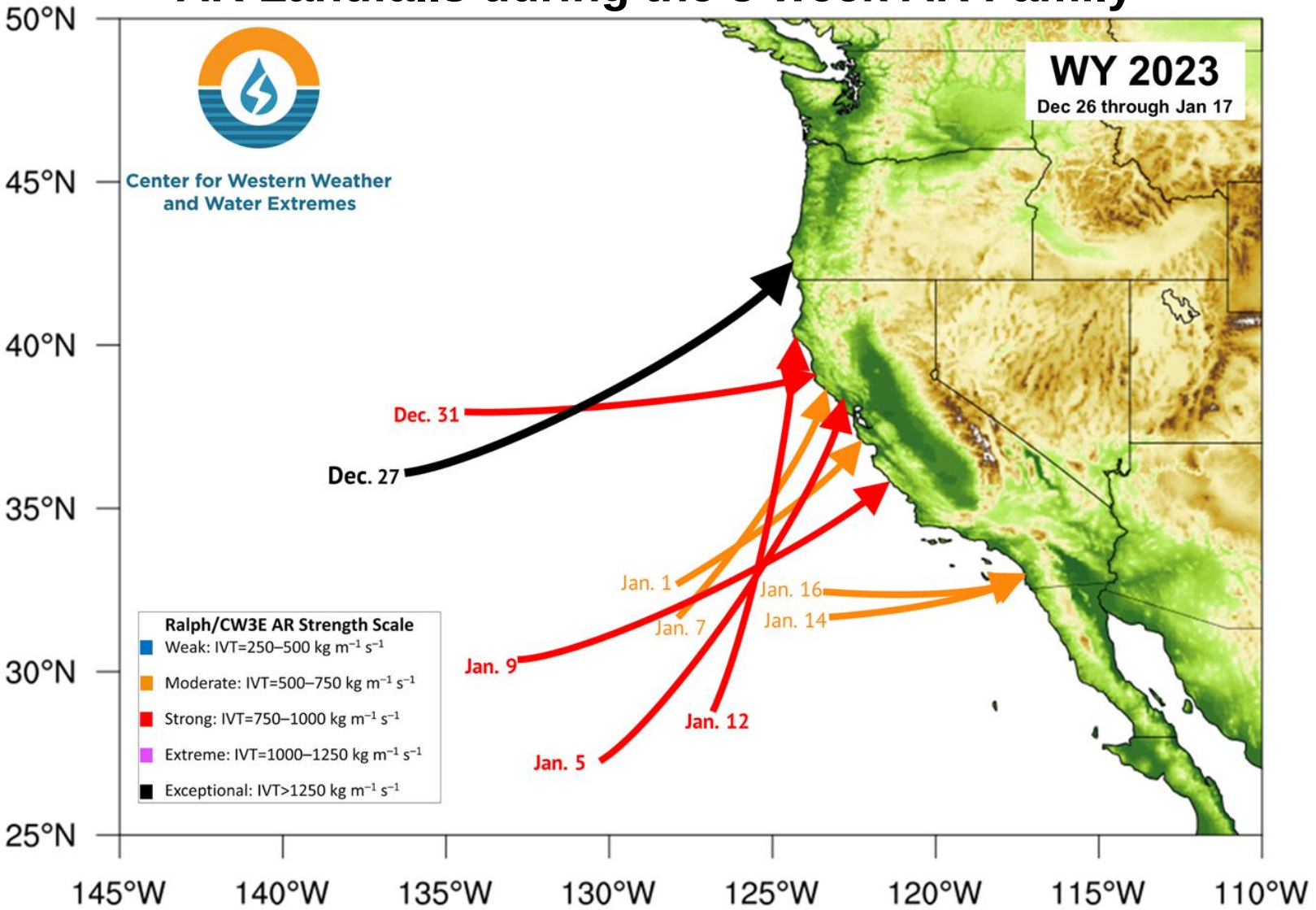
CW3E 2022-23 Winter (Dec – Feb) Recap

Wet winter helped alleviate drought conditions and produced massive snowpack

- A family of 9 ARs made landfall between 26 Dec and 19 Jan and brought about half the of California's precipitation during these three weeks.
- Parts of the Central and Southern Sierras and some transverse ranges received 60+ inches.
- Much of Central California received 100-150% of water year normal precipitation. Northeast and southeast California have received 50% or less of water year normal precipitation.
- According to the US drought monitor there has been 3-5 class improvement in drought conditions over Central California and at least a class drought improvement over much of California.
- Winter precipitation eliminated the 3-year drought deficit in 13% of the state.
- SWE in the Southern Sierra went from 14% of April 1st at the beginning of December to 198% of April 1st SWE at the end of February.
- By Mar 1, 9 reservoirs exceeded the historical average capacity, up from 1 on Dec 1 2022
- Water storage (reservoir +snowpack) in the Western Sierras increased from four-fold, with the greatest gains in the Southern Sierras.
- As part of AR Recon there were 33 Intensive Observing Period (IOPs) which included 25 C130 flights, 18 GIV flights and the release of 1,186 dropsondes.
- Precipitation and SWE totals during this winter are similar to Dec 2016– Feb 2017, with differences in the spatial patterns. In particular, northern CA received more precipitation in 2017 than this current winter.

