

WY2021 Water Resources Update – November 23, 2020

Summary:

- Another dry start to the water year (Oct. 1 – Nov. 23);
- Soil moisture deficits are much worse this year following the dry WY2020;
- Precipitation deficits increase the odds for a second dry year in a row;
- Chance for a below average WY2021 is at about 70%.

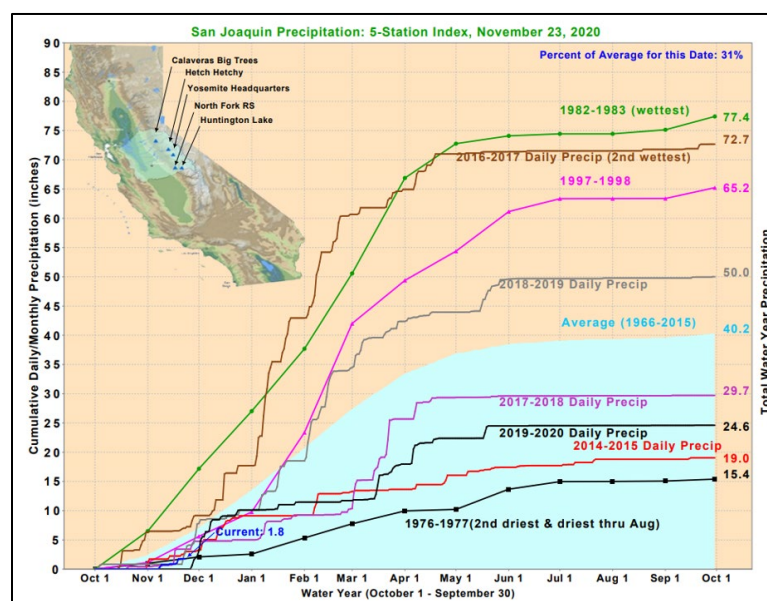
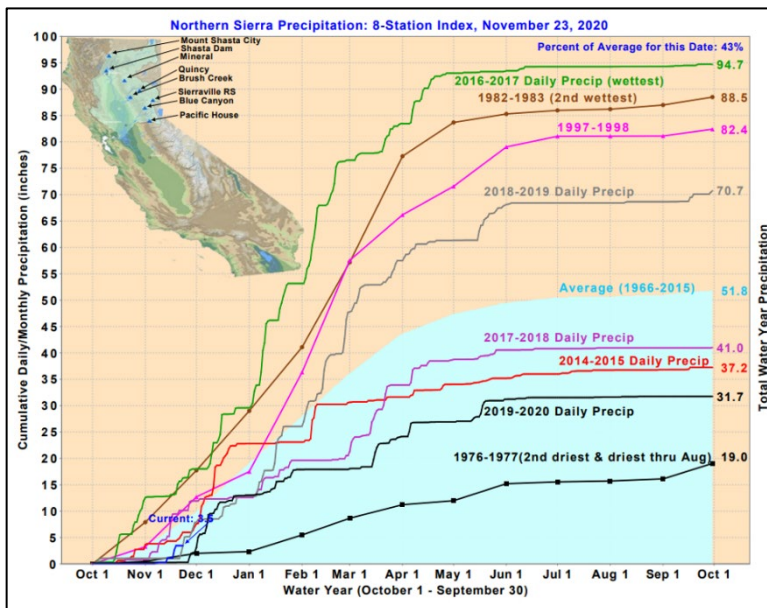
Details:

Dry Start to the Water Year

The start to WY2021 has been dismal. The Eight Station Index (8SI) tied the record for its driest October ever (0.01 inches, also recorded in October 1995). If November continues to be dry for the next week, the 8SI will stand at 3.45 inches, the 14th driest start (Oct. through Nov.) on record. One bright spot is that the rain started a couple weeks earlier than last year.

