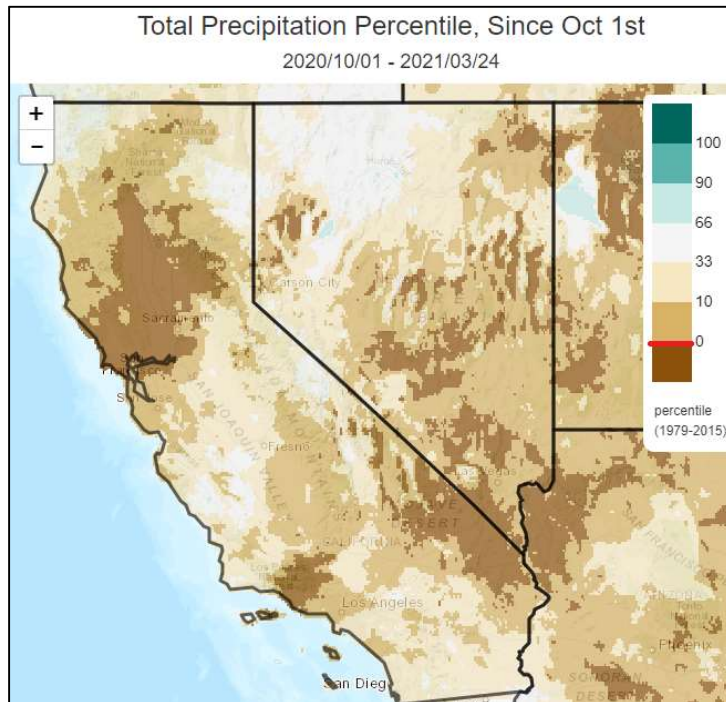


## WY2021 Water Resources Update – 26 March 2021

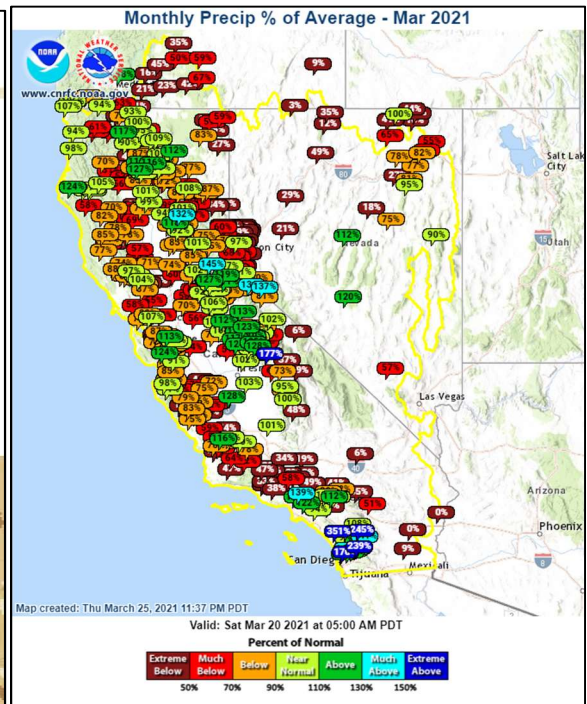
### Summary:

- Below average snowpack for the N. Sierra & low snowpack for S. Sierra persists
- Far below average precipitation accumulation water year totals observed for large portions of the Region
- Poor antecedent conditions expected to limit snowmelt-driven runoff and channel conveyance efficiencies
- Little to no good news on the hope for an Awesome April

