NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

December 28, 2010

Precipitation and Snowpack

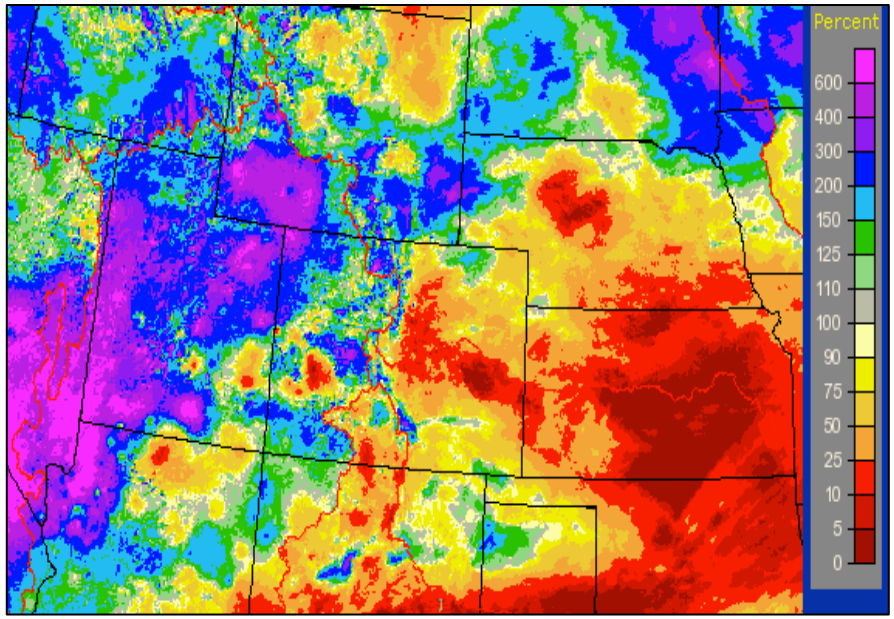


Fig. 1: December month-to-date precip as percent of average.

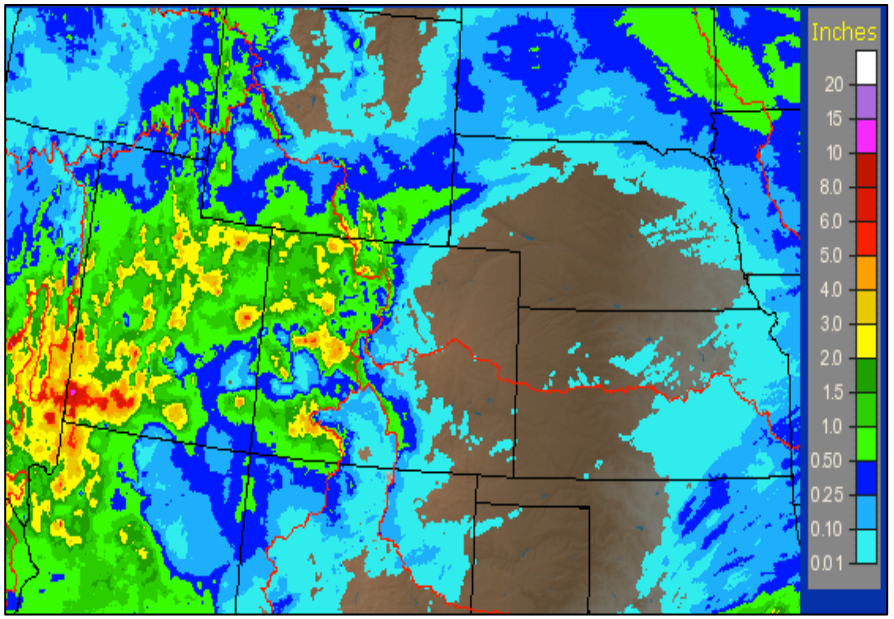


Fig. 2: December 21 – 27 precipitation in inches.

Most of the Upper Colorado River Basin (UCRB) received near or above average precipitation for November, while areas east of the UCRB remained dry—a pattern that has continued through December (Fig. 1). For most of December, southwestern Wyoming has seen over 300% of its average precipitation. Much of northeastern Utah and the north-central mountains of Colorado have also received generous amounts of moisture. Some areas near the Four Corners, the Dolores basin, the Rio Grande basin, and the Arkansas basin have seen very little precipitation, month-to-date.

