



**EASTERN SAN JOAQUIN
GROUNDWATER AUTHORITY**

**GWA Advisory Committee
April 10, 2019**

Agenda



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1. Approval of Minutes of March 13, 2019
2. Schedule Overview
3. Management Actions
4. Water Budget Planning Estimates
5. Sustainable Management Criteria Definitions
6. Six Sustainability Indicators & Goal
7. Monitoring Network
8. Groundwater Dependent Ecosystems Approach
9. Inter-basin Coordination
10. Next Steps and Key Decisions for the GWA
11. May Agenda Items

Schedule Overview



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	Public Draft#1 goes to Board for Review	BOARD MEETING JPA Board - Discussion (if areas of disagreement)	Possible Public Draft#2 goes to Board for Review	BOARD MEETING JPA Board – Action	Public Review Period	Staff provide response to comments/discussion of proposed revisions	GSA Review	Final Draft of GSP Distributed	BOARD MEETING JPA Board Action	GSA Final Approval
Bundle 1 (Administrative Information; Plan Area; HCM)	May 1	May Board Meeting – Date TBD	June 5	June 12	July 10-Aug 25	Sept 15	Oct 15	Nov 5	Nov 13	Dec/Jan
Bundle 2 (Water Budget – at basin-scale)	June 5	June 12	July 1	July 10	July 10-Aug 25	Sept 15	Oct 15	Nov 5	Nov 13	Dec/Jan
Bundle 3 (Undesirable Results & Minimum Thresholds, Monitoring Network, Projects)	June 5	June 12	July 1	July 10	July 10-Aug 25	Sept 15	Oct 15	Nov 5	Nov 13	Dec/Jan



Management Actions

Management Actions: Discussion



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Projects Approach: Projects that provide a net input to groundwater through supply-side, recharge, and conservation projects.

Demand-side Management Approach: Reductions in pumping through use restrictions and conservation.

Management Actions



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Action Needed: Recommendation to the GWA Board to mixture of supply-side projects and demand-side management actions where demand-side projects.

Policy decision will go to the GWA Board in June.



Water Budget Planning Estimates

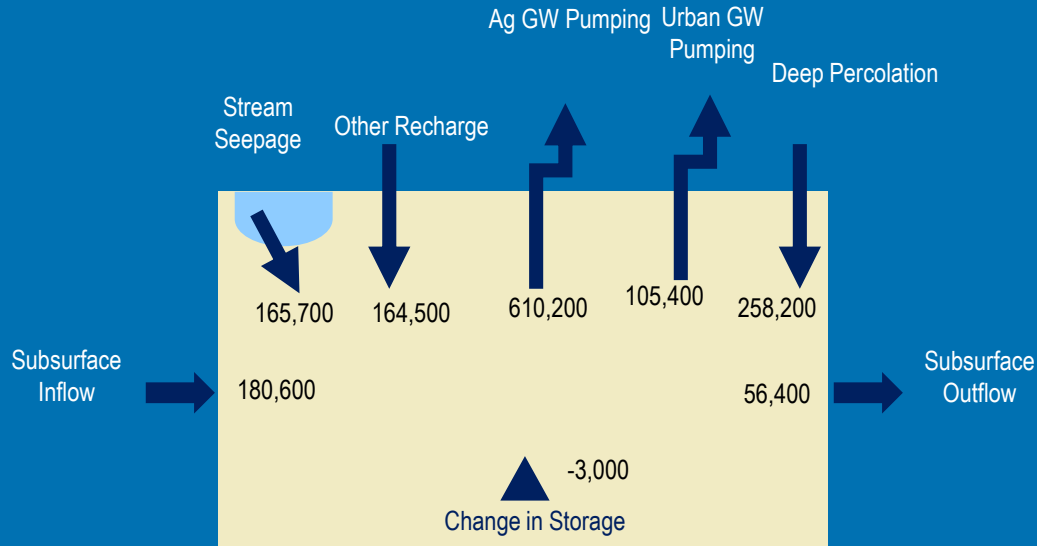
Review: Modeling Sustainable Yield



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- **Modeling Objective:** Understand how much pumping reduction would be required to bring basin into balance (on a long-term average basis) if no new SGMA projects are implemented
- **Modeling Process:** Develop a scenario that reflects a soft transition to no long-term annual change in GW storage over the Projected Conditions at Buildout
 - Land Use and Cropping Pattern: Lower groundwater production through reduced agricultural acreage/demand of all crops
 - Urban Demand: Reduce urban GPCD
 - Assume same reduction between ag and urban demand

Water Budget: Optimized GW Pumping Reduction



Note: All flows are rounded annual averages in acre-feet per year (AFY)

**Sustainable Yield:
Optimized GW Pumping Reduction**

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Water Budget Planning Estimates



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Action Needed: Recommendation on planning assumptions for GSP development:

Groundwater Pumping Offset Needed to Meet Sustainable Conditions:

- Low-End Estimate (80,000 AFY)

Topic was discussed by the Advisory Committee at the March 13th and April 10th meetings.



Sustainable Management Criteria Definitions

Objectives for SMC Discussion



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Sustainable Management Criteria Discussion Objectives:

- Review approach for the sustainable management criteria
- Review policy decisions related to minimum thresholds, measurable objectives, and monitoring network, to be brought to the Board in May

**All-day workshop was held on April 3 with GSA staff; proposed approaches reflect input from that workshop*

Review – Let's Talk Terminology



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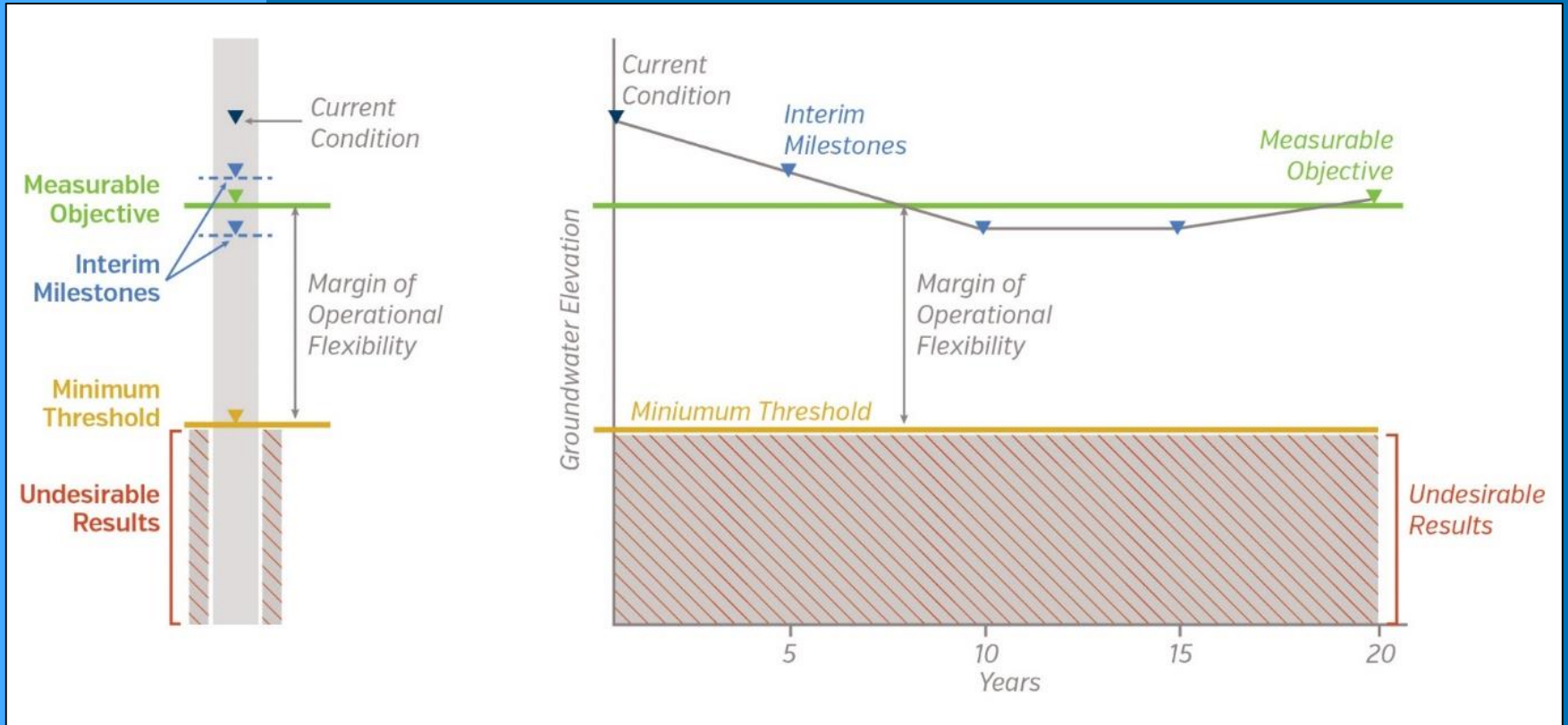
Why are terms important?

- Established by regulation
- Used by regulators during GSP review
- Consistency of terms assists SGMA discussion

Important to understand the relationship between:

- Sustainability Indicators
- Sustainable Management Criteria (Built off Each Sustainability Indicator)
 - Sustainability Goal
 - Undesirable Results
 - Minimum Thresholds
 - Measurable Objectives
 - a. Interim Milestones
 - b. Margin of Operational Flexibility
- Monitoring Network

Reaching Sustainability by 2040



Reminder: Consequence of Violating Minimum Thresholds



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Undesirable results are defined by minimum thresholds, and the State Board can intervene if minimum thresholds are violated for any of the sustainability indicators.



