Spanish Language Interpretation In Person

Interpretación en español en persona

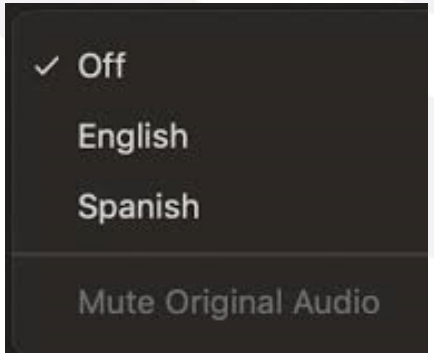
Por favor levante la mano si necesita auriculares o si tiene problemas técnicos.

Please raise your hand for a headset or if you have technical difficulties

Opción de Interpretación en Zoom

Seleccione el icono de interpretación desde los controles de la pantalla

- Haga clic en “Interpretation” en el menú
- Seleccione español (*Spanish*)
- Seleccione la opción para poner el audio original en silencio (*Mute Original Audio*)



Si necesita ayuda técnica, envíe un mensaje electrónico a

Board.Clerk@waterboards.ca.gov

Language Interpretation through Zoom

Click the Interpretation icon in your meeting controls

- Navigate to Language Channels
- Select Spanish OR English
- Mute Original Audio

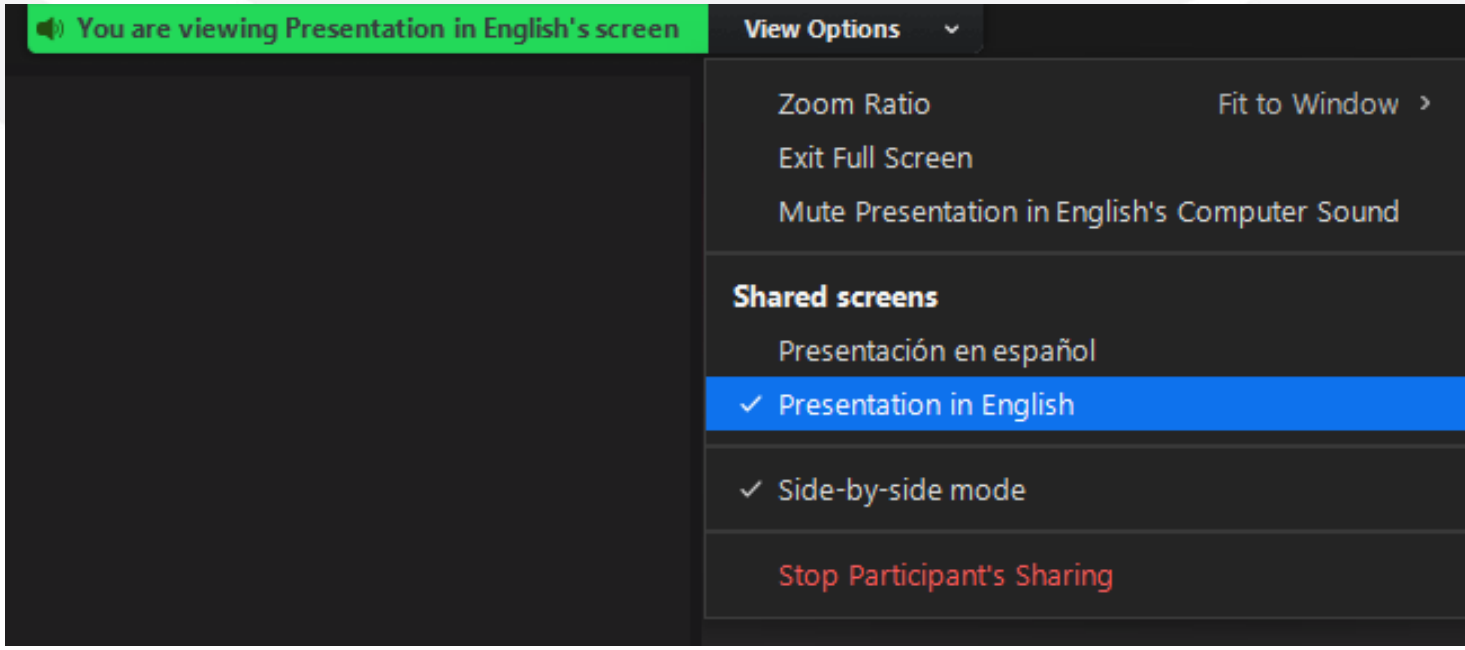
For technical assistance, email

Board.Clerk@waterboards.ca.gov

Opciones de Pantalla en Zoom

Haga clic en “View Options” en la parte superior de su pantalla y seleccione “Presentación en español” O “Presentation in English”

Si necesita ayuda técnica, envíe un mensaje electrónico a **Board.Clerk@waterboards.ca.gov**



View Options on Zoom

Click on View Options at the top of your screen and select "Presentación en español“ or "Presentation in English.”

For technical assistance, email **Board.Clerk@waterboards.ca.gov**

Tulare Lake Probationary Hearing

Public Hearing for Proposed Designation of Tulare Lake Subbasin as a Probationary Basin

April 16, 2024

CALIFORNIA Water Boards

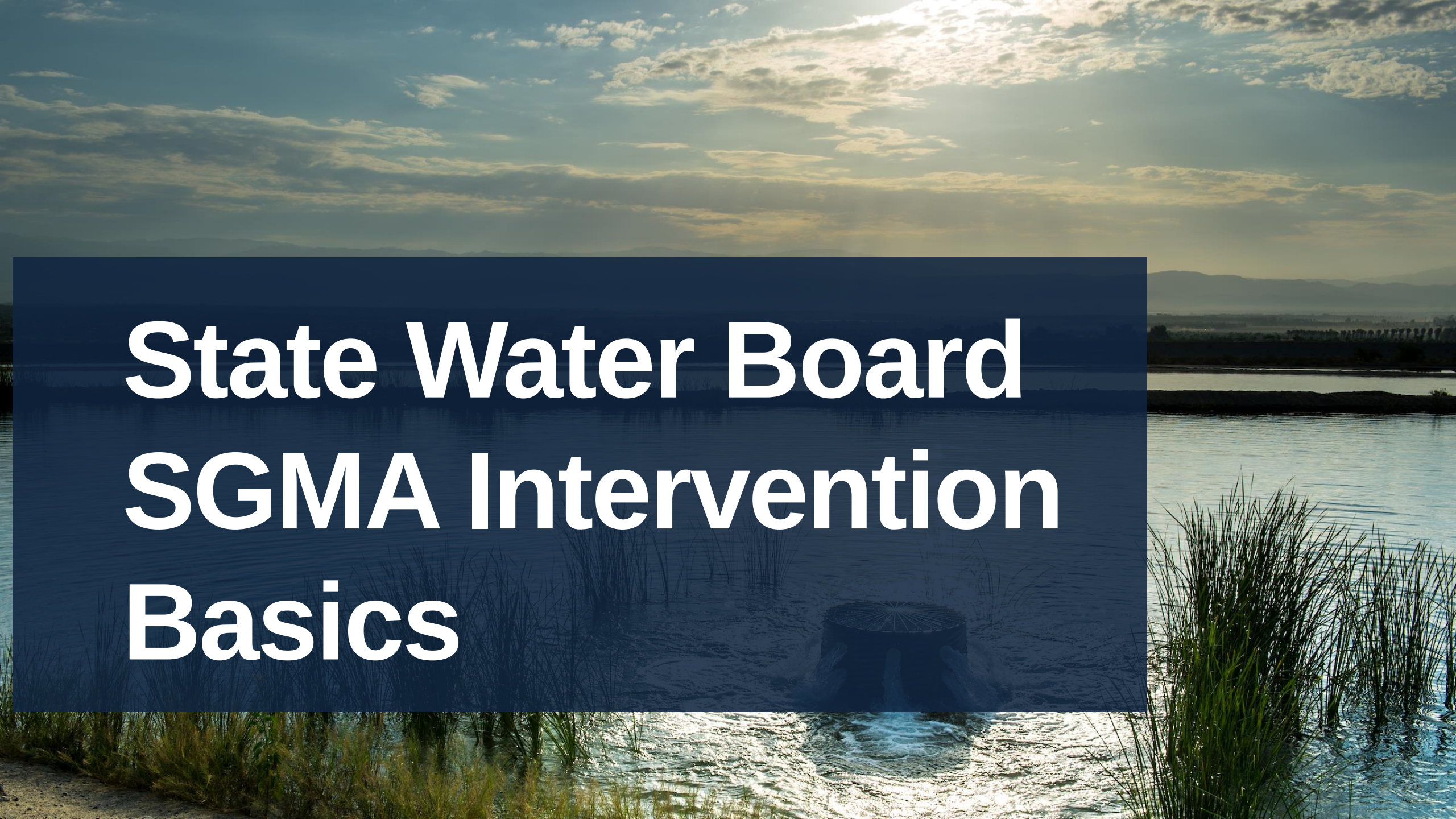
Office of Sustainable Groundwater Management

Hearing Agenda

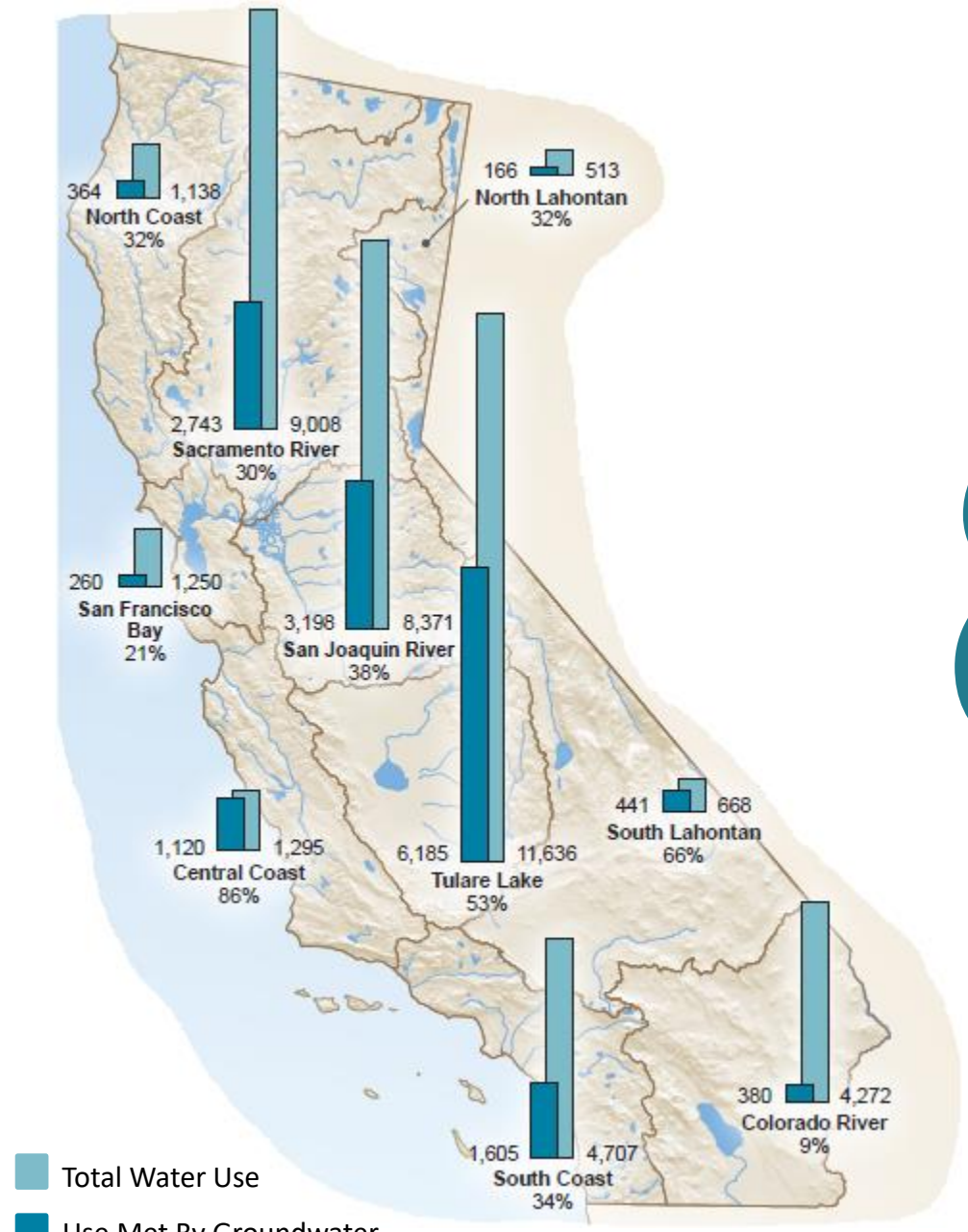
1. Comments from elected officials and California Native American Tribes
2. State Water Board staff presentation
3. Tulare Lake GSAs panel
4. Other panels
5. Public comments
6. Board consideration and potential vote on resolution

Staff Presentation

1. State Water Board SGMA Intervention Basics
2. Tulare Lake Basin Background
3. SGMA Process in Tulare Lake Subbasin
4. Sustainability Plan Deficiencies and Likelihood of Future Impacts to Beneficial Uses
5. Current Status of Tulare Lake Subbasin
6. Staff Recommendations to the Board
    - Designate the Basin as Probationary Without Exemptions
    - Requirements for Groundwater Extractors
    - Probation Next Steps
    - Board Considerations for Lifting Probation



