

Sonoma Valley Water Supply Conditions & Water Management Programs



**Sonoma Valley
Citizens Advisory
Commission**

Jay Jasperse, P.E.
Chief Engineer
January 22, 2014



About the Sonoma County Water Agency

Core Business Functions Align with Integrated Management:

- Wholesale water supplier to over 600,000 people - Sonoma & Marin Counties
- Flood Control
- Sanitation
- Power Generation/Renewable Energy Development

Our Approach to Business:

- Integrated Resource Management
- Partnerships
- Innovation

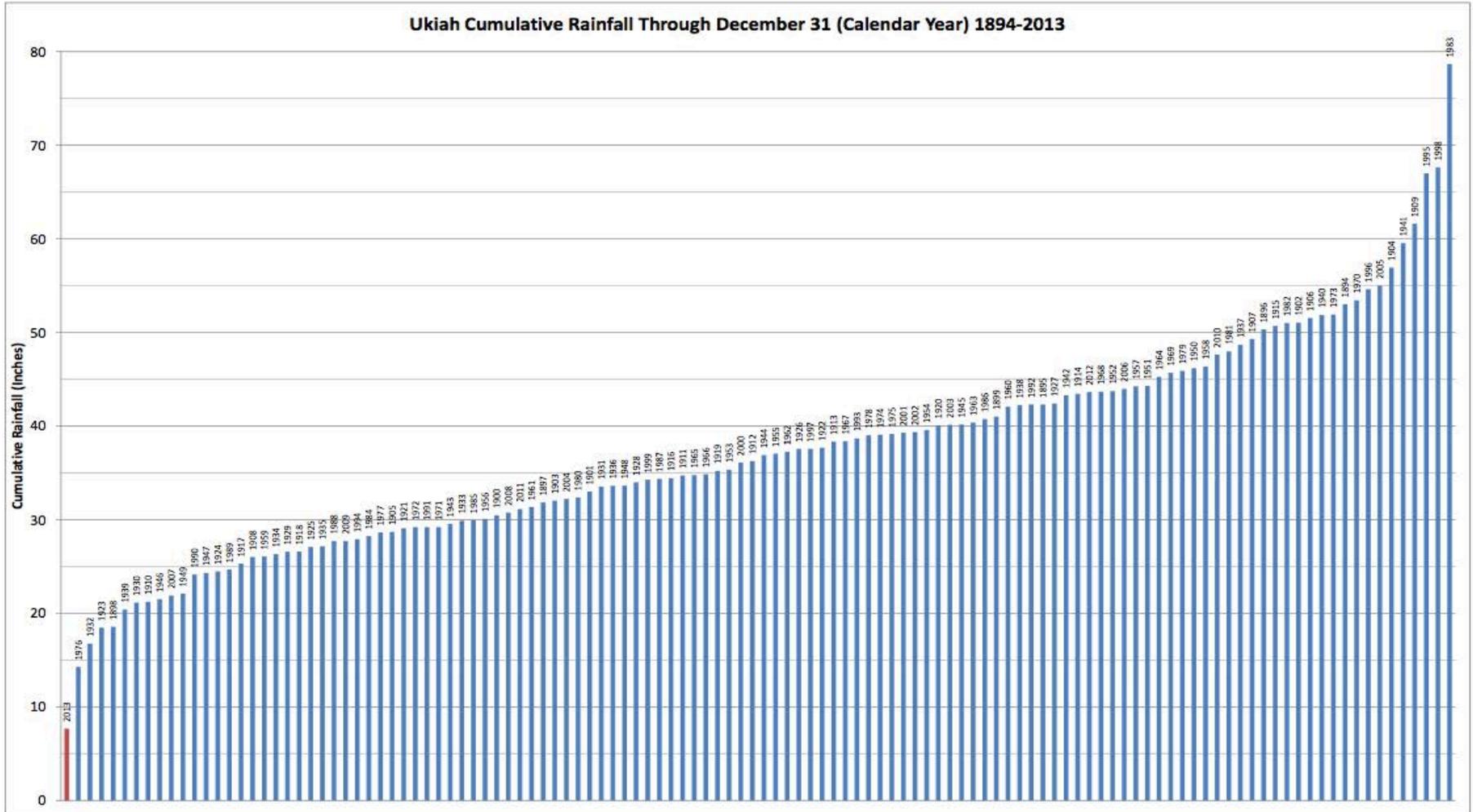


Overview

- Regional Context: 2012-2013 Drought - Russian River System
- Building Reliability Through Integrated Water Resource Management
- Sonoma Valley Water Supply Issues & Water Management Programs



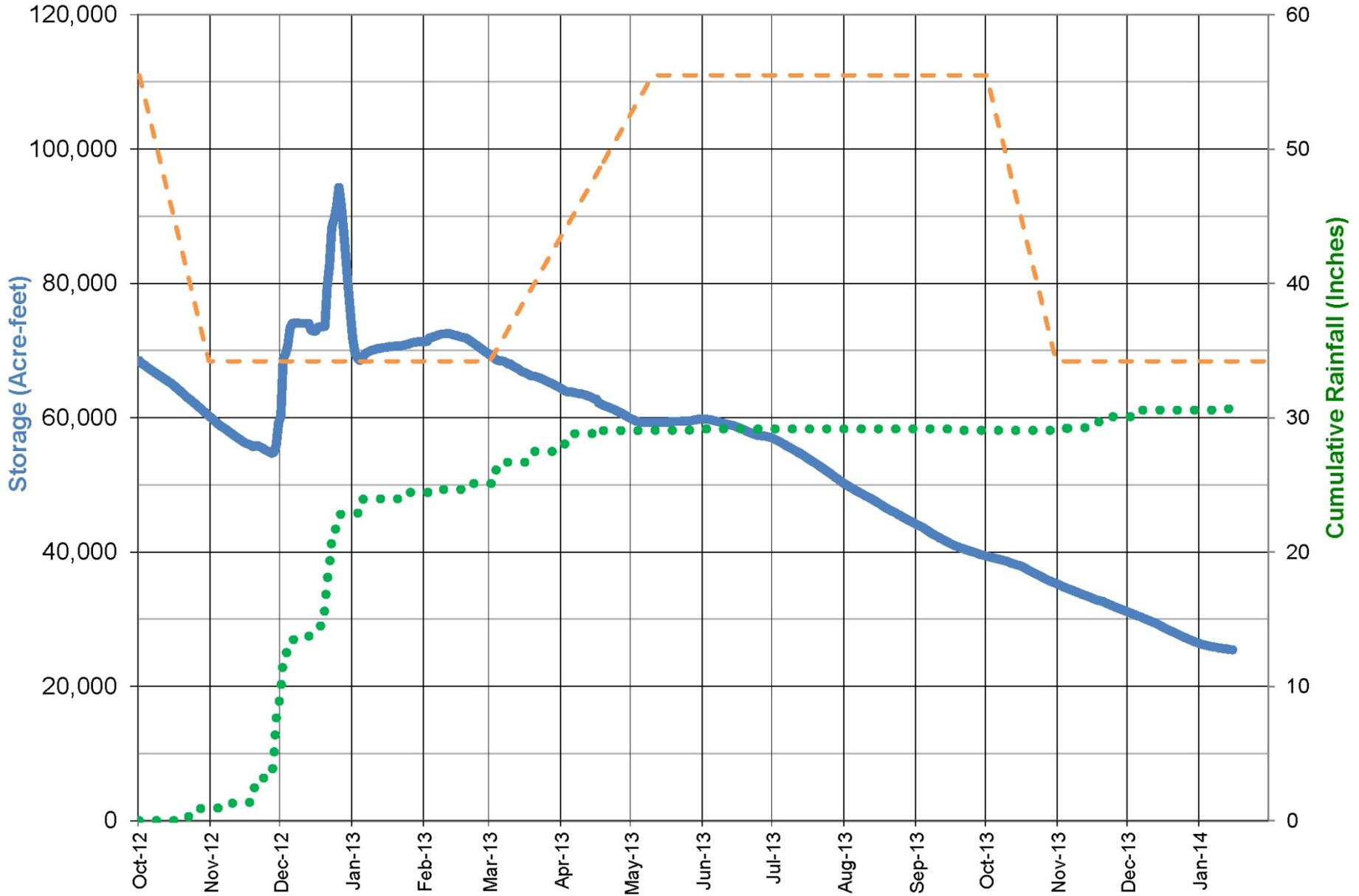
2013 Drought



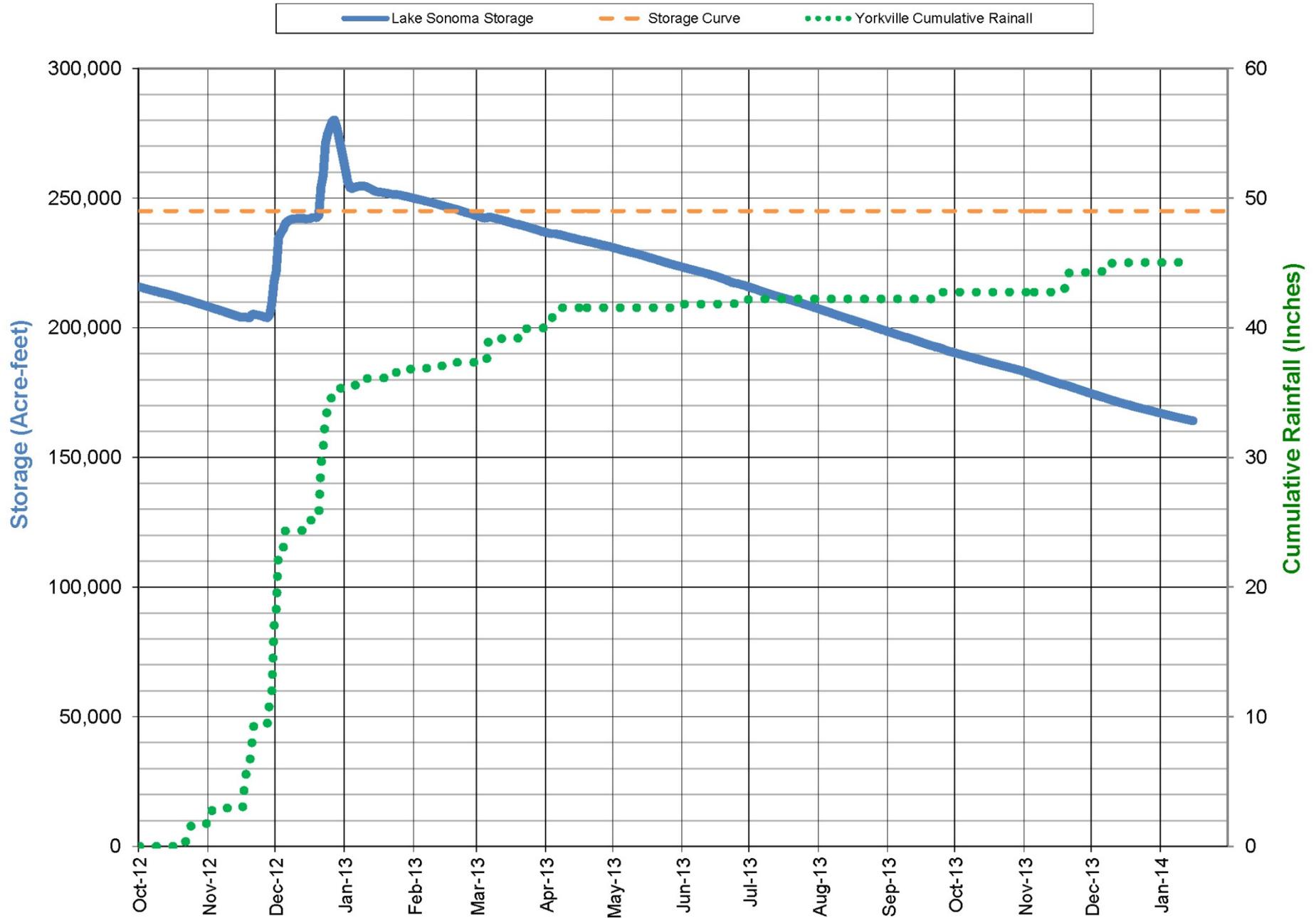
Note: Rainfall totals derived from daily precipitation measurements recored at National Climatic Data Center station #8351. Some years do not contain a complete record . The color of each bar represents the percent of completeness for each year of record.

