NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

March 20, 2012

Precipitation and Snowpack

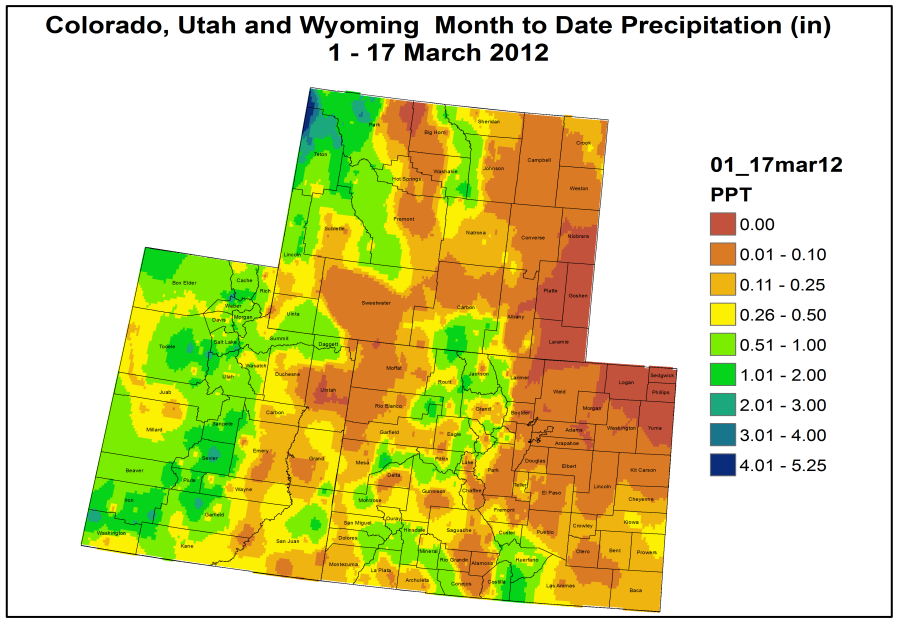


Fig. 1: March month-to-date precipitation in inches.

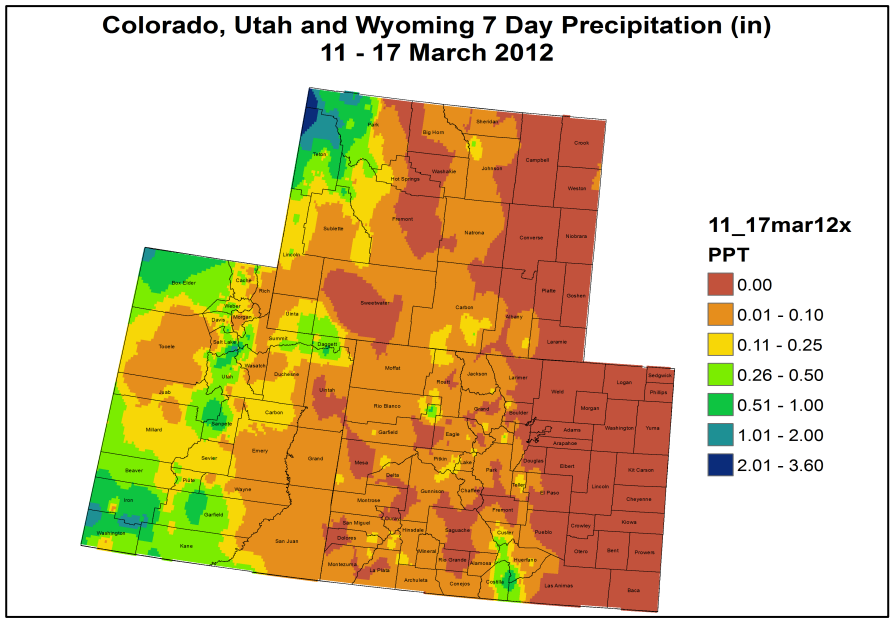


Fig. 2: March 11 – 17 precipitation in inches.

For the month of March so far, precipitation has mostly been concentrated over the higher elevations of the Upper Colorado River Basin (UCRB, Fig. 1). Accumulations ranging between half an inch to almost two inches have fallen over the Wasatch and Uintahs in Utah, the Wyoming and Wind River ranges on the northern boundary of the basin, in the northern and central Colorado mountains, and the San Juan and Sangre de Cristo mountains in southern CO. These totals are near to slightly below average for this time of year. The lower elevations of the basin and the rest of CO have been drier, with accumulations of less than half an inch month-to-date and many areas seeing less than a tenth of an inch.

