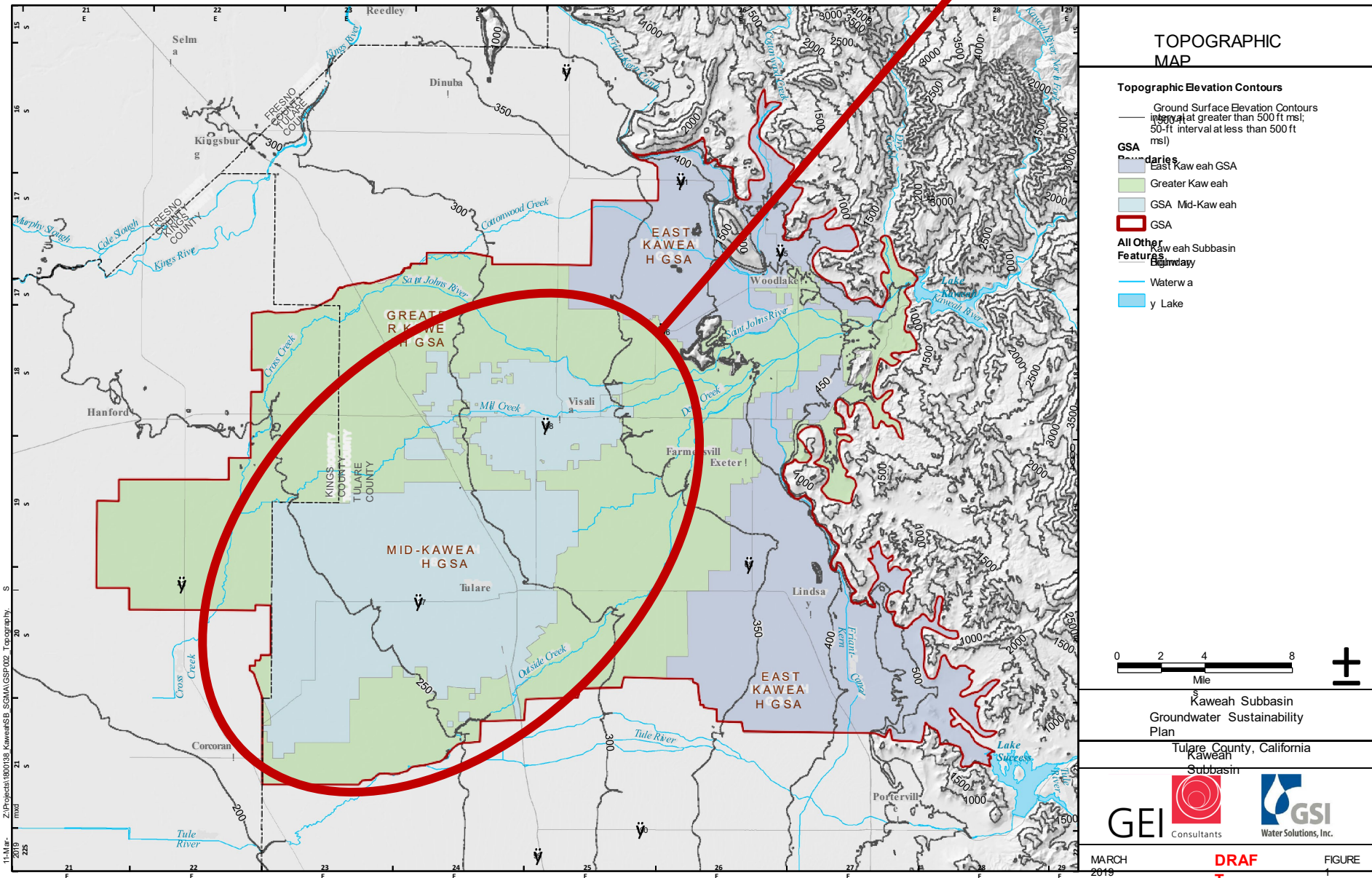
559-707-8928: Mobile

559-686-3425: Office

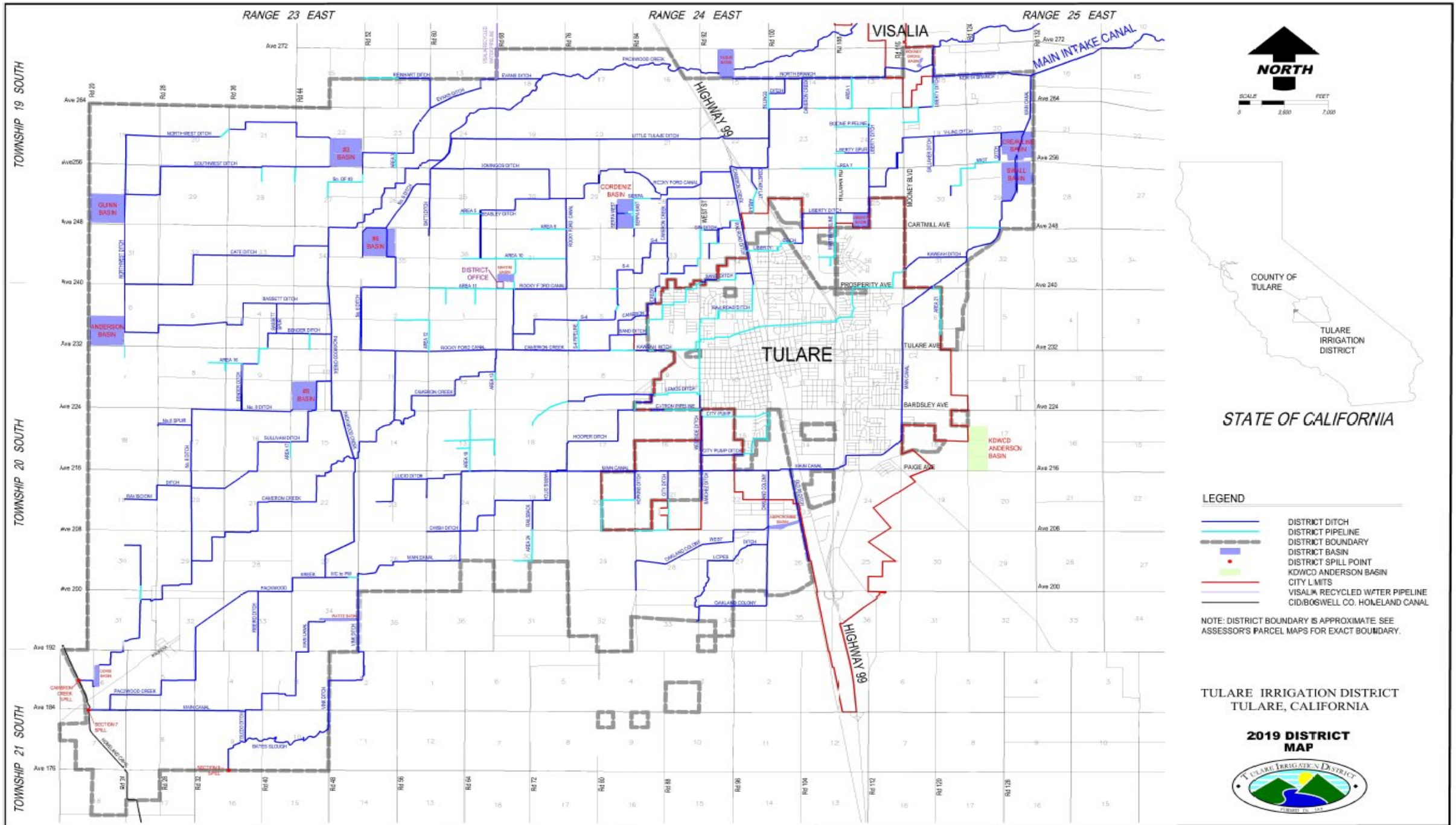


Kaweah Sub Basin

Mid-Kaweah GSA



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SCALE
0 2,500 7,000
FEET



STATE OF CALIFORNIA

- LEGEND**
- DISTRICT DITCH
 - DISTRICT PIPELINE
 - DISTRICT BOUNDARY
 - DISTRICT BASIN
 - DISTRICT SPILL POINT
 - KD/WCD ANDERSON BASIN
 - CITY LIMITS
 - VISALIA RECYCLED W/TER PIPELINE
 - CID/BOSWELL CO. HOMELAND CANAL

NOTE: DISTRICT BOUNDARY IS APPROXIMATE SEE ASSESSOR'S PARCEL MAPS FOR EXACT BOUNDARY.

