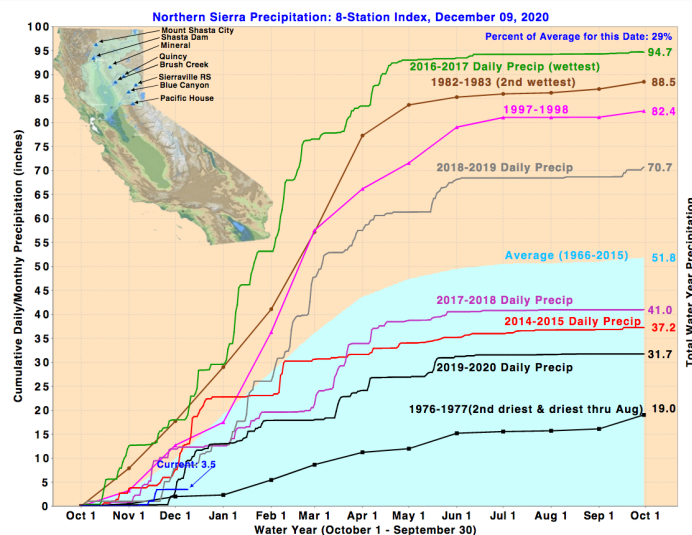


WY2021 Water Resources Update – December 10th, 2020

Summary:

- Dry stretch has persisted, but changes are coming;
- Atmospheric River to hit Northern CA and Pac NW this weekend.

Details:

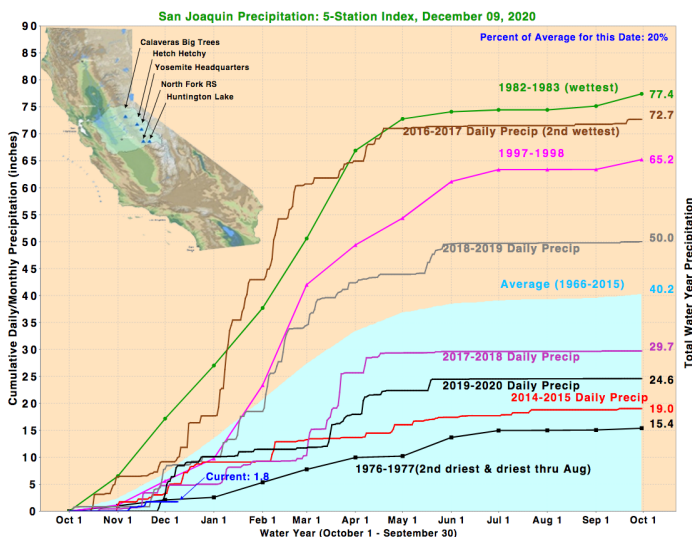


Dry Start to Water Year

The start to WY2021 continues to be dry. Precipitation since the start of the water year has added up to 3.5 inches for the Northern Sierra 8-Station index (8SI), which rivals some of the driest starts to any water year in history and represents 29% of average to date for the water year.

Source:

