# Napa County

1195 THIRD STREET
SUITE 310
NAPA, CA 94559

# Agenda

**Thursday, April 10, 2025**
**1:30 PM**

**Board of Supervisors Chambers**
**1195 Third Street, Third Floor**

## Groundwater Technical Advisory Group

***Albert Filipelli (Chair)***
***Monica Cooper***
***Julie Chambon***
***Miguel Garcia (Vice-Chair)***
***Mathias Kondolf***

***Brian D. Bordona, Secretary- Director***
***Chris Apallas, County Counsel***
***Jamison Crosby, Natural Resources Conservation Manager***
***Brendan McGovern, Principal Planner***
***Alexandria Quackenbush, Meeting Clerk***
***Angie Ramirez-Vega, Meeting Clerk***

**How to Watch or Listen to the Napa County Groundwater Technical Advisory Group Meetings**

The Napa County Groundwater Technical Advisory Group will continue to meet the 2nd Thursday of each month. There will be no regular meeting in January, May, June or October. August 19, 2025 will be a special-joint meeting of the GTAG & GSA.

The Groundwater Technical Advisory Group realizes that not all County residents have the same ways to stay engaged, so several alternatives are offered. Remote Zoom participation for members of the public is provided for convenience only. In the event that the Zoom connection malfunctions for any reason, the Groundwater Technical Advisory Group reserves the right to conduct the meeting without remote access.

Please watch or listen to the Groundwater Technical Advisory Group meeting in one of the following ways:

1. Attend in-person at the Board of Supervisors Chambers, 1195 Third Street, Napa, Third Floor.
2. Watch on Zoom using the attendee link: https://countyofnapa.zoom.us/j/89426085834. Make sure the browser is up-to-date.
3. Listen on Zoom by calling 1-669-900-6833 (Meeting ID: 894-2608-5834).

**If you are unable to attend the meeting in person and wish to submit a general public comment or a comment on a specific agenda item, please do the following:**

1. Email your comment to meetingclerk@countyofnapa.org. Emails will not be read aloud but will still become part of the public record and shared with the Groundwater Technical Advisory Group.
2. Use the Zoom attendee link: https://Countyofnapa.zoom.us/j/89426085834. Make sure the browser is up-to-date. When the Chair calls for the item on which you wish to speak, click "raise hand". Please limit your remarks to three minutes.
3. Call the Zoom phone number: 1-669-900-6833. (Meeting ID: 894-2608-5834). When the Chair calls for the item on which you wish to speak, press *9 to raise hand. Please limit your remarks to three minutes.

   **Please note that phone numbers in their entirety will be visible online while speakers are speaking**

For more information, please contact us via telephone at (707) 253-4417 or send an email to meetingclerk@countyofnapa.org.

ANY MEMBER OF THE AUDIENCE DESIRING TO ADDRESS THE COMMITTEE:

ON A MATTER ON THE AGENDA
Please proceed to the podium when the matter is called and, after receiving recognition from the Chair, give your name and your comments or questions. In order that all interested parties have an opportunity to speak, please be brief and limit your comments to the specific subject under discussion. Time limitations shall be at the discretion of the Chair or Committee, but is generally limited to three minutes.

ON A MATTER NOT ON THE AGENDA
Public comment is an opportunity for members of the public to speak on items that are not on the agenda but are within the subject matter jurisdiction of the Committee. Public comment is limited to three minutes per speaker, subject to the discretion of the Chair. Comments should be brief and focused, and speakers should be respectful of one another who may have different opinions. Please remember this meeting is being recorded and broadcasted live via ZOOM. The County will not tolerate profanity, hate speech, abusive language, or threats. Also, while public input is appreciated, the Brown Act prohibits the Committee from taking any action on matters raised during public comment that are not on the agenda.

**1. CALL TO ORDER; ROLL CALL**

**2. PUBLIC COMMENTS AND RECOMMENDATIONS**
**(The Committee invites comments and recommendations from the public concerning issues relevant to the charge of the Technical Advisory Group. Anyone who wishes to speak to the Technical Advisory Group on such a matter, if it is not on the agenda, may do so at this time. At the discretion of the Chair, individuals will be limited to a three-minute presentation. No action will be taken by the Technical Advisory Group as a result of any item presented at this time.)**

**3. APPROVAL OF MINUTES**

**A** The Secretary of the committee requests approval of the minutes from the March 13, 2025 TAG meeting. **25-593**

**Attachments:** Draft March 13, 2025 Meeting Minutes

**4. AGENDA REVIEW**

**5. ADMINISTRATIVE ITEMS**

**A** Technical Advisory Group (TAG) members will receive a presentation on the revised version of the NCGSA Water Certification Partnership document. In addition, the TAG will also receive an update on the extended replanting concept. This is intended to spur discussion, questions, and provide feedback to staff and participants. **25-607**

**Attachments:** GPR Workplan Implementation Update presentation
DRAFT NCGSA Water Conservation Certification Partnership
NCGSA Extended Replanting Concept Note
Item 5A-NCGSA-TAG(added after meeting).pptx

**B** Provide an update on streamflow depletion model scenarios and model updates to the Napa Valley Integrated Hydrologic Model (NVIHM). **25-601**

**Attachments:** NVIHM Model Scenarios and Updates presentation
Item 5B-TAG_LSCE_Model(added after meeting).pptx

## 6. FUTURE AGENDA ITEMS

## 7. ADJOURNMENT

I HEREBY CERTIFY THAT THE AGENDA FOR THE ABOVE STATED MEETING WAS POSTED AT A LOCATION FREELY ACCESSIBLE TO MEMBERS OF THE PUBLIC AT THE NAPA COUNTY ADMINISTRATIVE BUILDING, 1195 THIRD STREET, NAPA, CALIFORNIA ON 4/7/2025 BY 12:30PM . A HARDCOPY SIGNED VERSION OF THE CERTIFICATE IS ON FILE WITH THE COMMITTEE CLERK AND AVAILABLE FOR PUBLIC INSPECTION.

ALEXANDRIA QUACKENBUSH (By e-signature)
Alexandria Quackenbush, Committee Clerk

Napa County

Board Agenda Letter

1195 THIRD STREET
SUITE 310
NAPA, CA 94559
www.countyofnapa.org

Main: (707) 253-4580

Groundwater Technical Advisory Group **Agenda Date:** 4/10/2025 **File ID #:** 25-593

**TO:** Technical Advisory Group for the Napa County Groundwater Sustainability Agency

**FROM:** Brian Bordona - Director of Planning, Building and Environmental Services

**REPORT BY:** Jamison Crosby, Natural Resources Conservation Manager

**SUBJECT:** TAG Minutes from March 13, 2025

## RECOMMENDATION

The Secretary of the committee requests approval of the minutes from the March 13, 2025 TAG meeting.

## ENVIRONMENTAL IMPACT

ENVIRONMENTAL DETERMINATION: The proposed action is not a project as defined by 14 California Code of Regulations 15378 (State CEQA Guidelines) and therefore CEQA is not applicable.

## BACKGROUND AND DISCUSSION

The TAG held its twenty-third meeting on March 13, 2025. Minutes were prepared and are ready for the committee's approval.

# Meeting Minutes

# Technical Advisory Group

Julie Chambon
Monica Cooper
Albert Filipelli *(Chair)*
Miguel Garcia *(Vice-Chair)*
Mathias Kondolf

Brian D. Bordona, Director
Chris Apallas, County Counsel
Jamison Crosby, Natural Resources Manager
Brendan McGovern, Principal Planner
Alexandria Quackenbush, Meeting Clerk
Angie Ramirez Vega, Meeting Clerk

| **Thursday, March 13, 2025** | **1:30 PM** | **Board of Supervisors Chambers<br>1195 Third Street, Third Floor** |
|---|---|---|

**1. CALL TO ORDER / ROLL CALL**

Group Members Present: Chair Albert Filipelli (arrived during Agenda review), Julie Chambon, Matt Kondolf, Miguel Garcia, Monica Cooper.
Group Members Excused: None

**2. PUBLIC COMMENTS AND RECOMMENDATIONS**

None.

**3. APPROVAL OF MINUTES**

Motion by Member Kondolf to approve minutes for the November 14, 2024, meeting as presented, seconded by Member Chambon.
Vote: Carried 3-0-1-1
Yes: Kondolf, Chambon, Garcia
No: None
Absent: Chair Filipelli,
Excused: Monica Cooper (absent 11/14/24 meeting)

**4. AGENDA REVIEW**

Jamison Crosby provided the agenda review.

**5. ADMINISTRATIVE ITEMS**

**A.** Receive a presentation on the Water Year 2024 Annual Report model results and an update on groundwater conditions in Napa County with a focus on the Napa Valley Subbasin and an update on Groundwater Sustainability Plan implementation.
Cab Esposito, LSCE, presented the item.

Chair Filipelli opened public comment; five public comments were received. Chair Filipelli closed public comment.

**B.** Technical Advisory Group (TAG) members will receive a presentation on the revised certification program concept, the development of incentive concepts to support implementation of the Groundwater Pumping Reduction and Water Conservation Workplans, an extended replanting concept program, as well as updates on related education and outreach strategies and a brief update on the water use benchmarking program. This is intended to spur discussion, questions, and provide feedback to staff and participants.
Duncan McEwan and Tori Laird, ERA Economics, presented the item.
Chair Filipelli opened public comment; two public comments were received.
Chair Filipelli closed public comment.

**C.** Receive a presentation on the status of the Interconnected Surface Water and Groundwater Dependent Ecosystems Workplan implementation with a focus on applying the California Environmental Flows Framework in the Napa Valley Subbasin and describing the process for developing ecological management goals.
Christian Braudrick, Stillwater Sciences and Jacob Katz, California Trout, presented the item.
Chair Filipelli opened public comment, two public comments were received. Chair Filipelli closed public comment.

**6. FUTURE AGENDA ITEMS**
None.

**7. ADJOURNMENT**
Meeting adjourned at 5:01pm.

_____
ANGIE RAMIREZ VEGA, Meeting Clerk

Napa County

Board Agenda Letter

1195 THIRD STREET
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Main: (707) 253-4580

Groundwater Technical Advisory Group **Agenda Date:** 4/10/2025 **File ID #:** 25-607

**TO:** Technical Advisory Group for the Napa County Groundwater Sustainability Agency

**FROM:** Brian D. Bordona, Director of Planning, Building and Environmental Services

**REPORT BY:** Jamison Crosby, Natural Resources Conservation Manager

**SUBJECT:** Update on the Water Conservation and Groundwater Pumping Reduction Workplans Implementation

## RECOMMENDATION

Technical Advisory Group (TAG) members will receive a presentation on the revised version of the NCGSA Water Certification Partnership document. In addition, the TAG will also receive an update on the extended replanting concept. This is intended to spur discussion, questions, and provide feedback to staff and participants.

Procedure
Staff introduces.
Questions and answers with the TAG.
Public comments.

## BACKGROUND AND DISCUSSION

The Napa County Groundwater Sustainability Agency (NCGSA) is implementing the Water Conservation (WC) and Groundwater Pumping Reduction (GPR) Workplans (March 2024). The WC Workplan identified a suite of water conservation practices and the GPR Workplan developed an implementation plan to achieve measurable groundwater pumping reductions and overall water savings in the Napa Valley Subbasin (Subbasin). GPR implementation includes a voluntary, incentive-driven program for growers and other water users/industries in the Subbasin to adopt and expand water conservation practices. Mandatory measures are also included if the voluntary incentive-driven programs are insufficient. Napa Valley Subbasin Groundwater Sustainability Plan (GSP) implementation also includes evaluation of on-farm practices to increase infiltration (recharge).

The TAG has received information and presentations regarding WC, GPR, and certification program concepts, incentives, outreach, and benchmarking from NCGSA staff and consultants at TAG meetings in 2022, 2023, 2024, and 2025. A water conservation certification program concept was presented at prior TAG meetings, including an overview of the program concept and an update on revisions to the program concept in response to TAG and other stakeholder comments. Based on feedback from these meetings, the certification program concept has been revised. Modifications to the program concepts include: (i) editorial changes to the document, (ii) modifying/clarifying water conservation practices, (iii) updating verification requirements, (iv) expanding potential program partnerships, (v) examples for how the program could be implemented, and (vi) participant

and partner incentives. The revised program will be presented for TAG and other feedback.

The TAG will also have an opportunity to review progress toward other GPR implementation elements, including the extended vineyard replant concept. The conceptual program would offer incentives for extending the fallow/idle period between when an old vineyard is removed, and a new vineyard is (re)planted. The program would achieve water savings by extending the idle period, which could include options such as an idle period of one or more years, one replant cycle or multiple cycles, integration with other practices to increase infiltration, and other co-benefits (e.g., cover cropping, habitat, land repurposing, and recharge efforts. An updated overview will be presented for the TAG.

**Question/Prompts for TAG Discussion**

Two (2) questions were identified for this TAG meeting:

1. Does the TAG have additional suggestions for today's discussion as we transition the certification partnership towards implementation?
    - Additional context: After feedback and subsequent revisions, the NCGSA Water Conservation Certification Partnership is ready to be implemented. The next phases will likely consist of developing an RFQ and releasing it to gather proposals.
2. Will the extended replant concept gain traction with grape growers, and what else can be done to improve the program to encourage enrollment?
    - Additional context: The extended replant program concept is a form of voluntary demand management, incentivizing vineyard managers to save water by extending the fallow period. Understanding the range of factors impacting the replant decisions of vineyard owners and managers can improve program development and increase participation once implemented.

## ENVIRONMENTAL IMPACT

ENVIRONMENTAL DETERMINATION: The proposed action is not a project as defined by 14 California Code of Regulations 15378 (State CEQA Guidelines) and therefore CEQA is not applicable.

## SUPPORTING DOCUMENTS

A. ERA Economics PowerPoint Presentation: GPR Workplan Implementation Update, April 2025

B. NCGSA Water Conservation Certification Partnership Document, April 2025

C. NCGSA Extended Replanting Concept Note, April 2025

# Napa Valley Subbasin
## Groundwater Pumping Reduction Workplan Implementation Update

Napa County GSA TAG Meeting

# Overview

1. GPR Implementation
2. NCGSA Water Certification Partnership
3. Extended Replant Concept
4. Next Steps

# GROUNDWATER PUMPING REDUCTION WORKPLAN IMPLEMENTATION

# GPR Workplan Implementation

## Guiding Framework:

- Focus on voluntary actions that achieve groundwater benefits for the Subbasin
- Assess the costs and benefits of alternative actions and focus on those that are most cost-effective
- Leverage existing programs and opportunities to generate value from a suite of voluntary actions
- Include adaptive management to adjust the program as data and sustainability indicators evolve
- Mandatory measures if voluntary programs do not achieve measurable reductions in groundwater pumping (e.g., mandatory metering/reporting)

# Development & Implementation Timeline

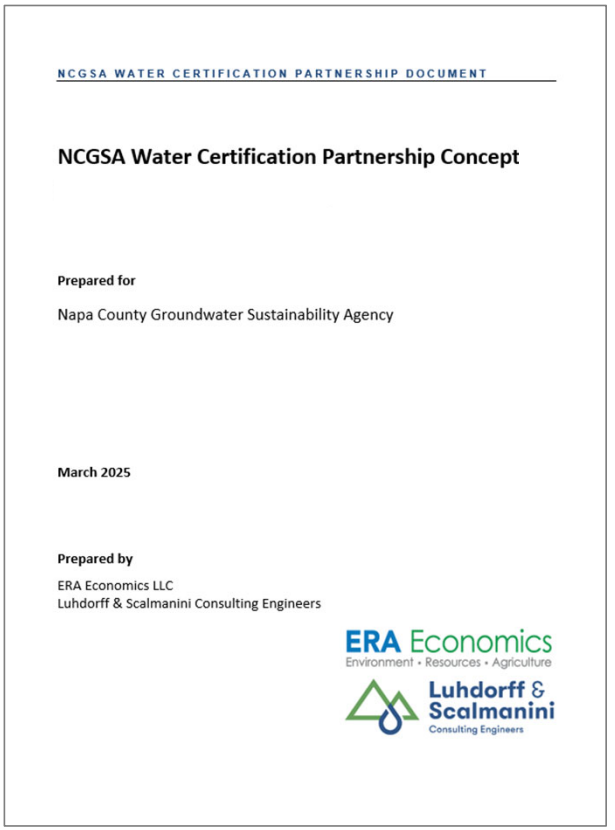
| Component/Activity | Q4 24 | Q1 25 | Q2 25 | Q3 25 | Q4 25 | Q1 26 | Q2 26 |
|---|---|---|---|---|---|---|---|
| **Component 1: Education and Outreach; Feasibility Analysis** | | | | | | | |
| Water Conservation Education Materials | D | D | D | D | I | I | I |
| Local Partnership Building | D | D | D | D | D | D | D |
| Water Conservation Messaging System | D | D | D | D | I | I | I |
| Recharge Feasibility Analysis | D | D | D | D | D | I | I |
| **Component 2: Voluntary Adoption** | | | | | | | |
| Incentivize Program Adoption | D | D | D | D | D | D | D |
| Benchmarking Pilot Program | D | D | D | D | I | I | I |
| Meter Data and Reporting Program | D | D | D | D | D | I | I |
| **Component 3: Voluntary Certification** | | | | | | | |
| Certification Partnership | D | D | I | I | I | I | I |

***D = Development, I = Implementation***

# NCGSA WATER CERTIFICATION PARTNERSHIP CONCEPT

# Water Certification Partnership

- Certification concept updates
  - Voluntary, incentive-driven partnership to encourage expansion of water conservation practices
  - Partnership with existing certification programs or other third parties (e.g., Farm Bureau, Napa RCD, etc.) to recognize vineyards and wineries implementing practices
  - One component of a suite of NCGSA programs



NCGSA WATER CERTIFICATION PARTNERSHIP DOCUMENT

**NCGSA Water Certification Partnership Concept**

**Prepared for**

Napa County Groundwater Sustainability Agency

**March 2025**

**Prepared by**

ERA Economics LLC
Luhdorff & Scalmanini Consulting Engineers

ERA Economics
Environment • Resources • Agriculture
Luhdorff & Scalmanini
Consulting Engineers

# Updated Program Overview

- **Partnership:** working with existing certification programs or third parties
- **Practices:** irrigation management, recycling/wastewater use, processes and technology
- **Metering:** required (as a conditions of receiving subsidy for certification costs)
- **Verification:** potential combination of audits, points, and self reporting
- **Data:** third party receives data and aggregates it at AVA level
- **Calculations:** quantify water savings for practices implemented at AVA level
- **Reporting:** aggregate measures of impact/benefit across AVAs and Napa Valley Subbasin

# Potential Program Incentives

# Key Components: Potential Partners

- Expand water conservation practices
- Partnership with NCGSA
- Water measurement
- Data management and aggregation
- Data reporting
- Incentives

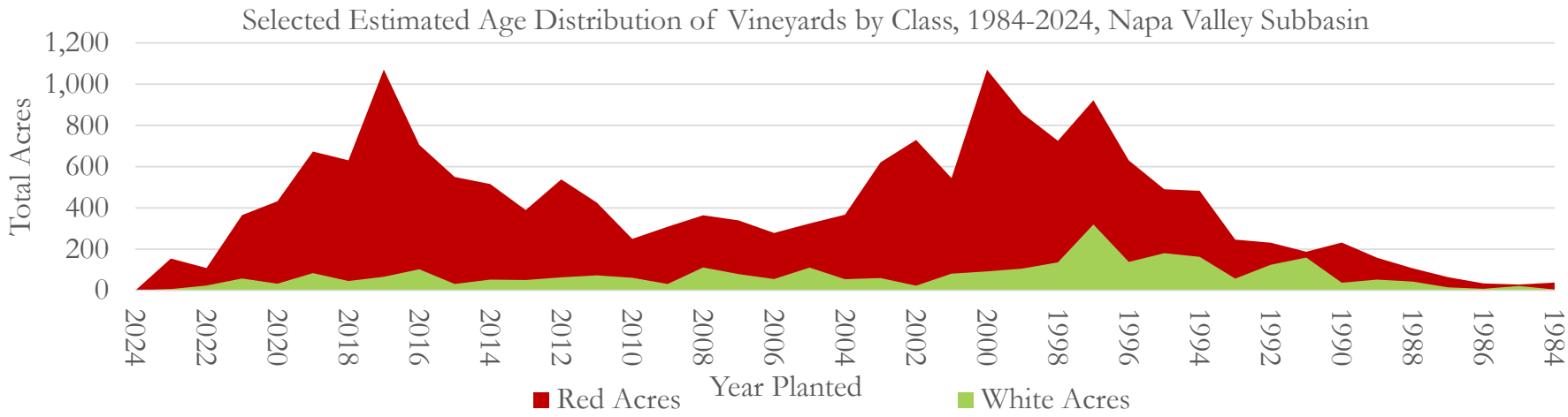
# Key Components: Wineries / Vineyards

- Implement expanded water conservation practices
- Partnership with certification program or other third-party
- Water measurement
- Data reporting
- Incentives

# VOLUNTARY EXTENDED REPLANTING PROGRAM UPDATES

# Extended Replant Program

- Voluntary program to incentivize vineyard managers to delay replanting for an extended period (+1 or 2 years)
- Extended idle leads to water savings as replants are shifted
- Can be combined with other practices to increase benefits, such as soil health and groundwater recharge

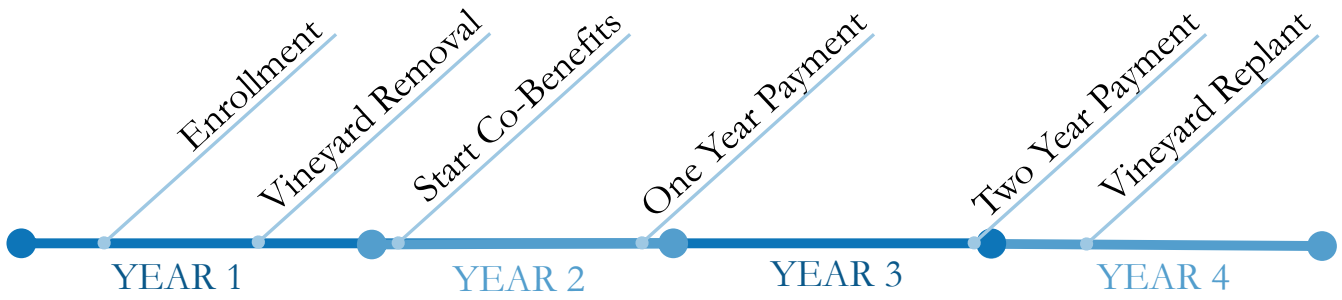


# Extended Replant Program

## Program Development Considerations

- Structure and enrollment?
- Program duration?
- What are incentives (payments)?
- Funding mechanism?
- Recharge and other conservation practices on farm?
- Integrate multi-benefit elements?

## Example 2-Year Program Timeline



# Potential Multi-Benefit Elements

Coupled w/ Extended Replant

Conservation

Recharge

Soil Health

Infrastructure

Co-Benefits and
Water Savings

# Multi-Benefit Elements: Recharge

- GPR implementation also includes evaluation of practices to increase infiltration
- Includes on farm recharge combined with replant concept
- Separate evaluation of approaches forthcoming

# NEXT STEPS

# Next Steps

Continue to implement the GPR Workplan

- Outreach
- Certification
- Incentives
- Benchmarking
- Pilot Sites
- Extended Replant / Other (Mothballing) Concepts

# NCGSA Water Certification Partnership Concept: Structure and Minimum Requirements

**Prepared for**

Napa County Groundwater Sustainability Agency

**April 2025**

**Prepared by**

ERA Economics LLC
Luhdorff & Scalmanini Consulting Engineers

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# Acknowledgements

The Water Certification Partnership document was developed by ERA Economics (ERA) and Luhdorff and Scalmanini Consulting Engineers (LSCE) on behalf of and in coordination with the Napa County Groundwater Sustainability Agency.

***NAPA COUNTY GROUNDWATER SUSTAINABILITY AGENCY BOARD OF DIRECTORS***

Anne Cottrell
Liz Alessio
Joelle Gallagher
Belia Ramos
Amber Manfree

***NAPA COUNTY TECHNICAL ADVISORY GROUP***

The Napa County Groundwater Sustainability Agency (NCGSA) Technical Advisory Group (TAG) is made up of five experts that provide guidance on the implementation of the Groundwater Sustainability Plan (GSP). The TAG has provided input on the direction, scope, and breadth of this document.

Albert Filipelli
Julie Chambon, PhD, PE
Miguel Garcia, PhD
Monica Cooper, PhD
Matt Kondolf, PhD

***ORGANIZATIONS***

During GSP implementation and throughout the development of this partnership document, many organizations and individuals provided valuable input and feedback. The Napa County Groundwater Sustainability Agency appreciates the contributions of all interested parties, including but not limited to the organizations listed below:

California Sustainable Winegrowing Alliance
Fish Friendly Farming
Napa County Farm Bureau
Napa County Resource Conservation District
Napa Green
Napa Valley Grapegrowers Association
Napa Valley Vintners Association
SIP Certified
Winegrowers of Napa County

On behalf of the Napa County Groundwater Sustainability Agency, thank you to all of the community members who participated in public meetings, information sessions, and various outreach events.

# 1. Executive Summary

The Napa County Groundwater Sustainability Agency (NCGSA) has developed and is implementing the Water Conservation (WC) and Groundwater Pumping Reduction (GPR) Workplans. The WC Workplan identified a suite of water conservation practices and the GPR Workplan developed an implementation plan to expand those practices and achieve measurable reductions in groundwater pumping in the Napa Valley Subbasin. The WC and GPR Workplans were identified in the Napa Valley Subbasin Groundwater Sustainability Plan (GSP) as measures to reduce groundwater pumping by an aggregate of 10 percent in the Subbasin. GPR implementation includes voluntary program components that incentivize growers and other water users/industries in the Subbasin to adopt and expand water conservation practices. It also includes mandatory actions as an option if voluntary actions are not successful.

One opportunity identified in the GPR implementation plan for encouraging voluntary adoption of water conservation practices is expanding adoption of certification programs or working with new partners to expand certification. Certification programs require participating operations to meet specified standards to become certified. Expanding certification standards to include new water conservation measures and reporting would result in measurable reductions in groundwater pumping. This could be accomplished by working with existing certification programs to expand and include water conservation measures and reporting, or by working with one or more new partner organizations.

This document defines the framework and elements for the NCGSA Water Certification Partnership. Under this program the NCGSA would partner with one or more existing certification programs, or other partner organizations, to incentivize vineyards and wineries to expand water conservation practices to realize measurable reductions in groundwater pumping and use. It is referred to as a partnership because it is meant to encourage wider adoption of water conservation practices through existing programs to support sustainable groundwater conditions in the Napa Valley Subbasin. Program participation is voluntary.

The NCGSA Water Certification Partnership includes six core elements that are described in detail in this document and summarized as follows:

1. **Minimum water conservation practices** for vineyards and wineries that the NCGSA has determined would reduce groundwater use in the Napa Valley Subbasin. These water conservation practices must be implemented under the program.
2. **NCGSA partnership with existing certification programs or new organizations** that will be responsible for certifying that the minimum water conservation practices are being implemented.
3. **Verification of water conservation practices** by the partner organization(s). This can be accomplished by multiple approaches determined by the partners, including a combination of third-party audits, self-reporting, certification program assessments, and points-based systems.
4. **Water measurement** is a required water conservation practice under the program. That is, any certified entity is required to track groundwater pumping and report to the certification program.