State Water Board SGMA Intervention Basics

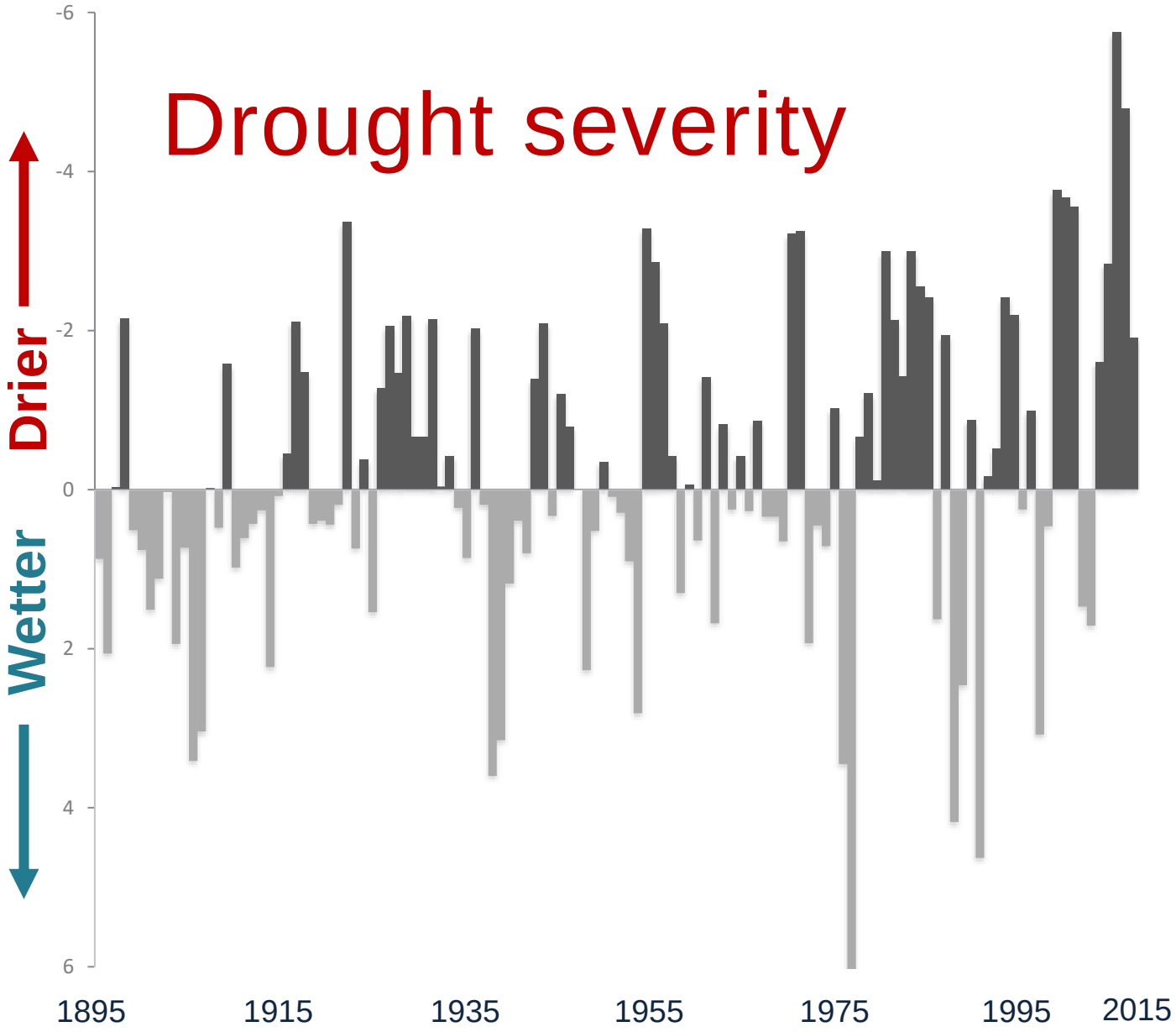


Source: California Water Plan Update 2013

80%

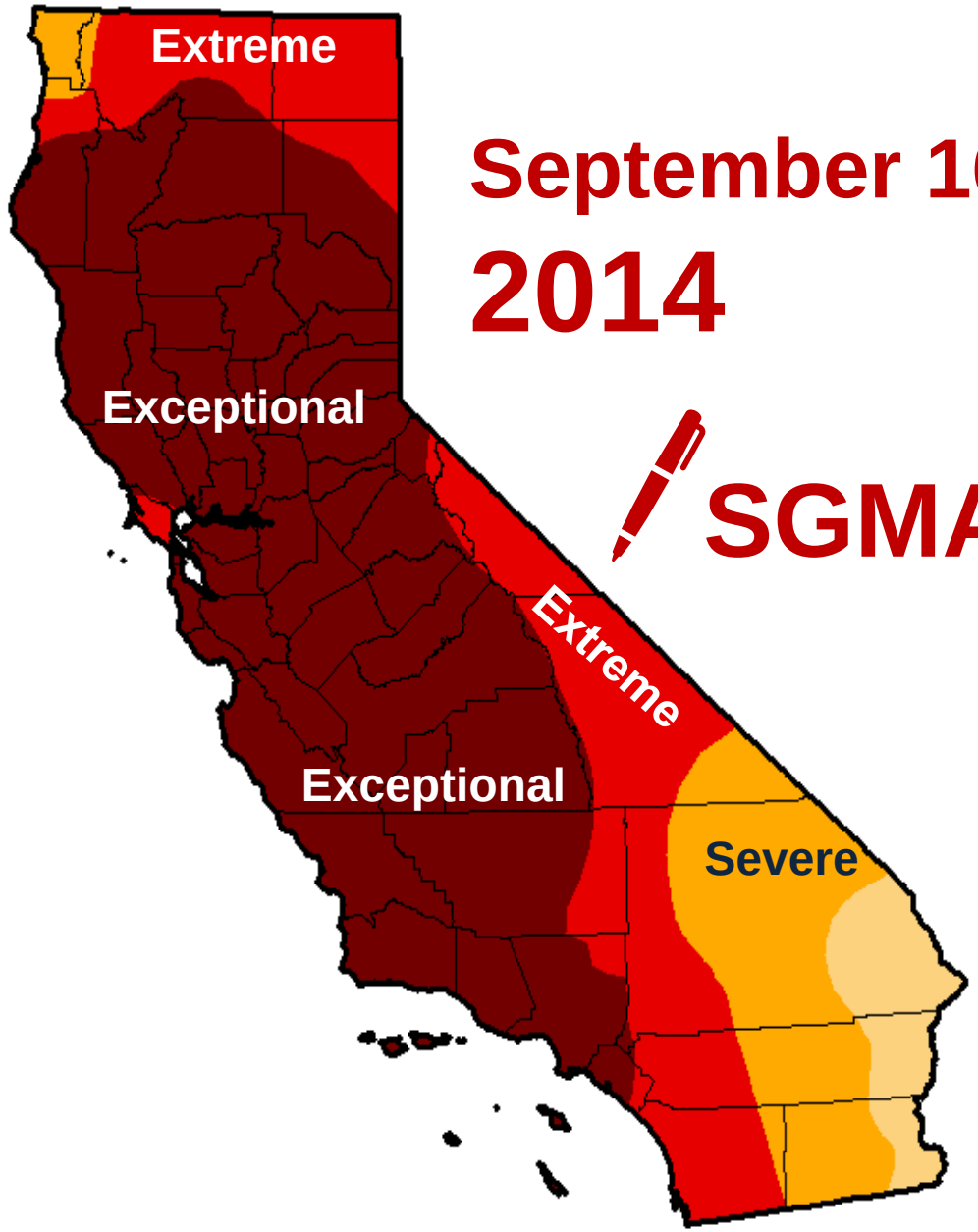
of Californians rely on GROUNDWATER for part of their water supply

Drought severity



Source: PDSI from NOAA

Source: NOAA

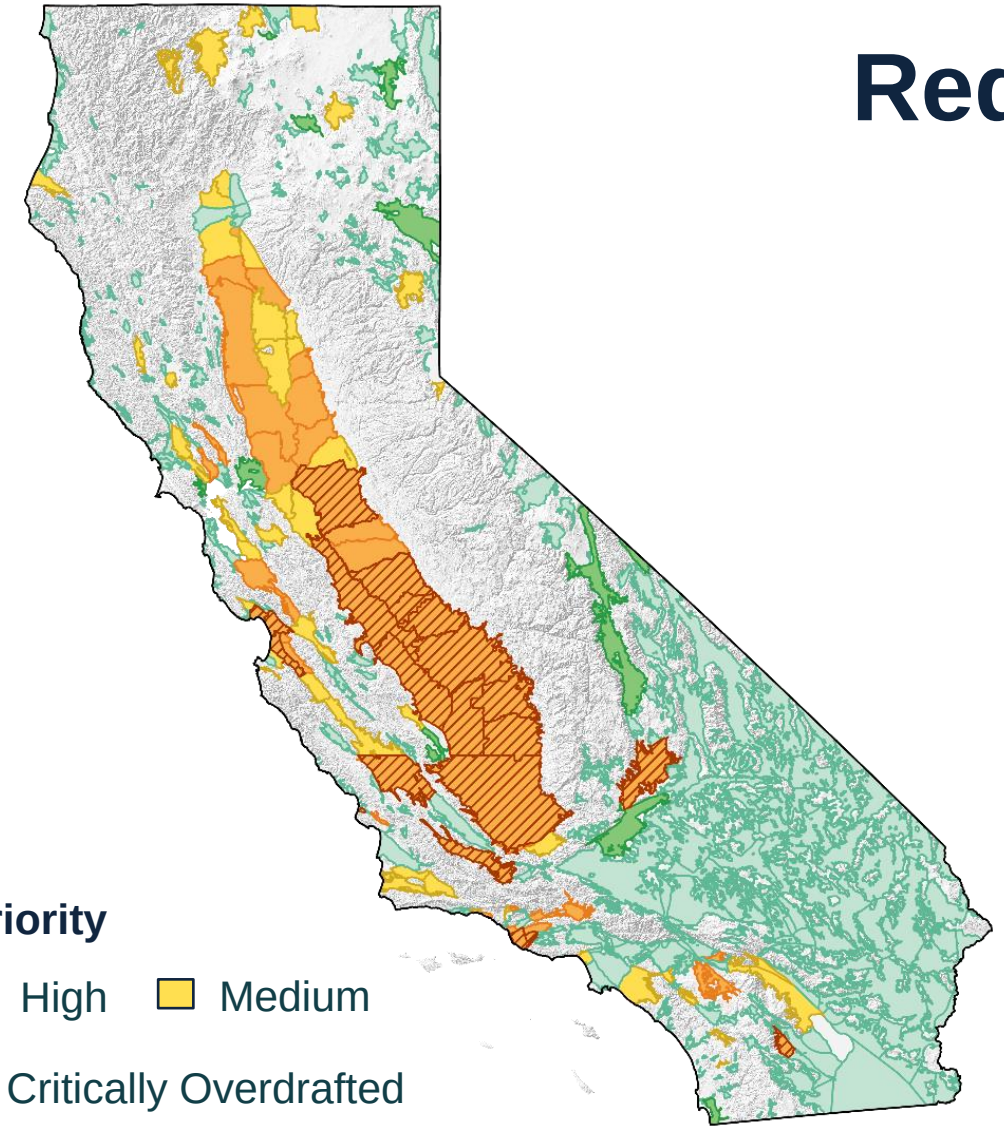


September 16, 2014

SGMA

Source: California Drought Monitor

Sustainable Groundwater Management Act



Requirements for SGMA basins:

- Groundwater sustainability agencies
- Groundwater sustainability plans
  - Sustainable management criteria
- Annual reports
- Five-year updates to GSPs
- Achieve sustainability goal by 2040/2042

What is Sustainability under SGMA?

Basin operated within its *sustainable yield* and not experiencing *undesirable results*, which are the significant and unreasonable occurrences of:

Groundwater Level Declines

Land Subsidence

Seawater Intrusion

Degraded Quality

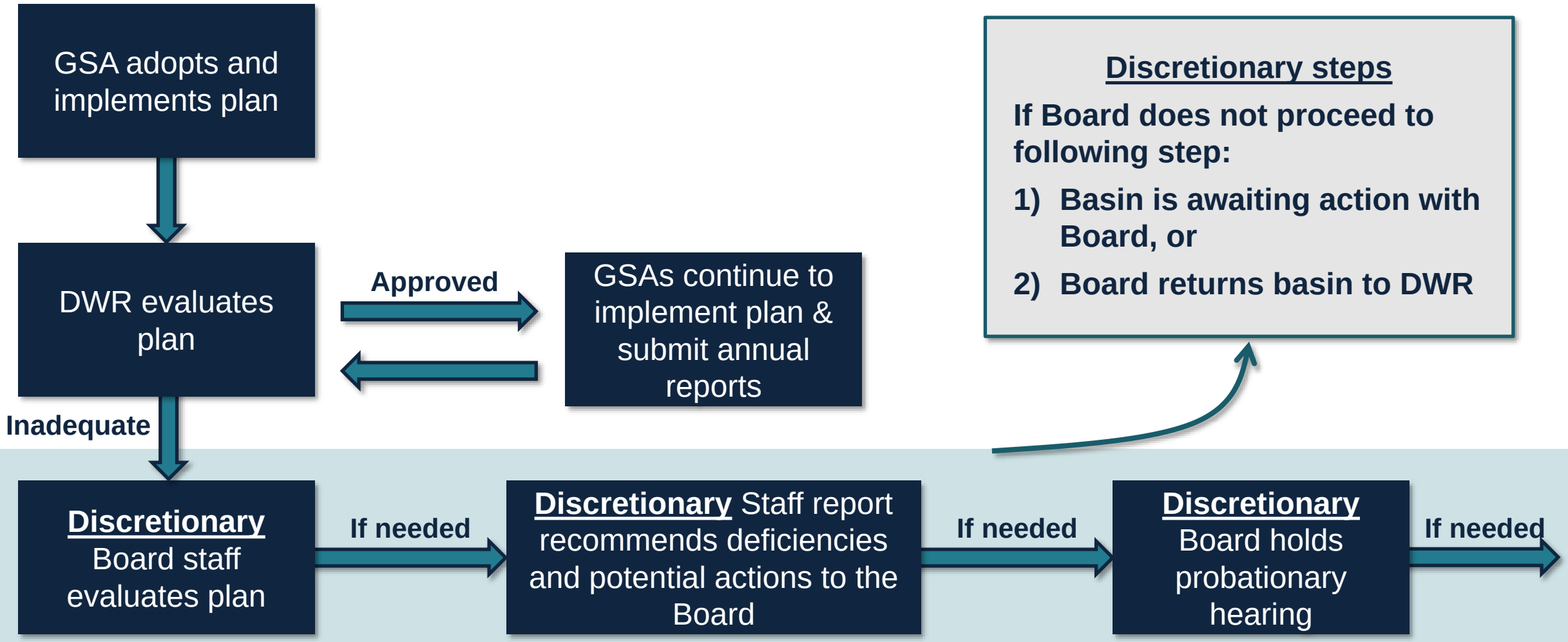
Land Subsidence

Surface Water Depletion

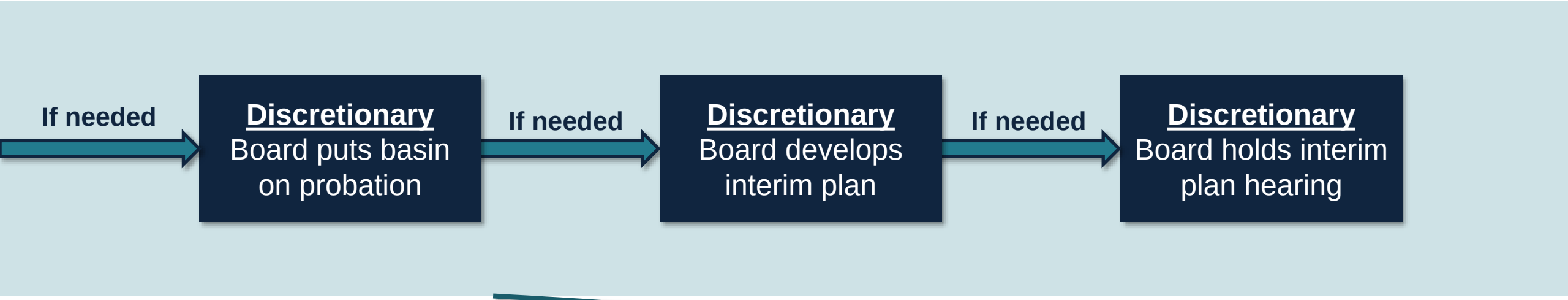
...caused by groundwater conditions occurring throughout the basin.

