Ukiah Valley Groundwater Basin
Sustainable Groundwater Planning Grants

Presented To:

Ukiah Valley Basin
Groundwater Sustainability Agency

Presented By:

LACO Associates
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Brian M. Wallace, EIT

Presentation Purpose and Goals

- Present GSA with deliverables completed by LACO during the Counties with Stressed Basins Grant.
- Present updated cross sections from the Hydrogeologic Conceptual Model
- Present Preliminary Water Budget Study results
- Discuss model calibration process and model validity
- Discuss Preliminary Sustainability Management Criteria report
- Present Recommended Actions

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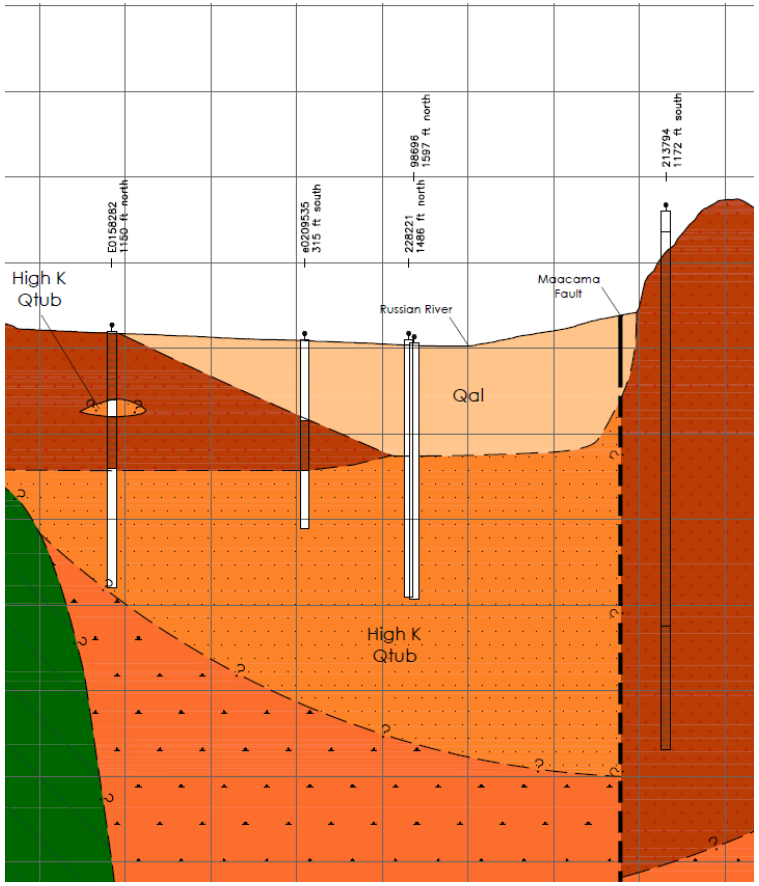
Hydrogeologic Conceptual Model



- Data Collection and Literature Review
- Basin Setting
- Groundwater Basin Boundary
- Bottom of Groundwater Basin
- Principal Aquifers and Aquitards
- Data Gaps

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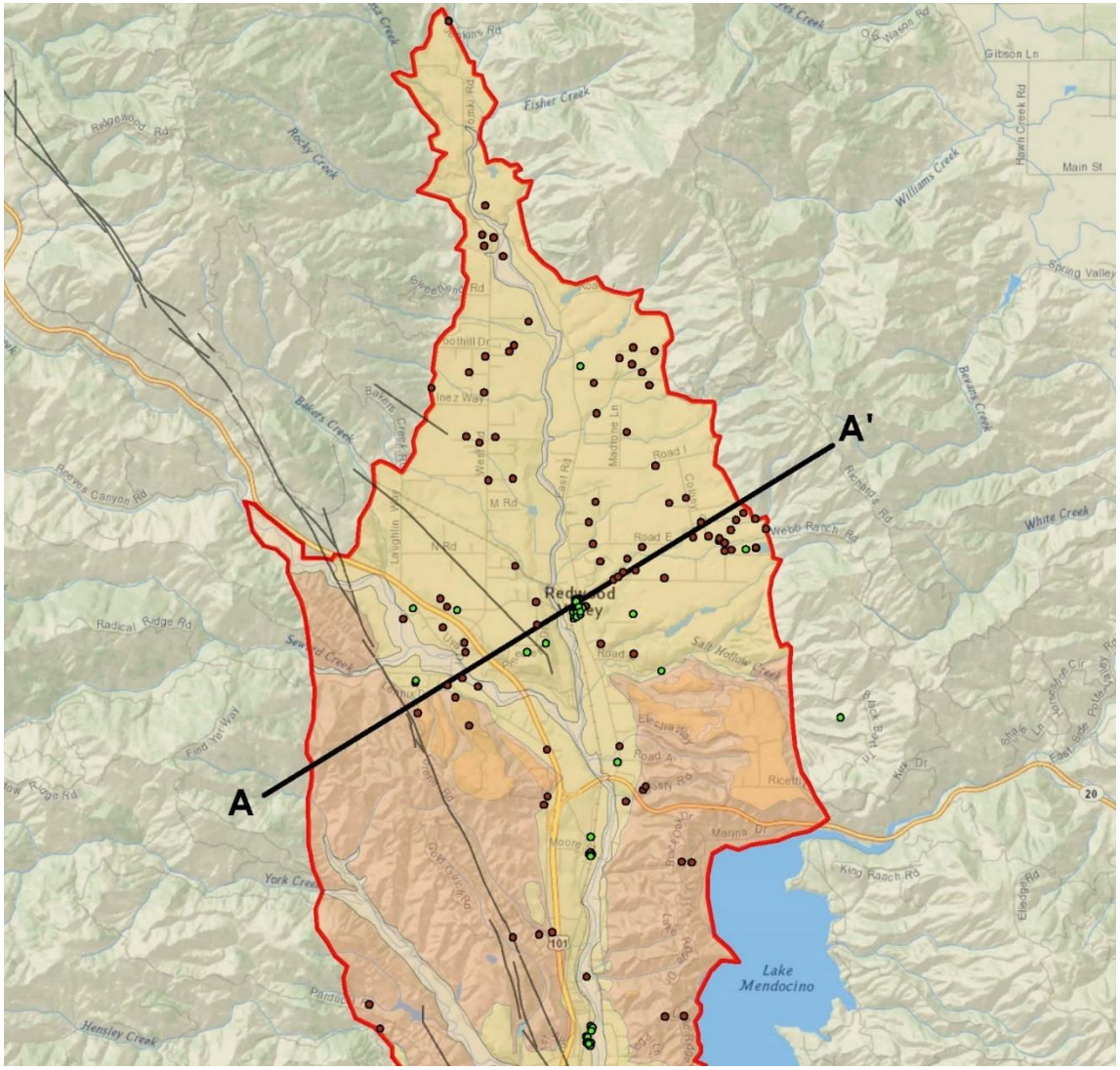
Cross Section A - A’



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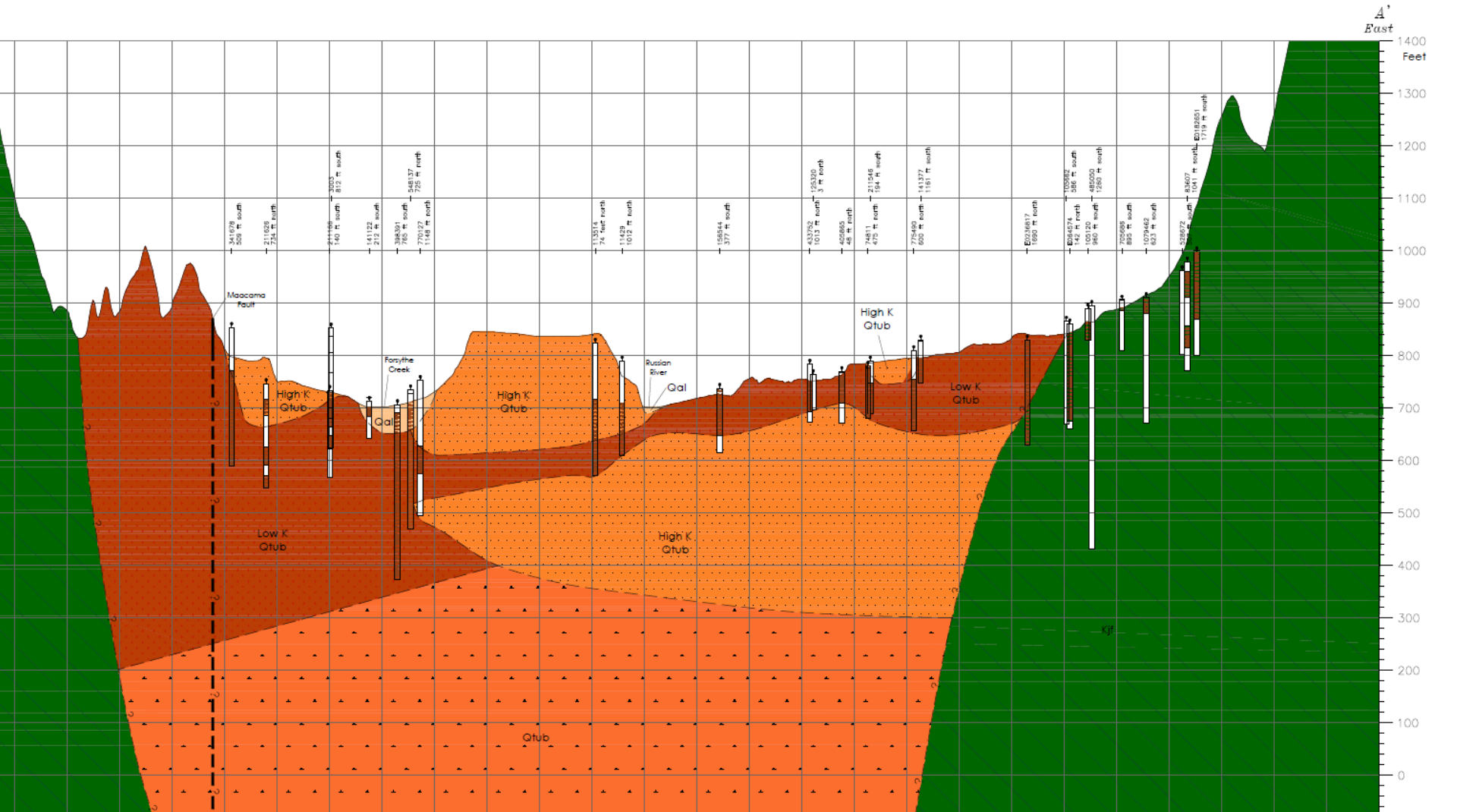
Cross Section A - A’