https://cdec.water.ca.gov/reportapp/javareports?name=PLOT_ESI.pdf

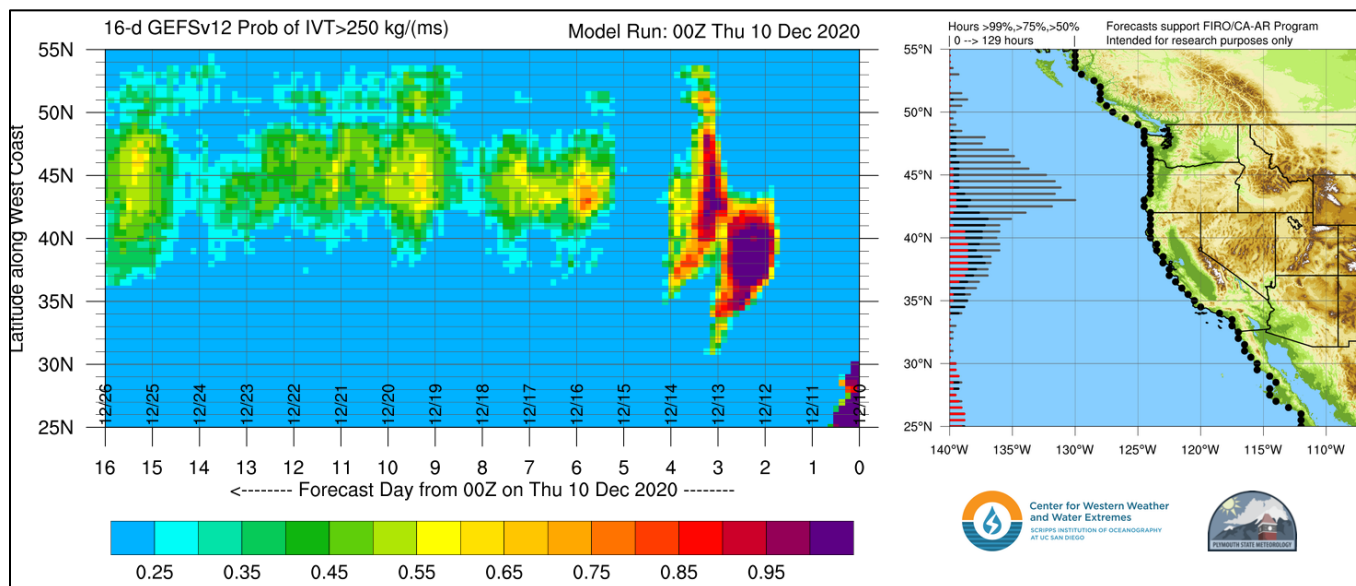


The San Joaquin Index (5SI) shows even drier conditions in the Central Sierra, with precipitation since the start of the water year only at 1.8 inches. The index is 20% of average to date for the water year.

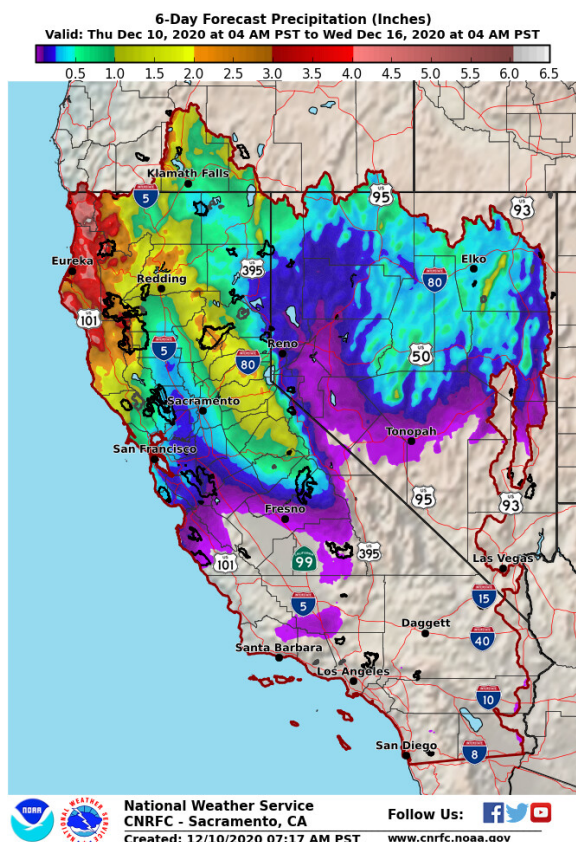
Source:

