

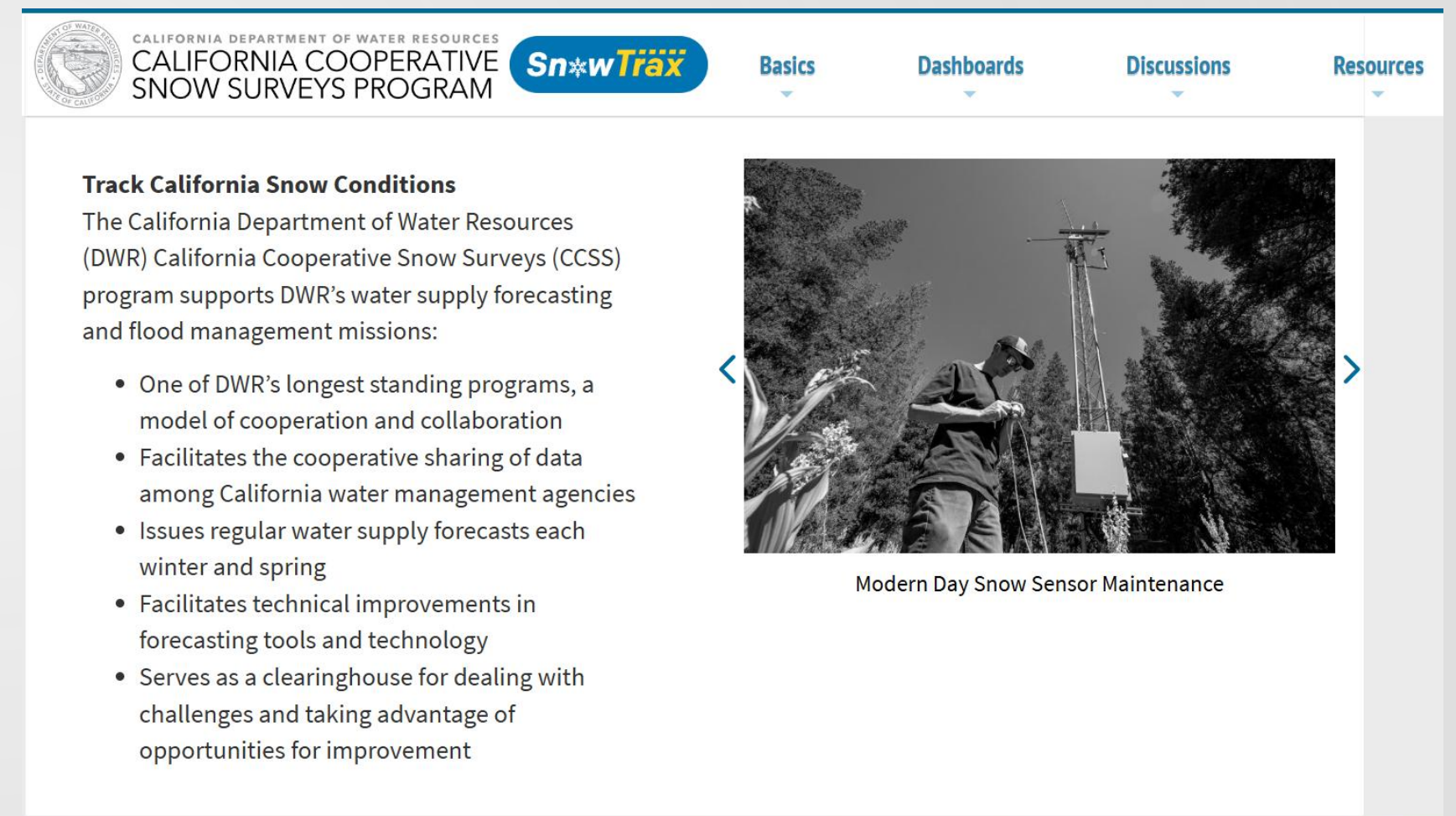
California's Roadmap to Climate Resilient Forecasting – Seasonal Efforts

WSWC Workshop May 9, 2025

Michael L. Anderson, State Climatologist

California's Roadmap to Climate Resilient Forecasting

- Surface Water Audit 2021
- The Plan:
 - Move from Index-based forecasting to spatially explicit information
 - Use both physics and AI based methods
 - Follow along at [Https://snow.water.ca.gov](https://snow.water.ca.gov)



