NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

December 6, 2011

Precipitation and Snowpack

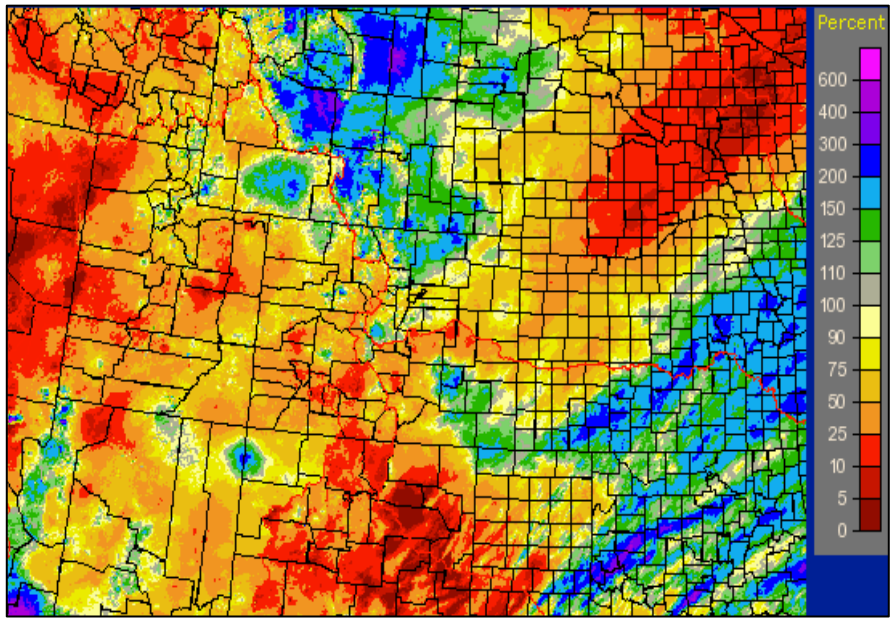


Fig. 1: AHPS November precipitation as a percent of average (normal maps unavailable this week).

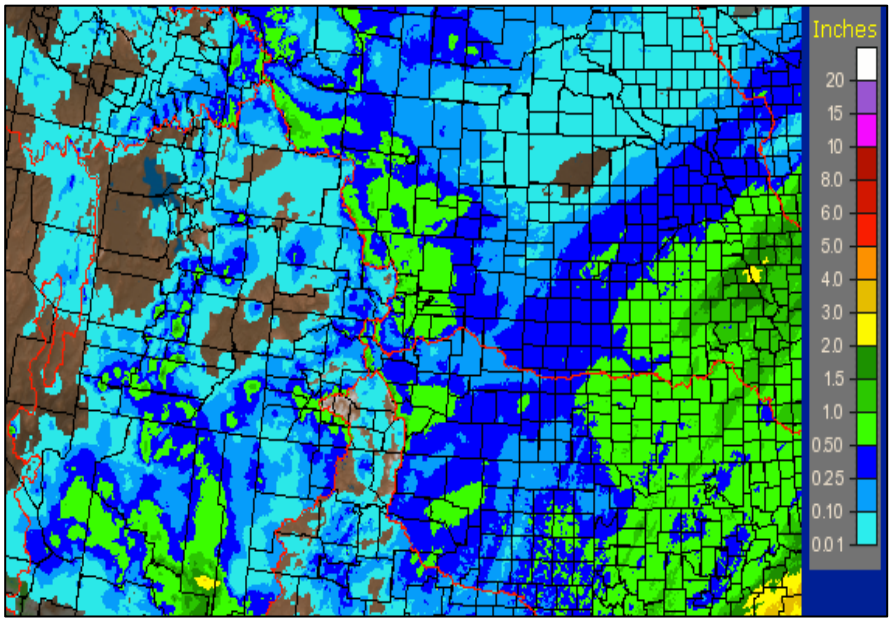


Fig. 2: AHPS November 29 – December 5 precipitation in inches.

