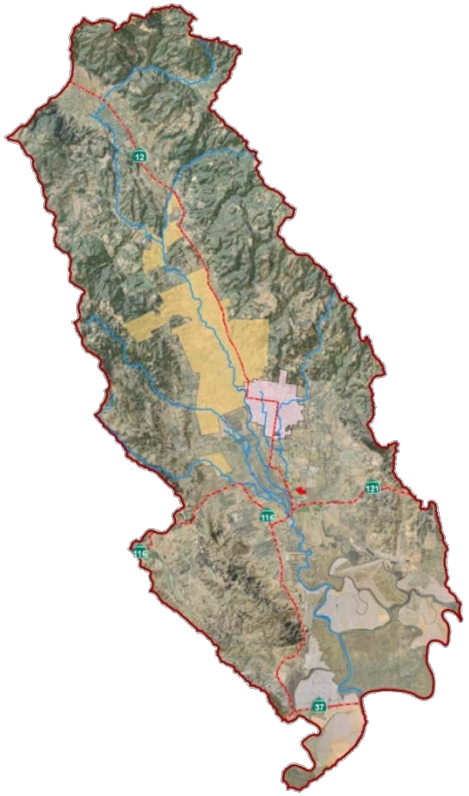
Sonoma Valley Groundwater Management Program

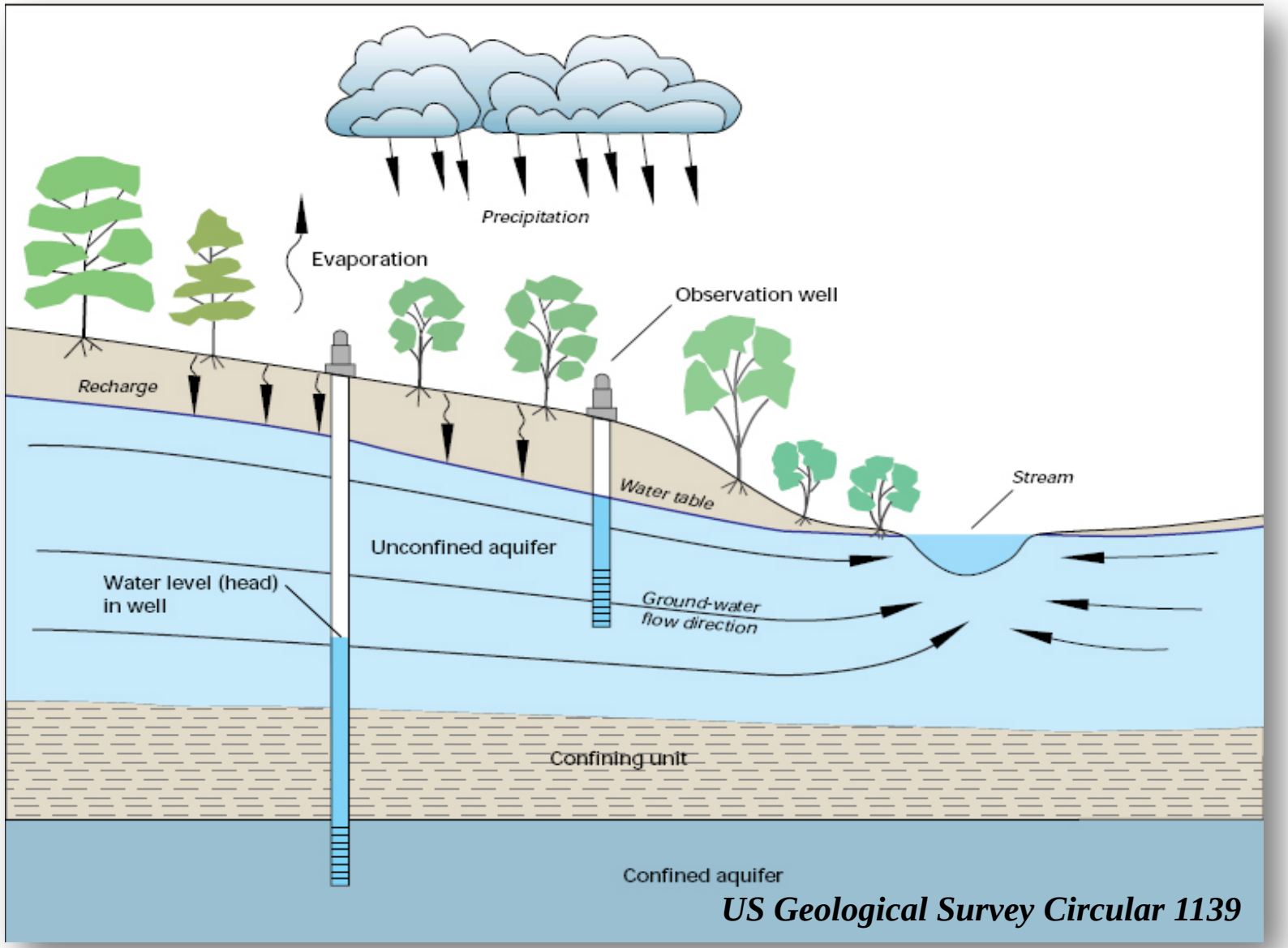


State of Sonoma Valley Water Supplies

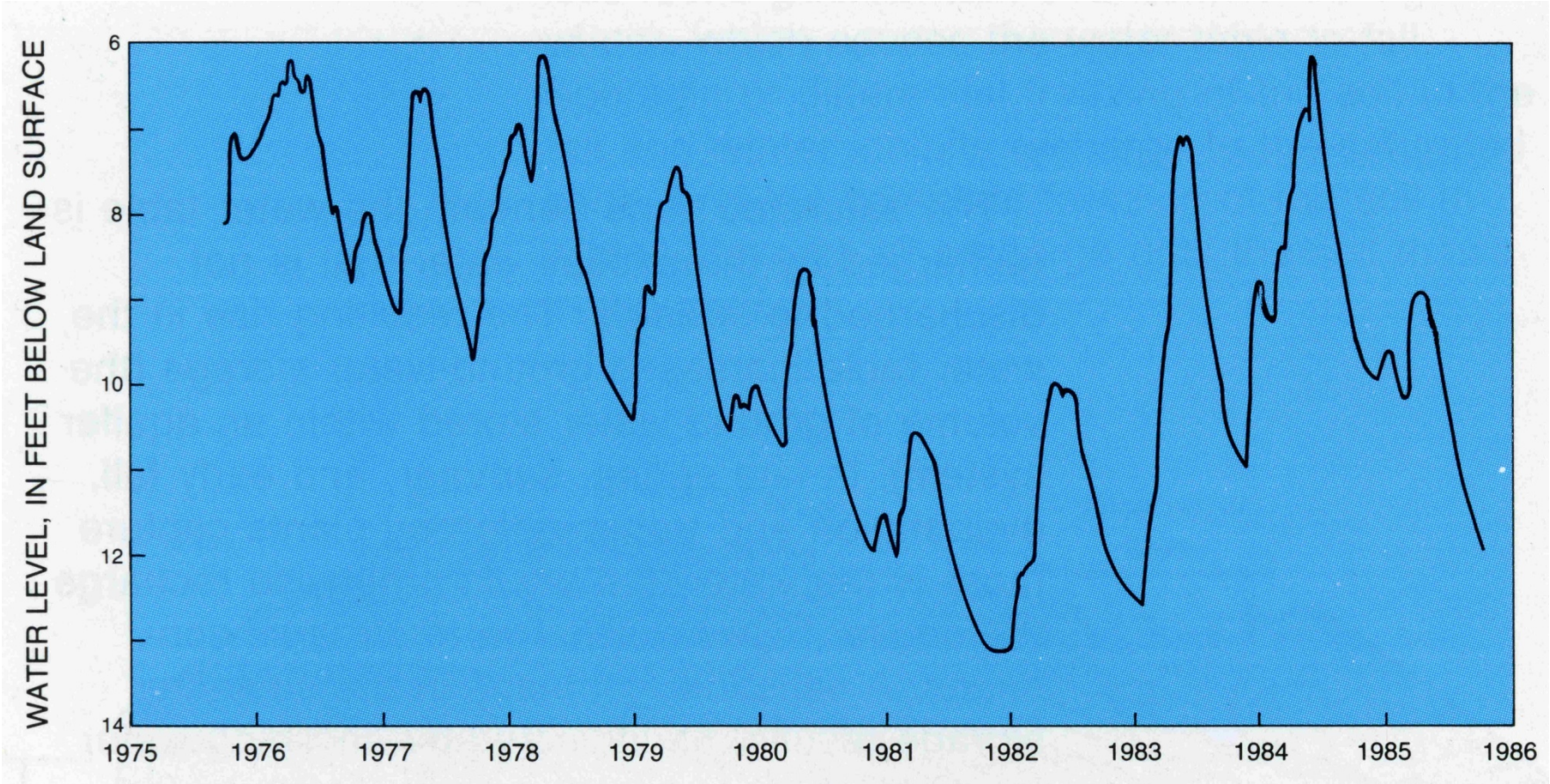
Marcus Trotta, PG, CHg,
Hydrogeologist
Sonoma County Water Agency

