



Water Resources Update - December 29, 2021

It has been a cold, wet start to the holiday season across the region. Heavy snow and downed trees in the foothills and mountains have created travel headaches this week with lengthy road closures along mountain routes. A break from the active weather is ahead for the New Year's weekend, but another storm looms early next week. Enjoy the break in the weather this weekend and hope you have a wonderful New Year!

KEY POINTS

- **Record snow for December in some Sierra locations has greatly improved the water supply outlook after a mostly dry November.**
- **Storms this month have been on the cold side with significant snow piling up at lower elevations.**
- **Another system will impact the area early next week.**

DETAILS

- **Precipitation and snowpack**
 - A parade of storms this month has led to a significant increase in the Sierra snowpack (Figure 1). The snowpack in the southern Sierra has already surpassed last year's water year total, while the central and northern Sierra snowpack is nearing the totals from last year. Just how big were the December storms? Many SNOTEL sites in the eastern Sierra are showing the largest increase in snow water equivalent on record for the month of December (Figure 2). Low elevation snowpack (Figure 3) is also in excellent shape due to a number of relatively cold storms with low snow levels. Overall, water year precipitation to-date is looking great across much of the region. Figure 4 shows the precipitation to-date departure from average on the positive side for all of the region except along the north coast.
- **Seasonal water supply forecasts**
 - With ample soil moisture from fall rain and a heavy snowpack building, water supply forecasts are trending well above normal in many areas. Figure 5 shows seasonal water supply forecasts in the Sierra are 120-150% of average. The Central Valley Index seasonal runoff forecast has nearly doubled since the beginning of the month (Figure 6). After making numerous headlines this summer for reaching a record low level, Lake Oroville has risen over 80ft since mid-October. Like many other reservoirs in the region, Oroville still has a long way to go to reach average levels for this time of year. One reservoir that has "filled" is Folsom, which has reached the top of the conservation pool and is expected to increase releases in the next few days. Figure 7 shows the current state of reservoirs across California.
- **Short-range forecasts**
 - Following a brief break from precipitation over the holiday weekend, another system is on tap for early next week that could add several more inches of precipitation to the snowpack across the Sierra. The atmospheric river landfall probability tool shown in Figure 8 depicts this storm impacting the region mainly in days 5-7. Figure 9 shows the latest precipitation forecast from the CNRFC for the next 6 days, which doesn't quite capture the entirety of this next storm system. Much of the forecast precipitation depicted across southern CA is expected in the next 36hrs. Precipitation and temperature outlooks from the Climate Prediction Center (CPC) show an elevated chance for the wet and cold pattern to continue for days 6-10 (Figure 10 and Figure 11). CPC forecasts for the 8-14 day range also show elevated probabilities of wet weather.
- **Long-range outlook**
 - The monthly climate anomaly forecast from the NCEP version 2 coupled forecast system model (CFSv2) shows increased probabilities for above normal precipitation for the month of January across the region. The model has trended a little drier in recent days, especially across southern California, but still shows anomalies in the 20-50% range across much of northern California (Figure 12). European and Canadian models have also started to reveal a shift to a warmer and wetter pattern as we head into the second week of January. While long-range

forecasts are trending towards a wet (and potentially very wet) January, keep in mind that these forecasts have much lower skill compared to short-term weather forecasts.

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