In November, near to above average precipitation fell over the northern and eastern parts of the Upper Colorado River Basin (UCRB) with parts of eastern Utah and southwest Colorado receiving less than 50% of average for the month (Fig. 1). Parts of the Upper Green River basin, and the Yampa-White basin received over 110% of average precipitation for the month. The Colorado River valley out of CO and into UT received about 75% of average. Much of northern CO and southern WY saw well above average precipitation and southeast CO also received above average precipitation for the month.

Last week, the heaviest amounts of precipitation were focused east of the UCRB, with the northern Front Range receiving between half an inch to an inch of moisture (Fig. 2). Southeast CO also received beneficial moisture, with accumulations of over a quarter of an inch. The UCRB was drier for the week, with scattered amounts of around a quarter inch to half an inch and many areas seeing less than a tenth of an inch.

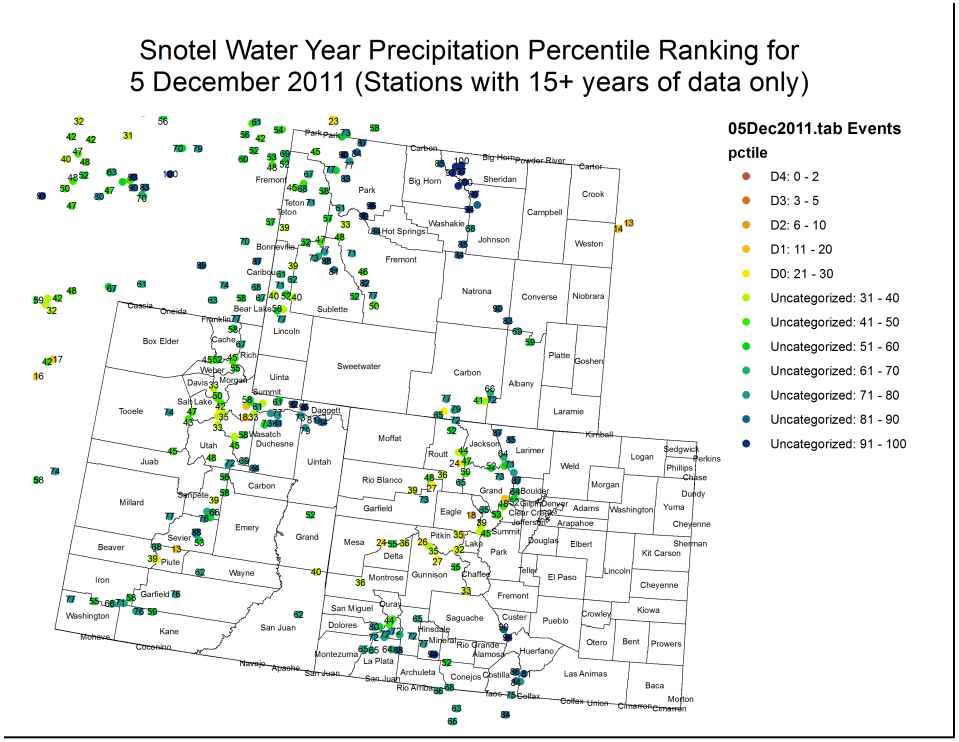


Fig. 3: SNOTEL WYTD precipitation percentiles (50% is median, 21 – 30% is Drought Monitor's D0 category).