GSAs aren't required to address undesirable results that occurred prior to 2015

GSP Review Process: DWR and State Water Board Roles



GSP Review Process: DWR and State Water Board Roles



Discretionary steps

If Board does not proceed to following step:

1) **Basin is awaiting action with Board**
2) **Board returns basin to DWR**

Probationary Hearing

- Requires a triggering event (such as an "inadequate plan" finding by DWR)
- Discretionary
- Public process
- Board identifies plan deficiencies & potential actions to fix them
- Determination is made via a Resolution

Probationary Hearing Resolution

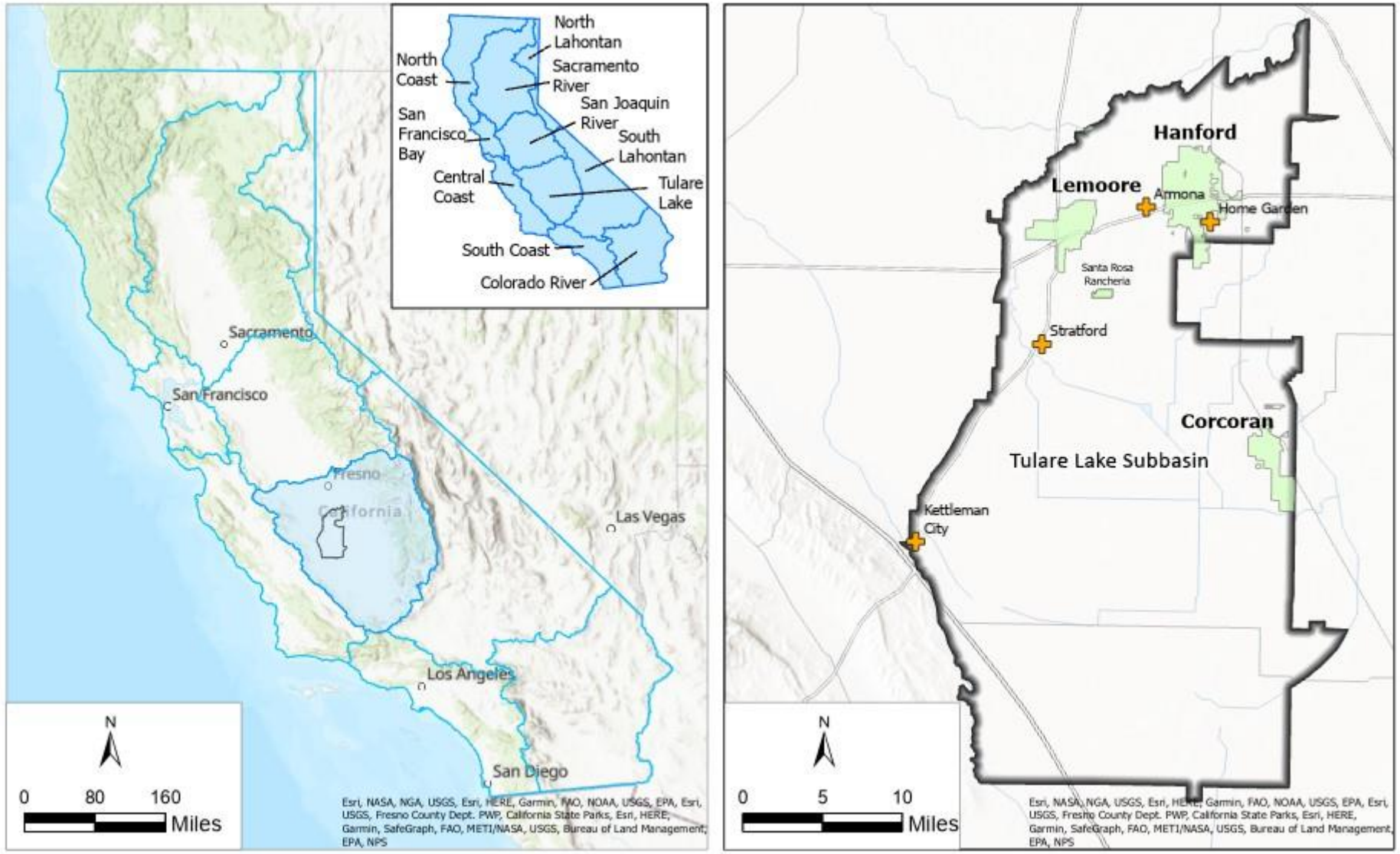
- Board can choose to
  - Adopt a probationary hearing resolution, or
  - delay the decision, or
  - return the basin back to DWR oversight
- Resolution can be amended in the future, e.g., to:
  - Make exclusions
  - Update requirements
  - Modify deficiencies

Probation: Key Points

- **Lasts only as long as it takes for GSAs to fix issues**
- **Does not limit GSA authorities**
- **Extractors begin reporting & paying fees**
- **<u>No Board-required pumping limits at this phase</u>**
- **If issues aren't fixed after 1 year, Board can develop and adopt an interim plan**

Tulare Lake Subbasin Background

Tulare Lake Subbasin: Physical Setting



Tulare Lake Subbasin: Hydrogeologic Setting

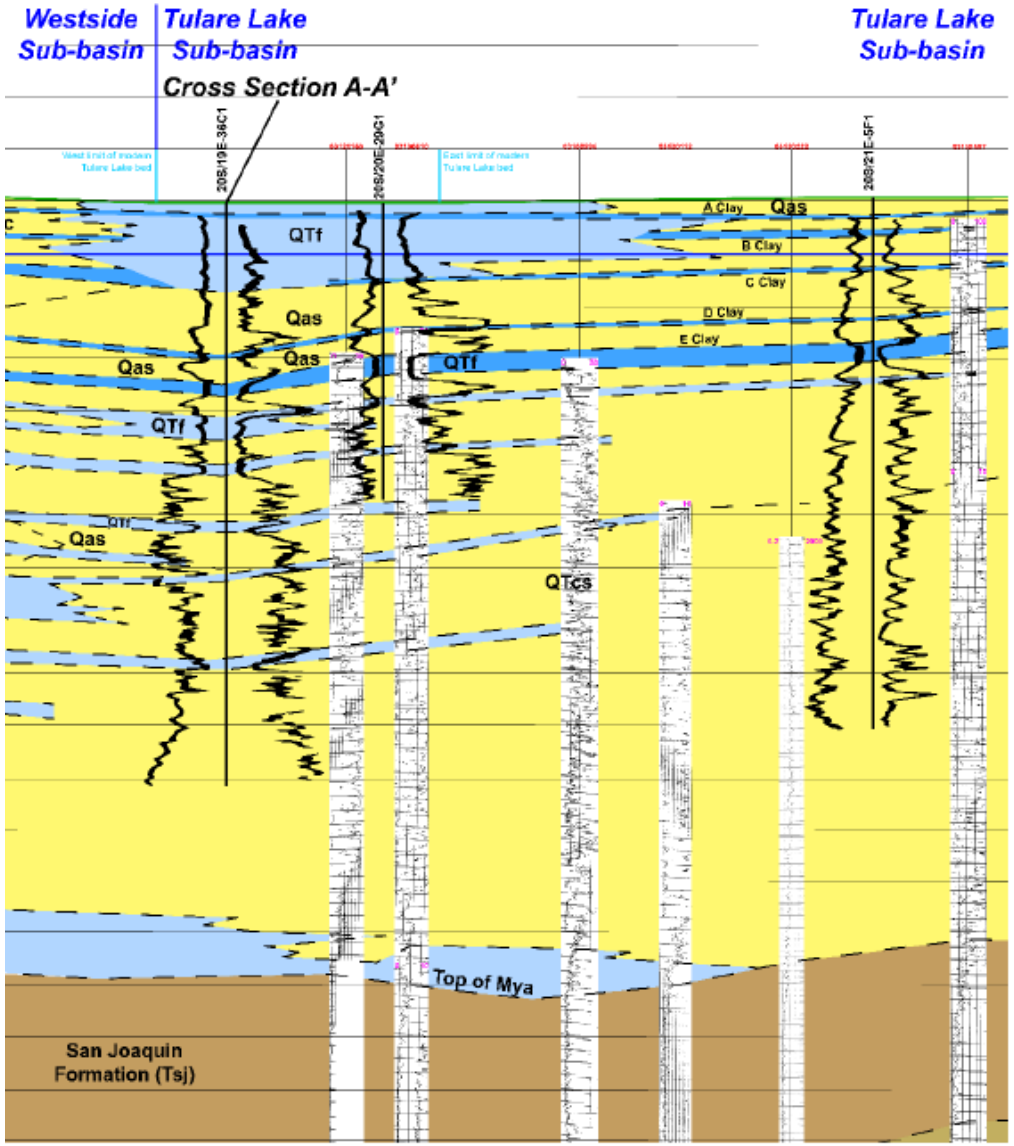


Image source: 2022 Tulare Lake Subbasin Amended GSP

A zone aquifer –

perched above A clay, unconfined, limited spatial extent

B zone aquifer –

between A clay and Corcoran clay, semi-confined to confined

C zone aquifer –

confined, below Corcoran Clay (E clay)

Tulare Lake Subbasin: Beneficial Uses

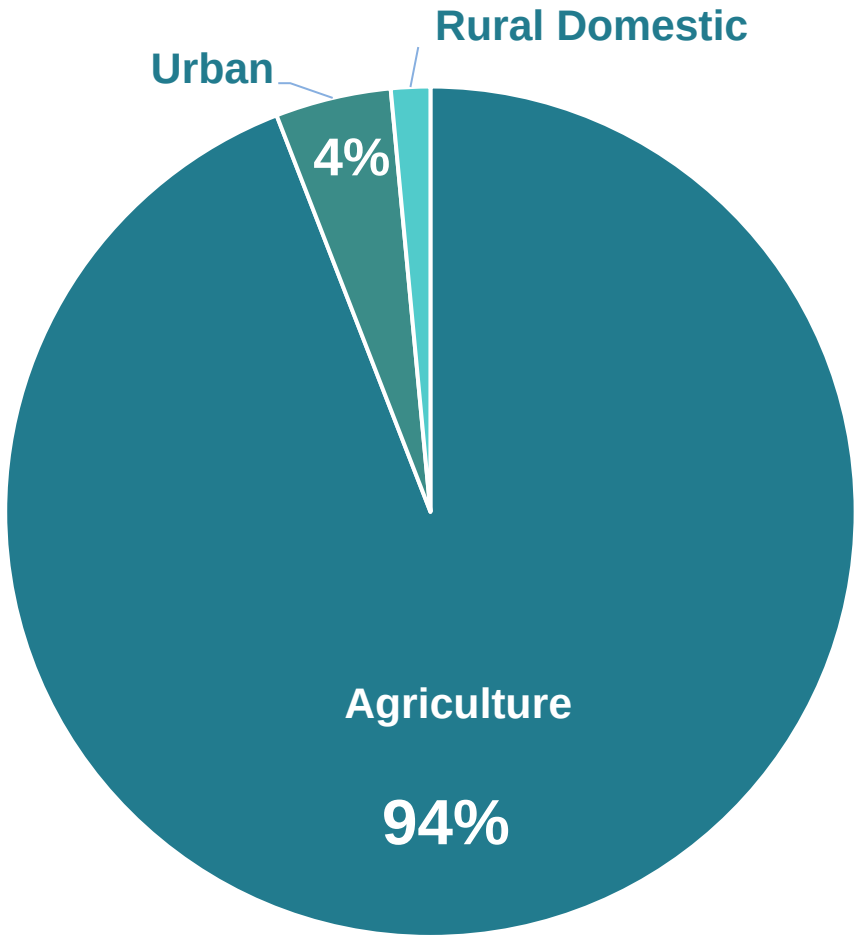
Beneficial Uses of Groundwater

- Drinking water
  - Urban: Corcoran, Lemoore, Hanford
  - Rural domestic: around 2,000 domestic wells*
- Agriculture
- Environmental
  - Various potential unquantified uses

*Data source: Estimated by GSAs from records from the U.S. Geologic Survey and Kings County

