NORTH AMERICAN SUBBASIN
Groundwater Sustainability Plan

PREPARED FOR:
RD1001 GSA
Sacramento Groundwater Authority GSA
South Sutter Water District GSA
Sutter County GSA
West Placer County GSA

DECEMBER 2021

North American Groundwater Subbasin (NASb) Groundwater Sustainability Plan Update

SGA Board Meeting
December 11, 2025

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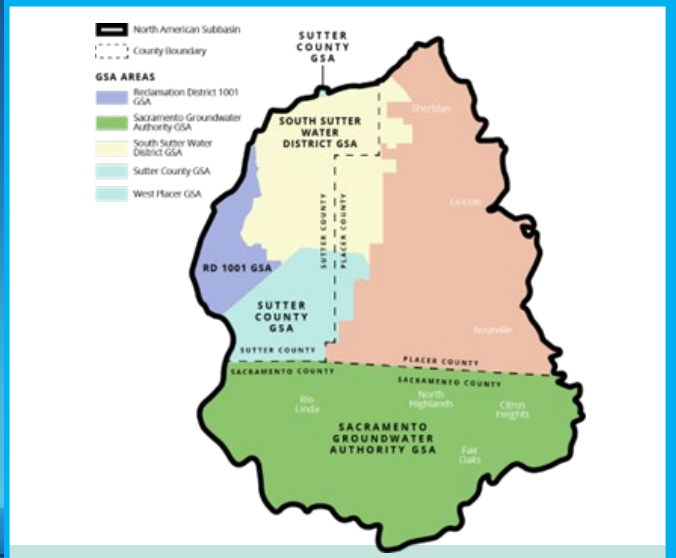
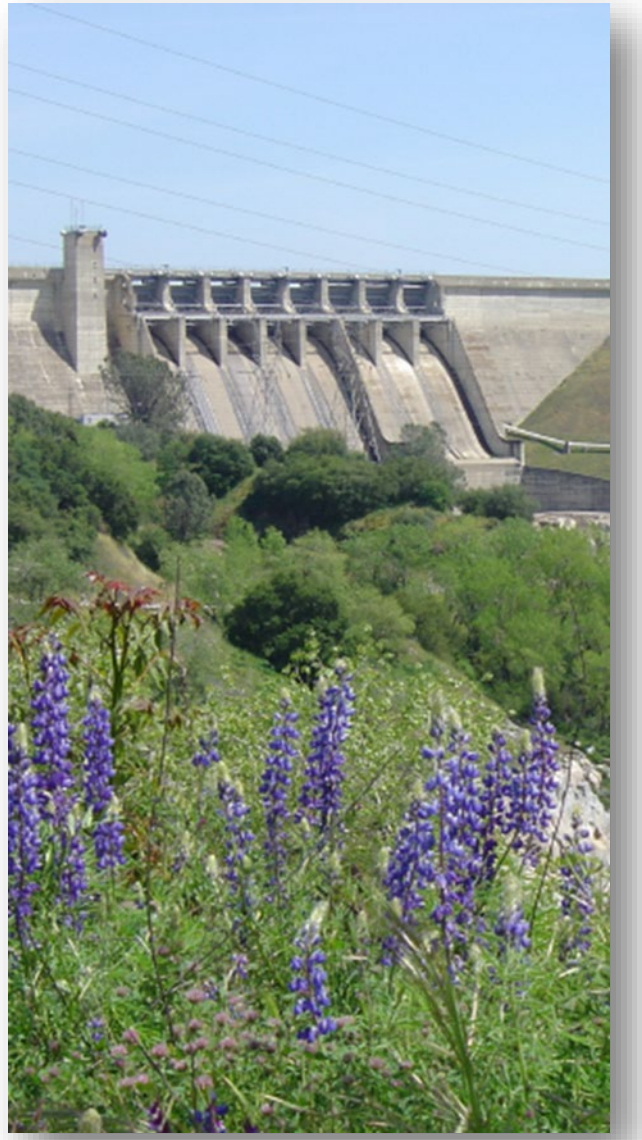


Agenda

- GSP 5-Year and GSP Amendment
  - Groundwater Level Sustainable Management Criteria & Groundwater Dependent Ecosystems
  - Land Subsidence Sustainable Management Criteria
- Timeline



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GSP

Goal: Ensuring sustainability through projects and programs that will assist in meeting goals

Current Status: Submitted in December 2021; approved by DWR in July 2023 with six corrective actions

Annual Report

Goal: Provides information on groundwater conditions and implementation of GSP for the prior water year

Current Status: The fourth annual report for Water Year 2024 was submitted to DWR in March 2025

Periodic Evaluation

Goal: Periodically review the GSP to ensure that proposed projects and programs are helping the basin meet its sustainability goals

Current Status: In progress, to be submitted by January 2027

Timeline – GSP development and adoption

June 2016
GSAs begin to develop GSP

Public Meetings

January 31, 2022
GSP due to State DWR

20 years with 5-year updates

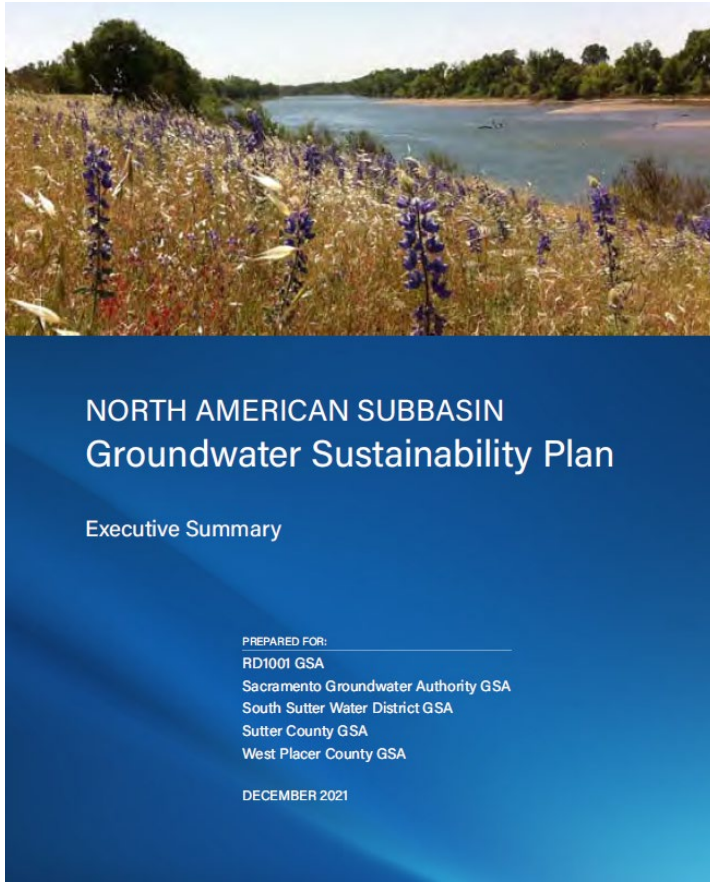
January 31, 2042
Avoid Undesirable Results

November 2020
Partial Draft GSP Release Sections 1 through 5

Mid 2021
Draft Final GSP Release

Late 2021
Adopt Final GSP & Implementation Begins

Late 2026
5 year Evaluation and GSP Update due to DWR



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SGA

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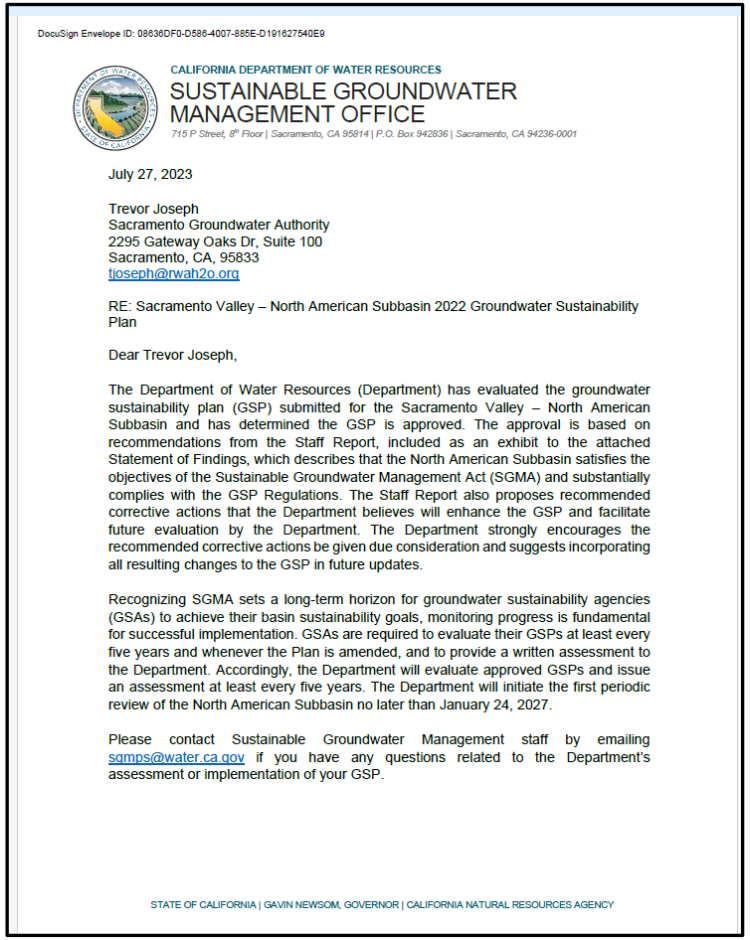

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CALIFORNIA DEPARTMENT OF WATER RESOURCES
SUSTAINABLE GROUNDWATER MANAGEMENT OFFICE
715 P Street, 8th Floor | Sacramento, CA 95814 | P.O. Box 942836 | Sacramento, CA 94236-0001

July 27, 2023

Trevor Joseph
Sacramento Groundwater Authority
2295 Gateway Oaks Dr, Suite 100
Sacramento, CA, 95833
tjoseph@rwah2o.org

RE: Sacramento Valley – North American Subbasin 2022 Groundwater Sustainability Plan

Dear Trevor Joseph,

The Department of Water Resources (Department) has evaluated the groundwater sustainability plan (GSP) submitted for the Sacramento Valley – North American Subbasin and has determined the GSP is approved. The approval is based on recommendations from the Staff Report, included as an exhibit to the attached Statement of Findings, which describes that the North American Subbasin satisfies the objectives of the Sustainable Groundwater Management Act (SGMA) and substantially complies with the GSP Regulations. The Staff Report also proposes recommended corrective actions that the Department believes will enhance the GSP and facilitate future evaluation by the Department. The Department strongly encourages the recommended corrective actions be given due consideration and suggests incorporating all resulting changes to the GSP in future updates.

Recognizing SGMA sets a long-term horizon for groundwater sustainability agencies (GSAs) to achieve their basin sustainability goals, monitoring progress is fundamental for successful implementation. GSAs are required to evaluate their GSPs at least every five years and whenever the Plan is amended, and to provide a written assessment to the Department. Accordingly, the Department will evaluate approved GSPs and issue an assessment at least every five years. The Department will initiate the first periodic review of the North American Subbasin no later than January 24, 2027.

Please contact Sustainable Groundwater Management staff by emailing sgmps@water.ca.gov if you have any questions related to the Department's assessment or implementation of your GSP.

