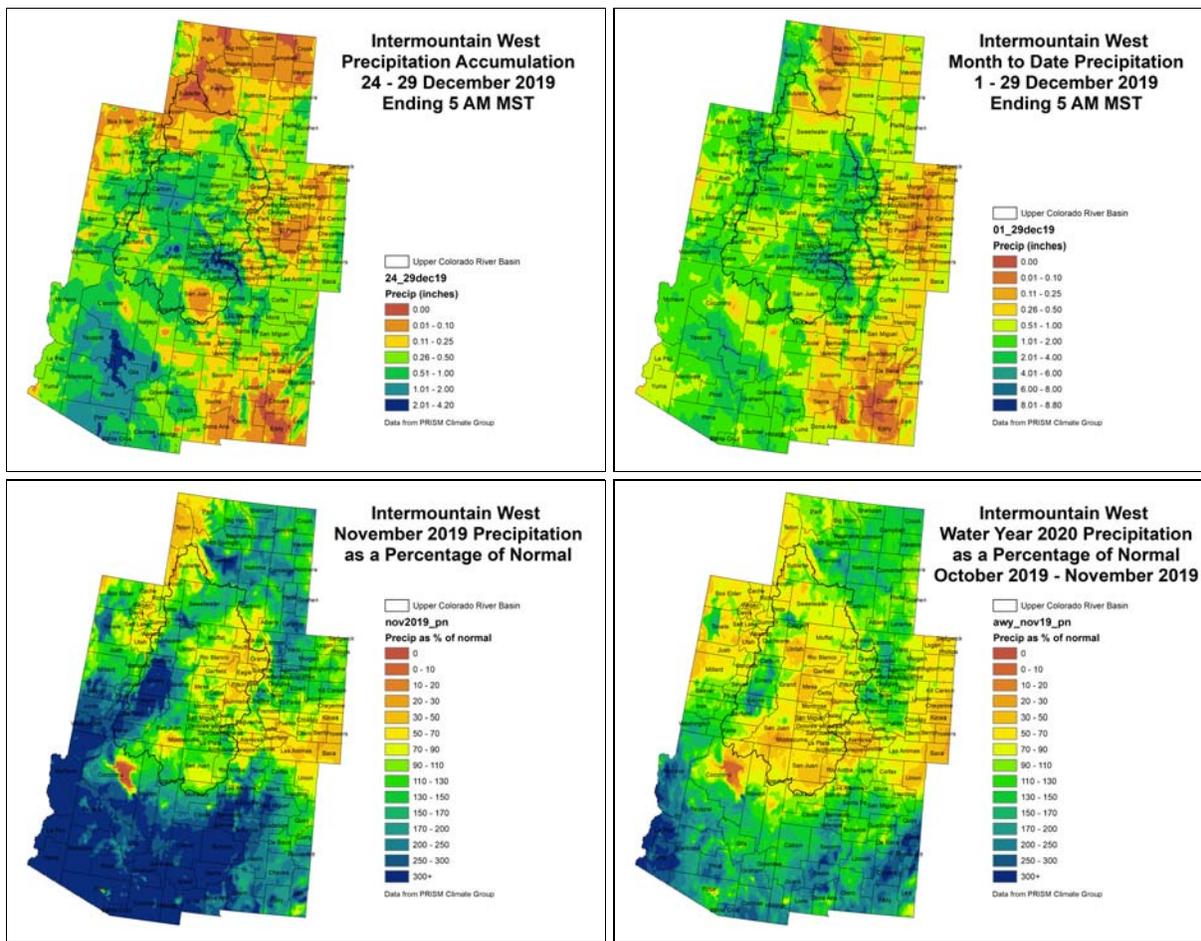


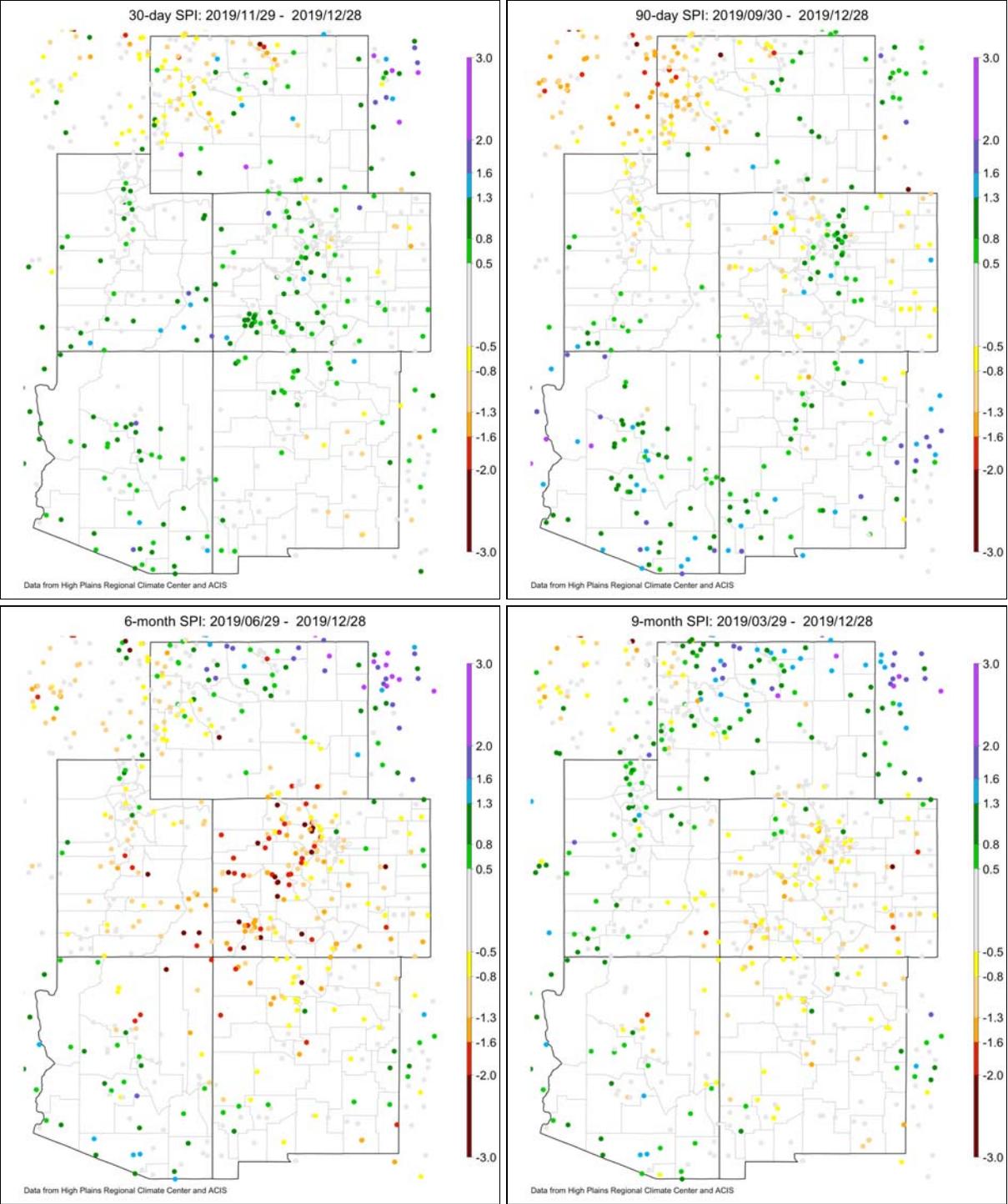
# NIDIS Intermountain West Drought Early Warning System December 31, 2019

