



**Sonoma
Water**

Clean. Reliable. Essential. Every day.

Managed Aquifer Recharge Planning and Studies

Santa Margarita Groundwater Agency Workshop

September 7, 2022

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Sonoma Water

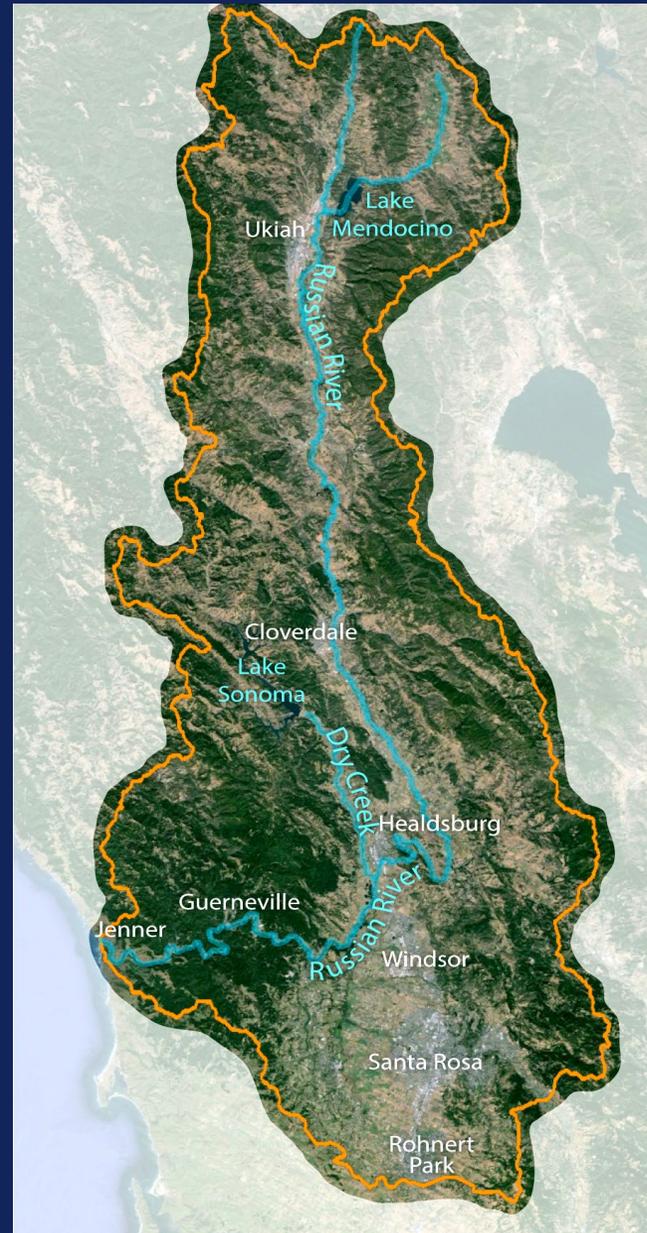
Russian River Watershed

2 major water supply/flood control reservoirs

Sonoma Water supplies water to about 600,000 residents

Potential constraints on existing regional surface water supplies

- Biological Opinion
- Reduced inflow for Potter Valley Project
- Climate Change
- Drought
- Natural Hazards



