Napa County Groundwater Sustainability Agency

Napa Valley Groundwater Sustainability Plan, Workplans & Implementation

Presented by

Jamison Crosby

Presented to

Napa Valley Grapegrowers Association

April 9, 2024

Outline

Napa Valley Subbasin – Highlights from Water Year 2023

Opportunities for Recharge and Resilience

GSP Implementation: Workplans and Survey – Seeking Your Input on Conservation Incentives

SGMA 10 Year Anniversary!

Local Control

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

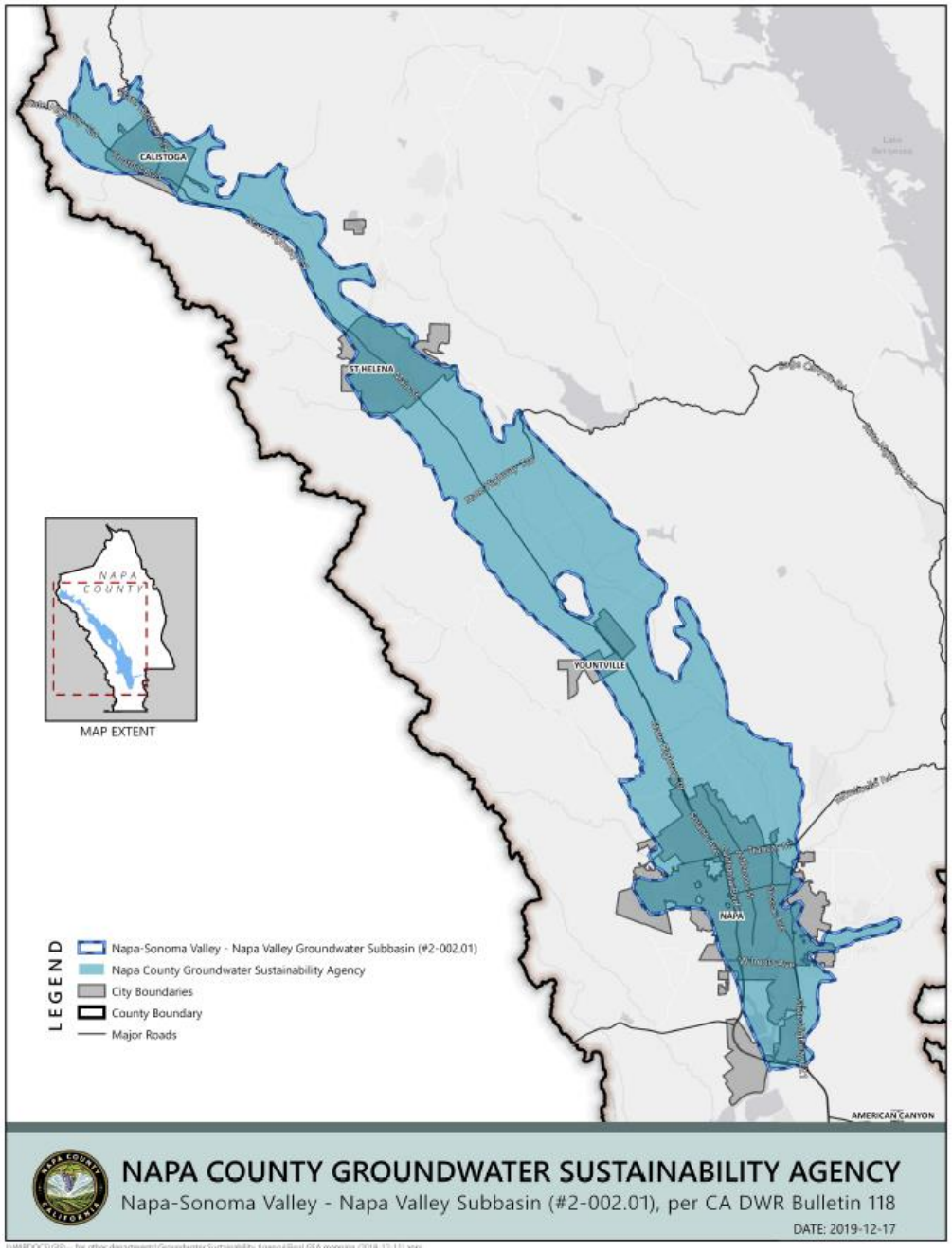
Governor Jerry Brown, September 2014

The Cliff Notes….

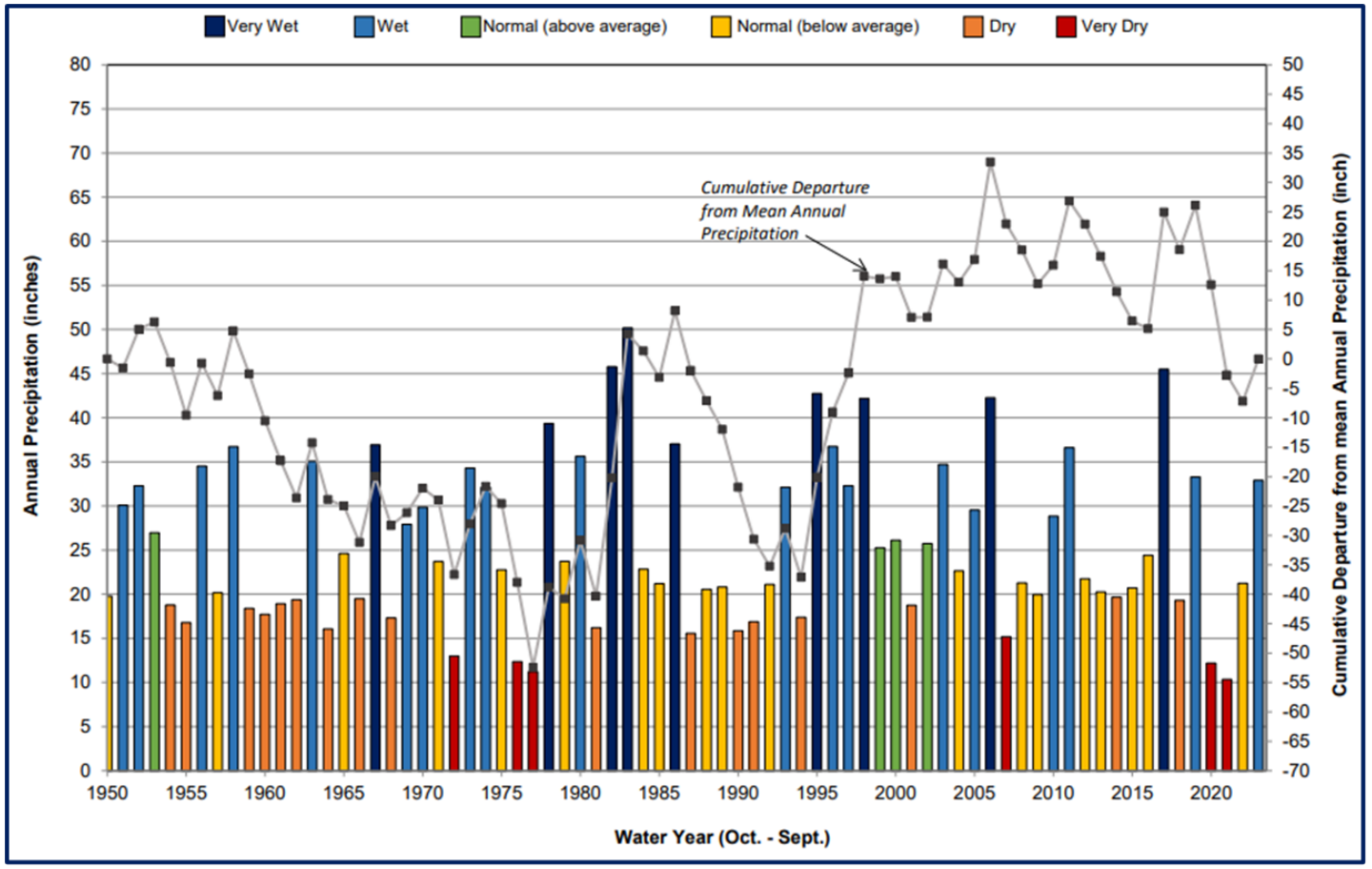
- Much has been accomplished since GSP submittal in January 2022
- ✓ DWR Approved Napa Valley Subbasin GSP January 26, 2023
- Many Workplans completed with implementation planned in Spring 2024
- Lots of opportunities for stewardship, innovation, and building climate resiliency
- Water Year 2023 was a wet year that resulted in <u>significant groundwater replenishment!</u>

