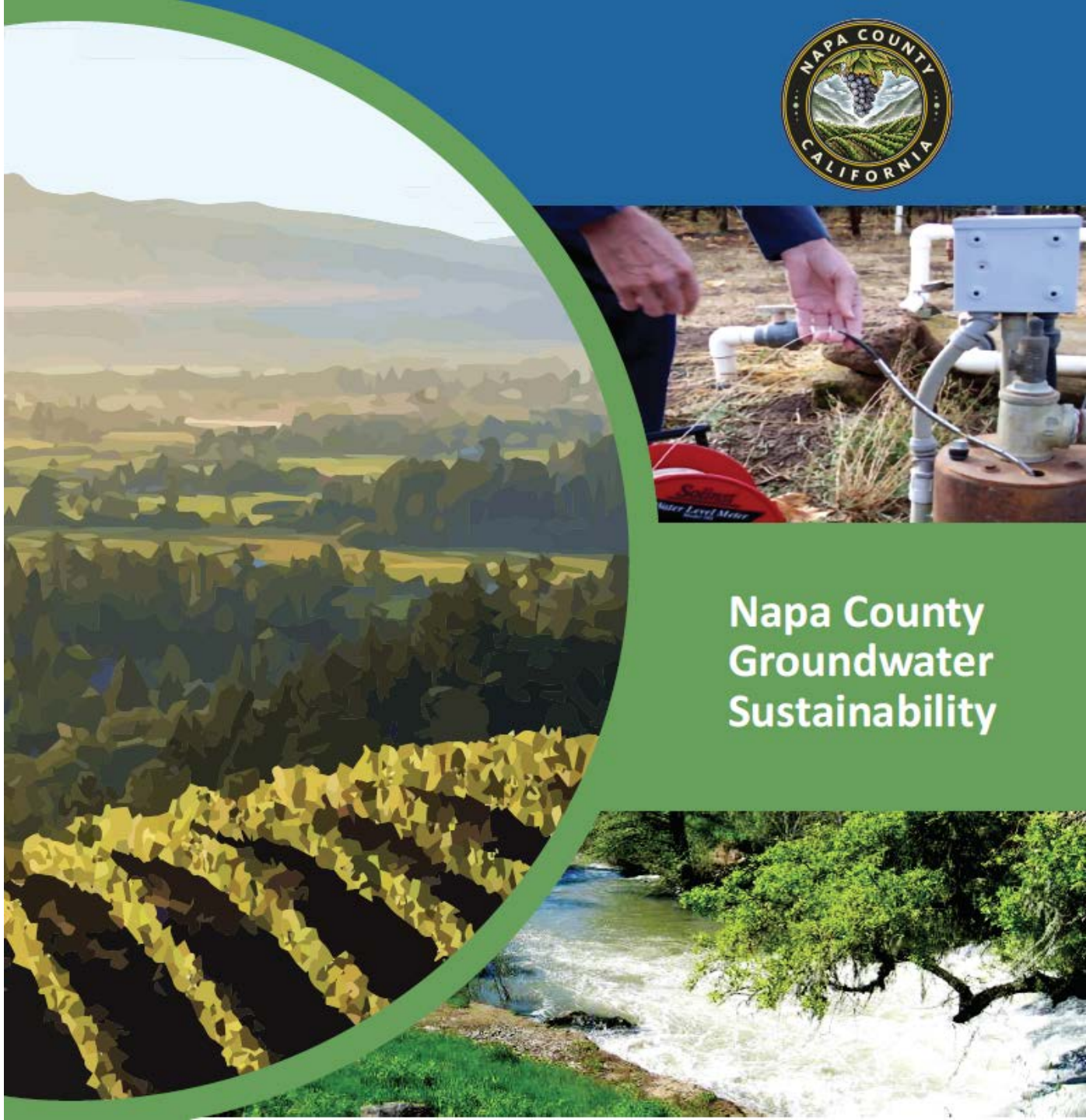
Groundwater: Pathways to Sustainability and Planning for Resiliency

Watershed Information &
Conservation Council Symposium
A Legacy of Stewardship
May 16, 2019

Luhdorff & Scalmanini
Consulting Engineers

Vicki Kretsinger Grabert

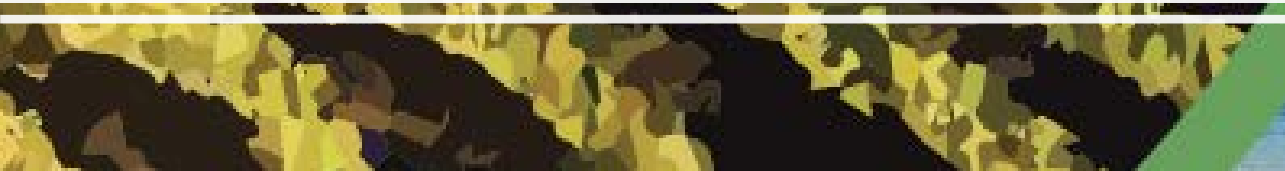


OVERVIEW

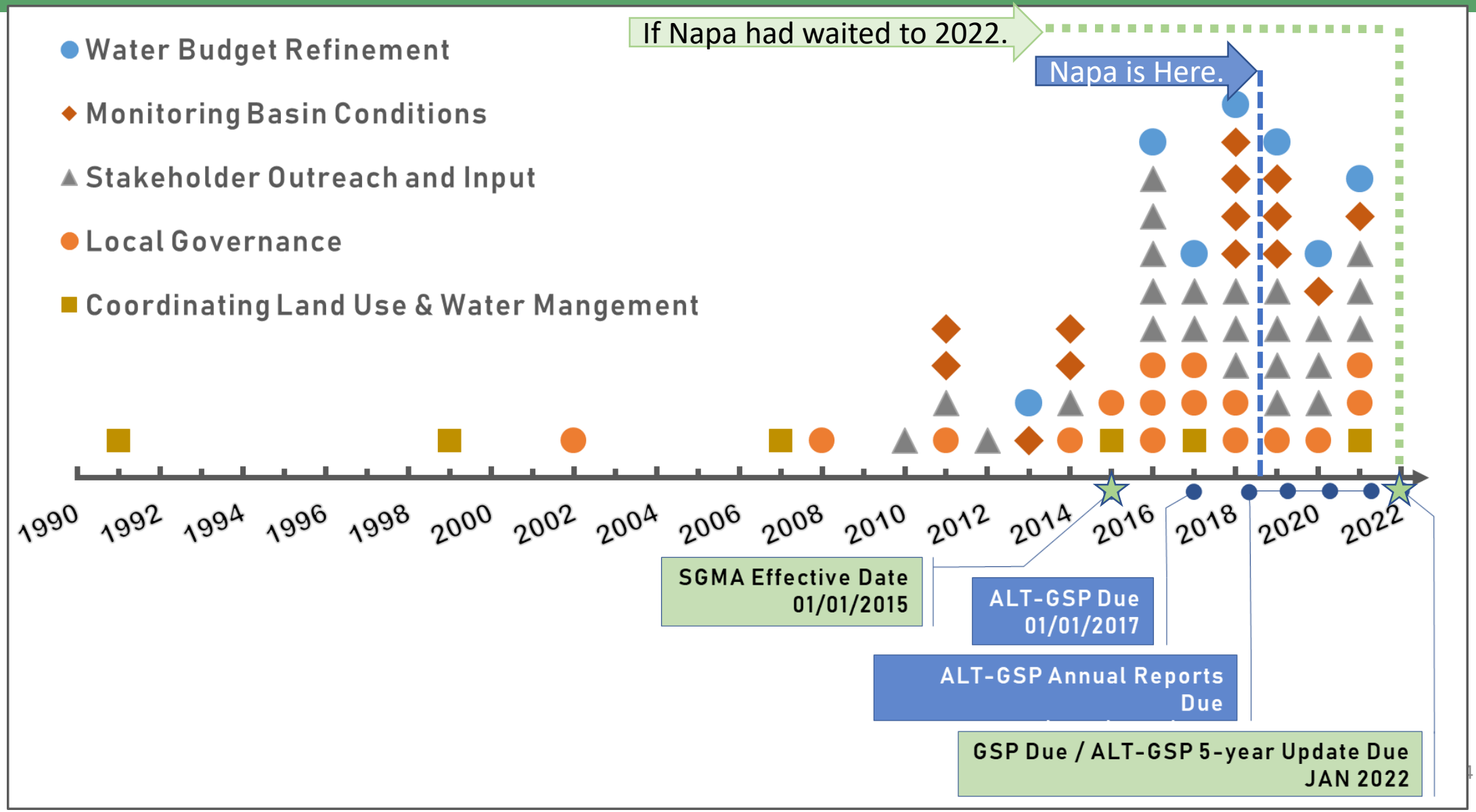
- Pathways to Sustainability
- Groundwater Conditions and Sustainability
- Planning for Resiliency

