NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

November 15, 2011

Precipitation and Snowpack

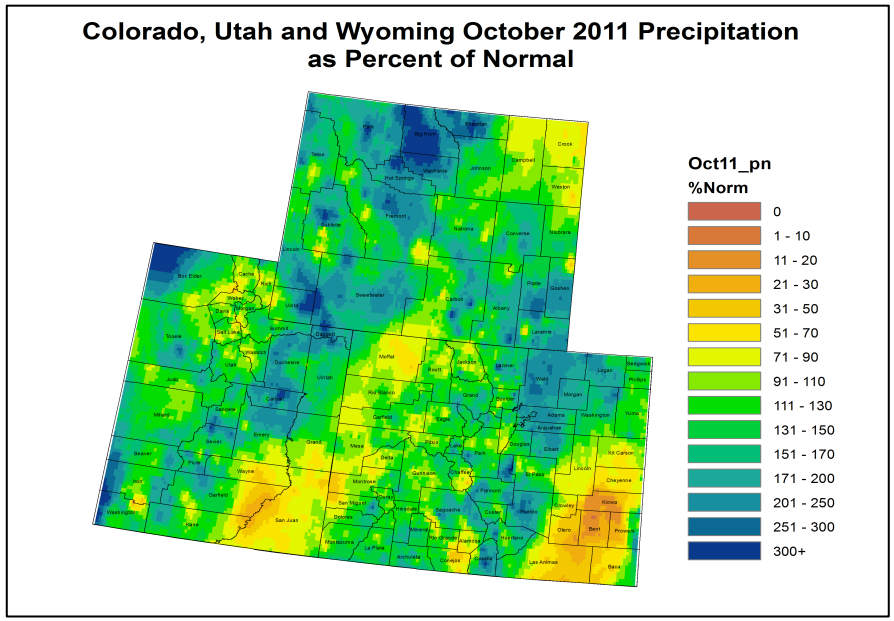


Fig. 1: October precipitation as a percent of average.

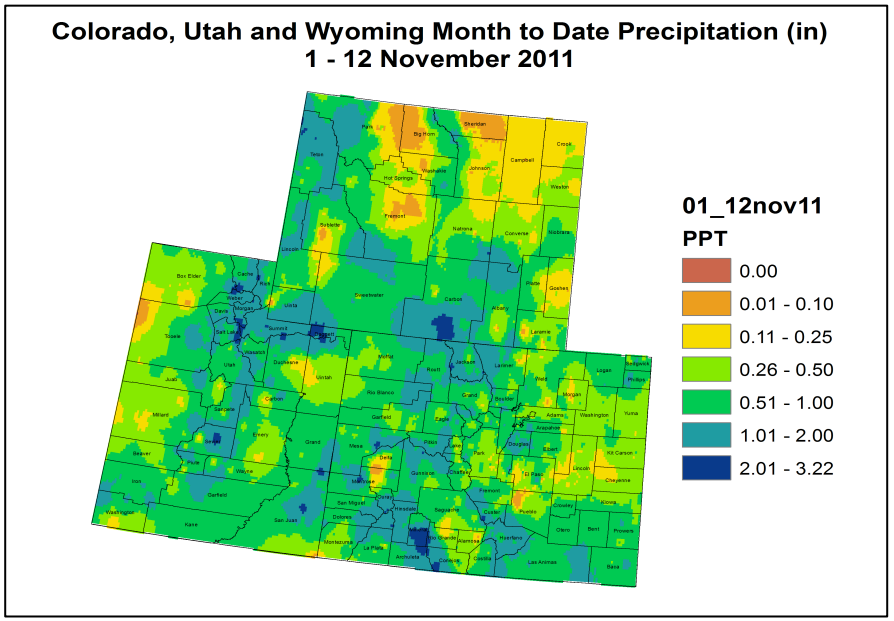


Fig. 2: November month-to-date precipitation in inches.

In October, most of the Upper Colorado River Basin (UCRB) received near to above average precipitation (Fig. 1). The Colorado River valley in southeast Utah was drier, receiving only around 50% of the average October precipitation in some spots. The Upper and Lower Green River basins in the northern part of the UCRB saw over 150% of their average precipitation. The Colorado River headwaters region and the San Juan mountains to the south also received generous moisture for the month, receiving more than 110% of average.