Napa Valley Subbasin

- 1 high priority Subbasin/1 GSA
- 45,900 acres
- Sustainable Yield ~15,000 AF/year
- “Responsive” to wet and dry conditions
- DWR approved GSP in January 2023

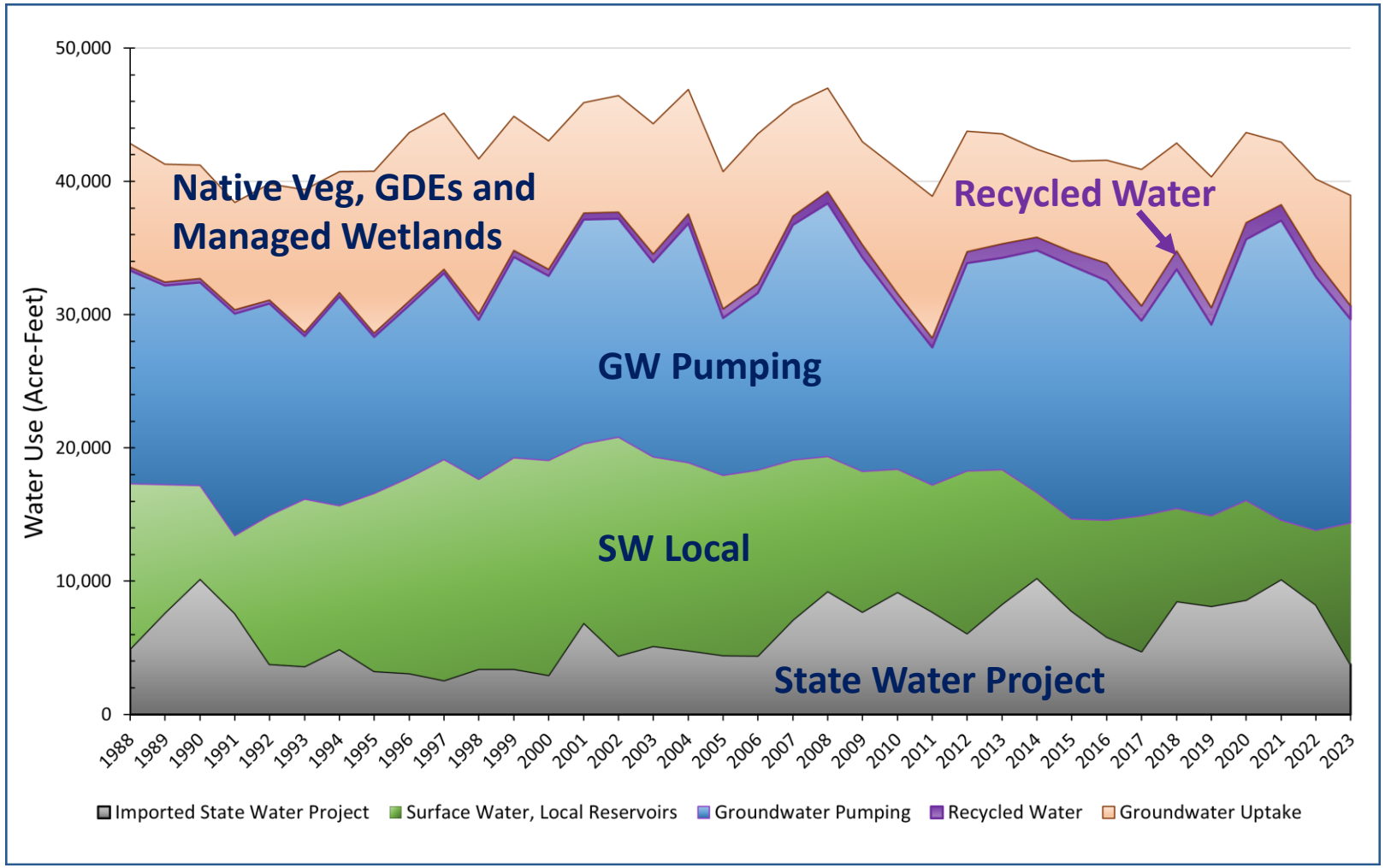


Climate Uncertainty and Weather Extremes – Normal "Above Average" Conditions are Becoming Rare



Water Use: Water Year 2023 (acre-feet)

Water Use	2022	2023
Groundwater Pumping (all users)	18,790	15,270
Native Veg, GDEs & Managed Wetlands	6,440	8,290
Recycled Water Use	1,220	1,020
Local Surface Water Use (including reservoirs, diversions, etc.)	5,562	10,627
State Water Project Use	8,290	3,740
TOTAL	**40,302**	**38,947**

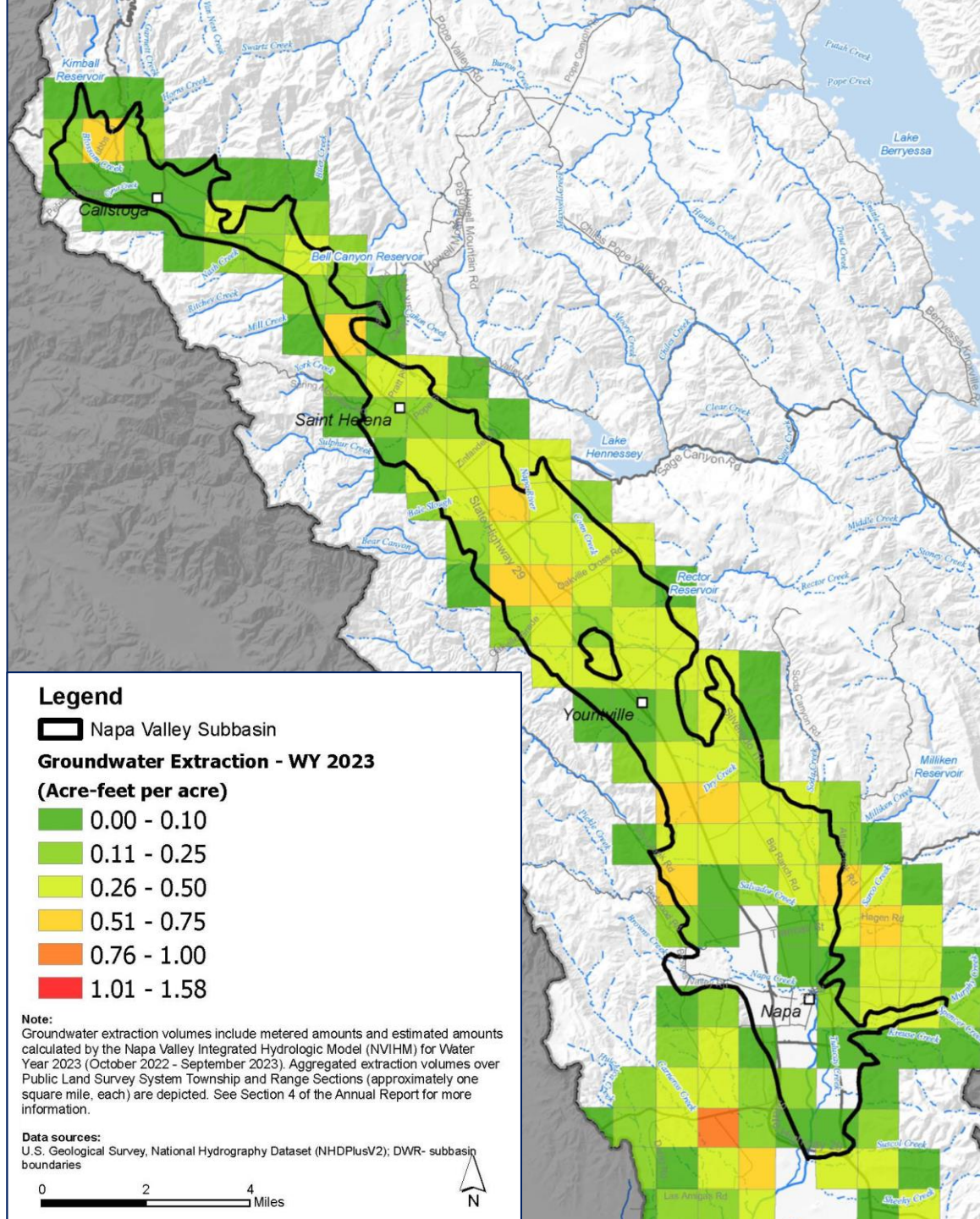


Groundwater Pumping, 2023 (Acre-feet)