1998
2000
2002
2004
2006
2008
2010
2012

Lake Mendocino Storage



Lake Sonoma Storage



Russian River Flow Management in Response to Dry Conditions 2013-14

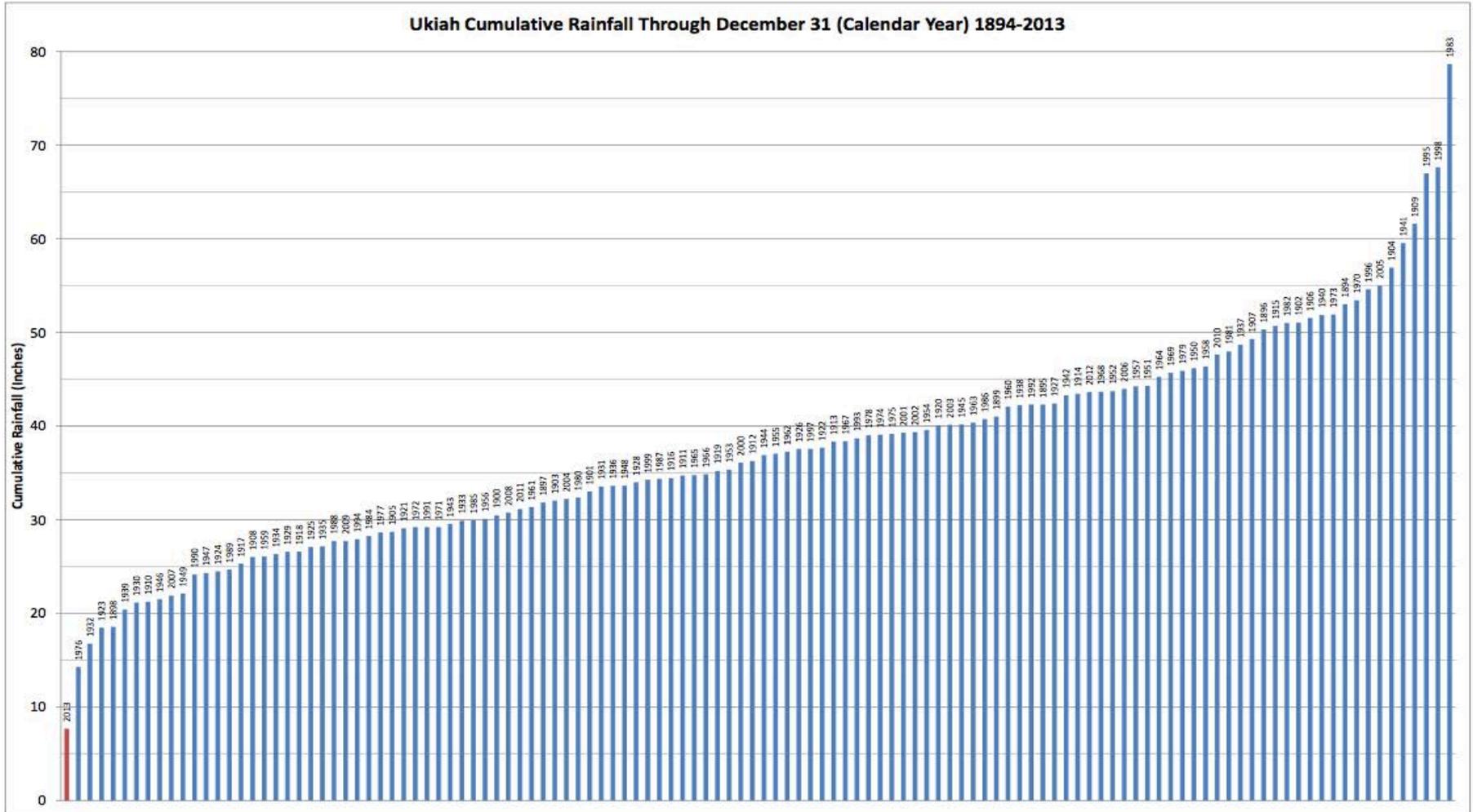
- Minimum in-stream flows & reservoir management regulated by State Water Resources Control Board Decision 1610
- SCWA filed petitions to State Board in May & December 2013 for Temporary Urgency Change Permits (Each 180 days) to respond to dry conditions
- December petition changes management controls from Lake Pillsbury (Eel River) to Lake Mendocino to better preserve water supply

Additional Responses to Dry Conditions

- **Work with SCWA Water Contractors, water managers & agriculture to implement additional water conservation measures & water shortage contingency plans**
- **Work with federal agencies to develop forecast based reservoir operations**



2013 Drought



Sonoma Valley Water Supply - The Bottom Line ...

Water Supply Reliability is Less than in Most Areas of Sonoma County

- Long Distance from Russian River Supplies
- Pipelines Vulnerable to Natural Hazards
- Aquifer Has Relatively Low Productivity
- Saline Water at Southern Boundary
- Increased Water Use Over Time

The Solution ...

Integrated Water Resource Management

- Increase Water Supply Portfolio
- Maximize Recycled Water & Conservation
- Balance Russian River & Groundwater Supplies
- Science-Based Management & Policies
- Partnerships are Key to Leverage Resources
 - Federal/State/Regional/Local Agencies
 - Community Constituencies: Agriculture, Municipal, Business, Rural Residential, Environmental

How Is Integrated Management Implemented In Sonoma Valley?

Goal: Increase Resiliency of Water Resources & Augment Russian River Supplies

- Groundwater Management
- Conservation
- Recycled Water
- Conjunctive Management of Surface & Groundwater

Surface Water



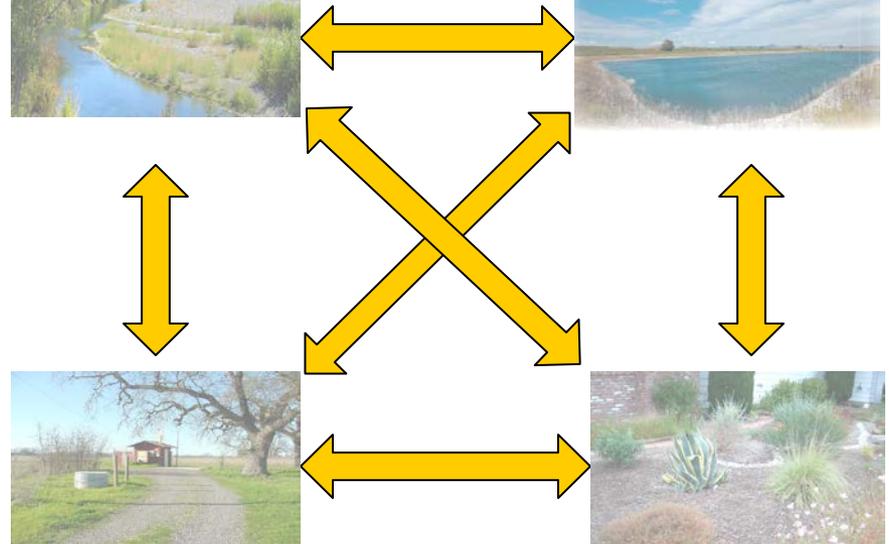
Recycled Water

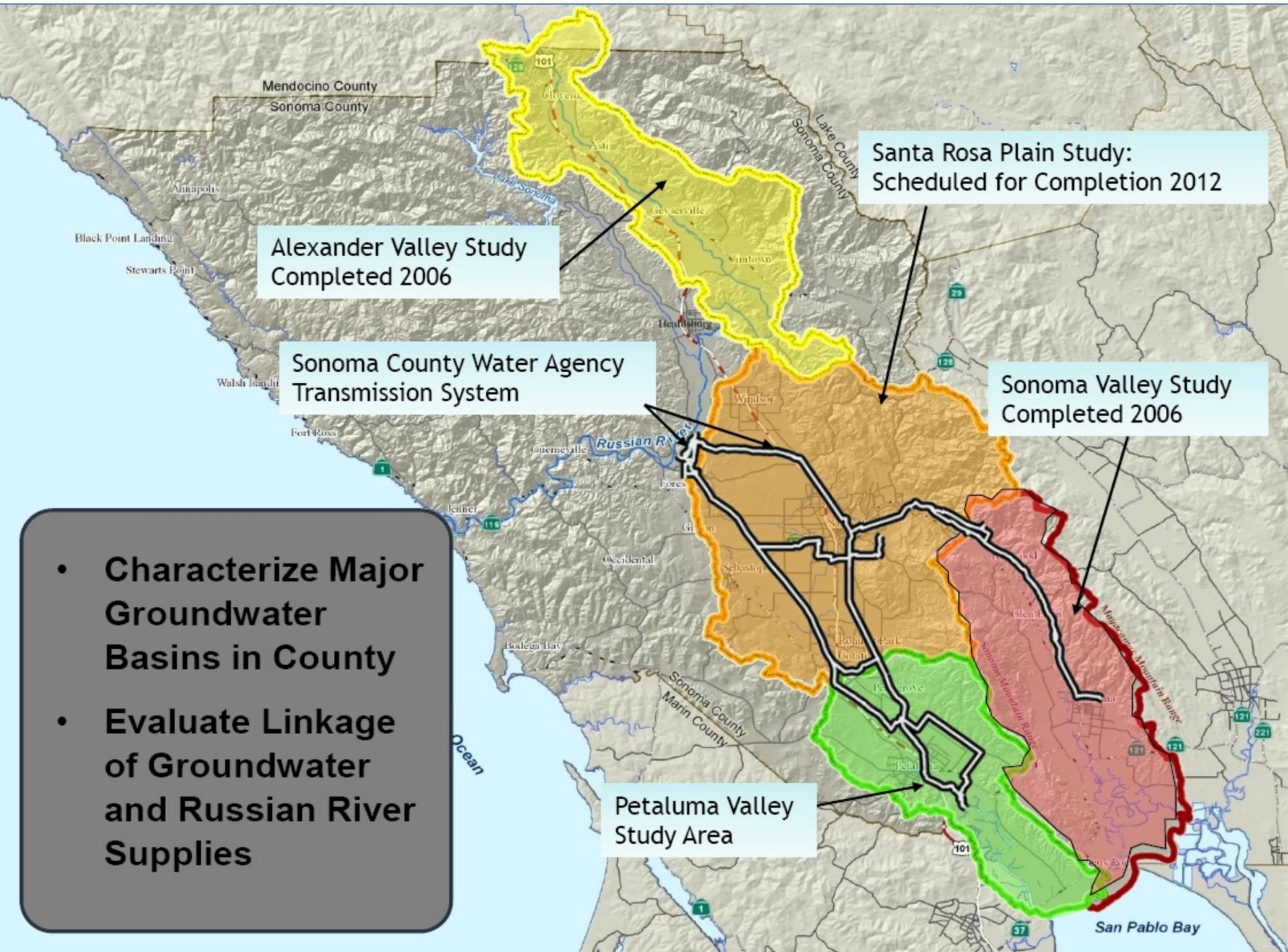


Groundwater



Conservation





Alexander Valley Study
Completed 2006

Sonoma County Water Agency
Transmission System

Santa Rosa Plain Study:
Scheduled for Completion 2012

Sonoma Valley Study
Completed 2006

Petaluma Valley
Study Area

- Characterize Major Groundwater Basins in County
- Evaluate Linkage of Groundwater and Russian River Supplies

Agency/USGS Sonoma Valley Groundwater Study



In cooperation with the
SONOMA COUNTY WATER AGENCY

**Geohydrological Characterization, Water-Chemistry,
and Ground-Water Flow Simulation Model of the
Sonoma Valley Area, Sonoma County, California**



Key Findings:

- **Increased pumping between 1975-2000**
- **Localized decline of groundwater levels**
- **Estimated storage decline of between 680 – 1,420 acre-ft per year**
- **Salinity issues in southern part of Valley**
- **Numerical Model - Evaluate data gaps & simulate future conditions**