Last week, the heaviest precipitation fell along the Wasatch and Uintahs, with accumulations between a quarter and half an inch (Fig. 2). Not shown on this map, more recent precipitation fell (with amounts between a quarter and half an inch) in southwest CO. Some spotty areas in the basin received between a tenth and quarter inch of precipitation. However, most of the UCRB received less than a tenth of an inch of moisture for the week, while eastern CO saw dry conditions for the week.

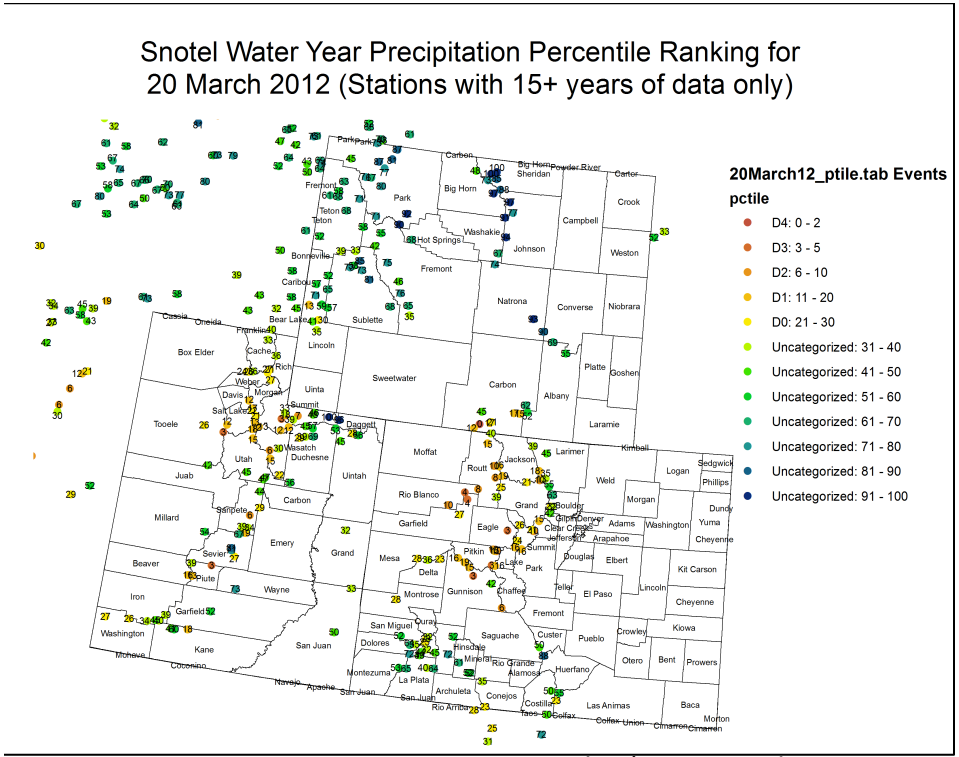


Fig. 3: SNOTEL WYTD precipitation percentiles (50% is median, 21 – 30% is Drought Monitor D0 category).

