EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY

ESJ Public Meeting – Process

August 29, 2018

Major Tasks and Timeline

GSP Development Tasks

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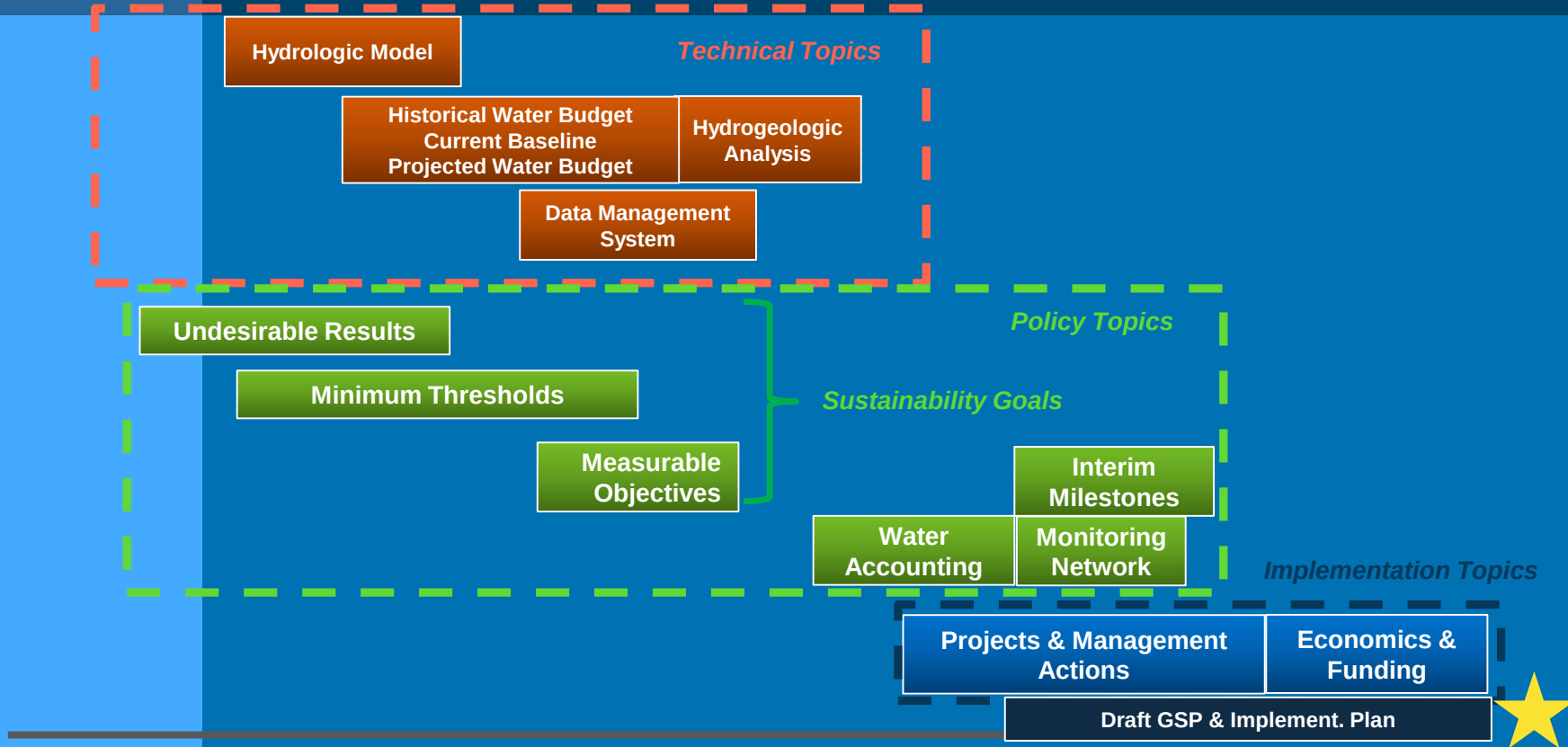

Stakeholder Involvement

Multiple Types and Levels of Stakeholders will be Involved

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- JPA and GSA Leadership – overall authority for decision-making, GSP development and implementation (monthly meetings open to the public)
- Advisory Committee – advise JPA on plan development (monthly meetings open to the public)
- Groundwater Sustainability Workgroup – diverse basin interests and provide input to plan development, Advisory Committee, and JPA (monthly meetings open to the public)
- General public – awareness and understanding; emphasis on engagement of DACs (quarterly meetings)

Anticipated Information Flow

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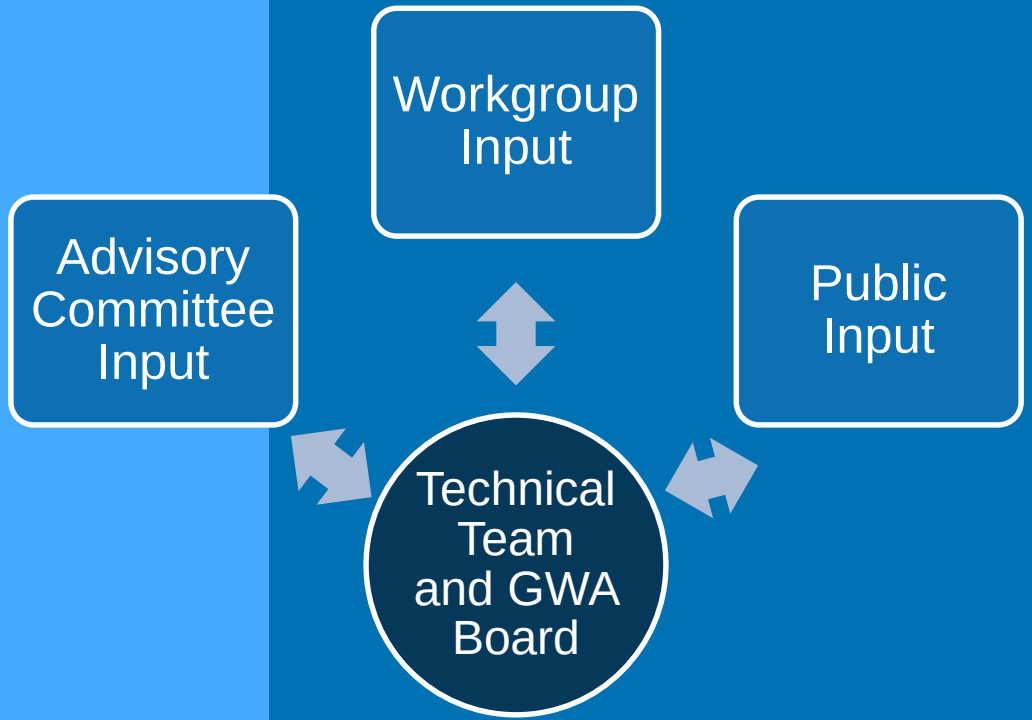

Information flow provides the Groundwater Sustainability Workgroup with an opportunity to comment on working draft concepts and documents with adequate time to incorporate feedback

Local Stakeholder Interests are Represented in the Groundwater Sustainability Workgroup

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23 members representing diverse categories of interest

- Groundwater Users
- Community/Neighborhood
- Agricultural
- Environmental
- Flood Management
- Native American Tribes
- Disadvantaged Communities
- Institutional
- Business

Workgroup Member Characteristics

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Workgroup members applied and were selected based on the following criteria.

