

MAY ADVISORY COMMITTEE MEETINGS

Scott Valley Groundwater Advisory Committee Meeting



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ASSOCIATES
science | policy | solutions



Agenda

- Recap on sustainable management criteria
- Progress to date, schedule through Fall 2024
- Implementation Project Updates
 - SVID Recharge
 - Ditch Infiltration Studies
 - Additional Projects- Discussion
- Upland Management
- Irrigation Workshop Recap

Timeline – To Date

2023 Q3

- Formation of work groups in August AC Meetings
- Work groups approve draft project scope and schedule
- Final grant awards expected in September

2023 Q4

- October AC Meetings- review of final funding awards
- Detailed scope and schedule for funded projects provided to Advisory Committee

2024 Q1

- February AC Meetings- updates from project work groups, updates depend on individual project schedules
- SGMA Compliance- Annual Report for WY 2023

2024 Q2

- May AC Meetings- update on implementation projects, upland management project discussion

Timeline through Fall 2024

2024 Q3

- Summer sample collection
- Select upland management project and preliminary monitoring design plan
- Continue development of well inventory
- August AC Meetings

2024 Q4

- Preliminary Database Management System (DMS)
- Model scenario results with different management actions
- October AC Meetings

Jan 1 Feb 1 Mar 1 Apr 1 May 1 Jun 1 Jul 1 Aug 1 Sept 1 Oct 1 Nov 1 Dec 1 Dec 31



 <i>In Progress</i>	 <i>Added to Backlog</i>
 <i>Complete</i>	 <i>Blocked</i>

Implementation Grant Progress *Through February 2024*

#	Component	Notes	Status
1	SGMA Compliance and GSP Updates		
1.1	GSP Revisions	Due January 2027	In Progress
1.2	Reporting (Data and Annual Report)	Annual Reports due April 1 of each year	In Progress
1.3	Model Updates and Scenario Evaluation		In Progress
1.4	Data Gaps and Monitoring Expansion and DMS		In Progress
2	Fee Study and Economic Analysis		
2.1	Evaluation of Fee/Rate Options and Schedule Development		Not Started
2.2	Parcel scale groundwater use estimate		In Progress
2.3	Economic Analysis		Not Started
3	Well Inventory		
3.1	Database Development and Well Risk Assessment		In Progress
3.2	Monitoring Well Construction or Well Instrumentation		Not Started
4	Irrigation Ditch Recharge Projects		
4.1	Planning/Permitting, Installation of Monitoring Infrastructure	Diversion permits, diversion infrastructure, flowmeters	In Progress
4.2	Monitoring and Data Analysis, Annual Diversion Reports	Biological monitoring, flow measurements, water quality	In Progress
5	Upland Management		
5.1	Project Planning and Environmental Documentation	Develop workplan	Not Started
5.2	Monitoring Design, Data Collection, and Data Analysis	Assess monitoring needs,	Not Started



Chronic
Lowering of
Groundwater
Levels



Reduction of
Groundwater
in Storage



Seawater
Intrusion



Degraded
Water Quality



Land
Subsidence



Depletions of
Interconnected
Surface Water

Sustainable Management Criteria



Chronic
Lowering of
Groundwater
Levels



Reduction of
Groundwater
in Storage

Minimum/ Maximum Threshold

Historic maximum depth to water measurement **prior to 2015 with a buffer of 10% of historic max depth or 10 feet**, whichever is smaller.

Measurable Objective

75th percentile of the fall measurement range (i.e., water levels >25% of historic record).

Undesirable Result

The fall low water level observation in any of the representative monitoring sites in the Basin **falls below the respective minimum threshold for 2 consecutive years.**



Degraded
Water Quality

Minimum/ Maximum Threshold

**Nitrate=10 mg/L, specific
conductivity= 900
umhos/cm**

Measurable Objective

More than 90% of wells
monitored for water quality
maintain their range of water quality
measurements measured from 1990
through 2020.

Undesirable Result

**More than 25% of
groundwater quality wells
exceed the maximum
threshold for
concentration** and/or
concentrations in over 25% of
groundwater quality wells increase
by more than 15% per year, on
average over ten years.



Depletions of
Interconnected
Surface Water

Minimum/ Maximum Threshold

Average **15% stream depletion reversal** caused by groundwater pumping from outside the adjudicated zone in 2024 and thereafter.

Measurable Objective

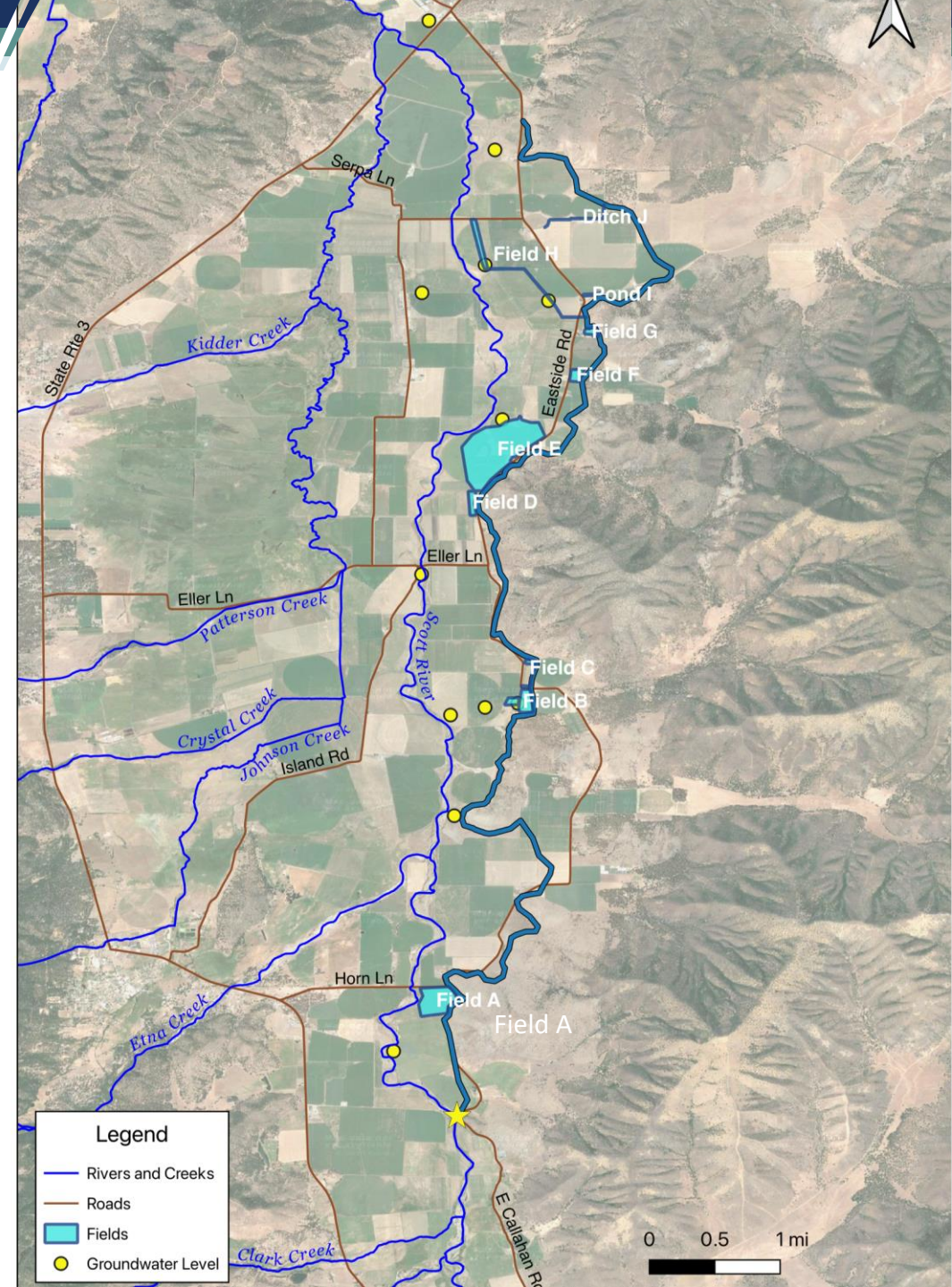
Average **stream depletion reversal of 20%** or above in 2024 and thereafter.

