

GROUNDWATER PLANNING COMMISSION MEETING LOWER TULE RIVER IRRIGATION DISTRICT

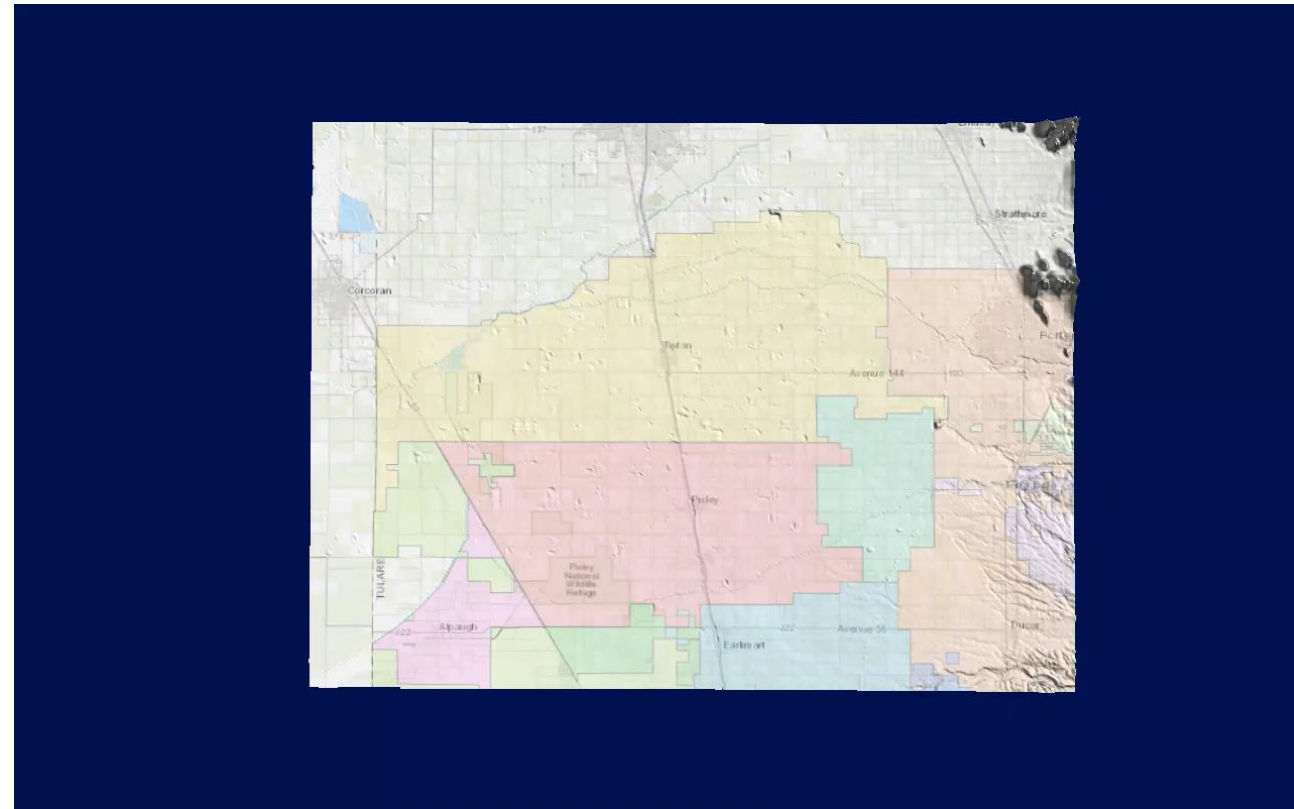
AUGUST 19TH 2025

PRESENTATION OUTLINE

- Summary of EKI work to date
- Summary of current and projected subsidence
- Subsidence Management Plan (SMP) compliance update
- GSP/SGMA compliance update
- Discussion of Landowners' role in managing subsidence

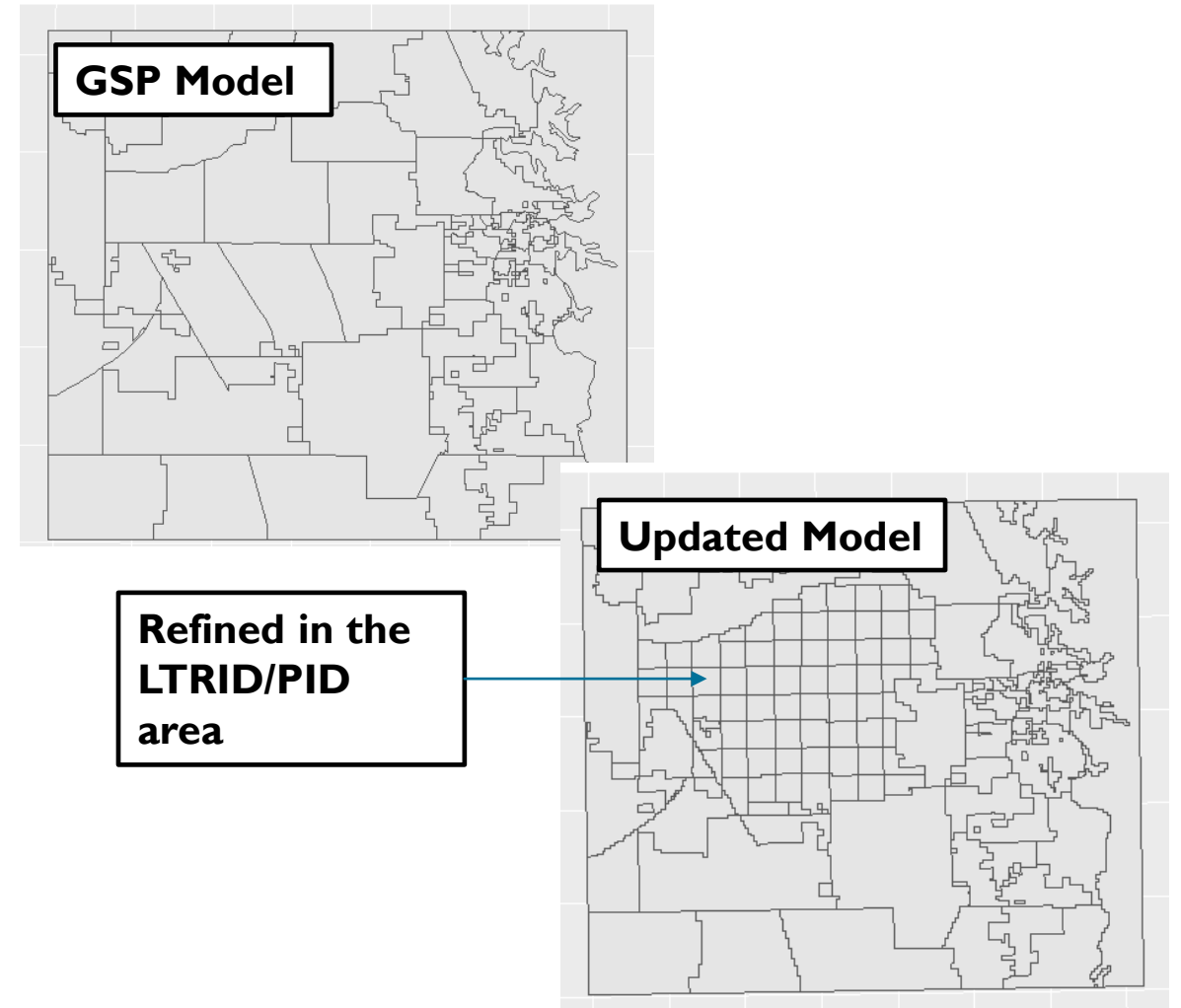
3D GEOLOGIC MODEL DEVELOPMENT

- Developed a 3D geological model to support SMP and P/MA implementation
- Includes:
 - 22 AEM surveys – geophysical mapping of subsurface
 - ~1,700 local well registrations
 - ~500 well completion reports
 - ~30 oil and gas e-logs
 - >17,000 texture points from the Central Valley Hydrologic Model (CVHM2)