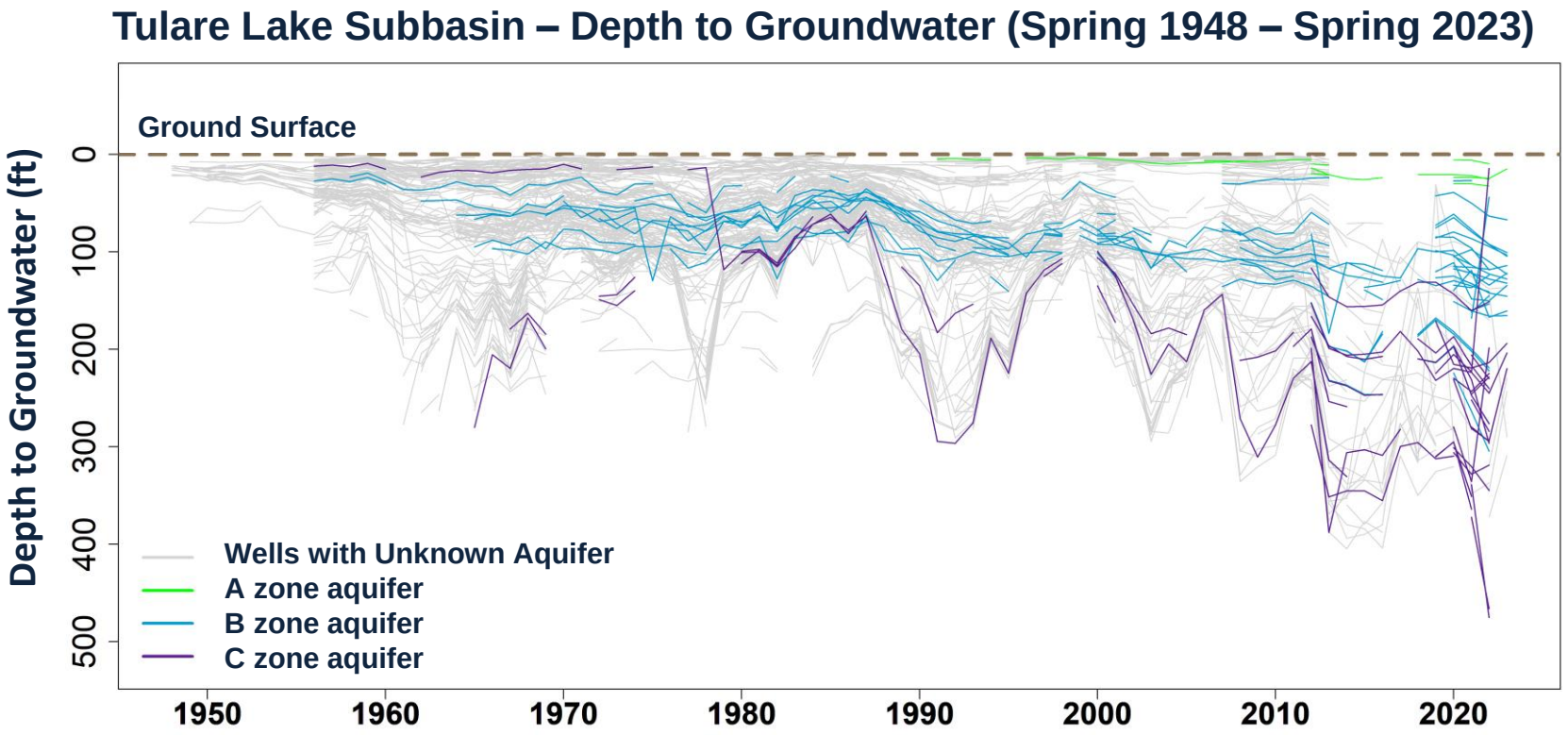
Groundwater Extractions

October 2021 - September 2022



Data source: WY 2022 Tulare Lake Subbasin Annual Report

Tulare Lake Subbasin: Groundwater Overdraft



Longterm subbasin sustainable yield:

299,220 acre-feet per year*

Total average annual groundwater extraction, 2019 - 2022:

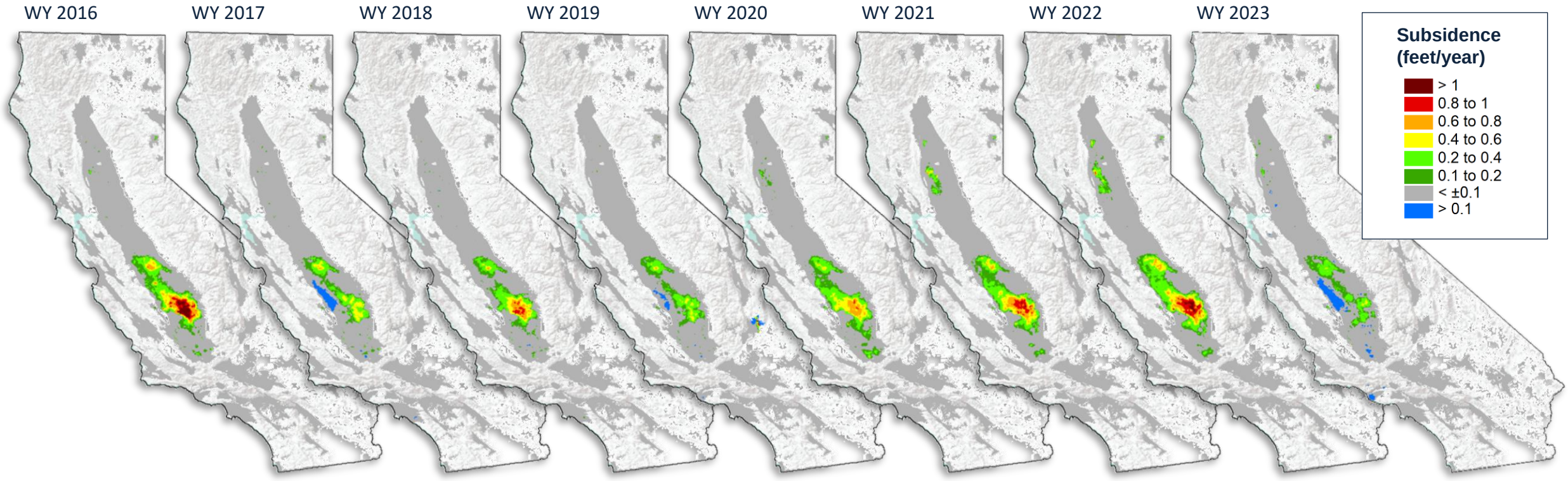
514,309 acre-feet per year**

Average subbasin overdraft, 2019 - 2022:

215,089 acre-feet per year

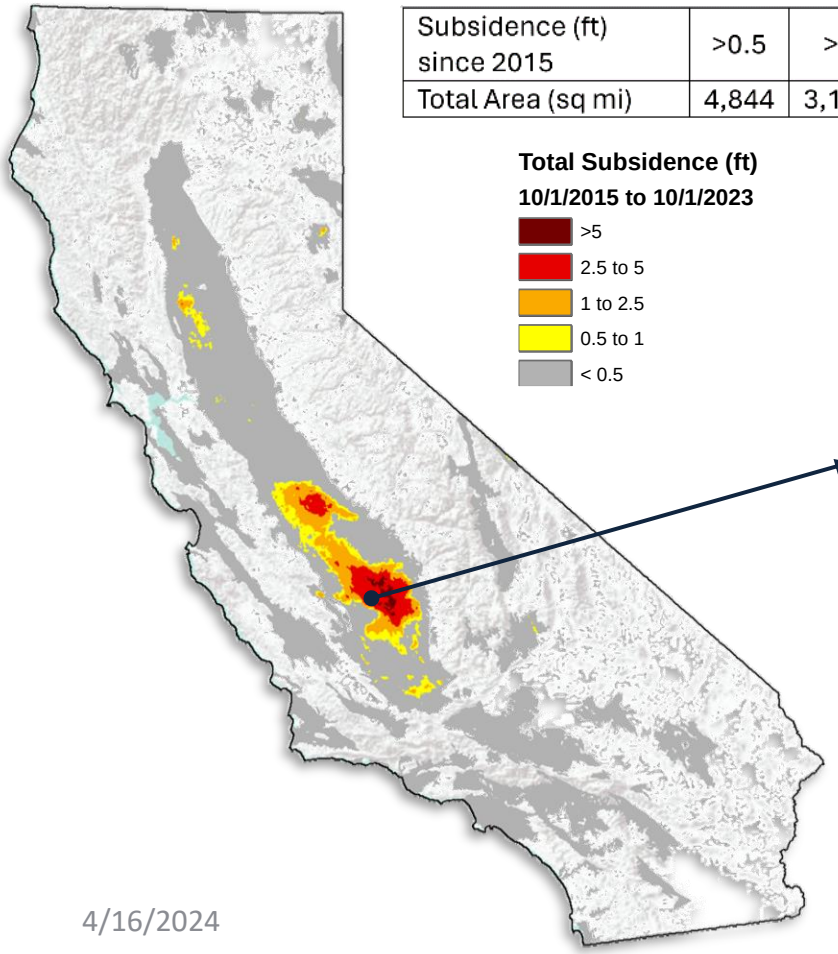
*Data source: 2022 Amended GSP and Addendum **Data source: basin annual reports

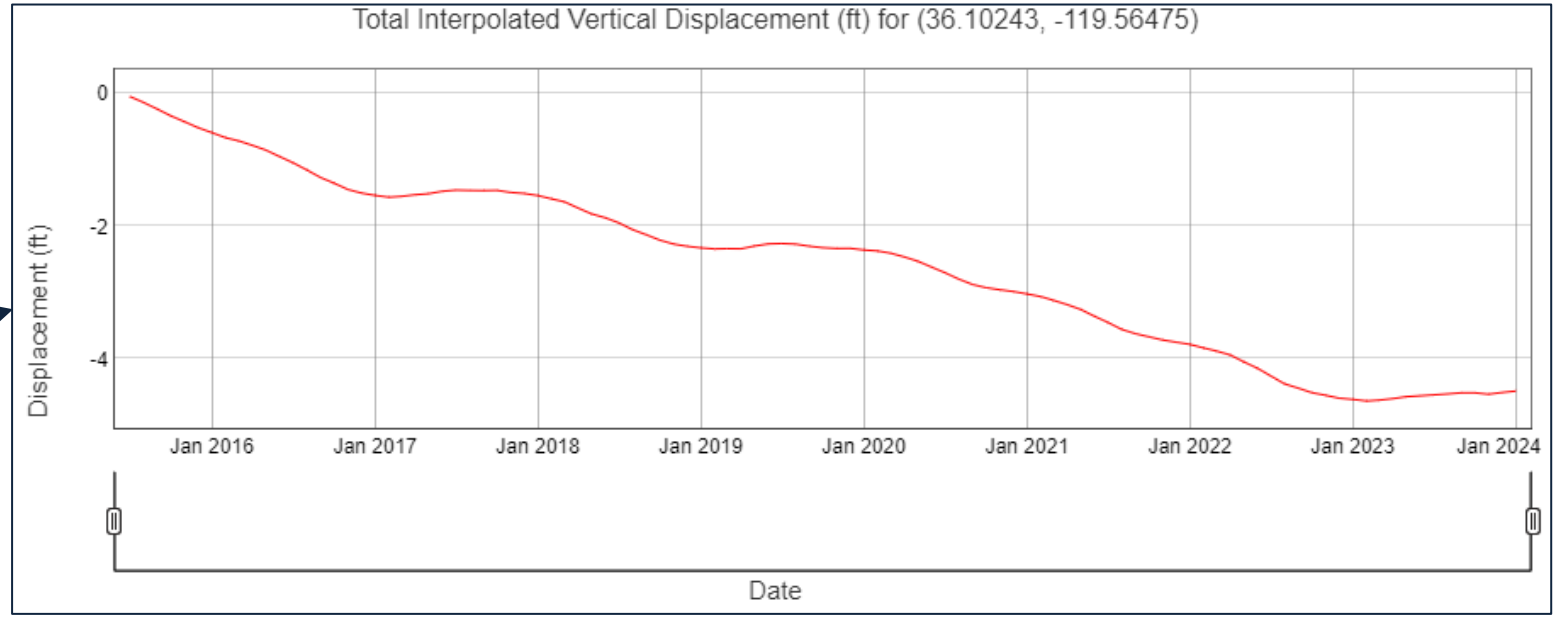
Recent Subsidence Data

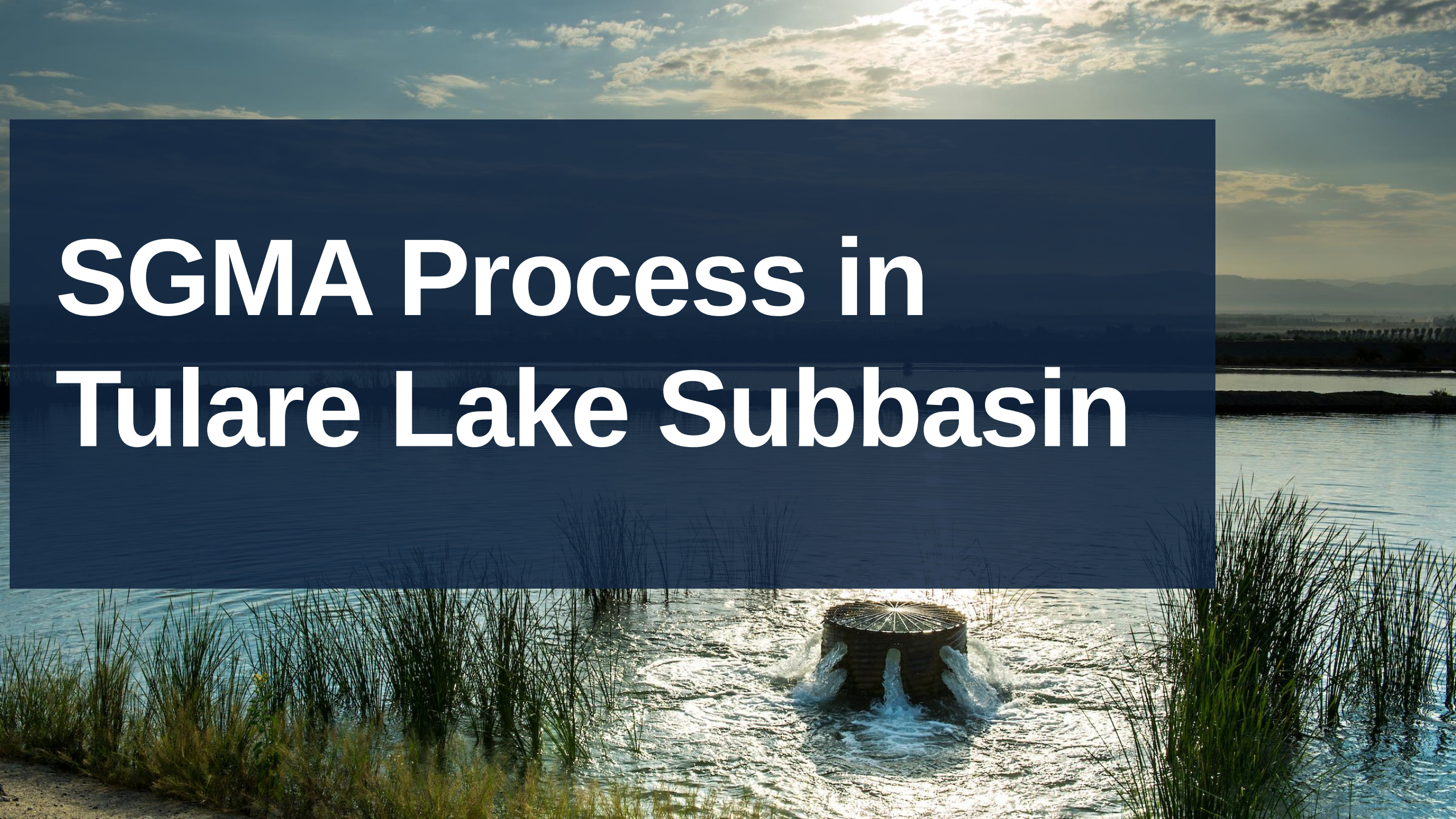


Recent Subsidence Data

Subsidence (ft) since 2015	>0.5	>1	>2.5	>5
Total Area (sq mi)	4,844	3,123	1,293	159