March 31, 2014

Groundwater is Part of the Hydrologic Cycle

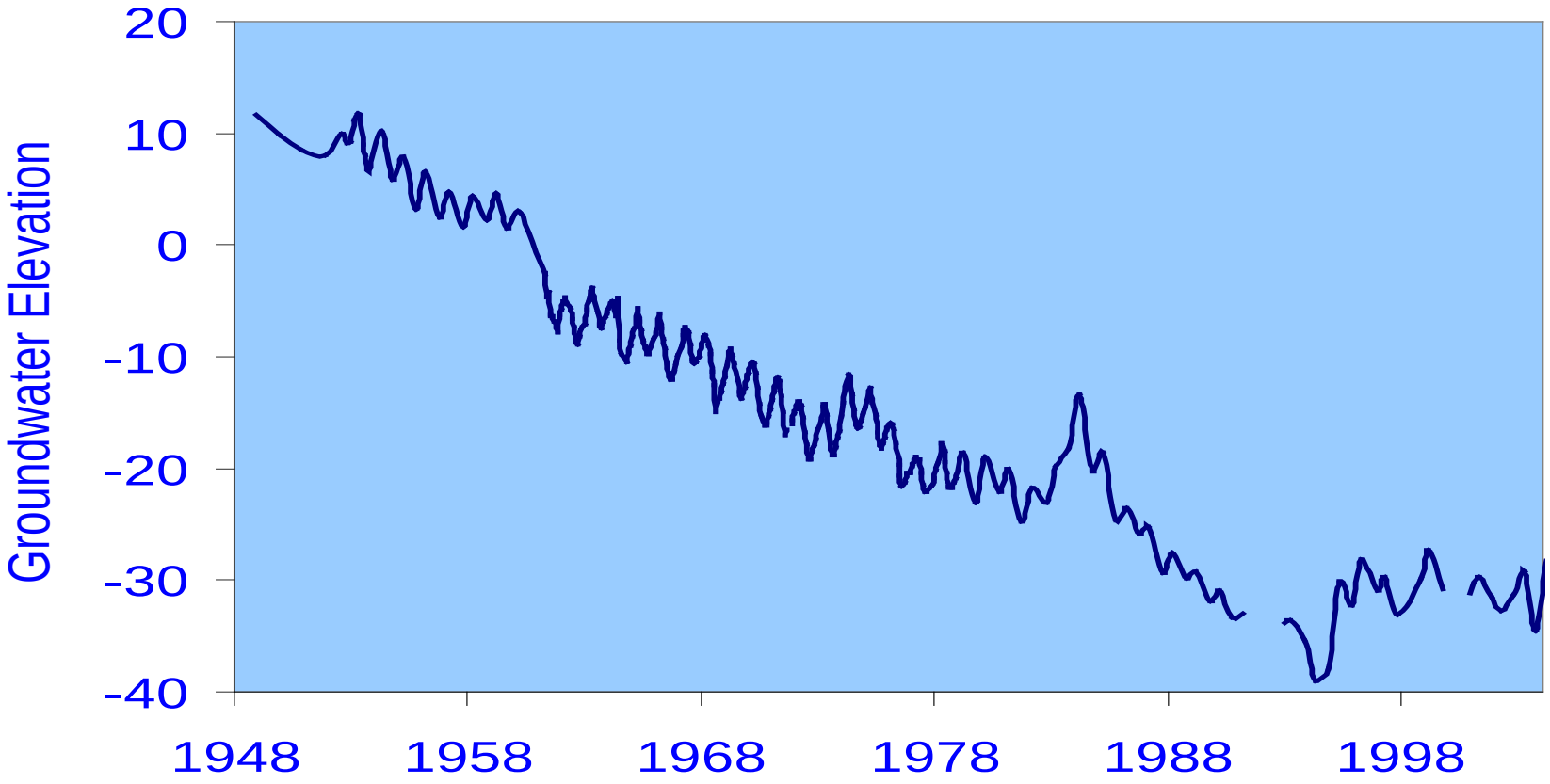


Groundwater Levels Change Seasonally and Climatically



Well Hydrograph, Groundwater and the Rural Homeowner, U.S. Geological Survey

Groundwater Levels Change When Discharge Exceeds Recharge



Well Hydrograph, Water Well Database, California Department of Water Resources

Importance of Groundwater in Sonoma Valley

Ecosystems

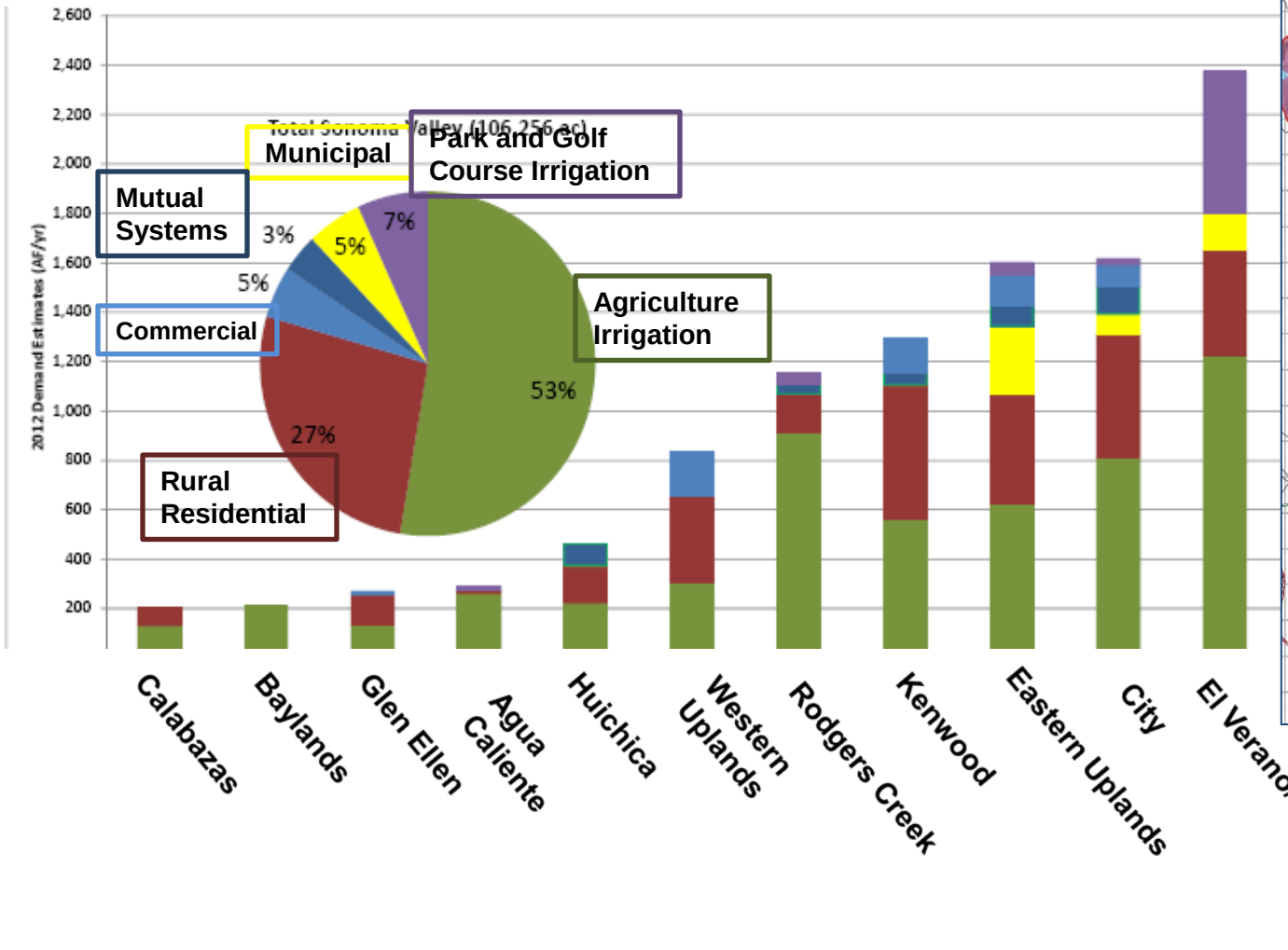
Agricultural Irrigation

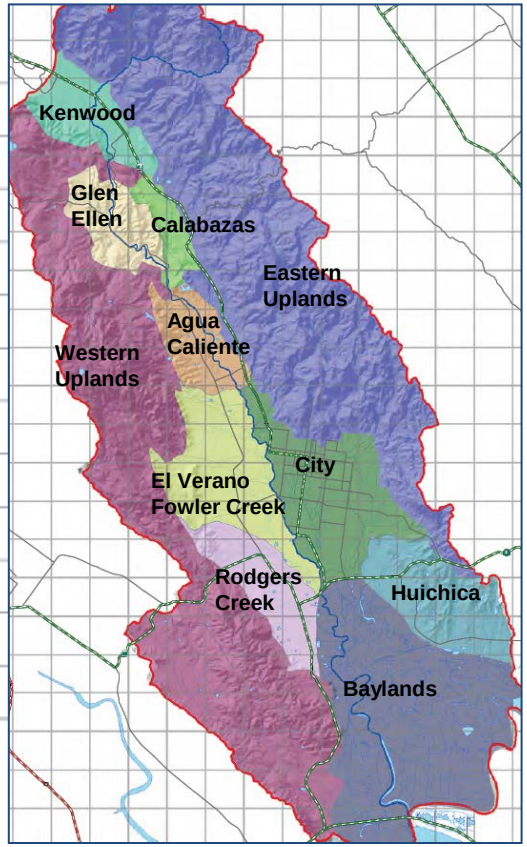
Rural Residences

Municipal

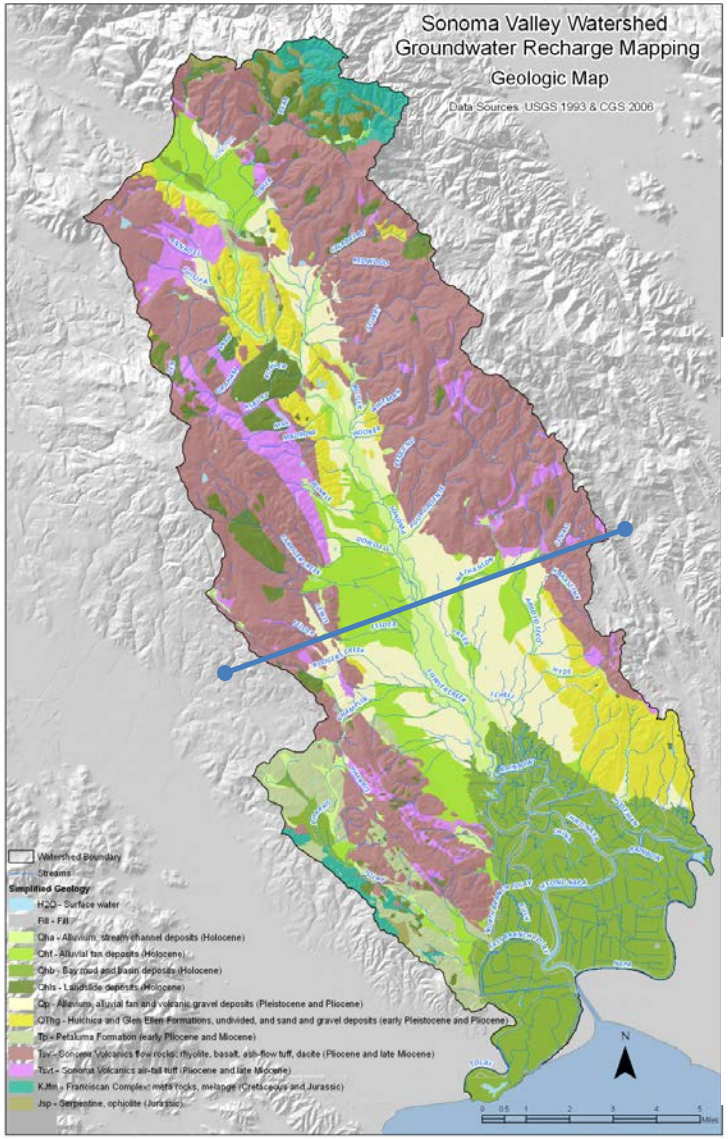
Businesses