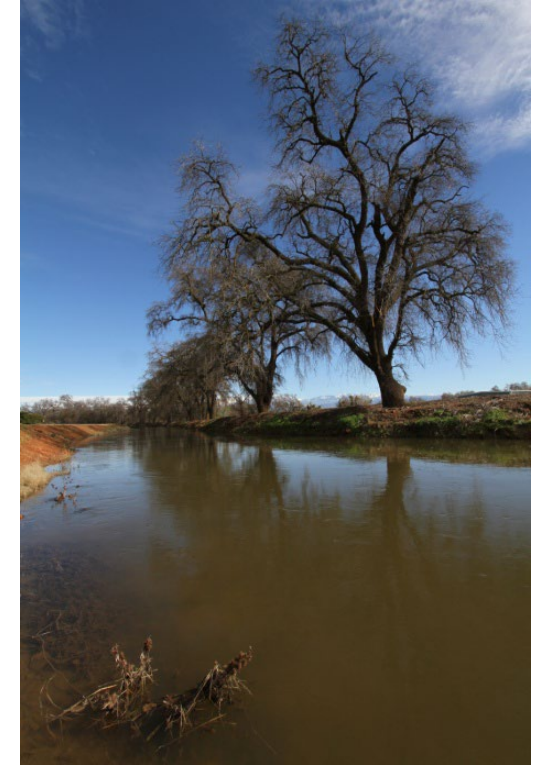
TULARE IRRIGATION DISTRICT
TULARE, CALIFORNIA

**2019 DISTRICT
MAP**

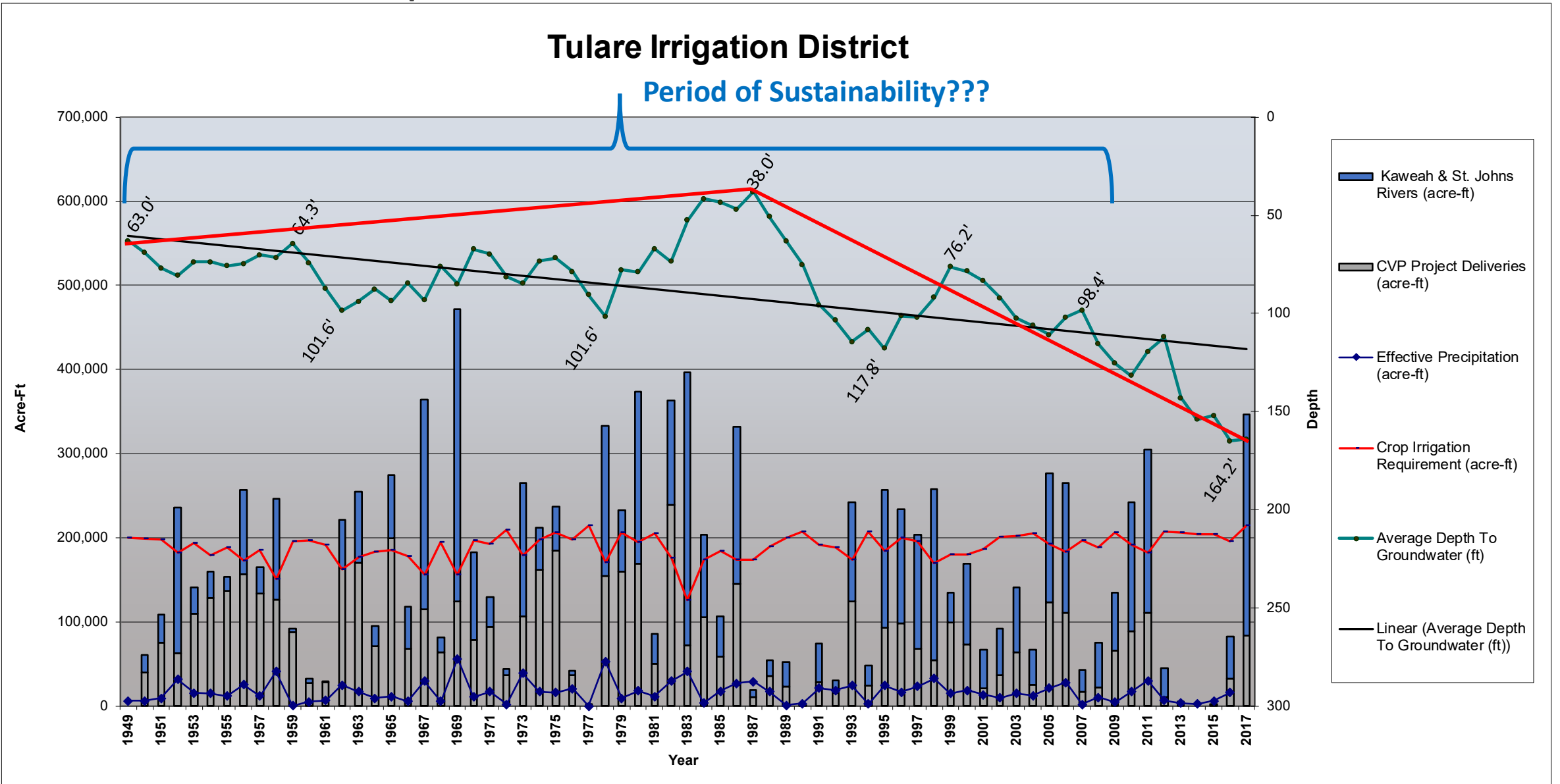


What is the Tulare Irrigation District

- Formed in 1889
- Acreage: Approx. 65,000 Acres
- *300 miles of earthen canals*
- 30 miles of pipelines
- *1,300 Acres of Recharge Basins*
- *Average Annual Surface Water Supply of 150,000 AF*
- Kaweah River Pre-1914 Water Rights
- CVP Friant Supplies
 - Class 1: 30,000 AF
 - *Class 2: 141,000 AF*
- Approx. 200 Growers
- Main Crops
 - Corn
 - Wheat
 - Alfalfa
 - Walnuts
 - Almonds
 - Pistachios

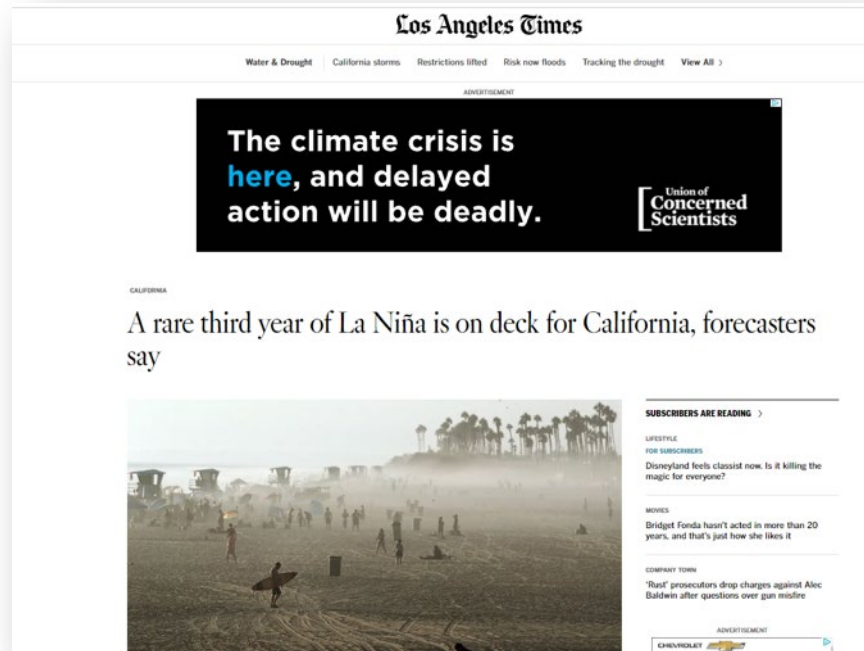


Historical Depth to Groundwater



3 Years of Drought →

Nov. 2022



3 Months of Preparation for Drought



Jan. 2023



9 Months of Recharge



The Story Begins

SGMA Compliance on The Ground in 2022

We are here to help;

We are going to allocate;

We are going to restrict; and

We are going to charge

You for GROUNDWATER.