Scientific Investigations Report 2006-5092

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY



Overview of Sonoma Valley Groundwater Management Program

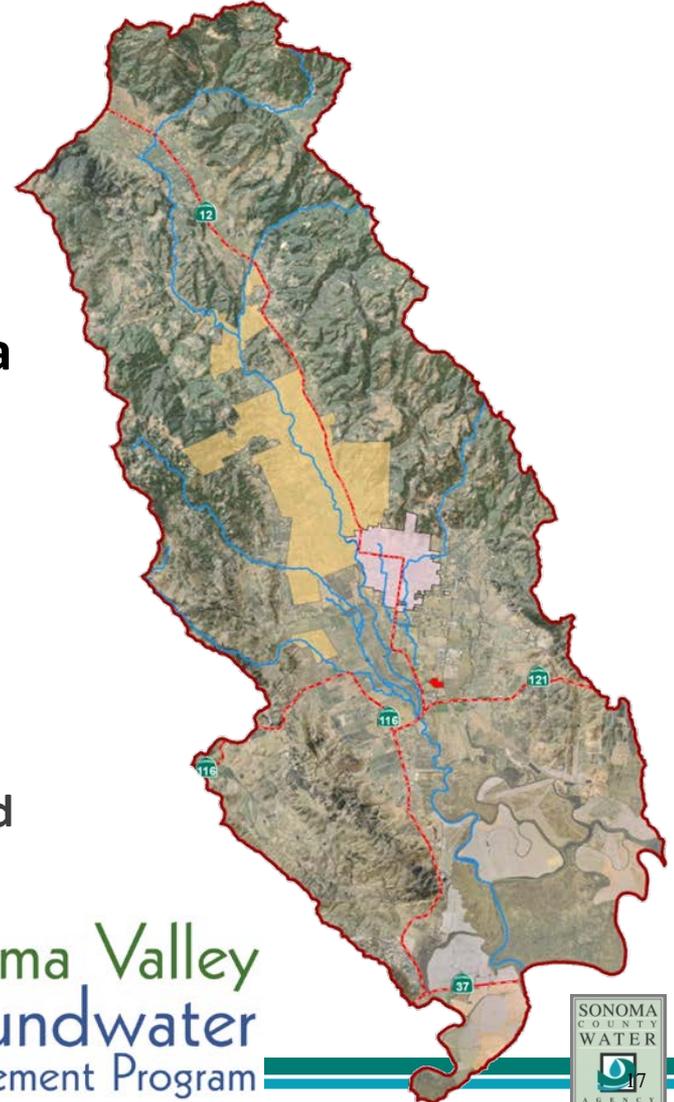
➤ Convened Stakeholder Group in June 2006

- Agricultural alliances, environmental organizations, water purveyors, and residential groundwater users

➤ Groundwater Management Plan Adopted by Sonoma County Water Agency, City of Sonoma & Valley of the Moon Water District in Late 2007

- Non-Regulatory and Collaborative Process
- Letters of Support and Endorsement received from Mission Highlands Mutual Water Company, Sonoma County Water Coalition, Sonoma Ecology Center, and the Sonoma Valley Vintners & Growers Alliance

➤ Sixth Year of Implementation



Sonoma Valley
Groundwater
Management Program

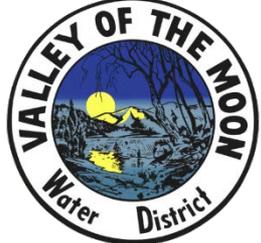
Groundwater Management Program Funding

- Local Cooperative Funding Agreement

 - SCWA, City of Sonoma, VOMWD, SVCSD and County

- DWR Memorandum of Understanding

 - Facilitation Services For Plan Development
 - Continuing Technical Assistance for Program Implementation

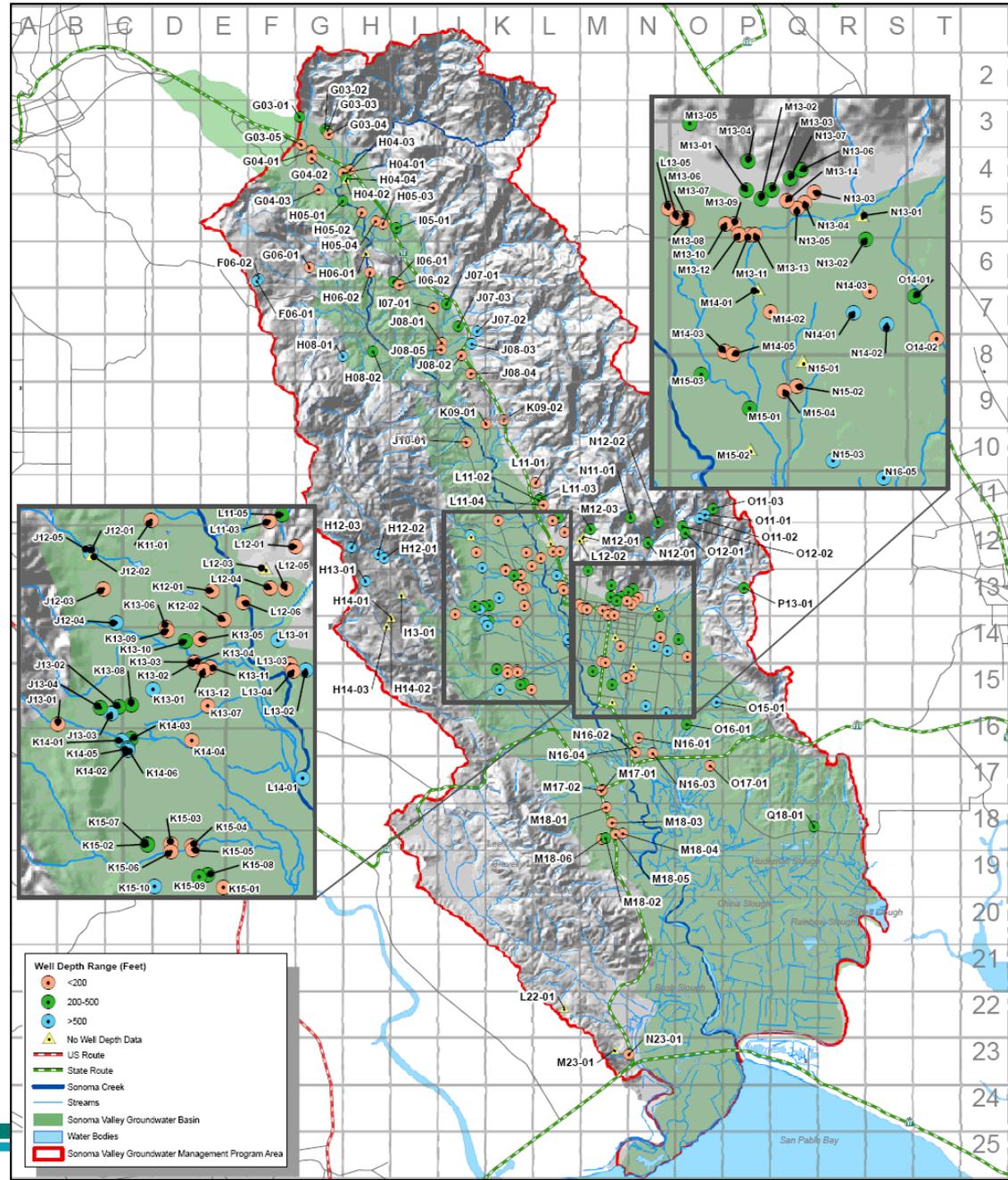


Partnerships: Recent State & Federal Funding

<u>Recent Grants and Direct Funding for Sonoma Valley</u>	<u>Funding of Groundwater Studies & Management</u>
<ul style="list-style-type: none">• Recycled Water >\$5M• Conservation >\$0.2M• Groundwater >\$1.3M• Stormwater ~\$2M	<ul style="list-style-type: none">• SCWA & SVCSD \$1.215M• Federal \$0.5M• State \$0.425M• City & VOMWD \$0.26M• County & Open Space \$0.15M

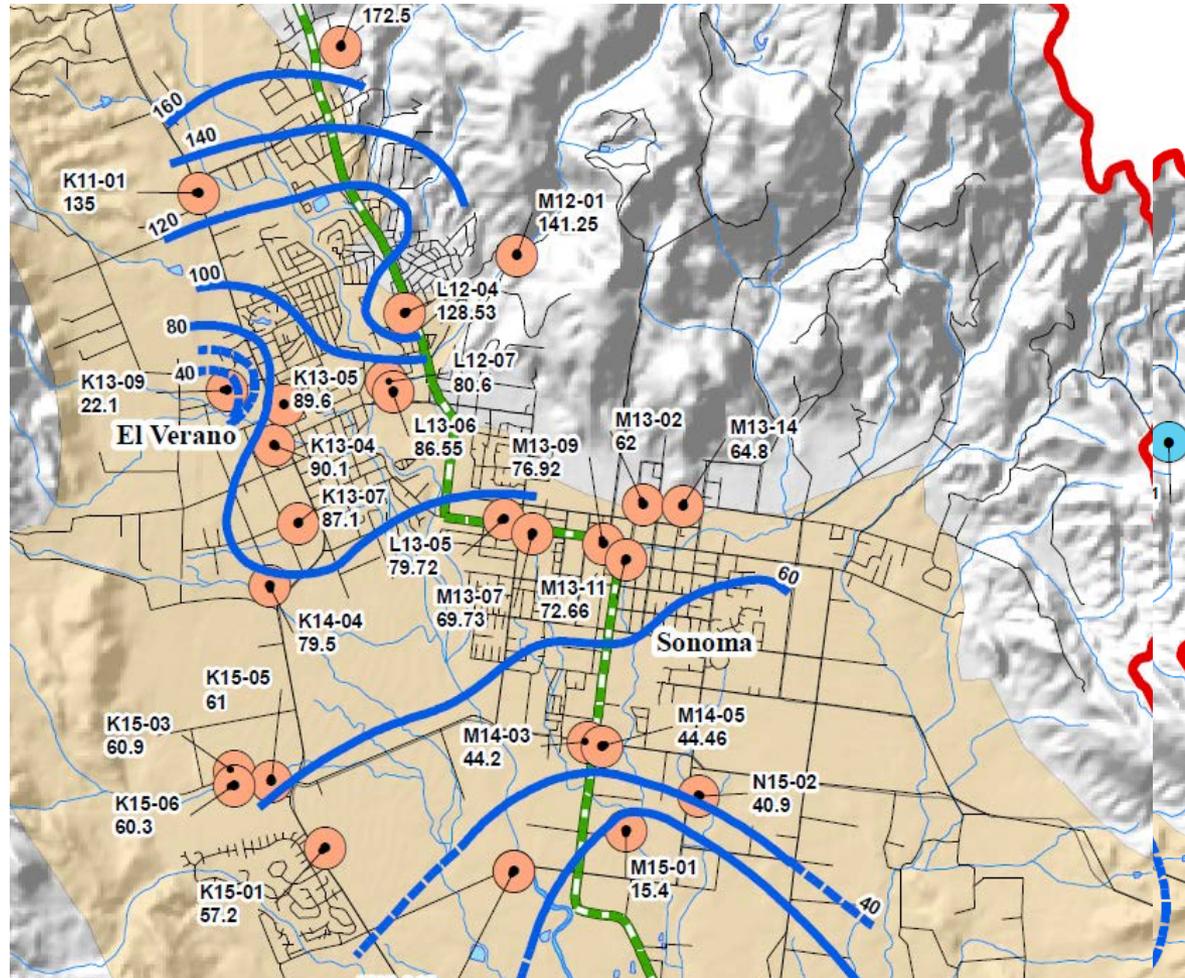
Voluntary Groundwater-Level Monitoring

- **80** - New Wells since 2007
- **140** - Wells with Synchronized Monitoring
- **Groundwater Levels Only**
- **Track and Assess Seasonal and Long-term Trends**
- **Incorporated subset of wells into CASGEM Program**



Groundwater Conditions

- Shallow-Zone wells generally stable and above sea level
- Localized areas of declining groundwater levels mainly observed in Deeper-Zone wells
 - El Verano Area
 - Southeast of City of Sonoma
- Groundwater-levels are locally below sea level