- Represent category/categories of interest
- Demonstrated commitment to community service, civic leadership or prior experience serving on similar task force or advisory committee
- Understanding of water issues
- Interest in learning about and providing comments on the GSP
- Willingness to commit to approximately monthly meetings
- Share information with their respective organizations and bring forth questions/comments back to the project team

Groundwater Sustainability Workgroup Members

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- 2Q Farming
- Calaveras County Resource Conservation District
- Catholic Charities of the Diocese of Stockton
- The Hartmann Law Firm/Advisory Water Commission
- San Joaquin Audubon
- Sierra Club
- San Joaquin Farm Bureau Federation
- Trinchero Family Estates and Sutter Home Winery
- South Delta Water Agency
- San Joaquin County Environmental Health Department
- Manufacturers Council of the Central Valley
- The Wine Group
- J.R. Simplot Co.
- Lima Ranch
- University of the Pacific
- Sequoia ForestKeeper
- Ag Business – Farmer
- The Environmental Justice Coalition for Water
- Spring Creek Golf & Country Club
- Machado Family Farms
- California Sportfishing Protection Alliance
- Restore the Delta
- PUENTES

How is Workgroup Feedback and Input Incorporated?

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- ✓ Comments reflected in work and meeting notes included in plan
- ✓ Standing agenda item at advisory committee and JPA meetings
- Other ideas?

Where Are We In Plan Development?

Major Plan Focus Areas

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Develop concept of what sustainability means for the Subbasin and identify high priority values around groundwater

Identify undesirable results occurring now or in the past

Develop minimum thresholds for each sustainability indicator

Develop and refine projected water budget

How to the Pieces Fit Together?

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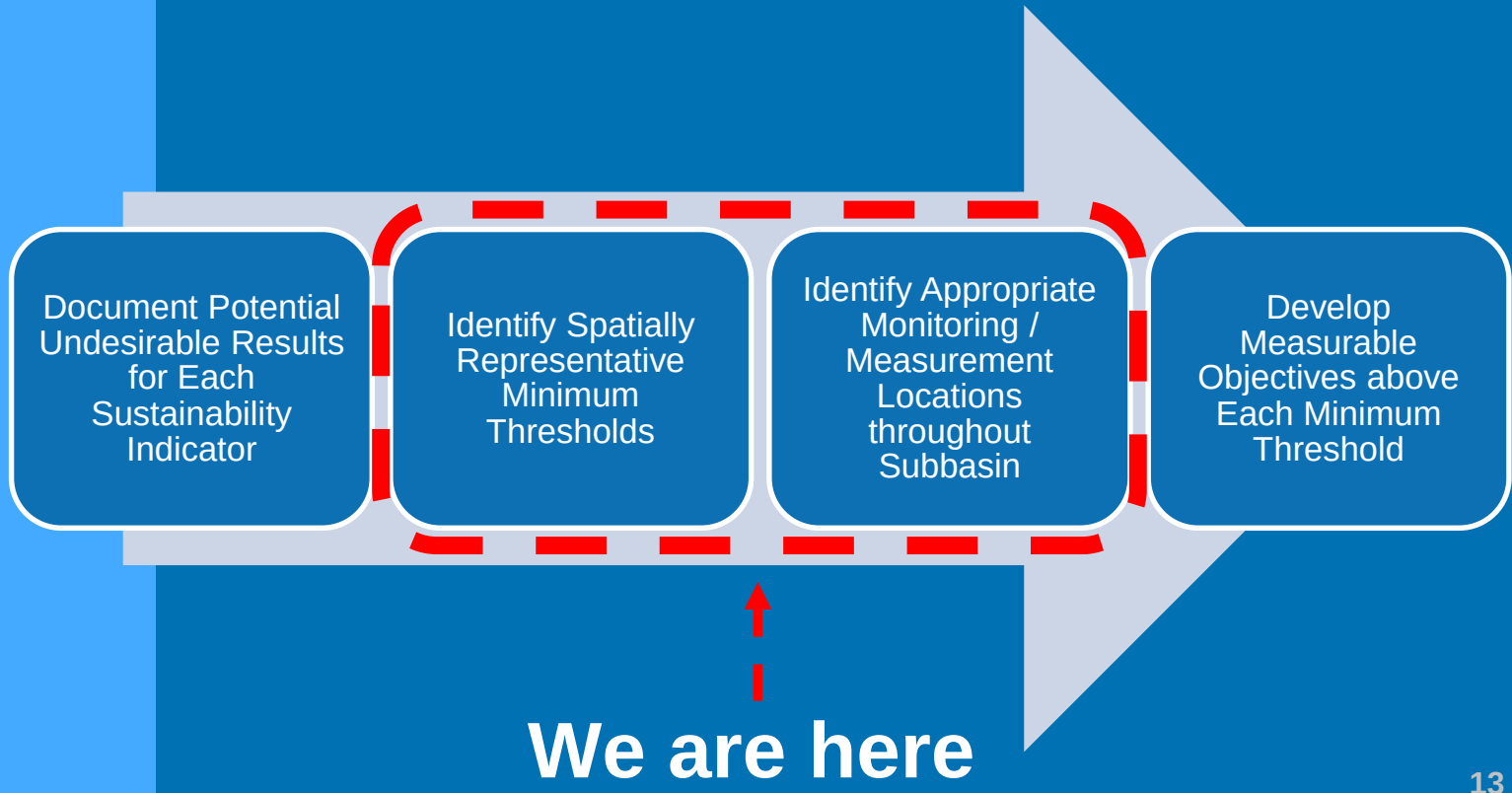

Six Sustainability Indicators to be Addressed

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Current areas of focus

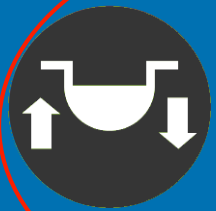
Chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply

Significant and unreasonable degraded water quality

Significant and unreasonable reduction of groundwater storage

Significant and unreasonable land subsidence

Significant and unreasonable seawater intrusion



Depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water

Sustainability Indicators Update

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Progress has been made on approach for developing minimum thresholds all six sustainability indicators

- Groundwater elevations will be the most important thresholds for the Subbasin – we started with those, and they will require the most work.

Developing Minimum Thresholds for GW Elevation is Iterative

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What Comes Next?

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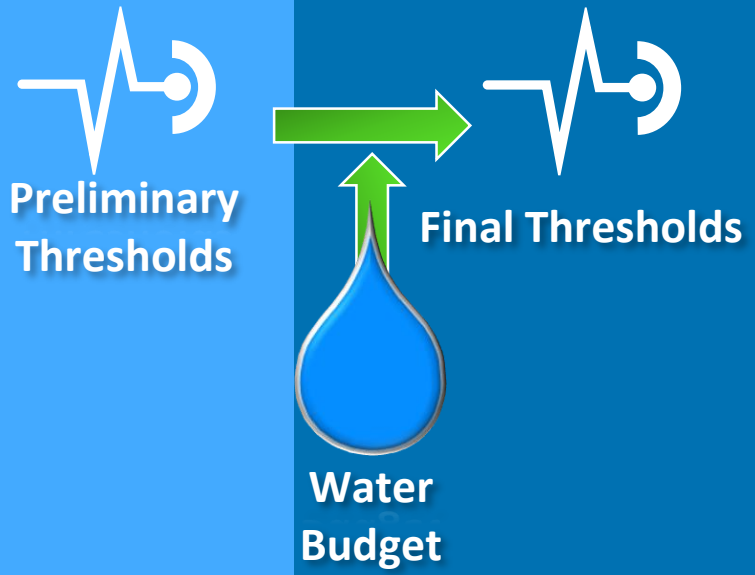

- The Projected Water Budget will be used to understand average sustainable pumping rates basin-wide
- Projects and Management Actions need to be identified to include supply and demand-side measures to achieve sustainability
- Depending on rate of project implementation, groundwater elevation thresholds may need to be adjusted

Water Budget

What is a Water Budget?