Groundwater Use in Sonoma Valley



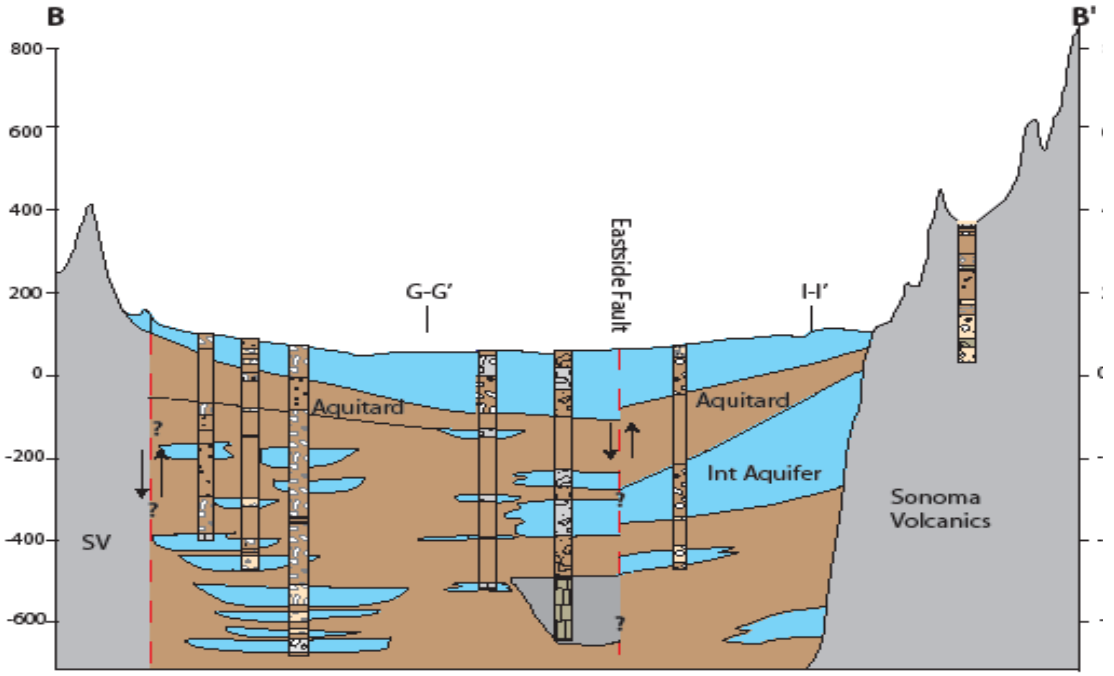


Sonoma Valley Hydrogeologic Setting

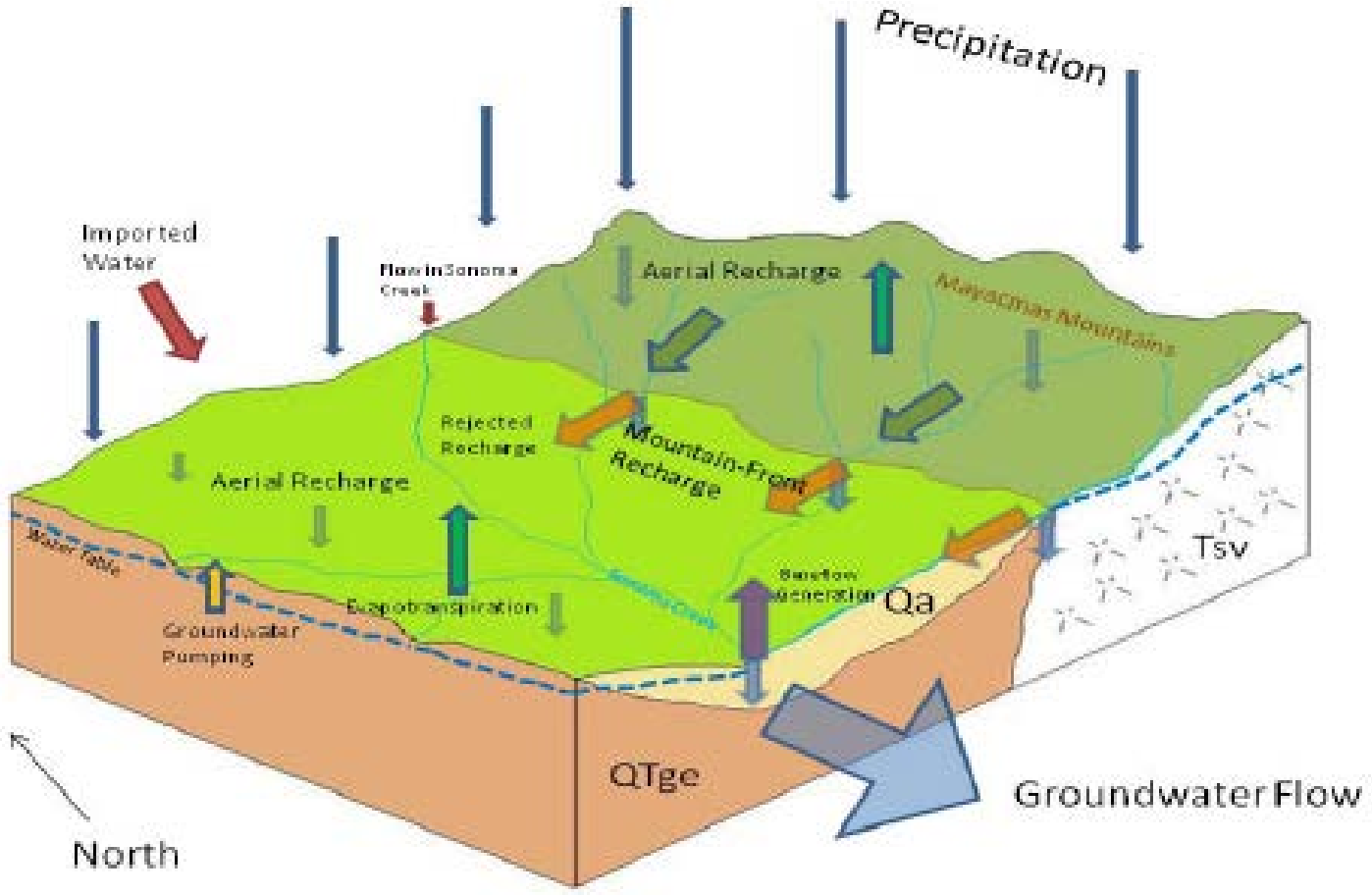


Complex Geology:

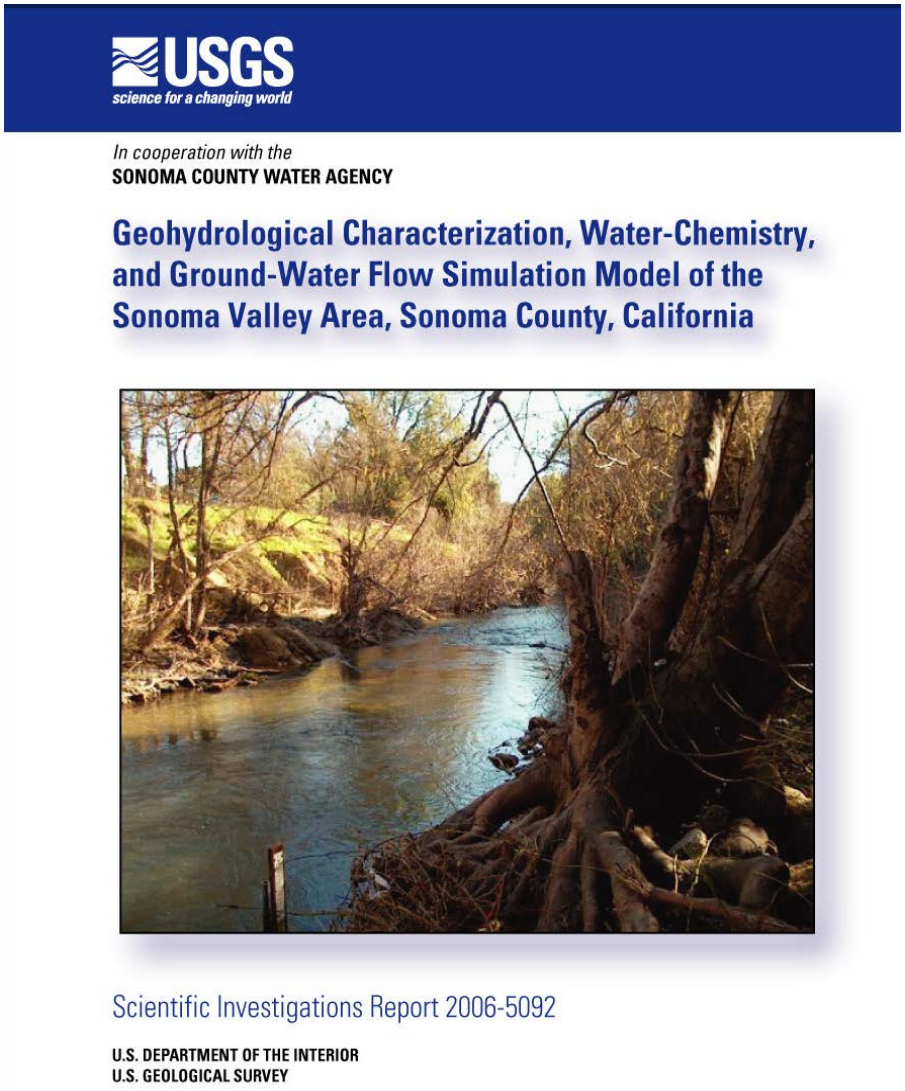
- Intermixed sedimentary and volcanic deposits
- Layers have been uplifted, tilted and faulted



How Groundwater Moves through Sonoma Valley - Conceptual Model



Water Agency/USGS
Sonoma Valley Groundwater Study



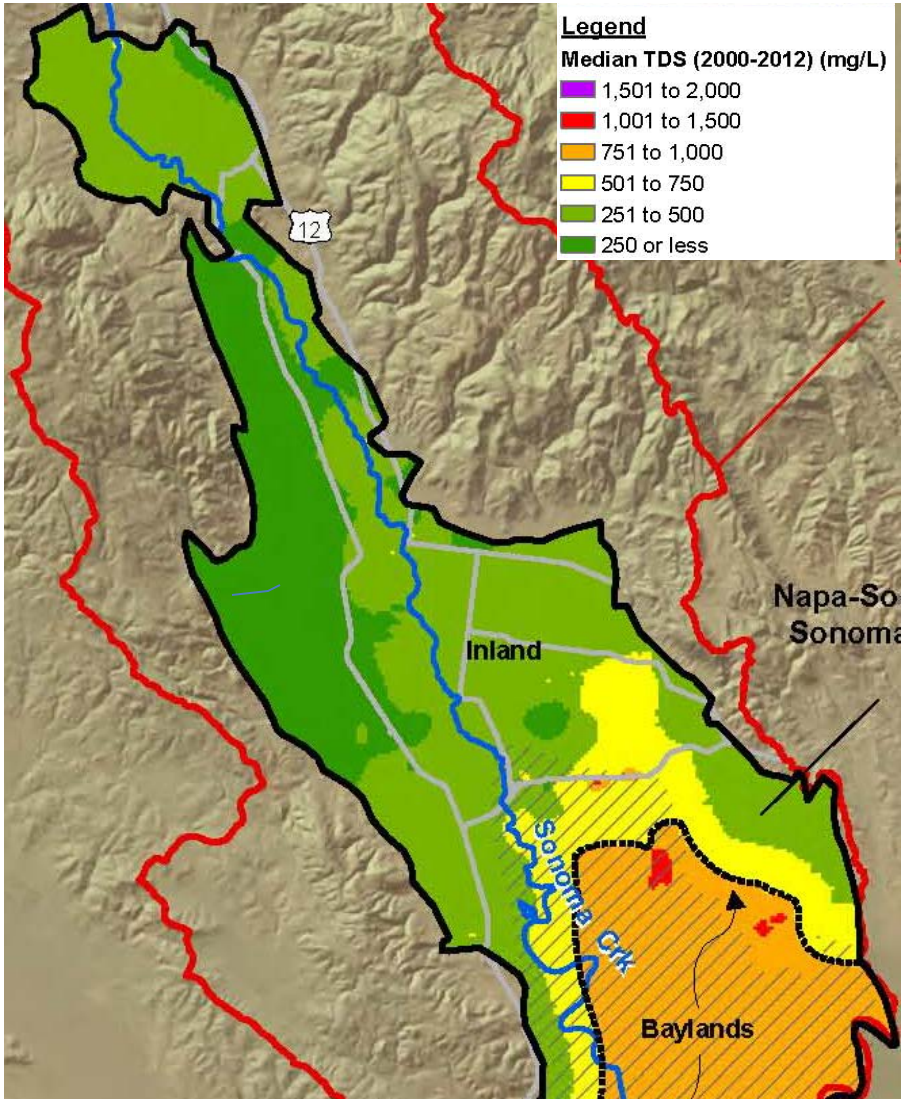
Key Findings:

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

Salinity In Groundwater is a Concern

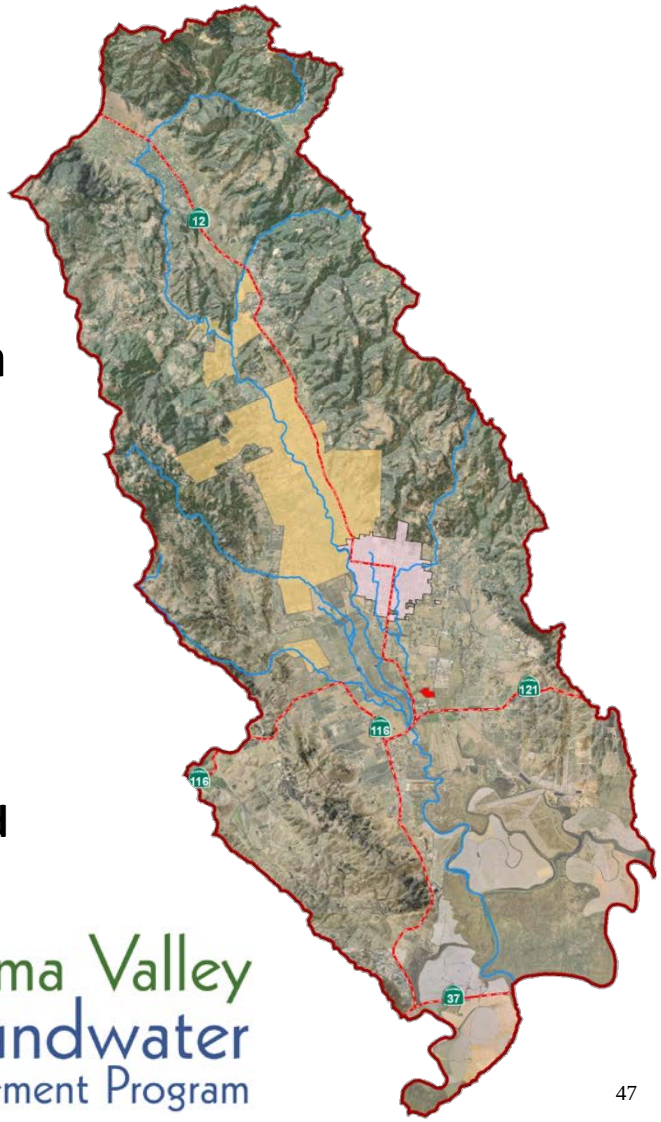
Salinity Sources:

- **Historical Brackish Water Beneath Tidal Marshlands**
- **Thermal Water**
- **Deep Groundwater from Older Formations**



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

Basin Advisory Panel Composition

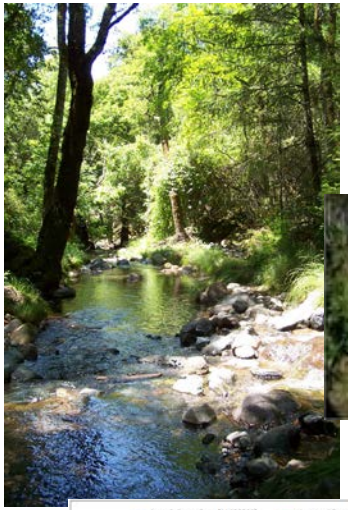
- **Agriculture**
  - Grape Growers
  - Dairy
- **Business / Developers**
  - Business Owners
  - North Bay Association of Realtors
- **Environmental**
  - Valley of the Moon Alliance
- **Natural Resource Management**
  - Sonoma Ecology Center
  - Sonoma Resource Conservation District
- **Governmental**
  - County of Sonoma – Permit and Resource Management Department
  - Valley of the Moon Water District
  - City of Sonoma
  - Sonoma County Water Agency
  - Sonoma County Agricultural Preservation & Open Space District
- **Rural Well Owners and Users**
  - Mission Highlands Mutual Water Company
  - Individual Well Owners

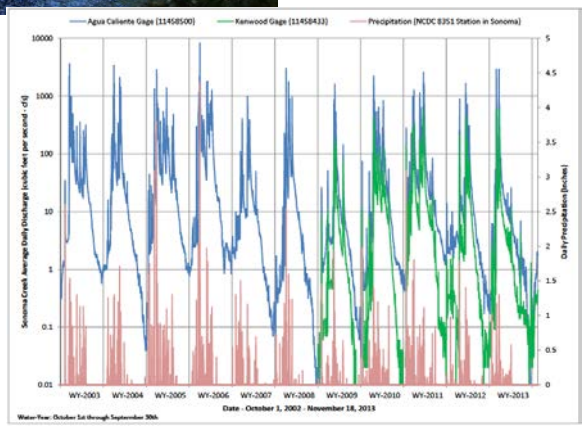
Sonoma Valley Groundwater Management Program

Program Activities

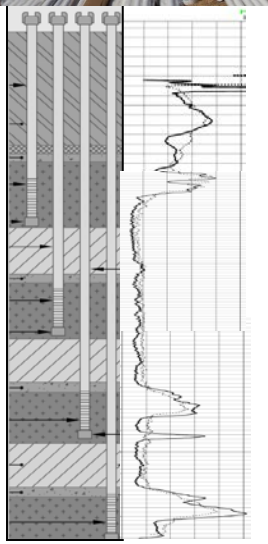
Involvement of Community Stakeholders

Groundwater-Level and Streamflow Monitoring

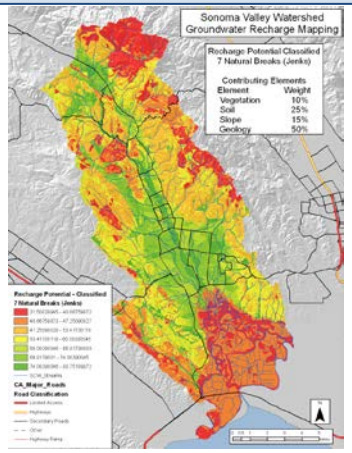




Monitoring Well Construction & Data Collection

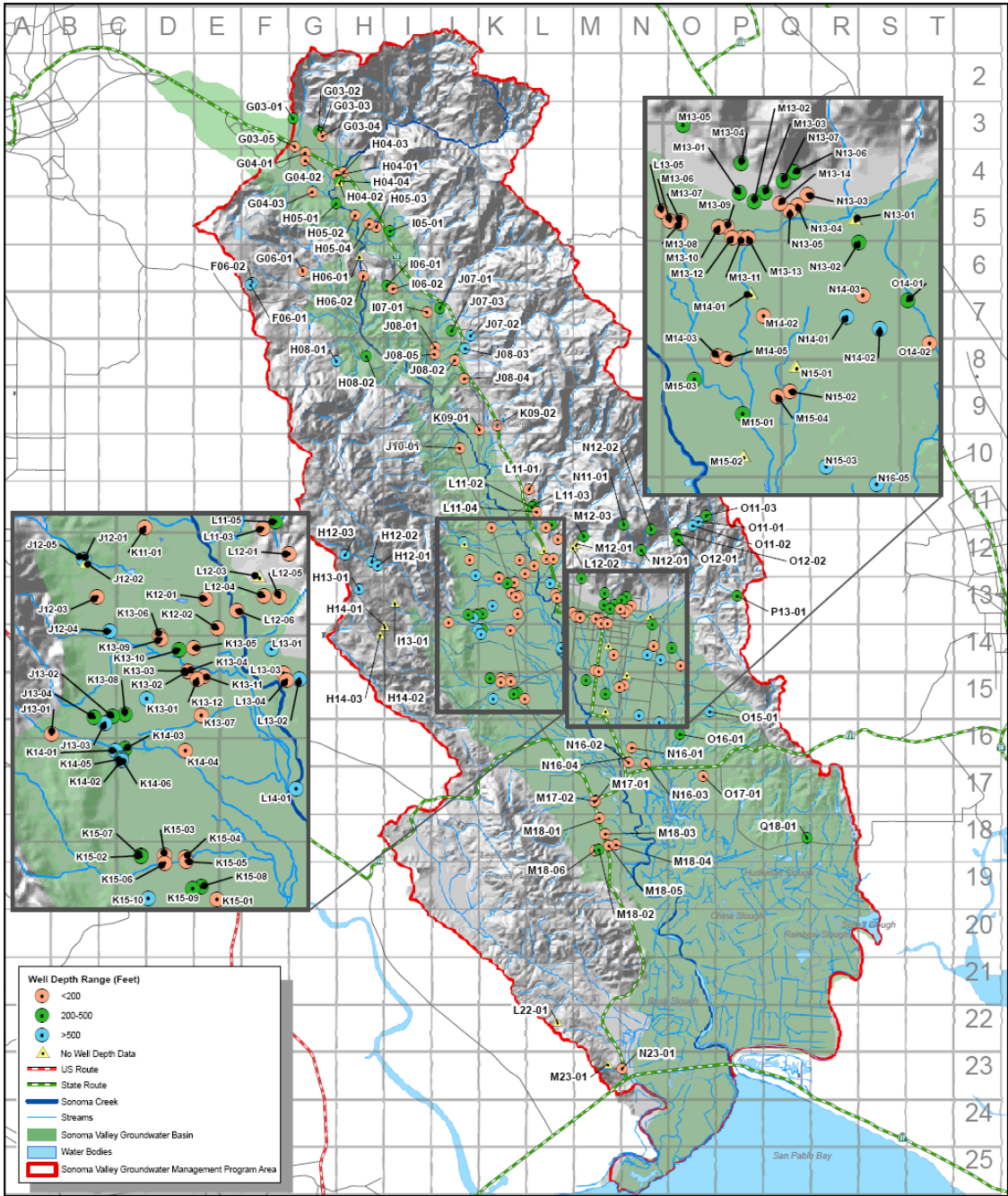


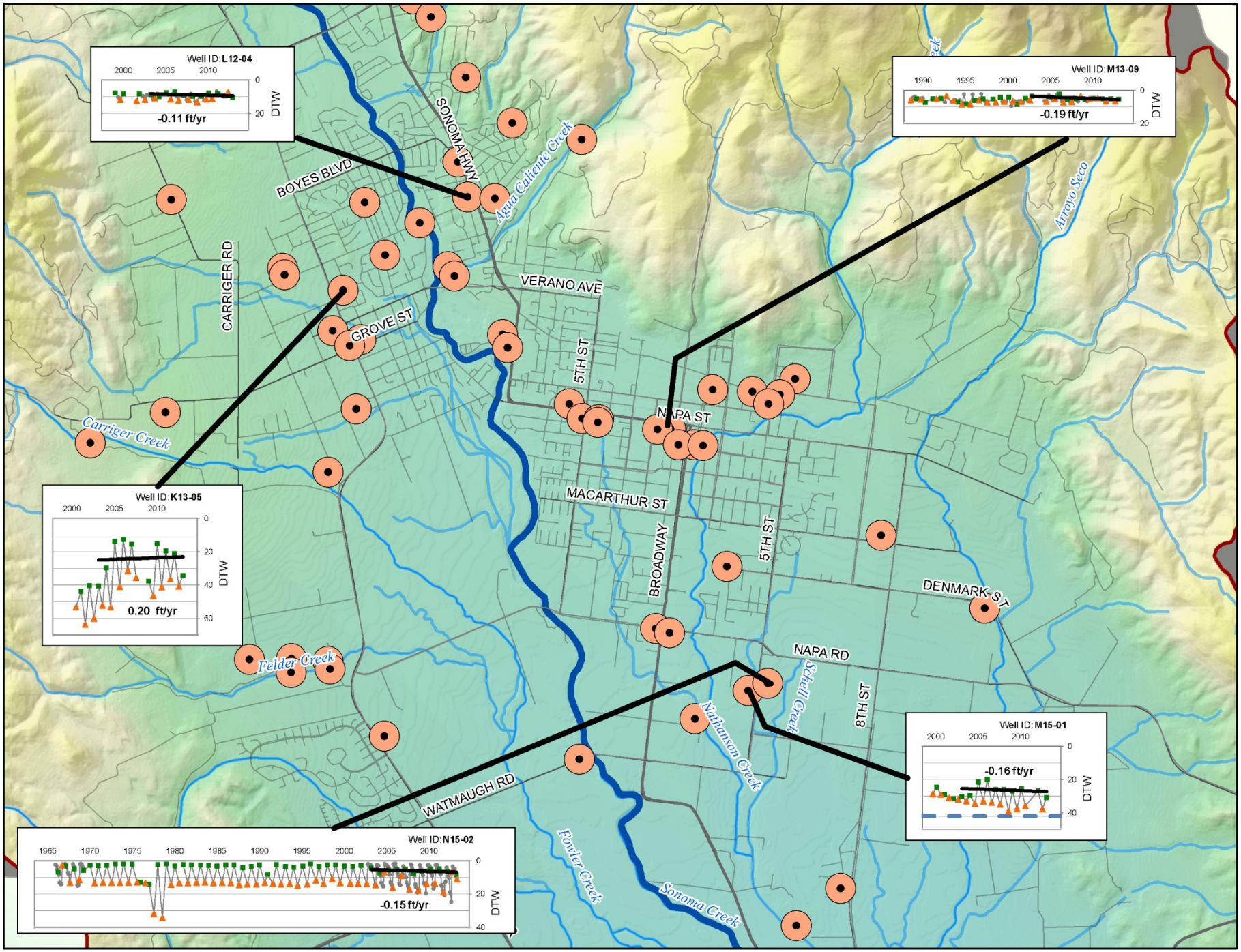
Groundwater Recharge Mapping



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**




Well ID: L12-04
2000
2005
2010
0
20
DTW
-0.11 ft/yr
Well ID: M13-09
1990
1995
2000
2005
2010
0
20
DTW
-0.19 ft/yr
Well ID: K13-05
2000
2005
2010
0
20
40
60
DTW
0.20 ft/yr
Well ID: M15-01
2000
2005
2010
0
20
40
DTW
-0.16 ft/yr
Well ID: N15-02
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
0
20
40
DTW
-0.15 ft/yr
SONOMA HWY
BOYES BLVD
CARRIGER RD
GROVE ST
VERANO AVE
5TH ST
NAPA ST
MACARTHUR ST
BROADWAY
5TH ST
DENMARK ST
NAPA RD
8TH ST
WATMAUGH RD
Agua Caliente Creek
Arroyo Seco
Carriger Creek
Felder Creek
Nathanson Creek
Schell Creek
Fowler Creek
Sonoma Creek