Source:

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

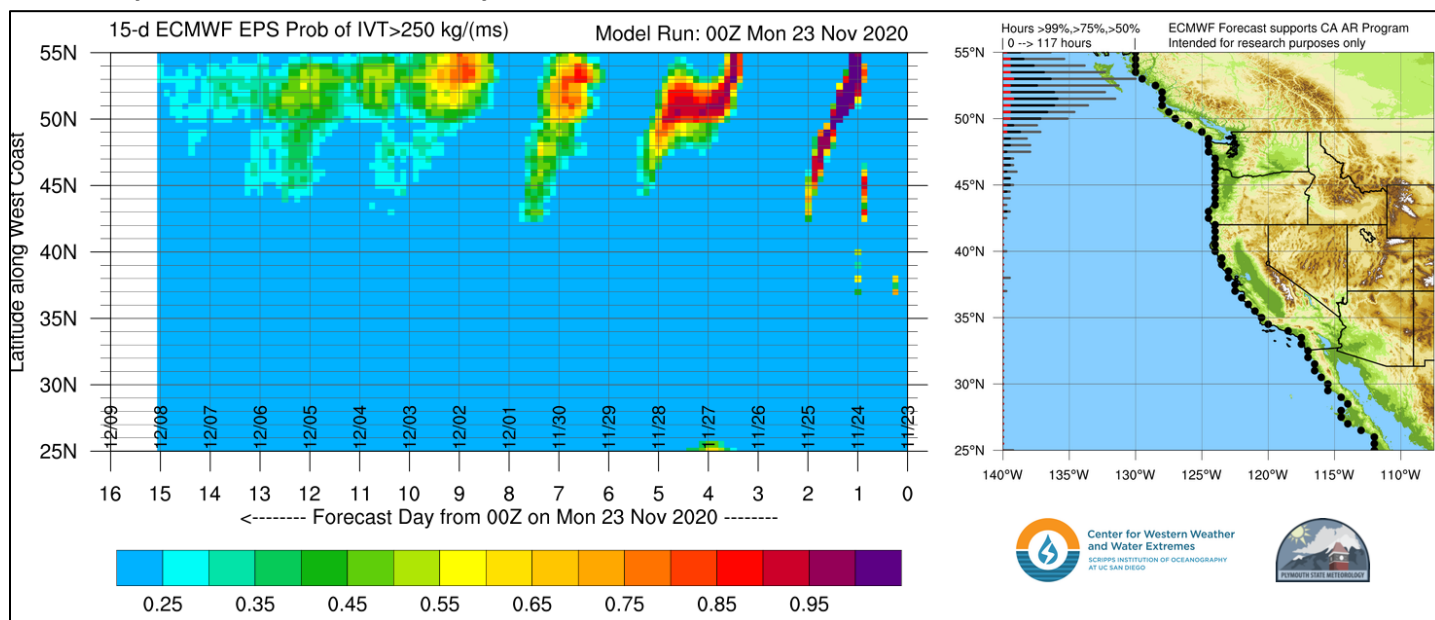


The San Joaquin Index (5SI) is even worse off, standing at 1.75 inches or 31% of average. This region had no measurable rain during October. If the 5SI did not receive any more precipitation it would be the 10th driest start (Oct. – Nov.) in the past 100 years.

Source:

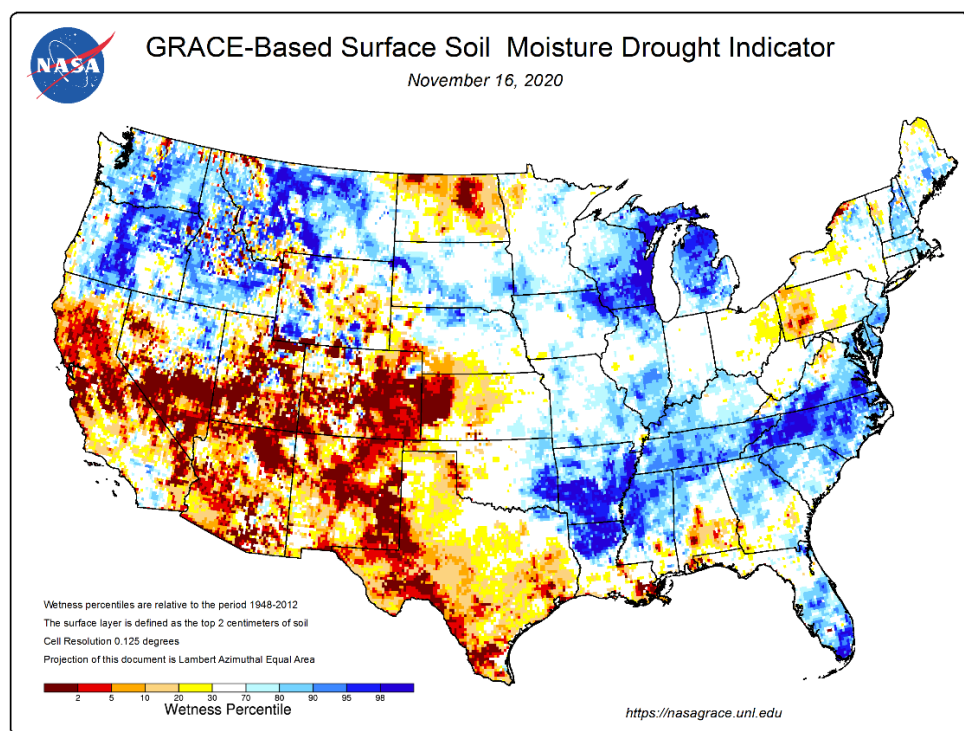
http://cdec.water.ca.gov/reportapp/javareports?name=PLOT_FSI.pdf

Dry Forecast for the next 10 days



The next 10 days are looking very dry, which means we'll continue to fall further behind the curve as we enter the wettest part of the water year. AR Landfall Tool from CW3E shows several storms but the ECMWF ensembles have them most likely to be focused north of 42 degrees North latitude, leaving CA and NV dry.

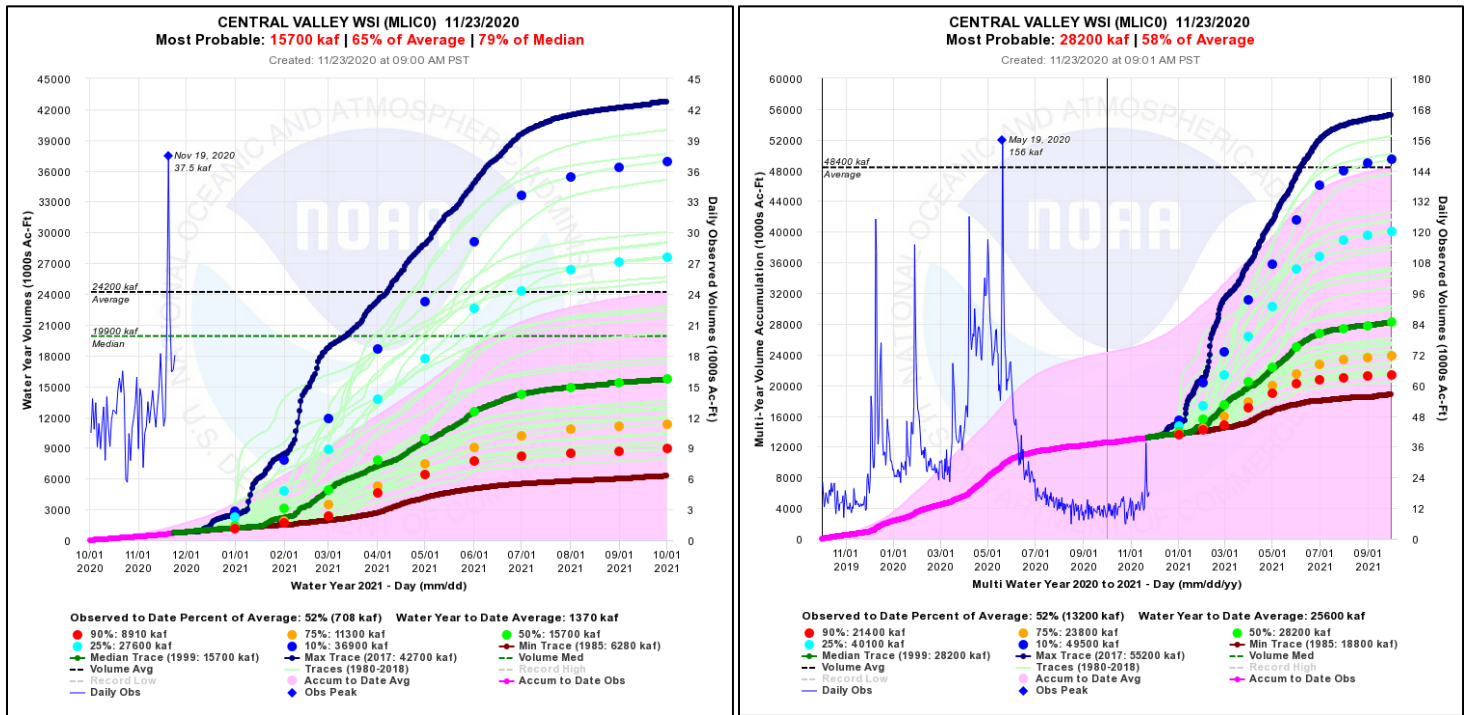
Source above: <http://cw3e.ucsd.edu/iwv-and-ivt-forecasts/>