Napa County Groundwater Sustainability

PATHWAYS TO SUSTAINABILITY



TIMELINE: NAPA COUNTY PATHWAYS TO SUSTAINABILITY; BEFORE AND AFTER SGMA ENACTED



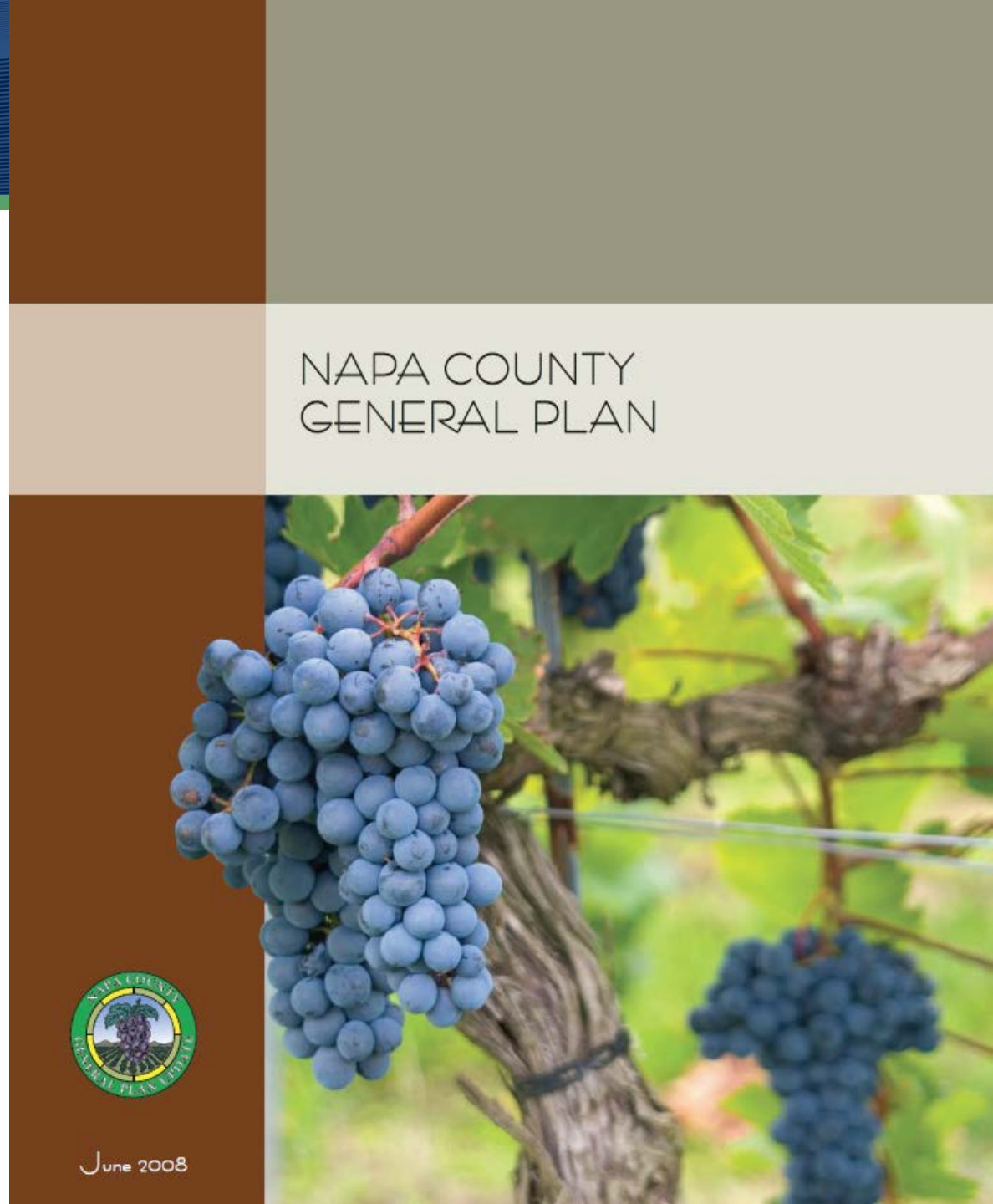
GENERAL PLAN UPDATE: 2008

Water Resources Goals, Policies, and Actions

- 6 water-related goals, 28 policies, and 10 water resources action items
  - ❖ Informed development of County watershed monitoring plan update and other actions

<u>One Example (GOAL CON-10)</u>

- ❖ "Conserve, enhance and manage water resources on a **sustainable basis** to attempt to ensure that sufficient amounts of water will be available for the uses allowed by this General Plan, for the natural environment, and for future generations."



GROUNDWATER RESOURCES ADVISORY COMMITTEE: 2011-2014

- GRAC: 15-member committee appointed by the County BOS (September 20, 2011)
- GRAC: Developed and recommended **Groundwater Sustainability Objectives** (Napa County Letter April 8, 2014 for BOS Meeting)
  - ❖Everyone in the County has a **shared responsibility for Groundwater Sustainability** and protecting groundwater resources
  - ❖Importance of monitoring to achieve groundwater sustainability
- GRAC: Visionary leadership and collaboration that **set a path toward ensuring sustainability** of Napa County's groundwater resources for future generations

Napa County Groundwater Resources Advisory Committee

Final Report from GRAC to Napa County BOS, April 8, 2014

"The most important thing that the GRAC recommended to us, and what they emphasized, is that we have to be sustainable; we have to promote sustainability…."
Supervisor Diane Dillon

"Because we are experiencing this drought, it is certainly a good time to have a dialog about sustainability…."
Supervisor Keith Caldwell

SUSTAINABLE GROUNDWATER MANAGEMENT ACT: SEPT. 2014

- SGMA: robust framework for sustainable groundwater management
  - First time in CA's history
  - CA last state to develop statewide regulations
- Enacted September 2014; began January 1, 2015
- Requires Groundwater Sustainability Plans (or their functional equivalent – Alternative Plans) in medium and high priority basins
- Recognizes management most effective at the local level by local agencies
- Creates State "backstop"

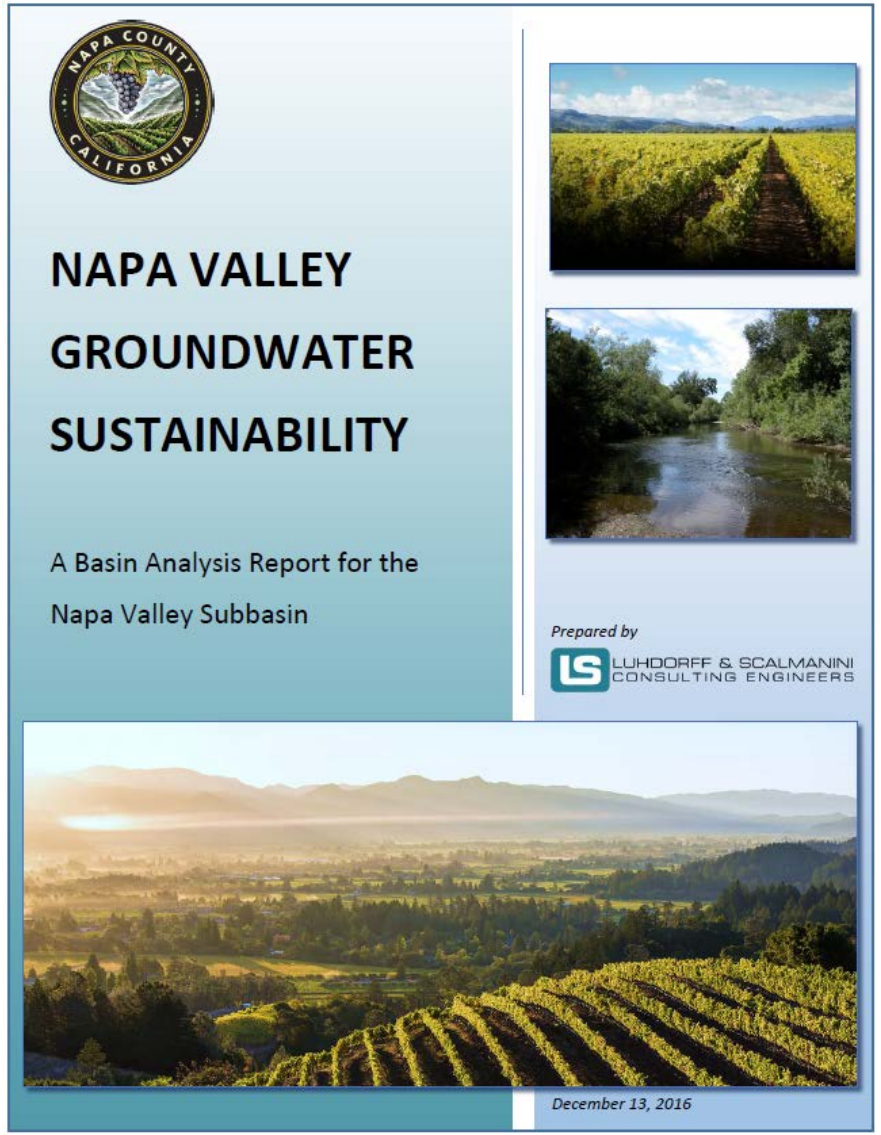
Local Control

"A central feature of these bills is the recognition that groundwater management in California is best accomplished locally."

