Brown AND Caldwell

Tuscan Aquifer INVESTIGATION

BUTTE COUNTY

Lower Tuscan Aquifer

Monitoring, Recharge & Data Management Project

Public Workshop

May 23, 2013

Presentation Overview

- Project Purpose
- Overview of the LTA Project
- Recharge Mechanisms and Aquifer Interactions of the LTA
- What's Next?
- Questions and Discussion

Project Purpose

- Things this study provided:
  - Improved understanding of infiltration in regions near foothill streams
  - Evaluation of surface water and groundwater interaction
  - Improved understanding of groundwater recharge to the LTA from streams, foothill areas, and other aquifers
  - Increased knowledge of hydrogeologic characteristics of the LTA
  - Enhanced groundwater monitoring well network
- Developed a sound scientific foundation advancing the understanding of the LTA hydrology

Project Purpose

- Things this study was not intended to do:
  - Determine the safe yield of the LTA, locally or regionally
  - Determine the storage capacity of the N. Sacramento Valley
  - Study recharge from the Sacramento and Feather Rivers
  - Update the Butte Basin IWFM model
  - Identify the subsurface extent of the Tuscan Formation
- New production wells were NOT installed
- Project is not connected to any water transfer programs

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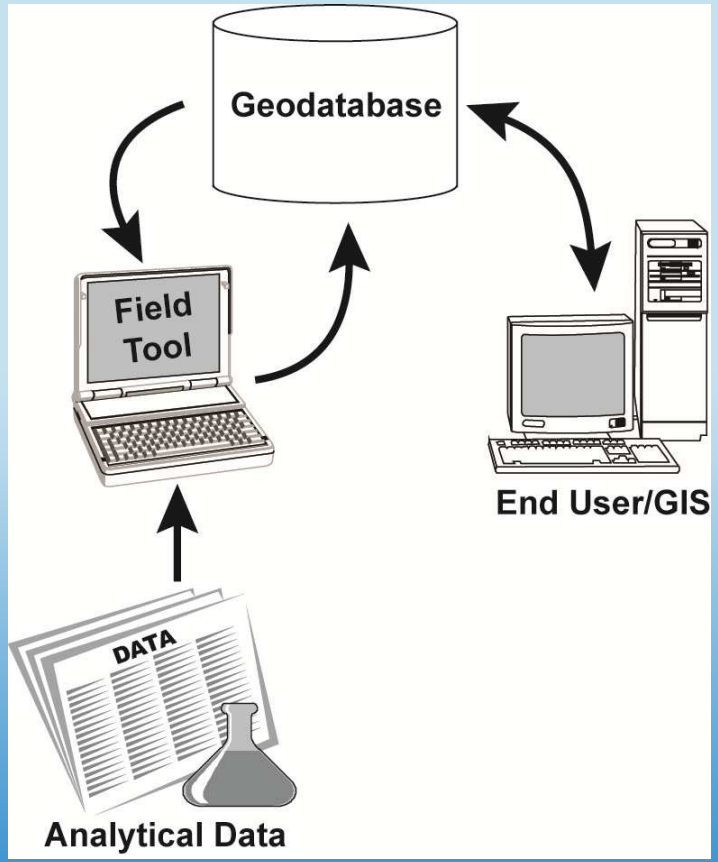
Constructed and Maintained GIS/Geodatabase



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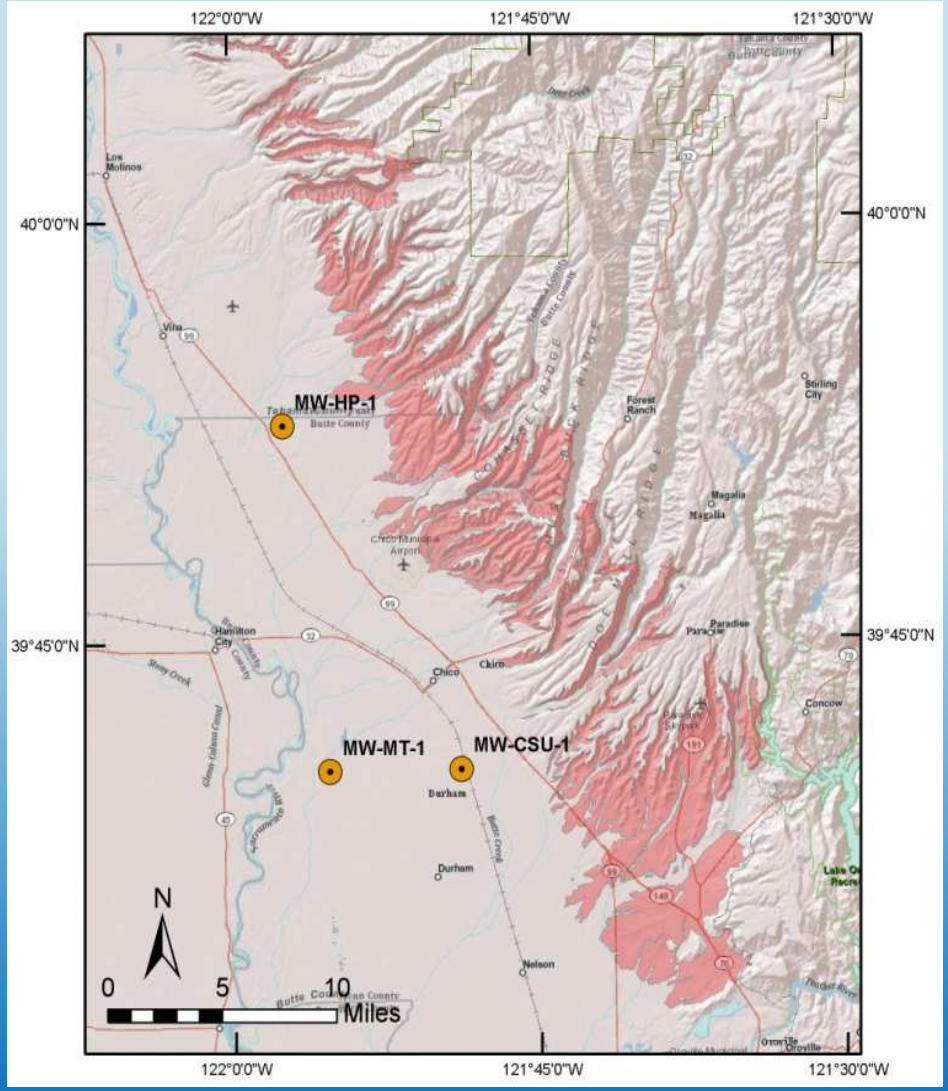
Installed 3 Monitoring Well Nests



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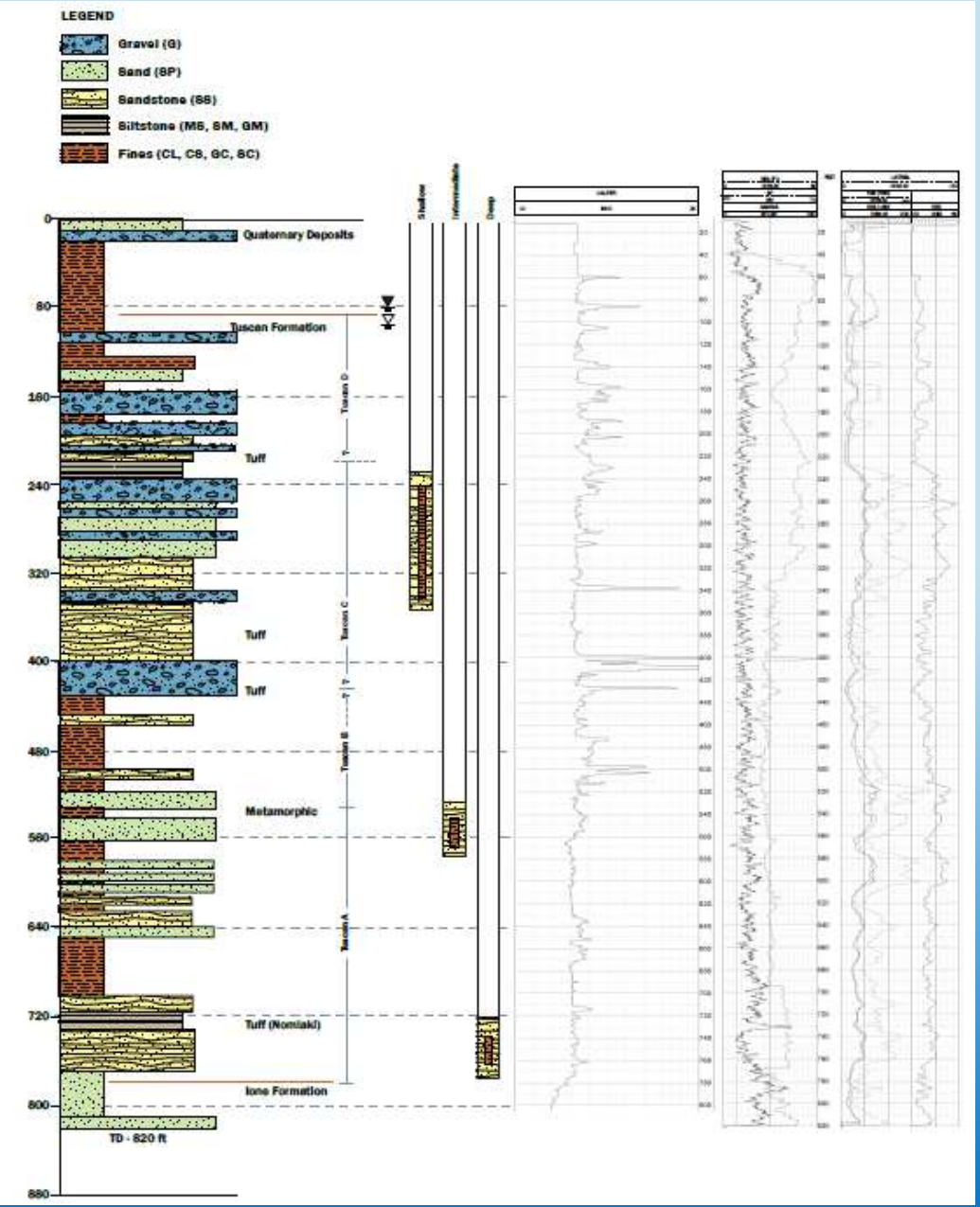