Undesirable Result

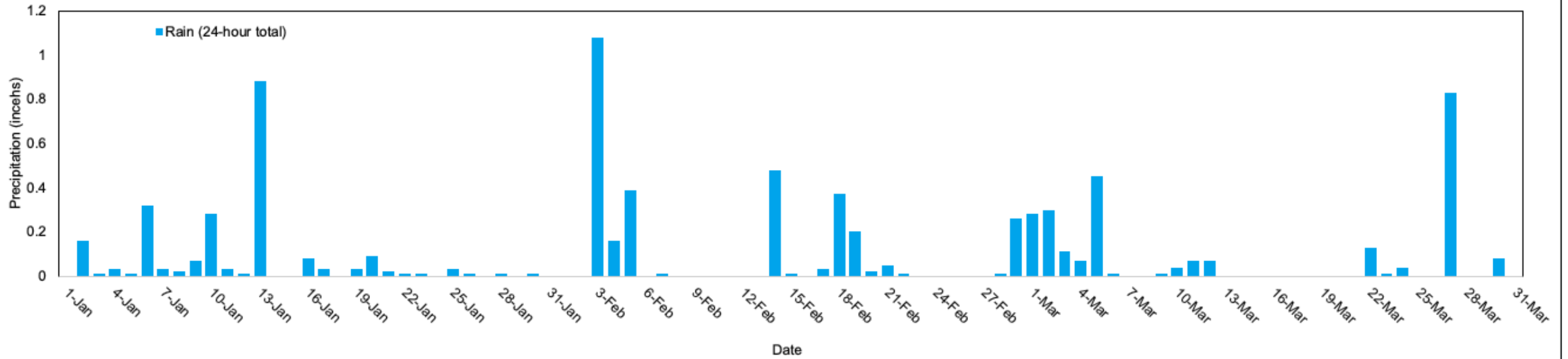
Ecological stress from **<15% average stream depletion reversal of the depletion** caused by groundwater pumping outside of the adjudicated zone in 2024 and later, as defined by specific reference scenarios with SVIHM.

SVID Recharge 2024

- Water diverted from Young's Dam from January 15, 2024 through March 31st 2024
- Total of **2,783 AF** diverted from Young's Dam
- 10 different locations used in SVID service area to apply water (A through J)
- Total area ~ 260 acres

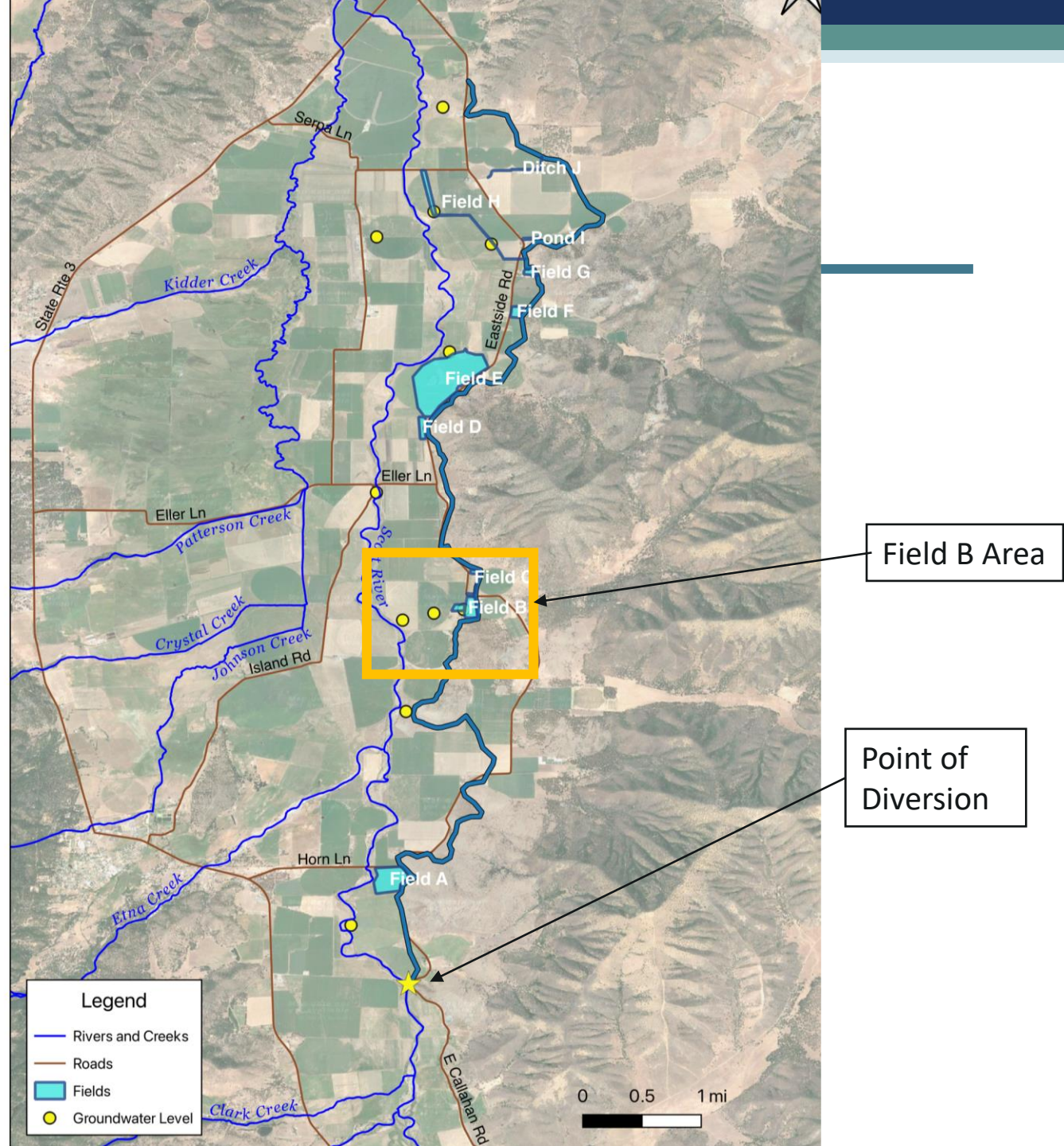


Precipitation January 1 through March 31, 2024

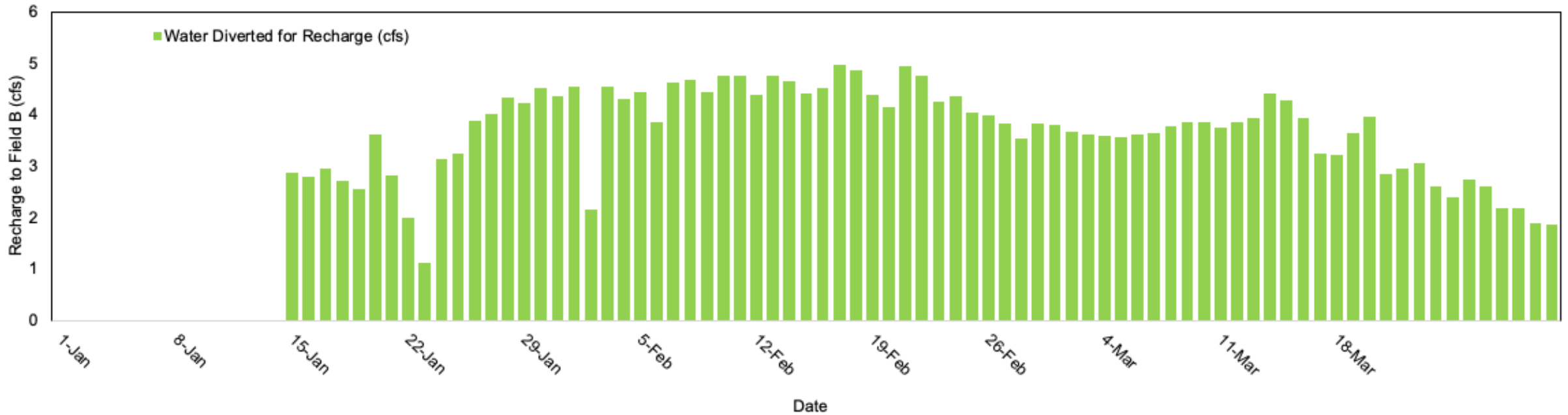


Snapshot of Field B

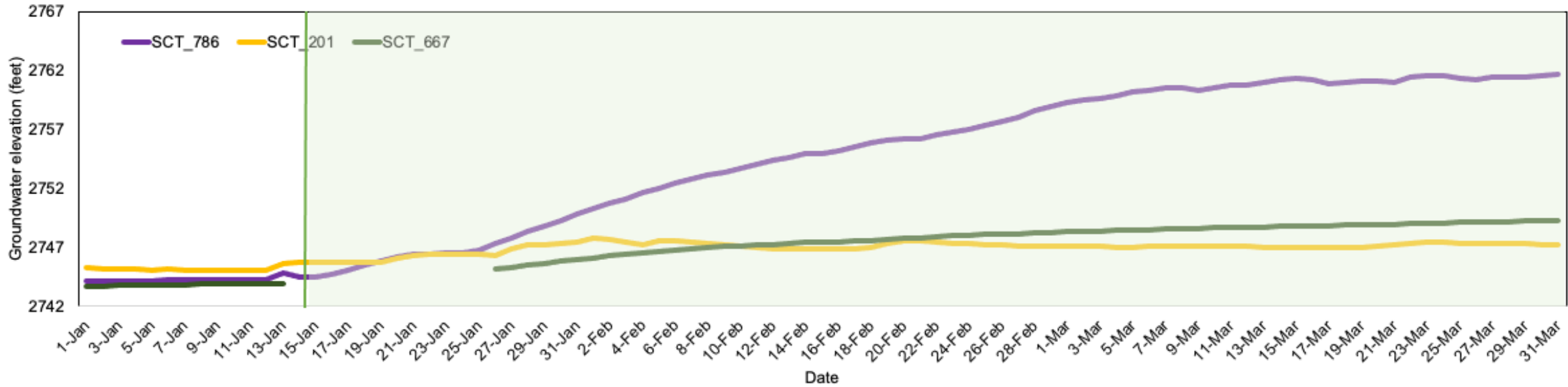
- Transect of wells from field used for recharge to the river
- Longest application period for recharge
 - Full recharge period from January 15 through March 31