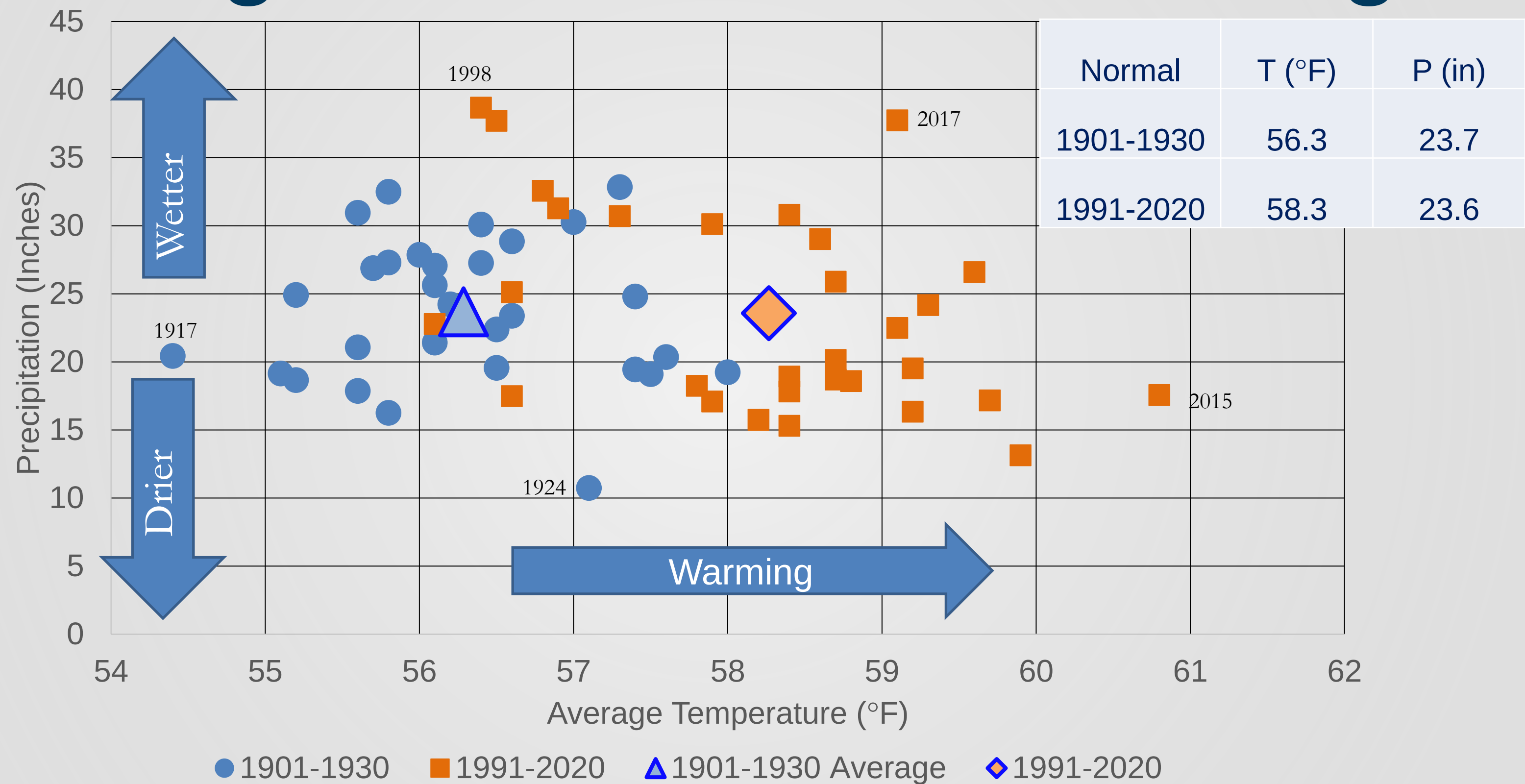
Building the Water Year

- 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?