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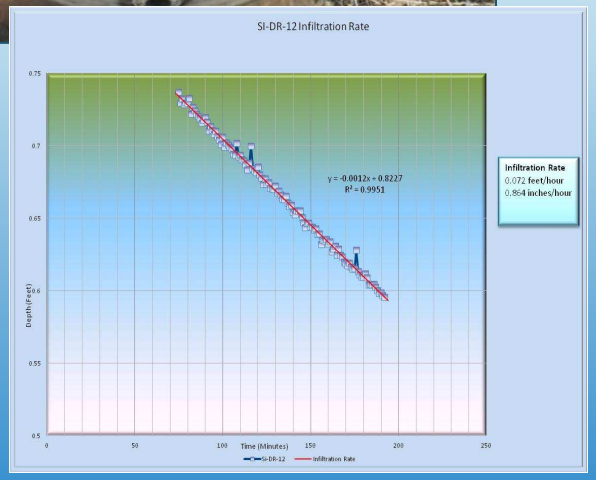
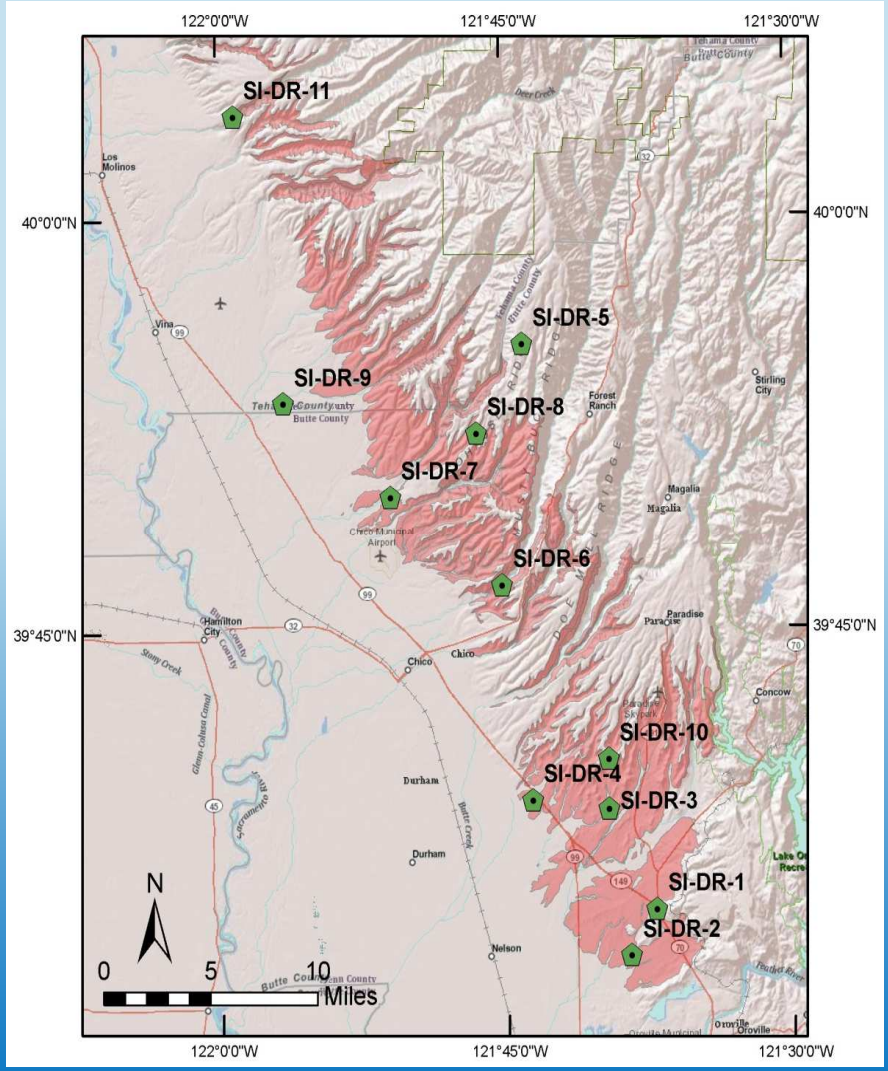
Conducted 11 Dual Ring Infiltrometer Tests





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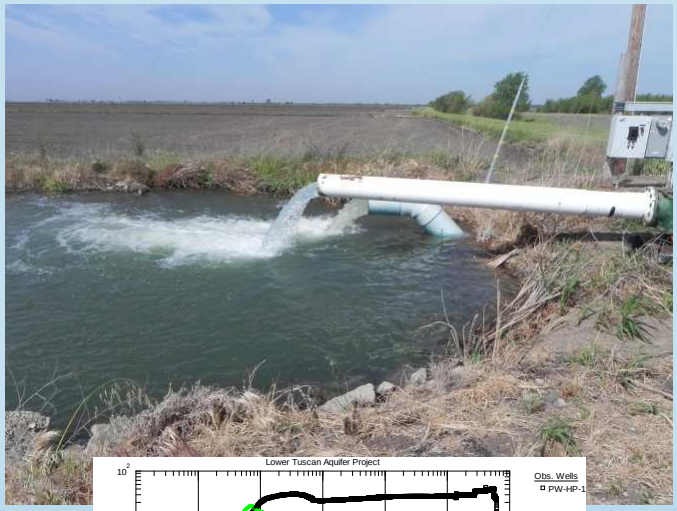
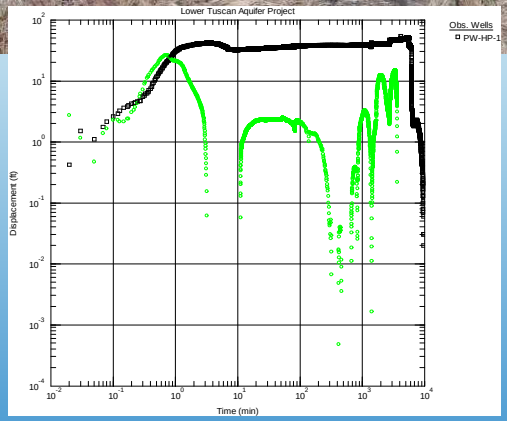
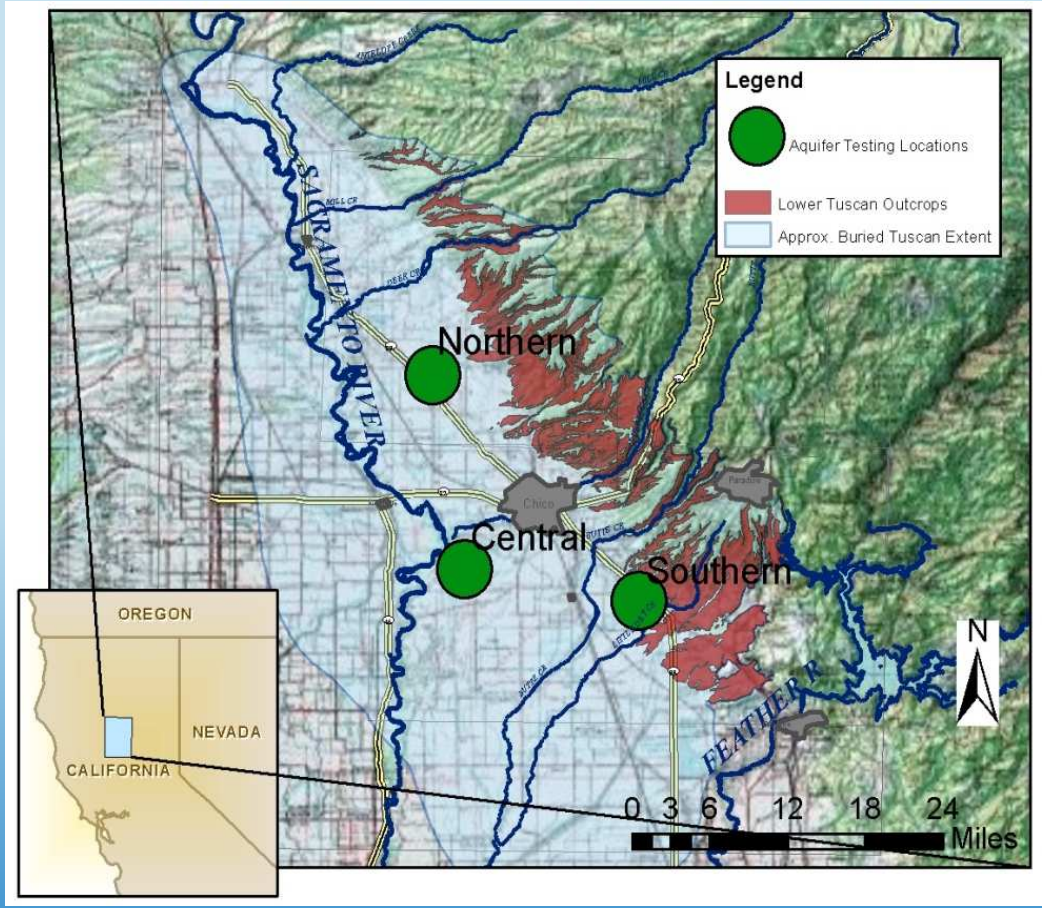
Performed and Analyzed Three Aquifer Tests