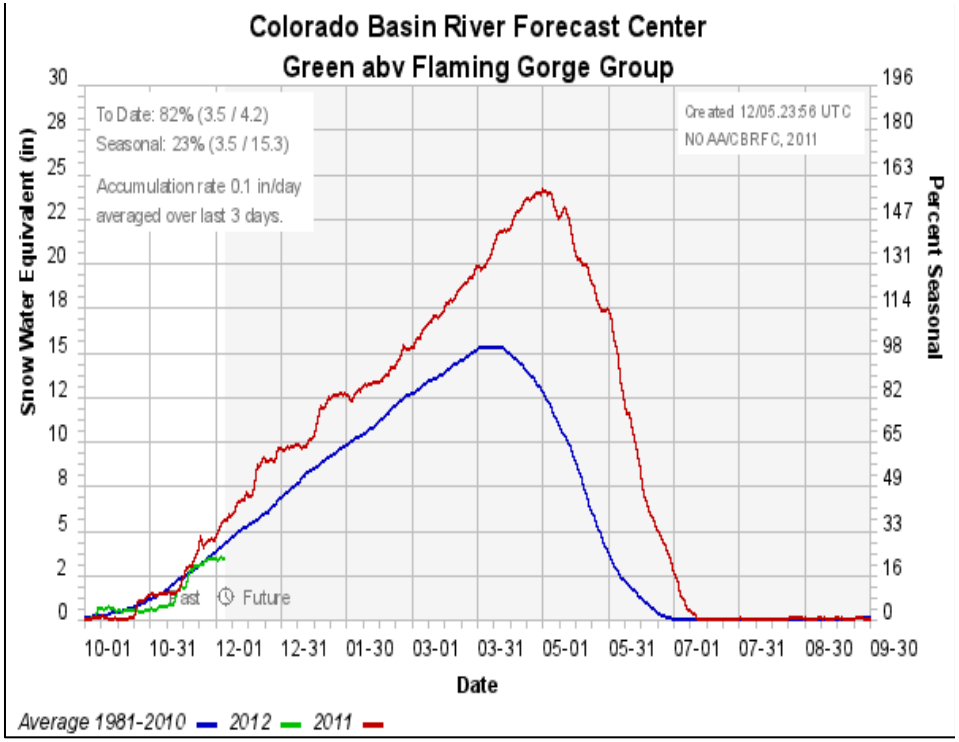


Fig. 4: Green River above Flaming Gorge WYTD snow water equivalent accumulation (green line) compared to the average (blue).

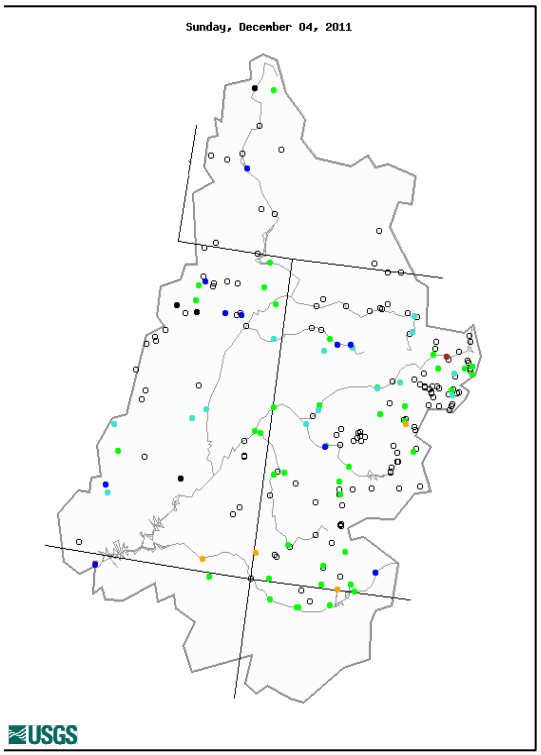
Water-year-to-date (WYTD), SNOTEL precipitation percentiles are in the near to above average range throughout most of the UCRB (Fig. 3). SNOTEL sites along the Duchesne River in UT, around the Colorado River headwaters, and in southern CO are showing higher percentiles, with many over the 70th percentile. The Gunnison basin in western CO is somewhat drier, WYTD, with many stations showing between the 25th and 40th percentiles. However, since it is still early in the water year, these percentiles don't represent large deficits and can easily increase with only a couple of storms.

In the Green River basin above Flaming Gorge, in Wyoming, snow water equivalent (SWE) has been tracking near average for much of the start of the water year (Fig. 4). Currently, WYTD SWE accumulations are slightly below average and about 2 inches less than this time last year.