5. **Anonymized water data reporting** from the certification partner(s) to the NCGSA is required. This allows for tracking program progress and demonstrating actual water savings. A certified operation (vineyard or winery) submits groundwater use data to the partner certification program or its designated third-party organization. The data is aggregated and anonymized before it is reported to the NCGSA so that it remains confidential to the individual winery or vineyard. The NCGSA is responsible for measuring water conservation in the Napa Valley Subbasin that is attributable to the partnership program.
6. **Incentives for participation** include payments targeted to both partner certification programs and participants (wineries and vineyards). Incentives are designed to encourage participation.

The Water Certification Partnership (hereafter, Partnership) will be implemented concurrently with other components of the GPR Workplan implementation. As the program matures, the Partnership framework will be evaluated and periodically updated through an adaptive management process. This document describes the Partnership concept and core elements.

The next steps for implementing the Partnership include working with interested parties that would include existing certification programs and potential new partners. This may include NCGSA working with interested entities or releasing a request for proposal/qualifications to select one or more partners. It is anticipated that implementation would start in Spring / Summer of 2025.

# 2. Background

The Napa County Groundwater Sustainability Agency (NCGSA) developed a Groundwater Sustainability Plan (GSP) for the Napa Valley Subbasin (Subbasin) that was reviewed and approved by the Department of Water Resources (DWR) in 2022 The GSP included several projects and management actions that NCGSA will implement to achieve and maintain sustainable groundwater conditions in the Subbasin, as required by the Sustainable Groundwater Management Act (SGMA). Management actions include reducing total groundwater pumping from the Subbasin by about 10 percent over current levels.

To achieve reductions in groundwater pumping the NCGSA has developed and is implementing the Water Conservation (WC)[1] and Groundwater Pumping Reduction (GPR)[2] Workplans. The WC Workplan identified a suite of water conservation practices and the GPR Workplan developed an implementation plan to achieve measurable reductions in groundwater pumping in the Napa Valley Subbasin. GPR implementation includes voluntary program components that incentivize growers and other water users/industries in the Subbasin to adopt and expand water conservation practices. It also includes mandatory actions as an option if voluntary actions are not successful. Water conservation actions include those that reduce total groundwater pumping and those that may also reduce net depletion of groundwater (total groundwater pumping less usable groundwater that returns to the aquifer).

One opportunity identified in the GPR implementation plan for encouraging voluntary adoption of water conservation practices is leveraging the concept of certification programs. Certification programs require participating operations to meet specified standards to become certified. In exchange, certified businesses can demonstrate good stewardship of resources, meet regulatory standards, satisfy buyer specifications, label their product in a certain way, and potentially have access to new markets. This can also create additional value (higher price or cost savings) for some producers.

This document defines the framework and elements for the **NCGSA Water Certification Partnership**, a partnership with existing certification programs and other organizations to incentivize vineyards and wineries to expand implementation of water conservation practices[3]. The Partnership is to work with programs to **expand water conservation practices**, provide **incentives to implement expanded practices**, **certify that those practices** are being implemented, and **measure the resulting water savings**. This Partnership is designed to encourage additional adoption of practices and provide an opportunity for vineyards and wineries to receive recognition for existing practices.

This Partnership document defines minimum standards and requirements for the program that broadly include:

- Requirements for water conservation practices implemented by vineyards and wineries. This includes specific practices and the timeline for implementing practices.

[1] https://www.countyofnapa.org/DocumentCenter/View/30301/Napa-County-Water-Conservation-Workplan-PDF?bidId=
[2] https://www.countyofnapa.org/DocumentCenter/View/30303/Groundwater-Pumping-Reduction-Workplan-PDF?bidId=
[3] Water conservation is being evaluated for all industries in Napa County, including municipal and industrial (M&I) water users. M&I water use, conservation opportunities, and existing programs are different than opportunities for vineyards and wineries. Programs and water conservation opportunities for M&I water uses are described in the Water Conservation and Groundwater Pumping Reduction Workplans. M&I water conservation is being evaluated under other GPR Workplan implementation components.

- Standards for self-assessments, program, and third-party audits and verification to determine that practices are implemented and maintained.
- Water measurement, data and reporting requirements for measuring program water conservation.
- Preliminary estimates of program costs and incentives for encouraging program adoption.

The minimum standards for the NCGSA Water Certification Partnership are specific in key components, but they are also purposefully flexible to include a wide range of potential partners and their different standards. The NCGSA anticipates working with one or more existing certification programs and/or other organizations to implement this Partnership. This partnership program is anticipated to be one aspect of a larger suite of NCGSA programs to promote and incentivize water conservation in the Napa Valley Subbasin. It is a voluntary program and not intended to be a new regulatory process.

The following sections of this document provide an overview of current certification programs in Napa County, define minimum water conservation practices for the NCGSA Water Certification Partnership, requirements for data and reporting, and opportunities for incentives to encourage program participation.

# 3. Current Winery and Vineyard Certification Programs

There are multiple certification programs that serve the wine industry in Napa County. These programs have different missions, water conservation practices, standards, verification methods, data reporting, and program costs. Due to the complexity of the program requirements and different program objectives, it is difficult to directly compare the programs. In general, vineyards and wineries utilize these programs to meet various goals related to regulatory compliance, stewardship, sustainability, and marketing.

## 3.1 Certification Goals

In Napa Valley, wineries and vineyards have various motivations to obtain certification, from demonstrating responsible business practices to fulfilling market expectations. Interviews with industry representatives, certification programs, and businesses identified the following key goals and incentives for certification:

- **Business practices and resource stewardship**. Many Napa wineries and vineyards view certification as a mark of commitment to high standards and environmental stewardship. This allows businesses to showcase their dedication to industry-leading practices and resource conservation, enhancing their reputation among peers and consumers.
- **Consumer preferences and marketing**. Growing consumer interest in responsibly produced wines may provide some certified businesses with a marketing edge. Certification sets these businesses and their products apart from their competitors by validating their sustainability claims through independent verification of a set of standards. Some certified producers report

they may achieve a modest price premium; although in Napa Valley, isolating the premium from factors like grape quality, brand reputation, and broader industry practices is challenging.

- **Regulatory compliance**. Some programs can also assist vineyards and wineries with meeting regulatory requirements for farming and other businesses practices in industry.
- **Buyer specifications**. Components of some certification programs are recognized by international buyers. This provides value to businesses exporting wine to meet requirements in export countries.

Enrolling in a certification program can be costly and is voluntary. Expanding participation in certification programs—especially for water conservation practices—requires developing incentives that align with business objectives and industry goals.

### 3.2 Existing Programs

There are multiple vineyard and winery certification programs in California. Every certification program certifies other practices in addition to irrigation and water conservation. This includes practices such as pest management, nutrient management, soil health, social equity, ecosystem, fire, air quality, energy, and climate. In short, certification programs offer their members a wide scope of certified practices in addition to water conservation. These additional practices are developed, in part, to meet consumer expectations and buyer specifications, and for the broader program objectives for the certification program.

There are four main certification programs in the Napa County region. [4] These four programs include some water conservation practices, many of which align with the goals of the GPR Workplan. The programs include:

- **Napa Green (NG)**. Napa Green is a sustainable winegrowing certification program focusing specifically on water efficiency, supply chain efficiency, energy efficiency, regenerative farming, soil health, and social equity. The local program has more than 90 Napa Green Certified wineries and 90 growers certified or in the process of becoming certified, representing over 7,200 vineyard acres certified or under transition in Napa County.
- **California Sustainable Winegrowing Alliance (CSWA)**. Certified California Sustainable Winegrowing is a certification program dedicated to producing quality winegrapes and wine while protecting the environment, people, and businesses. The program operates statewide and has approximately 44 wineries and 260 vineyards on 15,500 acres certified in Napa County.
- **Sustainability In Practice (SIP) Certified**. SIP Certified is a certification program for winegrowers and winemakers centered around economic viability (prosperity), environmental stewardship (planet), and social equity (people) outcomes and practices. This program focuses on vineyards and wineries on the Central Coast of California with some additional certifications in other parts of California, Oregon, and Michigan.

[4] There are other certifications and programs in Napa. A review of existing programs is also provided in the Water Conservation Workplan.

- **Fish Friendly Farming (FFF)**. Fish Friendly Farming is a vineyard and agricultural sustainability program, supporting regulatory compliance with water quality regulations and other environmental improvements, including water conservation and efficiency. It is the only program listed here that is specifically for regulatory compliance. This program serves 13 counties in California, with over 40,000 acres certified in Napa County.

There are many other organizations in Napa County that offer support to businesses seeking certification or regulatory compliance through resources, technical assistance, and data submission. For example, the Napa County Resource Conservation District (RCD) provides assistance with farm plan development under the LandSmart program. Napa County Farm Bureau (NCFB) manages submission of its members' data for Region 2 Water Board's Vineyard General Permit.

Figures 1 and 2 summarize four existing certification programs for vineyards and wineries. Since the programs differ in the practices that they certified, the programs are not directly comparable. However, the figures provide a concise summary of practices certified, presence in Napa and other regions, and program costs. The factors summarized include:

- An indication for whether each program offers vineyard **certification** and/or winery certification.
- Certification **costs**, including up-front (one-time) costs and annual ongoing costs. Program costs also include any additional costs, notes, and third-party audit costs (e.g., a third-party that verifies specific practices have been implemented).
- A list of **water conservation practices** that the program (currently) certifies, and any notes on each practice. This illustrates the current scope of water practices included in each program. The purpose of the NCGSA Water Conservation Partnership is to expand these practices.
- The **verification process** that the certification program uses, including if a third-party auditor is used and whether water metering is (currently) required by the program.
- A summary of the **Napa County presence** and **California presence** shows the number of acres/operations certified in each region. This provides an overview of the extent of each program's existing operations in Napa County.
- **Other program certifications** indicate other non-water conservation components of each certification program from pest management to climate and air quality.
- Lastly, the figures summarize **other program considerations** including education and outreach and the process for updating program guidelines and requirements.

Additional information about each program can be found on each program's website or by contacting a representative of the program.

**Figure 1: Vineyard Certification Comparison Chart**

| | California Sustainable Winegrowing Alliance | Fish Friendly Farming | Napa Green | SIP Certified |
|---|---|---|---|---|
| **Vineyard Certification** | Yes | Yes | Yes | Yes |
| **Costs** | | | | |
| Certification Cost (Up Front) | $0 | $500 + $12/acre | $250 | $500/$1,000 |
| Certification Cost (Annual) | $250-$2,500 | $0 | $500-$4,500 | $5-$20/acre |
| Additional Costs | $250 for vineyard management companies | 92% of Napa vineyards already paid initial | $125/hr for Carbon Farm Plan (every 3 years) and DU services (every 3-4 years) | $0 |
| Third-Party Audit | $650-$2,000+, depending on size | $500 every 5 years | $500-$1,500 every 3 years, depending on size | $100 - $2,000+ annually, depending on size and cycle type |
| **Water Conservation Practices** | | | | |
| Distribution Uniformity Testing | Yes | Yes | Yes | Yes |
| Metering (Water Use) | Yes (Category 3) | Yes | Yes | Yes |
| Soil Moisture Monitoring | Yes | Yes | Yes | Yes |
| Plant Water Status Monitoring | Yes | Yes | Yes | Yes |
| Water Source Documenting | No | Yes | Yes | Yes |
| Notes on Water Source | Auditors check data collection methods, and site specific efforts are made to minimize negative impacts on watershed issues | N/A | N/A | Wells are mentioned several times; when a well isn't used, source water is identified so backflow prevention can be implemented |
| Low-Volume Irrigation (e.g., drip) | Yes | Yes | Yes (Baseline) | Yes |
| Water Conservation for Replanting | No | Yes | Yes | No |
| Cover Cropping | Yes | Yes | Yes | Yes |
| Erosion Control | Yes | Yes | Yes | Yes |
| **Verification Process** | | | | |
| Third Party Verification | Yes | Yes | Yes | Yes |
| Report Metered Water Use | Yes | Yes | Yes | Yes |
| Verification Frequency | Annual | 5 years | Annual | Annual |
| Other Notes | Must rank Category 2 for 85% of 148 practices; 60 required practices; main costs from annual audit | Certified by National Marine Fisheries Service and County Agricultural Commissioner; annual online audits | Interim annual desk audits; third-party audit every 3 years | Third-party desk audit annually; Third-party onsite visit at least every 3 years |
| **Napa County Presence** | | | | |
| Vineyard Acres Certified | 15,500 | 40,000 | 6,000 | 390 |
| Number of Vineyards Certified | 260 | 1,100 | 91 | 12 |
| **California Presence** | | | | |
| Vineyard Acres Certified | 204,000 | 224,000 | 6,000 | 46,000+ (CA, OR, MI) |
| Number of Vineyards Certified | 2,247 | 2,000 | 91 | 400+ |
| **Other Program Certifications** | | | | |
| Pest Management | Yes | Yes | Yes | Yes |
| Applied Nitrogen | Yes | Yes | Yes | Yes |
| Social Equity | Yes | Yes | Yes | Yes |
| Forest/Fire Management | No (Not required, but provide resources for fire preparedness and practices to help with fire prevention) | Yes (Separate Fire Risk Reducion certification) | Yes | No |
| Ecosystem Management | Yes | Yes | Yes | Yes |
| Air Quality and Climate Protection | Yes | Yes (Separate Climate Adaptation certification) | Yes | Yes |
| **Other Program Considerations** | | | | |
| Educational Tools/Events | Yes | Yes | Yes | Yes |
| Process for Program Updates | Annual review | Annual review | Bi-annual update; Updates more frequently as needed | Annual review; 5-year peer review |

**Figure 2: Winery Certification Comparison Chart**

| | California Sustainable Winegrowing Alliance | Fish Friendly Farming | Napa Green | SIP Certified |
|---|---|---|---|---|
| **Winery Certification?** | Yes | No | Yes | Yes |
| **Costs** | | | | |
| Certification Cost (Up Front) | $0 | N/A | $0 | $500/$1,000 |
| Certification Cost (Annual) | $300-$5,000 | N/A | $550-$5,000 | $0.002-$0.03/gallon; 25% discount if combined with Vineyard certification |
| Additional Costs | $100 discount for certifying both winery and vineyard | N/A | Integrated resource audit in year 1, 6, 12,... $1,250-3,000; abbreviated resource audit in year 3, 9, 15,... $750-$2,000 | Only one application fee when certifiying both vineyard and winery; no cost to add winery to existing vineyard certification |
| Third-Party Audit | $650-$2,000+ per year, depending on size | N/A | $500-$1,500+ every 3 years, depending on size | $100 - $2,000+ annually, depending on size and Cycle type |
| **Water Conservation Practices** | | | | |
| Waste Water Management | Yes | N/A | Yes | Yes |
| Metering (Water Use) | Yes (category 3) | N/A | Yes | Yes |
| Sanitation | Yes | N/A | Yes | Yes |
| Landscaping | Yes | N/A | Yes | Yes |
| Process Water Reuse | Yes | N/A | Yes | Yes |
| Water Timing (off-peak hours) | Yes | N/A | Yes | Yes |
| **Verification Process** | | | | |
| Third Party Verification | Yes | N/A | Yes | Yes |
| Report Metered Water Use | Yes | N/A | Yes | Yes |
| Verification Frequency | Annual | N/A | Annual | Annual |
| Other Notes | Annual self-assessment; 4 categories; must rank category 2 for 85% of 108 requirements; 41 required practices; main costs from annual audit | N/A | Annual desk audit; third-party audit every 3 years; Winery Irrigation Resource Assessment is an "Upfront Cost" because it is required to be certified. | Third-party desk audit annually; Third-party onsite visit every 3 years |
| **Napa County Presence** | | | | |
| Wineries Certified | 44 | N/A | 92 | N/A |
| **California Presence** | | | | |
| Wineries Certified | 171 | N/A | 92 | 6 |
| **Other Program Certifications** | | | | |
| Energy or Greenhouse Gas Reporting | Yes | N/A | Yes | Yes |
| Social Equity | Yes | N/A | Yes | Yes |
| Labor/Employee Practices | Yes | N/A | Yes | Yes |
| Sustainable Purchasing | Yes | N/A | Yes | Yes |
| Air Quality and Climate Protection | Yes | N/A | Yes | Yes |
| **Other Program Considerations** | | | | |
| Educational Tools/Events | Yes | N/A | Yes | Yes |
| Process for Program Updates | Annually reviewed; regulatory compliance | N/A | Annually reviewed | Annual Review; 5-year Peer Review |

# 4. NCGSA Water Certification Partnership

Existing certification programs include selected water conservation measures. One of the purposes of this Partnership is to expand water conservation measures that are required by the certification program. This provides a benefit to the Napa Valley Subbasin by reducing water use and meeting the goals of the GSP. The Partnership defines minimum water conservation practices that must be met.

Certification program participation will be voluntary. It is not intended to be an additional regulatory burden for participants, but rather an opportunity to be recognized for conserving water in a region with significant concerns for the future of water and agriculture sustainability. The NCGSA Water Certification Partnership provides a process for measuring and validating water conservation practices and furthers outreach and education about water stewardship in the Napa Valley Subbasin.

Potential parties in the program include both partner organizations and wine industry businesses. These are defined as follows:

- **Partner organizations**. These are the existing certification programs, or other organizations such as Napa RCD and Farm Bureau, that would be recognized by the NCGSA as meeting the minimum requirements of the NCGSA Water Certification Partnership.
- **Certified vineyard and winery businesses**. These are participants (certified vineyards and wineries) that include wineries and vineyards located within the Napa Valley Subbasin. Participants attain or maintain certification through one or more of the partner organizations.

The following sections define the NCGSA Water Certification Partnership, including the Partnership's structure, minimum requirements for water conservation practices, verification, reporting, and steps for implementation.

### 4.1 Program Structure

The NCGSA Water Certification Partnership structure defines how the Partnership will be implemented by the NCGSA. The following options were considered:

1. A stand-alone program managed by NCGSA staff. There would be no partnerships in this option, as the NCGSA would be the program. This would impose a substantial administrative burden on the NCGSA and duplicate some of the efforts of other certification programs that already operate in the county. Therefore, this option was rejected.
2. NCGSA partners with one or more local organizations to develop components of the program. For example, the Napa County RCD manages the LandSmart program that assists growers with resource management and Farm Bureau manages Region 2 Water Board's Vineyard General Permit. This program or similar organizations/programs could be expanded to become the NCGSA Water Certification Partnership.
3. An existing certification program endorsed by NCGSA that meets minimum requirements for water conservation practices and verification. This would reduce the administrative burden on the NCGSA and would leverage an existing certification program that meets minimum

requirements defined by NCGSA. It may also require an existing certification program to modify standards to meet NCGSA requirements.

4. Multiple existing certification program endorsed by NCGSA that meet minimum requirements for water conservation practices. This would reduce the administrative burden on the NCGSA and would leverage multiple existing certification programs that meet minimum requirements defined by NCGSA, offering participating businesses more program options to choose from. It could also require existing certification programs to modify standards to meet NCGSA requirements.

After discussion and feedback, the recommended program structure is partnering with multiple existing certification programs or other interested organizations that meet the minimum requirements for water certification practices (Options 3 and/or 4). This gives businesses the most options for selecting a certification that meets their business goals while reducing the administrative burden for the NCGSA. In addition, this option offers NCGSA the opportunity to also partner with other organizations within the county to assist with the program.

A partner organization is responsible for one or more of the following program activities:

- **Certification.** This includes verifying that water conservation practices are implemented according to standards, communicating the framework for participants to apply for certification, and the auditing processes for verification. Existing certification programs have these protocols in place. However, other or new organizations may also develop these standards.
- **Data reporting and confidentiality.** This includes collecting, maintaining, and reporting water-related data from certified participating business and maintaining individual user's data confidentiality. Existing certification programs, data vendors/software solution service providers, or other organizations.
- **Water conservation analysis.** This includes calculating the estimated water savings of Partnership program and measuring its impact and contribution to sustainability indicators. The NCGSA may provide this service, or it may be provided by existing certification programs, other organizations, or third-party service providers.

An existing certification program or organization may complete all of these activities, or partner with other entities. For example, an existing certification program may certify businesses and report anonymized data to NCGSA that it can apply to evaluate program effectiveness. Or an organization such as Napa County RCD and Farm Bureau may partner to offer certification and data reporting services, similar to the Region 2 Water Board's Vineyard General Permit. The Partnership is purposefully defined as flexible for the NCGSA to work with one or more interested programs.

### 4.2 Minimum Water Conservation Practices

This section defines the minimum water conservation practices for the NCGSA Water Certification Partnership. The minimum required practices are described for vineyards and wineries, with some practices that potentially apply to both business types.

This NCGSA Water Certification Partnership defines minimum water conservation practices and the timeline for implementing those practices. As described in Section 3.2, many certification programs already require some water conservation practices. The Partnership expands the minimum water conservation practices to achieve additional water conservation in the Napa Valley Subbasin.

Many of the minimum requirements are purposefully flexible to allow for alignment to a wide range of existing certification programs. For example, Napa vineyards use different technologies to monitor plant stress and soil moisture. The minimum requirements do not define exact practices that must be implemented. Rather, the minimum requirements list a range of alternatives and require that one or more practices are implemented and documented. More specific guidelines are left to the partner certification entity.

#### *4.2.1 Vineyard Minimum Water Conservation Practices*

The NCGSA Water Certification Partnership defines minimum water conservation practices for vineyards. The practices are based on industry outreach, certification program outreach, the analyses described in the Water Conservation and Groundwater Pumping Reduction Workplans, and subsequent analyses to implement the Workplans. Under this Partnership, partner certification entities would verify vineyards have implemented these minimum practices. Table 1 summarizes the minimum water conservation practices for certified vineyards.

**Table 1: Vineyard Minimum Water Conservation Practices**

| Practice | NCGSA Program Minimum Requirement |
|---|---|
| **Irrigation System Maintenance and Efficiency** | All irrigation systems must be monitored and inspected for leaks, flow issues, line pressure, and filter cleaning frequently. Vineyard operators are responsible for taking action to fix issues as they arise and adjusting systems for improved efficiency. |
| **Distribution Uniformity** | All irrigation systems must be tested by a trained professional for distribution uniformity at least once every five years. Upon completion of testing, vineyards must address any identified issues with emitter outflows and pressure differences within the recommended timeframe, no more than three years after receipt of testing results and recommendations. |
| **Water Measurement/Metering** | All wells or other groundwater sources providing irrigation must be metered within three years of initial certification. Meter installation, maintenance, and recalibration must be completed according to manufacturer's recommendations. If transitioning to metering, water use must be measured with remote or ground-based sensing of evapotranspiration (ET), irrigation frequency and application specifications, or well electricity records and specifications in the interim. Water use must be documented and reviewed during the irrigation season, resulting in an annual cumulative measurement of applied water. |
| **Recycled Water** | Vineyard operations with access to recycled water must prioritize and utilize those supplies for irrigation. Applications of recycled water must be documented and recorded, similar to other applied water sources. |
| **Informed Irrigation Scheduling** | Vineyard operators must employ at least one soil moisture or plant stress monitoring technology in their operation. |

| | |
|---|---|
| **Management Practices:** | Vineyard operators must select and implement at least one soil management and one canopy management practice with positive effects on water use. |
| *Soil Management* | |
| *Canopy Management* | |
| **Planting Design Practices:** | When installing new plantings, vineyard operators must design blocks with consideration for water conservation, using factors such as rootstock selection, irrigation system design, and row orientation. This may also include dry farming in areas where it is appropriate to do so. |
| *Rootstock Selection* | |
| *Irrigation Systems* | |
| *Row Orientation* | |

The following describes each practice[5] and minimum requirements listed in Table 1.

**Irrigation System Efficiency**. Well-managed irrigation systems can effectively provide water to vines to reach an operation's fruit goals and vine health. System improvements can increase the efficiency of water delivery, reducing water loss. These improvements include a range of actions, from fixing leaks to improving system management and monitoring.

- **Requirement**: All irrigation systems must be monitored and inspected for leaks, flow issues, line pressure, and filter cleaning frequently. Vineyard operators are responsible for taking action to fix issues as they arise and adjusting systems for improved efficiency.

**Distribution Uniformity**. An evenly pressurized irrigation system can provide water equally to each vine in a vineyard, improving fruit quality as well as helping identify system issues to reduce water use. Testing irrigation systems helps identify issues and prevent over or under-irrigation. Distribution Uniformity (DU) tests evaluate how evenly water is distributed to the block or field throughout the irrigation system. In Napa Valley, several local businesses and organizations provide DU testing at little to no cost to the producer.

- **Requirement**: All irrigation systems must be tested by a trained professional for distribution uniformity at least once every five years. Upon completion of testing, vineyards must address any identified issues with emitter outflows and pressure differences within the recommended timeframe, no more than three years after receiving testing results and recommendations.

**Water Measurement/Metering.** Simply measuring water use helps vineyards and wineries identify opportunities for reducing water use. Measuring water use is also important for evaluating water conservation and efficiency of the Partnership program over time. Water use is best measured with meters or other measurement methods, including ground-based or remote sensing of ET, irrigation frequency and application specifications, or well electricity records and specifications.

- **Requirement**: All wells or other groundwater sources providing irrigation must be metered within three years of initial certification. Meter installation, maintenance, and recalibration must be completed according to manufacturer's recommendations. If transitioning to metering, water use must be measured with remote or ground-based sensing of evapotranspiration (ET), irrigation frequency and application specifications, or well electricity records and specifications

[5] Additional technical details and cost estimates for each practice are available in the Water Conservation Workplan and the Groundwater Pumping Reduction Workplan.

in the interim. Water use must be documented and reviewed during the irrigation season, resulting in an annual cumulative measurement of applied water. Water use data must be submitted to the certification program[6].

**Recycled Water**. Recycled water is treated wastewater that is then delivered for other uses, such as irrigation. Some vineyards can recycle (reuse) winery wastewater under specific conditions, and the Napa Sanitation District (NapaSan) treats, manages, and provides recycled water for delivery to specific areas in the county. Not all parcels are able to receive or apply recycled water.

- **Requirement**: Vineyard operations with access to recycled water must prioritize and utilize those supplies for irrigation. Applications of recycled water must be documented and recorded, similar to other applied water sources.

**Informed Irrigation Scheduling.** Informed irrigation scheduling relies on data and technologies to inform irrigation timing and quantity, which can provide benefits by improving irrigation efficiency, reducing water loss, and supporting productivity and fruit quality. Informed irrigation scheduling can be based on plant and soil moisture monitoring, ET monitoring, or other measures based on multiple available technologies. These can be soil-based monitoring for soil moisture depletion and/or plant-based water stress monitoring for vineyard moisture uptake and use. The technologies recommended include but are not limited to time temperature domain reflectometry, neutron probe, tensiometers, pressure chamber/bomb, leaf porometer, and normalized difference vegetation index measurements.

- **Requirement:** Vineyard operators must employ at least one soil moisture or plant stress monitoring technology in their operation.

**Management Practices**. Several agronomic practices can support efficient water use in a vineyard. These practices fall under two categories:

- *Soil Management*. Managing soil health can provide water benefits by improving soil structure and infiltration, moderating soil temperature, reducing reflectivity, increasing water retention, and supporting root growth. These practices include implementing cover crops, mulching, compost applications, and reduced tillage.
- *Canopy Management.* Vineyard canopies are carefully managed for productivity and fruit quality. Specific actions can be taken to reduce crop consumptive water use and save water, such as microclimate monitoring, fruit to pruning weight ratio, shoot density, and leaf pulling.