### Observations:



<https://climatetoolbox.org/tool/Climate-Mapper>



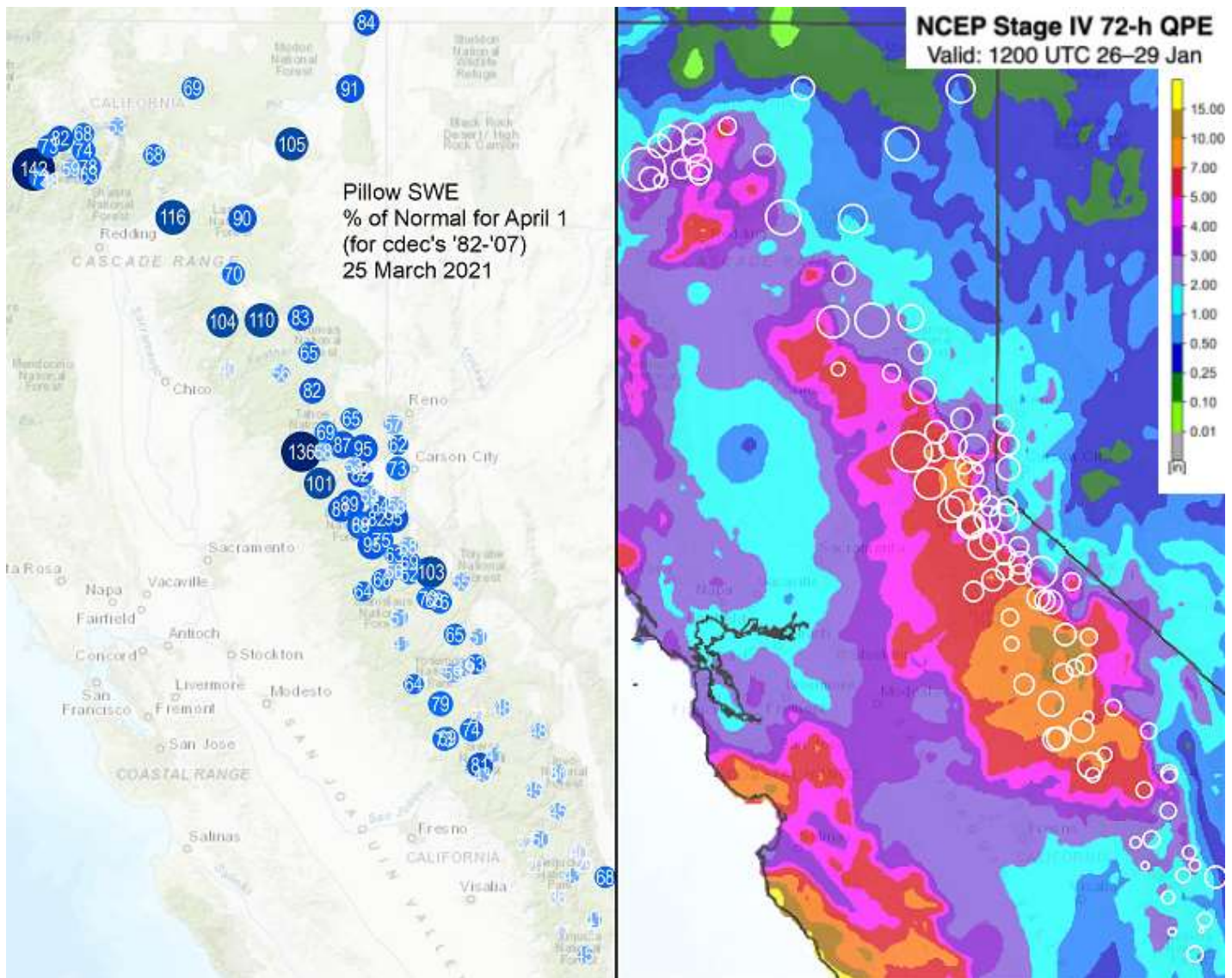
<https://cnrfc.noaa.gov>

### March Miraclelessness

Precipitation amounts over the region in March on average arguably did not vary too far from normal in this rainy season shoulder month (above right), whose normal values for this Region are considerably less than that of December's, January's, or February's typical "winter size" amounts. Minor systems did bring some precipitation to the Region, but nothing impressive arrived. To significantly offset the effects from the combination of a very dry fall, an arguably "one major storm winter", and a previous water year characterized by Dry water year type basin designations, large doors for moisture needed to open to produce anything near a Miracle March, but just didn't. Strong ridging over the Region in this La Niña year consistently deflected almost all moderate to major inbound plumes of moisture to the Pacific NW. As we begin to leave the accumulation season, which saw better Sierra snowpack conditions than precipitation scores over California in general, tens of thousands of square miles of area persist with potentially record low water year precipitation totals (above left).

## Sierra Snow Levels

Snow pillow data suggest the current distribution of snow over the Sierra Nevada still resembles the mark left after the main storm of the season nearly a couple of months ago, the January 26-29 Atmospheric River (AR) event that stalled over the Central Coast and portions of the Central Sierra. In general, the Southern Sierra missed this event and also many of the season's minor systems that passed through the Central Sierra or northward.