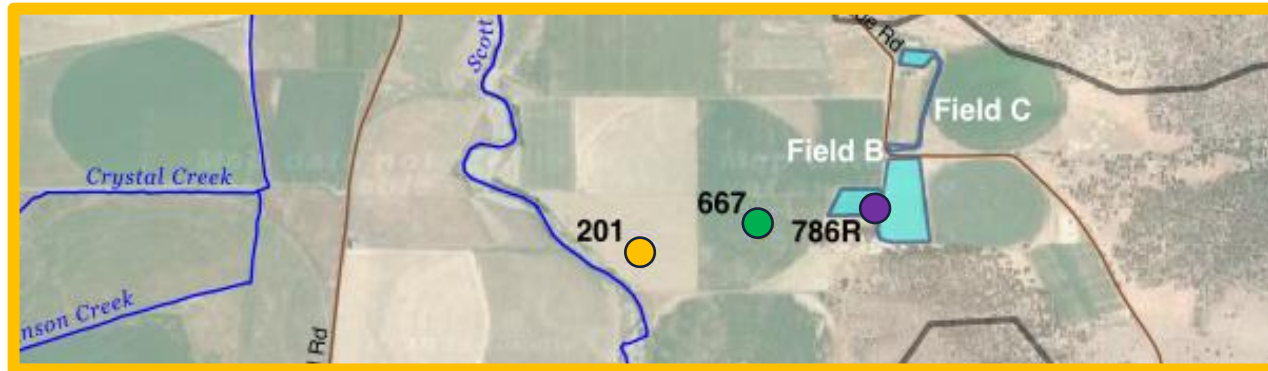
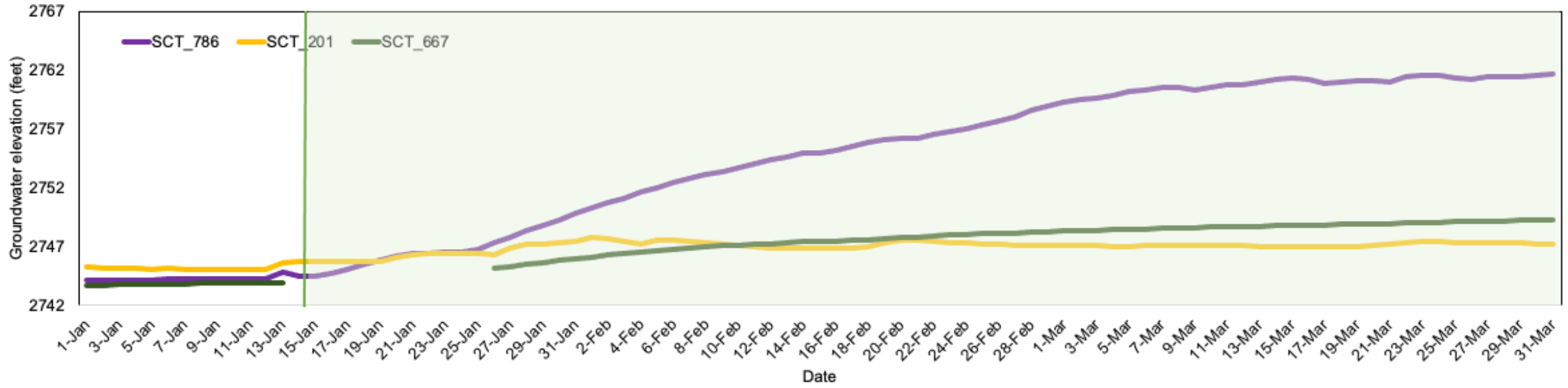
Precipitation and Recharge to Field B January 1 through March 31, 2024



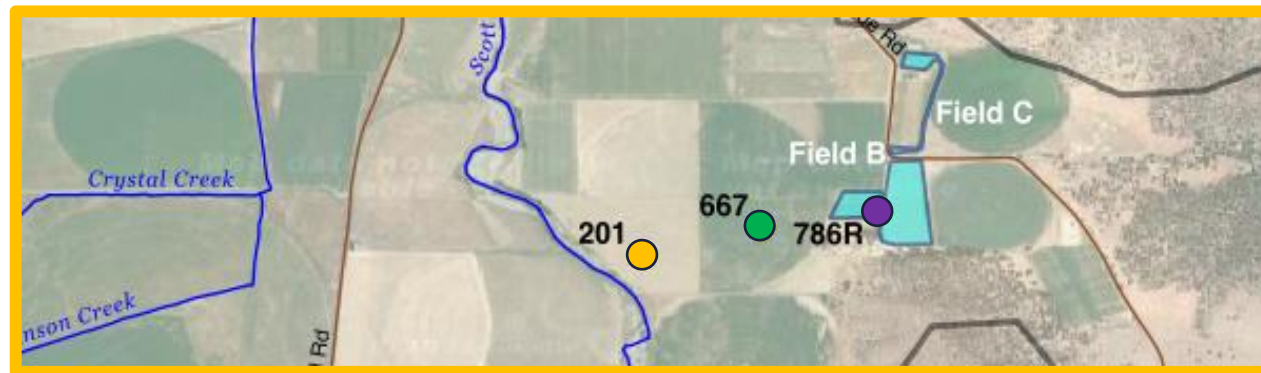
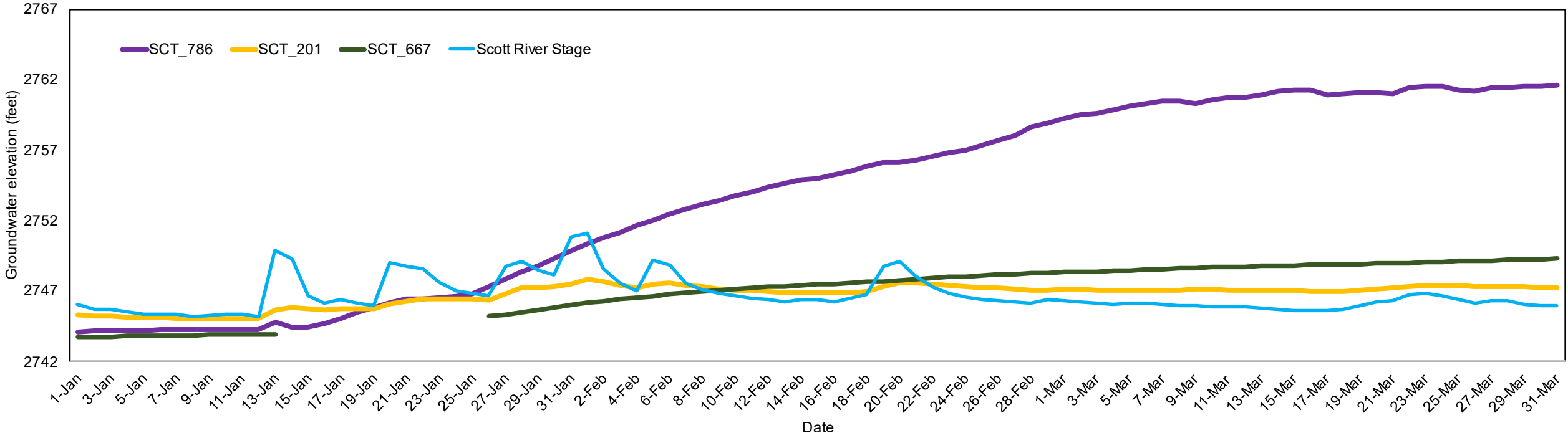
Groundwater Elevation near Field B