In November, precipitation has been widespread across much of the UCRB and across eastern CO (Fig. 2). In the UCRB, accumulations have ranged from a quarter inch in some isolated regions to over 1 inch in many of the higher elevations. Last week, beneficial moisture fell across southeast CO. Most of this precipitation fell before Tuesday morning, for last week's Drought Monitor assessment. However, additional precipitation did fall on the 9th in Baca and Las Animas counties. Additional precipitation has fallen in the northern CO mountains and in southwest CO on the 13th and the 14th (not shown).

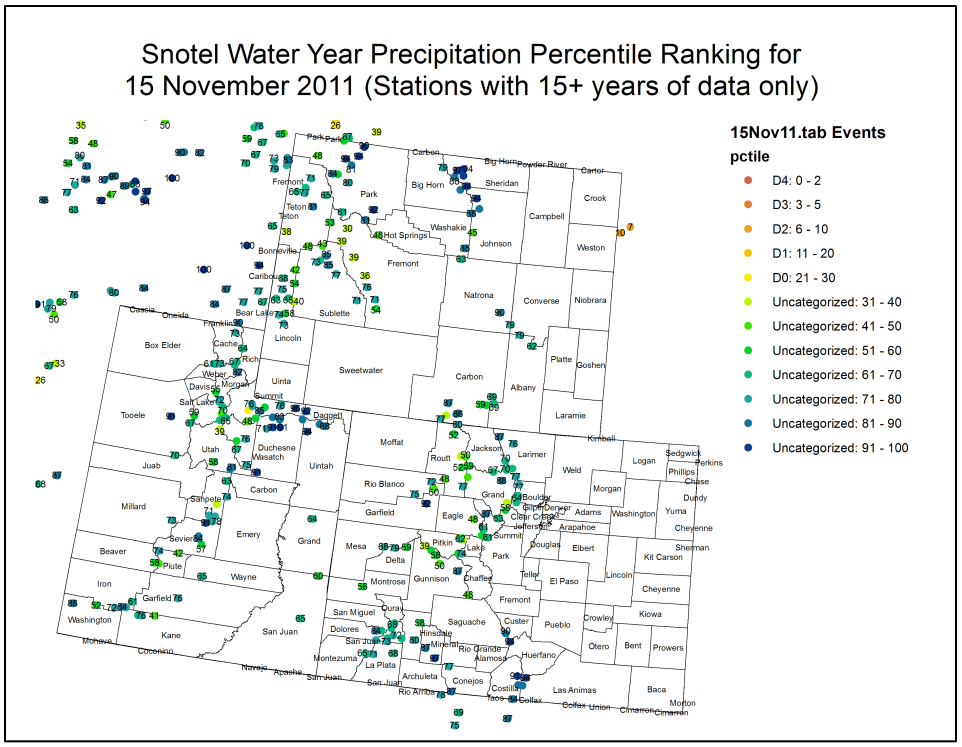


Fig. 3: SNOTEL WYTD precipitation percentiles (50% is median, 21 – 30% is Drought Monitor's D0 category).