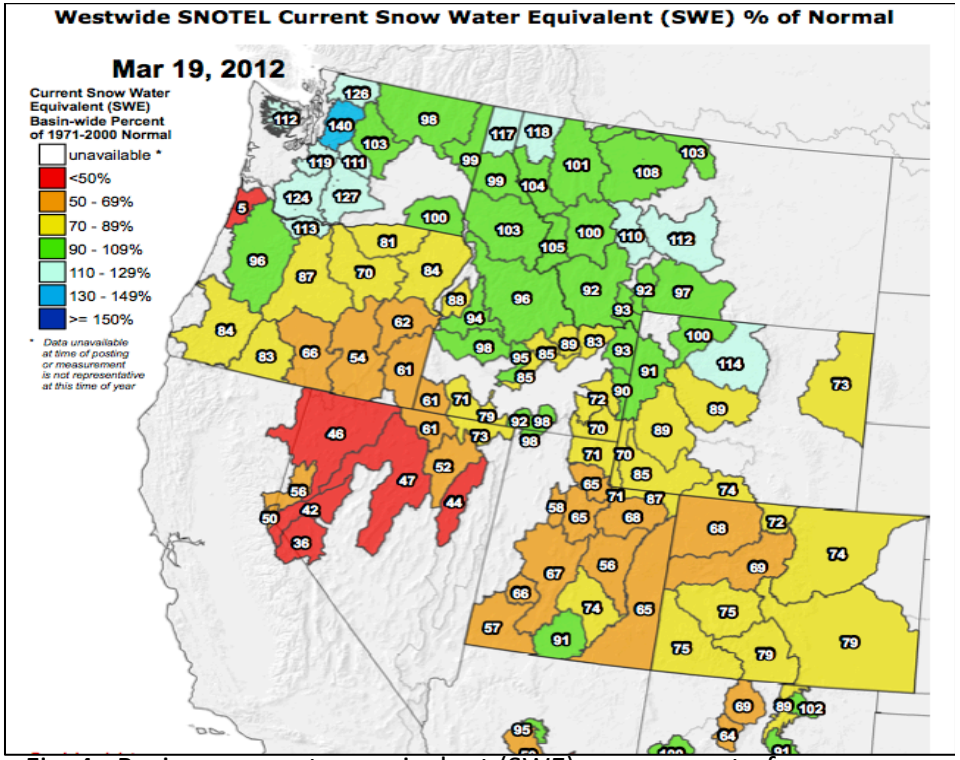


Fig. 4: Basin snow water equivalent (SWE) as a percent of average.

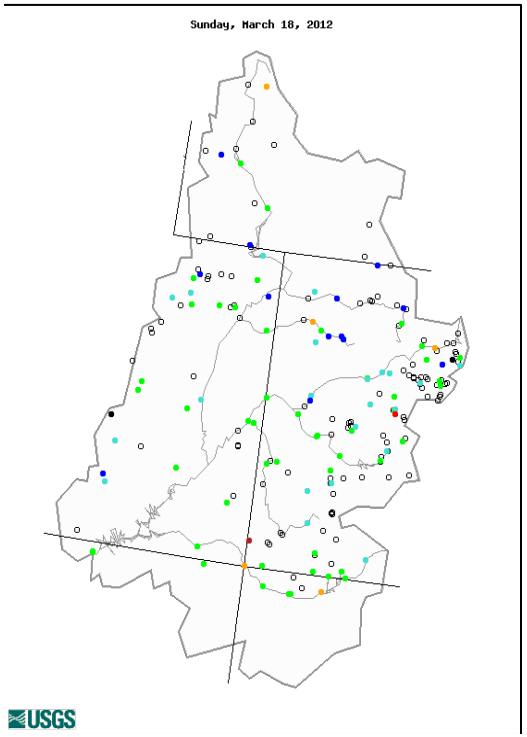
Water-year-to-date (WYTD), SNOTEL precipitation percentiles are lowest for the Yampa basin in northwest CO, with percentiles ranging from single digits to around the 20th percentile (Fig. 3). The Colorado and Gunnison basins in CO and the Wasatch range in UT are also fairly dry, with many SNOTEL sites showing percentiles in the teens. SNOTEL percentiles in the Upper Green basin in WY are generally above the 50th percentile, and most in the San Juan basin in southern CO are also near or above the 50th percentile.

Snowpack conditions around the UCRB are all below normal (Fig. 4). Most of the sub-basins showed a decrease in percents of average after a week of little snowfall combined with warm temperatures causing early melting. The sub-basins of northwest CO and eastern UT are recording below 70% of average. Southwest CO is currently showing percents of average in the mid-70s, and the southwest WY sub-basins are recording around 85% of average snowpack at this time.

Streamflow

As of March 18th, 93% of the USGS streamgages in the UCRB recorded normal (25th – 75th percentile) or above normal 7-day average streamflows (Fig. 5). About 41% of the gages in the basin are recording above normal flows, while about 6% of the gages in the basin are recording below normal flows. The number of reporting gages in the basin has increased by 30 in the past month (and the percent of above normal flow gages increased by 25% since last week), indicating warmer temperatures causing some early season melting. There are currently 7 gages recording below normal flows, and those are scattered across the basin.

Key gages throughout the basin have all shown an increase in streamflow over the past week (Fig. 6). Flows on the Colorado River near the CO-UT state line jumped from the 78% of normal to 93% of normal and is now recording at the 54th percentile. The San Juan River near Bluff, UT is now recording near normal flows at the 26th percentile. The Green River near Green River, UT is again recording flows in the above normal range, at the 82nd percentile.