## Precipitation



The images above use daily precipitation statistics from NWS COOP, CoCoRaHS, and CoAgMet stations. From top to bottom, and left to right: most recent 7-days of accumulated precipitation in inches; current month-to-date accumulated precipitation in inches; last month's precipitation as a percent of average; water-year-to-date precipitation as a percent of average.

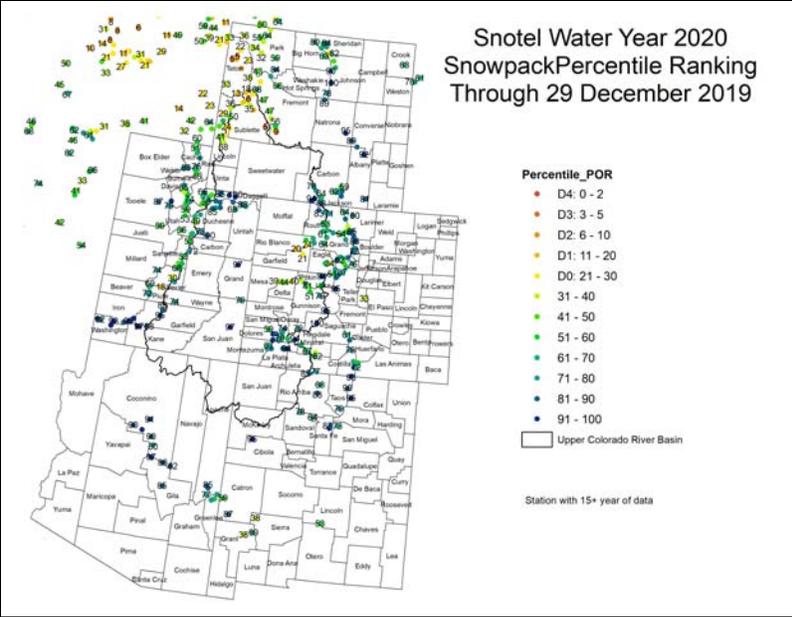
## Standardized Precipitation Index



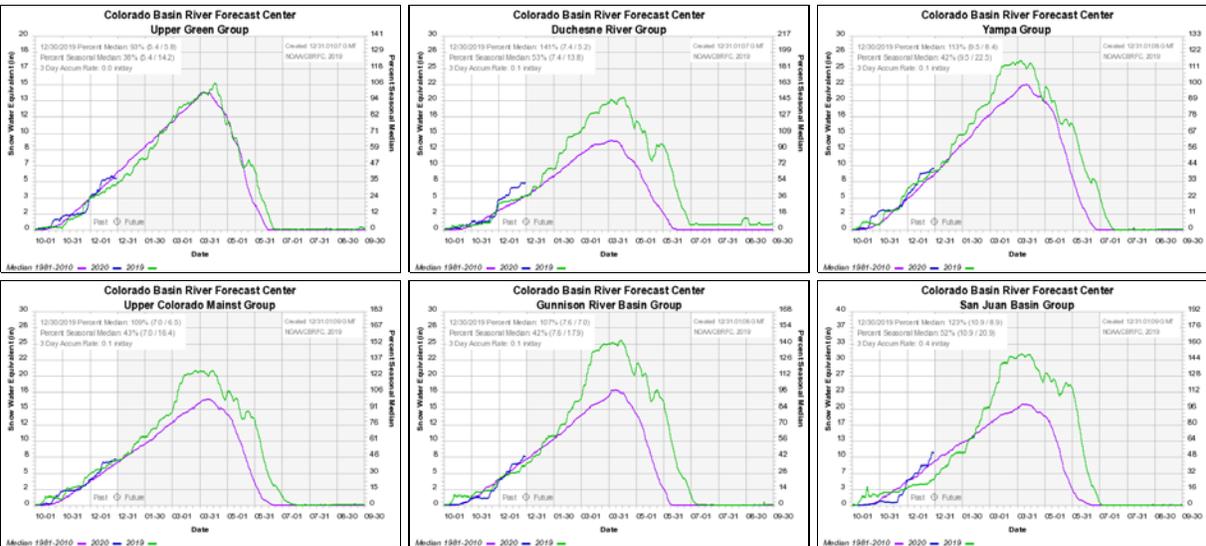
Standardized Precipitation Index standardizes precipitation accumulations for a specified time period into percentile rankings. Colors match the different drought categories with the U.S. Drought Monitor. 30- and 60-day SPIs focus on short-term conditions while 6- and 9-month SPIs focus on long-term conditions. SPI data provided by High Plains Regional Climate Center.