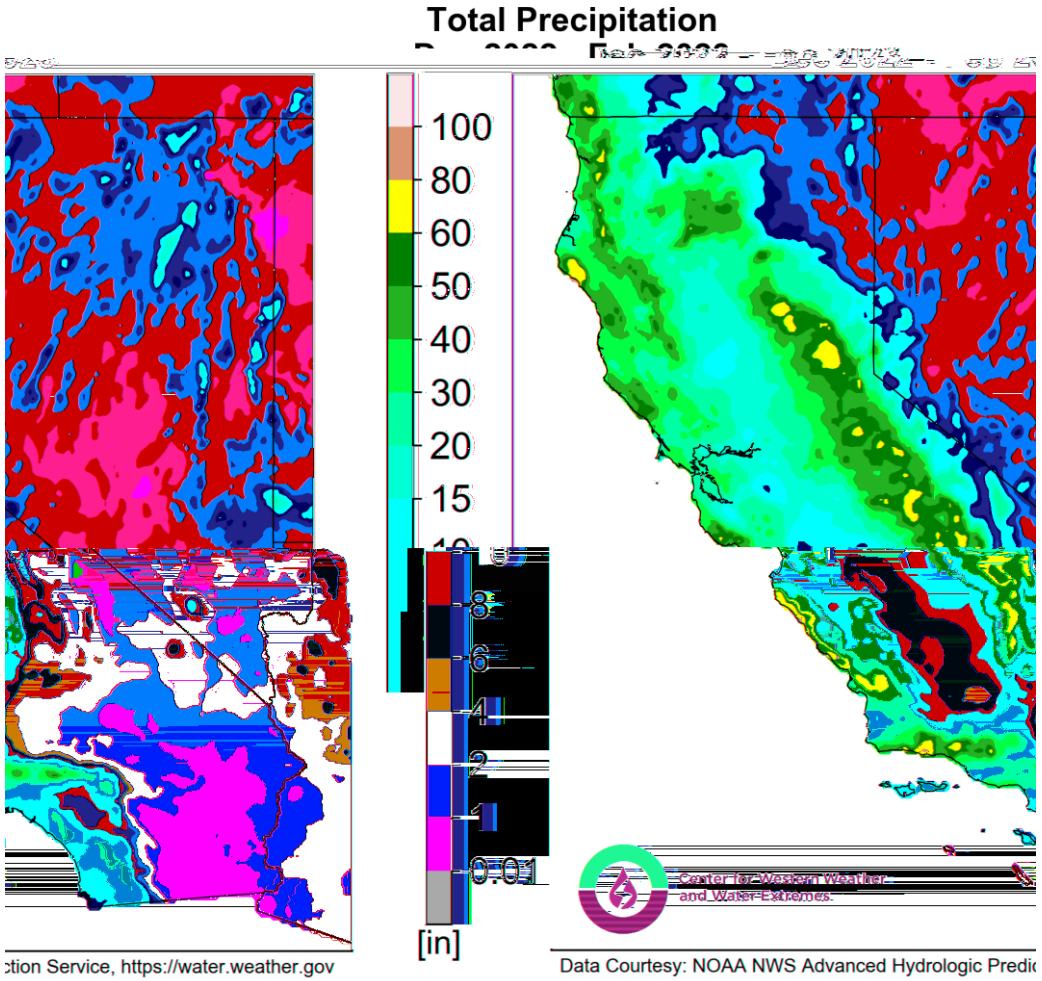
CW3E 2022-23 Winter (Dec – Feb) Recap

AR Landfalls during the 3-week AR Family



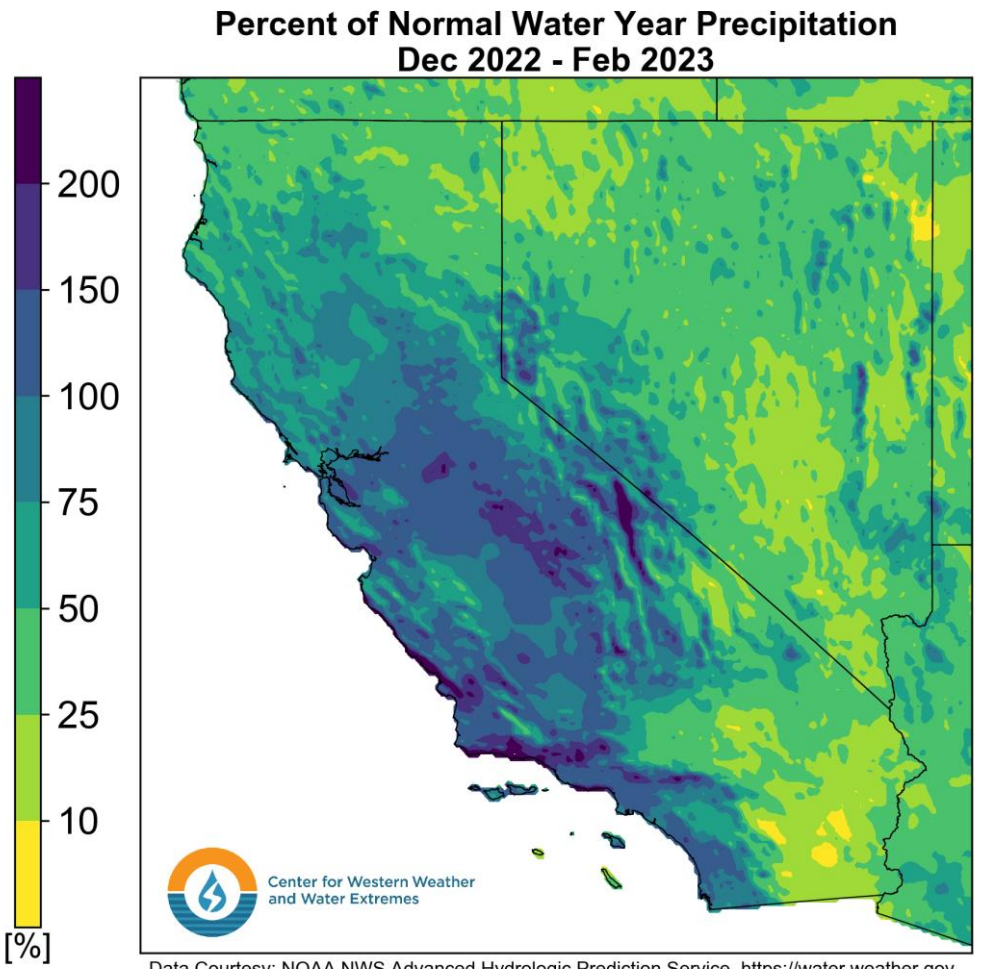
CW3E 2022-23 Winter (Dec – Feb) Recap

Precipitation Totals



ction Service, https://water.weather.gov

Data Courtesy: NOAA NWS Advanced Hydrologic Predic

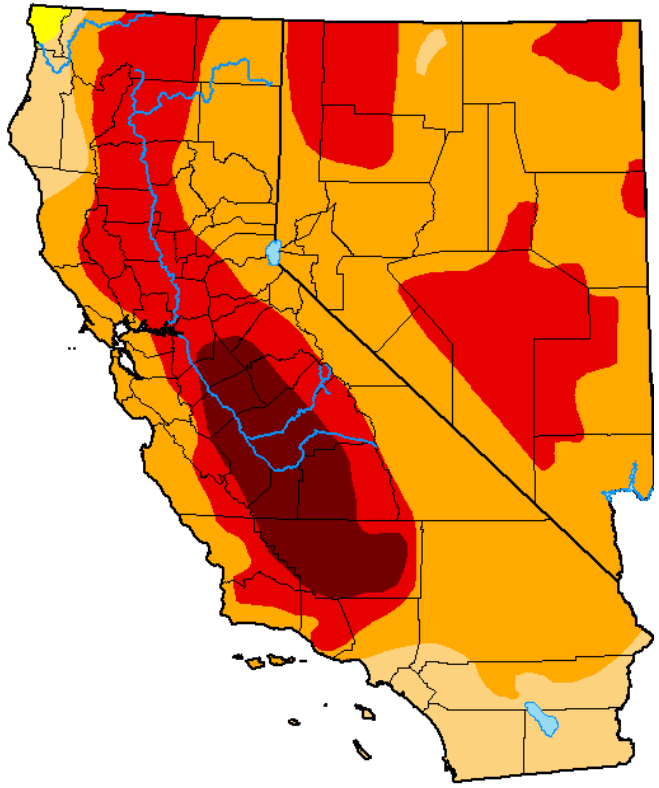


Data Courtesy: NOAA NWS Advanced Hydrologic Prediction Service, https://water.weather.gov
PRISM Climate Group, Oregon State University, https://prism.oregonstate.edu/