SGMA Implementation in Sonoma County

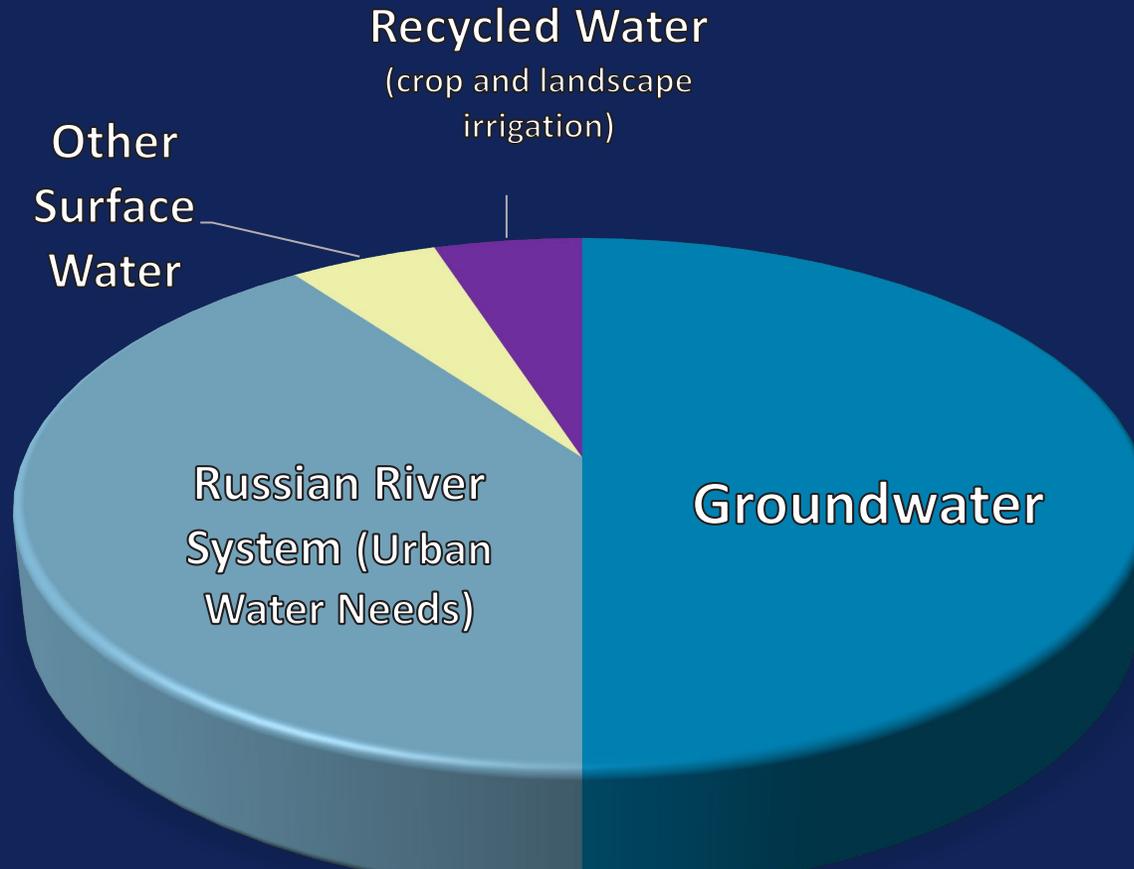
Basins/Subbasins:

- Sonoma Valley (high priority)
- Petaluma Valley (medium priority)
- Santa Rosa Plain (medium priority)

3 GSAs (one per basin) submitted
3 GSPs in January 2022



Primary Water Supply Sources



WATER SUPPLIES

(APPROXIMATE AVERAGE PERCENT OF SUPPLY IN 3 SONOMA COUNTY SGMA BASINS)



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GSP Projects and actions available to achieve sustainability – Reduce demands



Water use efficiency and alternative water source projects for rural residents, commercial and industrial users and agriculture



Policy options include discretionary review of well permits, Farm Plan Coordination, well metering for non-residential pumpers

GSP Projects and actions available to achieve sustainability – Increase supply



Stormwater capture and recharge



Recycled water expansion projects:

- Existing and new contracts
- New alignments



Aquifer Storage and Recovery (ASR – also known as groundwater banking) throughout the basin

Foundational and Ongoing Planning and Studies to Advance Managed Aquifer Recharge

Primary Study and Planning Programs

- USGS Cooperative Study Programs for Groundwater Basin Characterization and Model Development (2004 to present)
- Voluntary Groundwater Management Planning (2006-2014)
- Regional Groundwater Banking Feasibility Study (2013)
- City of Sonoma ASR Pilot Study (2018)
- Implementation of Groundwater Sustainability Plans (Ongoing beginning in 2022)
- Regional Water Supply Resiliency Planning (Ongoing beginning in 2021)

Motivations and Drivers for Regional Investments in MAR planning

- Strategic planning to optimize use of surface water supplies when available and more plentiful
- Changing climactic conditions and uncertainties related to future diversions through Potter Valley project
- Help address compliance with Biological Opinion
- Help address and prevent groundwater depletion

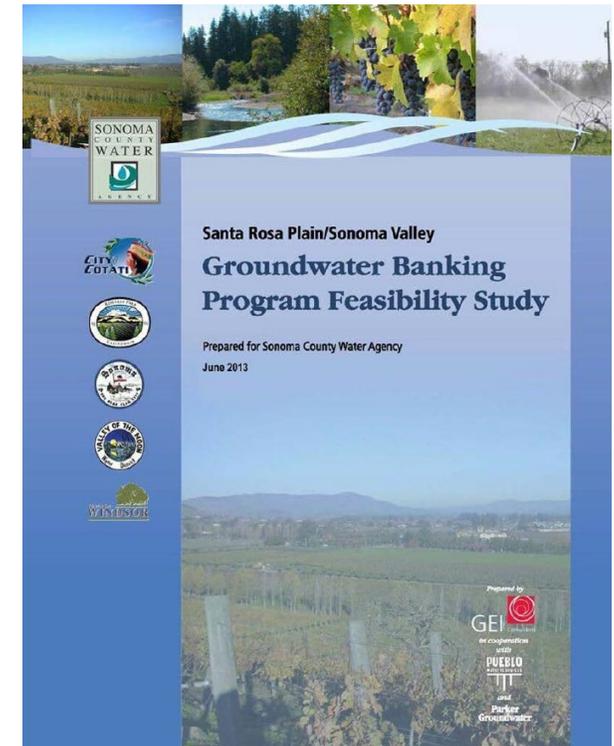
Primary Components of Groundwater Banking Feasibility Study (2013)