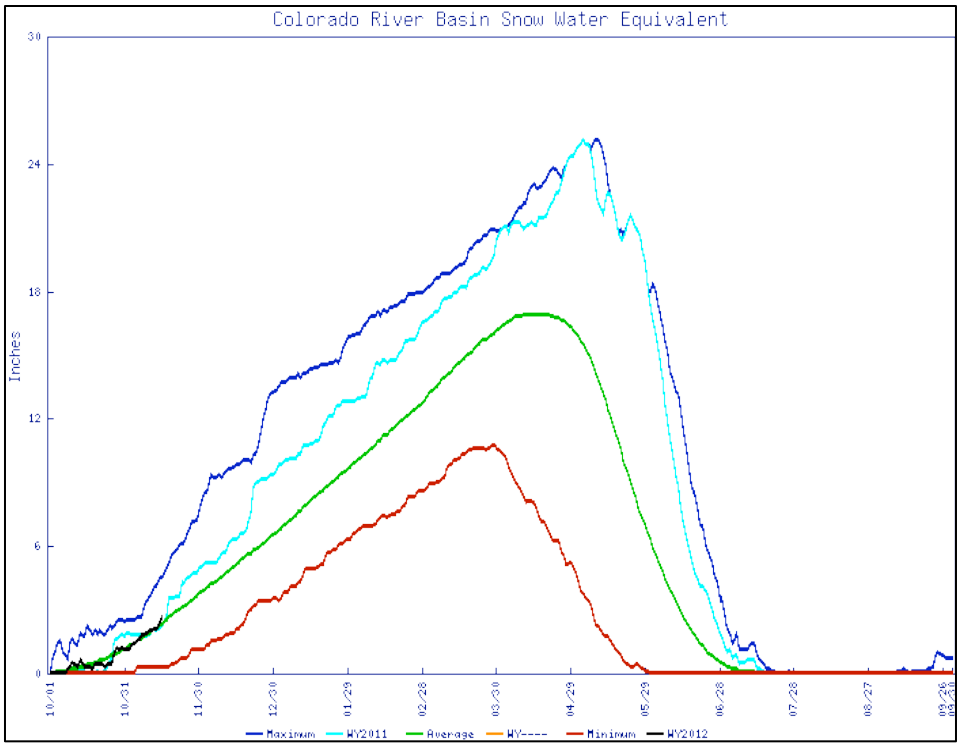


Fig. 4: CO Headwaters WYTD snow water equivalent accumulation (black line) compared to average (green) and last year (teal).

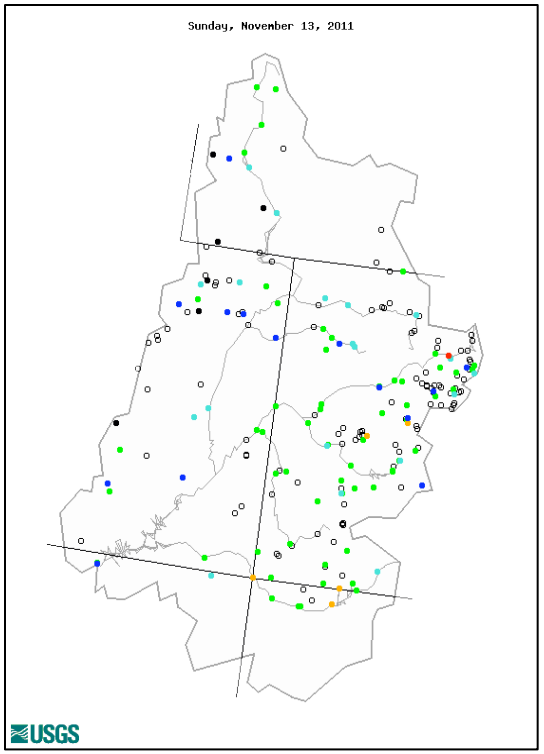
Water-year-to-date (WYTD), SNOTEL precipitation percentiles are in the near to above average range throughout most of the UCRB (Fig. 3) and are indicating a good start to the winter snowfall season. SNOTEL sites in the Upper Green River basin and in the northern and central mountains of CO range from around the 50th to the 80th percentiles. The southern mountains of CO and the mountains in northeast UT have already seen excellent precipitation accumulations since the beginning of the water year and are currently near or above the 90th percentile at many sites.

Around the Colorado River Headwaters, snow water equivalent has been tracking near average since the beginning of the water year (Fig. 4). Several early snow events quickly melted away, but since the end of October, snowpack has been steadily accumulating in the basin and cooler temperatures have prevented melting. The most recent event can be seen as the SWE line has gone above average over the last couple of days.

Streamflow

As of November 13th, 95% of the USGS streamgages in the UCRB recorded normal (25th – 75th percentile) or above normal 7-day average streamflows (Fig. 5). About 22% of the gages in the basin are recording much above normal flows, while 6% of the gages in the basin are recording much below normal flows. Most of the gages recording below normal flows are located in the southern part of the basin (in the San Juan basin). Higher flows are currently being observed in the Upper and Lower Green River basins in WY and UT.

Key gages on the Colorado River near the CO-UT state line and the San Juan River near Bluff, UT are currently recording near normal flows at the 57th and 36th percentiles, respectively (Fig. 6). The Green River gage at Green River, UT is reporting above normal flows at the 84th percentile.



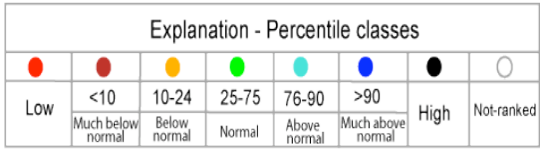


Fig. 5: 7-day average discharge compared to historical discharge for November 13th.

