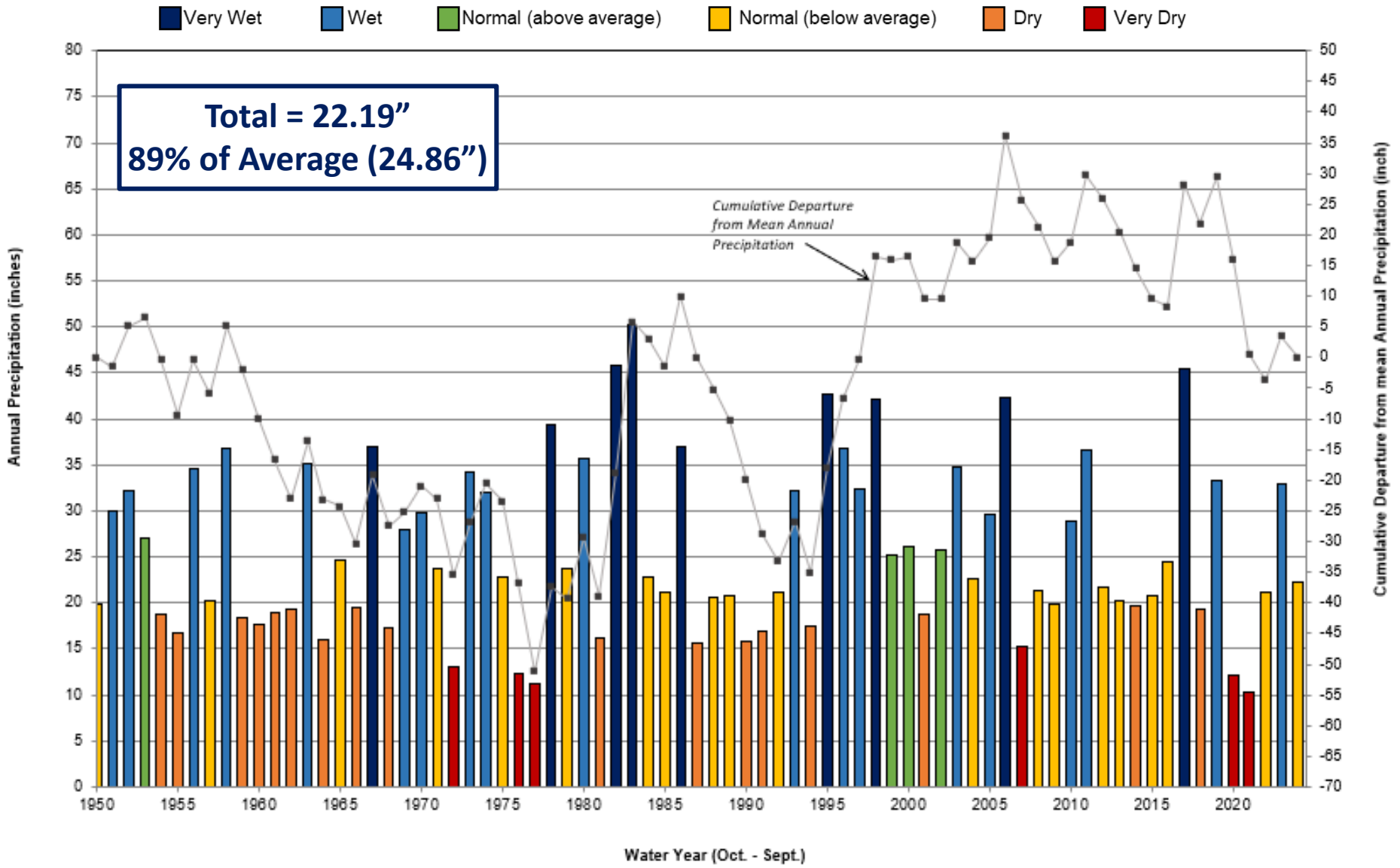
Napa County Groundwater Sustainability Agency

Current Conditions – Start of Water Year 2024

May 9, 2024

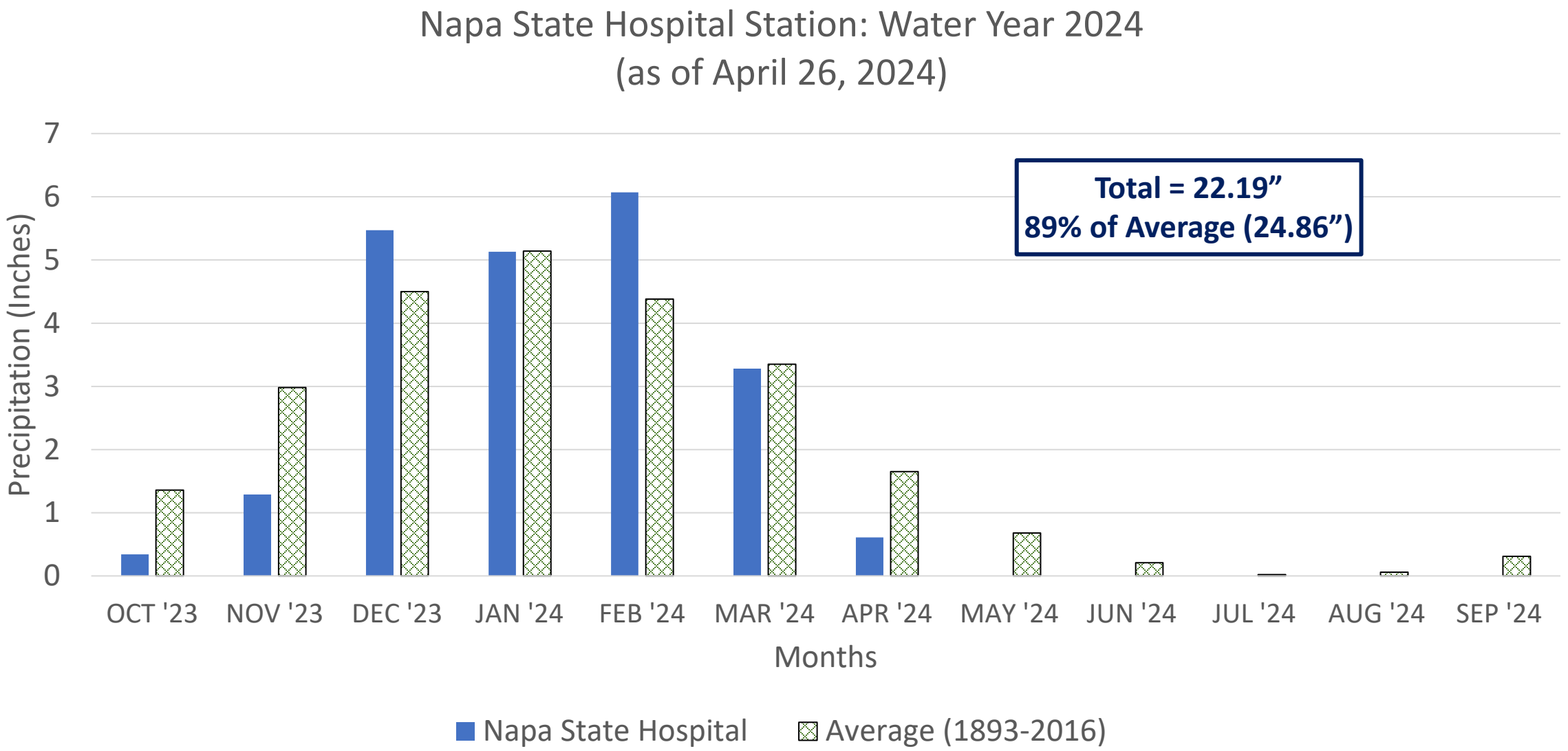
Luhdorff & Scalmanini
Consulting Engineers