## Snotel and Snowpack

# Snotel Water Year 2020 Snowpack Percentile Ranking Through 29 December 2019

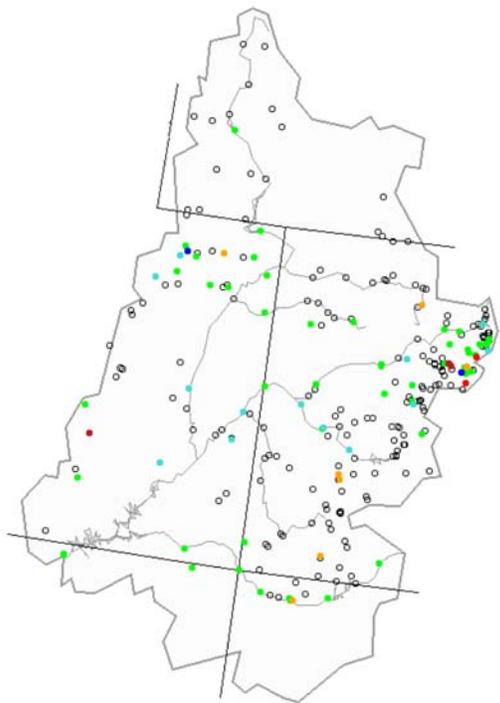


The above image shows SNOTEL snowpack percentiles for each SNOTEL site in the Intermountain West. The images below show accumulated snow water equivalent in inches (green) compared to average (blue) and last year (red) for several different sub-basins across the UCRB (and were created by the Colorado Basin River Forecast Center).



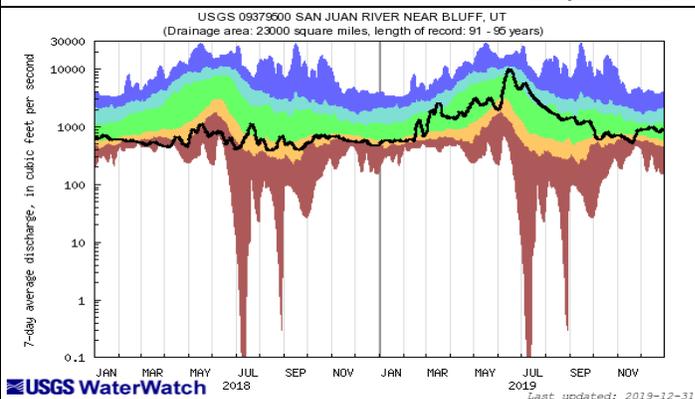
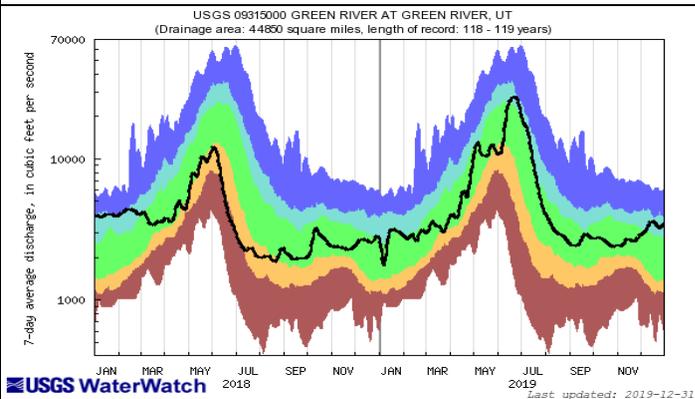
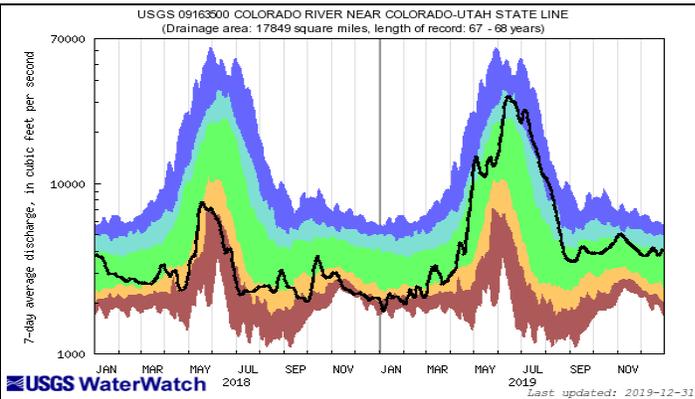
# Streamflow

Monday, December 30, 2019



Explanation - Percentile classes

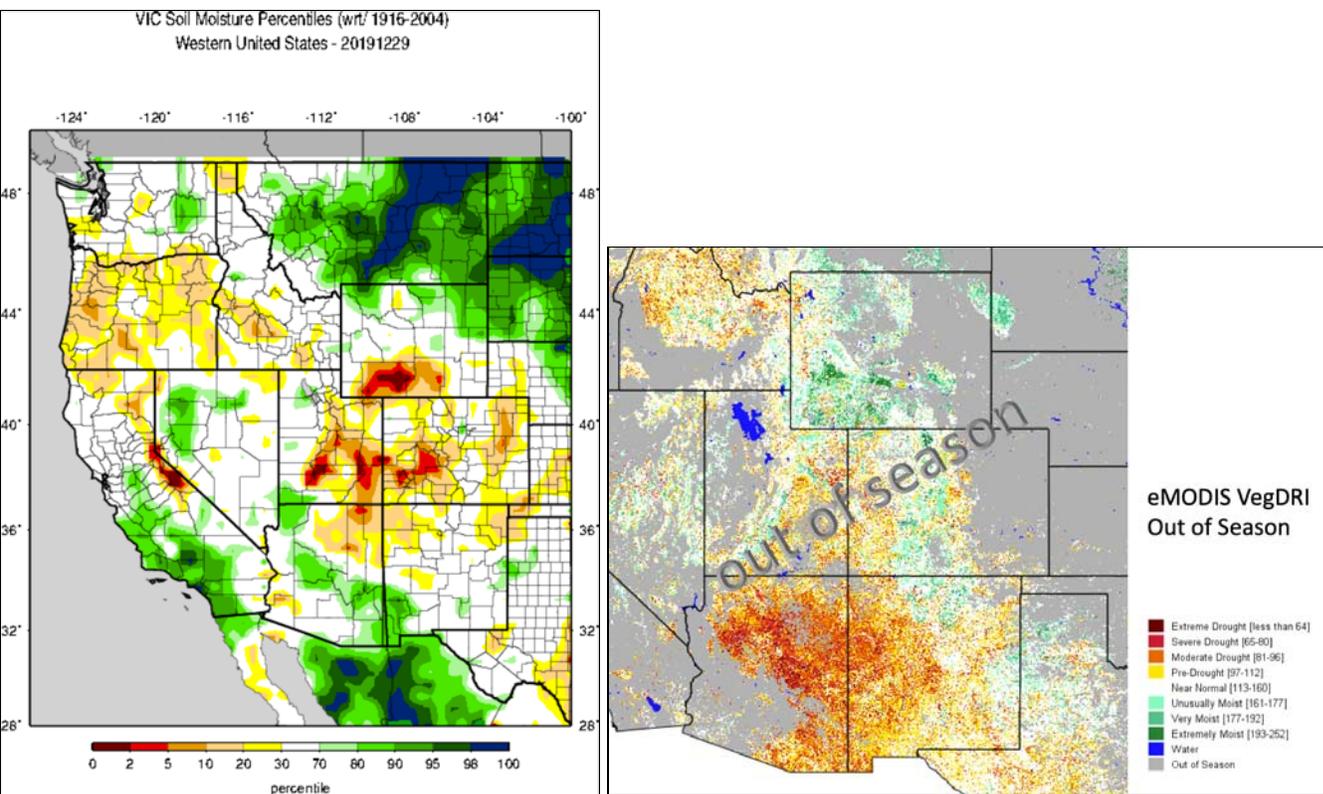
<span style="color: red;">●</span>	<span style="color: orange;">●</span>	<span style="color: green;">●</span>	<span style="color: cyan;">●</span>	<span style="color: blue;">●</span>	<span style="color: black;">●</span>	<span style="color: gray;">○</span>
Low	<10	10-24	25-75	76-90	>90	High
Much below normal	Below normal	Normal	Above normal	Much above normal	High	Not-ranked



