

NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

October 26, 2010

Precipitation and Snowpack

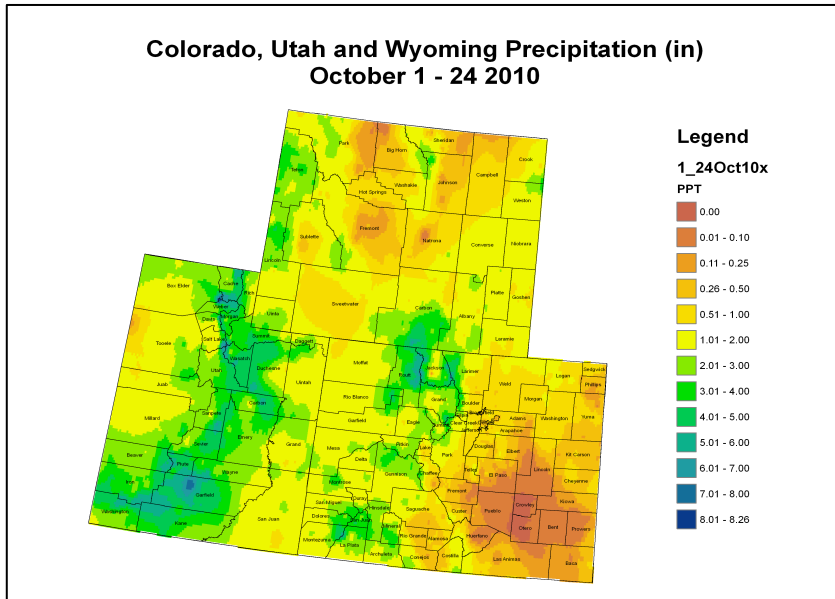


Fig. 1: October month-to-date precipitation in inches

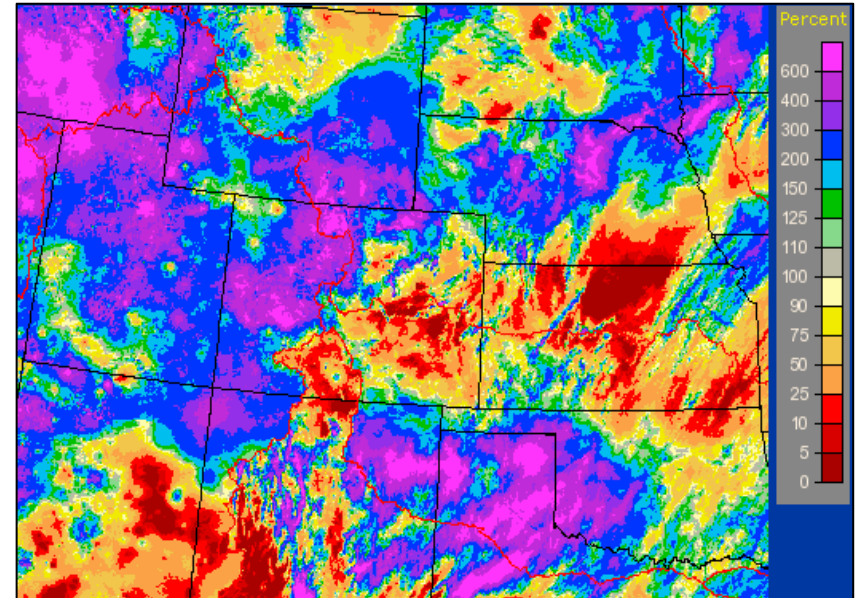


Fig. 2: October 20 – 26th precip as percent of average

Since the beginning of October, the heaviest amounts of precipitation in the Upper Colorado River Basin (UCRB) fell along the north-central mountains in Colorado and along the western UCRB border in Utah (Fig. 1). Routt County, CO has seen around 5 inches, while areas of the Lower Green River basin received anywhere from 2 to 4 inches since the beginning of the month. The CO plains, east of the UCRB, have been very dry for the month of October, with many counties in southeast CO seeing less than half an inch of precipitation.

The majority of this month's precipitation in the UCRB fell in the last week (Fig. 2). Much of the Colorado Headwaters, San Juan, and Lower Green River basins received well over 200% of their normal precipitation for this time of year. Moffat County, CO and Sweetwater County, WY were the driest in the UCRB, but still received near average amounts. Eastern CO only received between 25% and 75% of average for the past week, while eastern WY has made up for some of its deficits with ample amounts of precipitation this past week.