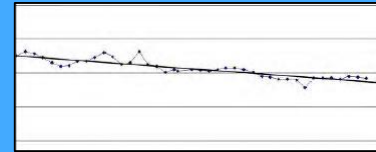
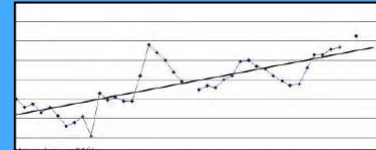
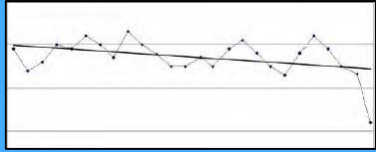
Sustainability Indicators:

1. Chronic Lowering of Groundwater Levels

Different Approaches for Different Conditions



Examples:



- 1) Undesirable results currently experienced
 - Minimum thresholds set at January 1, 2015 condition
- 2) Undesirable results experienced in the past but not currently
 - Minimum thresholds set at past undesirable result condition or January 1, 2015 condition
- 3) No undesirable results experienced
 - Minimum thresholds set at conditions where undesirable results would be reasonable expected

Work Completed on Groundwater Levels Minimum Thresholds



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- 1) Reviewed existing planning documents to identify existing and prior undesirable results
- 2) Based on language in prior planning documents, mapped the lower groundwater level for 1992 or 2015 compared to current levels
- 3) Met with GSAs to confirm understanding
- 4) Compared to domestic well depths and other drivers for undesirable results
- 5) Identified monitoring locations for groundwater thresholds, confirming robust, reliable, and representative data record
- 6) Compared projected water levels under sustainable yield conditions to historical low levels and domestic well depths

Minimum Thresholds and Measurable Objectives: Summary Recommendation



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Sustainable Management Criteria Summary – Chronic Lowering of Groundwater Levels

<u>Criteria</u>	<u>Narrative Description</u>
Proposed Minimum Threshold	The lower of: 1992 and 2015-16 levels with a buffer of 100% of historical range applied, or the 10th percentile domestic well depth, whichever is shallower
Proposed Measurable Objective	The lower of 1992 and 2015-16 levels
Proposed Interim Milestones	Interim Milestones under development
Proposed Definition of Violation	Undesirable results are considered to occur during GSP implementation when more than 25% of representative monitoring wells (5 of 19 wells in the Subbasin) fall below their minimum elevation thresholds for two consecutive non-dry years

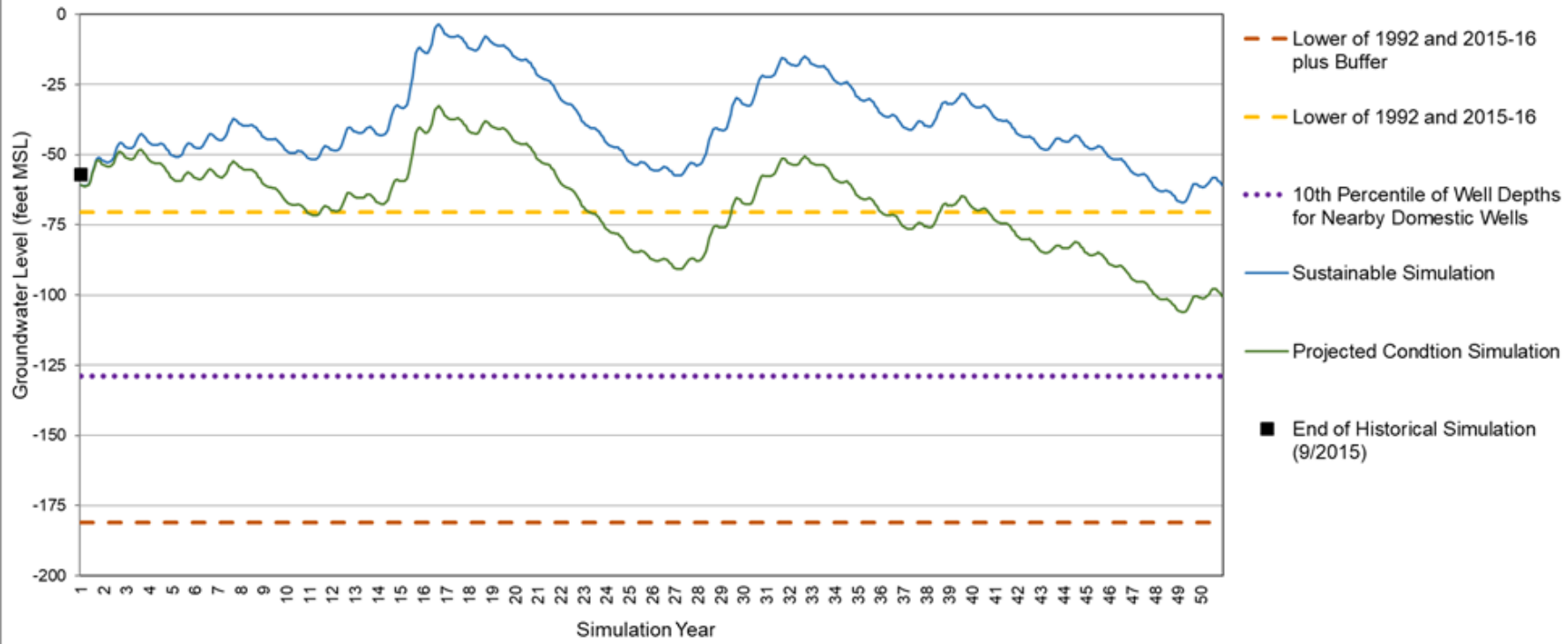
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Analysis of Projected Conditions – Example Hydrograph



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Hydrograph for Selected Representative Monitoring Well: 01N07E14J002 (GSA: Central San Joaquin)



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Action – Chronic Lowering of Groundwater Levels



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Action Needed: Recommendation on Sustainable Management Criteria for the Chronic Lowering of Groundwater Levels. Policy decision will go to the Board in May.

Sustainable Management Criteria Summary – Chronic Lowering of Groundwater Levels

<u>Criteria</u>	<u>Narrative Description</u>
Proposed Minimum Threshold	The lower of: 1992 and 2015-16 levels with a buffer of 100% of historical range applied, or the 10th percentile domestic well depth, whichever is shallower
Proposed Measurable Objective	The lower of 1992 and 2015-16 levels
Proposed Interim Milestones	Interim Milestones under development
Proposed Definition of Violation	Undesirable results are considered to occur during GSP implementation when more than 25% of representative monitoring wells (5 of 19 wells in the Subbasin) fall below their minimum elevation thresholds for two consecutive non-dry years



Sustainability Indicators:

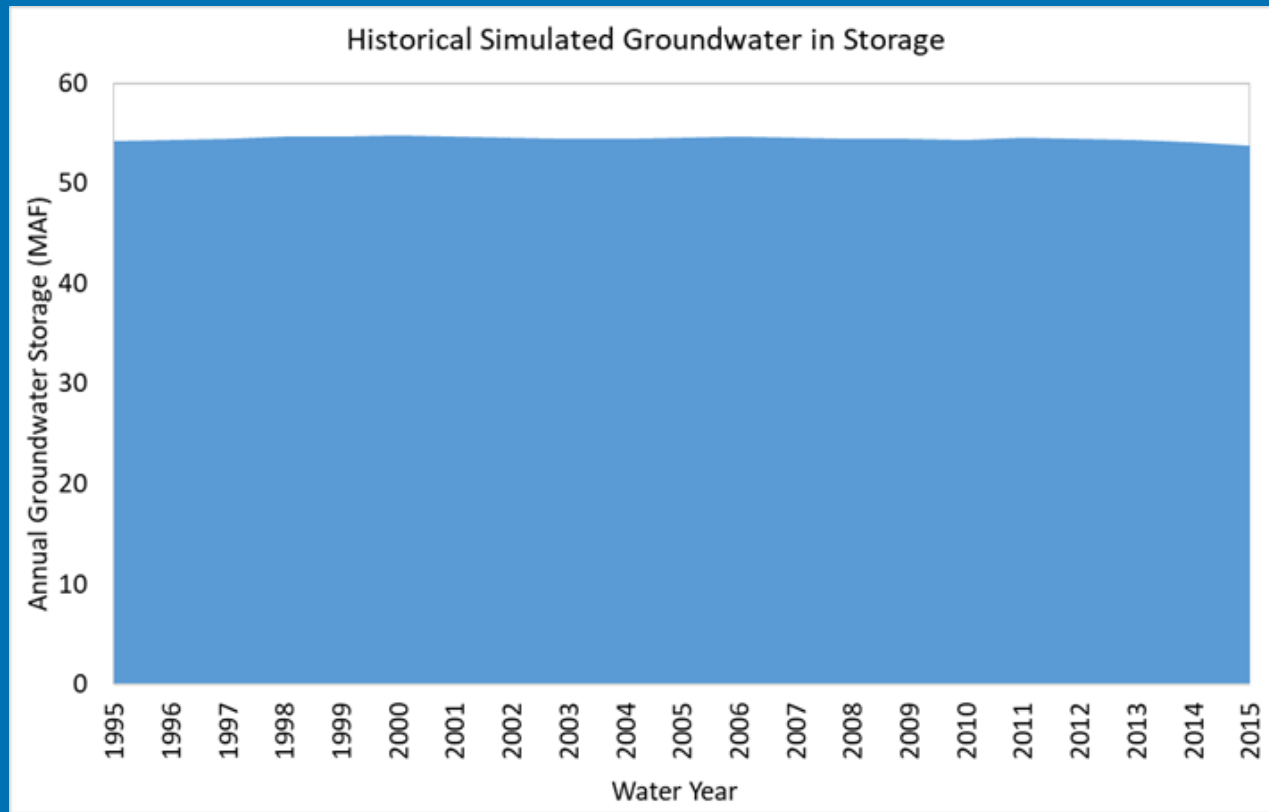
2. Reduction of Groundwater Storage

Historical Modeled Change in Groundwater Storage



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- 53.0 Million AF freshwater in storage (2015)
- Cumulative change of -0.05 MAF per year (-.09%)



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Approach 1: Using GW Elevations as Proxy



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GSP regulations allow GSAs to use groundwater level can be used as a proxy metric for any sustainability indicator, provided the GSP demonstrates that there is a significant correlation between groundwater levels and the other metrics. One possible approach for this is:

1) Demonstrate that the minimum thresholds and measurable objectives for chronic declines of groundwater levels are sufficiently protective to ensure significant and unreasonable occurrences of other sustainability indicators will be prevented. In other words, demonstrate that setting a groundwater level minimum threshold satisfies the minimum threshold requirements for not only chronic lowering of groundwater levels but other sustainability indicators at a given site.