Individual operations have different goals and management approaches. For this program, operators are required to implement at least one water conservation practice from each category, for a total of two management practices. Defining the practices within these two categories is at the discretion of the certifying program.

- **Requirement**: Vineyard operators must select and implement at least one soil management and one canopy management practice with positive effects on water use.

[6] As described in Section 5 this data will be confidential and anonymized by the certification program.

**Planting Design Practices**. The permanent structure of a vineyard can impact its long-term water consumption patterns. When planting or replanting a vineyard, producers have control over design factors that reduce water use over the vineyard's lifetime. These factors can include but are not limited to:

- *Rootstock Selection*. Vineyard rootstocks are selected for pest and disease resistance, and some varieties provide drought tolerance. These traits enable healthy vines to uptake water more effectively under stress and can help manage water during times of shortage.
- *Irrigation Systems*. During replanting, vineyards can install updated low-flow irrigation systems to improve efficiency and reduce applied water, typically through drip irrigation. These systems should be designed by a qualified professional and installed following the original design. Producers may also forgo systems in favor of dry land farming if it meets their production requirements.
- *Row Orientation*. The orientation of vineyard rows affects sun and wind exposure, which affects crop consumptive water use. Adjusting row orientation to optimize these elements can reduce water use over the vineyard's lifetime.

These factors can be considered and developed through a design plan or similar documentation, which shows the vineyard's design and describes how these factors are addressed for optimal water conservation considering the operation's goals.

- **Requirement**: When installing new plantings, vineyard operators design blocks with consideration for optimal water conservation, using factors such as rootstock selection, irrigation system design, and row orientation.

#### *4.2.2 Winery Water Conservation Practices*

The NCGSA Water Certification Partnership defines minimum water conservation practices for wineries. The practices are based on industry outreach, certification program outreach, and the analyses described in the Water Conservation and Groundwater Pumping Reduction Workplans. Under this program, partner certification entities would verify wineries have implemented these minimum practices.

A summary of the minimum water conservation practices for certified wineries is presented in Table 2.

**Table 2: Winery Minimum Water Conservation Practices**

| Practice | NCGSA Program Minimum Requirement |
|---|---|
| **Winery Sanitation Processes** | Wineries must implement at least one water-saving technology or other enhanced water-saving technique in winery sanitation processes. |
| **Processing Water Treatment and Reuse** | Wineries able to implement additional treatment processes to recycle treated wastewater or with access to recycled water must prioritize utilizing treated wastewater for beneficial use, such as landscaping or irrigation purposes. |

| | |
|---|---|
| **Landscape Irrigation Efficiency** | All landscape irrigation systems must be monitored and inspected for leaks, flow issues, line pressure, and filter cleaning frequently. Wineries are responsible for taking action to fix issues as they arise and adjusting systems for improved efficiency. |
| **Water Measurement/Metering** | All wells or other groundwater sources providing water for irrigation or operations must be metered within three years of initial certification. Meter installation, maintenance, and recalibration must be completed according to manufacturer's recommendations. If transitioning to metering, water use must be measured with landscape irrigation frequency and application specifications or well electricity records and specifications in the interim. Water use must be documented and reviewed during the irrigation season, resulting in an annual cumulative measurement of water used. |

**Winery Sanitation Processes.** Wineries must clean tanks and complete other operations that use water. New technologies are available to reduce water use in these processes, such as tank and barrel steamers or clean-in-place (CIP) equipment. In addition, other management practices can help reduce water use during sanitation processes, such as timers and automatic shut-off valves on equipment.

- **Requirement:** Wineries must implement at least one water-saving sanitation technology or other enhanced water-saving technique in winery processes.

**Processing Water Treatment and Reuse.** Reusing water in wineries is an opportunity to reduce net water use. Winery process water must currently be treated and managed before discharging to land to comply with state regulations. Some treatment processes can make the water usable for landscaping or vineyard irrigation purposes. Not all wineries are able to treat wastewater to this level or use recycled water.

- **Requirement:** Wineries that are able to implement additional treatment processes to recycle treated wastewater or with access to recycled water must prioritize utilizing treated wastewater for beneficial use, such as landscaping or agricultural irrigation purposes.

**Landscape Irrigation Efficiency.** Irrigated landscaping around a winery can be a major water user. In addition to installing native/low water plants, irrigation timing, and other design actions, system improvements can increase the efficiency of water delivery and reduce water loss. These improvements include a range of actions, from fixing leaks to improving system management and monitoring.

- **Requirement.** All landscape irrigation systems must be monitored and inspected for leaks, flow issues, line pressure, and filter cleaning frequently. Wineries are responsible for taking action to fix issues as they arise and adjusting systems for improved efficiency.

**Water Measurement/Metering.** Simply measuring water use helps vineyards and wineries identify opportunities for reducing water use. Measuring water use is also important for evaluating water

conservation and efficiency of the Partnership program over time. Water use is best measured with meters or other measurement methods, including ground-based or remote sensing of ET, irrigation frequency and application specifications, or well electricity records and specifications.

- **Requirement:** All wells or other groundwater sources providing water for irrigation or operations must be metered within three years of initial certification. Meter installation, maintenance, and recalibration must be completed according to manufacturer's recommendations. If transitioning to metering, water use must be measured with landscape irrigation frequency and application specifications or well electricity records and specifications in the interim. Water use must be documented and reviewed during the irrigation season, resulting in an annual cumulative measurement of water used.

### 4.3 Minimum Verification and Audit Requirements

The NCGSA Water Certification Partnership requires verification that minimum water conservation practices are implemented. Existing certification programs use multiple methods to determine whether the required practice is met and verify compliance with certification requirements.

Water conservation practice requirements may be defined by options that include but are not limited to:

- Defining mandatory practices that must be implemented.
- Defining elective practices that may be implemented, or must be implemented over a defined period For example, a program could list soil and crop water monitoring methods and require a business to select at least one to meet the certification practice requirement.
- Scoring (i.e., a points-based system) may be applied where points are assigned to different water conservation practices, with a minimum score required to receive certification.
- Measures of continuous improvement may be used to require continuous progress/investment toward a required practice.

A certification program must verify practices, and this may be accomplished by the following audit options that include but are not limited to:

- Self-reporting, where the certified business self-reports compliance with specific aspects of the program. For example, a business may self-report that it is using specific technologies, and the certification program may only verify that periodically.
- Third-party audits are independent experts that review records, visit a site, and verify that specific requirements are met. These are typically viewed as the most robust verification method because an independent party reviews records, however this also increases costs. These are strongly preferred by the NCGSA Water Certification Partnership, but are not specifically required.

- Certification program audits, where the certification program has experts on staff that can audit specific requirements.

A partner certification program will be responsible for defining the minimum water conservation practices and certifying vineyards and/or wineries. The partner certification program or other designated certifying entity will determine if certified vineyards and wineries meet the minimum requirements. This can be accomplished using any of the above defined methods, or others that may be proposed by the certification program. However, NCGSA reserves the right to review and accept any verification methods. This is important for ensuring that the program achieves measurable water conservation.

To maintain certification recognition annually, participants are required to maintain and submit data to the partner certification entity that demonstrates compliance with each practice. This includes submitting data and records to the certification entity each year.

It is strongly recommended, but not required, that verification of water conservation practices should be completed by a third-party auditor at least once every three years. An on-site third-party audit should be required in the first year for a business seeking to become certified to demonstrate compliance with certification requirements. The partner certifying entity would identify appropriate third-party auditors for water conservation practices. After the initial audit, certified participants should be required to complete additional third-party audits at least every three years to maintain certification. This is not required, and the partner certification program(s) will identify appropriate third-party auditors for water conservation practices for ongoing audits.

Tables 3 and 4 define example verification requirements for practices in audit years and annual documentation. Most practices will need to be verified with records, but photos and other documentation may be required to validate implementation. These are example requirements for verification; partner certification programs or entities may have more specific requirements or definitions and will be required to define both verification and audit requirements for the NCGSA Water Certification Partnership program.

**Table 3: Vineyard Water Conservation Practice Verification Methods**

| Practice | Verification –Audit Years | Documentation – Annual |
|---|---|---|
| **Irrigation System Management and Efficiency** | • Audit reviews irrigation system inspection records or similar documentation, showing inspection schedule and actions taken to address any issues. | • Participant provides irrigation system inspection records or similar documentation, showing inspection schedule and actions taken to address any issues. |
| **Distribution Uniformity** | • Audit verifies irrigation systems have been tested for DU at least once every five years and recommended remediation actions have been taken to address issues within the recommended timeframe, no more than three years since the receipt of testing results and recommendations. | *If DU test completed:*<br>• Participant provides DU test results with recommended remediation actions<br>*If no DU test completed:*<br>• Participant provides year of DU test |
| **Water Measurement/ Metering** | • Audit inspects water meter(s) and verifies operation.<br>• Audit reviews meter maintenance records. | • Participant provides photo of meter(s).<br>• Participant provides water year cumulative measurement of applied water, presented as groundwater and total water applied. |
| **Recycled Water** | • Audit verifies whether the operation has access to recycled water and documents any implementation records. | • Participant indicates if recycled water is used.<br>• Participant provides water year cumulative measurement of applied water, presented as groundwater and total water applied. |
| **Informed Irrigation Scheduling** | • Audit verifies at least one soil moisture or plant stress monitoring technology is in use at operation. | • Participant provides farm management records or similar documentation, describing technology employed. |
| **Management Practices:**<br>*Soil Management*<br>*Canopy Management* | • Audit verifies implementation of at least one practice for soil management and at least one canopy management practice via records or similar documentation. | • Participant provides farm management records or similar documentation, describing practices and implementation. |
| **Planting Design Practices:**<br>*Row Orientation*<br>*Rootstock Selection*<br>*Irrigation Systems* | *If planting or replanting vineyard:*<br>• Audit reviews current design plan or similar documentation, explaining of how design will optimize water conservation.<br>• Audit documents the final installation if completed.<br>*If not planting or replanting vineyard:*<br>• No action. | *If planting or replanting vineyard:*<br>• Participant provides current design plan or similar documentation, explaining of how design will optimize water conservation.<br>*If not planting or replanting vineyard:*<br>• No action. |

**Table 4: Winery Water Conservation Practice Verification Methods**

| Practice | Verification –Audit Years | Documentation – Annual |
|---|---|---|
| **Winery Sanitation Processes** | • Audit verifies implementation of at least one water-saving technology or technique | • Participant provides winery management records or similar documentation, describing technology or technique employed. |
| **Processing Water Treatment and Reuse** | • Audit verifies whether the operation can recycle treated wastewater or has access to recycled water and reviews any implementation records. | • Participant indicates if treated wastewater or recycled water is used.<br>• Participant provides water year cumulative measurement of water use, presented as groundwater and total water use. |
| **Landscape Irrigation Efficiency** | • Audit documents irrigation system inspection records or similar information, showing inspection schedule and actions taken to address any issues. | • Participant provides irrigation system inspection records or similar documentation, showing inspection schedule and actions taken to address any issues. |
| **Water Measurement/ Metering** | • Audit documents water meter(s) and verifies operation.<br>• Audit reviews meter maintenance records. | • Participant provides photo of meter(s).<br>• Participant provides water year cumulative measurement of water use, presented as groundwater and total water use. |

# 5. Data Reporting and Water Conservation Measurement

The NCGSA Water Certification Partnership will achieve measurable reductions in groundwater pumping across the Napa Valley Subbasin. To track program progress, the partner water reporting entities will be required to collect and summarize water-related data, to be reported in aggregated, confidential format to NCGSA.

## 5.1 Data Reporting

Under the NCGSA Water Certification Partnership the participant (certified vineyard or winery) submits data to the partner certification entity as part of annual documentation. The partner certification program (or another third-party organization) then collects, aggregates, anonymizes, and reports the aggregated data to NCGSA. The process for data reporting is described below.

**Participant data reporting**. Participants are required to submit water use data every year, including current season water use as a cumulative annual measure, either directly or through the certification entity. At a minimum, the reported data must include vineyard acres and/or wineries enrolled, year of initial certification, and water use measurements (as defined below) for the current period. Participants

will also indicate when water conservation practices were implemented. If participating in multiple partner certification programs, participants will submit data to one data reporting entity.

In the initial year of the program, participants will be asked to provide historical water use data, if it is available. This is important for establishing a baseline against which water conservation can be measured. If the participant has water meter(s) installed, these data should come from meter records. However, it is unlikely that every participant will already have meters installed, maintained correctly, and have accurate records. Participants may instead provide alternative estimated historical water use data for baseline[7] years.

Water use data will be confidential and only released to the NCGSA in an aggregated format (defined below) to allow NCGSA to verify program water conservation to support GSP implementation. Data will only leave the entity as aggregated and anonymized statistics for reporting purposes or within the confines of a confidentiality agreement for analysis with a third party.

**Partner certification program data reporting**. The certification program or partner will be responsible for managing and submitting aggregated, anonymized annual reports to the NCGSA. That is, the certification program (or other organization) maintains confidentiality of participant water use data. The reporting partner will summarize, aggregate, and report water use metrics annually to the NCGSA in a standardized format that will be provided by NCGSA. Data may include:

- Number of vineyards enrolled
- Vineyard acres enrolled
- Number of wineries enrolled
- Water conservation practices implemented
- Most recent water year groundwater use for certified vineyards
- Most recent water year groundwater use for certified wineries
- Calculated groundwater savings

Program participant data are held by the partner data reporting entity and only reported to the NCGSA in aggregate. The minimum level of reported data aggregation is the American Viticulture Area (AVA). NCGSA will use reported data to estimate water savings and analyze the impact of the program over time across the Napa Valley Subbasin. This information is critical for program evaluation and GSP implementation.

### 5.2 Measuring Water Conservation

Implementing water conservation practices is intended to reduce gross, and ideally, net water use. To measure or estimate the impact of these practices on groundwater, water conservation will be

[7] See Section 4.2: Measuring Water Conservation for definition.

calculated annually by the NCGSA using the general method outlined below, which will be refined by NCGSA to meet GSP implementation and reporting needs.

1. Calculate baseline water use. Water use may include gross (applied) or net (consumptive) water use[8].
    a. The baseline is defined as average annual water use over a five-year historical period prior to certification (or with a more limited number of water conservation practices implemented in the operation).
    b. The baseline is also calculated separately for different water year (precipitation and weather) conditions that affect gross and net water use. Each year is classified by Water Year type (WY) as: very dry, dry, average, wet, or very wet using the Napa Watershed Water Year Classification Methodology.[9] This is based on the average rainfall recorded at a station on the valley floor each year.
    c. The resulting baseline will define average annual water use (gross and/or net) as the:
        i. Five-year (simple) average annual water use
        ii. Five-year average annual water use by WY type

This definition of baseline water use accounts for both investments in water conservation practices and variability in precipitation that affects gross and net water use. Historical data from participants are likely to be limited for many operations; as a result, these baseline calculations are limited to five years. The Partnership program will develop better information over time. Regional average data can be used to approximate an initial baseline, which would be refined as additional data are available over time.

Water use will be measured on a gross and/or net basis. The reporting period will be consistent with GSP reporting periods (annual or water year).

2. Compile groundwater use (gross or net) information from each participant. The availability of data for measurement will determine if gross and/or net water use is utilized. There are four data measurement options to calculate water use from.
    a. Groundwater well meter data. This is a measure of gross (applied) water.
    b. Remote sensing of ET. This provides an estimate of consumptive water use. Gross water application can be calculated from remote sensing estimates if it is combined with irrigation efficiency and effective precipitation data, which are typically drawn from other public data and studies.
    c. Irrigation timing records can be used to estimate gross (applied) water when combined with irrigation system specifications.

[8] Gross water use measures the total water applied, or how much water was pumped and applied to the land or used in the winery. If utilizing meter data, gross water use is already available. Net water use measures the total water consumed, or how much water was evaporated and transpired by a crop.
[9] https://www.napawatersheds.org/managed_files/Document/6838/WaterYear_Methodology.pdf

d. Well electricity usage records or timing records. These can create proxy data for groundwater use, but would require well specifications (pump energy use, well and pump efficiency, depth to water, etc.) and other data to be an effective measurement method.

The NCGSA Water Certification Partnership requires meters after a period of three years. As vineyards and wineries transition into the program, there will be sufficient data to calculate gross (applied) water for each aggregated region (i.e., AVA) in the Napa Valley Subbasin.

The last step in the process is calculating the water savings attributable to participation in a recognized certification program. The steps below describe methods for calculating water savings.

3. Calculate water savings by subtracting current year water use from the baseline defined in Step 1. This calculation is made for each individual participant.
    a. If calculating from an average baseline, the current water use may be averaged over a given period and compared to the baseline with a similar composition of water years.
    b. If calculating for a single year, that year can be compared to the historical average annual water use by WY type.

It is important to differentiate between groundwater savings and surface water savings, where possible/feasible to do so. The NCGSA Water Certification Partnership focuses on groundwater savings. When applicable, these steps can be applied to total water use or surface water use, reported separately from groundwater.

The NCGSA, or other organization that it designates, will apply the steps outlined above to calculate water savings. Water conservation will be calculated for the entire Napa Valley Subbasin and at the AVA level, where feasible, each year. A report will be prepared to evaluate program performance and determine if water conservation objectives are being met. This will include impact evaluation evidence-based tools that assess the changes in outcomes attributed to the Partnership. This will inform adaptive management for the Partnership.

# 6. Program Costs, Incentives, and Funding

The NCGSA Water Certification Partnership is voluntary. It is anticipated that incentives will be offered to both encourage partner organizations and participants to join the Partnership. A separate document[10] will describe incentives. This document provides an initial overview of program incentives and opportunities.

### 6.1 Certification Program (or Other Organization) Costs

Programs may need to modify standards, modify certain certification tiers or scores, or adjust data reporting and calculation practices to meet the requirements of the NCGSA Water Certification

[10] See Section 6.1: Outreach and Education Timeline for an overview of when materials are estimated to be available.

Partnership. Since most existing programs have these water conservation practices and data reporting procedures included in some form, program administration costs are expected to increase minimally. The resulting costs may be absorbed by the program administration, accounted for with changes in fees, or offset with other funding sources (e.g., incentives).

### 6.2 Program Participant Costs

Vineyards and wineries that choose to become certified will incur costs. This includes paying the certification costs, implementation costs, and other administrative costs.

Under existing sustainability certification programs in Napa Valley, program costs for participating businesses vary by program. According to certification program staff, most programs have an initial cost for the application and certification process[11]. Fees are typically per acre (vineyard) or per gallon of wine produced (winery). All programs have an annual cost for continued certification that varies by winery or vineyard size. These are generally between $500 and $3,000. A third-party audit is required after initial certification every three to five years, with reported audit costs between $500 and $2,000 depending on the size of the operation and complexity of the audit. Discounts are available for participants that audit more than one property or type of business or who join concurrent education programs.

Annually, a 200-acre vineyard operation can expect to pay a total cost between $500 and $5,000 in audited years and between $0 and $2,700 in non-audit years, depending on the program and level of complexity. For wineries, a small 40,000 case winery can expect to incur a total cost between $1,000 and $5,000 in audited years and $1,000 and $2,500 in non-audit years, depending on the program and level of complexity.

Other costs for participants to remain in compliance might increase if new practices are required to meet a modified standard. For example, the NCGSA Water Certification Partnership requires participants to meter all water sources, requiring individuals to purchase, calibrate, and maintain water meters on properties. This may be an additional expense for these businesses. The Water Conservation Workplan[12] includes a summary of capital and operating expenses for different water management technologies and practices.

### 6.3 Incentive Opportunities

To promote voluntary participation, NCGSA may offer additional incentives designed to address barriers to entry, offset costs, or offer value for participation. Incentives can be offered to partners for meeting standards, participants for implementing practices, or a combination of both. Incentive mechanisms may include but are not limited to cost sharing, services, direct payments, grants, or other non-financial options. Direct service and financial incentives for all GPR programs are being developed and considered in separate forthcoming documents.

[11] See figures 1 and 2 in this document.
[12] See Section 3: Voluntary Approaches to Reduce Groundwater Pumping
https://www.countyofnapa.org/DocumentCenter/View/30301/Napa-County-Water-Conservation-Workplan-PDF?bidId=

Potential incentives for partners (i.e., certification programs or other organizations) include but are not limited to:

- **Cost share for administering new water conservation standards.** Although the minimum practice requirements for this Partnership closely mirror those of existing partnerships, partners may need to make some adjustments to meet the established requirements. NCGSA could support partners through the initial planning and administration of updated certification practices, offsetting the costs to integrate practices into standards, change resources, or request approval from governing bodies. The expected scale of this cost varies across programs and depends on the final standards of the program. NCGSA could establish this incentive as a percentage share, single payment, or a specific rate discussed with the individual partner.
- **Cost share for certification.** NCGSA could offer a direct payment to assist partners with expanding staff and resources to process new certifications and data reporting. This could take the form of a single lump sum or payment per certified business served each year. Several existing certification programs have asserted that the fees they charge do not cover the costs to certify businesses, and this payment could make up for that difference.
- **Program technical assistance.** A potential service incentive could be NCGSA providing technical assistance to support onboarding and implementation for each type of entity. This may include providing access to county staff and other service providers for questions, onboarding participants, practices verification, and other administrative support.
- **Cost share for data reporting and calculations.** The data reporting responsibilities outlined in this document will require time and resources for partners to accurately complete each year. NCGSA may offer full or partial cost reimbursement or payment for an entity's efforts to collect and manage data.
- **Other incentive options.** NCGSA may also develop incentives that would address other barriers to partnering. These could include offering technical assistance services, support for onboarding participants, and promotion and marketing in the region.

The goal of the Partnership is encouraging vineyards and wineries to implement water conservation practices. These practices have costs. To address these barriers, potential service and financial incentives for participating vineyards and wineries include but are not limited to:

- **Cost share for water conservation practices.** The NCGSA may offer participants a cost share for the infrastructure and processes necessary to implement the practices outlined above. For example, NCGSA could offer grants or direct payments for participants that submit verification that they have installed a meter for certification. Verification of installation can be facilitated through the certification program (e.g., results of audit or annual documentation) or submitted through a simple form to NCGSA to receive the incentive.
- **Technical and regulatory assistance.** NCGSA could provide technical assistance to participants during the planning and implementation of practices or while becoming certified. County staff

and other service providers could provide hands-on education or services to participants, such as field day workshops, on-site DU testing, or one-on-one permit application review. Businesses actively seeking certification under the partnership could be eligible to access these incentives. Services could be provided free of charge to participants, or at a discount, and the costs of staff or service provider time would be borne by NCGSA.

- **Cost share for certification costs.** NCGSA may offer a cost share of participants' annual certification fees over a defined period. These fees are typically paid by the grower or winery directly to the program at initial certification and each year after, creating regular, stable revenue for the certification program. Fees range from $500 to $3,000 each year, depending on the size of the operation and the certifying entity. This incentive could be implemented multiple ways, such as a participant fee discount facilitated through the certification entity then paid directly to the certification entity or a simple application with the paid invoice submitted to NCGSA by the participant.
- **Cost share for auditing costs.** Annual certification audits can be a substantial cost for participants, with the greatest cost occurring at initial certification and every three years afterwards. This fee may be paid to a third-party auditor, the certification entity, or a combination of both, depending on the program and year of certification. Offering a cost share on audits would incentivize participants to engage with the program. Audit costs will vary by certification program, year, and operation, but current audit costs range from $500 to $2,000 per business. To receive this incentive, participating businesses could submit a copy of their paid audit invoice with a simple form to NCGSA, who would verify with the certification entity that the operation is certified under the terms of the Partnership. The participant would then directly receive reimbursement for a portion of the costs.
- **Partial fee deferral, reduction, or rebate.** Wineries and vineyards that become certified reduce costs for NCGSA. An incentive program could include reduced rate for GSP implementation fees or similar service fees. This could take several different forms, but it is most likely to include a partial rebate or discount system facilitated directly with NCGSA. Participants would need to provide evidence (through a certification entity or directly though application) of active certification to be eligible for this incentive.
- **Cost share for water data measurement and metering.** NCGSA may offer a payment or reimbursement for sharing water use data each year.
- **Cost share for data management and reporting.** Certification increases record keeping and management costs for participating operations. NCGSA could offer reimbursement for costs associated with additional data collection, management, and reporting as a part of the program.
- **Other incentive options.** NCGSA may also develop incentives that would address other barriers to participating. These could include but are not limited to offering other technical assistance services, support for onboarding, and other recognition for water conservation efforts in the valley.

Financial incentives could be reimbursed through payment to a partner for invoiced costs or directly to producers who apply. Certification Partnership participants would be eligible for multiple incentives at the discretion of the NCGSA.

### 6.4 Funding Opportunities

To create incentives or cost shares attached to the Partnership program, NCGSA may pursue grant funding opportunities. Other funding may come from a variety of sources. These may include but are not limited to existing county SGMA funding sources, regulatory or property fees established through Water Code §10730, grants from state and federal sources, or alternative mechanisms such as special taxes and benefit assessments.

# 7. Program Implementation

The NCGSA will define a process (e.g., a request for proposals or request for qualifications) for interested certification (and other) organizations to apply for, be selected, and participate in the program. Once a certification program or other organization is recognized as a NCGSA partner for the program, it will work with vineyards and wineries for certification.

The NCGSA Water Certification Partnership will be implemented concurrently with other components of the GPR Workplan implementation. This includes education and outreach, evaluation of on-farm recharge opportunities, an extended vineyard replanting concept program, a benchmarking program, other incentives, and expanding water measurement technology.

Continued education and outreach are a core component of GPR implementation, including this Partnership program. These activities create opportunities to receive feedback, improve the Partnership's design, partner with other organizations, increase awareness of SGMA and its requirements, and educate water users.

Partnership program development has benefited from extensive stakeholder input. Implementation is expected to include continued outreach with organizations such as:

- **Local certification programs.** Since these programs are likely to become partners and administrators for this certification, their experience and knowledge is key to ensuring the program's success.
- **Local agriculture, wine, and water industry representatives**. Additional one-on-one outreach will engage Napa Valley Grapegrowers, Napa Valley Vintners, Napa County Farm Bureau, Napa Valley Winegrowers, and other local organizations for their perspective and input on the Program and develop connections to growers and vintners in the region who may be willing to provide input.
- **Wine industry member meetings to review Program design.** Meetings with growers in either one-on-one or facilitated group settings began in November 2024. Gaining a better understanding of stakeholders' enthusiasm or hesitation to participate is important. Outreach

will continue through informational resource meetings with the public to answer questions, receive commentary, and update stakeholders on the process.

- **Program feedback.** Feedback will be received through public processes, including during scheduled Technical Advisory Group (TAG) meetings and other stakeholder meetings for additional feedback at various stages of Program development and implementation.

### 7.1 Partnership Development and Implementation Timeline

Table 5 presents the timeline for implementation and outreach activities for the NCGSA Water Certification Partnership, including prior activities during the development stages of the program. The program framework was presented to the TAG for feedback in November and December of 2025. This document has been revised in response to TAG and other stakeholder feedback. Input from stakeholders will continue to shape the program's implementation. The NCGSA expects to begin working with interested partner certification programs in Spring or Summer of 2025. Education and outreach would continue while certification programs update standards to meet Partnership program requirements.