STATE OF CALIFORNIA | GAVIN NEWSOM, GOVERNOR | CALIFORNIA NATURAL RESOURCES AGENCY

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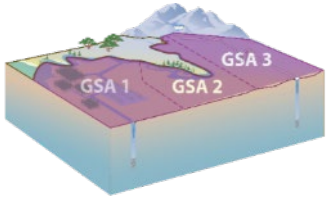
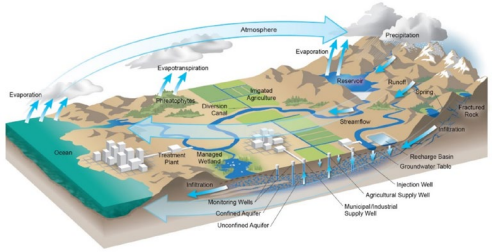
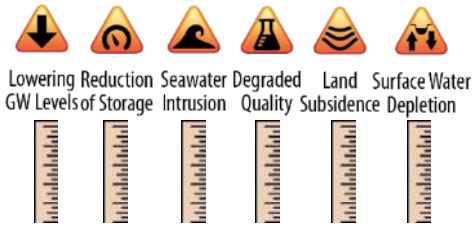
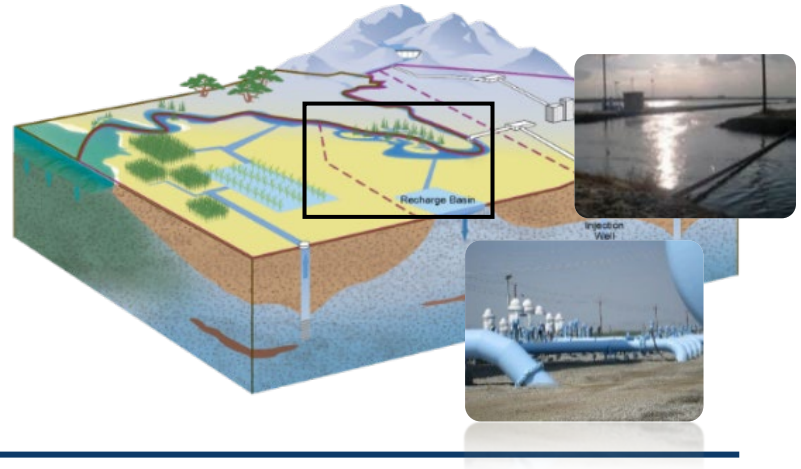
GSP Regulations & NASb GSP Sections

GSP Development Phases	1. Understand existing basin conditions	2. Develop water levels that consider beneficial uses and users	3. Develop management actions and/or projects to ensure basin is sustainable
GSP Regulation Requirements	**Who** *- Administrative Information -*  **What** *- Basin Setting -* 	**Where** *- Sustainable Management Criteria -*  *- Monitoring Network -* 	**How** *- Projects & Management Actions -* 
NASb GSP Draft Sections	**Draft Release Sections** Section 1 – Introduction Section 2 – Agency Information Section 3 – Description of Plan Area Section 4 – Hydrogeologic Setting Section 5 – Groundwater Conditions	**Current Section Topics** Sustainable Management Criteria Representative Monitoring Network Water Budgets	**Current Section Topics** Projects and Actions

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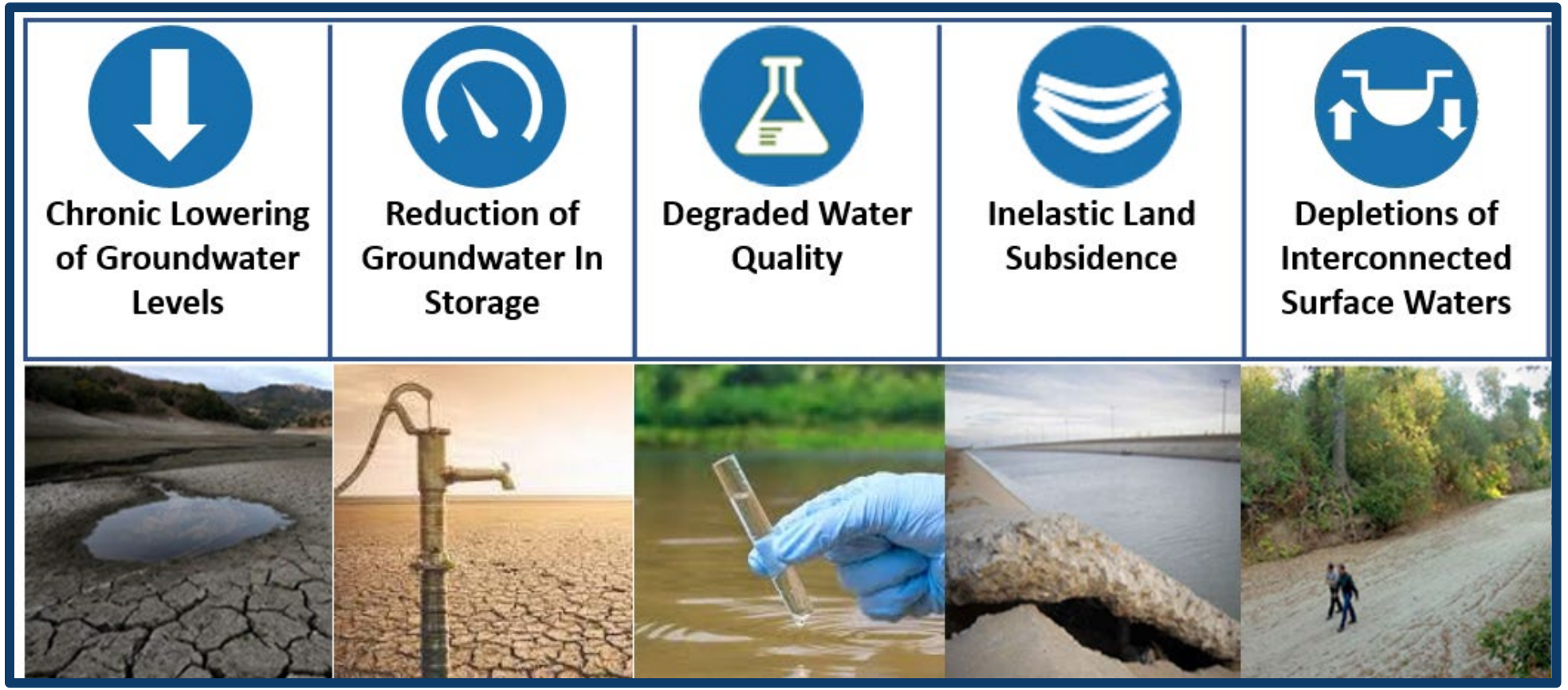
Sustainability Indicators

"effects caused by groundwater conditions throughout the basin that, when significant and unreasonable, cause undesirable results…"

Undesirable Results



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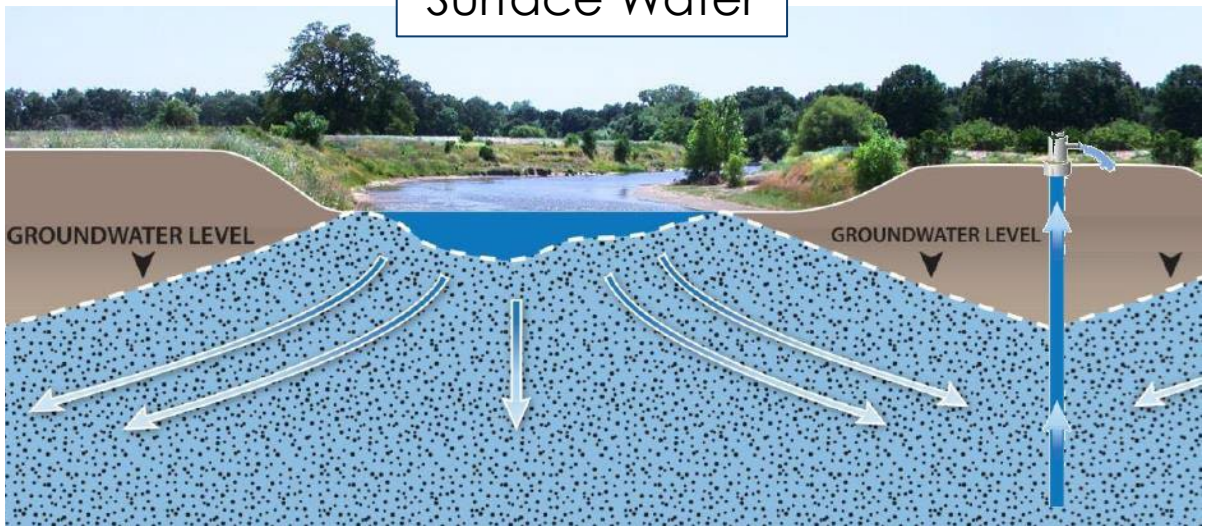
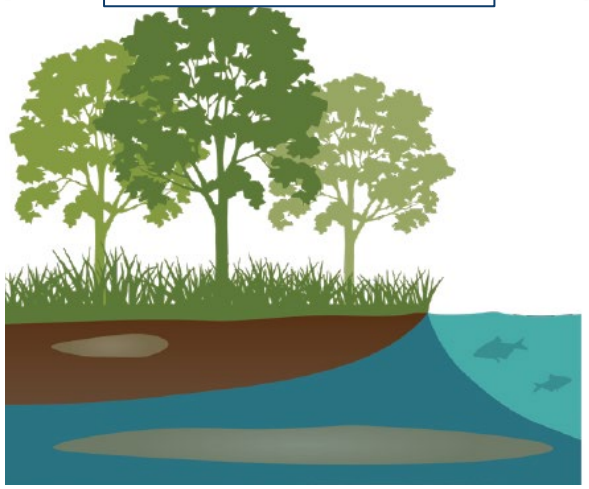
Beneficial Uses and Users