Above: NASA's GRACE Soil Moisture (Percentiles) for Nov. 16, 2020. Unlike last year there is little carryover in soil moisture. The regions along the northern border of CA and NV have fared better than the majority of the region. The Pacific Northwest is clearly getting the most benefit from this year's La Nina.

Source: <https://nasagrace.unl.edu/>

Water Supply Impacts



CNRF water supply forecasts are based on the Hydrologic Ensemble Forecast Service (HEFS). HEFS uses a 15-day weather forecast from the GEFS and the climatology from WY1980 – WY2018 (new climatology this year!). So given the dry start to this year and the dry short-term forecast, HEFS water supply forecasts have been dropping rapidly. Despite the few storms already “in the bank” we are still running about 500,000 ac-ft behind where we were last year at this time (WY2020 forecast = 16.2 MAF; WY2021 = 15.7 MAF).

Since we had a dry year last year, CNRFC will be producing a 2-year water supply accumulation at most of our ensemble nodes (see [here](#)). Look for the “Multi WY Accum Vol” tab. The plot above on the right is an example, combining both WY2020 (observed) and WY2021 (forecast).

If we managed to get a median amount of runoff, we’d end up at 65% of average for this year and 58% of average for the 2 years. The chance of a below average water year this year is already about 70%. Given the large deficit in runoff from last year, the chance of remaining below the two year average of 48.4 MAF is now about 90%. Even if the coming water year has average runoff, we’d still be running a large deficit over the 2 year period.

Above: Sacramento Valley Water Supply Index over the WY2020 and the two year period WY2020-’21 period.

Source: <https://cnrfc.noaa.gov/ensembleProduct.php?id=MLIC0&prodID=11>

Future Editions of Water Resources Updates:

This year our office is going to share the task of writing these Water Resources Updates. We hope to continue to issue around two updates per month. If there is a major pattern change on the horizon, we may issue additional updates.

Conclusion:

Every region has different time scales for how long it can endure a dry spell before it gets into a serious drought. For California's Central Valley, I've generally seen this time scale at about two years, i.e., if it's very dry for two years, the water supply system will likely be strained. Though it's still early, the dry start to this year will make a comeback more difficult.

Is there any hope of escaping drought? I often look for analog years to see if the past might inform the coming water year (though I've learned over the years that every water year is unique, and that we should be prepared for anything). Nevertheless one water year is a close analog: WY1996. Some similarities:

- Moderate La Nina Year;
- Followed a weak-moderate El Nino;
- Had a dry October – November (only 0.58 inches in the 8SI).

WY 1996 followed a dry Fall with three wet months in a row (Dec. – Feb.) and ended up above average in the northern CA region. So there is always hope.

For more details and individual basin forecasts, see our website: <https://www.cnrfc.noaa.gov/>