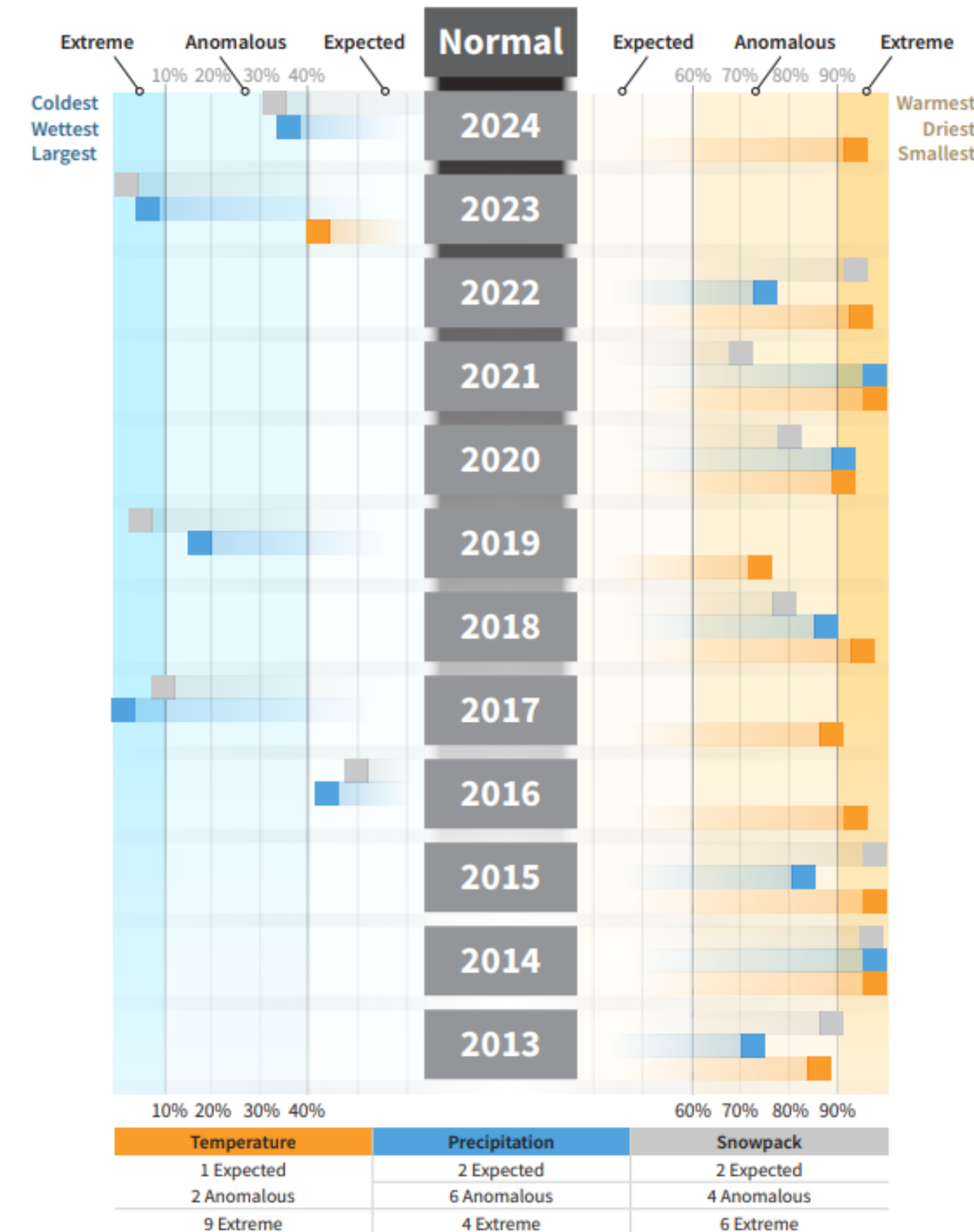


Evolving Normal – 30 Year Averages



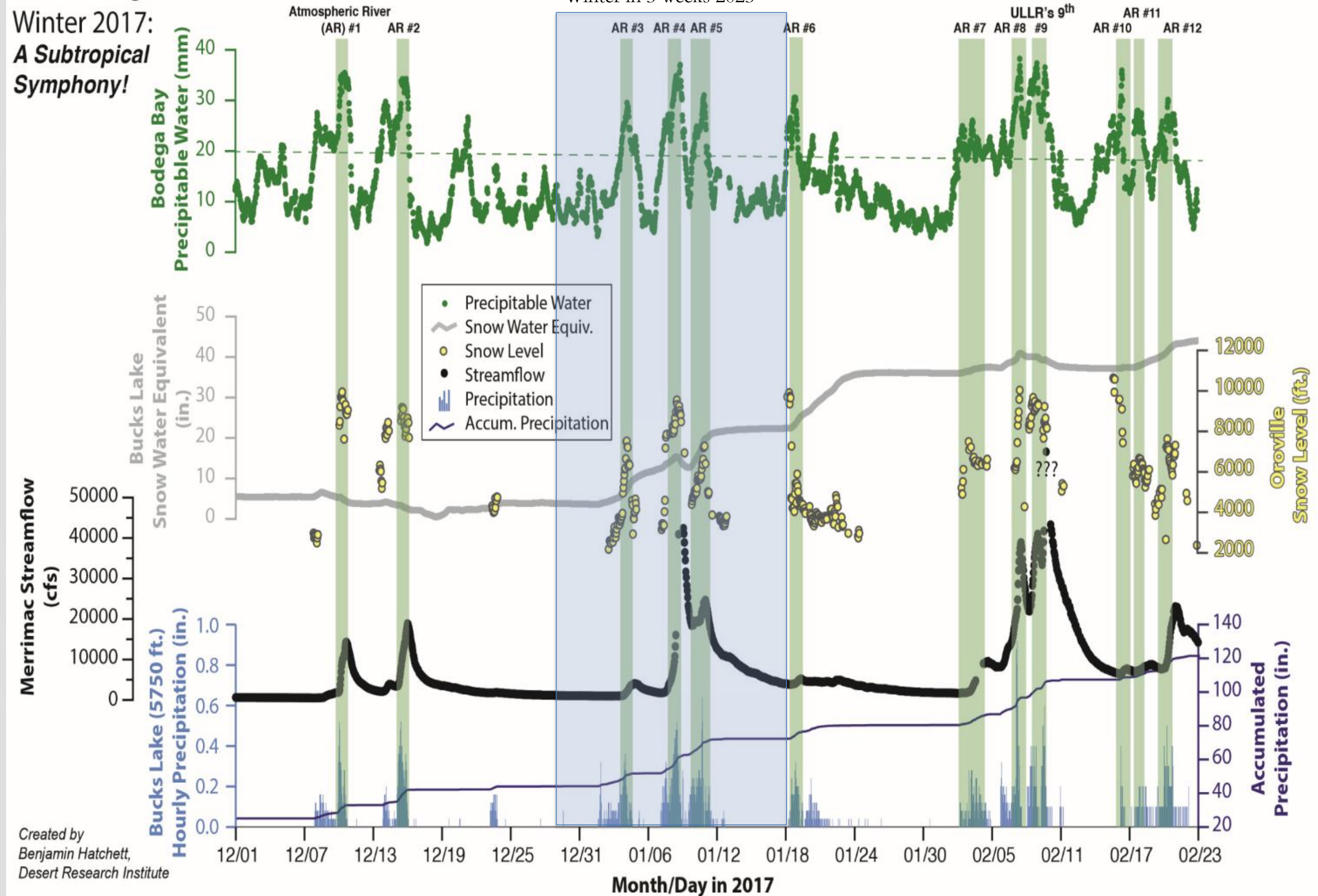
More than a Decade of Extremes