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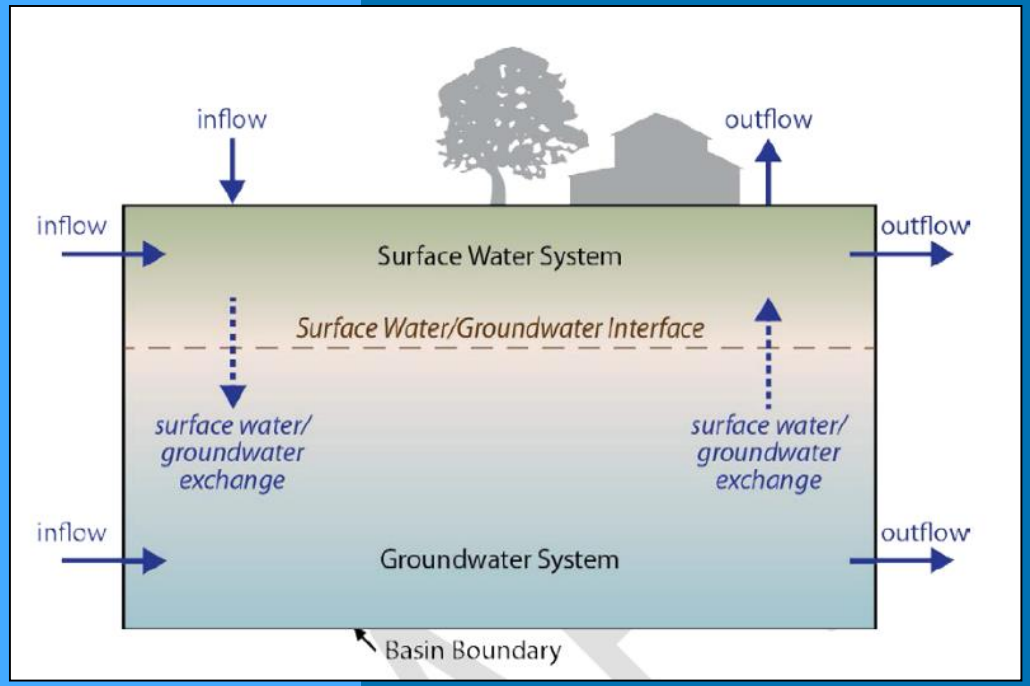

A Water Budget is an accounting of the total groundwater and surface water entering and leaving a groundwater basin.

A Water Budget Operates like a Bank Account

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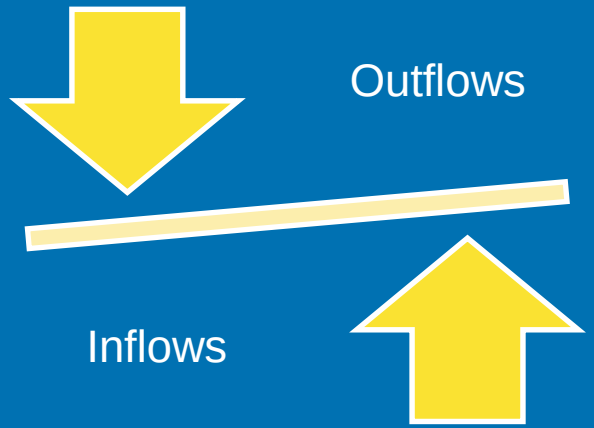
Inflows (supplies) and outflows (demands) are tracked and compared over time to identify change in amount of water stored.



Water Budgets Quantify the Movement of Water

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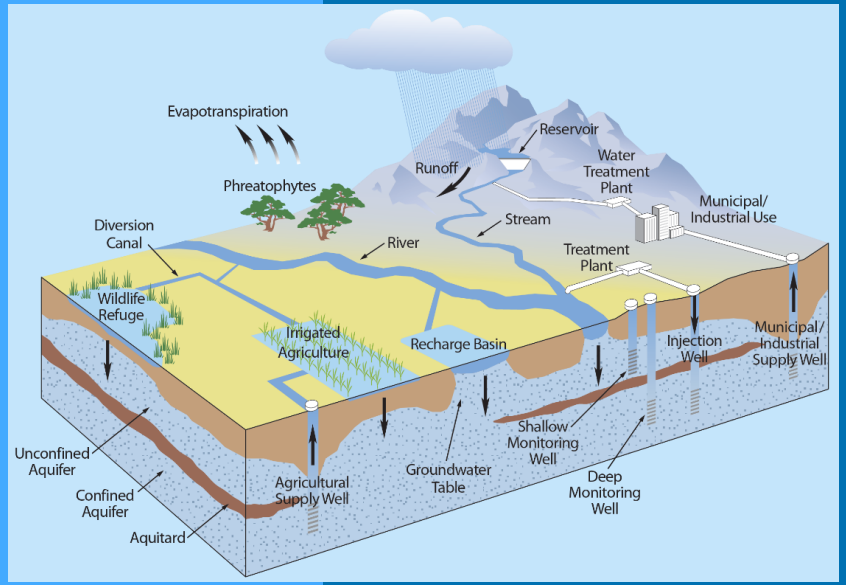

A Water Budget takes into account the storage and movement of water between the four physical systems of the hydrologic cycle:

- Atmospheric system
- Land surface system
- River and stream system
- Groundwater system

Why are Water Budgets Important?

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- "You can't manage what you don't measure"
- A series of ongoing negative balances can result in long-term conditions of overdraft (the ESJ Subbasin is currently classified as "critically overdrafted")
- Carefully calculated Water Budgets increase the likelihood that planned projects and management actions will achieve the intended outcome within the intended timeframe

The Water Budget for the ESJ GSP Pulls Combines Land and Water Use

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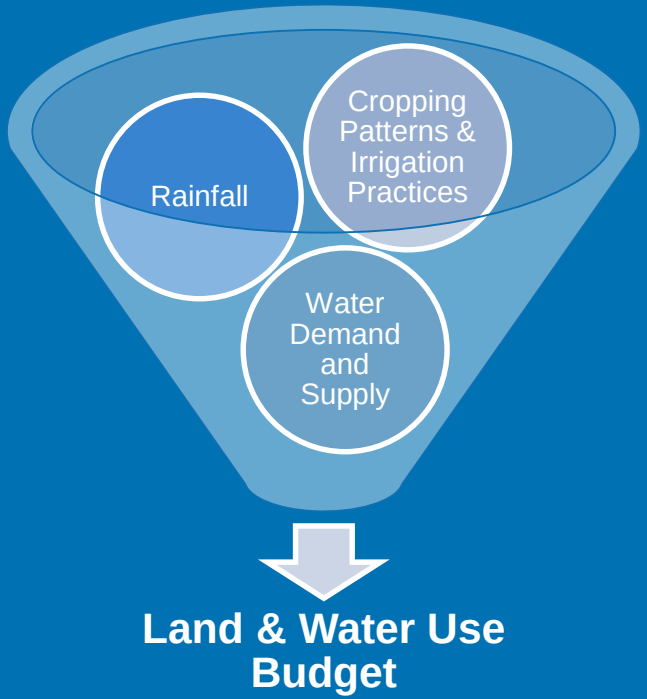

Water Budget Time Frames

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Historical Water Budget

Uses historical information for temperature, precipitation, water year type, and land use going back a minimum of 10 years.

Current Conditions Baseline

Uses the most recent data on population, land use, temperature, year type, and hydrologic conditions projected out over 50 years of hydrology.

Projected Water Budget

Uses estimated future population growth, land use changes, climate change, and sea level rise projected out over 50 years of hydrology.

