NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

March 6, 2012

Precipitation and Snowpack

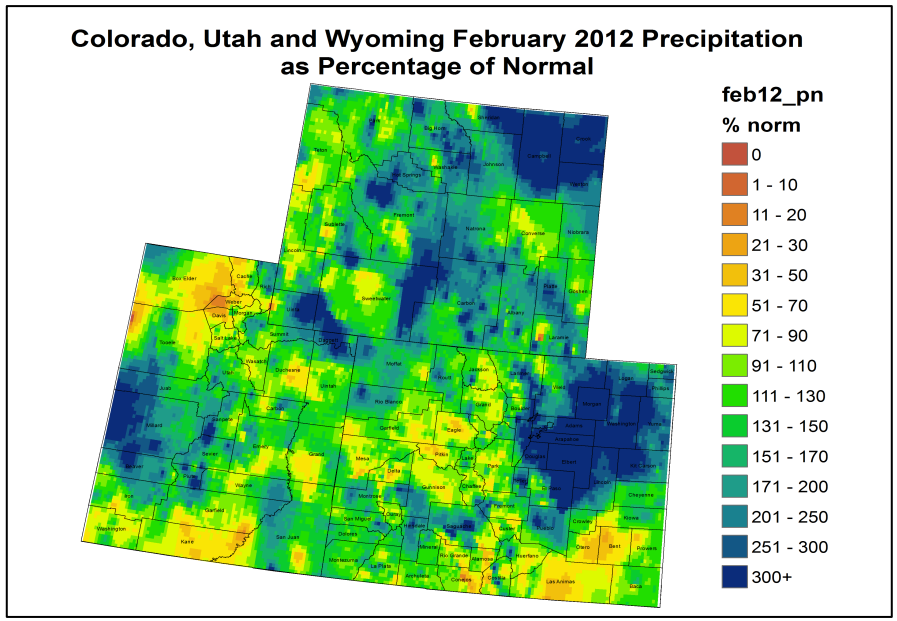


Fig. 1: February precipitation as a percent of average.

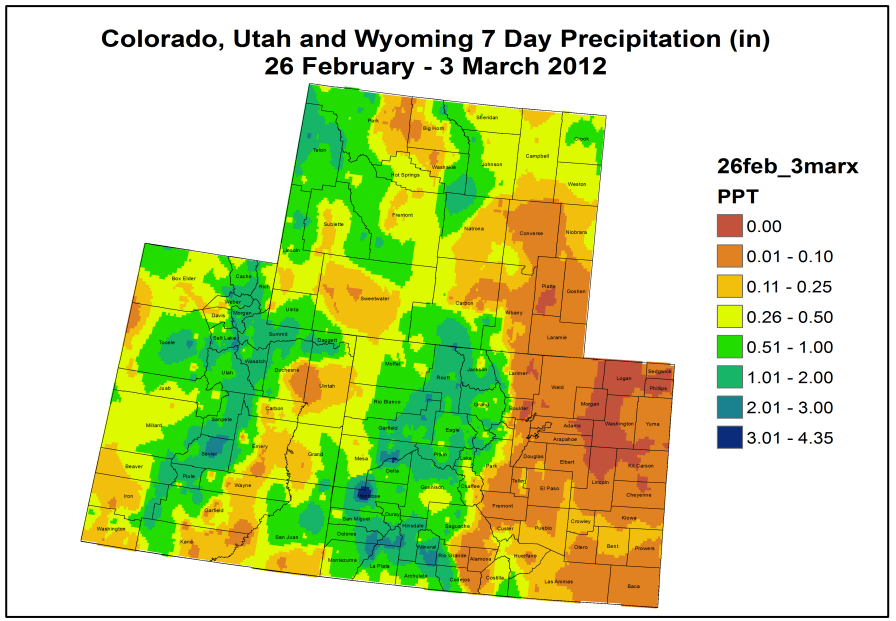


Fig. 2: February 26 – March 3 precipitation in inches.

