
GWA
EASTERN SAN JOAQUIN
GROUNDWATER AUTHORITY
GWA Advisory Committee
March 13, 2019

Agenda

EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY

- Approval of February Meeting Minutes
- Summary of Approach for Water Budget and Plan Finalization
- Water Budget Planning Estimates
  - Long-term Average Groundwater Deficit
  - Sustainable Conditions
- Sustainability Indicators
- Monitoring, Measuring, and Model Refinements
- Project Implementation
- Management Actions
- Groundwater-Dependent Ecosystems
- April Agenda Items

Summary of Approach for Water Budget and Plan Finalization

Review of Revised Schedule

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- Overview of schedule and summary activities with staff over the last month
  - GSA Staff Workshop 2/28

Updated GSP Deliverables Review Schedule

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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 8	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

Summary of Approach for Water Budget and Plan Finalization

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Report out –

- Where are we at with plan elements?
- Where are we going with basin scale implementation and financing?

Water Budget Planning Estimates

Review: 2/28 Workshop Objectives

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- **Board Direction:** Work with staff at the administrative level before bringing chapters to the Advisory Committee, and to begin scheduling a workshop to sort out the policy decisions to take back to the Board.

- **Workshop Objectives:**
  - Go over the details of the water budget and sustainable yield calculations
  - Provide a schedule of when to release the draft internally, when comments are due, and when to release the draft to the public
  - Identify policy decisions related to water budgets to be brought to Advisory Committee

Water Budget: Projected Conditions At Buildout

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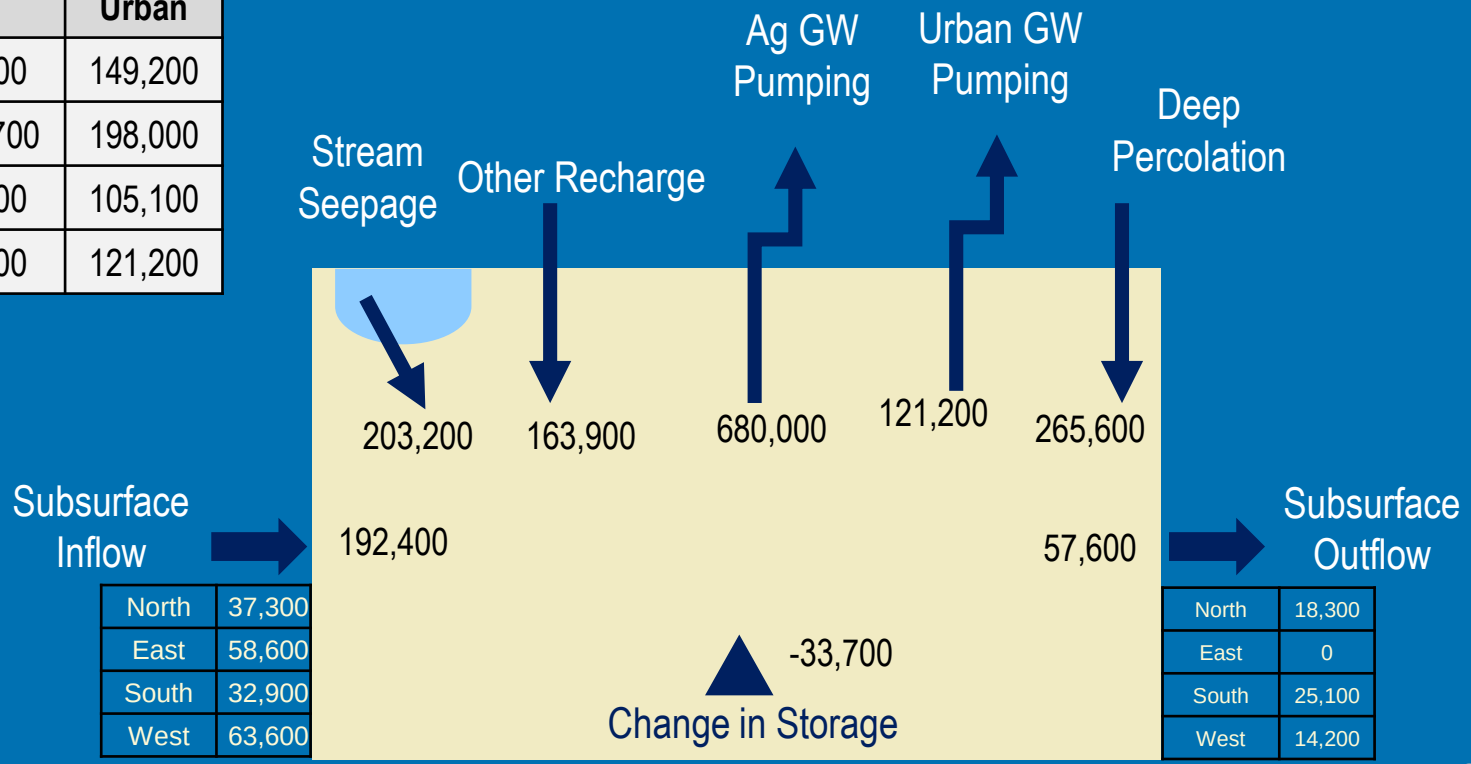
Component	Ag	Urban
Acreage (acres)	357,500	149,200
Demand (AF)	1,093,700	198,000
SW Deliveries (AF)	424,400	105,100
GW Pumping (AF)	680,000	121,200



North	37,300
East	58,600
South	32,900
West	63,600

North	18,300
East	0
South	25,100
West	14,200

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

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Model Sensitivity Analysis

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Component	Uncertainty
Deep Percolation	20%
Stream Seepage	15%
Other Recharge	5%
Groundwater Pumping	20%
Boundary Flow	10%

What is Sustainable Yield?

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"Sustainable yield means the maximum quantity of water, calculated over a base period representative of long-term conditions in the basin and including any temporary surplus, that can be withdrawn annually from a groundwater supply without causing an undesirable result."