SGMA Process in Tulare Lake Subbasin

Tulare Lake Subbasin: GSAs and GSP

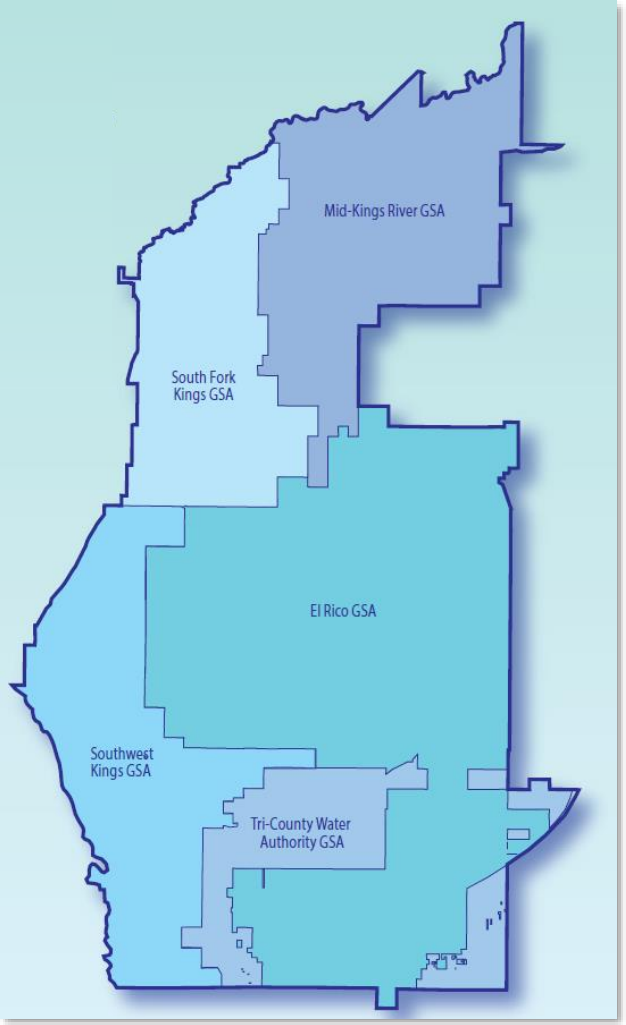


Image source: 2022 Tulare Lake Subbasin Amended GSP

Five Groundwater Sustainability Agencies (GSAs):

- **Mid-Kings River GSA**
- **South Fork Kings GSA**
- **Southwest Kings GSA**
- **El Rico GSA**
- **Tri-County Water Authority GSA**

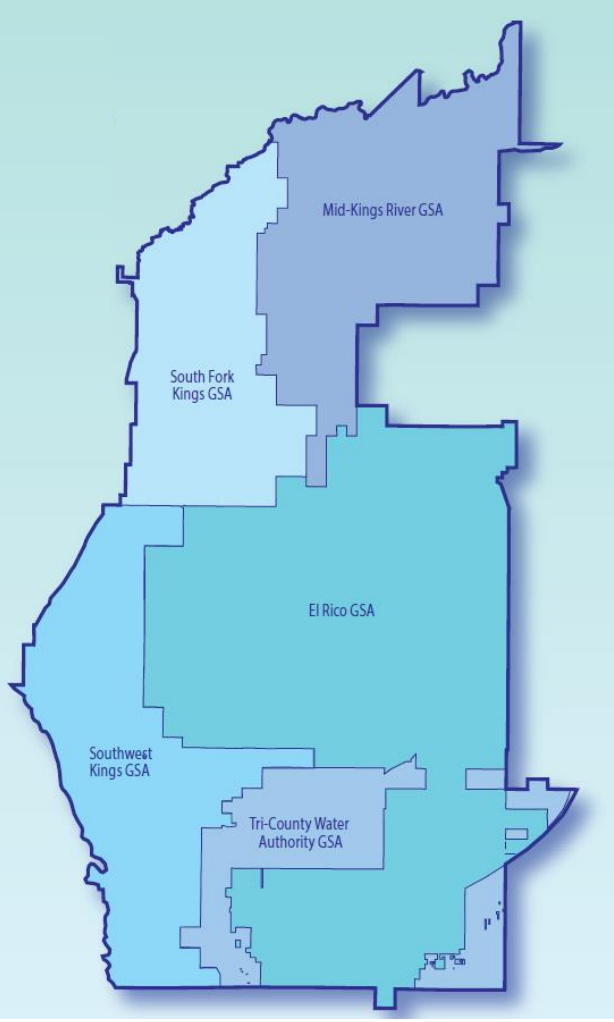
One Groundwater Sustainability Plan (GSP):

- **Tulare Lake Subbasin Amended Groundwater Sustainability Plan (2022)**

Tulare Lake Subbasin: SGMA History

January 2020	January 2022	July 2022	March 2023	October 2023	November 2023
Original GSP submitted	DWR evaluation of original GSP: Incomplete	Revised GSP submitted	DWR evaluation of revised GSP: Inadequate	Draft staff report and beginning of public comment	Public Board virtual and in-person workshops

State Water Board Staff Report



Tulare Lake staff report evaluates the July 2022 GSP:

- **State Water Board and DWR deficiencies:**
  - **Groundwater levels**
  - **Subsidence**
  - **Groundwater quality**
- **Potential actions to correct deficiencies**
- **Responses to public comments on draft staff report (Appendix C)**

Engagement and Public Input

Since October 2023

- Staff workshops – virtual and in-person with Spanish interpretation
- Public comment period – comments addressed in final staff report
- Offered consultations to California Native American Tribes
- Discussions, by request

Plan Deficiencies – Groundwater Levels

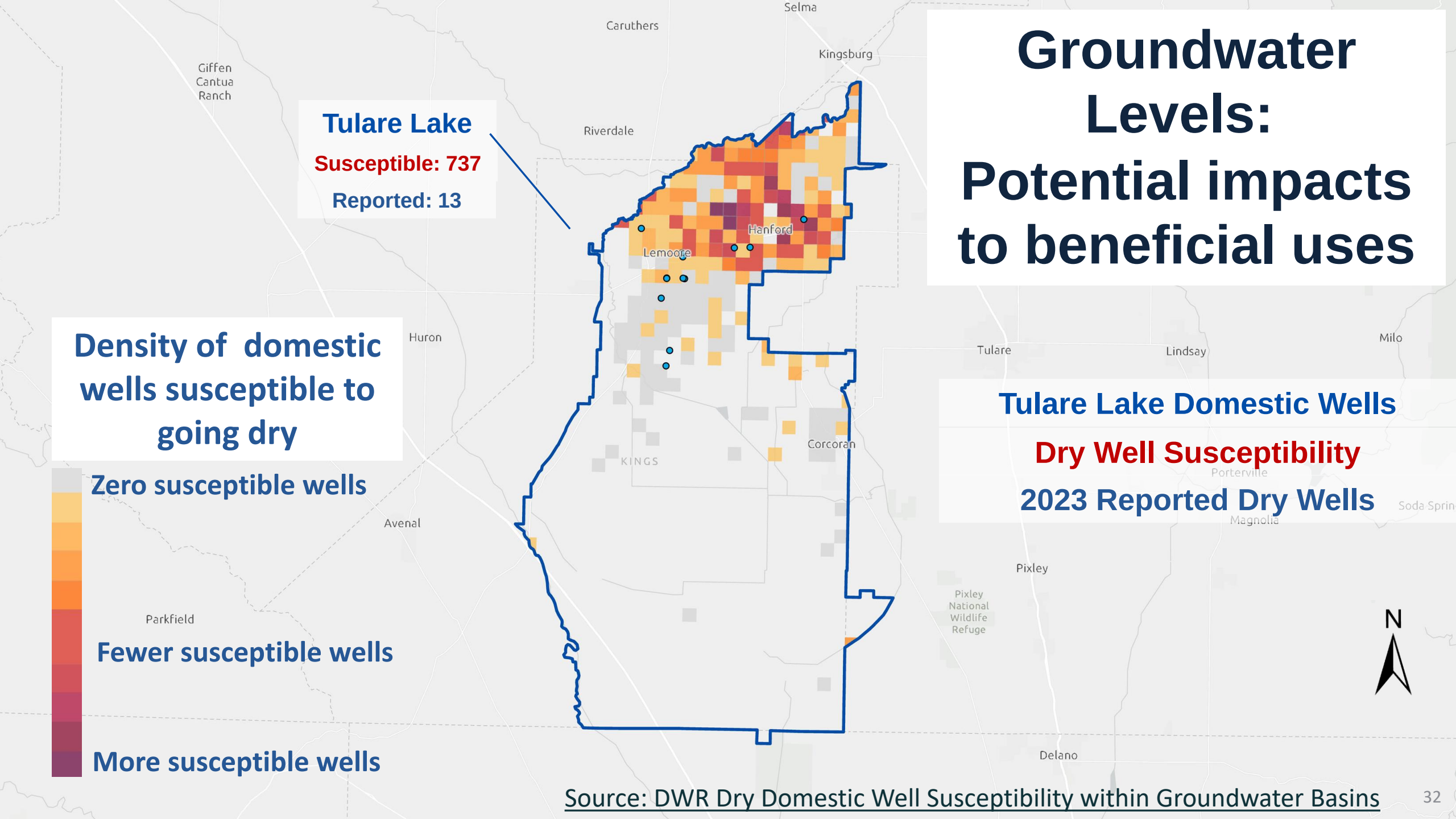
Groundwater Levels

Deficiency	Potential Action
1. Inadequate definition of undesirable result.	1. Clearly define the undesirable result, e.g., how low can the groundwater levels decline and how many wells are estimated to be impacted at those groundwater levels.
2. GSAs didn't consider all beneficial uses and users in setting ground-water level sustainability criteria.	2. Set minimum threshold groundwater levels to protect drinking water wells from dewatering.
3. Insufficient monitoring network for groundwater levels.	3. Use a consistent set of monitoring wells from year to year; establish additional monitoring wells in the A zone.

Groundwater Levels, continued

Deficiency	Potential Action
4. Insufficient description of well impact mitigation.	4. Establish accessible, comprehensive, and appropriately funded well impact mitigation programs.
5. The 2022 GSP does not describe a feasible path for halting chronic lowering of groundwater levels in the subbasin.	5. Plan ahead for drought conditions and commit to managing groundwater demand.
6. The GSAs don't consider the effects of groundwater level sustainability criteria on subsidence or groundwater quality.	6. Revise groundwater level minimum thresholds as necessary to avoid undesirable results for other sustainability indicators.

Groundwater Levels: Potential impacts to beneficial uses



Source: DWR Dry Domestic Well Susceptibility within Groundwater Basins

Plan Deficiencies – Subsidence

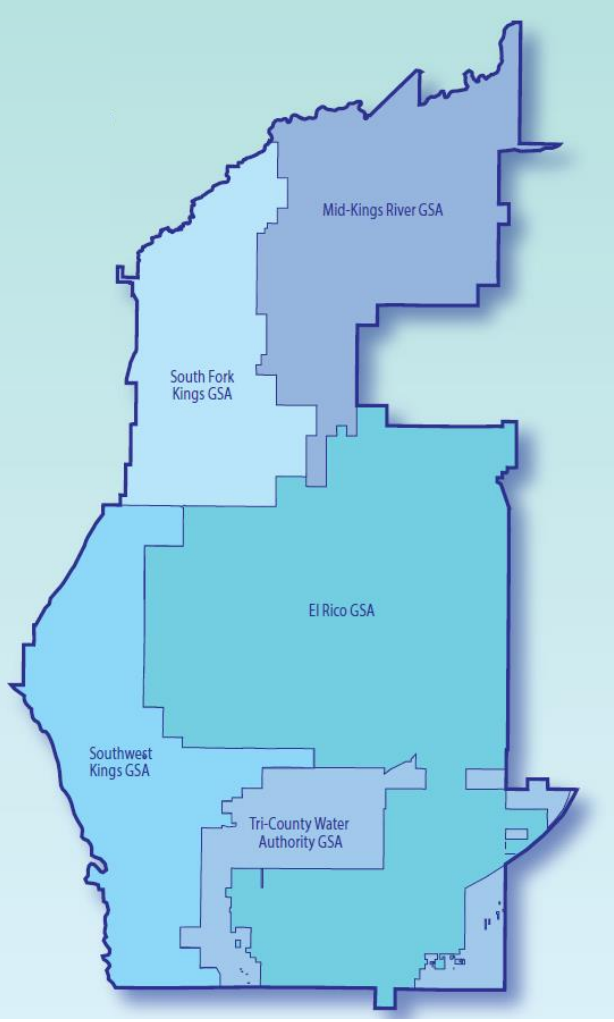
Plan Deficiencies – Subsidence

Deficiency	Potential Action
1. Inadequate definition of undesirable result.	1. Clearly define the undesirable result, e.g., what amount of damage is allowable to canals, levees or wells.
2. GSAs didn't consider all beneficial uses and users in setting subsidence sustainability criteria. Some minimum thresholds appear to exceed subsidence limits set in other pre-existing agreements.	2. Develop quantitative criteria that would avoid undesirable results and conform with other legal agreements.

Plan Deficiencies – Subsidence, continued

Deficiency	Potential Action
3. The GSAs did not adequately consider the impacts of subsidence on flood protection infrastructure.	3. When establishing criteria, evaluate the impacts of reduced channel capacity, uncertainty around longitudinal differential subsidence, and increased inundation depths.
4. The GSP does not provide adequate implementation details.	4. Develop a plan to trigger management actions when subsidence exceeds defined thresholds, especially near critical infrastructure/facilities. Update the Well Registration Program to meet subsidence goals. Develop infrastructure mitigation programs with clear triggers, eligibility requirements, metrics, and funding sources.