What's available to bank? – **Source Water Characterization**

Where can it be banked? – **Hydrogeology/Conveyance**

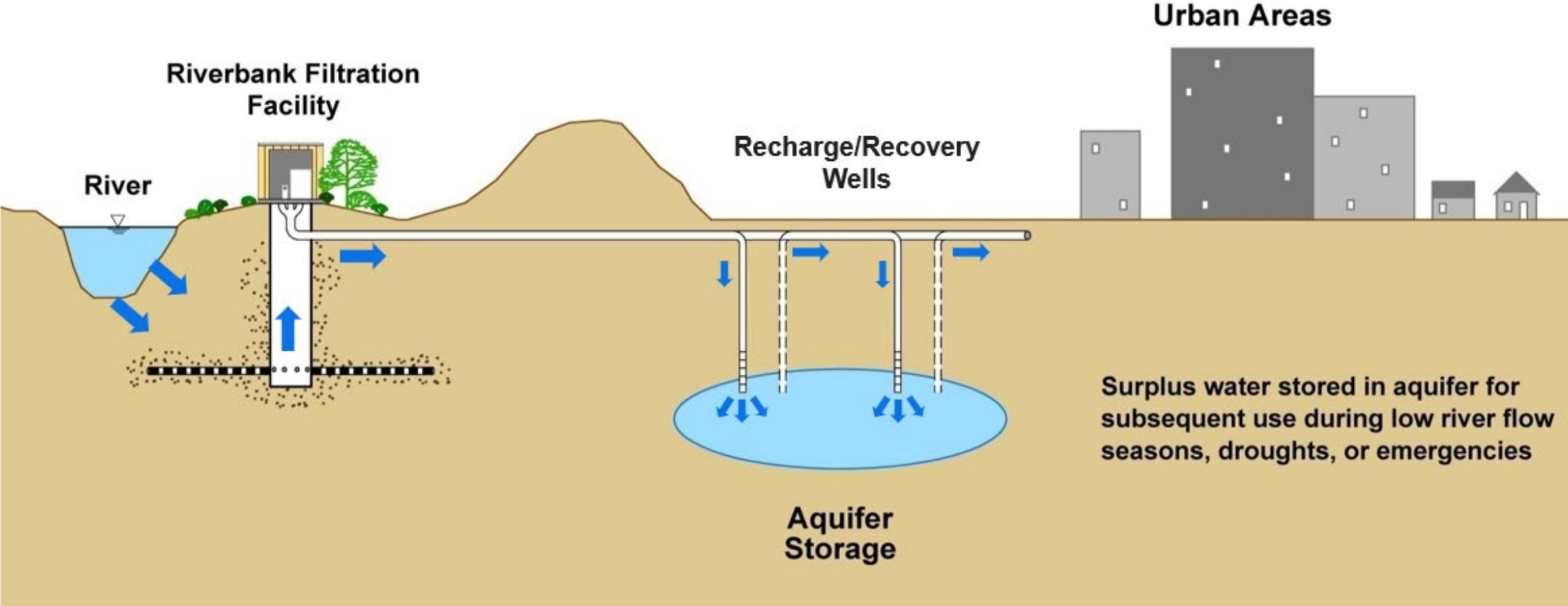
How? – **Technical Considerations**

- Water Quality Testing & Modeling
- Permitting
- Recommended incrementally phased pilot-scale testing