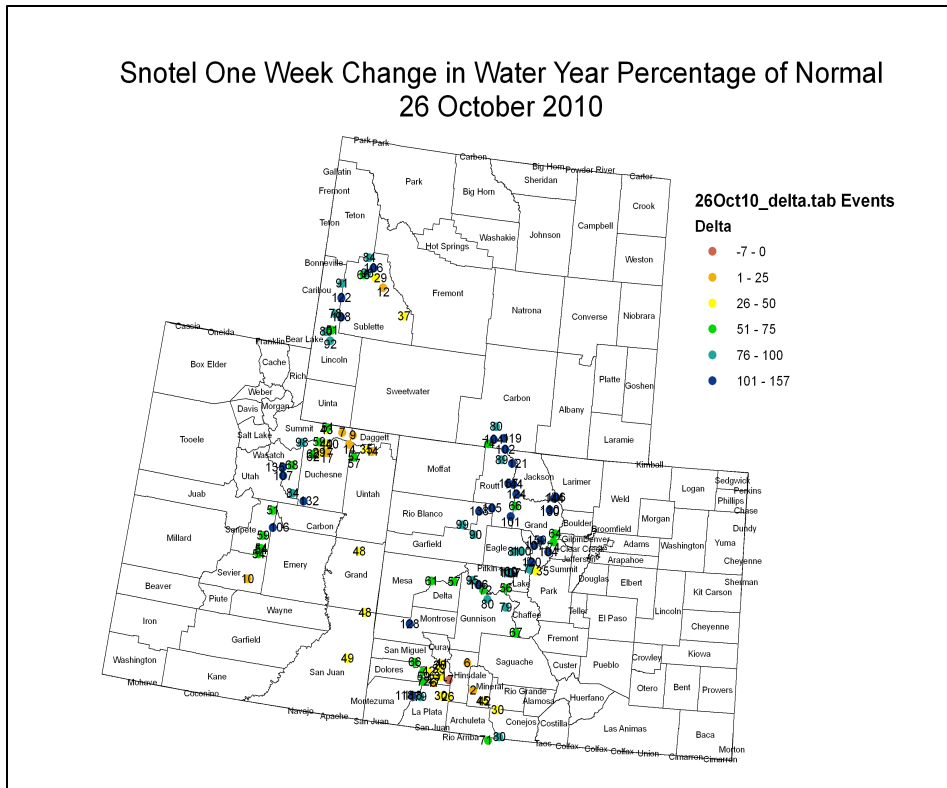


Fig. 3: SNOTEL WYTD precipitation percent of average change from last week.

