

CALIFORNIA DEPARTMENT OF WATER RESOURCES

Raising Managed Water Capability in a Changing Climate - Partnerships

Connecting the Drops Talk November 20, 2025

Monet's Water Lilies at the Orangerie, Paris

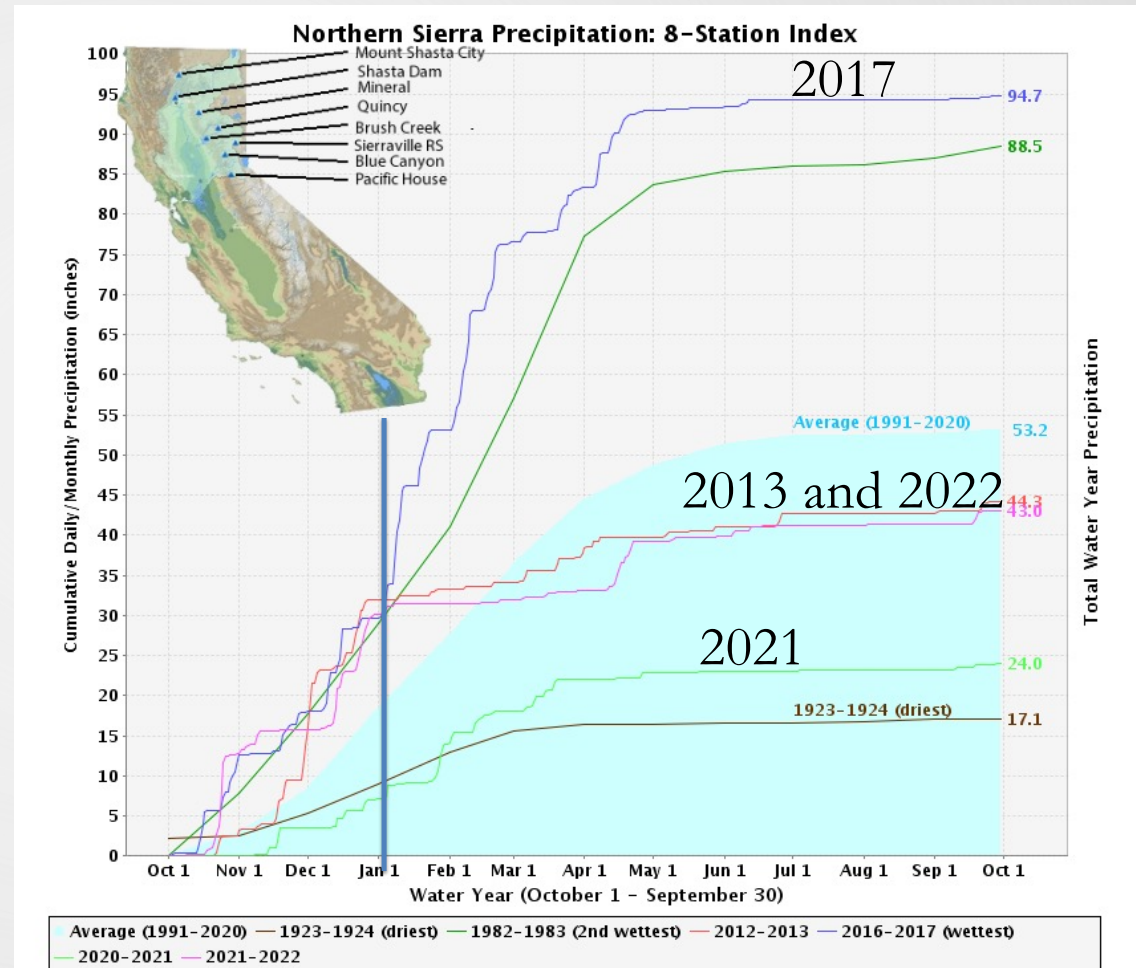
Michael L. Anderson, State Climatologist

Overview

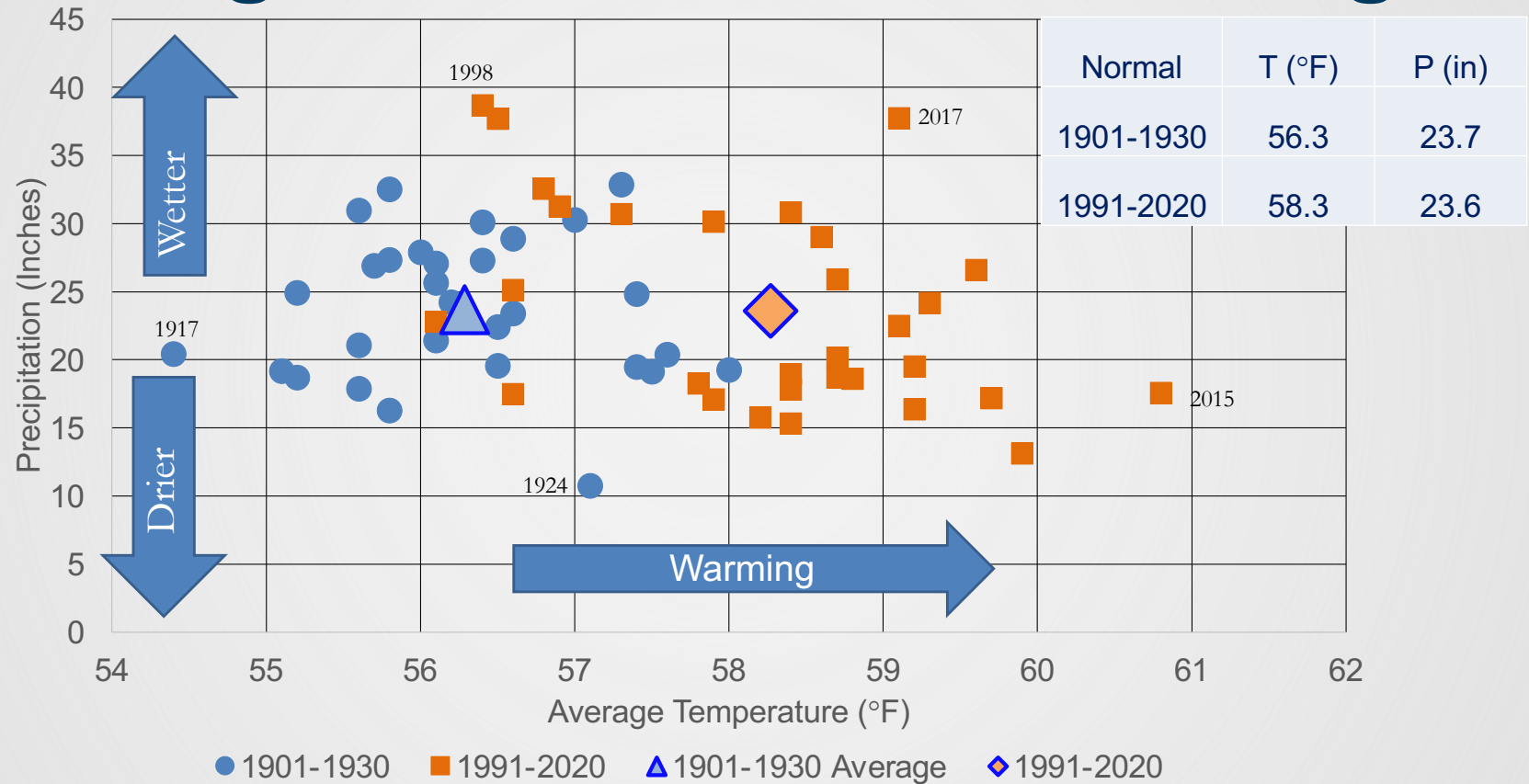
- Setting the Stage
- The Roadmap for a Climate Resilient Forecasting Framework
- The Value of Partnerships