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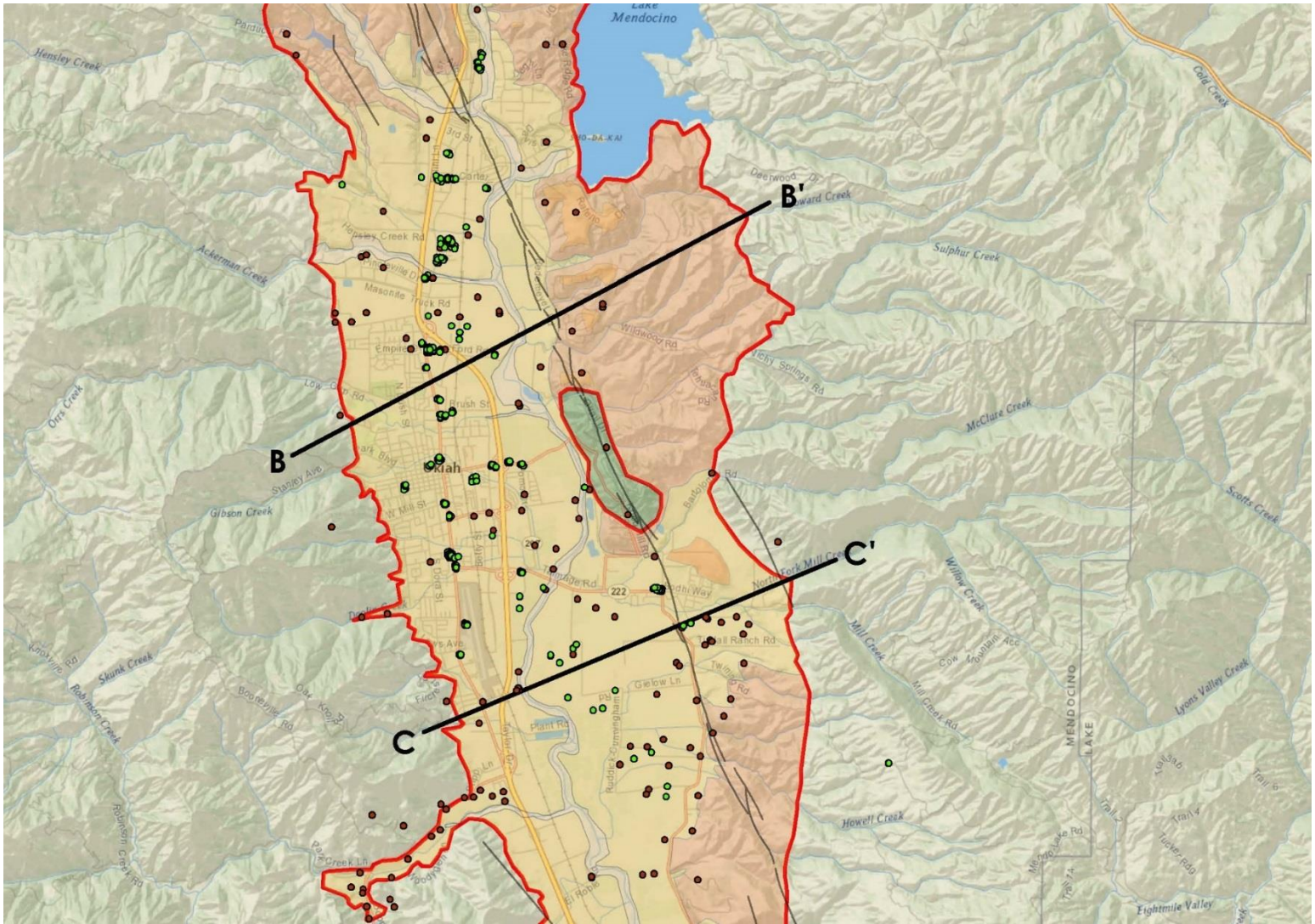
Cross Section B – B’



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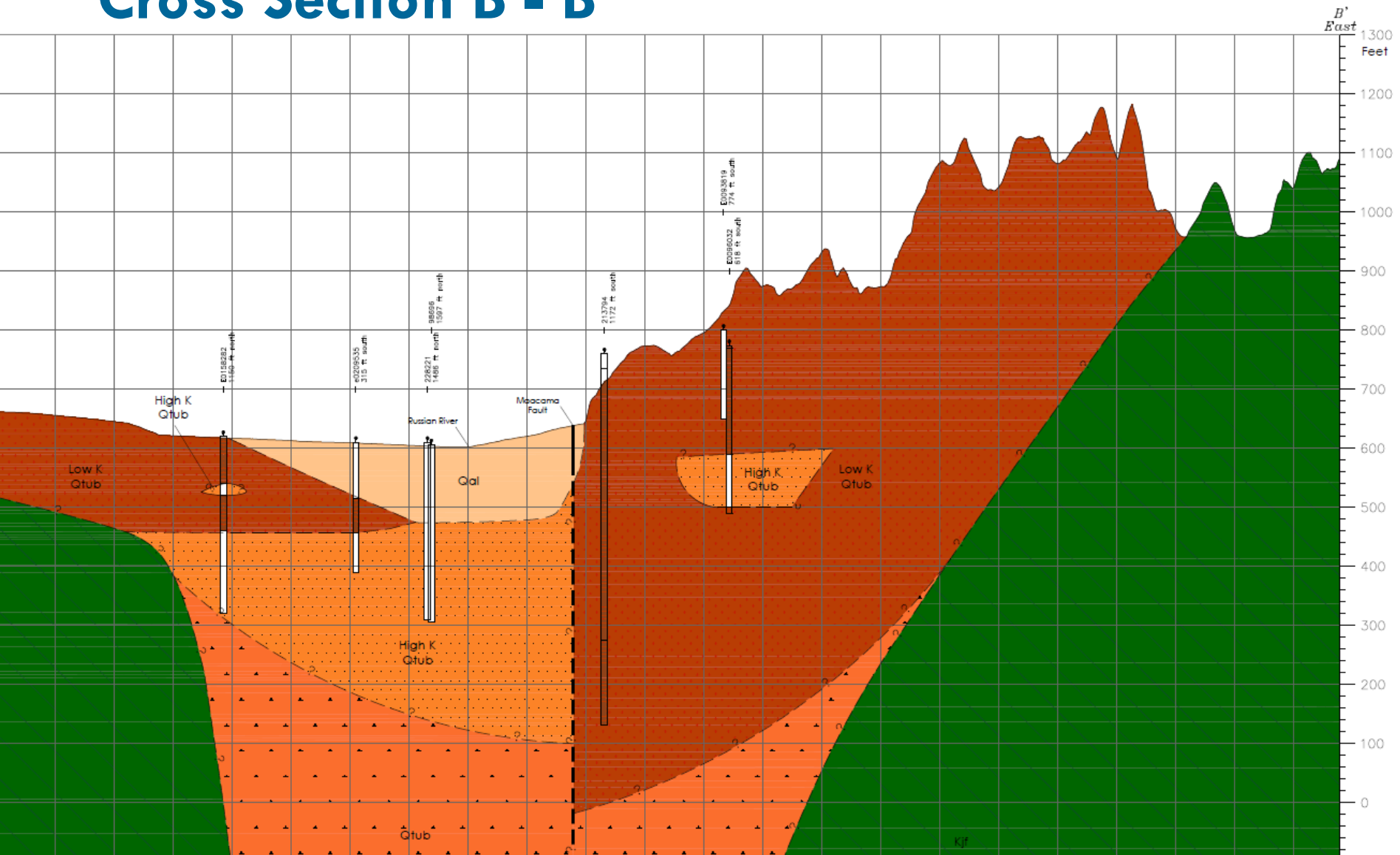

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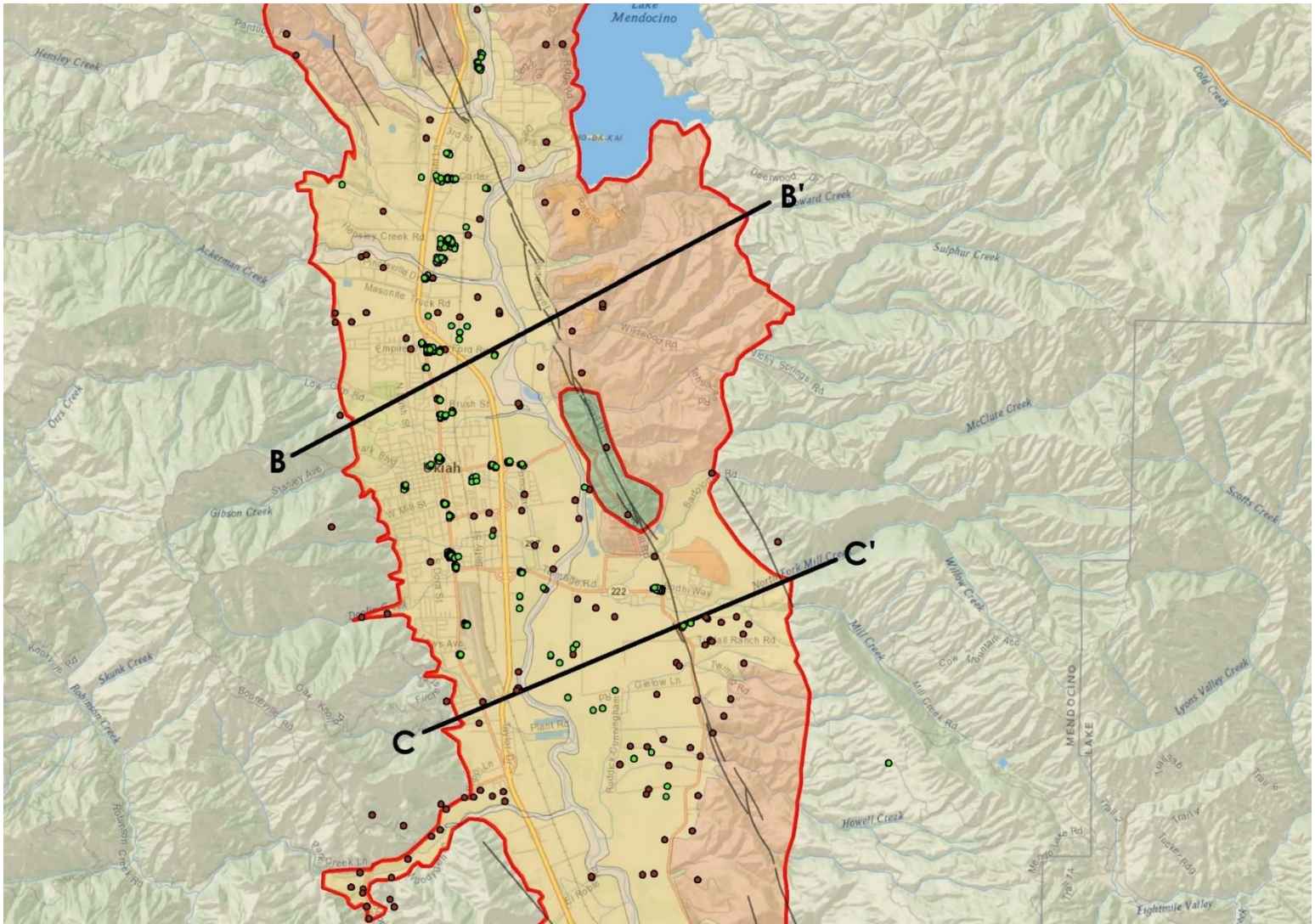
Cross Section C - C’