Last week, most of the UCRB received half an inch to two inches of precipitation (Fig. 2). Parts of northeastern UT and the central mountains in CO received around 3 inches or more of precipitation. The Rio Grande basin in southern Colorado remained fairly dry, receiving less than a quarter of an inch of precipitation, with much of eastern CO receiving no precipitation.

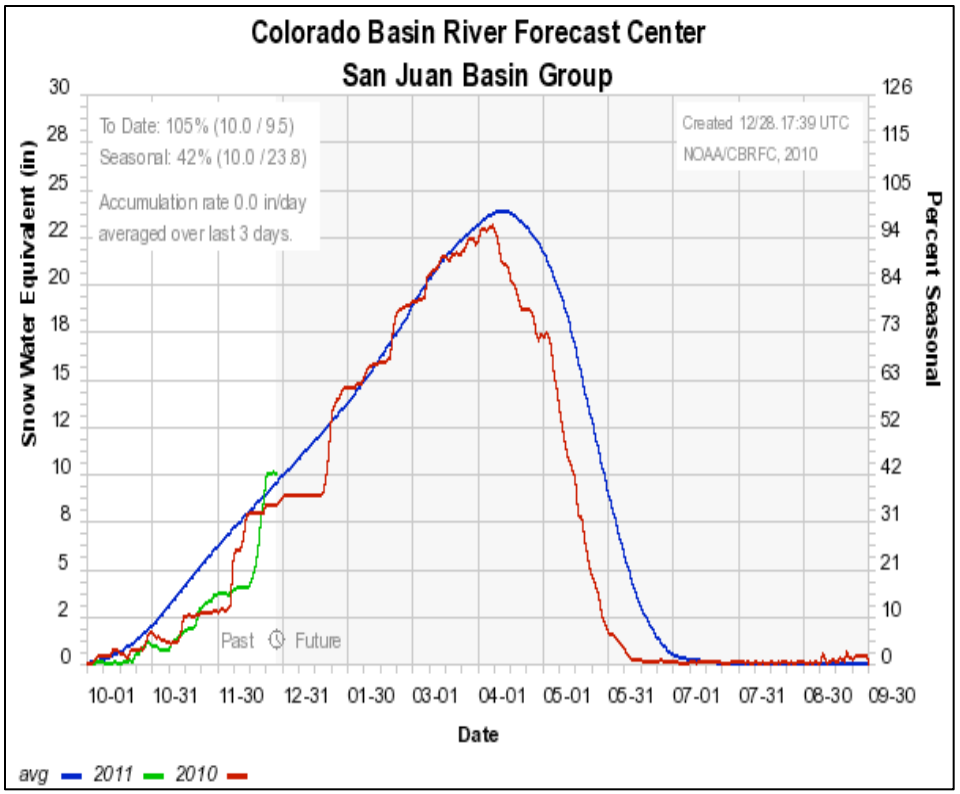


Fig. 3: SNOTEL WYTD accumulated snowpack averaged over the San Juan River basin.