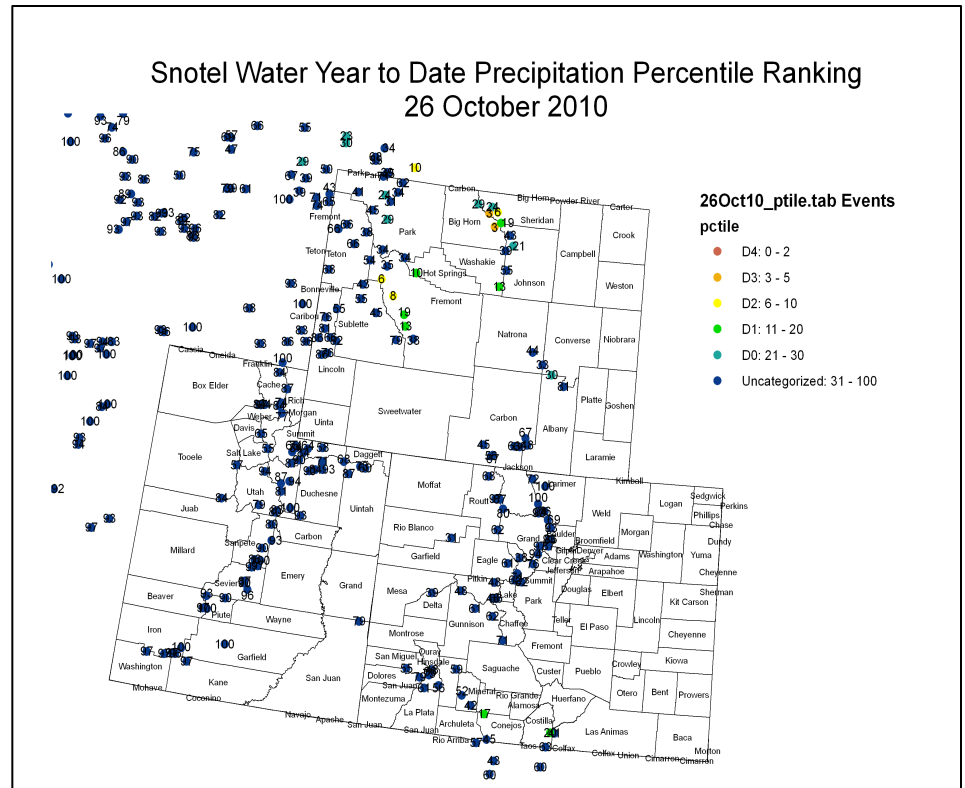


Fig. 4: SNOTEL WYTD precipitation percentiles (50% is median, 21-30% is Drought Monitor's D0 category).

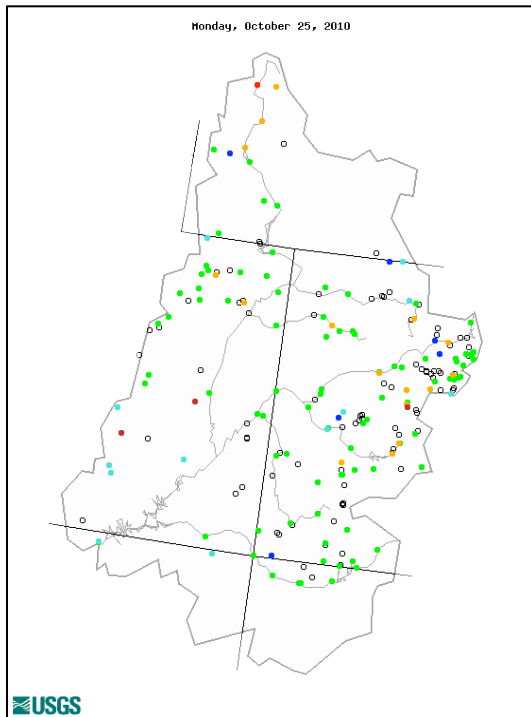
Due to the recent precipitation, there were large increases in SNOTEL water-year-to-date (WYTD) precipitation percents of average from last week across the entire basin (Fig. 3). Since this is the beginning of the water year, weekly changes tend to be fairly large. Though all regions saw increases from last week, the Colorado headwaters and Yampa-White basins showed the largest increases, while increases over the San Juan basin and along the Duchesne River were smaller.

Percentile rankings for the SNOTEL stations around the UCRB show most stations ranked very high (Fig. 4). This is also due to being in the very earliest part of the water year. A couple of stations in the Rio Grande basin to the south, and some stations along the boundary of the Upper Green River basin to the north, remain dry and are showing low percentiles.

Streamflow

As of October 25th, over 80% of the USGS streamgages in the UCRB recorded normal (25th – 75th percentile) or above normal 7-day average streamflows (Fig. 5). Also, 6 gages are recording much above normal streamflows (over the 90th percentile), compared to only 1 gage last week. The improvements seen over the past week are primarily due to the large precipitation amounts experienced throughout the region.