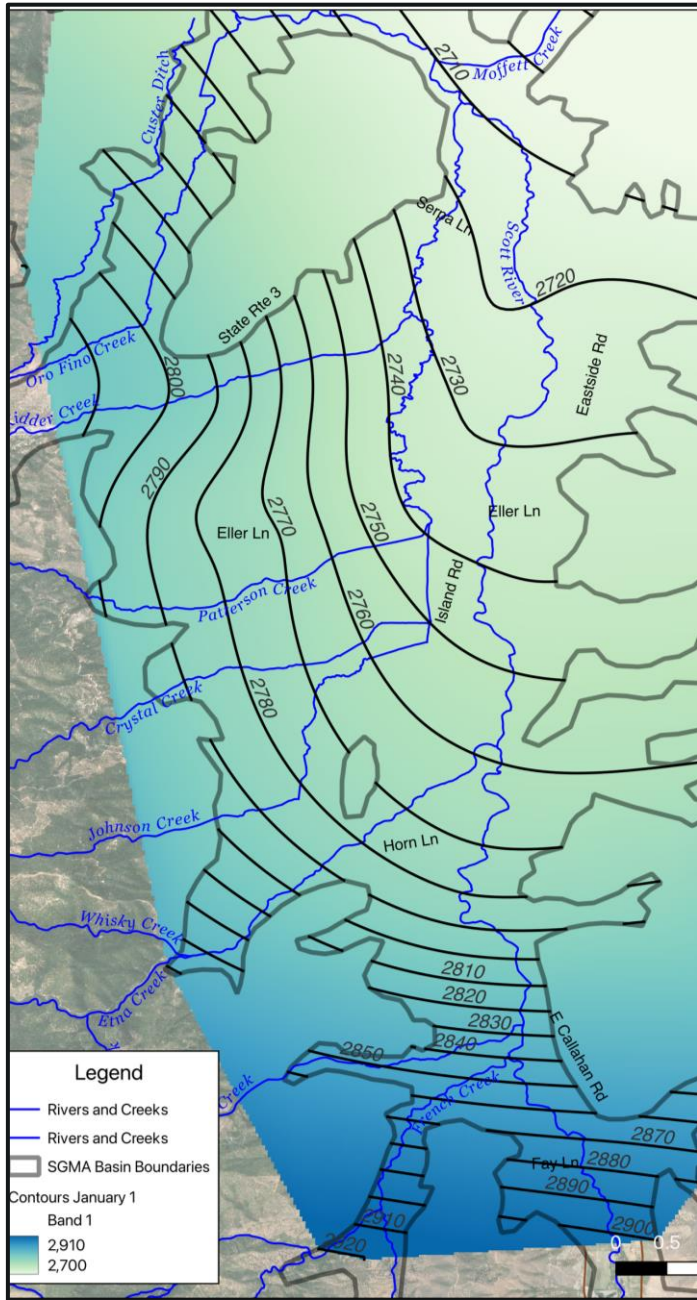


Groundwater Elevation near Field B



Groundwater Elevation and Scott River Stage

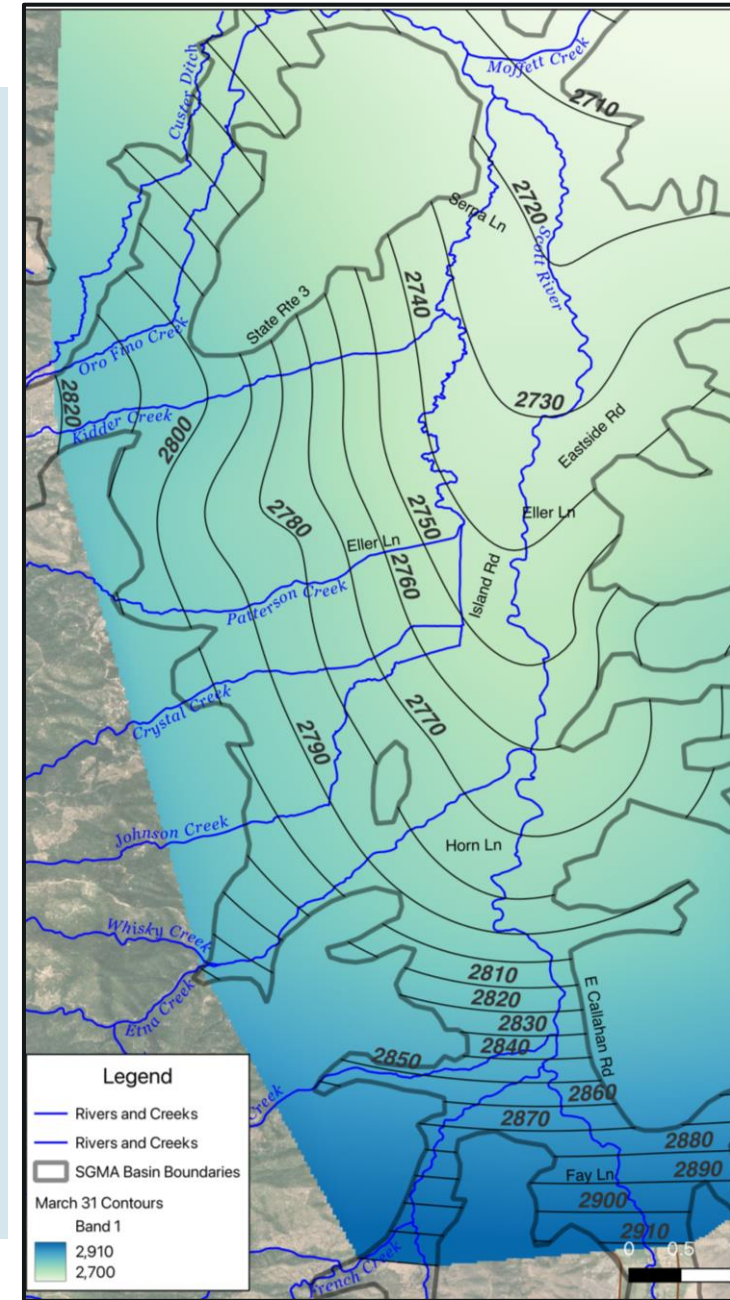




Contour Maps

← Contour map from January 1, 2024 on the left

Contour map from March 31, 2024 on the right →



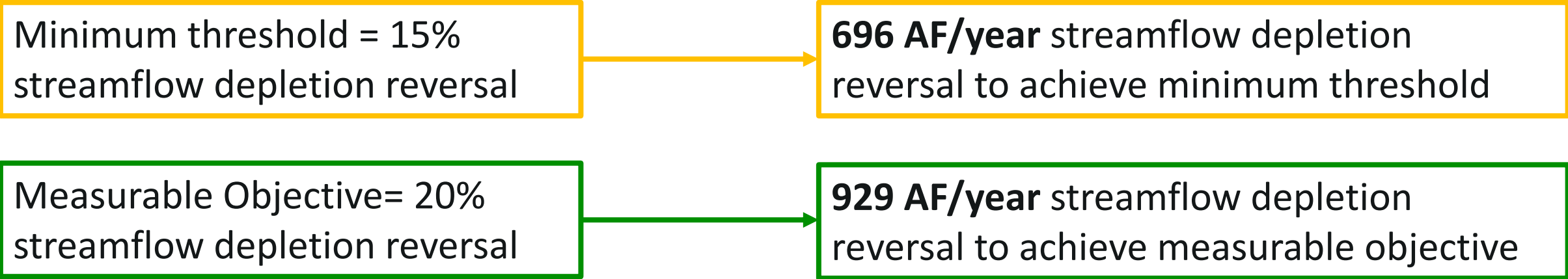
Connecting Project Implementation with SMCs

Streamflow depletion reversal achieved with different recharge scenarios

Scenario ID	Scenario Depletion Reversal, Sep-Nov '91-'18 (TAF)	Relative Depletion Reversal, Sep-Nov '91-'18
MAR (Managed Aquifer Recharge) in Jan-Mar	13	10%
ILR (In-Lieu Recharge) in the early growing season	12	9%
MAR + ILR	25	19%

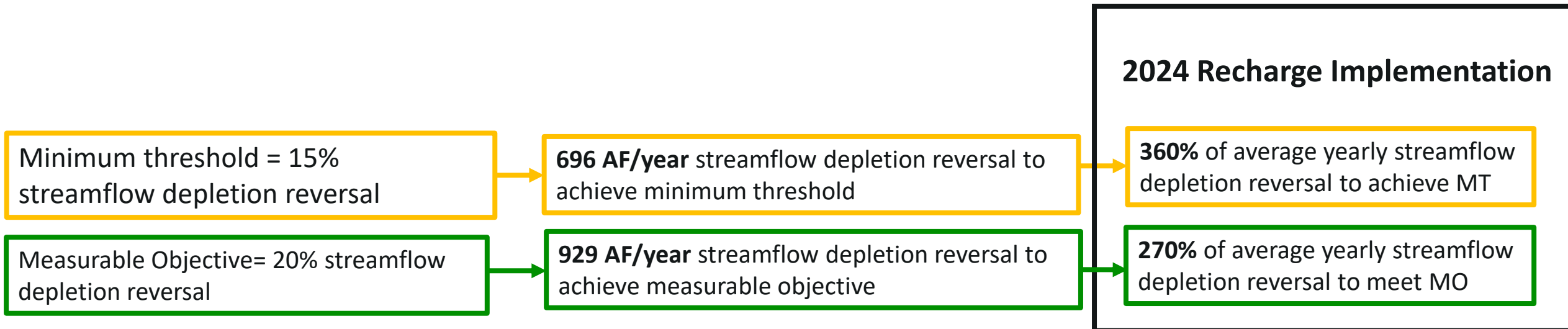
Depletion reversal modelled over a 28-year period