Pillow data: <https://cdec.water.ca.gov/reportapp/javareports?name=PAGE6>

QPE: [http://cw3e.ucsd.edu/wp-content/uploads/2021/02/2Feb2021\\_Summary/Slide6.png](http://cw3e.ucsd.edu/wp-content/uploads/2021/02/2Feb2021_Summary/Slide6.png)

Because the Jan 26-29<sup>th</sup> event was climatically cold and responsible for the bulk of the Sierra Nevada's precipitation accumulation this season, lower elevation portions of basins unusually received a similar amount of snow as higher elevations did, or in some places perhaps more, as precipitation from the Sierra crest to near valley floor elevations was deposited widely as snow in an unusually narrow range of thickness. The two figures in Attachment A illustrate this occurrence and show the snow pillow signal by elevation for March 25 for this water year and last, by general region (i.e. <https://cdec.water.ca.gov/snowapp/sweq.action>) and individual basin (only pillows active in both 2020 and 2021 are compared). The pillow data and reservoir inflow data to date does show continued melting in the lowest elevation areas of some basins, but in general major melting is not yet underway for the Sierra.

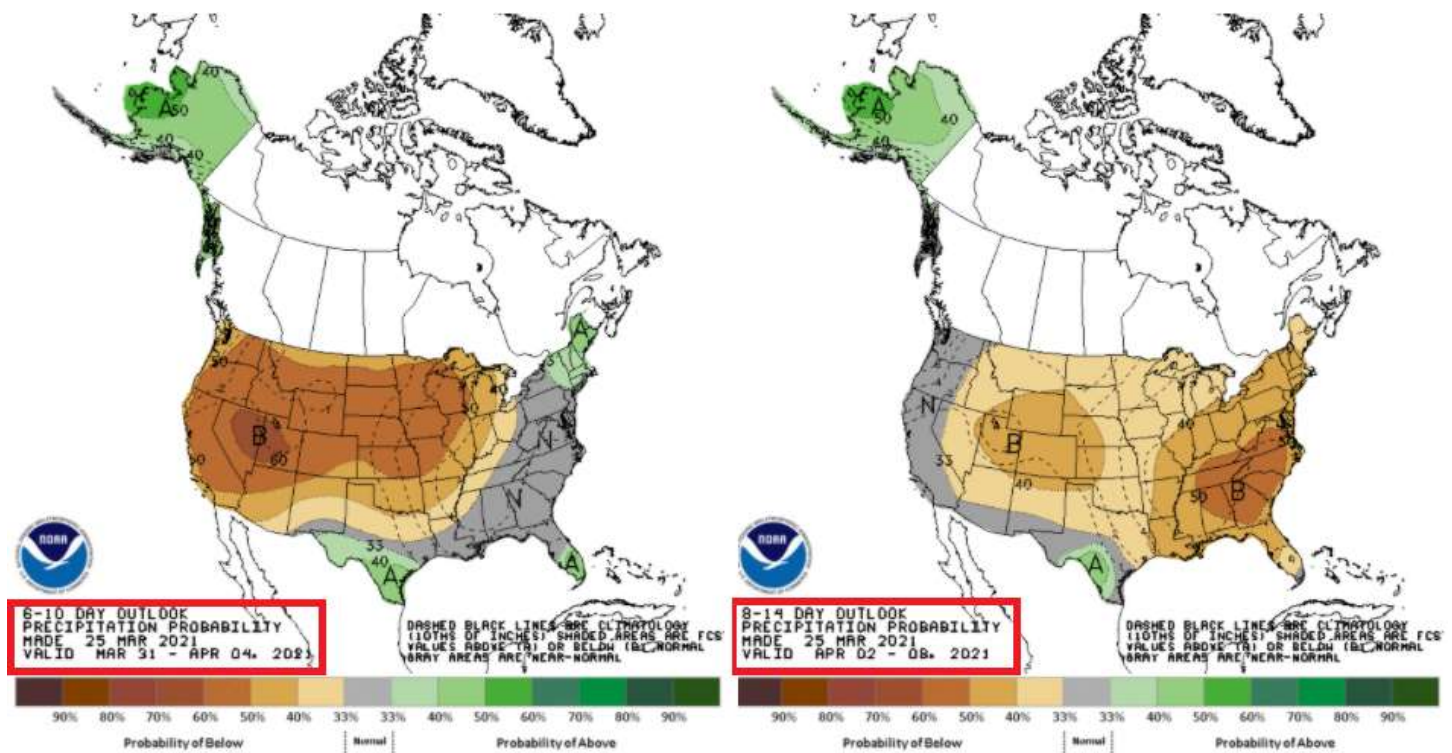
### **Antecedent Conditions**

Because last year on the whole received below normal precipitation and the current year has seen large precipitation deficits, many signs are pointing to Critical water year types for the Sacramento and San Joaquin systems (especially considering that last year both the Sacramento and San Joaquin systems were classified Dry under their respective year type indices, the 40-30-30 and 60-20-20, respectively). In