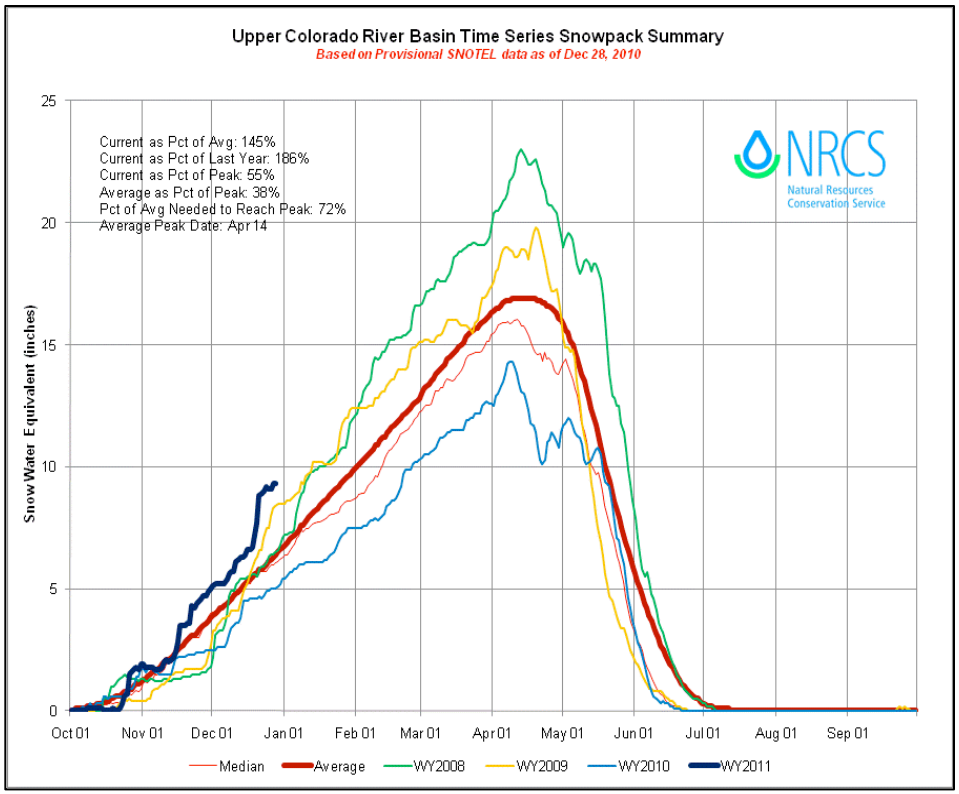


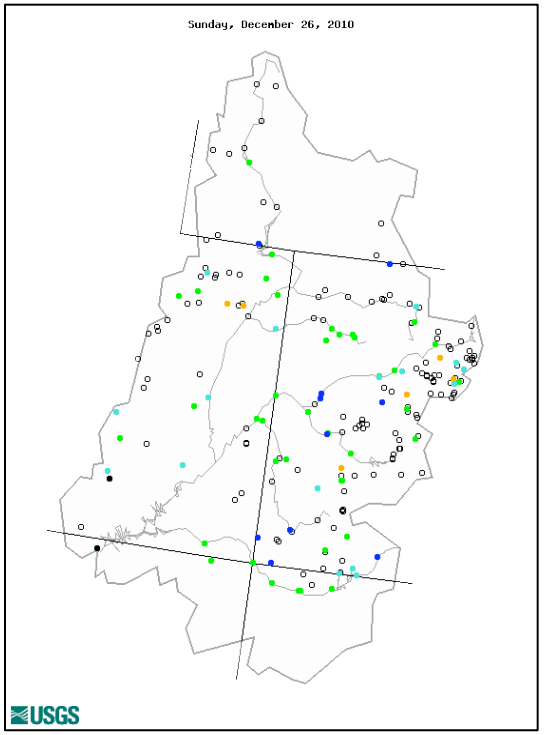
Fig. 4: SNOTEL WYTD accumulated snowpack averaged over the Colorado headwaters for past 4 water years.

All of the sub-basins in the UCRB are now above average snowpack and precipitation for the current water year, with only a few individual sites slightly below average. This includes the San Juan basin in southwestern CO and southeastern UT (Fig. 3). Initially, the San Juan basin started the water year well below average. But after two weeks of heavy precipitation and snowfall, the basin averaged snowpack is now 105% of average. The Rio Grande basin in southern CO has also improved and is now slightly below average for the water year—99% of average precipitation and 95% of average snowpack. Averaged over the Colorado headwaters, snowpack is currently at 145% of average (Fig. 4). This is the highest percent of average compared to the previous three water years. Water-year-to-date (WYTD) precipitation averaged over the UCRB is now at 147% of average and current snowpack over the UCRB is at 142% of average.

Streamflow

As of December 26th, about 92% of the USGS streamgages in the UCRB recorded normal (25th – 75th percentile) or above normal 7-day average streamflows (Fig. 5). Runoff producing precipitation occurred over the past week in southern UT and in central and northwestern CO, which increased flows throughout much of the basin.

Looking at hydrographs around the UCRB, key sites are showing near normal discharges and are in good condition in terms of seasonal flow (Fig. 6). 7-day average discharge on the Colorado River at the CO-UT state line, on the Green River near Green River, UT and on the San Juan River near Bluff, UT are at 110%, 160% and 113% of normal, respectively. While recent flow conditions have been good, these three gages show that total cumulative runoff from the upper basin to the lower basin for the 2010 calendar year will be substantially less than the historical average. Cumulative annual runoff on the San Juan River near Bluff, UT is only at 51% of normal.