Water Demands are Based on Urban and Agricultural Water Use Estimates

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- Urban water use based on:
  - Population
  - Water Use Per Person
  - Agency projections
- Agricultural water use based on
  - Crop type and acreage
  - Soil conditions
  - Irrigation practices
  - Hydrogeology and climate

Urban Water Demand: Changes in Use Over Time

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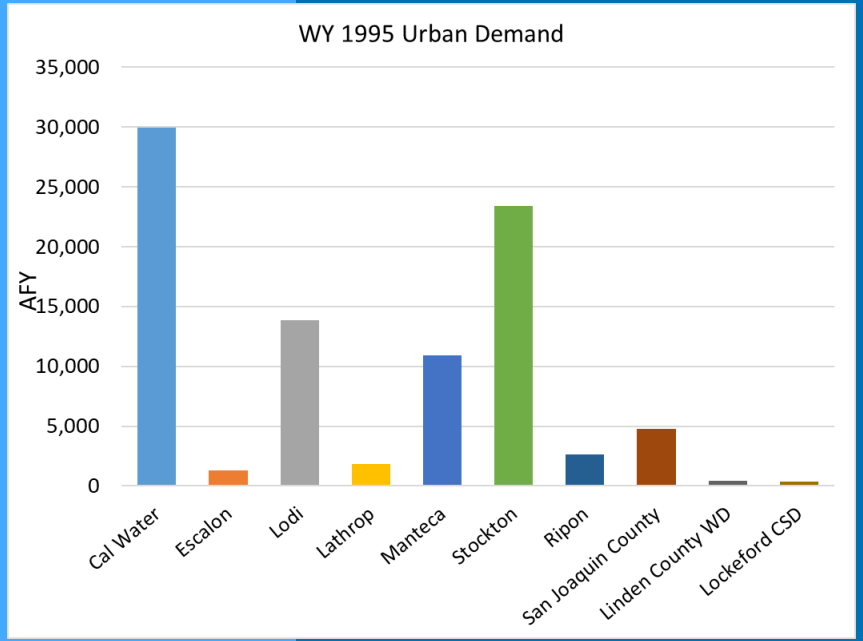

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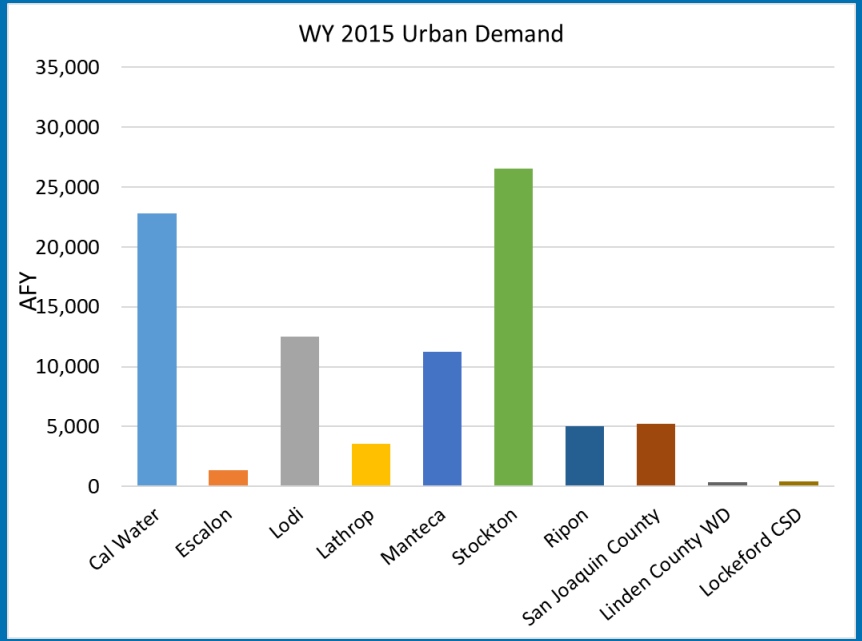

2015

Estimated Annual Urban Land and Water Use Budget

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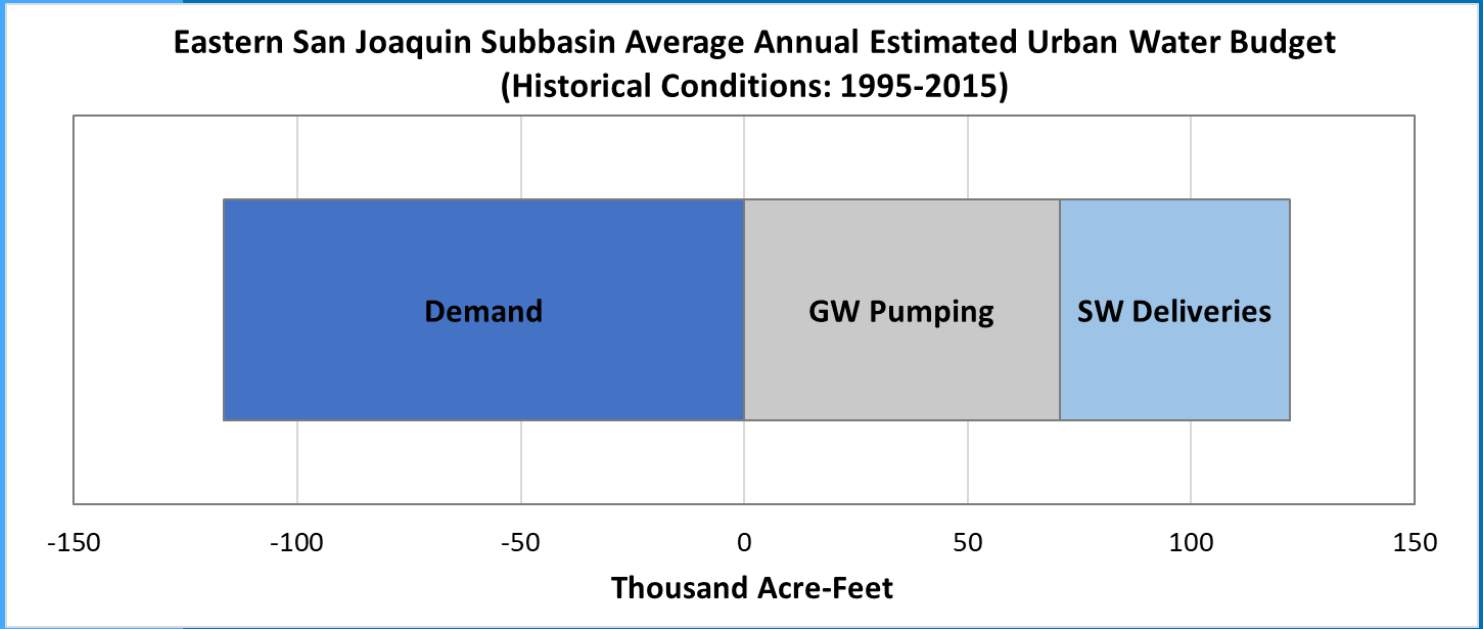

Historical Agricultural Water Demand: Changes in Crop Type Over Time

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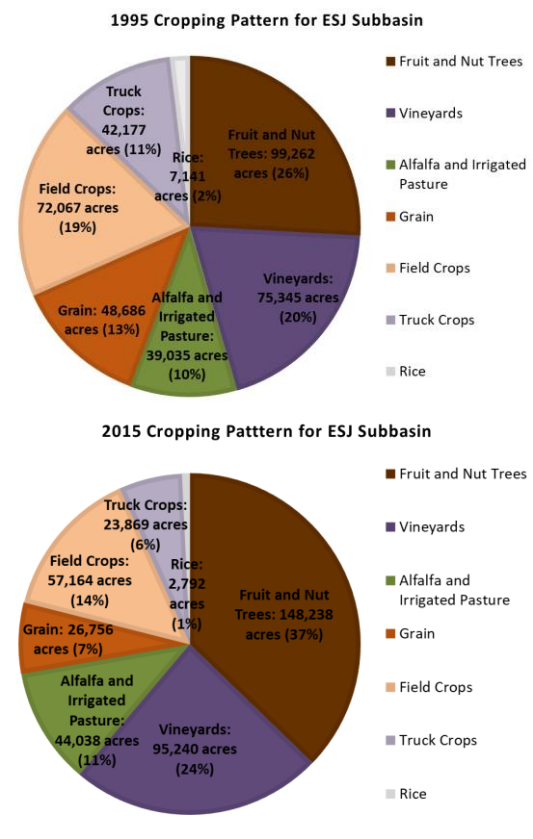