2) Identify representative groundwater elevation monitoring sites where minimum thresholds and measurable objectives based on groundwater levels are developed for a specific sustainability indicator. In other words, the use of a groundwater level minimum threshold is not intended to satisfy the minimum threshold requirements for chronic lowering of groundwater but is intended solely for establishing a threshold for another sustainability indicator.

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Two Approaches



Approach 1 – Using Groundwater Levels as a Proxy

Use groundwater levels as a proxy (with justification that the groundwater levels minimum thresholds will be protective)

Approach 2 – Establish a threshold for groundwater storage based on the general zone of GW management

Set a threshold at a point at which undesirable results would occur based on volume at which groundwater is being accessed

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Approach 1: Using GW levels as Proxy



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- Sustainability in the ESJ Subbasin related to groundwater volume is driven by the groundwater level indicator, which relates to the ability of infrastructure to economically access groundwater and the sustainability of groundwater dependent ecosystems, to the extent connected to the aquifer accessed for water supplies.
- Groundwater elevation levels will be protective of significant and unreasonable depletion of groundwater storage.

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Approach 2: Setting a Threshold at Zone of Groundwater Management



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There is a greater understanding of the top management area of the aquifer with regard to water quality and other parameters. Uncertainty increases with depth, and having storage drop below that point is considered undesirable.

Groundwater is currently pumped from Layers 1 and 2 of the model

- Total volume at which groundwater is pumped: **24.3 MAF**

53.0 MAF Total Storage – 24.3 MAF in the general zone of GW Management

= 28.7 MAF as Proposed Threshold (Round to 30 MAF)

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Action: Reduction in Groundwater Storage



Action Needed: Recommendation to the Sustainable Management Criteria for Reduction in Groundwater Storage. Policy decision will go to the Board in May.

Sustainable Management Criteria Summary – Reduction in Groundwater Storage

<u>Criteria</u>	<u>Narrative Description – Approach 1 (GWE as Proxy)</u>	<u>Narrative Description – Approach 2 (Establish New Threshold)</u>
Proposed Minimum Threshold	Consistent with groundwater levels minimum thresholds	30 MAF
Proposed Measurable Objective	Consistent with groundwater levels measurable objectives	Historical drought low (1992 or 2015-16)
Proposed Interim Milestone	Consistent with groundwater levels interim milestones	To be developed
Proposed Definition of Violation	Consistent with groundwater levels definition of violation	Undesirable results are considered to occur when the 5-year average estimated storage for the Sustainable Simulation exceed the minimum threshold



**Sustainability Indicators:
3. Degraded Water Quality**

Work Completed: Identified Concerns for Water Quality



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What we've heard from the Advisory Committee:

- Salinity
- Arsenic (naturally occurring)
- Nitrates
- Point-source contamination
 - 1,2,3 TCP

Identified Concerns for Water Quality – NOT Addressed in the GSP



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What we've heard from the Advisory Committee:

- Salinity

- Arsenic

- **Nitrates** →

- **Point-source contamination** →

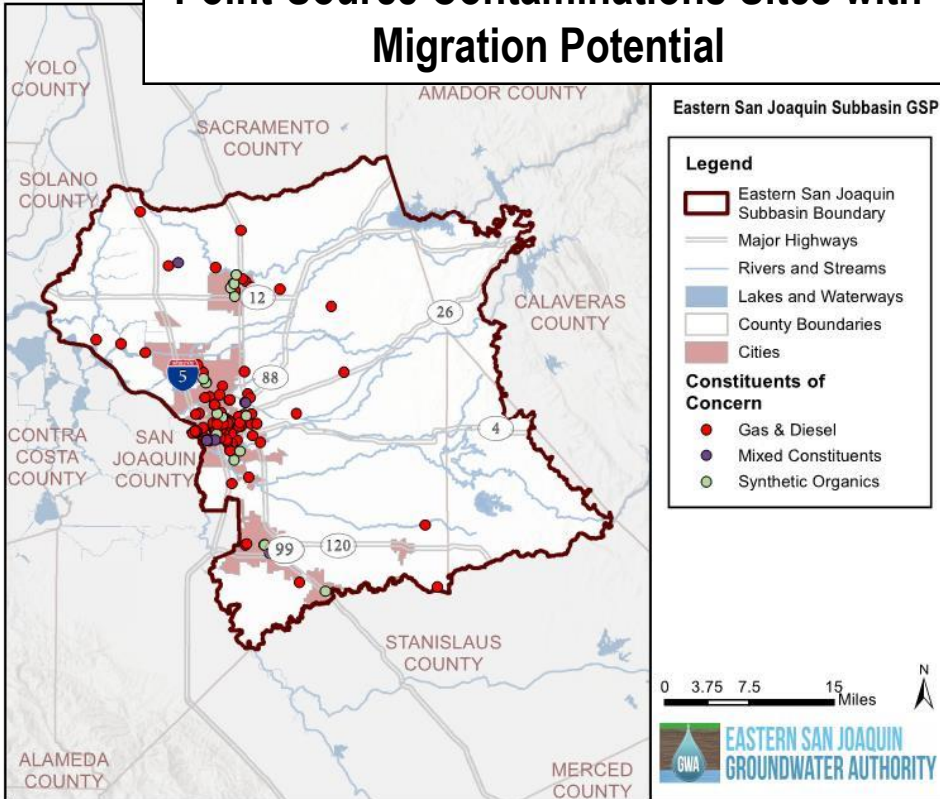
- **1,2,3 TCP** →

Managed through existing regulatory programs and agencies, including:

- CV-SALTS/IRLP
- Cal/Federal EPA
- Regional Board
- DTSC

Point-Source Contamination

Point-Source Contaminations Sites with Migration Potential



- Analysis conducted to identify active point-source contamination sites with potential to mobilize
- Considered in screening of proposed projects with recharge component

Identified Concerns for Water Quality

– Addressed in the GSP



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What we've heard from the Advisory Committee:

- **Salinity** →
 - **Arsenic** ↘
 - Nitrates
 - Point-source contamination
 - 1,2,3 TCP
 - Naturally occurring
 - Doesn't result in unsustainable groundwater extraction activities
 - No thresholds set
- Historic WQ concern
 - Can be feasibly managed by a GSP/GSA
 - Measured using TDS as a proxy (most widely available data)

Work Completed on Salinity Threshold



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GSA's impacted by water quality issues developed an initial approach to establishing thresholds for salinity (City of Manteca, City of Stockton, City of Lodi, City of Lathrop, Cal Water, and San Joaquin County)

- Discussed Minimum Threshold for Salinity
- Established Monitoring Well Network

Outcome: Support for adding buffer to SMCL to establish minimum threshold; considered protective of drinking water and predominant crops in the Subbasin

Action – Degraded Groundwater Quality



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Action Needed: Recommendation on Sustainable Management Criteria for Degraded Groundwater Quality. Policy decision will go to the Board in May.

Sustainable Management Criteria Summary – Degraded Water Quality

<u>Criteria</u>	<u>Narrative Description</u>
Minimum Threshold	1,000 mg/L TDS at identified wells
Measurable Objective	600 mg/L TDS at identified wells
Interim Milestone	5-year milestones along a linear trend between current condition and the measurable objective
Definition of Violation	Undesirable results are considered to occur during GSP implementation when more than 25% of representative monitoring wells (3 of 10 sites) exceed the minimum thresholds for water quality for two consecutive years and where these concentrations are the result of groundwater management activities



**Sustainability Indicators:
4. Seawater Intrusion**

Seawater Intrusion: Current Conditions



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- Recent USGS study (O’Leary, Izbicki, and Metzger, 2015) looked at sources of high-chloride waters throughout the ESJ Subbasin to characterize source.
- Assessing high-chloride water sources involved determining water type from major-ions, and evaluating stable isotope concentrations. The ratio of chloride to iodide is also used to differentiate high-chloride water sources besides seawater.
- Within the Subbasin, the research shows that there are three primary sources of salinity:

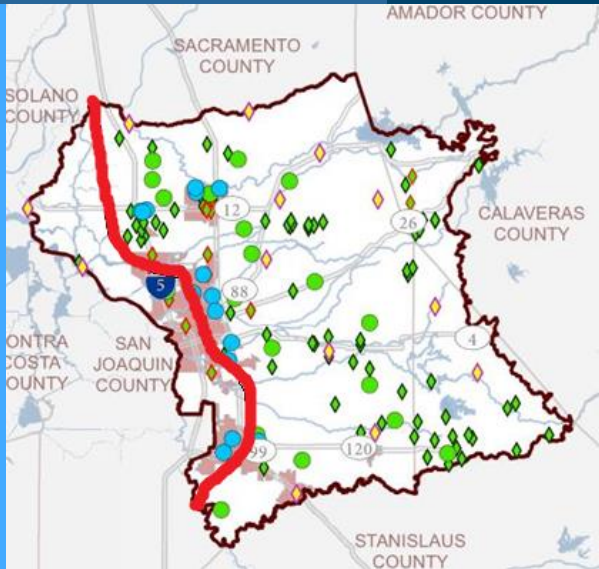
1. San Joaquin Delta Sediments
2. Deep Deposits
3. Irrigation Return Water

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Seawater Intrusion: Developing an Isocontour Line



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- The proposed contour would be between the westernmost monitoring points and the next most-westerly points, to serve as a sentinel.
- Alternately, it could be placed along I-5 for simplicity.

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Action – Seawater Intrusion



Action Needed: Recommendation on Sustainable Management Criteria for Seawater Intrusion. Policy decision will go to the Board in May.