Plan Deficiencies – Subsidence



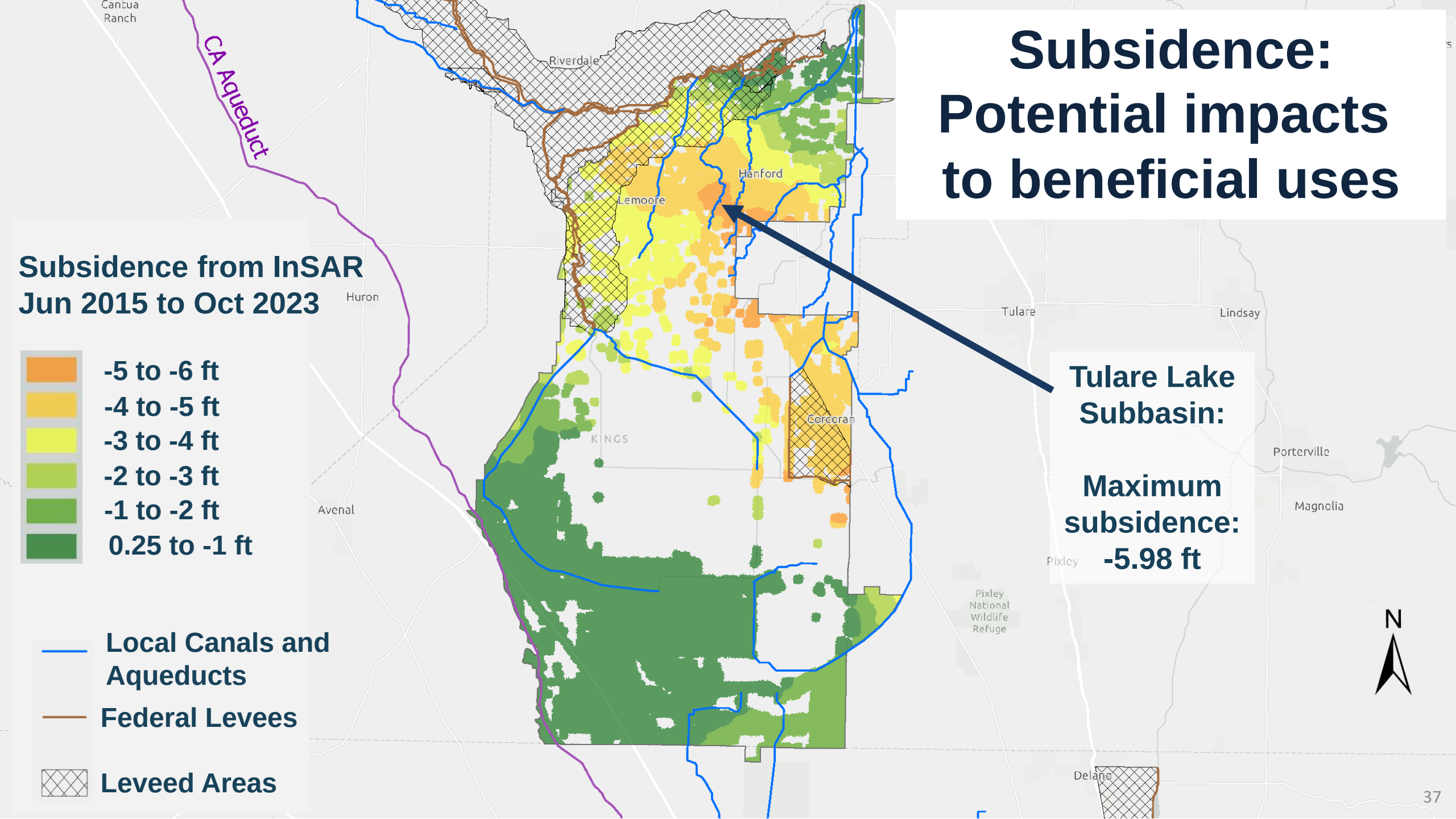
Current subsidence impact is substantial.

Since plan was adopted, subsidence has continued.

Based on staff's analysis:

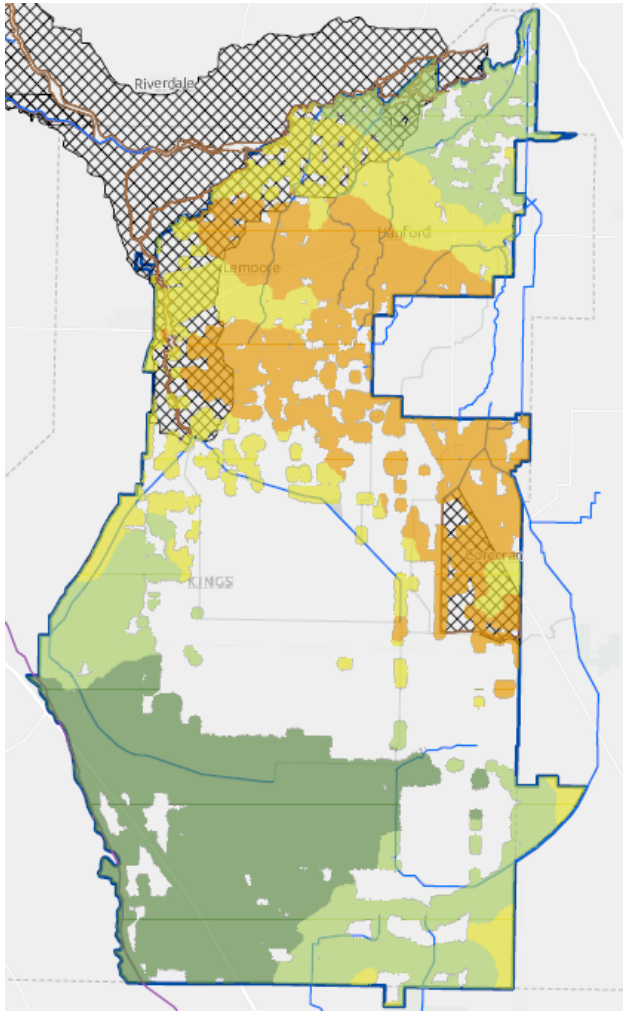
- **Plan will not adequately decrease subsidence**
- **Poses a risk to infrastructure, such as:**
  - **California aqueduct**
  - **Levees**

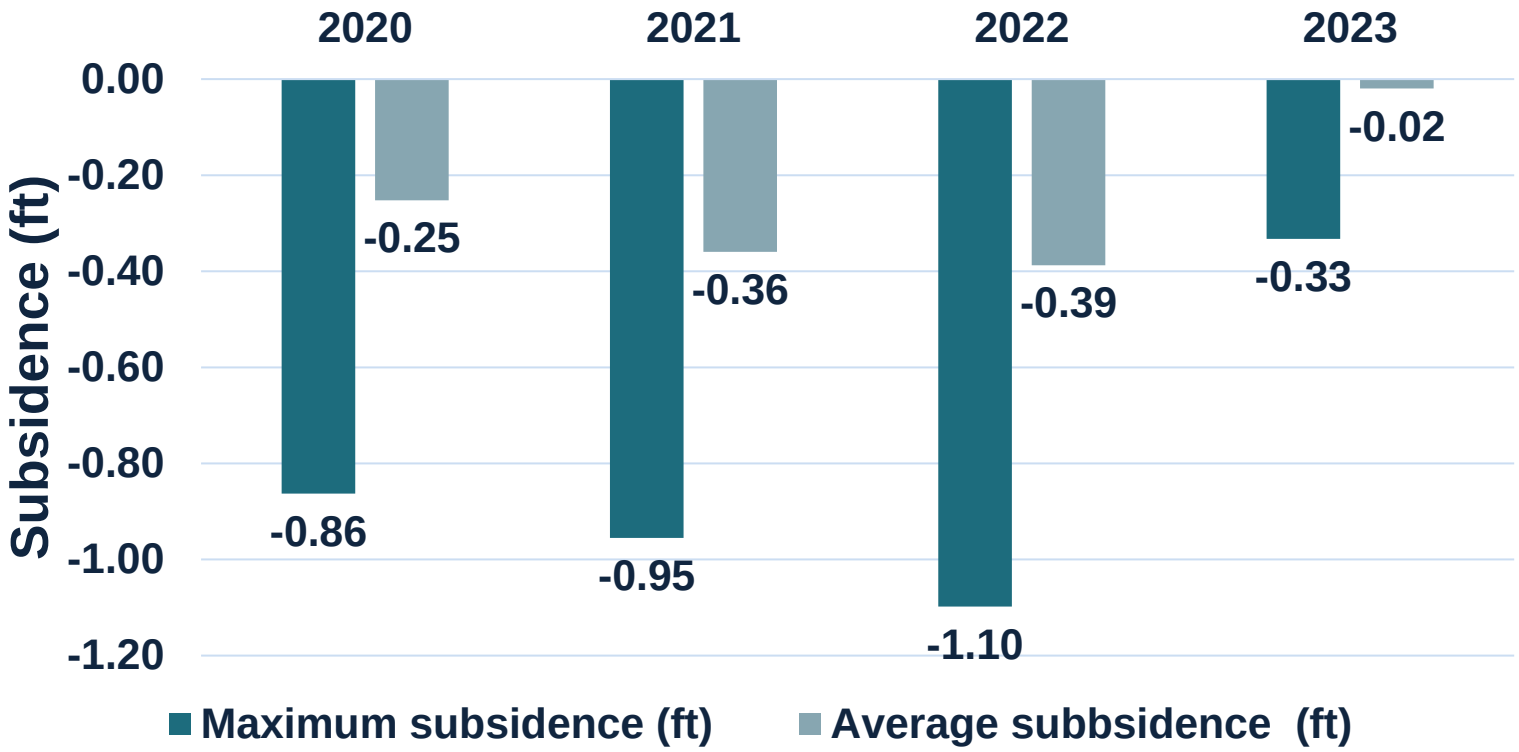
Subsidence: Potential impacts to beneficial uses



Subsidence Since 2020

Subsidence from InSAR Jan 2020 to Jan 2024





-2 to -3 ft
-1 to -2 ft
0 to 1 ft
No subsidence

Maximum Subsidence in Tulare Lake Subbasin January 2020-2024: -2.91 feet

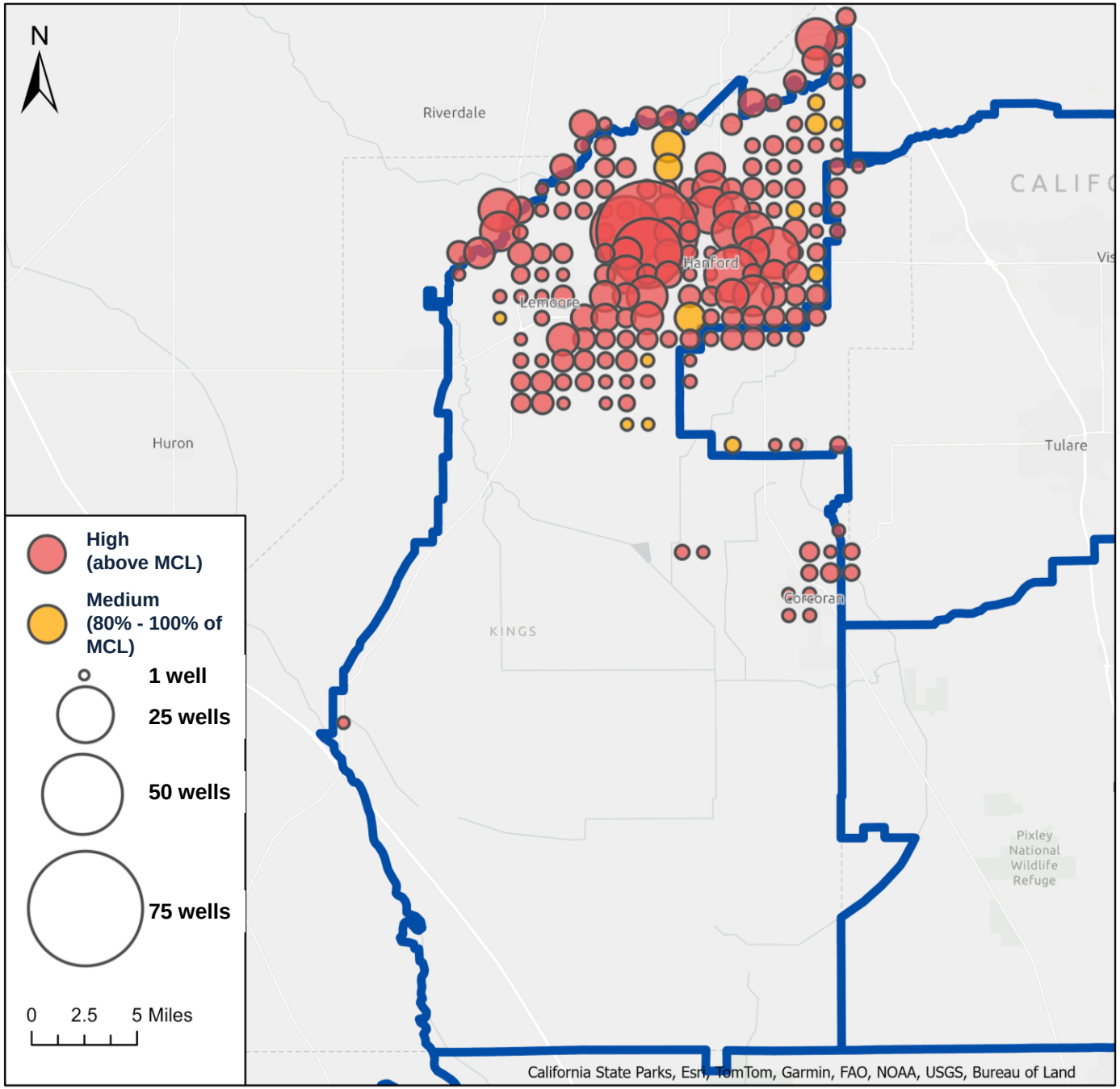
Plan Deficiencies – Groundwater Quality

Plan Deficiencies – Groundwater Quality

Deficiency	Potential Action
1. Inadequate definition of undesirable result.	1. Clearly define the undesirable result, e.g., how much water quality may worsen near drinking water wells.
2. Minimum thresholds for water quality could allow further groundwater quality degradation.	2. Do not establish water quality criteria that would allow for substantial degradation of groundwater quality.
3. Measurable objectives for water quality could allow further groundwater quality degradation.	3. Do not establish water quality criteria that would allow for substantial degradation of groundwater quality.

Potential Actions – Groundwater Quality, continued

Deficiency	Potential Action
4. The proposed monitoring network does not adequately monitor the three key aquifers.	4. Adequately monitor the three key aquifers and better describe monitoring schedules.
5. Management actions are not responsive to groundwater quality degradation. Well mitigation plans lack details.	5. Plan for additional sampling when water quality is degraded. Develop well mitigation programs with clear triggers, eligibility requirements, metrics, and funding sources.