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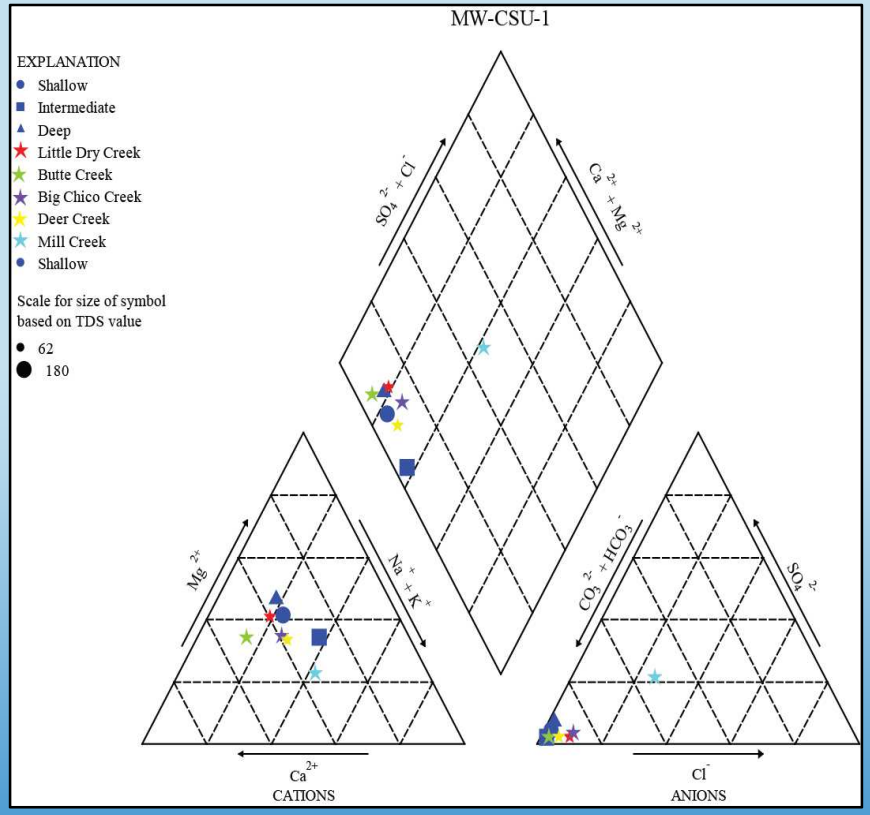
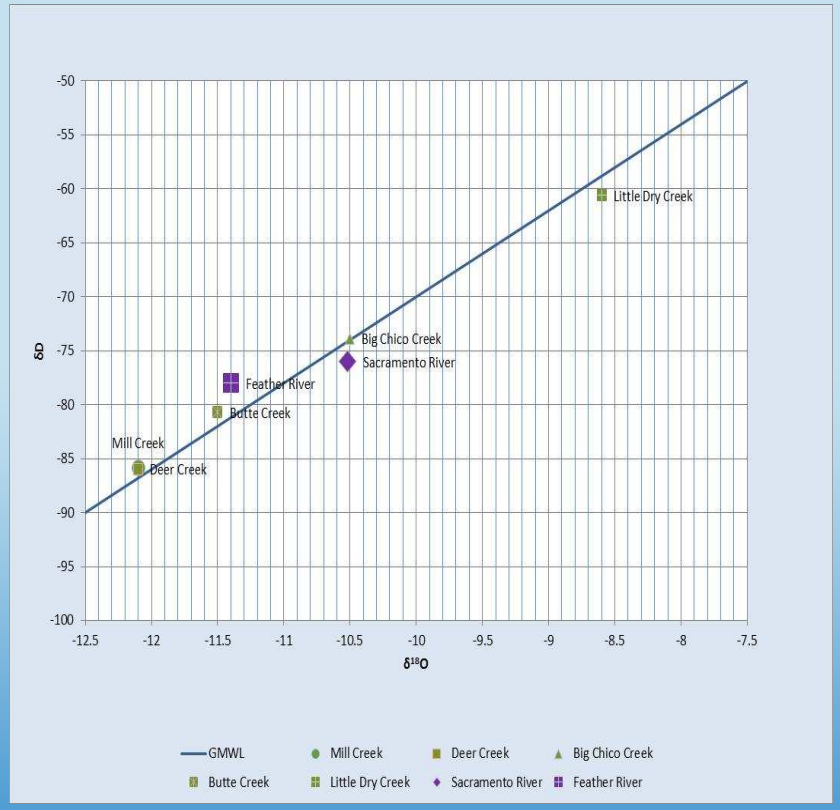
Collected Groundwater and Surface Water Samples





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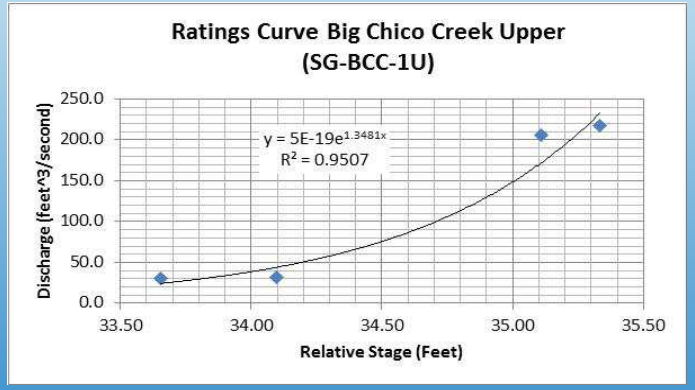
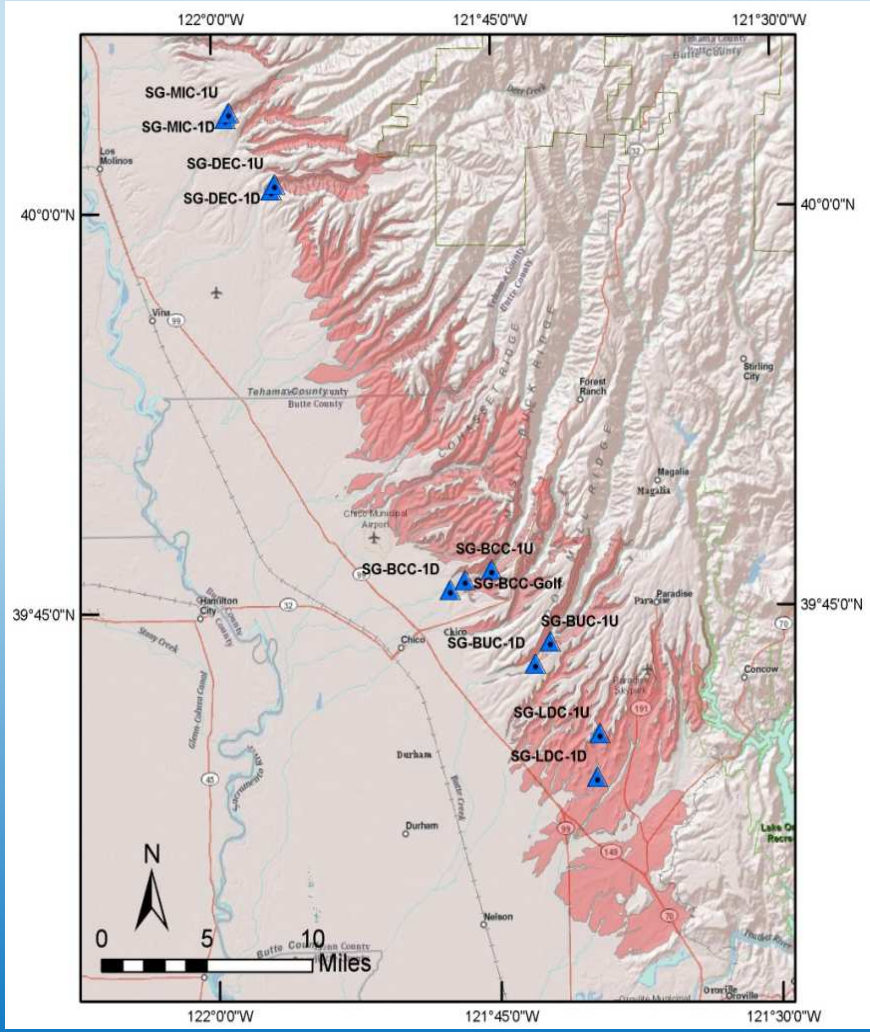
Installed and Monitored Stream Gauges at Five Creeks