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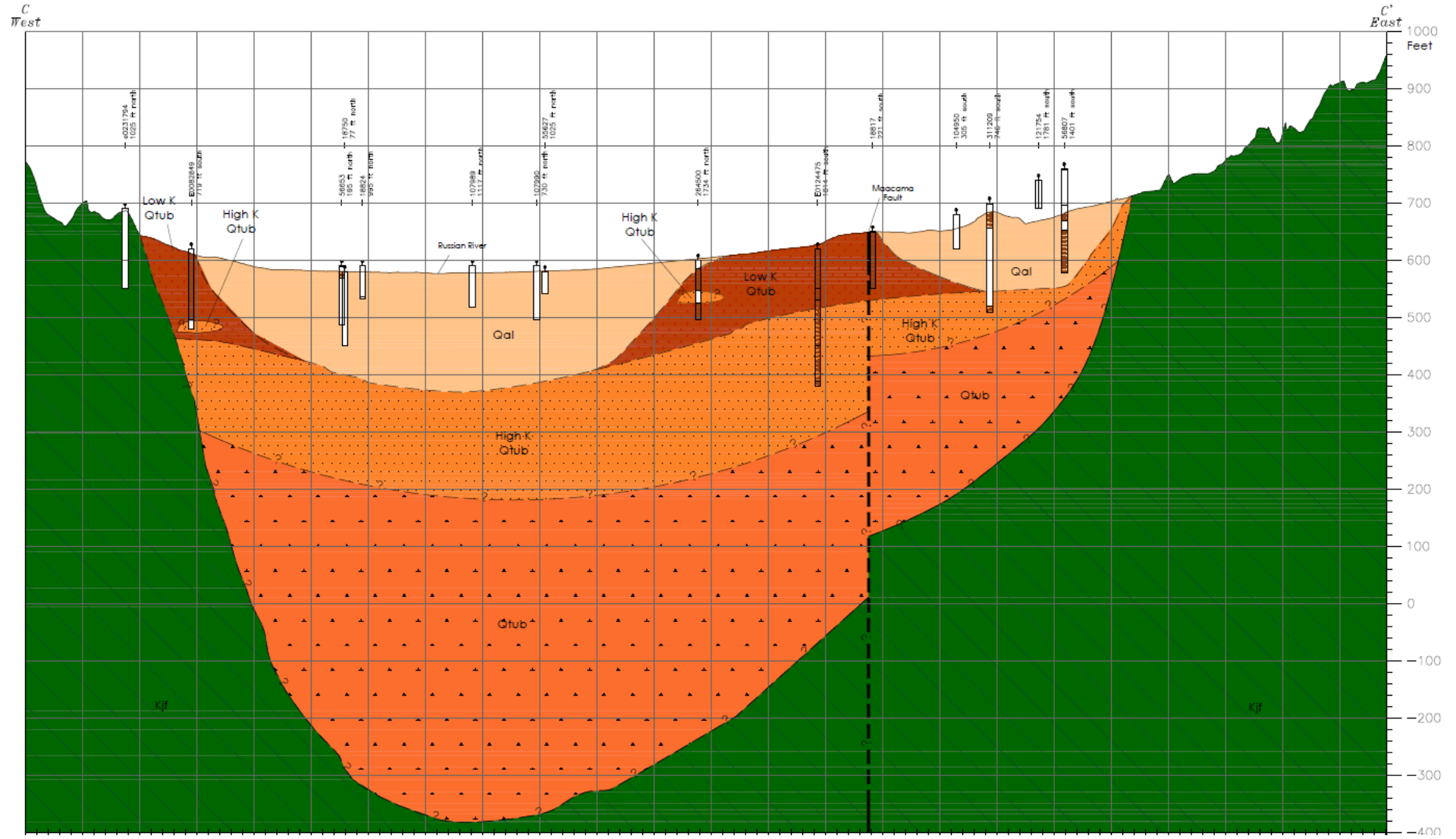
Cross Section C - C'



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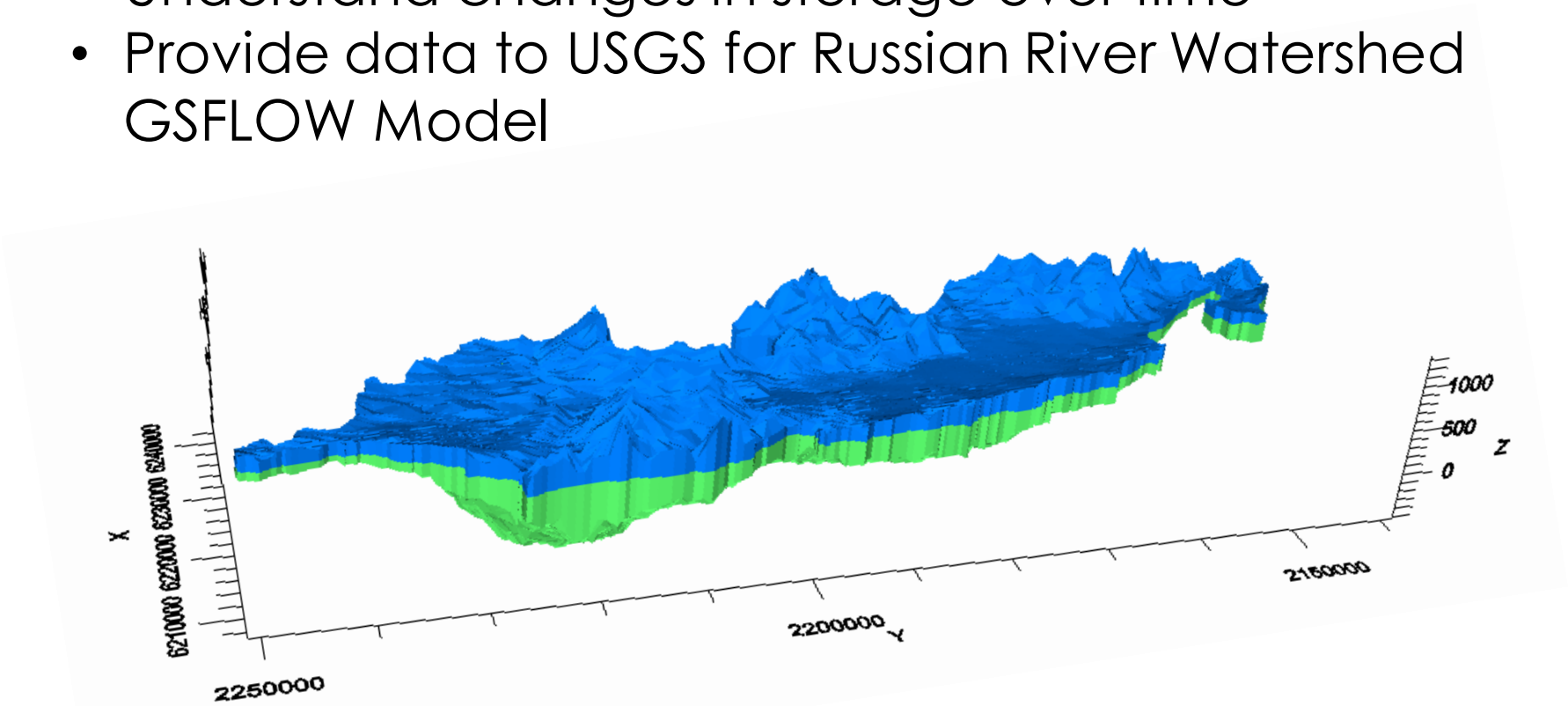
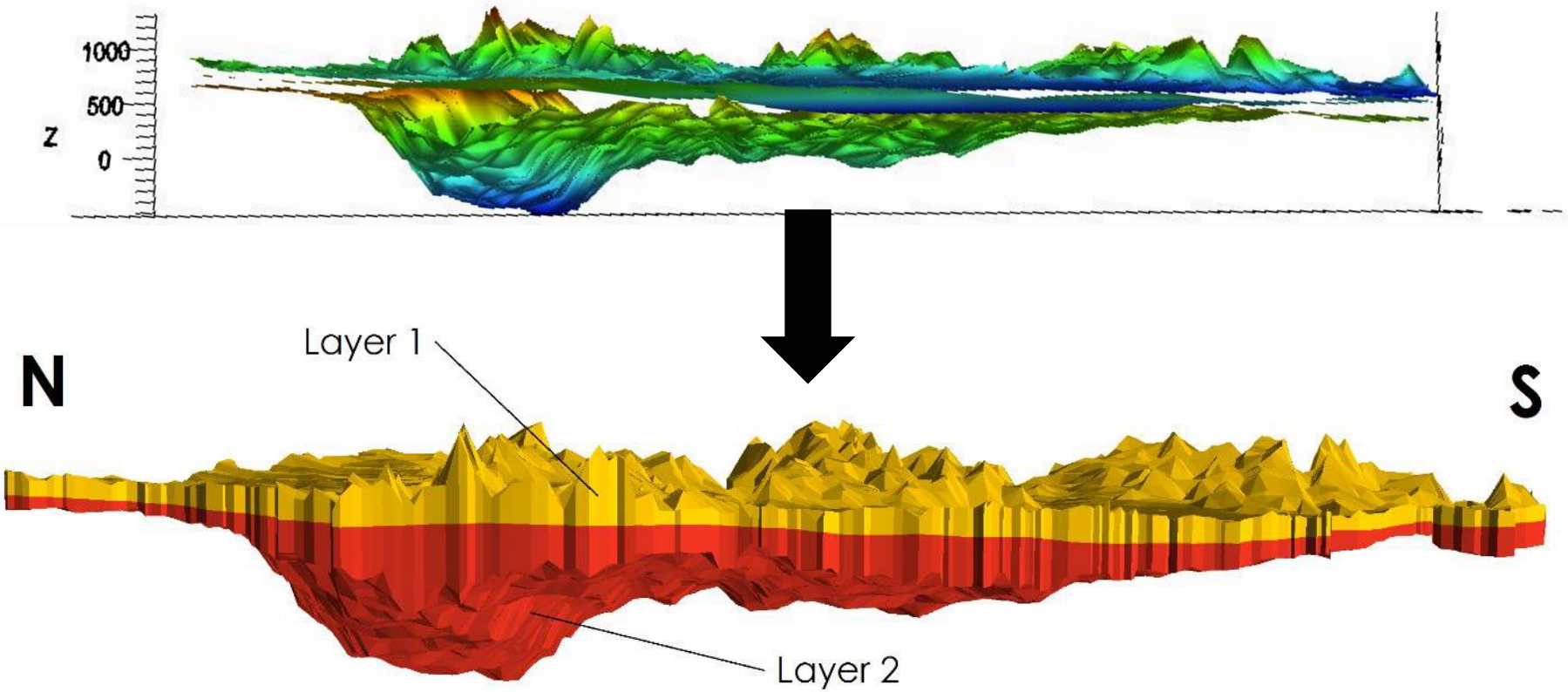
Water Budget – Groundwater Flow Model