For the month of February, precipitation has favored the higher elevations of the Upper Colorado River Basin (UCRB, Fig. 1). The northern mountains of Colorado, the higher elevations of northeast Utah, and the San Juan mountains in the southern part of the basin all received 90% of average or more precipitation for the month. Many areas in the lower elevations of western CO and eastern UT received less than 70% of average precipitation. East of the UCRB, northeast CO was very wet, with many areas receiving over 300% of average precipitation for the month, while southeast CO and the San Luis Valley were a little drier, receiving less than 70% of average in many areas.

Last week, the heaviest precipitation fell in the mountains and western slopes of CO and the Wasatch range in UT (Fig. 2). Accumulated amounts of over half an inch to nearly two inches were recorded in these areas (a normal amount for this time of year), while the lower elevations in eastern UT and southwest WY were drier, receiving between a tenth and half an inch for the week. Eastern CO, the San Luis Valley and the Front Range were fairly dry for the week, receiving less than a tenth of an inch in most areas.

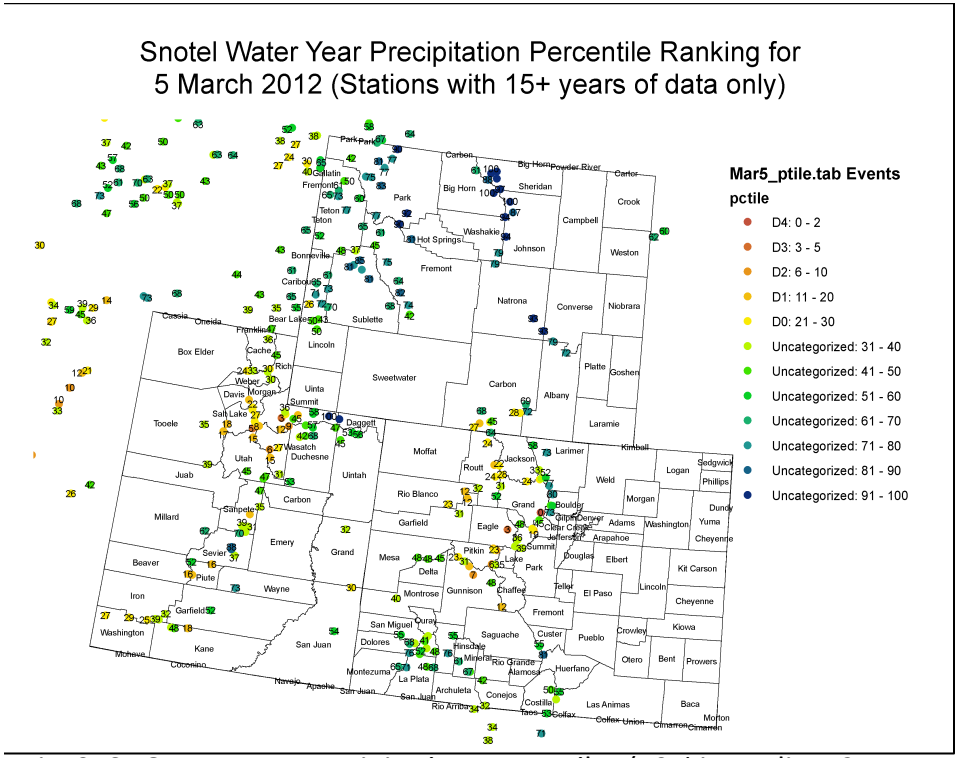


Fig. 3: SNOTEL WYTD precipitation percentiles (50% is median, 21 – 30% is Drought Monitor D0 category).