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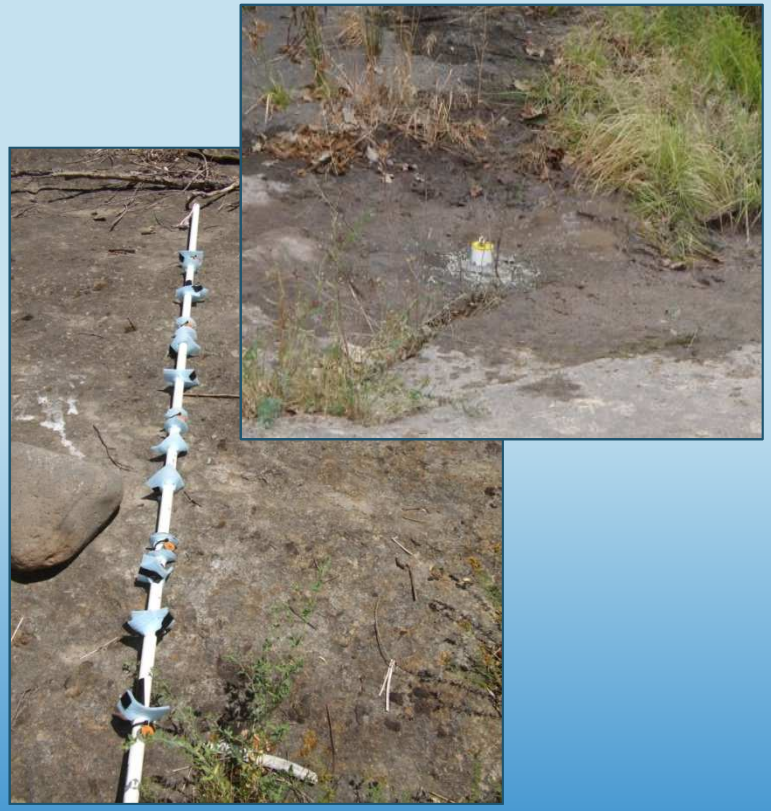
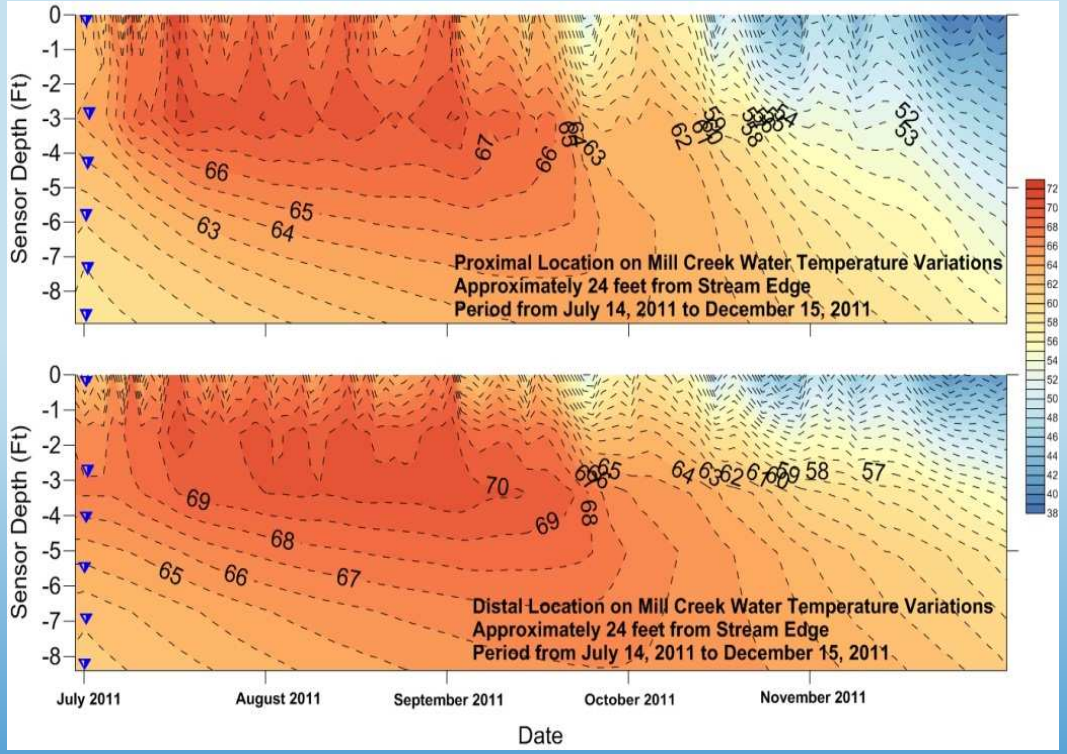
Installed and Monitored Temperature Gradient Wells at Mill Creek





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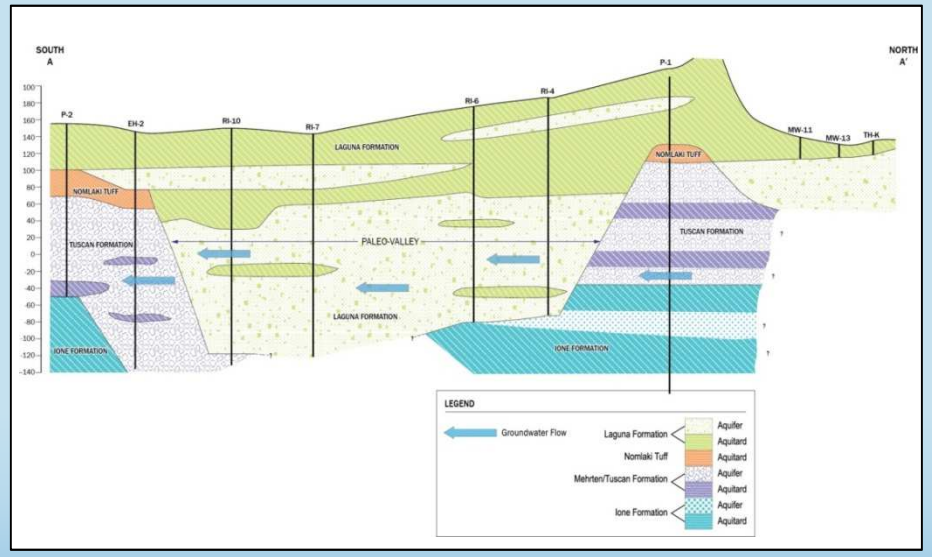
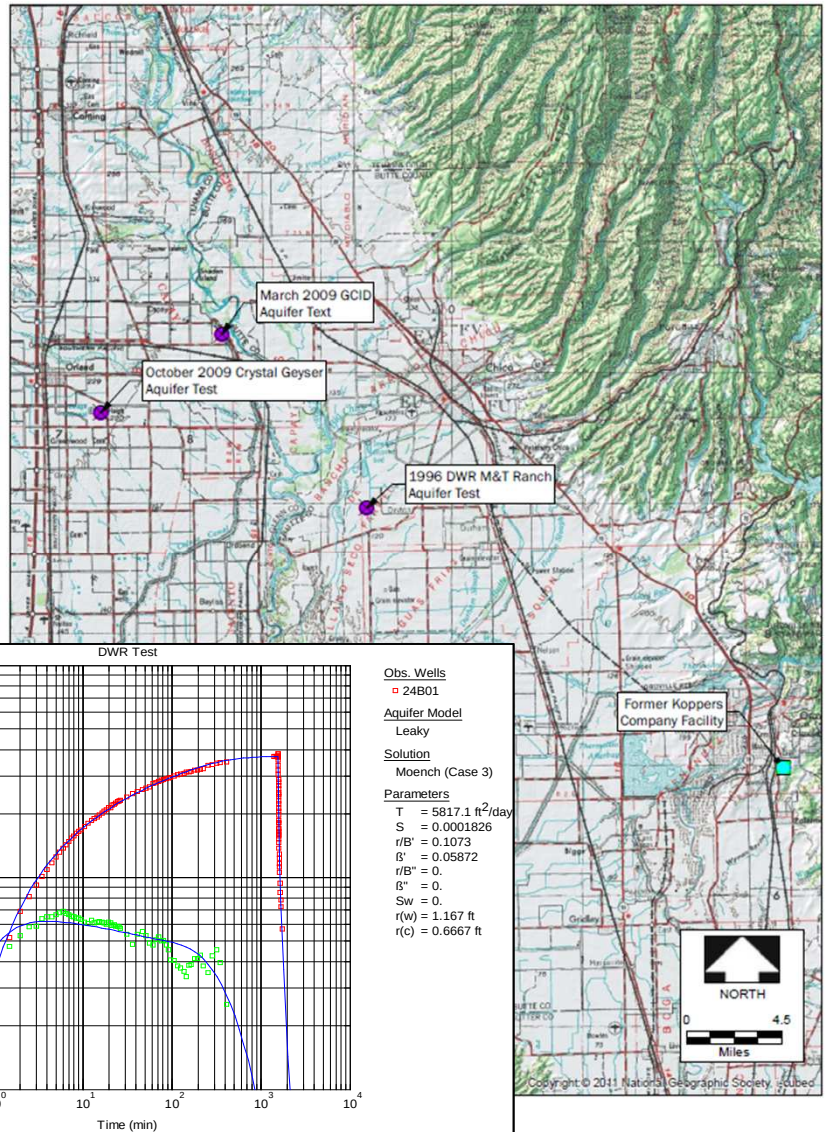
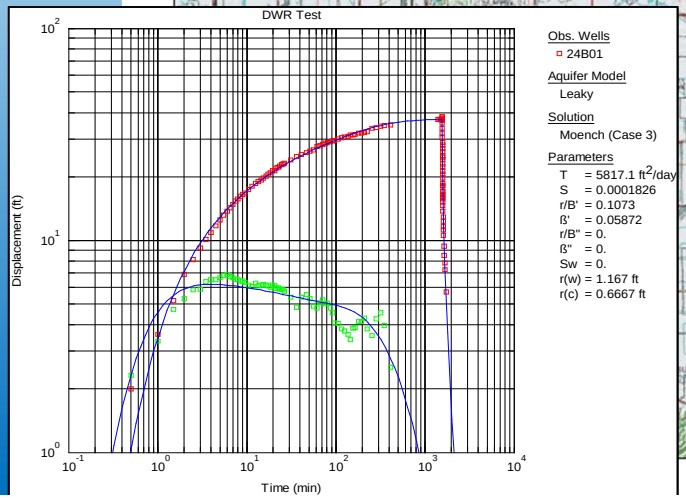
Reassessed Results of Previous Aquifer Tests