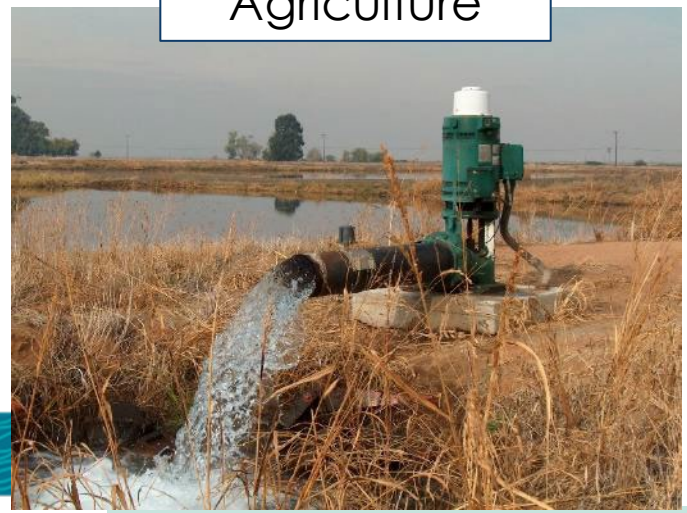
Surface Water



Environment



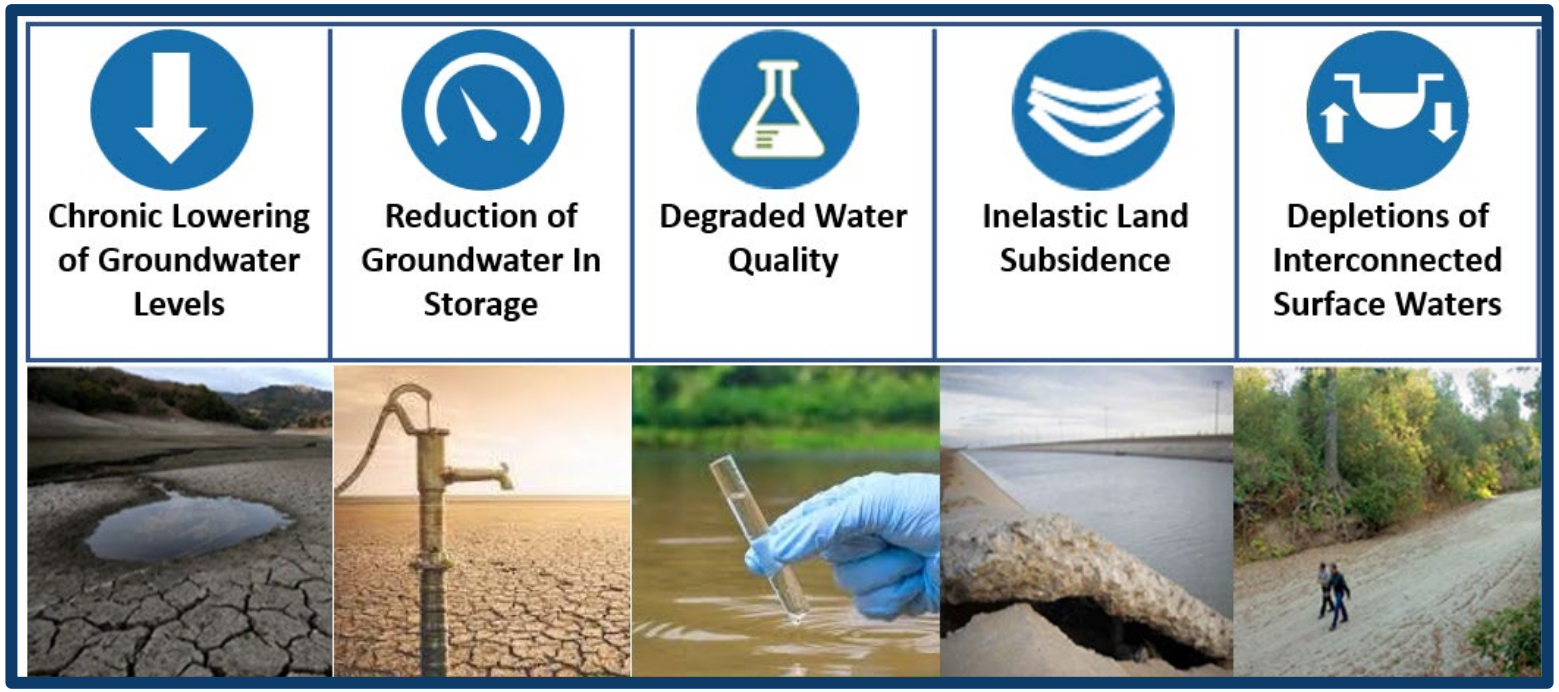
Agriculture



Municipal

Domestic

Demonstrating Sustainability Under SGMA



Define ***significant and unreasonable*** undesirable results for six indicators (five in our case)

- In consideration of beneficial uses and users
- Establish criteria to track progress (measurable objectives and minimum thresholds)
- Develop a representative monitoring network

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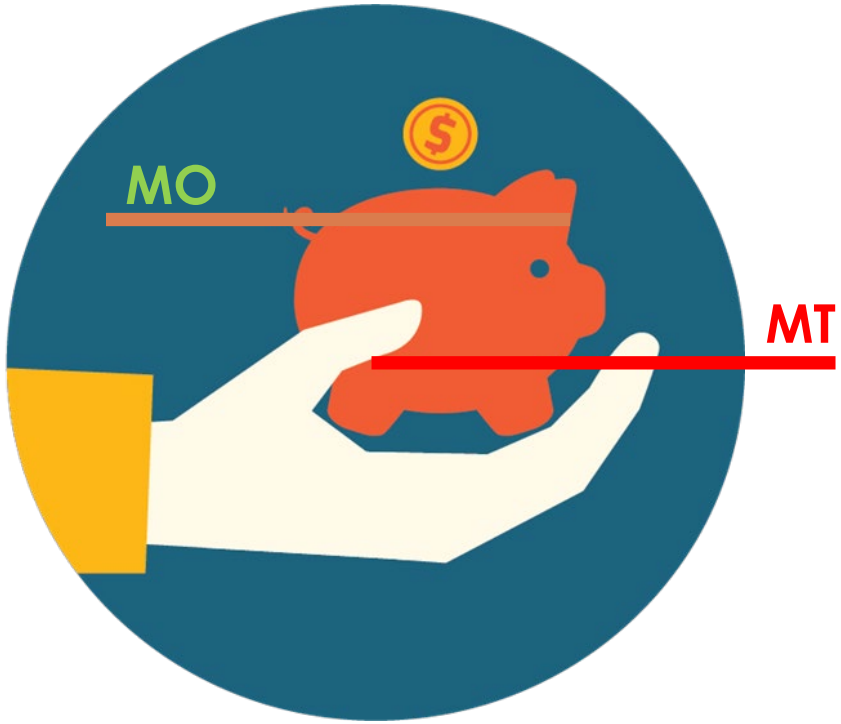
Measurable Objectives and Minimum Thresholds



Measurable Objective (MO) = levels that reflect desired conditions…that enable GSA to achieve sustainability

Minimum Threshold (MT) = levels at a site that when exceeded, either individually or at a combination of sites, may cause undesirable results

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SGA

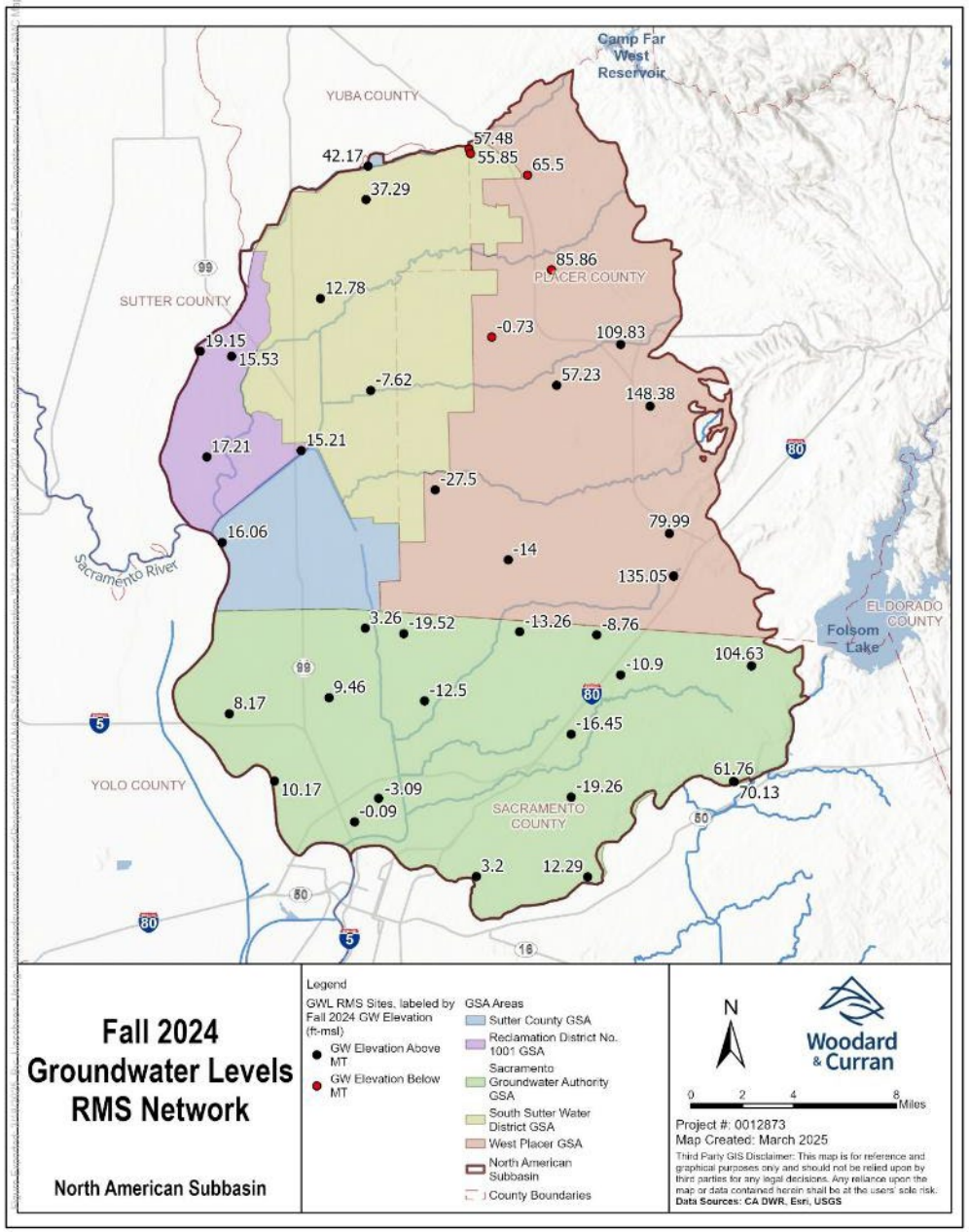
Chronic Lowering of Groundwater and Reductions of Groundwater in Storage

- 40 wells analyzed in WY 2024
  - MT: Varies based on well
  - MO: Varies based on well
  - Minimum: -27.50 ft.
  - Maximum: 148.38 ft.

- 5 out of 40 representative monitoring wells exceeded the MT
  - 4 of these wells observed consecutive fall MT exceedance
  - See hydrographs on following slides

- An undesirable result is not occurring

Note: An undesirable result occurs if 20% of representative monitoring network wells exceed their MTs