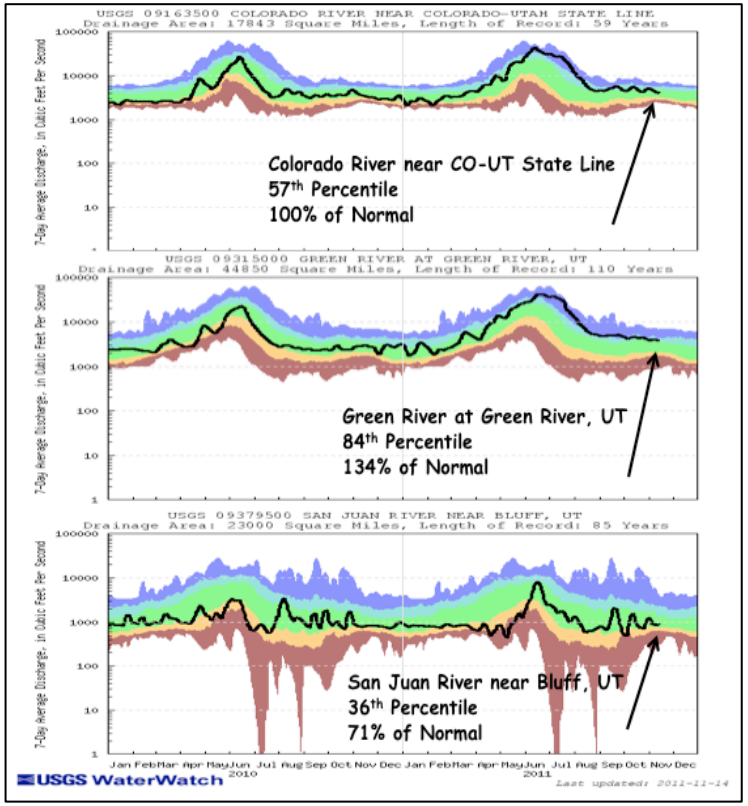


Fig. 6: USGS 7-day average discharge over time at the CO-UT stateline (top), Green River, UT (middle) and Bluff, UT (bottom).

Water Supply and Demand

Last week, cooler than average temperatures continued to dominate the UCRB, with slightly warmer than average temperatures seen across the CO Front Range. The cooler temperatures have helped early snowpack conditions build up without subsequent melting. The VIC model continues to show dry soil moisture conditions in southeast CO and along the lower Green River in UT (Fig. 7). Dry soil conditions are showing up in UT around the Colorado River valley. Soil moisture conditions have improved in Sweetwater County, WY and are now near normal. Wet soils can be seen in the northern CO mountains and eastward.

All of the major reservoirs above Lake Powell are near or above their November averages. Most reservoirs have only seen minor drops in storage volumes for the month, with the exception of Lake Granby and Green Mountain which have seen relatively larger decreases. Aside from Lake Granby and Navajo, all of the reservoirs are higher than they were last year at this time. Lake Powell is currently at 89% of average and 70% of capacity, compared to 62% of capacity one year ago.

Precipitation Forecast

The UCRB is currently underneath brisk northwest flow aloft, with a few minor disturbances expected to pass over the region during the middle of the week. These features are very weak and should only manage to generate a few light snow showers over the Continental Divide of Colorado with little snow accumulations. Following the passage of the second disturbance Wednesday evening, expect warming for the latter half of the week. The next Pacific trough moves into the basin on Saturday, driving a strong cold front across the northern half of the basin through the day. This system will quickly move out of the area Saturday evening only to be replaced by the next surge of Pacific energy on Sunday. Expect significant snow accumulation for most of the UCRB this weekend, with liquid accumulations approaching 0.75 inches over the northern CO mountains, eastern UT, and southern WY by Sunday evening while more widespread liquid accumulations of 0.25 inches will be possible across lower elevations. Additional Pacific energy moves onshore on Monday keeping unsettled conditions in the forecast for the UCRB moving into next week.