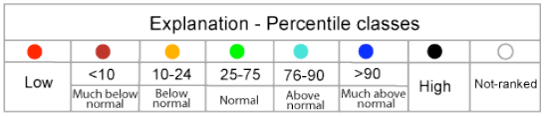


Fig. 5: USGS 7-day average streamflow compared to historical streamflow for December 26th in the UCRB.

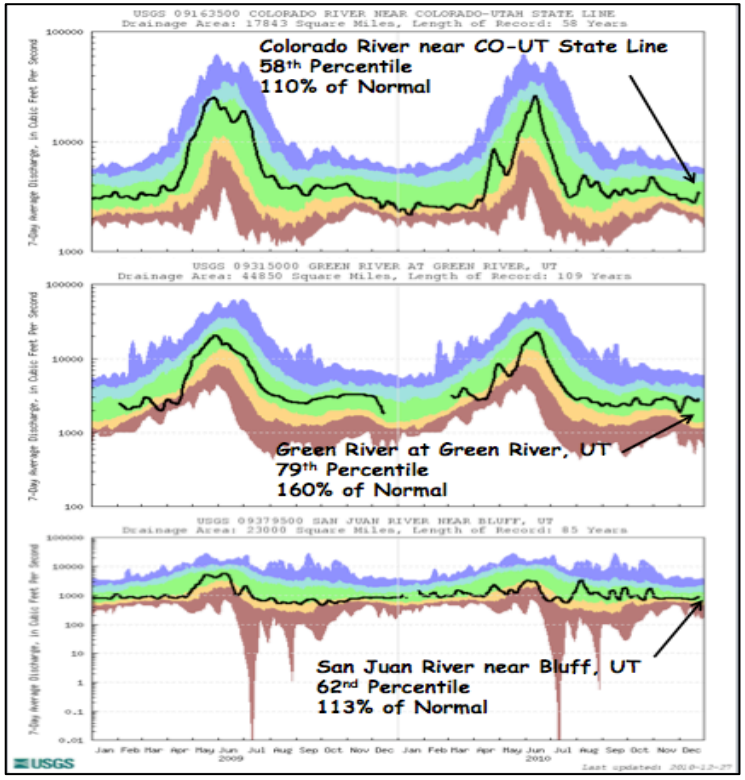


Fig. 6: USGS 7-day average discharge over time at the CO-UT state line (top), Green River, UT (middle) and Bluff, UT (bottom).

Water Supply and Demand

Another week of warmer than average temperatures prevailed throughout the UCRB. For the month of December, temperatures were around 6°F warmer than average through much of the basin and more than 10°F warmer than average in western CO. While temperatures have been warm the air has been moist with a persisting flow of moist Pacific air for most of the month. Soil conditions have improved in northeastern UT, the Four Corners region and in western WY (Fig. 7). Soils are continuing to dry east of the UCRB throughout eastern CO.

Only minor changes in storage amounts were seen in the reservoirs throughout the basin for the last week, with Blue Mesa and Lake Dillon seeing slight increases in storage since December 1st. Blue Mesa, Flaming Gorge, Navajo Lake and Lake Granby are all above average for this time of year. Lake Powell's storage decreased by another 61,800 acre feet this past week bringing its month-to-date storage decrease to 339,000 acre feet. Lake Powell is currently at 77% of average for this time of year and around 60% of capacity.

Precipitation Forecast

Mostly dry conditions on Tuesday will give way to more unsettled weather late into the week. The northern mountains of Utah should see snow showers beginning on Wednesday, with activity spreading eastward into Colorado as the day progresses. A strong polar cold front will then move through the area on Wednesday night bringing heavy snow and very cold temperatures to all of the Colorado and Wyoming mountains. QPF fields are showing about 1.5 inches of liquid accumulation along the southern continental divide, with 1.0 inch forecast for most of the Colorado western slope by Friday. Meanwhile, the potential for much needed snowfall on the northeastern plains of Colorado exists during the Thursday/Friday time frame, but the exact track of the storm will dictate how much precipitation is realized in these areas. Persistent snow showers will linger in the mountains through Saturday morning before dry conditions take over by the end of this weekend. There is a great deal of uncertainty with the timing and strength of the next trough, but expect a return of snow showers in the high terrain of the basin sometime next week.