The top left image shows 7-day averaged streamflows as a percentile ranking across the UCRB. The top right image shows 7-day averaged discharge over time at three key sites around the UCRB: The Colorado

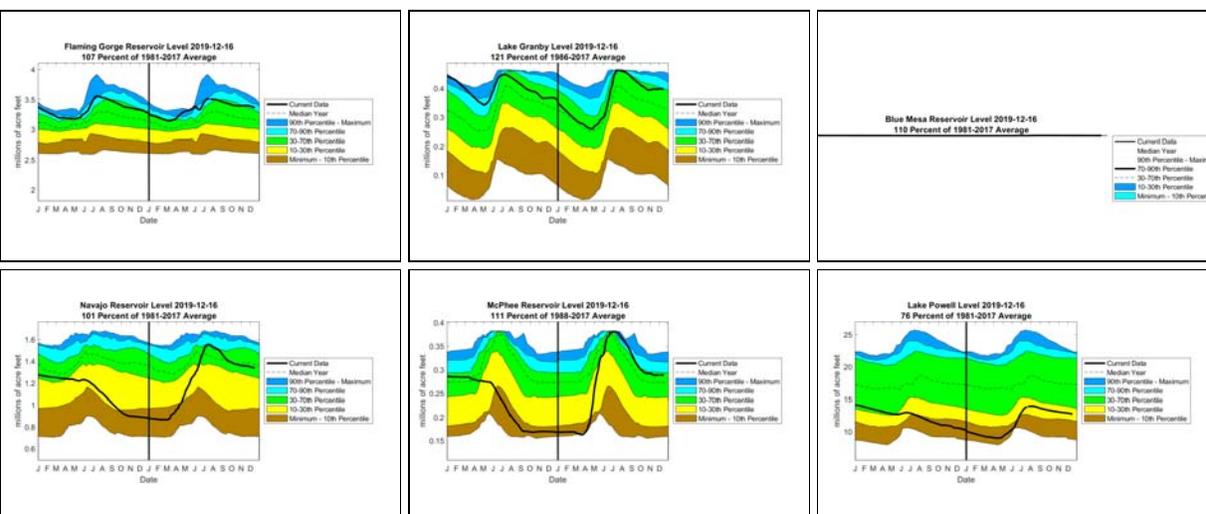
River at the CO-UT state line; the Green River, UT; and the San Juan River near Bluff, UT. All streamflow data provided by United States Geological Survey.

# Surface Water



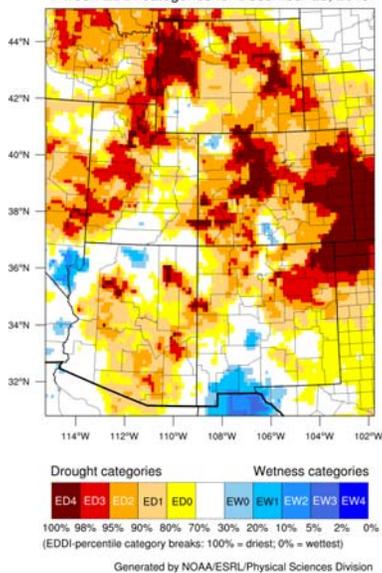
The top left image shows VIC modeled soil moisture as a percentile ranking. The top right image shows satellite-derived vegetation from the VegDRI product (which updates on Mondays).

The graphs shown below are plots of reservoir volumes over the past full year and current year to date (black). The dashed line at the top of each graphic indicates the reservoir's capacity, and the background color-coded shading provides context for the range of reservoir levels observed over the past 30 years. The data are obtained from the Bureau of Reclamation. Some of the reservoir percentiles don't line up at the new year due to differences in reservoir levels at the beginning of 1985 and the end of 2014. Dead storage has been subtracted. Note: Lake Granby data are obtained from the Colorado Division of Water Resources, and only goes back to the year 2000.

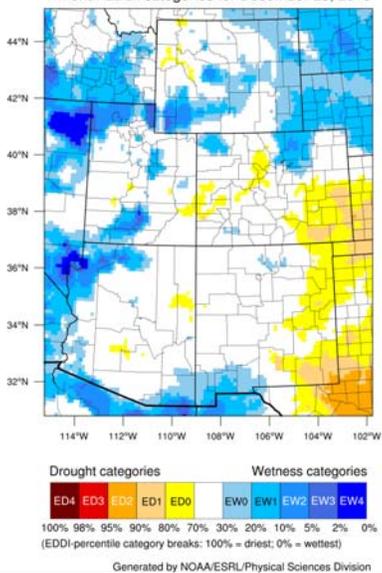


# Evaporative Demand

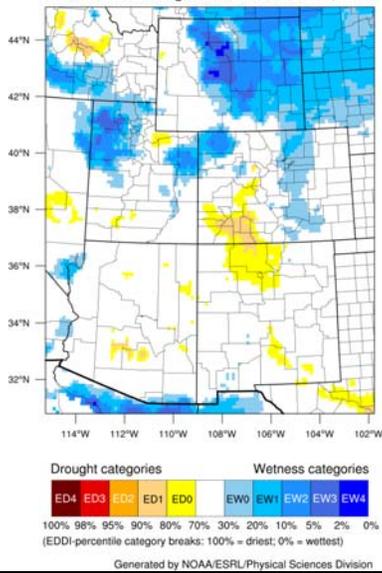
1-week EDDI categories for December 25, 2019



