NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

March 19, 2013

To be added to the mailing list, email: hreges@atmos.colostate.edu
View previous briefings: http://ccc.atmos.colostate.edu/drought_webinar.php
Register for the webinar: http://ccc.atmos.colostate.edu/drought_webinar_registration.php

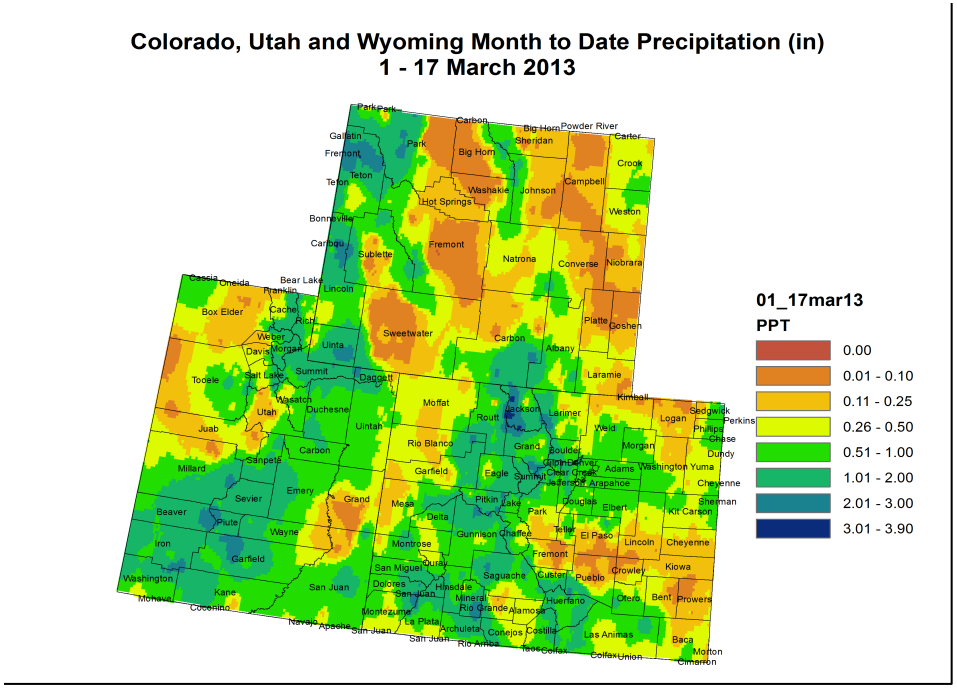


Fig. 1: March month-to-date precipitation in inches.

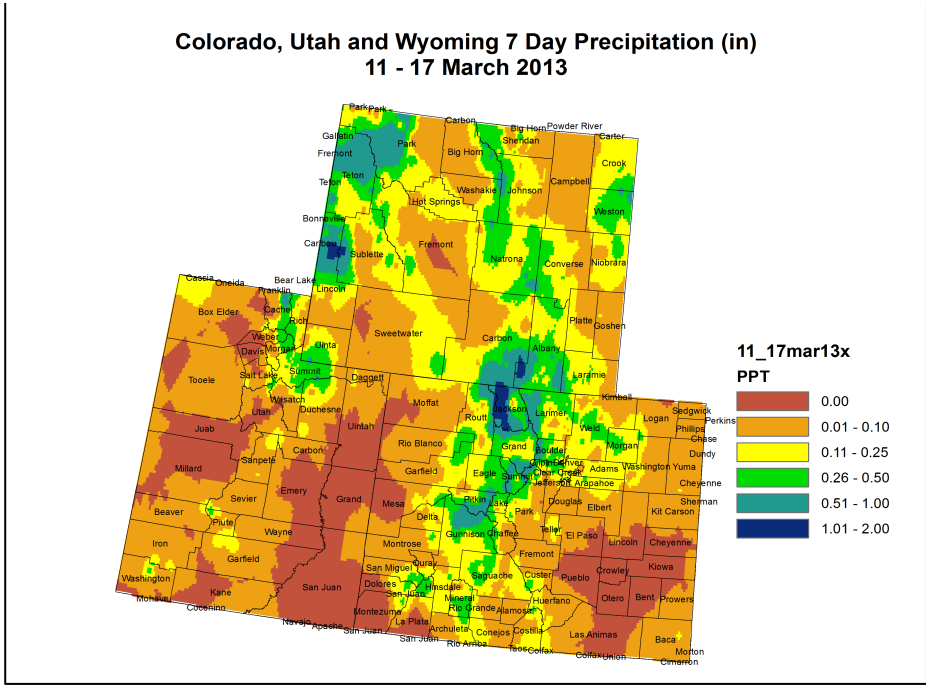


Fig. 2: March 11 – 17 precipitation in inches.

Precipitation

Since the beginning of the month, most of the higher elevations in the Upper Colorado River Basin (UCRB) have received more than 1 inch of moisture (Fig. 1). Many of the lower elevation locations received have received between .5 and 1 inch month-to-date. A few locations, such as Sweetwater County, WY, northwest CO and parts of the Colorado River valley in eastern UT, have been a little drier, receiving less than .50 inches of precipitation. East of the basin, the wet mountains and Sangre de Cristos in southern CO have received over .5 inches of moisture. The Front Range urban corridor, extending east into the plains, have also received over .5 inches. The Arkansas valley region and far northeast CO have been drier, receiving less than .5 inches in most locations.