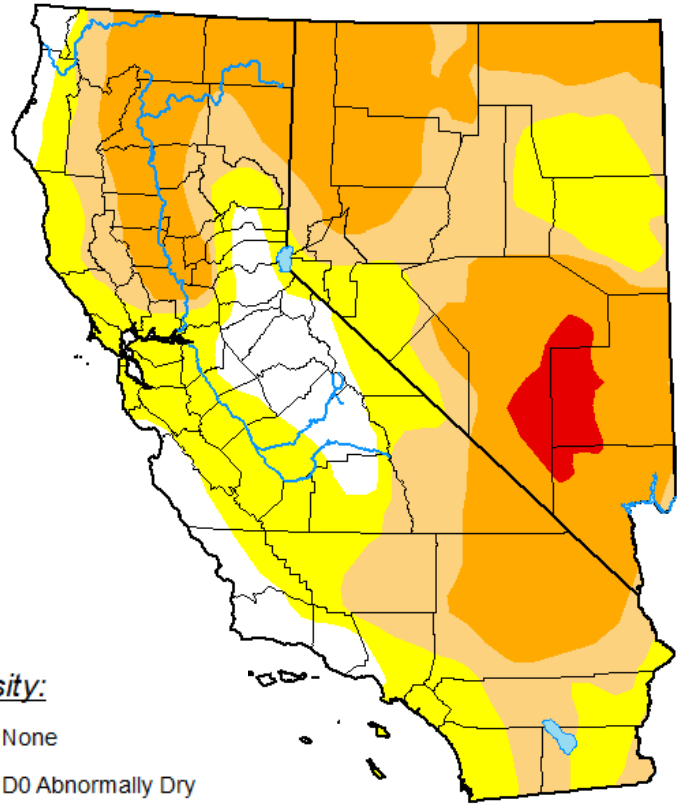
CW3E 2022-23 Winter (Dec – Feb) Recap

Drought Monitor Changes

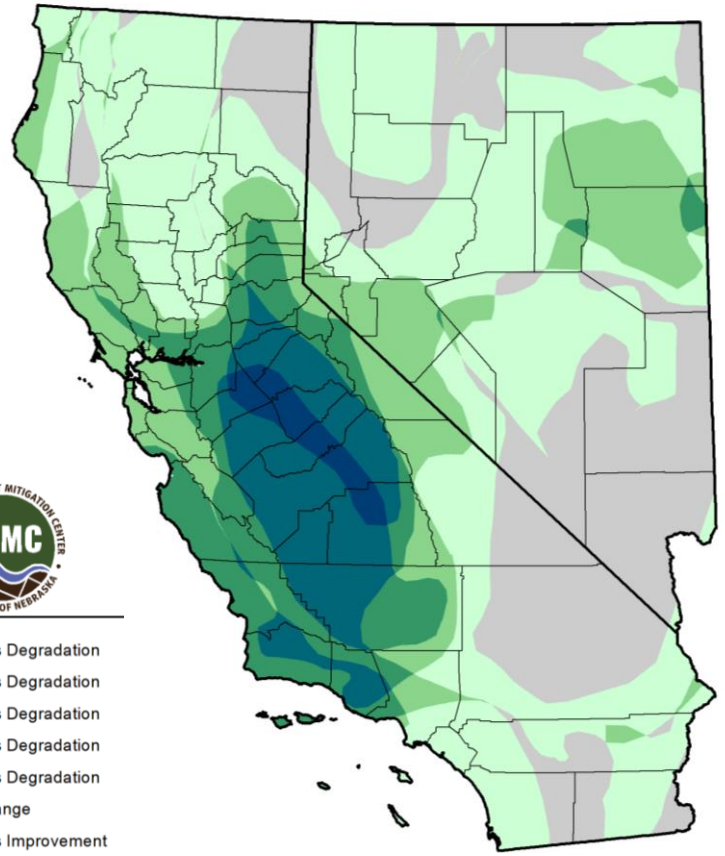
December 6, 2022



February 28, 2023



Drought Monitor Class Change
(12 weeks; 28 Feb 2023 – 6 Dec 2022)