https://cdec.water.ca.gov/reportapp/javareports?name=PLOT_FSI.pdf

Atmospheric River to Hit Northern CA and the Pacific NW States This Weekend



Source: <http://cw3e.ucsd.edu/iwv-and-ivt-forecasts/>

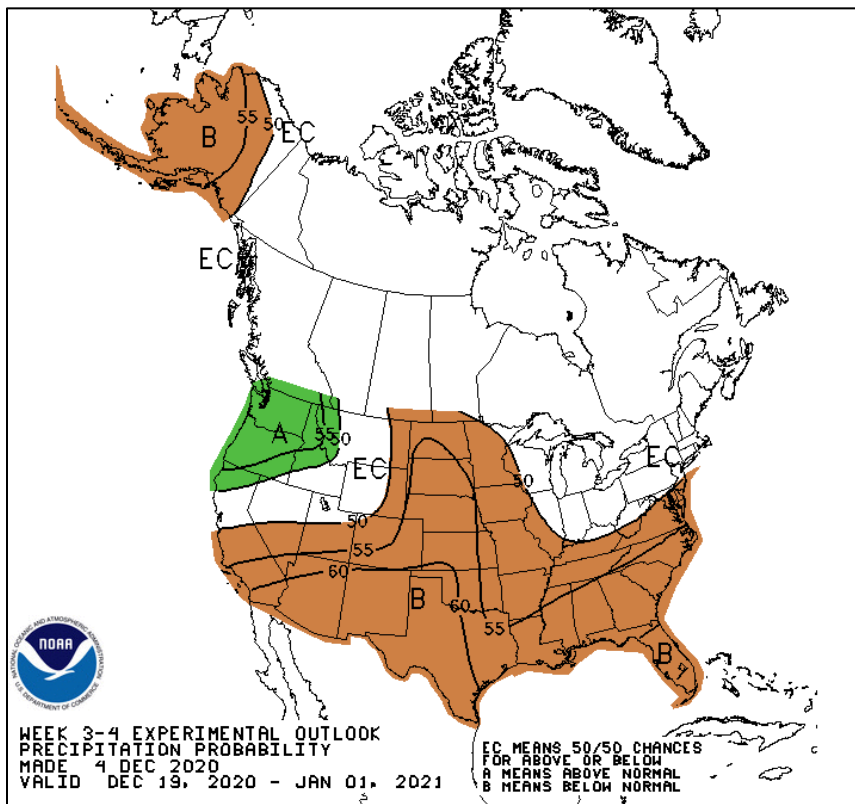


The Atmospheric River (AR) Landfall Tool from CW3E (depicted above) shows an AR poised to hit Northern CA this weekend with a weaker AR on its heels and centered farther north early next week.

This AR will bring much needed precipitation this weekend into early next week with a weaker weather system impacting the area in the middle of next week. The six-day Quantitative Precipitation Forecast (QPF) totals (graphic to the left) yield 1-2 inches in the Sierra Nevada watersheds from around Yosemite north to around Lake Shasta. The heaviest precipitation will be on the North Coast of California with basins north of Fort Bragg expected to receive 3-5 inches with amounts tapering off southward toward the San Francisco Bay.

Source: <https://www.cnrfc.noaa.gov/precipForecast.php?cwa=RSA&imgNum=1>

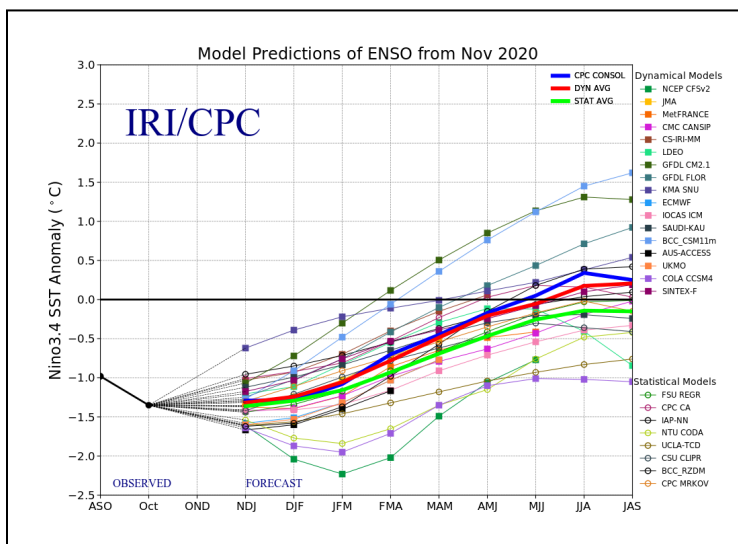
CPC Experimental Precipitation Outlook for Weeks 3-4



The Climate Prediction Center (CPC) experimental outlook for precipitation for weeks 3-4 (Dec 19 2020 – Jan 1 2021) shows an elevated probability for above normal precipitation in the Pacific NW extending into far Northern California. The outlook shows an elevated probability for below normal precipitation over the southern half of California.

This outlook is consistent with the current La Nina phase of the ENSO cycle, which favors more active weather in the Pacific Northwest and suppressed activity in Southern California.

Source: <https://www.cpc.ncep.noaa.gov/products/predictions/WK34/gifs/WK34prcp.gif>