- Multiple Extremes
- New Records
- New opportunities for adaptation

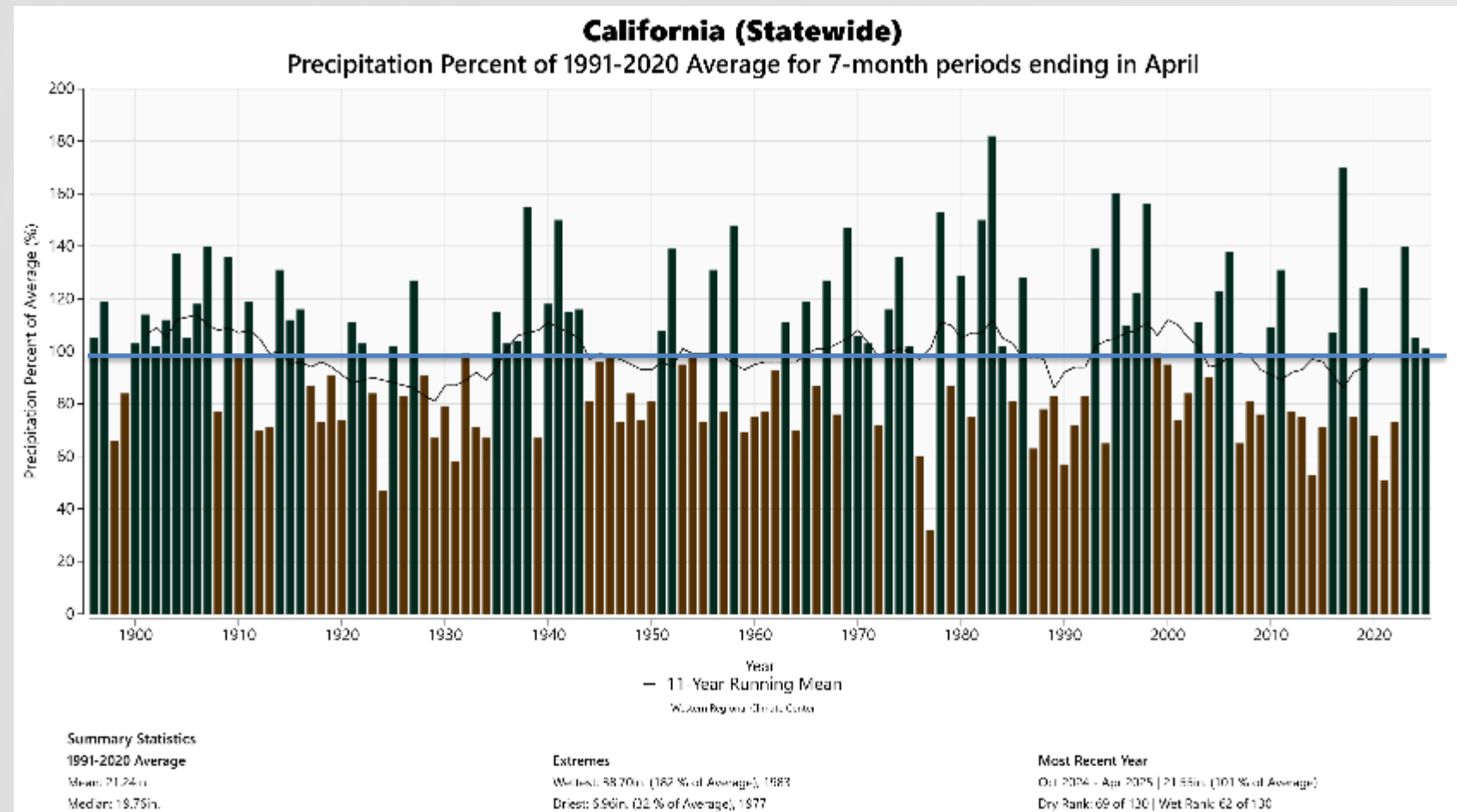


Meteorological

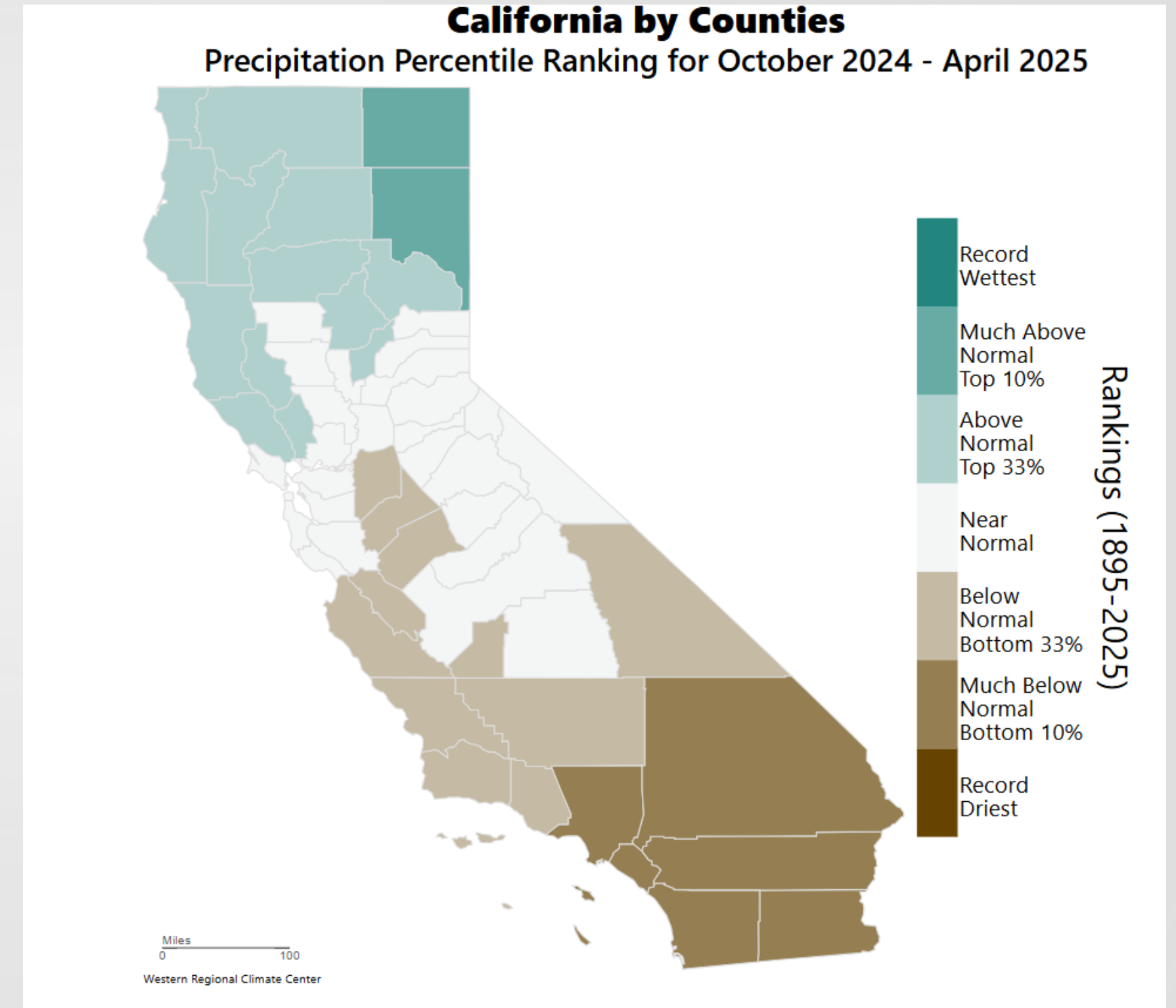
Winter 2017: *A Subtropical Symphony!*



Water Year 2025 Wet Season



WY 2025 Outlook – Dry with Punctuated Extremes
3rd Average or Better Year in a Row?