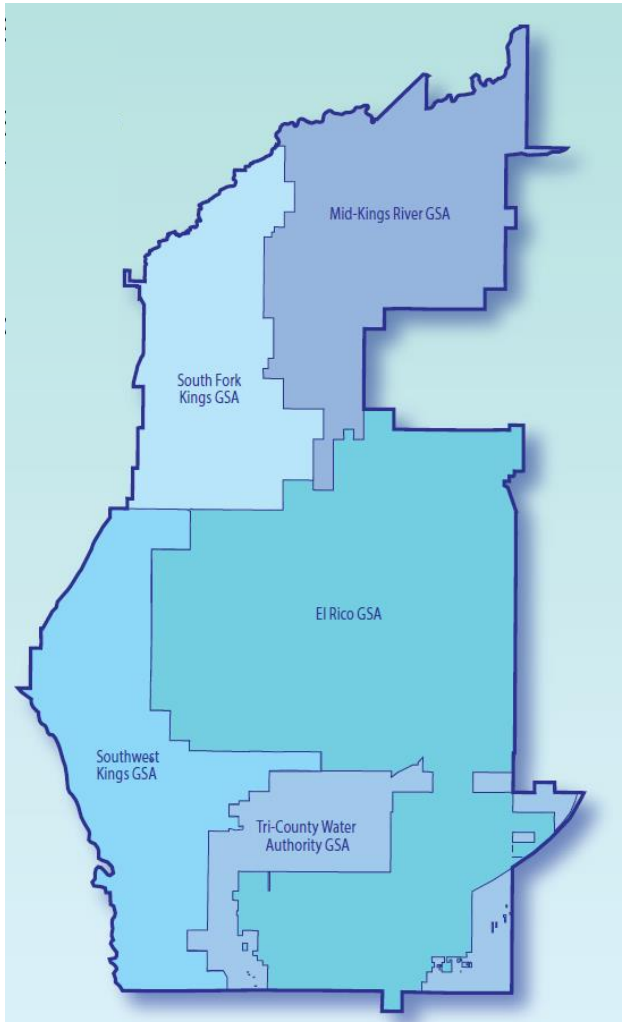


Water Quality: Potential impacts to beneficial uses

- Number of domestic wells at risk of water quality degradation due to constituents impacted by groundwater management

Notes:
Data source: State Water Board 2023 Aquifer Risk Map
Constituents: arsenic, Hexavalent chromium, nitrate, 1,2,3-TCP, uranium
Well Density: based on DWR OSWCR well locations
Risk: determined from (1) a single measured exceedance of 80% (medium) or 100% (high) MCL or (2) a trend analysis of long-term data
MCL – Maximum Contaminant Level

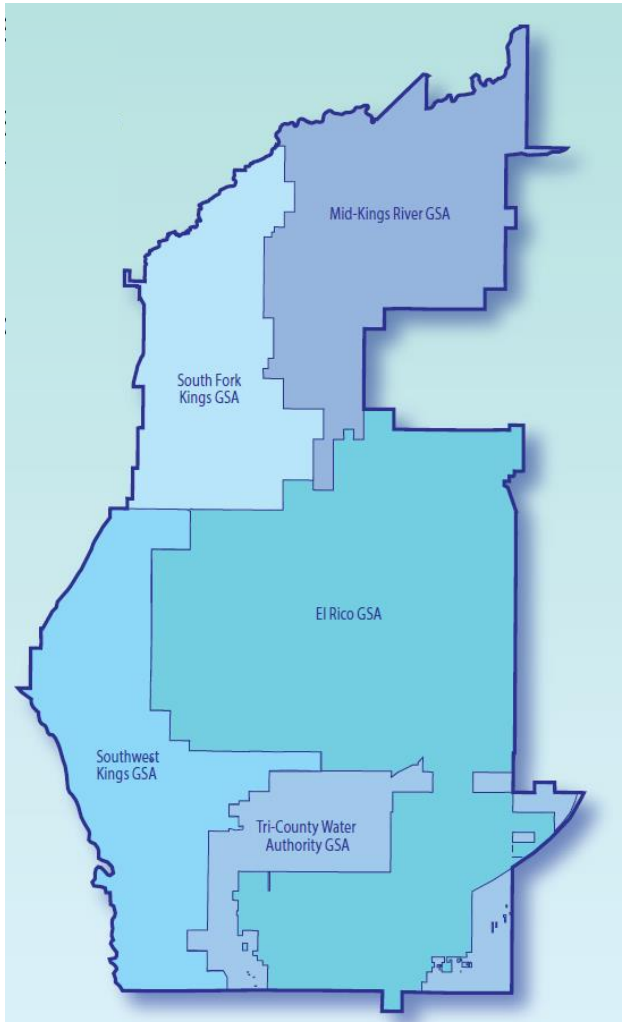
Subbasin Status Since Inadequate Determination



- **Staff-GSAs Meetings: 7 meetings to discuss concerns**
- **Unclear whether the GSAs have fully considered and/or incorporated staff report recommendations**
- **Note: staff will need time (3+ months) for a substantive review of revised GSPs**

Staff Recommendations for Tulare Lake Subbasin

Staff Recommendations:
Designate the Basin Probationary

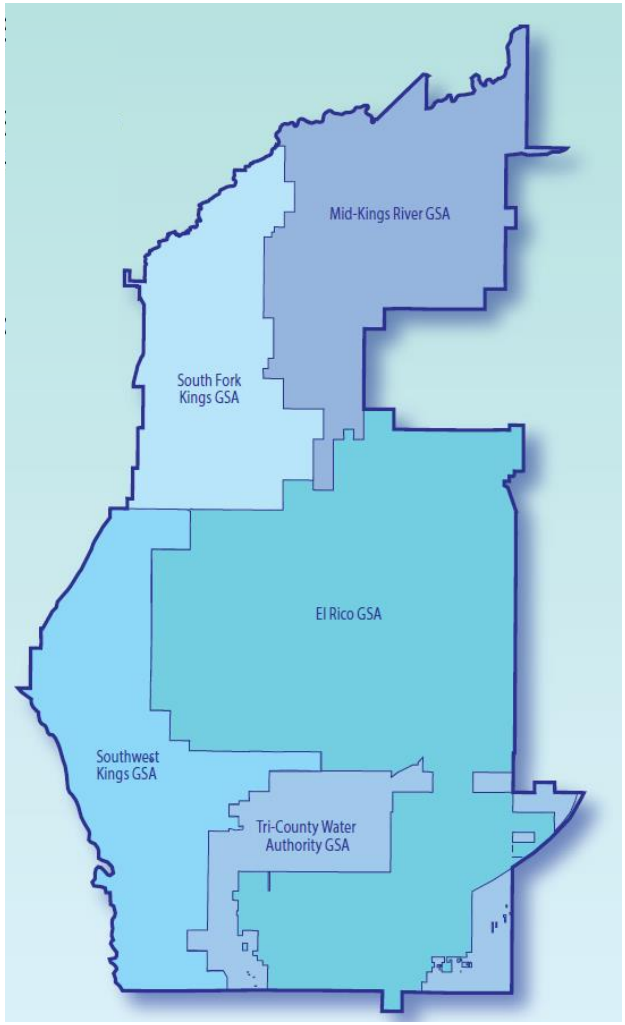


The 2022 plan will allow substantial impacts to:

- **Domestic wells users**
- **Critical infrastructure, e.g., canals, levees**
- **Aquifers**

Plan <u>will not</u> achieve groundwater sustainability by 2040.

Staff Recommendations:
Do Not Exclude Any Portion of the Basin



Qualification for the exclusion from probation requires*:

1. **GSA coverage**
2. **GSP that is being implemented**
   - **Achieves sustainable groundwater management**
   - **Implements measures targeted to ensure basin operated within sustainable yield**

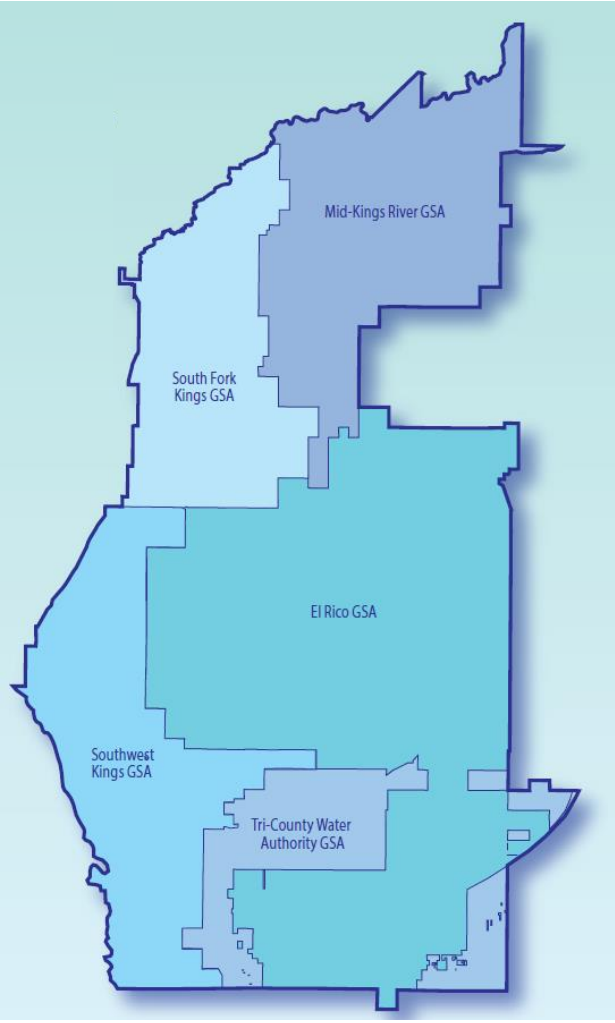
Requests to be excluded from probationary status:

- **Southwest Kings GSA, Tri-County Water Authority GSA**
- **<u>Neither meets the statutory criteria</u>**

The Board may amend a probationary designation to apply the exclusion at any time

* Water Code §§ 10721(u) & 10735.2 (e)

Staff Recommendations:
Reporting Requirements

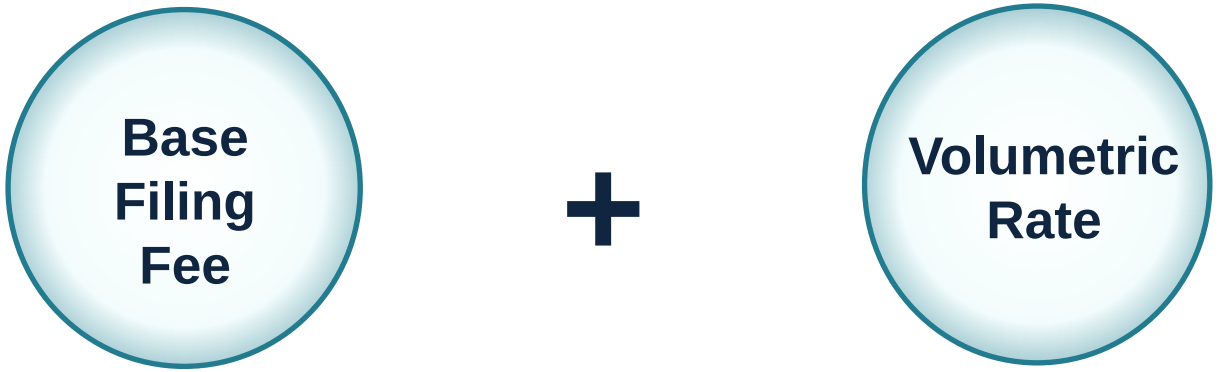


- **All people who extract groundwater (unless <u>excluded</u>*) must report:**
  - ☑ **well location & capacity**
  - ☑ **monthly extraction volumes**
  - ☑ **place & purpose of use**
- **Begin recording July 15, 2024**
- **Reports due annually starting December 1, 2024**
- **People who extract more than 500 acre-feet per year: measure extractions with a certified meter**

*** <u>EXCLUDE</u> de minimis (2 acre-feet per year or less) domestic well users from reporting and fees**

Probationary Extraction Reporting Fees

If the Board places the basin on probation today, for groundwater extractions beginning July 15, 2024:



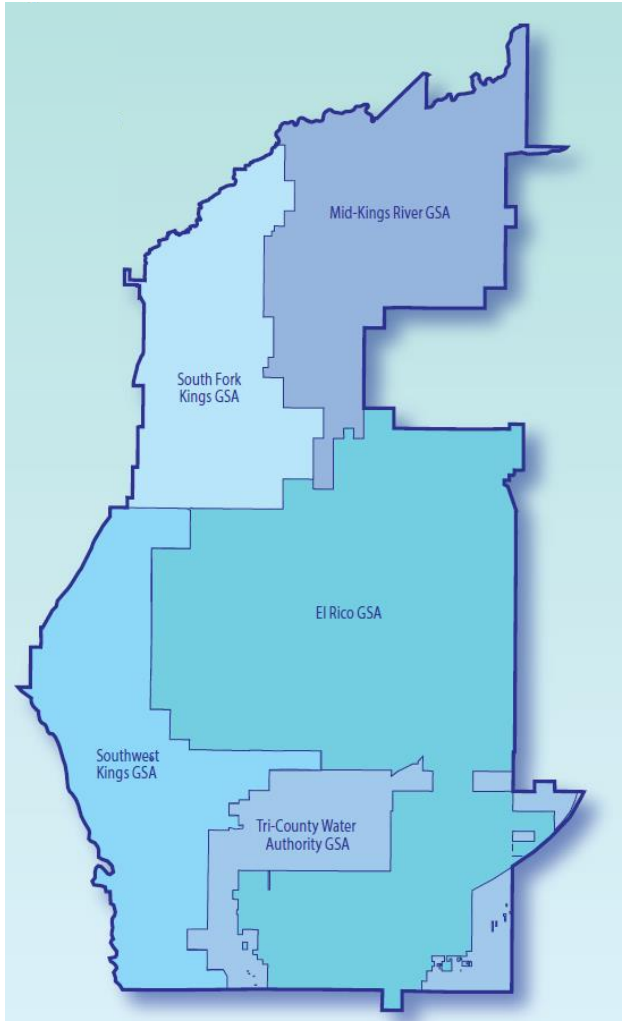
$300 per well per year

$20 per acre-foot extracted

Late reporting fee: 25% per month late

*Fee waivers available for water systems and schools serving disadvantaged communities and for those with low income