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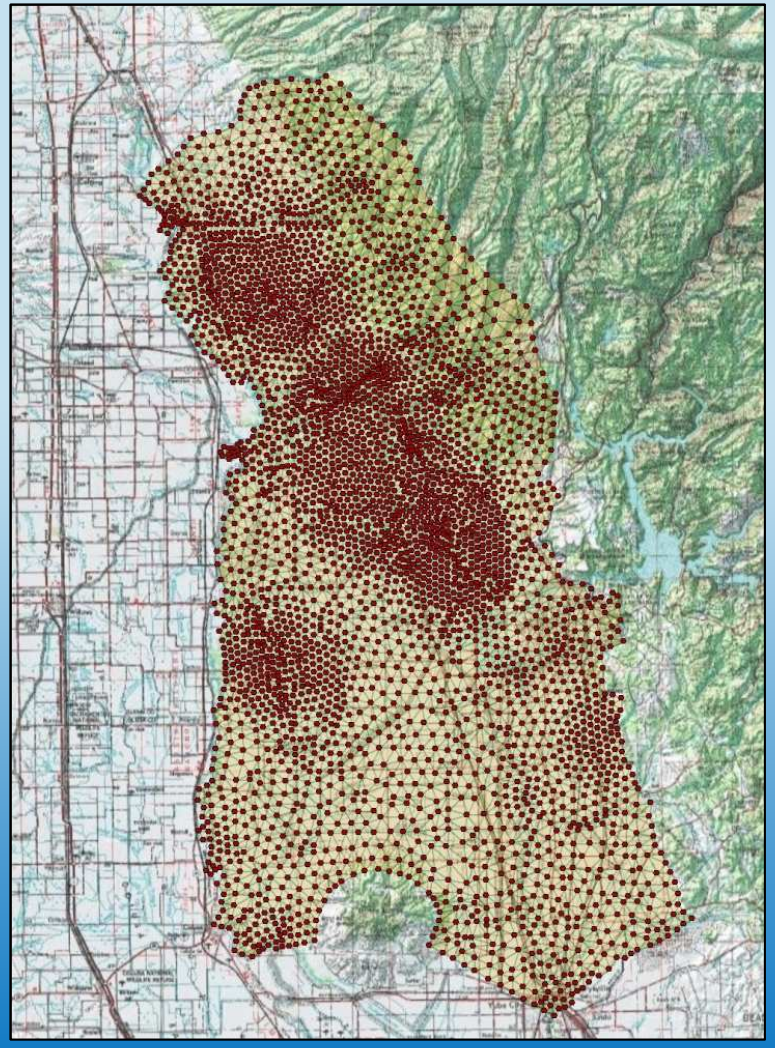
Compared results of project to input parameters of IWFM Butte Basin Model

- Compared Data from LTA Project with Input Data at 100 nodal points of Model



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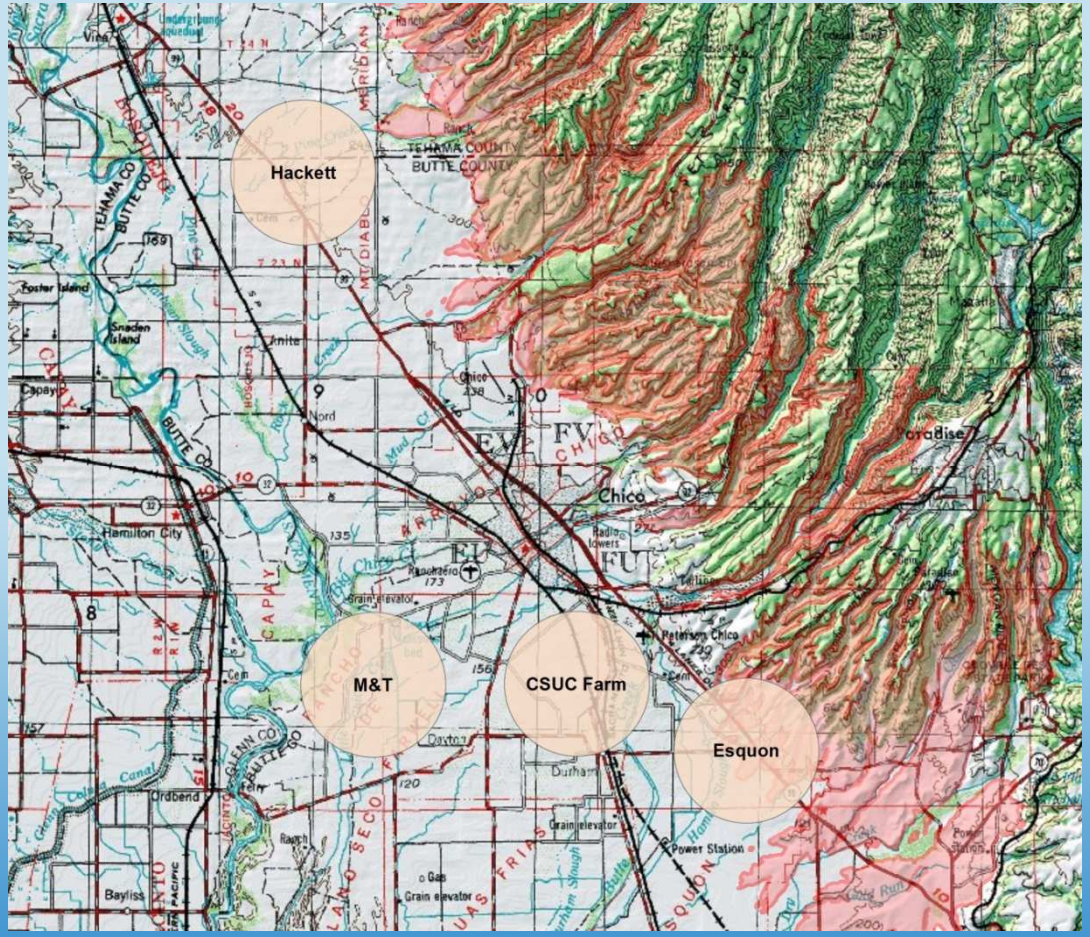
Recharge Mechanisms and Aquifer Interactions of the LTA

- Observations at:
  - Hackett Area
  - M&T Area
  - CSUC Farm Area
  - Esquon Area



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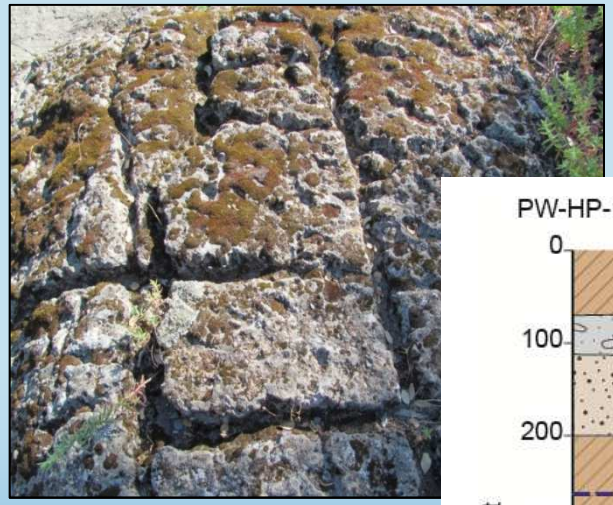
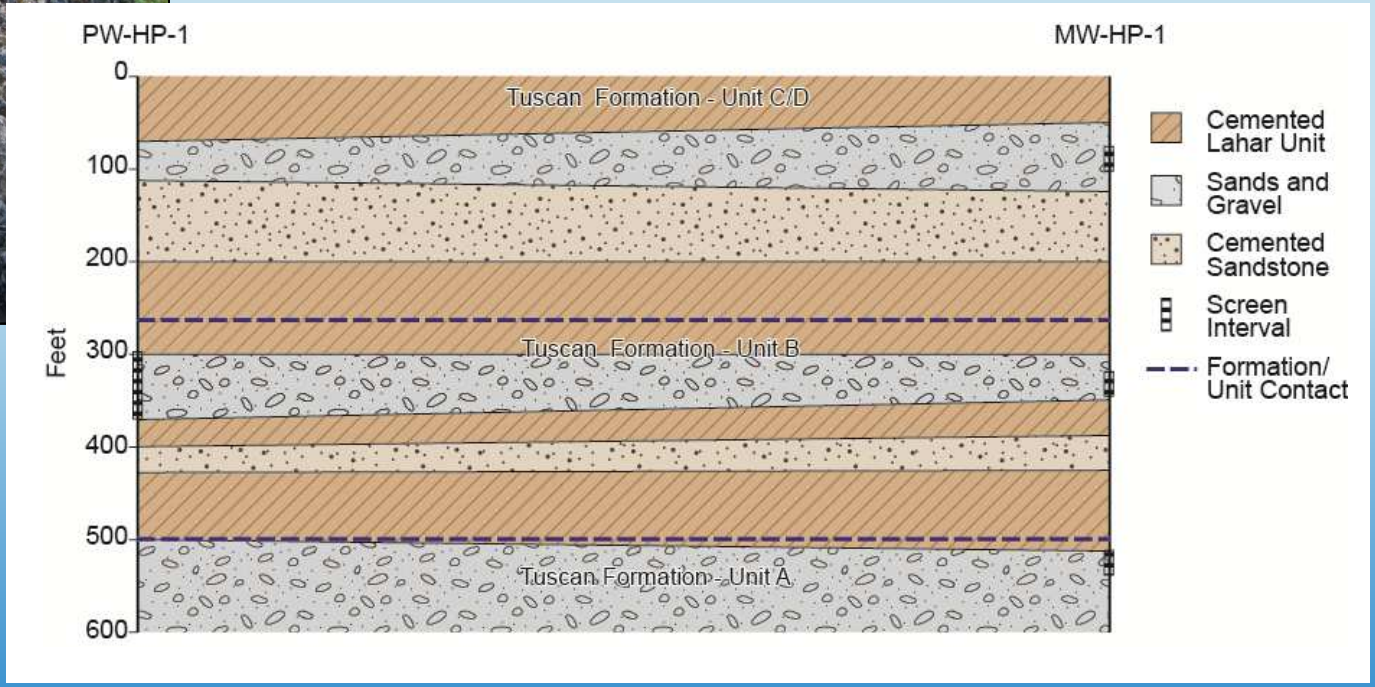
Hackett Property Area – Northern LTA Project Area





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Hackett Property Area – Northern LTA Project Area