Chronic Lowering of Groundwater Levels

Reduction of Groundwater In Storage

Degraded Water Quality

Inelastic Land Subsidence

Depletions of Interconnected Surface Waters

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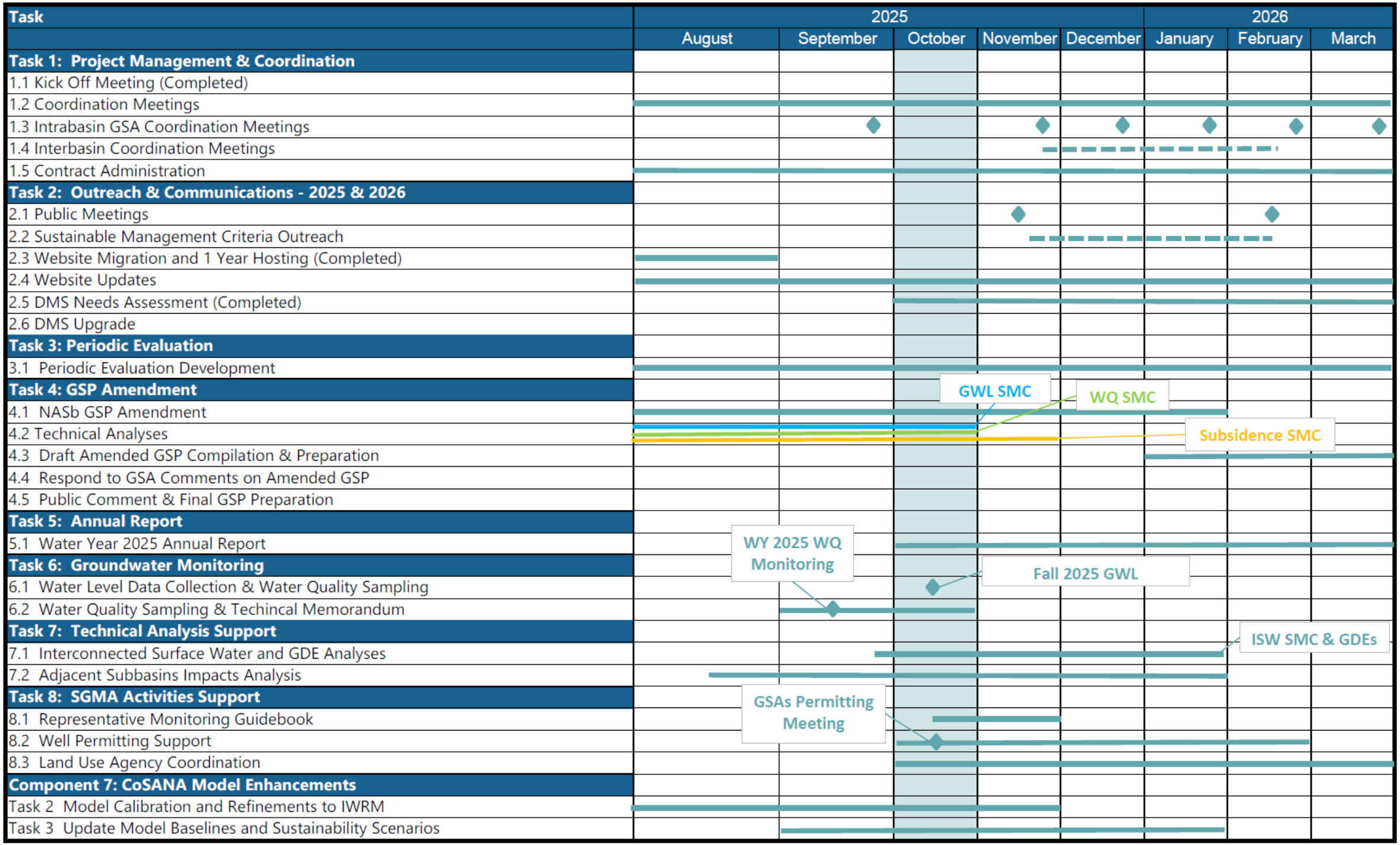
Groundwater Budget from Model

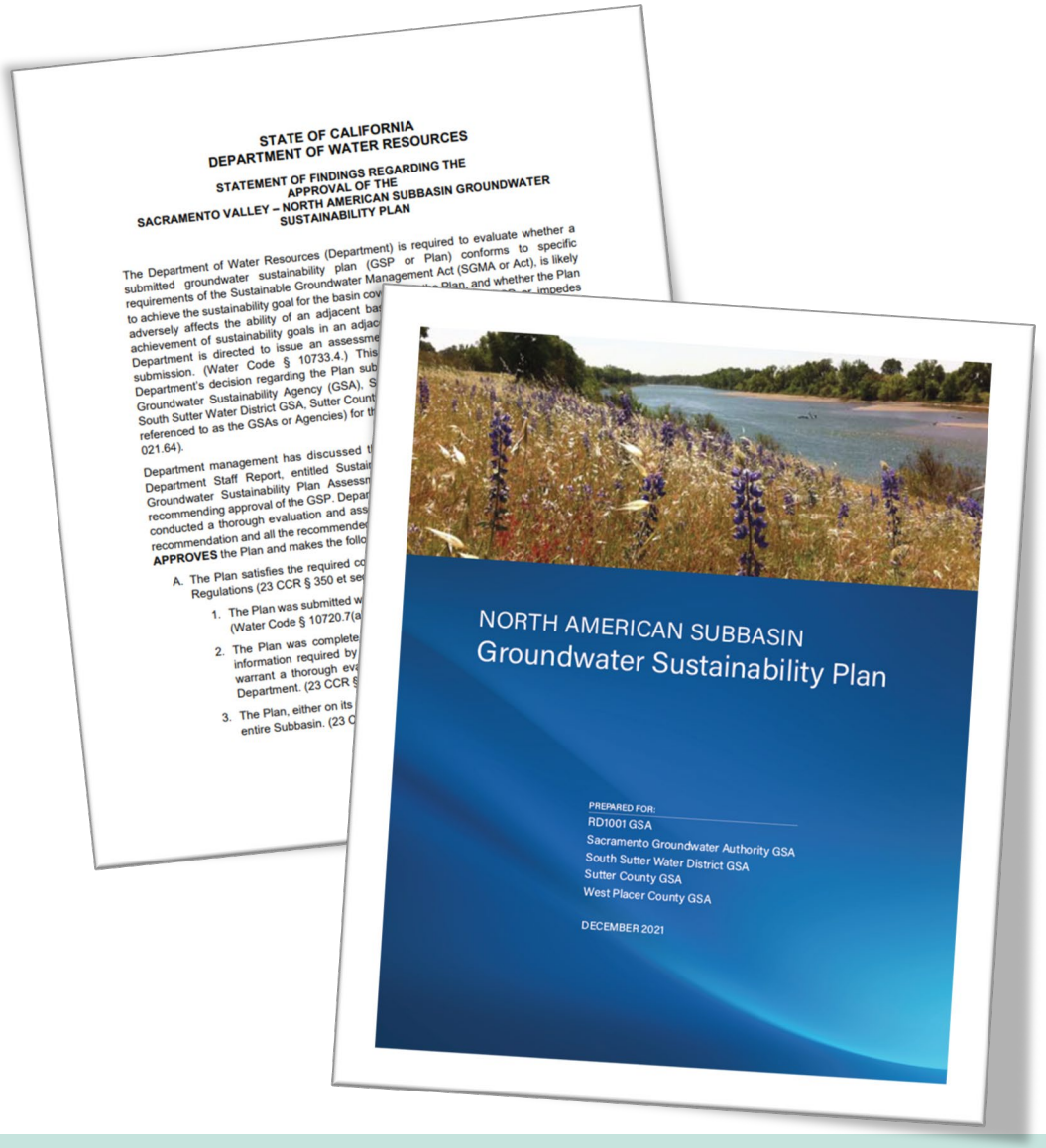
Model Scenario	Groundwater Use (acre-feet)	Change in Storage (acre-feet)
Current Conditions	303,300	14,900
Projected Conditions	325,300	5,400
Projected Conditions with Climate Change	345,100	-3,500

Estimated sustainable yield = 336,000 acre-feet per year


Task
2025
2026
August
September
October
November
December
January
February
March
Task 1: Project Management & Coordination
1.1 Kick Off Meeting (Completed)
1.2 Coordination Meetings
1.3 Intrabasin GSA Coordination Meetings
1.4 Interbasin Coordination Meetings
1.5 Contract Administration
Task 2: Outreach & Communications - 2025 & 2026
2.1 Public Meetings
2.2 Sustainable Management Criteria Outreach
2.3 Website Migration and 1 Year Hosting (Completed)
2.4 Website Updates
2.5 DMS Needs Assessment (Completed)
2.6 DMS Upgrade
Task 3: Periodic Evaluation
3.1 Periodic Evaluation Development
Task 4: GSP Amendment
4.1 NASb GSP Amendment
4.2 Technical Analyses
4.3 Draft Amended GSP Compilation & Preparation
4.4 Respond to GSA Comments on Amended GSP
4.5 Public Comment & Final GSP Preparation
Task 5: Annual Report
5.1 Water Year 2025 Annual Report
Task 6: Groundwater Monitoring
6.1 Water Level Data Collection & Water Quality Sampling
6.2 Water Quality Sampling & Techincal Memorandum
Task 7: Technical Analysis Support
7.1 Interconnected Surface Water and GDE Analyses
7.2 Adjacent Subbasins Impacts Analysis
Task 8: SGMA Activities Support
8.1 Representative Monitoring Guidebook
8.2 Well Permitting Support
8.3 Land Use Agency Coordination
Component 7: CoSANA Model Enhancements
Task 2 Model Calibration and Refinements to IWRM
Task 3 Update Model Baselines and Sustainability Scenarios
GWL SMC
WQ SMC
Subsidence SMC
WY 2025 WQ Monitoring
Fall 2025 GWL
ISW SMC & GDEs
GSAs Permitting Meeting

Drivers for a GSP Amendment

- DWR provided six recommendations
  - Addressing them can impact determination
- Substantial improvements in data and understanding
- GSAs are considering refinements to meet local needs
- Current Status: In progress, to be submitted by January 2027



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Approach to GSP Amendment

Review DWR Feedback

Consider what has and hasn't worked for the Subbasin

Integrate new data and modeling results

Refine management criteria

Conduct outreach & gather feedback

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DWR's Recommended Corrective Actions

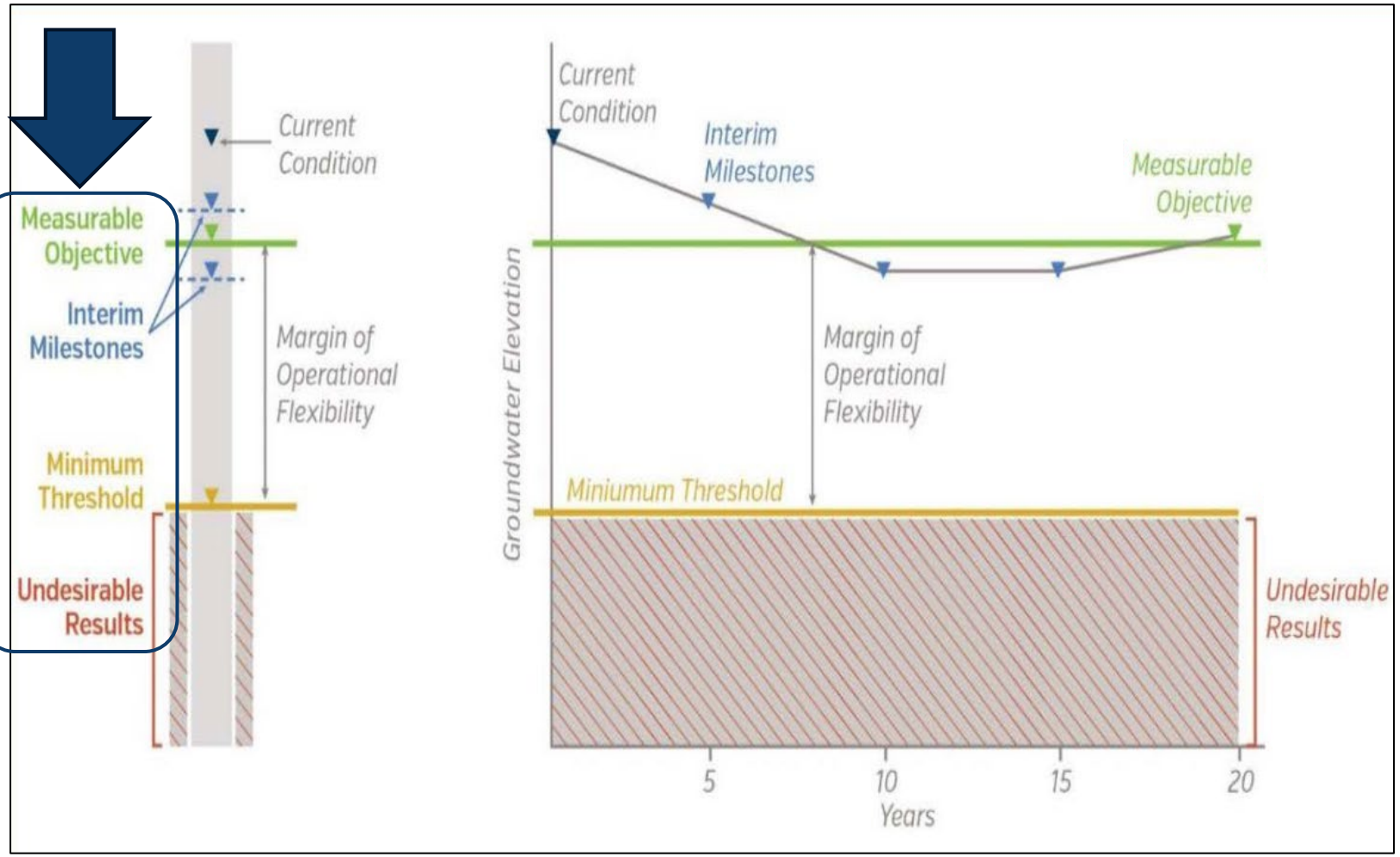
- Bottom of Basin Definition
- Data Gaps
- Water Quality Criteria
- Subsidence Criteria
- Interconnected Surface Water Criteria
- Monitoring Network Documentation

Sustainability Indicators

Today's topics

- Chronic lowering of groundwater levels
- Land subsidence
- Degraded water quality
- Seawater intrusion
- Reduction of groundwater storage
- Depletions of interconnected surface waters

What are Sustainable Management Criteria?



