

WY2019 Water Resources Update – December 4, 2018

Summary:

- Very dry start to the water year (Oct. 1 – Nov. 20)
- Good 12 days of colder storm systems producing rain & snow (Nov. 21 – Dec. 1)
- Result : Above average snowpack on top of dry soils.

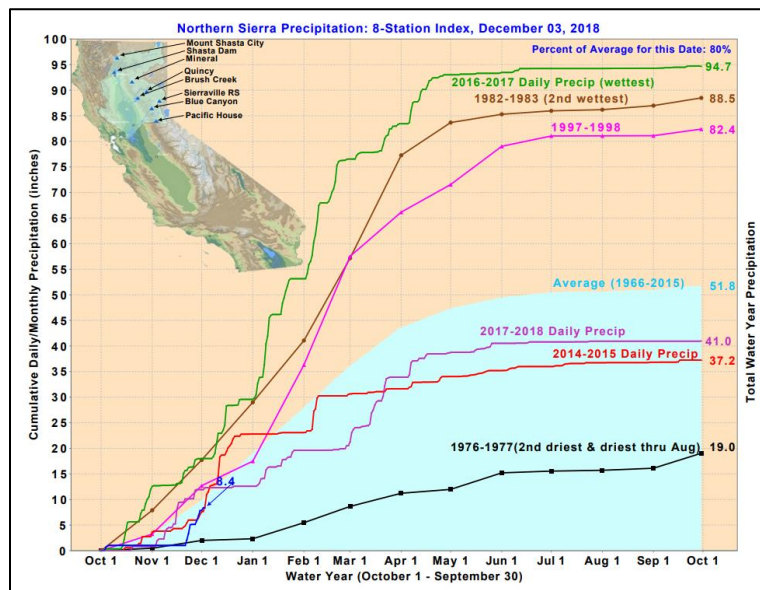
Below average runoff is still most probable forecast for the Water Year

Details:



After the cold storm systems last week, we've been seeing lots of great pictures of snow, even down to low elevations. Getting snow in places like Yosemite Valley does not often happen this early in winter. This made me wonder how our long-range water supply outlook was doing.

Dry Start to the Water Year

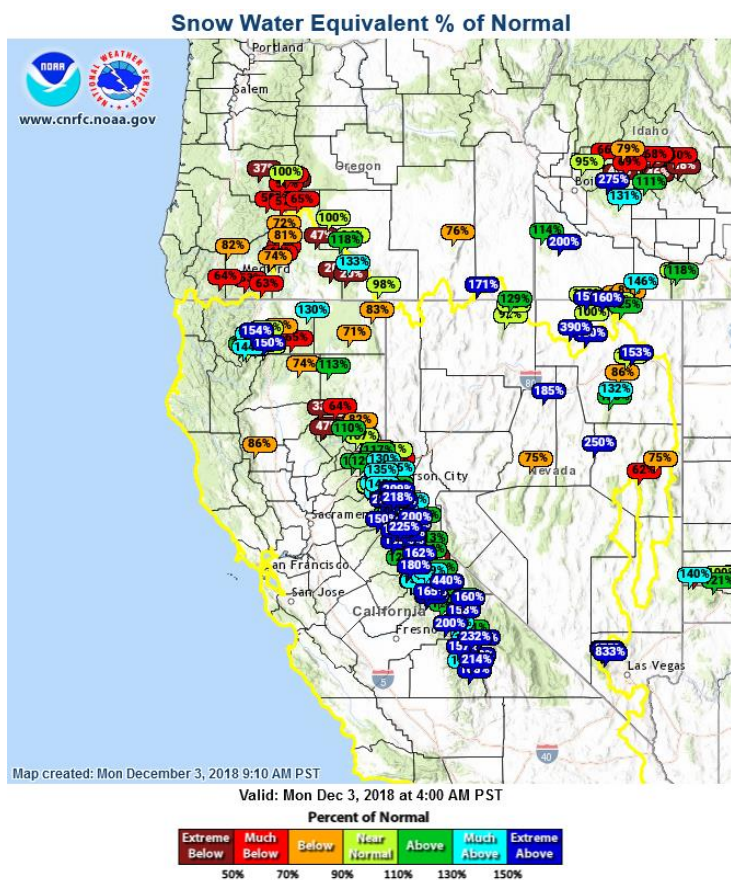


The first week of October started out promising with some good early rains. Convection on October 3rd gave some high totals in isolated spots. But then we had nearly 7 weeks of dry weather. Several north wind events during this time dried out much of the region leaving soils even more parched. By mid-November, many rainfall indices were tracking near the record-low of '76-'77.

Source:

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

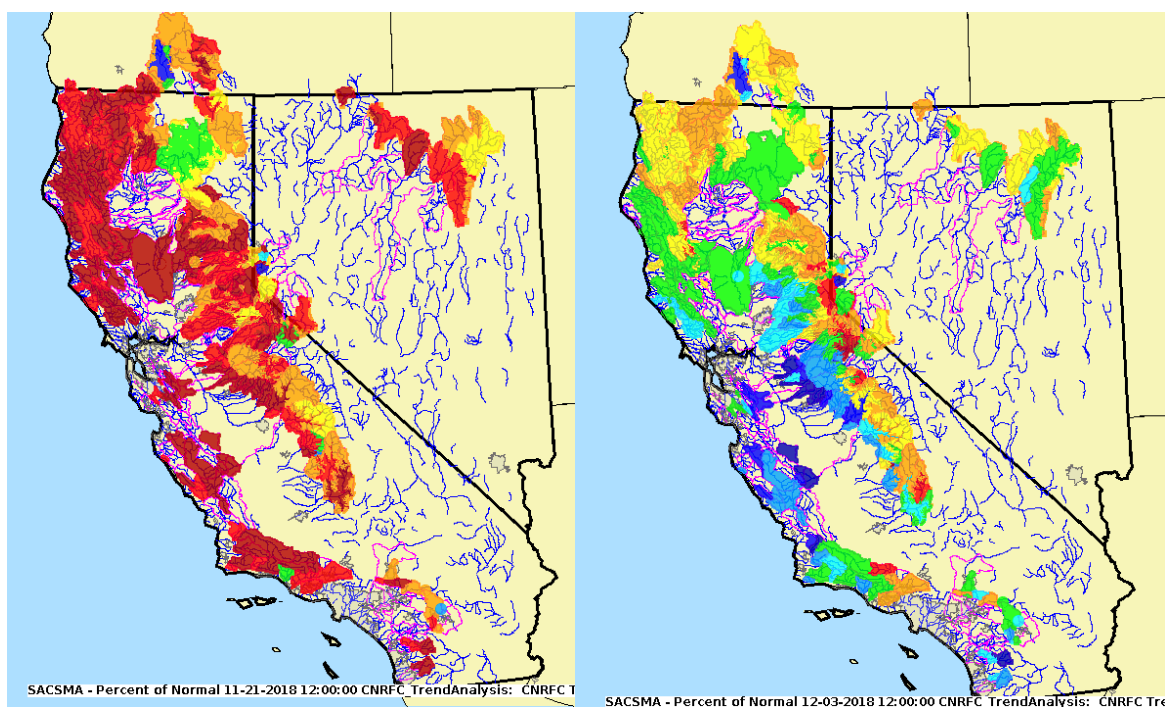
Wet and Cold 12 Days (Nov. 21 – Dec. 2)



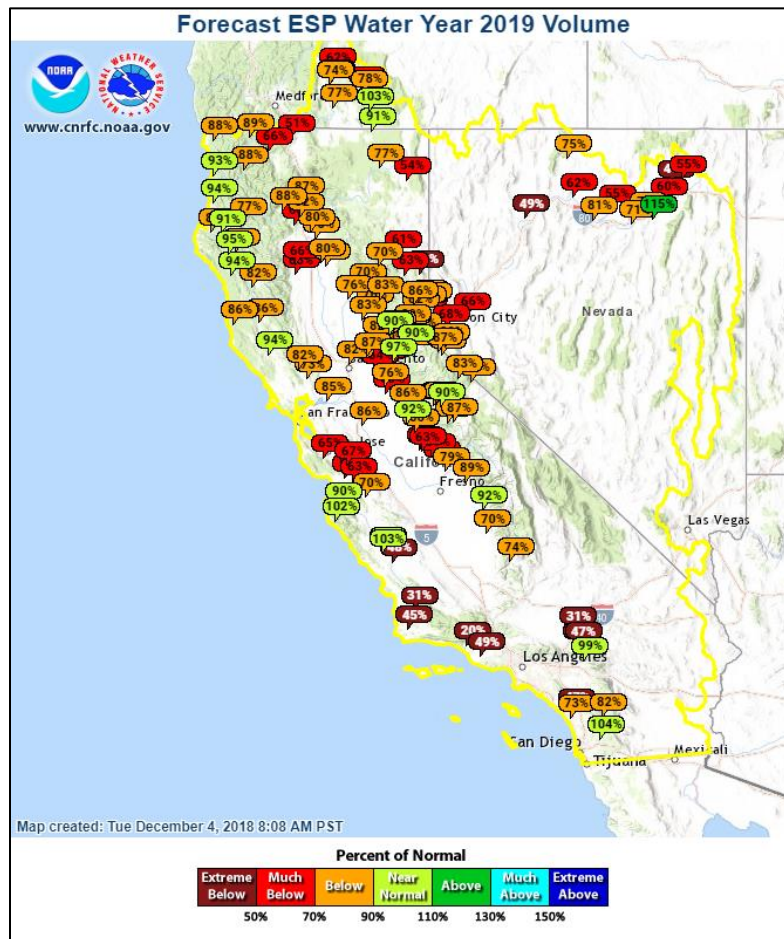
Rainfall over the 12 days beginning November 21 brought a much needed change. While initial storms were warmer, with now lines around 7000 feet, last week's storms brought snow lines down to as low as 3500 feet (though snow totals were not great).

Left: Percent of Average snowpack for December 3rd. Notice the lower elevation snow pillows in the Feather Basin are still below normal. Also the Upper Klamath basin missed out on much of the precipitation.

Below: CNRFC modeled Soil Moisture (Percent of Normal) for Nov. 21 and Dec. 3, 2018. Note that the upper elevations in the Sierras continue to show below normal soil moisture on Dec 3rd.



Water Supply Impacts



So what happens when you get good early season snowpack sitting on top of drier soils? Our modeling shows that most basins are still looking at below average runoff for WY2019. Our ensembles (which include a 15-day weather forecast as well) indicate that the above average snowpack would not be enough to satisfy the large soil deficits still sitting below the snowpack. These ensembles (from Dec 3rd) use climatology beginning on Dec. 18. So even normal precipitation and snow from Dec 18th forward, still leaves most basins below average for the water year.

Left: Median 2019 Water Year volume forecast based on Dec. 3rd snow and soil conditions.

Conclusion:

The situation we find ourselves in is not uncommon. There have been many other years where good snowpack has not resulted in equivalent runoff. WY2016 is a prime example. After 3 years of drought, soils throughout the state were very dry. While snowpack on April 1st was measured around 80-90% of normal, the April-July runoff was only 65-80% of normal.

We are still early in the water year and much can change. But for those looking at April-July runoff, the soil deficits we currently have could still impact the spring melt season.