Sustainable Management Criteria Summary – Seawater Intrusion

<u>Criteria</u>	<u>Narrative Description</u>
Proposed Minimum Threshold	2,000 mg/L chloride isocontour line
Proposed Measurable Objective	The current condition (2015-2018 average)
Proposed Interim Milestone	5-year milestones along a linear trend between current condition and the measurable objective
Definition of Violation	Undesirable results are considered to occur during GSP implementation when 2,000 mg/L chloride reaches an established isocontour line and where these concentrations are caused by intrusion of a seawater source. The proposed contour would be between the westernmost monitoring points and the next most-westerly points, to serve as a sentinels. Alternately, it could be placed along I-5 for simplicity.
Trigger and Action Plan	Put action plan in place at to trigger additional monitoring and analysis to confirm seawater source at lower concentrations (proposed at 1,000 mg/L chloride)



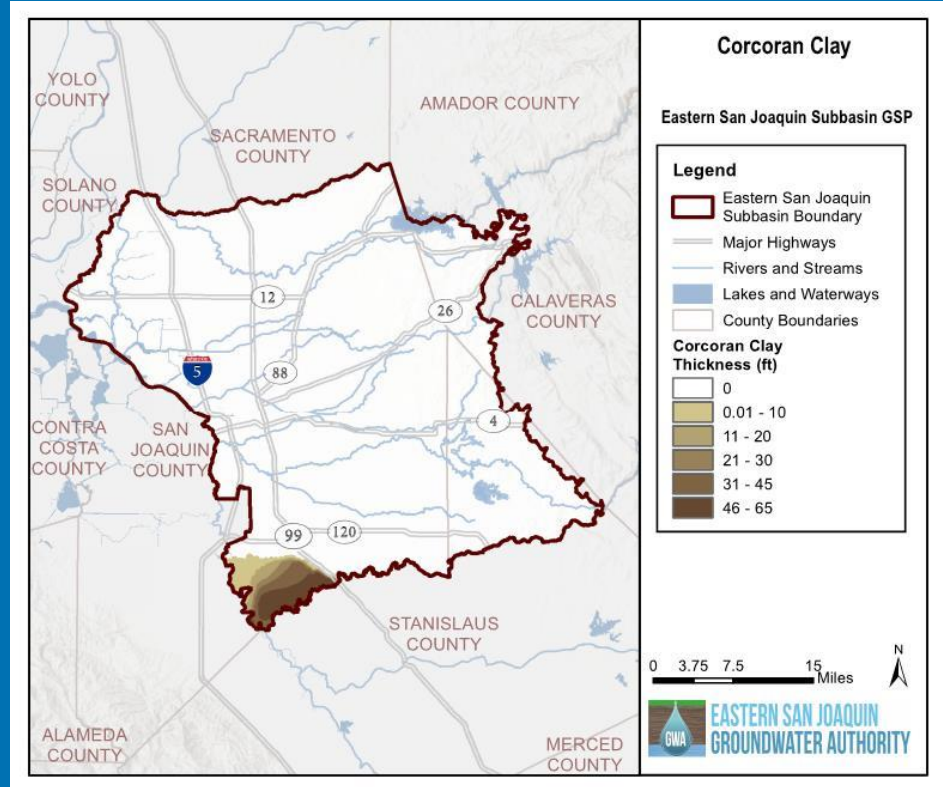
**Sustainability Indicators:
5. Land Subsidence**

Subsidence has not been Observed Historically in the Subbasin



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Monitoring Stations (USGS)



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Using GW Levels as a Proxy



- The use of groundwater levels as a proxy metric for this sustainability indicator is justified by the significant correlation between groundwater levels and land subsidence and is necessary given the lack of extensive monitoring for land subsidence.

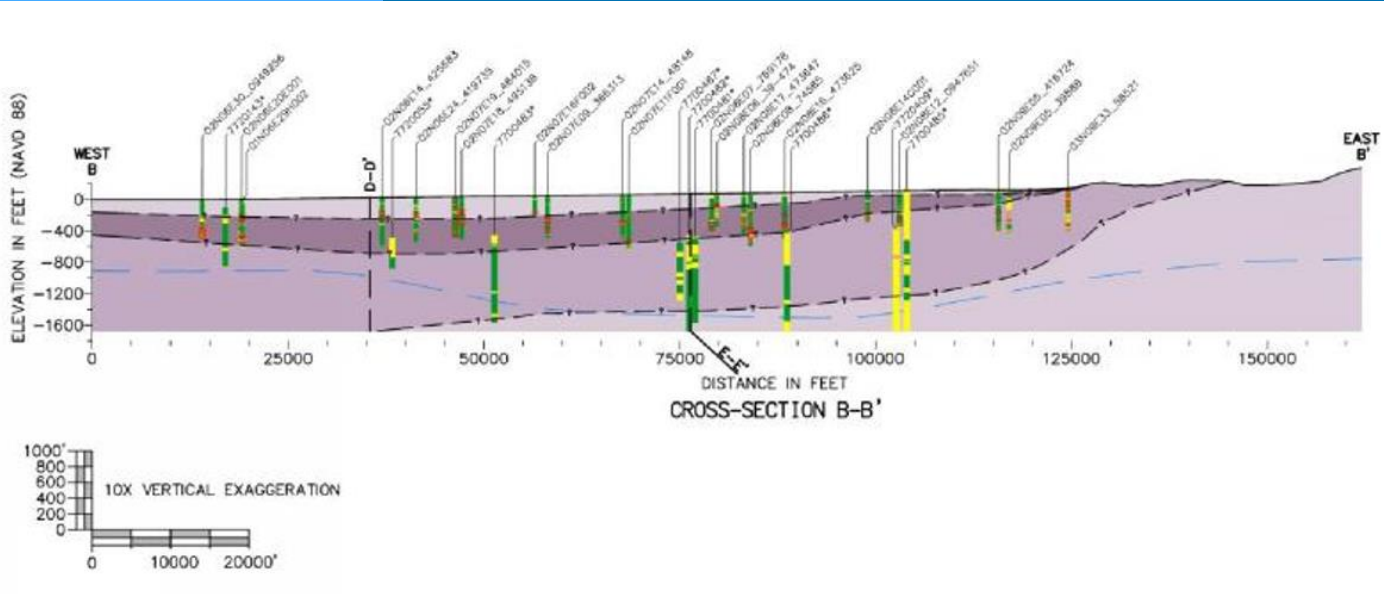
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Justification for Using Levels as a Proxy



- Land subsidence requires two conditions – dewatering of subsurface materials and that those dewatered subsurface materials be compressible.
- Historical declines in groundwater levels are not known to result in subsidence.
- If the basin were to operate within the margin of operational flexibility proposed for GW levels, future dewatering would take place in similar geologic units to those currently dewatered.
- It is therefore anticipated that additional declines in groundwater levels are unlikely to cause subsidence, as dewatered materials are expected to behave consistently with historical dewatering, which resulted in no known subsidence. Thus, the groundwater level minimum thresholds are protective against additional subsidence.

B-B' Cross-Section



Legend

- Eastern San Joaquin Subbasin Boundary
- Formations**
 - Modesto/Riverbank
 - Turlock Lake/Laguna
 - Mehrten
 - Valley Springs/Ione
 - Bedrock
 - Base of Fresh Water
- Screens
- Cross-Section Intercepts
- Inferred Formation Contacts
- Well Strata**
 - Clays and Silts
 - Sands and Gravels
 - Sedimentary Rock
 - Igneous/Metamorphic Rocks
 - Other

*Oil and Gas Wells are Indicated by **

Pumping is primarily from within the Modesto/Riverbank Formation both under current conditions and at the MT condition for GW levels.

Action – Land Subsidence



Action Needed: Recommendation on Sustainable Management Criteria for Land Subsidence. Policy decision will go to the Board in May.

Sustainable Management Criteria Summary – Land Subsidence

<u>Criteria</u>	<u>Narrative Description</u>
Minimum Threshold	Consistent with groundwater levels minimum thresholds
Measurable Objective	Consistent with groundwater levels measurable objectives
Interim Milestone	Consistent with groundwater levels interim milestones
Definition of Violation	Consistent with groundwater levels definition of violation



Sustainability Indicators:
6. Depletion of Interconnected Surface Waters

Two Approaches



Approach 1 – Set minimum threshold and measurable objectives using stream modeling estimates

Approach 2 – Use groundwater levels as a proxy, and monitor for depletion of interconnected surface water at selected monitoring locations

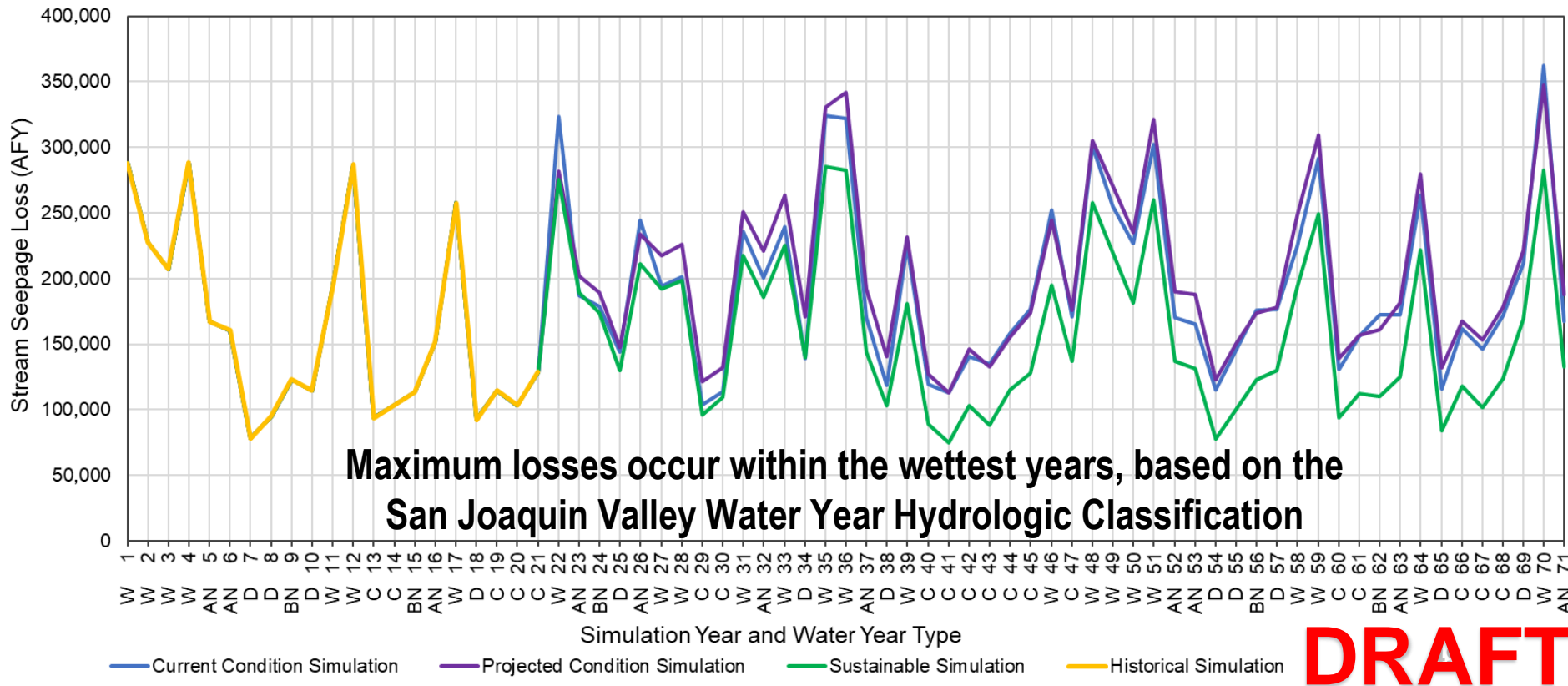
Approach 1: Set Thresholds Using Stream Modeling Estimates