California Water Code Section 10721

Undesirable Results:

- Chronic Lowering of Groundwater Levels
- Reduction in Groundwater Storage
- Seawater Intrusion
- Degraded Water Quality
- Land Subsidence
- Depletion of Interconnected Surface Water

Sustainable Yield Modeling

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- **Modeling Objective:** Understand how much pumping reduction would be required to eliminate overdraft 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

GW Sustainability Options

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1. Pumping Reduction Uniformly Basin-wide
   - Ag Land Reduction by about 10%
   - Urban GW use Reduction by about 10%

2. Pumping Reduction Under Optimized Conditions
   - Ag Land Reduction by about 15%
   - Additional Urban Conservation about 10%

Water Budget: Sustainable Yield At Buildout- Uniform Pumping Reduction

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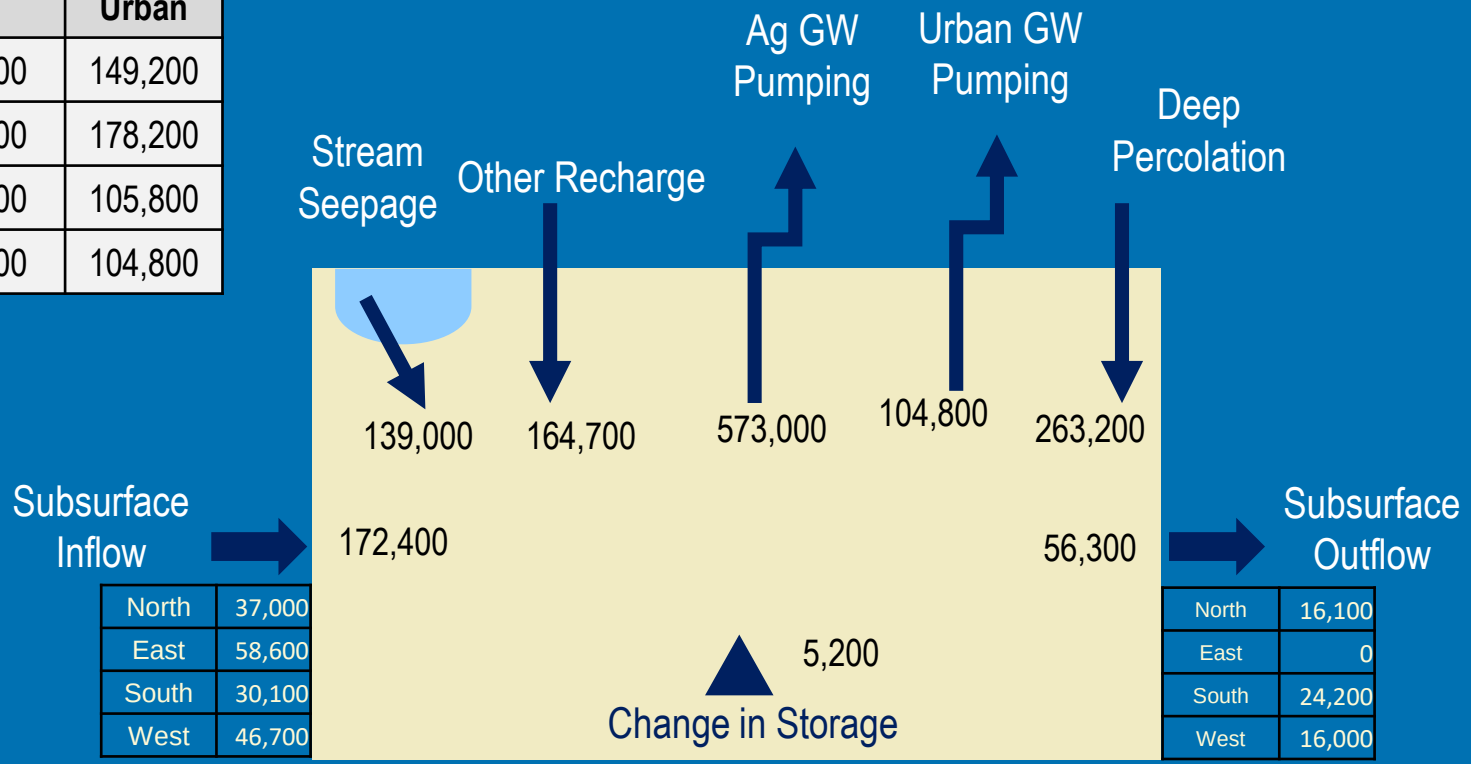
Component	Ag	Urban
Acreage (acres)	321,700	149,200
Demand (AF)	974,900	178,200
SW Deliveries (AF)	426,600	105,800
GW Pumping (AF)	573,000	104,800



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

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Water Budget Comparison
Uniform Pumping Reduction