Streamflow

As of December 4th, 93% 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 3% 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 northern part of the basin.

The gage on the Colorado River near the CO-UT state line is currently recording near normal flows at the 61st percentile (Fig. 6). The Green River gage at Green River, UT is reporting above normal flows at the 84th percentile. The San Juan River gage near Bluff, UT is reporting that flows have recently dipped below normal and are now at the 24th percentile.



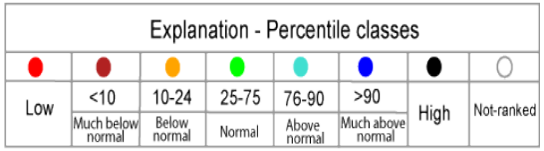


Fig. 5: 7-day average discharge compared to historical discharge for December 4th.

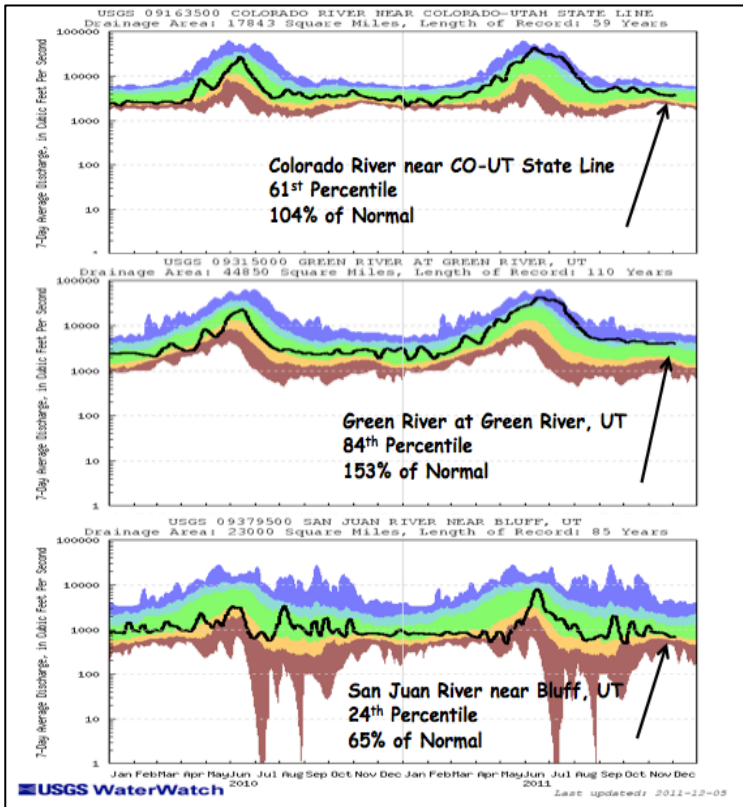


Fig. 6: USGS 7-day average discharge over time at the CO-UT stateline (top), Green River, UT (middle) and Bluff, UT (bottom).

Water Supply and Demand

Last week, most of the UCRB saw near average to above average temperatures with the eastern portion of the basin seeing much warmer than average temperatures. Near average to below average temperatures were observed along the Front Range and in eastern CO. The VIC model continues to show dry soil moisture conditions in southeast CO (Fig. 7). Dry soil conditions are showing up in UT around the Colorado River valley and have again deteriorated in Sweetwater County, WY. Wet soils can be seen in the northern CO mountains and eastward.

All of the major reservoirs above Lake Powell are above their December averages. Except for Navajo and Lake Granby, all of the major reservoirs in the UCRB are above their storage levels for the same time last year. Lake Powell is currently at 68% of capacity and 88% of its December average, compared to 78% of average one year ago.