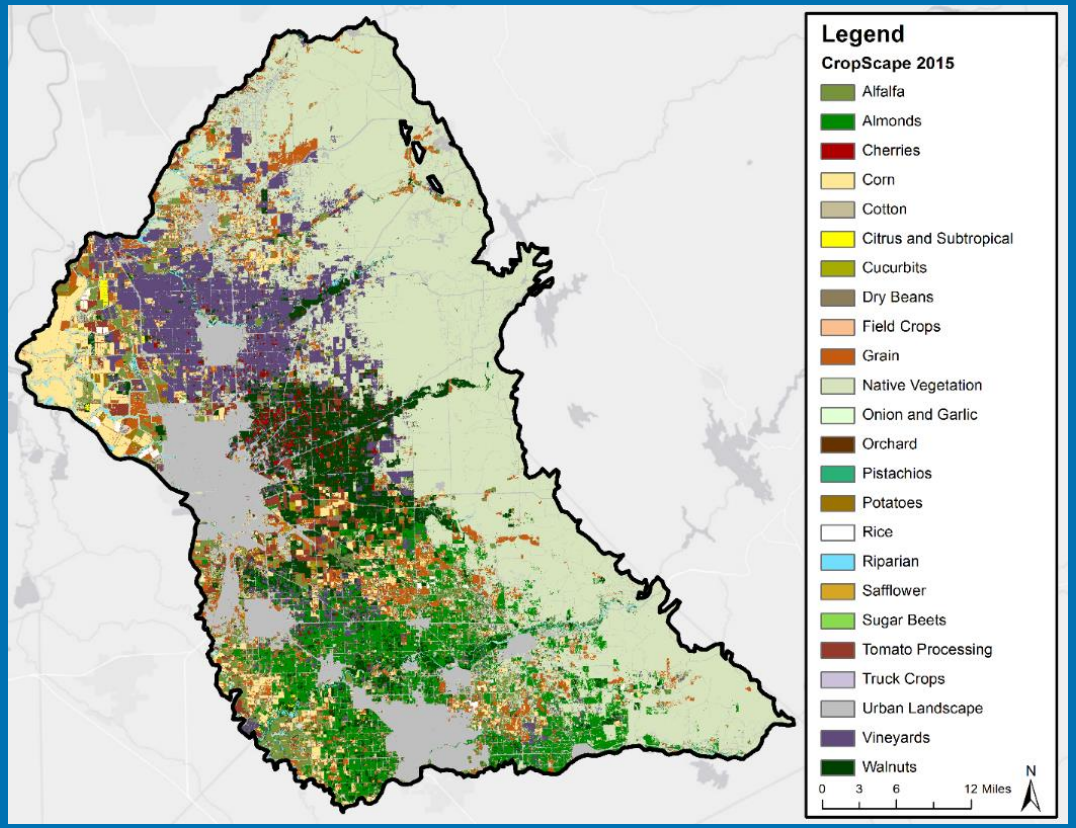

Estimated Annual Agricultural Land and Water Use Budget

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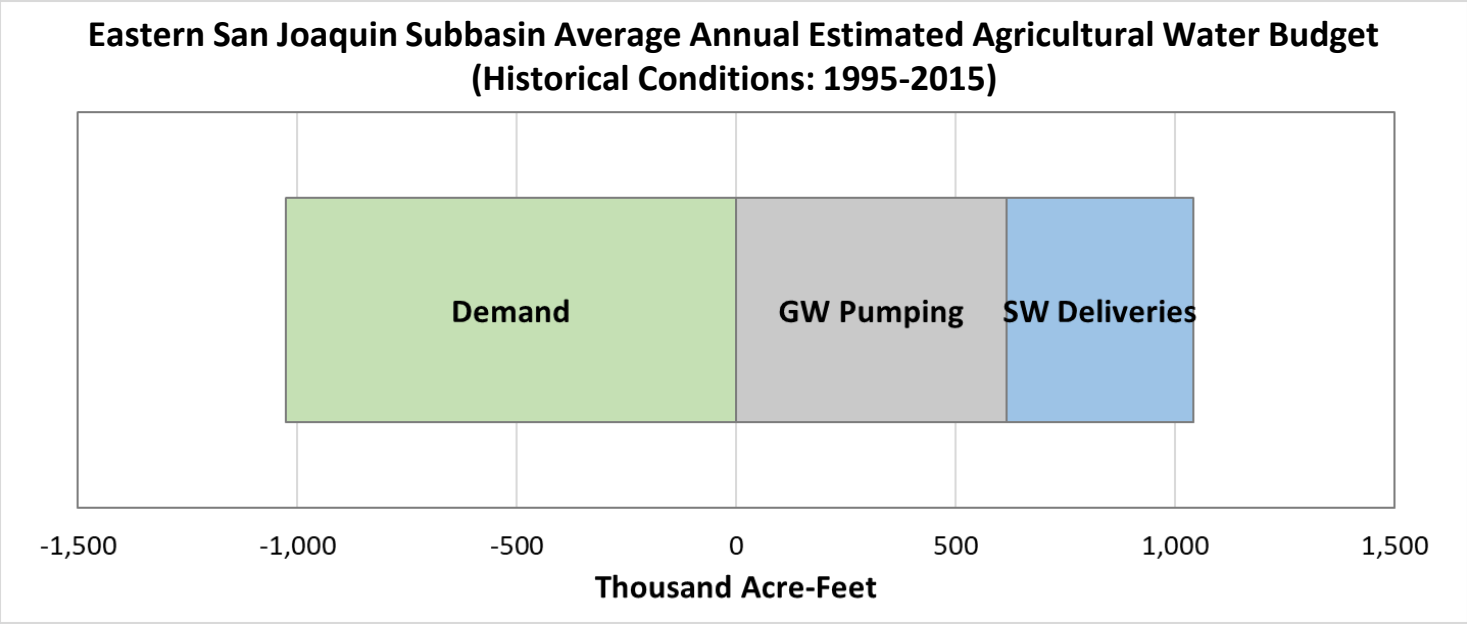

Estimated Annual Groundwater Budget

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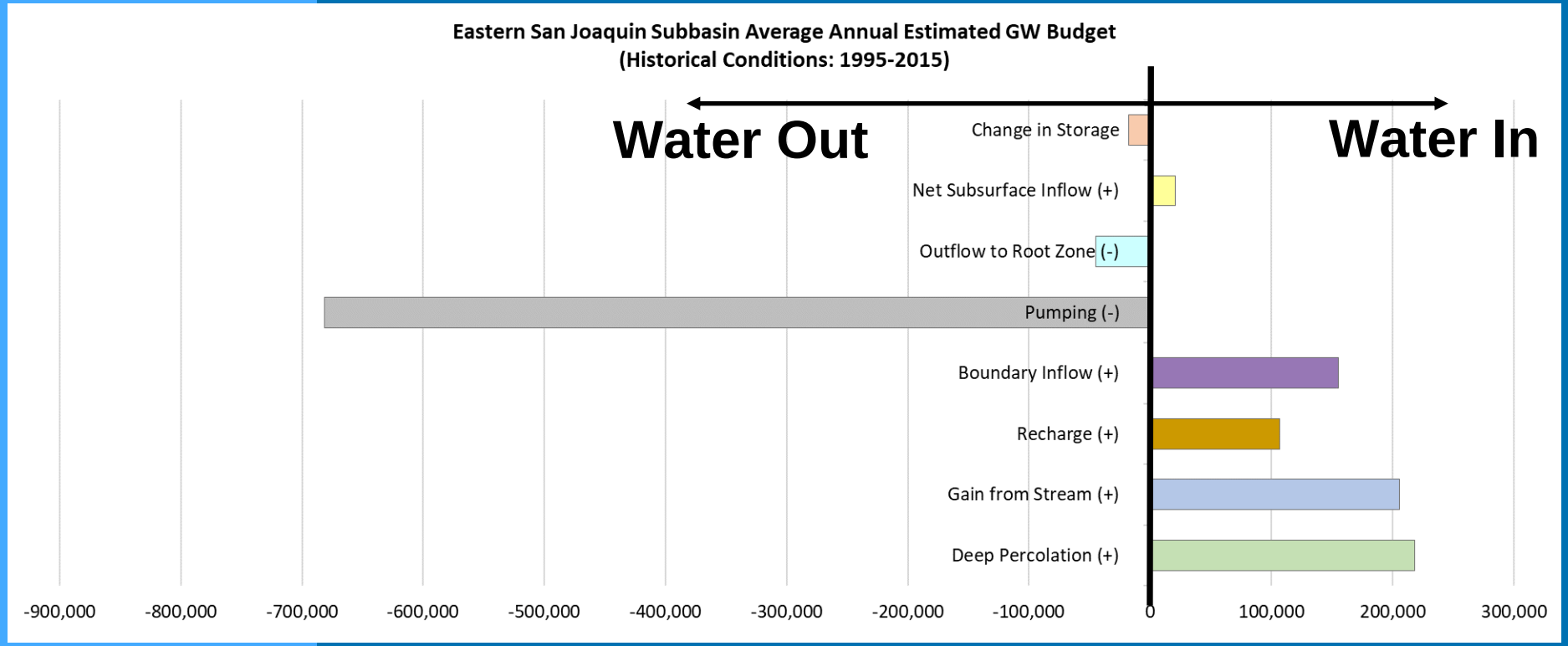