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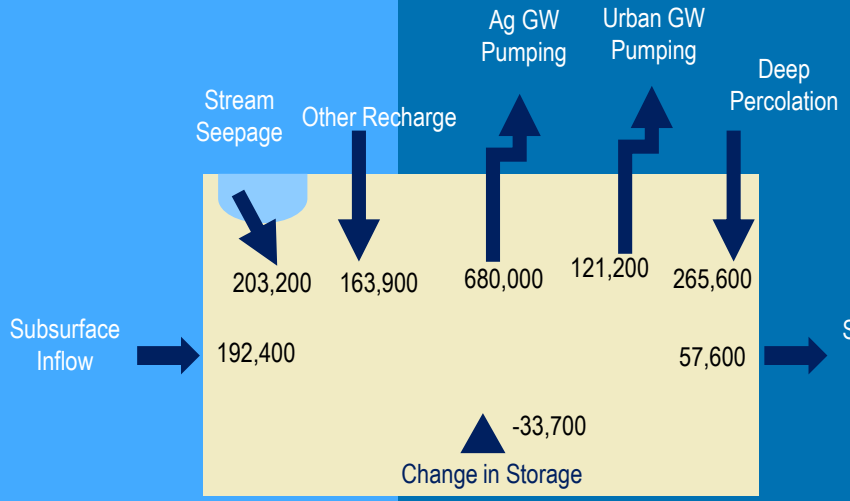
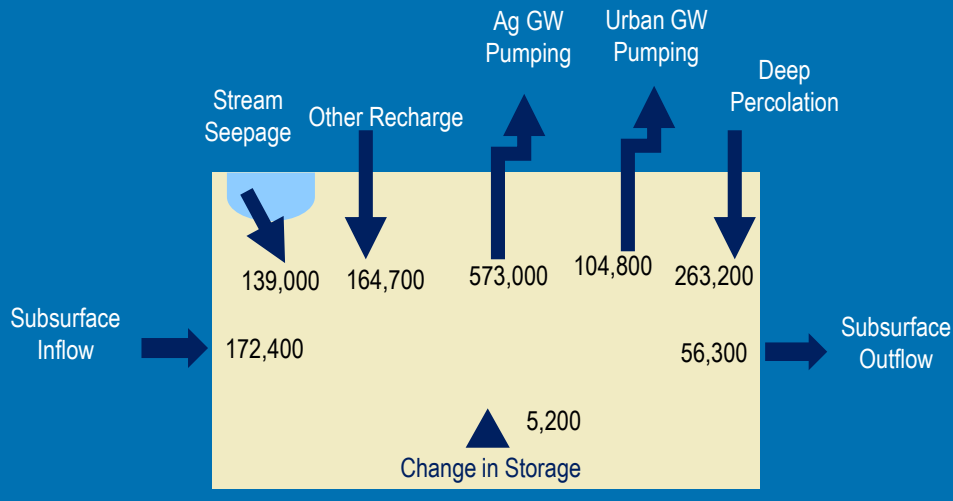


Projected Conditions



Sustainable Yield: Uniform GW Pumping Reduction

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

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Optimized Pumping Reduction

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- Focused in areas of higher unit Agricultural GW use and away from the major river courses
- Included additional urban conservation

Water Budget: Sustainable Yield At Buildout- Optimized GW Pumping Reduction

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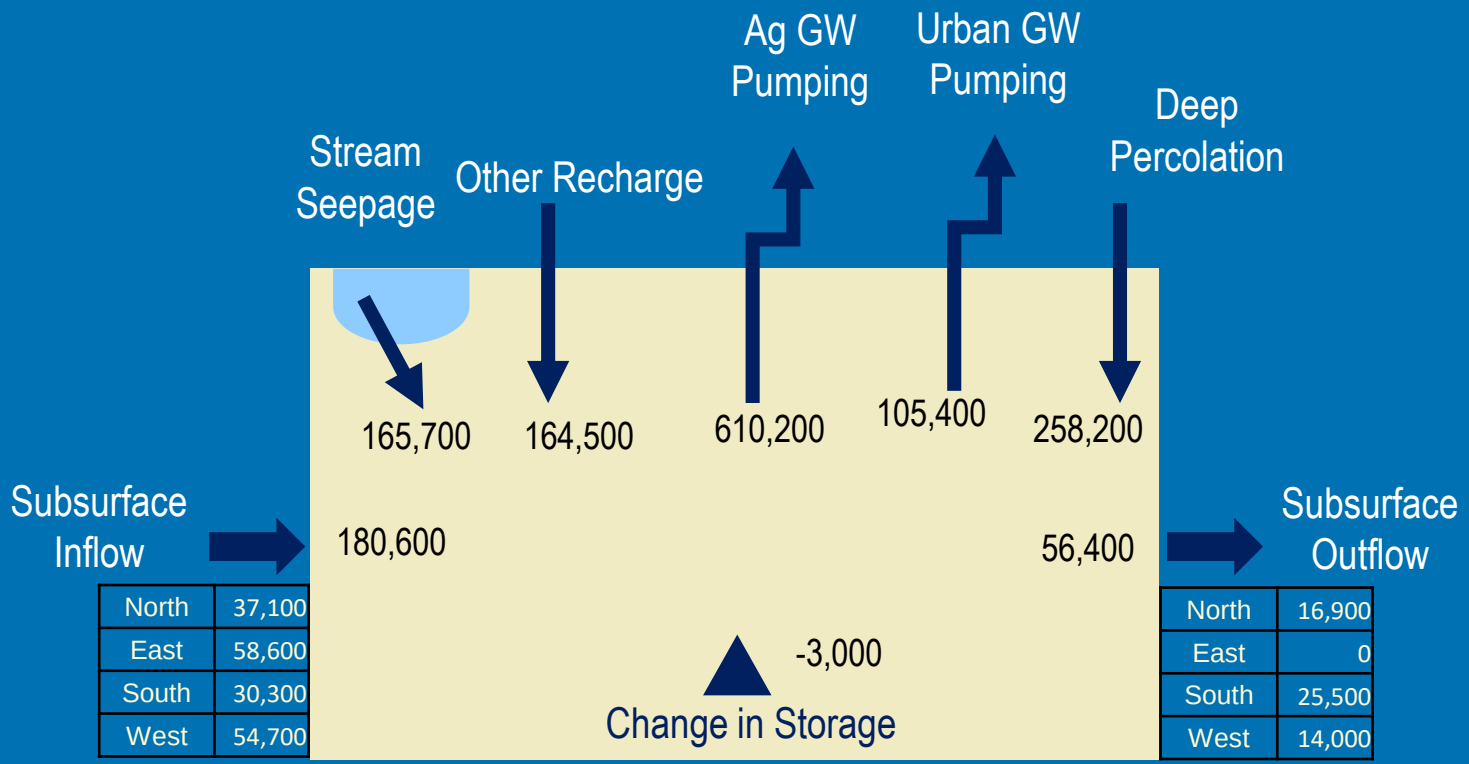