addition, a Shasta Critical Year (<3.2 MAF water year inflow) designation appears possible for Lake Shasta. From about 1905, the last years a Shasta Critical Year forecast volume followed a Dry or Critical Sacramento year type were water years '31,'33,'34,'77,'91,'92, '14, and '15. As written about more in previous reports, runoff initiation and efficiency across the Region as a whole is expected to be low with very dry soil profiles common. In addition, groundwater discharge contributions to surface waters are expected to be low in general, as the far below normal rain for low elevation areas for the water year left little opportunity for aquifer recharge and significant opportunity for channel losses.

## Outlook

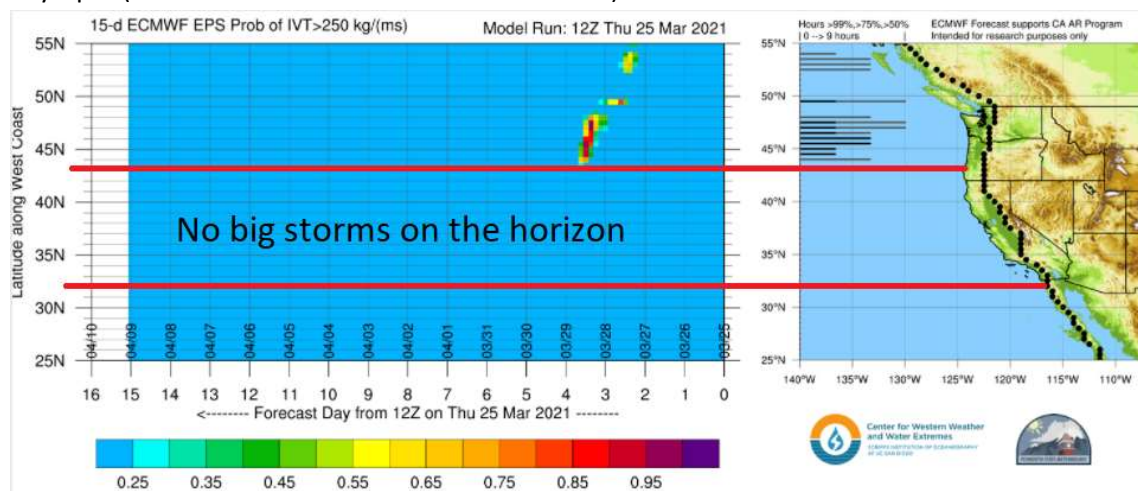
Unfortunately, there's really just not much precipitation chance on the horizon to report, in short or long range forecasts. Over the next six days CNRFC is predicting no substantial precipitation and European and American ensembles are likewise showing almost no chance for moderate precipitation over the next ten days.

The below image shows 6-10 day, and 8-14 day guidance from the Climate Prediction Center, depicting elevated probability of below normal precipitation for the March 31-April 4th period, and no strong signal for above or below normal precipitation during April 2 – April 8<sup>th</sup> for most of the Region.



<https://www.cpc.ncep.noaa.gov/>

The AR Landfall Tool from CW3E shows the European ensemble probability of AR conditions possible for the Region – sadly, none through early April (the American Ensembles show the same).