Richard Heim
NCEI/NOAA

droughtmonitor.unl.edu

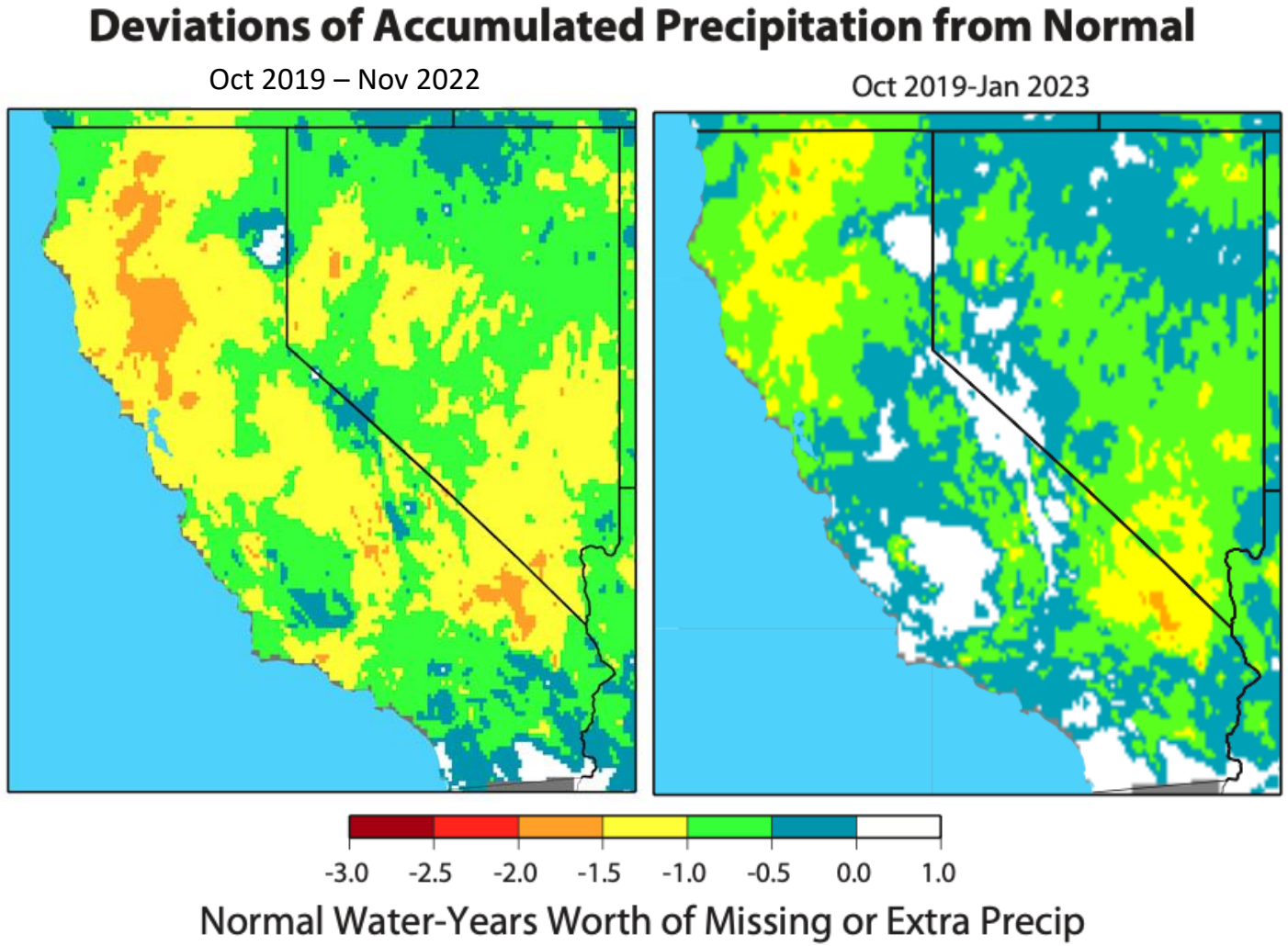
Intensity:

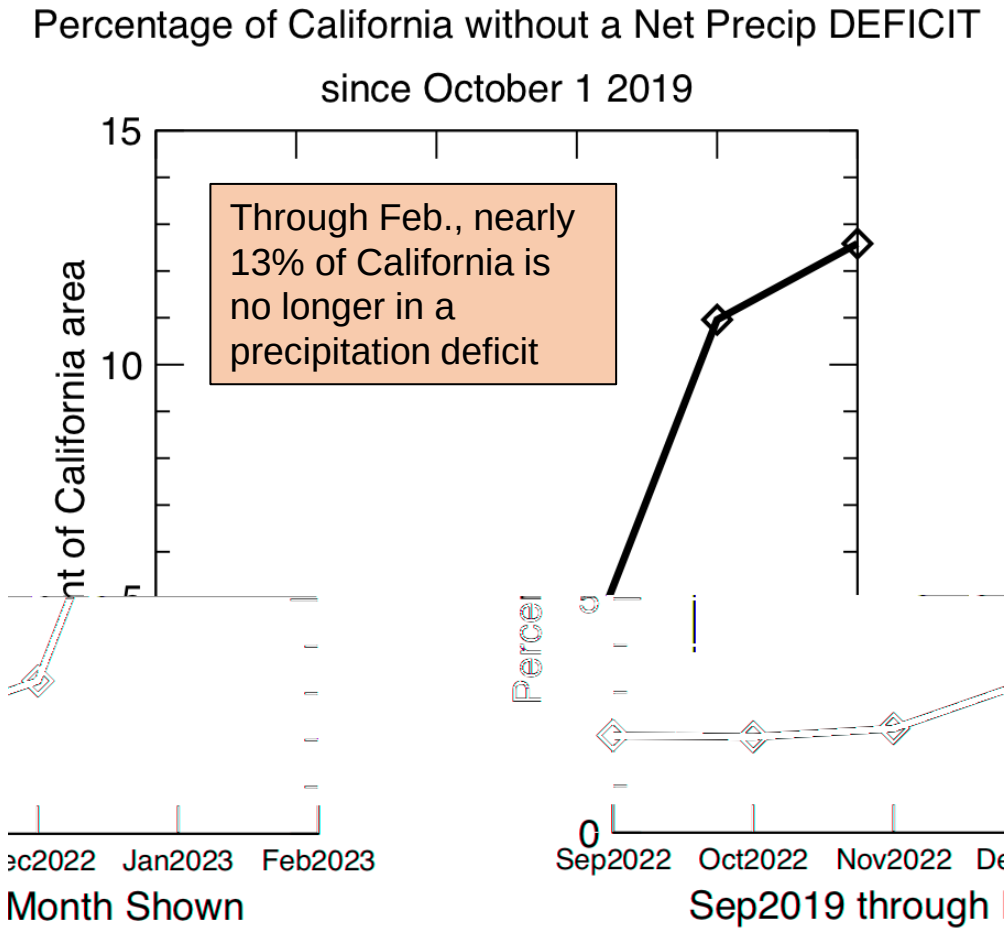
- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

- 5 Class Degradation
- 4 Class Degradation
- 3 Class Degradation
- 2 Class Degradation
- 1 Class Degradation
- No Change
- 1 Class Improvement
- 2 Class Improvement
- 3 Class Improvement
- 4 Class Improvement
- 5 Class Improvement