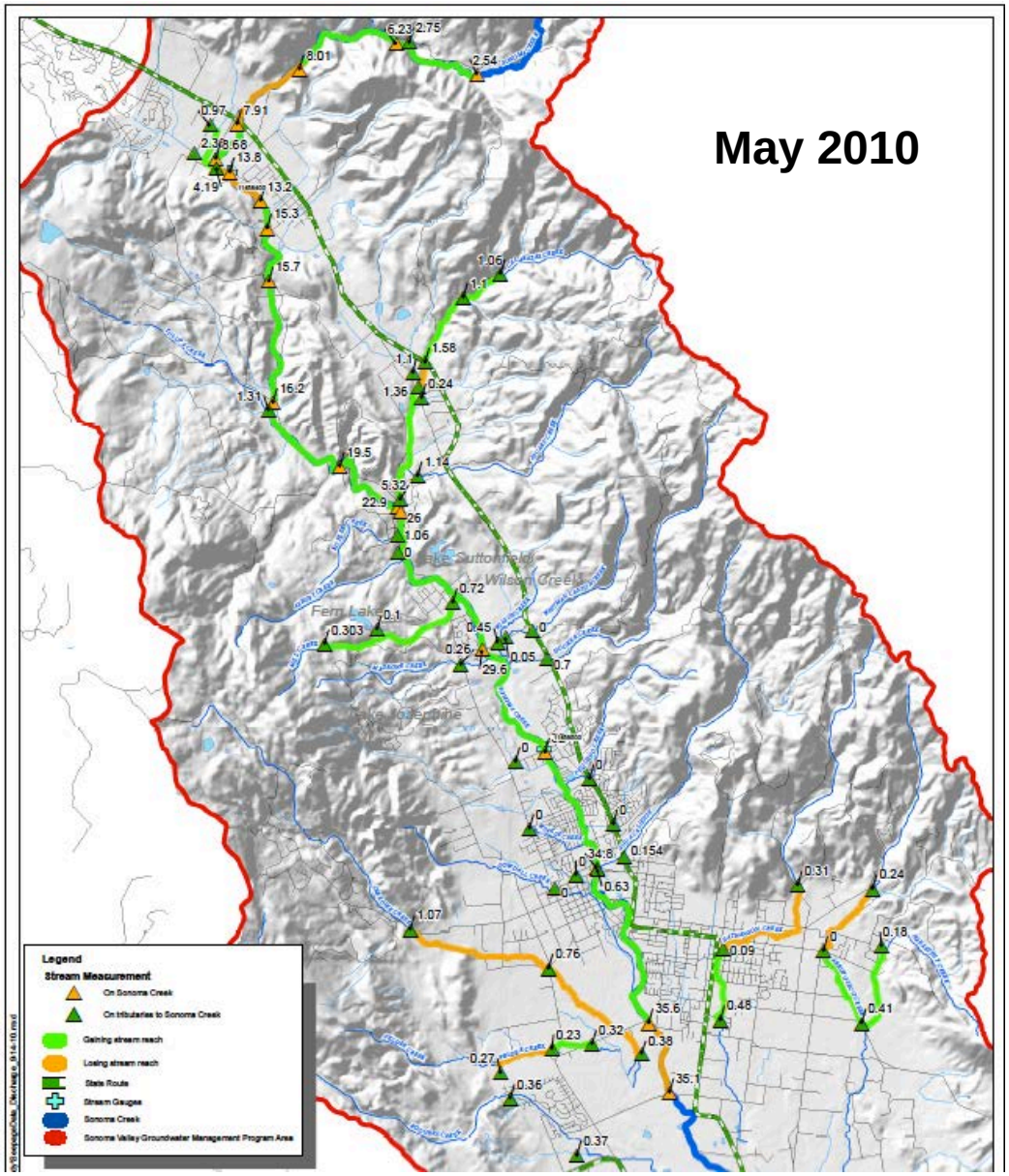
Groundwater Important Provider of Flow to Streams

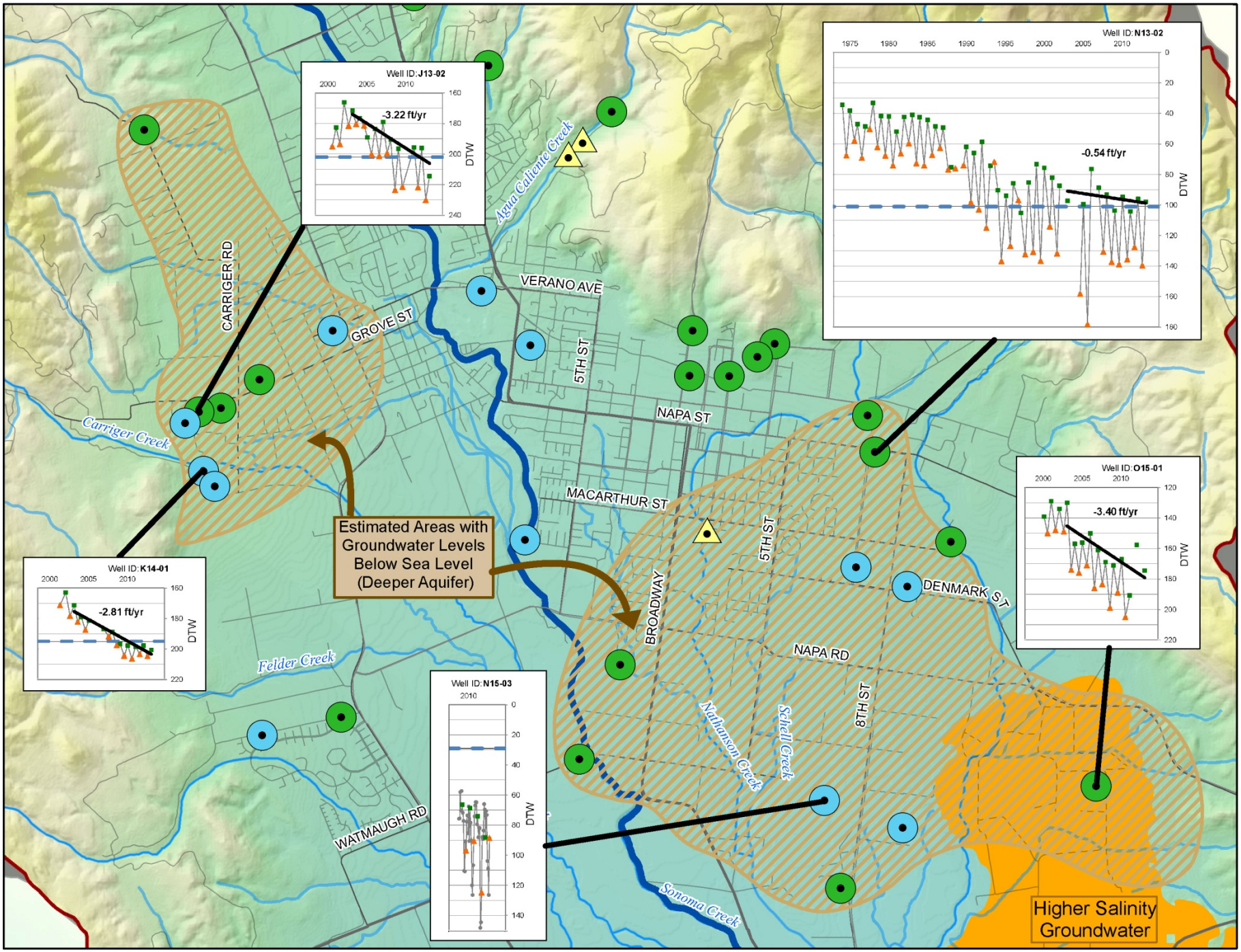
Discharge Segments
(Groundwater flows into Stream)

- Most of Sonoma Creek
- Most of Calabazas
- Lower reaches of Fryer and Nathanson

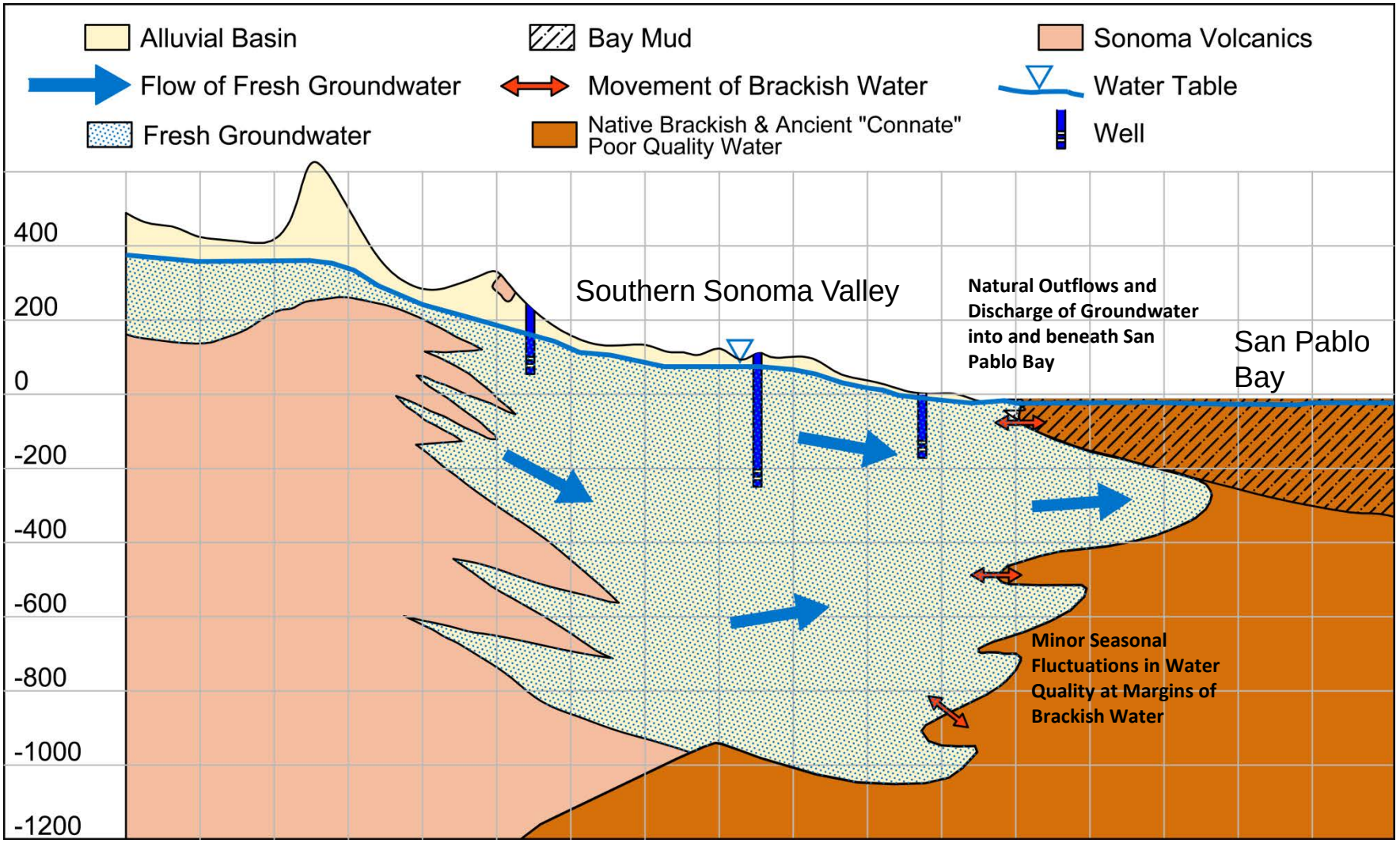
Recharge Segments
(Stream recharges Groundwater)