Precipitation Forecast

The UCRB is currently under a generally dry, Arctic airmass, with temperatures well below normal across most of the area. Expect to see temperatures along the mountain slopes begin to warm up over the next few days while valley locations remain cold underneath strong inversions. Precipitation chances will also remain low to non-existent through the weekend as the storm track is expected to stay to the north and east of the basin into the extended period (Fig. 8). The exception to this will be a slight chance for flurries or light snow showers over the far northern edge of the region on Thursday, with little accumulation anticipated. With the next Pacific storm not expected to make landfall until early next week, dry conditions should persist across the entire basin while temperatures gradually return to near normal through the weekend. The next chance of precipitation will depend on how the previously mentioned system evolves, but do not expect to see any significant accumulations until the middle of next week at the earliest.

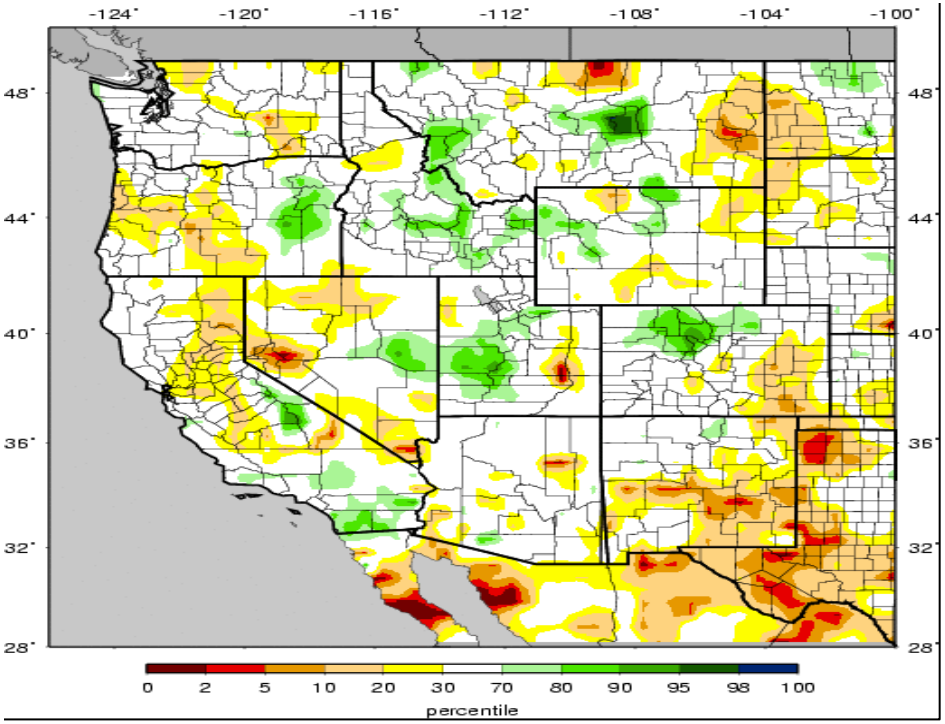


Fig. 7: VIC soil moisture percentiles as of December 4th.