Historical Precipitation at Napa State Hospital

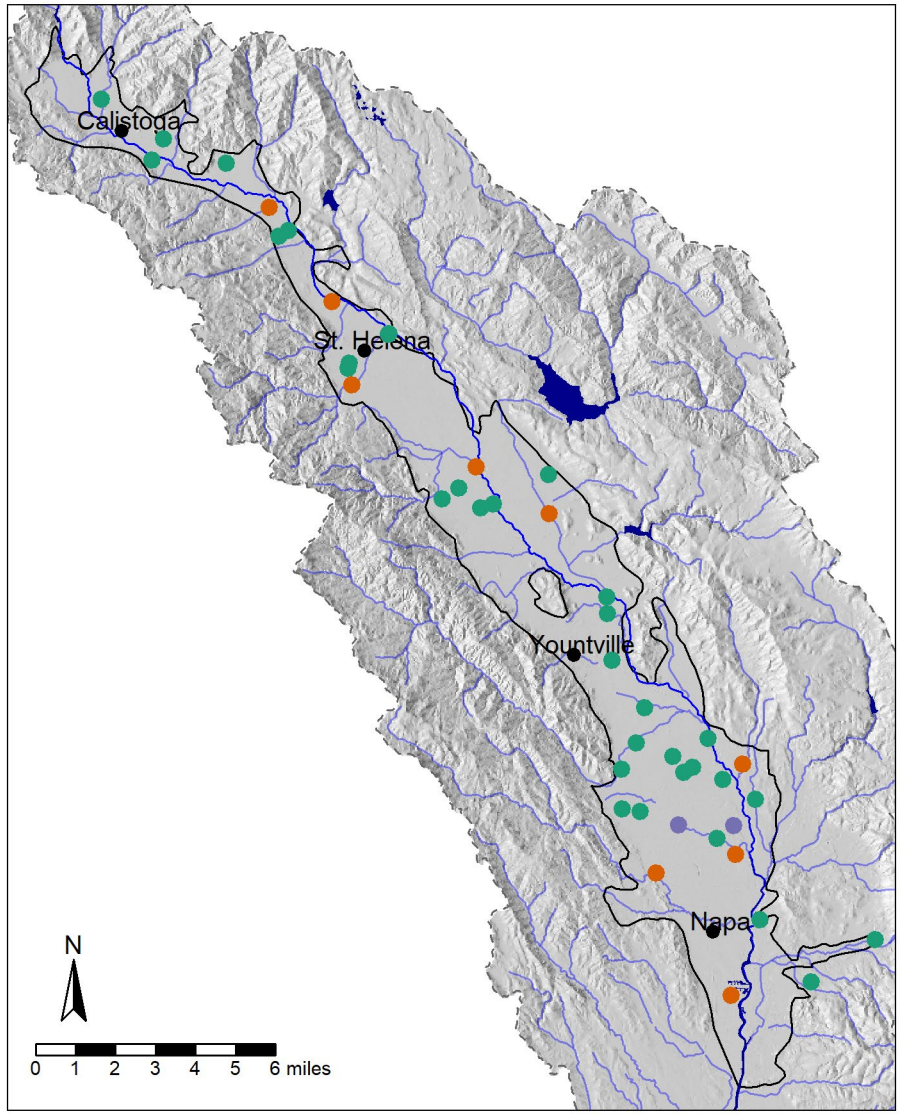


NOTE: Gaps in this data record have been reconstructed using data from the Oakville CIMIS station (77) and NOAA Saint Helena, CA station (GHCND:USC00047846).