Average annual streamflow depletion reversal to achieve minimum threshold and measurable objectives



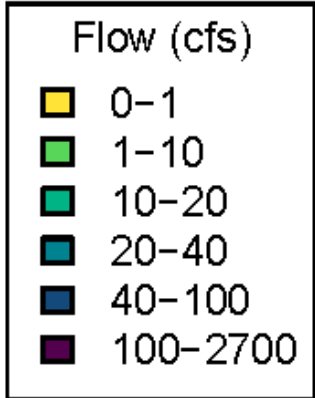
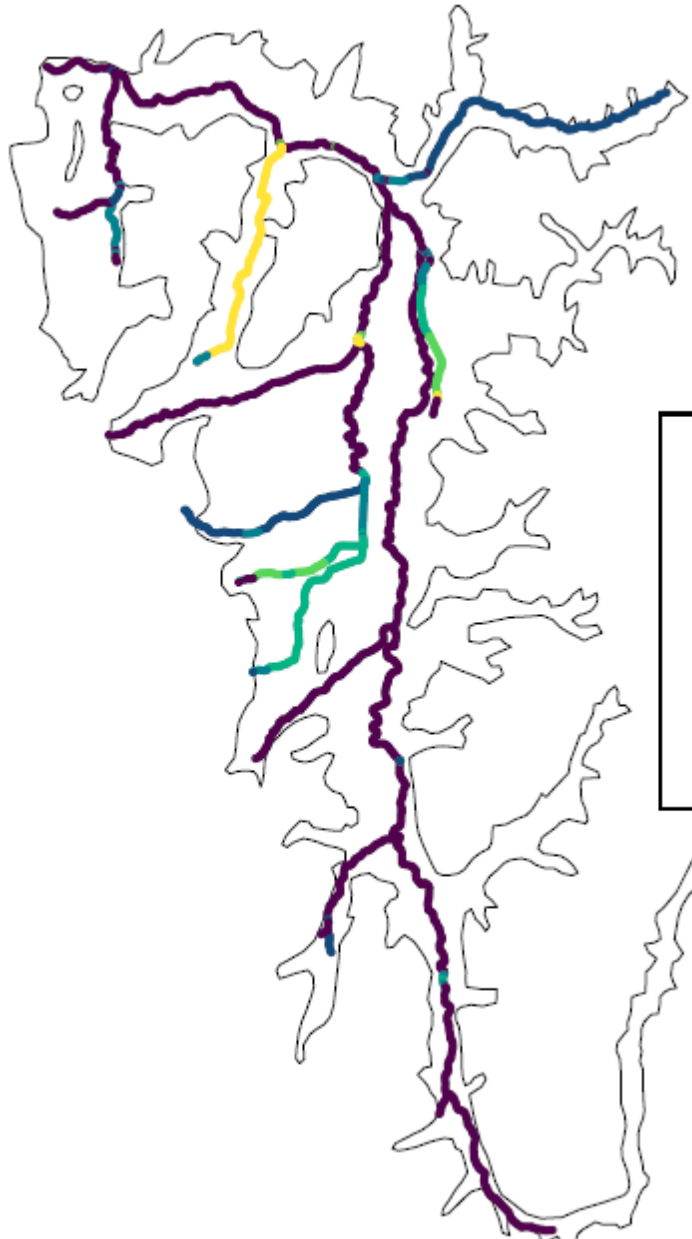
2024 Results- SVID Recharge Project

- Total diverted for recharge from January through March 2024 was **2,783 AF**
- Using 2016 simulation results “*nearly 90% of diverted water resurfaces as downstream streamflow enhancement April through December*”¹

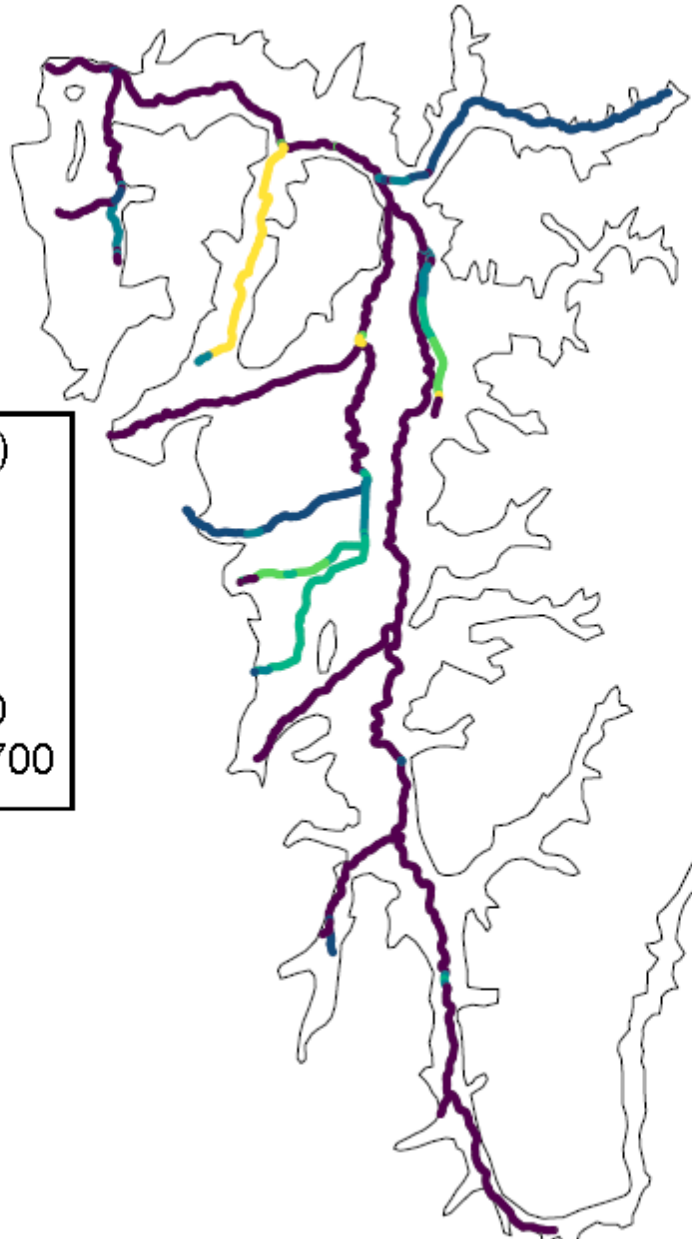


¹Dahlke, H. E., & Morris, J. (2016). Temporary Permit for Diversion and Use of Water Application T032564 Temporary Permit 21364 Summary Report.