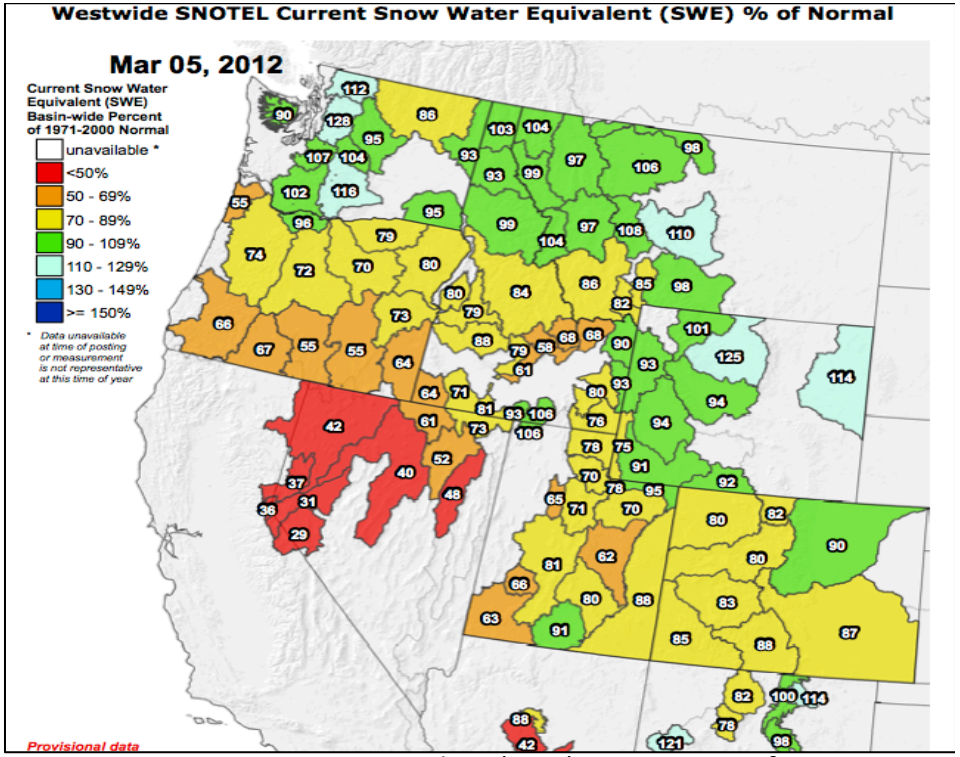


Fig. 4: Basin snow water equivalent (SWE) as a percent of average.

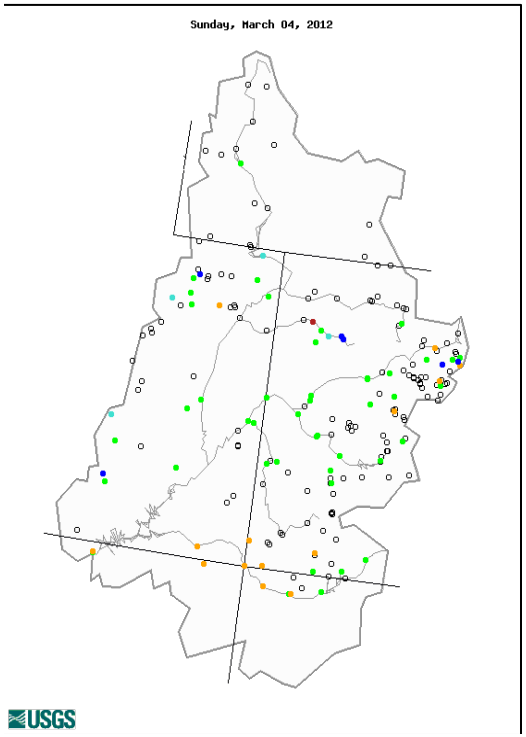
Water-year-to-date (WYTD), SNOTEL precipitation percentiles are lowest for the Wasatch range in UT, with percentiles ranging from single digits to around the 20th percentile, with higher percentiles along the Duchesne River in northeast UT (Fig. 3). The Yampa, Colorado, and Gunnison basins in CO are also fairly dry, with many SNOTEL sites showing percentiles in the 20s. SNOTEL percentiles in the Upper Green basin in WY are generally above the 70th percentile, and most in the San Juan basin in southern CO are near or above the 50th percentile.

Snowpack conditions around the UCRB are all below normal (Fig. 4) though most sub-basins saw some improvement from last week. All of the sub-basins in western CO are recording 80 – 90% of average snowpack. Eastern UT is also showing snowpack at 88% of average while the northeast UT sub-basins are drier, showing snowpack less than 80% of average, with parts of the Green River basin in UT at only 62% of average. The sub-basins in southwest WY are showing over 90% of average snowpack.