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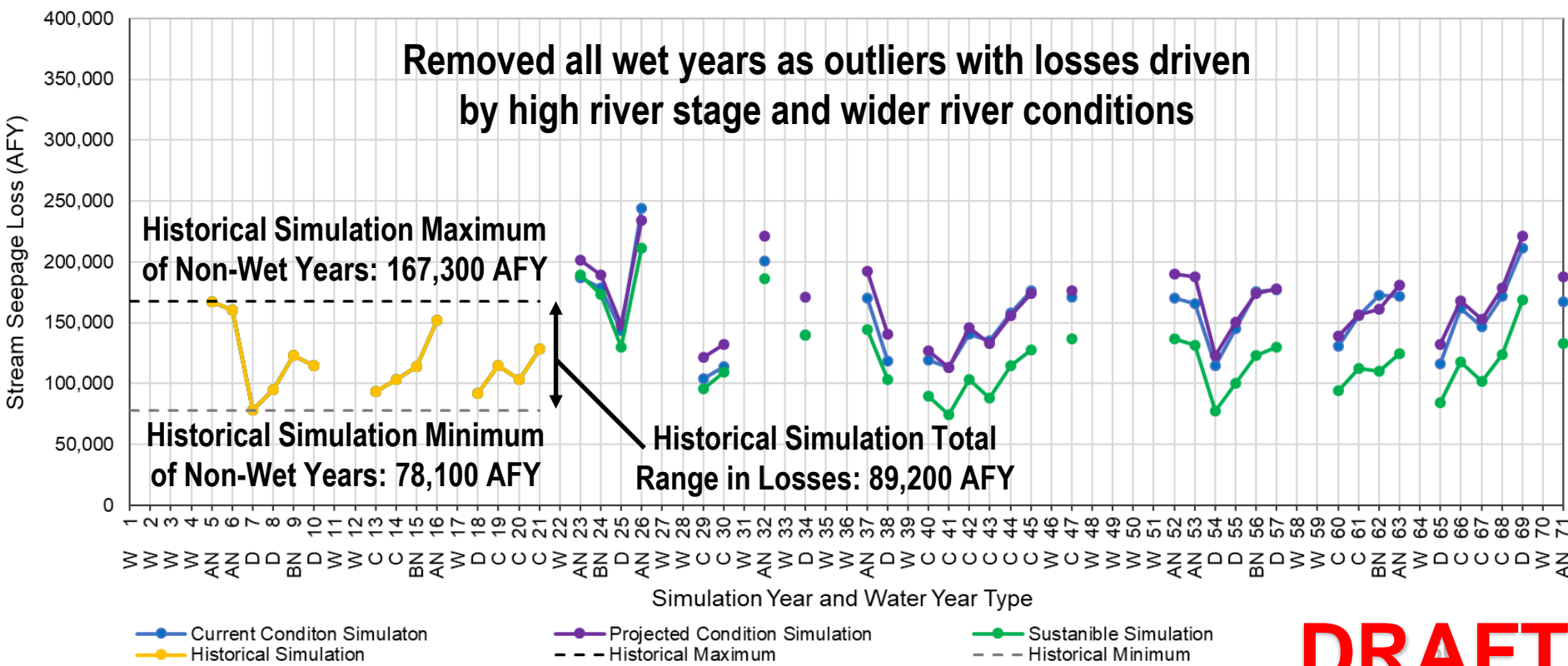
Quantify modeled stream losses under non-wet conditions and establish thresholds to protect against significant and unreasonable stream depletion

Approach 1: Set Thresholds Using Stream Modeling Estimates



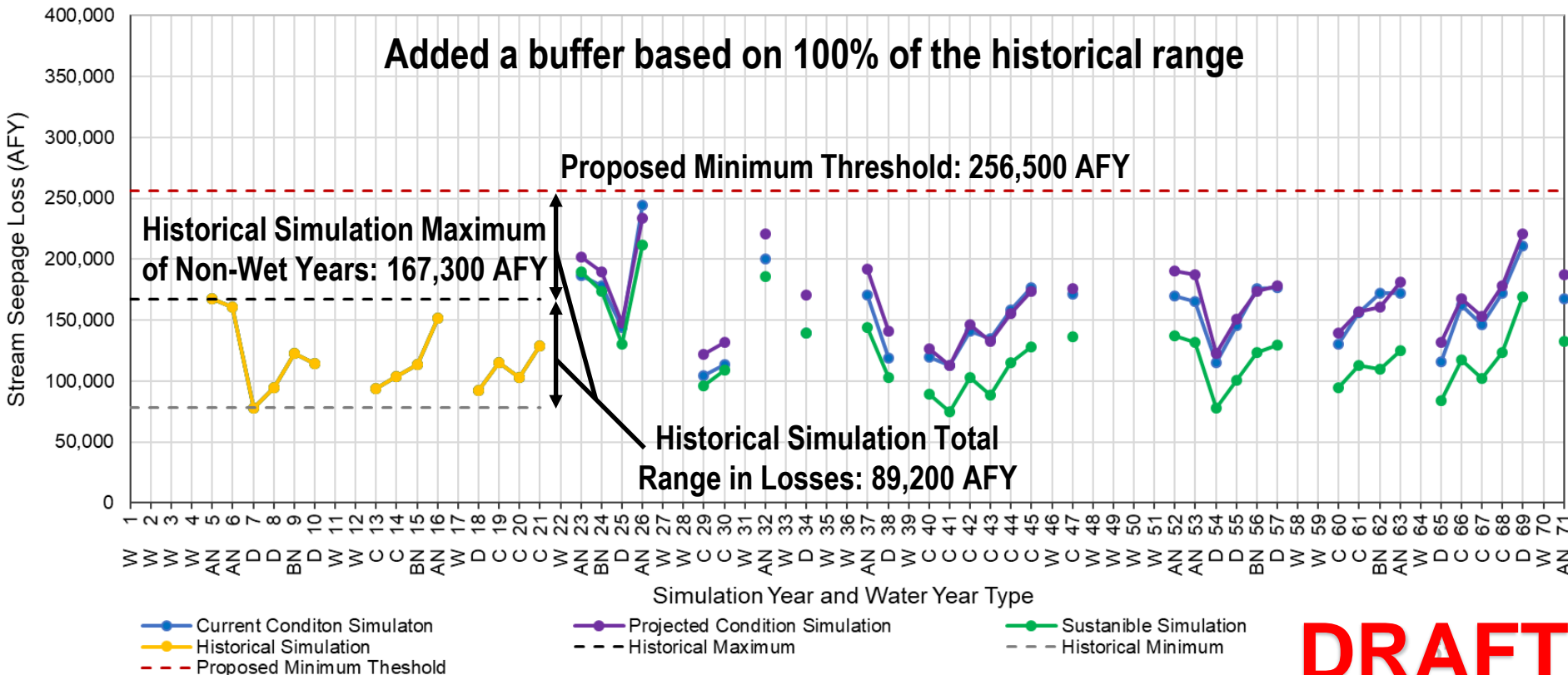
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Approach 1: Set Thresholds Using Stream Modeling Estimates