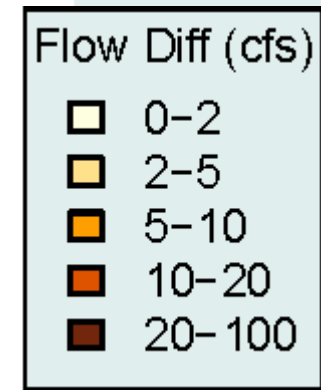
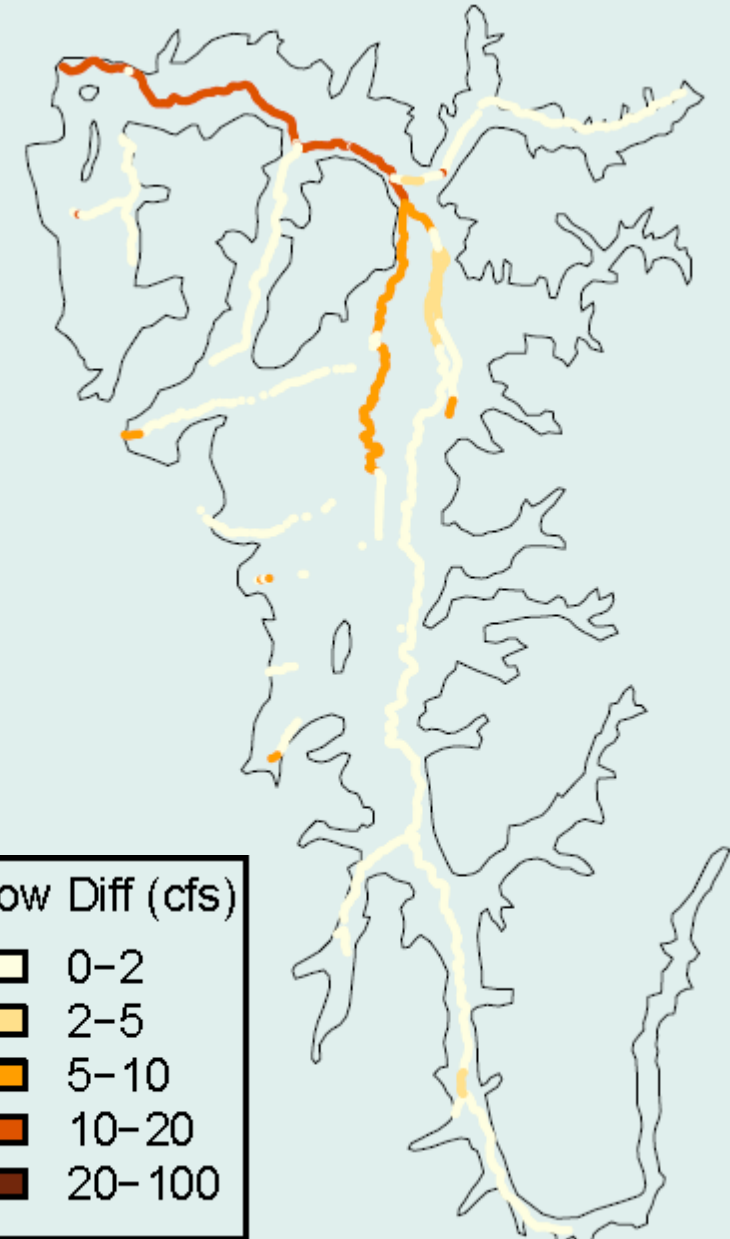
June 1993: Basecase



MAR Scenario

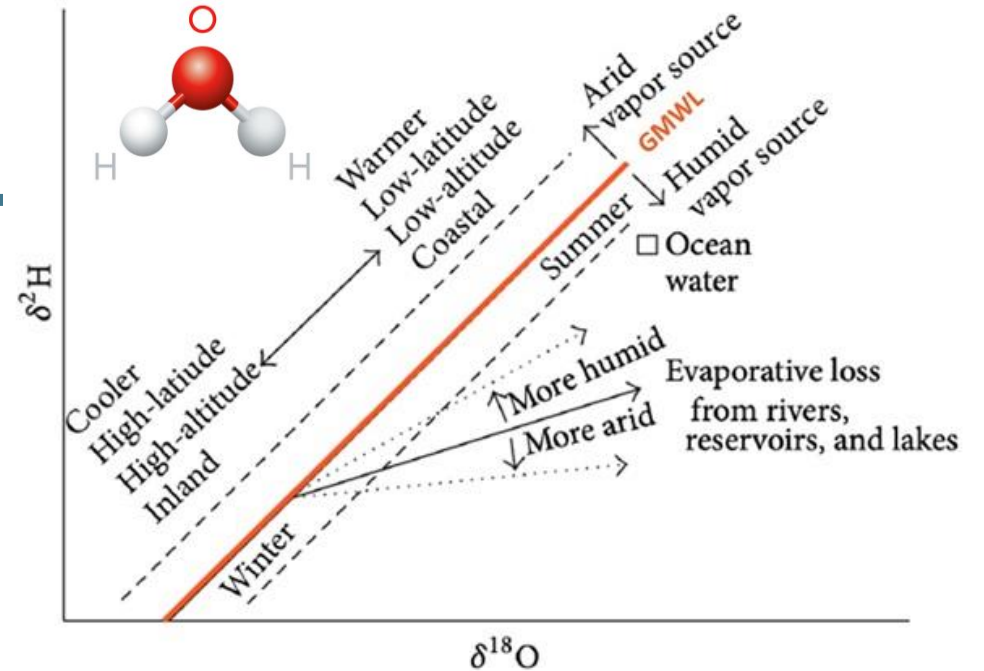


MAR minus Basecase Flow Difference



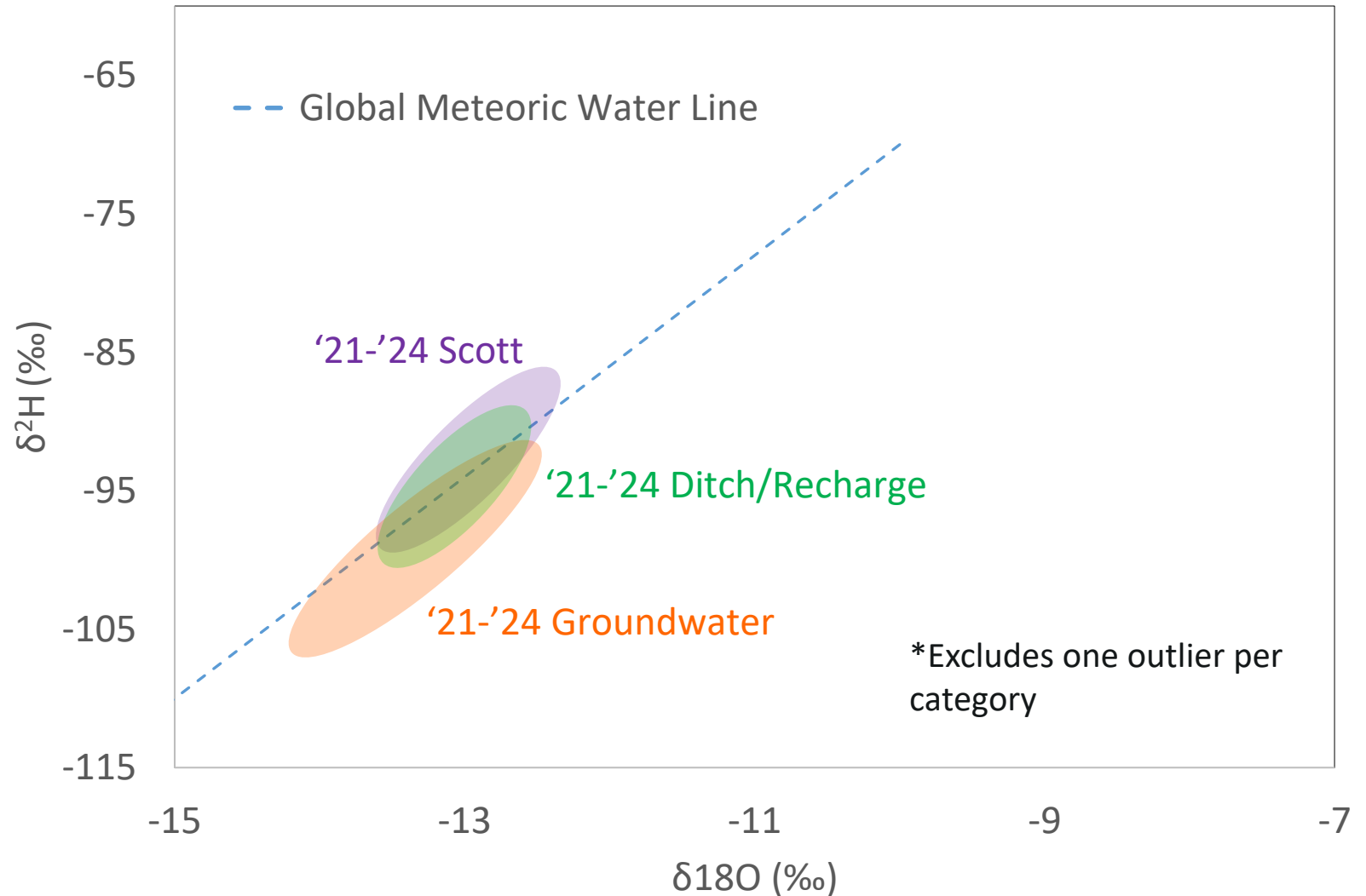
What can geochemistry tell us?