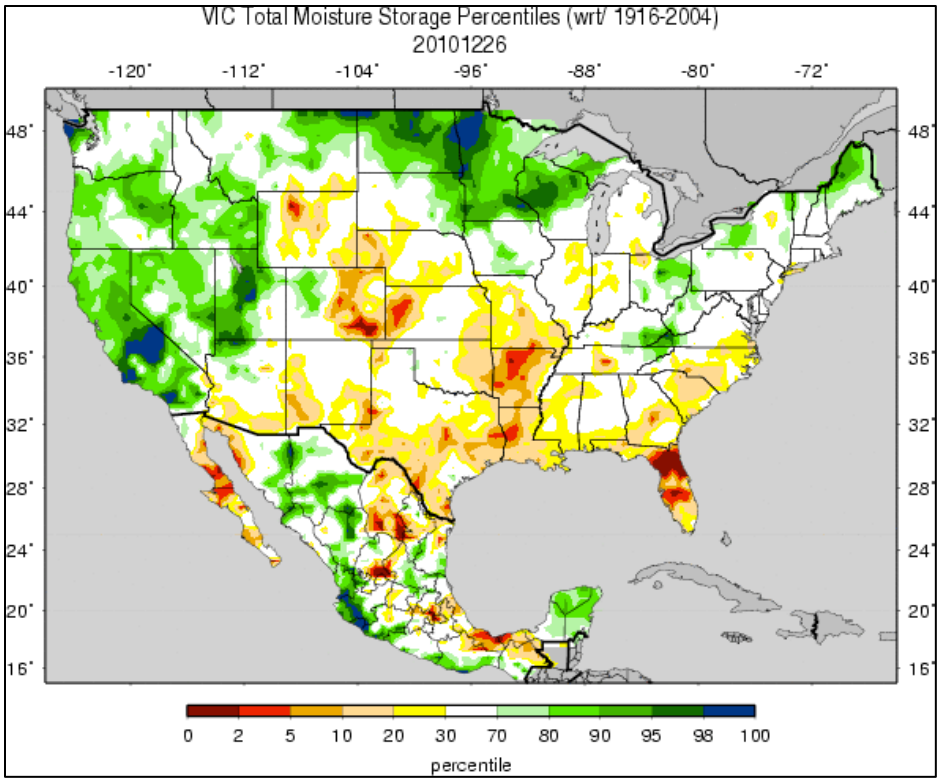


Fig. 7: VIC soil moisture percentiles as of December 26th.