Projected Water Budget Approach

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Step 1	Identify future demands through 2040
Step 2	Identify supply projects with yield and timing
Step 3	Develop water budget from “current” (2016) to 2040

Projected Future Conditions: Land Use and Cropping Patterns

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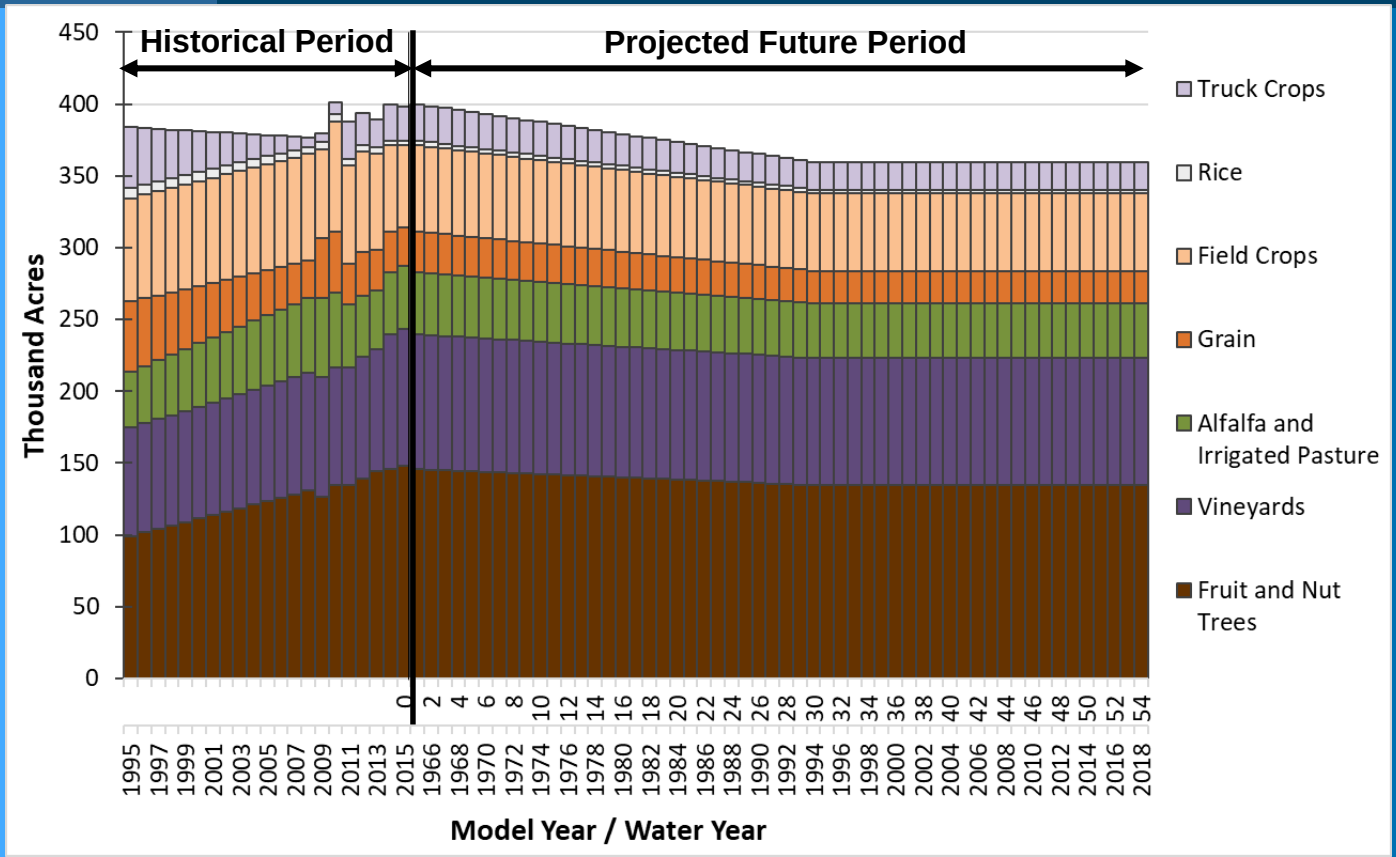

Projected Future Conditions: Estimated Population and Water Use

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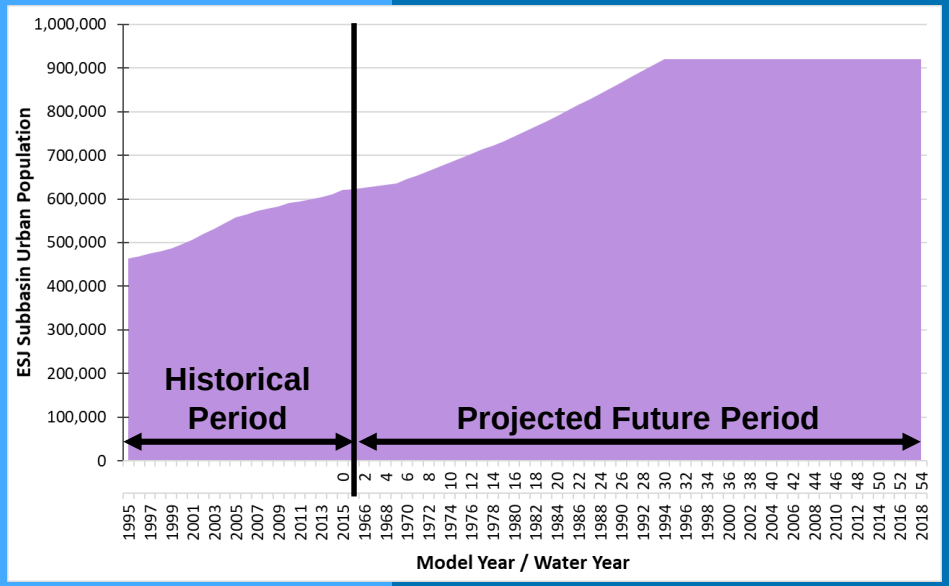