- Water isotopes and major ions
 - Distinguish water sources
 - Identify mixing of different water sources
- Radon
 - Helps to identify **gaining** and **losing** areas
 - Identify piezometers and shallow wells with very recent recharge
 - Can complement sensor data and other physical (temp, conductivity) and geochemical measurements to help understand streamflow dynamics through time
- Time series can be very informative

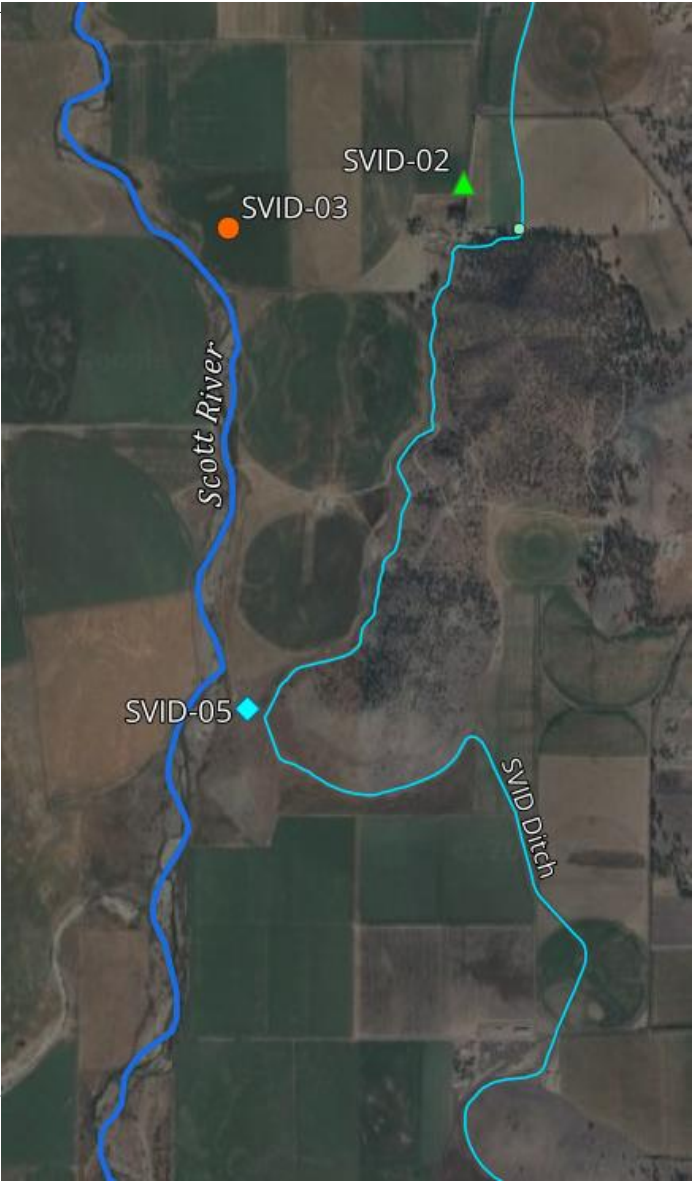
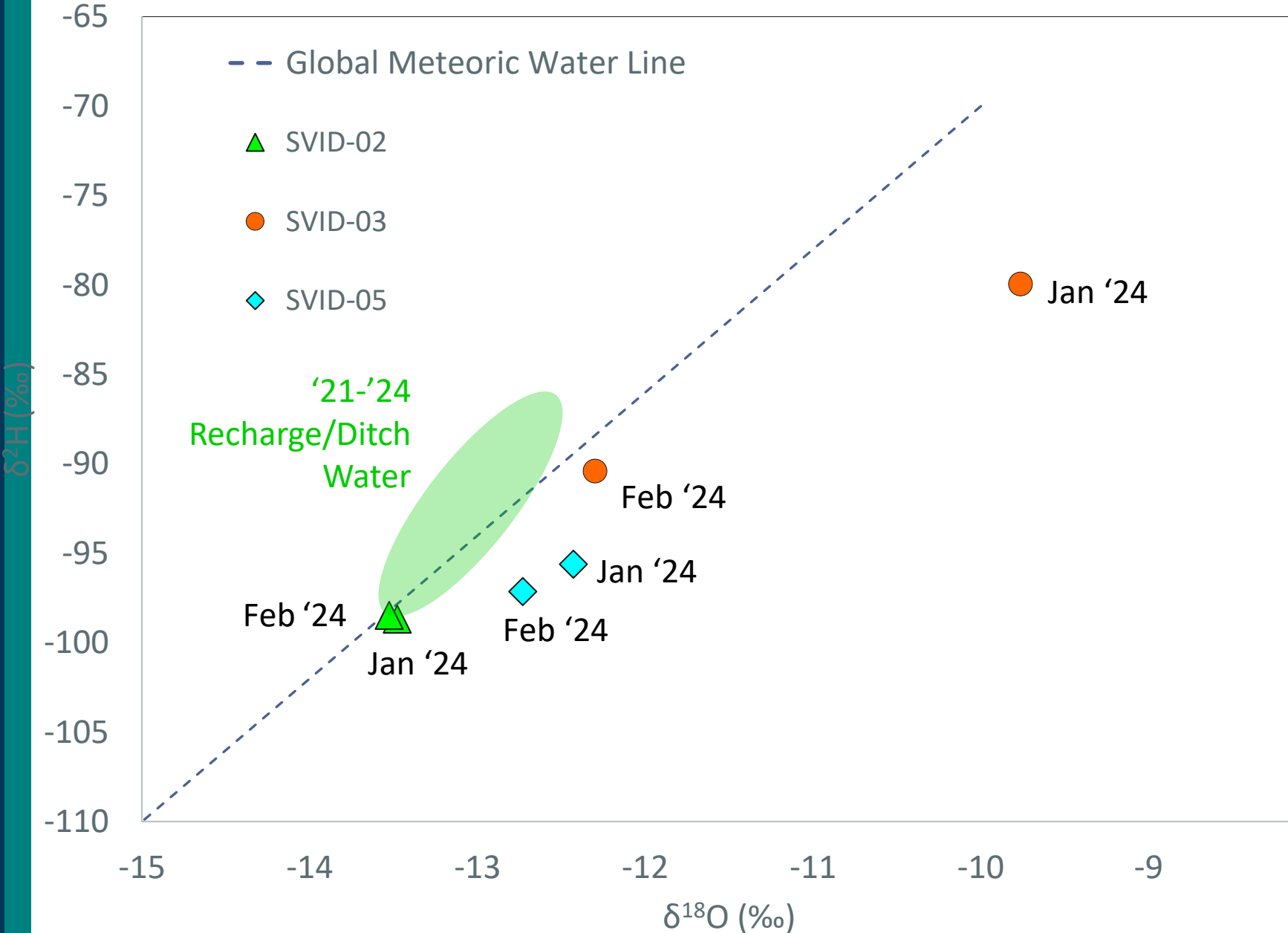


Range of SVID Water Isotope Results 2021-24

- GW has limited overlap with Scott River/Recharge Water
- Sampling in previous years stopped in March/April or earlier
- Longer time series should provide more information



Water Isotope Results for SVID Well Locations Jan – Feb 2024





2024: Next Steps

- **Monitoring Updates**

- Add two temperature sensors in Scott River:
 - Near recharge field
 - Near Point of Diversion
- Additional shallow piezometer transects