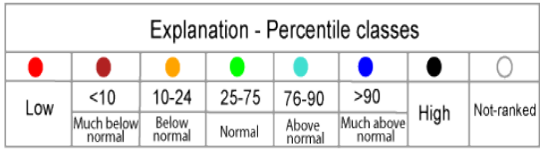


Fig. 5: 7-day average discharge compared to historical discharge for March 18th.

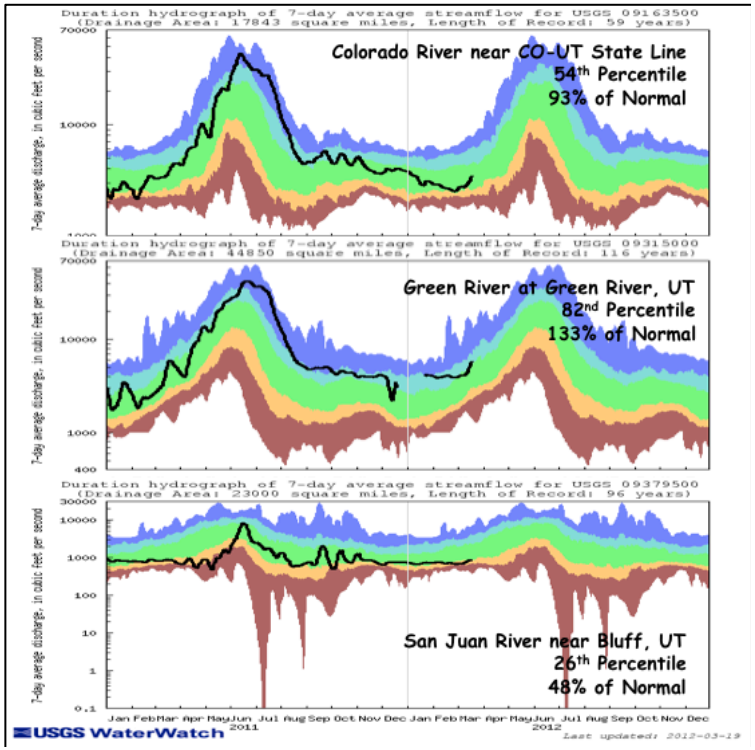


Fig. 6: USGS 7-day average discharge over time at the CO-UT stateline (top), Green River, UT (middle) and Bluff, UT (bottom).

Water Supply and Demand

All of the UCRB and the rest of CO continued to experience warmer than average temperatures last week, with the northern part of the basin experiencing temperatures more than 10 degrees above average for this time of year. The VIC model shows dry soil moisture conditions in eastern CO, in UT around the Colorado River valley, and in southern WY (Fig. 7). All of these dry regions have been expanding in areal size. The VIC shows very wet soils around the Colorado headwaters region (likely due to melting of snowpack infiltrating the soils). When VIC SWE and soil moisture are combined, this area shows a moisture storage deficit.

All of the reservoirs above Lake Powell are currently above their March storage averages. Blue Mesa and Navajo have begun increasing in storage and now show near equal volumes to the beginning of March. McPhee and Dillon have increased slightly since the beginning of the month. Granby and Green Mountain continue to show larger storage decreases, which is normal for this time of year. Lake Powell is currently at 84% of average and 63% of capacity (compared to 54% one year ago).

Precipitation Forecast

The storm that effected southern portions of the UCRB through the weekend has moved well to the east of the region with only a few isolated snow showers remaining in its wake. Expect these showers to be on the decline through Wednesday as ridging begins to build in from the west and drier air moves over the entire basin. High pressure ridge will center itself over the Continental Divide of Colorado on Thursday and lead to warming temperatures along with very dry conditions. This area of high pressure is anticipated to linger over basin well into the weekend, bringing a prolonged period of above average temperatures and ample sunshine through Sunday. A small disturbance in the upper levels will bring a chance of light snow showers over the far northwest portions of the basin on Friday, but little to no accumulation is anticipated from this weak feature (Fig. 8). The next Pacific trough is expected to lift northeast of the UCRB on Monday, and should mainly effect the northern-most reaches of the UCRB while leaving the rest of the area dry with above average temperatures moving into next week.