CALIFORNIA DEPARTMENT OF
WATER RESOURCES



Evolving Normal – 30 Year Averages



CALIFORNIA DEPARTMENT OF
WATER RESOURCES

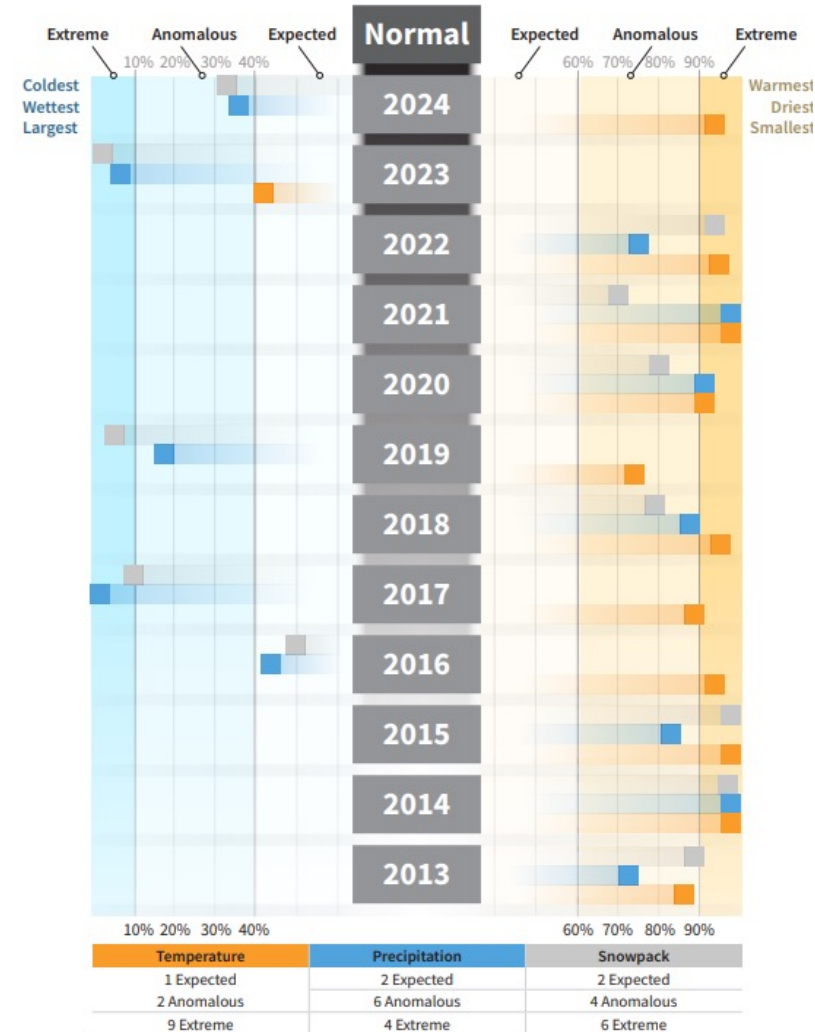
More than a Decade of Extremes

- Multiple Extremes
- New Records
- New opportunities for adaptation

FIRO Begins

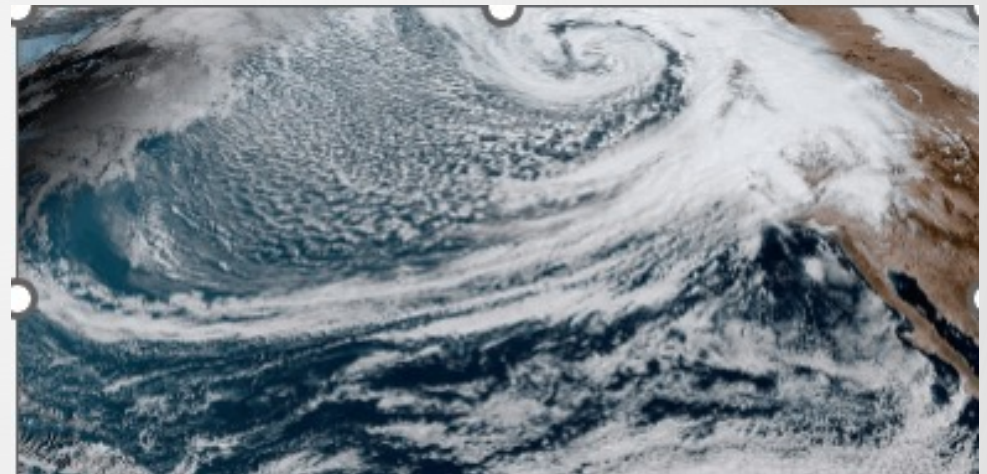
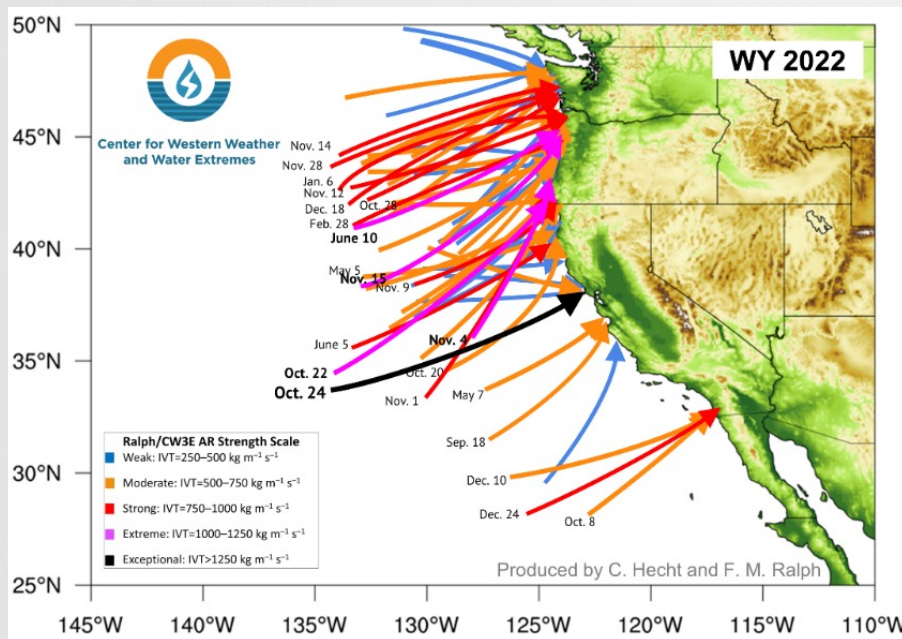