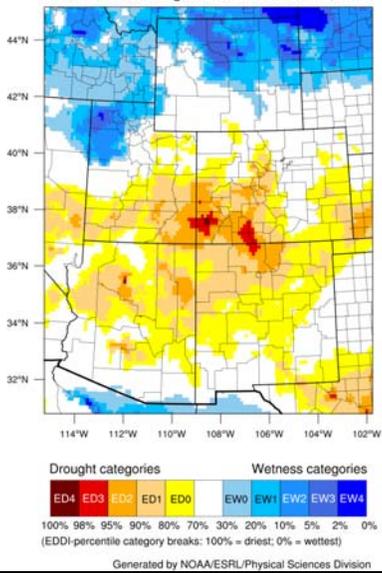
1-month EDDI categories for December 25, 2019



2-month EDDI categories for December 25, 2019



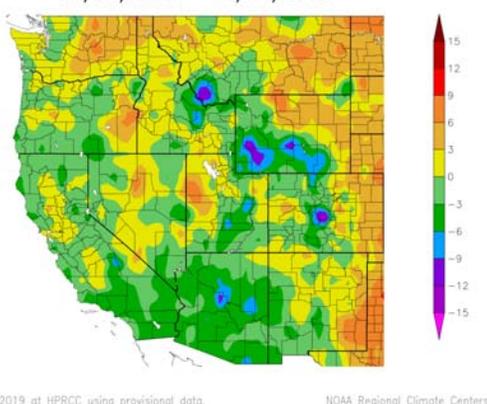
3-month EDDI categories for December 25, 2019



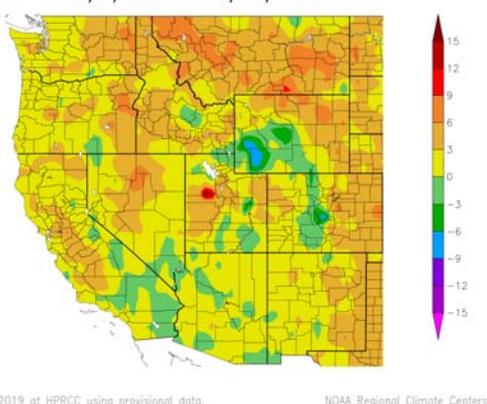
The above images are available courtesy of NOAA's Evaporative Demand Drought Index (EDDI). Drought classification listed is a function of the depth of reference evapotranspiration accumulated over a given period of record with respect to a climatology of 1981-2010. The drought categories displayed are in line with the [US Drought Monitor's Percentile Ranking Scheme](#). Data used to generate these maps come from the North American Land Data Assimilation System Phase-2 (NLDAS-2) project, which assimilates observations of temperature, wind speed, radiation, and vapor pressure deficit. The date indicates the last day of the period of record, and the week number indicates the window size for the period of record.

# Temperature

Departure from Normal Temperature (F)  
12/24/2019 - 12/30/2019

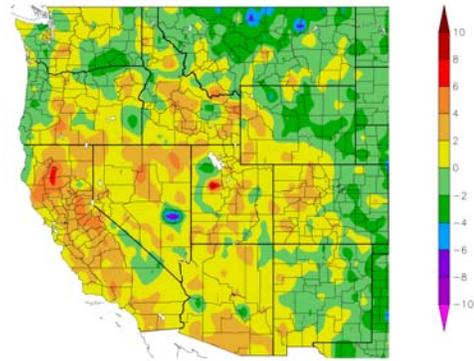


Departure from Normal Temperature (F)  
12/1/2019 - 12/30/2019



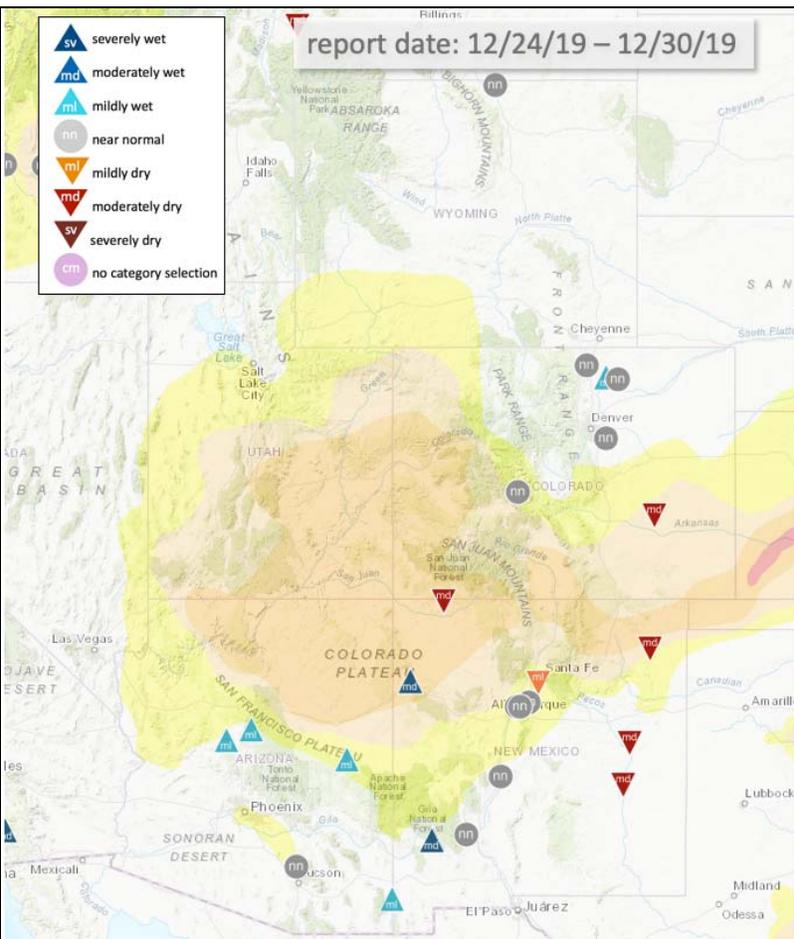
All images show temperature departures from average over different time periods (last 7 days on top left; month-to-date on top right; last full month on bottom). Temperature departure maps provided by HPRCC