Roadmap Actions

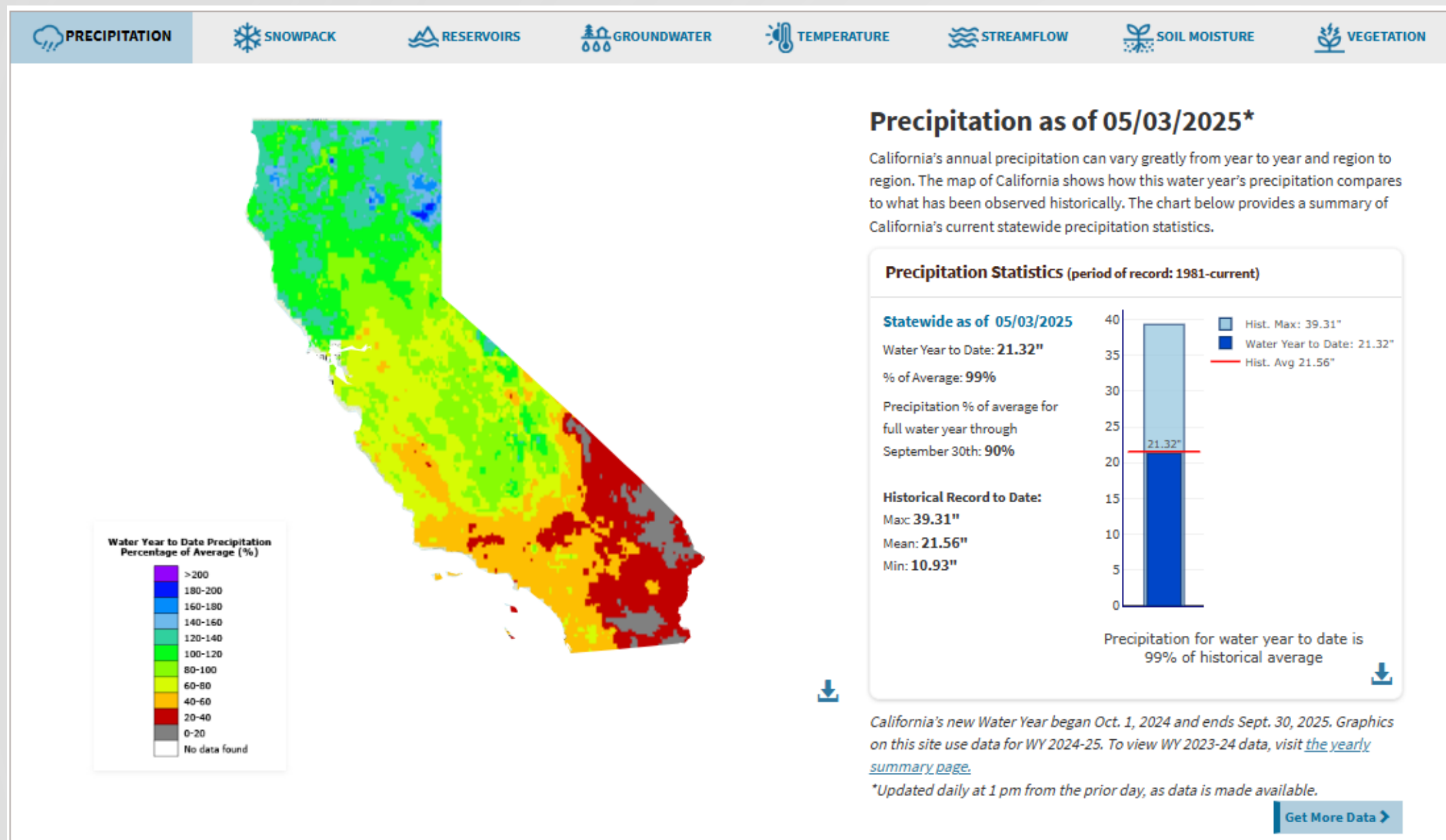
- Establish Partnerships –
Federal/State/Local/Academic/Private
- Development Partnerships Collaborate to:
 - Expand Observation Toolkit
 - Build the Forecasting and Analysis Toolkit
 - Develop Targeted Dashboards for Purpose
- Collaboration/Coordination/Communication



California Water Watch

Provides current conditions of key water metrics:

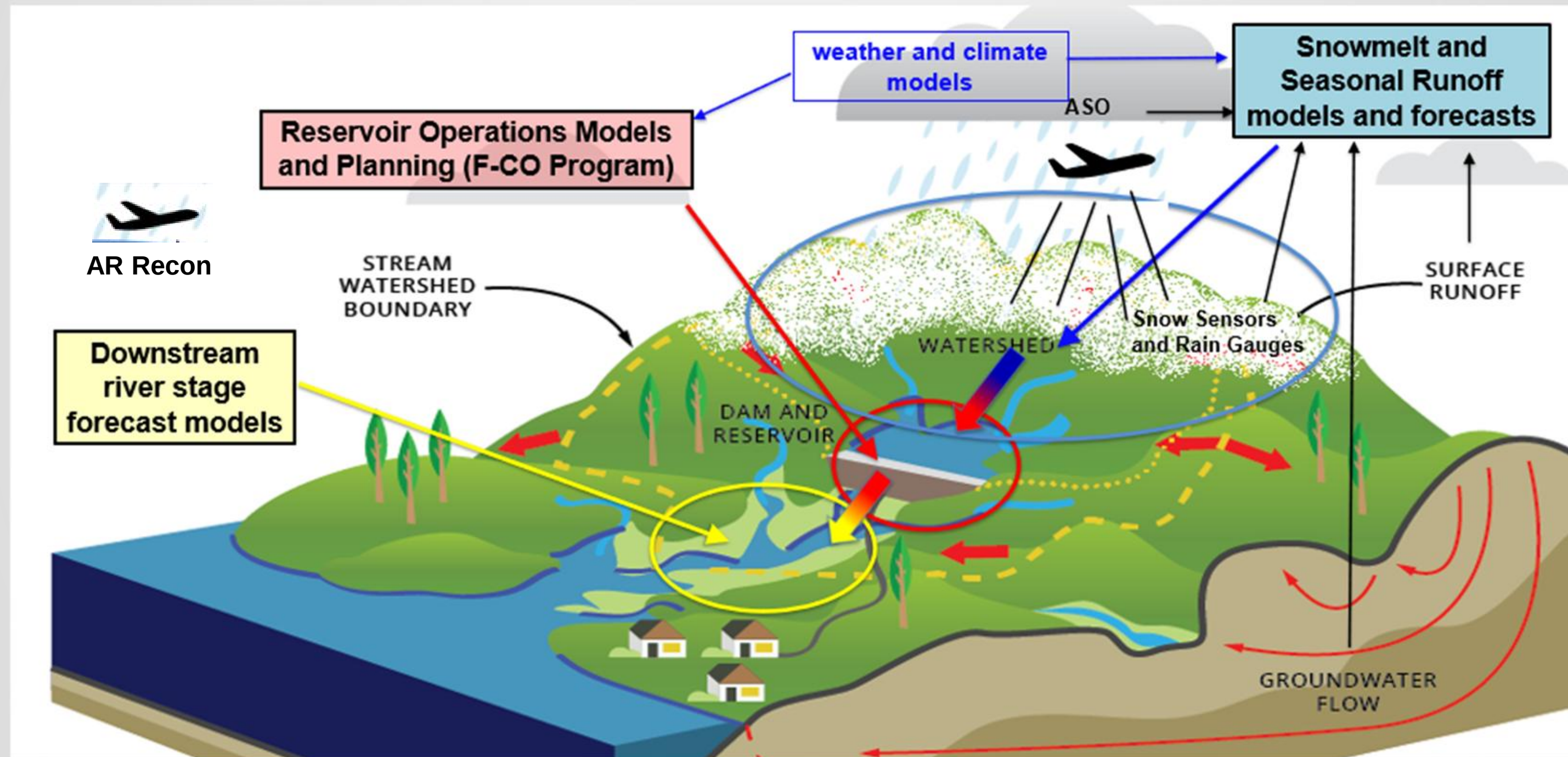
- Precipitation
- Temperature
- Snowpack
- Runoff
- Reservoirs
- Groundwater
- Soil Moisture
- Vegetation