North	37,100
East	58,600
South	30,300
West	54,700

North	16,900
East	0
South	25,500
West	14,000

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

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Water Budget Comparison
Optimized GW Pumping Reduction

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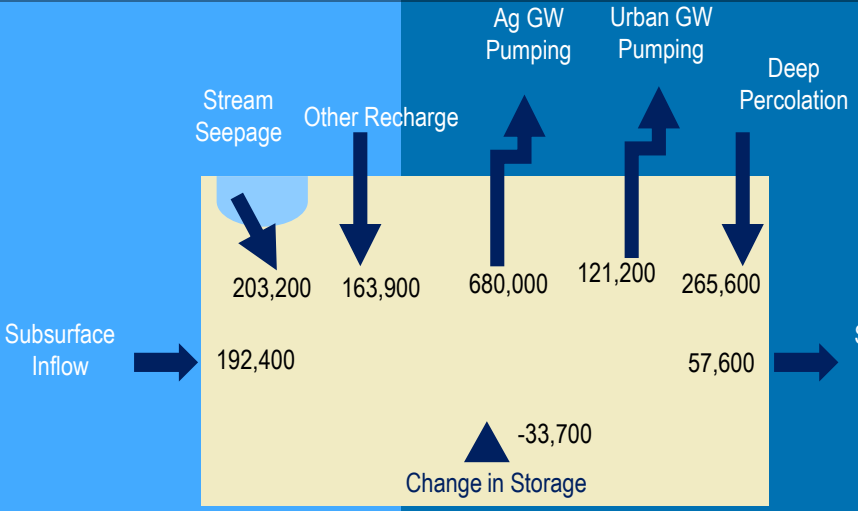
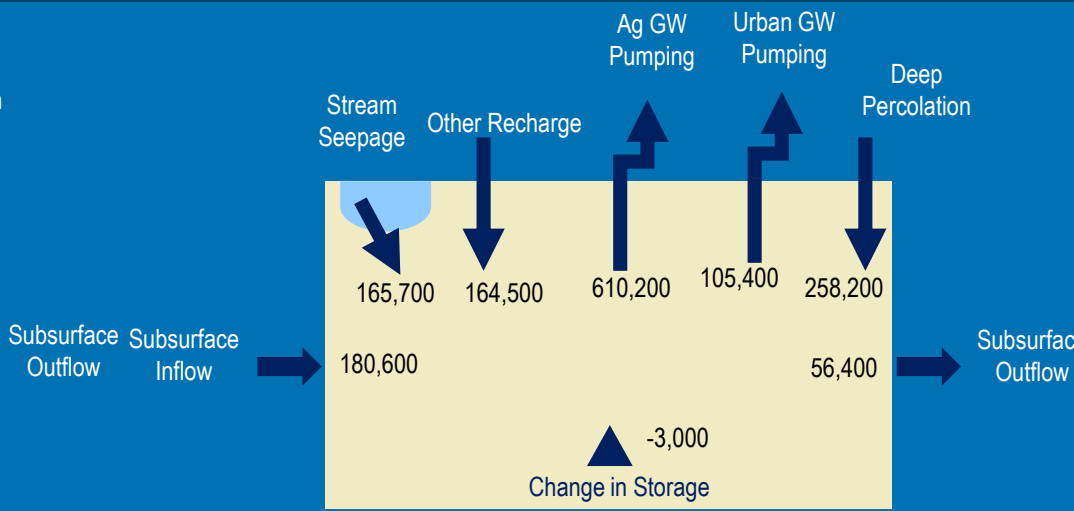


Projected Conditions



Sustainable Yield: Optimized GW Pumping Reduction

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

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Sustainable Yield Results

Optimized GW Pumping Reduction

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Projected GW Storage Deficit: 33,700 AFY

	Average Conditions	Recommendation (Low-End Estimate)
Projected GW Pumping	**801,200**	**728,400**
Ag Pumping	680,000	618,200
Urban Pumping	121,200	110,200
Sustainable GW Pumping	**715,600**	**650,500**
Ag Pumping	610,200	554,700
Urban Pumping	105,400	95,800
Actions / Projects Size to Achieve Sustainability	**85,600**	**77,900**

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Putting Sustainable GW Pumping Estimate In Context

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Project and Management Actions:

- Projected Additional Urban Conservation or GW Offsets Needed: 10% (~14,000 AFY)
- Projected Ag Conservation or GW Offsets Needed in Core Area: 10% (~ 64,000 AFY)

Water Budget Planning Estimates

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Action Needed: Recommendation to the GWA Board to adopt the following planning assumptions in GSP development:

Groundwater Pumping Offset Needed to Meet Sustainable Conditions:

- Low-End Estimate (77,900 AFY)

Sustainability Indicators

Overview of Six Sustainability Indicators

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- Chronic Lowering of Groundwater Levels
- Reduction in Groundwater Storage
- Seawater Intrusion
- Degraded Water Quality
- Land Subsidence
- Depletion of Interconnected Surface Water

Approach in the GSP: Recommendation Summary

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Address in detail with thresholds and objectives:

- Chronic lowering of groundwater levels
- Degraded water quality
- Depletion of interconnected surface waters

Justify not establishing thresholds and objectives:

- Seawater intrusion
- Reduction in groundwater storage
- Land Subsidence

Approach in the GSP: Recommendation

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Seawater Intrusion

Justification: Seawater intrusion is not a potential risk in the ESJ Subbasin, as the Subbasin is not in a coastal area and seawater intrusion is not present. Groundwater quality conditions related to salinity will be addressed with the Water Quality indicator.

Approach in the GSP: Recommendation

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Reduction in Groundwater Storage

Justification: It is not reasonable to expect that the available groundwater in storage would be exhausted within any foreseeable time period.