Governor Jerry Brown, September 2014

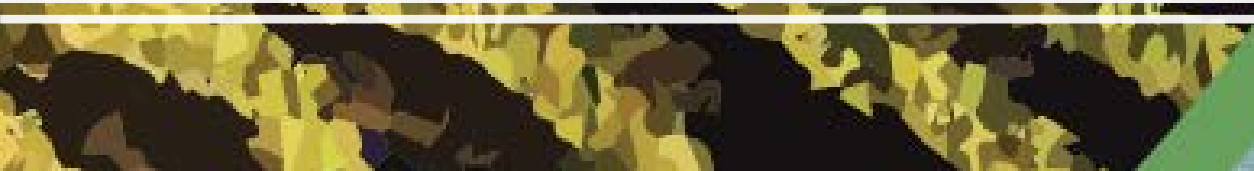
NAPA VALLEY SUBBASIN BAR: PATHWAY TO SUSTAINABILITY (2016)

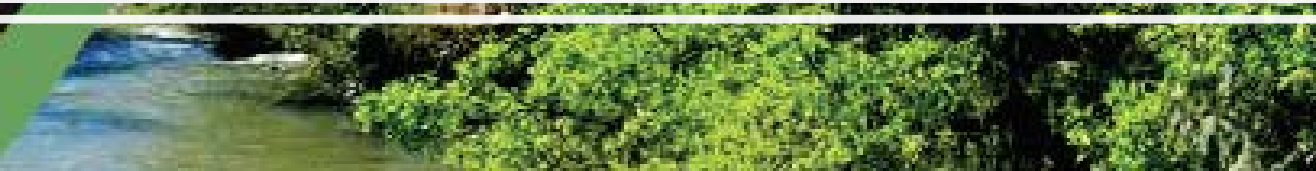
- General Plan 2008
- Updated Hydrogeologic Work (2009 to 2016)
- GRAC: Sustainability Objectives (2014)
- Napa Valley Subbasin: Basin Analysis Report (Alternative to a Groundwater Sustainability Plan) (Dec. 13, 2016)
  - ~1,200 pages
  - 13 Appendices
  - 13 Recommendations
  - Framework to Maintain Sustainability
- DWR Evaluating Alternatives



Napa County Groundwater Sustainability

GROUNDWATER CONDITIONS & SUSTAINABILITY





GW LEVEL MONITORING: 2018

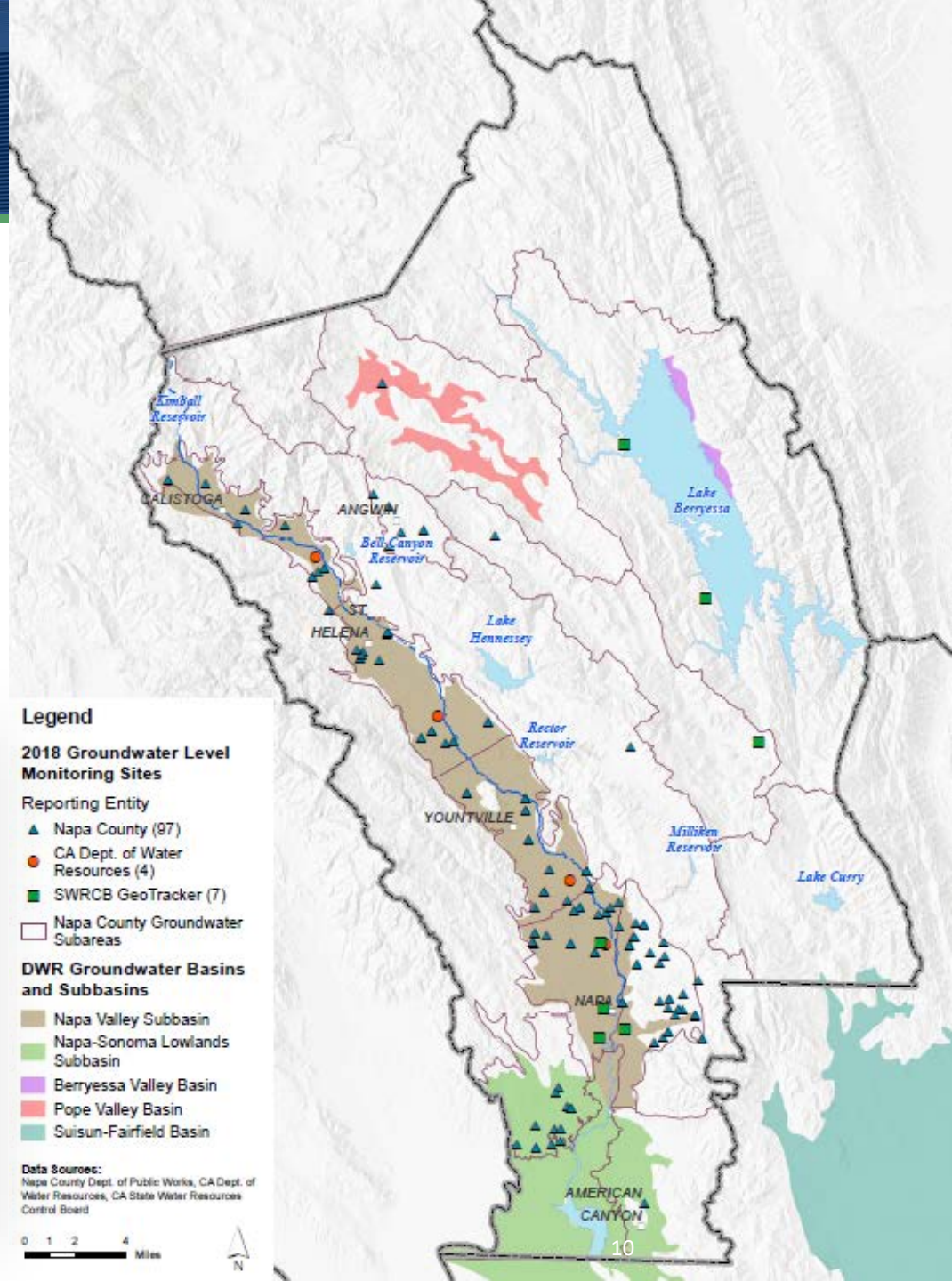
Napa Co., 97 (including 10 SW/GW)

DWR, 4

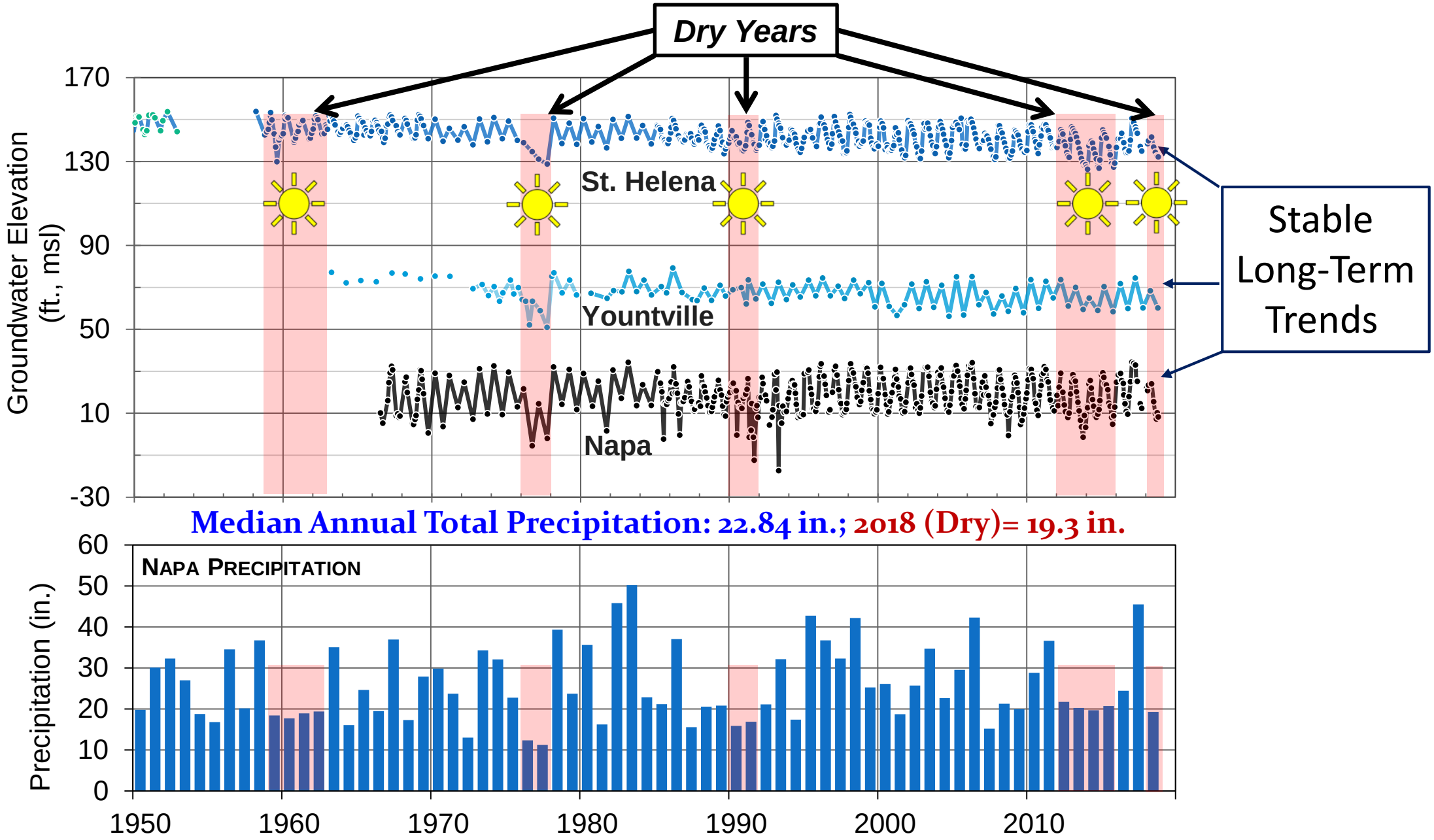
GeoTracker, 7

Total Wells = 108

- Frequency: semi-annual; monthly; continuous
- Some wells monitored for decades
- Still recruiting volunteered wells