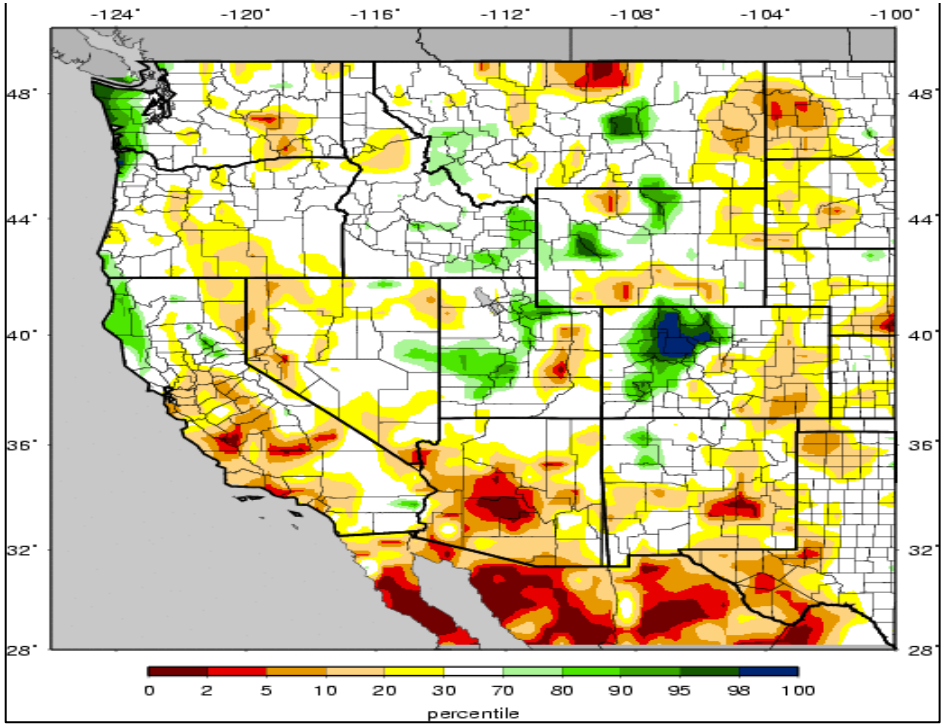


Fig. 7: VIC soil moisture percentiles as of March 18th.

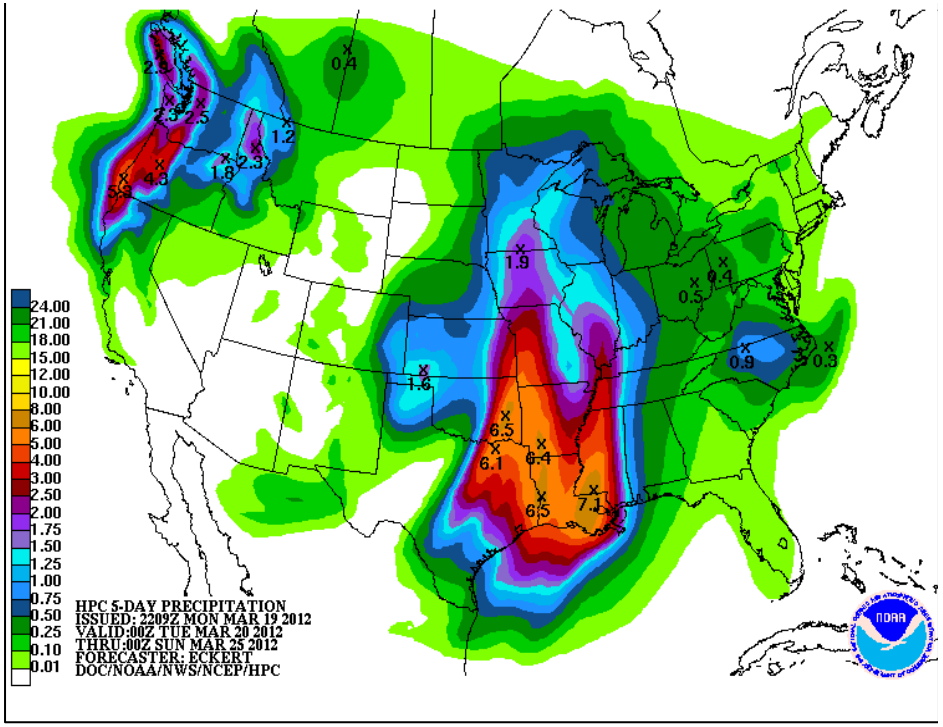


Fig. 8: HPC Quantitative Precipitation Forecast (QPF) through 0Z Sunday.