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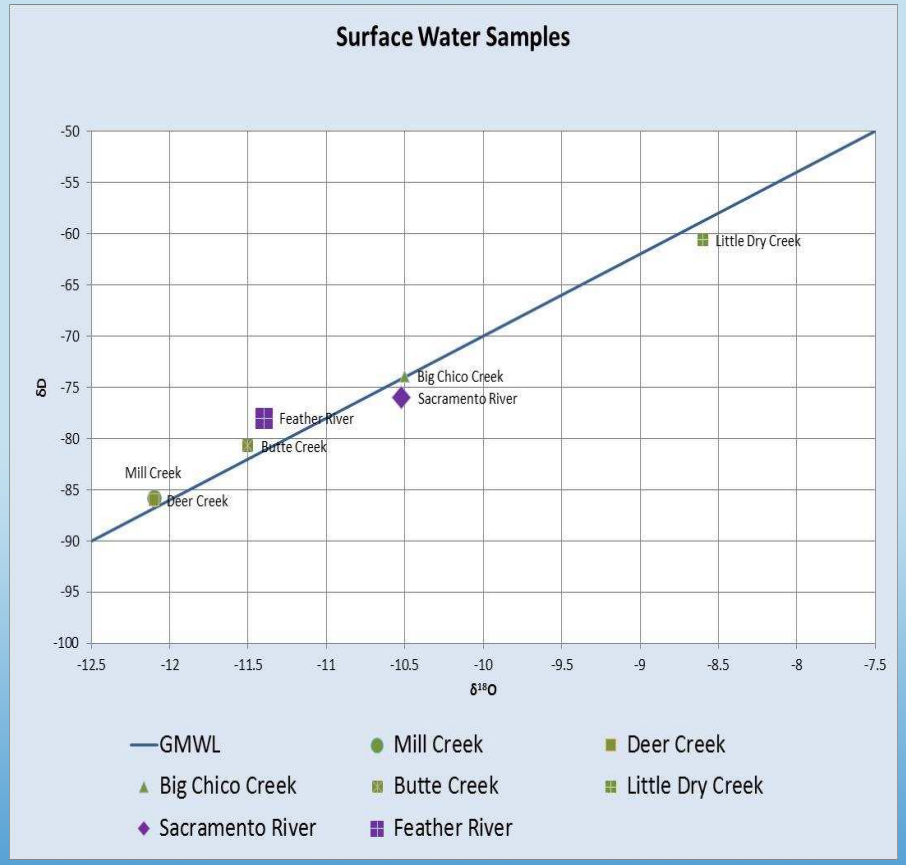
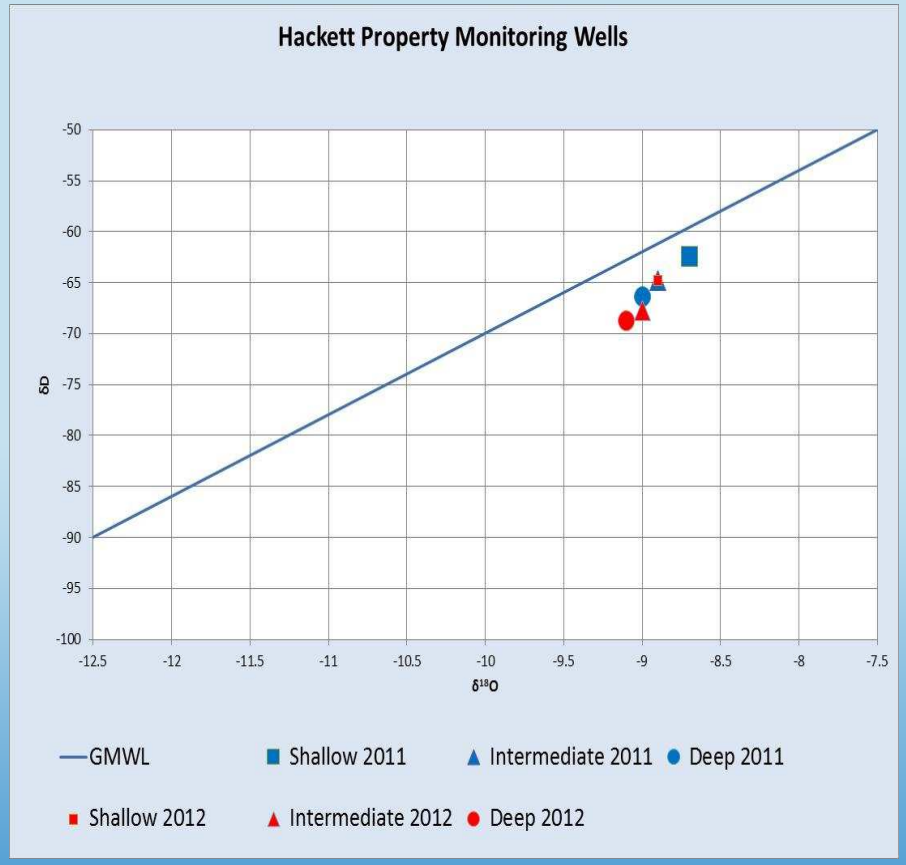
Hackett Property Area – Isotopic Analysis





Monitoring Well Screen Intervals

Shallow – 70 to 100 Feet BGS: Upper Tuscan Aquifer

Intermediate – 320 to 340 Feet BGS: Lower Tuscan Aquifer

Deep – 510 to 540 Feet BGS: Lower Tuscan Aquifer

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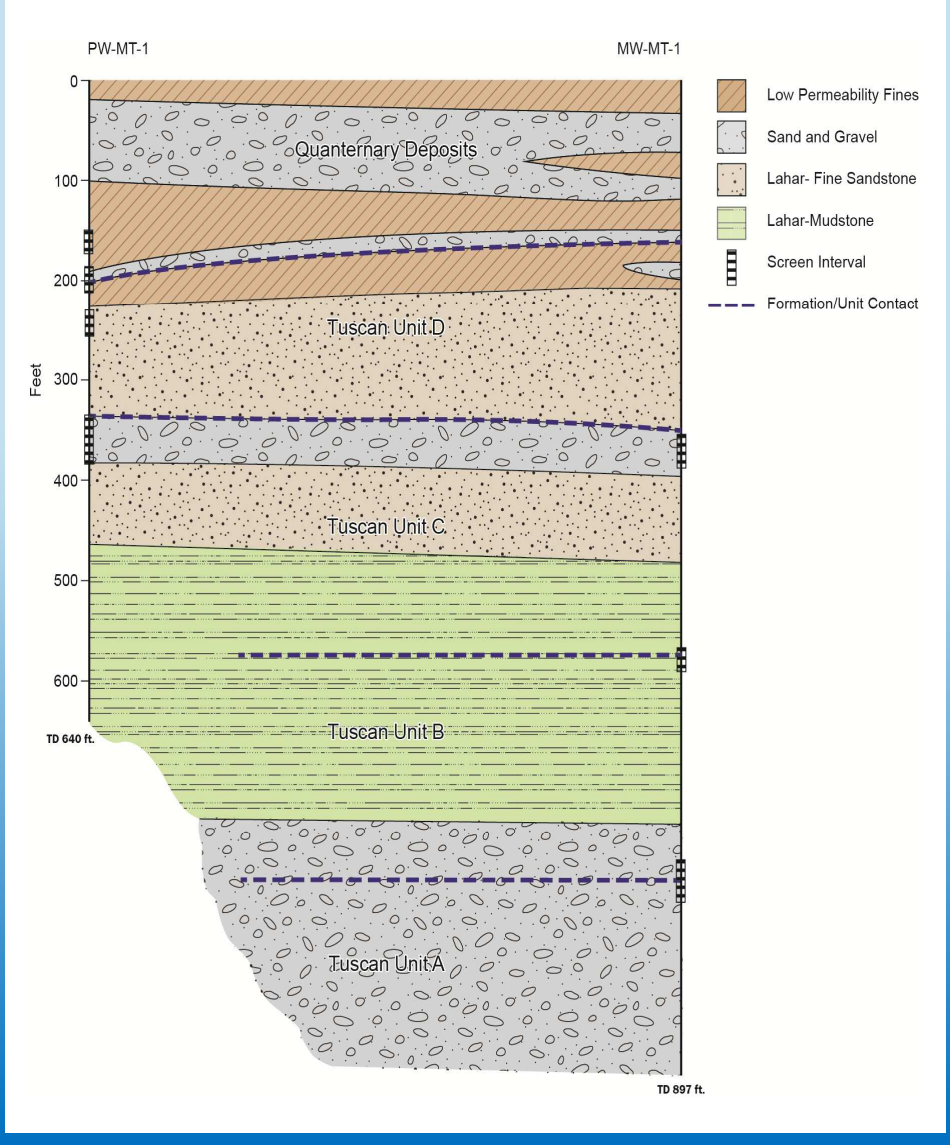
M&T Ranch Area