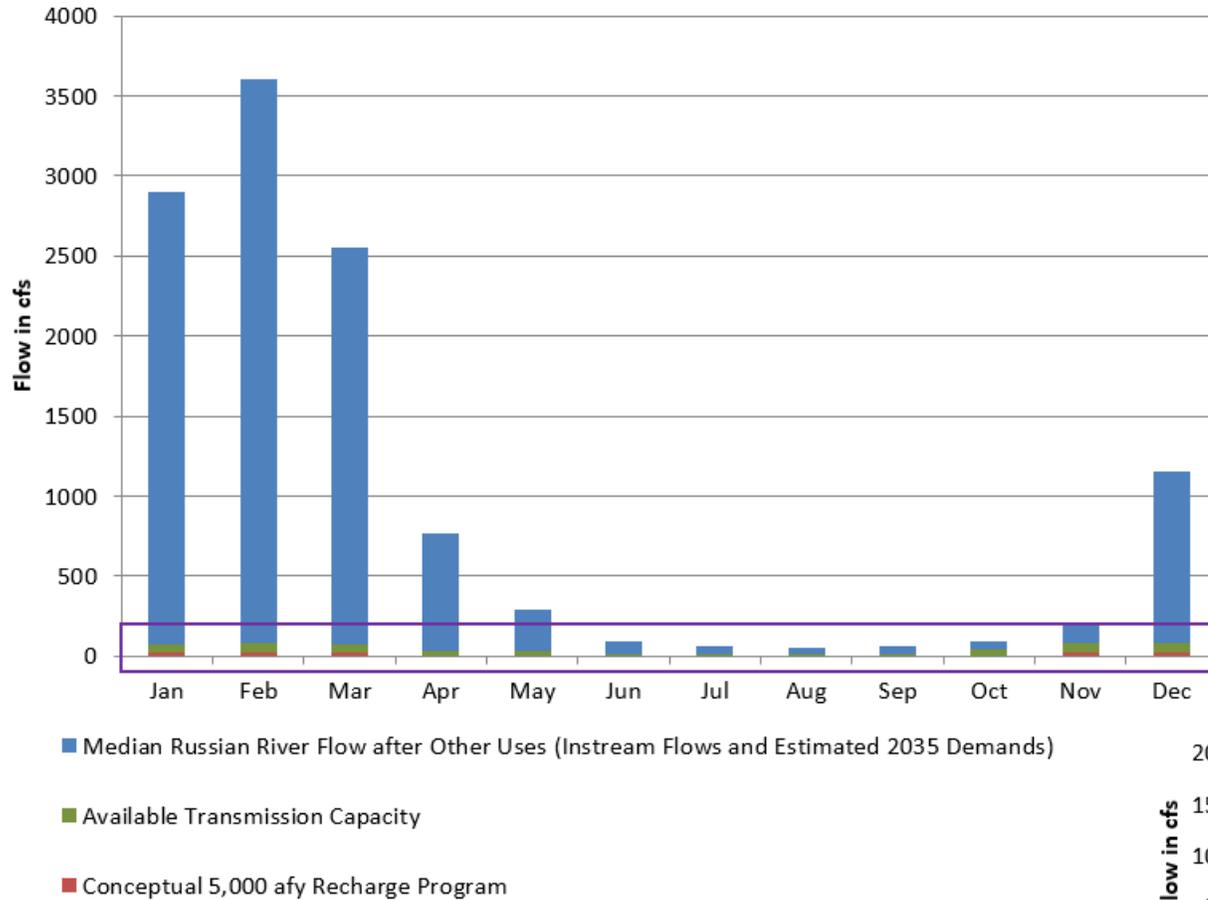


<https://www.sonomawater.org/groundwater-banking/>

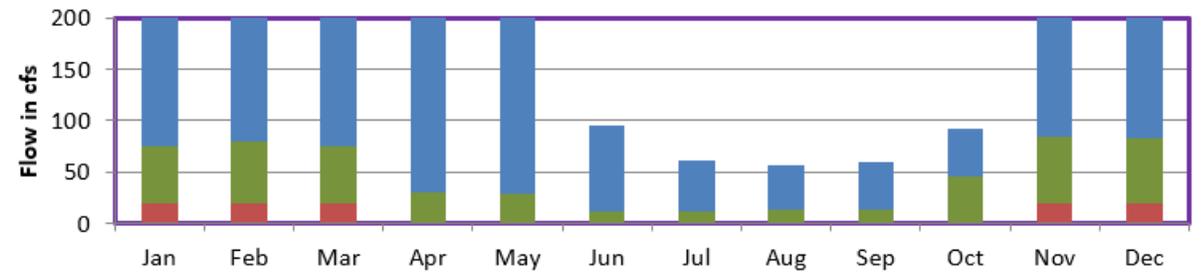
Aquifer Storage and Recovery Concept



Recharge Water Availability (at projected 2035 demand levels)