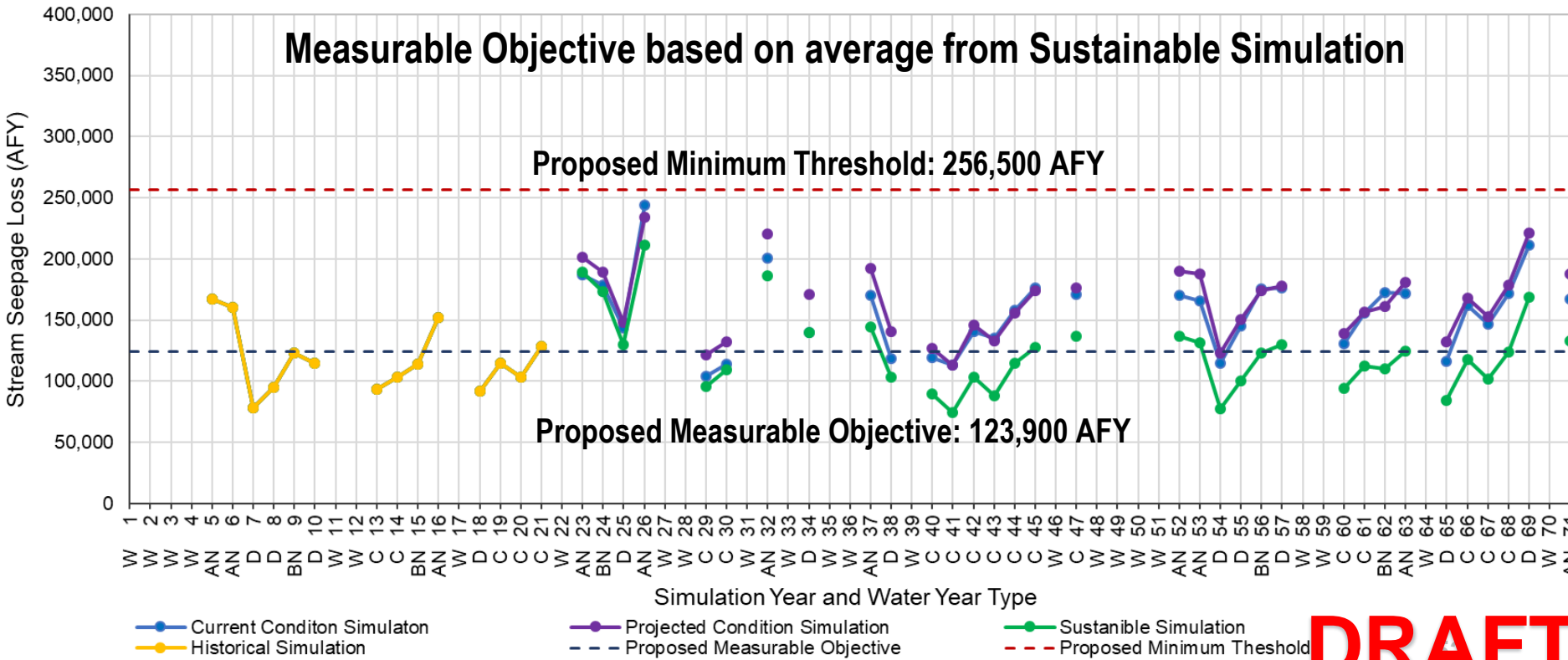
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Approach 1: Set Thresholds Using Stream Modeling Estimates



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Approach 1: Measurable Objectives



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Approach 2: Use GW Levelss as Proxy



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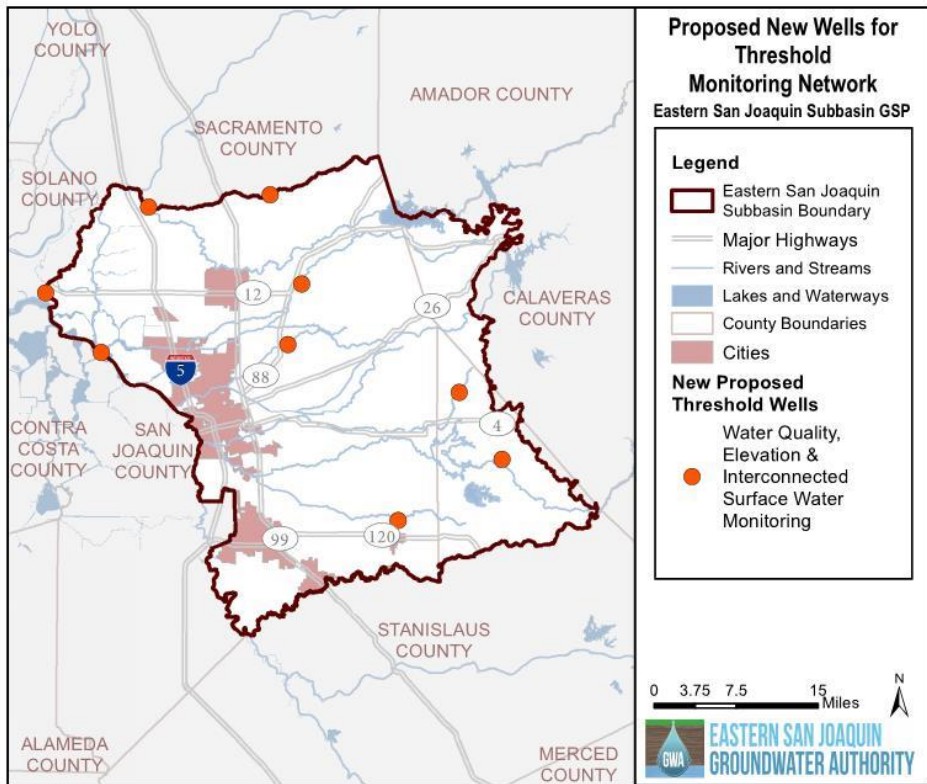
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1) Demonstrate that the minimum thresholds and measurable objectives for chronic declines of groundwater levels are sufficiently protective to ensure significant and unreasonable occurrences of other sustainability indicators will be prevented. In other words, demonstrate that setting a groundwater level minimum threshold satisfies the minimum threshold requirements for not only chronic lowering of groundwater levels but other sustainability indicators at a given site.

2) Identify representative groundwater elevation monitoring sites where minimum thresholds and measurable objectives based on groundwater levels are developed for a specific sustainability indicator. In other words, the use of a groundwater level minimum threshold is not intended to satisfy the minimum threshold requirements for chronic lowering of groundwater but is intended solely for establishing a threshold for another sustainability indicator.

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Approach 2: Minimum Threshold Context



Proposed Representative Monitoring Wells for Stream Depletion (Approach 2):

- Wells located within $\frac{1}{4}$ miles of a stream and screened within 30 feet of the surface
- All are proposed well locations

Action – Depletion of Interconnected Surface Water



Action Needed: Recommendation on Sustainable Management Criteria for Depletion of Interconnected Surface Water. Policy decision will go to the Board in May.

Sustainable Management Criteria Summary – Interconnected Surface Water

<u>Criteria</u>	<u>Narrative Description – Approach 1 (Modeled Simulation)</u>	<u>Narrative Description – Approach 2 (GWE as Proxy)</u>
Proposed Minimum Threshold	Maximum Historical Simulation stream loss (critical, dry, below normal, and above normal water years) plus buffer equal to historical range	To be developed (minimum threshold to be measured as GWE, in feet MSL)
Proposed Measurable Objective	Average Sustainable Simulation stream loss (critical, dry, below normal, and above normal water years)	To be developed (measurable objective to be measured as GWE, in feet MSL)
Proposed Interim Milestone	5-year milestones along a linear trend between current condition and the measurable objective	To be developed (interim milestones to be measured as GWE, in feet MSL)
Proposed Definition of Violation	Undesirable results are considered to occur when the 5-year average stream losses for the Sustainable Simulation exceed the minimum threshold as a result of groundwater pumping	To be developed (a percentage of wells with thresholds exceeds minimum threshold as a result of groundwater pumping over a set period of time)



Sustainability Goal

Sustainability Goal



- The sustainability goal succinctly states the GSAs' objectives and desired conditions of the Subbasin.

The proposed Sustainability goal description for the Subbasin is:

to maintain an economically-viable groundwater resource for the beneficial use of the people of the Eastern San Joaquin Subbasin by operating the basin within its sustainable yield or by modification of existing management to address unforeseen future conditions.

- The exact wording of the sustainability goal for Eastern San Joaquin Subbasin is still under development. A discussion measures and an explanation of how the goal will be achieved in 20 years will be presented at a later time.

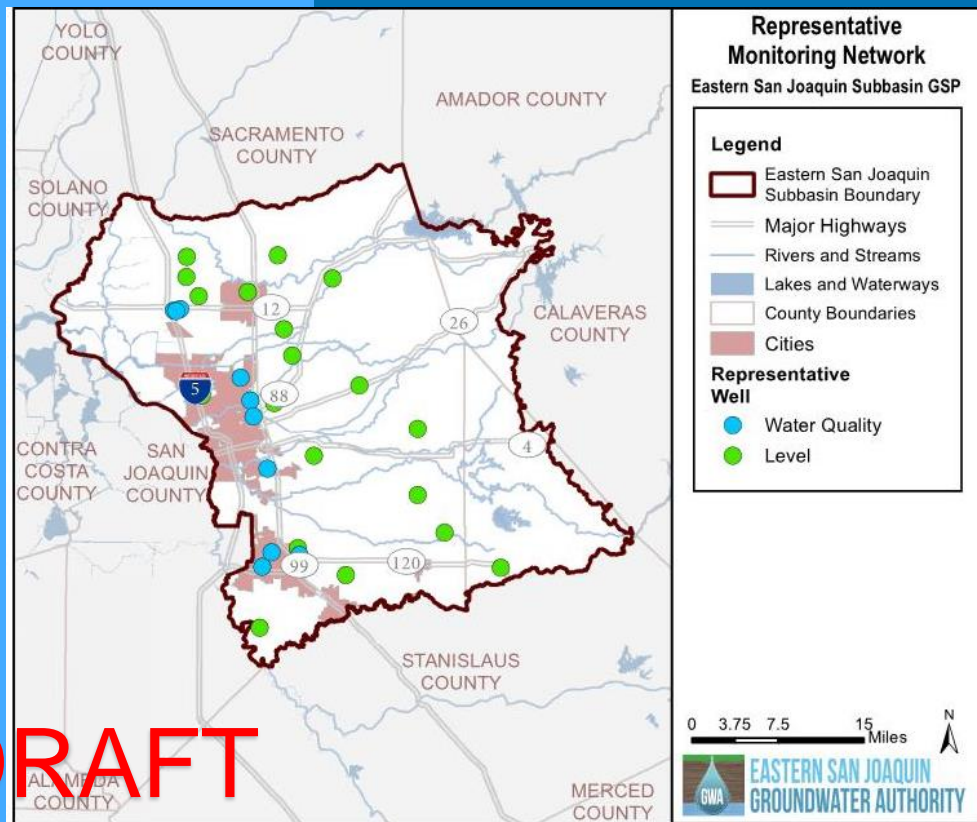


Monitoring Network

Representative Monitoring Network Wells



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Includes:

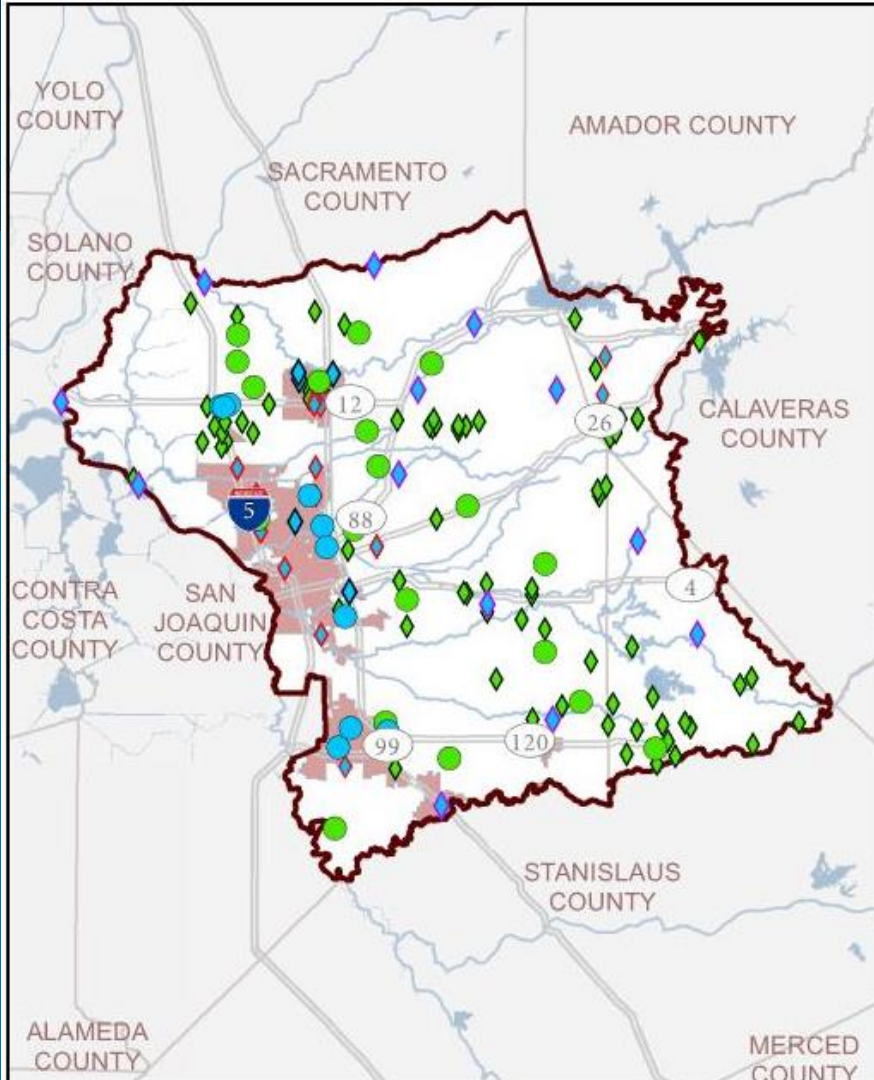
- Dedicated Threshold Wells for GW Levels (19)
- Dedicated Threshold Wells for GW Quality (10)

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Broad Monitoring Network

- Representative monitoring and additional broader network

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Broad Monitoring Network Eastern San Joaquin Subbasin GSP

Legend

- Eastern San Joaquin Subbasin Boundary
- Major Highways
- Rivers and Streams
- Lakes and Waterways
- County Boundaries
- Cities

Monitoring Wells (MW)

- Existing Representative MW
- Existing Broad Network MW
- Existing Broad Network MW - Nested &/or Clustered
- New Broad Network MW

Sustainability Indicator Monitored

- Water Quality & Level
- Level



Monitoring Well Density



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Network Type	Density (Wells per 100 sq. miles)
Representative Network – Water Quality & GW Levels	2.6
Representative Network – Water Quality	0.9
Representative Network – GW Levels	2.6
Broad Network – Water Quality & GW Levels	13
Broad Network – GW Levels	8.6

DWR recommends a monitoring network density of 0.2-10 monitoring wells per 100 sq. miles

Action – Monitoring Network



Action Needed: Recommendation on monitoring locations, constituents sample, and frequency of sampling in the GSP monitoring network. Policy decision will go to the Board in May.

Well Type	#	Monitoring Network	Constituent Monitored		Proposed Frequency
			Elevation	Water Quality	
Dedicated level Threshold	19	Representative Monitoring	X		Quarterly
Dedicated Groundwater Quality Threshold	10	Representative Monitoring	X	X	Quarterly
CASGEM Wells (Official)	76	Broad	X		Semi-Annually
Nested &/or Clustered Wells	21	Broad	X	X	Semi-Annually
TSS Wells + 10 New Wells (Planned)	13	Broad	X	X	Semi-Annually
Additional local wells in water quality network	5	Broad	X	X	Semi-Annually



Groundwater Dependent Ecosystems

Preliminary Methodology and Results



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- Today we are presenting a preliminary methodology for identifying GDEs in the Subbasin
- The draft results will be reviewed with GSAs to ground-truth areas that have and have not been identified as GDEs areas through this analysis

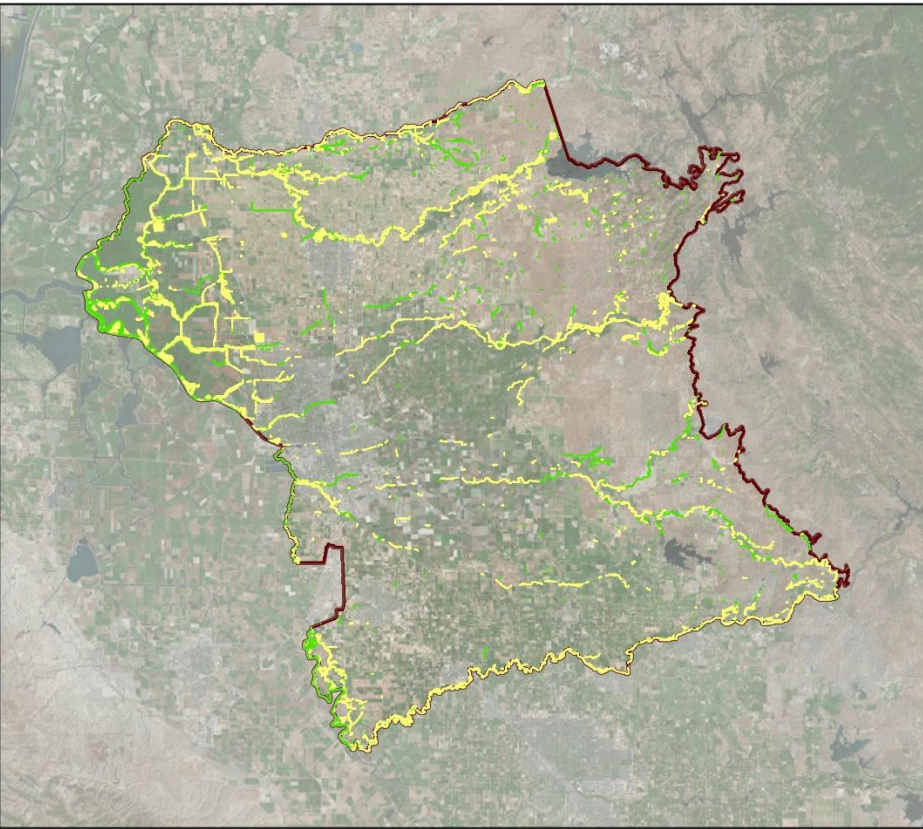
Preliminary Methodology for Assessing GDEs



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- DWR's Natural Communities Commonly Associated with Groundwater (NCCAG) dataset was used, developed with The Nature Conservancy
- Areas with access to supplemental water supplies were removed, including
 - Managed wetlands and areas without shallow groundwater
 - Areas adjacent to canals and ditches, irrigated ag fields, losing streams, perennial rivers, and managed wetlands.