Groundwater Pumping	Acre-feet	Percent Use*
Ag (i.e., vines)	11,330	74%
Municipal	330	2%
Self-Supplied Users Domestic (2,294 AF for outdoor use)	2,540	17%
Small Public Water Systems	1,070	7%

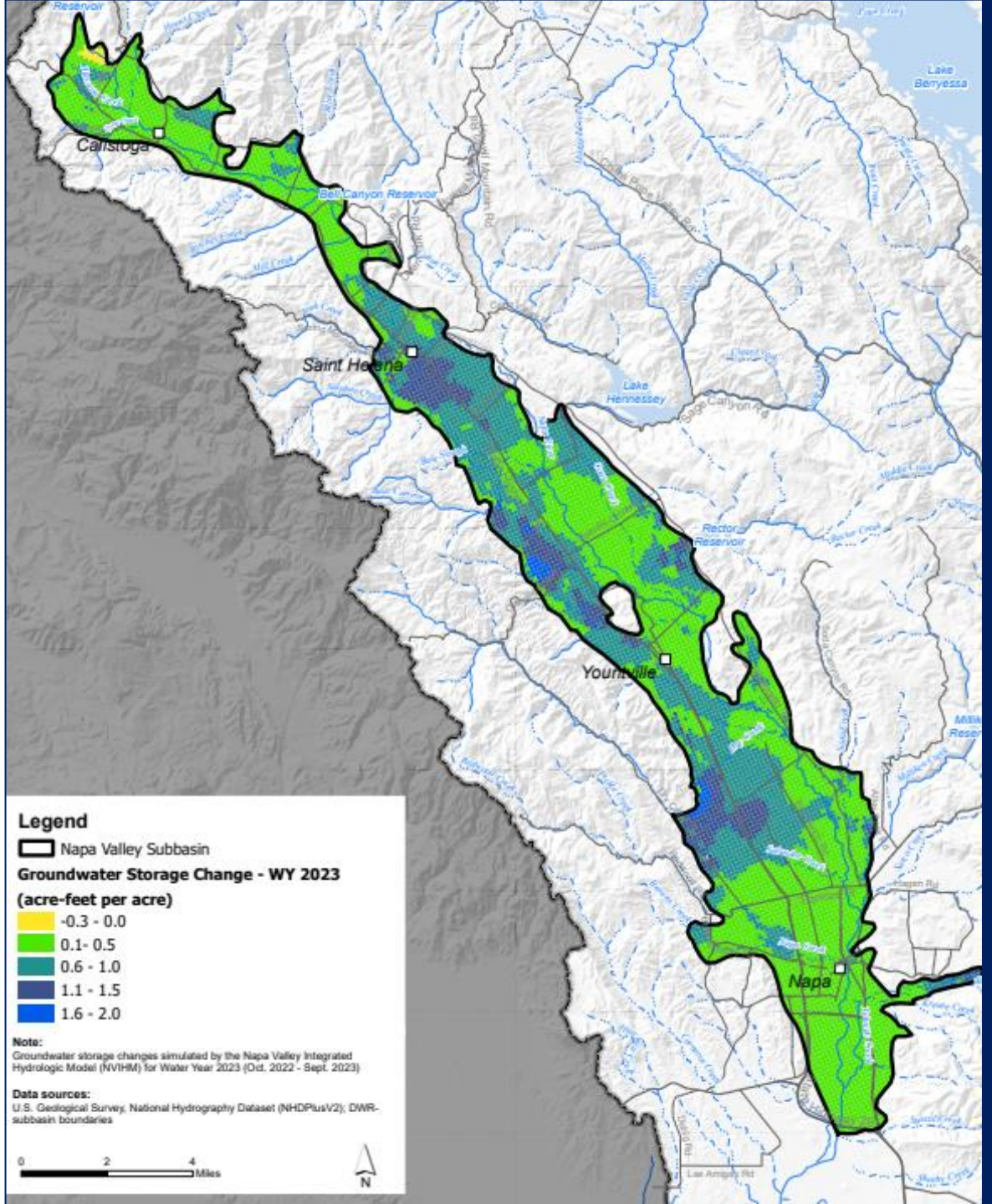
*Percentages comparable to historical averages.

TOTAL = 15,270 Acre-feet



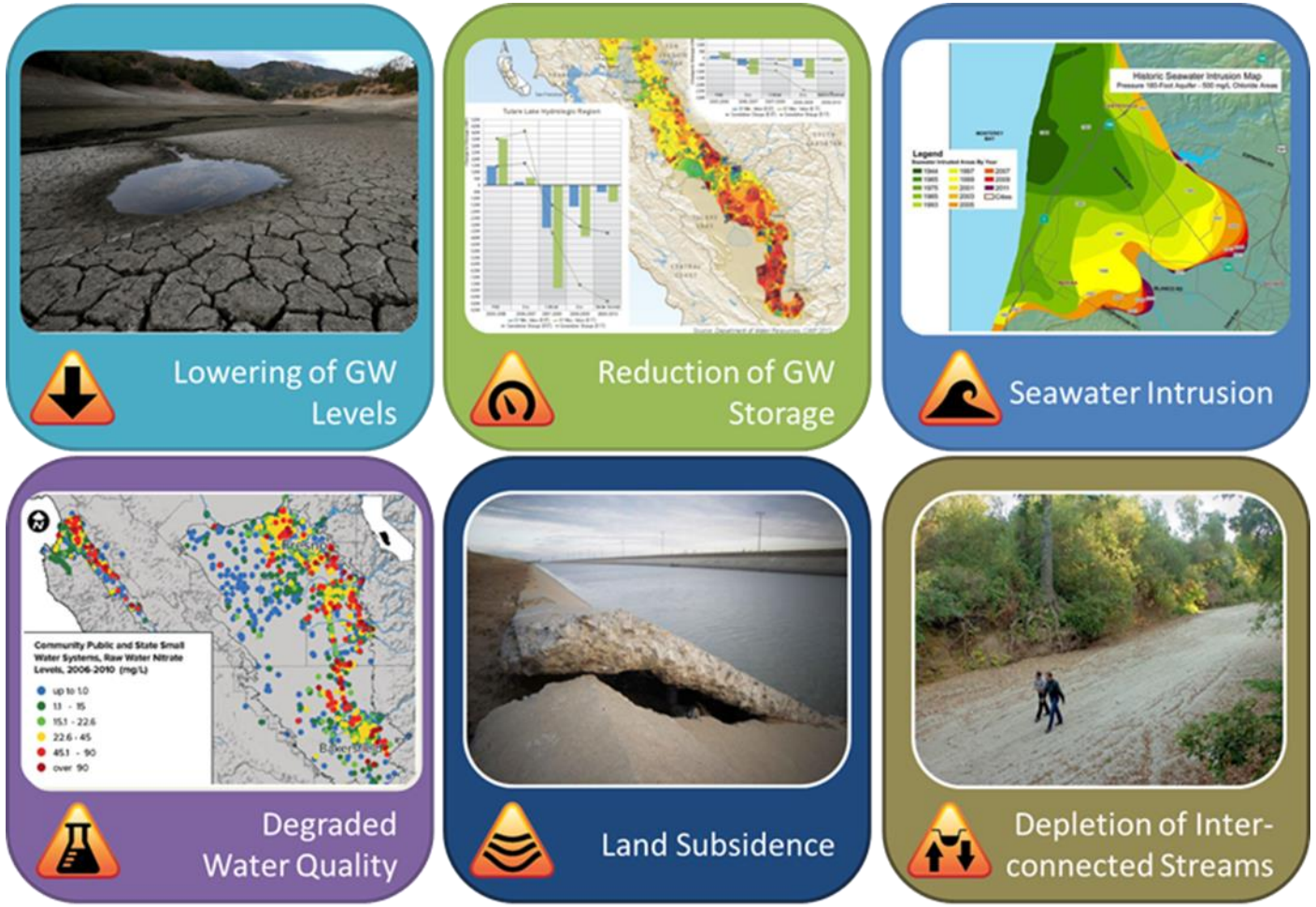
GW Storage Change for Water Year 2023

- One-Year (Oct. 2022 to Sept. 2023) increase in GW storage across Subbasin based on NVIHM Model = **+21,600 AF**
  - Continued to replenish GW removed from storage during drought
- Total GW storage in Alluvium as of Fall 2023 = ~214,000 AF
- Cumulative GW storage change **~4,800 AF (+2%)**
- More GW storage space remains to be filled to build GW reserves



Six Sustainability Indicators

Within 20 years, achieve "Sustainability" and avoid Groundwater Conditions that Cause Significant and Unreasonable effects…..