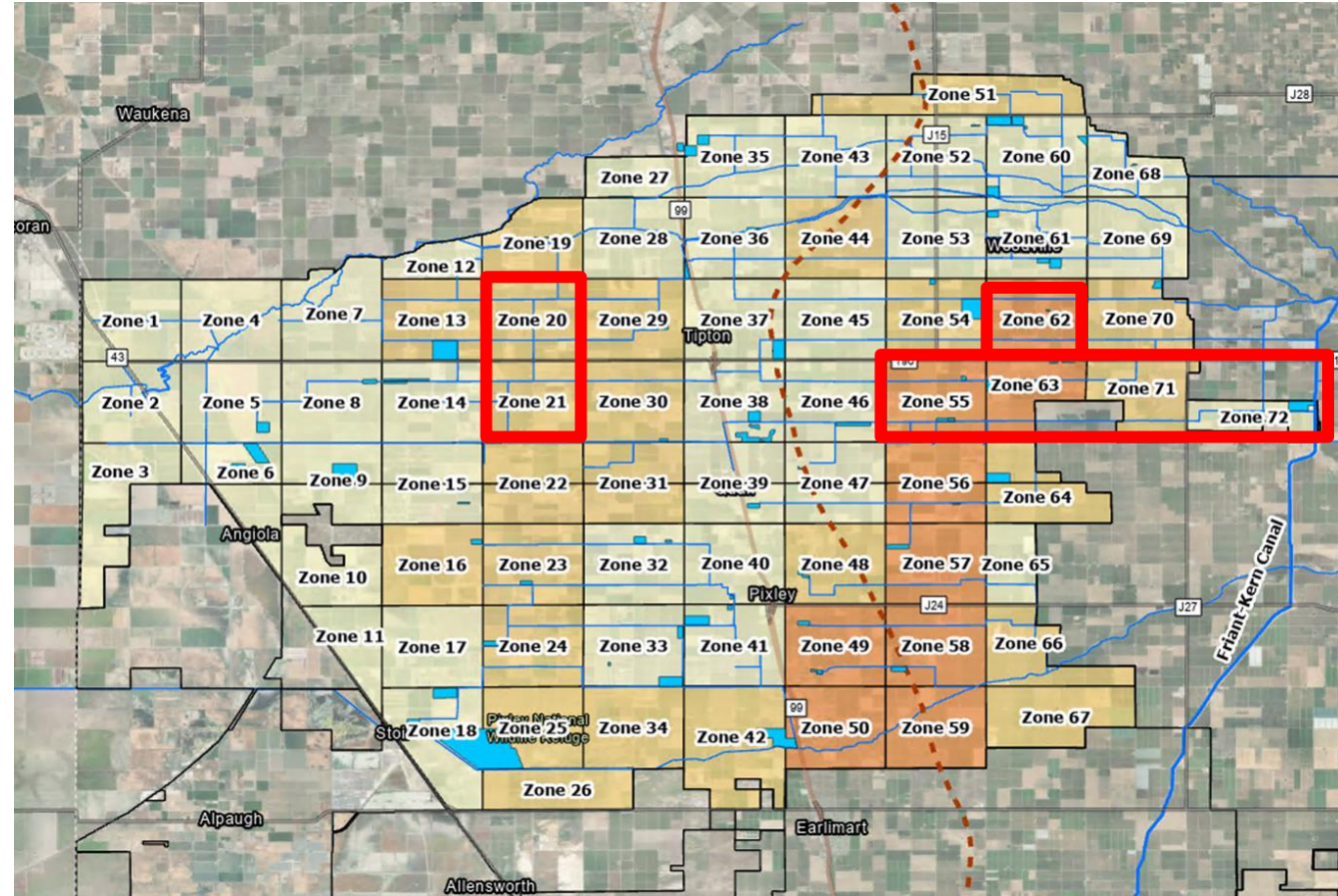
FLOW MODEL REFINEMENT AND APPLICATION

- EKI modified the TH&Co. model to provide better model resolution in LTRID/PID
 - Projected period converted to monthly instead of annual to 2070 – greater temporal resolution
 - Refined model within LTRID/PID – greater spatial resolution
- Model now has better representation of subsidence and water levels
- Model can now be modified and analyzed on a SMMZ-level



OTHER ACTIVITIES

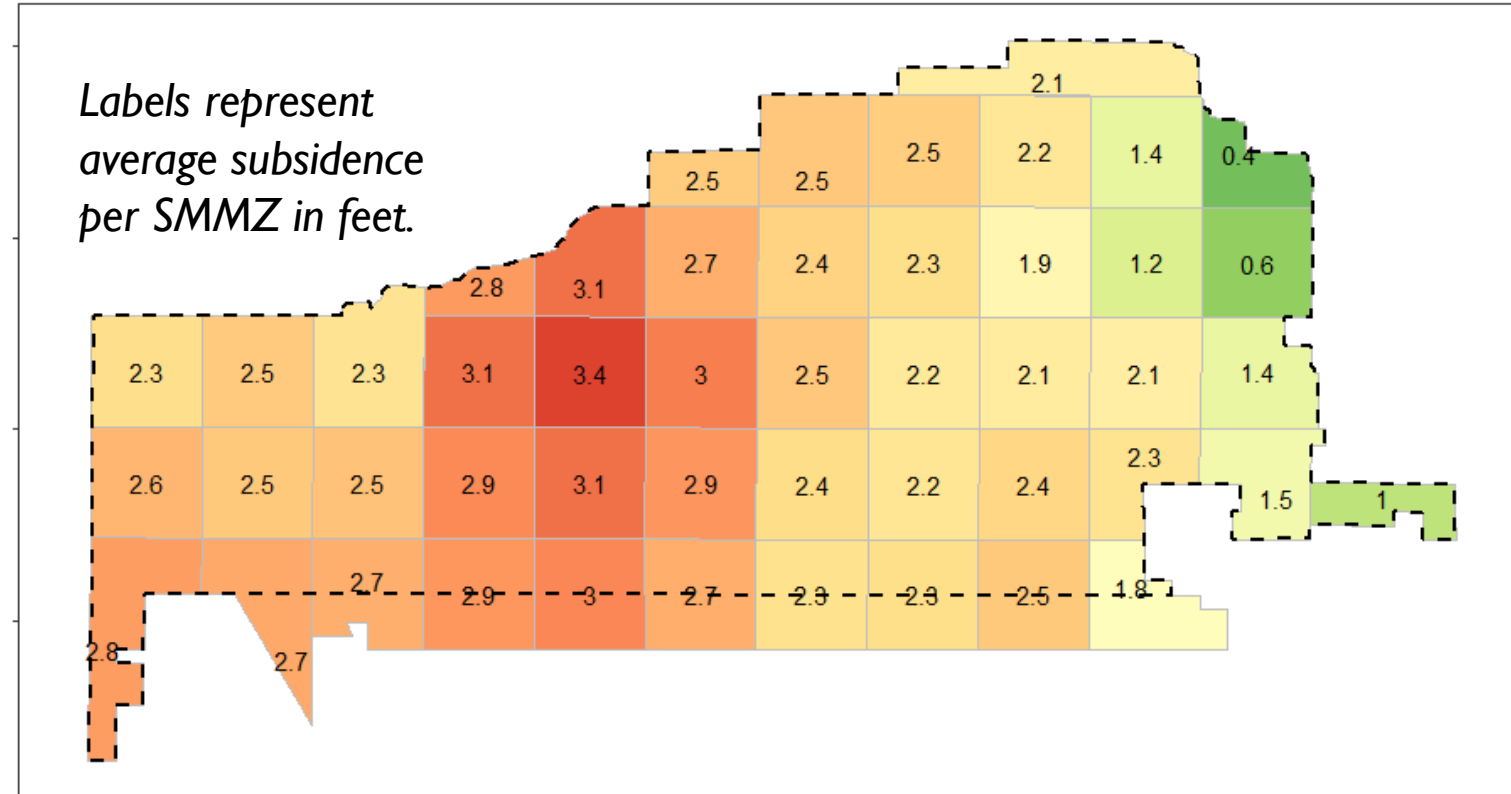
- Coordinating with Provost & Pritchard to begin Aquifer Storage and Recovery (ASR) study
- In early stages of developing a Dashboard to aid the Districts and Landowners in tracking ongoing subsidence conditions and SGMA/SMP compliance
- EKI has represented the Districts in relevant inter- and intra-basin coordination meetings