Full NCCAG Dataset



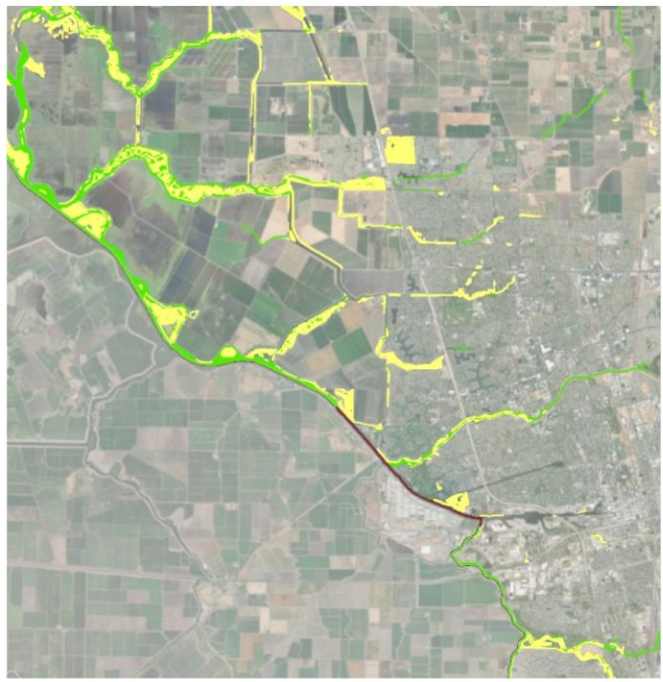
Eastern San Joaquin Subbasin NCCAG

Eastern San Joaquin Subbasin GSP

Legend

- Eastern San Joaquin Subbasin Boundary
- Vegetative NCCAG
- Wetland NCCAG

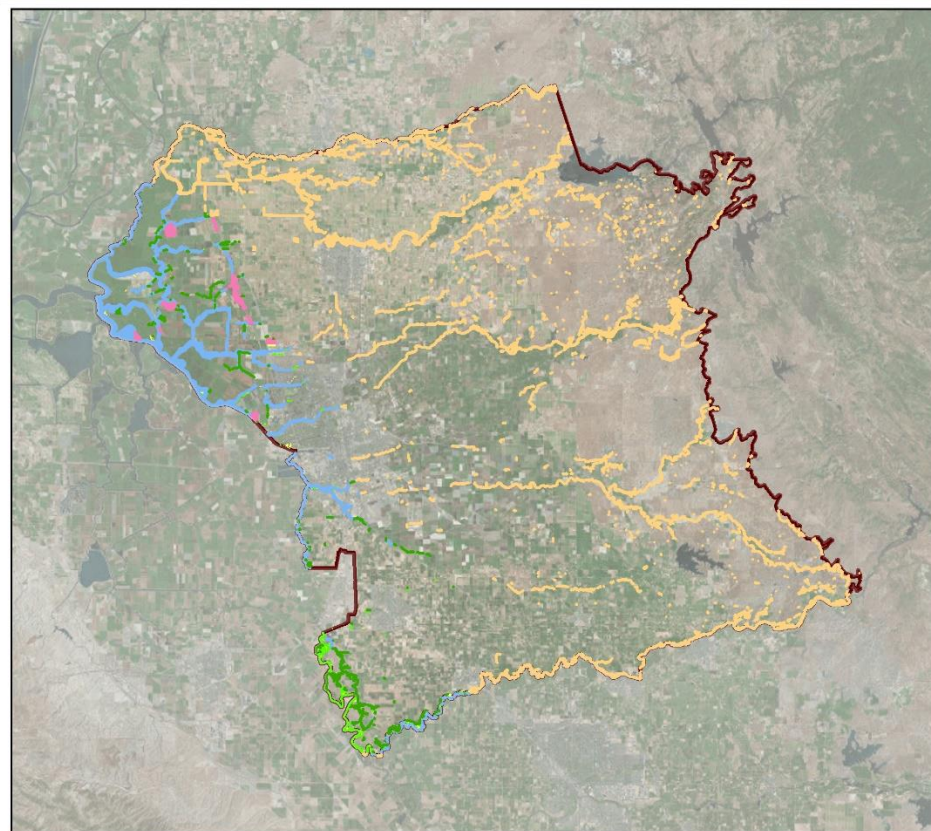
NCCAG: Natural Communities Commonly Associated with Groundwater
GDE: Groundwater Dependent Ecosystems



NCCAG Dataset: Potential GDEs and Other



EASTERN SAN JOAQUIN
GROUNDWATER AUTHORITY



Identified GDEs and NCCAGs not Identified as GDEs

Eastern San Joaquin Subbasin GSP

Legend

- Eastern San Joaquin Subbasin Boundary
- NCCAG GDEs**
- NCCAG Vegetative GDE
- NCCAG Wetland GDE
- NCCAG Not GDEs**
- Depth to Water > 30 ft.
- Managed Wetland
- Adjacent to Agriculture
- Perennial Surface Water Bodies

NCCAG: Natural Communities Commonly Associated with Groundwater
GDE: Groundwater Dependent Ecosystems



Buffers Used

DTW 30+ ft.	Drawn from area of shallow DTW measurements
Managed Wetland	150 ft.
Adjacent to Ag.	50 ft.
Losing or Perennial Streams	150 ft.
Canals and Ditches	150 ft.

NCCAG Dataset: Potential GDEs and Other



EASTERN SAN JOAQUIN
GROUNDWATER AUTHORITY

Identified GDEs and NCCAGs not Identified as GDEs

Eastern San Joaquin Subbasin GSP

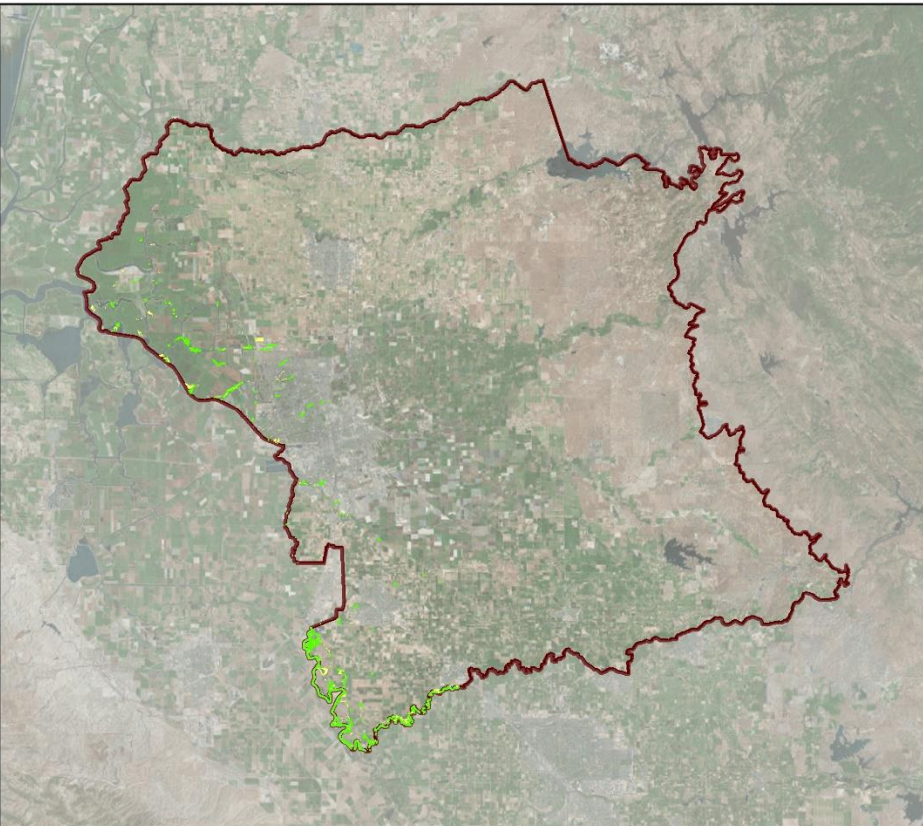
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Identified Potential GDEs



Groundwater Dependent Ecosystems (GDEs)

Eastern San Joaquin Subbasin GSP

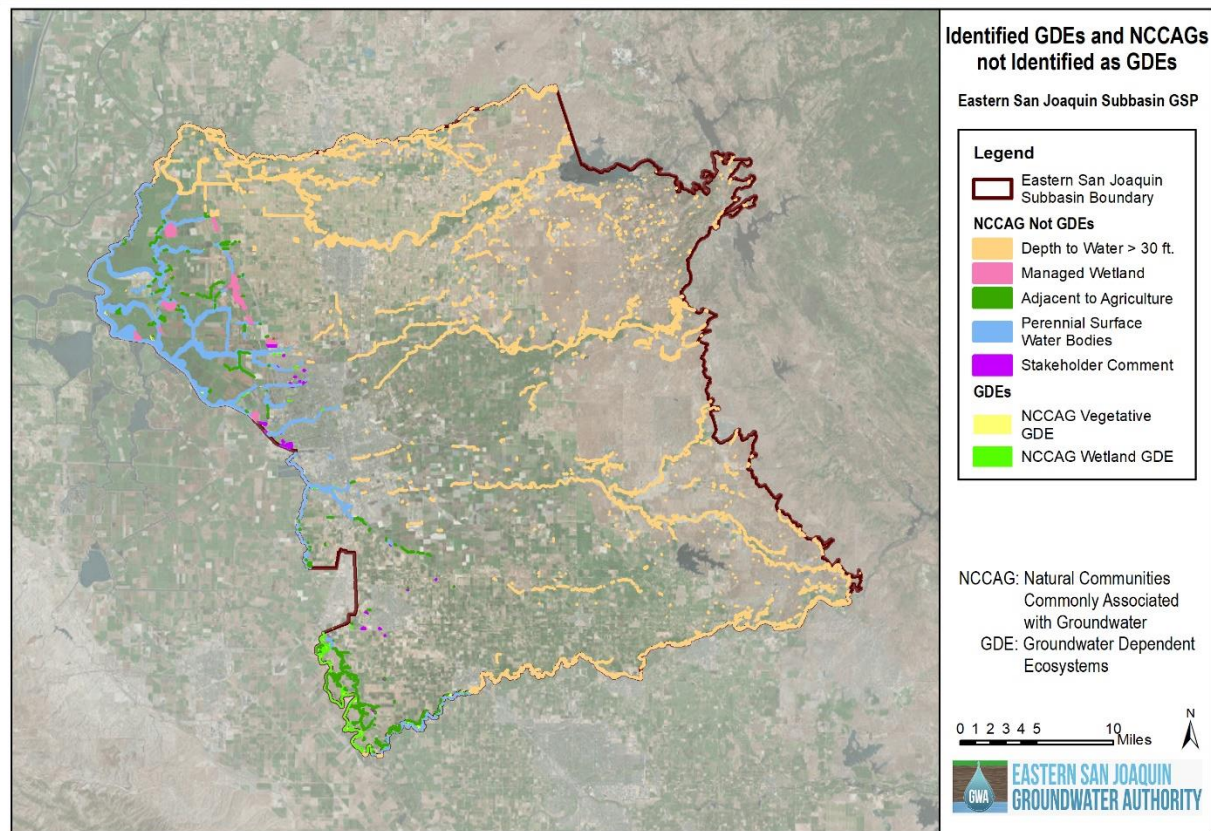
Legend

- Eastern San Joaquin Subbasin Boundary
- GDEs
 - NCCAG Vegetative GDE
 - NCCAG Wetland GDE

NCCAG: Natural Communities Commonly Associated with Groundwater
GDE: Groundwater Dependent Ecosystems



GSA and Workgroup Comments are Shown in Purple (Removed as GDEs)





Inter-basin Coordination

Inter-Basin Coordination



EASTERN SAN JOAQUIN
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- Next Step: Reach out to neighboring subbasins
Cosumnes (2022 timeline)
South American (Alternative plan)
Solano (2022 timeline)
Tracy (2022 timeline)
Modesto (2022 timeline)
East Contra Cost (2022 timeline)



Next Steps and Key Decisions for the GWA

Next Steps



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- Meet with individual GSAs to discuss minimum thresholds
- These items will be presented to the GWA Board at the May Advisory Committee meeting