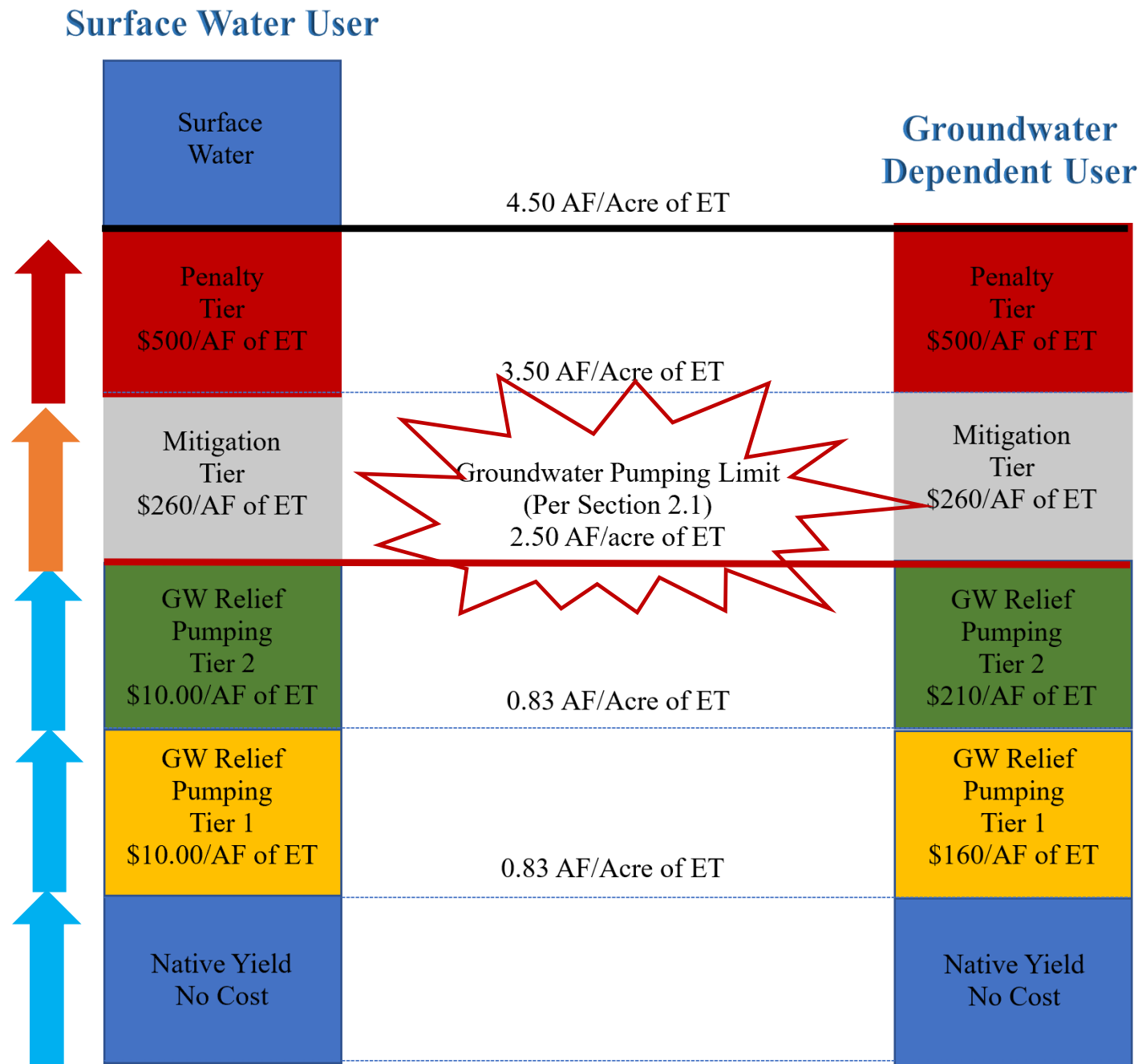


MKGSA Emergency Ordinance



Emergency Ordinance - Groundwater Pumping Limit

- Pumping Limit (“Cap”): 2.5 AF/acre as ET
 - Native Yield – 10”
 - Relief Pumping Tier 1 – 10”
 - Relief Pumping Tier 2 – 10”
 - Costs: Service Fees and Replacement Fees
- Mitigation Tier – 1 AF/Acre
 - Allows for buffer as we begin the program
 - Pricing based upon cost to replace water
- Penalty Tier – 1 AF/Acre
 - High Penalty Fees
 - Loss of future water allocation on a 1:1 ratio



Water Dashboard – Online Allocation/Usage Tool

Shared View

Dashboard

WD1779

Tulare Irrigation District
Aaron Fukuda
(559) 686-3425

Member Menus

- Home
- Water Accounts
- Farm Map
- Explore Usage

WA0000027: Tulare Irrigation District

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Water Account Summary Table Definitions

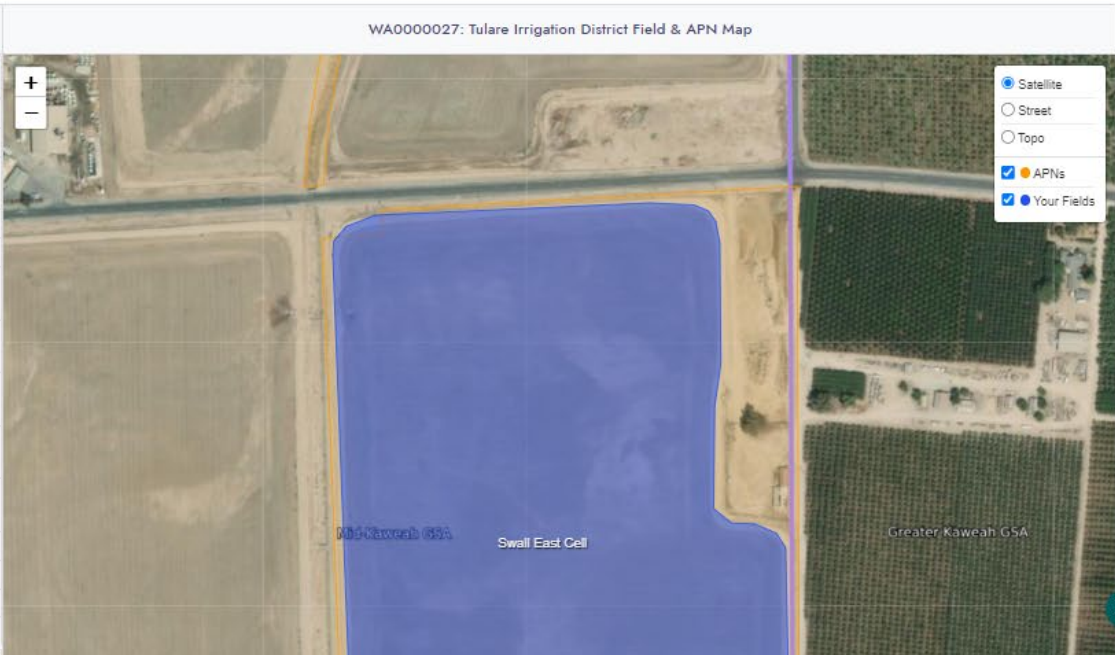
*Mid-Kaweah GSA Emergency Groundwater Extraction Ordinance is in effect as of May 1, 2022.
East Kaweah GSA Emergency Groundwater Allocation Policy is effective retroactively from October 1, 2021, through September 30, 2022.
Greater Kaweah GSA approved Rules and Regulations setting a groundwater pumping cap for water year 2023 on September 27th, 2022. Call (559)302-9987 if you have any questions.*

Groundwater Sustainability Agency	Billing Period	Billing Usage to Date	Water Supply	Usage to Date		Last Year's Usage		Parcel Acres	Field Acres
				Land IQ ET Oct 2021 - August 2022	Land IQ ET Oct 2020 - Sept 2021				
Mid-Kaweah GSA	May 22 - Sep 22	5.3 AF	251.15 AF	29.23 AF	0.52 AF/field ac	28.66 AF	0.51 AF/field ac	100.37	56.76
Greater Kaweah GSA	N/A	N/A	N/A	0.02 AF	0.00 AF/field ac	0.09 AF	0.00 AF/field ac	693.93	0.00

Water Supply Summary Table Definitions

MKGSA 2022 (May 22 - Aug 22)