- >50 MAF fresh groundwater in storage (>50 MAF)
- Cumulative change in storage of 0.91 MAF over 20 years

Sustainability in the Subbasin related to groundwater storage volume is driven by the groundwater level indicator, which primarily relates to the ability of infrastructure to economically access groundwater. Groundwater elevation can be used as a proxy for subsidence because GSAs can actively manage groundwater levels.

Approach in the GSP: Recommendation

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Land Subsidence

Justification: There is potential for land subsidence in only a small portion of the ESJ Subbasin where Corcoran Clay exists, and groundwater levels in these areas are typically high. Historical groundwater levels have been protective against undesirable results. Groundwater elevation can be used as a proxy for subsidence because GSAs can actively manage groundwater levels. With groundwater elevation monitoring happening as part of the groundwater elevation Sustainability Indicator, separate and distinct thresholds and objectives are not needed for land subsidence.

Sustainability Indicators

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Action Needed: Recommendation to the GWA Board to address the following sustainability indicators: groundwater elevation, water quality, interconnected surface and groundwater.

Policy decision will go to the GWA Board in April.

Monitoring, Measuring, and Model Refinements

Monitoring, Measuring, and Model Refinements

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- Monitoring and reporting
- Data collection and analysis
- Administrative actions
- 5-year update
- DMS updates
- Public outreach
- Website maintenance
- Legal support
- Grant writing

Monitoring, Measuring, and Model Refinements: Recommendation

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Recommendation: Monitoring and measuring for thresholds (including groundwater levels and groundwater quality) continue to be at the Subbasin scale as opposed to the local GSA scale. Model refinements will be needed with increased monitoring information coming in and further detail into refining water budgets for future project information. It is recommended these elements take place at the Subbasin level and a financing plan for conducting these activities be developed with appropriate cost share allocations after the final GSP is approved.

Monitoring, Measuring, and Model Refinements

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Action Needed: Recommendation to the GWA Board to conduct monitoring, measuring, and modeling at the basin-scale subject to a financing plan that will be developed after the GSP is approved.

Policy decision will go to the GWA Board in April.

Project Implementation

Project Implementation: Discussion

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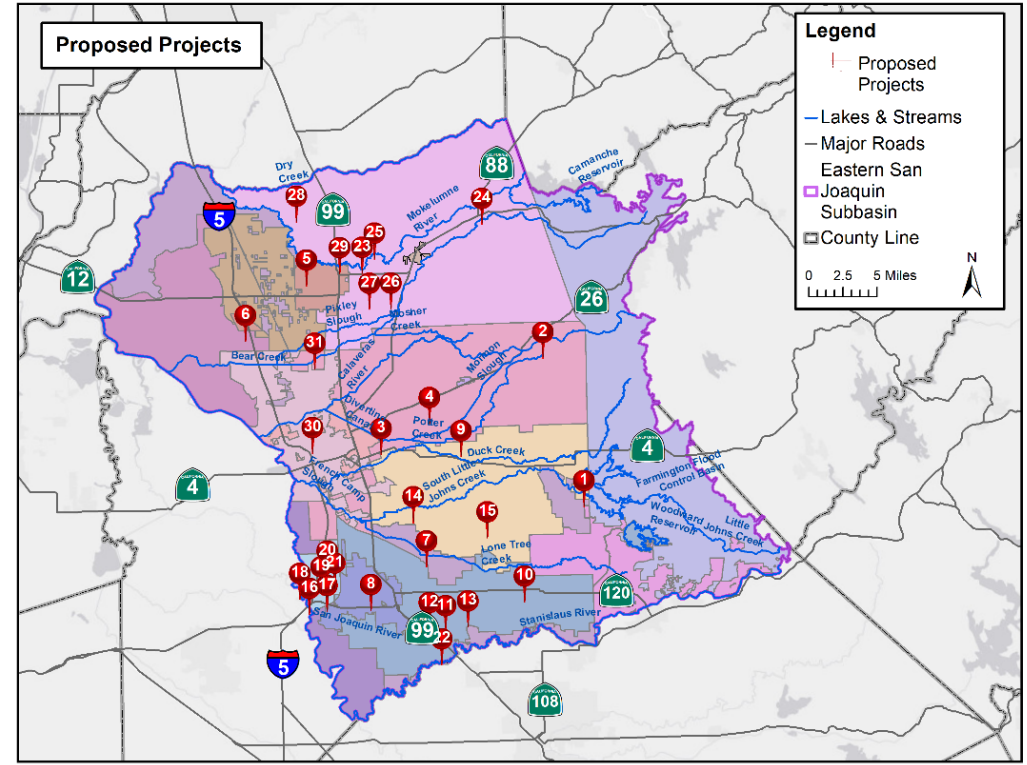

Project Implementation: Recommendation

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Recommendation: That projects in the GSP Implementation Plan be developed and implemented at the GSA level. This allows for GSAs to lead projects in their area and have full responsibility and authority regarding those projects as they typically do as an agency. GSAs with projects in the GSP may work with additional parties in the development of their projects.

Project Implementation

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Action Needed: Recommendation to the GWA Board that projects in the GSP Implementation Plan be developed and implemented at the GSA level, with the option for GSAs with projects in the GSP to work with additional parties in the development of their projects.

Policy decision will go to the GWA Board in April.

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: Recommendation

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Recommendation: Use a mixture of supply-side projects and demand-side management actions in the implementation plan to achieve sustainability consistent with community values.

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 April.