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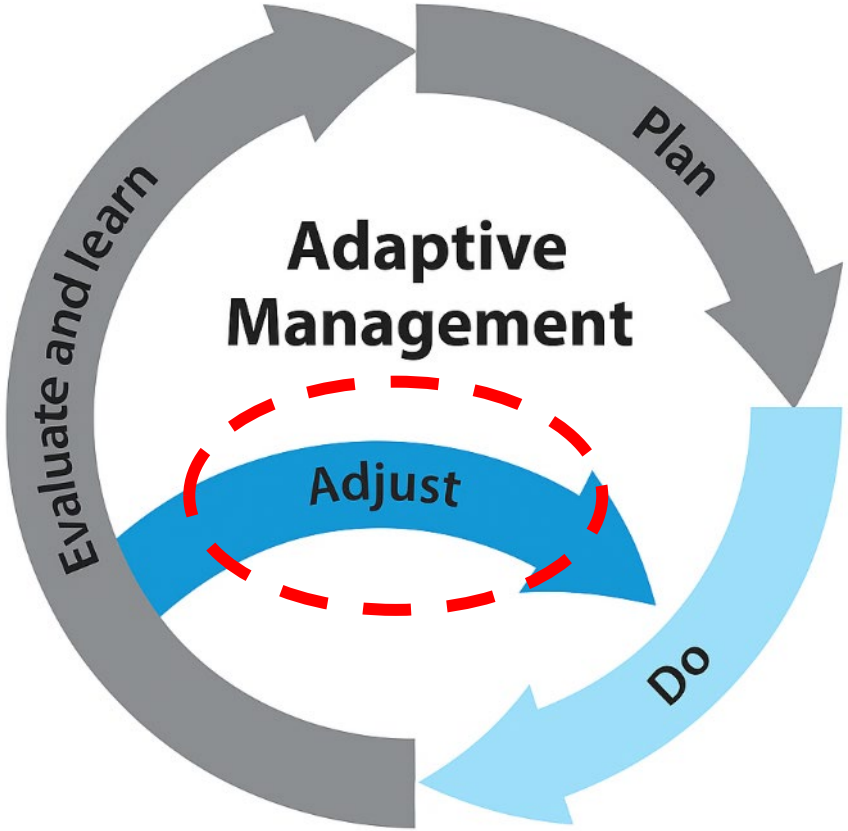
Groundwater Level Sustainable Management Criteria
&
Groundwater Dependent Ecosystems

Why update Groundwater Level Criteria?

- **New data and information** on groundwater conditions and impacts to users
- **Knowledge gained** in implementation
- **Additional time** to consider best approaches



Undesirable Results: What are we trying to avoid?

- Groundwater Dependent Ecosystems cannot survive
- Agricultural landowners cannot sustain crops
- Domestic wells go dry, and owners do not have access to water
- <u>Determined by Minimum Threshold exceedances</u>

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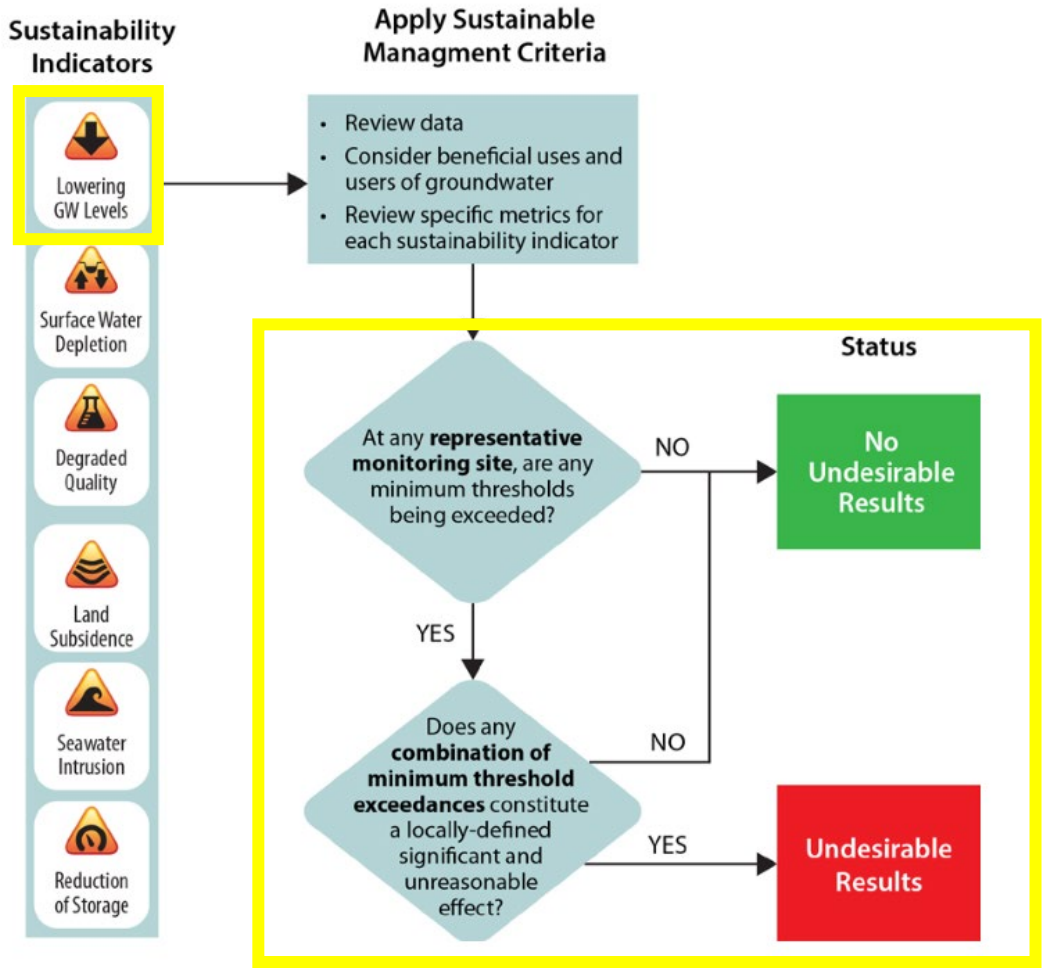
Undesirable Results Definition

- Definition would stay the same as the 2021 GSP:

An Undesirable Result occurs when 20% or more of all Representative Monitoring Sites exceed the Minimum Threshold for two consecutive fall measurements.



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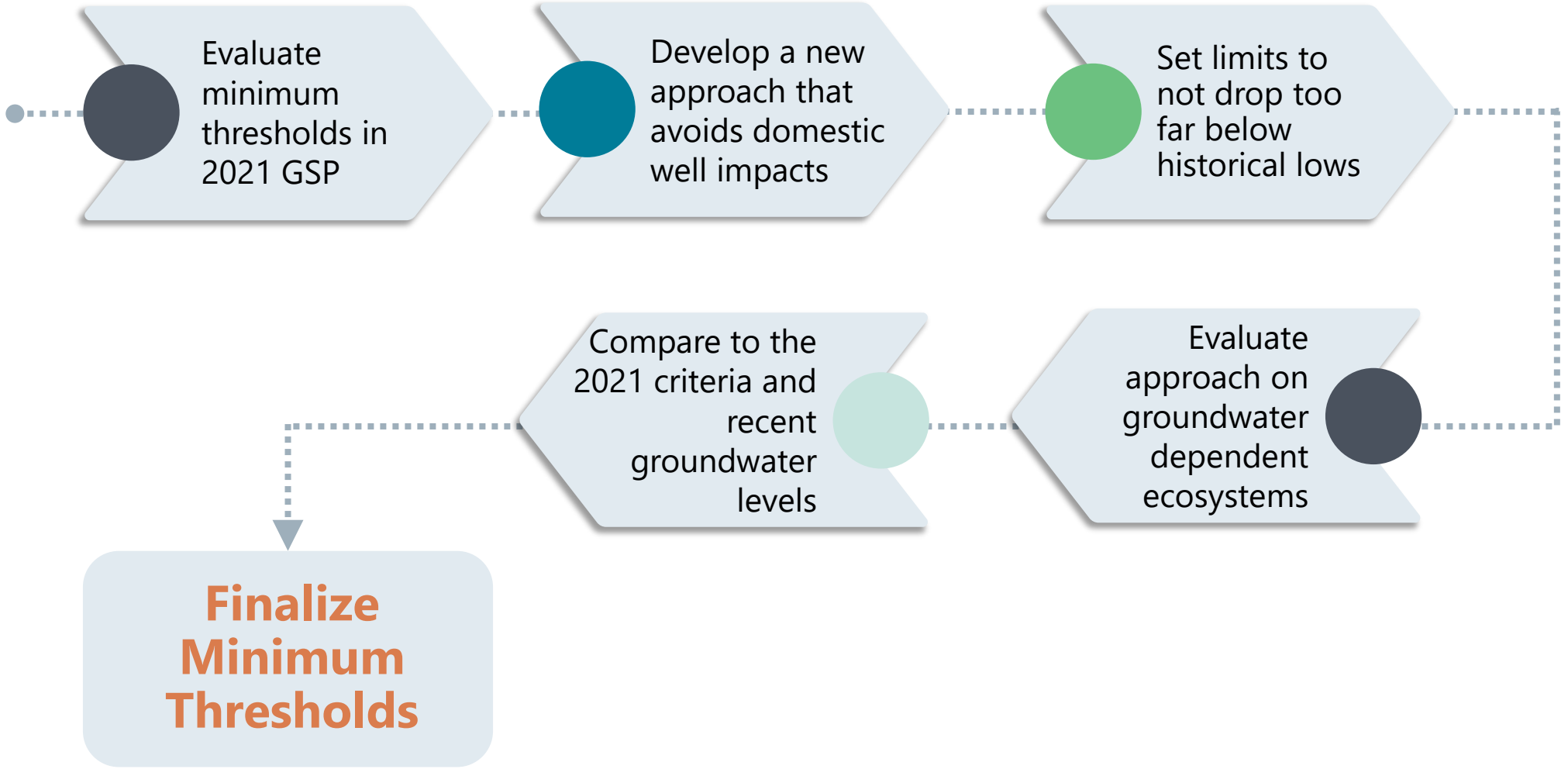
Approach to Minimum Thresholds



Minimum Thresholds Development

Collected domestic, agricultural, and municipal well data near each monitoring site

Identified shallowest domestic well in each area

Set the Proposed Minimum Threshold at 20 feet above the bottom of the shallowest domestic well to account for pump coverage