Sustainability Indicator: Reduction of Groundwater Storage

Minimum Threshold

Net GW extraction by pumping exceeding the sustainable yield for the Subbasin, where net GW extraction is the volume extracted less any volume of augmented recharge achieved by projects implemented in the Subbasin.

Undesirable Result

Seven (7) year average annual net GW extraction in the Subbasin exceeds the sustainable yield.

- No MT: WY 2023 pumping approx. equal to sustainable yield
- UR occurred since 7-year average exceeds the sustainable yield for the Subbasin.

Sustainable Yield (Est.) = ~15,000 AFY

Year	Total Groundwater Extraction (AF)
2017	14,630
2018	17,950
2019	14,340
2020	19,560
2021	22,510
2022	19,050
2023	15,280
7 Year Avg.	**17,620**

Summary of Water Year 2023: Sustainable Management Criteria

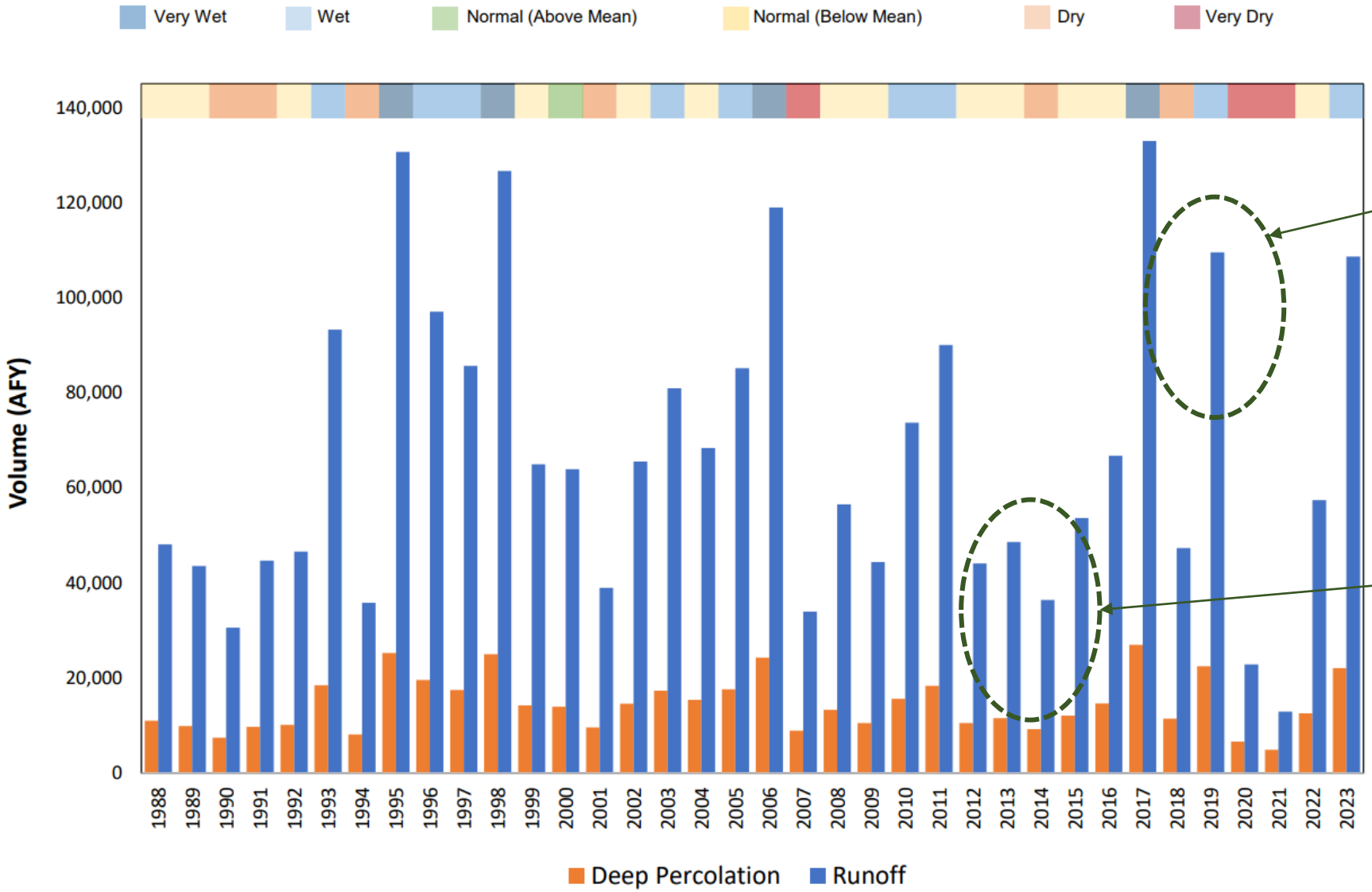
- Avg. GW pumping over 7-year period exceeds Sustainable Yield
  - **An Undesirable Result has occurred for Reduction in Groundwater Storage since WY 2021**
- This indicator is directly related to long-term conditions and achieving sustainability
- Key aspects of the current results for this indicator highlight the need to consider opportunities to address climate change and build resiliency

Sustainability Indicator	WY 2021	WY 2022	WY 2023
	UR: Yes or No	UR: Yes or No	UR: Yes or No
Chronic GWL Lowering (CGWL)	No	No	No
Depletion of Interconnected Surface Water (ISW)	No	Yes	No
GW Quality Degradation	No	No	No
Reduction of GW Storage	Yes	Yes	Yes
Land Subsidence	No	No	No
Seawater Intrusion	No	No*	No*

*New RMS wells are being evaluated for this SI.

Opportunities for Recharge and Building Resiliency

Opportunities for Recharge: Retaining Stormwater Runoff



Wetter years provide opportunities to replenish groundwater and increase resilience to drought effects.

Dry years provide significant opportunity to increase recharge to mitigate drought effects.

Recharge Opportunities: On-Farm Approaches Scaled Up for Basin Benefits

Cover Crops and building Soil Health

Vineyard-Specific BMPs: Conservation/ Recharge

SW Right: Winter Recharge

Tile Drainage: Capture and Store for In-Lieu Use

On-Site Ponds: Stormwater Storage, In-Lieu Use, Recharge

Recharge Workshop April 12, 2024

UNIVERSITY OF CALIFORNIA
Agriculture and Natural Resources

UCDAVIS

Save Water: Napa Valley Water Conservation Workshop

Workshop Contents:

- Learn About Implementing Groundwater Recharge On Agricultural Land.
- Discover New Drought-Resilient Practices Such As Dry Farming.
- Hear From Experts From UC Davis and UC Cooperative Extension.