**Table 5: Development and Implementation Estimated Timeline**

| Timeline | Actions |
|---|---|
| **August 2024** | Certification program development<br>Meet with certification programs for feedback<br>Meet with grower/vintner groups for feedback and contact discovery |
| **September 2024** | Present annotated outline of program to Technical Advisory Group (TAG)<br>Refine program based on feedback<br>Meet with certification programs for feedback<br>Meet with grower/vintner groups for feedback and contact discovery |
| **October 2024** | Refine program based on feedback<br>Meet with certification programs for feedback<br>Meet with grower/vintner groups for feedback and contact discovery<br>Initiate contact with growers for one-on-one meetings<br>Host facilitated or one-on-one meetings with growers for feedback |
| **November/December 2024** | Present full draft of NCGSA Program document to TAG<br>Continue one-on-one meetings with growers and vintners for feedback<br>Develop partnerships for Program education and outreach<br>Develop incentive analysis document |
| **January 2025** | Finalize NCGSA Program document based on feedback<br>Initiate Program education and outreach<br>Implement targeted outreach to certification programs and growers<br>Host facilitated or one-on-one meetings with growers for feedback |
| **February 2025** | Host informational resource meetings<br>Host meetings with growers for feedback and insights<br>Develop incentive analysis report |

| | |
|---|---|
| **March/April 2025** | Present revised NCGSA Program to TAG<br>Begin identifying partner programs<br>Establish partnerships with certification programs<br>Continue outreach and education<br>Develop and present incentive analysis report |
| **May-July 2025** | Support certification programs in processes to adjust program standards<br>Release Water Conservation Program with partner programs<br>Develop process for measuring water savings<br>Continue to define program incentives<br>Continue outreach and education |
| **August 2025 and beyond** | Continue outreach, education, and partnership building<br>Refine incentives<br>Pursue potential grant opportunities to support Program implementation<br>Conduct periodic evaluation of the Program<br>Modify Program (adaptive management) as needed |

### 7.2 Ongoing Program Implementation and Evaluation

The NCGSA Water Certification Partnership will be evaluated and periodically updated. This will include evaluating funding opportunities, partners, participation, and measurable outcomes from program implementation. It may also include technical updates, including instances when additional technologies become available or peer-reviewed studies present emerging practices or strategies to increase water conservation by vineyards, wineries, or other water users. These activities will be developed and presented through the public process, including at periodic TAG meetings, NCGSA Board meetings, and other public workshops.

Measurable outcomes from the program will be evaluated, including but not limited to water savings attributable to the program. This will determine if the program is effective, and any financial incentives are providing an acceptable return on investment. As described in Section 5.2, evidence-based impact evaluation methods will be applied. This will ensure the Partnership provides measurable savings in groundwater and informs future GSP implementation.

The NCGSA Water Certification Partnership is part of several programs being developed for GPR implementation. A common theme across all programs is continuing education and outreach such that water users in the Napa Valley Subbasin and Napa County remain engaged in ongoing groundwater management initiative that benefit all communities. The NCGSA and its partners will continue to identify opportunities for outreach and engagement under this program and other GPR programs.

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# Memorandum

**Subject:** Napa Valley Subbasin Vineyard Replant Extension Program

**By:** ERA Economics and LSCE

**To:** Napa County Groundwater Sustainability Agency

**Date:** April 10, 2025

## Program Concept Overview

An extended crop replacement program is a voluntary program concept in which a landowner is offered an incentive payment to increase the duration of their current fallowing practice between removal and replanting of perennial crops (e.g., almonds, walnuts, grapes) by one or more growing seasons. The program can be offered for one or more replanting cycles, or in perpetuity. By delaying replanting and leaving land fallow for a specified period, groundwater pumping is reduced, which provides a benefit to the subbasin. A landowner is compensated for delaying replanting. These programs are voluntary and can contribute to groundwater sustainability efforts.

Key components of such a program include:

- The program is paying to delay replanting for a defined period (say, 1 year). Replanting is an activity that will occur on all vineyards as vines reach the end of their productive economic life. Economic life depends on a range of factors including but not limited to variety, agronomic factors (e.g., disease, block productivity), market conditions (e.g., prices and costs), and farm management practices/preferences. A typical economic life is 25 to 30 years. The program incentive payments would not be based on the full value of a productive acre of vineyard. Rather, it is paying for an incremental delay in the typical replanting cycle.
- The program saves water by shifting the entire water use pattern of the vineyard. A newly established vineyard applies and uses very little water. The water savings of the program accounts for the entire stream (time path) of water application and use over the economic life of the vineyard. In effect, the total water use over the life of a vineyard is spread over, for example, 26 years instead of 25 years.

## Water Savings

Perennial crops are replanted on a typical schedule based on the economic life of the crop. For example, an almond orchard is typically replanted every 25 years or so. This means that, on average and assuming a uniform age distribution, about 4 percent (1/25) of almond orchards are not farmed (being replanted) in any given year. Young perennials consume less water than mature crops.

An extended replanting program saves water by increasing the length of time for replanting and therefore the share of fallow land each year not receiving applied water. Using the almond example, if every replant is extended by one additional year, then 8 percent (2/25) of the land is fallow in that year. To realize permanent water savings, the program would run in perpetuity, but even a temporary program would achieve water savings. Savings also require that alternative, new lands are not developed. These program requirements can be addressed as part of the program design.

The potential water savings can be illustrated by a simple example. Suppose an acre of vineyard uses a total of 50 acre-feet applied during its 25-year life (average of 2 acre-feet applied water per acre per year). If one year of additional fallow before replanting are added, the same 50 acre-feet would be applied over 26 years rather than 25 years, resulting in an average of 1.92 acre-feet per year, or a 4 percent reduction in average annual applied water for that acre.

## Incentive Approach

The basis of the incentive payment structure is that the program is voluntary and must provide a fair total incentive payment that is sufficient to entice a willing landowner to participate in the program. An incentive payment can be comprised of three types:

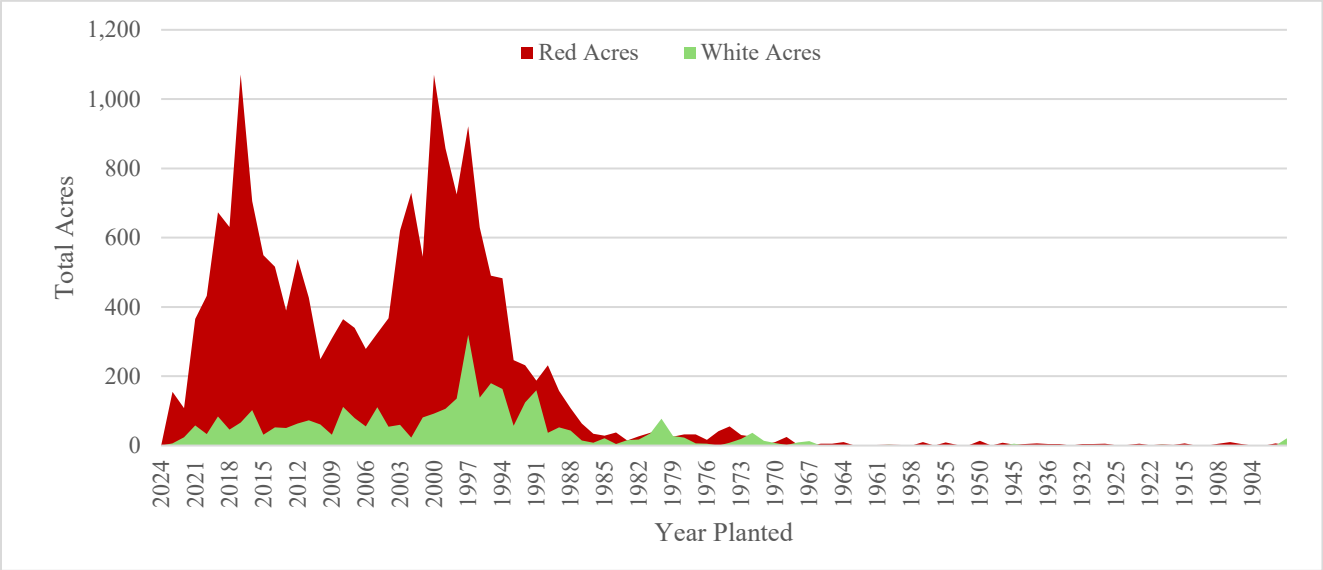
1. **Groundwater Savings.** This component rewards participants for reducing groundwater extraction by keeping land fallow and halting irrigation over a specified period. An incentive is based on costs incurred (or avoided) and forgone income resulting from the delay in replanting. Net present value of a replanted permanent crop can represent these values.
2. **Other Transition Practices.** Additional incentive payments could be included for specific agricultural practices (e.g., cover crops, enhancing soil health, etc.). These provide a broader public benefit and an additional private benefit to the landowner.
3. **Other Benefits.** This component may include payments for other public benefits. For example, other programs have considered payments that target lands in specific areas (e.g., near domestic wells). This could also include incentives (e.g., reduced GSP fee) for participants who comply with the program's reporting and monitoring requirements.

Program incentive payments depend on the structure of the program, crop mix, market conditions, costs, and water availability. These are established as part of the program design, typically with landowner input. Importantly, the program is incentivizing an incremental change in practices (delaying replanting by one or more years) and does not need to compensate for the value of a fully productive vineyard.

## NCGSA Program Concept Evaluation Approach

NCGSA could evaluate an extended replanting program. A preliminary review of Subbasin vineyard data shows around 21,190 acres with an average estimated age of 20 years. 41.5 percent of Subbasin acres are 20 to 30 years old. The typical replanting schedule for vineyards is between 25 and 30 years, with some vineyards maintained for a longer duration if they remain productive and disease-free. Grapes are typically removed in the fall and replanted the following spring. Grape market conditions are currently soft, making this program potentially more attractive to growers in the near future. Figure 1 illustrates the estimated age distribution for red and white wine grapes in the Napa Valley Subbasin.

**Figure 1: Estimated Age Distribution of Vineyards by Class, Napa Valley Subbasin**




The general technical approach to designing the program includes:

- Design general program concepts, technical studies to support development (e.g., agronomic feasibility, scale, location, timing, duration of contracts, etc.)
- Evaluate potential incentive payments (and sensitivity range) for extending vineyard replanting under the program using estimated net present value of replanted vineyard.
- Integrate grower/stakeholder outreach throughout to inform program technical and policy design.
- Evaluate program potential water savings.
- Develop preliminary program rules and contract design.
- Design program co-benefits (e.g., targeted to lands near GDEs? Or increase the scale of the program in drier years?)
- Typically run a pilot program and/or test program to gage interest and improve design
- Implement broader program

## Multi-Benefit Elements

The extended replant program can be developed and implemented in tandem with other groundwater and conservation initiatives, enhancing potential co-benefits during the fallow period and once a new vineyard is planted. For example, this could include on-farm recharge opportunities. These parallel elements or programs include but are not limited to conservation actions, supply augmentation, soil health, and infrastructure improvements.

- **Conservation Actions.** In replanting a vineyard, there are opportunities to promote environmental benefits through specific conservation measures. For example, vineyard managers

and growers could elect to repurpose all or a portion of a vineyard for other land benefits, such as habitat restoration. By only planting back a lesser percentage of the field, water savings can be achieved. The fallow period may provide an opportunity to reintroduce or host beneficial species to the location, establish erosion or habitat buffers, or implement prescribed burns. These decisions can enhance the ecosystem and offer positive spillover benefits to the operation if it is returned to agriculture. Conservation actions require capital investment and management and would need to be incentivized.

- **Supply Augmentation (Recharge).** An extended replanting program could include practices to improve groundwater infiltration (and/or hold additional water on the land for recharge). This would use the idle land to increase groundwater recharge in areas where it is feasible to do so while promoting greater infiltration and subsoil moisture prior to replacing the vineyard.
- **Soil Health.** Improved soils can impact both the long-term viability and water use of the vineyard. The idle period is a prime time to establish cover crops, apply compost and other soil amendments, improve carbon sequestration, and implement other beneficial practices. These actions may be temporary (during idle period) or continuous (both idle and planted periods).
- **Infrastructure Improvements.** With the extended replant period, vineyard managers and growers may improve infrastructure without impacting regular vineyard operations. These projects can impact a wide range of operational and ecological aspects of the vineyard, with the goals of improving efficiency, reducing water use, and increasing positive benefits. Some examples include installing water meters, implementing water quality initiatives, improving well or pump station equipment, or updating erosion control for roads and slopes.

## Other Considerations / Notes

The extended replanting program concept is a form of a rotational fallowing program. There are several similar programs that are implemented or under development with GSAs in critical subbasins to reduce groundwater demand.

To yield sustained groundwater savings, an extended replant program must ensure that acreage held out of production does not move elsewhere, effectively transferring water use and eliminating potential water savings. In Napa County, available acreage and county permitting will prevent this. In addition, the program is most effective if it continues in perpetuity, but this is not a prerequisite for program benefits. Even a pilot program operating for a single year generates immediate and future water savings by shifting the time path of the replanting cycle.

Additional analysis is necessary to develop program concepts and evaluate options for idle land, including the use of annual or permanent cover crops and tillage between plantings and increasing recharge. These methods can promote infiltration and soil health and affect water use. The extent of the benefits of these practices can be determined during the program's development. Necessary incentive payments and program costs can also be assessed as a next step.

The program is voluntary, and incentives would be established to encourage participation. This could be linked to incentives for a certification program, GSP fees, and other demand management programs in Napa. Assessing program costs is a logical next step.

# Napa Valley Subbasin

## Groundwater Pumping Reduction Workplan Implementation Update

## Napa County GSA TAG Meeting

# Overview

1. GPR Implementation
2. NCGSA Water Certification Partnership
3. Extended Replant Concept
4. Next Steps

# GROUNDWATER PUMPING REDUCTION WORKPLAN IMPLEMENTATION

# GPR Workplan Implementation

## Guiding Framework:

- Focus on voluntary actions that achieve groundwater benefits for the Subbasin
- Assess the costs and benefits of alternative actions and focus on those that are most cost-effective
- Leverage existing programs and opportunities to generate value from a suite of voluntary actions
- Include adaptive management to adjust the program as data and sustainability indicators evolve
- Mandatory measures if voluntary programs do not achieve measurable reductions in groundwater pumping (e.g., mandatory metering/reporting)

# Development & Implementation Timeline

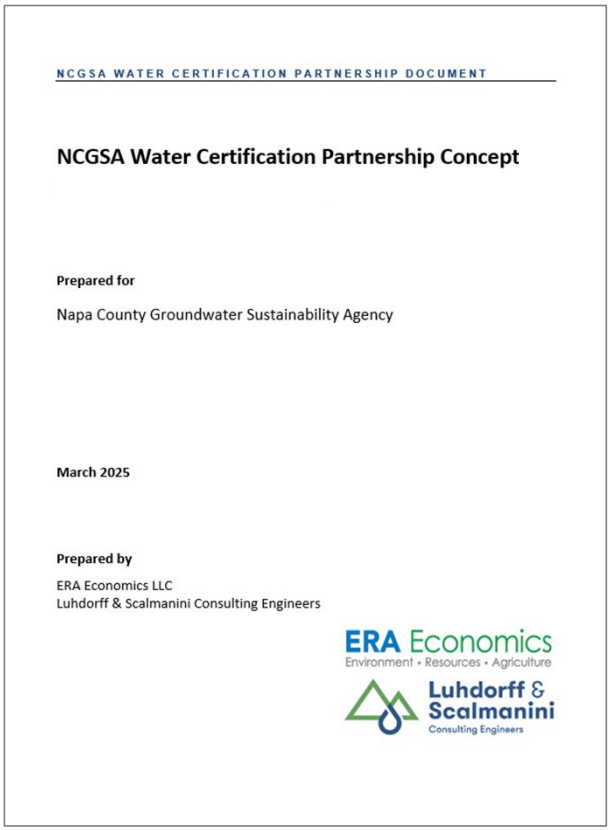
| Component / Activity | Q4 24 | Q1 25 | Q2 25 | Q3 25 | Q4 25 | Q1 26 | Q2 26 |
|---|---|---|---|---|---|---|---|
| Component 1: Education and Outreach; Feasibility Analysis | | | | | | | |
| Water Conservation Education Materials | D | D | D | D | I | I | I |
| Local Partnership Building | D | D | D | D | D | D | D |
| Water Conservation Messaging System | D | D | D | D | I | I | I |
| Recharge Feasibility Analysis | D | D | D | D | D | I | I |
| Component 2: Voluntary Adoption | | | | | | | |
| Incentivize Program Adoption | D | D | D | D | D | D | D |
| Benchmarking Pilot Program | D | D | D | D | I | I | I |
| Meter Data and Reporting Program | D | D | D | D | D | I | I |
| Component 3: Voluntary Certification | | | | | | | |
| Certification Partnership | D | D | I | I | I | I | I |

*D = Development, I = Implementation*

# NCGSA WATER CERTIFICATION PARTNERSHIP CONCEPT

# Water Certification Partnership

- Certification concept updates
  - Voluntary, incentive-driven partnership to encourage expansion of water conservation practices
  - Partnership with existing certification programs or other third parties (e.g., Farm Bureau, Napa RCD, etc.) to recognize vineyards and wineries implementing practices
  - One component of a suite of NCGSA programs


NCGSA WATER CERTIFICATION PARTNERSHIP DOCUMENT

NCGSA Water Certification Partnership Concept

Prepared for

Napa County Groundwater Sustainability Agency

March 2025

Prepared by

ERA Economics LLC
Luhdorff & Scalmanini Consulting Engineers

ERA Economics
Environment • Resources • Agriculture
Luhdorff & Scalmanini
Consulting Engineers

# Updated Program Overview

- Partnership: working with existing certification programs or third parties
- Practices: irrigation management, recycling/wastewater use, processes and technology
- Metering: required (as a conditions of receiving subsidy for certification costs)
- Verification: potential combination of audits, points, and self reporting
- Data: third party receives data and aggregates it at AVA level
- Calculations: quantify water savings for practices implemented at AVA level
- Reporting: aggregate measures of impact/benefit across AVAs and Napa Valley Subbasin

# Potential Program Incentives

# Key Components: Potential Partners

- Expand water conservation practices
- Partnership with NCGSA
- Water measurement
- Data management and aggregation
- Data reporting
- Incentives

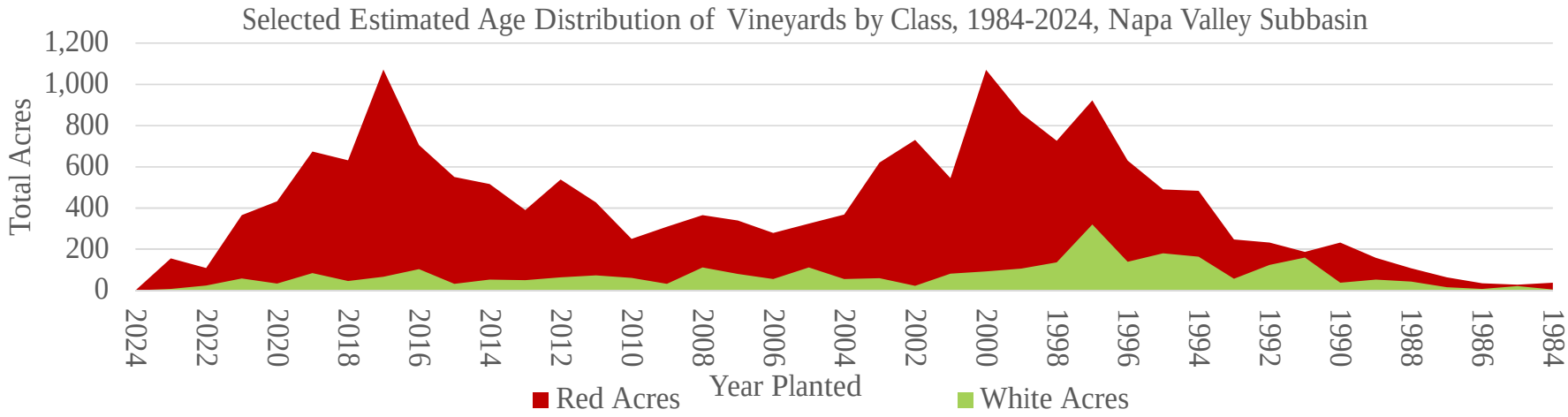
# Key Components: Wineries / Vineyards

- Implement expanded water conservation practices
- Partnership with certification program or other third-party
- Water measurement
- Data reporting
- Incentives

# VOLUNTARY EXTENDED REPLANTING PROGRAM UPDATES

# Extended Replant Program

- Voluntary program to incentivize vineyard managers to delay replanting for an extended period (+1 or 2 years)
- Extended idle leads to water savings as replants are shifted
- Can be combined with other practices to increase benefits, such as soil health and groundwater recharge

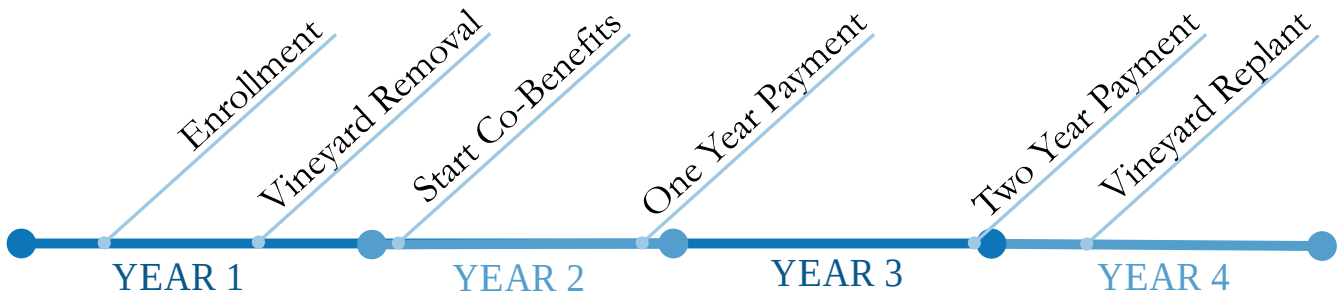


# Extended Replant Program

## Program Development Considerations

| | | |
|---|---|---|
| Structure and enrollment? | Program duration? | What are incentives (payments)? |
| Funding mechanism? | Recharge and other conservation practices on farm? | Integrate multi-benefit elements? |

## Example 2-Year Program Timeline



# Potential Multi-Benefit Elements

Coupled w/ Extended Replant

Conservation

Recharge

Soil Health

Infrastructure

Co-Benefits and
Water Savings

# Multi-Benefit Elements: Recharge

- GPR implementation also includes evaluation of practices to increase infiltration
- Includes on farm recharge combined with replant concept
- Separate evaluation of approaches forthcoming

# NEXT STEPS

# Next Steps

Continue to implement the GPR Workplan

- Outreach
- Certification
- Incentives
- Benchmarking
- Pilot Sites
- Extended Replant / Other (Mothballing) Concepts

Napa County

Board Agenda Letter

1195 THIRD STREET
SUITE 310
NAPA, CA 94559
www.countyofnapa.org

Main: (707) 253-4580

Groundwater Technical Advisory Group **Agenda Date:** 4/10/2025 **File ID #:** 25-601

**TO:** Technical Advisory Group for the Napa County Groundwater Sustainability Agency

**FROM:** Brian D. Bordona, Director of Planning, Building and Environmental Services

**REPORT BY:** Jamison Crosby, Natural Resources Conservation Manager

**SUBJECT:** Update on Napa Valley Integrated Hydrologic Model updates and streamflow depletion model scenarios

## RECOMMENDATION

Provide an update on streamflow depletion model scenarios and model updates to the Napa Valley Integrated Hydrologic Model (NVIHM).

Procedure
Staff introduces.
Questions and answers with the TAG.
Public comments.

## BACKGROUND AND DISCUSSION

The Napa Valley Integrated Hydrologic Model (NVIHM) was developed by LSCE from 2020 through 2021 to support key elements of the Napa Valley Subbasin Groundwater Sustainability Plan (GSP). NVIHM is a numerical model which simulates landscape, surface water and groundwater processes and interactions using an integrated approach and is an important tool used to explore and understand the complex hydrologic interactions throughout the Napa Valley Subbasin (Subbasin). Originally, the NVIHM was calibrated through Water Year (WY) 2019 and has been updated annually based on climate and reported water use. The NVIHM continues to match observed values in wells with similar fit statistics as the calibrated model. Monthly streamflow at the Napa River Pope Street and Oak Knoll USGS gages also align with observed values.

LSCE is developing updates and refinements to NVIHM to better represent key physical processes and elements in the landscape, streams, groundwater dependent ecosystems, and the groundwater system. As previously presented to the TAG, the total water use as measured by total evapotranspiration (ET), is variable across the Subbasin. Multiple data sources, including local sensors as well as remotely sensed data, are being used to update modeled ET. Data specifically compiled by Napa County, including refined stream geometries, well locations, and land use are being incorporated. As previously identified by the TAG, accounting for soil moisture is a high priority in the Subbasin. LSCE has been in coordination with the United States Geological Survey (USGS) to update the model platform to better account for soil moisture. These updates, as well as the additional calibration data that has been collected, will update and inform the current understanding of water movement through the Subbasin.

NVIHM has been used to estimate historical flows of a system but can also be utilized to learn more about how the system may behave under certain conditions. These exercises are called "scenarios" and involve the development of a set of hypothetical management changes that are executed in the model. The results can be used to estimate the effect of possible changes to the hydrologic system. One scenario that is run every year is the stream depletion scenario, which is utilized in evaluating the Interconnected Surface Water (ISW) Sustainable Management Criteria (SMC). The stream depletion scenario used in the ISW SMC involves simulating a condition where there is zero pumping from all agricultural and outdoor applications. Additional scenarios have been developed and run to evaluate stream depletion in the Calistoga and Saint Helena areas to better assess the impact of sub-regional pumping on stream depletion in the Napa River in the northern portion of the Subbasin. Results of these scenarios will be presented in the TAG meeting.

## ENVIRONMENTAL IMPACT

ENVIRONMENTAL DETERMINATION: The proposed action is not a project as defined by 14 California Code of Regulations 15378 (State CEQA Guidelines) and therefore CEQA is not applicable.