SUBSIDENCE AS OF Q1 2025

- Minimum thresholds (MTs) are set relative to January 2020 (“Baseline”)
- InSAR data, averaged per SMMZ, shows subsidence has continued in LTRID and PID
- Subsidence magnitude increases east to west

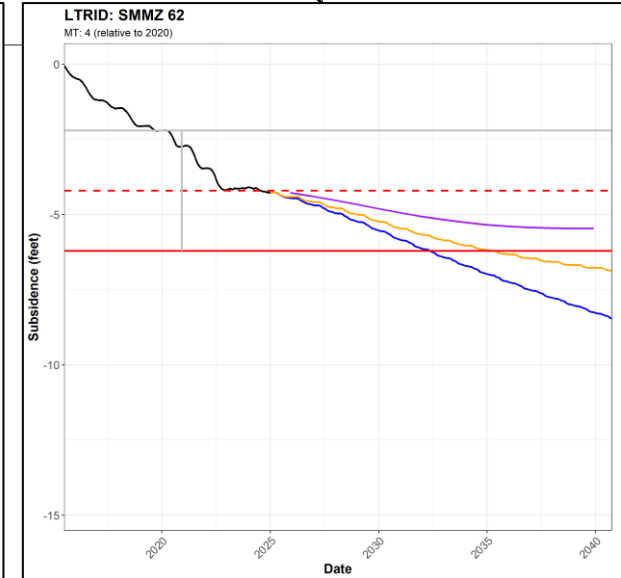
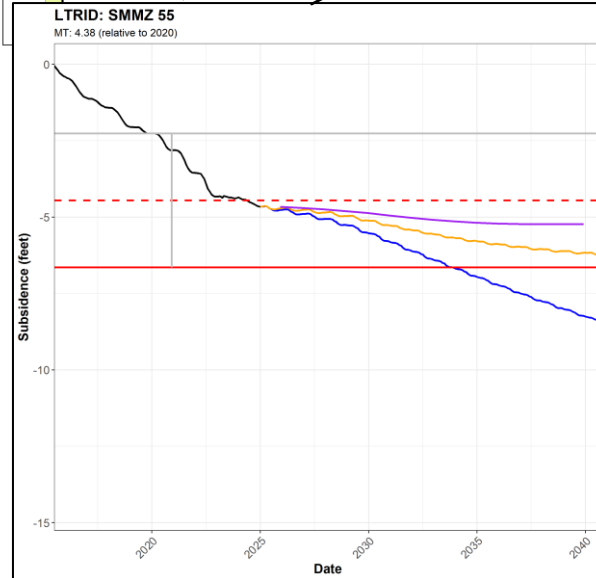
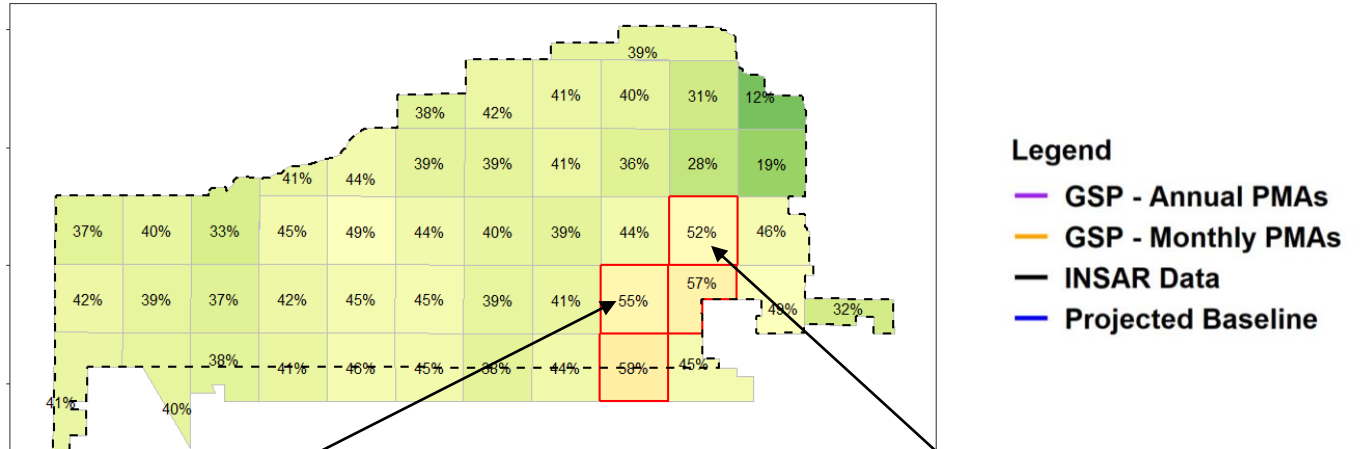
Average Subsidence per SMMZ
January 2020 - January 2025



MODEL VS. OBSERVED SUBSIDENCE

- **Original GSP Model:** generally overly optimistic relative to the rate of observed subsidence
- **Refined GSP Model:** the Projected Baseline run, which projects business-as-usual after 2025 better represents current trends
- If patterns of groundwater pumping remain similar to recent years, subsidence minimum thresholds in most SMMZs may be reached before the mid-2030s