Probation Next Steps

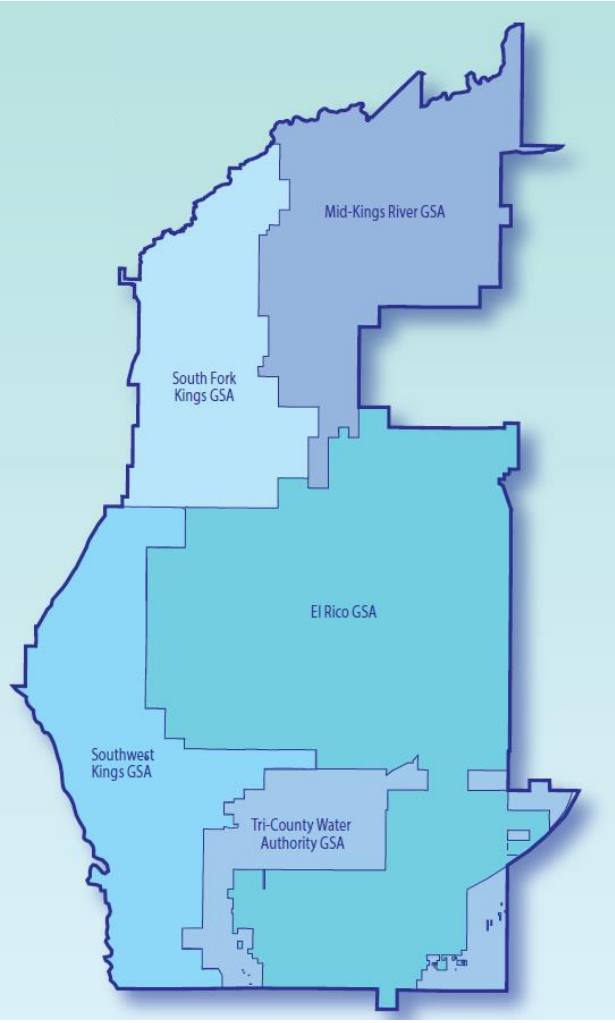


<u>Board considers whether to designate the basin as probationary</u>

Proposed probationary hearing resolution includes:

- **Background, factual findings, and probationary designation**
- **Deficiencies and potential actions**
- **Reporting requirements (de minimis exemption)**
- **Limited delegation to Executive Director**
- **Direction to staff to provide at least 30 days' notice and public comment before any changes before the Board considers any changes to the resolution**

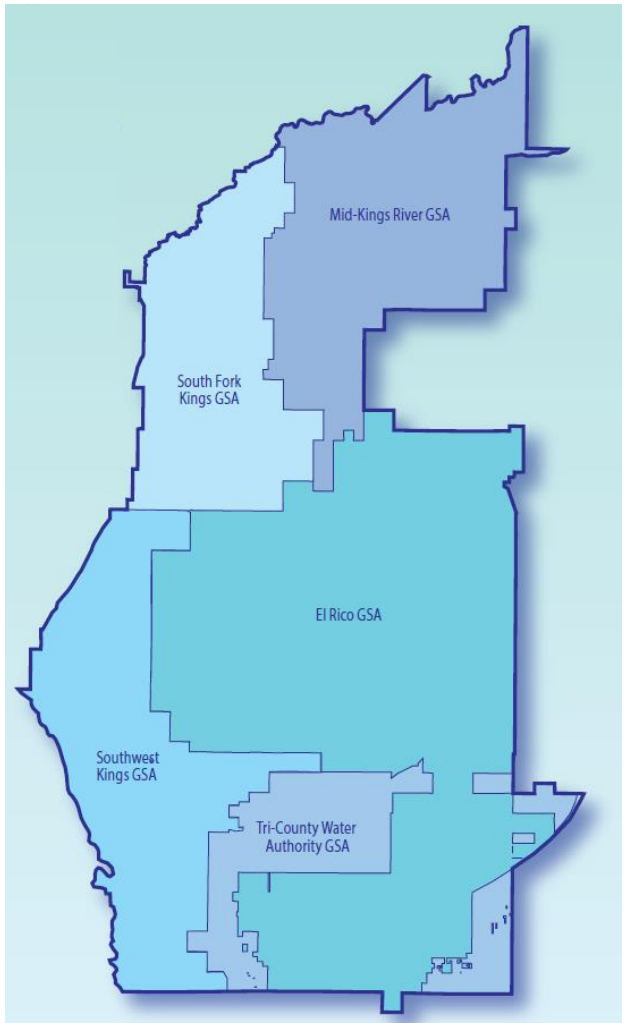
Probation Next Steps



GSAs continue working to address plan deficiencies

- **Implement the potential actions or similarly effective actions**
- **Meet with Board staff to discuss progress**
- **Submit revised GSP to Board for evaluation**
- **Board staff evaluate the plan**
- **Continue implementing proposed projects and management actions**

Board Considerations for Lifting Probation



Staff evaluate any resubmitted plan:

If (1) deficiencies are resolved and (2) GSAs are on track to achieve the basin sustainability goal,

- ➔ **staff will recommend that the Board repeal the probationary resolution.**
- ➔ **Basin oversight would then return to DWR.**

If (1) deficiencies are not resolved and (2) after at least one year:

- ➔ **Board may develop an interim plan to manage overdraft**
- ➔ **Effective until GSP deficiencies are resolved and GSAs are able to resume basin management.**

Office of Sustainable Groundwater Management

SGMA@waterboards.ca.gov

www.waterboards.ca.gov/sgma

Evapotranspiration-based Extraction Estimates

Evapotranspiration (ET)-based models estimate crop water consumption using satellite images, local weather information, crop type, and other data.

Most effective to estimate extractions with:

- **Detailed info on crops and irrigation practices**
- **Parcel-level information for other water sources**
- **No groundwater uses *not* captured by ET (e.g., frost protection, livestock watering, greenhouses, exports)**
- **No rain during growing season**

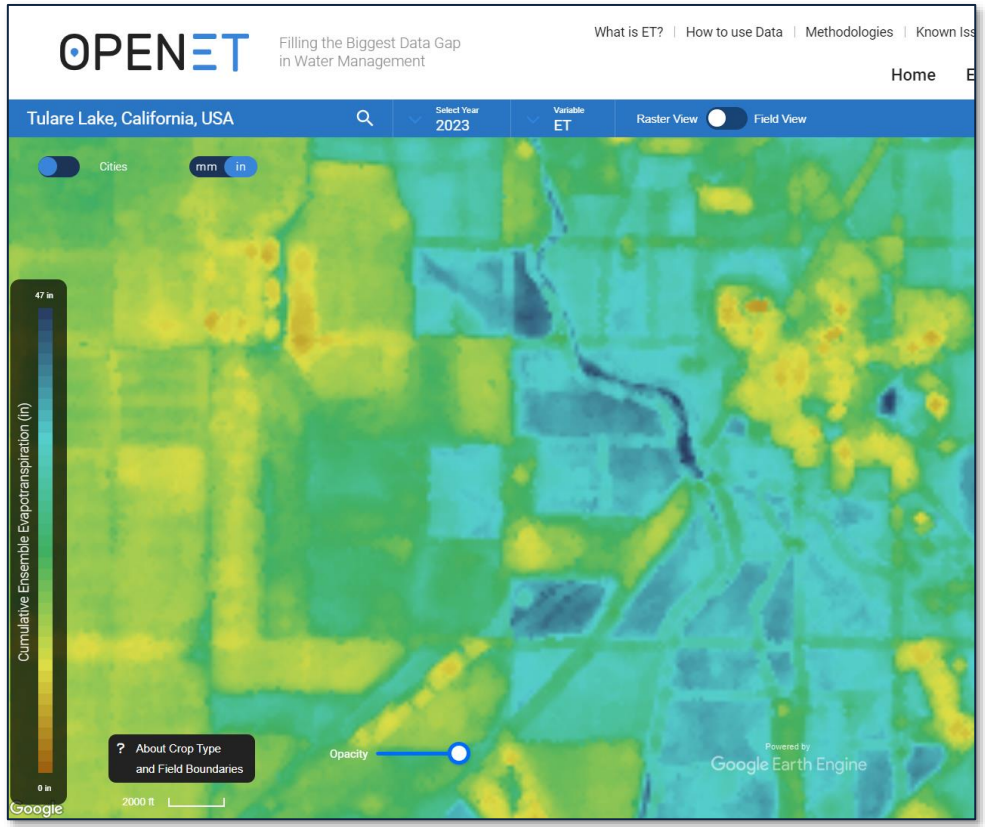


Image source: OpenET

Benefits of ET-based Estimates

Remotely sensed ET data are publicly available from the OpenET platform

- OpenET data provide continuous spatial coverage at a relatively high resolution (pixel size 30m x 30m; 0.2 acres per pixel) at monthly intervals

Can be used to develop water use analysis tools that can be applied at a range of scales – from parcels to basins

Data collection can be simple for the landowner if:

1. They have the technical skills to use OpenET, OR
2. They subscribe to services providing water use estimates

Limitations of ET-based estimates

Estimated ET varies substantially by model

- Monthly ET values from the models provided by the OpenET tool commonly vary about 20% around the ensemble mean

Accuracy of pumping estimates varies substantially based on inputs

- Recent study: OpenET-based estimates can differ from 8% to more than 50% compared to measured extractions, mainly due to variability of annual precipitation and irrigation behaviors (Brookfield et al. 2024)

It is difficult to evaluate accuracy of proprietary models (e.g., LandIQ)

Monthly ET from Different Models

Variability of monthly ET estimated from different models for an arbitrary location

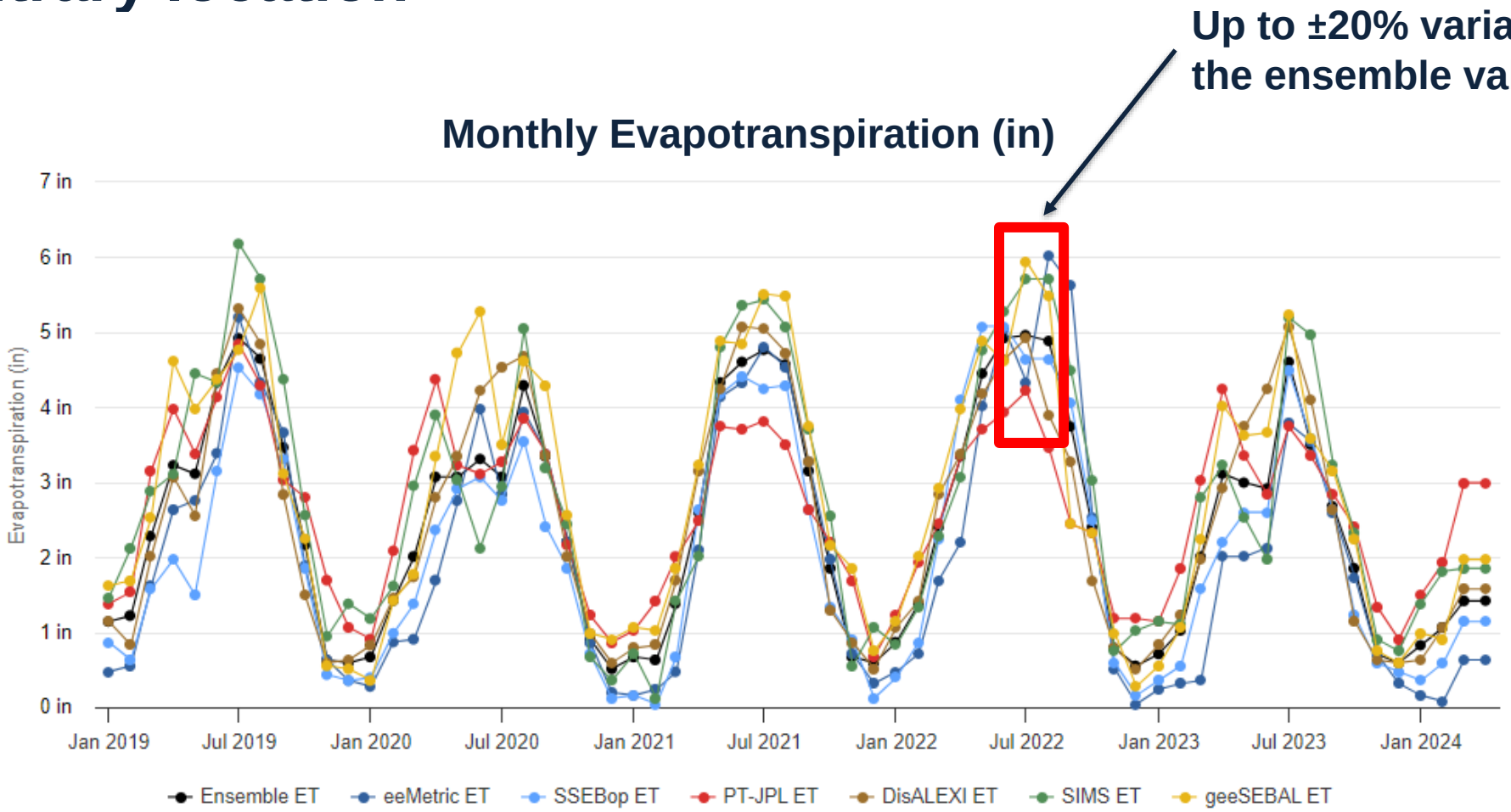


Image source: OpenET

Benefits of Meters

Flow meters may be installed at the extraction source – at individual wellheads or at manifolds connected to multiple wells

Proper calibration and maintenance can keep the measurement error less than 5% by volume.

Meters estimate groundwater extraction, not plant water consumption

Affordability and common historical usage of meters may make meters preferable to many groundwater extractors

Limitations of Meters

Meters require maintenance:

- **Re-calibration and maintenance necessary for accuracy**
- **Changes in flow conditions and/or plumbing can impact measurement accuracy**
- **Meters are susceptible to damage due to mechanical wear and tear and being in contact with water**
    - Ultrasonic and electromagnetic flow meters are robust against mechanical failures but are more expensive than mechanical meters

Meter readings must be collected manually if a data logging or telemetry system is not used

Alternate Resolution Text

Allow Alternatives to Meters

For individuals required to report who do not already have meters installed, the State Water Board will consider alternative compliance pathways to the metering requirement, taking into account the reliability and accuracy of alternative measurement techniques and whether auditable information is used. Specific considerations include but are not limited to whether:

(1) groundwater is extracted for uses not captured by evapotranspiration,

(2) sufficient details about crop irrigation and irrigation efficiency are provided, and

(3) contributions of precipitation and other sources to consumptive use are known and accounted for.

The Board delegates authority to approve alternative compliance pathways to the Executive Director or the Executive Director's delegee pursuant to Water Code Section 7.