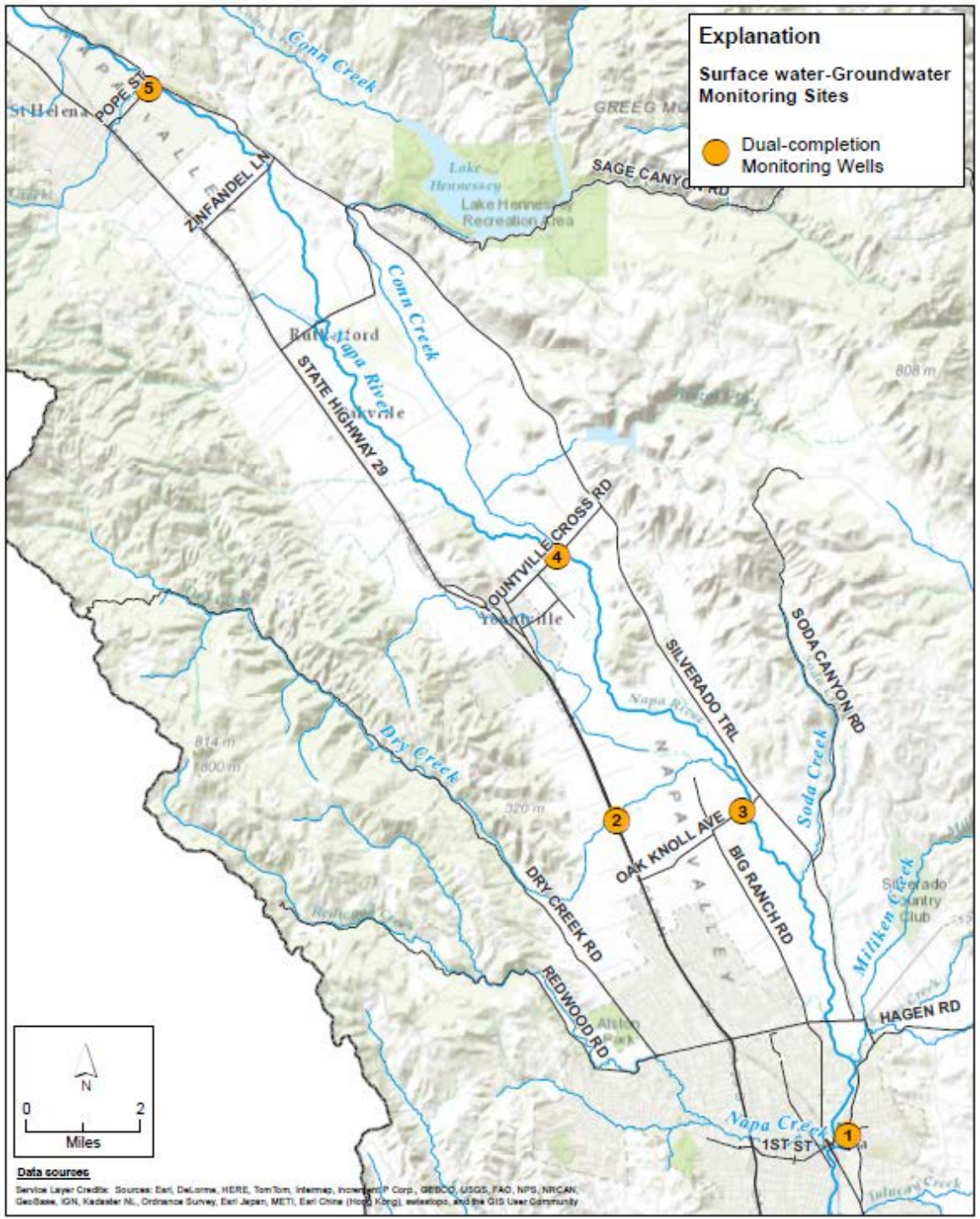
GROUNDWATER CONDITIONS: NAPA VALLEY SUBBASIN



SURFACE WATER/GROUNDWATER INTERACTION

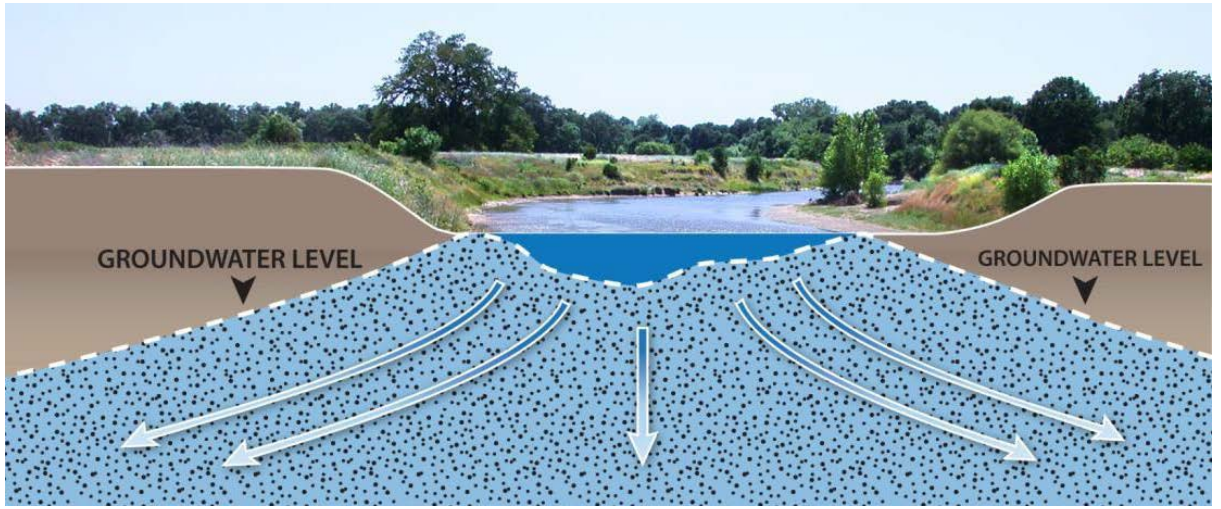
Dedicated Monitoring Facilities at 5 Sites

- DWR grant support
- Paired Shallow Monitoring Wells (MWs) each site
  - ❖ Levels & quality
- Stream Gauge each site
  - ❖ Streamflow & quality
- > 4 years of data

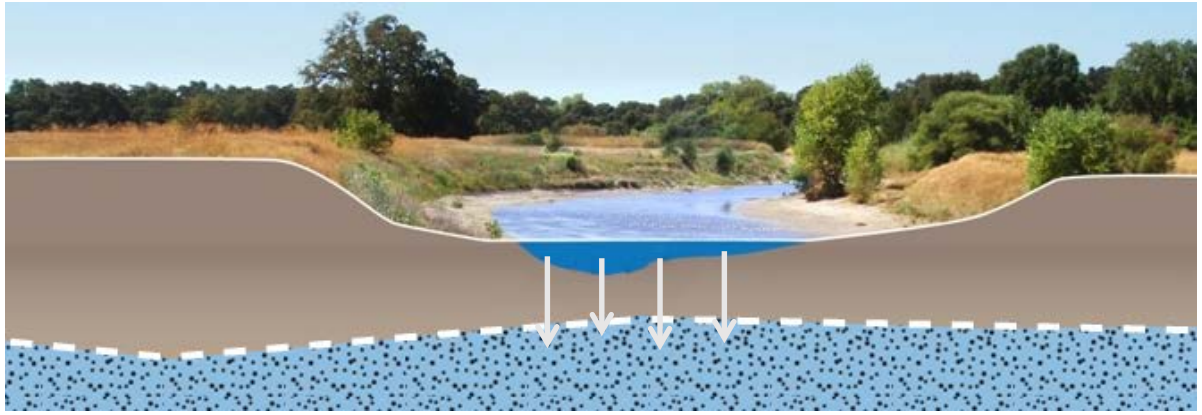


GAINING AND LOSING STREAM CONDITIONS
RECHARGE AND STREAM DEPLETION

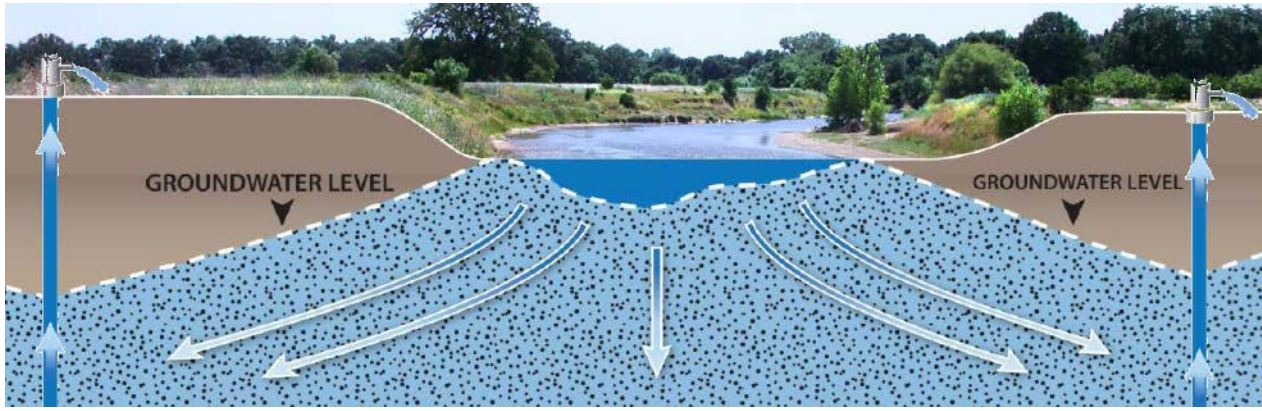
Gaining Stream: Groundwater Provides Baseflow to Stream