- Sonoma Creek near Kenwood
- Carriger
- Upper reaches of Fryer and Nathanson
- Portion of Felder Creek

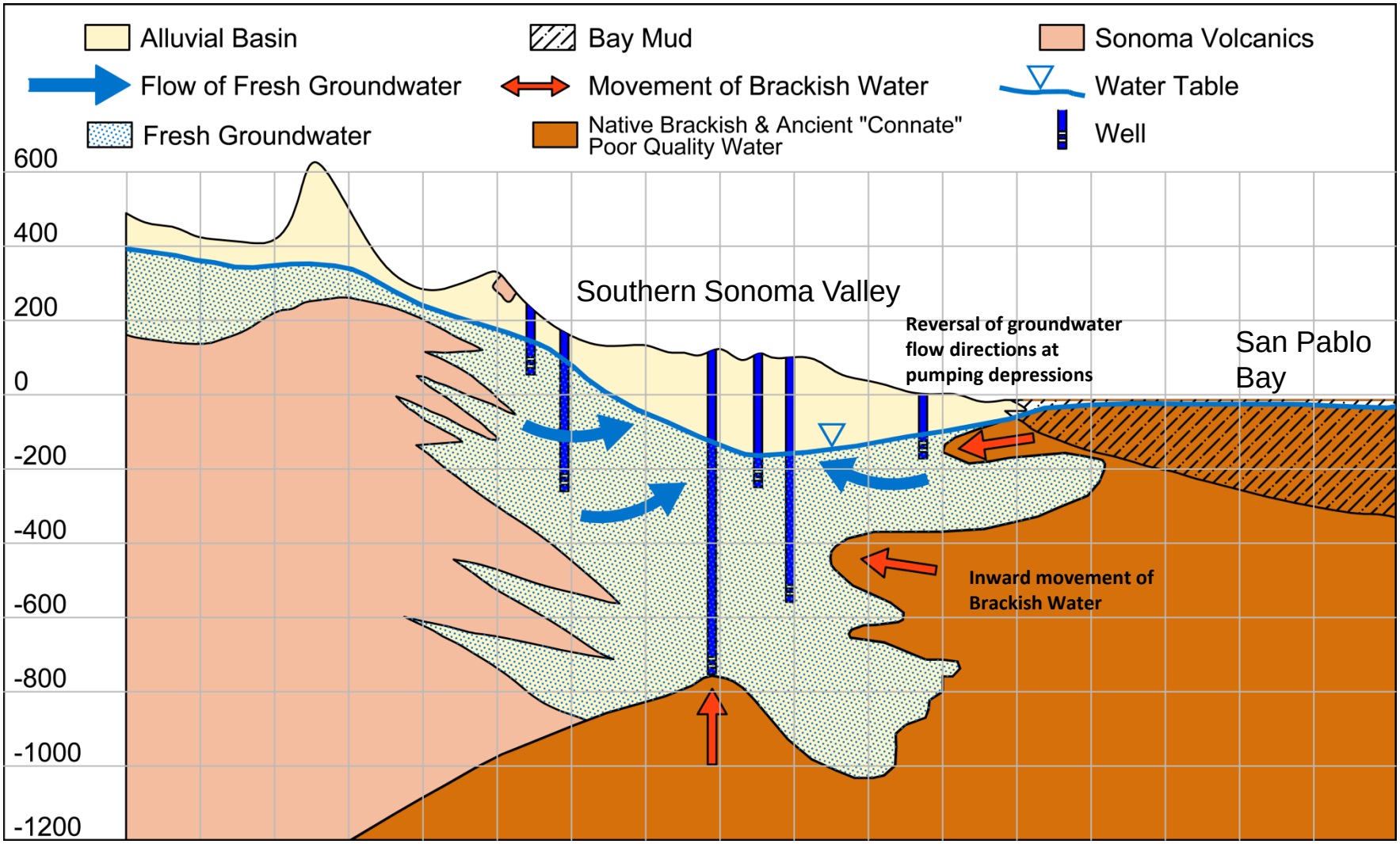



Well ID: J13-02
-3.22 ft/yr
DTW
Well ID: N13-02
-0.54 ft/yr
DTW
Well ID: K14-01
-2.81 ft/yr
DTW
Well ID: O15-01
-3.40 ft/yr
DTW
Well ID: N15-03
DTW
Estimated Areas with Groundwater Levels Below Sea Level (Deeper Aquifer)
Higher Salinity Groundwater
CARRIGER RD
GROVE ST
VERANO AVE
5TH ST
NAPA ST
MACARTHUR ST
BROADWAY
NAPA RD
DENMARK ST
8TH ST
WATMAUGH RD
Agua Caliente Creek
Carriger Creek
Felder Creek
Nathanson Creek
Schell Creek
Sonoma Creek

1950: Shallow Groundwater Levels Prior to Extensive Pumping

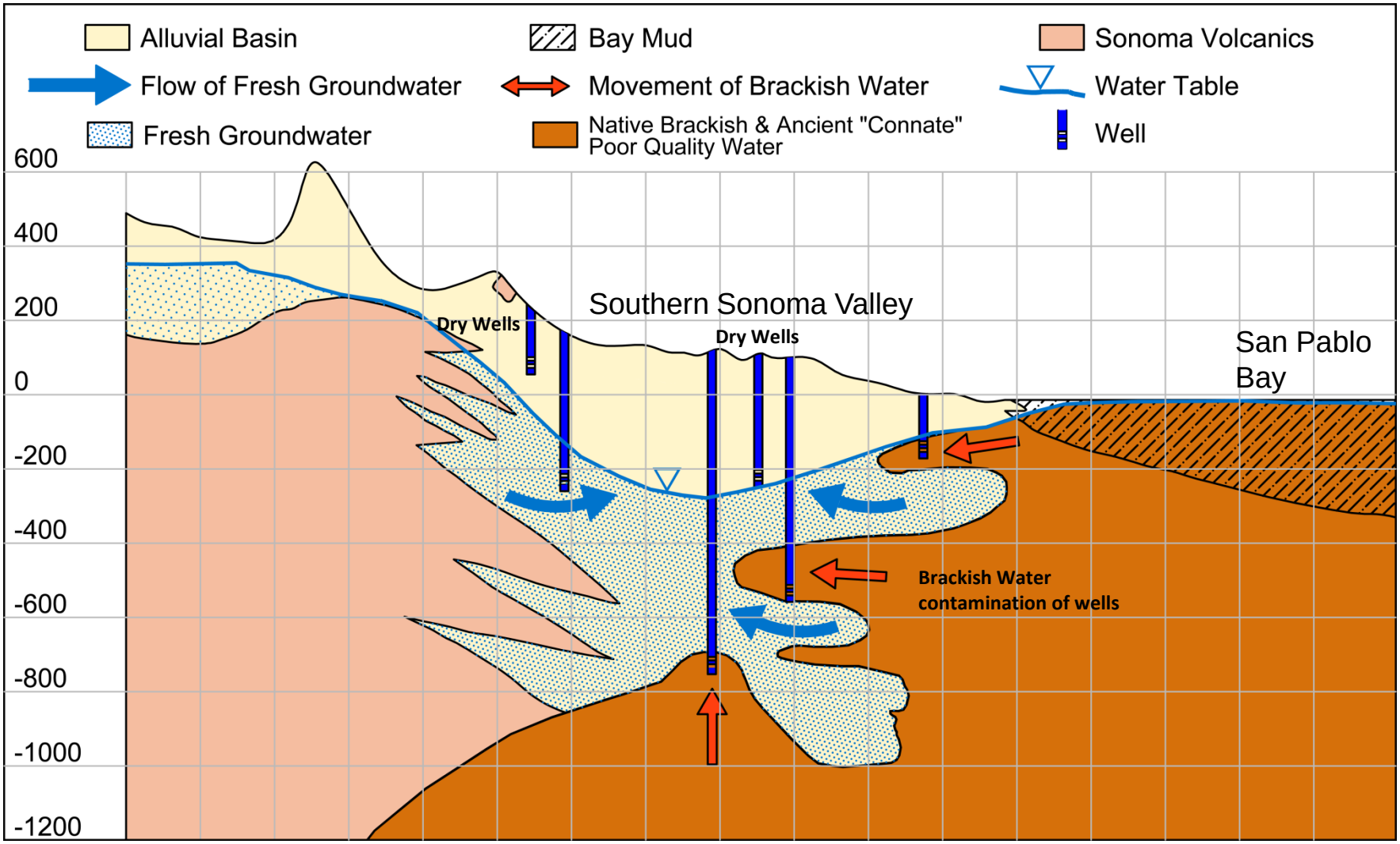


Today: Groundwater Levels Lowered over 100 Feet in Southern Sonoma Valley



Future Continued Depletion of Groundwater?

* **Dry Wells**
* **Brackish Water Contamination of Wells**

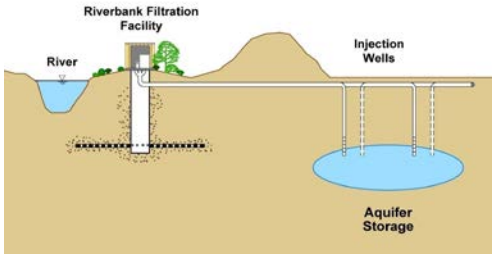


So What Can Be Done to Improve Water Supply Conditions in the Sonoma Valley?

Basin Advisory Panel Recommended Management Strategies

CONSERVATION
of Urban, Non-Urban, & Agriculture

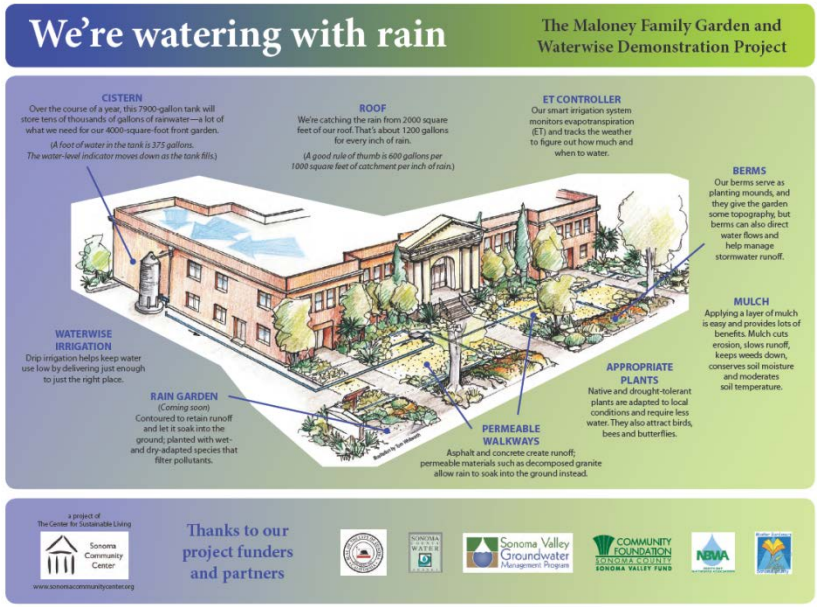
RECYCLED WATER
use to offset groundwater pumping

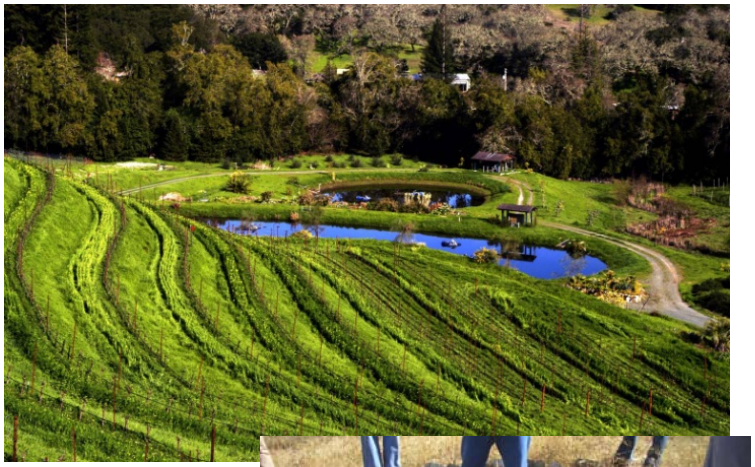


GROUNDWATER BANKING
Russian River winter-time water to recharge groundwater basin