Percent of MT Reached - January 2025 relative to January 2020
2025 Average Subsidence - 01/2020 Subsidence



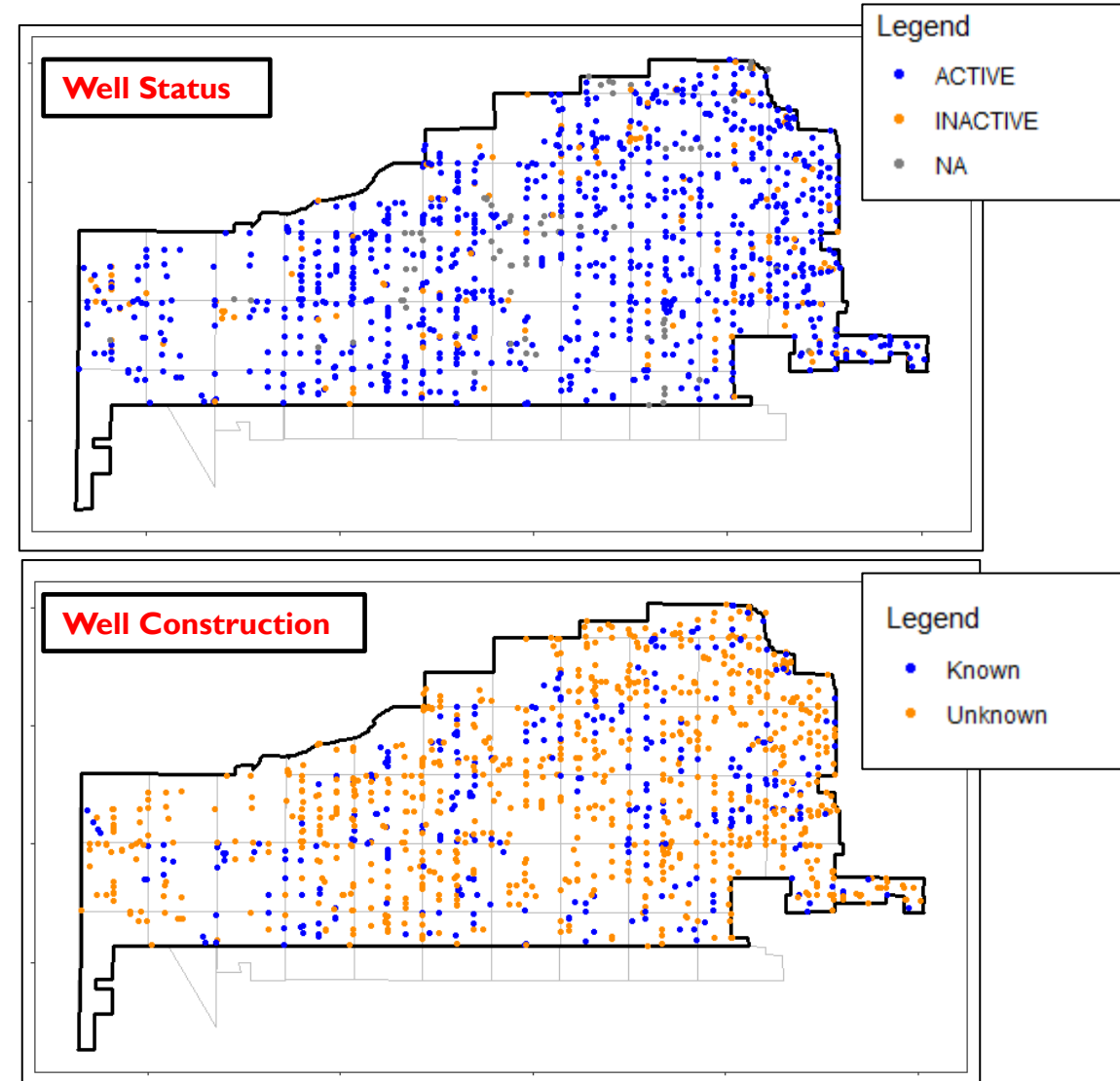
REVIEW OF KEY SMP COMPONENTS

- LTRID/PID established the Subsidence Management Plan (SMP) in 2024 to “*establish enforceable management actions to address subsidence and avoid violating the MTs*”
- As part of the SMP, the Districts take the following actions:
 - Establish subsidence monitoring and management zones and high-risk zones
 - Implement Early Action Plans for high-risk zones that include:
 - Well registration and metering
 - Specific district actions such as ASR and focusing surface water deliveries
 - Districts may issue Corrective Subsidence Management Orders (CSMOs) that include pumping reductions corresponding to different subsidence thresholds

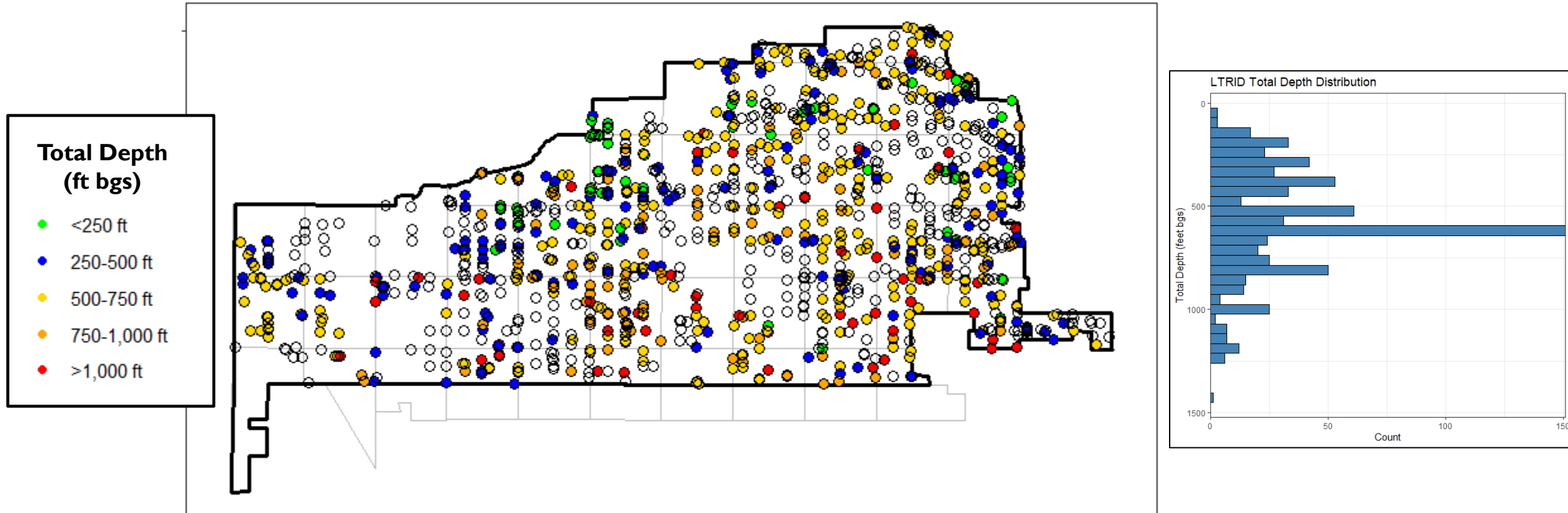
WELL REGISTRATION STATUS – AUGUST 2025

- In early 2025, LTRID and PID adopted a High-Risk Zone Early Action Plan to address subsidence concerns
- Required well registration throughout the GSAs
 - 1,124 wells registered so far (~68% compliance)
 - ~25% of wells have construction details