## SUPPORTING DOCUMENTS

A. Napa County Groundwater Sustainability Agency, Napa Valley Integrated Hydrologic Model Updates and Scenarios (LSCE, April 2025)

# Napa County Groundwater Sustainability Agency

## *Napa Valley Integrated Hydrologic Model Scenarios And Updates*

**April 10, 2025**


Luhdorff & Scalmanini
Consulting Engineers

# Outline

Stream Depletion Scenarios

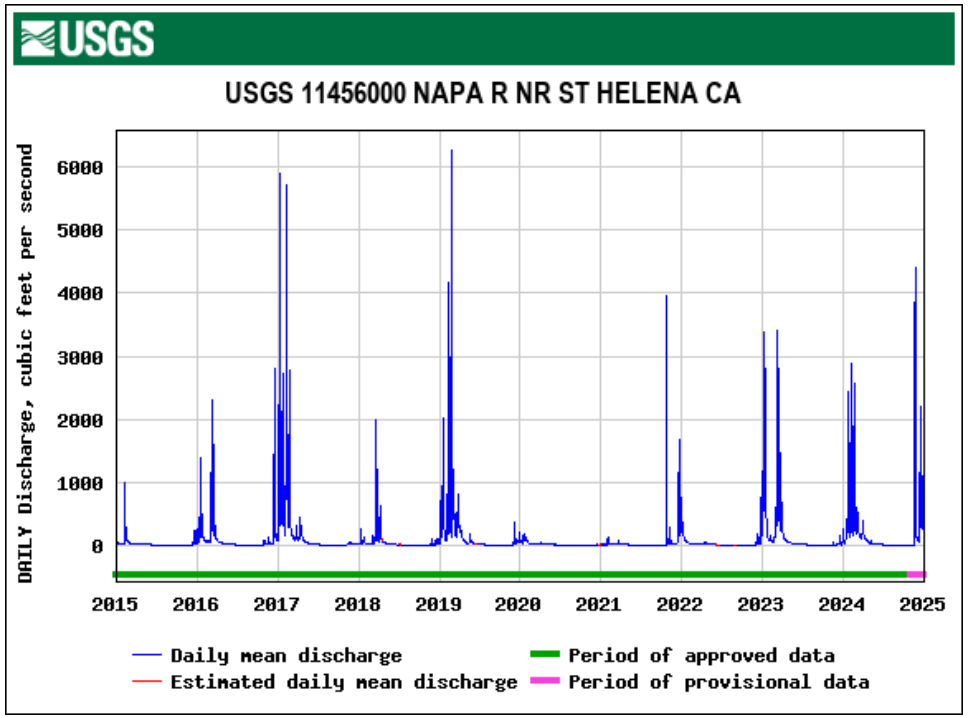
Model Updates

Questions and Discussion

# Background

## Streamflow in the Napa River

- No flow, very low flow, and disconnected pools observed in the Napa River near St Helena
- Desire to understand relationship between groundwater pumping and streamflow in this area
- Previous scenarios have looked at the effect of agricultural and landscape pumping in all the Napa Valley using Napa Valley Integrated Hydrologic Model (NVIHM)
- Recent interest in understanding how more localized pumping may affect streamflow in this reach



# Depletion Scenarios

## Approach

Compare streamflow in Baseline (calibrated) model (WY2005-2024) to various groundwater pumping scenarios

### Scenario 1:

- No pumping for irrigation (agricultural or landscape) in the St Helena "Water Balance Region" (WBR)

### Scenario 2:

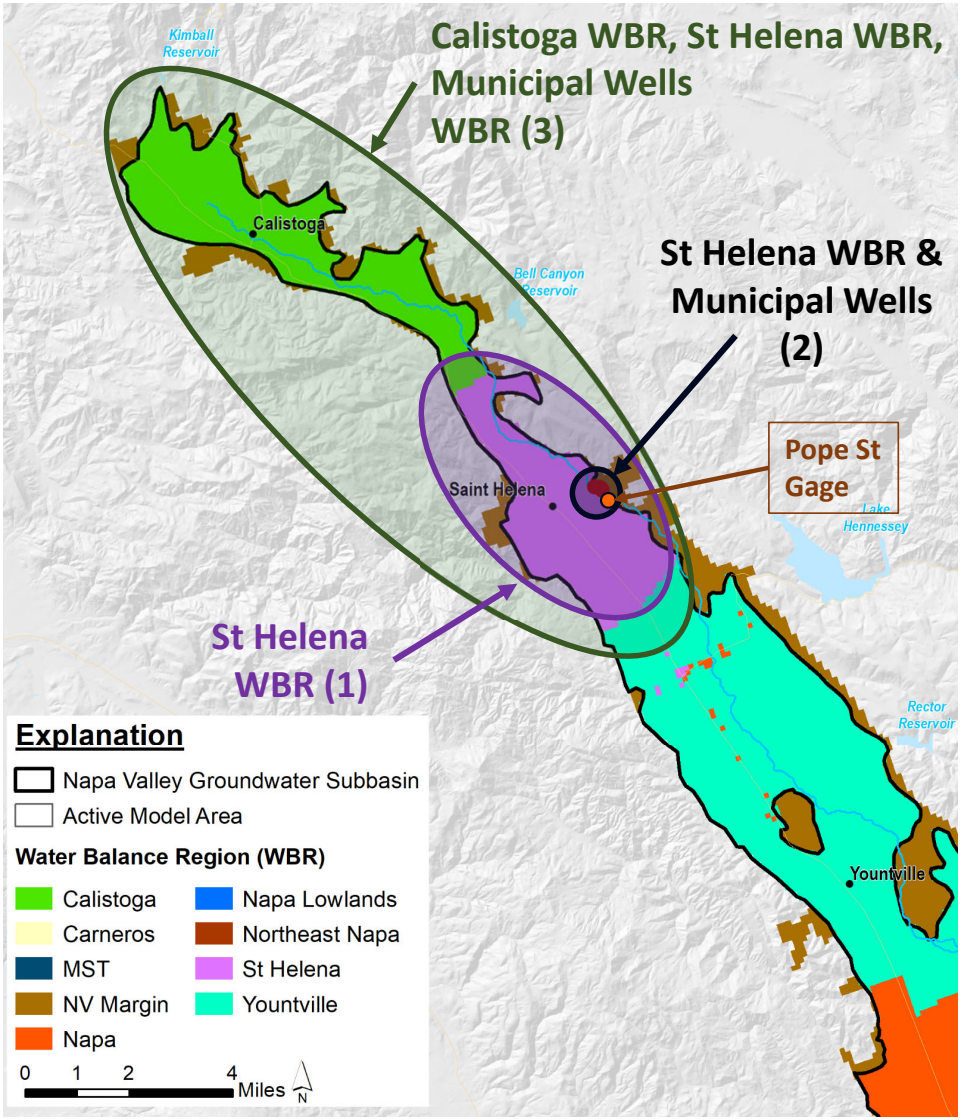
- No pumping for irrigation in the St Helena WBR
- No pumping in St Helena municipal wells

### Scenario 3:

- No pumping for irrigation in the St Helena WBR
- No pumping in St Helena municipal wells
- No Pumping in the Calistoga WBR

### Scenario 4:

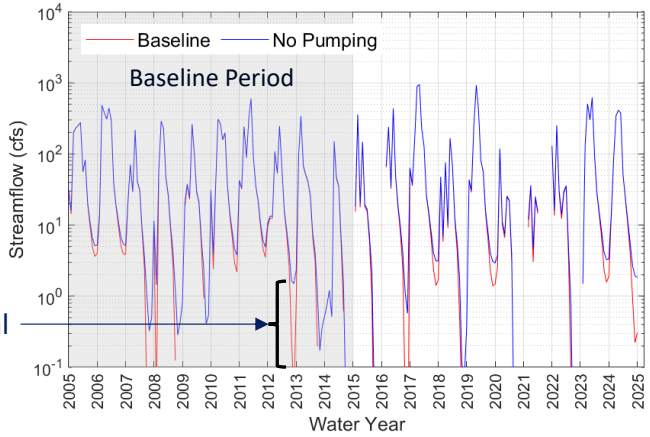
- No pumping for irrigation in the Napa Valley
- No pumping in St Helena municipal wells



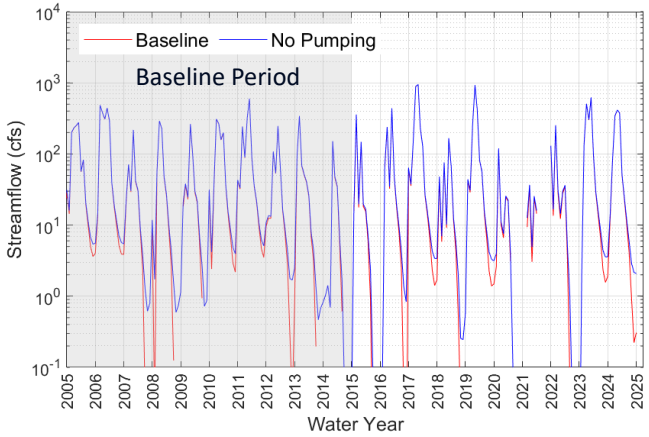
# Streamflow in Napa River at Pope Street

Change in streamflow resulting from removal of pumping ("Stream Depletion")

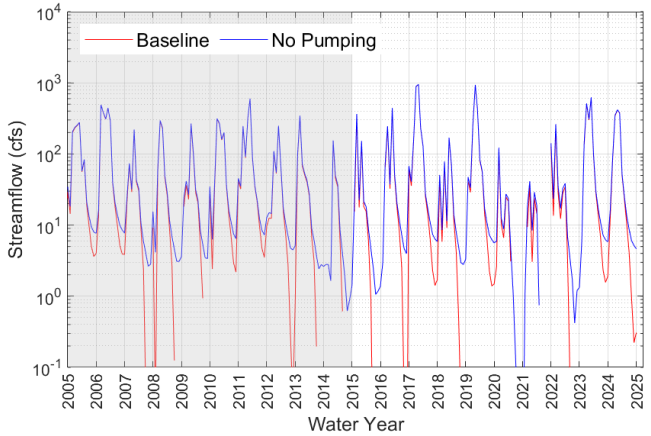
### No Agricultural or Landscape Pumping (St Helena Water Balance Region)



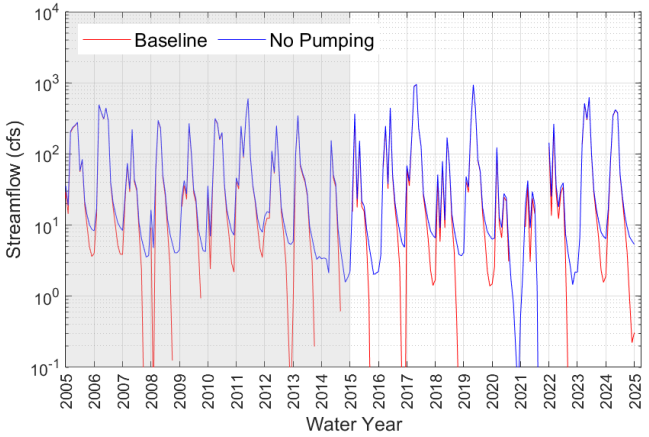

### No Agricultural, Landscape or Municipal Pumping (St Helena Water Balance Region)




### No Agricultural, Landscape or Municipal Pumping (St Helena & Calistoga Water Balance Regions)

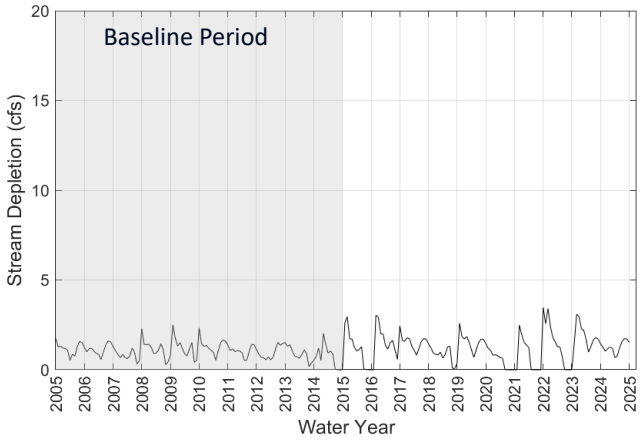



### No Agricultural, Landscape or Municipal Pumping (Napa Valley)



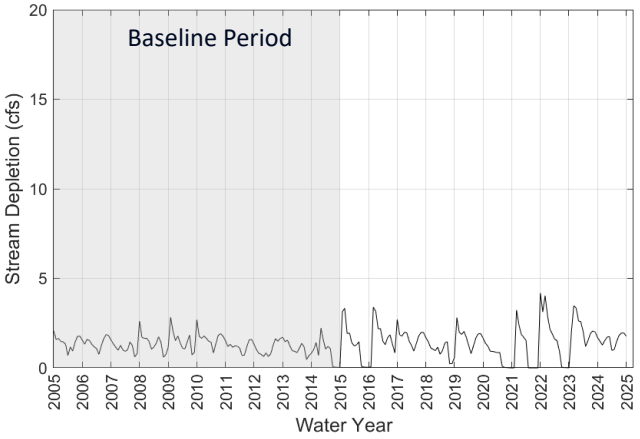
# Stream Depletion in Napa River at Pope Street

**No Agricultural or Landscape Pumping (St Helena Water Balance Region)**



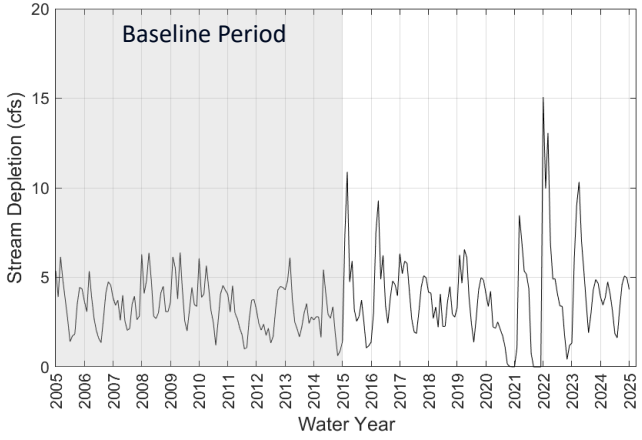

Minor (<~0.2 cfs) increase in stream depletion due to municipal pumping

**No Agricultural, Landscape or Municipal Pumping (St Helena Water Balance Region)**



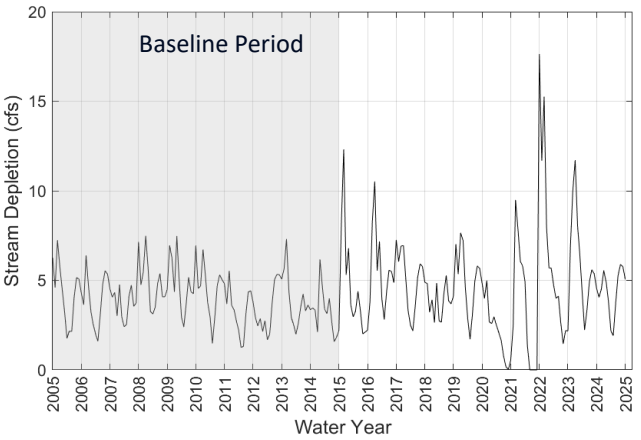

Substantial increase in stream depletion due to pumping in Calistoga WBR

**No Agricultural, Landscape or Municipal Pumping (St Helena & Calistoga Water Balance Regions)**




Minor increase in stream depletion at this gage due to pumping in rest of Napa Valley

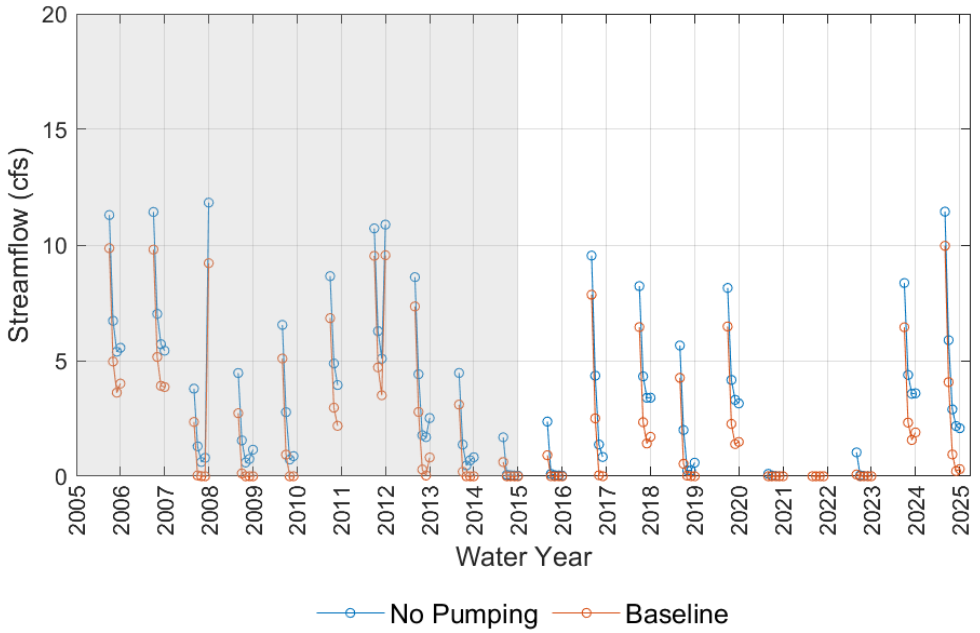
**No Agricultural, Landscape or Municipal Pumping (Napa Valley)**



# Low Flow Analysis

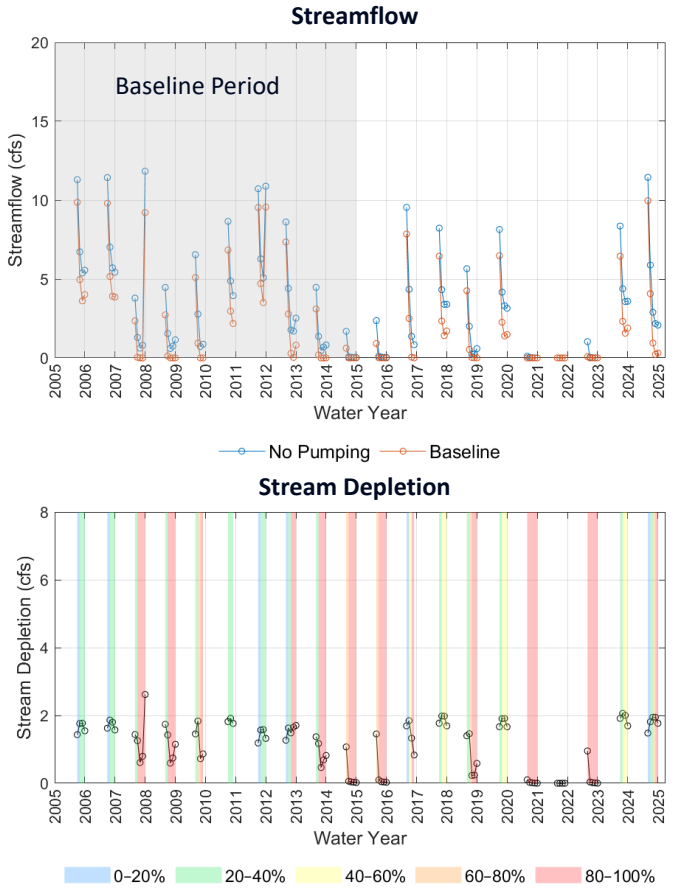
## Approach

- Removed months that do not fall within typical low flow period (June – October)
- Only considered “low flows” within these period
  - For this purpose, we define “low flow” as less than or equal to 10  cubic feet per second (cfs)
  - Excludes high spring and fall flows due to early storms

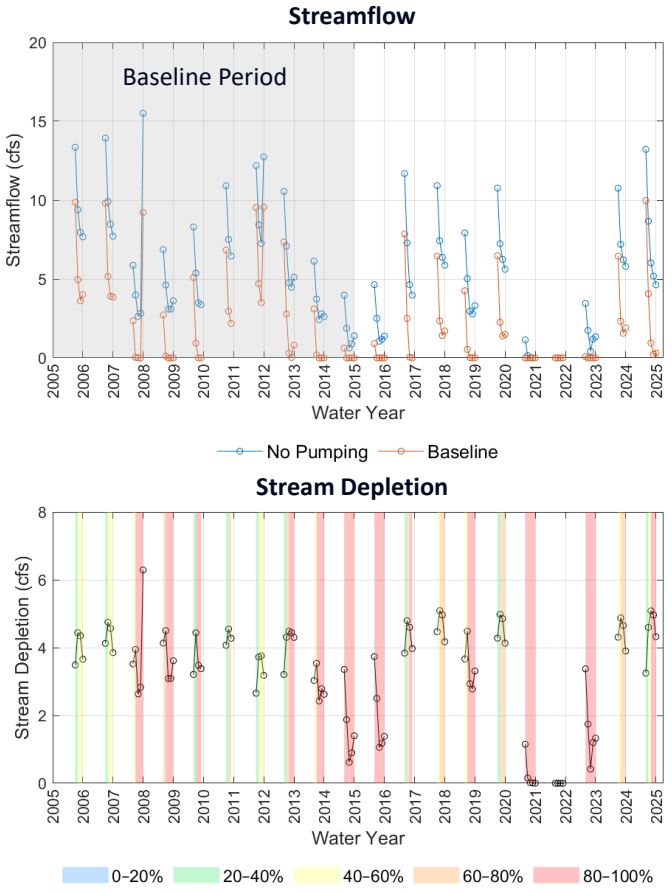


# Low Flow Stream Depletion at Pope Street (June – October)

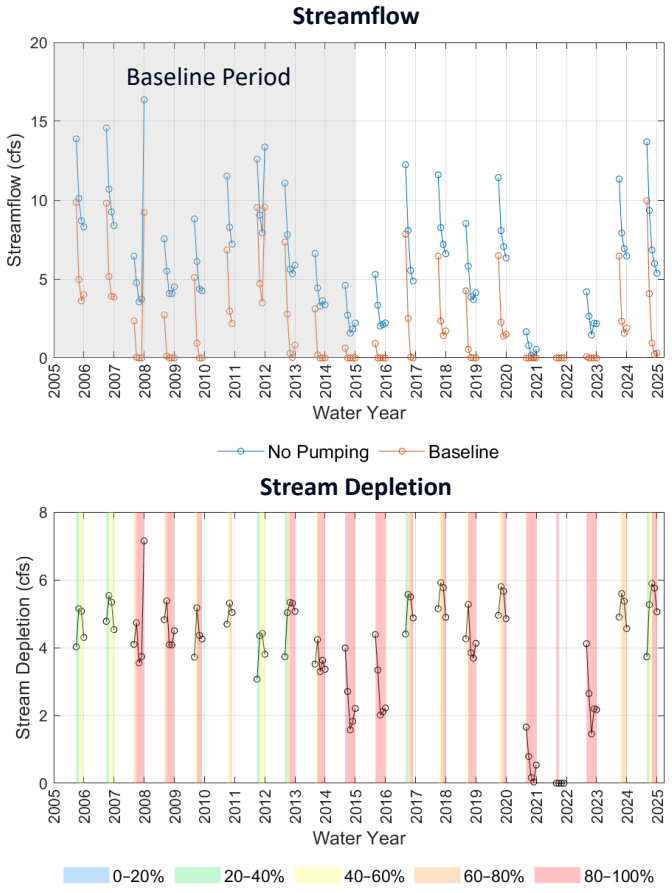
## No Agricultural, Landscape or Municipal Pumping (St Helena Water Balance Region)




## No Agricultural, Landscape or Municipal Pumping (St Helena & Calistoga Water Balance Region)

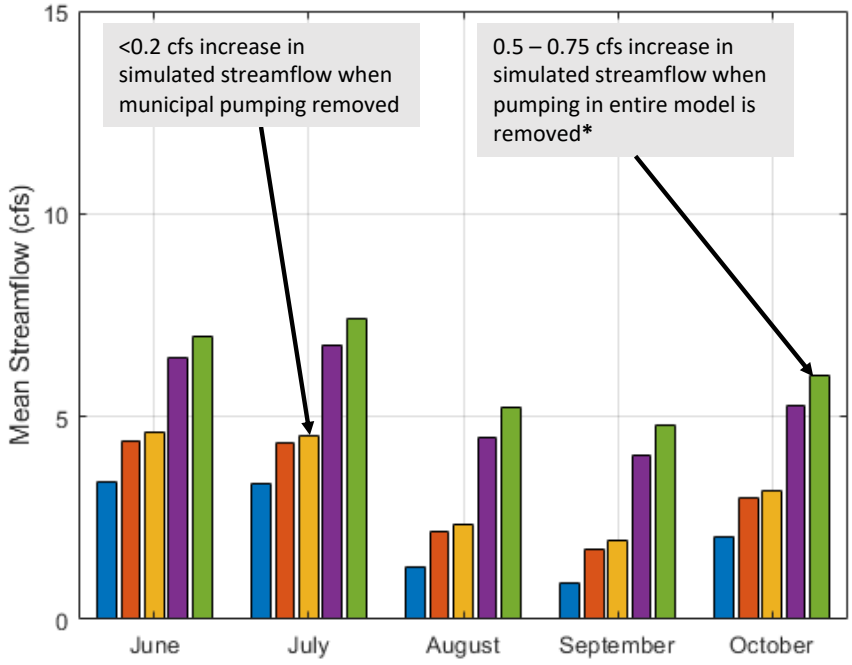



## No Agricultural, Landscape or Municipal Pumping (Napa Valley)

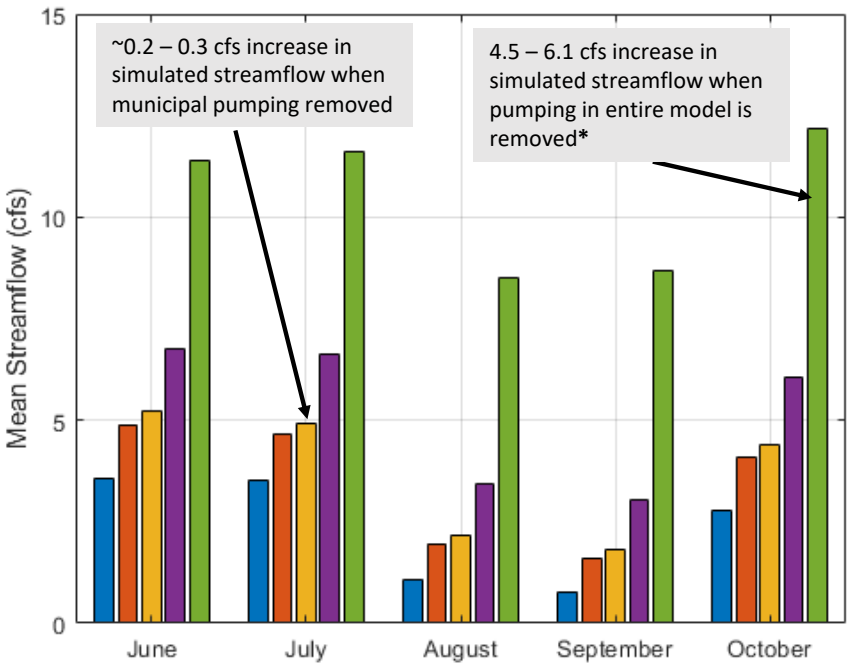


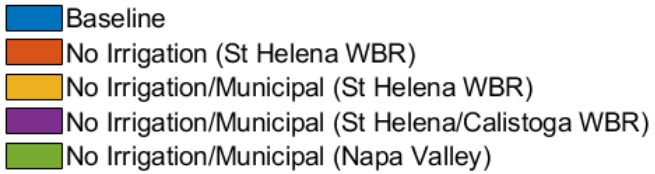
# Low Flow Discharge Summary Statistics (Pope St and Oak Knoll)