Losing Stream: Stream Recharges Groundwater



Disconnected Stream: Stream Recharges Groundwater

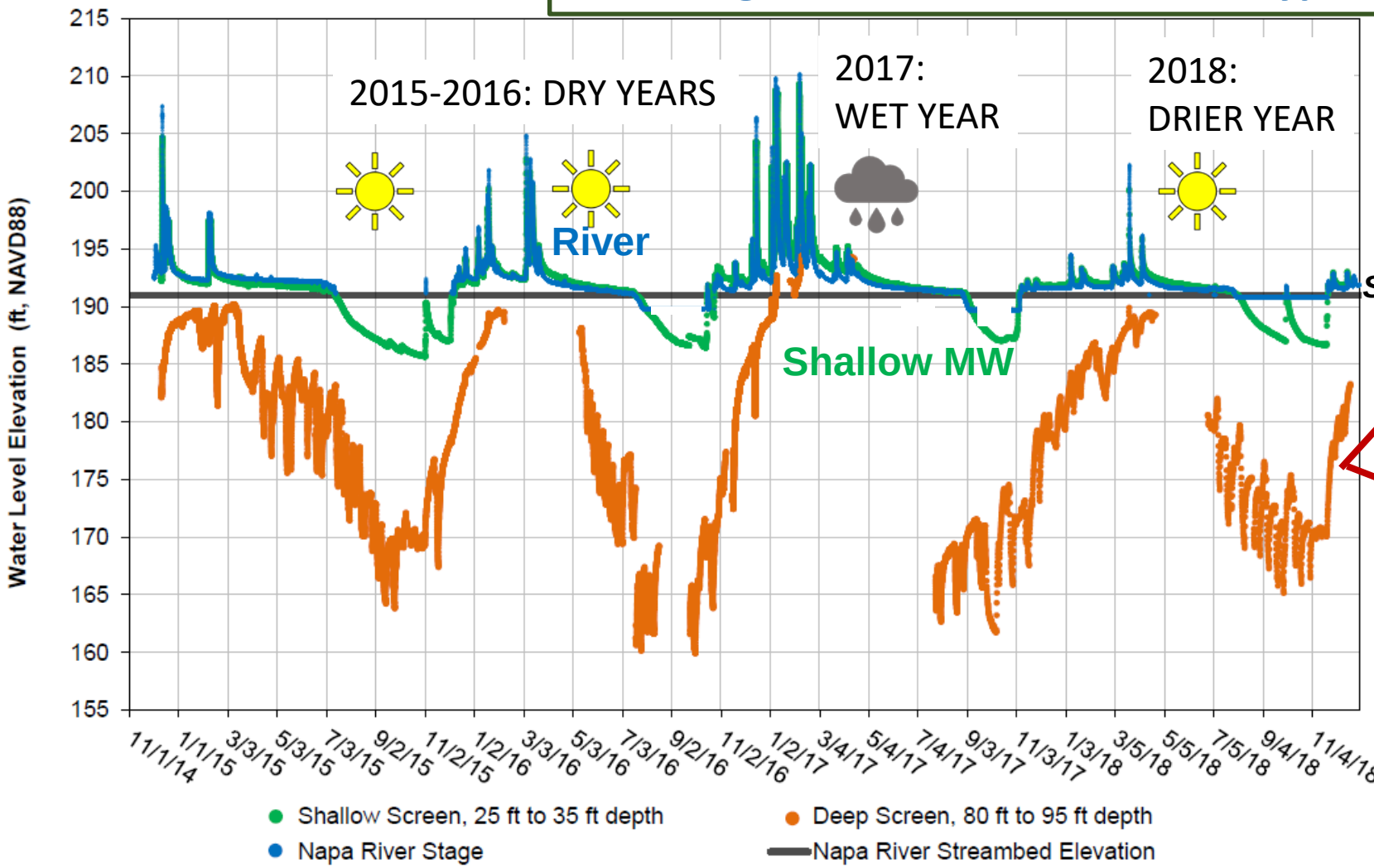


Streamflow Depletion from Groundwater Pumping

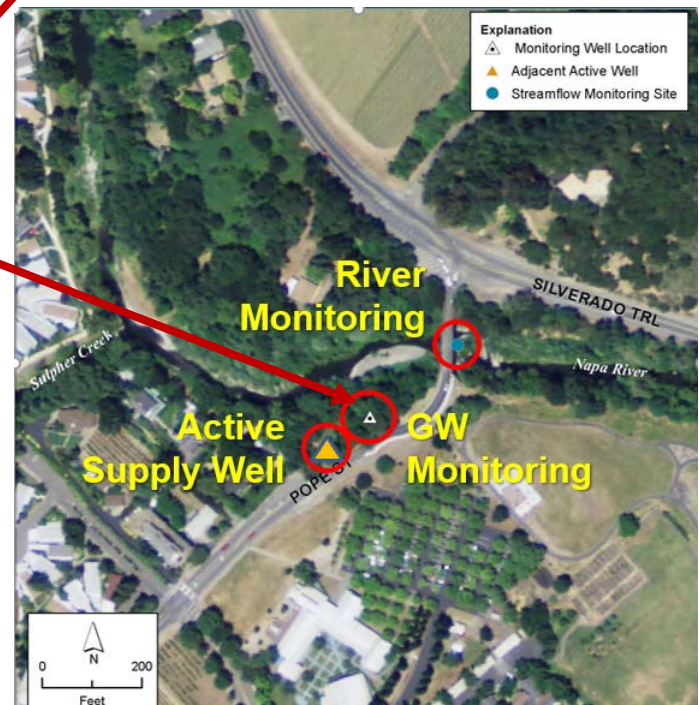
SURFACE WATER/GROUNDWATER MONITORING

St. Helena SW/GW Site 5

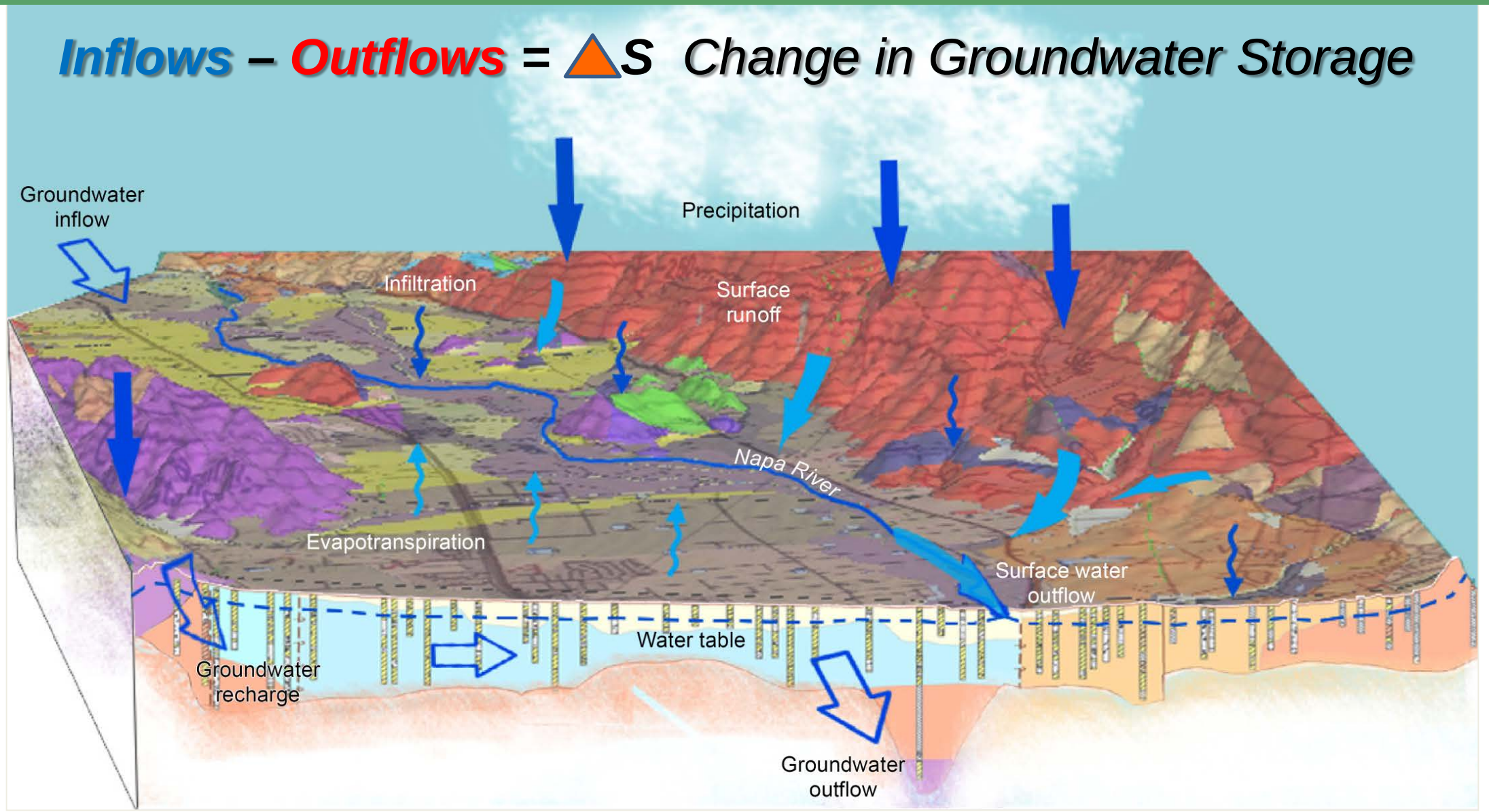
River and Shallow MW not showing short-term nearby pumping effects; Shallow groundwater fluctuations typical of seasonal/regional effects