CALIFORNIA DEPARTMENT OF
WATER RESOURCES



Atmospheric Rivers

- Key to CA Water Extremes
- Defined physical structure



CALIFORNIA DEPARTMENT OF
WATER RESOURCES

Building a Framework for Resilience

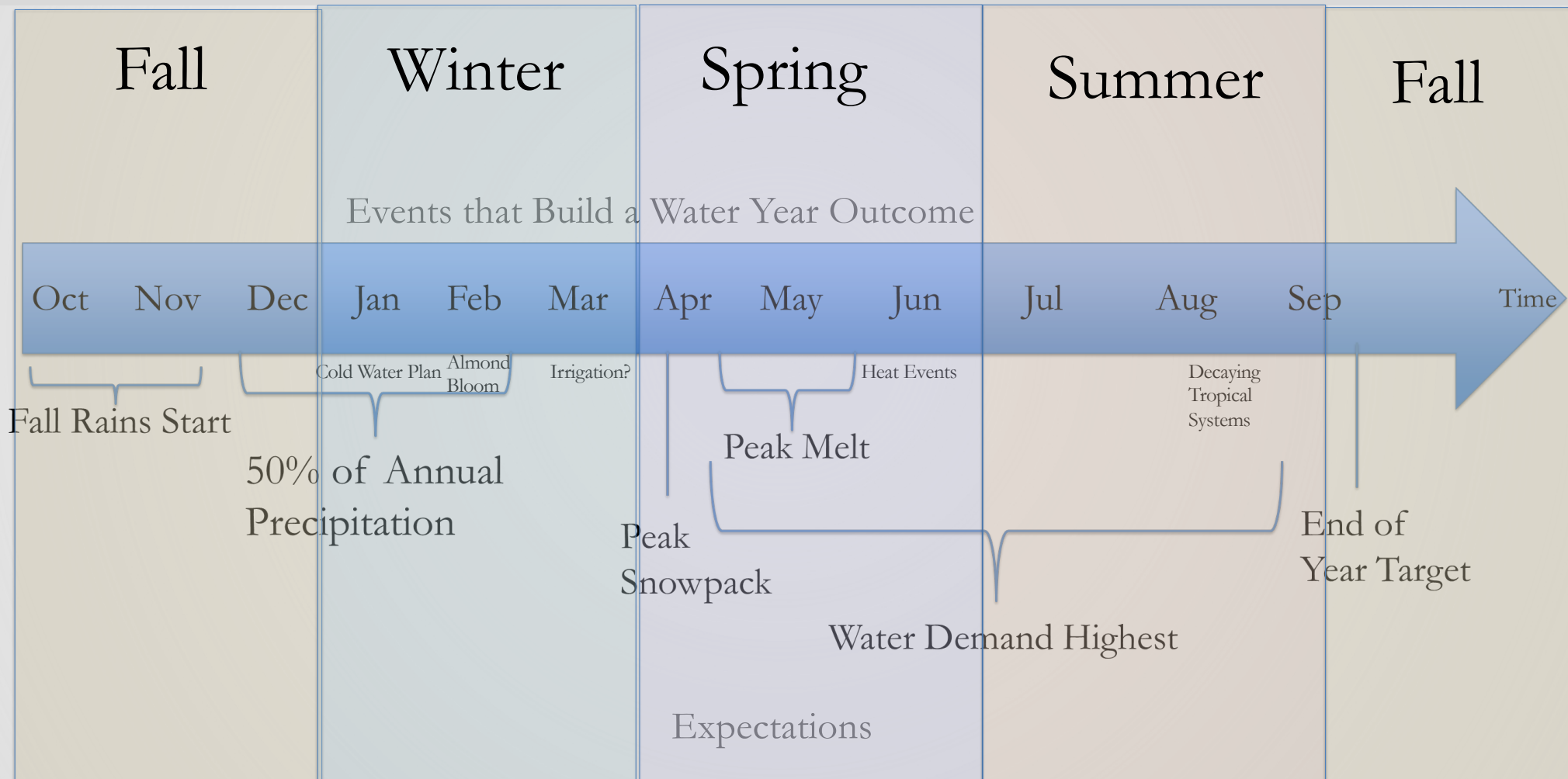
- Federal Foundation
- State Customization
- Local Implementation
- Integrated Observing System
- Seamless Forecasting Environment
- Analytics and Tools to Inform Decisions

What information enables resource positioning for the most successful outcomes across the landscape?



CALIFORNIA DEPARTMENT OF
WATER RESOURCES

Water Year Timeline



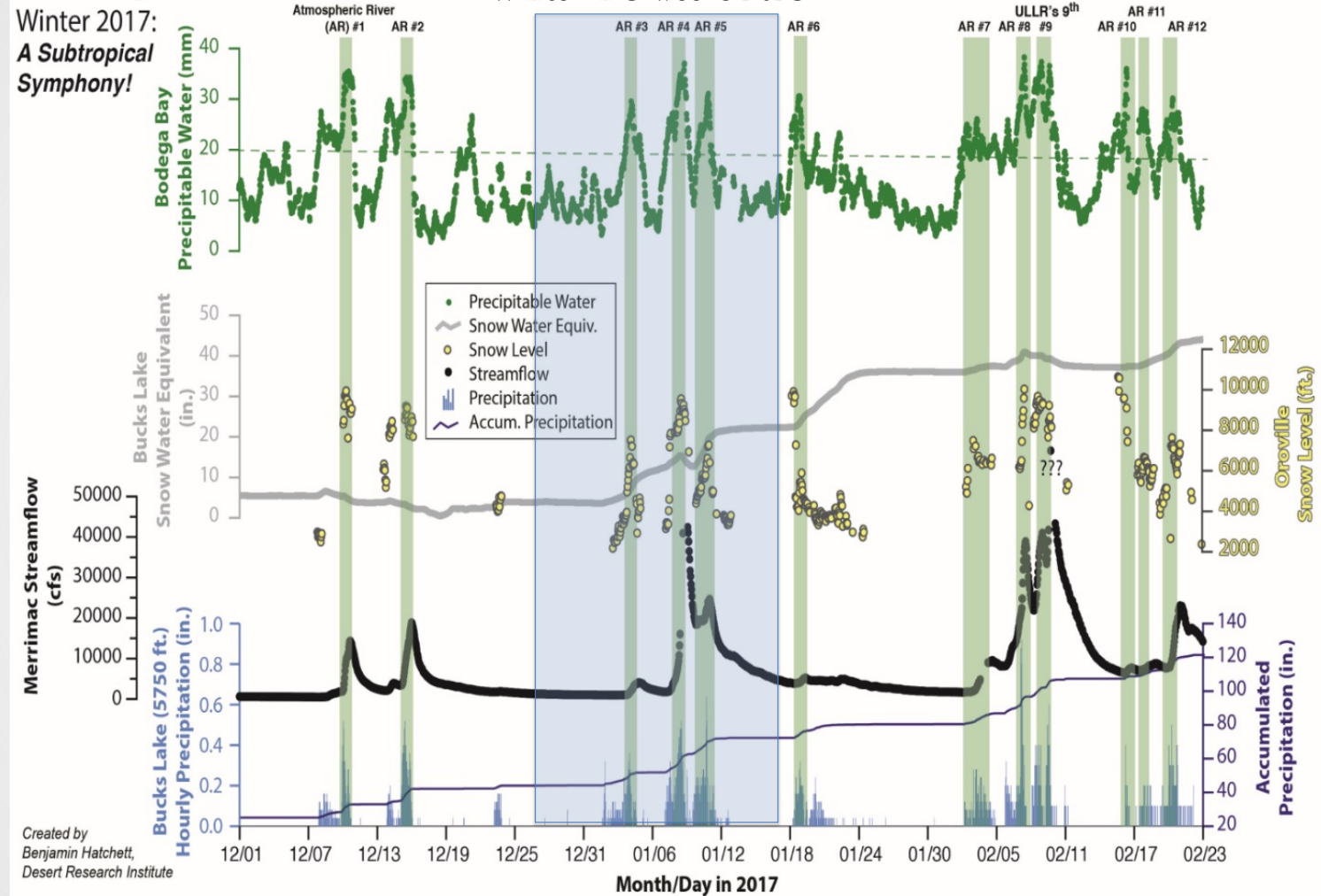
What is:
Now?
Next?
On the Horizon?