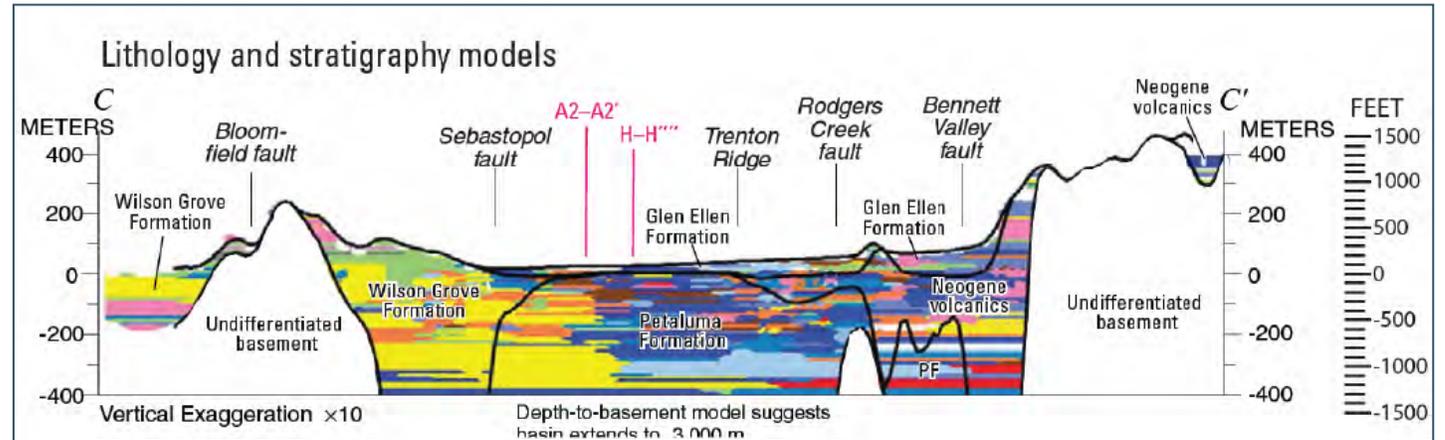
- Recharge water available from Russian River for reasonably sized recharge program
- Available capacity within transmission system for distribution to recharge locations



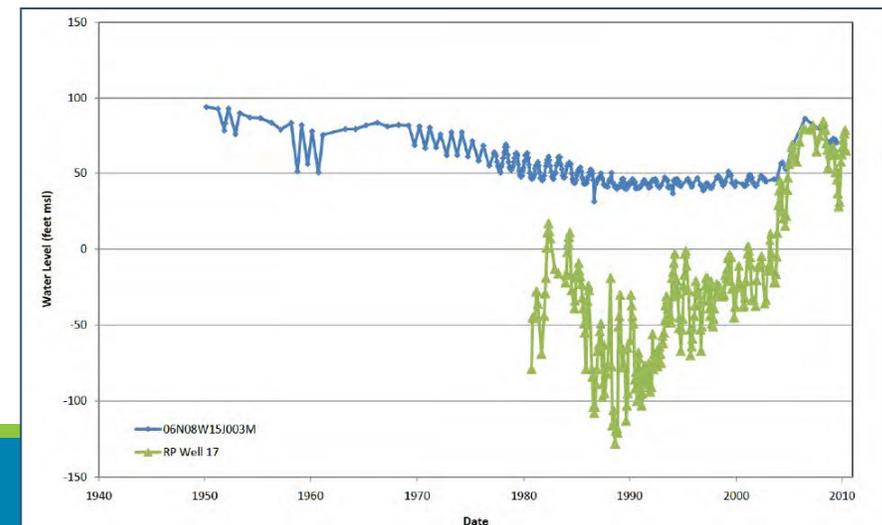
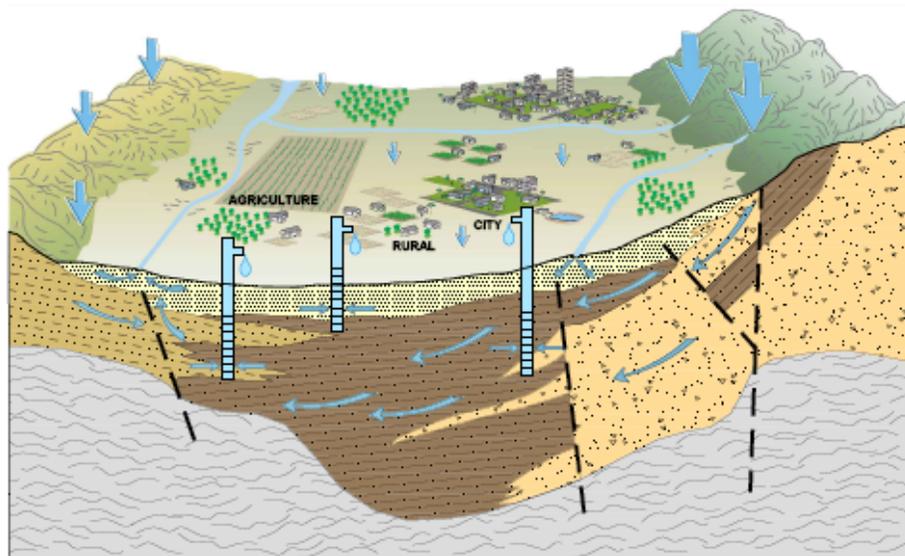
Hydrogeologic Analysis