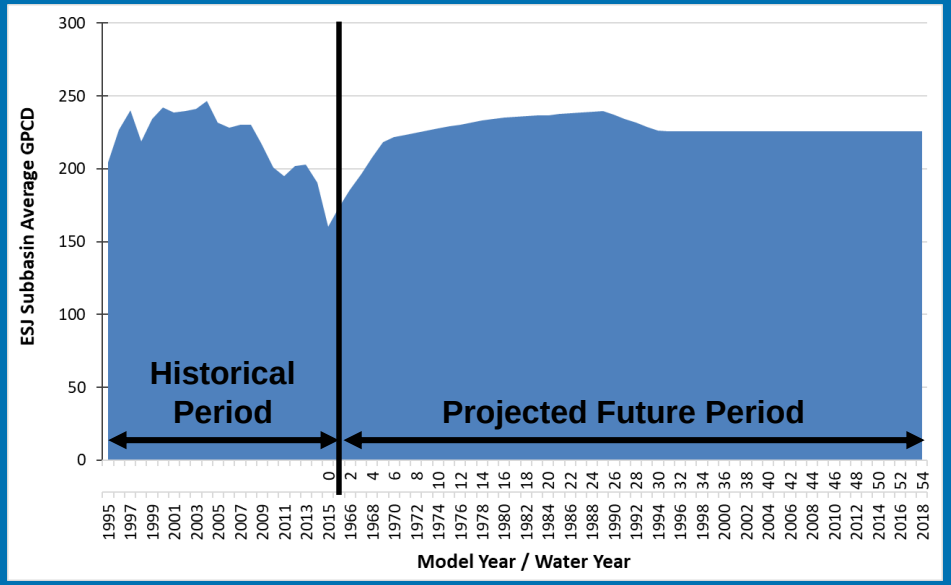

**GPCD = gallons per capita per day*

Projected Future Conditions: Estimated Surface Water Deliveries

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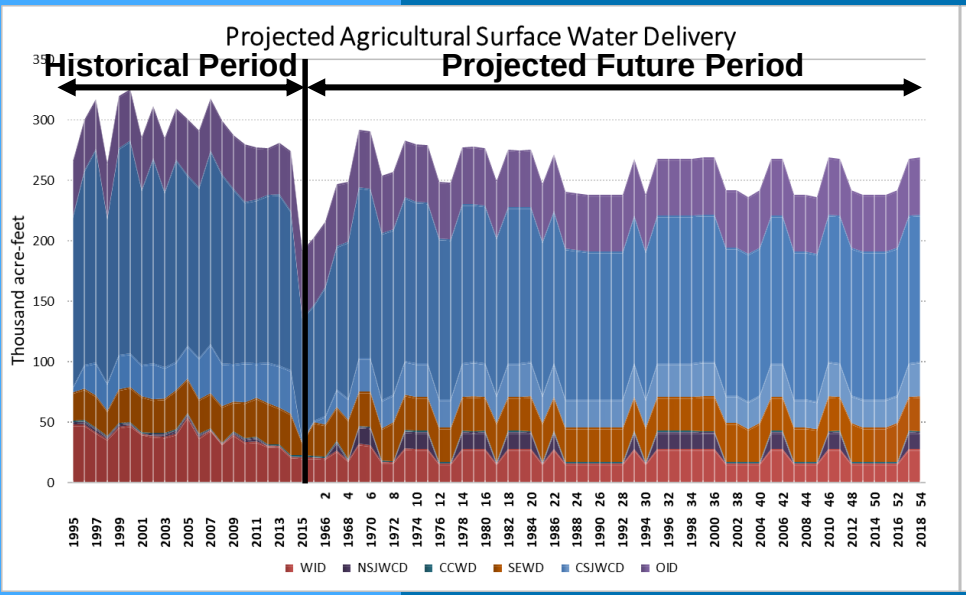

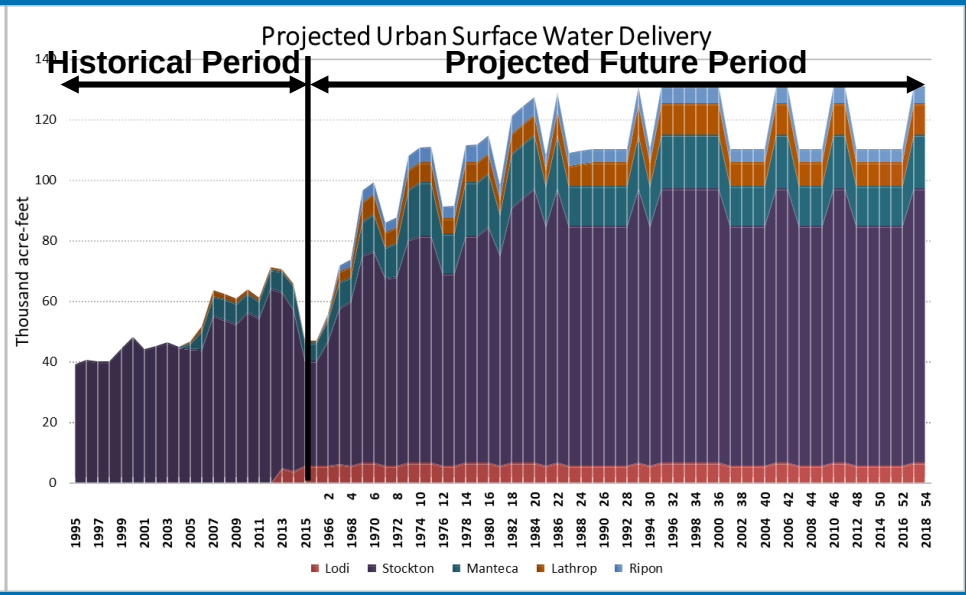

Hydrogeologic Conceptual Model (HCM)

HCM Development – Basic Process

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The process of creating cross sections and other HCM figures comprises 3 basic steps.

Wells and Logs

- Obtaining well logs from various sources.
- Comparing spatial distribution of wells for usefulness in HCM.

Examining Data

- Documenting well log data, such as construction and lithological information.
- Organizing data for use in GIS software and DMS.

Figure Generation

- Producing cross sections and 3D figures of subsurface geology and groundwater conditions via GIS software.

Example HCM Cross-Section

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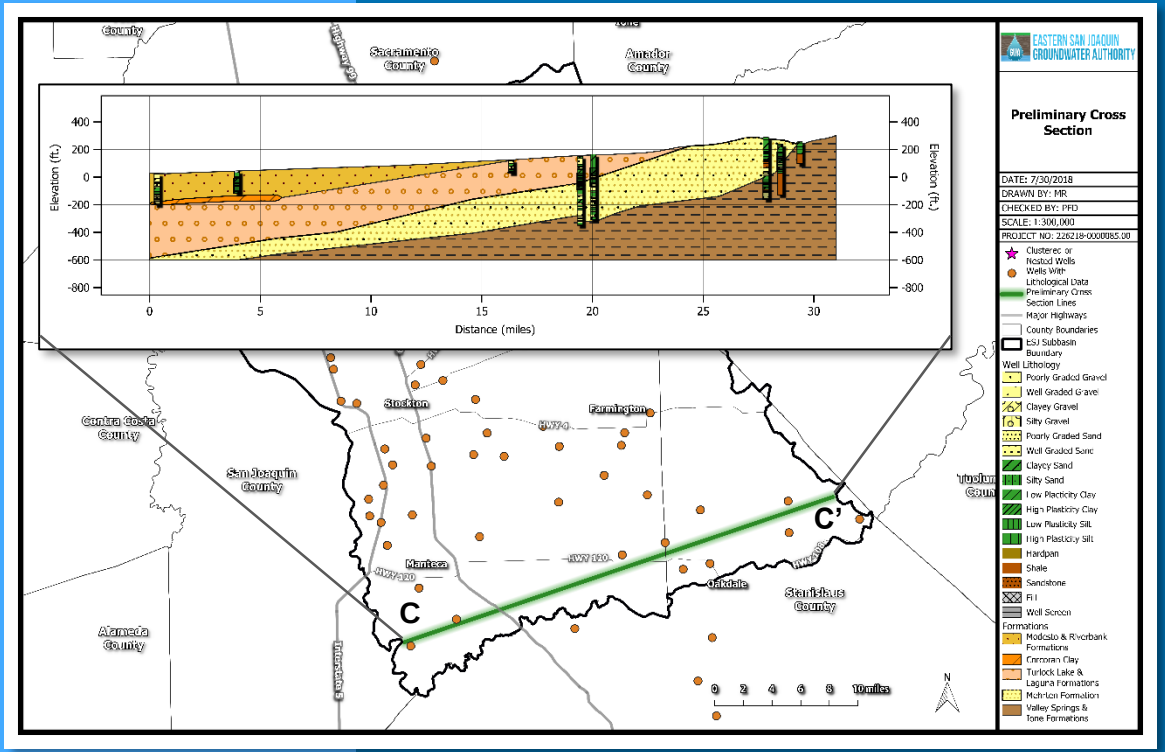