Precipitation: Water Year 2024

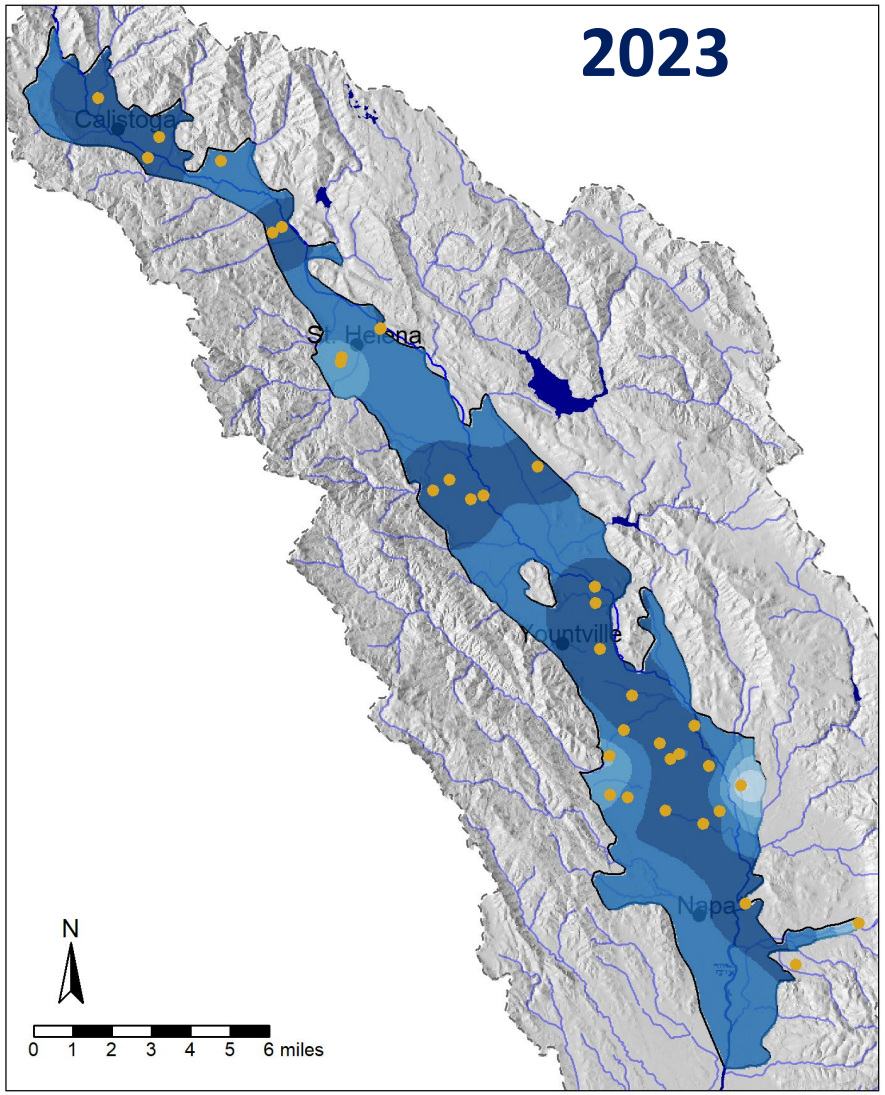


Changes in Quaternary Alluvium (Qa) Monitoring Sites



- Generally shallow wells screened within the alluvium are used to assess water table conditions.
- Total of 44 wells uses to assess storage in 2023/2024.
- Two wells were only measured in 2023.
- Nine wells only measured in 2024 (including the eight new ISW wells).

Depth to Water (DTW) for Spring 2023 and 2024

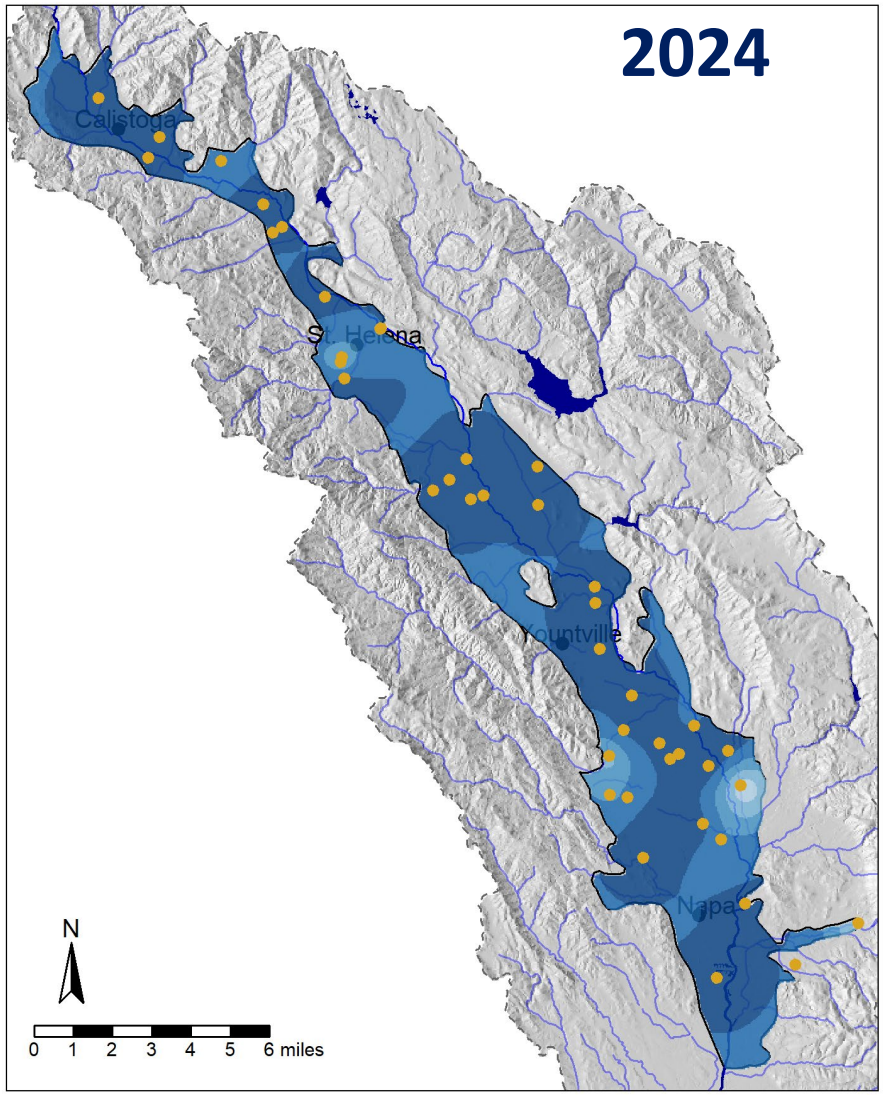


Similar pattern of DTW from 2023 to 2024. Generally, DTW are:

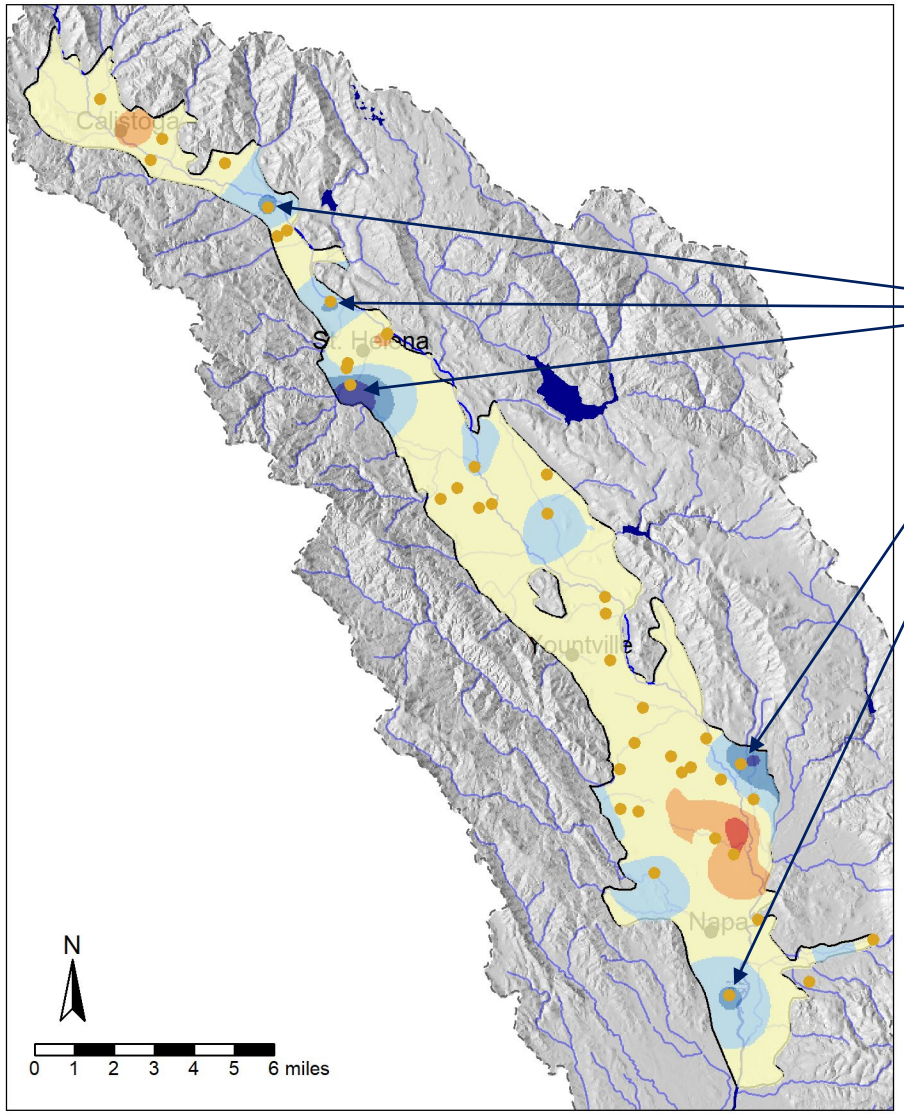
- Calistoga: 2-36 ft bgs
- St. Helena: 7-58 ft bgs
- Yountville: 4-26 ft bgs
- Napa: 4-88 ft bgs

Depth to Water
(ft below ground surface)
0 to 20
20 to 40
40 to 60
60 to 80
80 to 100
100 to 120

Groundwater Well (Qa)



Change in Saturated Thickness from 2023 to 2024



New wells had generally higher heads than would be expected based on previous interpolation of groundwater elevations.

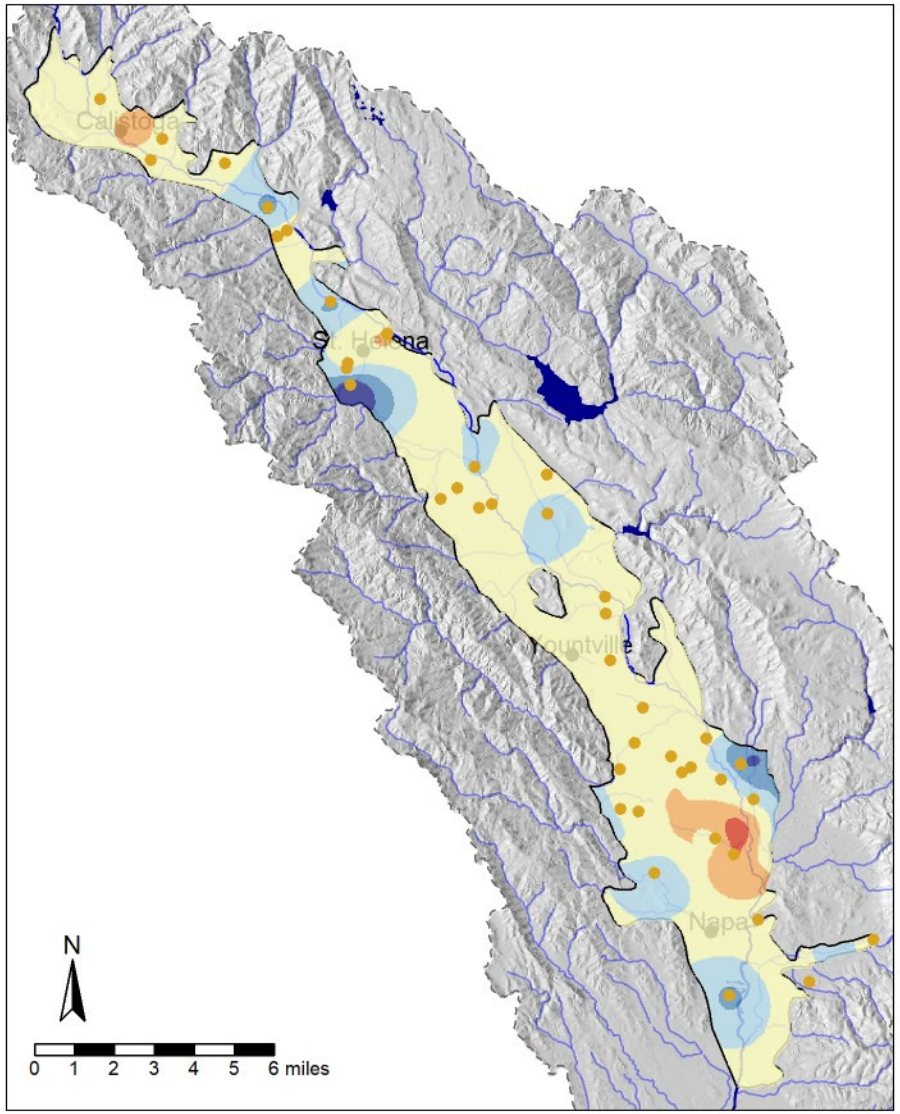
New wells addressed important data gaps throughout the Subbasin. Dedicated monitoring wells provide important measurements of water table conditions.