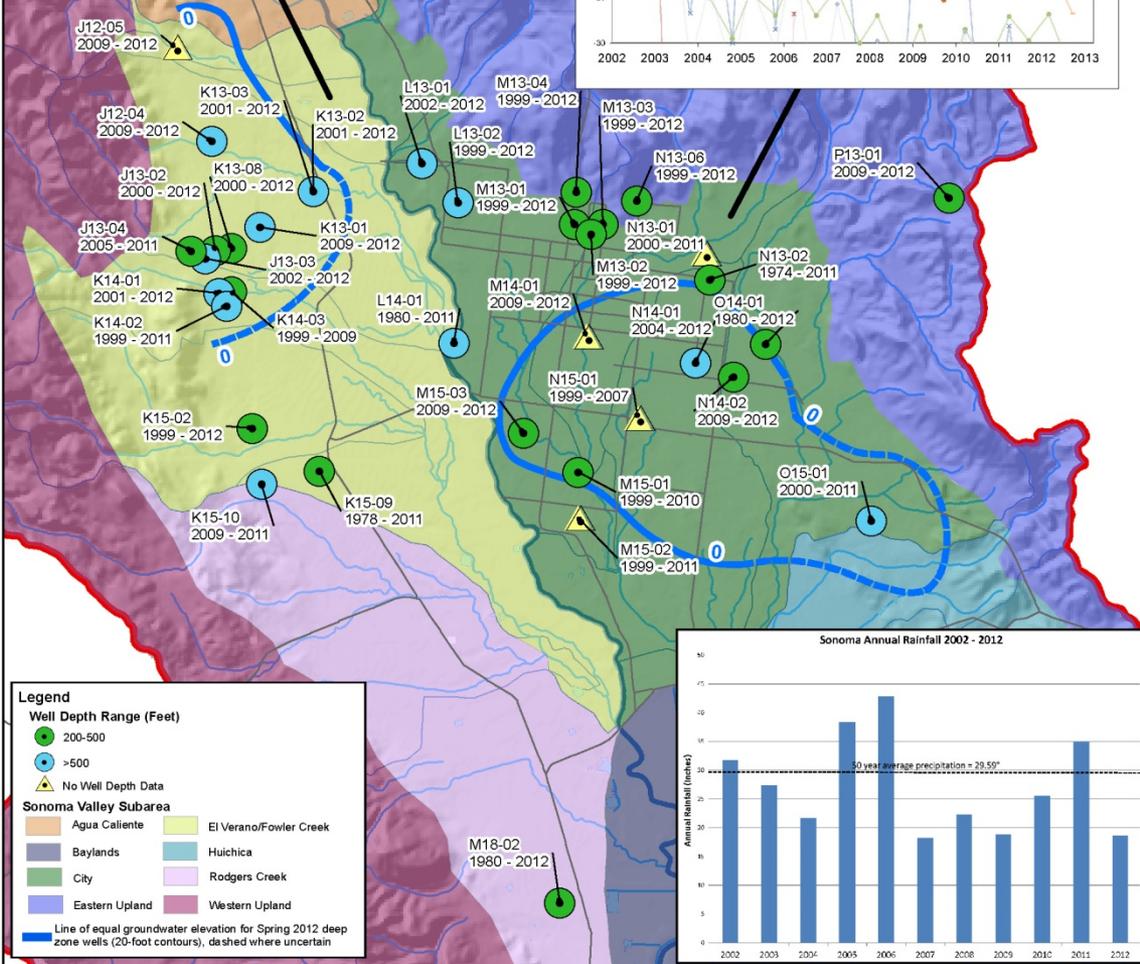
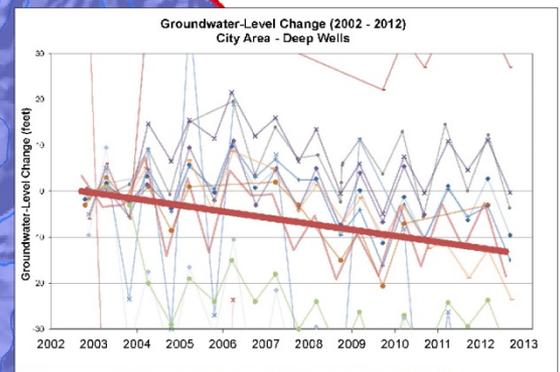
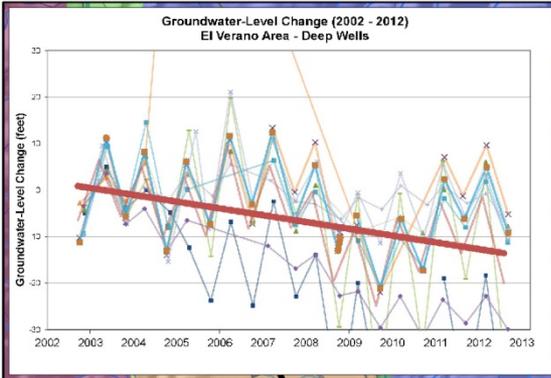


Groundwater-Level Changes by Subarea

2002 to 2012 Deep-Zone Wells

➤ Persistent declining trends

- El Verano: up to ~3 ft/yr
- Southeast of the City of Sonoma: up to ~5 ft/yr



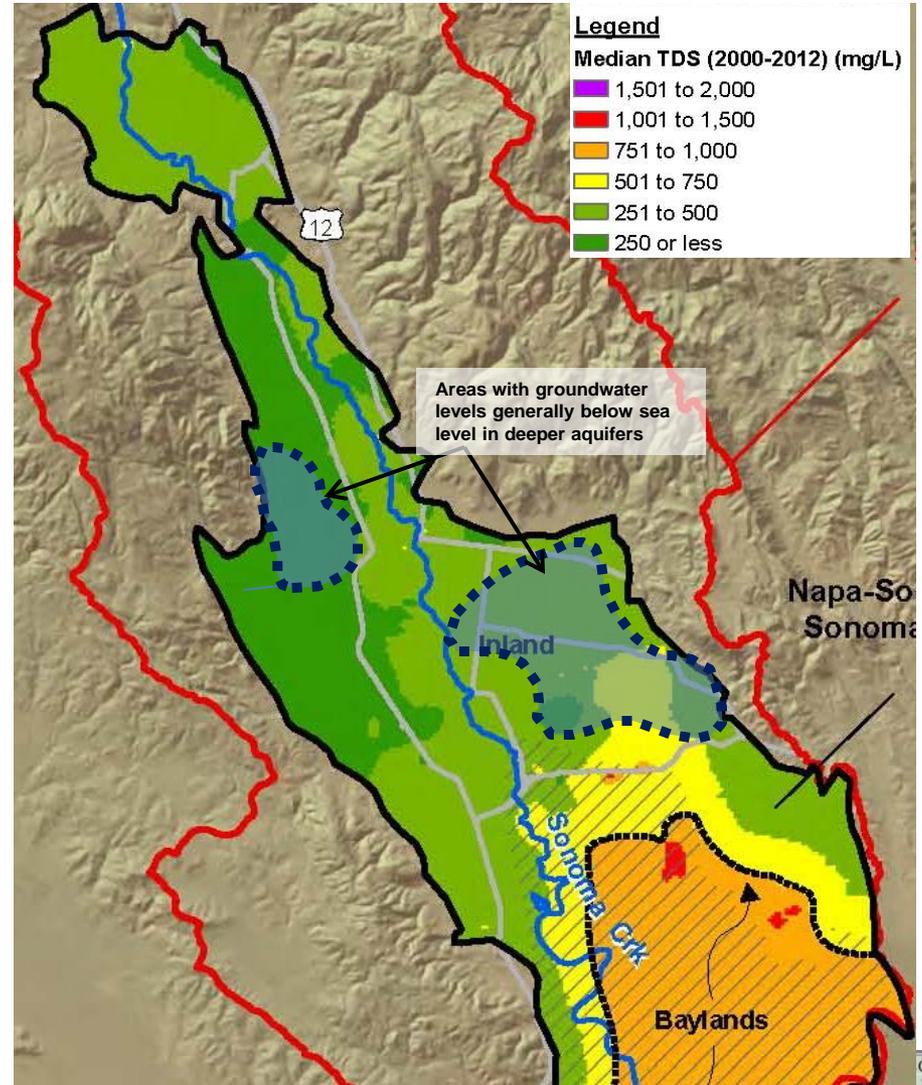
Salinity In Southern End of Sonoma Valley

Salinity Sources:

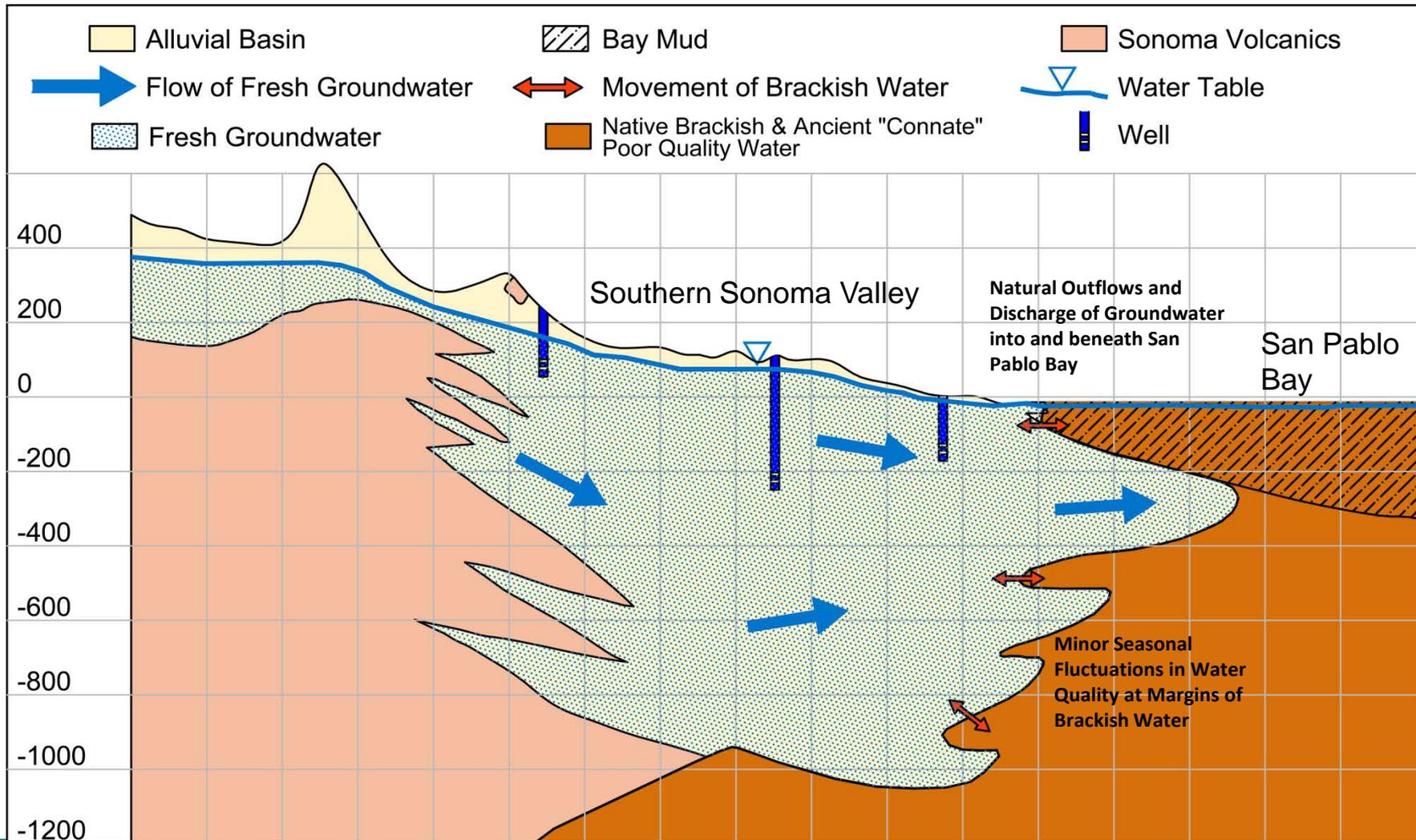
- Historical Brackish Water
- Thermal Water
- Connate Water from older formations

Groundwater Levels:

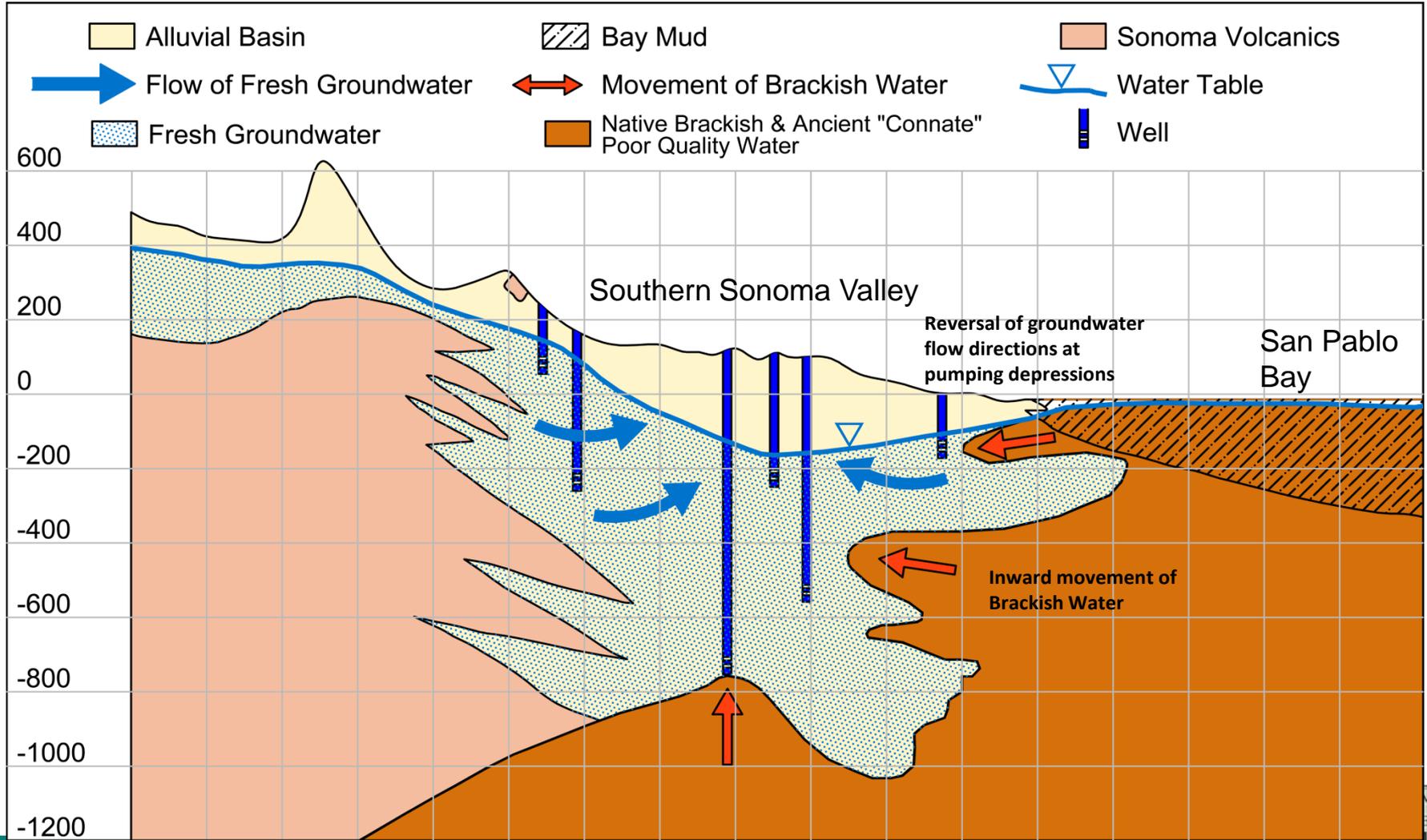
- Shallow-Zone generally stable and above sea levels
- Declining trends observed in deep zone wells with groundwater elevations locally below sea level



1950: Shallow Groundwater Levels Prior to Extensive Pumping



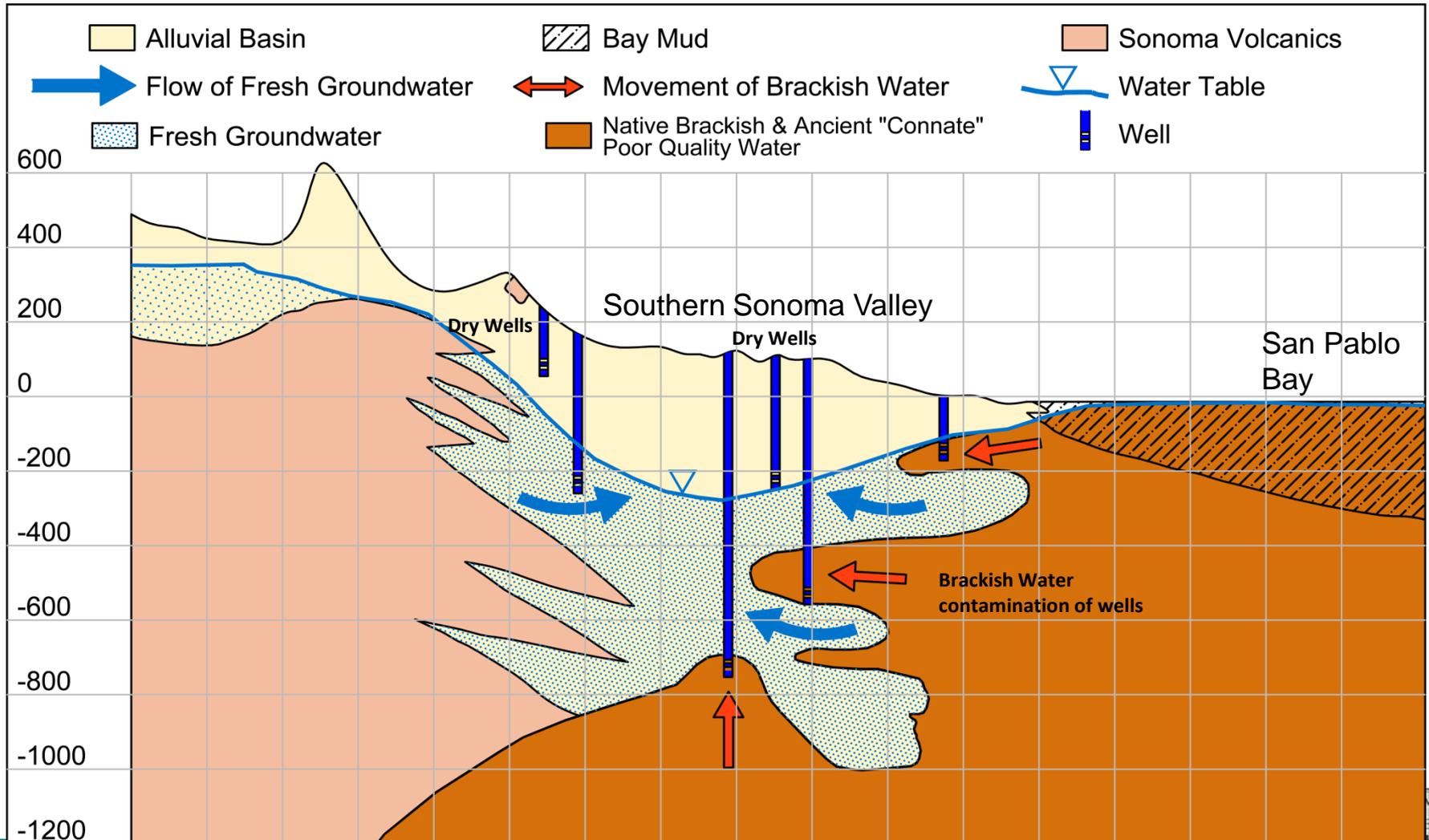
Today: Groundwater Levels Lowered over 100 Feet in Southern Sonoma



Future Continued Depletion of Groundwater?

* Dry Wells

* Brackish Water Contamination of Wells



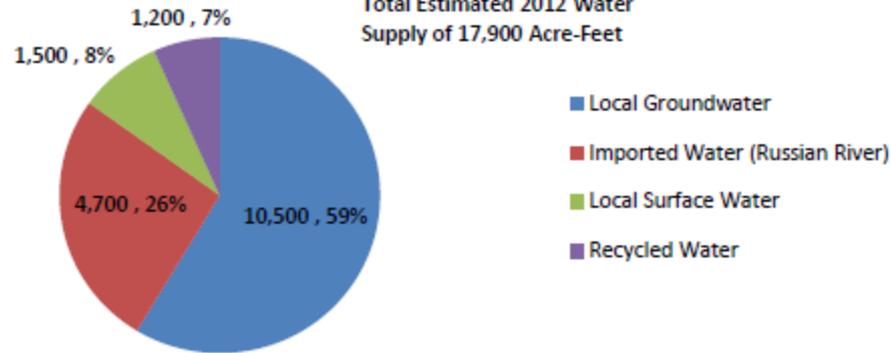
How Much Water Is Used & Who Uses It?

- **USGS compiled data & developed water use estimates from 1975 – 2000**
- **Water use estimates updated by Sonoma Valley Groundwater Management Plan 5-year review (SCWA)**
- **New estimates also evaluate geographic distribution of groundwater use to focus on groundwater depletion zones**

Total Estimated Water Supply Demands in Sonoma Valley

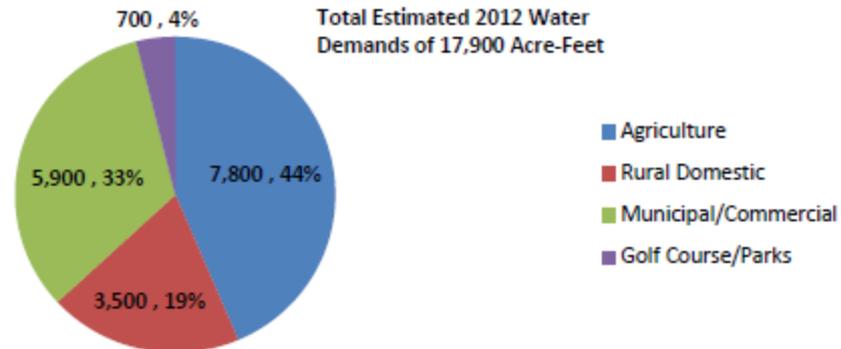
2012 Water Demands by Supply Sources (Acre-Feet)