Most aquifers not laterally continuous

Geology conducive to local ASR projects in deeper confined aquifers

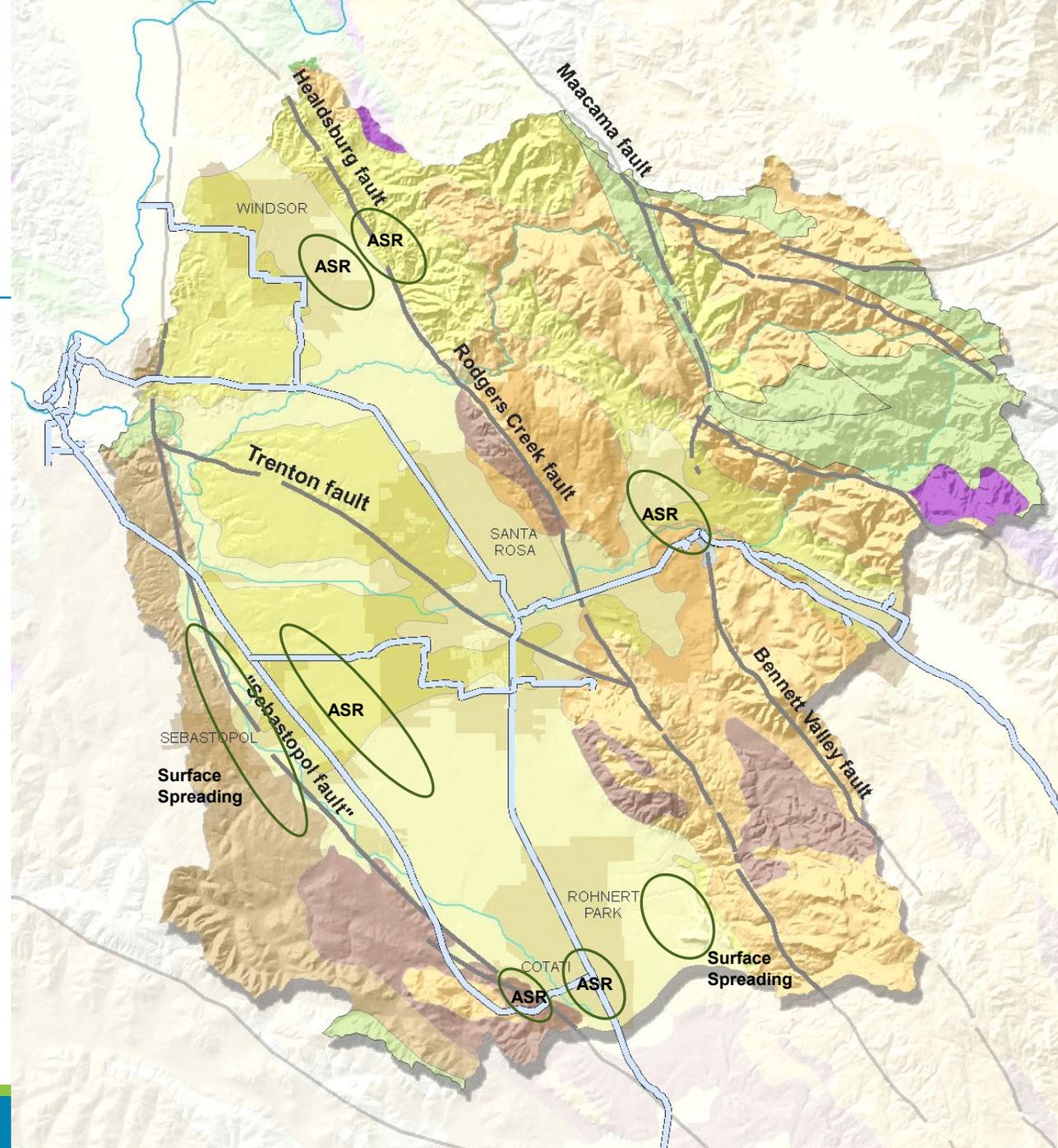


- Limited storage volume in some areas



Santa Rosa Plain Conceptual Alternatives

- Aquifer Characteristics
 - Ability to move water in and out efficiently
 - Structurally sound aquifer formations
 - Confined aquifers with hydraulic gradients compatible for storage
- Available storage volume
- Proximity to conveyance of Russian River water



Water Quality Assessment

Source Water Quality Characterization (Russian River)

- Physical quality (particulates)
- Mineral saturation (over/under equilibrium)
- Redox condition
- Disinfection by-products (e.g. THMs, HAAs)
- Reactive compounds
- Title 22 potability