Groundwater Elevation Change
(2023 to 2024)

- -25 to -15 (ft; lower in 2024)
- -15 to -5
- -5 to 5
- 5 to 15
- 15 to 25
- 25 to 35 (ft; higher in 2024)

Groundwater Well (Qa)

Change in Saturated Thickness from 2023 to 2024



- For wells measured in both 2023 and 2024, year-to-year changes ranged from -7.9 decline to 8.2 increase (feet).
- Total estimated increase in groundwater storage of **3,500 acre-feet**.

Groundwater Elevation Change
(2023 to 2024)

- -25 to -15 (ft; lower in 2024)
- -15 to -5
- -5 to 5
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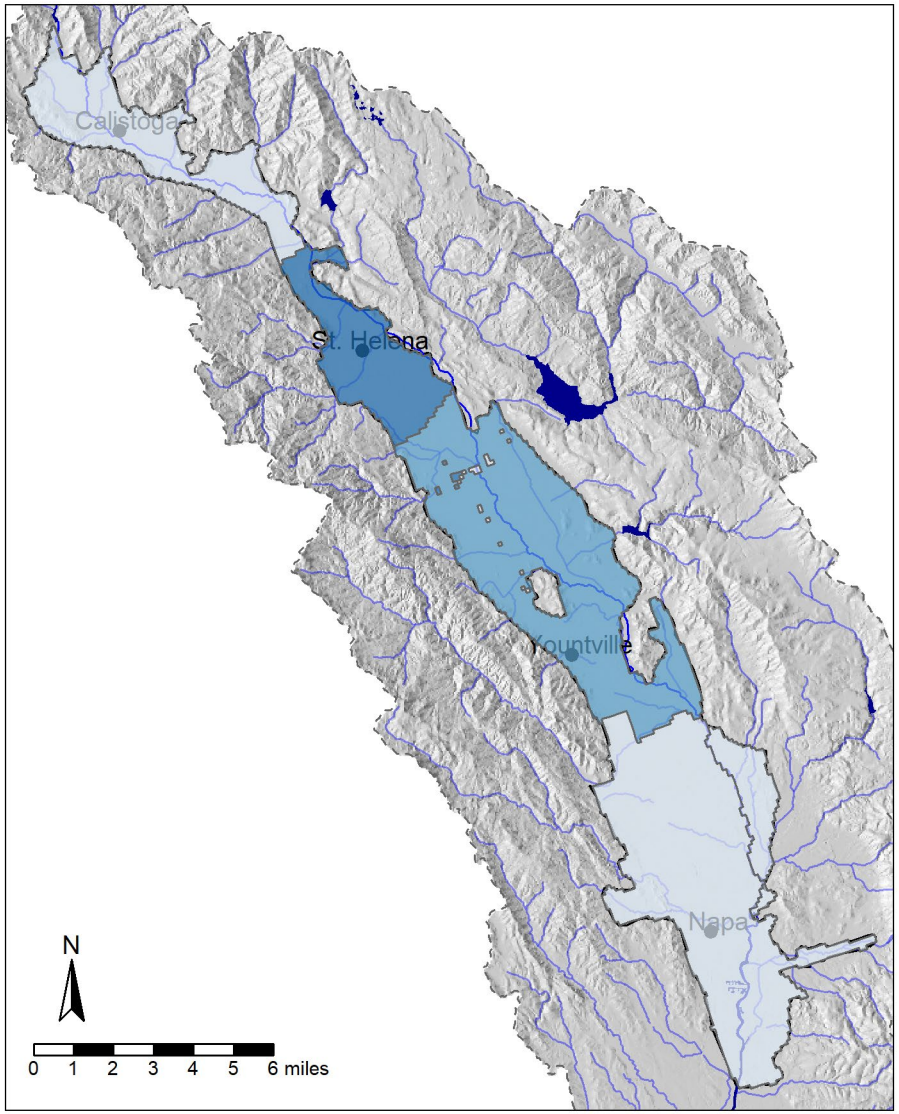
Groundwater Well (Qa)