- What information is available?
- What is useful?
- How is it presented?

Meteorological

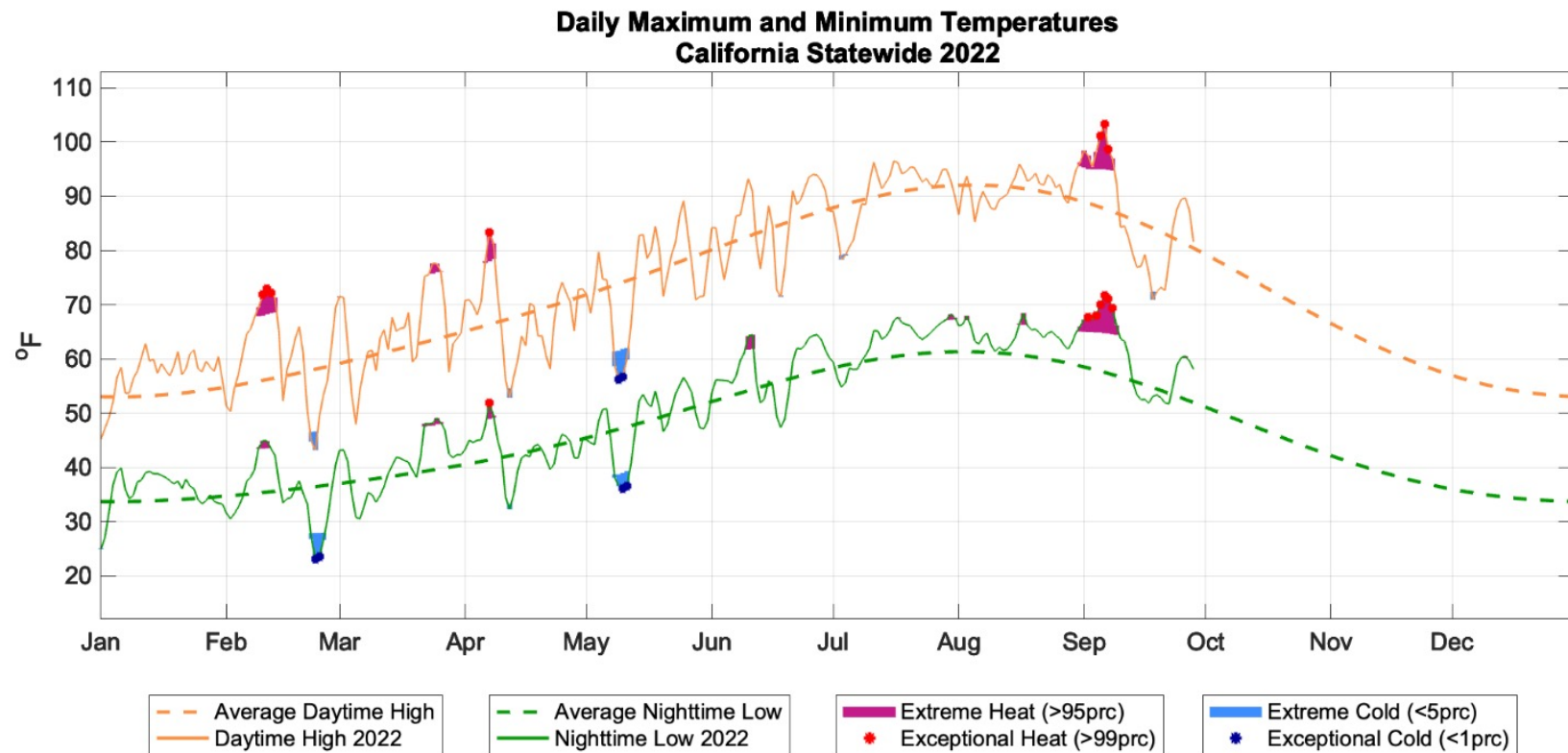
Winter 2017:
*A Subtropical
Symphony!*

Winter in 3 weeks 2023



Partnership: Western Region Climate Center

Extreme Heat and Cold in 2022



CALIFORNIA DEPARTMENT OF
WATER RESOURCES

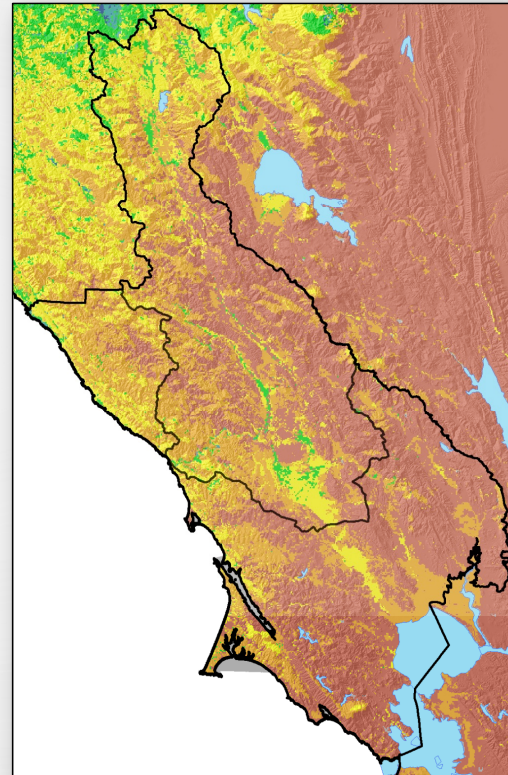
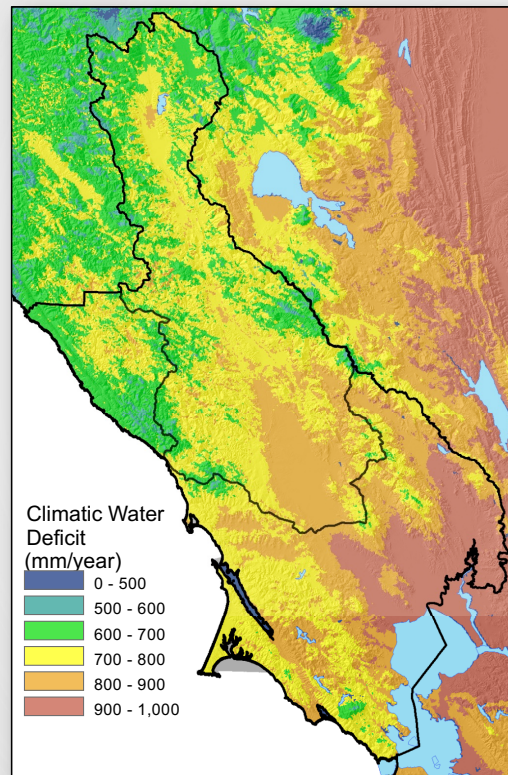
Credit: Kristen Guirguis, Scripps Institution of Oceanography