Departure from Normal Temperature (F)  
11/1/2019 - 11/30/2019



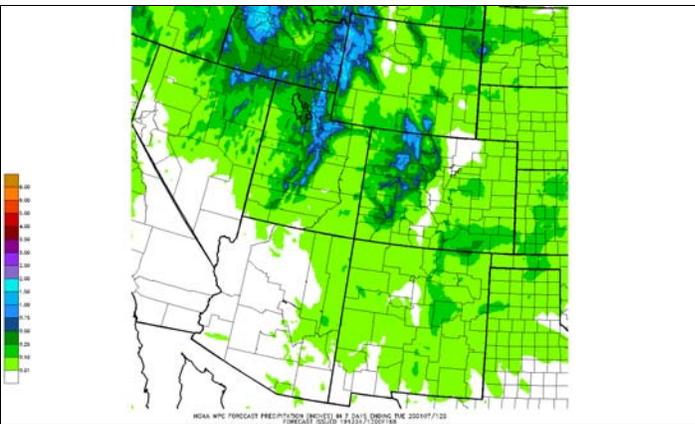
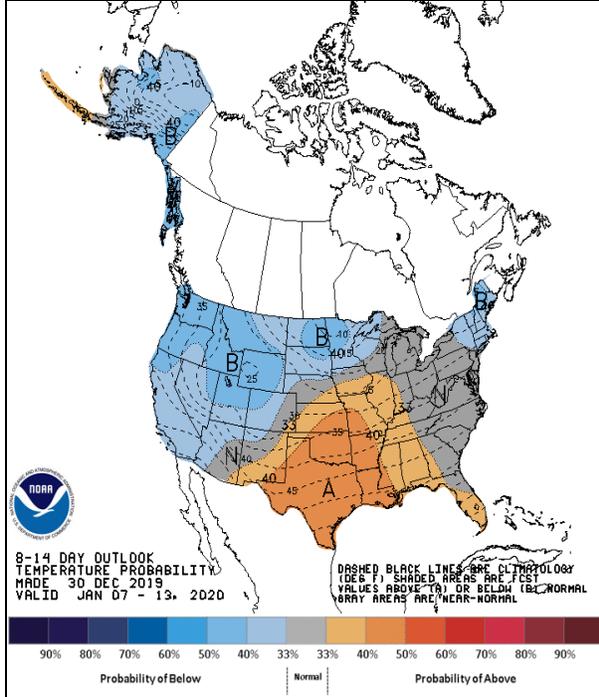
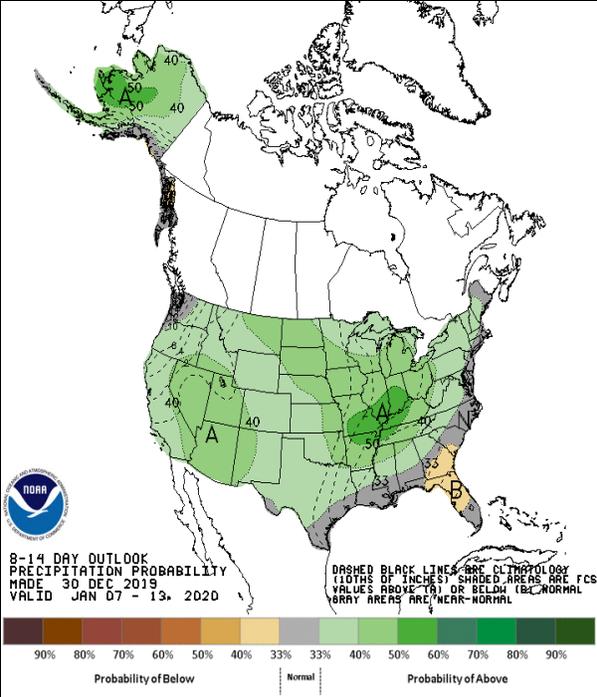
Generated 12/20/2019 at HPRCC using provisional data. NOAA Regional Climate Center.

## Condition Monitoring and Impacts

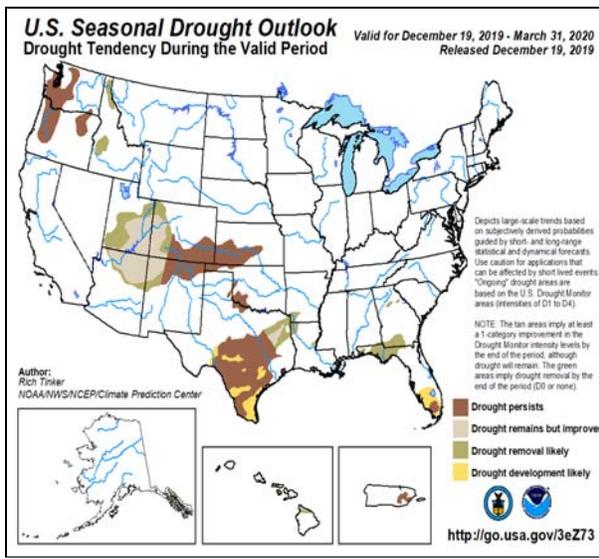
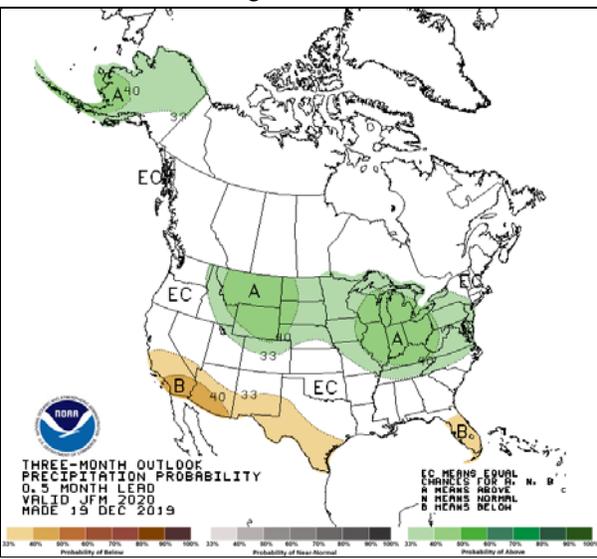


Map of current condition monitoring reports submitted to CoCoRaHS in the last week overlaid on the current U.S. Drought Monitor depiction. Specific impacts reports from local experts listed below.