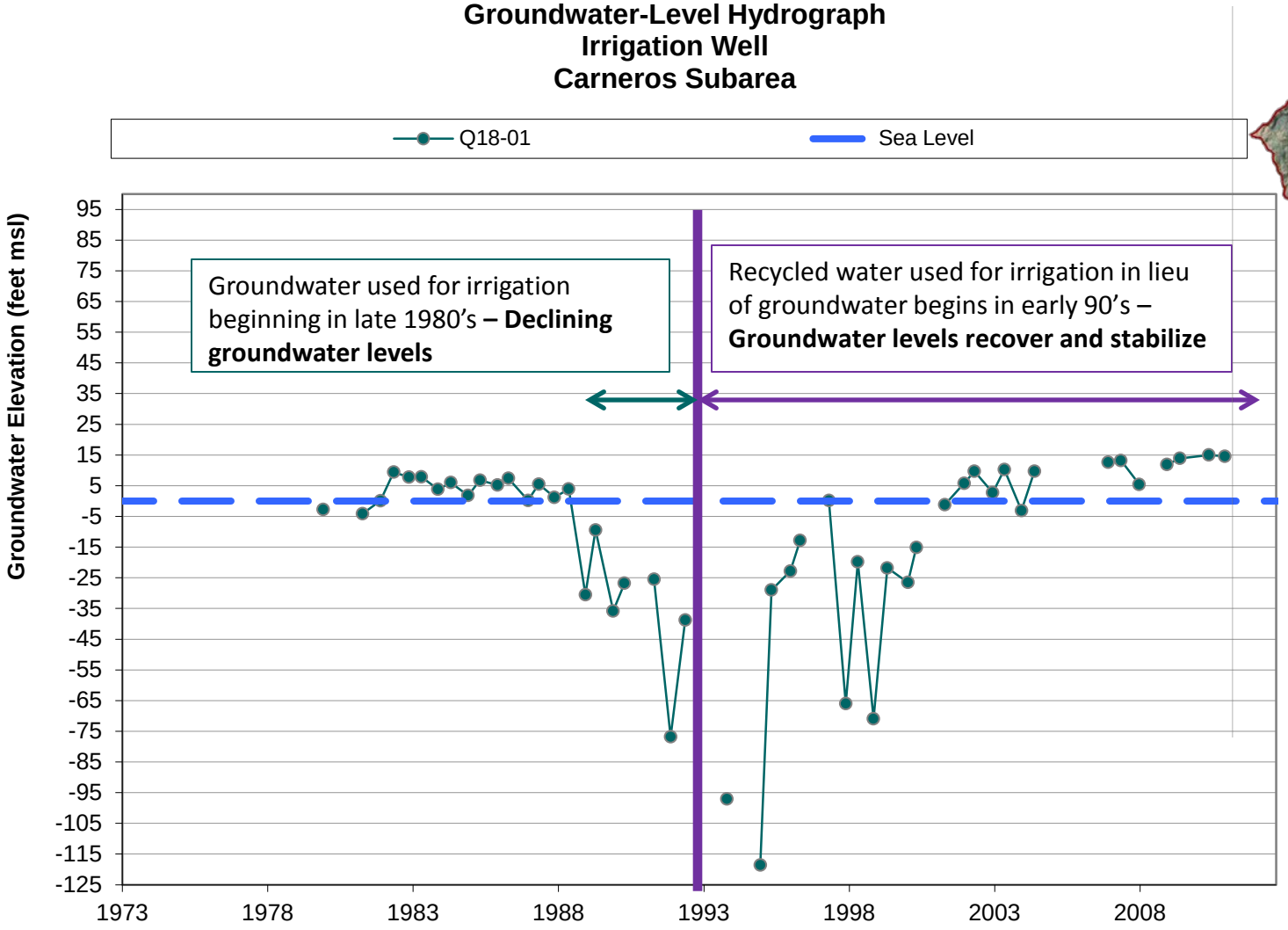
STORMWATER
to recharge groundwater

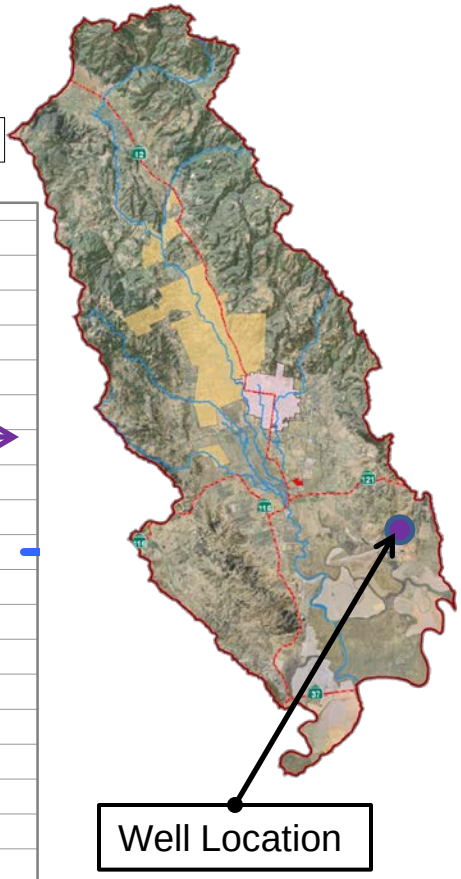
Sonoma Valley Water Conservation Awards





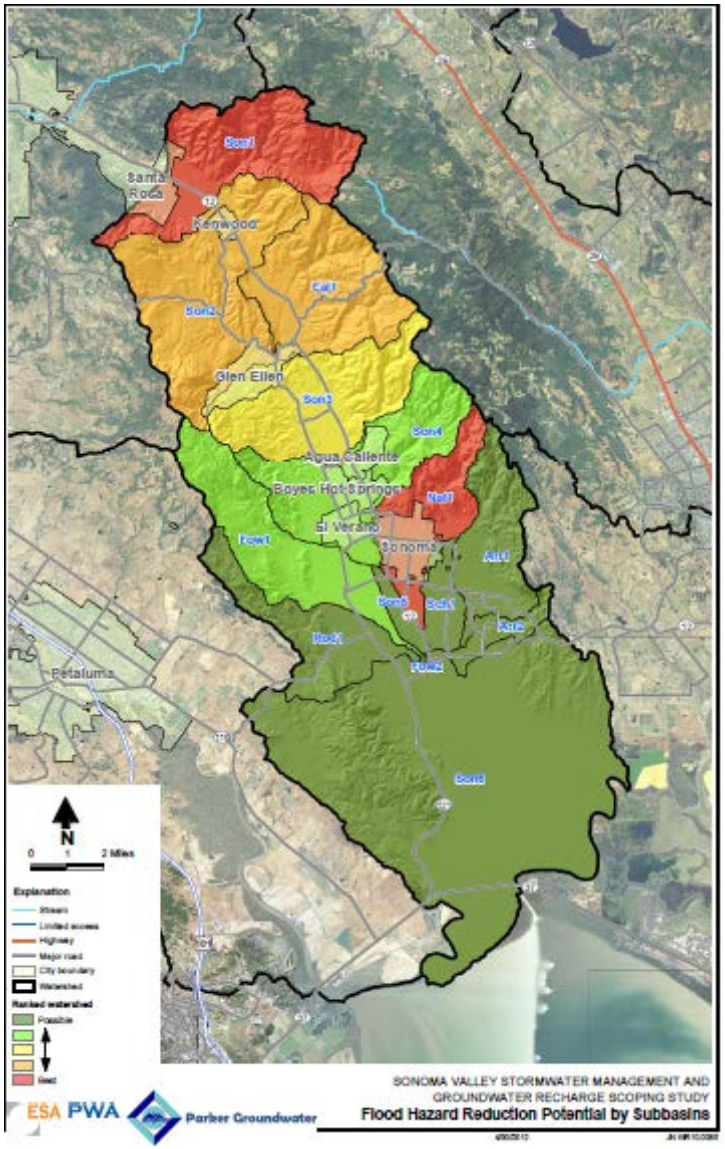
Irrigation with Recycled Water to Offset Groundwater Pumping





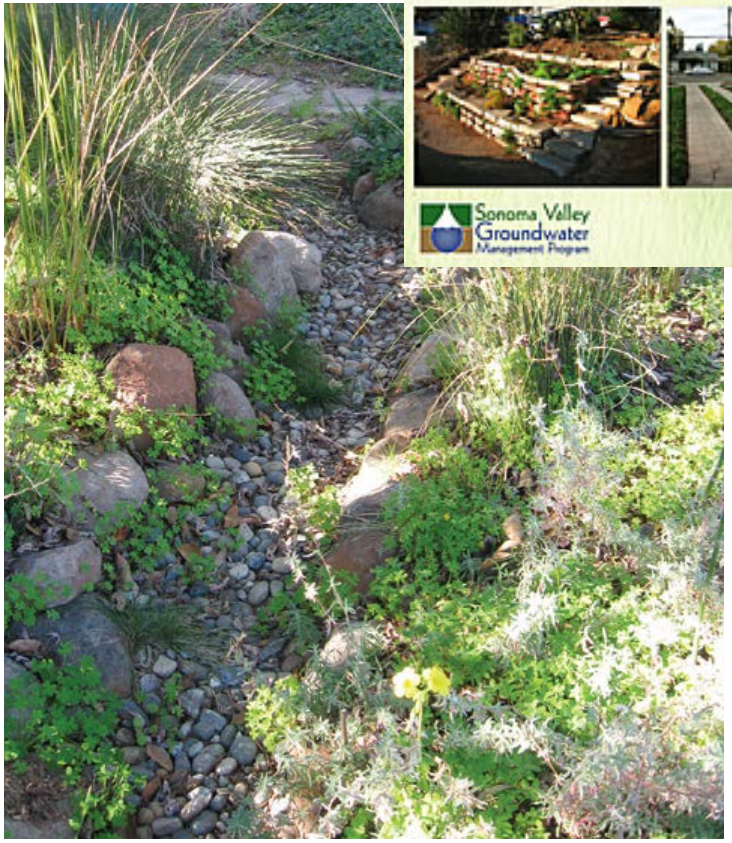
Combining Stormwater Management & Groundwater Recharge - Multi-Benefit Approach

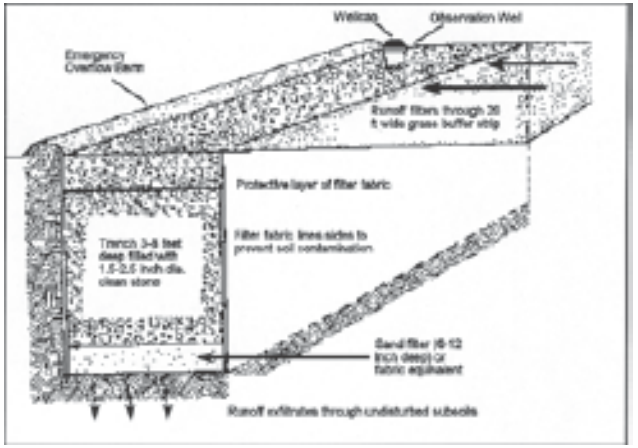
Combining Stormwater Management & Groundwater Recharge –Studies