Landscape drought: The influence of temperature

Water Year	Temperature deg F	Precipitation inches
1977	57.4 (21st)	11.94 (2nd)
2014	59.9 (1st)	13.13 (3rd)

1977

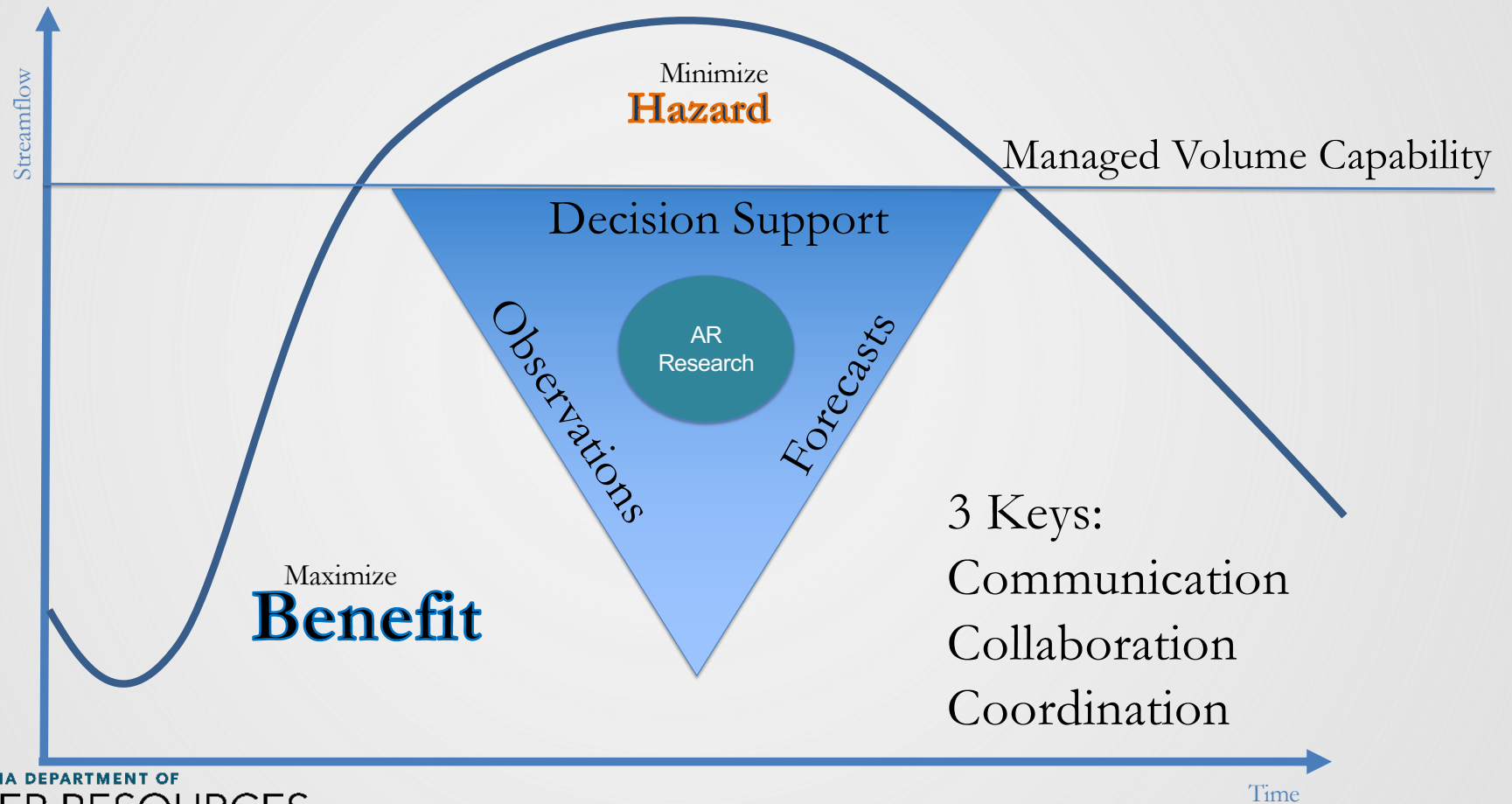
Jan 2014



CALIFORNIA DEPARTMENT OF
WATER RESOURCES

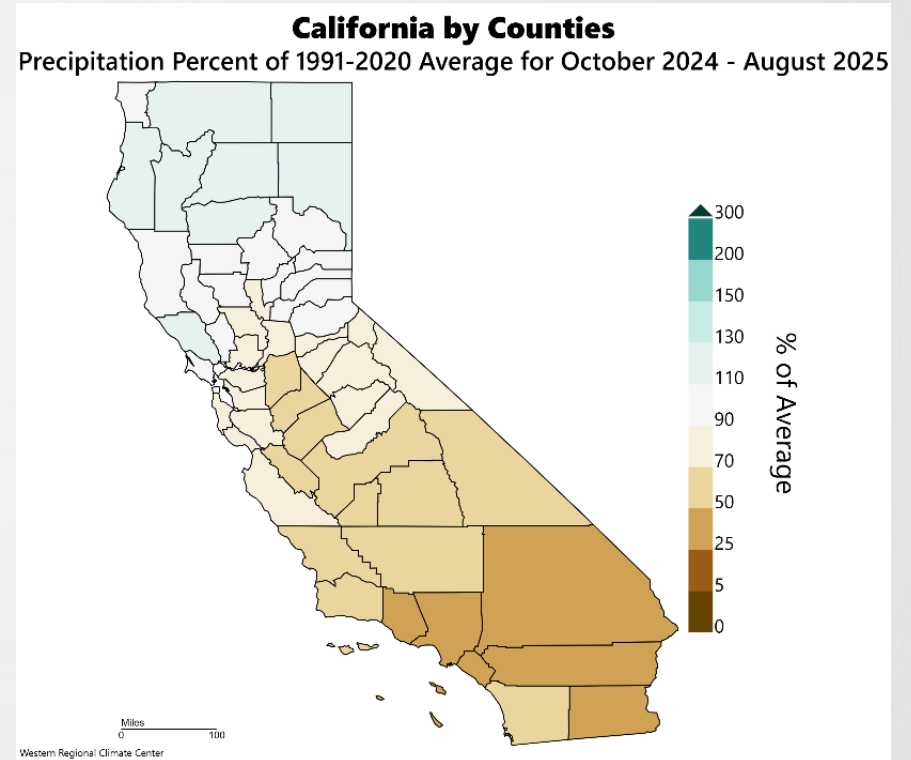
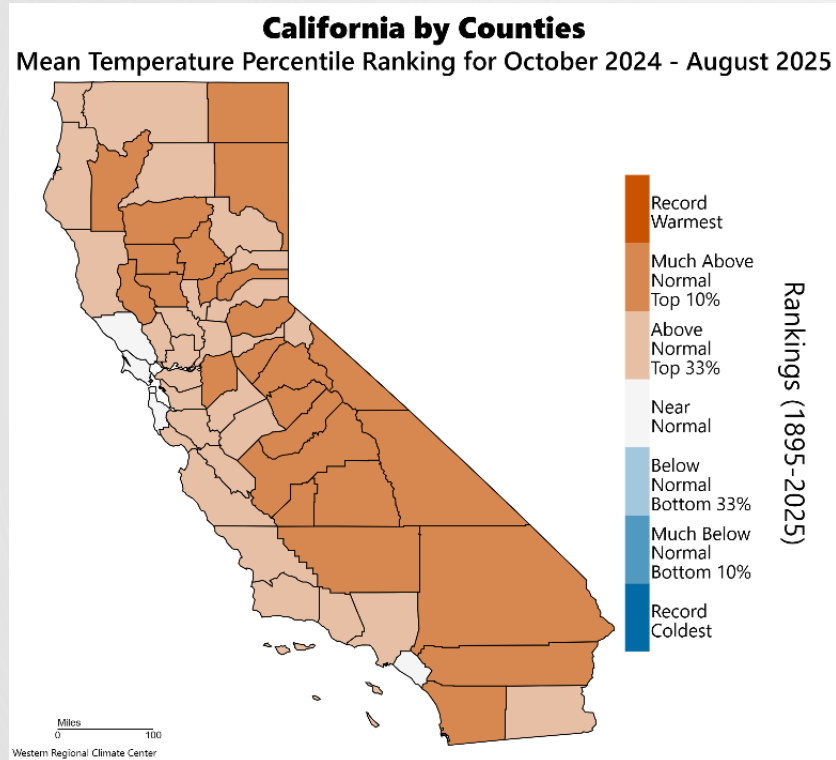
Partnership: USGS/Earth Knowledge