CW3E 2022-23 Winter (Dec – Feb) Recap

Elimination of Precipitation Deficit



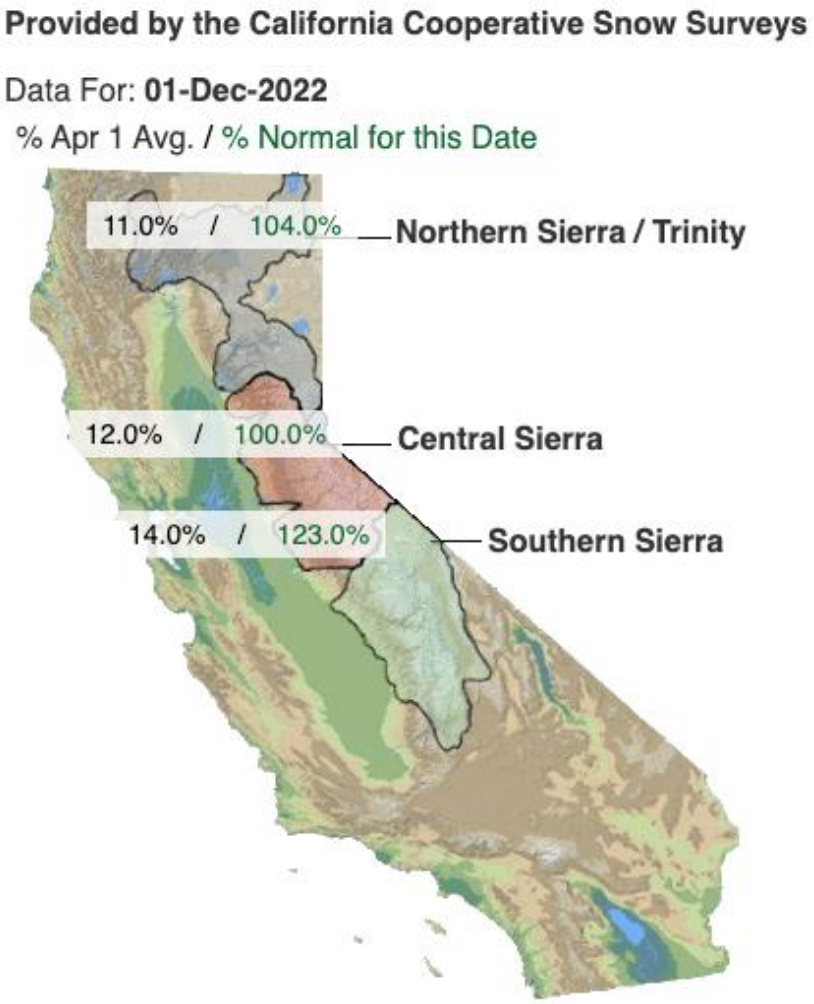


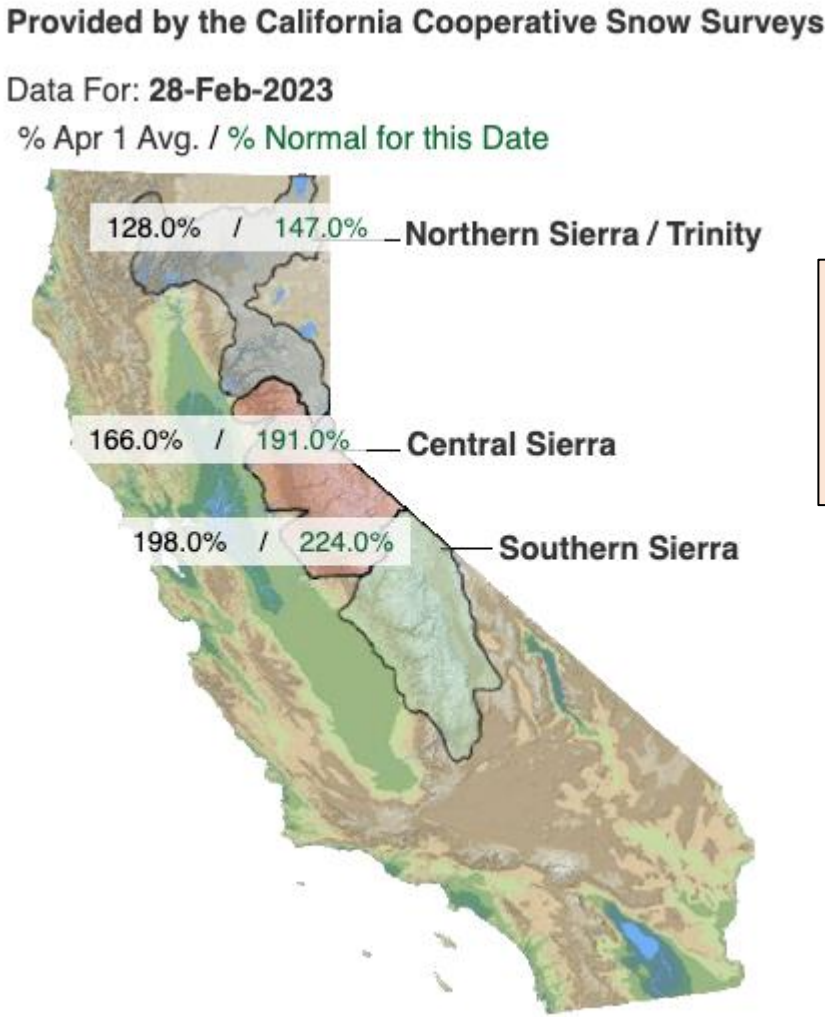
Amount of precipitation missing since the start of the current drought, October 2019, in missing water years worth of precipitation at the start of the winter (left) and at the end of January (middle) and the percent of area without a precipitation deficit in California by month (right).

CW3E 2022-23 Winter (Dec – Feb) Recap

Snow Accumulation Over Winter

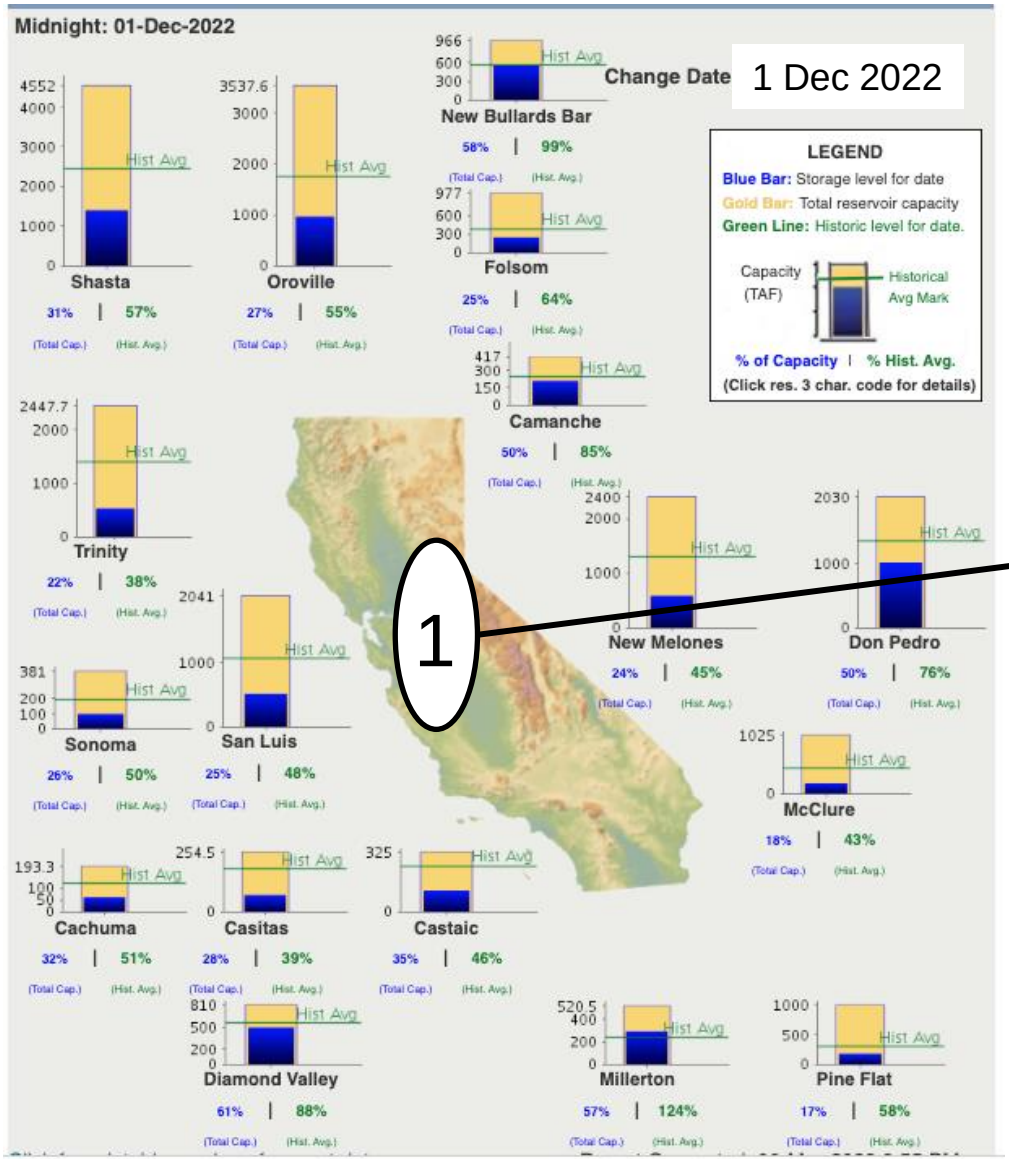
Snow Water Equivalent (SWE)