- Expand on UC Davis Thesis Study
- Quantify surface water-groundwater interaction
- Understand changes in storage over time
- Provide data to USGS for Russian River Watershed GSFLOW Model



Water Budget – Layer Development



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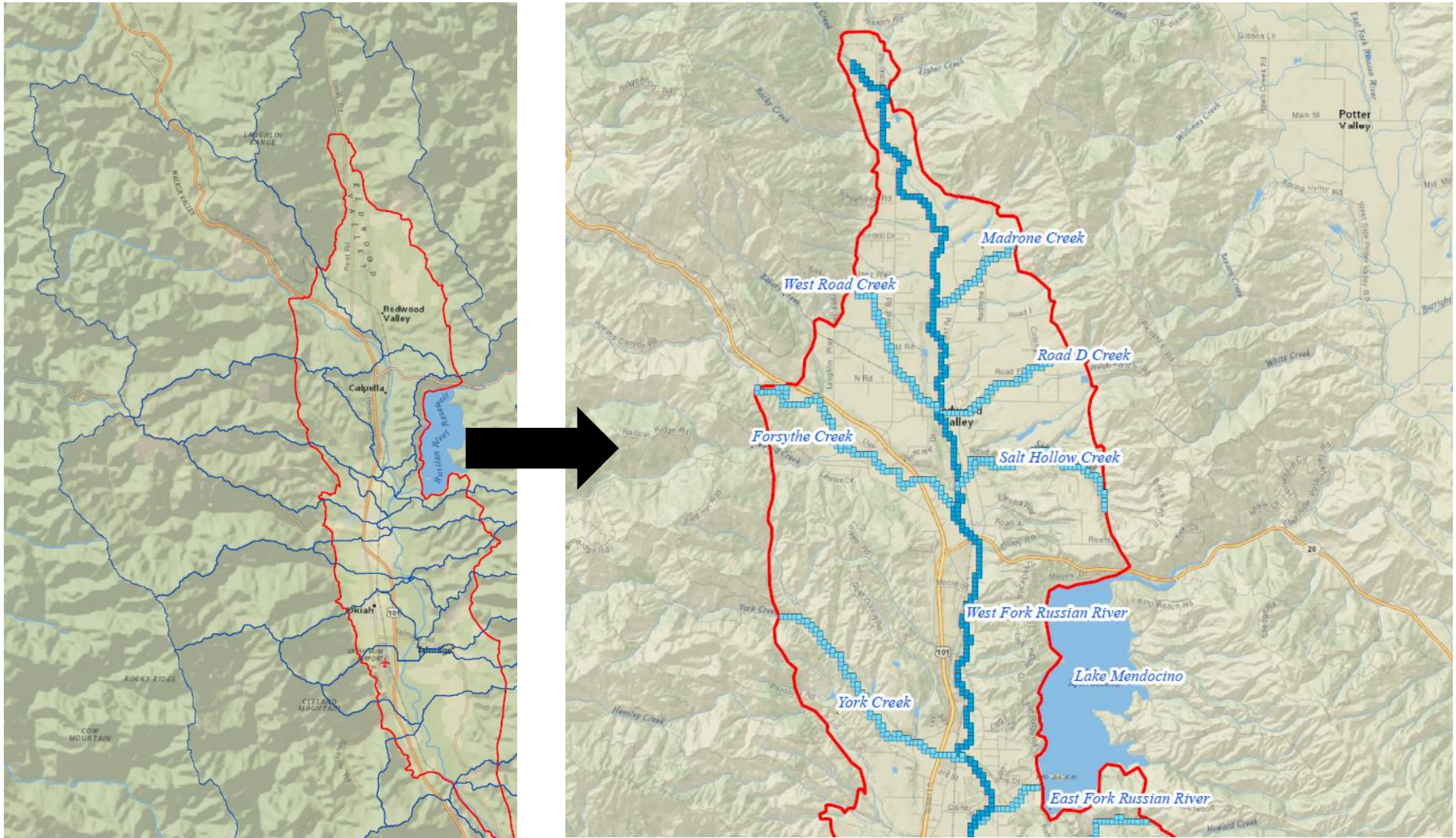
Water Budget – Stream Development



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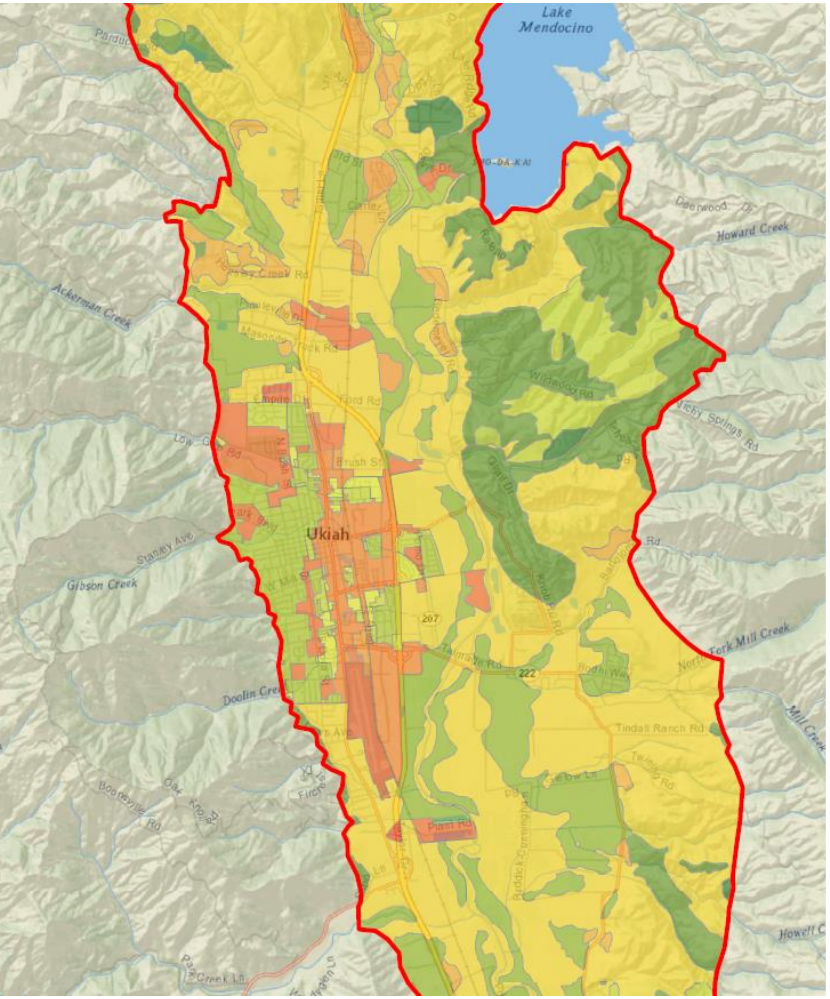
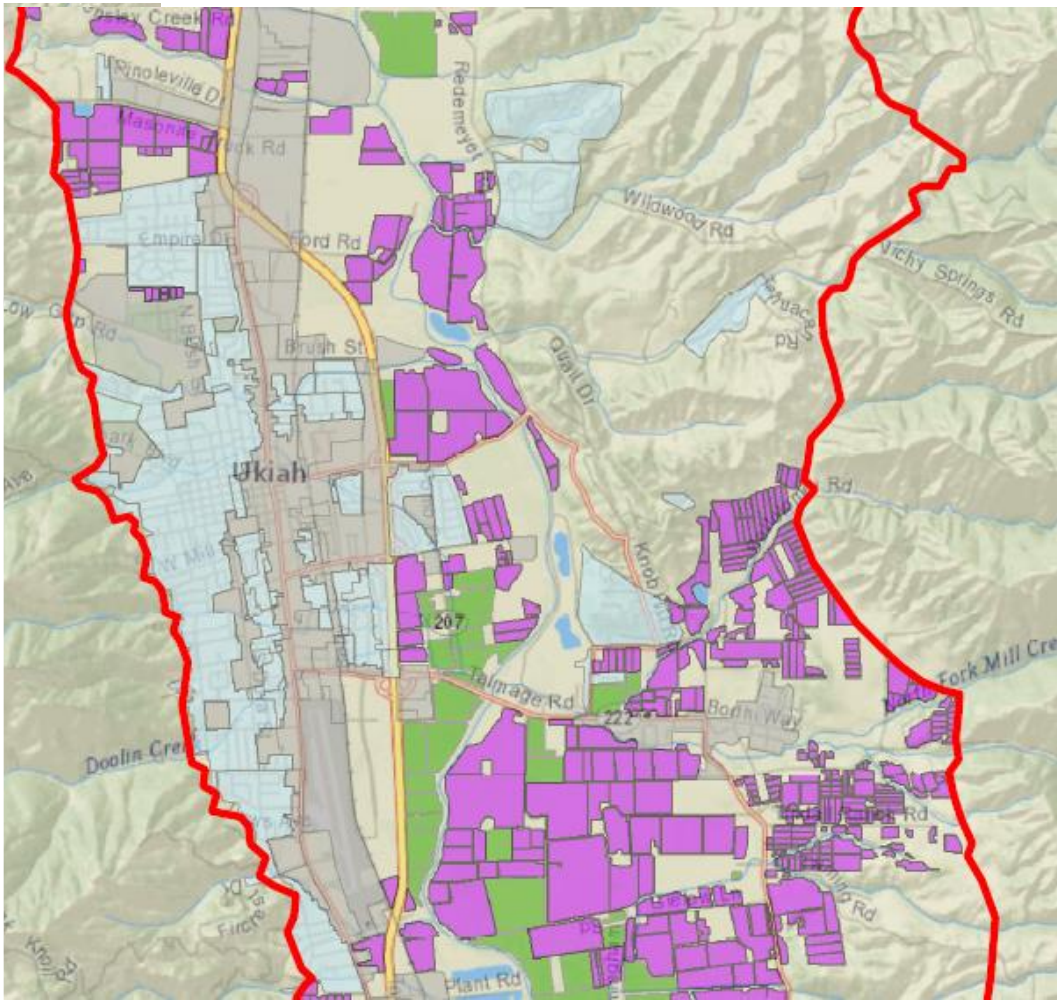
Water Budget – Recharge Development