Real-Time Water Management



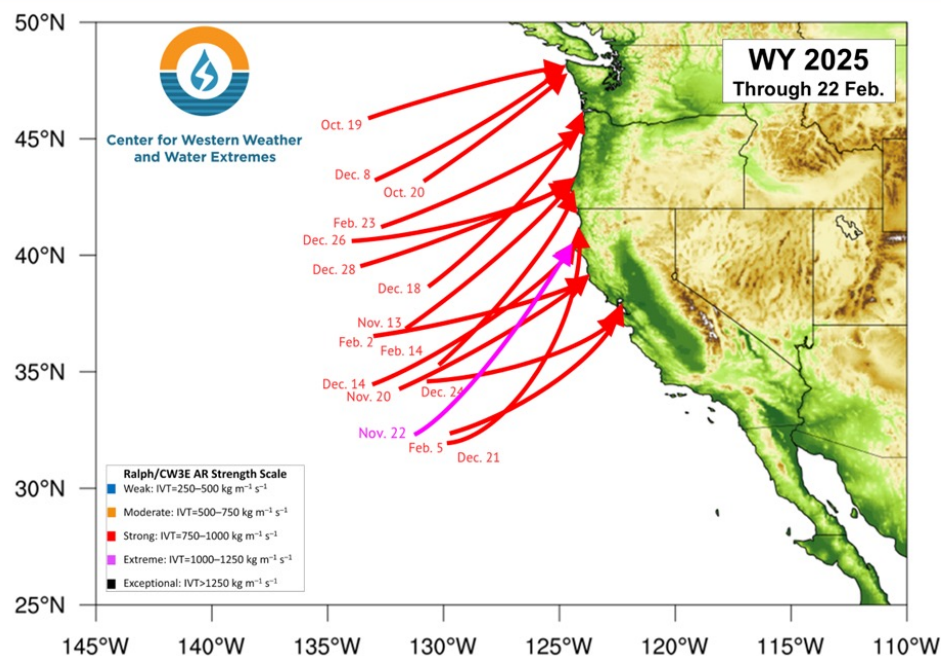
CALIFORNIA DEPARTMENT OF
WATER RESOURCES

Water Year 2025



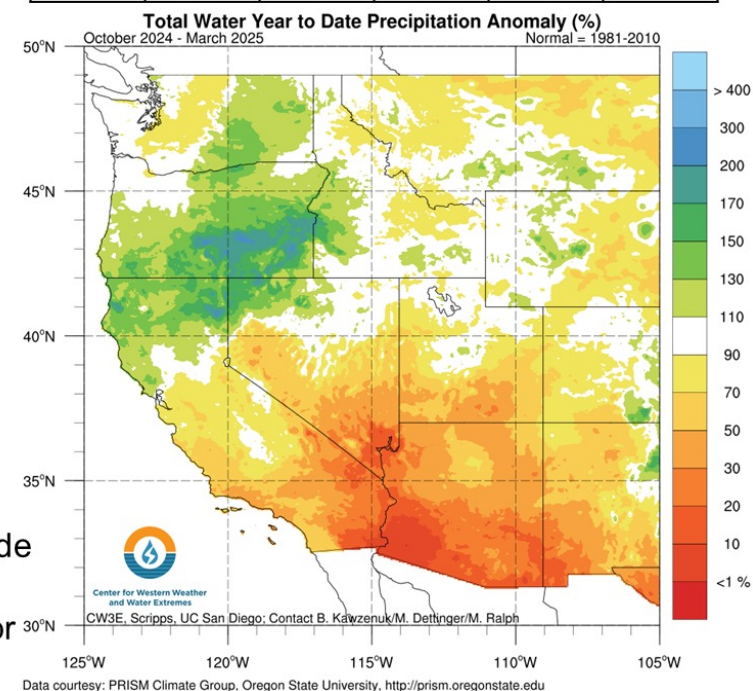
CALIFORNIA DEPARTMENT OF
WATER RESOURCES

A Tale of Two California's



- Northern California, which averages 6 strong or greater magnitude ARs per year, experienced 9 instances in WY 2025 through April 1, leading to above normal precipitation accumulations
- In contrast, Southern California did not experience any strong or greater magnitude ARs and only one moderate strength AR
- This lack of activity over Southern California led to the region experiencing 70% or below normal precipitation accumulations through March

Breakdown by Region					
	Weak	Mod.	Str.	Ext.	Total
N. CA	14	15	8	1	38
C. CA	16	5	1	0	22
S. CA	10	1	0	0	11