+ Total Water supply	251.15 AF
+ Precipitation	0.23 AF
Precipitation Credit <small>80% of total precipitation for (May 22 - Aug 22)</small>	0.23 AF
+ Surface Water Deliveries	Not Currently Available
+ Groundwater Allocations (2.5 AF/Ac)	250.93 AF
Native <small>SW: 0.84 AF/parcel ac</small>	<small>\$0/AF</small> SW: 84.31 AF
Tier 1 <small>SW: 0.83 AF/parcel ac</small>	<small>\$10/AF</small> SW: 83.31 AF
Tier 2 <small>SW: 0.83 AF/parcel ac</small>	<small>\$10/AF</small> SW: 83.31 AF
Mitigation Tier <small>\$260/AF</small>	More Information
Penalty Tier <small>\$500/AF</small>	More Information
+ Groundwater Credits	TBD
+ Recharge and Banking Credits and Debits	TBD
+ Prohibited Tier 3 Groundwater Pumping	
Dairy Operations	Not Currently Available



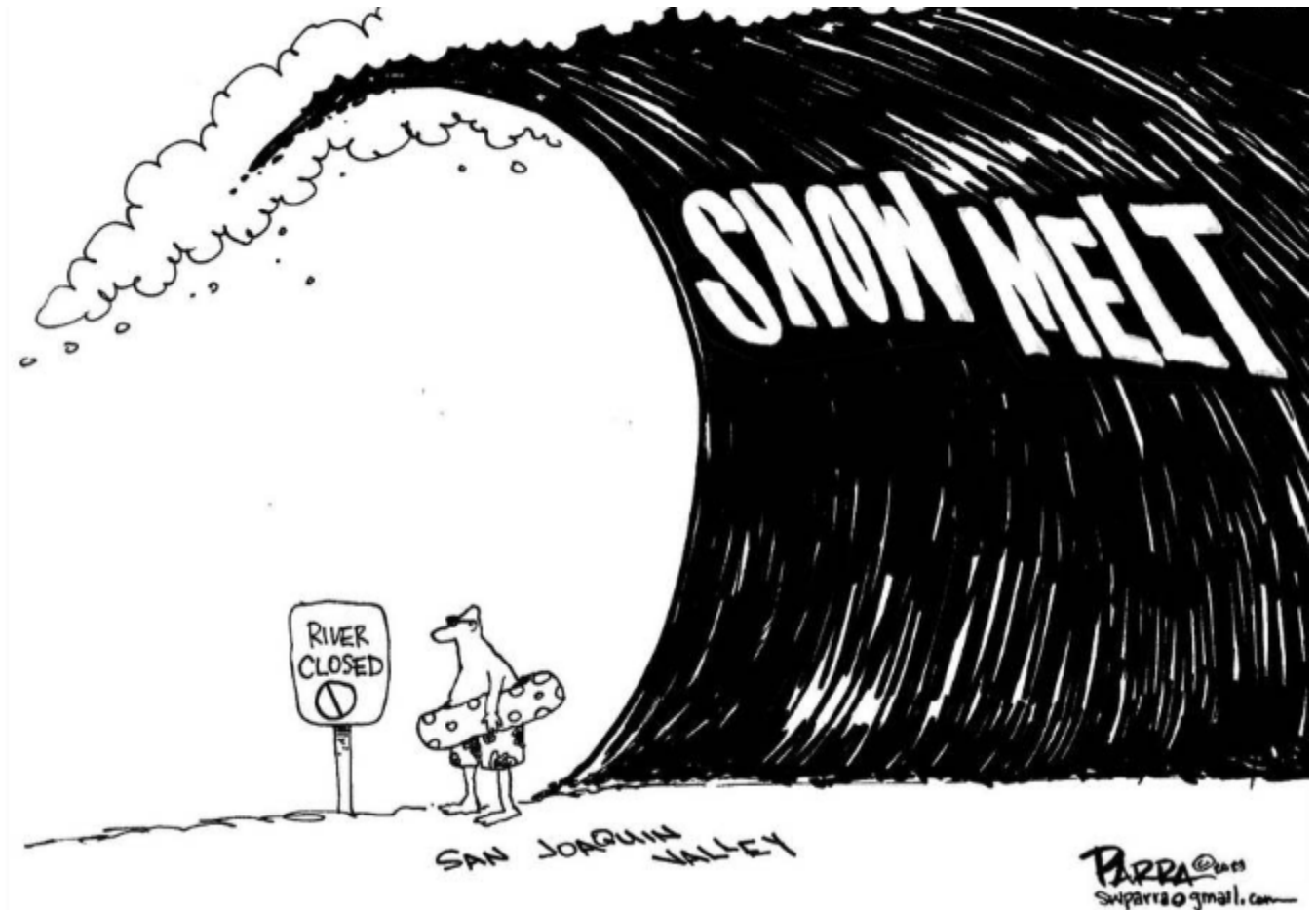
Getting Started Guide

Contact Us

Roadmap

Winter 2023 on the Ground Recharge Operations

- Early January started flows into the system but kept the system with room to accommodate ongoing Atmospheric Rivers
- Mid-January: After atmospheric river activity
 - Opened up for irrigation deliveries and immediately went to 80+ turnouts active and **750 cubic feet per second (1,500 AF per day)**
 - Where is the water going:
 - Field irrigation (majority of irrigation going to groundwater)
 - Canal system losses (filling entire system)
 - Recharge Basin (1,300 acres of recharge basin)



Cordeniz Basin (60 Acres)



Swall/Creamline Basin (265 Acres)



Martin Basin (27 acres)