Checked thresholds against historical water levels and adjusted them to avoid going below historic lows

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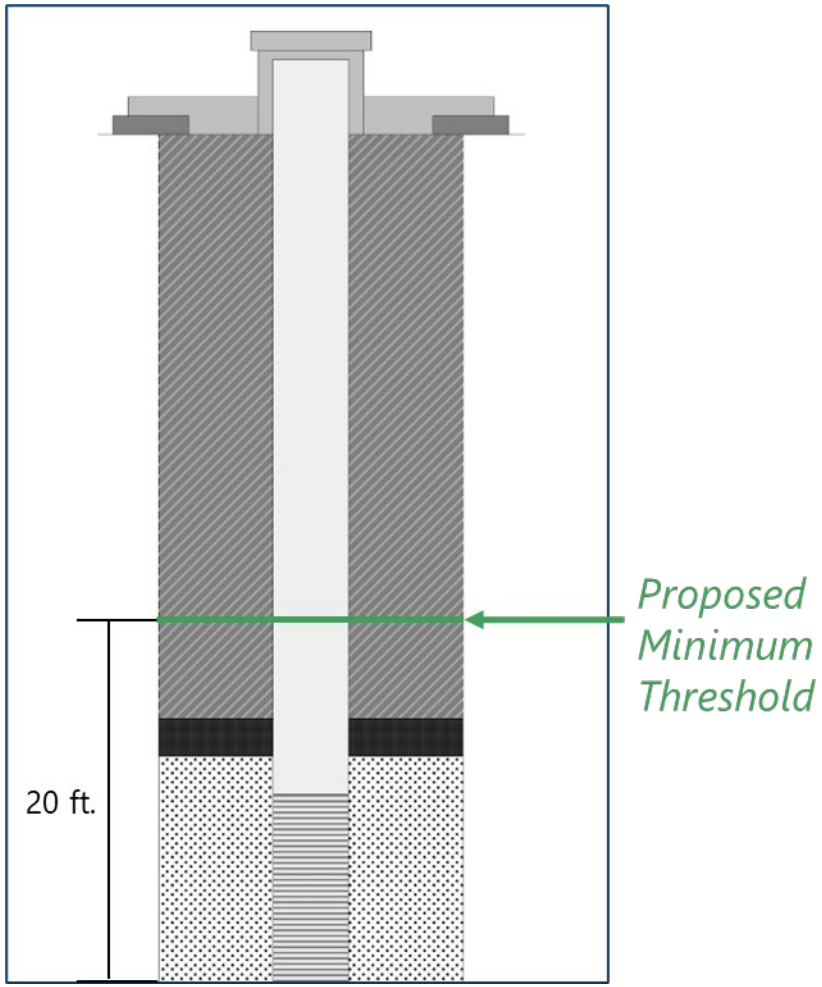
Proposed Minimum Threshold

- Protects domestic wells and groundwater dependent ecosystems
- Gives buffer for drought conditions
- Avoids significant and unreasonable effects



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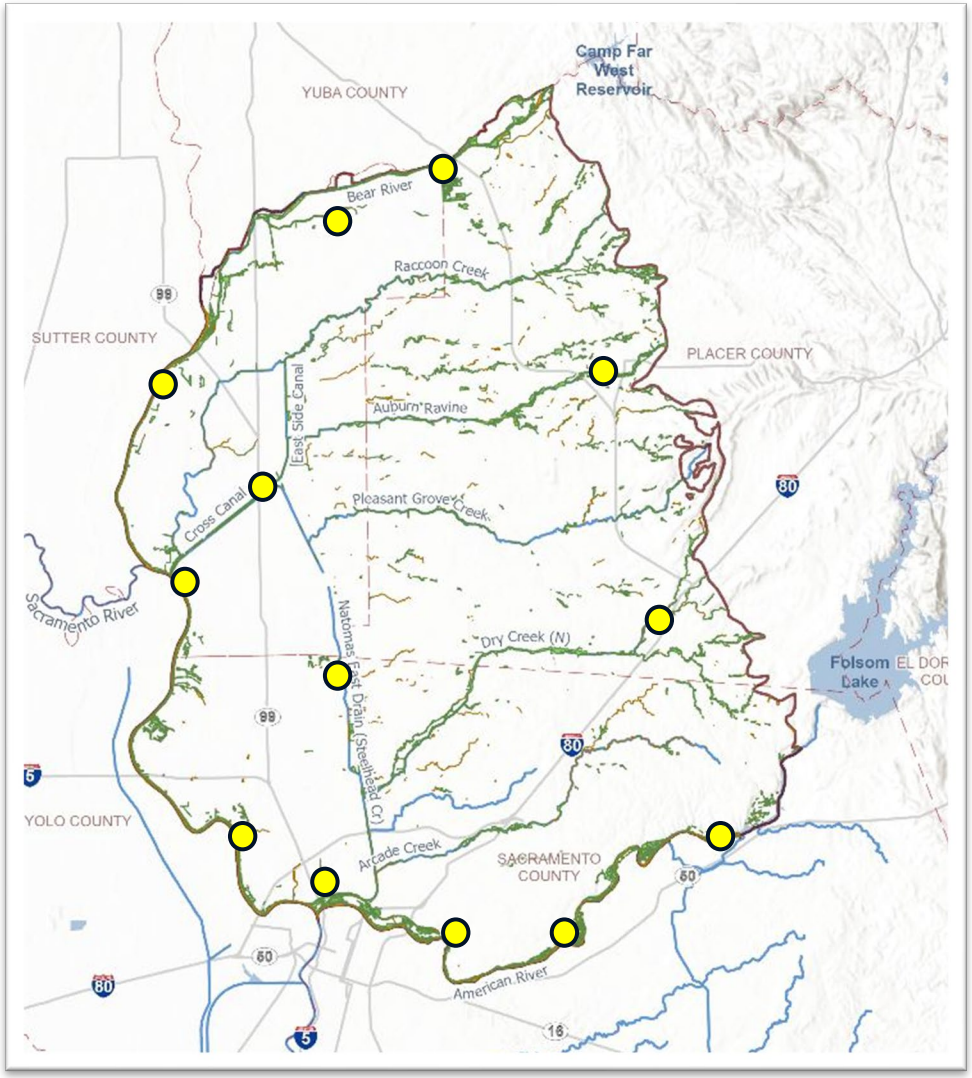
Groundwater Dependent Ecosystems & Minimum Thresholds

- Goal is to determine if Proposed Minimum Thresholds are protective of groundwater dependent ecosystems (GDEs)

- Studies recommend water table **≤30 ft.** below ground for GDEs such as the Valley Oak



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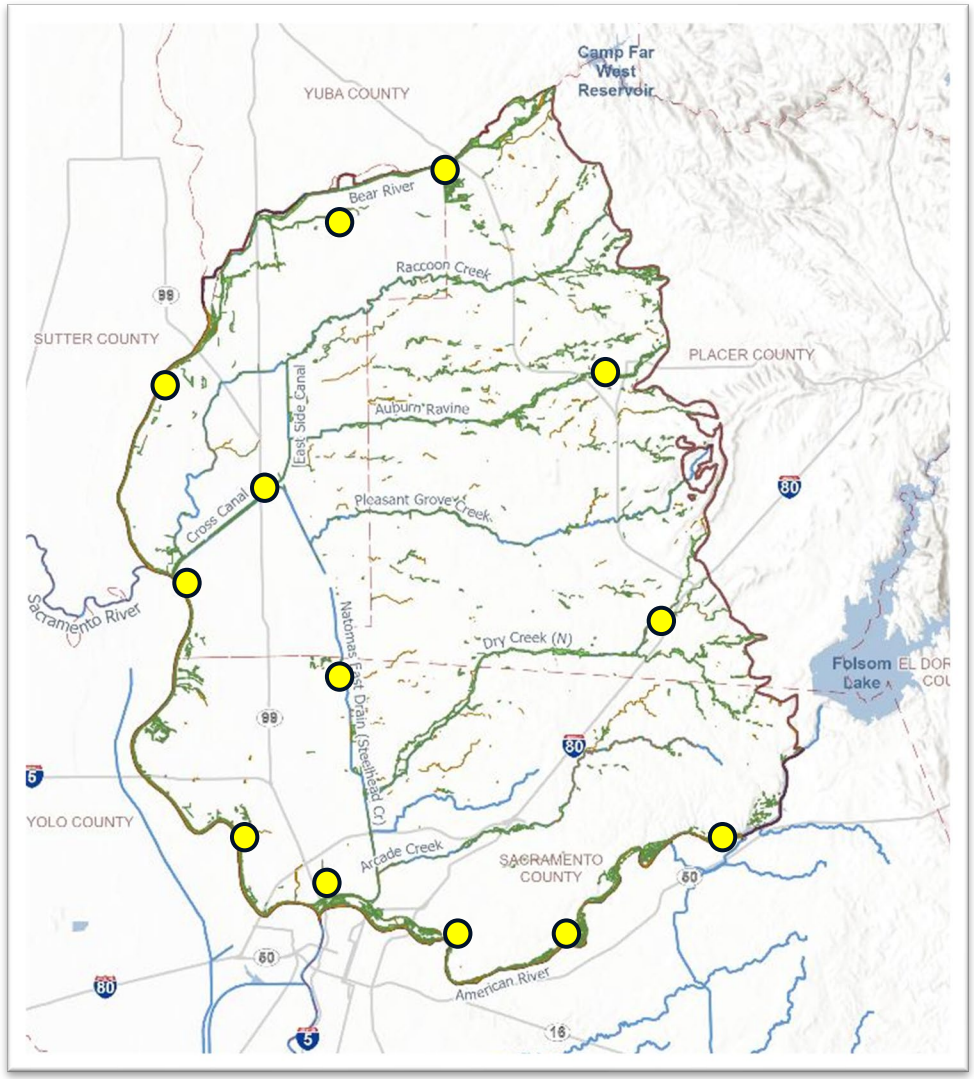
Groundwater Dependent Ecosystems & Minimum Thresholds

- Evaluated Minimum Thresholds at sites in:
  - Areas with likely GDEs
  - Top of Screen depths approximately ≤50 ft. below ground