CALIFORNIA DEPARTMENT OF
WATER RESOURCES

Water Year 2025

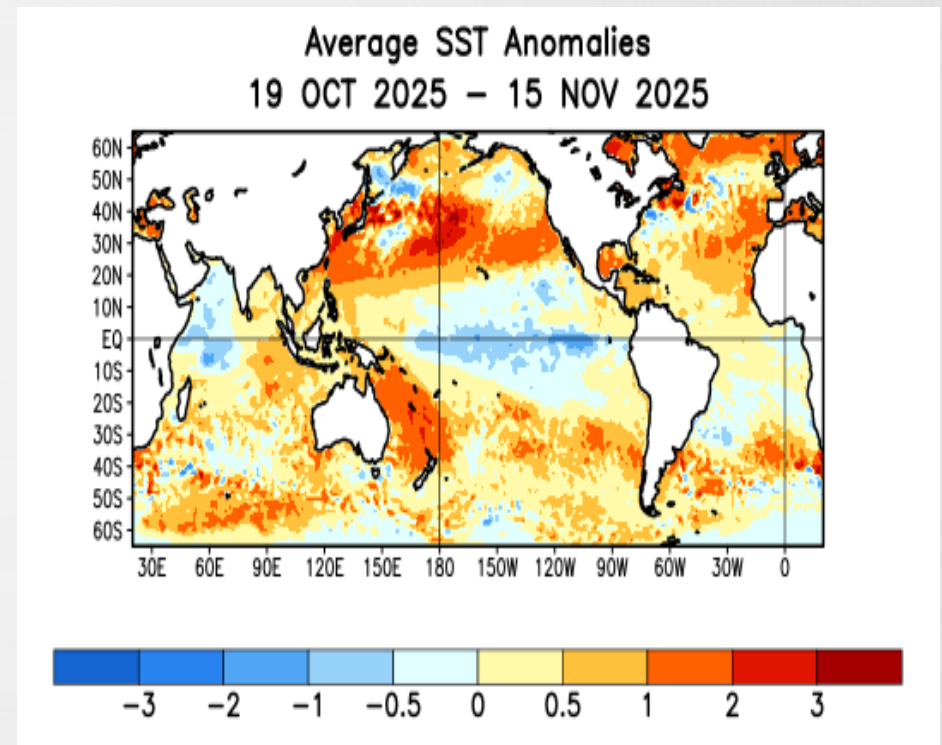
ENSO Impacts Wintertime Storm Tracks

- Follow the High Pressure location and strength
- Watch for cold-air outbreaks
- Watch for long-duration atmospheric rivers

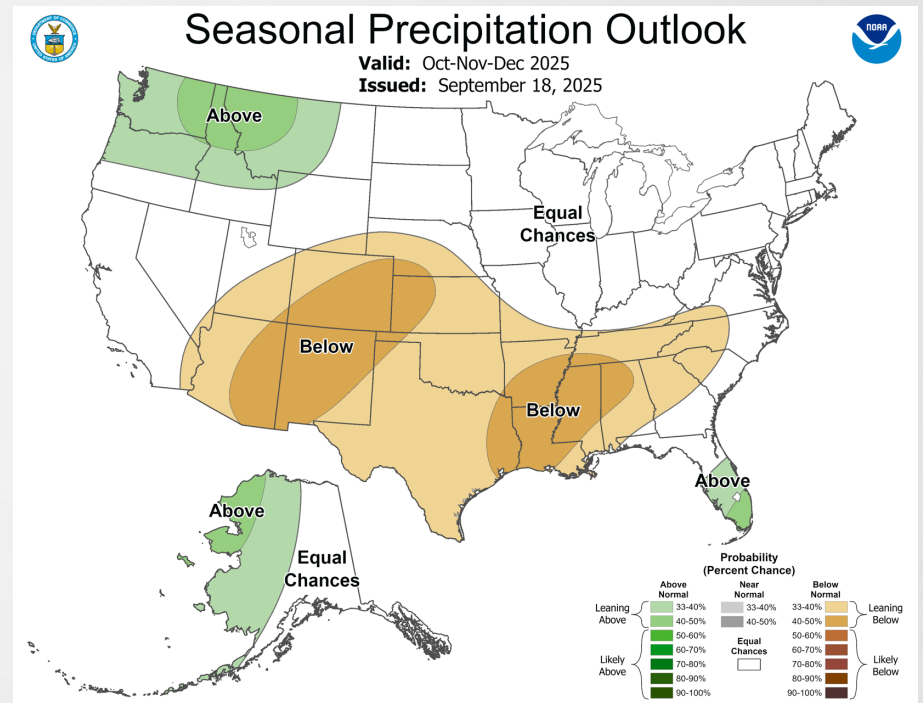
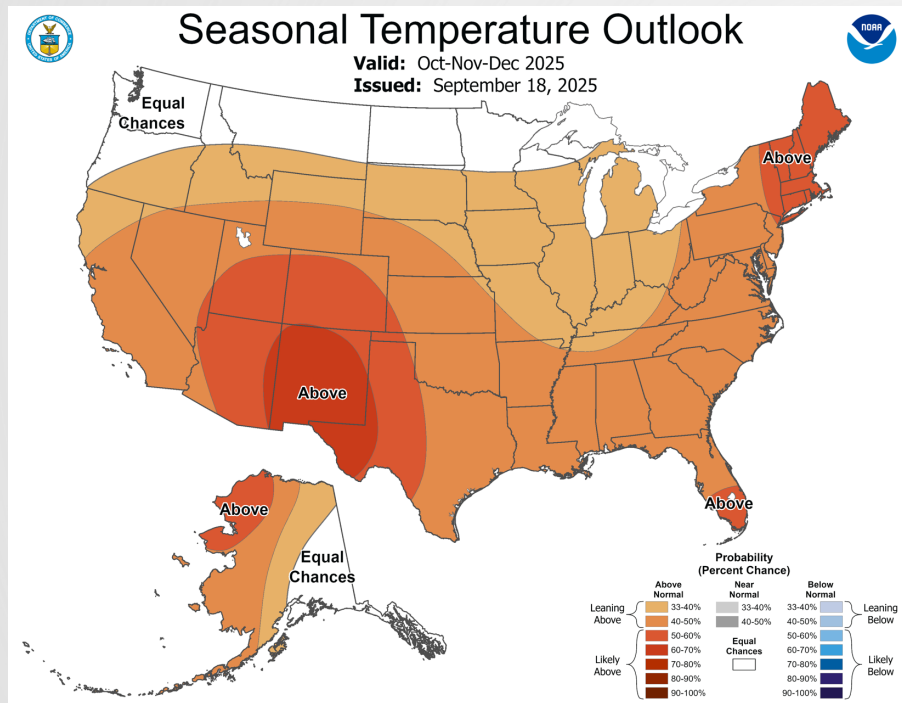


La Niña and Marine Heat Anomalies

- What is different now versus 1980s?
- What studies are worth revisiting?
- What additional knowledge is available to incorporate into new expectations?