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M&T Ranch Area

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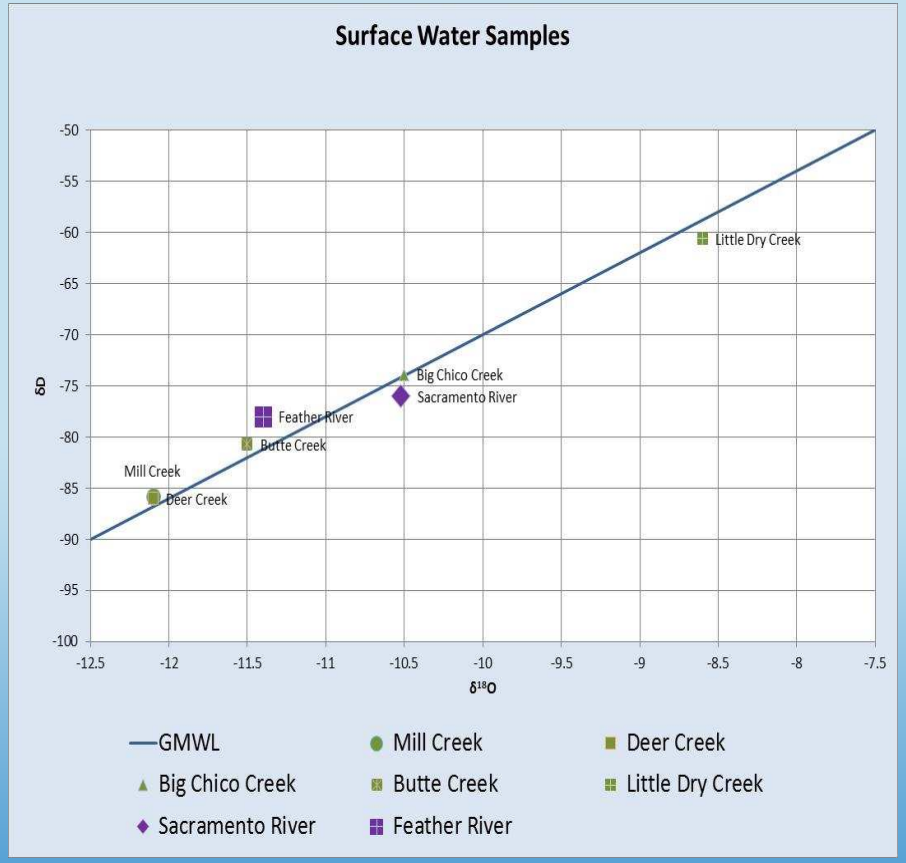
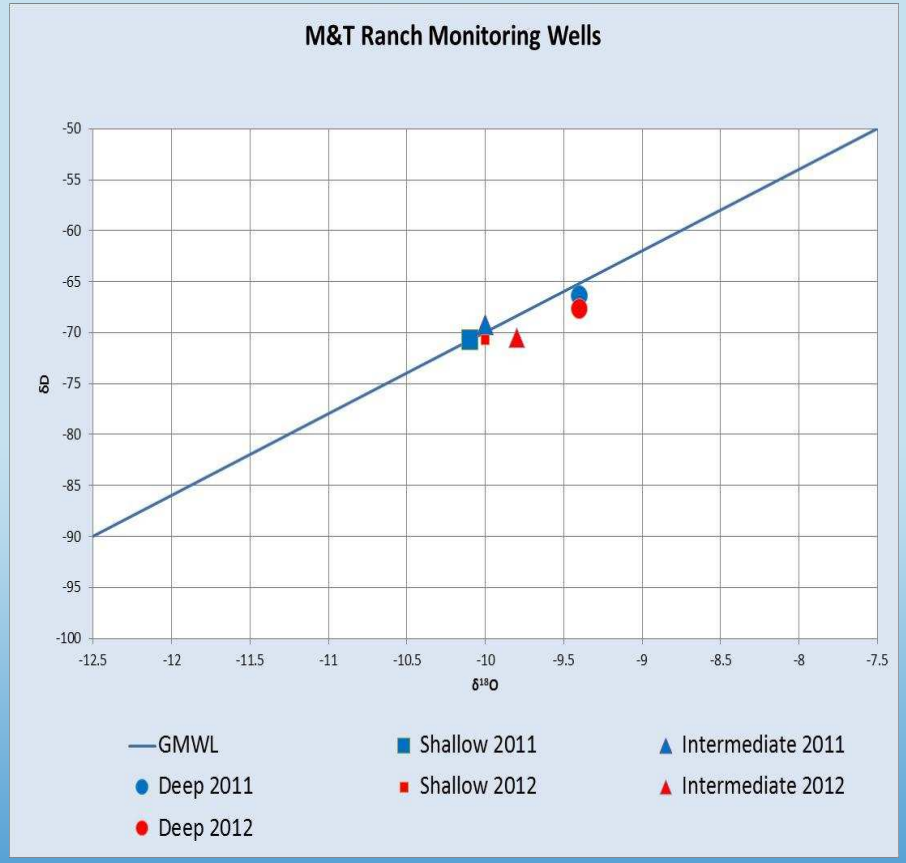
M&T Ranch – Isotopic Analysis





Monitoring Well Screen Intervals

Shallow – 355 to 385 Feet BGS: Upper Tuscan Aquifer

Intermediate – 570 to 590 Feet BGS: Lower Tuscan Aquifer

Deep – 780 to 820 Feet BGS: Lower Tuscan Aquifer

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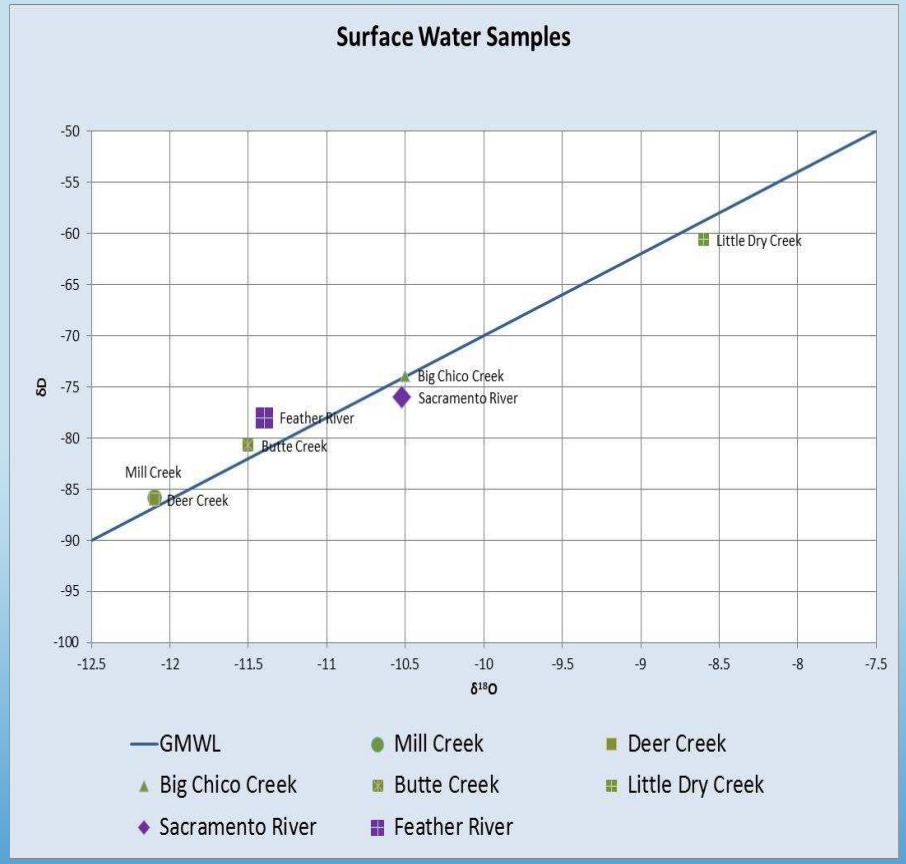
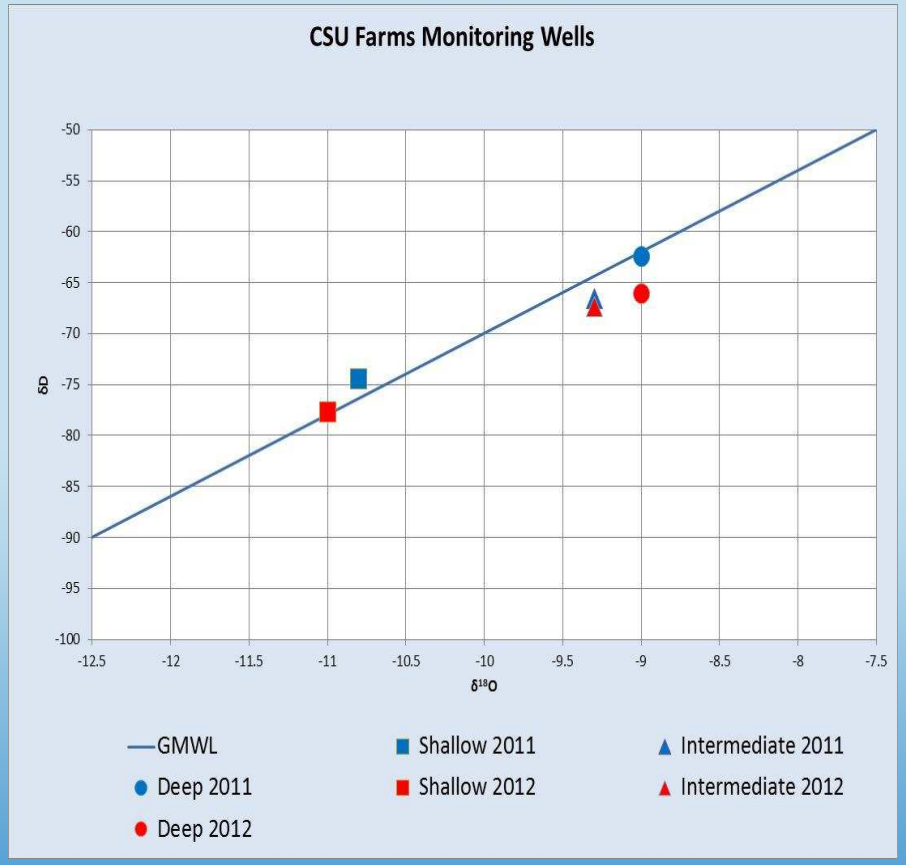
CSU Farms – Isotopic Analysis