Recharge Basins



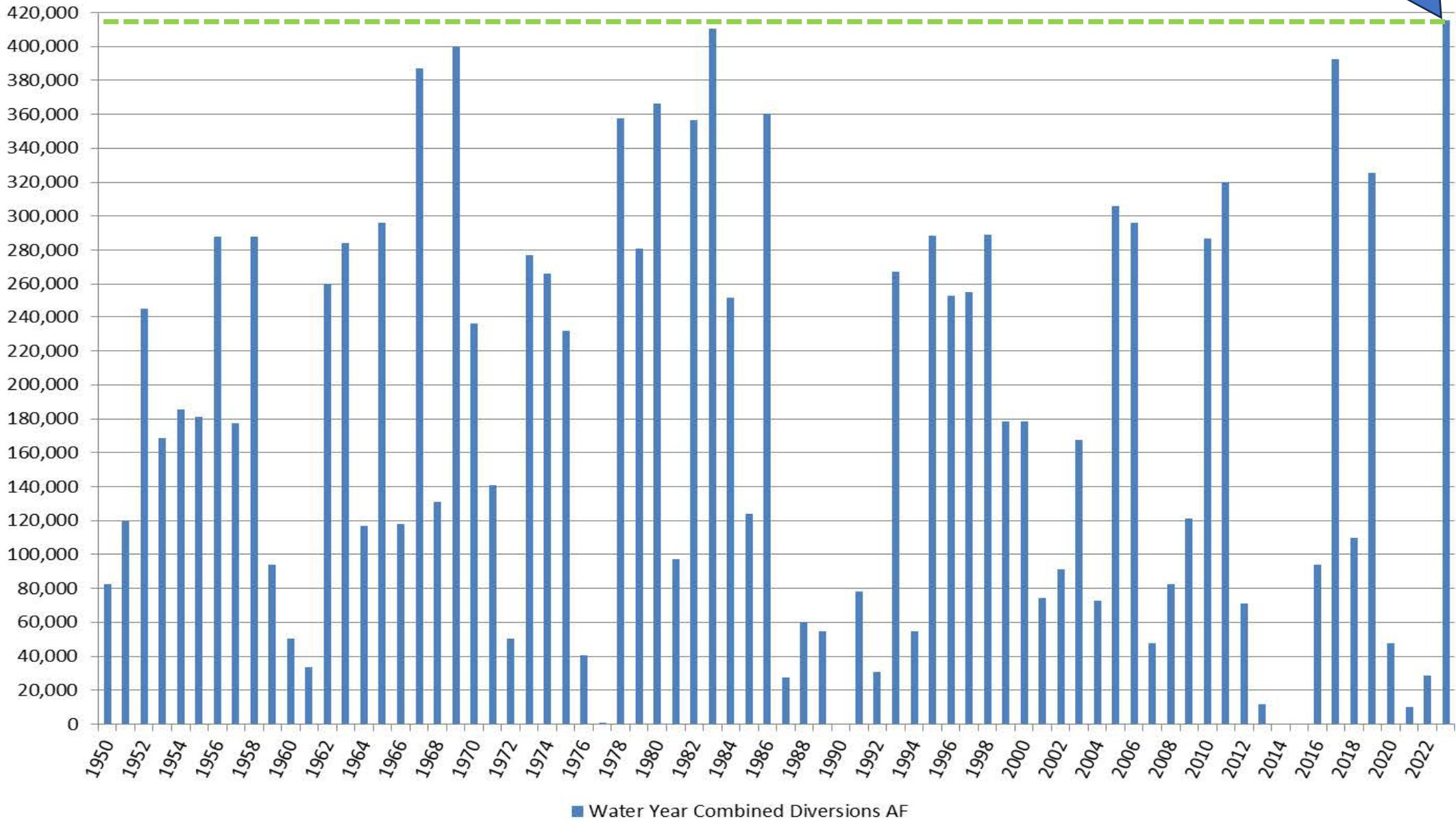
Winter Irrigation Recharge

TID/City of Tulare/City of Visalia Partnerships

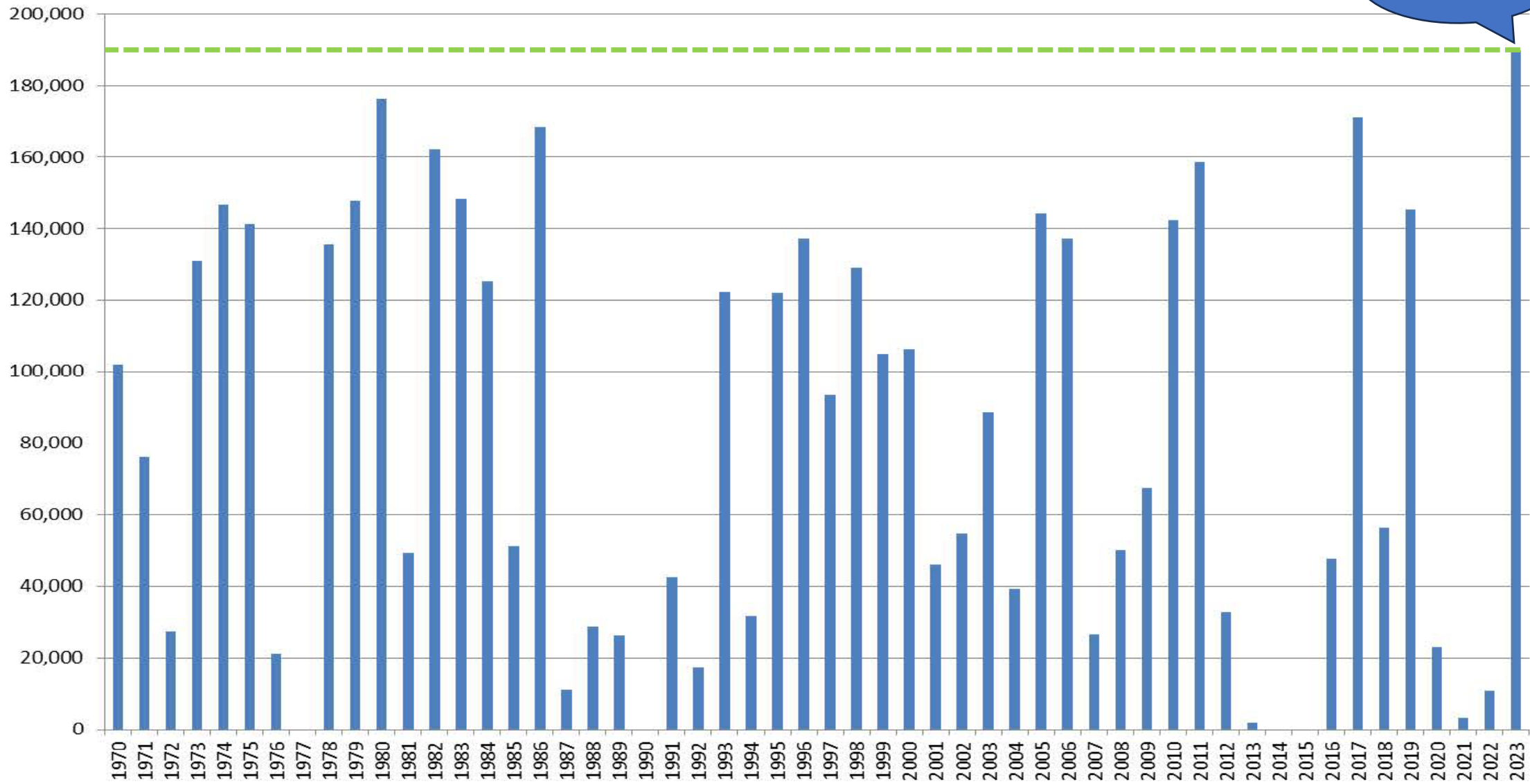
- City of Tulare – goes back to the formation of the District, but over 70+ years of water collaboration
 - TID manages Tulare stormwater
 - TID coordinates the undergrounding of canals through the city – leave large canals earthen for recharge
 - Recharge agreement – TID recharge on behalf of Tulare to offset groundwater pumping
 - Recharge projects – Swall Basin: 150-acre recharge basin
- City of Visalia
 - Tertiary Treated Water Exchange Agreement: 2:1 exchange for recharge water in basins impacting Visalia
 - Packwood Creek Linear Recharge project – conversion of the creek into linear recharge basin
 - Cameron Creek Linear Recharge project – under design and funded