GSA	Total # Wells	Total Active Wells*	Known Perforation	# Unknown
LTRID	1,124	904	315	809

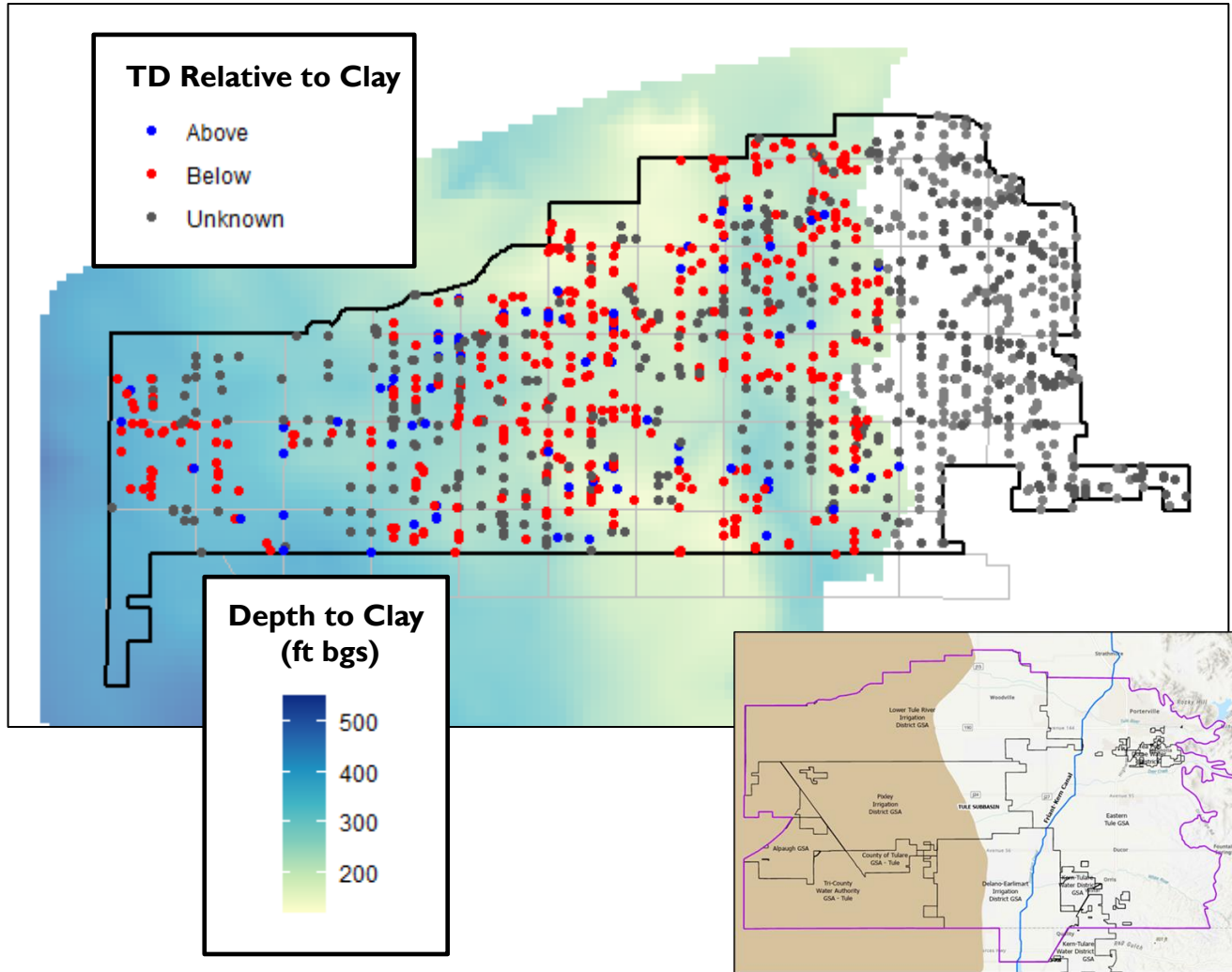


DISTRIBUTION OF WELL TOTAL DEPTHS



- The majority of wells with known completion depths appear to be completed at depths likely beneath significant clay layers.
- Based on the distribution of well depths, wells without completion data are assumed to be in the Lower Aquifer.