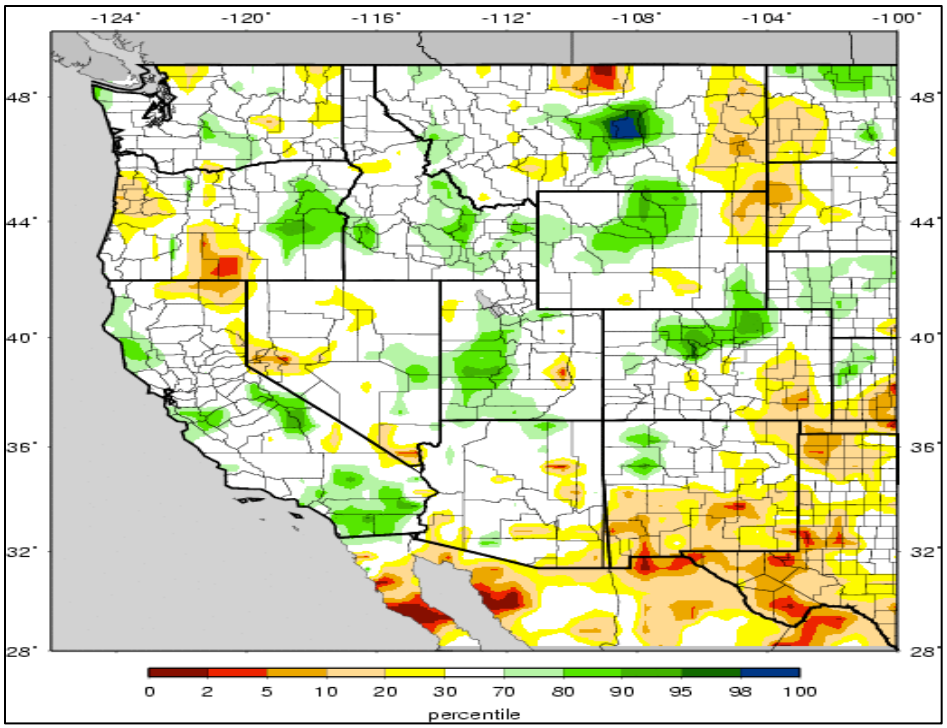


Fig. 7: VIC soil moisture percentiles as of November 13th.