Streamflow

As of March 4th, 79% of the USGS streamgages in the UCRB recorded normal (25th – 75th percentile) or above normal 7-day average streamflows (Fig. 5). About 15% of the gages in the basin are recording above normal flows, while about 21% of the gages in the basin are recording below normal flows. The number of reporting gages in the basin has increased from under 50 to nearly 70 in the past few weeks, indicating warmer temperatures causing some early season melting. There are currently 15 gages recording below normal flows, most of them located in the San Juan basin.

Key gages throughout the basin are showing variable conditions (Fig. 6). Flows on the Colorado River near the CO-UT state line have been steadily dropping since the beginning of the calendar year, but have seen a slight increase last week to the 35th percentile. The San Juan River near Bluff, UT is recording below normal flows at the 15th percentile. The Green River near Green River, UT is recording above normal flows at the 74th percentile, though flows there have also dropped.



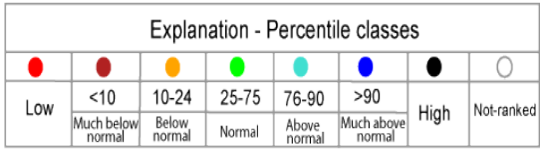


Fig. 5: 7-day average discharge compared to historical discharge for March 4th.

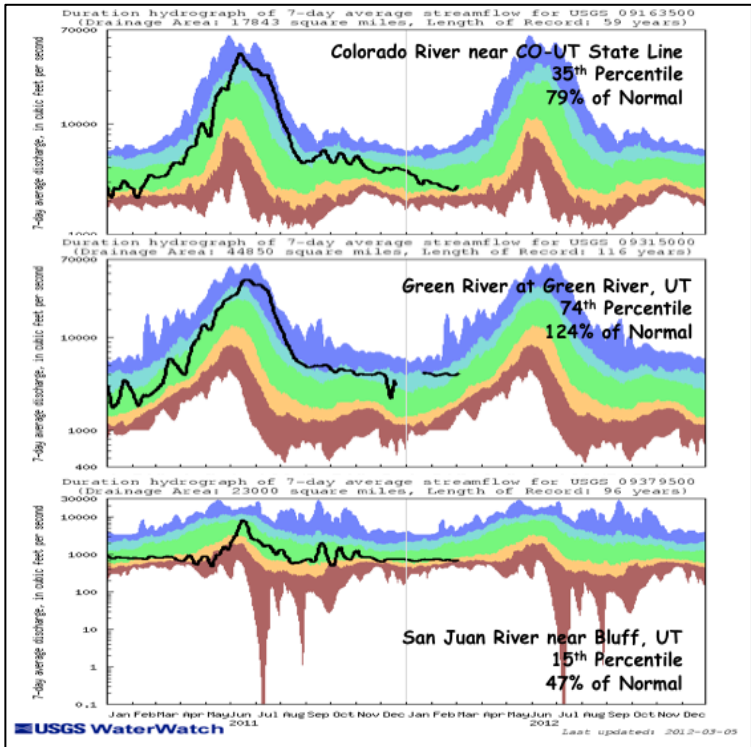


Fig. 6: USGS 7-day average discharge over time at the CO-UT stateline (top), Green River, UT (middle) and Bluff, UT (bottom).

Water Supply and Demand

For the month of February, warmer than average temperatures were experienced over northeast UT and northwest CO with near average temperatures observed in the southern part of the basin. The VIC model shows dry soil moisture conditions in southeast CO, in UT around the Colorado River valley, and in southern WY (Fig. 7). The VIC shows wet soils around the Colorado headwaters region and in the Wasatch mountains, though when VIC SWE and soil moisture are combined, these areas show a moisture storage deficit. Near normal soil moisture conditions are being observed in the Four Corners and San Juan region.

Most of the major reservoirs in the UCRB saw decreases in storage for the month of February, though that is normal for this time of year. McPhee levels stayed nearly steady for the month (though it normally increases around this time of year) and Lake Dillon increased very slightly for the month (though it normally sees a decrease in storage). All of the reservoirs above Lake Powell are currently above their March storage averages. Lake Powell is currently at 84% of average and 63% of capacity (compared to 54% one year ago).