Total Estimated 2012 Water Supply of 17,900 Acre-Feet



2012 Water Demands by Use Type (Acre-Feet)

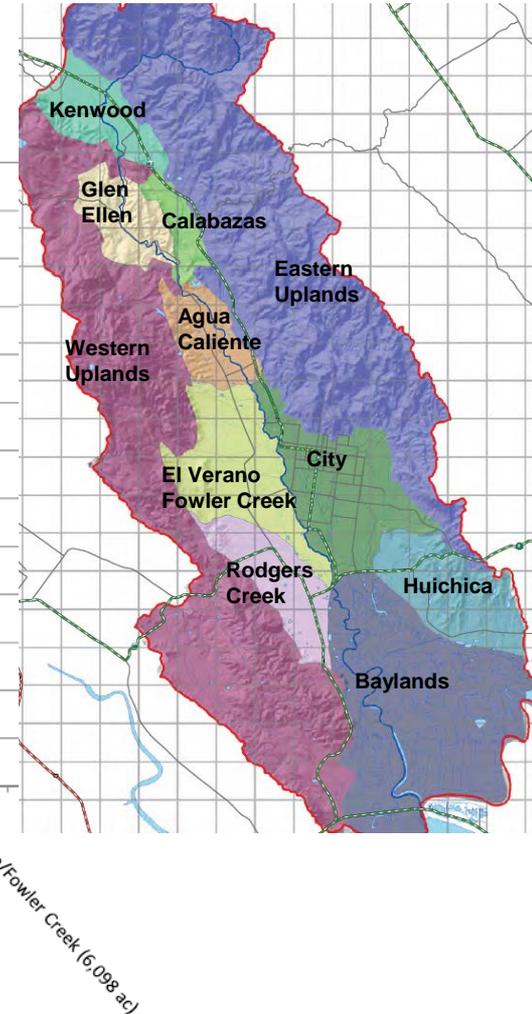
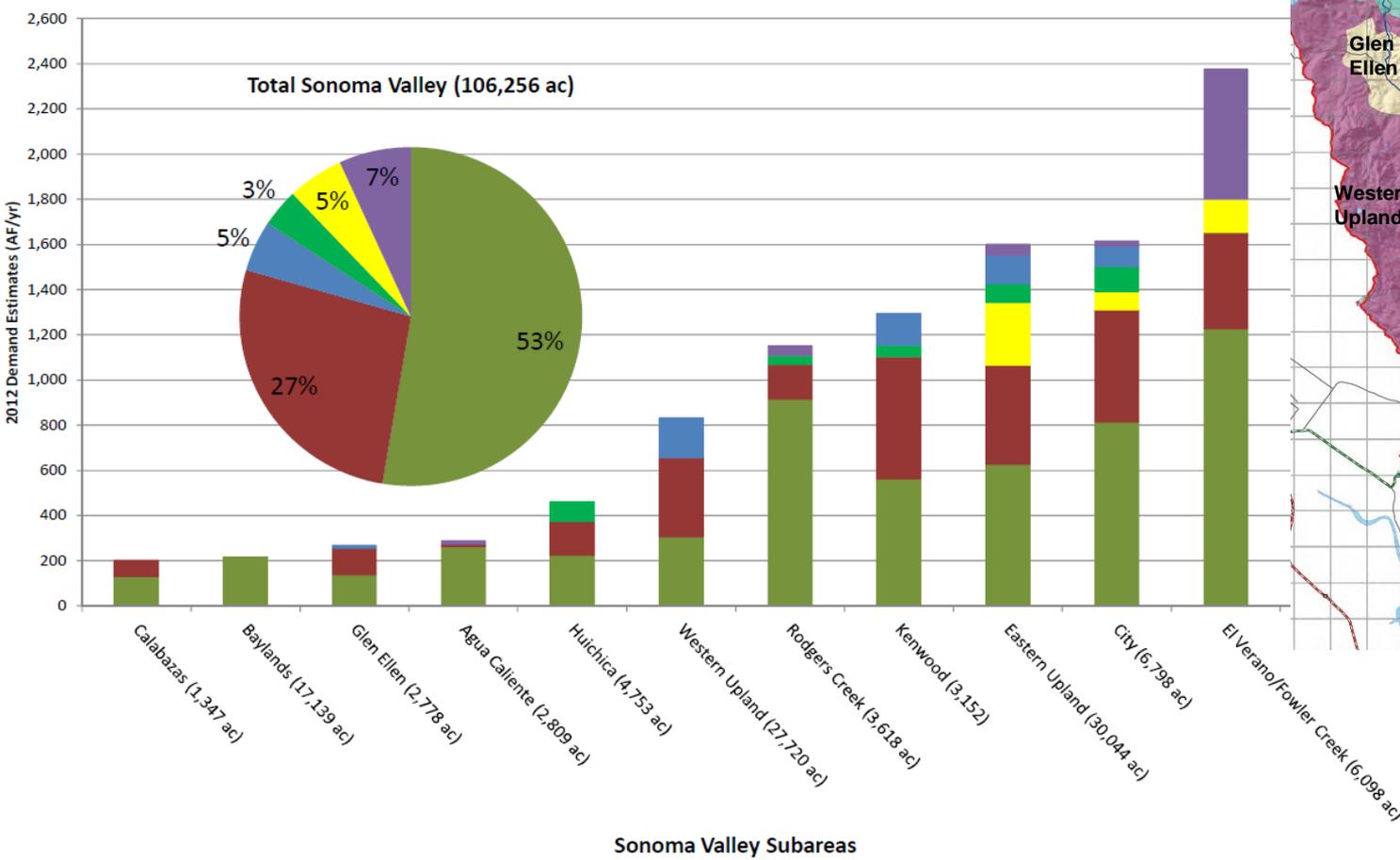
Total Estimated 2012 Water Demands of 17,900 Acre-Feet



Groundwater Use in Sonoma Valley

Estimated 2012 Groundwater Demands in Sonoma Valley Groundwater Basin

■ Agriculture ■ Rural ■ Municipal ■ Small Water Systems ■ Mutual/Private Water Companies ■ Irrigated Turf



So What Can Be Done to Improve Water Supply Conditions in the Sonoma Valley?

Basin Advisory Panel Recommended Management Strategies

- **CONSERVATION** of Urban, Non-Urban, & Agriculture
- **RECYCLED WATER** use to offset groundwater pumping
- **BANKING** Russian River water to recharge groundwater basin
- **STORMWATER** to recharge of groundwater

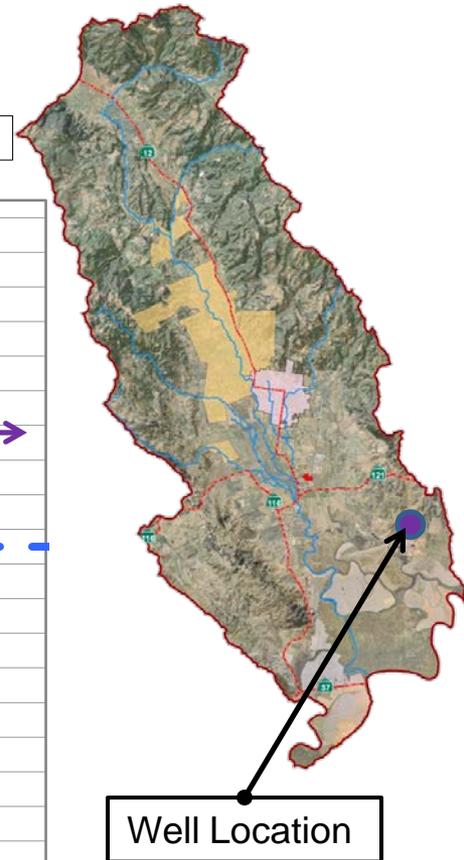
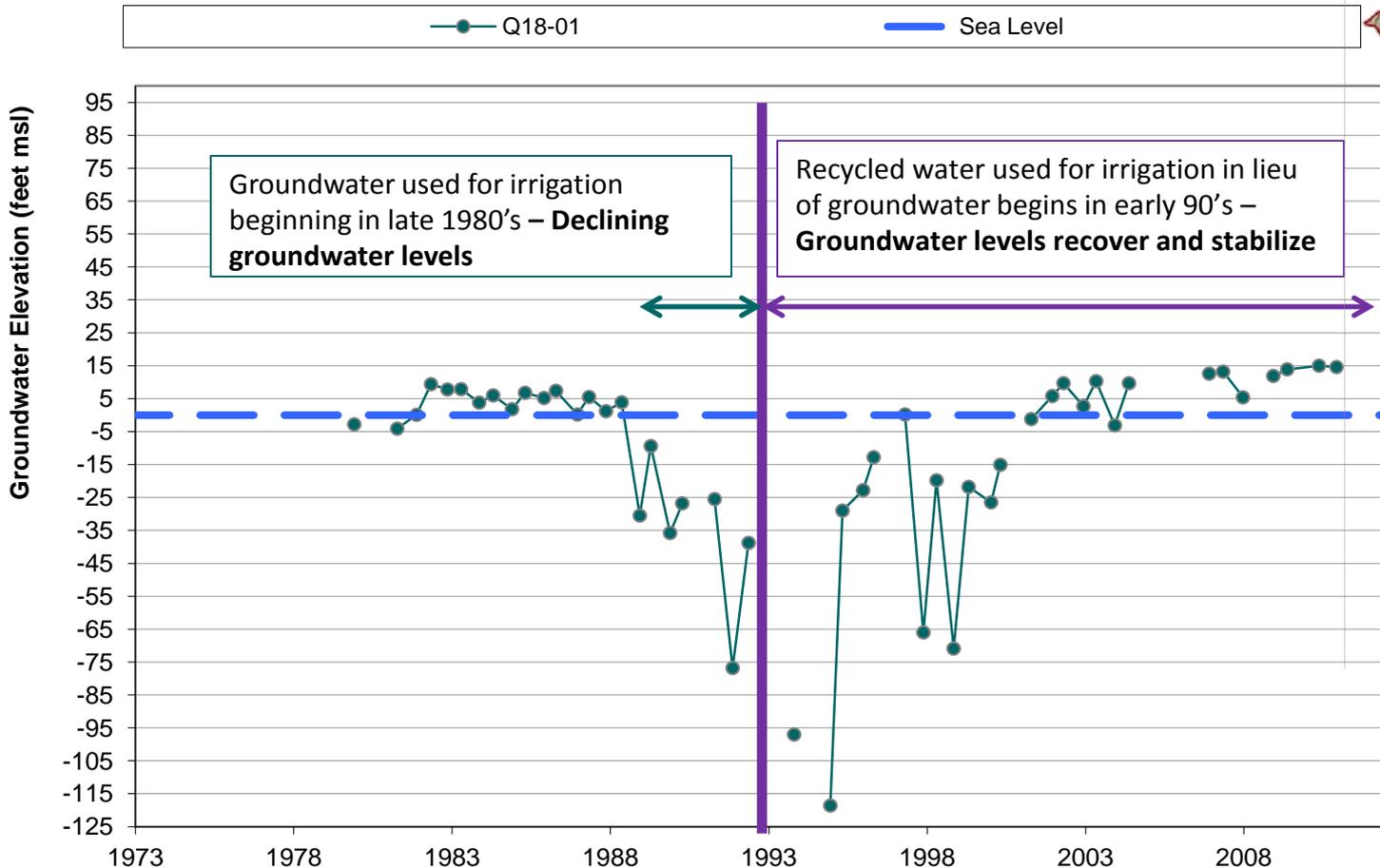
Sonoma-Marin Saving Water Partnership

- Regional Coordination for Implementation of Water Conservation Programs
- Allocates annual funding levels for Partners
- Provides mechanism for Regional Alliance to comply with State 20 x 2020 legislation
- Programs include: Public Awareness Campaigns, Green Business Program, the Qualified Water Efficient Landscaper Programs, Water Education Program, and Garden Sense



Irrigation with Recycled Water to Offset Groundwater Pumping

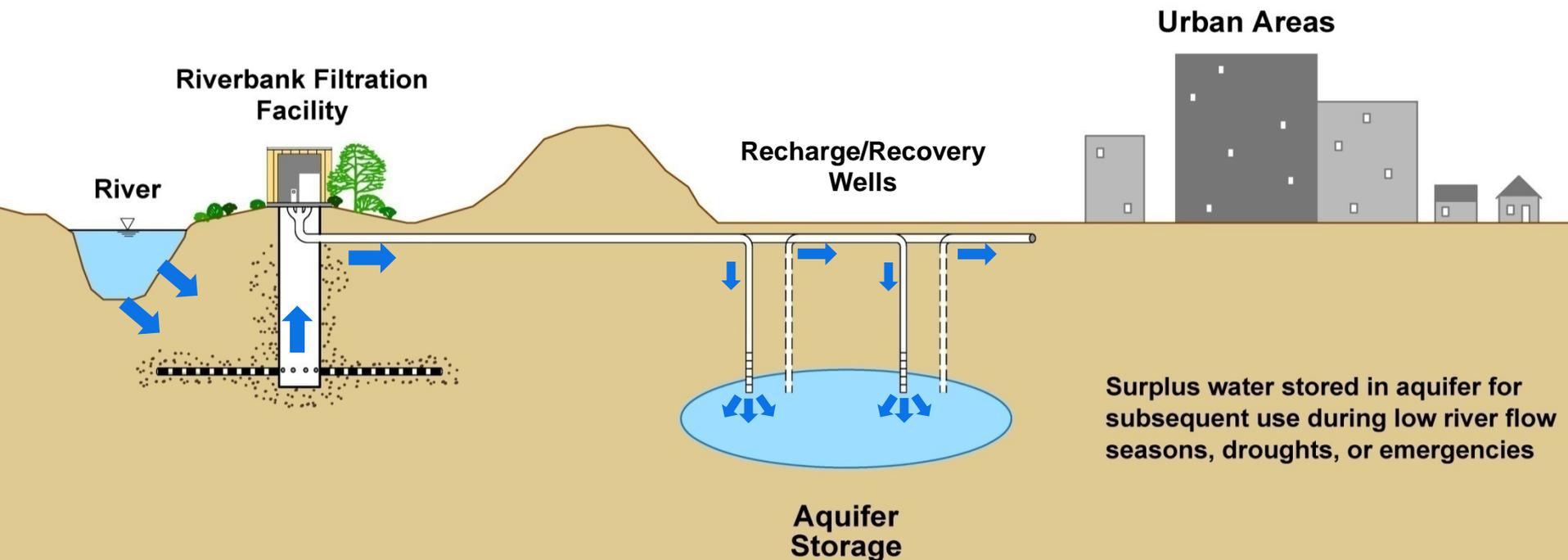
Groundwater-Level Hydrograph
Irrigation Well
Carneros Subarea