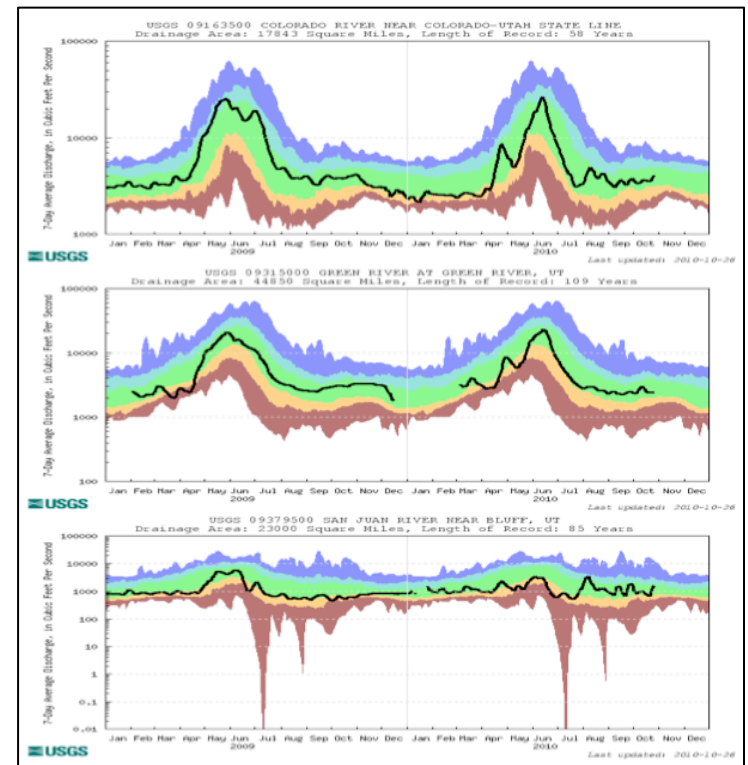
Looking at hydrographs from several sites around the UCRB, improvements are seen on the Colorado and San Juan Rivers (Fig. 6). A recent rise in flows occurred on the Colorado River near the CO-UT state line, which is currently at 99% of normal (54th percentile), and also on the San Juan River near Bluff, UT which is at 98% of normal (69th percentile). The Green River at Green River, UT experienced a decline in streamflows and is only at 79% of normal (40th percentile).



Explanation - Percentile classes							
●	●	●	●	●	●	●	○
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		

Fig. 5: USGS 7-day average streamflow compared to historical streamflow for October 25th 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

Temperatures remained above average for the UCRB and the eastern plains over the past week. Since October 1st, temperatures throughout the basin and surrounding region have been around 2 – 6°F warmer than average. However, thanks to recent precipitation, soil conditions have improved throughout the UCRB (Fig. 7), with wet soils now showing up over the 4-corners region and an improvement of the dry soils over the northern part of the region. Soil conditions over the plains continue to deteriorate.

Reservoir releases continued to slow over the past week, due to reduced demand and precipitation over the region. However, many reservoirs have seen very large drops in levels since the 1st of the month—both Blue Mesa and Lake Powell saw around 50,000 acre foot drops, and Green Mountain (a compensatory reservoir for CO mountain communities) experienced a 26,000 acre foot decrease. Flaming Gorge, McPhee, Navajo, and Granby levels are all above average for this time of year.

Precipitation Forecast – Short Term

A strong, moist northwesterly flow on the backside of last weekend's departing storm will lead to lingering snow showers over the northern and central Colorado and Wyoming mountains. These showers may produce additional accumulations along favored northwest slopes before activity finally diminishes into Wednesday. For Thursday through Saturday a ridge will build across the UCRB, bringing a return to dry and warmer conditions. Most of the forecast models are in good agreement on bringing a small disturbance through the area on Saturday evening. This fast moving system will likely result in some light accumulations over the high terrain of western Colorado and northern Utah. Beyond this weekend the forecast becomes more uncertain as models diverge on the evolution of Pacific energy coming onshore, but current trends would indicate another decent shot at some snow favoring northern areas of the UCRB into early next week.