"Deeper" MW: shows effects from nearby pumping



WATER BUDGET COMPONENTS



SUSTAINABLE YIELD: THE CRUX OF SUSTAINABILITY

Sustainable Yield (Definition; Water Code Section 10721(v)):

- *"Maximum quantity of water, calculated over a base period representative of long-term conditions in the basin and including any temporary surplus, that can be withdrawn annually without causing an undesirable result."*

Undesirable Result – key term linked to accomplishing sustainability. Avoid significant and unreasonable effects on groundwater levels, storage, streamflow, and other sustainability indicators.

NAPA VALLEY SUBBASIN: LONG-TERM BALANCE

Description	2017 (AF)	2018 (AF)
Groundwater Pumping	15,831	17,889
Annual Storage Change	 +4,470	 -9,300
Sustainable Yield (Estimated Range, AF/Yr)		17,000 to 20,000
Avg. Annual Recharge (AF/Yr) (1988-2015)		69,000
1988-2018: Cumulative Annual Storage Change (AF/Yr)		**+4,400**

← 2017 Wet Year
2018 Drier Year than 2012-2016

Avg. Annual Recharge
← Nearly 4X Greater than Pumping

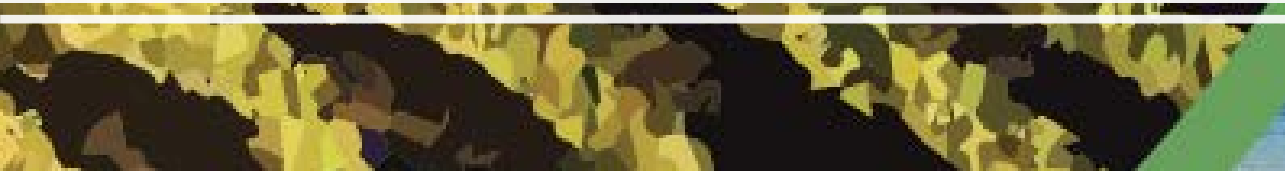
← Overall, Groundwater System in Balance

"The County and everyone living and working in the county will integrate stewardship principles and measures in groundwater development, use, and management to protect economic, environmental, and social benefits and **maintain groundwater sustainability indefinitely without causing undesirable results**, including unacceptable economic, environmental, or social consequences."

(Excerpt Napa SGMA Sustainability Goal)

Napa County Groundwater Sustainability

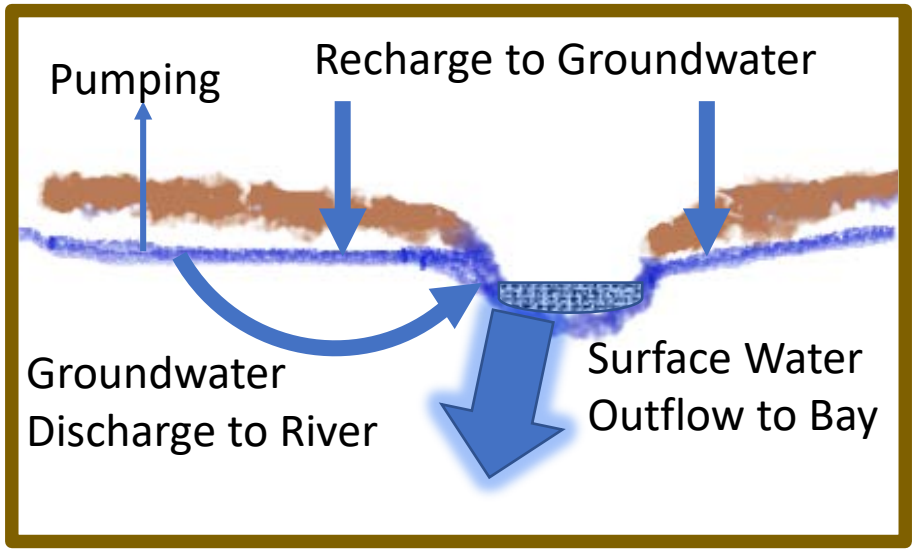
PLANNING FOR RESILIENCY

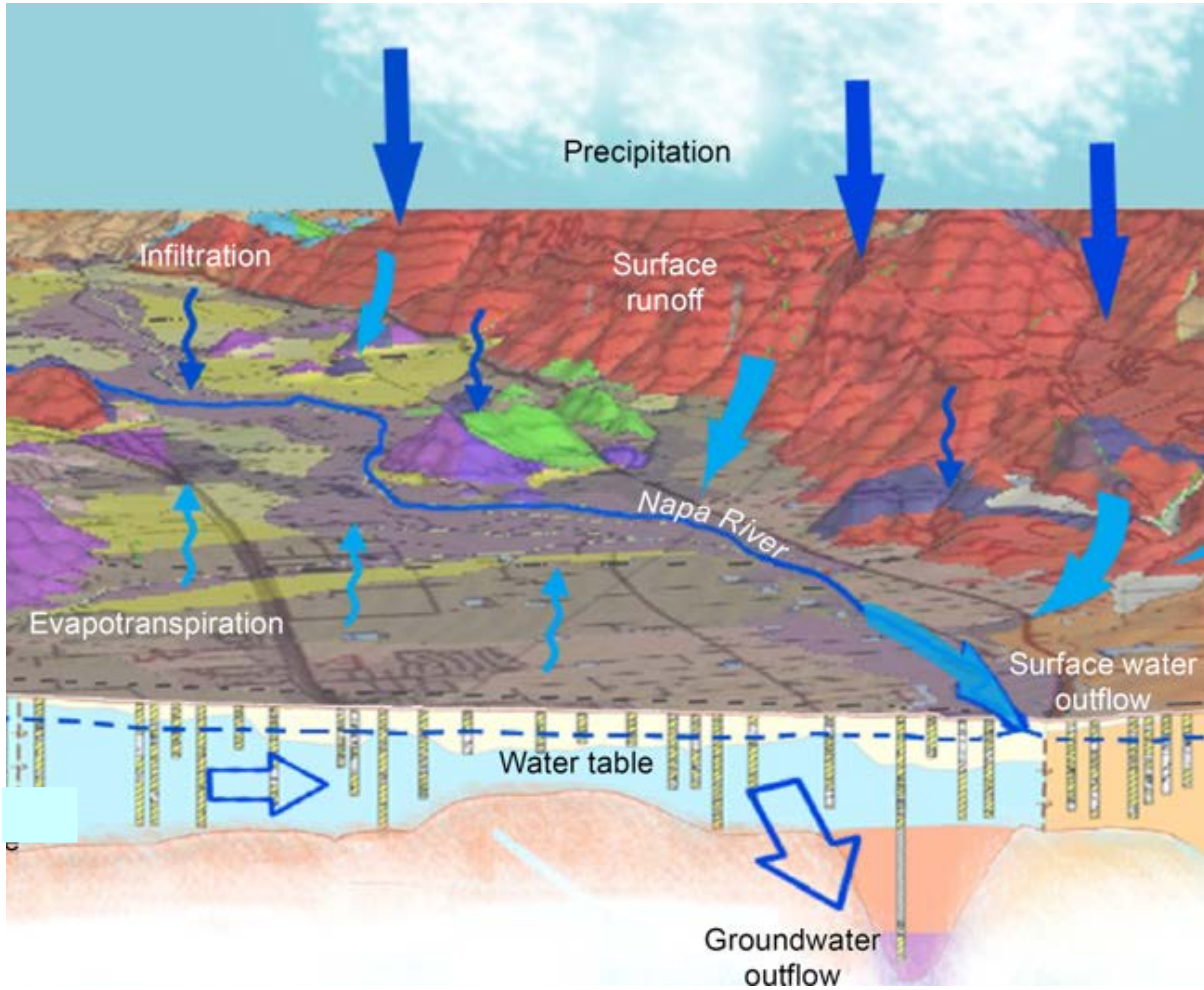


FUTURE STRATEGIES FOR SUSTAINABILITY & RESILIENCY

- Avg. Recharge to Groundwater (69,000 AF/yr)
- Pumping Dry Year (18,000 Af/yr)
- Avg. Discharge to Napa River and Outflow to San Pablo Bay (176,000 AF/yr)

How can we utilize the natural/contemporary landscape to retain more water in the basin?