Groundwater Quality Characterization

Mixing of Source Water and Groundwater – Geochemical Modeling for Compatibility

- Potential redox changes
- Plugging potential

Aquifer Storage and Recovery Pilot Study Approach

Permitted through Regional Water Quality Control Board

- Statewide General Order 2012-0010 for Drinking Water Aquifer Storage and Recovery Projects
 - Notice of Intent submitted to RWQCB Region 2 in December 2017
 - Notice of Applicability issued by RWQCB Region 2 on March 1, 2018

CEQA compliance – Notice of Exemption for Pilot Study

Limited scale/duration of pilot program

- Short-term testing of approximately 12 acre-feet for ~4 to 6 months
- Three repeated cycles of recharge/storage/recovery

Highly monitored

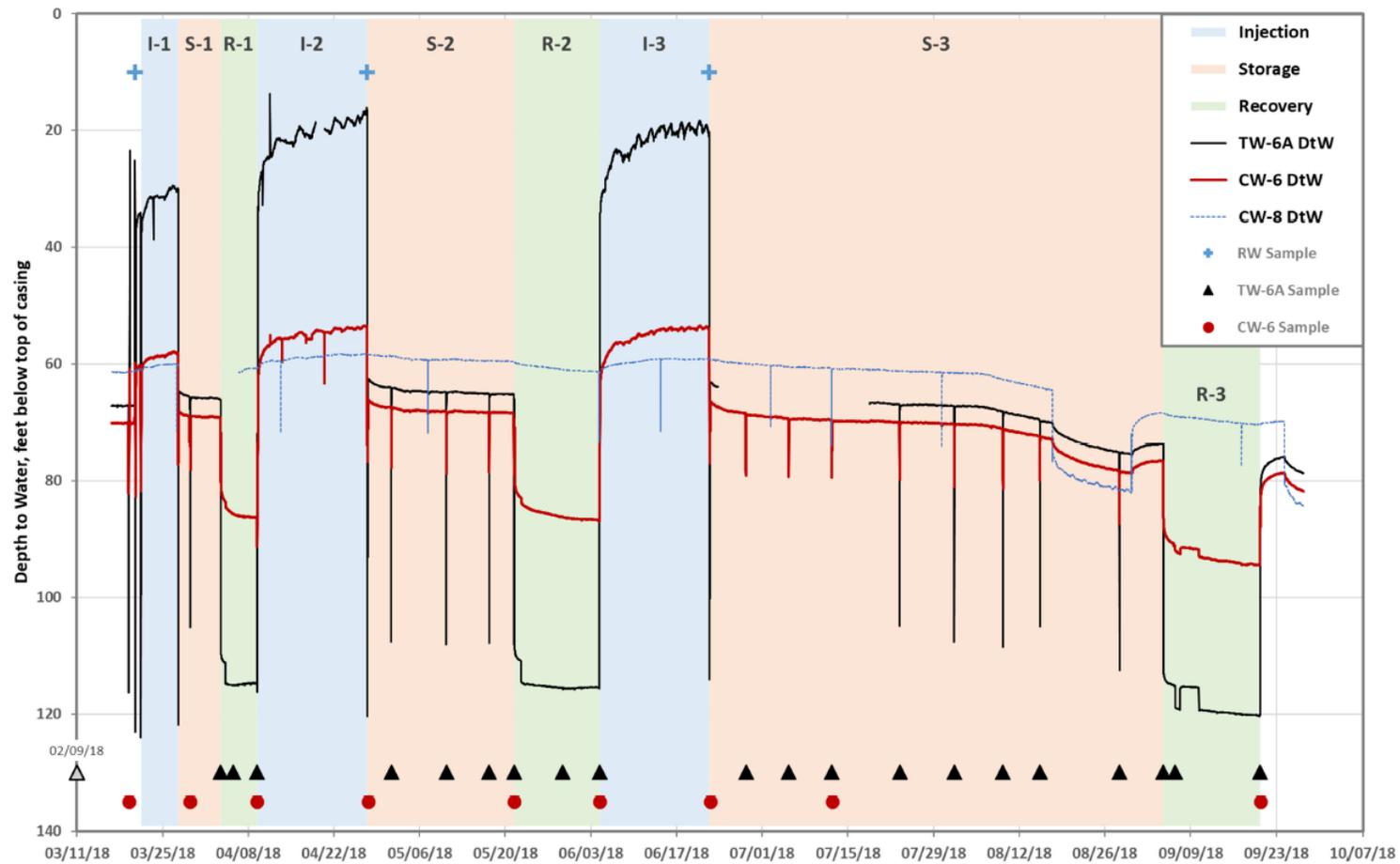
- Extensive water-level and water quality monitoring at test well and nearby wells