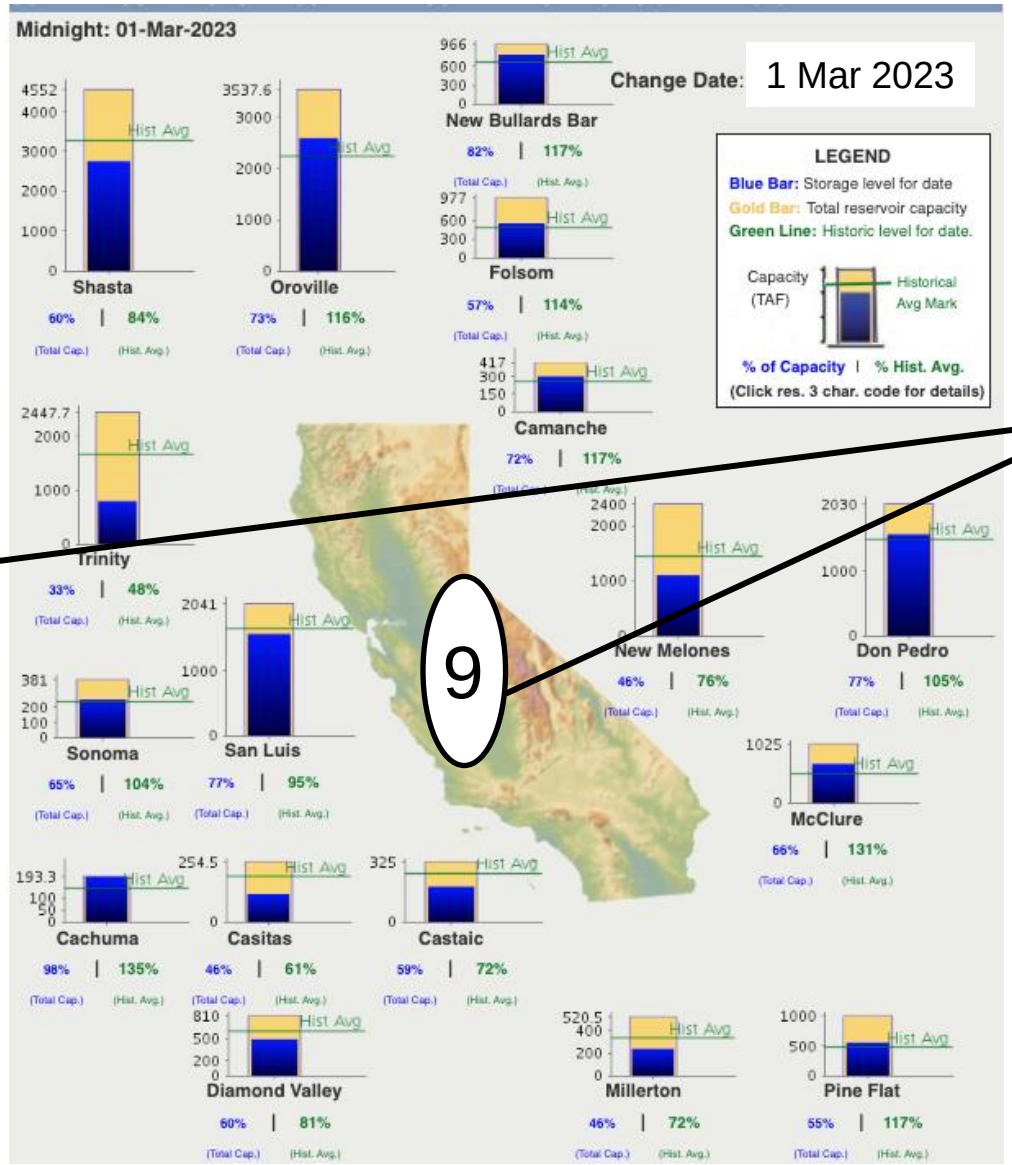




Based on % of April 1st Normal between Dec – Feb:
Northern Sierra increased by 117%
Central Sierra increased by 154%
Southern Sierra increase by 184%