**Pope Street**




**Oak Knoll**



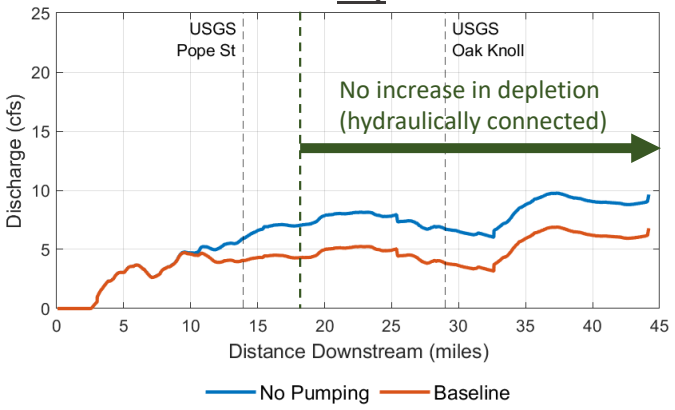




*** Includes the Napa Valley Subbasin and laterally adjacent areas included in model domain**

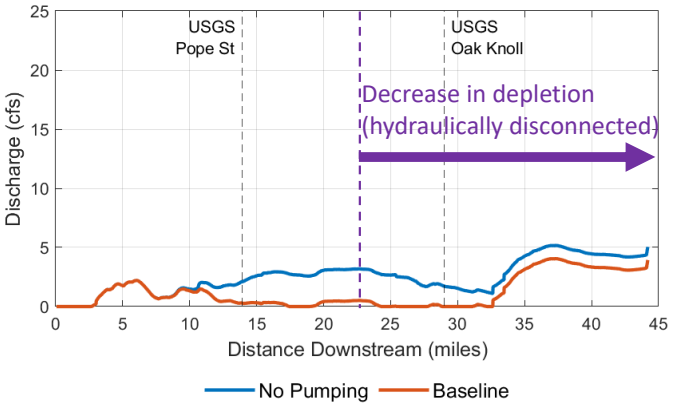
# Stream Depletion on the Napa River (2024)

**No Agricultural, Landscape or Municipal Pumping (St Helena Water Balance Region)**

**July**

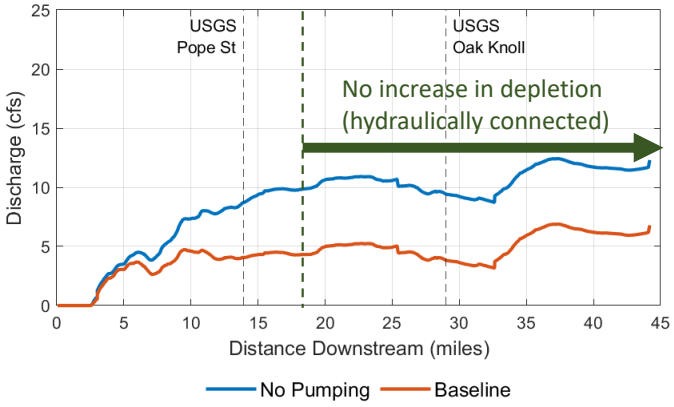



**September**

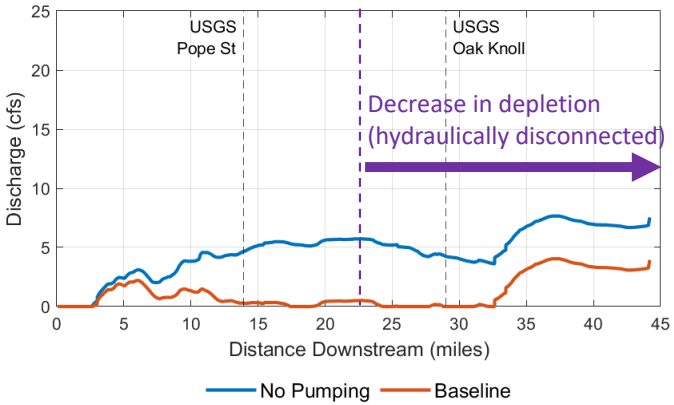



**No Agricultural, Landscape or Municipal Pumping (St Helena & Calistoga Water Balance Region)**

**July**

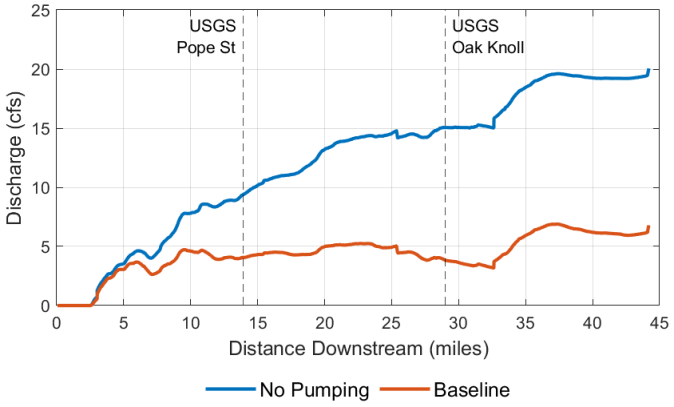



**September**

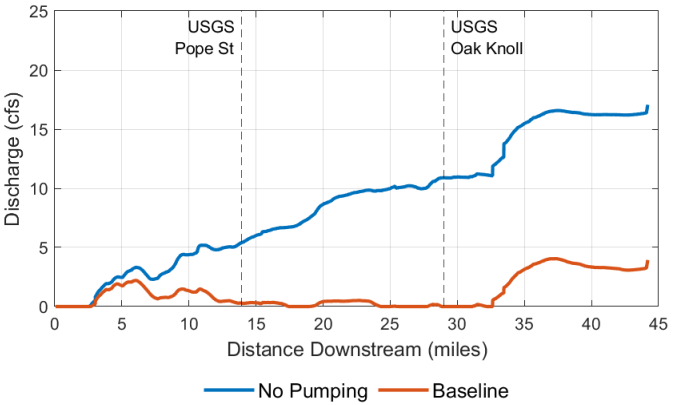



**No Agricultural, Landscape or Municipal Pumping (Napa Valley)**

**July**

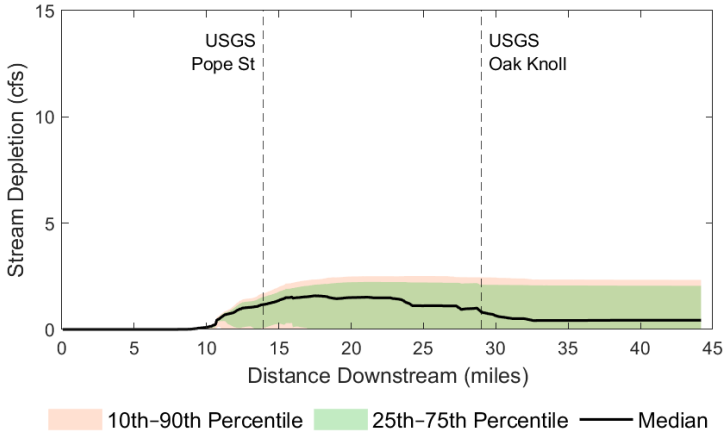



**September**

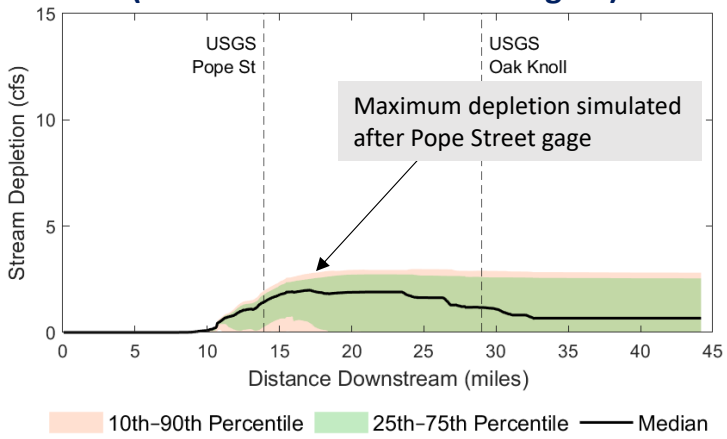


# Low Flow Stream Depletion on the Napa River (2005-2024)

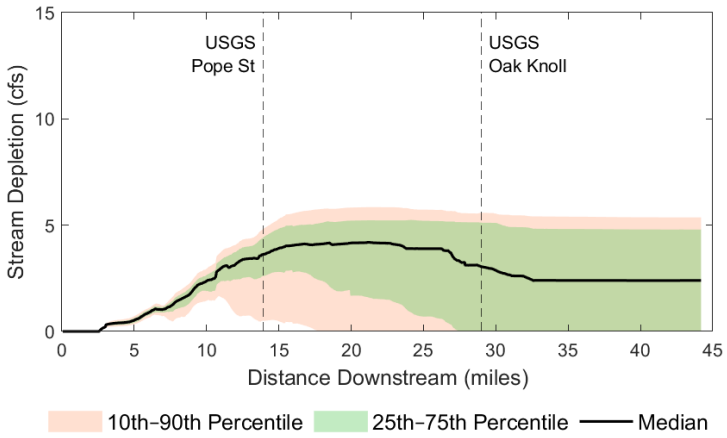
## No Agricultural or Landscape Pumping (St Helena Water Balance Region)



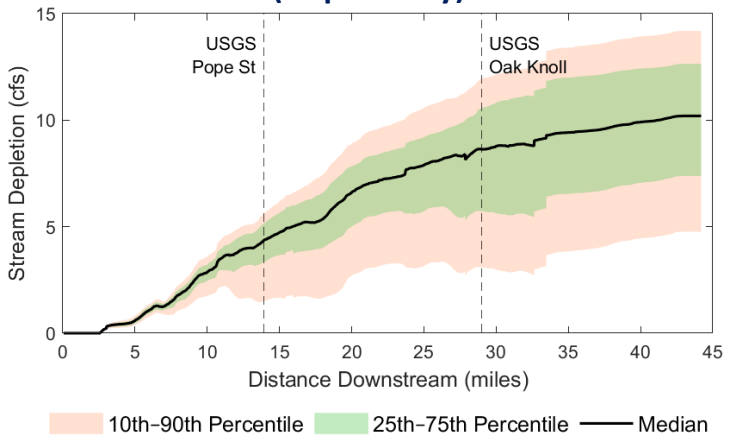

## No Agricultural, Landscape or Municipal Pumping (St Helena Water Balance Region)



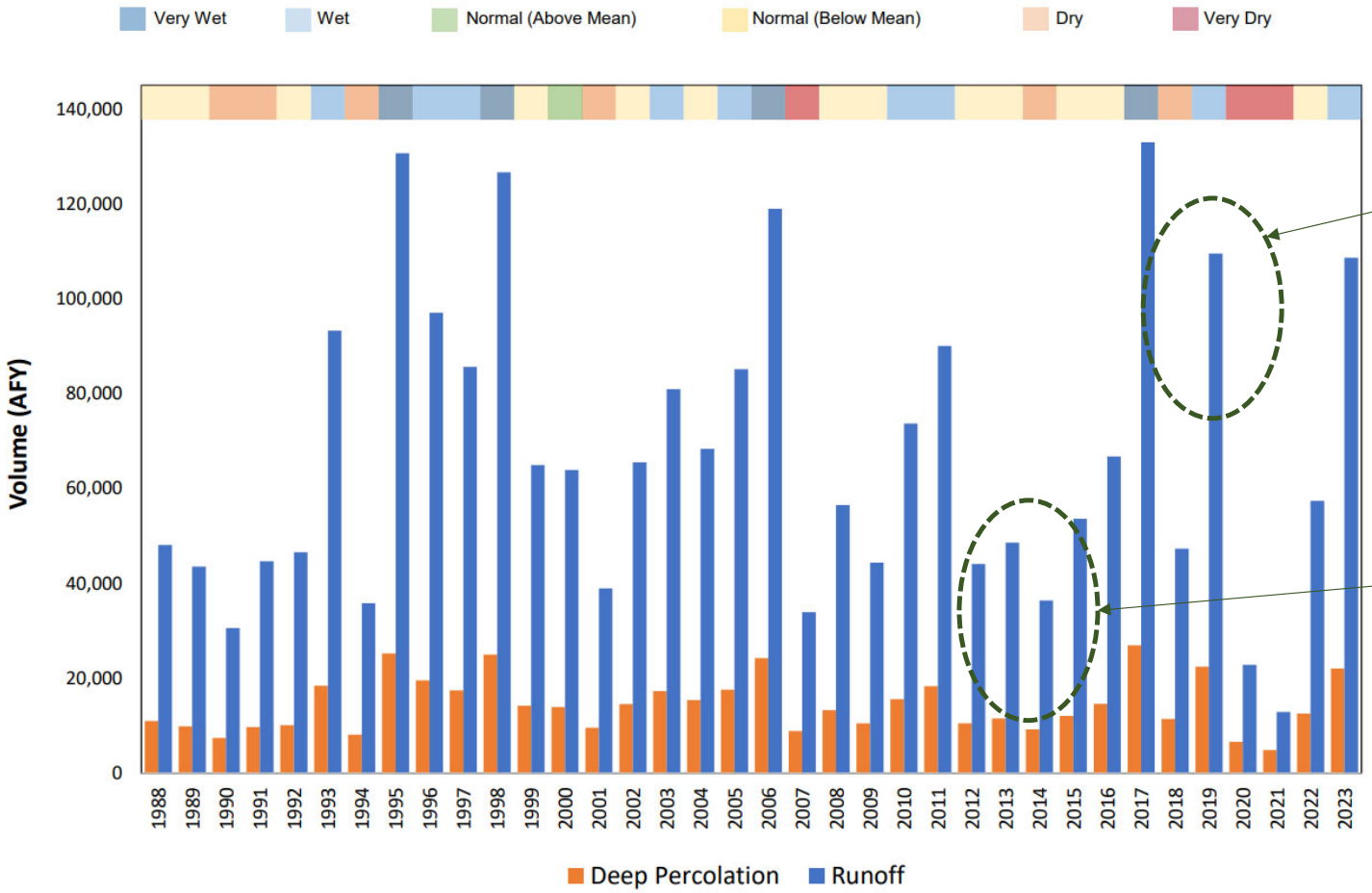

## No Agricultural, Landscape or Municipal Pumping (St Helena & Calistoga Water Balance Regions)




## No Agricultural, Landscape or Municipal Pumping (Napa Valley)



# Other Potential Scenarios: Retaining Runoff (Recharge)




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

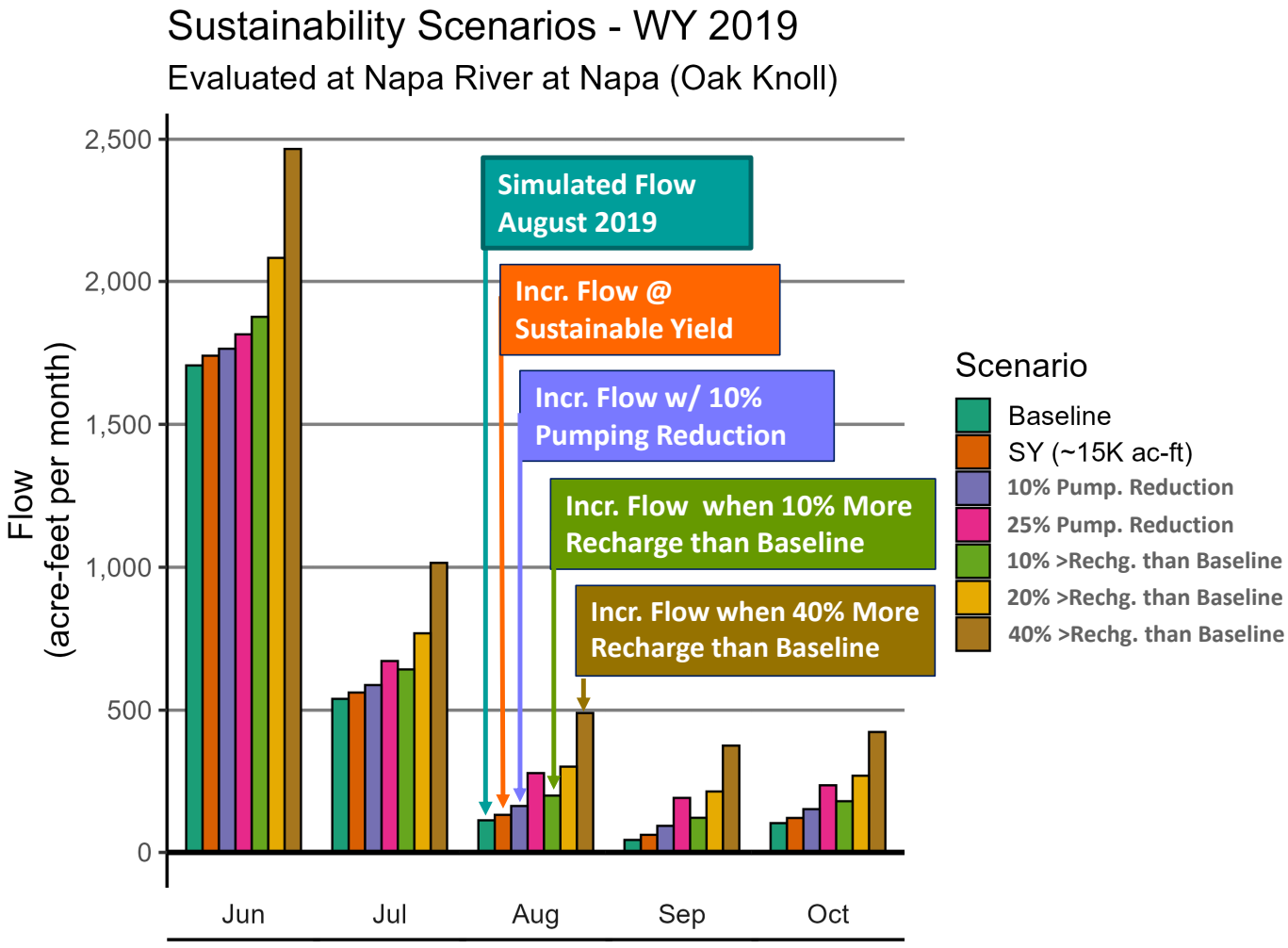
Dry years still provide key opportunities to increase recharge to mitigate drought effects.

# Other Potential Scenarios: Retaining Runoff (Recharge)

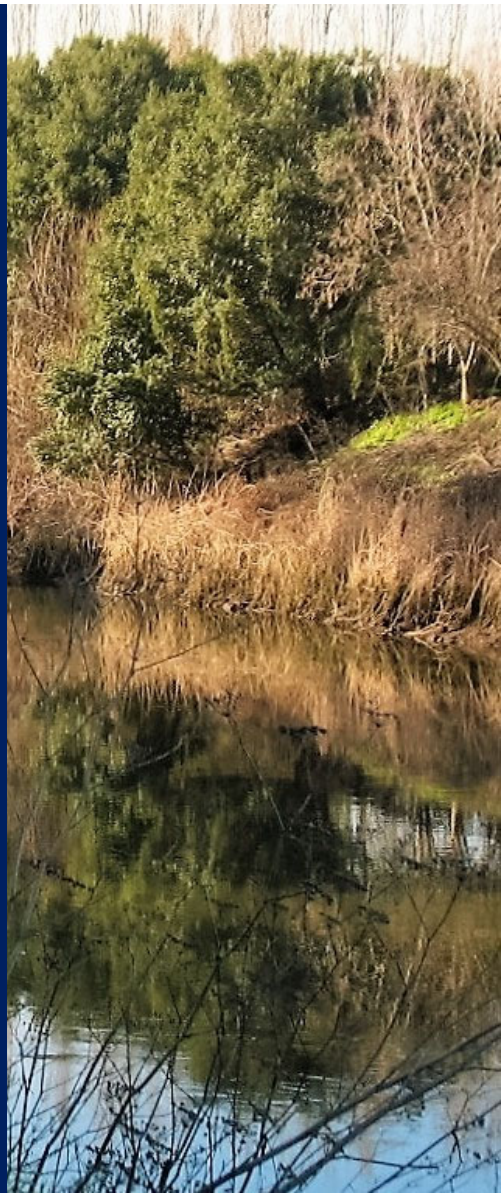
***Recharge & Pumping Benefits (Napa Valley)***

*Actions to Achieve*
*10% More Recharge*
*Compared to Baseline Result*
*in More Streamflow than*
*10% Pumping Reduction*

***Localized recharge scenarios can be used to evaluate (and optimize) benefits to specific reaches***



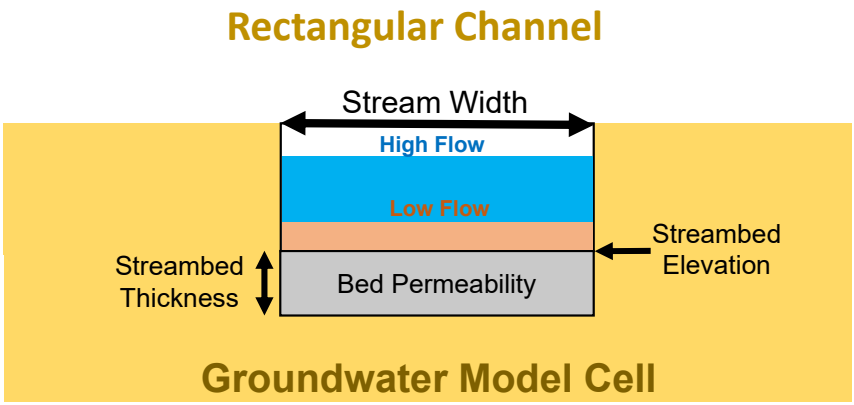
# Model Updates

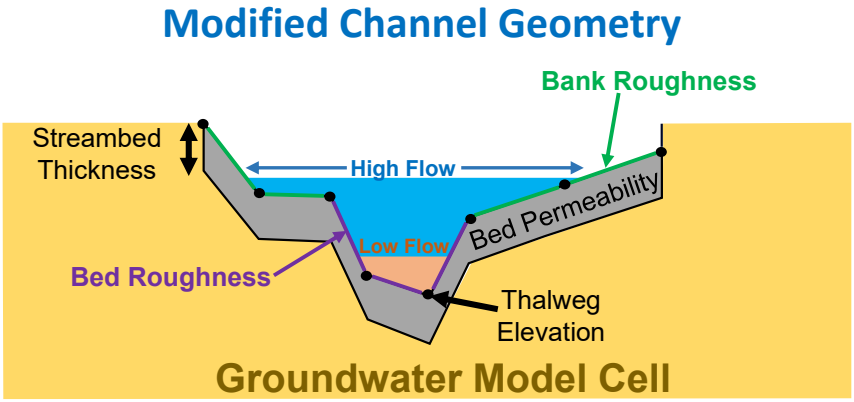


# Surface Water (Channel Geometry Refinements)

## Updates

- Updated channel methodology to better represent geometry
  - Lidar (2003, 2018)
  - Channel cross sections from pre- and post-restoration
- Utilized datasets to vary channel geometry over time
- Completed, but not yet included in current model
  - Model requires some re-calibration to be conducted during other model updates



# Water Use (Evapotranspiration Updates)

## Evapotranspiration

- Discrepancies between measured (Tule) and remotely sensed ET (OpenET)
- Issues with local CIMIS station

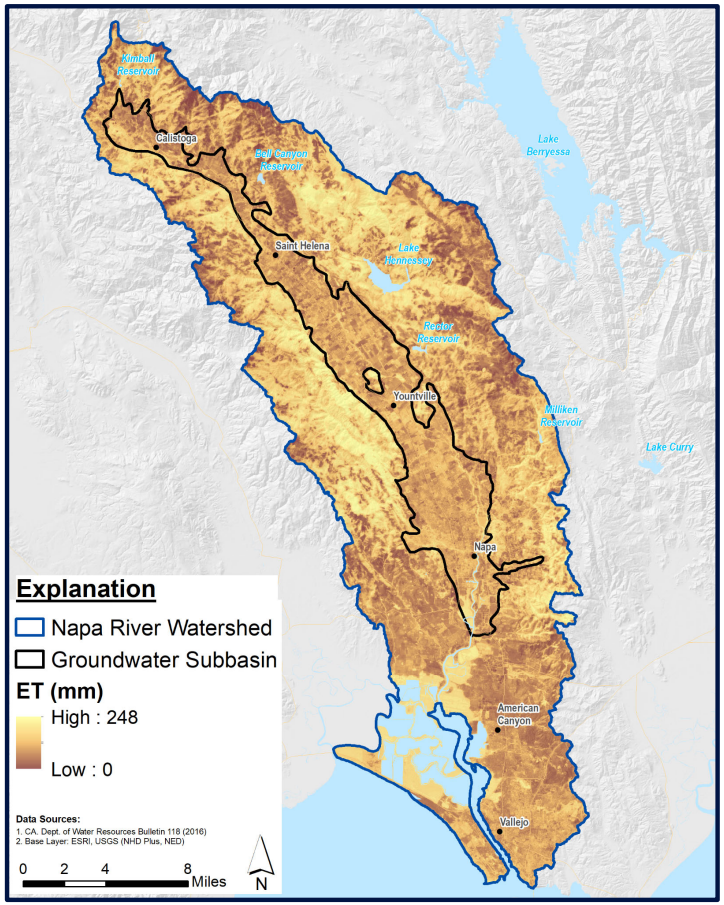
## Crop Coefficients

- Assigned by crop type (e.g. white vs black grapes)
- May not account for spatial variability in ET
- May not account for temporal variability in ET

## Updates

- Determine Factors that influence Kc and ET
  - Physical Processes
  - Cultural Practices
- Developing approach to appropriately adjust framework to capture variability

**OpenET Evapotranspiration (July 2021)**



# Water Use (Soil Moisture Storage)

## Existing Framework

- Assumes soil moisture storage is reduced on the scale of days to weeks
- Irrigation is required when precipitation or groundwater uptake cannot satisfy crop water demand
- Irrigation begins earlier in season
- Native vegetation can be easily water stressed