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

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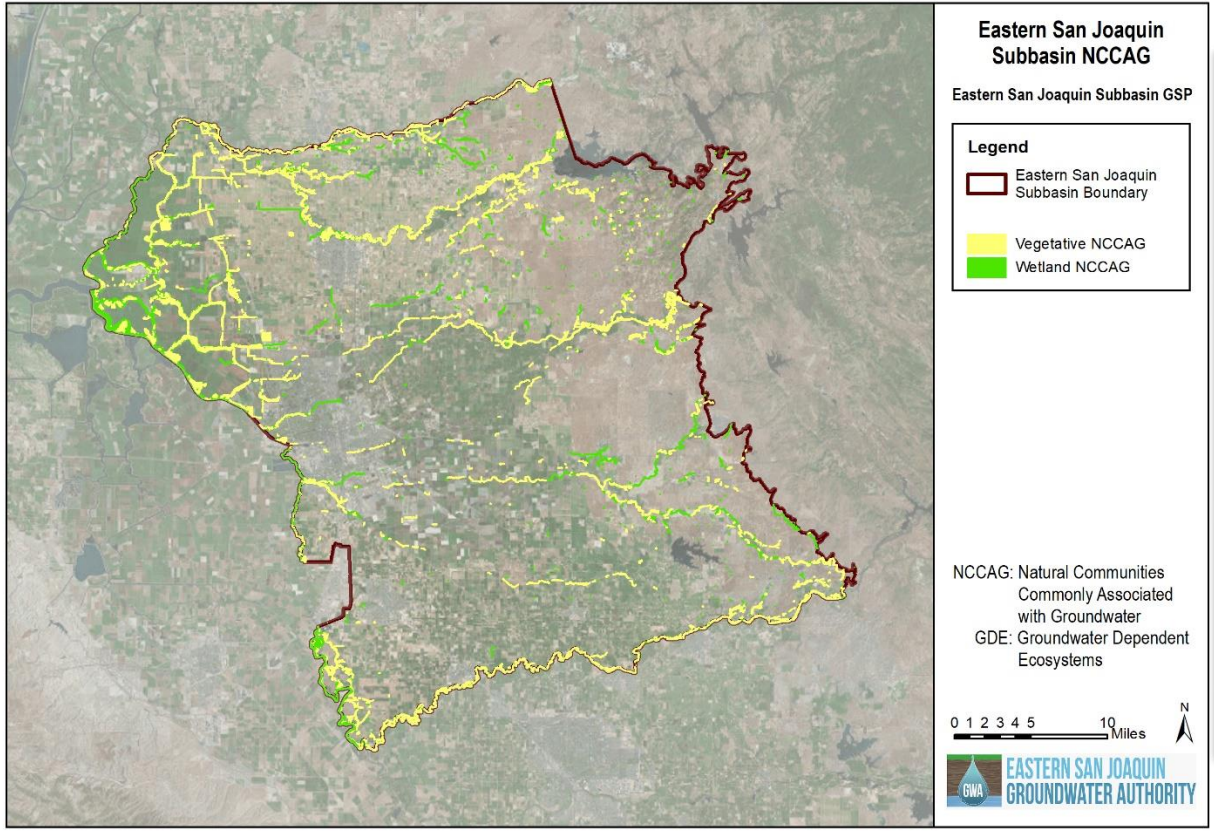