- Proposed Minimum Thresholds range from **8 ft.** to **28 ft.** below ground



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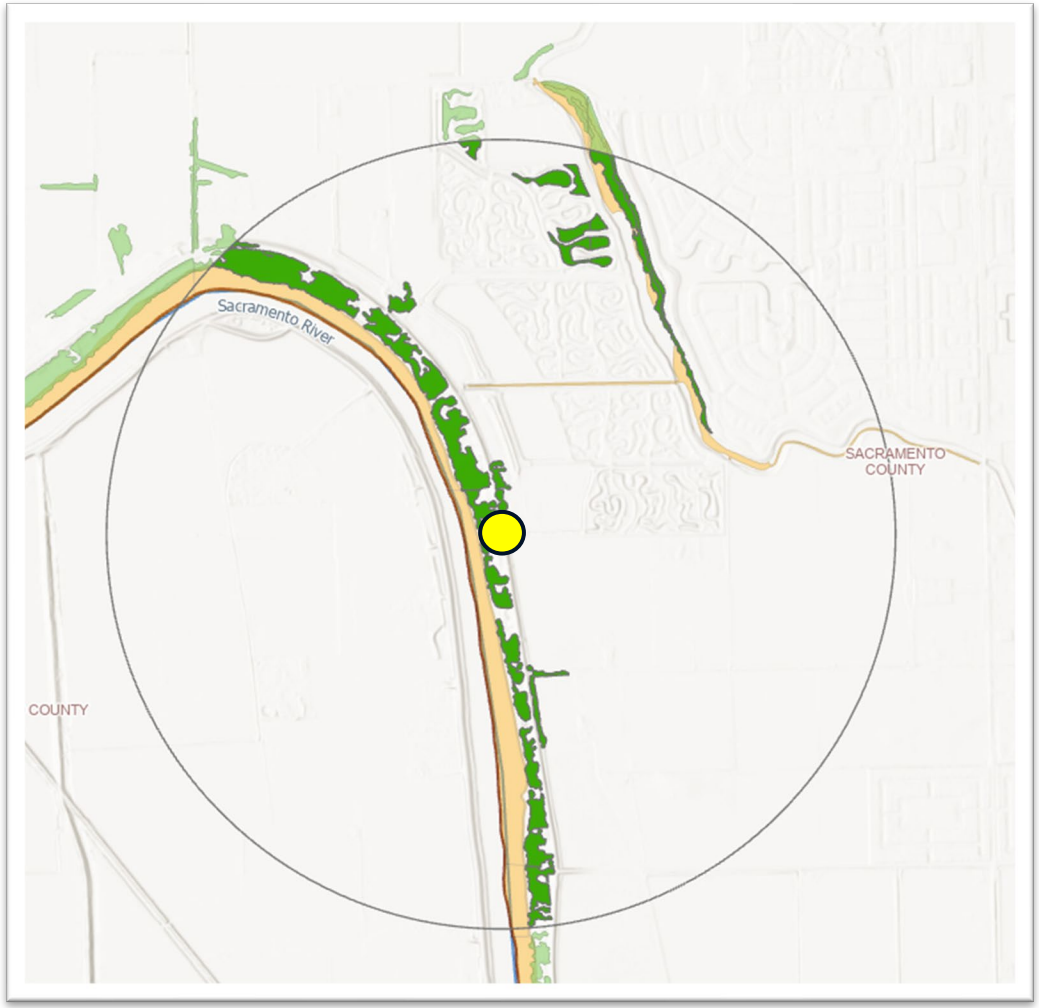
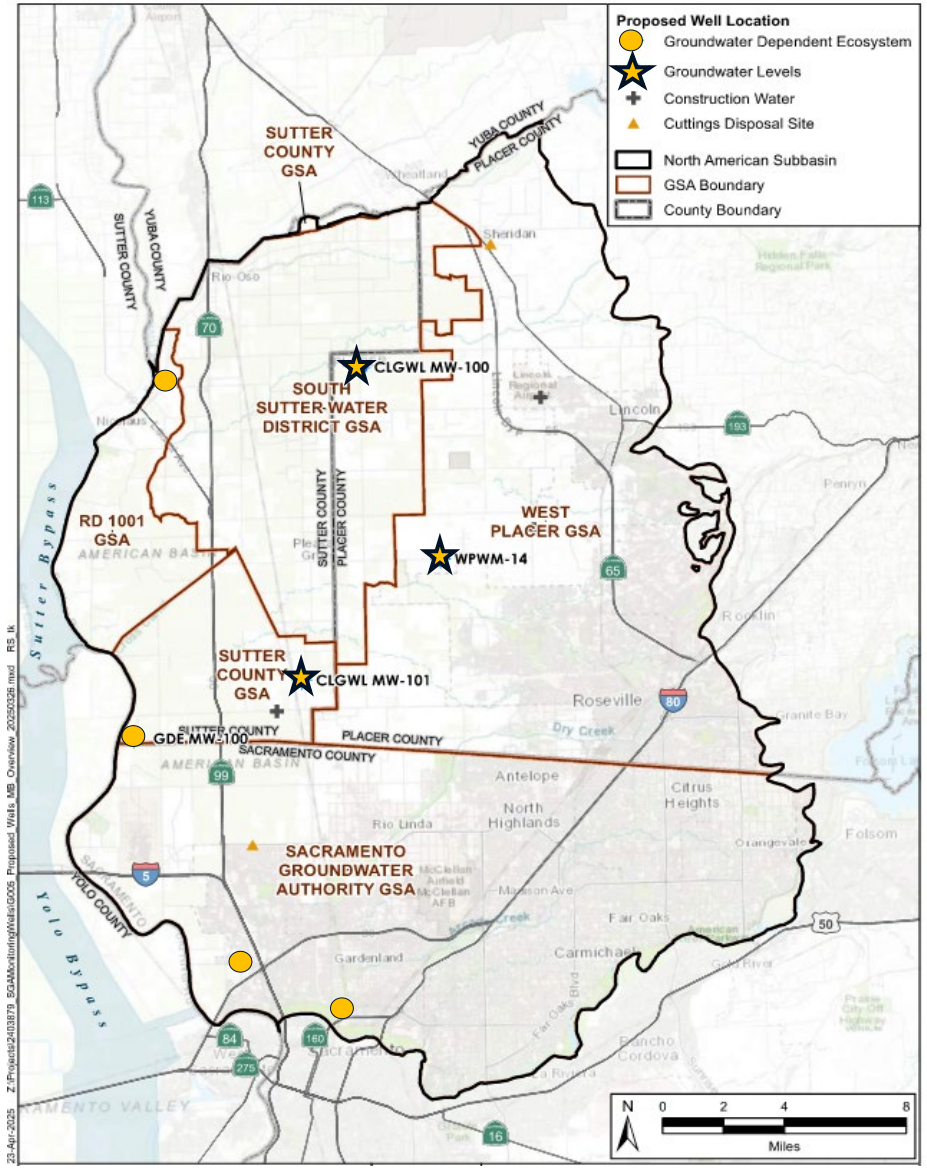
Groundwater Dependent Ecosystems Analysis

- A GDE analysis comparing NDVI/NDMI and depth-to-water is underway
- TNC's GDE Pulse has created a dataset that correlates vegetation data and remote sensing data
- The goal is to determine any correlation to water levels and GDE health



Addressing Data Gaps

- Seven monitoring wells will be installed by April 2026
- Four will provide data to better understand GDEs and interconnected surface water
- Three will be for groundwater level monitoring



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Approach to Measurable Objectives & Interim Milestones

Review potential issues in the 2021 GSP

Define sustainable groundwater conditions

Set Interim Milestones as step-by-step progress towards the new Measurable Objective

Measurable Objectives & Interim Milestones Development

Found that the 2021 GSP's Measurable Objectives were set lower than historic low water levels.

Defined "sustainable conditions" based on past water use and the Subbasin's sustainable yield

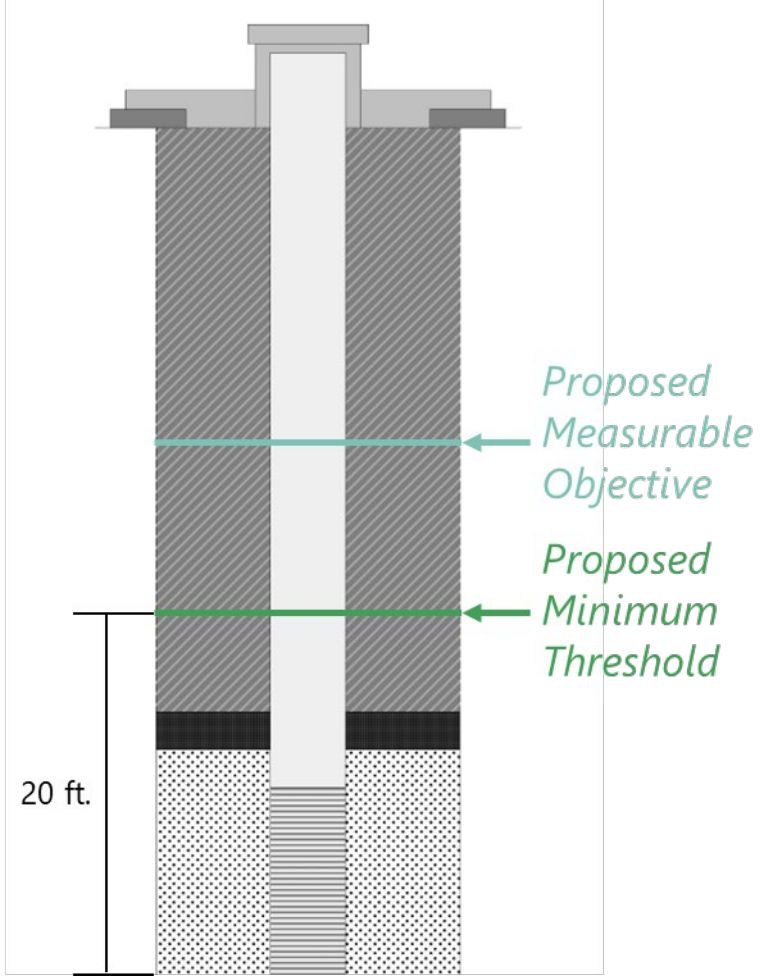
Reviewed historical groundwater levels to check whether:

- Sustainable conditions occurred during non-dry or critically dry years, and
- Fall measurements were suitable for monitoring along with Minimum Thresholds

Chose fall measurements for the Measurable Objective and updated Interim Milestones to move toward that goal.

Proposed Measurable Objectives

- Based on fall measurements for better tracking with Minimum Thresholds
- Incorporates sustainable groundwater conditions experienced during non-dry or critically dry water years
- Measurable Objectives would increase at 20 sites (~50% of monitoring network)



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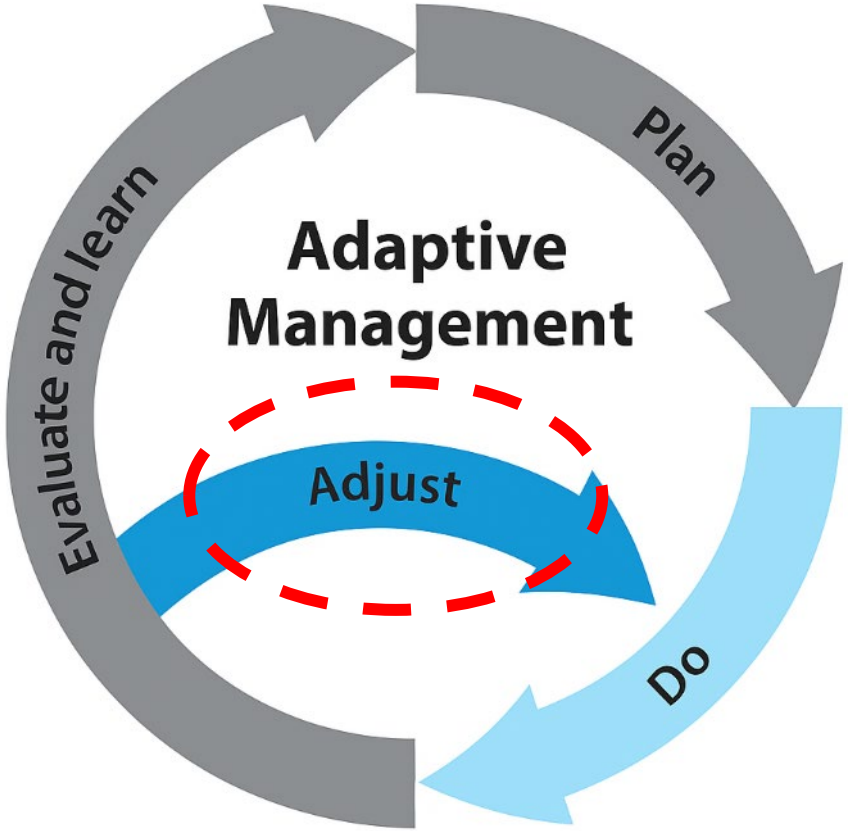
Land Subsidence
Sustainable Management Criteria

Why update Land Subsidence Criteria?