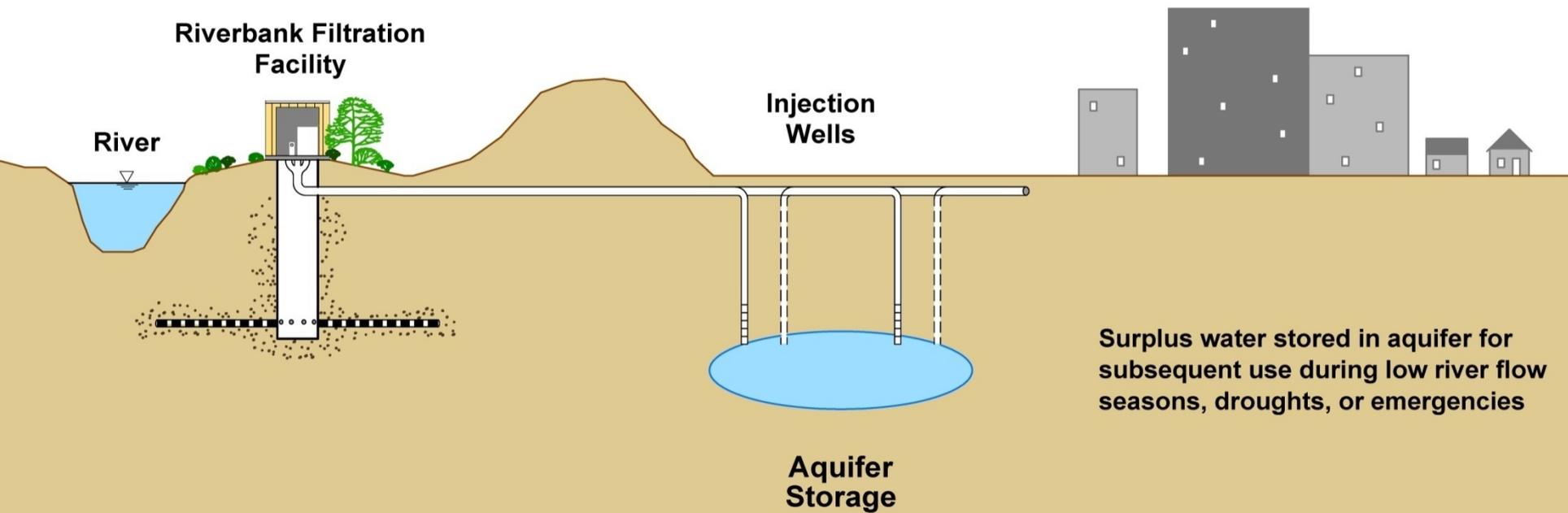
Conceptual Groundwater Banking Schematic

Aquifer Storage and Recovery

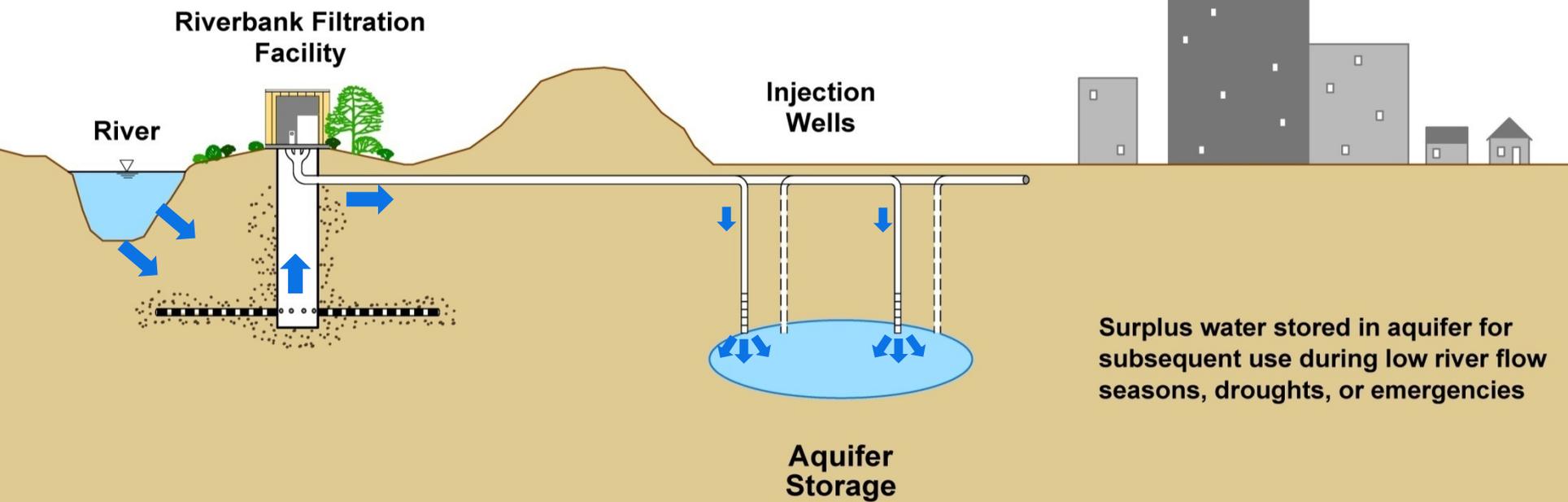
- Proceeding with Aquifer Storage and Recovery Concepts
- Geochemical compatibility assessment
 - Groundwater quality sampling and geochemical modeling
- Developing Work Plans for Pilot-Scale Demonstration Project(s)
- Explore funding options