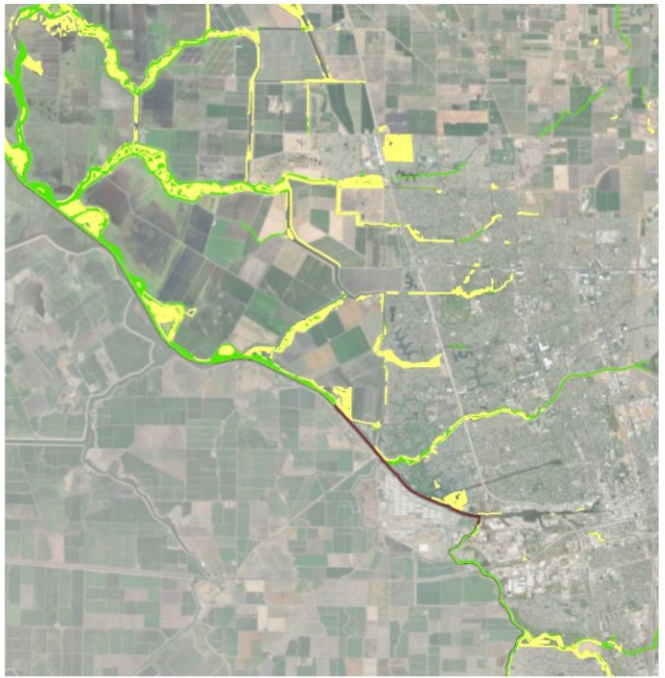

NCCAG Dataset: Potential GDEs and Other

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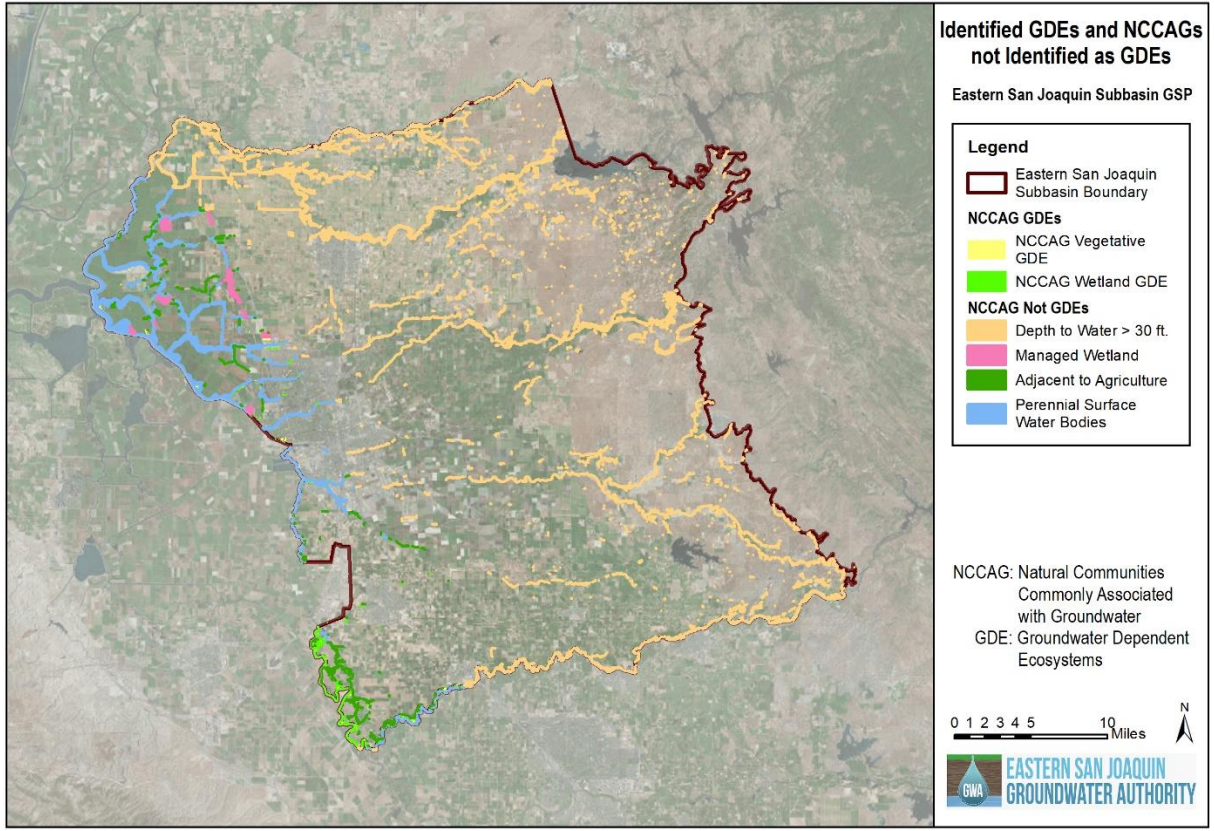

Buffers Used

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

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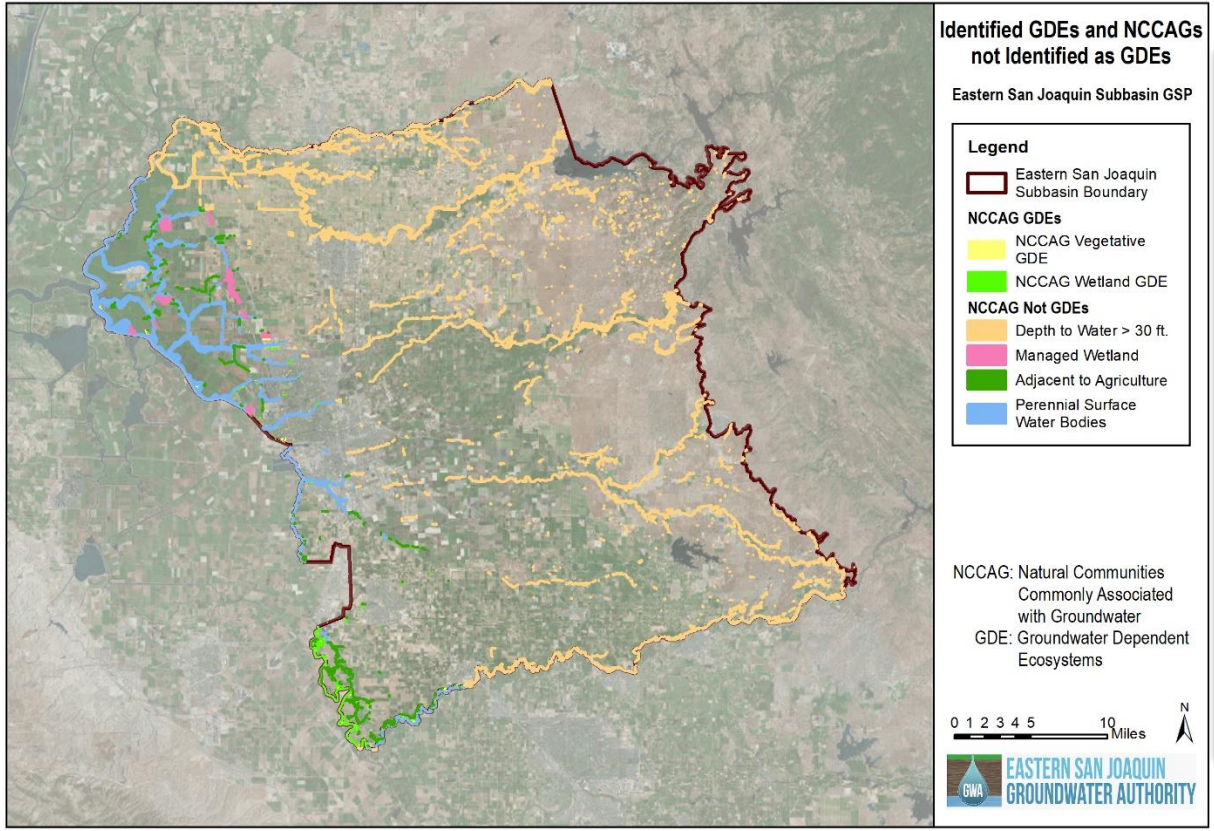