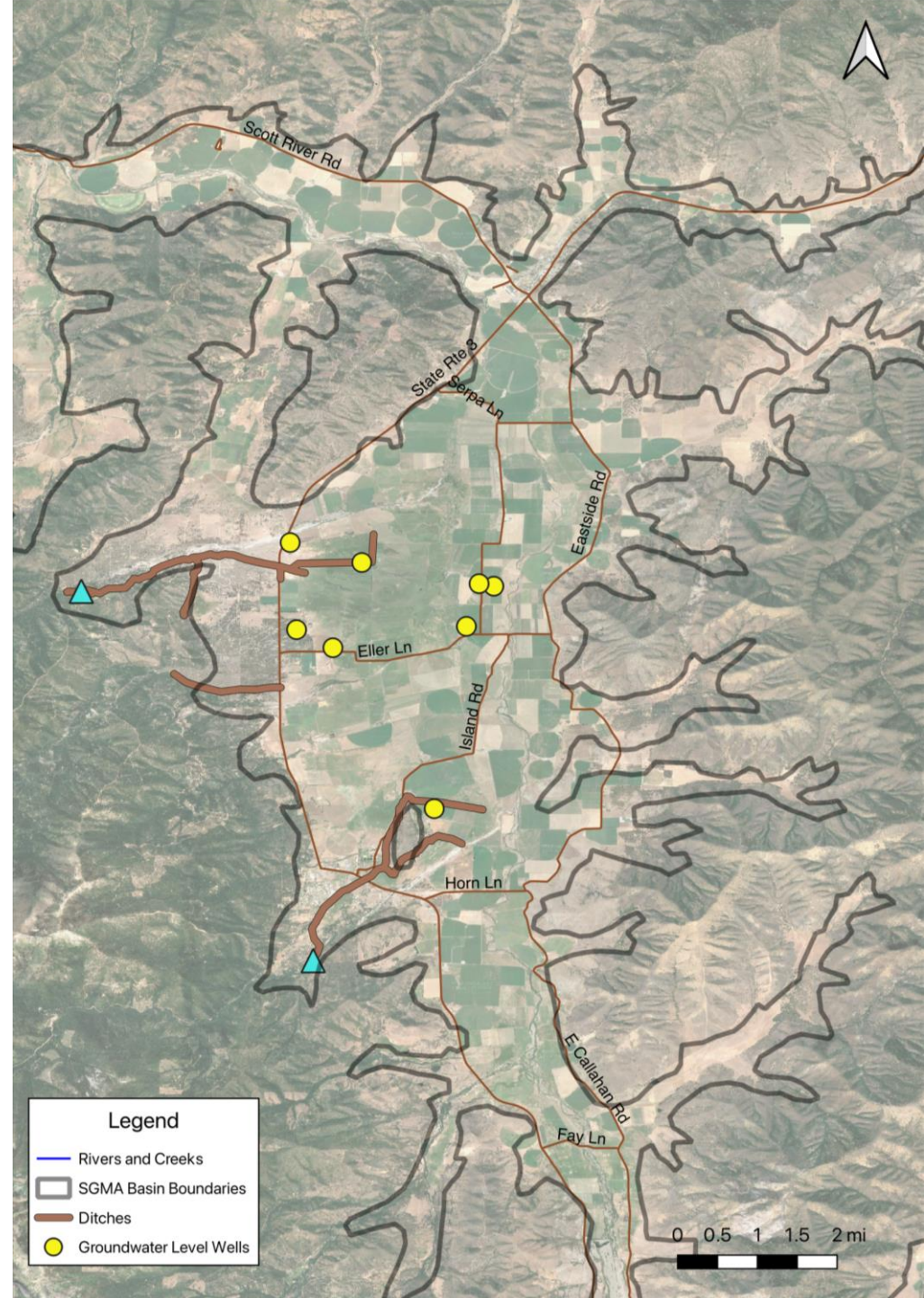
- **Results**

- Diversion report and conclusions from 2024 recharge season
- Run scenarios using SVIHM to quantify benefits from actual implementation in 2024

- **Permitting**

- 5-Year temporary permit application

Ditch Infiltration Study



Ditch Infiltration Study

- **What role do unlined irrigation ditches play in groundwater recharge in the Basin?**
- Project includes ditches on the westside of Scott Valley (3 areas of focus)
- Monitoring includes:
 - Long-term continuous data collection:
 - flow stations
 - groundwater level monitoring
 - Geochemical sampling to answer localized question of ditch infiltration relationship to perennial pools
- SVIHM to incorporate collected data to help answer this question

Ditch Infiltration Study- Progress and Plan

Work to date

- Locations identified for monitoring instrumentation
- Installation of high-priority flow stations, instrumentation of groundwater wells
- Collection of baseline geochemical samples
- Initial particle tracking using SVIHM

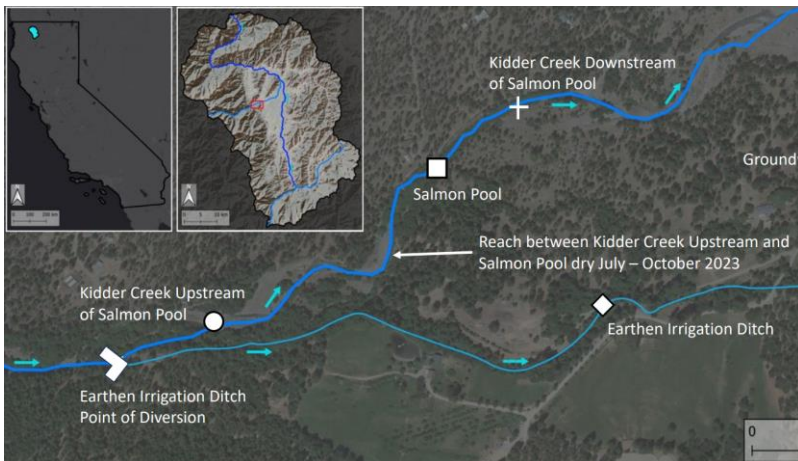
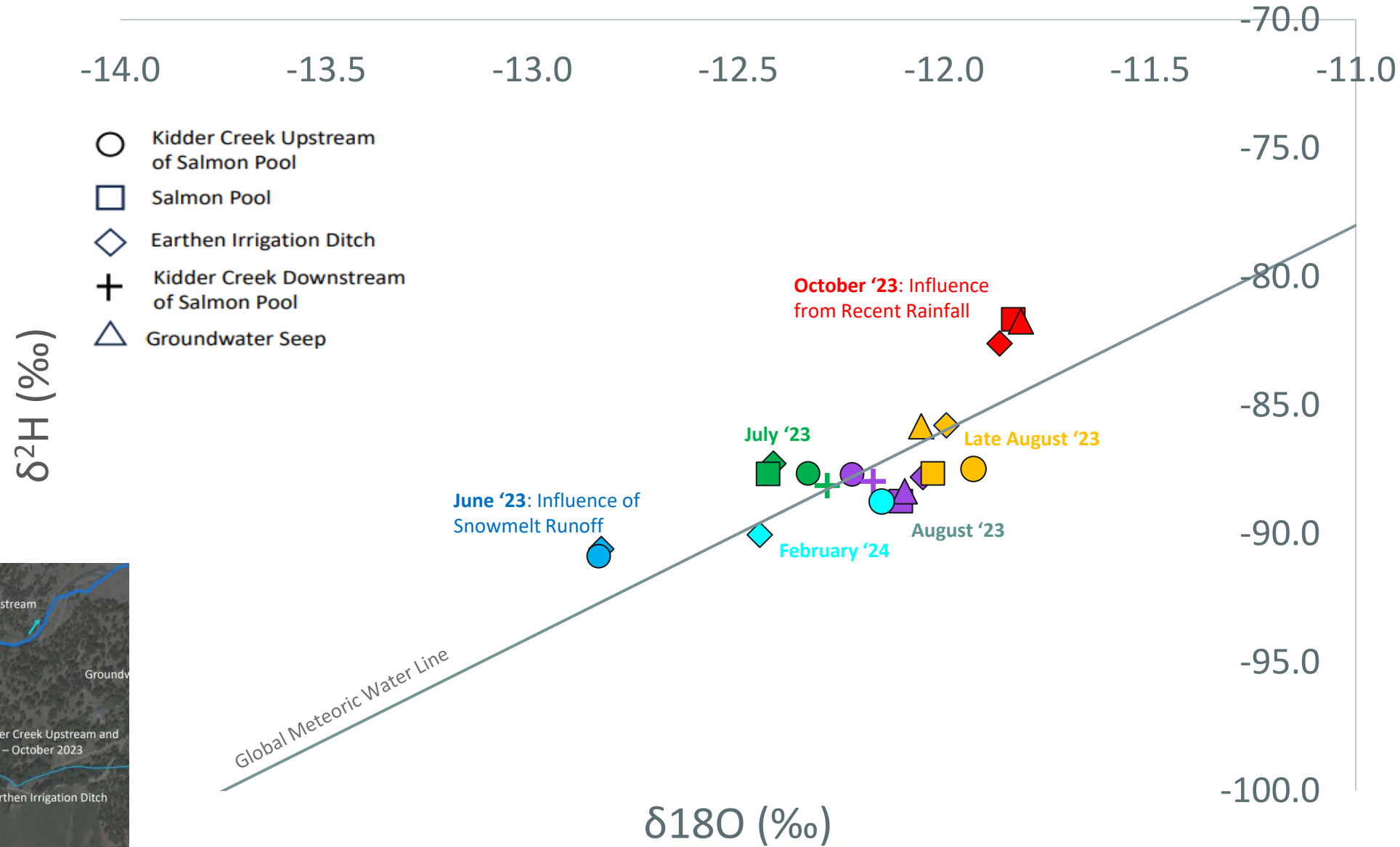
Current Phase

- Review of initial data collection, and monitoring network refinement, as needed
- Continue geochemical sampling throughout summer and fall months

Next Steps

- Discussion

Water Isotope Results for Kidder Creek June 2023 - February 2024



Which scenarios should we be looking at?

- Additional groundwater recharge scenarios (with different times and locations)
- Conjunctive use
- In-lieu recharge
- In-lieu recharge using SVID
- Pumping groundwater into the river at critical times

Upland Management

- Identify existing upland management projects and evaluate the impact on water supply (up to 3 projects)
 - Management of upland forest vegetation
- Discussion:
 - **What upland management practices are of most interest ?**
 - **Are there ongoing projects that would be good candidates?**
- Design and install monitoring network to quantify impact to groundwater
- Collect and evaluate data
- Incorporate results into modeling scenarios
- Evaluate watershed responses under differing upland management strategies

Irrigation Workshop Recap

- “Workshop on Efficient Water Management for Forage Crops”
- Conducted Thursday March 14th
- Field visits with irrigation specialist May 21, 22, 23rd
- Link to survey: <https://us11.list-manage.com/survey?u=2516c89941f49355f514cefb8&id=3435a2de67&attribution=false>



Thank You