## Update

- Coordination with USGS platform developers
  - Updates to model platform to incorporate longer-term soil moisture storage
  - Evaluating options for evaluating runoff from precipitation
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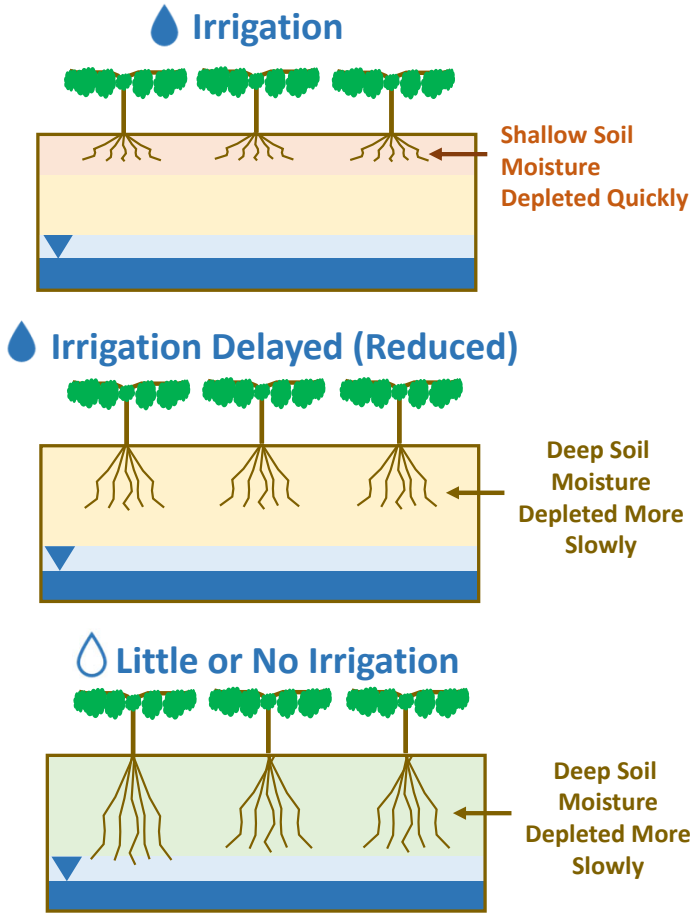
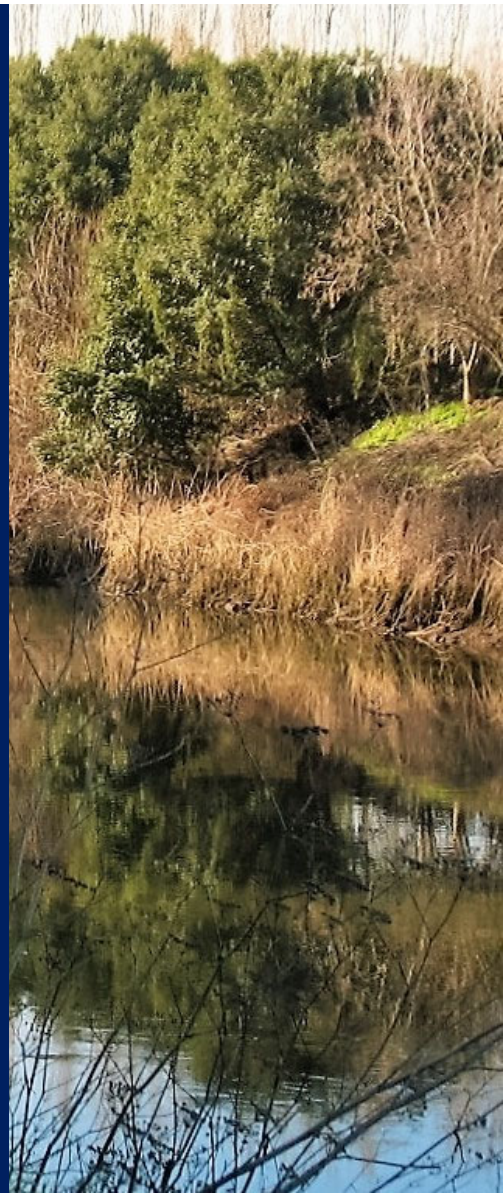


# Questions and Discussion



# Thank You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# Napa County Groundwater Sustainability Agency

## *Napa Valley Integrated Hydrologic Model Scenarios And Updates*

**April 10, 2025**

Luhdorff & Scalmanini
Consulting Engineers

# Outline

Stream Depletion Scenarios

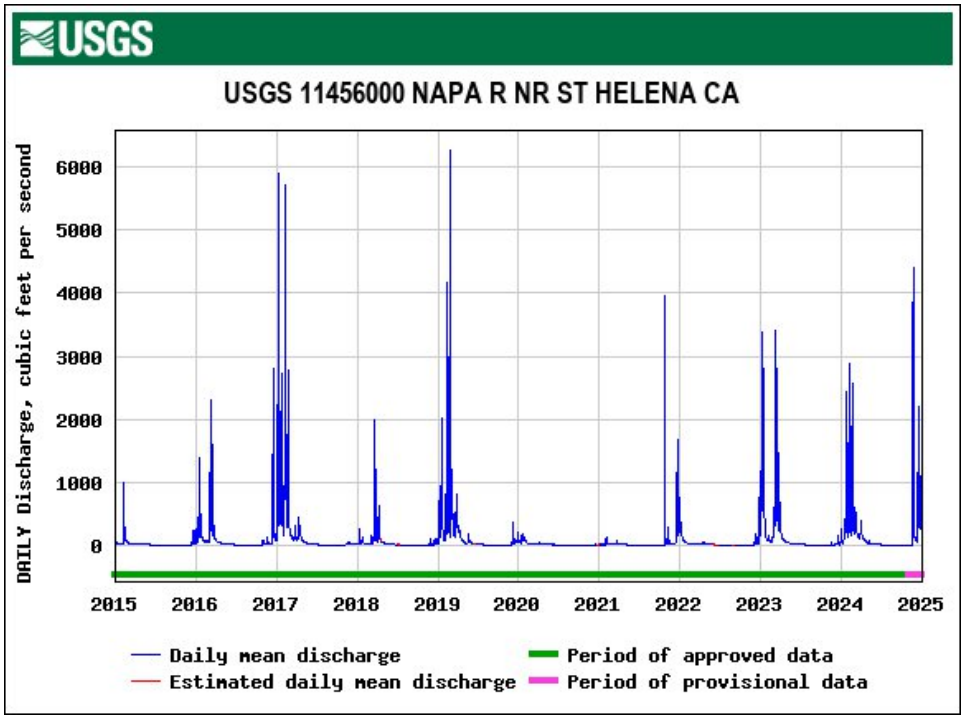
Model Updates

Questions and Discussion

# Background

## Streamflow in the Napa River

- No flow, very low flow, and disconnected pools observed in the Napa River near St Helena
- Desire to understand relationship between groundwater pumping and streamflow in this area
- Previous scenarios have looked at the effect of agricultural and landscape pumping in all the Napa Valley using Napa Valley Integrated Hydrologic Model (NVIHM)
- Recent interest in understanding how more localized pumping may affect streamflow in this reach



# Depletion Scenarios

Approach

Compare streamflow in Baseline (calibrated) model (WY2005-2024) to various groundwater pumping scenarios

Scenario 1:

- No pumping for irrigation (agricultural or landscape) in the St Helena "Water Balance Region" (WBR)

Scenario 2:

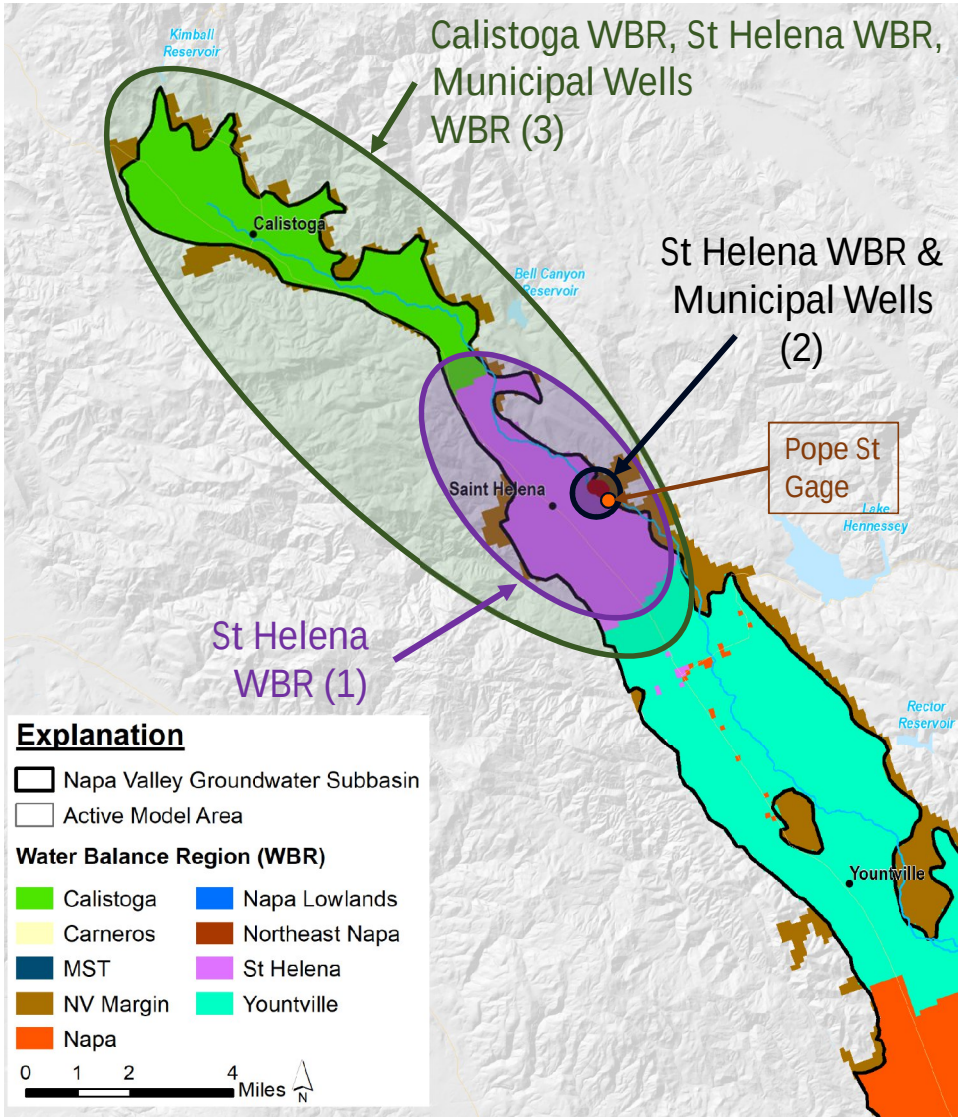
- No pumping for irrigation in the St Helena WBR
- No pumping in St Helena municipal wells

Scenario 3:

- No pumping for irrigation in the St Helena WBR
- No pumping in St Helena municipal wells
- No Pumping in the Calistoga WBR

Scenario 4:

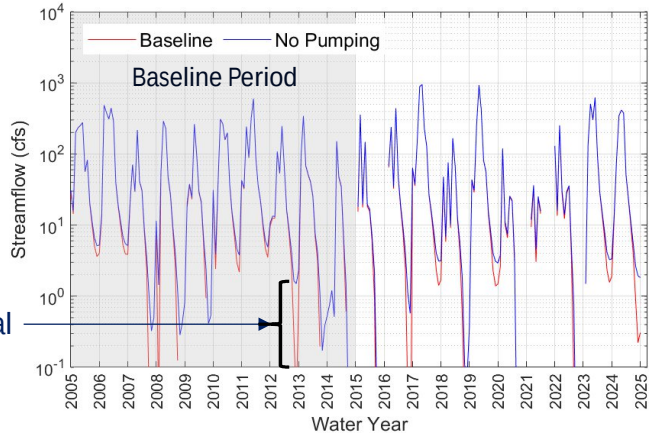
- No pumping for irrigation in the Napa Valley
- No pumping in St Helena municipal wells



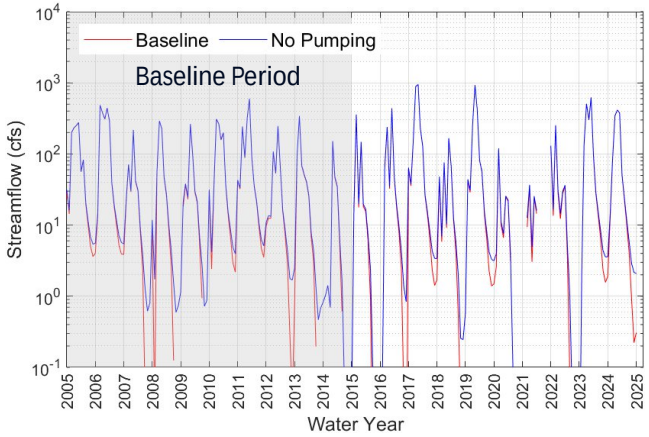
# Streamflow in Napa River at Pope Street

Change in streamflow resulting from removal of pumping ("Stream Depletion")

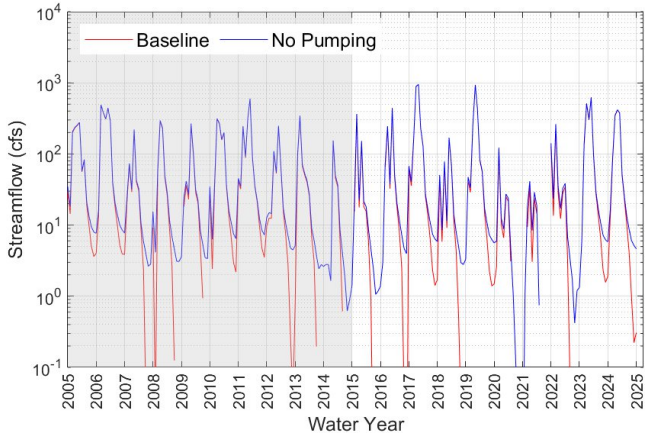
No Agricultural or Landscape Pumping (St Helena Water Balance Region)



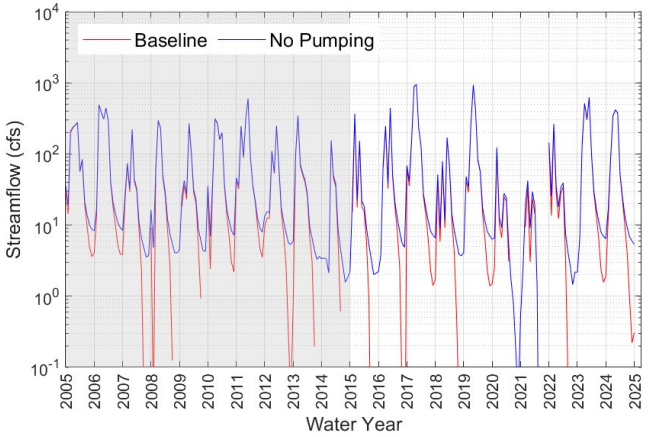

No Agricultural, Landscape or Municipal Pumping (St Helena Water Balance Region)




No Agricultural, Landscape or Municipal Pumping (St Helena & Calistoga Water Balance Regions)

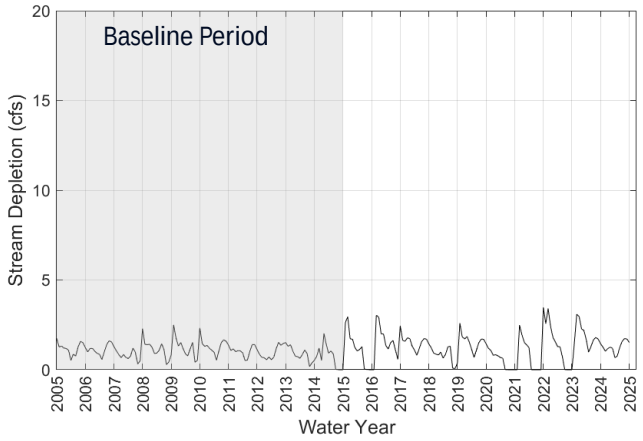



No Agricultural, Landscape or Municipal Pumping (Napa Valley)



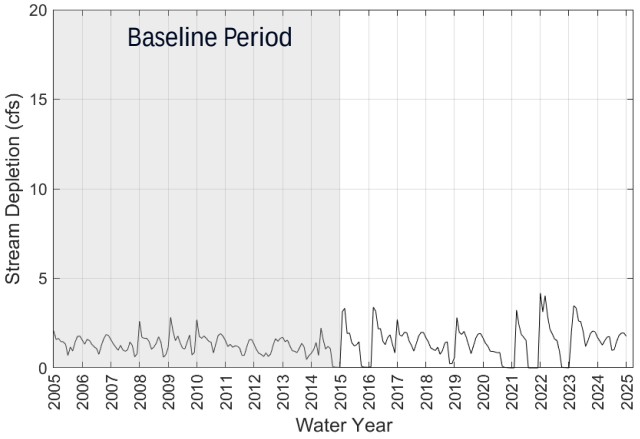
# Stream Depletion in Napa River at Pope Street

No Agricultural or Landscape Pumping
(St Helena Water Balance Region)



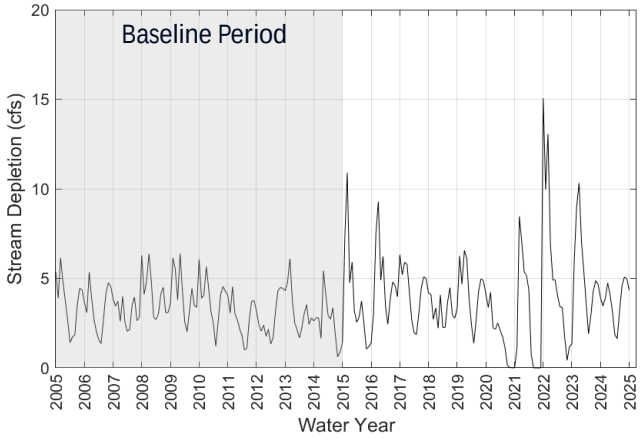

Minor (<~0.2 cfs) increase in stream depletion due to municipal pumping

No Agricultural, Landscape or Municipal Pumping
(St Helena Water Balance Region)



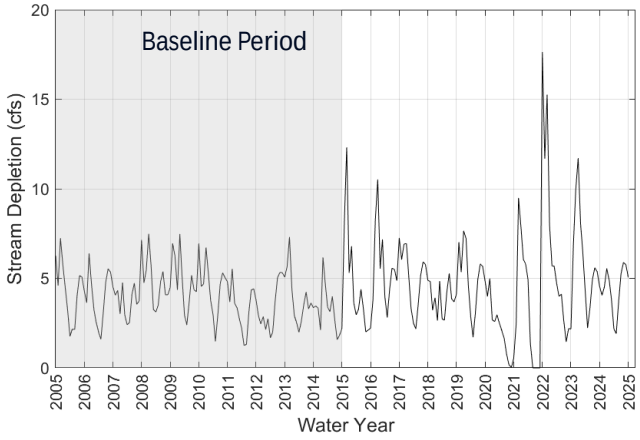

Substantial increase in stream depletion due to pumping in Calistoga WBR

No Agricultural, Landscape or Municipal Pumping
(St Helena & Calistoga Water Balance Regions)




Minor increase in stream depletion at this gage due to pumping in rest of Napa Valley

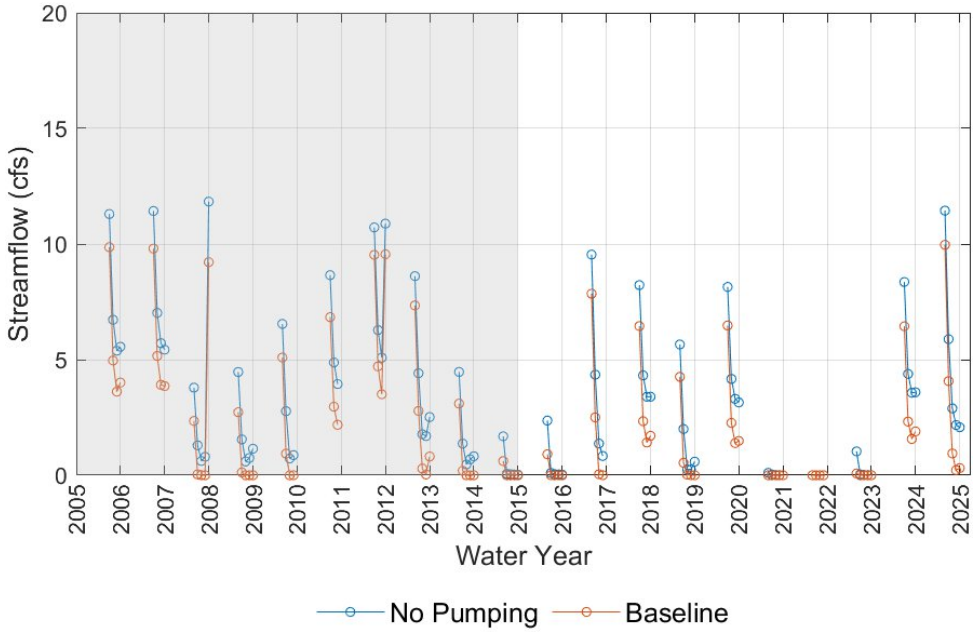
No Agricultural, Landscape or Municipal Pumping
(Napa Valley)



# Low Flow Analysis

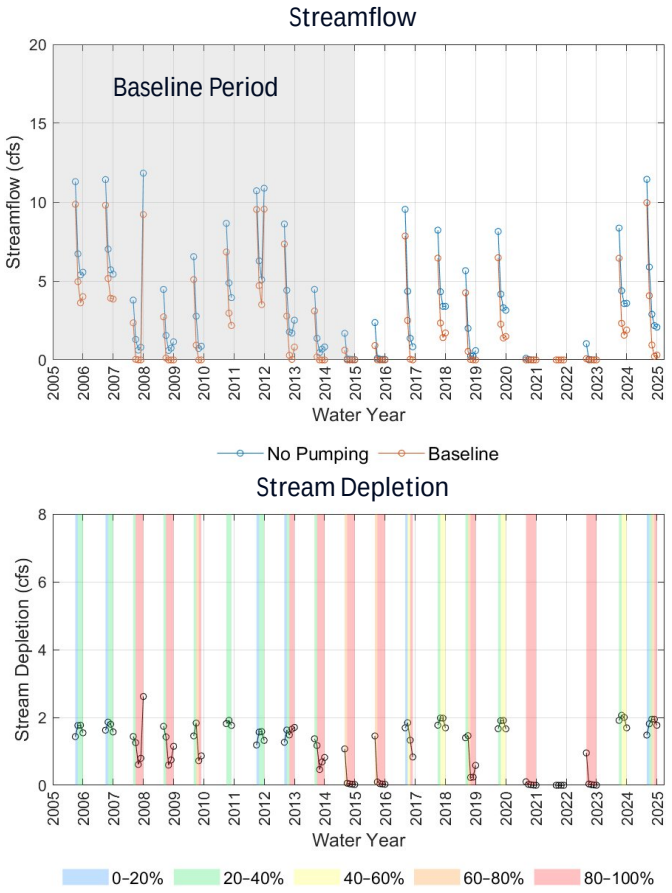
## Approach

- Removed months that do not fall within typical low flow period (June – October)
- Only considered “low flows” within these period
  - For this purpose, we define “low flow” as less than or equal to 10  cubic feet per second (cfs)
  - Excludes high spring and fall flows due to early storms

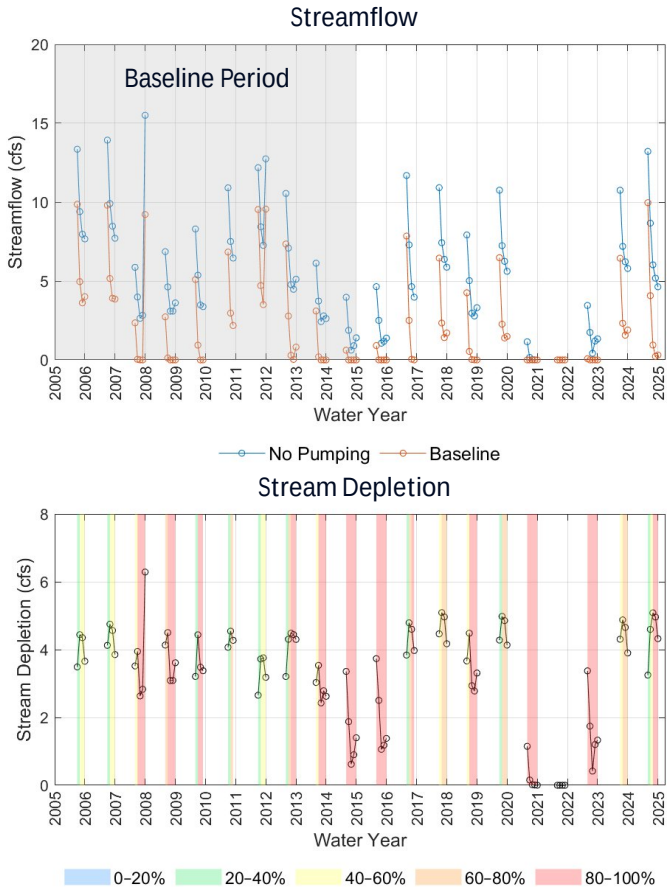


# Low Flow Stream Depletion at Pope Street (June – October)

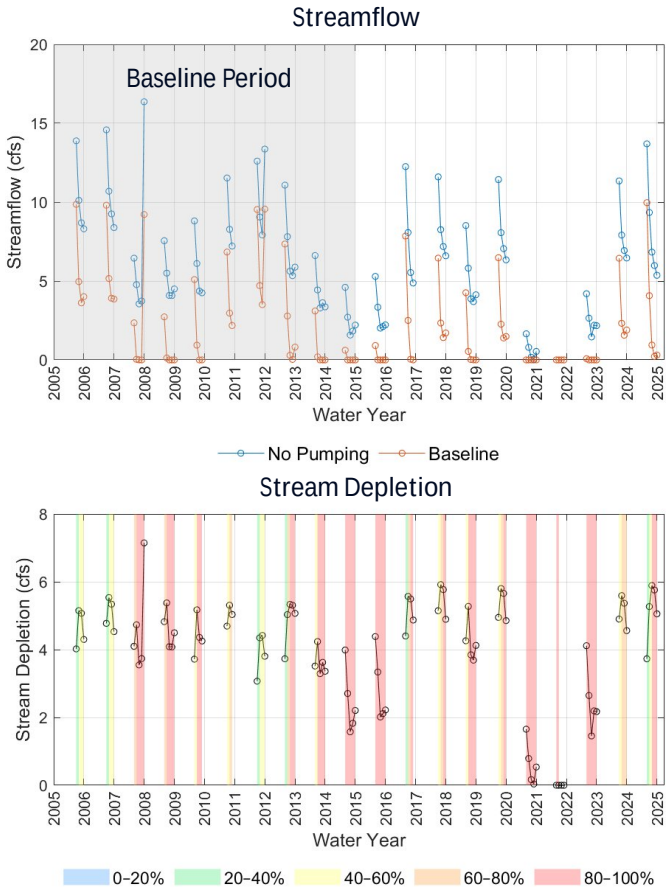
No Agricultural, Landscape or Municipal Pumping (St Helena Water Balance Region)




No Agricultural, Landscape or Municipal Pumping (St Helena & Calistoga Water Balance Region)

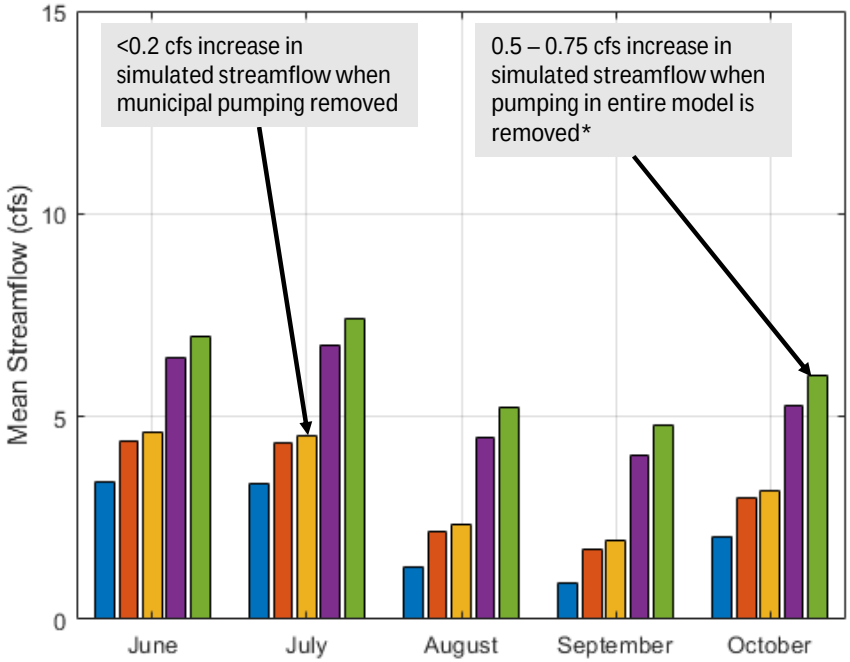



No Agricultural, Landscape or Municipal Pumping (Napa Valley)