Registration Fee: $10

Guest Speakers

Dr. Helen Dahlke, Professor in Integrated Hydrologic Sciences, UC Davis

Dr. Ellie Marie Andrews, Specialty Crops Advisor, Sonoma, Marin, and Napa Counties, UC Cooperative Extension

Register HERE to attend either in person or through Zoom - space is limited! 😊

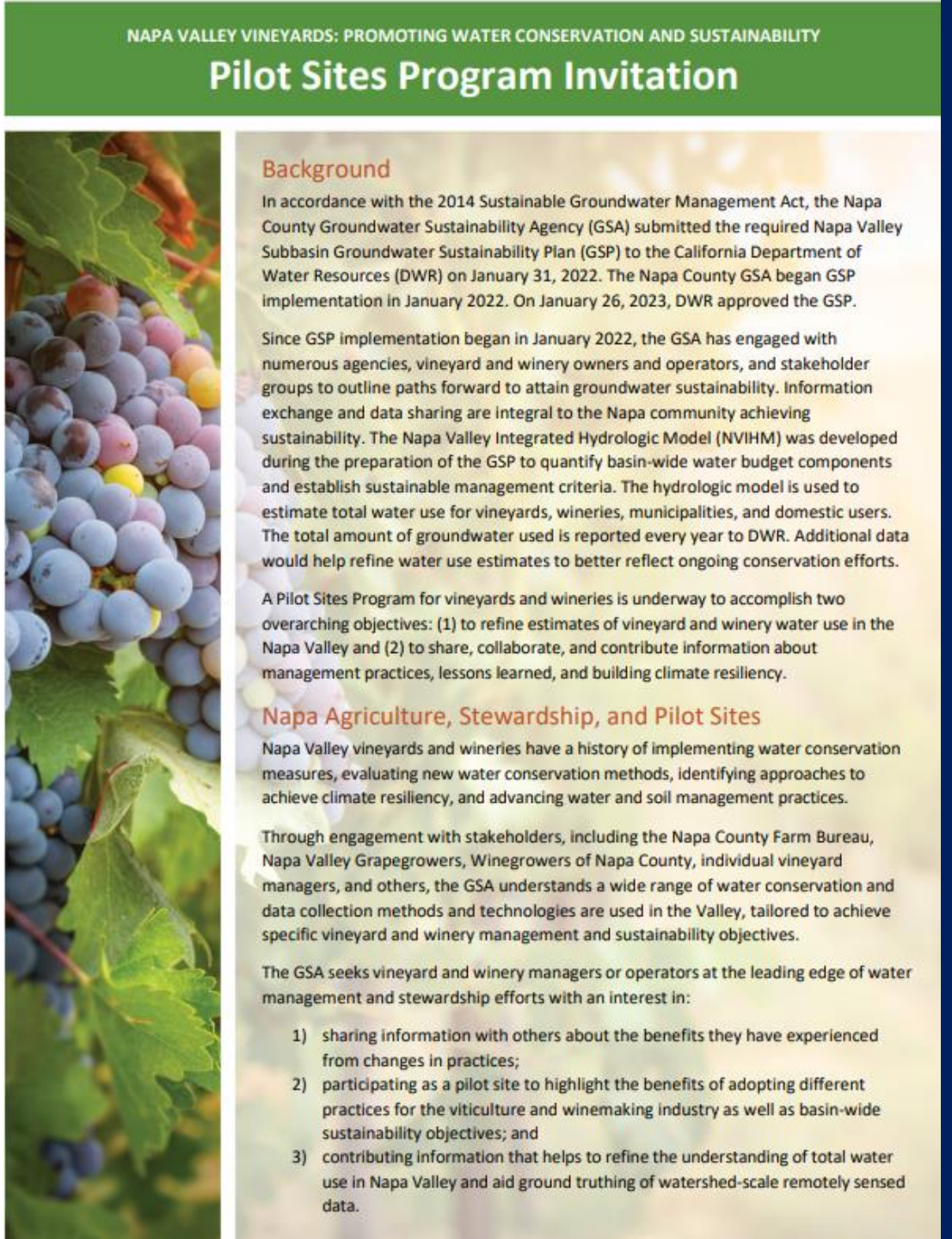
Time: Friday April 12, 2024, 1-4 pm.

Location: 1710 Soscol Avenue, Suite 3, Napa County (Zoom option also available)

Please email Qicheng Tang (qictang@ucanr.edu) with questions.

Pilot Sites: Invitation

- Share innovative conservation approaches with peers and help educate the public
- Highlight the benefits of climate adaptation measures
- Contribute information on newer BMPs, retaining stormwater runoff for recharge, and increasing resiliency to weather extremes
- Share information anonymously to help refine water use estimates and modeled Subbasin conditions



NAPA VALLEY VINEYARDS: PROMOTING WATER CONSERVATION AND SUSTAINABILITY

Pilot Sites Program Invitation

Background

In accordance with the 2014 Sustainable Groundwater Management Act, the Napa County Groundwater Sustainability Agency (GSA) submitted the required Napa Valley Subbasin Groundwater Sustainability Plan (GSP) to the California Department of Water Resources (DWR) on January 31, 2022. The Napa County GSA began GSP implementation in January 2022. On January 26, 2023, DWR approved the GSP.

Since GSP implementation began in January 2022, the GSA has engaged with numerous agencies, vineyard and winery owners and operators, and stakeholder groups to outline paths forward to attain groundwater sustainability. Information exchange and data sharing are integral to the Napa community achieving sustainability. The Napa Valley Integrated Hydrologic Model (NVIHM) was developed during the preparation of the GSP to quantify basin-wide water budget components and establish sustainable management criteria. The hydrologic model is used to estimate total water use for vineyards, wineries, municipalities, and domestic users. The total amount of groundwater used is reported every year to DWR. Additional data would help refine water use estimates to better reflect ongoing conservation efforts.

A Pilot Sites Program for vineyards and wineries is underway to accomplish two overarching objectives: (1) to refine estimates of vineyard and winery water use in the Napa Valley and (2) to share, collaborate, and contribute information about management practices, lessons learned, and building climate resiliency.

Napa Agriculture, Stewardship, and Pilot Sites

Napa Valley vineyards and wineries have a history of implementing water conservation measures, evaluating new water conservation methods, identifying approaches to achieve climate resiliency, and advancing water and soil management practices.

Through engagement with stakeholders, including the Napa County Farm Bureau, Napa Valley Grapegrowers, Winegrowers of Napa County, individual vineyard managers, and others, the GSA understands a wide range of water conservation and data collection methods and technologies are used in the Valley, tailored to achieve specific vineyard and winery management and sustainability objectives.

The GSA seeks vineyard and winery managers or operators at the leading edge of water management and stewardship efforts with an interest in:

1) sharing information with others about the benefits they have experienced from changes in practices;
2) participating as a pilot site to highlight the benefits of adopting different practices for the viticulture and winemaking industry as well as basin-wide sustainability objectives; and
3) contributing information that helps to refine the understanding of total water use in Napa Valley and aid ground truthing of watershed-scale remotely sensed data.

GSP: Implementation

Thank You for Your Input on the Workplans!

- *Grapegrowers Association*
- *Winegrowers of Napa County*
- *Napa County Farm Bureau*
- *Napa Valley Vintners*
- *Individual Growers/Wineries*
- *Many Others*

GSP Workplans

Water Conservation Workplan

- "What water conservation options are available for Napa Subbasin water users?"
- Designed as a resource for **ALL WATER USERS** to learn about, consider, and expand upon voluntary water conservation measures