Cross sections show principal aquifers, aquitards, and stratigraphy

5 Preliminary HCM Cross-Sections Will be Developed for the Subbasin

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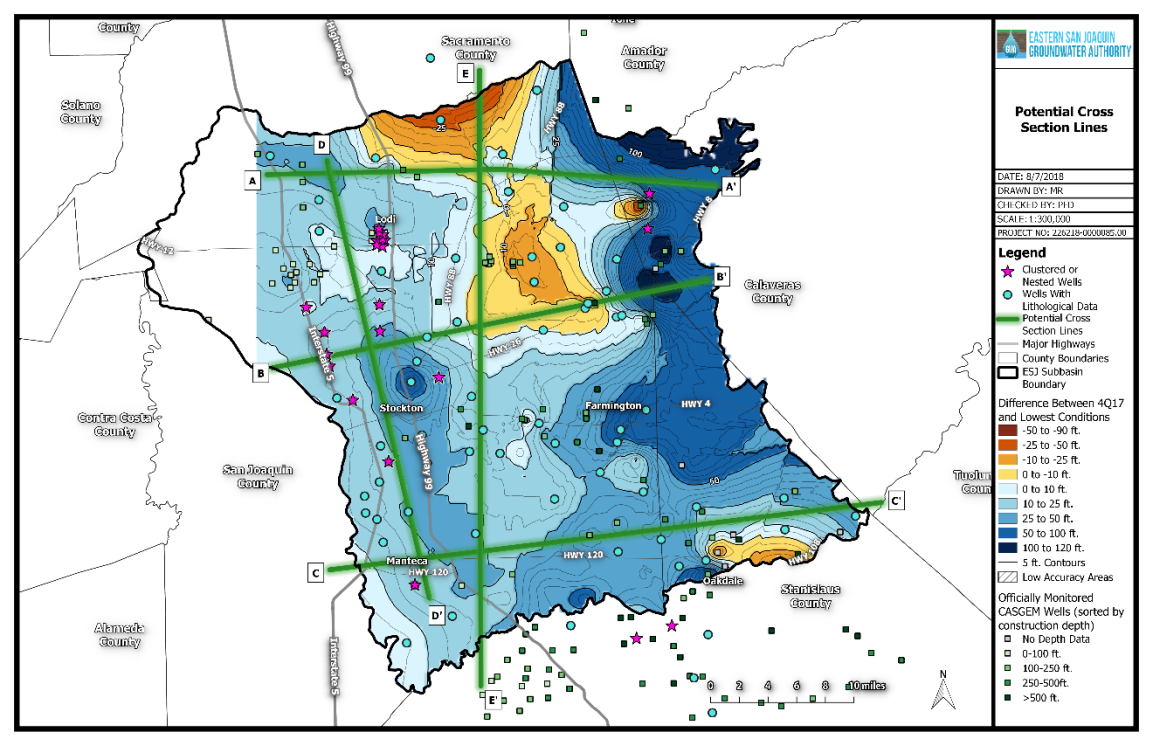

Cross-section lines were chosen based on the following characteristics:

- Spans the entire subbasin
- Proximity to an adequate number of wells with geologic and construction information
- Covers areas where current groundwater levels are lower than drought levels

GSP Includes a Plan to Fill Data Gaps

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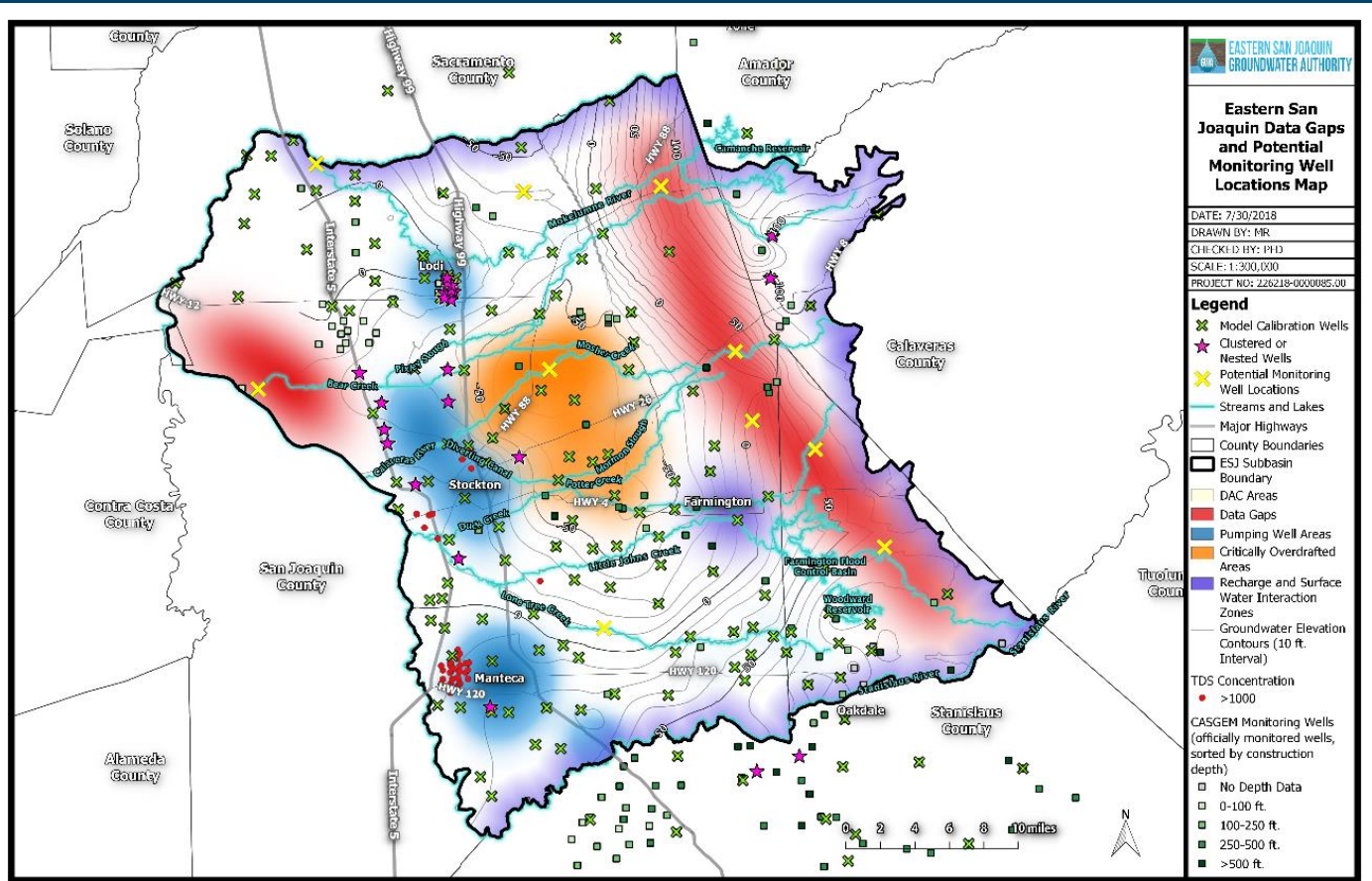
X: potential future monitoring well location



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