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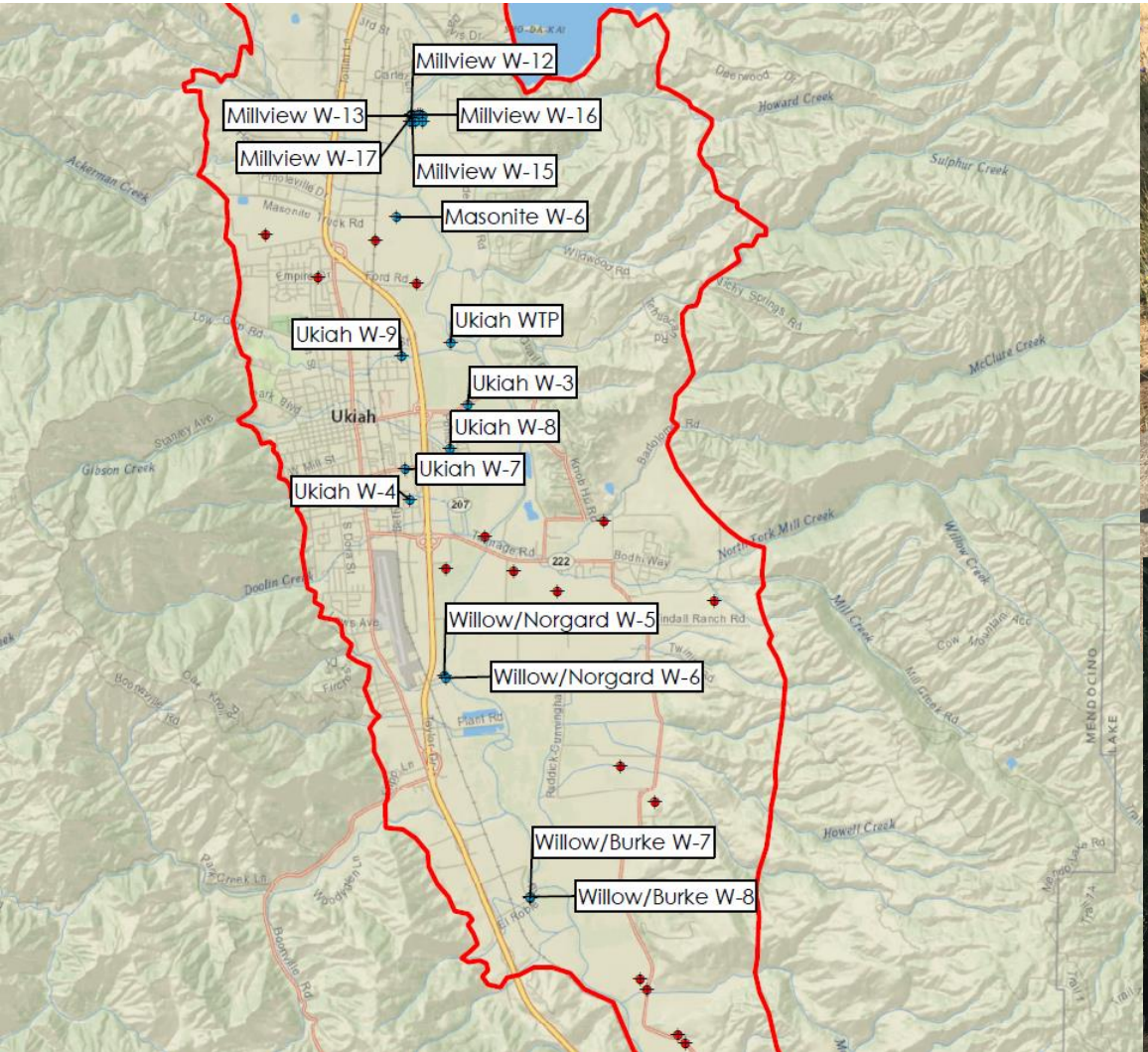
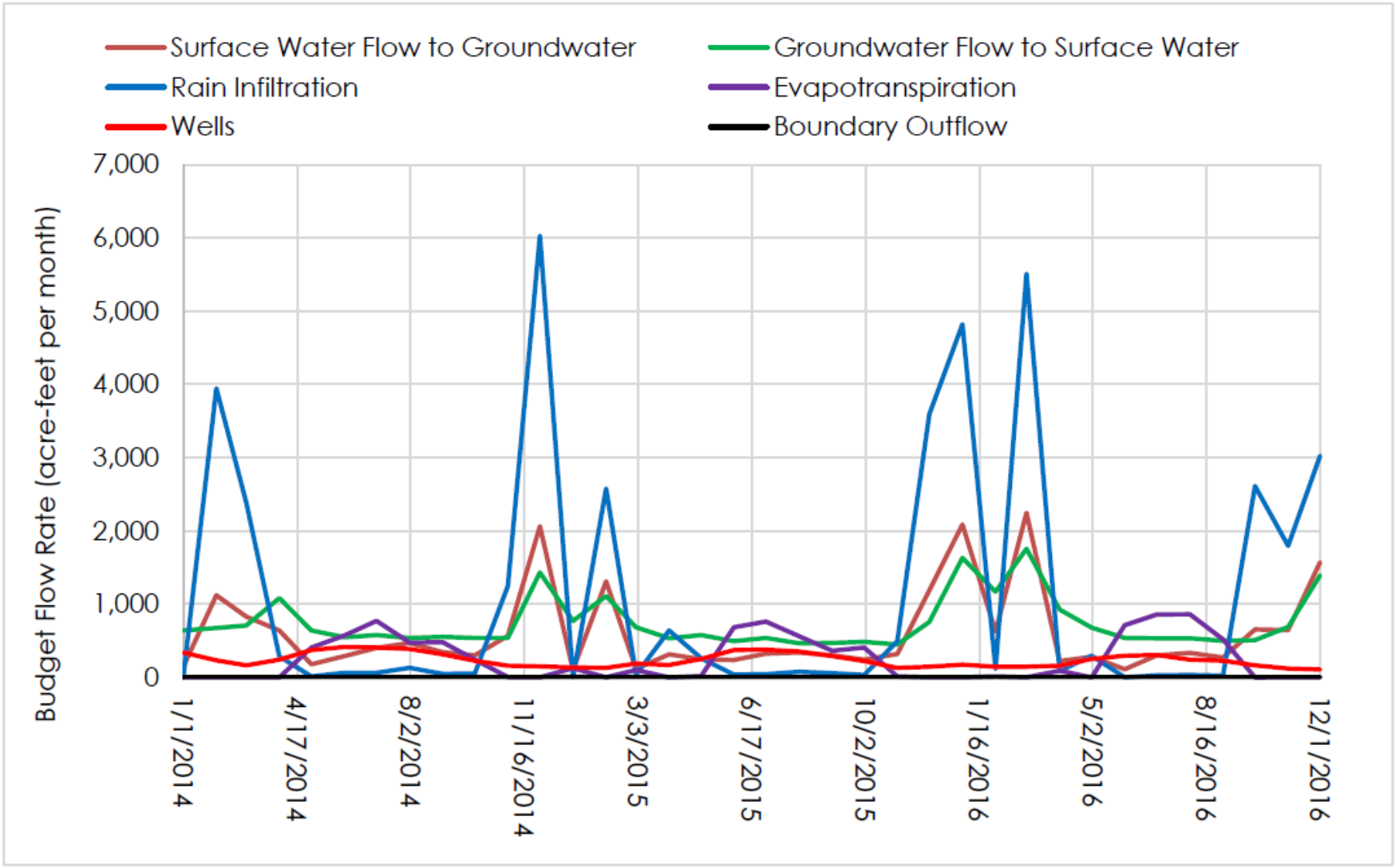
Water Budget – Extraction Wells