CW3E 2022-23 Winter (Dec – Feb) Recap: Reservoir Increases

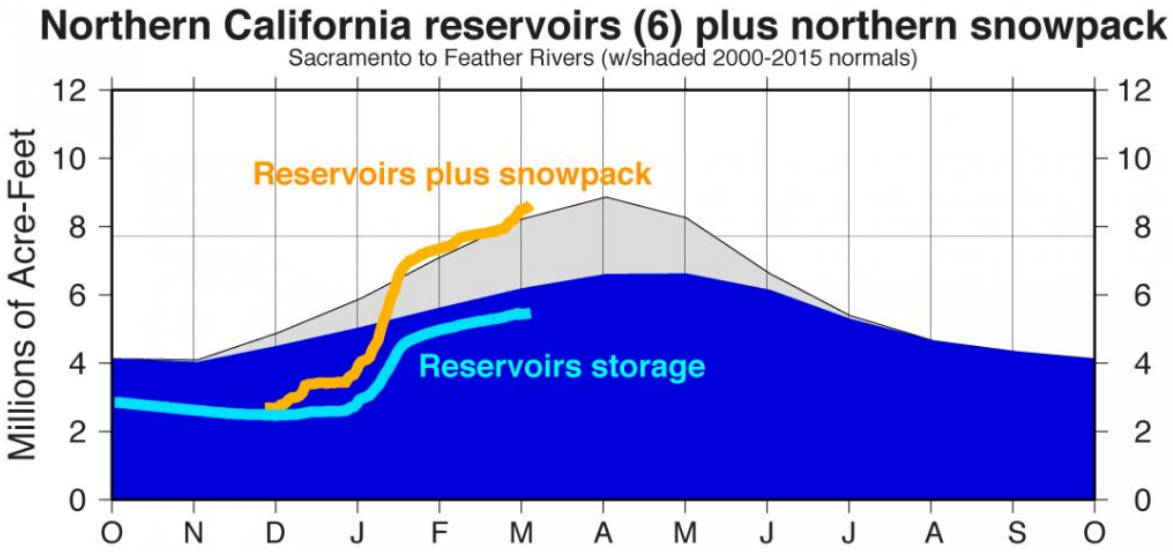


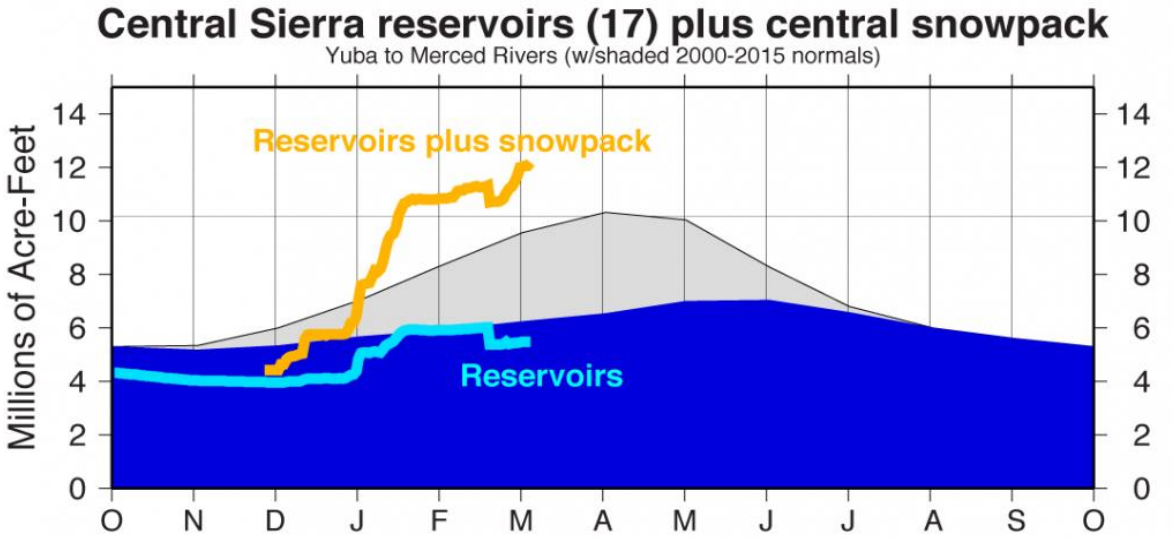


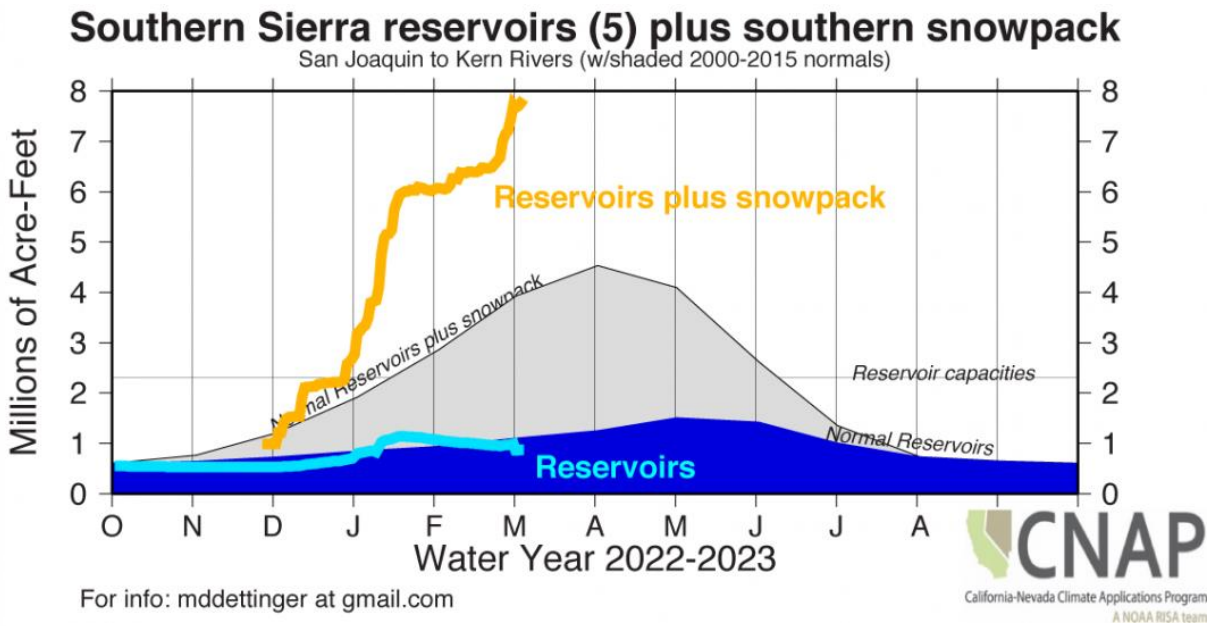
Number of reservoirs with storage at or above historical average at the beginning (left) and end of the winter months.