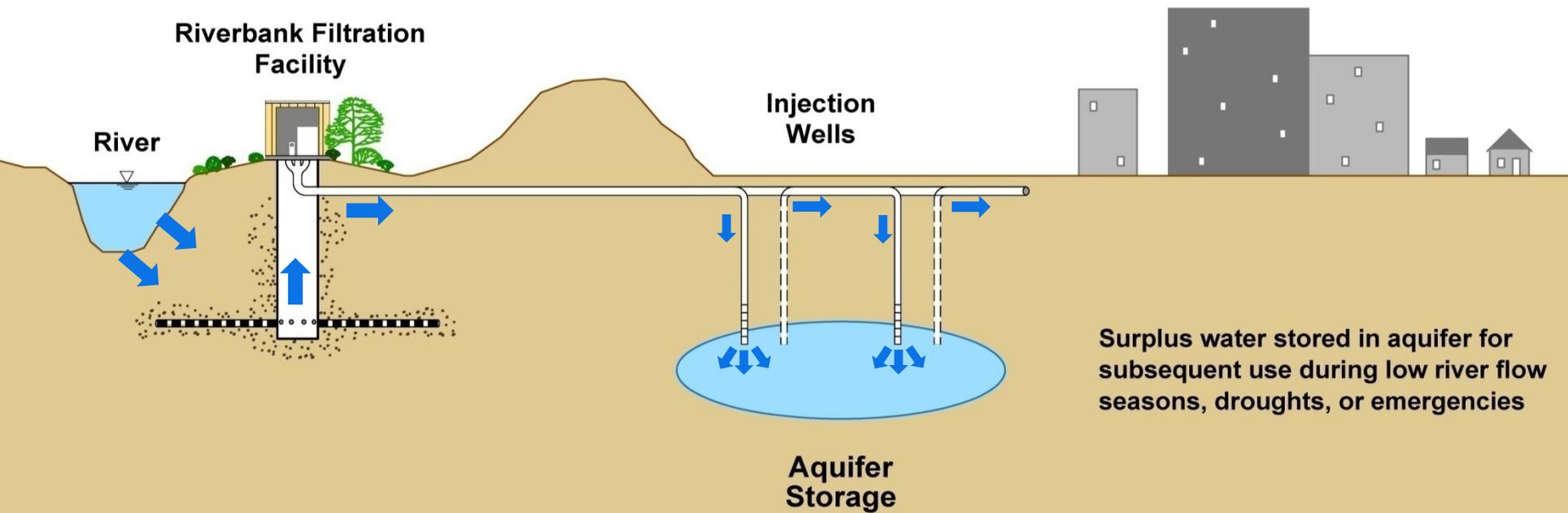
High River Flow Conditions



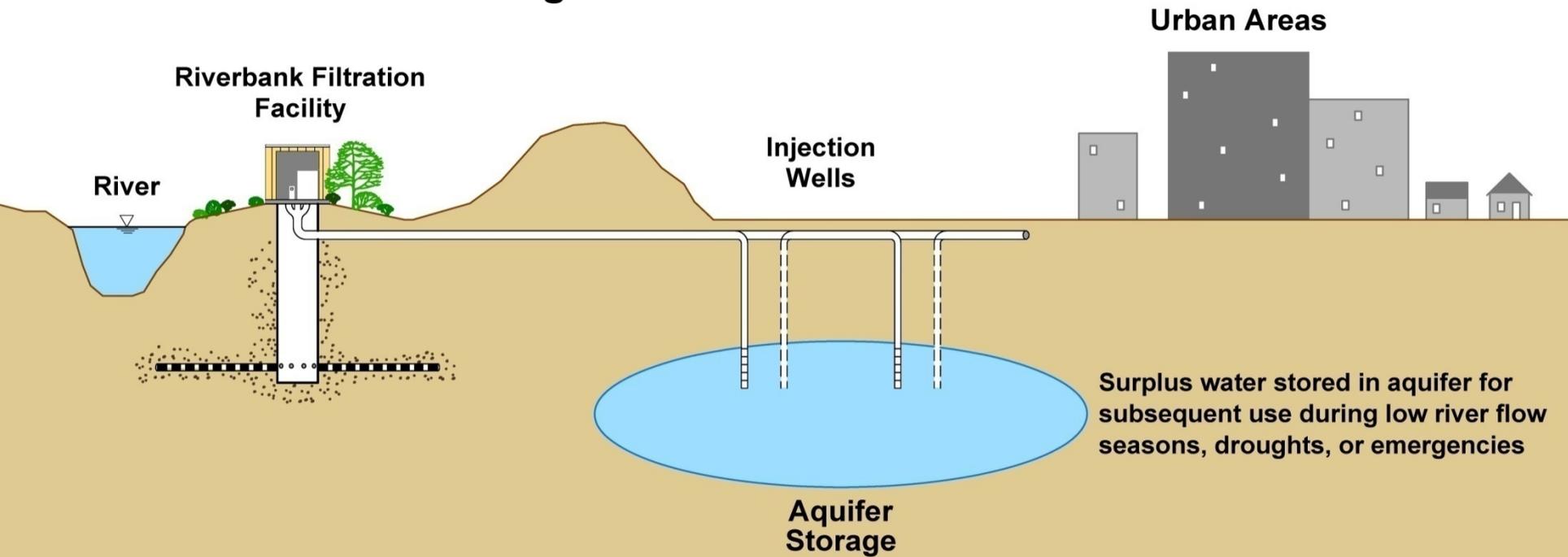
High River Flow Conditions



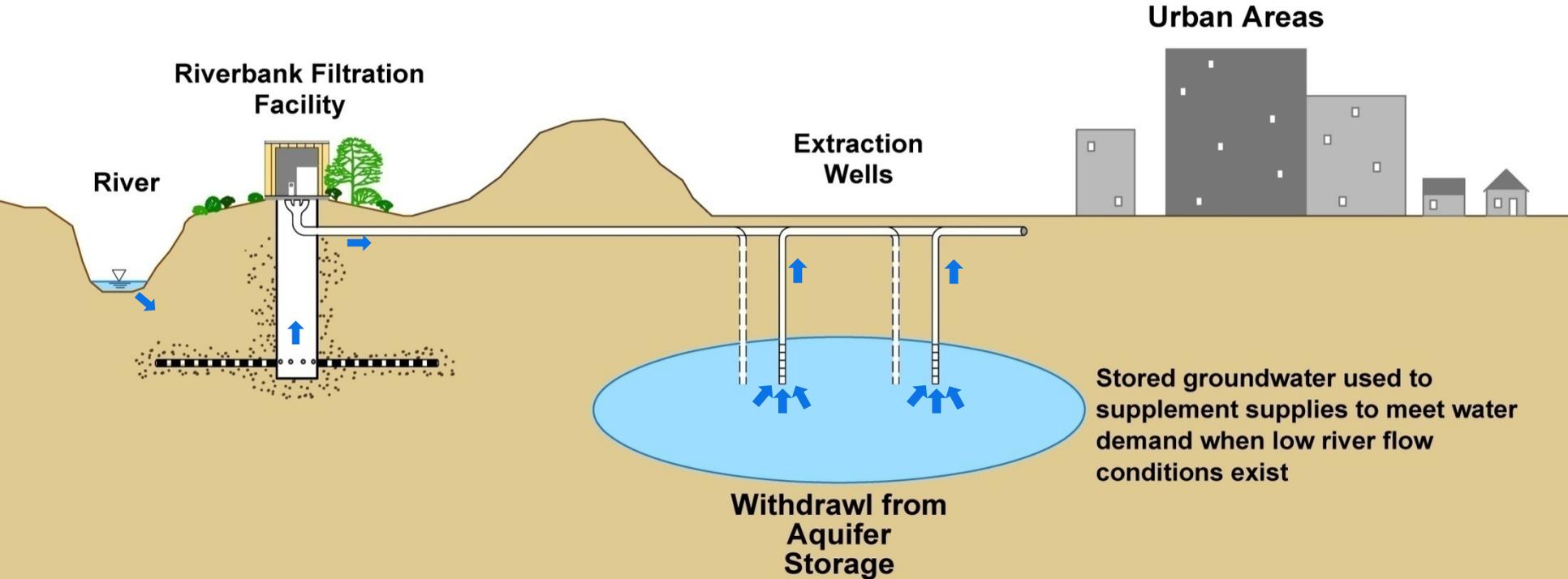
High River Flow Conditions



High River Flow Conditions



Low River Flow Conditions



Riverbank Filtration Facility

River

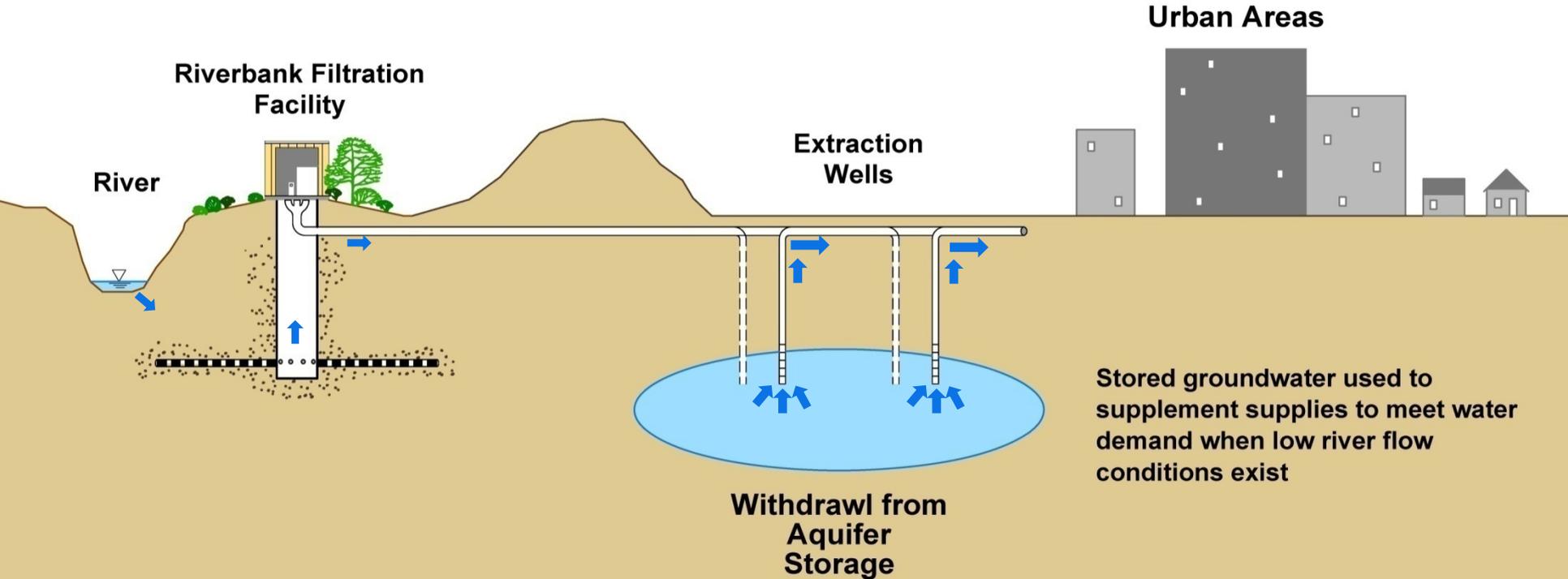
Extraction Wells

Urban Areas

Stored groundwater used to supplement supplies to meet water demand when low river flow conditions exist

Withdrawal from Aquifer Storage

Low River Flow Conditions

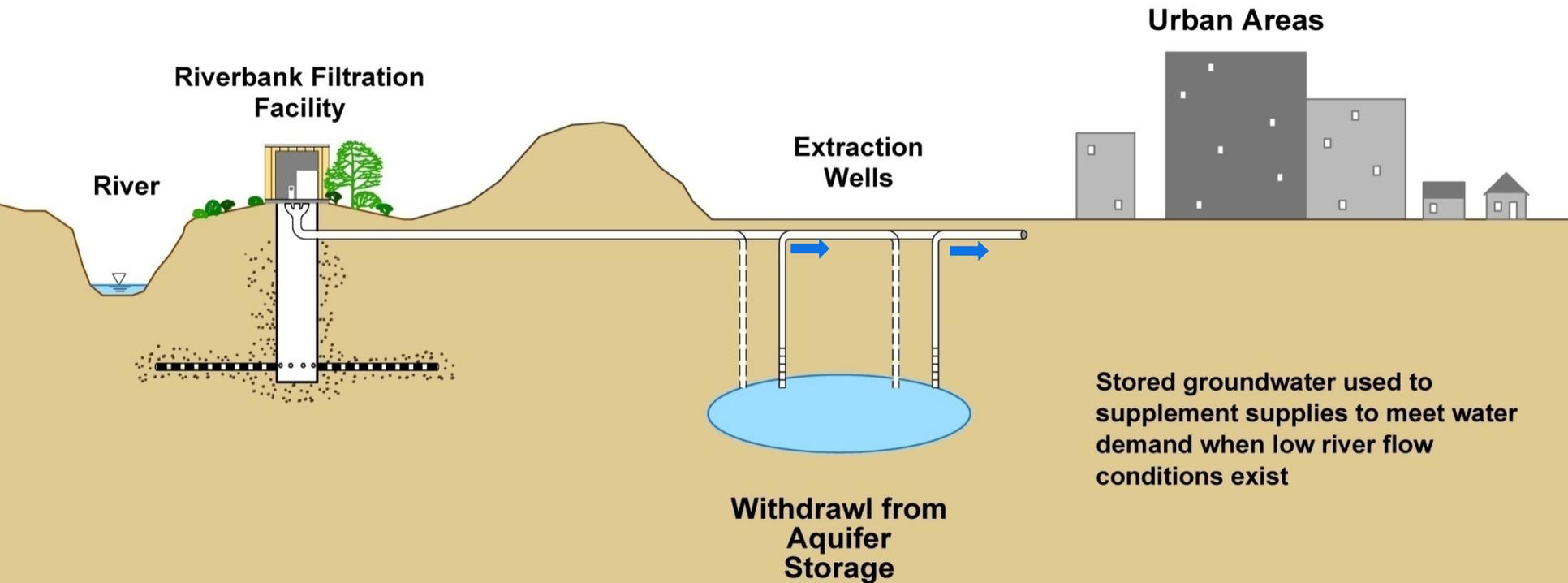


Urban Areas

Stored groundwater used to supplement supplies to meet water demand when low river flow conditions exist

Withdrawal from Aquifer Storage

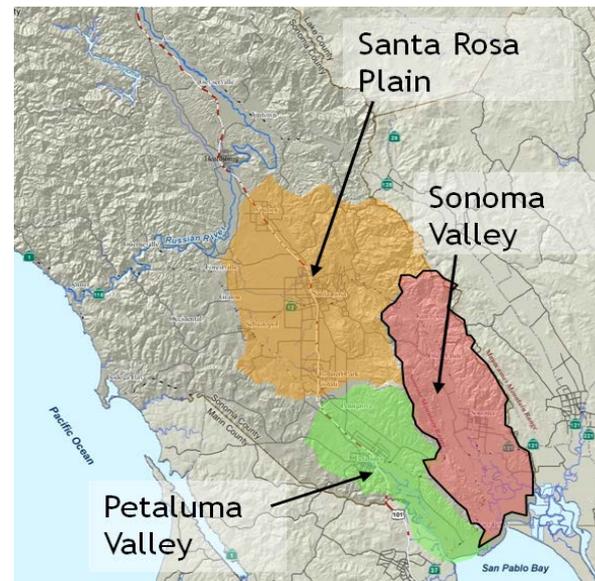
Low River Flow Conditions



Combining Stormwater Management & Groundwater Recharge - Watershed Studies

Goals and Objectives of Scoping Studies:

- 3 Watersheds - Simultaneous Studies
- Strategically managing surface & groundwater improving flood protection & groundwater recharge
- Develop design strategies
- Grant funding opportunities
- Stakeholder Input



Community Meeting: 1.29.2014



City Watersheds of Sonoma Valley: Reducing Flood Risks Along Fryer Creek

Wednesday, January 29, 2014

6:30 pm - 8:30 pm

Community Meeting Room (City Council Chamber)
177 First Street West, Sonoma, CA 95476

Summary - Groundwater Depletion & Salinity Issues

- Groundwater depletion areas exhibit declining water levels over several years/decades – Many years in the making
- 2012-2014 drought exacerbates but did not cause depletion areas
- Groundwater depletion areas require additional measures to address declining water levels & salinity issues
- Primary water users (e.g., Rural Residential & Agriculture) in depletion areas must participate in developing & funding solutions to address this problem

Groundwater Management Plan 5 Year Review

- Sets course of management plan for next 5 years.
- Does current plan adequately address groundwater issues (e.g., depletion zones & salinity)?
 - ✓ Answer is No - Data & analysis presented in 5 year review indicates plan needs to be modified to address issues
- Alternative Analysis – Proposing public stakeholder effort to review existing objectives & management programs to determine changes to plan

Alternatives Analysis - SV Groundwater Management Program

- Identify potential technical, regulatory, land use & institutional response actions to mitigate declining groundwater levels.
- Prioritize response actions (or groups of actions) & evaluate effectiveness in addressing groundwater depletion areas using groundwater model.
- Scenario-based planning by stakeholder group to develop scenarios & consider results. BAP to approve & make recommendations regarding solutions.
- Community participation is essential throughout this process

Schedule and Next Steps

- **December 2013 - February 2014**
 - Draft Report undergoes TAC and BAP review
- **February 20, 2014**
 - BAP considers approving 5-Year Review Report
- **March/April 2014**
 - Water Agency Board considers approving 5-Year Review Report and recommendation for Alternatives Analysis
- **April or May 2014**
 - Public Forum on Sonoma Valley Groundwater Issues
- **April - December 2014**
 - TAC and BAP identify and analyze alternative actions through scenario-based planning

Stakeholder participation will be critical!

To participate: contact Marcus Trotta - 707.547.1978

Marcus.Trotta@scwa.ca.gov

Final Points

- Regional & local water issues are inter-related
- Sonoma Valley has a vulnerable water supply that requires proactive management
- Solutions involve increasing water supply “Portfolio” via integrated water management to increase reliability
- SCWA can help Sonoma Valley stakeholders by providing:
 - ✧ Technical Resources & Funding
 - ✧ Coordination with Federal & State Agencies