Water Budget – Results



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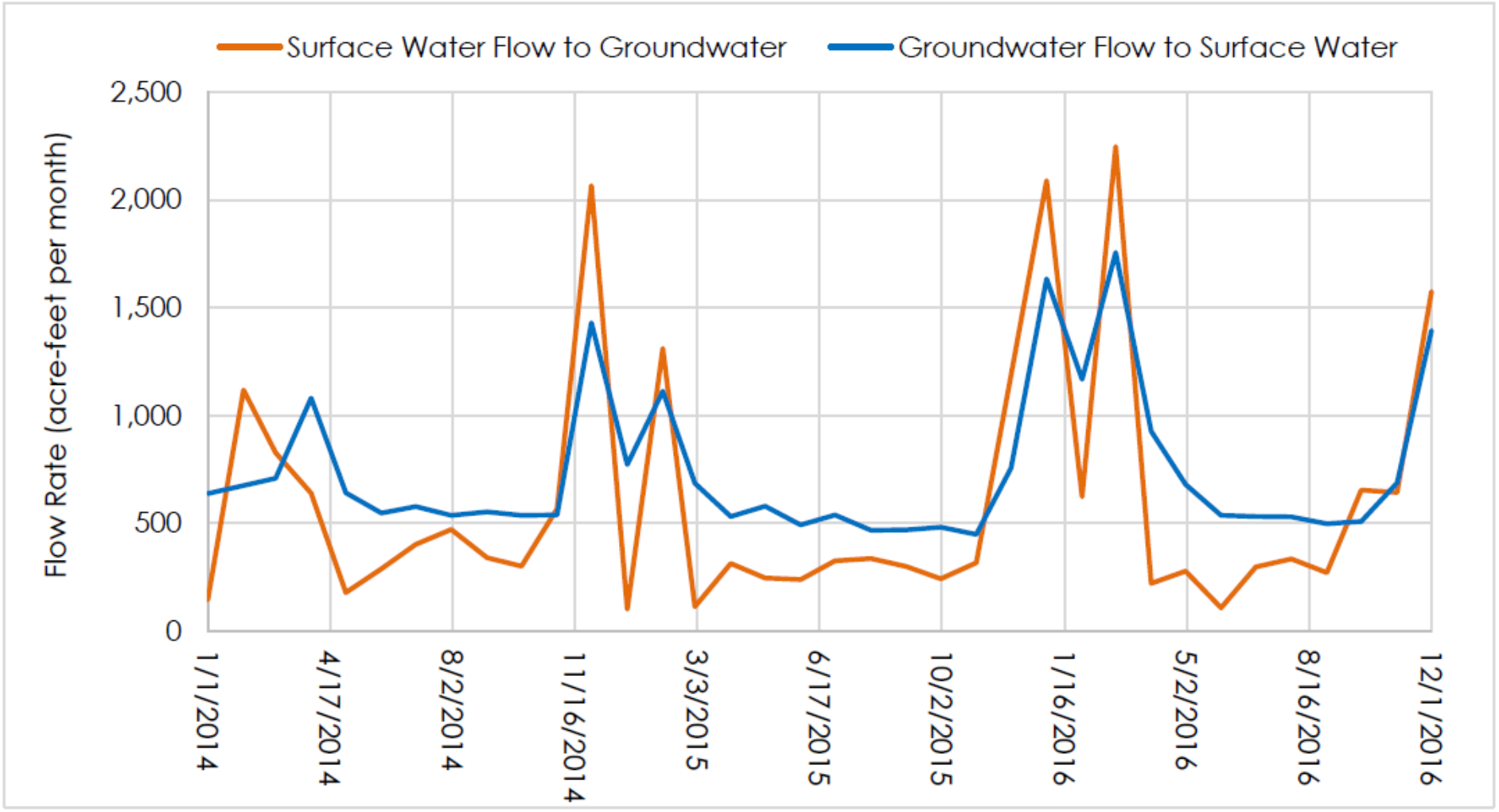
Water Budget – Results



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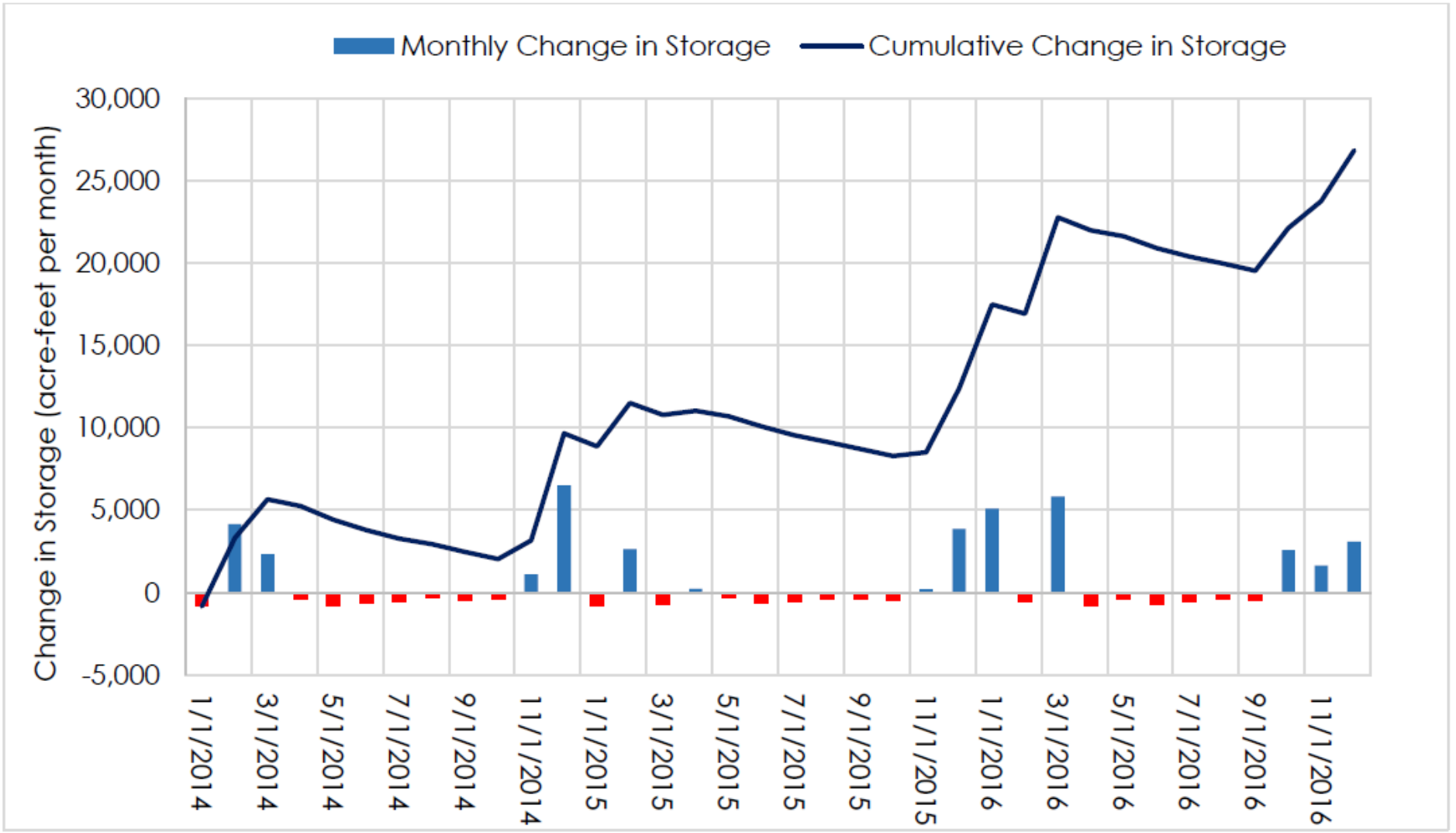
Water Budget – Results