Change in Storage from 2023 to 2024 by Area

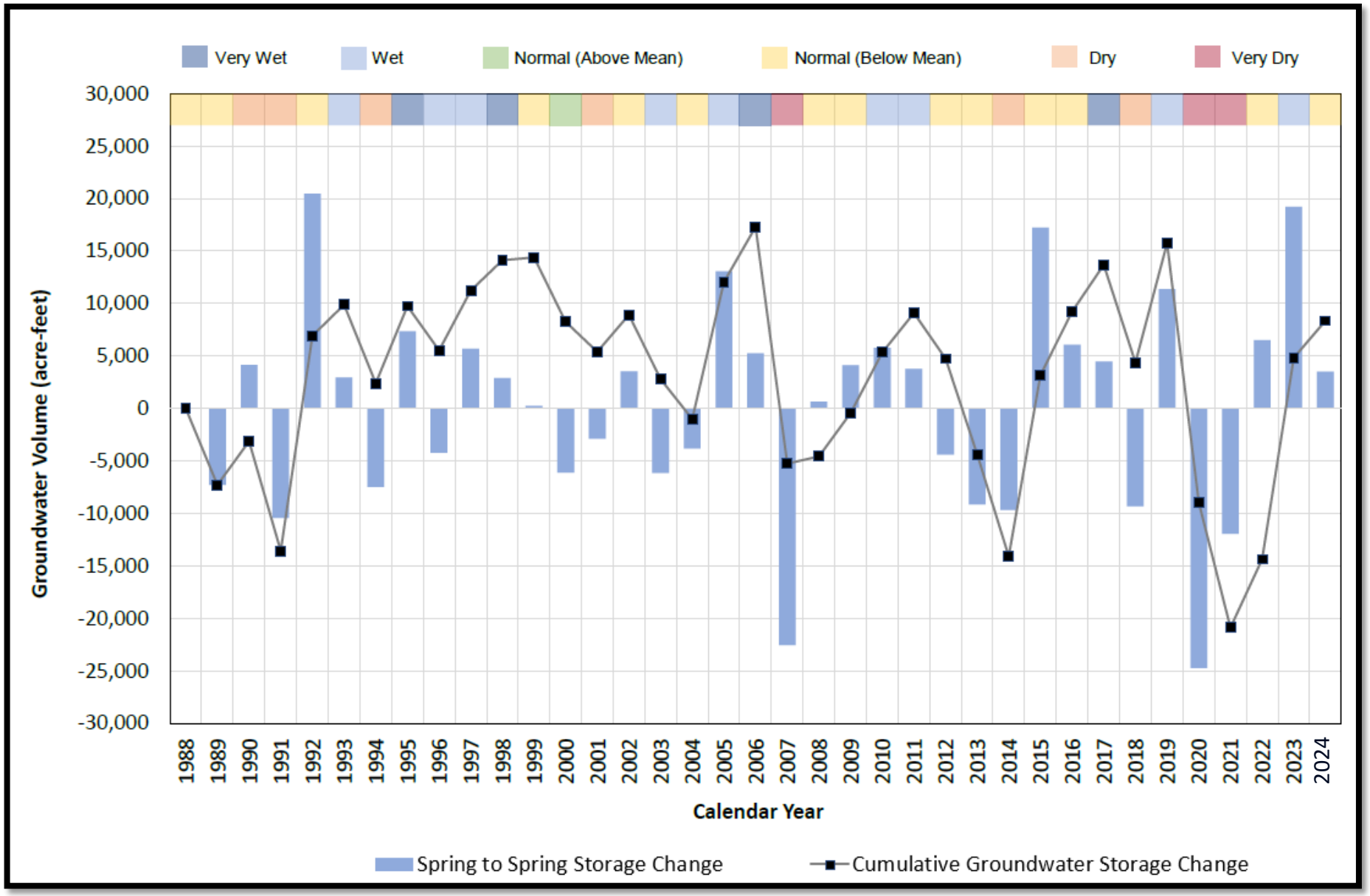


- All areas increased in storage.
- From north to south (in ac-ft), Calistoga (+200), St. Helena (+1,800), Yountville (+1,000), Napa (+300), and Northeast Napa (+130).
- St. Helena increased by ~0.33 ac-ft/ac, other areas ranged from 0.02-0.07 ac-ft/ac.
- Total estimated increase in groundwater storage of **3,500 acre-feet**.

Change in Storage 2024 (ac-ft)

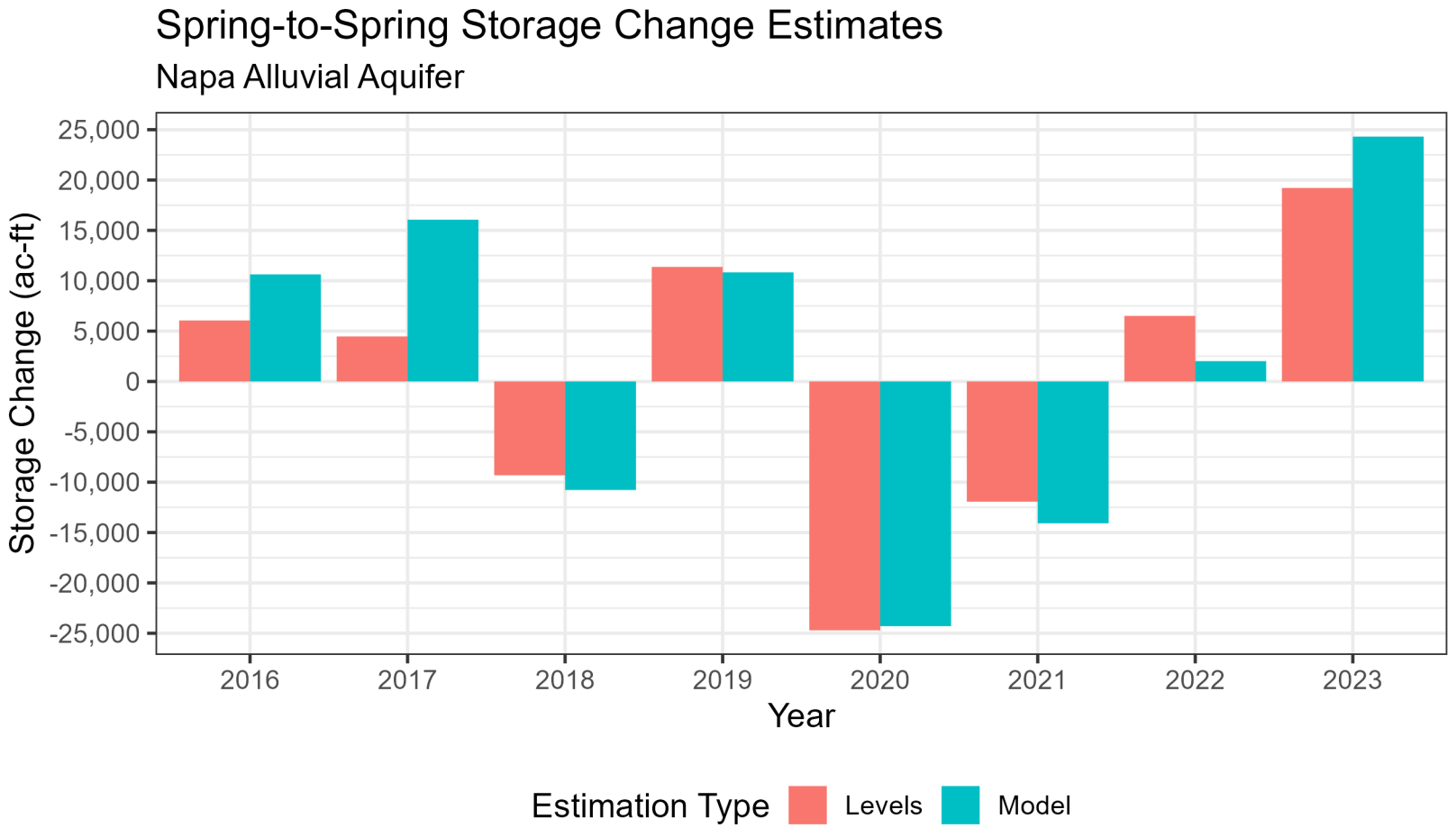
- 0 to 500
- 500 to 1,000
- 1,000 to 1,500
- 1,500 to 2,000

Subbasin Estimated Storage Change: Spring to Spring Groundwater Levels



- Spring 2024 marks the third year of increased groundwater storage.
- Average start to WY 2024 further increased storage across the Subbasin.
- Storage change was essentially stable in Calistoga and Napa with slight increases in St. Helena and Yountville.

Subbasin Estimated Storage Change: Comparing Modeled to Analytical Estimation



- Change in storage calculations, both through water levels and within the NVIHM, generally agree.
- Differences include:
  - Basin geometry/extent.
  - Water levels integrate all fluxes.
  - Model better accounts for areas without data.