Precipitation Forecast

Active weather will be on tap for the middle part of the week as an area of low pressure developing over the Great Basin begins to slide eastward over the UCRB. Gusty southwest winds will develop ahead of this system before snow begins to fall on Wednesday evening. Despite the vigorous nature of this system, the lack of a decent moisture source will limit its impact in terms of precipitation. Most of the energy with this storm will focus over southern portions of the basin where liquid accumulations of 0.50-0.75 inches are possible by Thursday evening over the southern Colorado mountains. Further north and west expect amounts of 0.10 inches over valleys with 0.25 inches of liquid possible over the higher mountains (Fig. 8). Beyond Thursday, a high pressure ridge will build over the UCRB from the northwest while the low pressure system stalls and weakens over New Mexico. Light snow showers will persist over the southern-most zones through the weekend, with the rest of the UCRB remaining dry moving into next week.

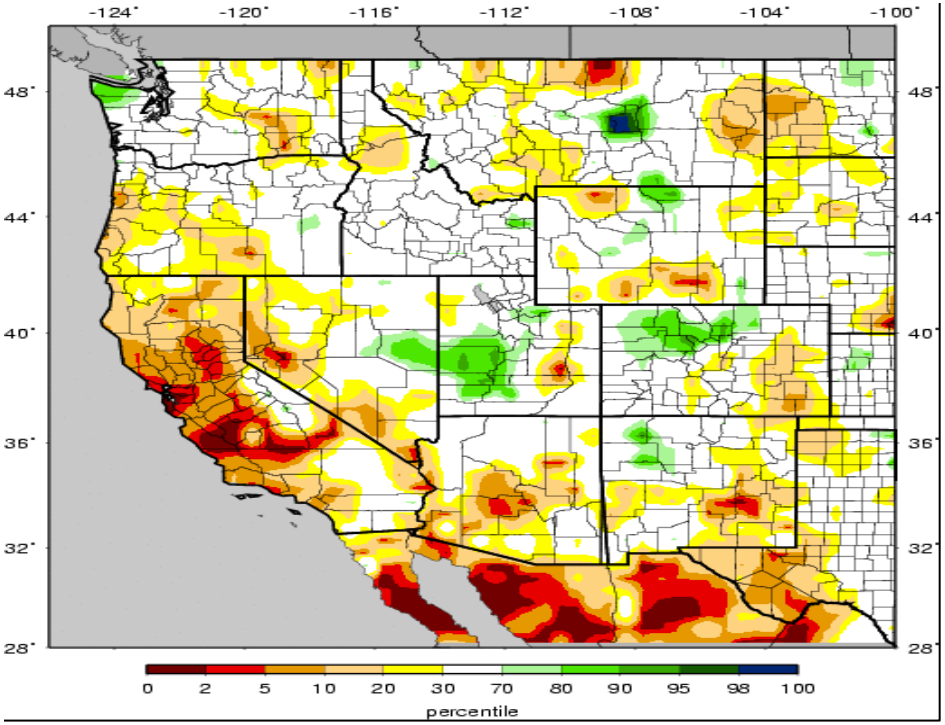


Fig. 7: VIC soil moisture percentiles as of March 4th.