Water Year Combined Diversions to TID Acre-Foots 1950 - 2023

414,000 AF



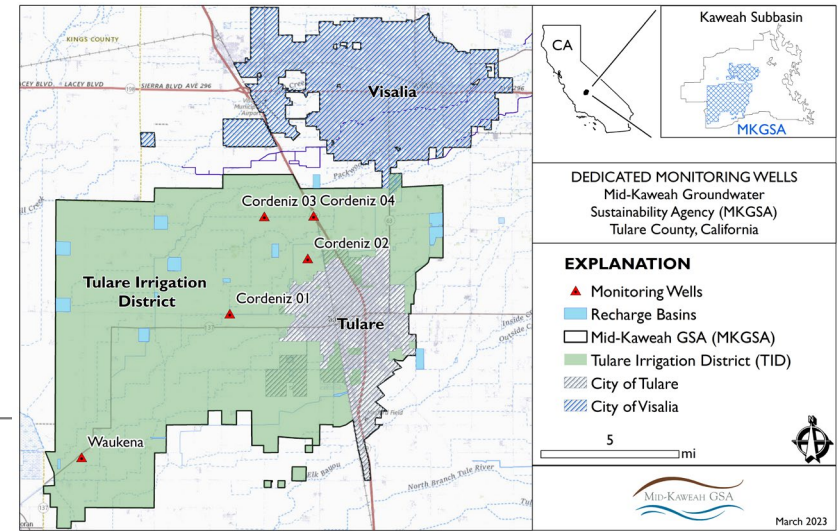
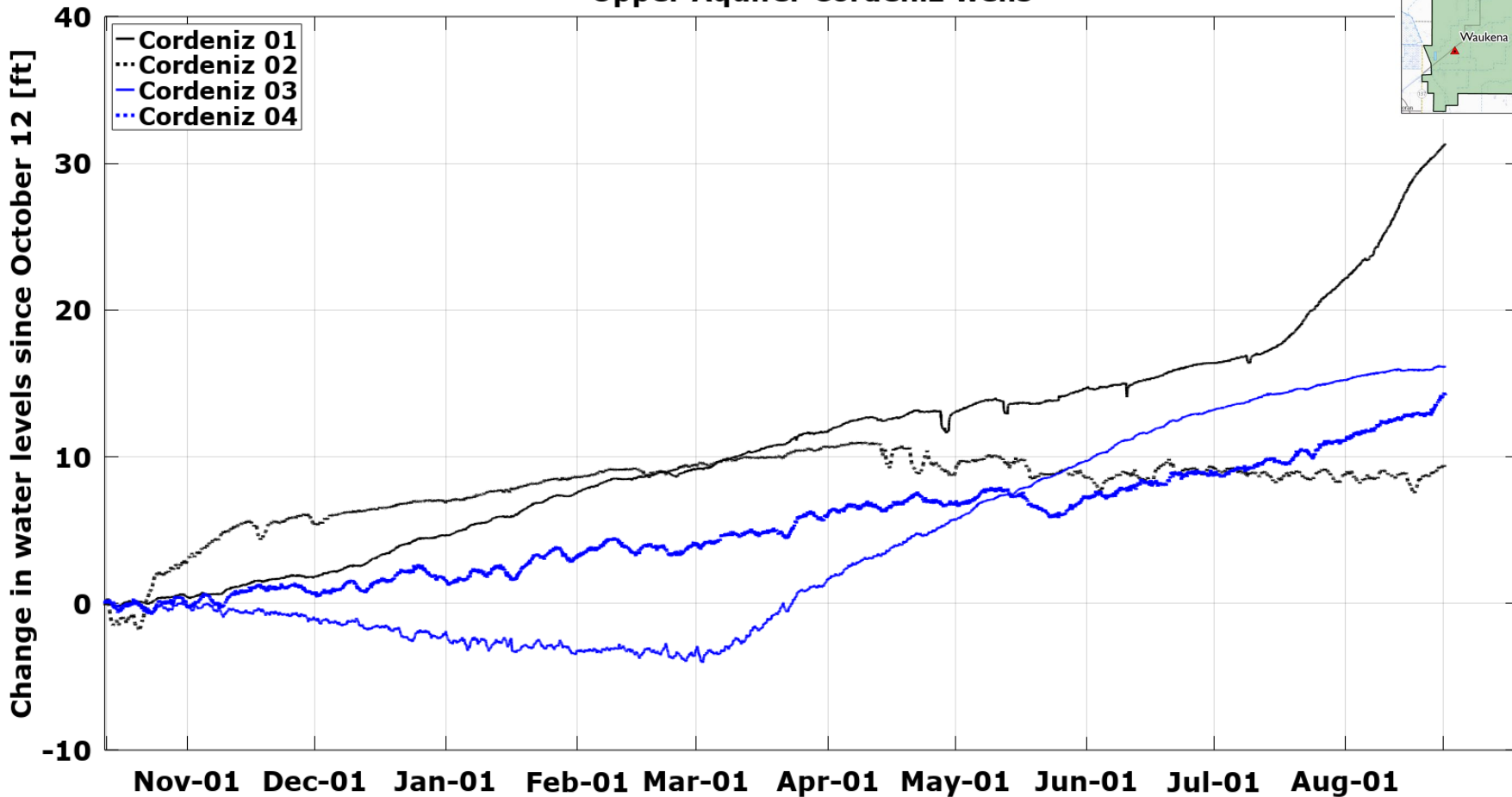
Water Year Deliveries to TID Farmers Acre-Feet 1970-2023