GOVERNOR NEWSOM: EXECUTIVE ORDER APRIL 29, 2019

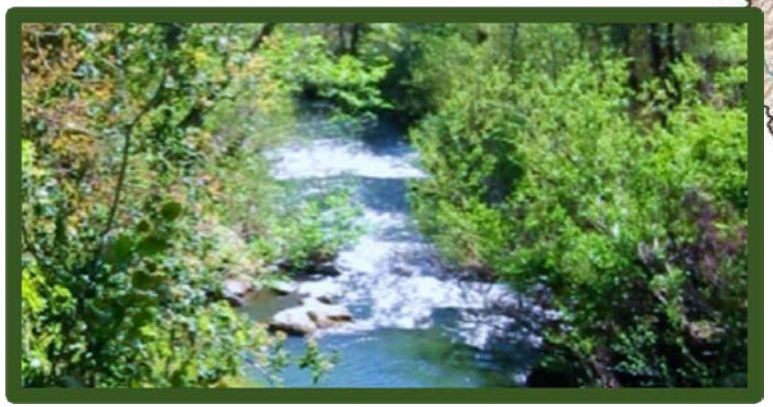
- Prepare a **Water Resilience Portfolio** that meets needs of Communities, Economy and Environment
  - Prioritize **multi-benefit** approaches
  - Utilize **natural infrastructure** such as forests and floodplains
  - Encourage **regional approaches** among water users sharing watersheds
- Inventory/Assess Existing Water Demands and Projected Water Needs, including for Environment
- Update Projected Climate Change Impacts
- Embrace Innovation and New Technologies

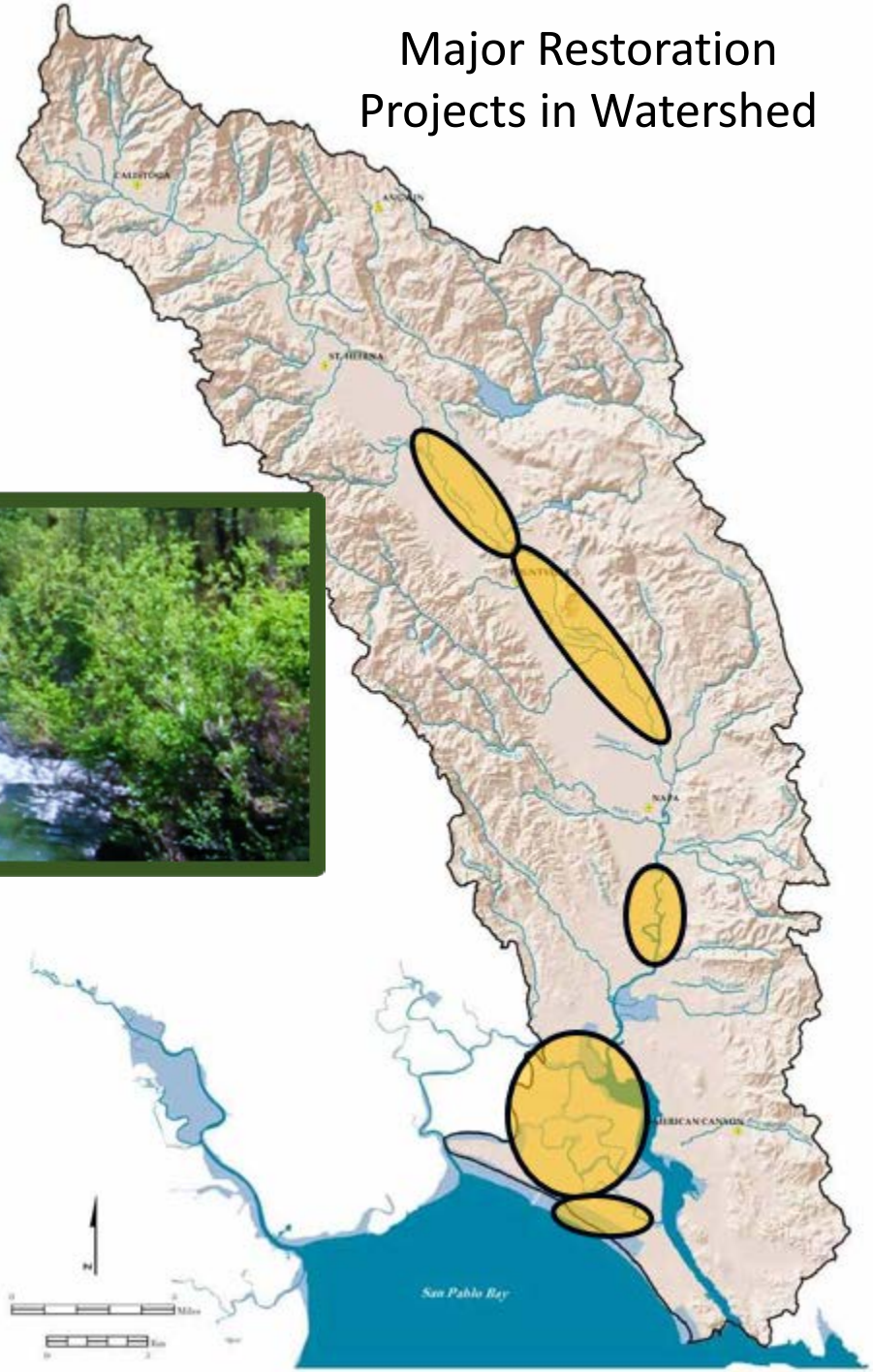
> **WHEREAS**, climate change is having a profound impact on water and other resources, making the climate warmer and more variable, which reduces mountain snowpack, intensifies drought and wildfires, and drives shorter, more intense wet seasons that worsen flooding; and

NAPA VALLEY RESILIENCY: ENHANCING GROUNDWATER RECHARGE & RESILIENCY

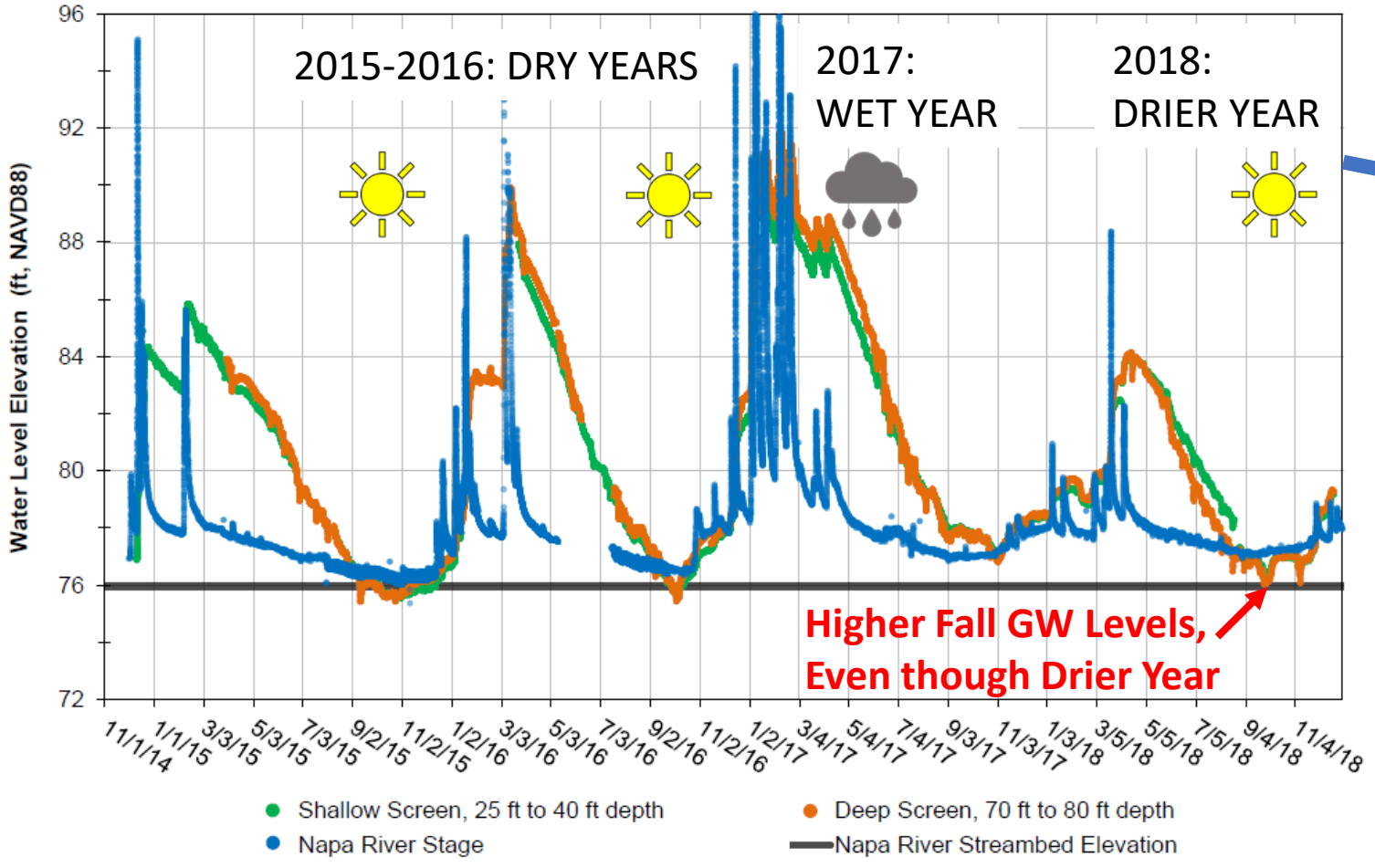
- Napa Valley landscape: significant change over the past two centuries
- "….the valley's **ecological health and resilience** could be greatly enhanced…."
- "**enhancing groundwater recharge**;
- enabling the natural capabilities of streams and wetlands to **retain surface water**;
- identifying, preserving, and expanding strongly perennial wetlands and stream reaches;
- ….and increasing the connectivity of habitats are **all part of designing a more complex, robust and resilient landscape**."