Groundwater Pumping Reduction Workplan

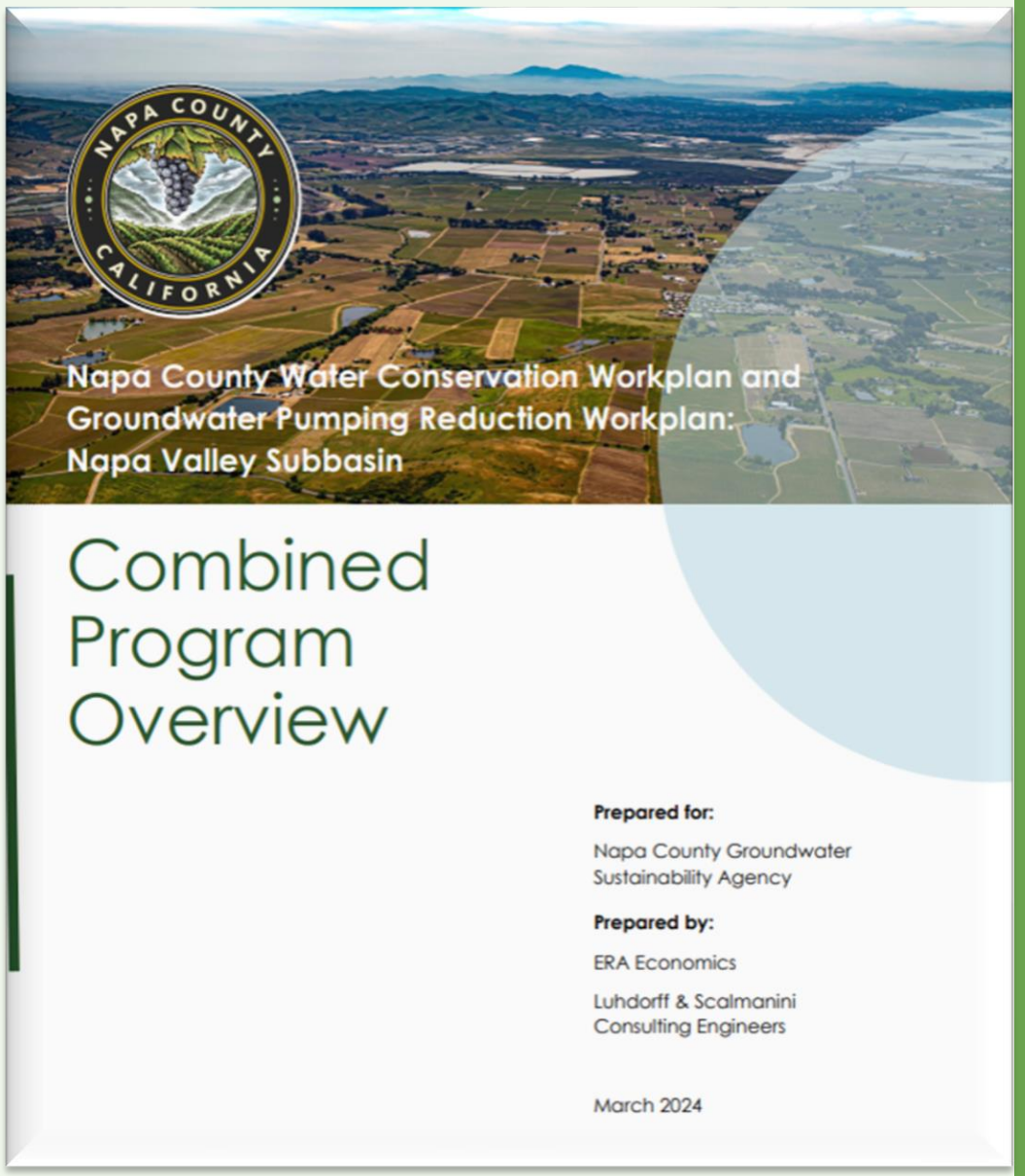
- "How do we achieve a **10% voluntary groundwater pumping reduction…as measured Subbasin-wide**?"
- Offers a suite of voluntary programs that cost-effectively result in Subbasin benefits.
- Expand on voluntary actions that achieve groundwater benefits for the Subbasin with mandatory measures as needed.

Interconnected Surface Water and Groundwater Dependent Ecosystems Workplan

- GSP recognized data gaps on the relationship between ISW conditions and GDEs.
- Expands on types of monitoring needed to characterize ISW conditions and GDEs.

Overview of the WC & GPR Workplans

- Summarizes the WC and GPR Workplans and key findings
- Posted in English and Spanish
- 10 pages
- Available at: https://www.countyofnapa.org/3219/County-of-Napa-Plans-Reports-Documents



Interviews & Outreach

- California Department of Fish & Wildlife
- California Sustainable Winegrowing Alliance
- Fish Friendly Farming
- Napa County Farm Bureau
- Napa County Resource Conservation District
- Napa County Flood Control District
- Napa County University of California Cooperative Extension
- Napa Green
- Napa Valley Grapegrowers Association
- Napa Valley Vintners Association
- National Marine Fisheries Service
- Save Napa Valley Foundation
- SIP Certified
- UC Davis – Center for Watershed Sciences
- UC Berkeley Extension
- Winegrowers of Napa County
- Industry professionals

Initial Implementation Steps

Component 1: Education & Outreach

- Develop educational materials
- Build partnerships with local organizations
- Develop notification/messaging system

Component 2: Voluntary Adoption

- Develop incentive program for adoption of High-Priority Water Conservation Practices
- Pilot a benchmarking program
- Develop a voluntary meter data and reporting program

Component 3: Voluntary Certification

- Define minimum criteria (practices) for a certification program's members to receive a financial incentive
- Develop incentives for certification

High Priority Water Conservation Practices

- Cost, adoption, water saving potential, and economic analysis of alternatives
  - Summary matrix of alternatives
- Preliminary list of high-priority practices based on Workplan analysis
  - Metering
  - Recycled water
  - Benchmarking
  - Distribution uniformity
  - Plant water and soil moisture monitoring
  - Row orientation
  - WaterSense devices

Table ES-2. Summary of Water Conversation Practices

Practice	Upfront Cost	Annual Costs	Potential Water Savings
Unit	$ (units as indicated)	$ (units as indicated)	% (relative to baseline water use)
Water Practices for All Water Users			
Water Measurement[3]	$600 - $2,500/well	$100/well	5%
Recycled Water	N/A	$362 - $720/AF	100% (In lieu)
Benchmarking	N/A	N/A	10%
Vineyard-Specific Water Practices (Established)			
Irrigation System Efficiency[2,3]	$2,500/acre	$126/acre	6 – 20%
Distribution Uniformity[1]	$1,200 - $2,000/field	Varies based on needed maintenance	9 – 23%
Plant Water and Soil Moisture Monitoring[2,3]			5 – 16%
High Tech, Low Labor (TDR)	$1,640 – $3,500/sensor	$32/acre	
Medium Tech and Labor (Neutron Probe)	$5,000 - $10,000/sensor	$40/acre	
Low Tech, High Labor (Tensiometers)	$100 - $600/sensor	$32/acre	
Soil Management (Cover Crop)[3,4]	$154/acre	$260/acre	4 – 14%
Canopy Management	N/A	$360/acre	15%
Vineyard-Specific Water Practices (New Plantings)			
Row Orientation	Low	N/A	18 – 30%
Rootstock Selection	Low	N/A	Data Gaps
Winery-Specific Water Practices			
Waterless Sanitation	$50,000	Data Gaps	80%
Processing Water Treatment and Reuse	Data Gaps	Data Gaps	100% (In lieu)
Municipal, Industrial, and Residential Water Practices			
WaterSense Devices[5]	$2,710/household	N/A	20%
Other Urban Water Conservation[6]	Data Gaps	Data Gaps	Data Gaps

[1] Eligible for cost-share funding or other technical support through the Napa RCD.

[2] Eligible for cost-share funding through the State Water Efficiency and Enhancement Program (SWEEP).