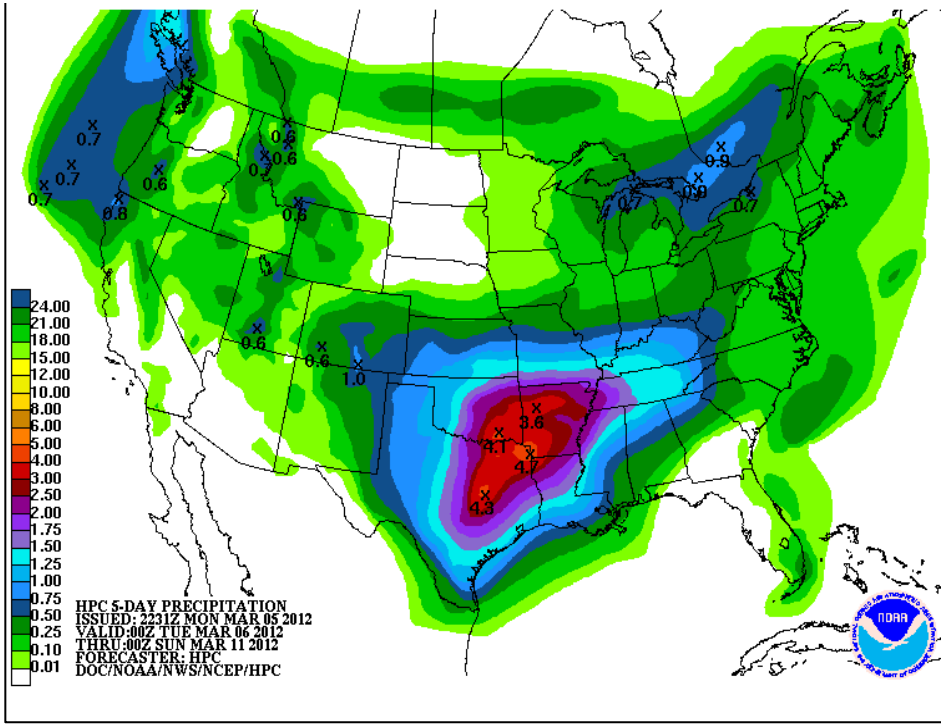
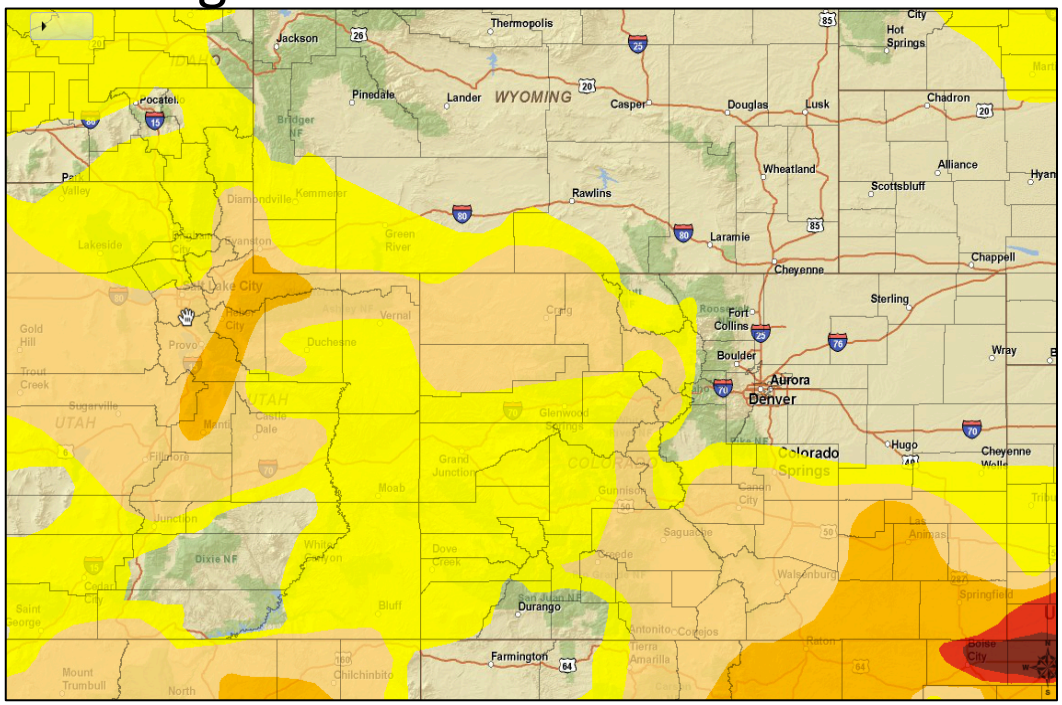


Fig. 8: HPC Quantitative Precipitation Forecast (QPF) through 0Z Sunday.

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: February 28th release of U.S. Drought Monitor for the UCRB

The current U.S. Drought Monitor (USDM) author has already made slight changes to the current USDM map for the UCRB (Fig. 9). The D2 along the Wasatch Range in UT has been expanded slightly westward. The D2 in northeast Arizona has also been expanded northward almost to the UT border. East of the basin, a D0 expansion in Kansas carried over slightly into the eastern portion of Kit Carson County in Colorado.

No other changes are recommended for the UCRB or the rest of Colorado for this week's USDM map.