- **Recommended Corrective Action** from DWR
- **New data and information** on land surface elevations and DWR guidance
- **Knowledge gained** in implementation
- **Additional time** to consider best approaches



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Undesirable Results: What are we trying to avoid?

- When subsidence becomes permanent (inelastic), the land cannot return to its previous elevation

- This can damage critical infrastructure

- Irrigation and agricultural facilities
- Water supply and distribution systems
- Drainage networks
- Roads and transportation systems
- Flood control structures

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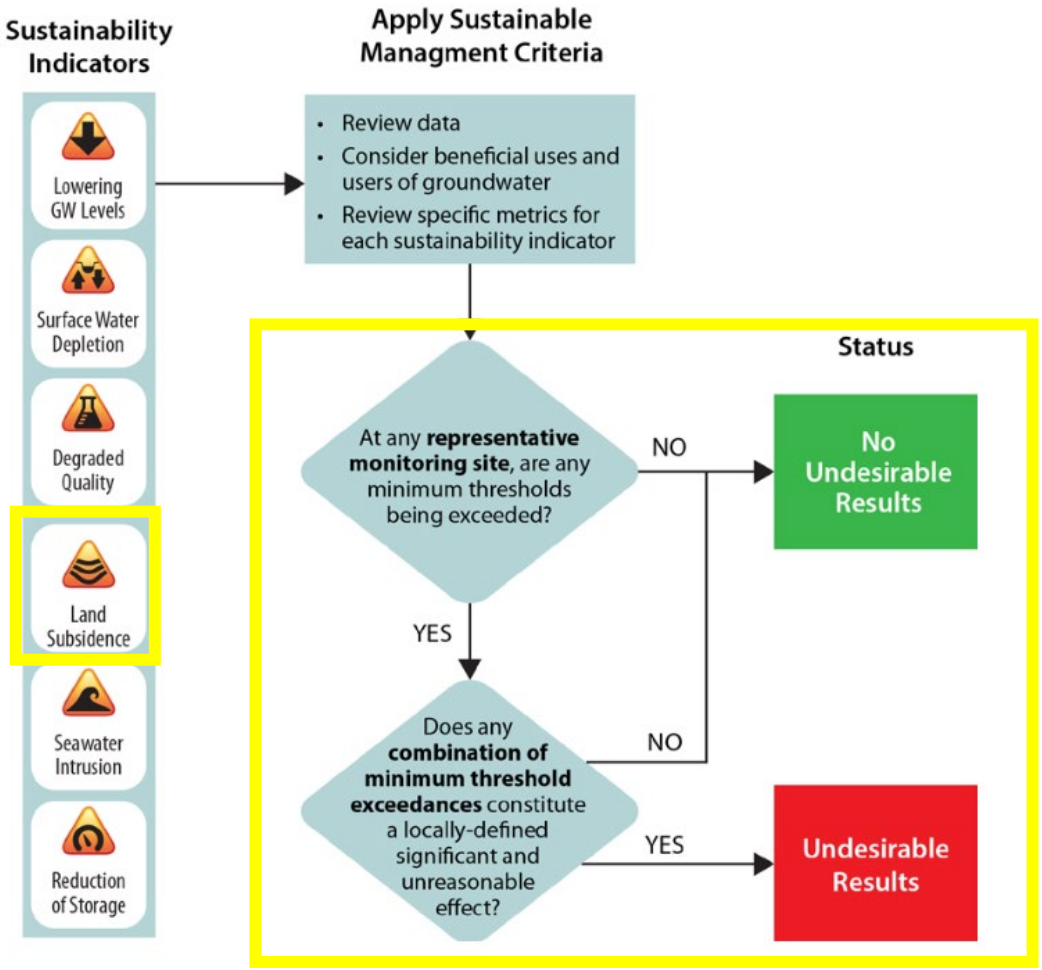
Undesirable Results Definition

- New definition would be linked to Minimum Thresholds:

An Undesirable Result for inelastic land subsidence occurs when the Minimum Threshold is exceeded.



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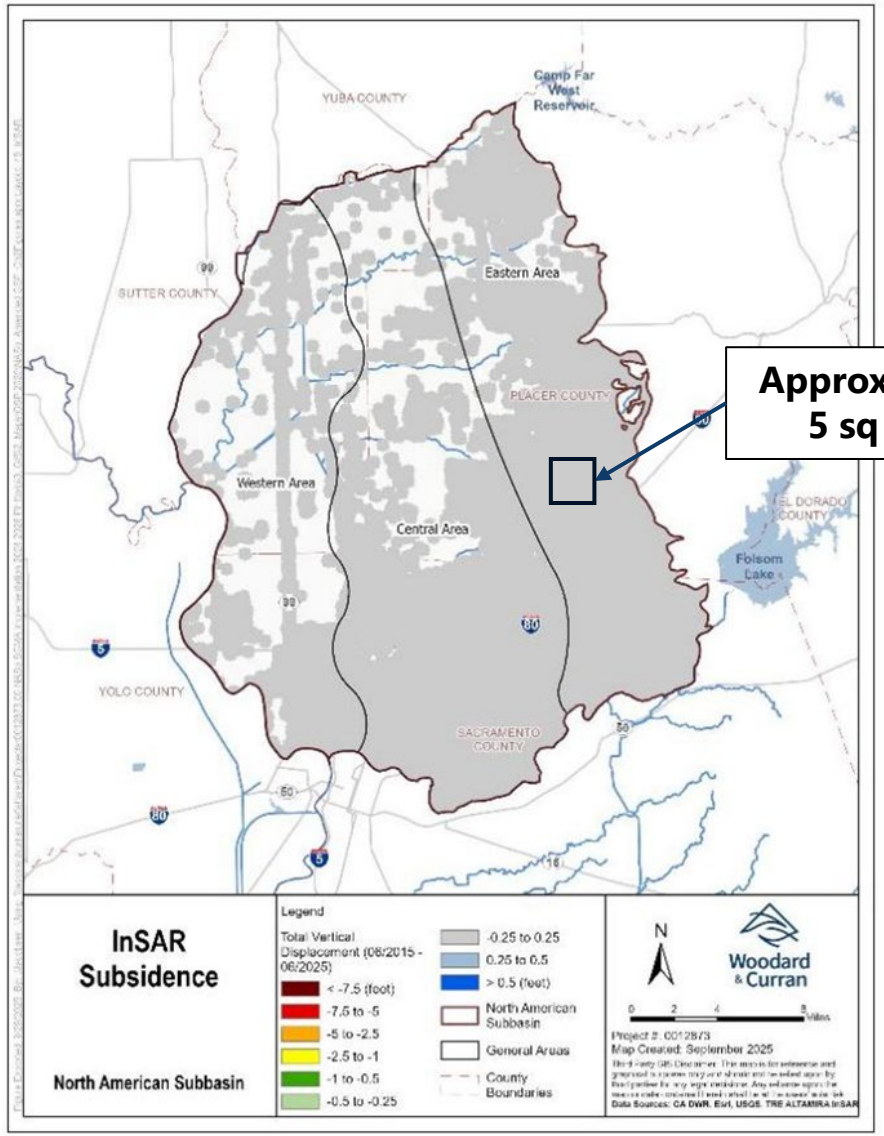
Proposed Minimum Threshold

- The rate of subsidence exceeds:
  - 0.5 feet over a five-year period, +/- measurement error
  - Over an area covering at least 5 or more square miles
- Monitored by annual InSAR data



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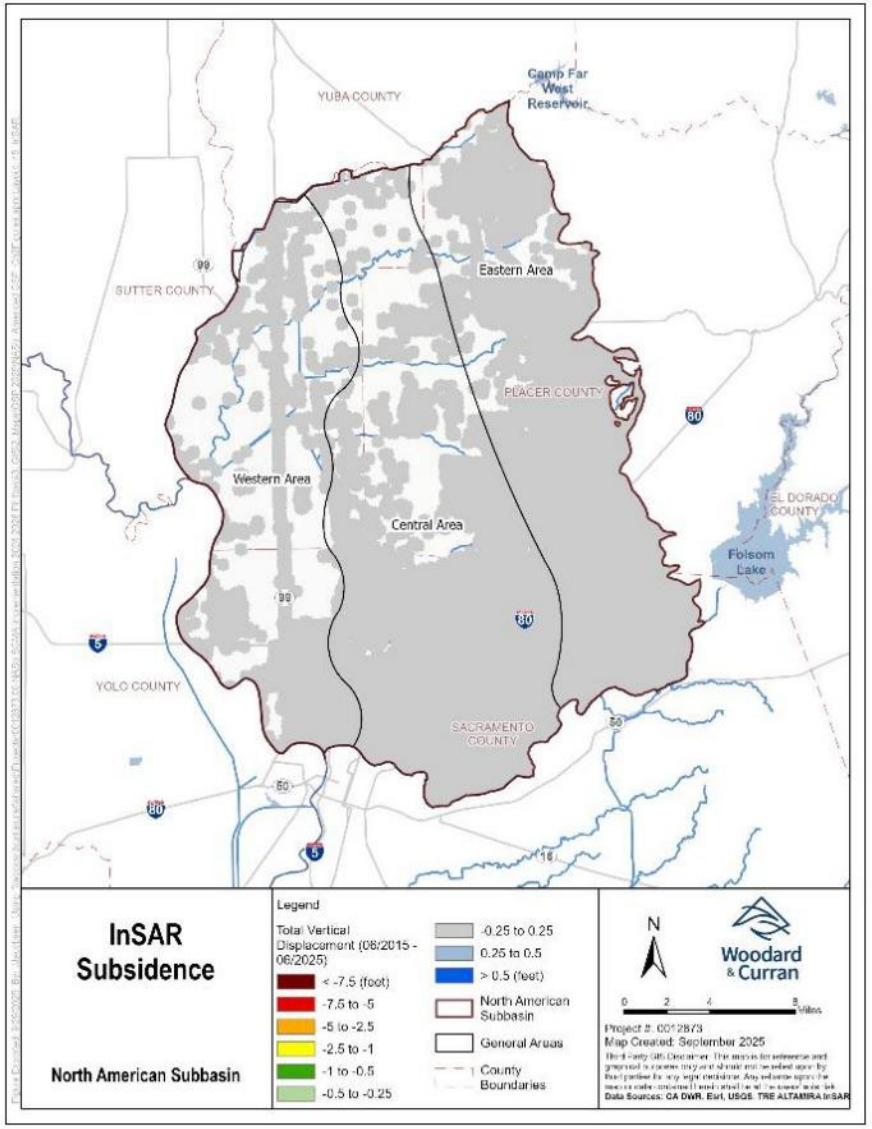
Approach to Measurable Objectives & Interim Milestones

- **DWR Guidance**
  - Measurable Objectives for subsidence should be set to avoid or minimize subsidence

- **NASb Approach**
  - 0.0 feet over a five-year period, +/- measurement error
  - Interim Milestones are set the same as Measurable Objective



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Timeline

Timeline of Activities

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Upcoming Public Engagement

- **January 22, 2026**
  - Water Quality
  - Interconnected Surface Water
  - Groundwater Model (CoSANA) Upgrade & Water Budgets

- **March 12, 2026**
  - Projects & Management Actions
  - GSP Implementation
  - Periodic Evaluation

- **Fall/Winter 2026**
  - Public Comment on GSP Amendment
  - GSP Amendment Adoption