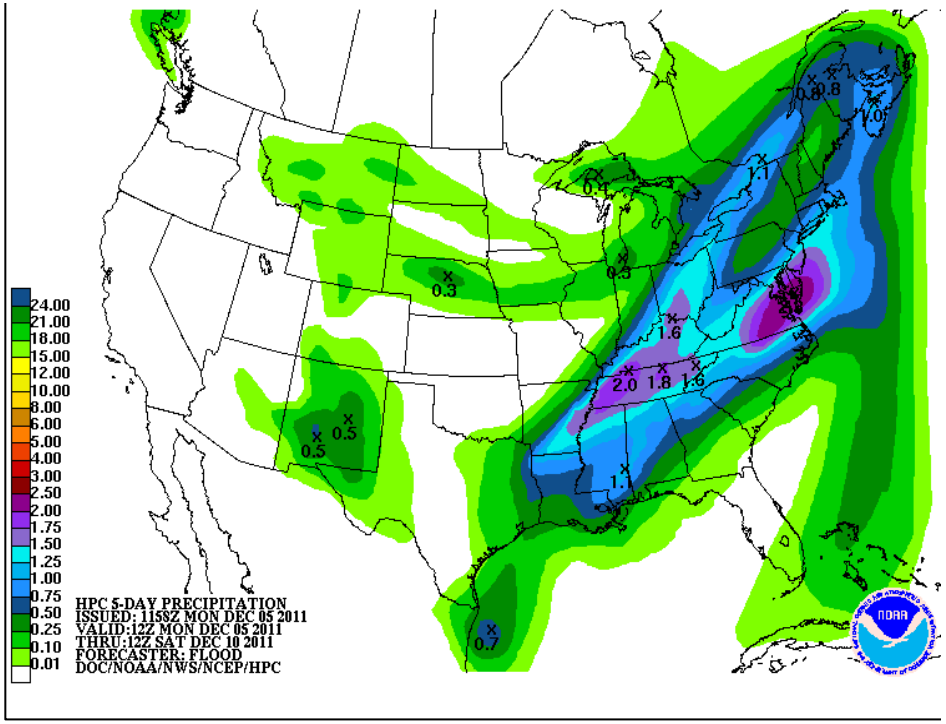
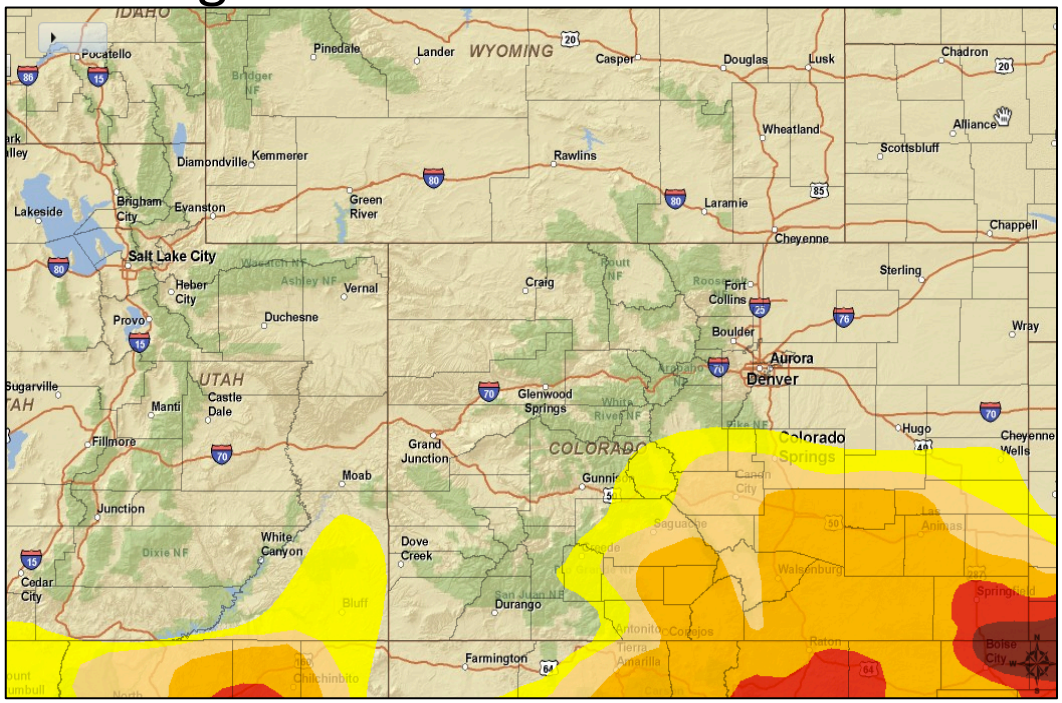


Fig. 8: HPC Quantitative Precipitation Forecast (QPF) through 12Z Saturday.

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: November 29th 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). The current USDM author has already adjusted the D0 – D4 lines across the eastern border of Colorado—each category was slightly shifted southward along the CO-KS border to better represent improvements that the author observed on the AHPS 60- 90- and 180-day percent of average precipitation values. No additional improvements are recommended for the rest of southeast CO at this time, and no degradations are needed.