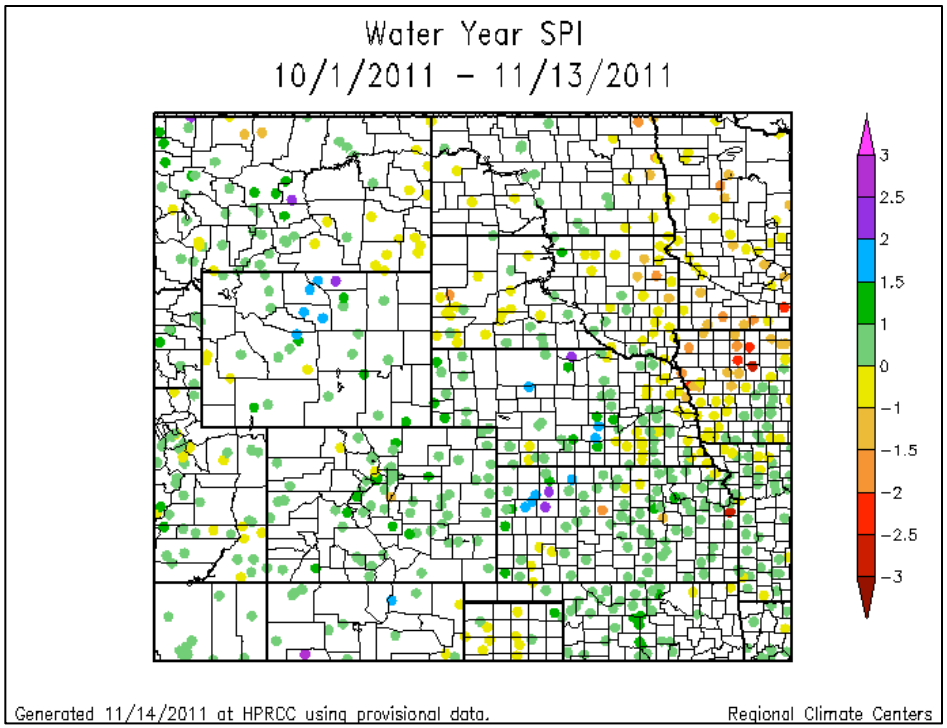
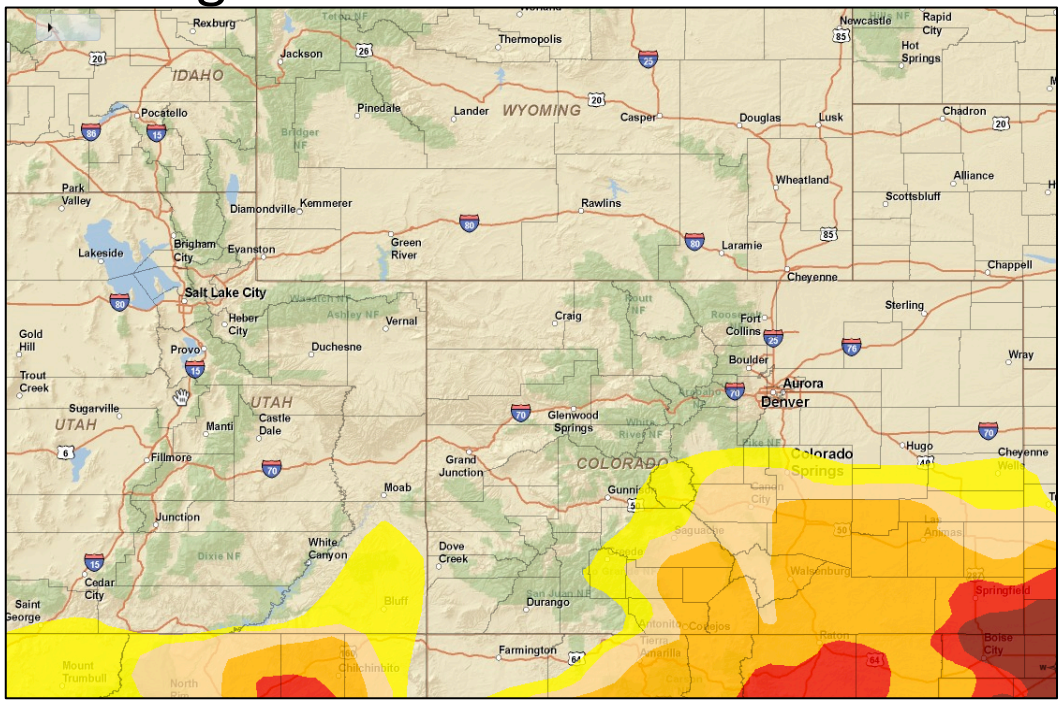
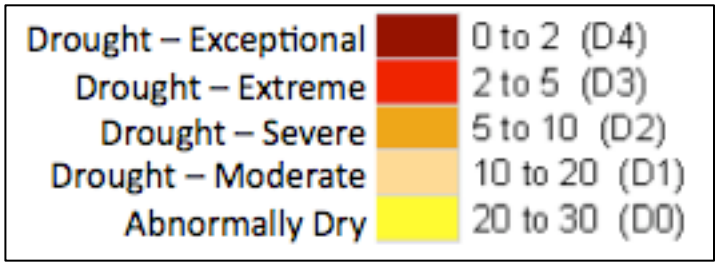


Fig. 8: Water-year-to-date standardized precipitation index (SPI) as of November 13th.

Drought and Water Discussion





Drought categories and their associated percentiles

Fig. 9: November 8th release of U.S. Drought Monitor for the UCRB

Status quo is recommended for the UCRB in the most current depiction of the U.S. Drought Monitor (USDM) map (Fig. 9). Continued dryness in southeast UT still warrants the D0 there. This area should be closely monitored for a possible westward expansion of the D0 (to cover the Colorado River valley) in the near future, however this action can be held off for another week.

Water-year-to-date standardized precipitation indices (SPIs) show excellent conditions for the UCRB and the rest of CO (Fig. 8). Improvements have been observed in southeast CO, but most of that precipitation fell prior to this week's assessment and warranted the improvements for last week. Some additional precipitation did fall in Baca and Las Animas counties, where D2 and higher still resides. However, long-term SPIs (9 months or greater) still indicate that D3/D4 is justified in that area. Additional precipitation also fell in Otero County, but long-term SPIs still show justification of D2 in that region. Therefore, status quo is recommended for southeast CO this week.