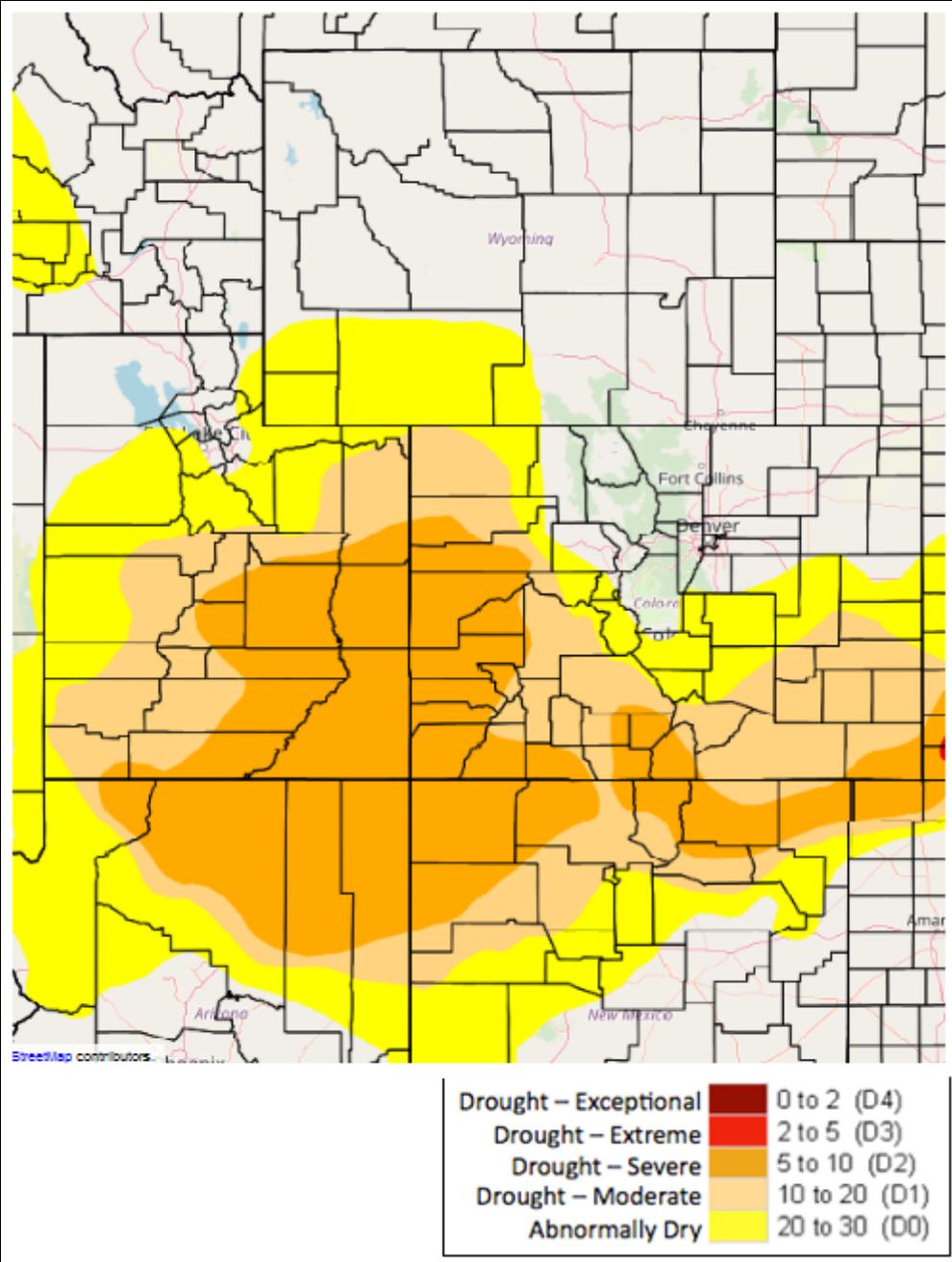
## Outlook



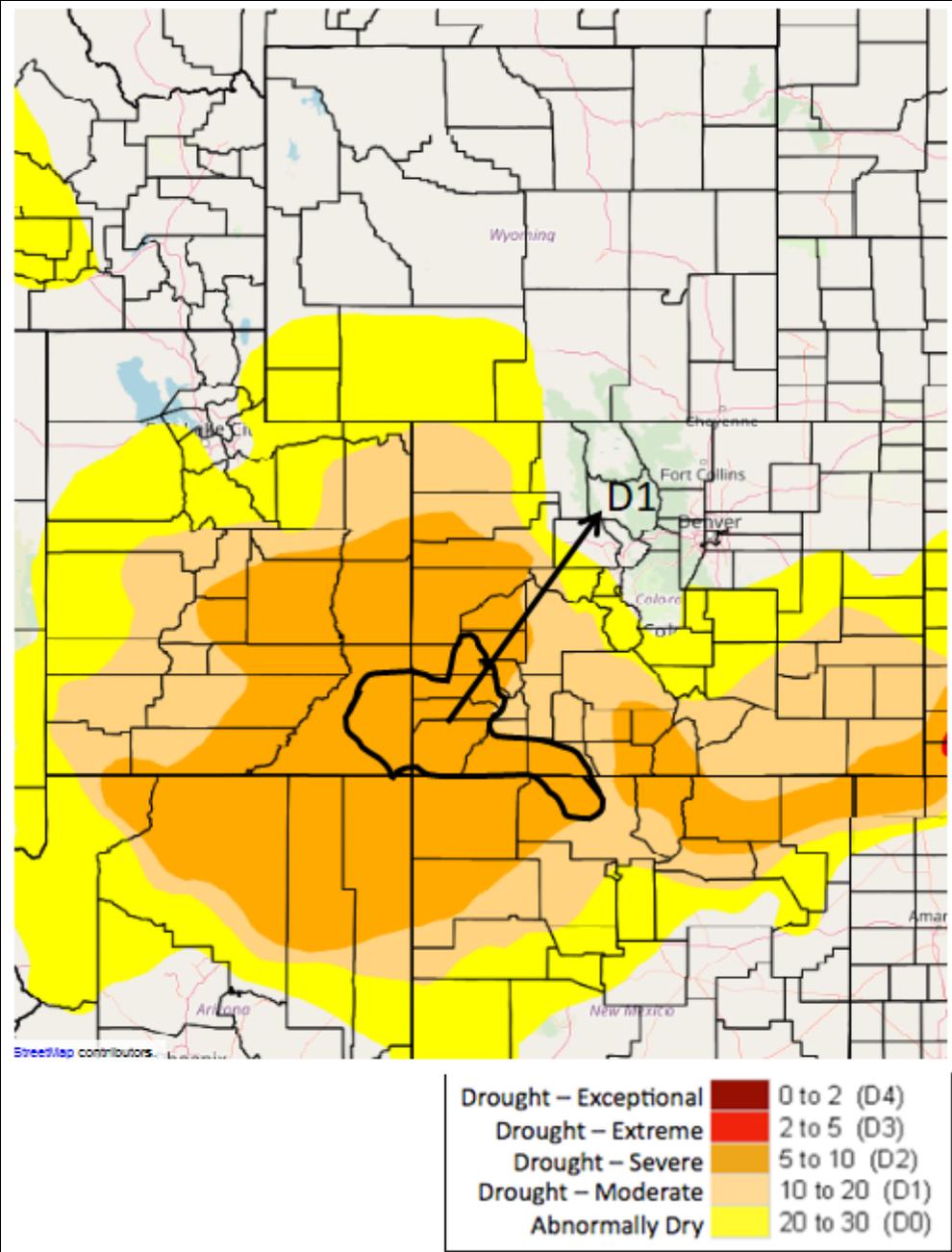
The top two images show Climate Prediction Center's Precipitation and Temperature outlooks for 8 - 14 days. The middle image shows the Weather Prediction Center's Quantitative Precipitation Forecast accumulation for seven days. The bottom left image shows the 3-month precipitation outlook from Climate Prediction Center, and the bottom right image shows the Climate Prediction Center's most recent release of the U.S. Seasonal Drought Outlook.