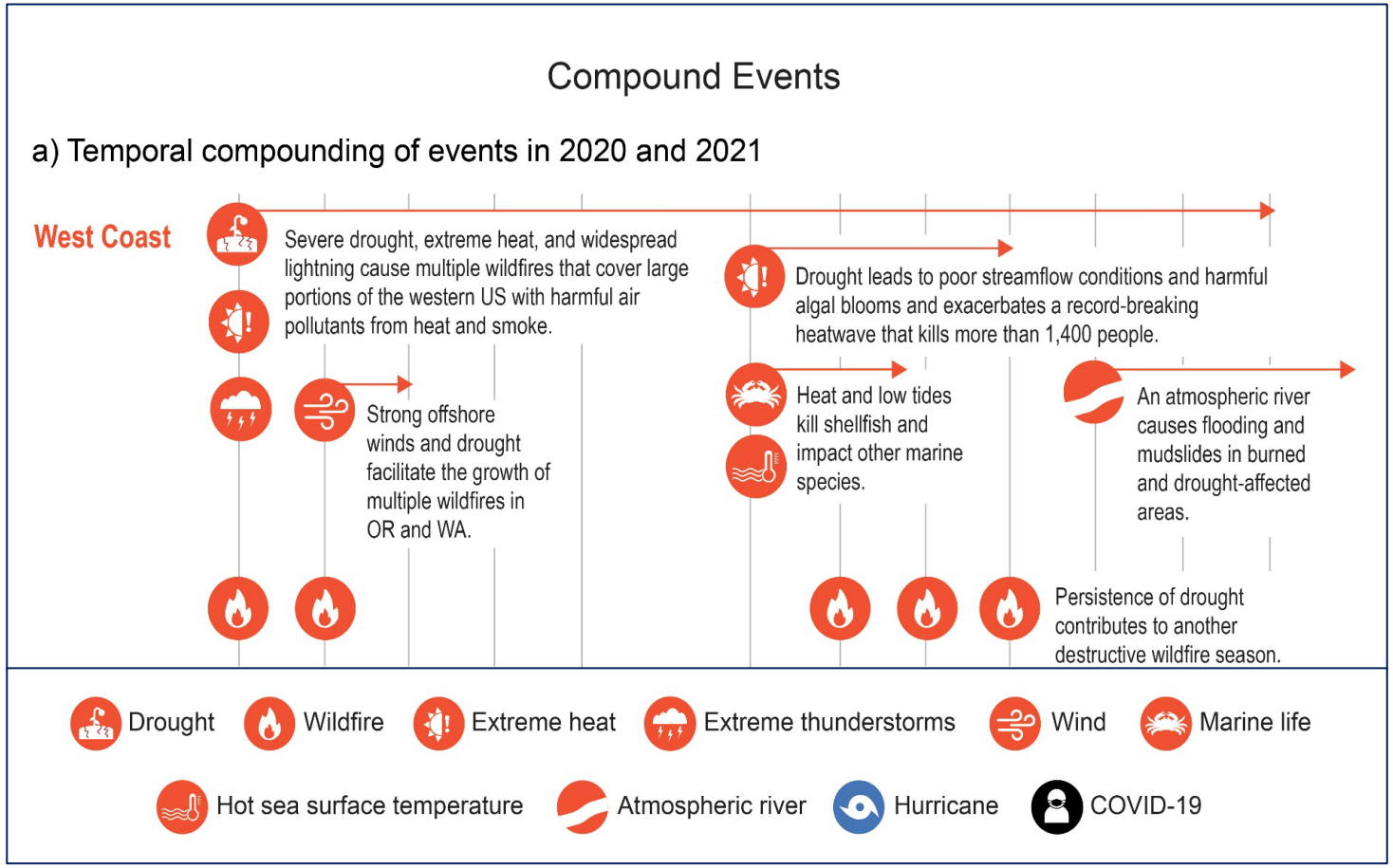
Climate Change and Potential Impacts From Fifth National Climate Assessment

- The Fifth National Climate Assessment (NCA5) was published in 2023 and provides tools for the entire country to assist decision makers in understanding climate impacts.
- Impacts to multiple sectors are detailed including water, energy, forest, ecosystems, agriculture, transportation, etc…
- County level impacts were assessed based on four climate scenarios, 1.5°C (2.7°F), 2°C (3.6°F), 3°C (5.4°F), and 4°C (7.2°F).

Jay, A.K., A.R. Crimmins, C.W. Avery, T.A. Dahl, R.S. Dodder, B.D. Hamlington, A. Lustig, K. Marvel, P.A. Méndez-Lazaro, M.S. Osler, A. Terando, E.S. Weeks, and A. Zycherman, 2023: Ch. 1. Overview: Understanding risks, impacts, and responses. In: *Fifth National Climate Assessment*. Crimmins, A.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, B.C. Stewart, and T.K. Maycock, Eds. U.S. Global Change Research Program, Washington, DC, USA.