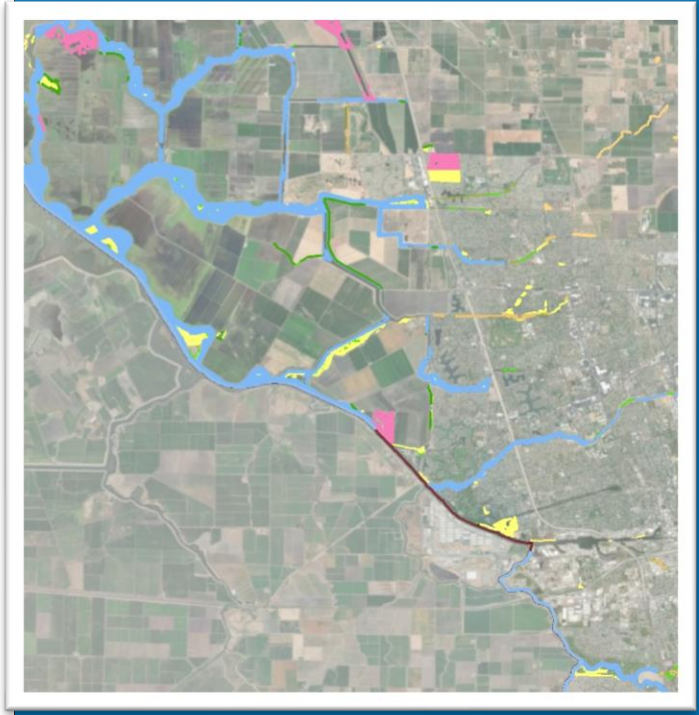

Identified Potential GDEs

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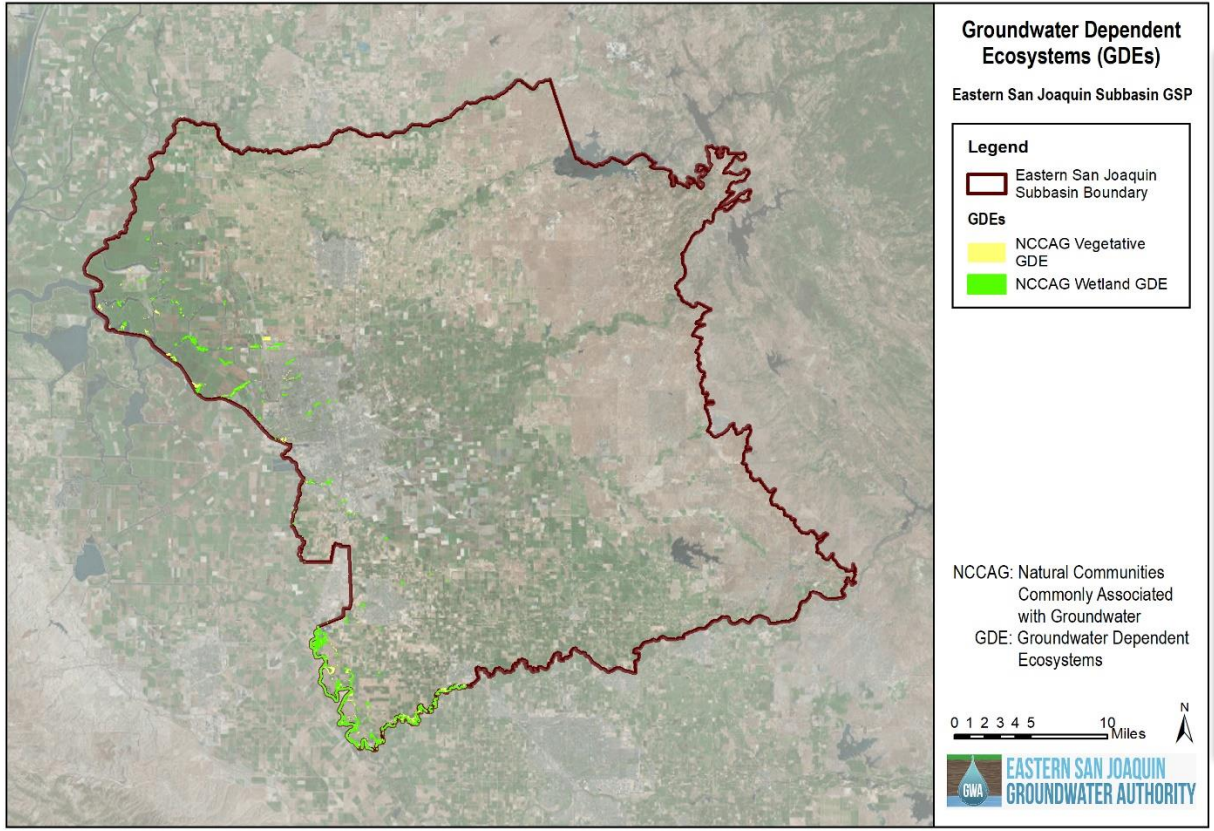

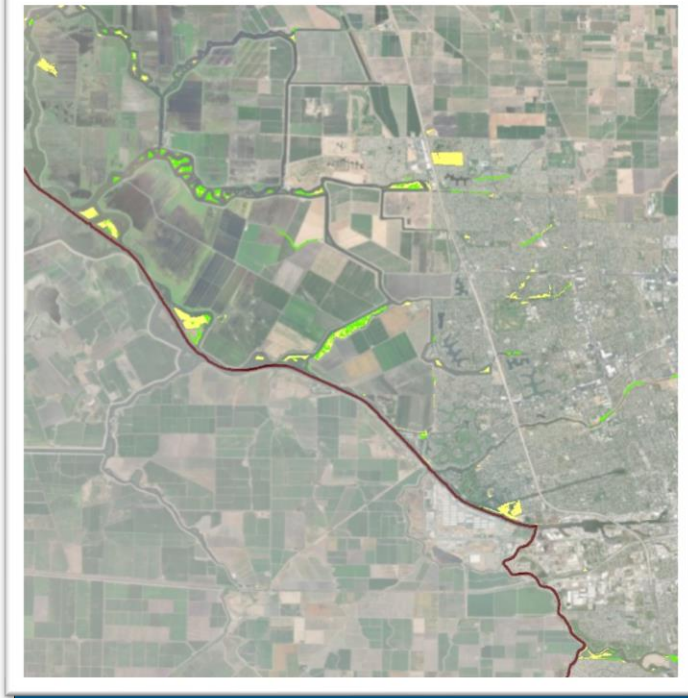

April Agenda Items

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- Water Budgets
- Sustainability Indicators
- Monitoring Network


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