# Summary and Recommendations



Above is the most recent release of the U.S. Drought Monitor map for the UCRB region. Below shows the proposed changes for this week, with supporting text.



Drought – Exceptional	0 to 2 (D4)
Drought – Extreme	2 to 5 (D3)
Drought – Severe	5 to 10 (D2)
Drought – Moderate	10 to 20 (D1)
Abnormally Dry	20 to 30 (D0)

**Summary: December 31, 2019**

The last week over the Intermountain West has been a fairly quiet one, with little precipitation falling throughout the region with the exception of the four corners area. Northern Wyoming, northern Utah, and eastern Colorado were dry while SE Utah and SW Colorado received 2.01-4.20” of precipitation over the last week. Temperatures across the Upper Colorado River Basin were near to slightly warmer than average. The warmer areas included NE Wyoming and eastern Colorado. Colorado foothills did see below average temperatures, Park county experiencing temperatures of 9 to 12 degrees cooler than average. Month-to-date, the higher elevations of the IMW have received between 2 and 6 inches of precipitation, with the lower elevations mostly getting less than an inch. This is a pretty normal pattern for this time of year, although some areas are a bit drier than average for the month. Despite that, 30 and 60 day SPIs look pretty good for the entire region, with some drier 30 and 60-day SPIs creeping into northwest Wyoming.

SNOTEL snowpack for the Intermountain West is off to a good start, with basin-wide averages ranging from slightly below average in western WY to over 200% of average in southern Utah. Individual SNOTEL sites in western WY are struggling a bit with areas in Teton county showing 5-23<sup>rd</sup> Percentile, but Utah and Colorado snowpack are in good condition with much of the region snow covered right now. This is helpful for

croplands to protect them from extreme cold and wind. We are entering a dry and windy time of year, which can be harsh on the lands. Anytime there is snow cover, it is helpful. Unfortunately there really isn't any in southeast Colorado.

EDDI product of 1 week shows high evaporative demand. While we don't typically rely on this product in the winter, it is telling us a couple of things, it's drier, windy and warmer. While there isn't much to evaporate right now from the croplands, these types of conditions are tougher on the dormant vegetation.

There is some good news on the horizon, with decent precipitation amounts forecasted over the next 7 days, especially focused in some drier spots. Northwest Wyoming is forecast to receive 0.50-3.00" of precipitation, this could be beneficial to those low SNOTEL sites mentioned above. Central Utah and western Colorado are forecast to get between 0.5 and 1.5 inches over the next week. Most of the higher elevations should be able to get in on some of the activity as well. Unfortunately, Eastern Colorado, Arizona and New Mexico are looking to miss out on the bigger accumulations.

Cool temperatures will dominate the region through the next couple of weeks, with cooler than average temperatures coming after the holiday. Climate Prediction Center shows a higher possibility of cooler than average temperatures continuing through the New Year.

## **Recommendations:**

**Southwest Colorado** - We are recommending an improvement to D1 in the four corners region. This area has done well, 30 and 60-day SPIs look really good, 120-day SPIs aren't as bad as last week, however, 6month SPIs still haven't improved much. With that being said, it appears we have had enough precipitation to make some more improvements but not enough to improve any D1 to D0 yet. Based on the weekly precipitation map, it looks like improvements would stop at the CO-NM border since no areas in San Juan County, NM got more than one inch like Colorado did. Our improvement area has bled over from Archuleta County into Rio Arriba County, NM and some of the western side of the improvements has bled over into San Juan County, UT. We defer to New Mexico experts on how to depict improvements of D2.

**Southeast Colorado** - We are recommending status quo. While the 7-day QPF looked very promising, showing that the area could get 1-1.5 inches of moisture, most of that fell in Kansas. We had much more modest amounts in eastern CO. While a half inch this time of year is good we don't think it's enough to make improvements.

**Northwest Wyoming:** We are in agreement with adding some D0 in this region as seen in Draft 1 this week. This area has been drying out on the short-term as seen on the 30, 60, and 90-day SPI timescales. Snowpack isn't great, SNOTEL precipitation percentile is especially concerning with areas in Teton seeing snowpack in the 5th percentile. With little precipitation over the last week downgrading is recommended.

**Utah** - We are in agreement with the improvements that the drought author made in southwest Utah in Draft 1. We are recommending status quo for rest of eastern and central UT. This region did receive beneficial precipitation in the last week, 30-90-day SPI time scales have improved however, SPI start to downgrade again at 120-day.