Drought and Water Discussion

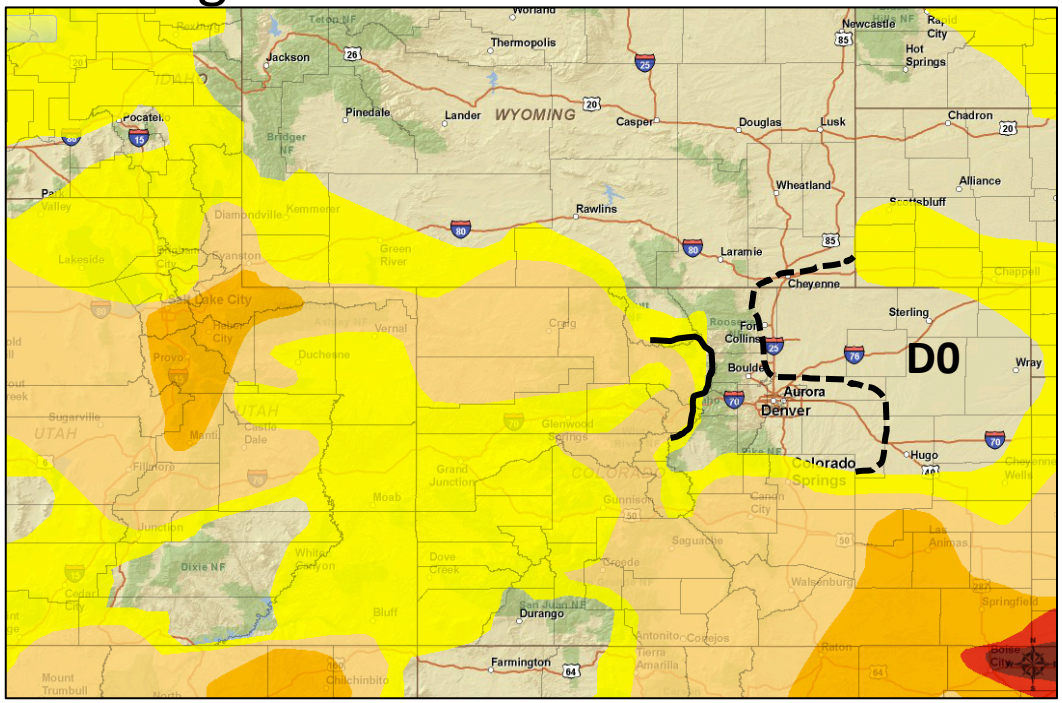
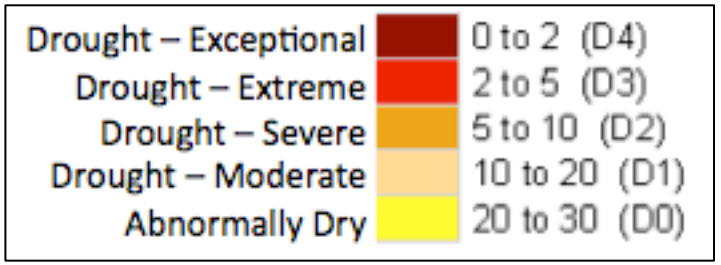


Fig. 9: March 13th release of U.S. Drought Monitor for the UCRB.



Drought categories and their associated percentiles

On the current depiction of the U.S. Drought Monitor (USDM) map (Fig. 9), the USDM author has decreased the area of D2 in the Wasatch range in the UCRB based on recent precipitation. In the northern CO mountains (Grand County), it is recommended that the D1 be adjusted slightly and expanded eastward along the Continental Divide (Fig. 9, solid black line). This will set up a very sharp gradient at and west of the Divide, which is representative of conditions in that area and will match better with SNOTEL precipitation percentiles.

In northeast CO, a further expansion of D0 is recommended (Fig. 9, dashed black line). In the past 30 days, this area has experienced little to no precipitation, much warmer than average temperatures, low relative humidities, high winds, and wildfire dangers. 30-day SPIs are very low, VIC soil moisture shows drying, and D0 will better represent that short-term dryness being experienced there.

Status quo is recommended for the rest of CO and the rest of the UCRB.