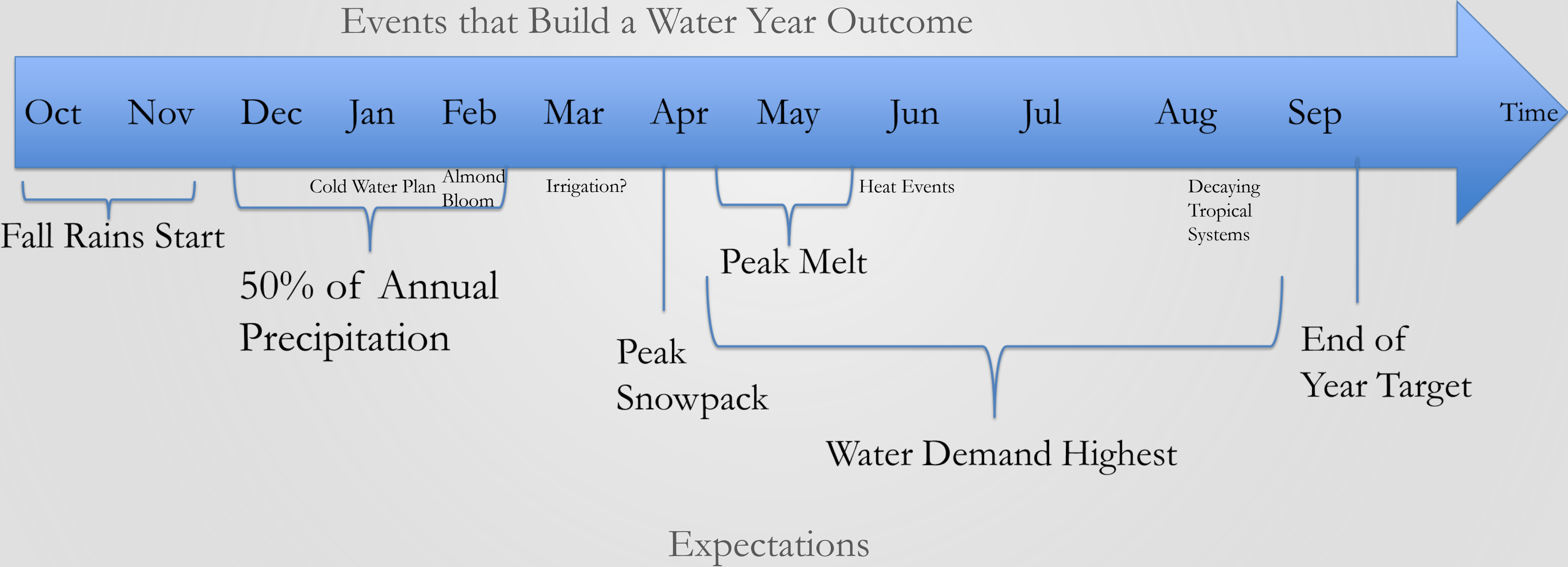
California Water Watch
<https://cww.water.ca.gov>