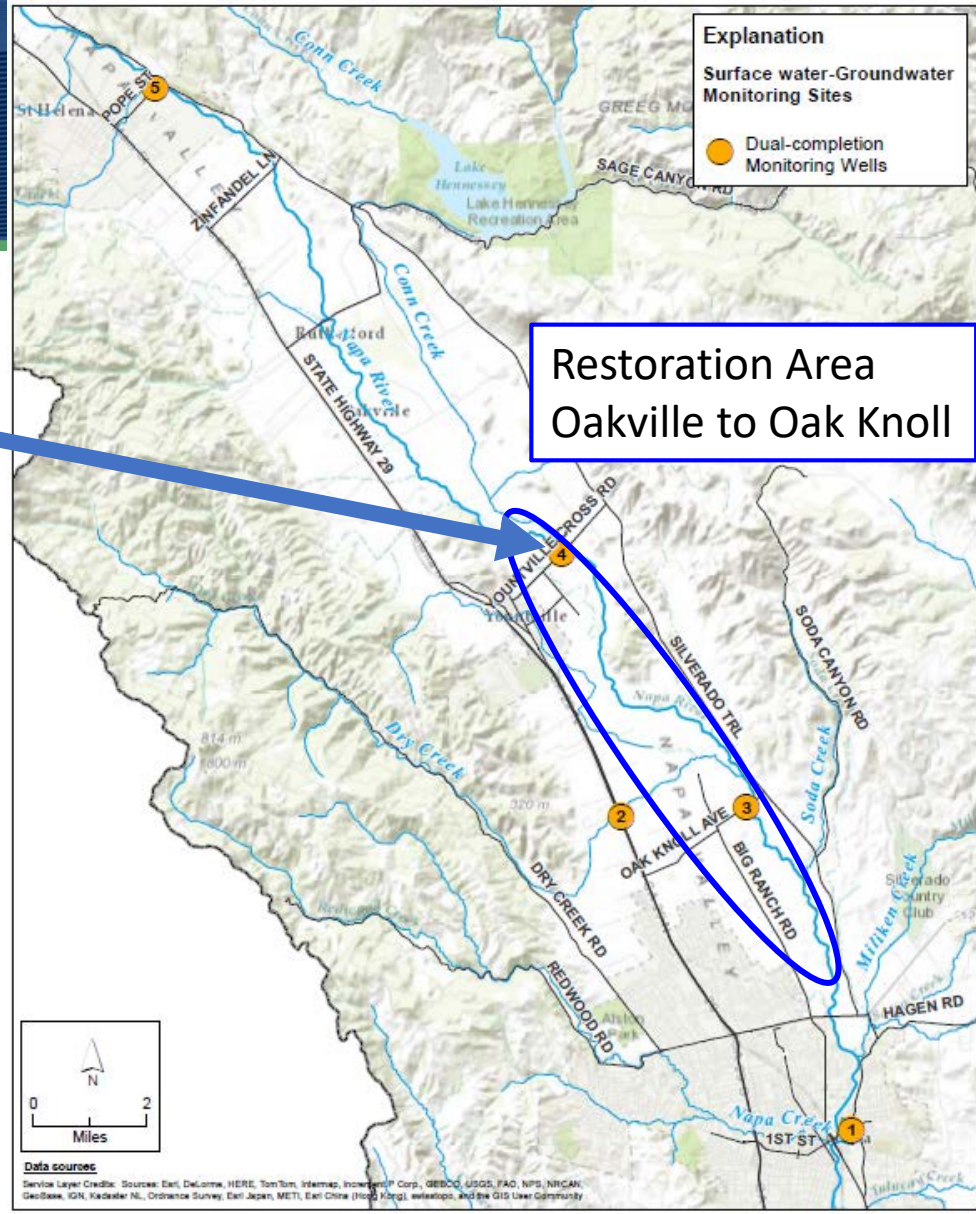
(Robin Grossinger, 2012; *Napa Valley Historical Ecology Atlas*)





MONITORING IN THE WATERSHED: TRACKING SUSTAINABILITY





Ongoing Regional Monitoring: 108+ Wells + SW

ENVIRONMENTAL MONITORING: ENGAGING COMMUNITIES

Citizen Science: Streamflow Observations

- Helping to monitor streams and rivers
- Staff and public record streamflow observations at 13 sites (380+ observations to date)
- Complements data collection at permanent RCD and USGS stream gauges
- ~100 other sites being assessed

"Fifty years from now the valley again will look dramatically different, shaped by the visions of today…

It is not a choice between then and now, but a question of which elements of the valley people want to maintain in the future."

Grossinger, Robin. 2012.

***Napa Valley and River*, 1885, by Manuel Valencia.**

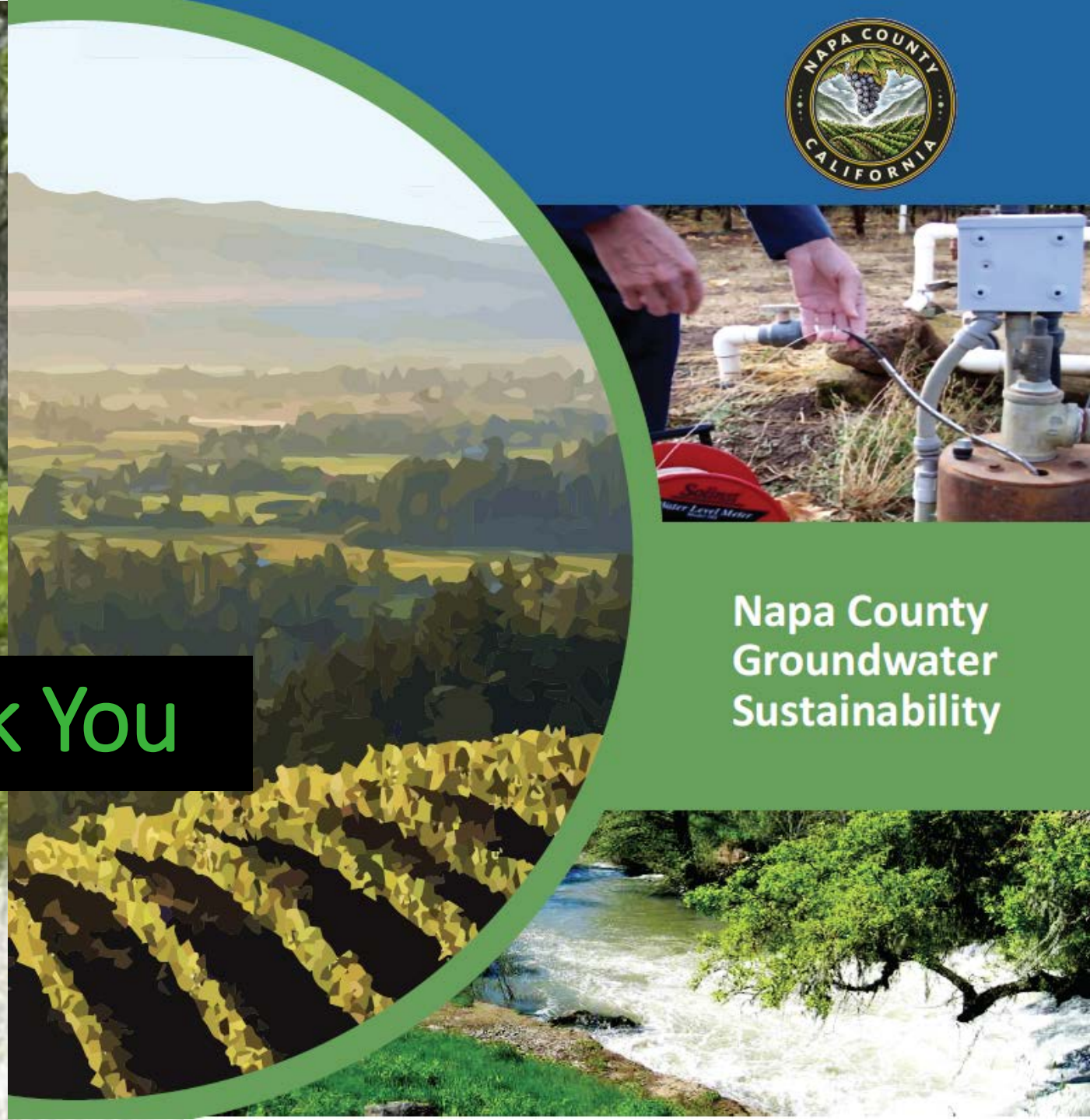
A Legacy of Stewardship:

Everyone sharing responsibility for maintaining watershed sustainability and protecting groundwater resources….

With the implementation of SGMA, choices were made to maintain the momentum of the groundwater activities launched following the General Plan update in 2008.

SGMA efforts for the Napa Valley Subbasin were aligned with the early January 1, 2017 deadline, and updates have begun for the 5-year January 2022 deadline.

Thank You



Napa County Groundwater Sustainability