■ Water Year Deliveries to TID Farmers

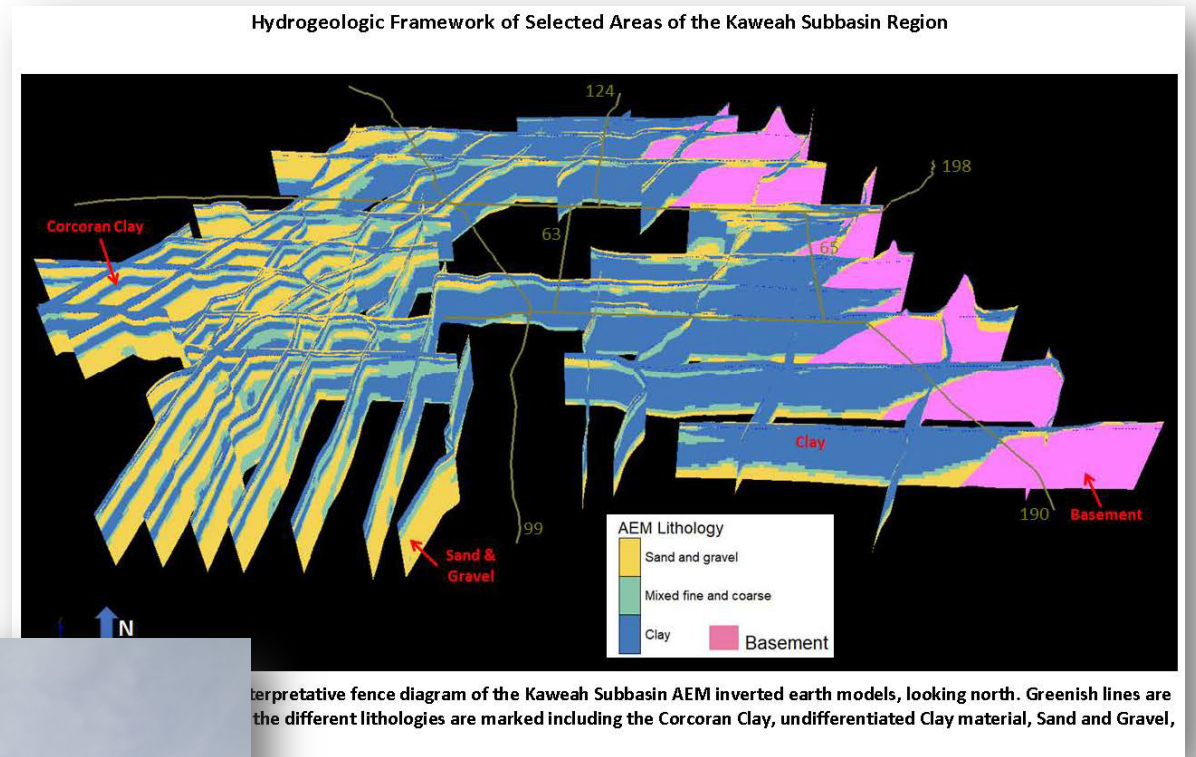
Summer Groundwater Levels

Upper Aquifer Cordeniz wells



SkyTEM

- Kaweah Sub Basin in partnership with Stanford University completed a SkyTEM data acquisition for the entire subbasin IN 2019
 - Data has been incorporated into an updated MODFLOW model of the subbasin
- MKGSA is working with Stanford and has acquired a TowTEM unit
 - Will be used to evaluate District recharge opportunities
 - Grower requests to evaluate future use of land
 - Assist local subbasin recharge efforts
- Continue to collect data to increase subsurface knowledge and to calibrate TEM data collected within the sub basin

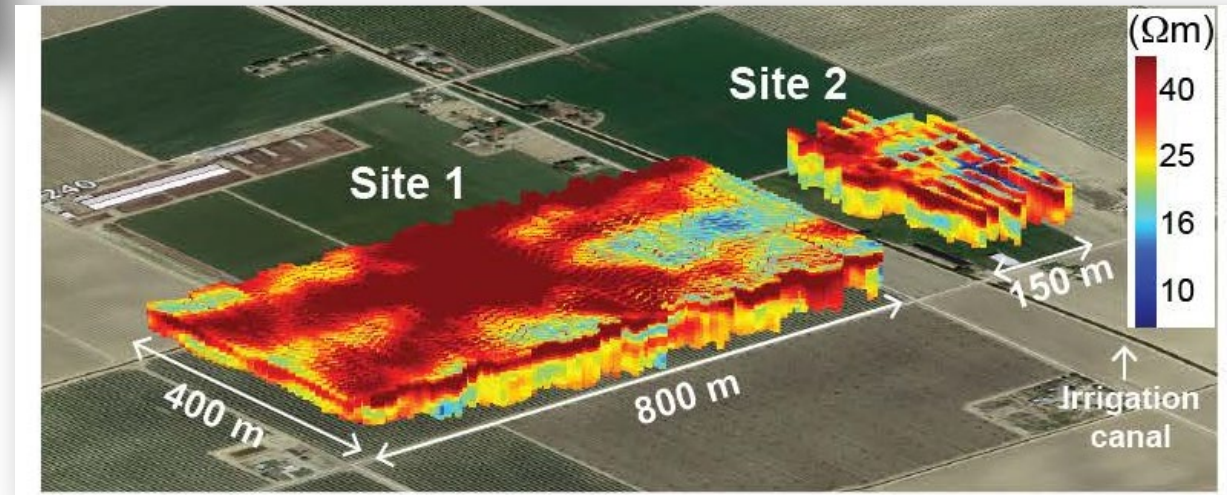


TowTEM



How do we use the information:

1. Confirmation
2. Inform site specific testing program
3. Assist with due diligence during lease/purchase agreements
4. Increase efficiency of on-farm recharge program
5. Increase existing recharge basin sinking capacity
6. Provide textural input to our groundwater models
7. Assist in citing new groundwater monitoring wells



Lessons Learned

- Conjunctive Use Irrigation District – history of recharge, but we can **drastically improve**
- Allocation and limits, while not welcomed, are valuable tools and incentives
 - Growers can use these tools to ensure a good business plan
- Staff has to be committed to the success of your programs – this takes more time and energy than what a 40-hour work week takes
- Make decisions **BEFORE** you **HAVE** to make decisions.
- We have 4 years to solve SGMA, I think we have 2 (maybe 3) left.



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Thank You