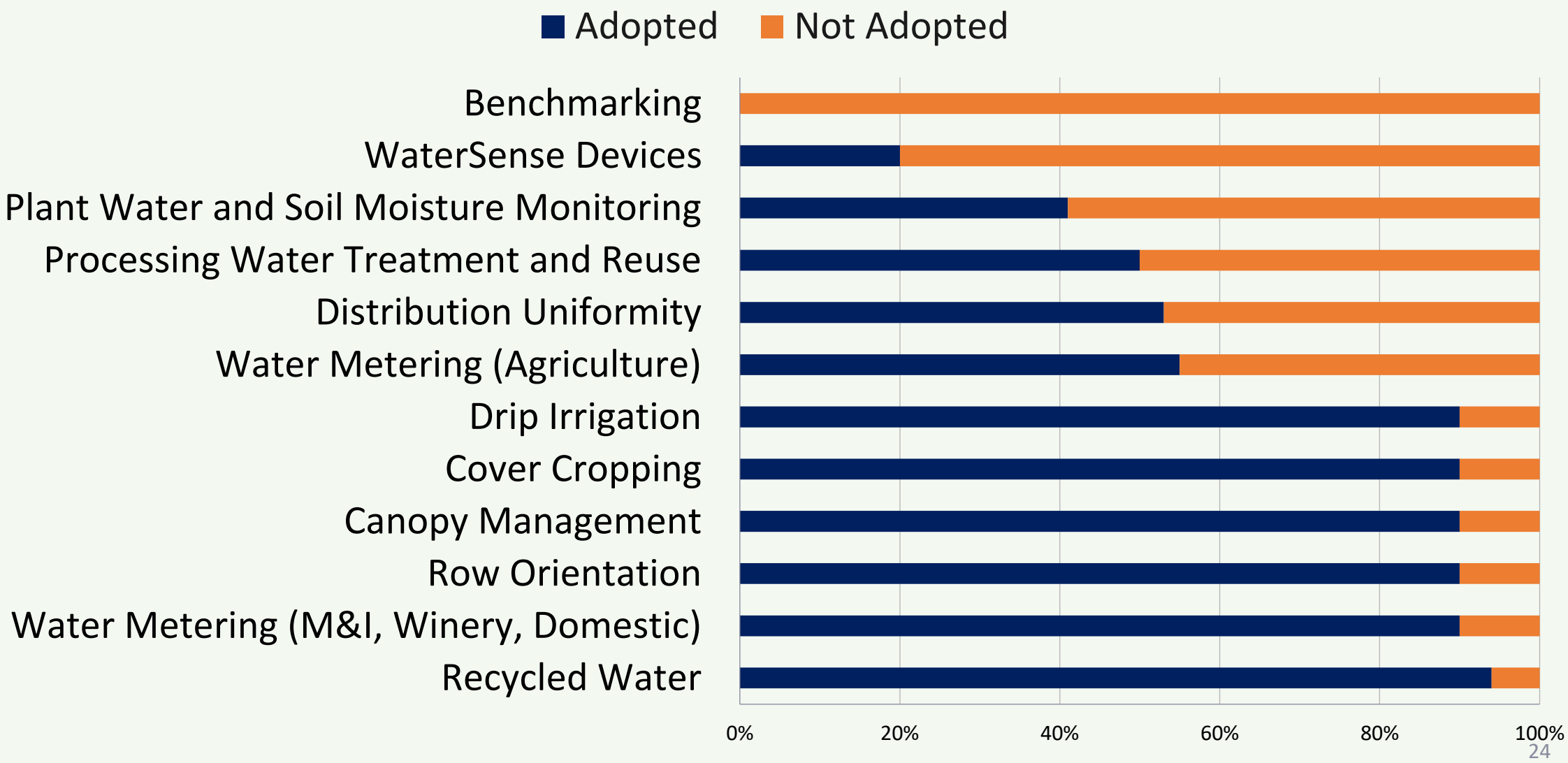
[3] Eligible for cost-share funding through the Environmental Quality Incentives Program Conservation Incentives Contracts (EQIP-CIC).

[4] Eligible for cost-share funding through the Healthy Soils Program (HSP).

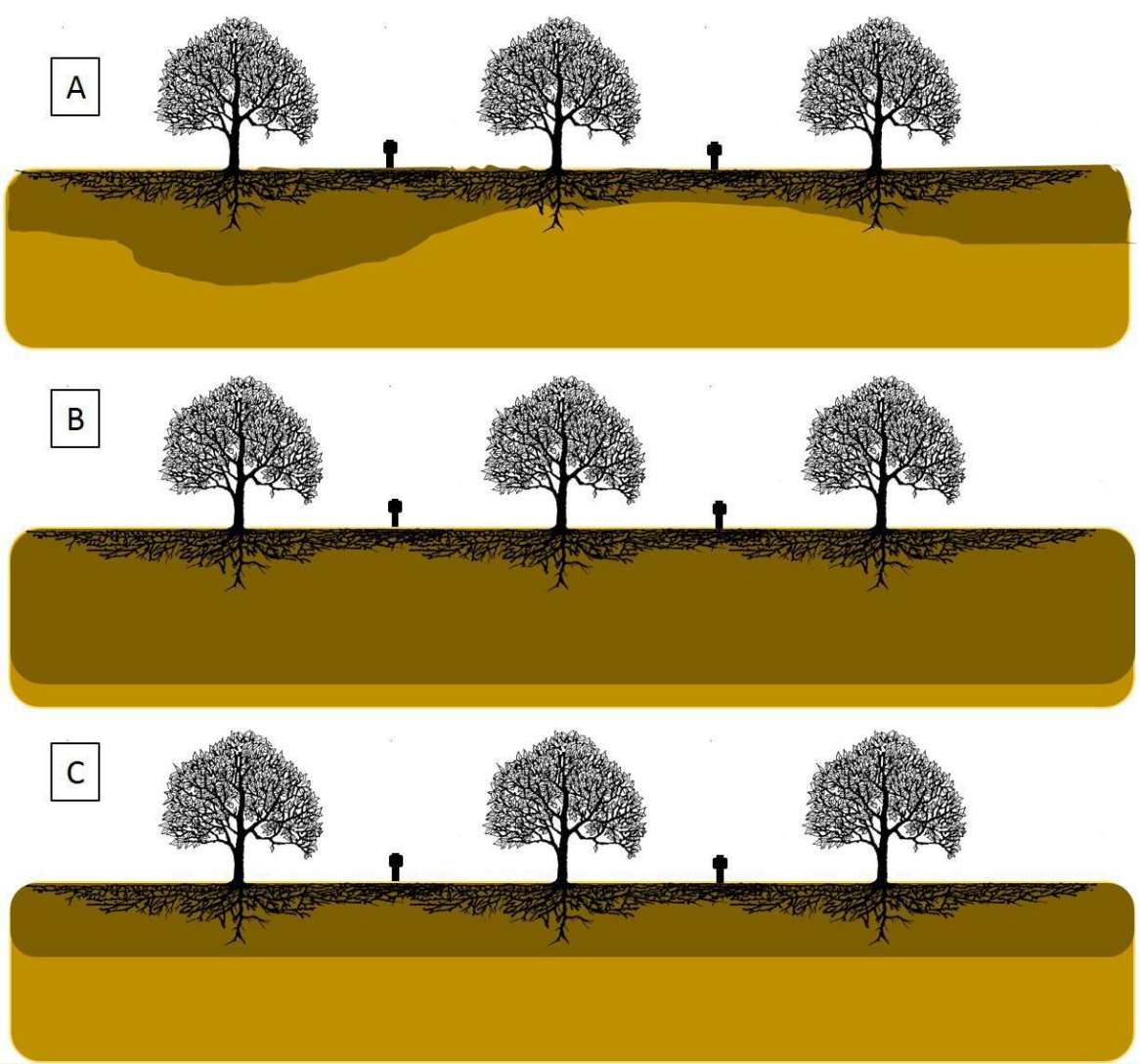
[5] Eligible for financial assistance programs in select municipalities in Napa County.

[6] Example opportunities include improved outdoor irrigation management, low water use landscaping, and use of reclaimed water for outdoor irrigation. Detailed cost and scalability data were not available for initial workplan development. Additional information will be provided as part of education and outreach for Workplan implementation.

Adoption Rates of Select Practices



Irrigation efficiency vs distribution



- **Distribution uniformity** (DU) is a measure of how evenly water is applied across a field during an irrigation event.

- **Irrigation efficiency** refers to how well the irrigator matches water applications to crop water needs, and generally answers the questions of how much water to apply and how often.

DU is expressed as a percentage:

92-100% = Excellent
91-88% = Good
87-83% = OK
82-75% = Low
<75% = Poor

Example Scenario

Assume a given vineyard block (5 acres) with vine spacing 6x8 ft (4540 vines total) with two1-gal/hr emitters/vine. Each vine is expected to receive 2 gal/hr.

After a 3-hour irrigation event we expect a total of 27,240 gallons of water used.

If emitters are discharging on average water in excess by 15%. Emitters are now discharging 1.15 gal/hr.

After a 3-hour irrigation event under these conditions we used 31,326 gallons of water, 4,086 gallons in excess.

Assuming two irrigation events per week and 15 weeks in the **irrigation season**, **this vineyard is using an excess of 122,580 gallons of water...** and that's for a system which would be considered "ok".

Distribution Uniformity Evaluations in Napa vineyards

- 135 vineyard irrigation systems evaluated since 2014
- **Average distribution uniformity score** among these vineyards is **78%, which is considered poor.**
- The distribution uniformity score is obtained by measuring the water discharge of emitters throughout the vineyard under normal operating conditions.
- Pressure measurements are also conducted to ensure optimum conditions for the specific type of emitters installed.
- **Conclusion: Conduct a DU test every 5 years and…**
- Take advantage of this free service with **funding provided by Napa County**

Workplan Implementation: We Want Your Input!