CW3E 2022-23 Winter (Dec – Feb) Recap

Water Storage: Reservoir + Snowpack by in the Western Sierra by Region

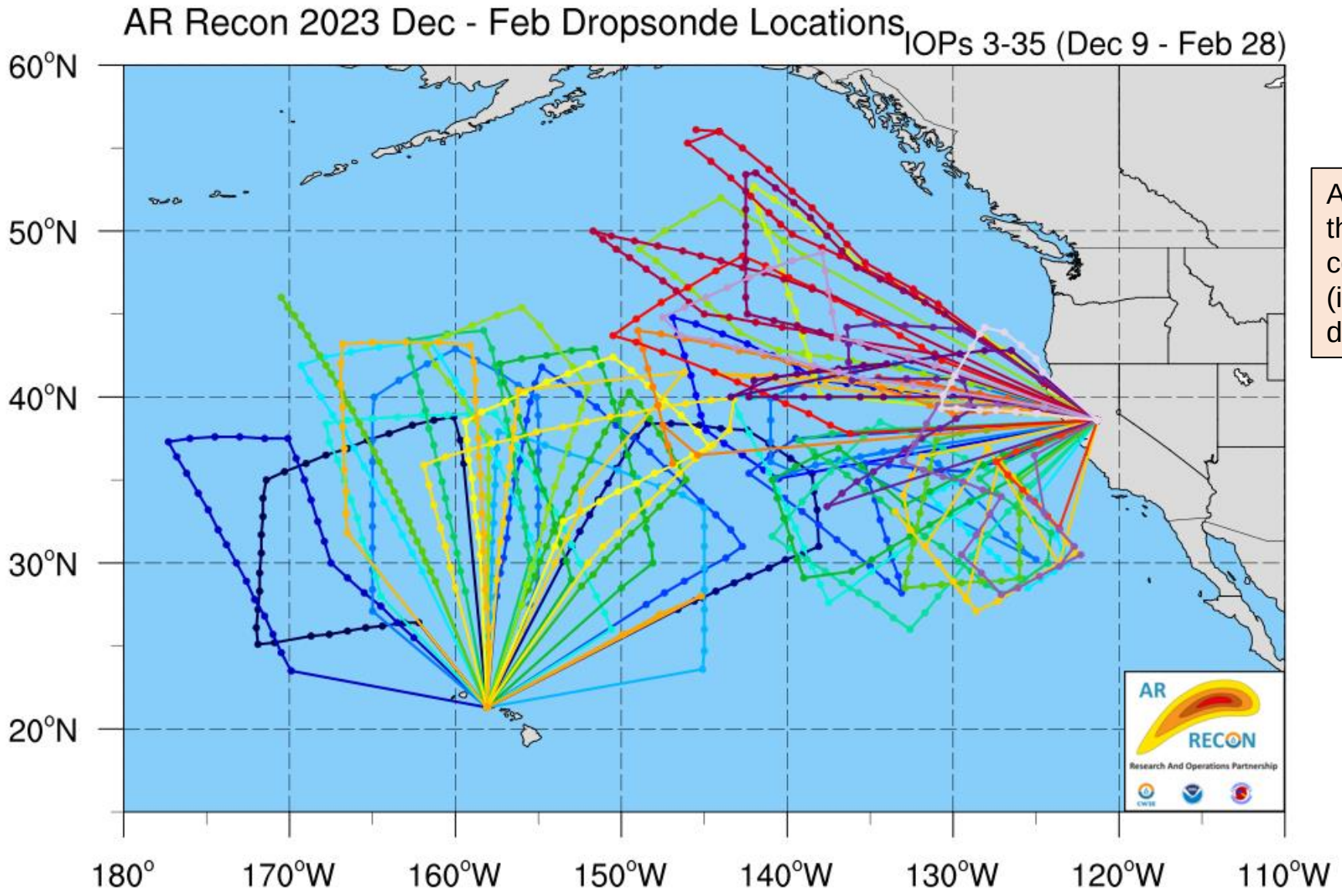






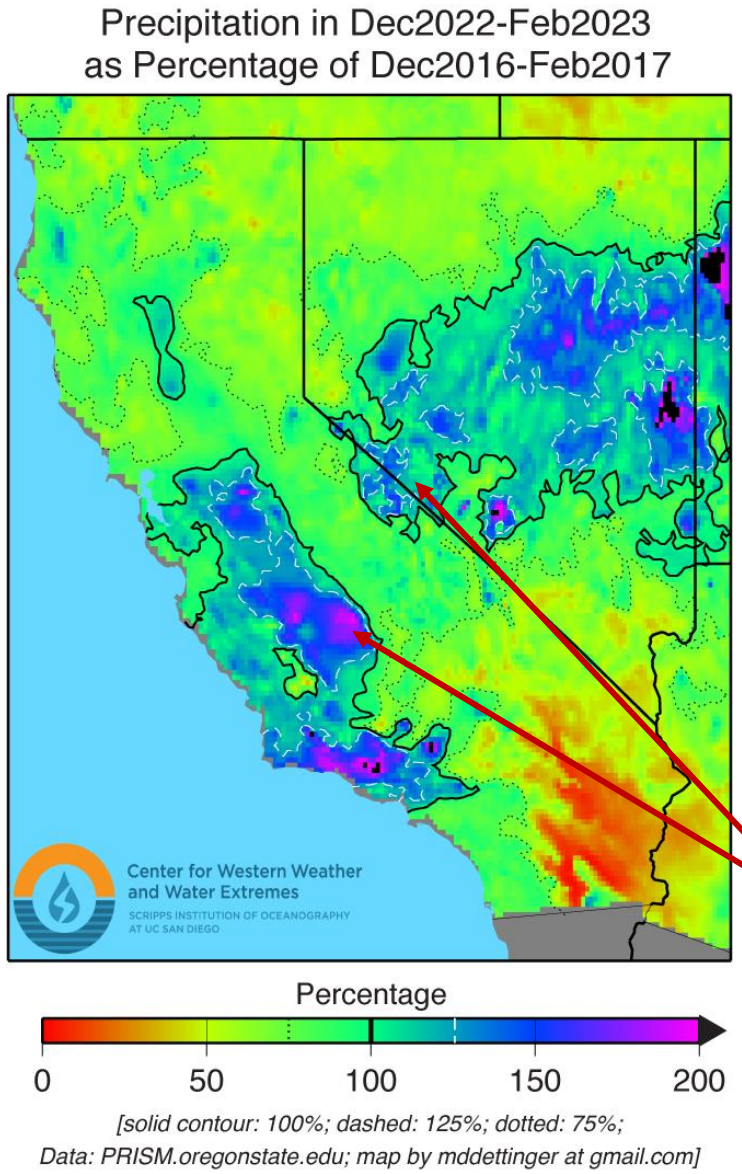
- Reservoir + snow storage went from below normal at the start of the Dec to at or above normal by the end of December.
- The Southern Sierra storage increase 8 fold, while the Central Sierra storage tripled.

CW3E 2022-23 Winter (Dec – Feb) Recap: AR Recon Flights Over the Winter



AR Recon flights throughout the winter months. Same color indicate same IOP (intensive observing period; days with a flight).

CW3E 2022-23 Winter (Dec – Feb) Recap: Comparison to 2017



Regions (inside the solid contour) where Dec 2022 – Feb 2023 precipitation was greater than Dec 2016-Feb 2017