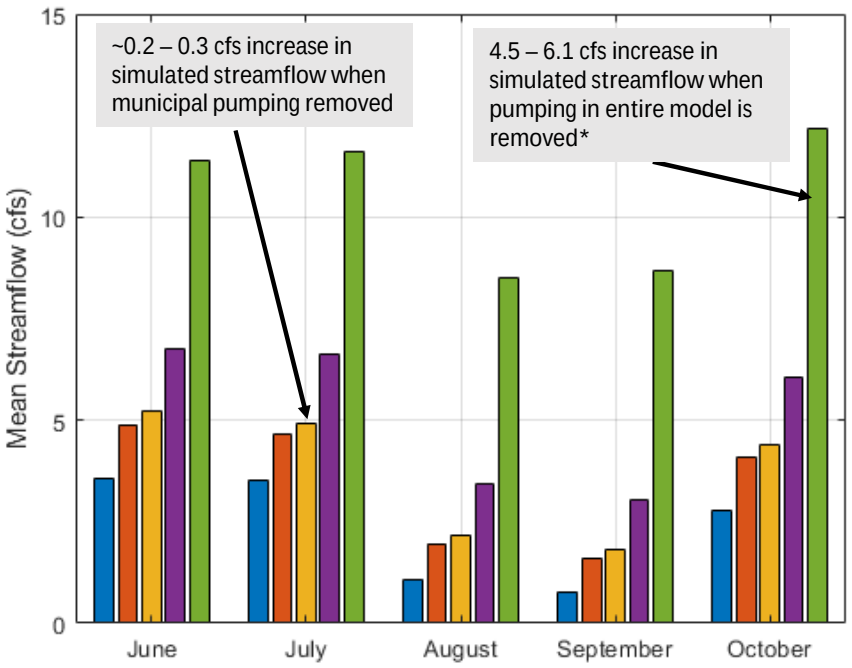


# Low Flow Discharge Summary Statistics (Pope St and Oak Knoll)

Pope Street




Oak Knoll

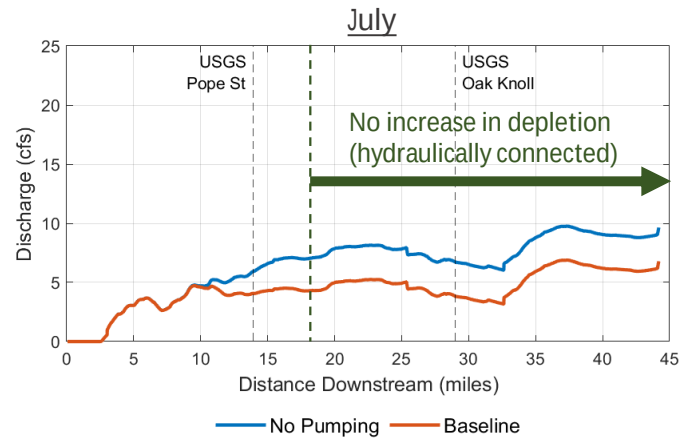


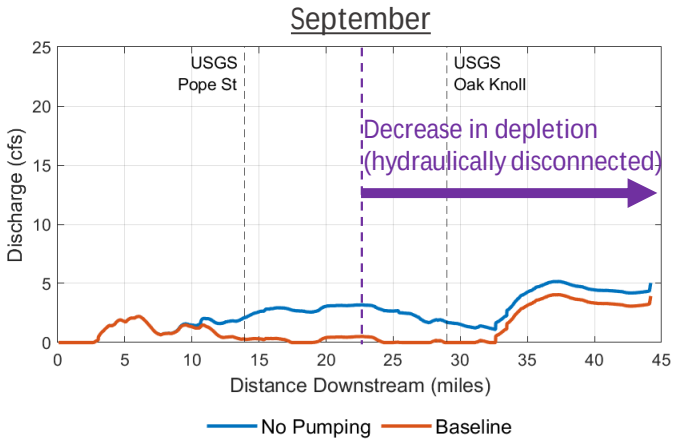

Baseline
No Irrigation (St Helena WBR)
No Irrigation/Municipal (St Helena WBR)
No Irrigation/Municipal (St Helena/Calistoga WBR)
No Irrigation/Municipal (Napa Valley)

* Includes the Napa Valley Subbasin and laterally adjacent areas included in model domain

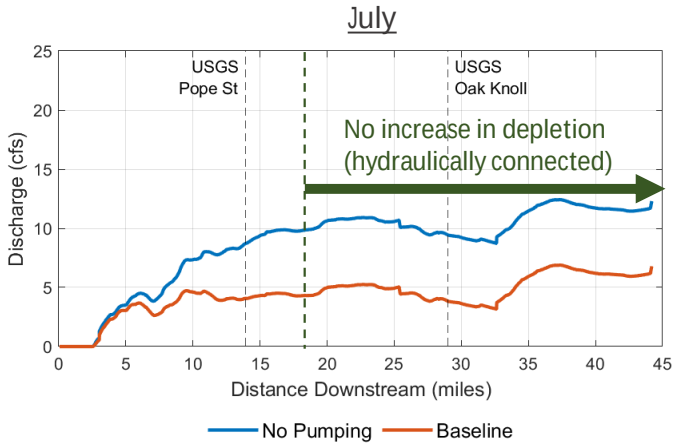
# Stream Depletion on the Napa River (2024)

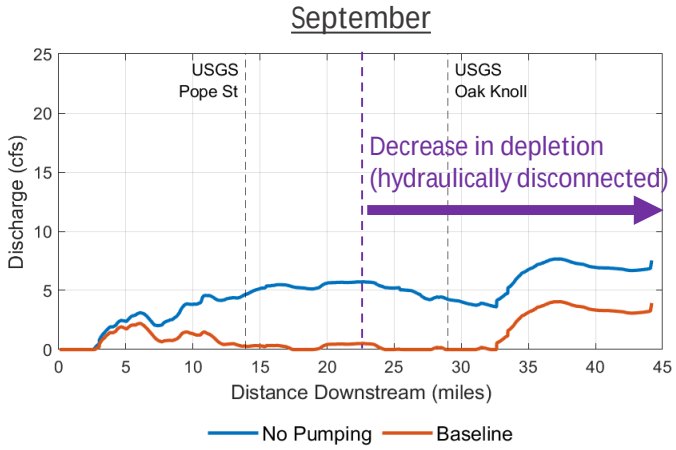
No Agricultural, Landscape or Municipal Pumping (St Helena Water Balance Region)



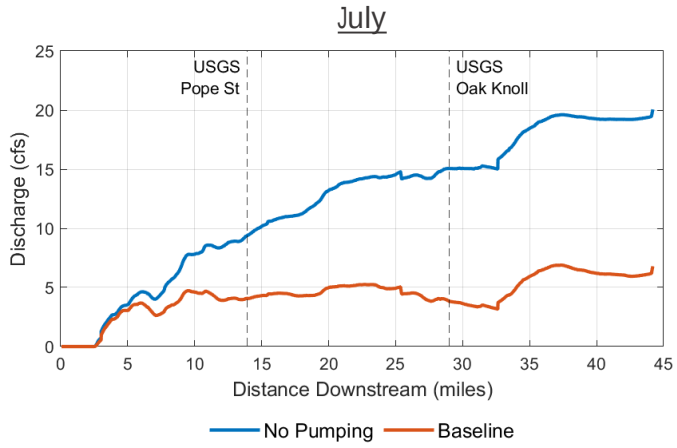



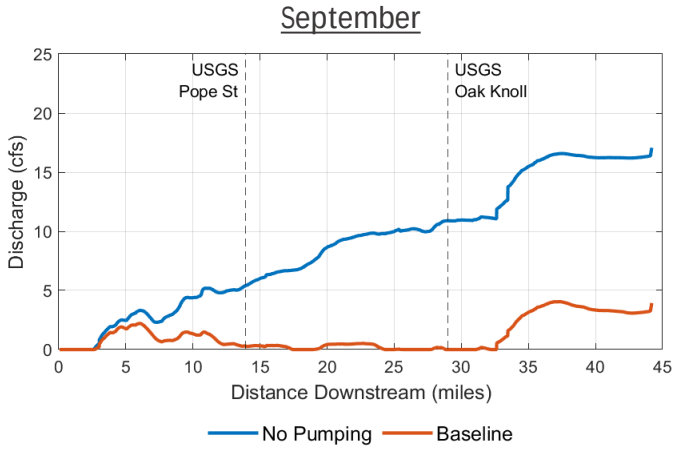

No Agricultural, Landscape or Municipal Pumping (St Helena & Calistoga Water Balance Region)



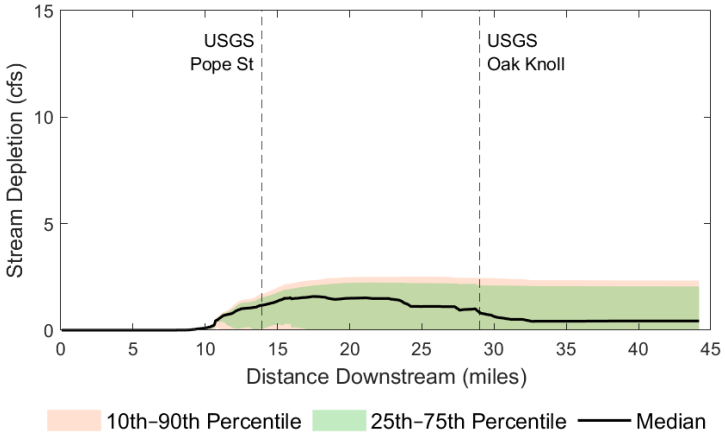

No Agricultural, Landscape or Municipal Pumping (Napa Valley)



# Low Flow Stream Depletion on the Napa River (2005-2024)

## No Agricultural or Landscape Pumping (St Helena Water Balance Region)

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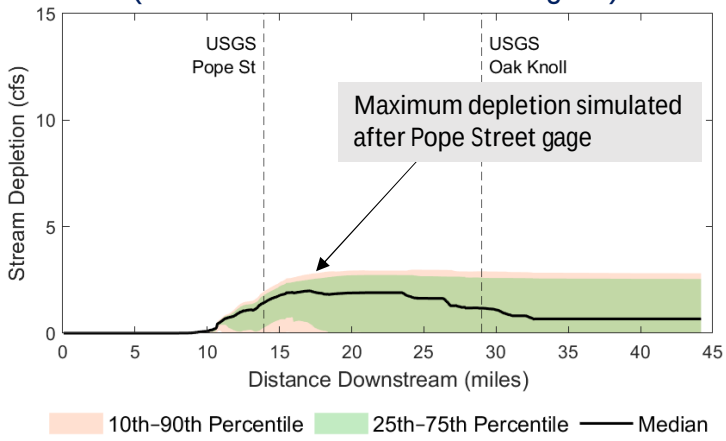


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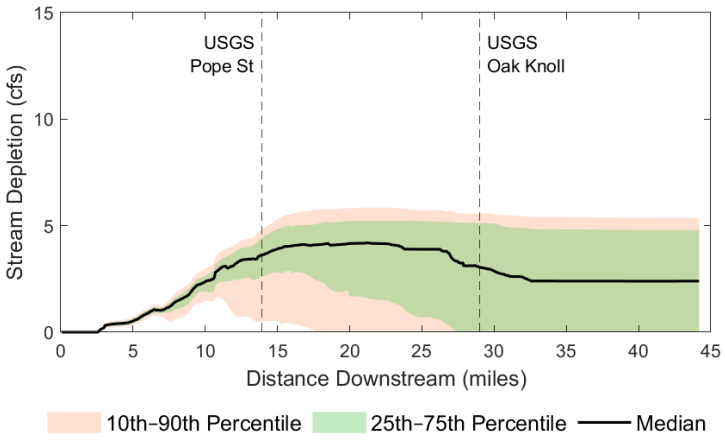


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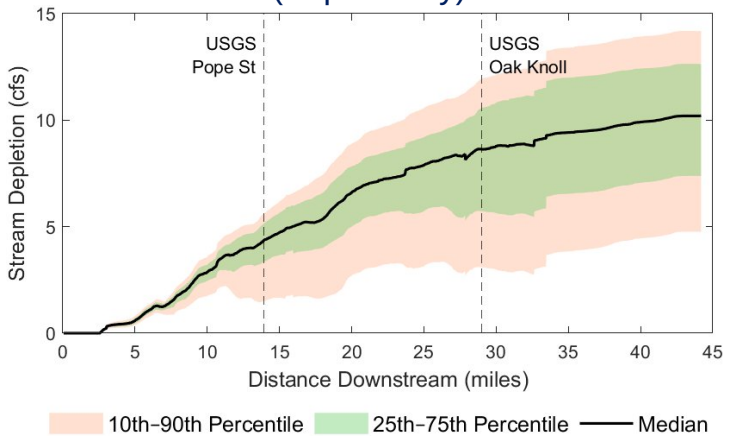
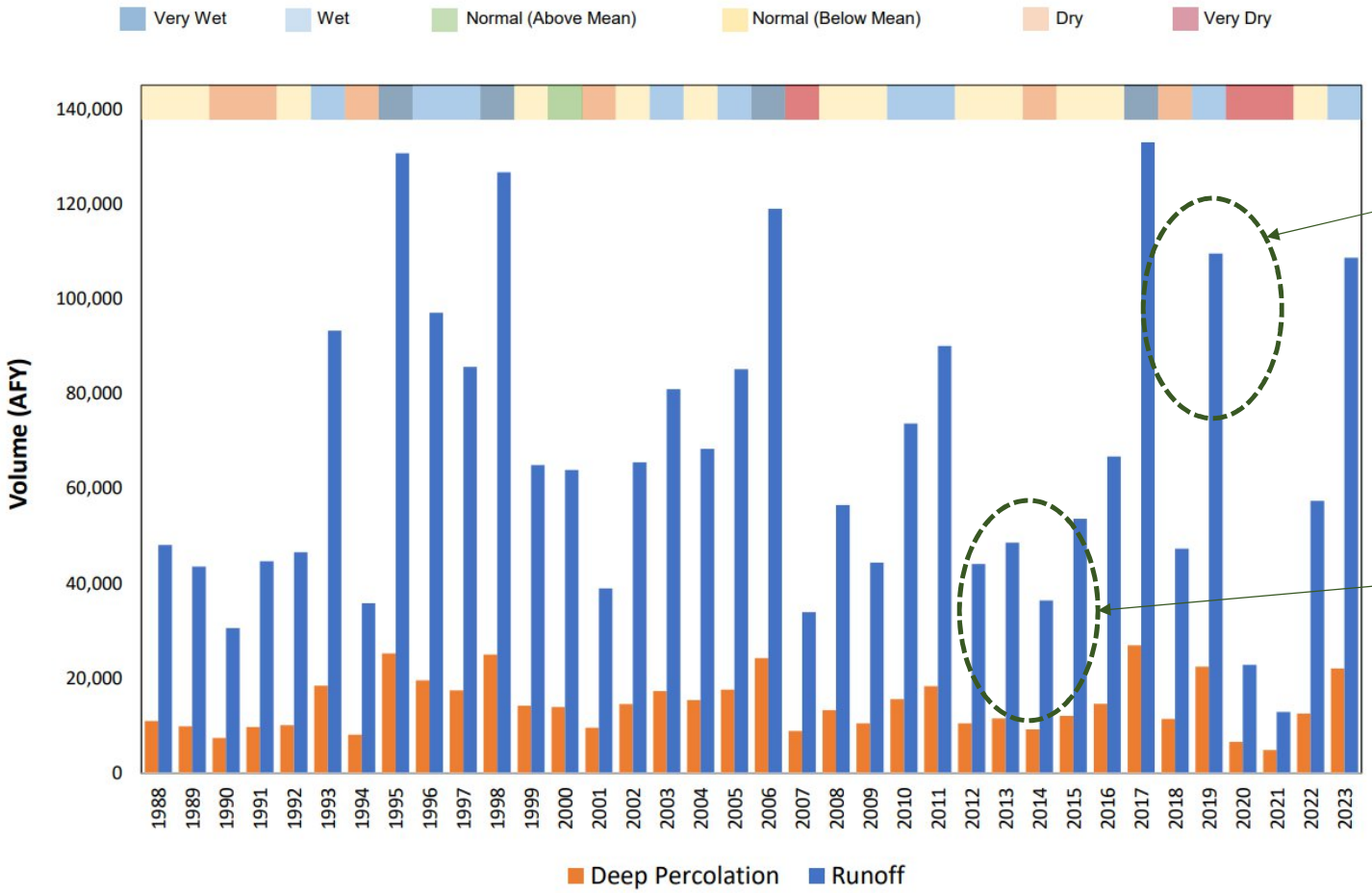


# Other Potential Scenarios: Retaining Runoff (Recharge)




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

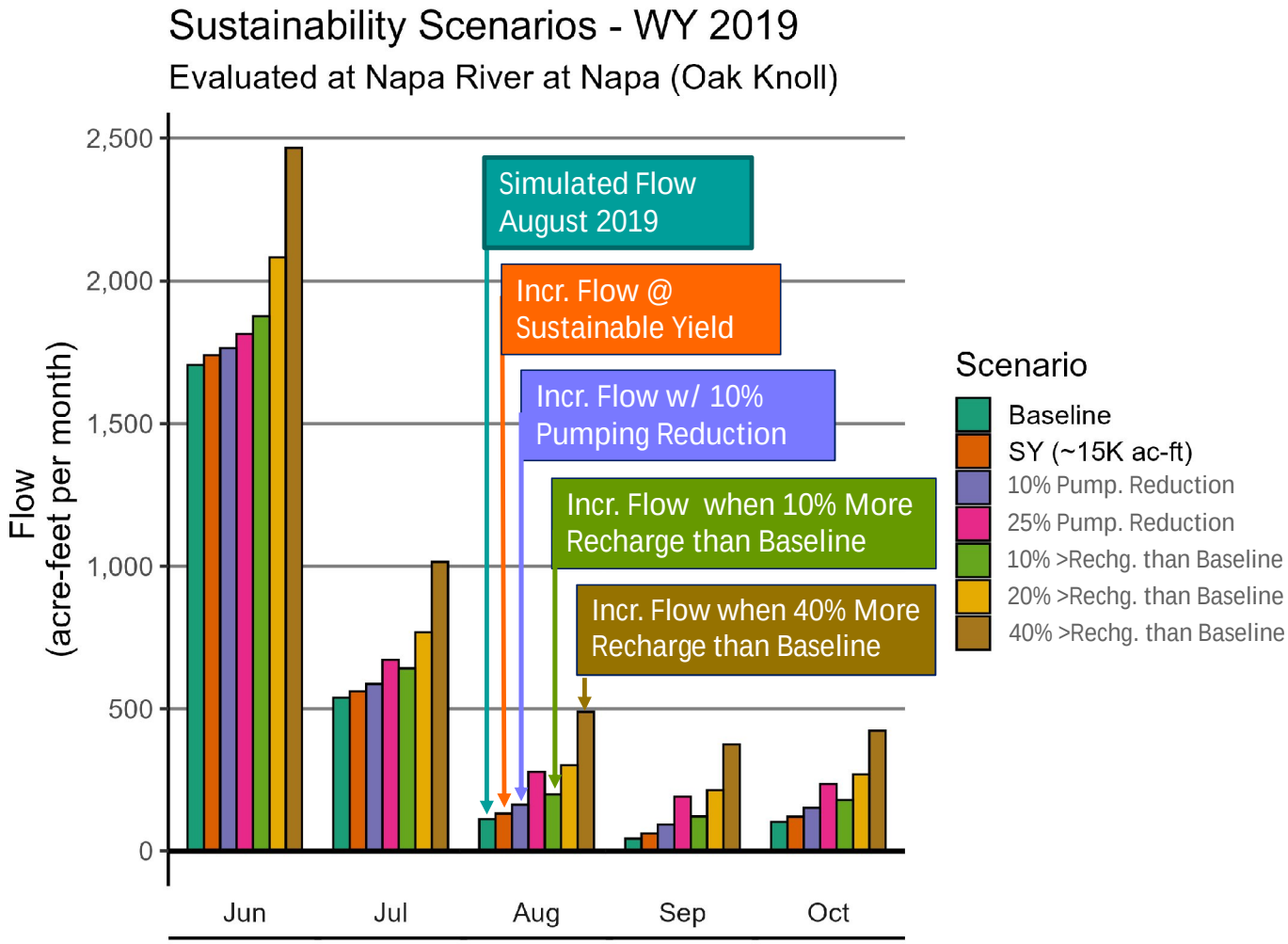
Dry years still provide key opportunities to increase recharge to mitigate drought effects.

# Other Potential Scenarios: Retaining Runoff (Recharge)

*Recharge & Pumping Benefits (Napa Valley)*

*Actions to Achieve 10% More Recharge Compared to Baseline Result in More Streamflow than 10% Pumping Reduction*

*Localized recharge scenarios can be used to evaluate (and optimize) benefits to specific reaches*



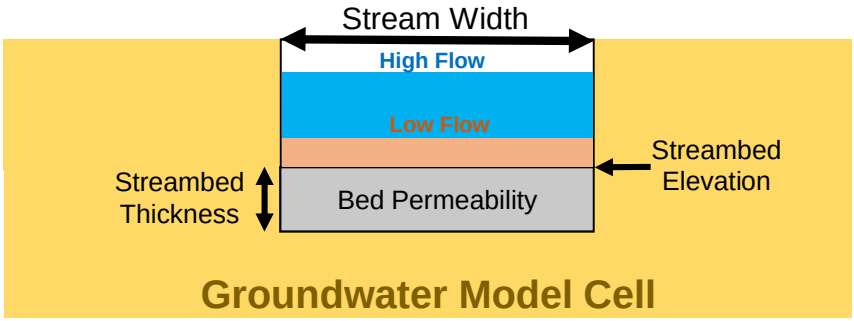
# Model Updates

# Surface Water (Channel Geometry Refinements)

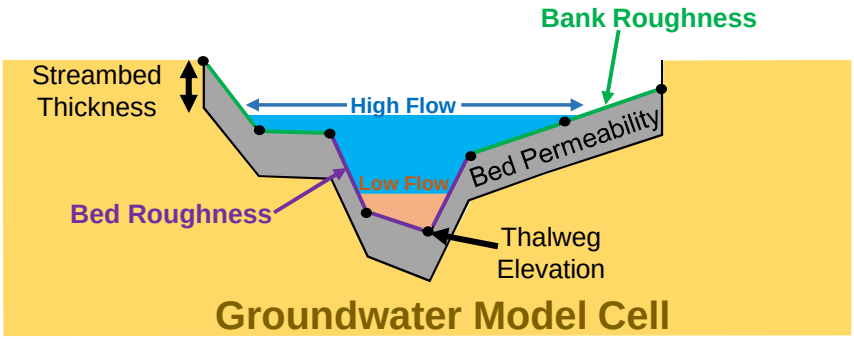
## Updates

- Updated channel methodology to better represent geometry
  - Lidar (2003, 2018)
  - Channel cross sections from pre- and post-restoration
- Utilized datasets to vary channel geometry over time
- Completed, but not yet included in current model
  - Model requires some re-calibration to be conducted during other model updates

Rectangular Channel




Modified Channel Geometry



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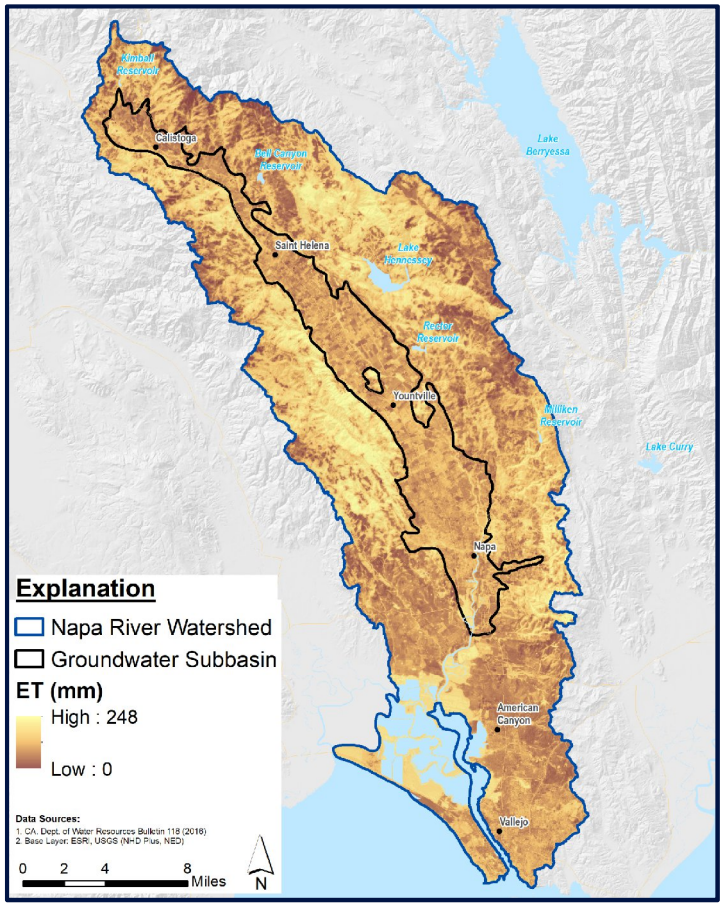
OpenET Evapotranspiration (July 2021)



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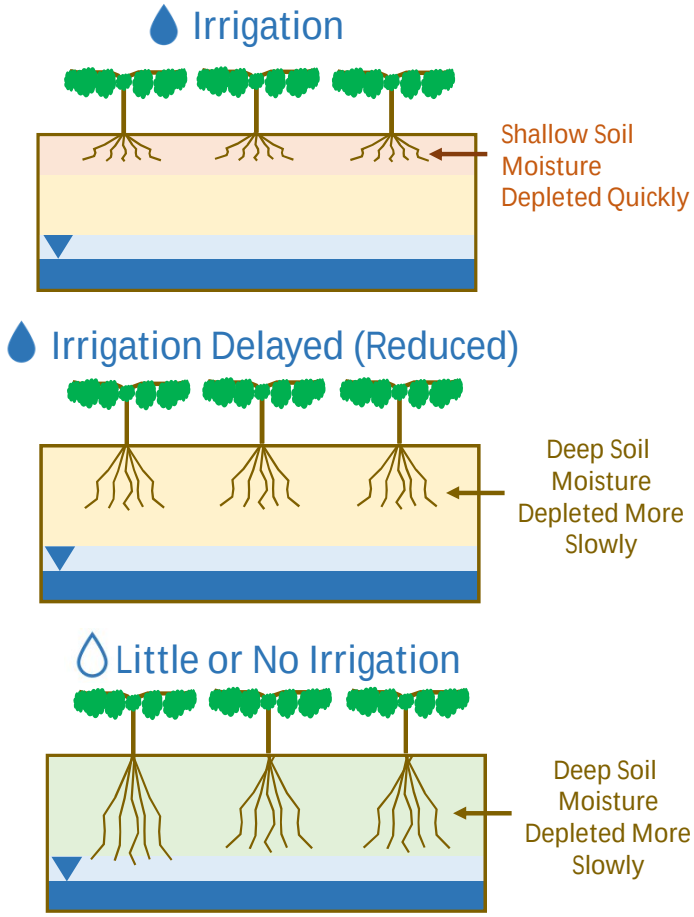

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