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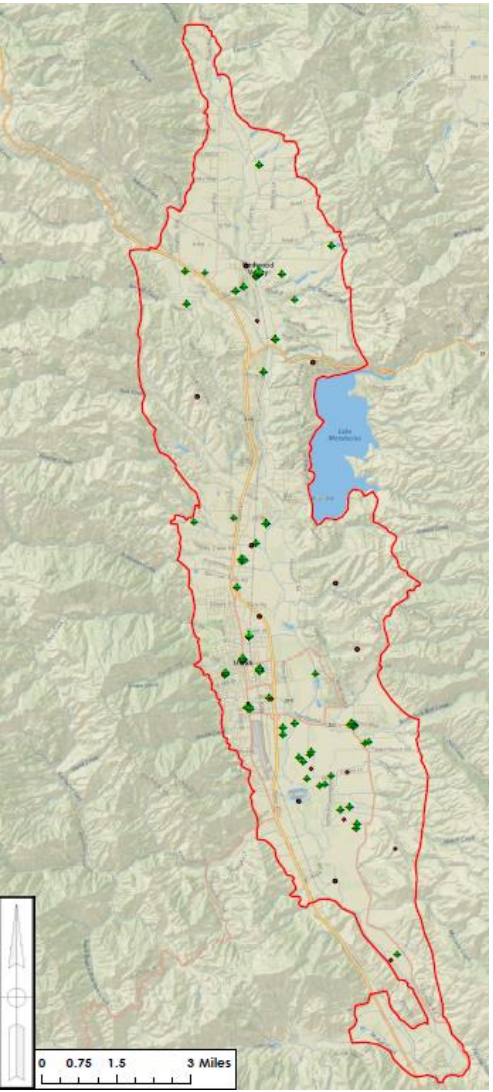
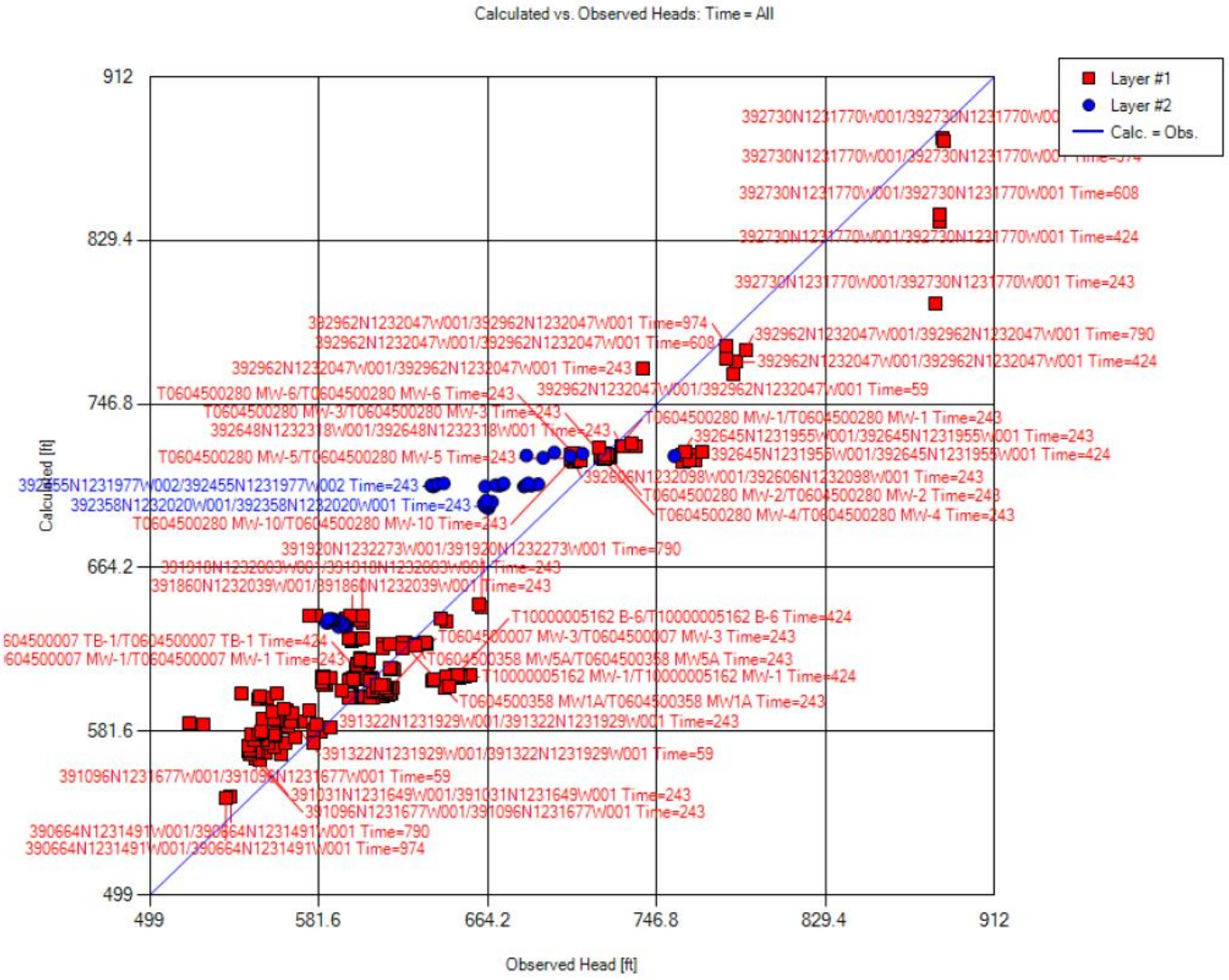
Water Budget – Model Calibration





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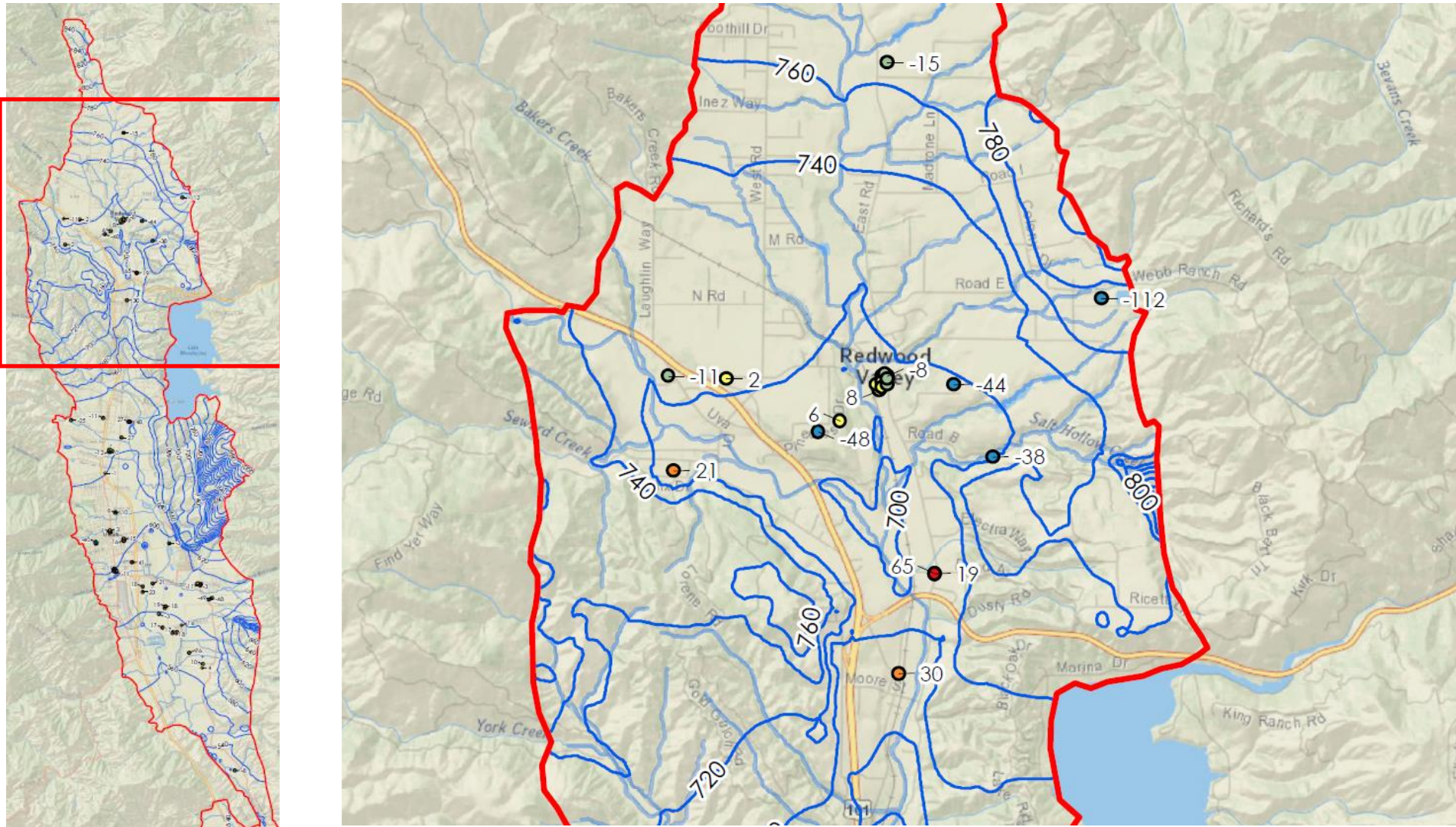
Water Budget – Model Validation



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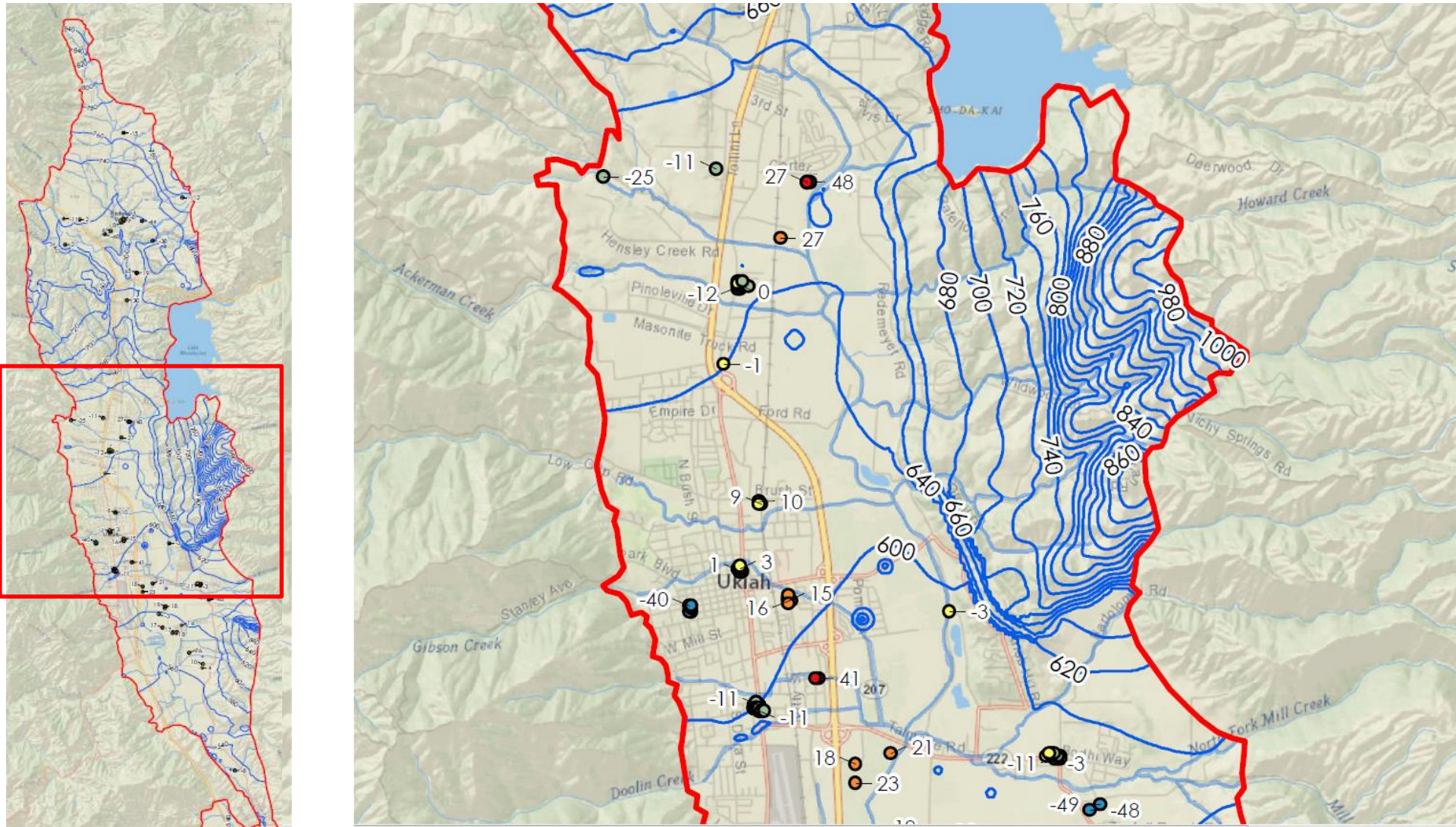