WELL TOTAL DEPTH RELATIVE TO CLAY LAYERS

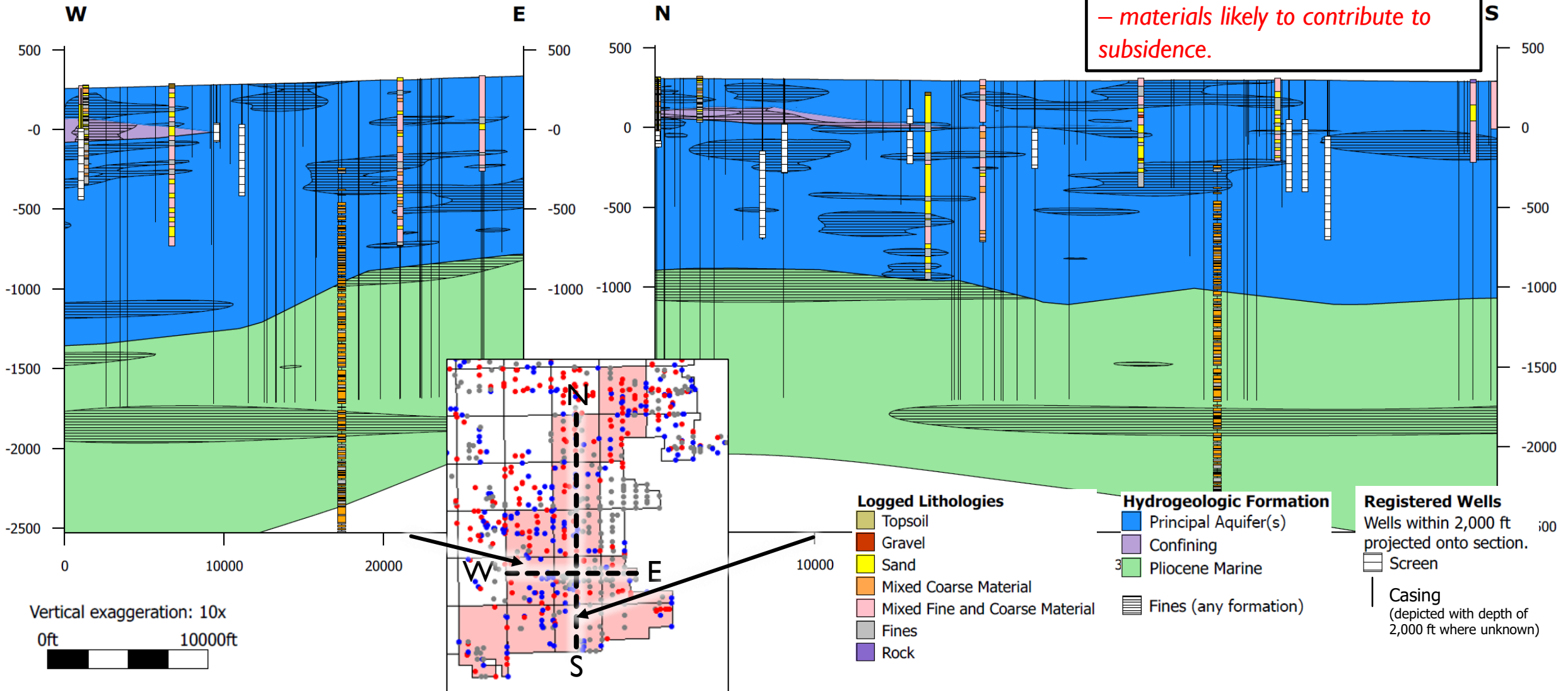


- Compared total depth in well registration data to the bottom of the Upper Aquifer as estimated by 3D Geological Model
- In LTRID, there are 5-6x as many Lower Aquifer wells compared to Upper Aquifer wells
- **“Combined Aquifer”** to the east of Corcoran clay - clay lenses begin showing up around 200 – 300 ft
 - Currently, Upper vs. Lower designations are not made outside the extent of the Corcoran Clay
 - GSAs may set threshold values below which a well is considered “Lower Aquifer” based on SMMZ-specific data regarding presence of clays

GSA	Upper Aquifer	Deep Aquifer	Unknown
LTRID	72	404	422

WELLS & CROSS SECTIONS IN SMMZS

Note: “Fines” include silts and clays – materials likely to contribute to subsidence.

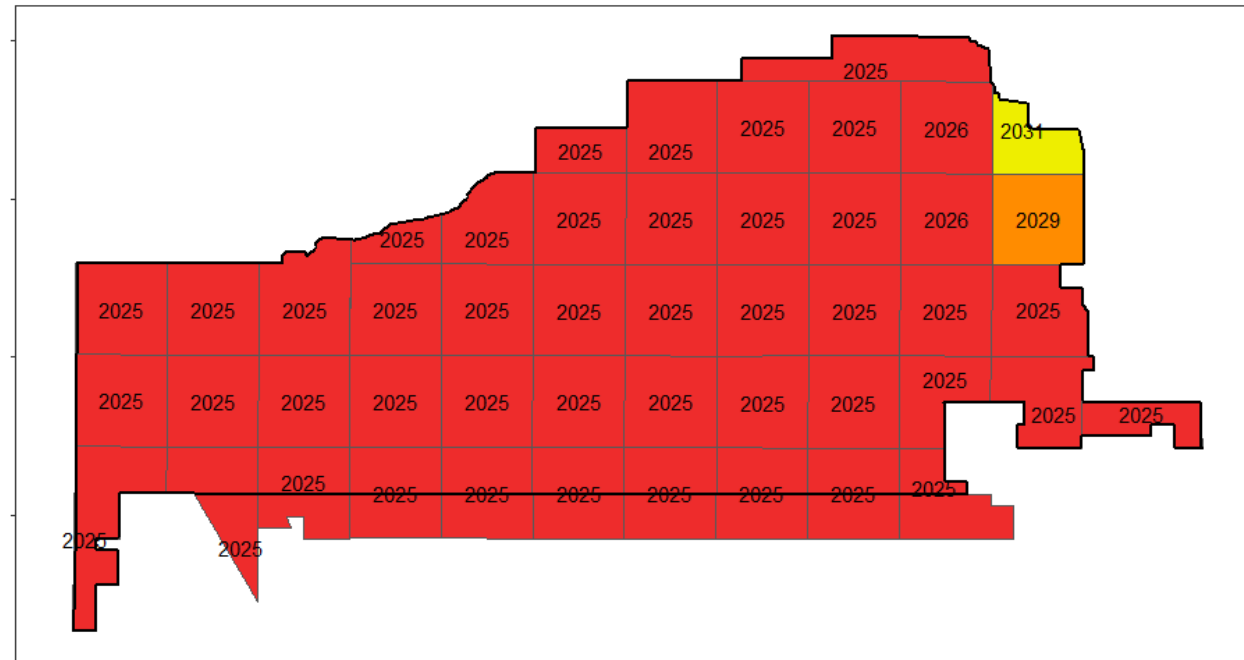


REQUEST TO LANDOWNERS

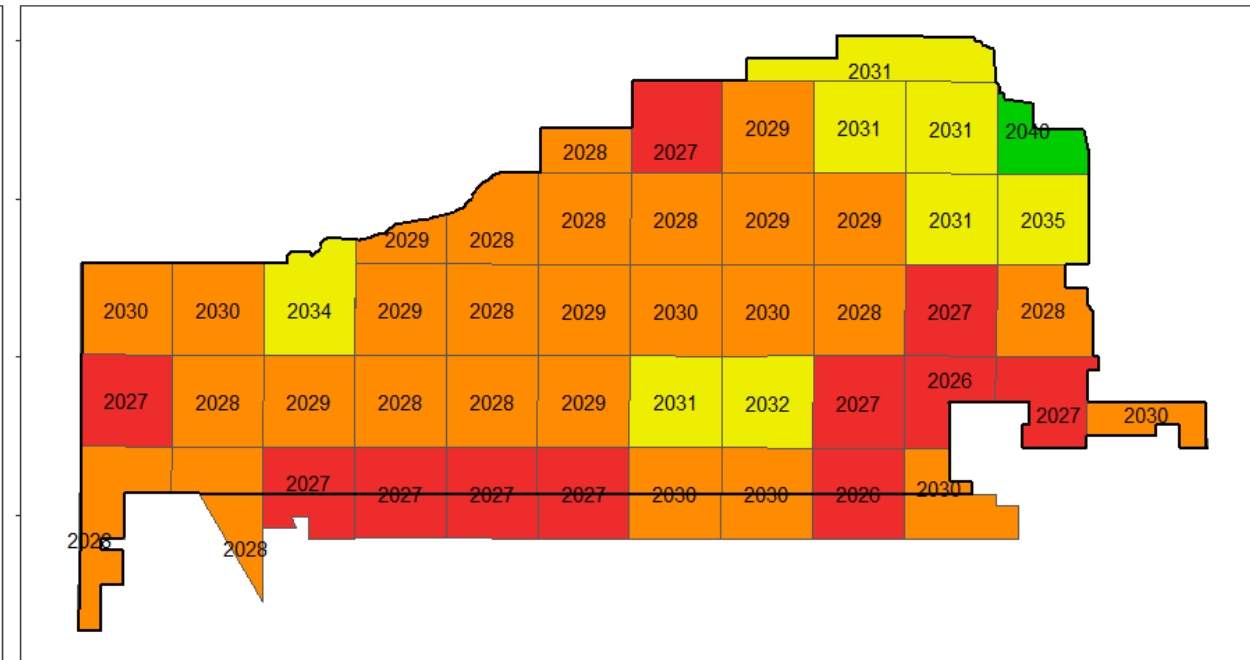
- Please submit as much local well and geological information as possible
- Accurate and complete well registration and metering is **critical** to successful SMP implementation
- In the absence of data to demonstrate otherwise, wells are assumed to be completed in the Lower Aquifer and therefore contribute to subsidence

PROJECTED BASELINE – TIMELINE TO THRESHOLDS

Projected Baseline: Timeline to 50% MT



Projected Baseline: Timeline to 75% MT



Most remaining SMMZs are projected to reach 50% MT soon (within a year or two). This is supported by InSAR data that shows most SMMZs are currently in the 40-50% range.