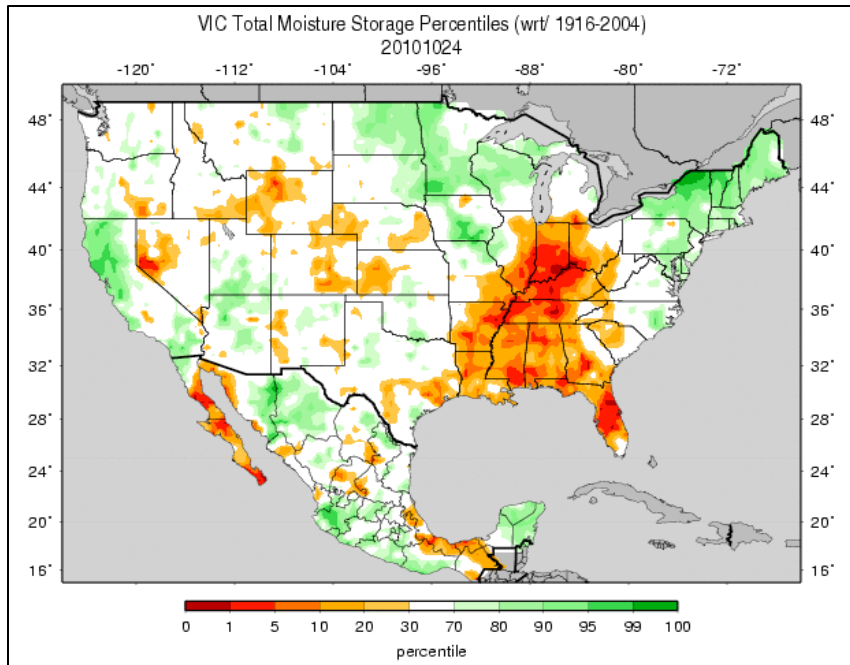


Fig. 7: VIC Soil Moisture as of October 24th.



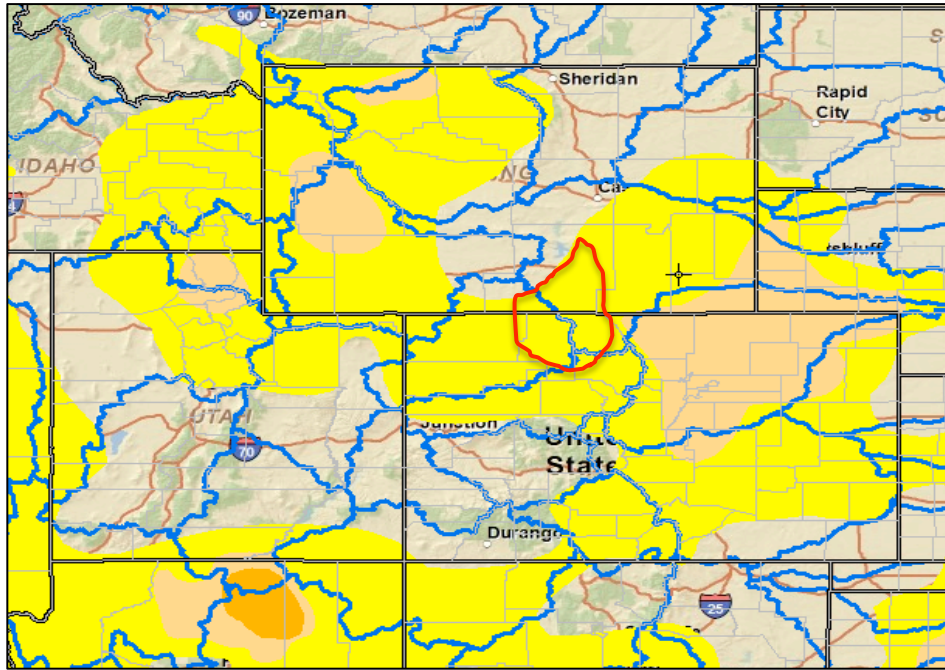
Fig. 8: NOAA Winter Precipitation Outlook.

Precipitation Forecast – Long Term

This fall, winter, and spring, conditions will likely be dominated by the current strong La Nina and the negative phase of the Pacific Decadal Oscillation (PDO). For the fall, this usually means drier than average conditions for most of Colorado, but with near normal to wetter than average conditions for the Upper and Lower Green River basins in Utah and Wyoming. Warmer than average conditions are also likely to continue for the remainder of fall in the UCRB.

Looking ahead to the winter, UCRB tends to have near normal precipitation with slightly above average temperatures. The NOAA outlook shows good chances for drier conditions in the southern mountains and wetter conditions in the northern mountains (Fig. 8).

Drought and Water Discussion



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)

Drought categories and their associated percentiles

Fig. 9: October 19 release of U.S. Drought Monitor for the UCRB

Several changes have already been made to the current U.S. Drought Monitor map (Fig. 9) for the UCRB in recent drafts. The D1 line in Colorado was expanded southward into Huerfano County—a recommendation which we made last week but was not incorporated in time for the final map. D0 was also removed from the northern portion of the San Juan basin in Utah and Colorado as a result of the recent precipitation.

A D0 reduction in northwestern Colorado and southern Wyoming could also be a consideration for this week. 7-day streamflows have recovered nicely in the area, soils have showed some improvement and some areas in the region have received around 5 inches of precipitation month-to-date. However, SPIs out 60 days or more still show negative values for the area and though soils have improved, some areas still show a deficit in soil moisture. D0 reductions around Routt County should still be considered.