Questions and Discussion

Question #2

1. **Many vineyards and wineries have already adopted water conservation practices, such as low-volume (drip) irrigation systems. What additional (new) water conservation practices have you considered, or would you be <u>MOST LIKELY</u> to implement in the future?**
   a. Soil moisture monitoring, method:_____
   b. Plant stress monitoring, method:_____
   c. Measuring applied water, method:_____
   d. Distribution uniformity testing
   e. Rootstock, type:_____
   f. Row orientation
   g. Other: _____

Question #3

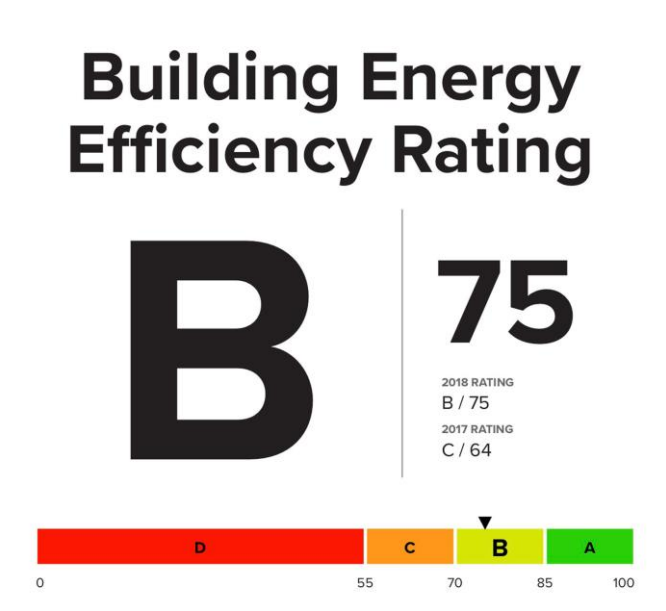
1. **For the vineyard/winery/other farming operation you manage, what are some of the main constraints to wider adoption of new water conservation practices?**
   a. Cost
   b. Uncertainty about what practice(s) are the most cost-effective
   c. Access to technical resources to implement practices
   d. No perceived benefits to vineyard management
   e. Other: _____

Question #4

1. **Many vineyards and wineries have already adopted water conservation practices. What types of incentives would cause you to consider adopting additional conservation practices?**
   a. Cost-sharing or other grant programs to pay for water conservation practices
   b. Marketing / recognition of operations that are early adopters
   c. Technical resources and support with implementation
   d. Other: _____

PAUSE HERE FOR AUDIENCE FEEDBACK

Benchmarking for Water



- Borrowing a concept from the energy sector
- Fully anonymous and confidential
- Operates on the principal that often even just knowing how much energy (or water) you use is enough to prompt to be more efficient.

- Potential Benefits:
  - Increase focus on water efficiency by creating a competition to be the best
  - On-ramp to identify, diagnose, and address high water use – tool to nudge behavior change
  - Monitor system-wide improvements.

Question #5

Benchmarking

1. **Benchmarking programs are widely used in other industries such as energy to provide anonymous information about how your use compares to an anonymous group of peers. Would a benchmarking program provide useful information that you could use to improve water management?**
    a. Yes, comments:_____
    b. No, comments:_____
    c. Potentially, but I have the following concerns:

PAUSE HERE FOR AUDIENCE FEEDBACK

Certification

Private Benefits

- Efficiency improvements
- Intrinsic value
- Marketing and value-add
- Regulatory compliance (e.g., LandSmart, Fish Friendly Farming)
- Environmental, Social, and Governance (ESG) Standards

Public Benefits

- Water quality improvements
- Water Conservation
- Soil health
- Ecosystem & habitat improvements

Question #6

1. **Do you currently use a certification program (or programs)?**
    a. Yes, program(s):_____
    b. No, comments:

Question #7

1. **Would you consider using a certification program (or programs) that includes water conservation practices?**
    a. Yes, program:_____
    b. No, comments:_____
    c. Potentially, but I have the following concerns:

Question #8

1. **What types of incentives could be offered to achieve wider adoption of certification programs?**
    a. Create consumer (and buyer) awareness of the value of water conservation practices
    b. Provide cost-sharing for certification
    c. Provide technical assistance for becoming certified
    d. Other:

PAUSE HERE FOR AUDIENCE FEEDBACK

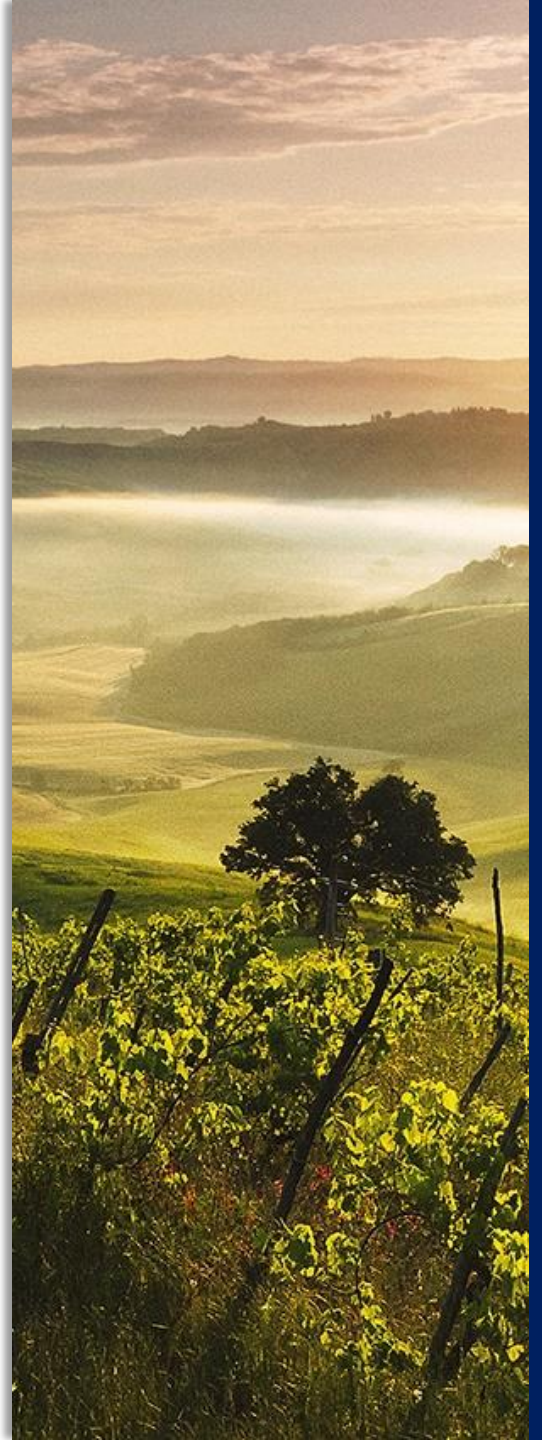
Last Question…

Please provide any other general thoughts and feedback about encouraging adoption of water conservation practices to meet the objectives of the Groundwater Pumping Reduction Workplan:

Drought or Deluge: Conservation as a Napa Way of Life

- California is experiencing hotter/drier conditions, including uncertain climate with more extreme events.
- Approaches are needed to adapt to climate change, build resiliency, and better protect interconnected surface water.
- Napa Valley vineyards and wineries are widely recognized for their resource stewardship and conservation practices.
- These uncertain times and changing climate call for ***Conservation as a Napa Way of Life***.

4Rs: Retain – Replenish – Resilience – Reserves



THANK YOU!

Vicki Kretsinger Grabert, ***Senior Principal***
Luhdorff & Scalmanini, Consulting Engineers
Duncan MacEwan, ERA Economics

Jamison Crosby, ***Natural Resources Conservation Manager***
Planning, Building, and Environmental Services Department
jamison.crosby@countyofnapa.org

Ryan Alsop, ***County Executive Officer***
Napa County Groundwater Sustainability Agency
1195 Third Street
Napa, CA 94559

Brian Bordona, ***Director***
Planning, Building, and Environmental Services Department
1195 Third Street
Napa, CA 94559