75% MT is expected in most SMMZs within 5 years.

SUMMARY OF SMP ACTIONS

50% MT

- 1) Groundwater withdrawals to be metered
- 2) No precipitation or transitional pumping credits are allowed for the Lower Aquifer
- 3) No pumping credits can be transferred into affected area
- 4) Surface water must be prioritized
- 5) No new wells are permitted in the Lower Aquifer

75% MT

- 6) No groundwater pumping allowed from Lower Aquifer wells that are shown to be contributing to land subsidence

100% MT

- 7) No groundwater pumping allowed from **any** wells that are shown to be contributing to land subsidence

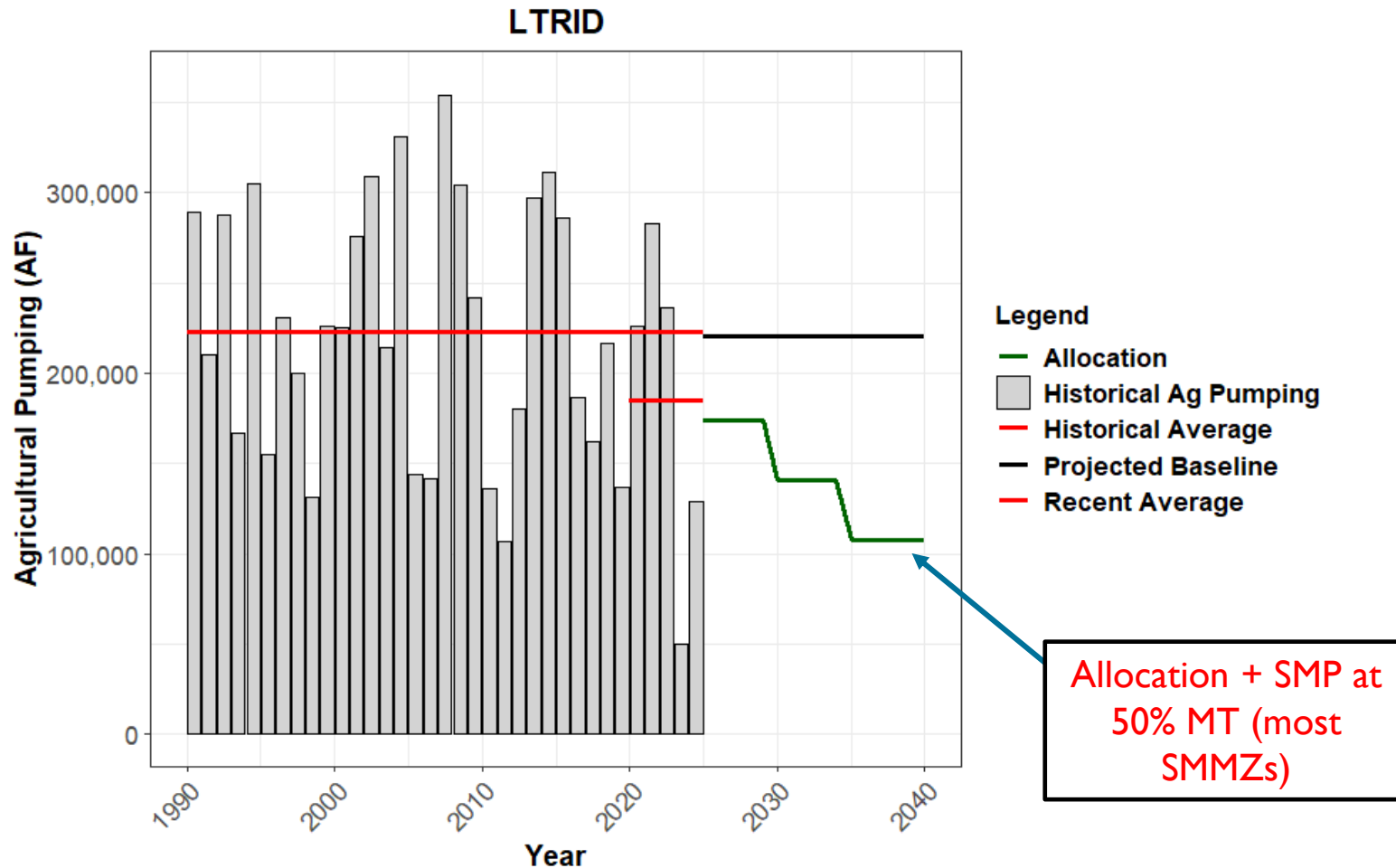
SMP implementation overrides the District's Allocation Framework.

As subsidence progresses, the SMP will aggressively reduce consumptive use above sustainable yield where needed.

PERFORMANCE RELATIVE TO GSP COMMITMENTS

- GSP Model begins P/MA implementation in 2020 and includes the following
 - Progressive, permanent land following in PID (41% of irrigated land by 2040)
 - Significant demand reduction over SGMA implementation period in LTRID and PID (-5,400 AFY in LTRID and -9,400 AFY in PID) starting in 2020
 - Ongoing demand reduction out to 2040
- While allocations are in place to reduce demand, GSAs have not fully achieved the level of implementation reflected in the GSP Model
 - Per Annual Reports, some reductions in ET and pumping have been observed in LTRID and PID, largely driven by wet WY 2023
 - Some following has occurred in PID (variable based on year, but not 5,000 acres for the entire 5 years)
 - Some land has been retired and converted to recharge basins in LTRID

PLANNED PUMPING REDUCTION SCENARIOS

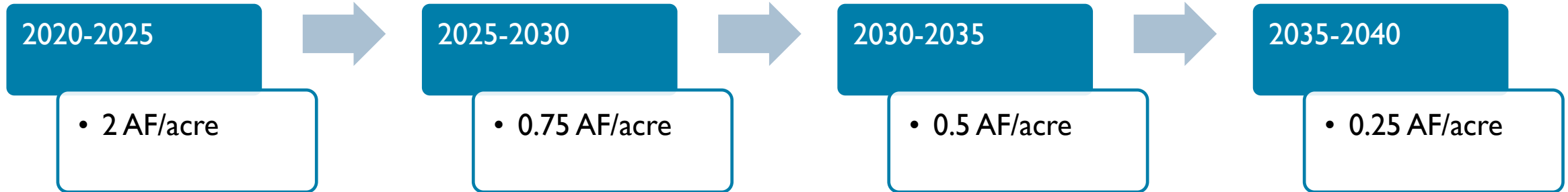


SMP implementation + Allocation reflects a ~60% decline in GW Pumping relative to recent averages.