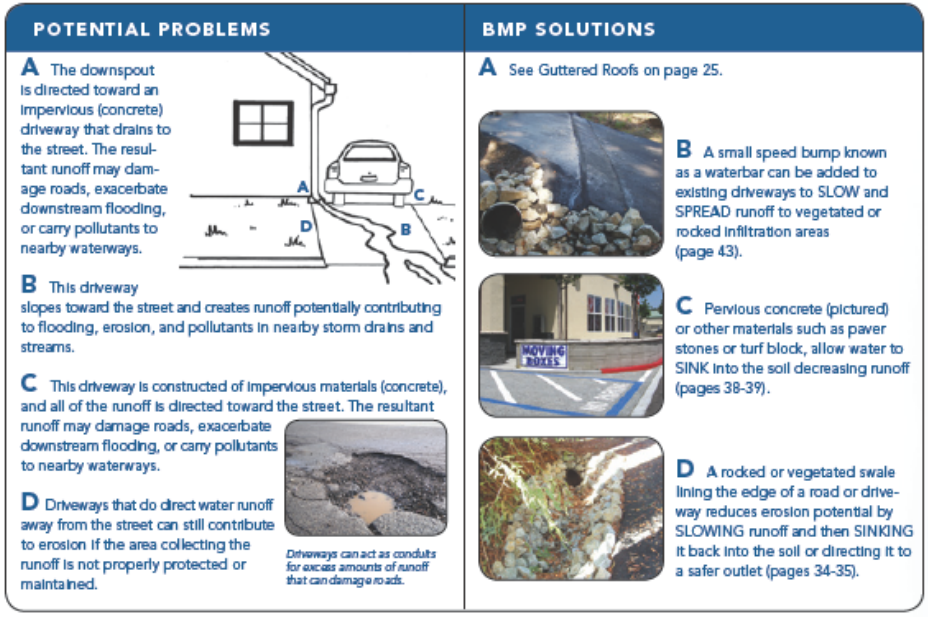


- **Identify opportunities to implement integrated, multi-benefit projects**
- **Help build a more resilient water supply by mimicking natural environment**
- **General areas most favorable for projects identified**
- **City Watersheds Project – received $1.9M Grant**
  - **Fryer Creek (Phase 1)**
  - **Nathanson (Phase 2)**
- **Planning for Feasibility-Level evaluation of other locations in Sonoma Valley**

Sonoma County RCD
Slow it. Spread it. Sink it.



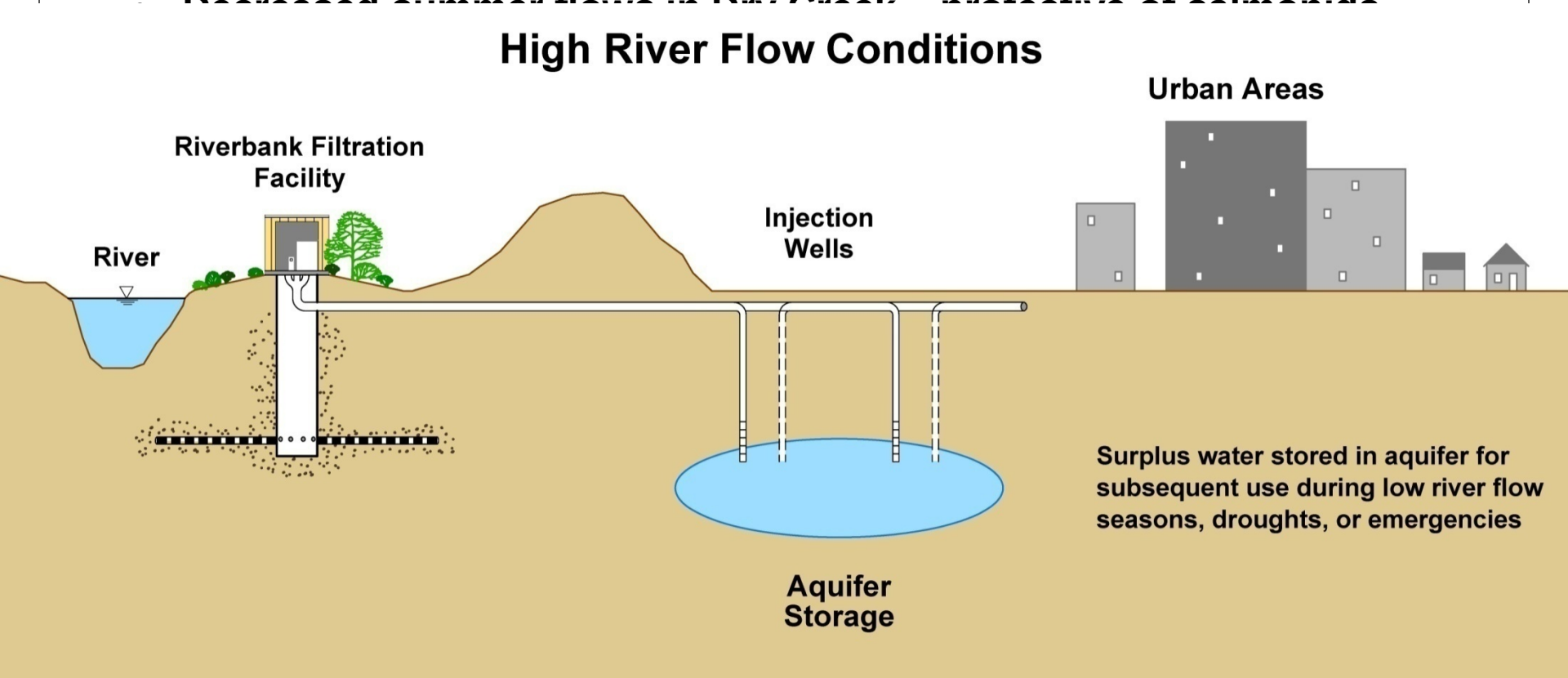




Groundwater Banking Can Be Instrumental in Improving Groundwater Conditions

Advantages/Benefits

- Increased drought and natural hazard reliability
- Improve adaptability to climate variations/change
- Fewer large expensive water supply & transmission facilities needed
- Decrease competition for local groundwater
- Decreased summer flows in Dry Creek – protective of salmonids



Findings of Groundwater Banking Feasibility Study

Availability of Wintertime Russian River Water

Source Water is Very High Quality

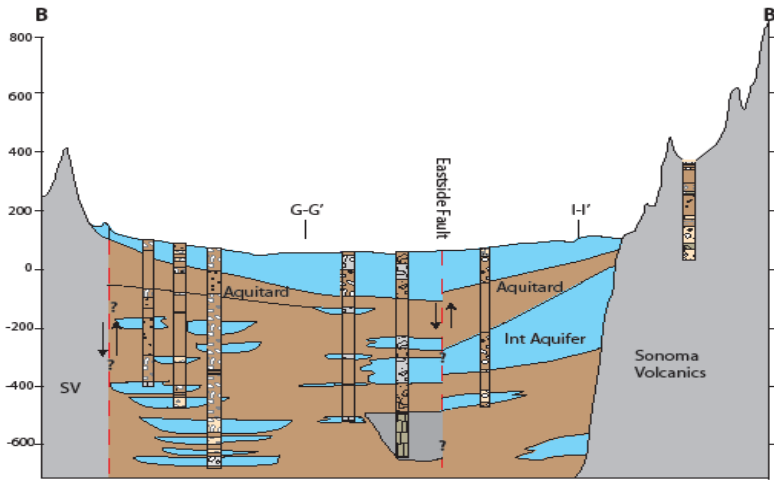
Existing Wells and Infrastructure Available for Pilot Testing

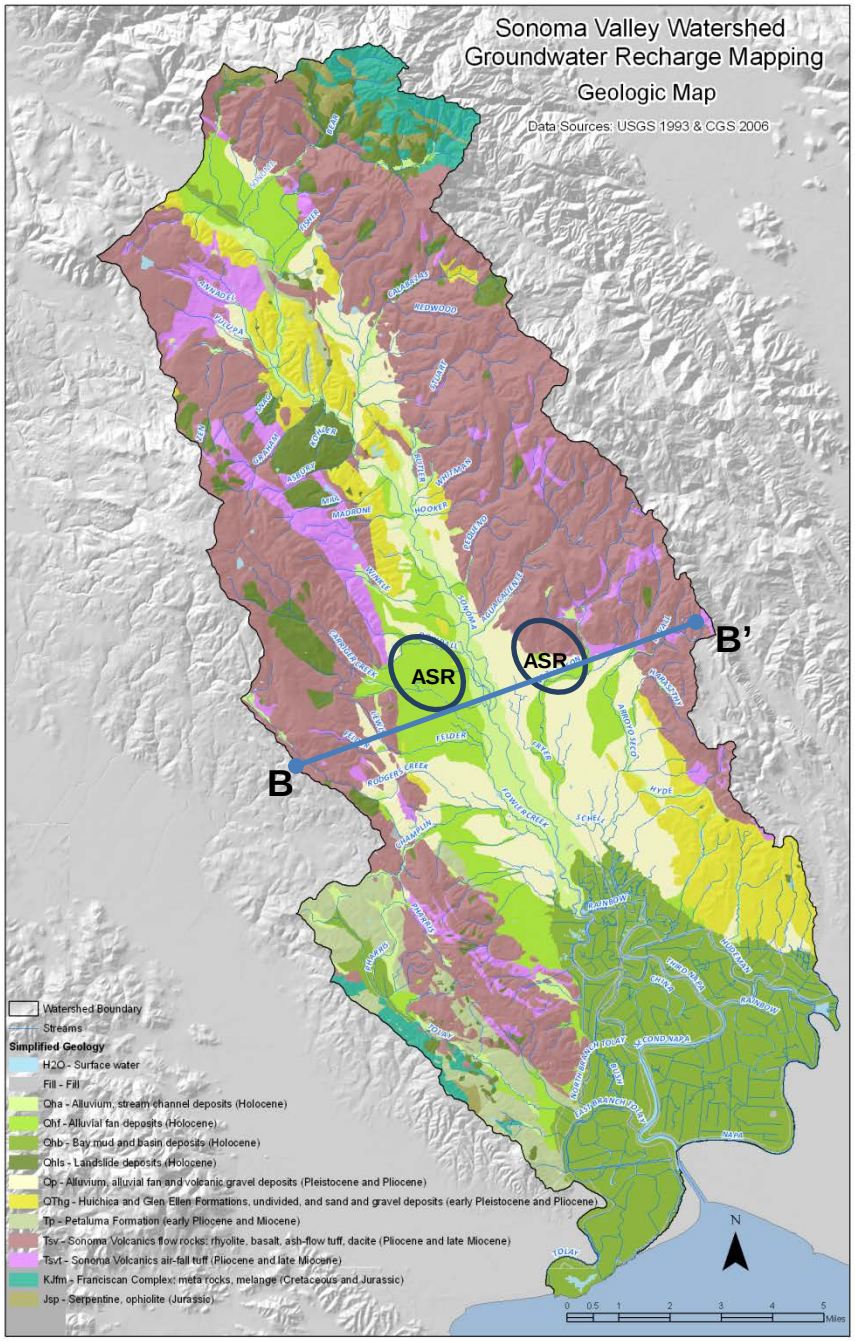
Storage Space is Available in Sonoma Valley Aquifers

Proceed with Incremental Pilot Testing

Where Could Groundwater Banking Be Done in Sonoma Valley?

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





Partnerships: Recent State & Federal Funding

Recent Grants and Direct Funding for Sonoma Valley

- Recycled Water >$5M
- Conservation >$0.2M
- Groundwater >$1.3M
- Stormwater ~$2M

Funding of Groundwater Studies & Management

- SCWA & SVCSD $1.215M
- Federal $0.5M
- State $0.425M
- City & VOMWD $0.26M
- County & Open Space $0.15M

Summary – Groundwater Depletion & Salinity

- 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

What's Next? Alternatives Analysis

- 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.

- **It is essential that Local Stakeholders are actively involved in selecting the correct mix of solutions that is right for the Community**

Schedule and Next Steps

- **February 20, 2014**
  - Panel approves 5-Year Review Report
- **March/April 2014**
  - Public Forums on Sonoma Valley Groundwater Issues
- **April 2014**
  - Water Agency Board considers approving 5-Year Review Report and recommendation for Alternatives Analysis
- **April – December 2014**
  - TAC and Panel identify and analyze alternative actions through scenario-based planning

Participation by all stakeholders will be critical during this process.

For more information or to participate contact Marcus Trotta 707.547.1978
Marcus.Trotta@scwa.ca.gov

http://www.scwa.ca.gov/svgroundwater/