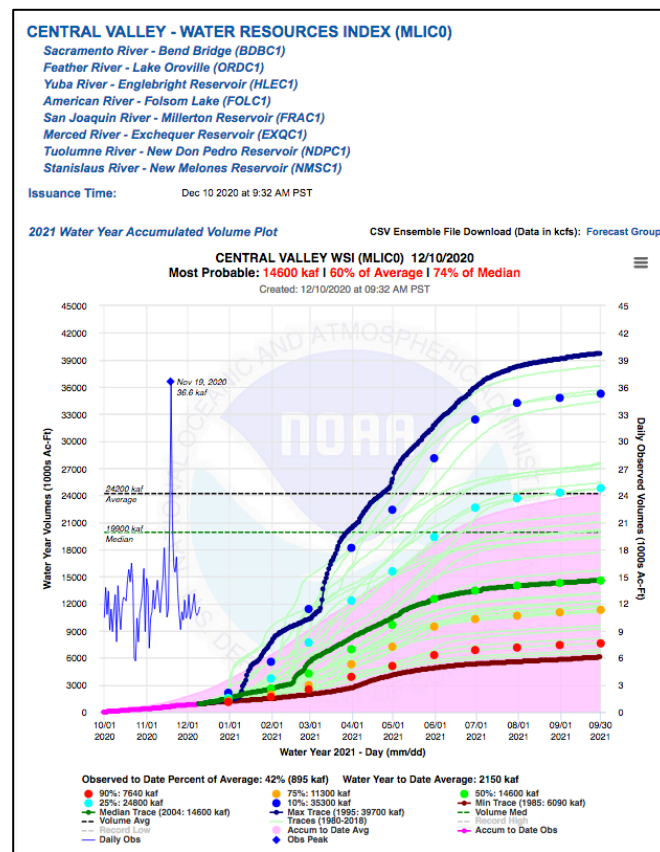
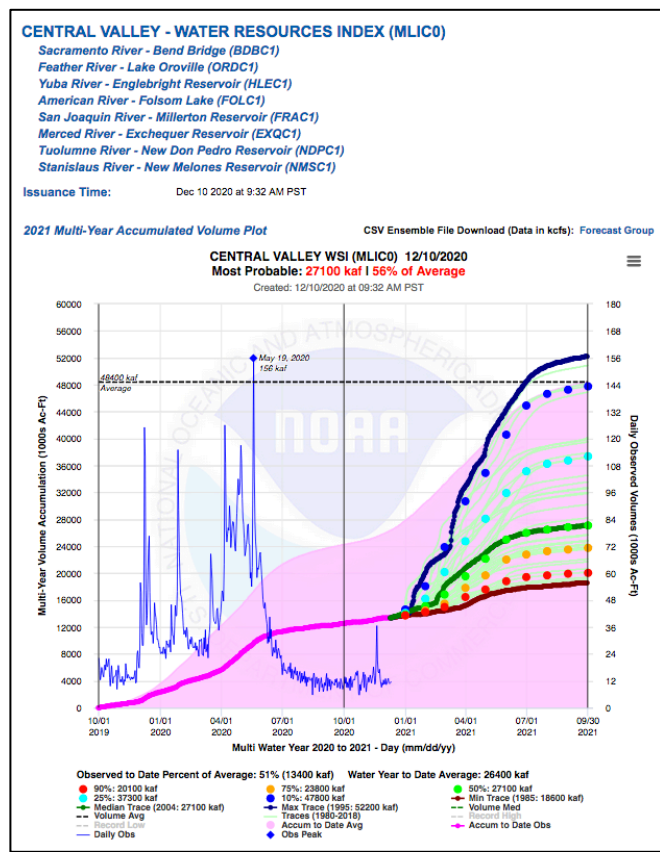


Ensemble predictions for the evolution of ENSO indicate that La Nina conditions will persist through the cool season likely transitioning to ENSO neutral conditions by spring.

The graphic to the left shows forecasts of sea surface temperature anomalies for the Niño 3.4 region (5°N-5°S, 120°W-170°W). Negative anomalies are associated with La Nina.

Source: https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/ensodisc.pdf

Water Supply Impacts



Given that WY2020 was relatively dry and the start to WY2021 has been dry, it is meaningful to look at the 2-year cumulative volume forecast from the Hydrologic Ensemble Forecast Service (HEFS) for the Central Valley Water Supply Index (WSI) to assess what it would take to close the cumulative deficit. The plot on the left above shows the 2-year cumulative projection most probable volume at 27.1 MAF, which is 56% of the average. There is a 10% chance of exceeding the average 2-year volume (48.4 MAF).

The projection for WY2021 indicates the most probable volume at 14.6 MAF (right plot above), which is about 60% of average (24.2 MAF) or 74% of the median (19.9 MAF). There is a 25% chance of exceeding the average volume this WY.

Source: <https://www.cnrfc.noaa.gov/ensembleProduct.php?id=MLIC0&prodID=9>

Conclusion:

California typically experiences much year-to-year variability in precipitation, and a couple of dry years can result in strain on the Central Valley water supply. Last year was dry, and the start of WY2021 has started dry, so the odds have tilted toward putting pressure on the water supply in the future.

The good news is that a beneficial Atmospheric River will impact Northern California in the near future and contribute to soil moisture and some runoff into reservoirs. La Nina conditions could suppress winter precipitation over the southern half of California which would adversely impact the many large water storage projects in the San Joaquin and Tulare basins. Still, there is a 25% chance of exceeding the average volume for the Central Valley Water Resources Index this year, but only a 10% chance of closing the 2-year deficit by the end of the WY.