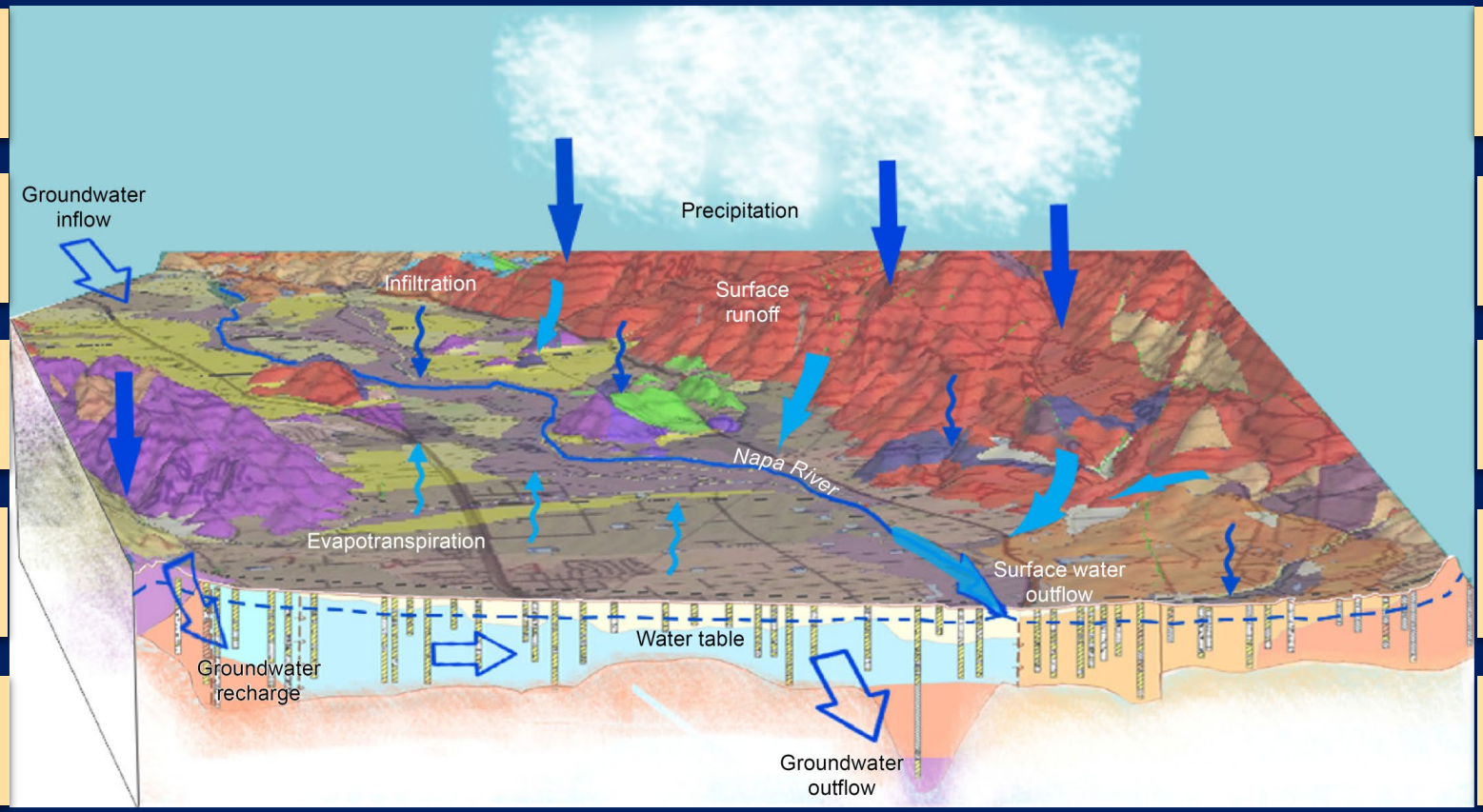
Key Takeaways from NCA5

- Increase in compound and cascading events:
  - Compound events result from occurrence of multiple climate drivers or hazards either in individual or multiple locations that, when combined, have greater impacts than isolated hazards.
- Hotter hot days as well as hotter minimum temperatures are expected.
- More precipitation is simulated under most climate scenarios.
- More high-intensity storms.



Addressing Climate Urgency

- Increasing Extreme Precipitation
- Changing Hydrological Variability
- Shifting Streamflow Timing
- Increasing Drought Severity
- Increasing Evaporative Demand



- Increase Avg/Extreme Air Temperature
- Increasing Wildfires
- Increasing Flooding
- Changing Groundwater Recharge
- Increasing Water Temperature

California Water Plan Update 2023 Theme: Adapted to Napa River Watershed

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

Cover Crops and building Soil Health

Vineyard-Specific BMPs: Conservation/ Recharge

SW Right: Winter Recharge

Tile Drainage: Capture and Store for In-Lieu Use

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

Adapting to Climate Change by Building Resiliency

BMPs to Recharge Groundwater

Maintain/Improve Groundwater Discharge to Streams

Maintain/Improve Functional Flows

Capture/Store Surplus Stormwater to Buffer Drought Effects

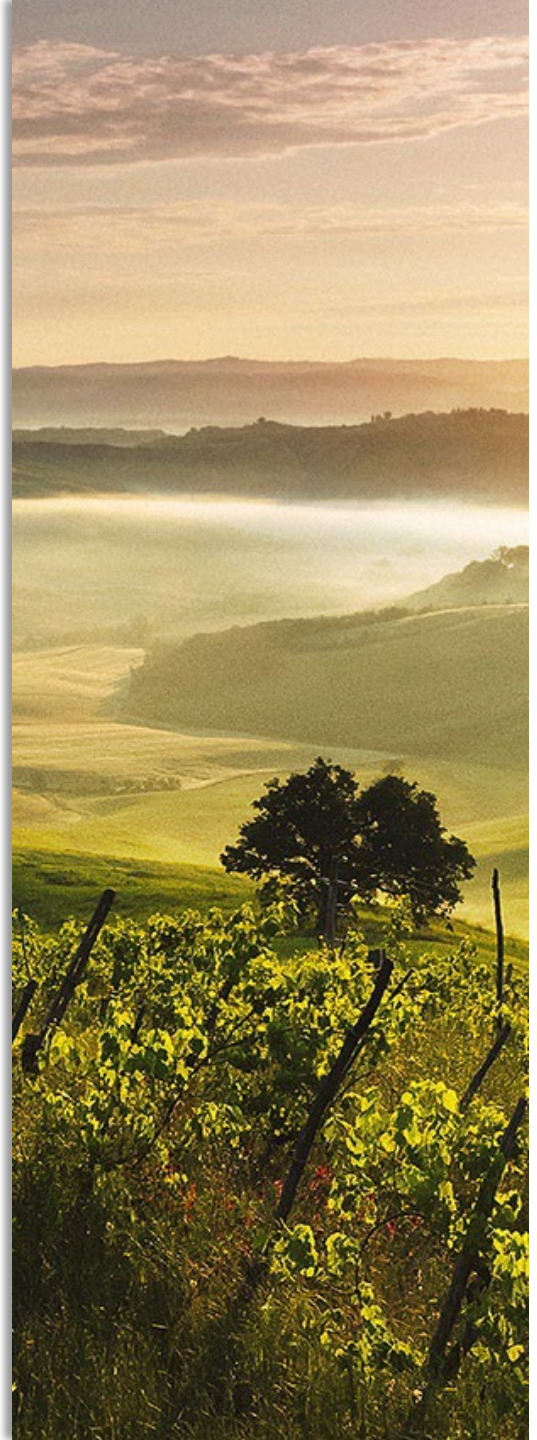
Enhance Soil Moisture Profile

Reduce GDE Drought Effects

Drought or Deluge:
Conservation as a Napa Way of Life

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

4Rs: Retain – Replenish – Resilience – Reserves



Questions and Discussion

Thank You

Napa County Groundwater Sustainability Agency

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