Note: GSA has not identified lands in LTRID to fallow

IMPACT OF SMP ON ALLOCATIONS

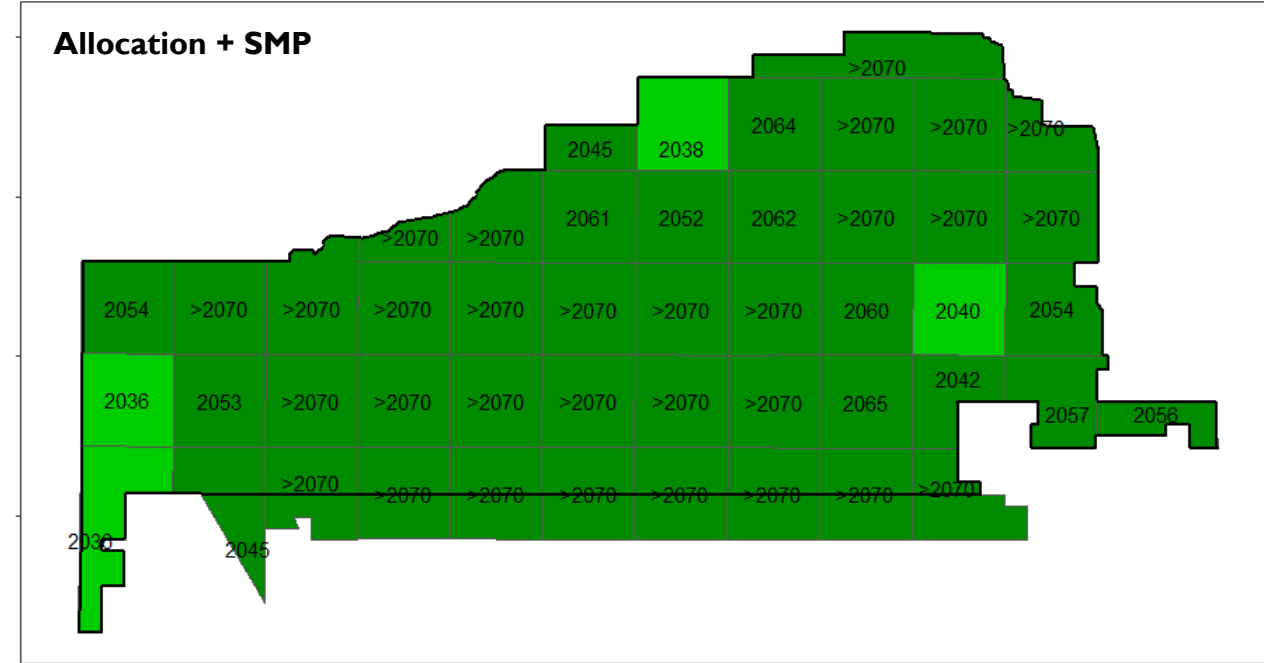
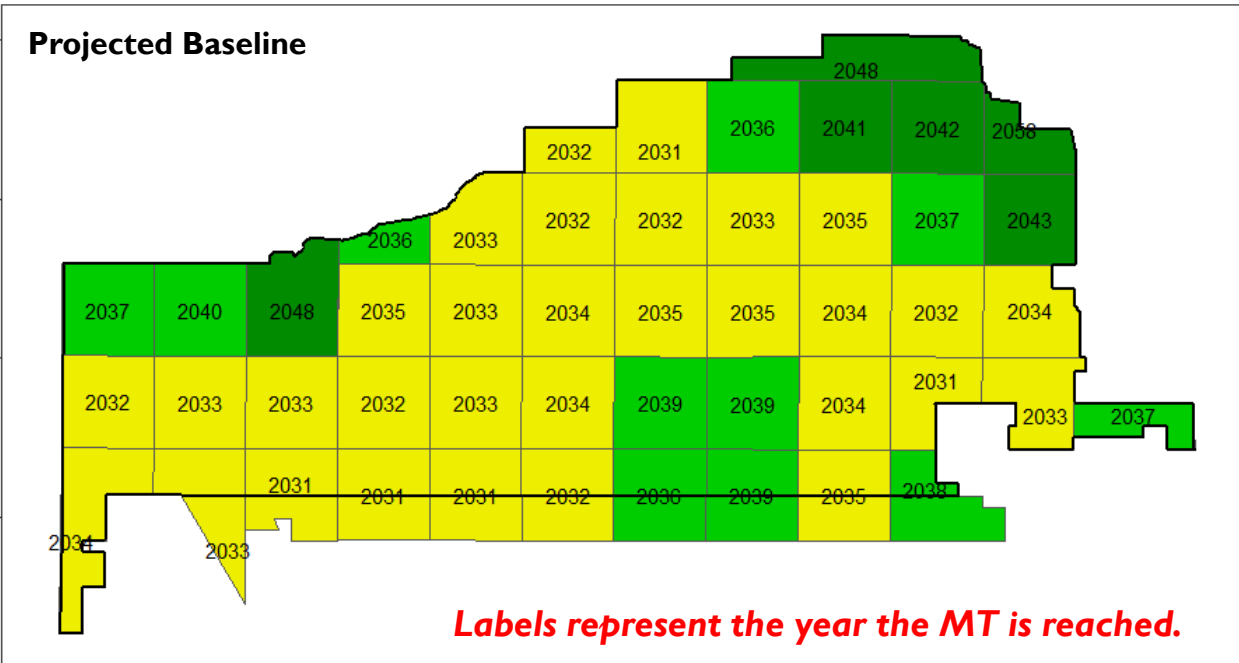
GSP Transitional Pumping Allocation Schedule



SMP Allocations Supersede GSP Allocations

Allocation Components (example year 2025)	Lower Aquifer Allocation (AF/acre)		
	Subsidence < 50% MT	At 50% MT	At 75% MT
Precipitation Yield	0.76	0.76	0.76
Sustainable Yield	0.15	0.15	0.15
District-Allocated Recharge	0.94	0.94	0.94
Transitional Credit (for 2025)	0.75	0.75	0.75
Total	2.60	1.09	0.00

SGMA COMPLIANCE



Timeline to MT

- After 2040
- 2035-2040
- 2030-2035
- 2025-2030
- Imminent

A combination of the SMP and GSA Allocation framework appears likely to avert MTs in most SMMZs.

SUMMARY

- Per the SMP and GSP, immediate and significant action regarding well registration and pumping reductions is needed to avert MTs and demonstrate action to the State Board

RECOMMENDED NEXT STEPS – TECHNICAL PATH FORWARD

- Conduct critical head analysis at selected sites to confirm water level MTs
 - DWR has released a Subsidence BMP that heavily utilizes analysis of critical head
 - Several other Basin GSAs also pursuing this approach
- Evaluate District's Allocation policies – revisit calculation of precipitation credits per Staff Report on Tule GSP
- 3D Geologic Model Refinement
 - Incorporate additional data as provided by landowners
 - As model is refined, explore establishing depth thresholds for “Lower” Aquifer pumping outside of the area of the Corcoran Clay
- Aquifer Storage and Recovery
 - EKI is coordinating with P&P. Once P&P has identified a well location, EKI will work with P&P to develop a feasibility study and work plan
- SMP/GSP Compliance Dashboard
- Ongoing Inter/Intra-Basin support

DISCUSSION