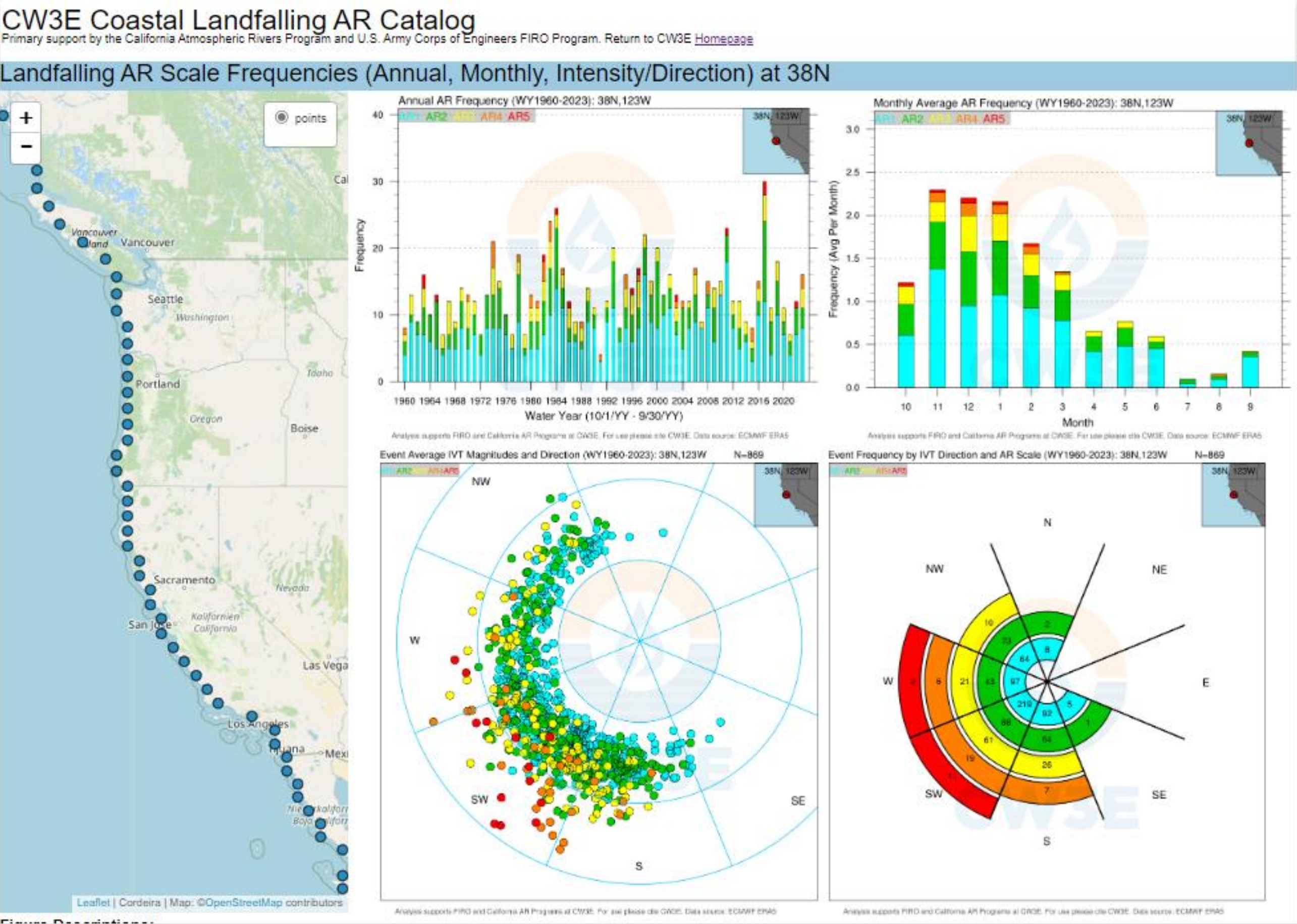
Observations and Forecasts Informing Water Management



Water Year Timeline



CW3E – Atmospheric River Landfall Catalog



Building the Water Year

- Summer(June to September)
 - Fiscal New Year
 - Latest Wet/Dry Season Progression
 - Looking Ahead – End of WY Planning
- Winter (December/January/February)
 - Wet/Dry and Notable Anomalies
 - Floods and Consequence – Drought or not?
 - Fiscal Planning for New Budget Year
- Fall (October/November)
 - Antecedent Conditions
 - Water Year Outlook
 - Fiscal Situation and Response Capability
 - Fires and Consequence
- Spring (March/April/May)
 - Late-Season Bailout or Early Shutoff?
 - Peak Snowpack Timing and Magnitude
 - Dry Season and Budget Expectations
 - What about Next Year?

Climate Change: How different will the next decade be? What about now?



Closing Thoughts

- A warming world has already shown **new and more frequent extremes** impacting water management actions on multiple timeframes.
- Expectations are for these extremes to amplify further leading to **longer dry spells between larger storms** requiring adaptation strategies to maintain supply reliability and reduce flood risk **in concert** rather than in sequence with **as much lead time** as possible.



Closing Thoughts

- **Space and time scales** for observations and forecasts are key to change, impacts, and consequence.
- **Collaborations** with the research community and with local, state, and federal government and private sector will facilitate **meeting multiple objectives using emerging science and technology** to meet the challenge.
- **Collaboration/Coordination/Communication** are key!



Questions?

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