Pilot Study Findings

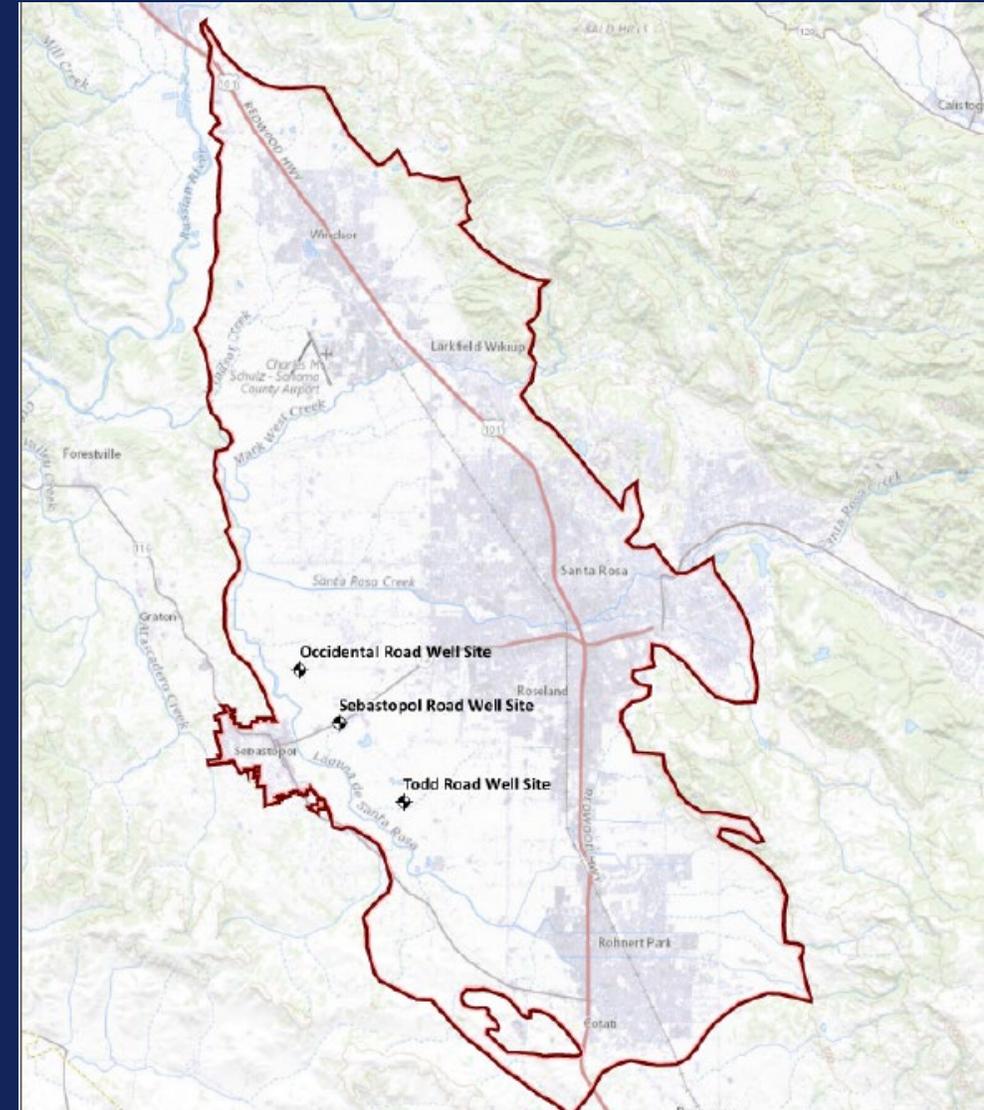
Pilot test successful in demonstrating:

- Capacity of aquifer for storage and recovery - ~12 acre feet of water stored and recovered.
- Geochemical compatibility of source water and groundwater – water quality remained well below regulatory thresholds and very little evidence of well or aquifer clogging
- Short-term water quality changes can be readily monitored and tracked due to distinguishing characteristics of source water and groundwater



Groundwater – Sonoma Water Facilities

- Three production wells in Santa Rosa Plain (Todd Rd, Sebastopol Rd and Occidental Rd.)
- Between 1999-2009, wells averaged 3,600 acre-feet annually
- After 2009 shifted to conjunctive use (rest wells during normal/wet years and pump during dry years)
- Relied upon wells during 2012-2015 drought
- Have been offline since 2018 (upgrades needed to comply with recent drinking water regulatory changes)



Santa Rosa Plain Wells Drought Resiliency Project

Project awarded \$6.9M State Drought Relief Grant

- Sebastopol Rd Well (work underway)
 - Test, design and upgrade existing well
 - Bring online for production asap
 - Plan, permit, test and implement recharge components (2023-2025)
- Occidental Rd Well (in planning phase)
 - Downhole testing to inform design of new well
 - Construct new well in 2023 capable of standard production and recharge operations
 - Plan, permit, test and implement recharge components (2024-2025)



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QUESTIONS?

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