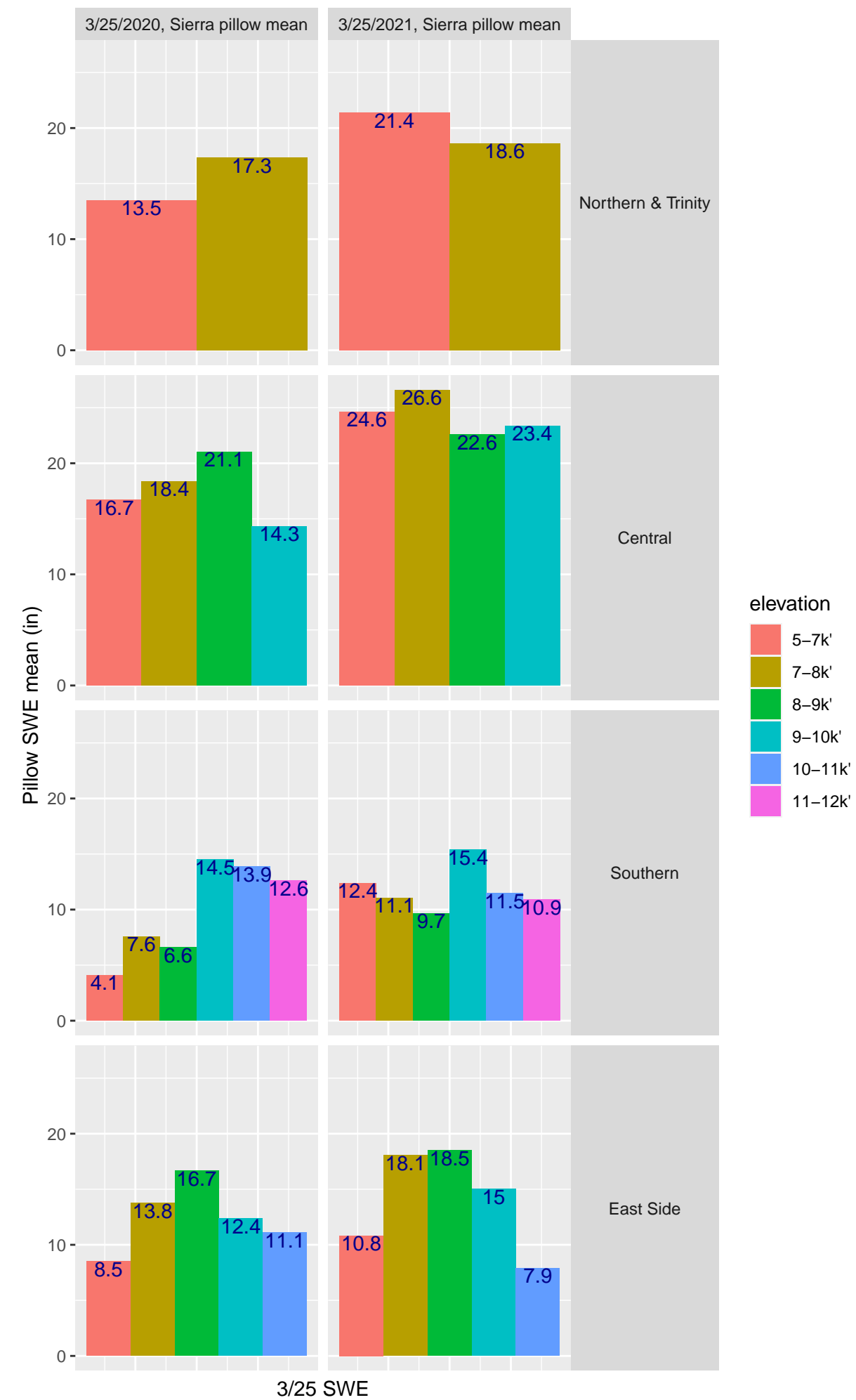
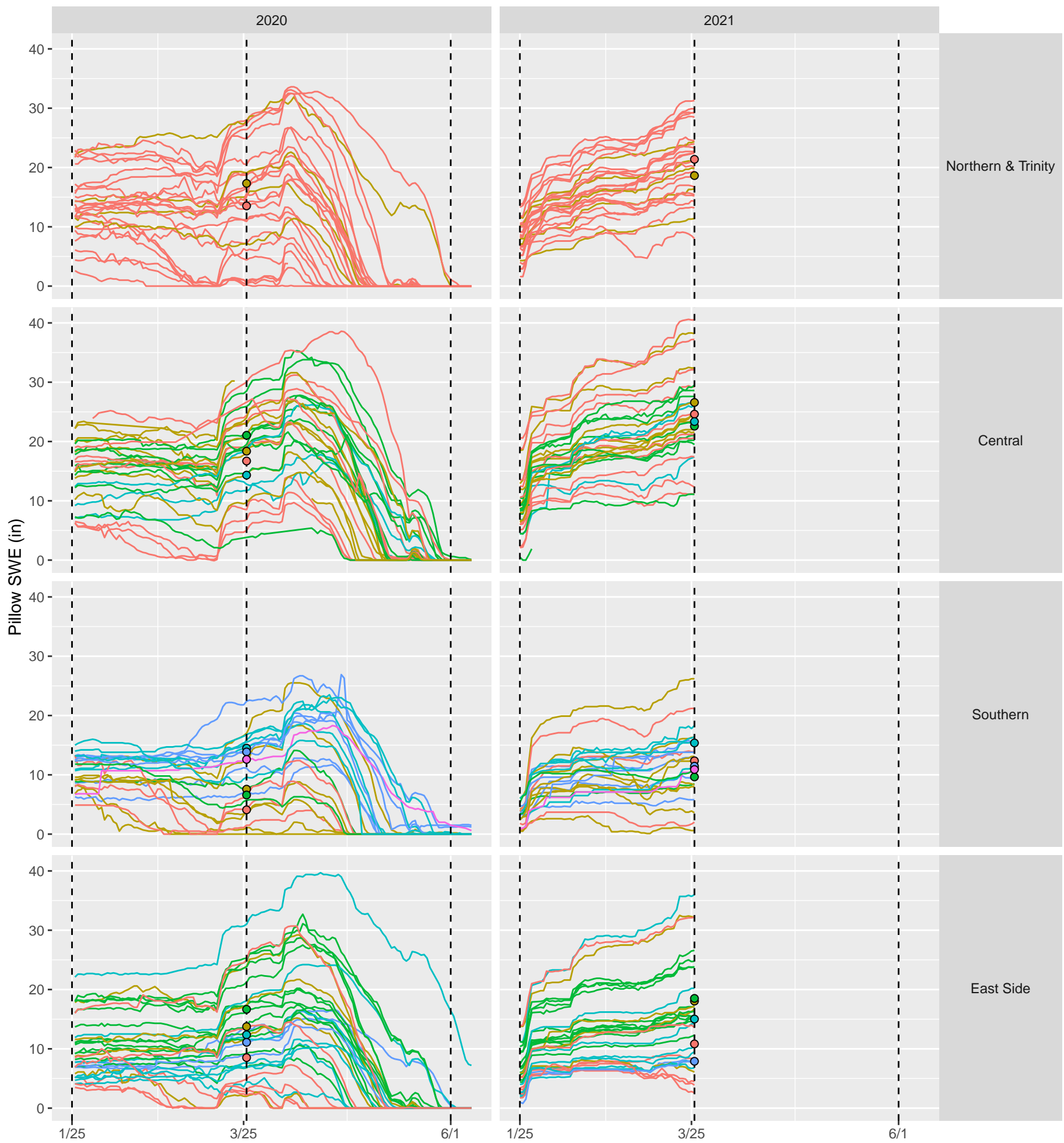
<https://cw3e.ucsd.edu/iwv-and-ivt-forecasts/>

## **Conclusion**

The Region remains firmly planted in drought conditions and severe drought conditions are present for very large areas. There is hope for substantial accumulation later in spring, as occurred last year, but things are certainly looking grim from a water supply perspective, especially considering a second consecutive year of dryness, reduced reservoir storage and low water project allocations, large and even record water year precipitation deficits, and a below normal snowpack. To date, the snowpack volume is similar to last year's, but last year followed a much wetter previous year.

Attachment A – Water year so far and last from a snow pillow perspective  
(starting from the main storm of the year, end of January event)

WY2020 & WY2021 Pillow Data (swe inches) from 1/25 on, w/ March 25th means



WY2020 & WY2021 Pillow Data (swe inches) from 1/25 on, w/ March 25th means