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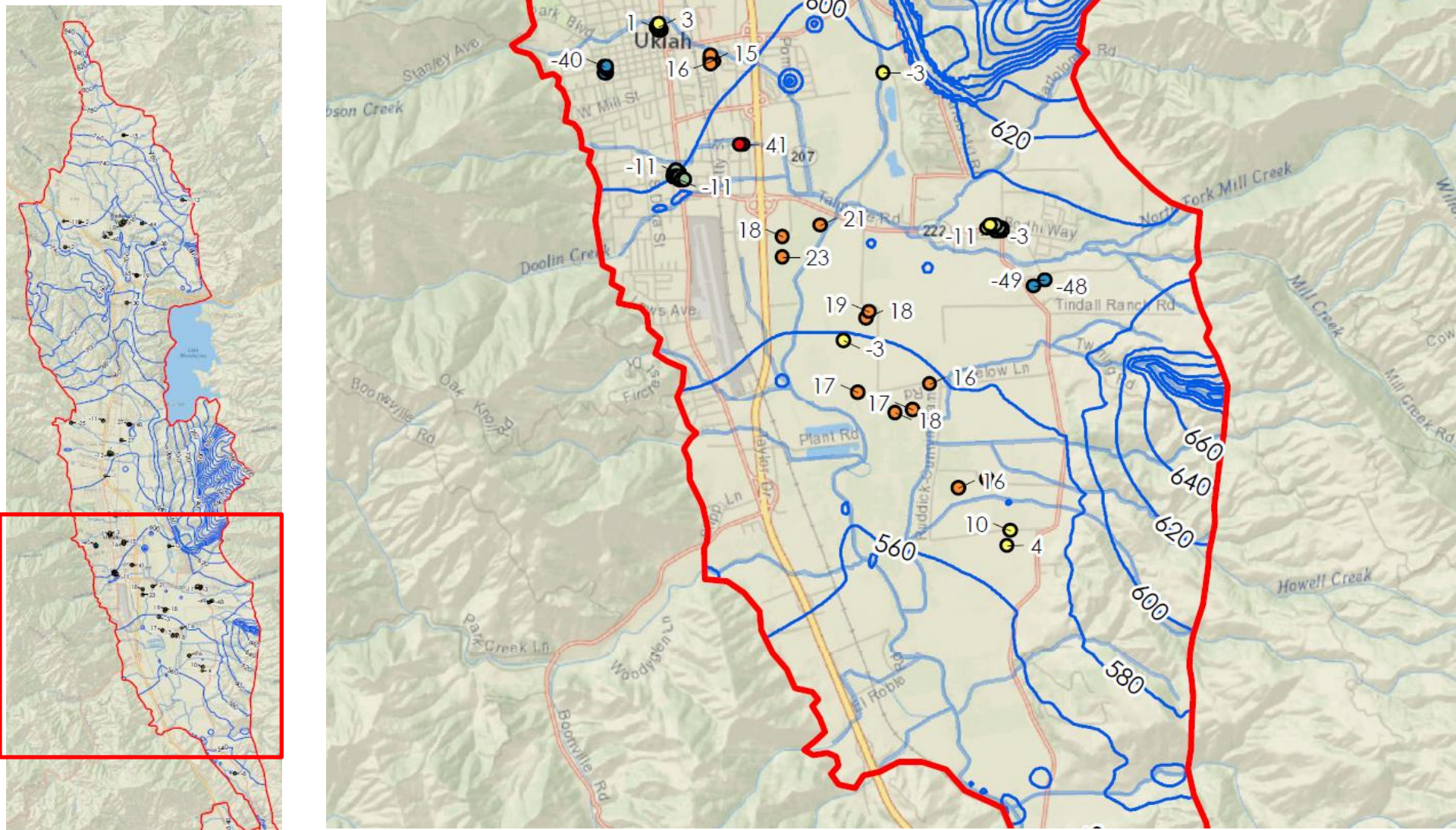
Water Budget – Model Validation



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Preliminary Water Budget Study Conclusions

- Cumulative groundwater storage increased by 27,000 acre-feet from for the three year study period.
- Groundwater storage increased between November and March and decreased during the dry season.
- Groundwater recharges tributaries and the Russian River during the dry season and the flow gradient reverses during storm events during the wet season.
- Data gaps pertaining to streamflow, hydraulic head observations, agricultural groundwater pumping, return flows from irrigation, evapotranspiration, and boundary inflows from the Franciscan formation

Sustainable Management Criteria

Undesirable Results
Surface water-groundwater interaction

Measurable Results
Hydraulic heads and streamflow stage

Minimum Thresholds
Coupled groundwater-streamflow monitoring

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Sustainable Management Criteria

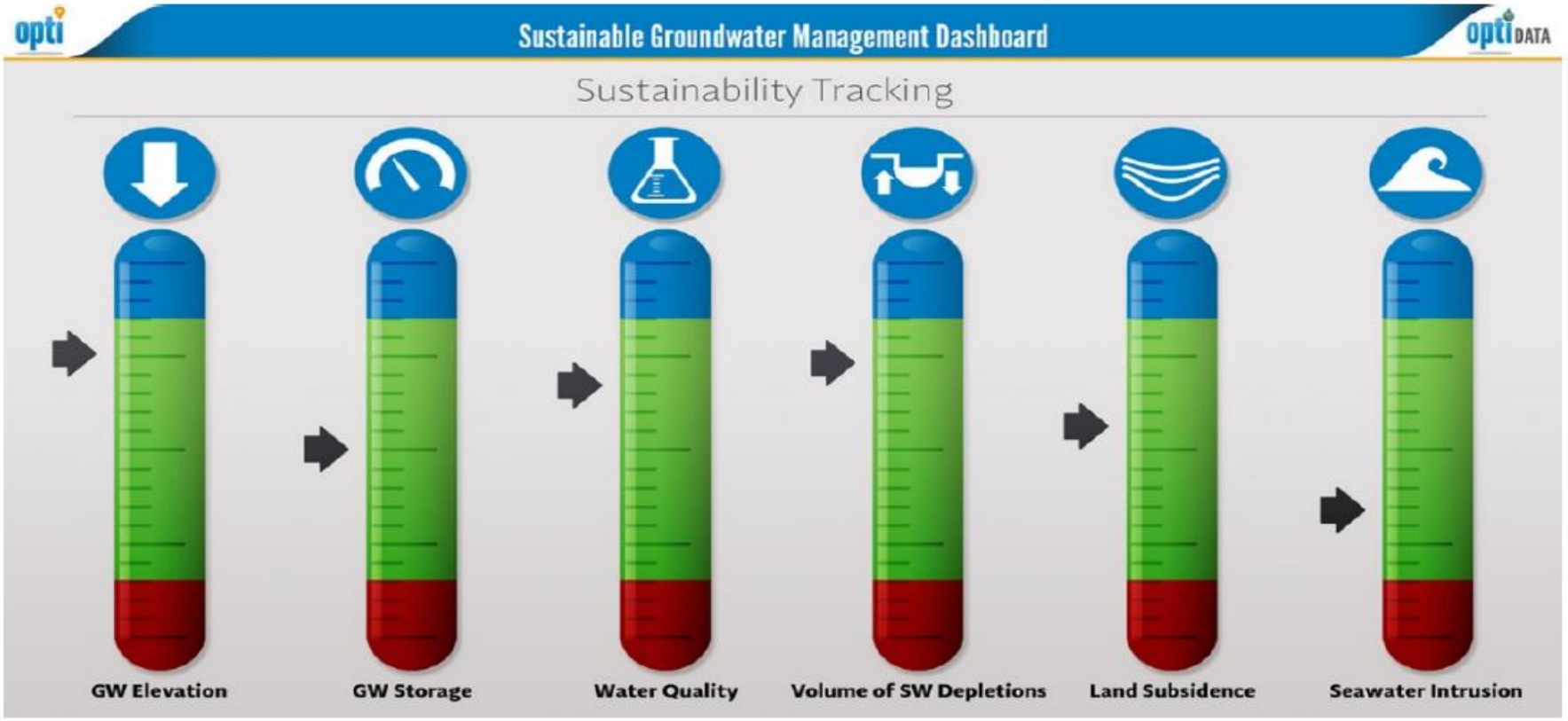
Table 1. Summary of Existing Conditions

Groundwater Sustainability Indicator	Existing Condition
Chronic Lowering of Groundwater Levels	Not present
Reduction of Storage	Not present based on previous studies from G.T. Cardwell (1965), C.D. Farrar (1986), Marquez (2015), and LACO Associates (2017)
Seawater Intrusion	Not applicable, only applicable for basins adjacent to the Pacific Ocean, bays, deltas, or inlets
Degraded Water Quality	No point source Impacts to Groundwater Wells. Nonpoint source impacts need evaluation
Land Subsidence	Not present because there is not chronic lowering of groundwater levels.
Interconnected Surface Water Depletion	Data gaps pertaining to surface water-groundwater interaction must be filled in order to document existing conditions.

Table 2. Minimum Thresholds for Sustainability Indicators

Sustainability Indicator	Minimum Threshold Unit
Chronic Lowering of Groundwater Levels	Head
Reduction of Storage	Volume withdrawn
Seawater Intrusion	-
Degraded Water Quality	No. of wells exceeding contaminant concentration
Land Subsidence	Rate of subsidence + Extent of subsidence
Interconnected Surface Water Depletion	Flux between surface and groundwater

Sustainable Management Criteria



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Key Findings

- Hydrogeologic Conceptual Model
- Preliminary Water Budget Study
- Sustainable Management Criteria

Recommended Actions

- Fill data gaps and obtain the necessary data to quantify surface water-groundwater interaction fluxes.
- Use the groundwater model calibration system to identify areas and parameters that are sensitive to data gaps and areas that do not have a significant effect on model results.
- Install coupled streamflow gauges and groundwater monitoring wells on tributaries and the Russian River.
- Conduct pump tests with monitoring wells in the different hydrogeologic formations.

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Thank you!