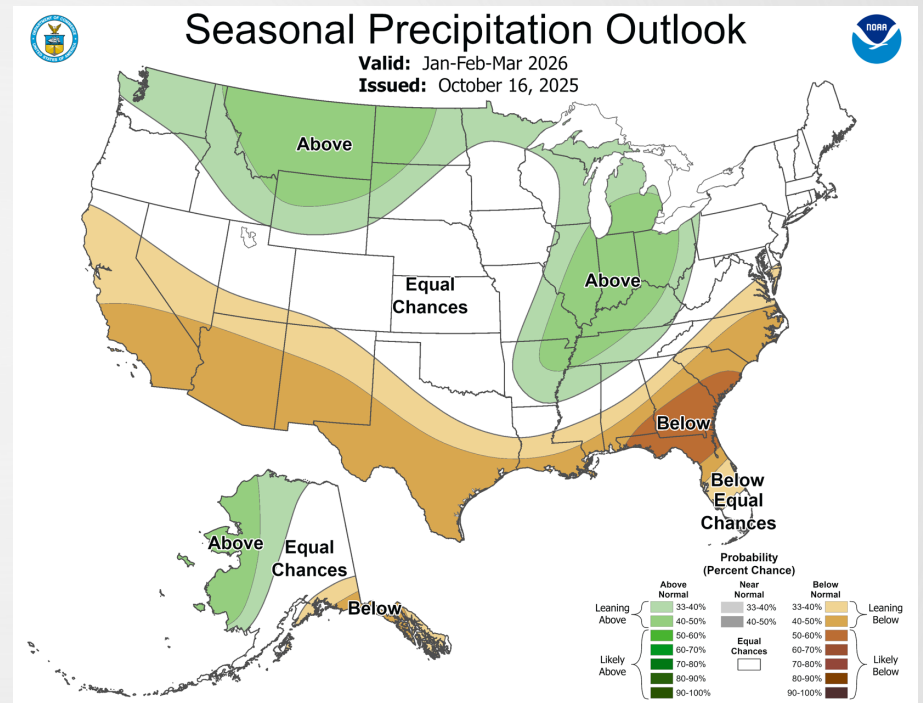
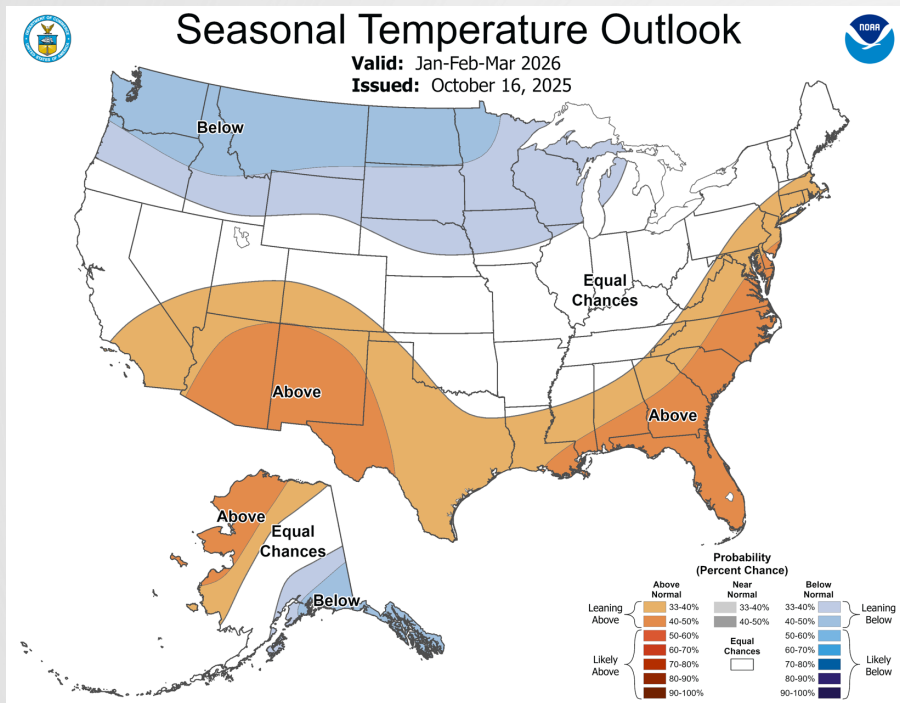


CPC Expectations Oct-Dec 2025



CALIFORNIA DEPARTMENT OF
WATER RESOURCES

CPC Expectations Jan-Mar 2026



CALIFORNIA DEPARTMENT OF
WATER RESOURCES

Building the Water Year

- Fall (October/November)
 - Precipitation Onset
 - Temperature Anomaly
 - Soil Moisture State with Snowpack Initiation
- Winter (December/January/February)
 - Wet/Dry
 - Notable Anomalies
- Spring (March/April/May)
 - Late-Season Bailout or Early Shutoff?
 - Peak Snowpack Timing and Magnitude
- Summer (June/July/August/September)
 - Drying Pace and Scale
 - Heat Events
 - Tropical Activity
- Multi-Year Prediction – What about next year?

Climate Change: How different will the next decade be?



Closing Thoughts

- The consequences of a warming world have started.
- Expect the challenges to amplify.
- The right tools informing the right actions communicated at the right time in the right way will enable us to thrive in this new world that is taking shape and evolving.
- Partnerships can enhance opportunity for success.



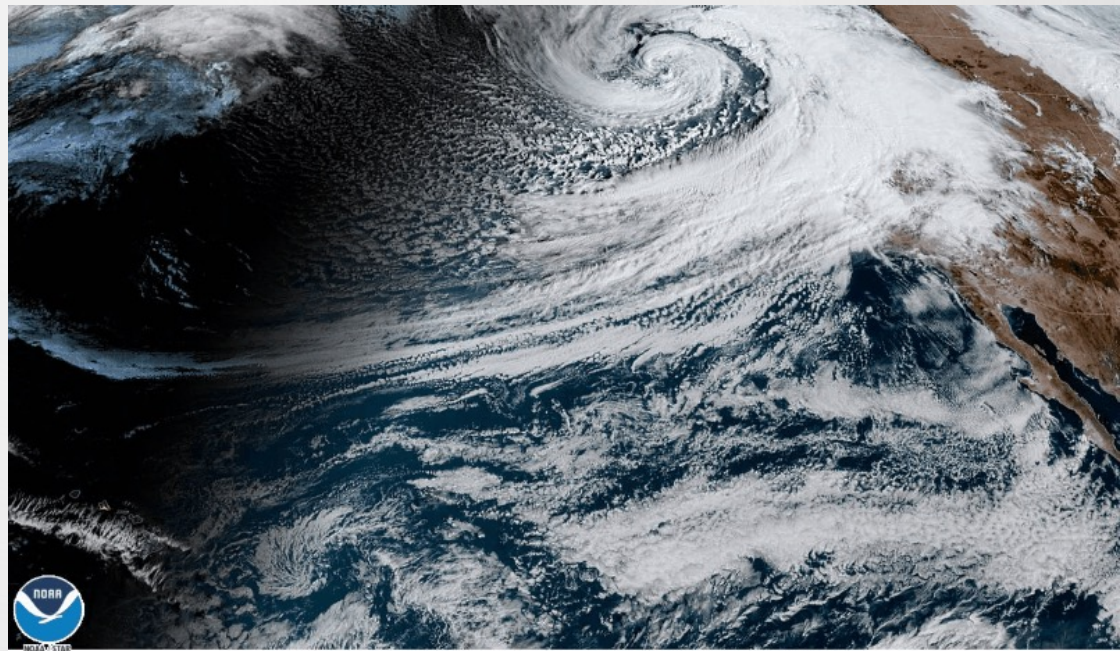
CALIFORNIA DEPARTMENT OF
WATER RESOURCES

Questions?

- Email: Michael.L.Anderson@water.ca.gov



CALIFORNIA DEPARTMENT OF
WATER RESOURCES



24 Oct 2021 16:56Z NOAA/NESDIS/STAR GOES-West GEOCOLOR