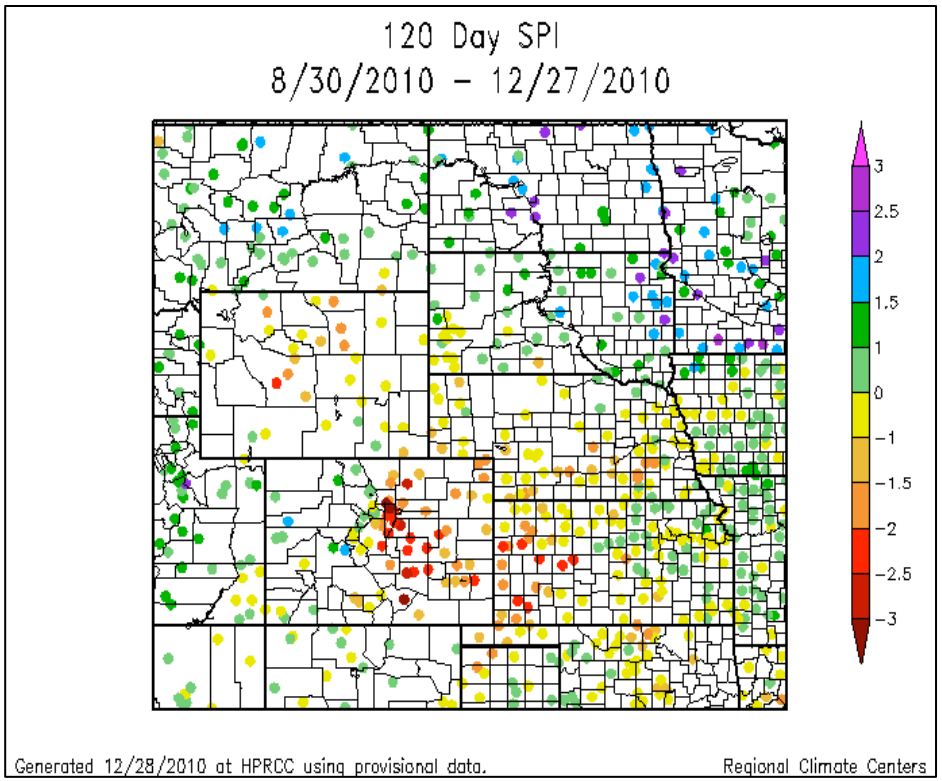
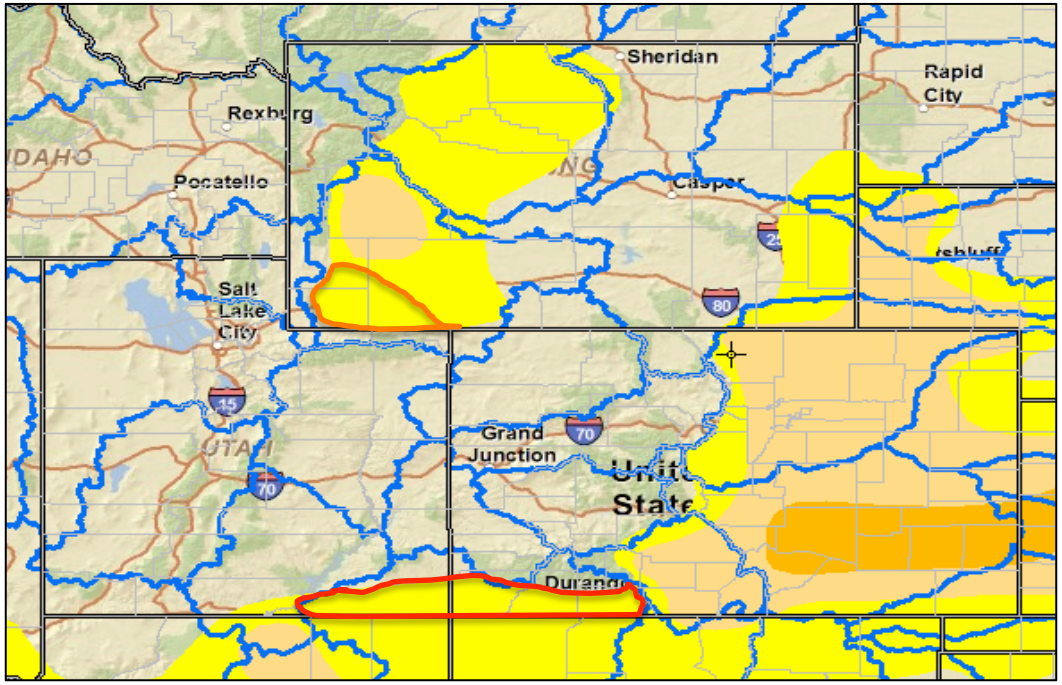
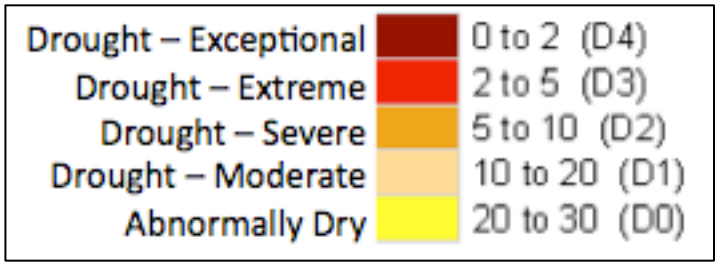


Fig. 8: 120 – day SPI as of December 28th.

Drought and Water Discussion





Drought categories and their associated percentiles

Fig. 9: December 21st release of U.S. Drought Monitor for the UCRB

Due to the recent heavy snow events that have occurred in the San Juan basin, it is recommended that the D0 line be completely removed from southwestern CO and southeastern UT (Fig. 9, red line). The line can possibly be further scaled back in AZ and NM, but we'll leave those decisions to the current USDM author and other local experts.

It is also recommended that D0 be scaled back somewhat in the Upper Green River basin in WY (Fig. 9, orange line). Soil and streamflow conditions in southwest WY are in good condition and precipitation for the month of December is over 300% of average.

Status quo is recommended for the remaining areas. The plains east of the UCRB will be closely monitored in the coming weeks. With very negative SPIs along the front range (Fig. 8) and poor soil conditions, this area could see increased fire danger and possible high water demands in the near future.