Monitoring Well Screen Intervals

Shallow – 240 to 340 Feet BGS: Upper Tuscan Aquifer

Intermediate – 540 to 560 Feet BGS: Lower Tuscan Aquifer

Deep – 735 to 760 Feet BGS: Lower Tuscan Aquifer

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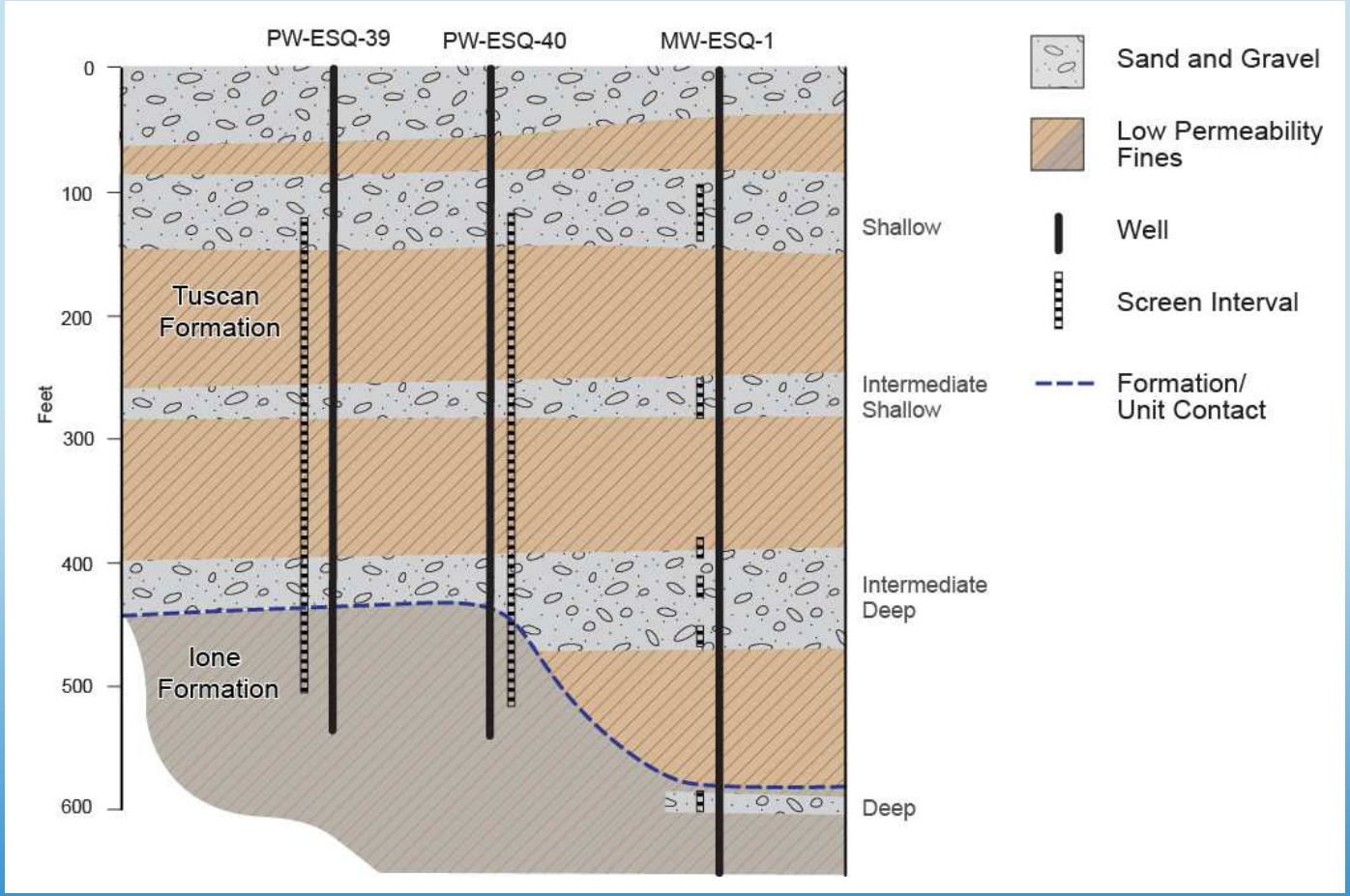
Esquon Ranch Area



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Esquon Ranch Area

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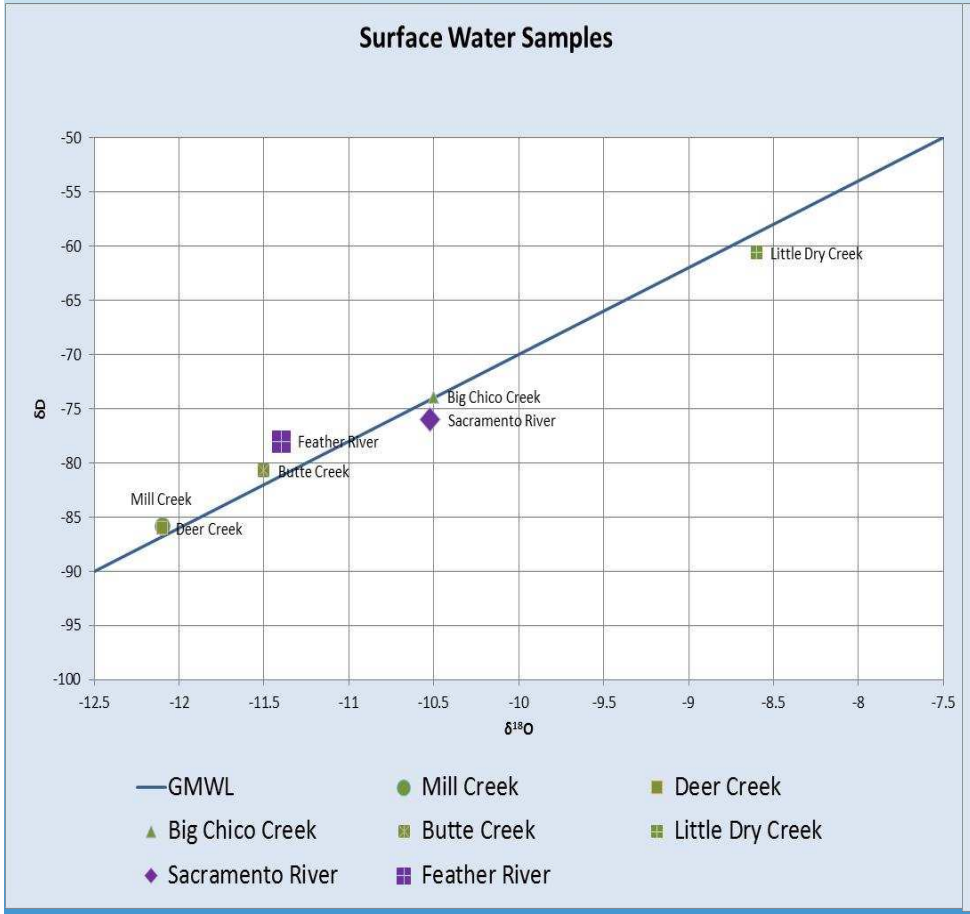
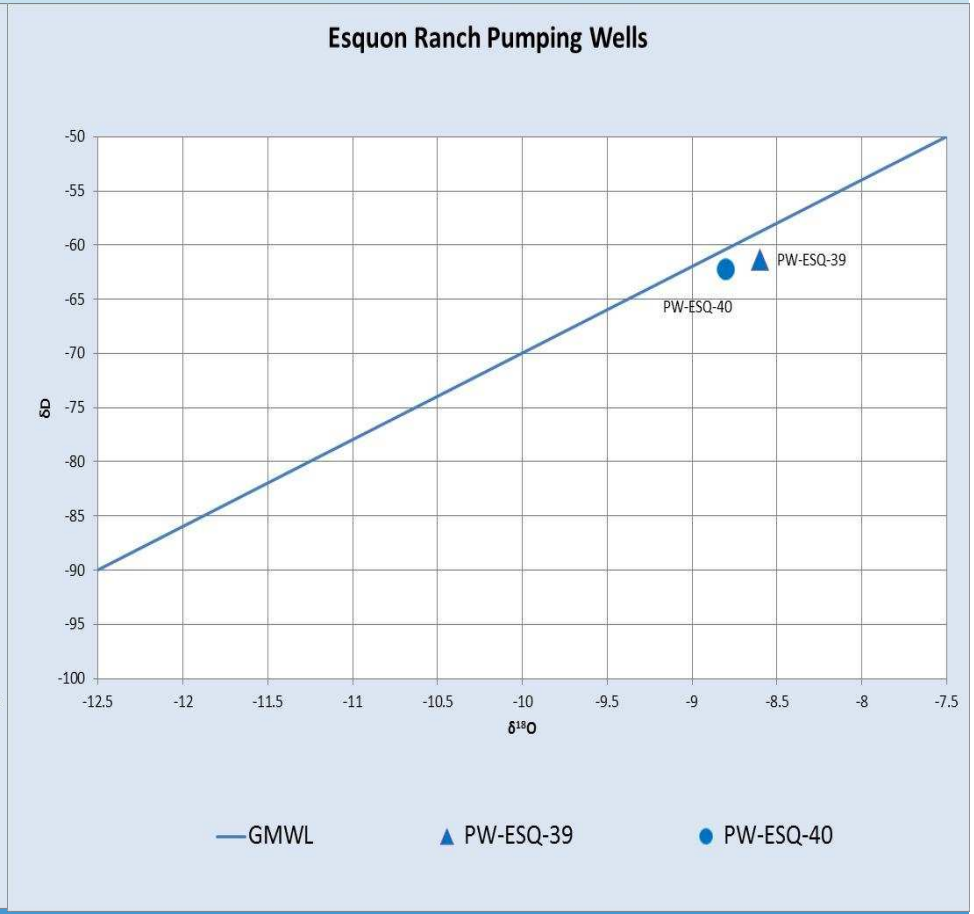
Esquon Ranch – Isotopic Analysis





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Pumping Well Screen Intervals

PW-ESQ-39 – 110 to 520 Feet BGS: Lower Tuscan Aquifer

PW-ESQ-40 – 115 to 515 Feet BGS: Lower Tuscan Aquifer

Recommended Future Studies

1. Expand isotopic analysis to further assess spatial and seasonal relationships
2. Assess interaction between Sacramento and other river stage response to changes in groundwater levels
3. Assess recharge potential of shallow alluvial aquifer to LTA
4. Conduct focused recharge and aquifer interaction assessments towards development of management tools such as groundwater model.

Recommended Future Studies

5. Definition of stratigraphic zones
6. Development of subregional groundwater models
7. Development of Hydrogeologic Conceptual Model for Eastern Sacramento Valley Basin.

Discussion

- Questions and general discussion
- Poster session