Last week, the heaviest concentration of precipitation was in northern CO, around the North Park region, seeing more than .50 inches (Fig. 2). Some spotty locations in the central and southern CO mountains, in northeast UT, and far western WY received between .26 and 1 inch of moisture last week. The majority of the basin and the majority of eastern CO received less than .10 inches, with some areas receiving no precipitation last week.

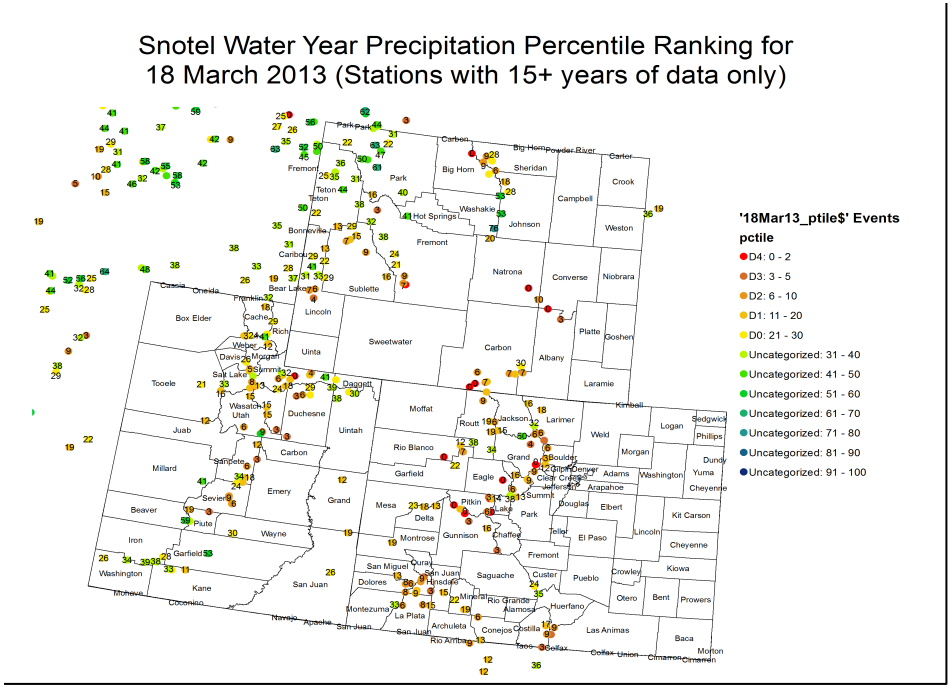


Fig. 3: WYTD SNOTEL precipitation percentiles (50th percentile is median, 30th percentile is D0 drought category) as of March 18th.

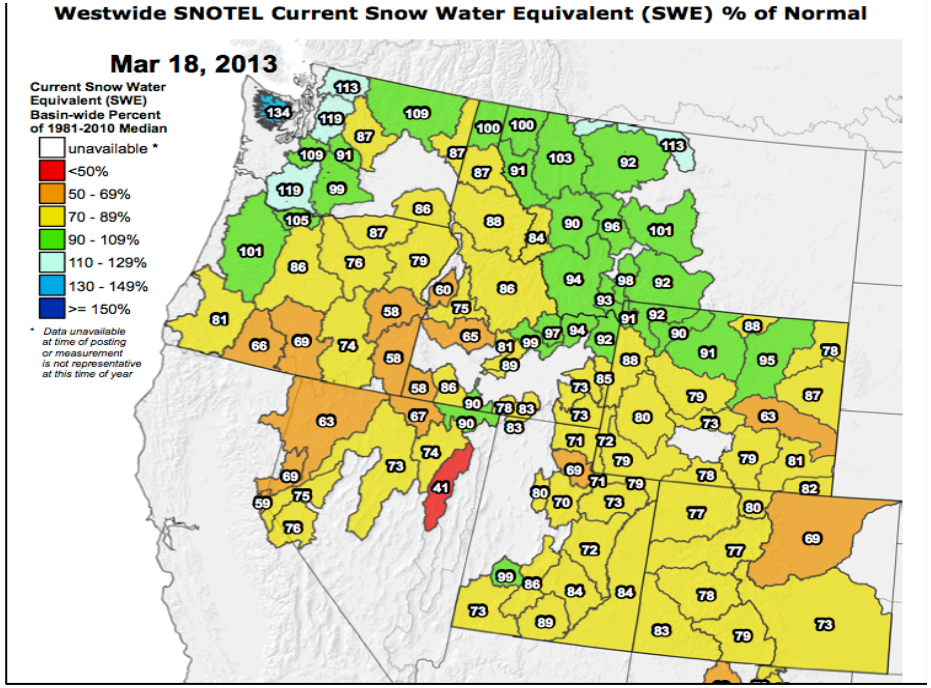


Fig. 4: Basin-averagd snow water equivalent as a percent of normal (median), as of March 18th.

Snowpack

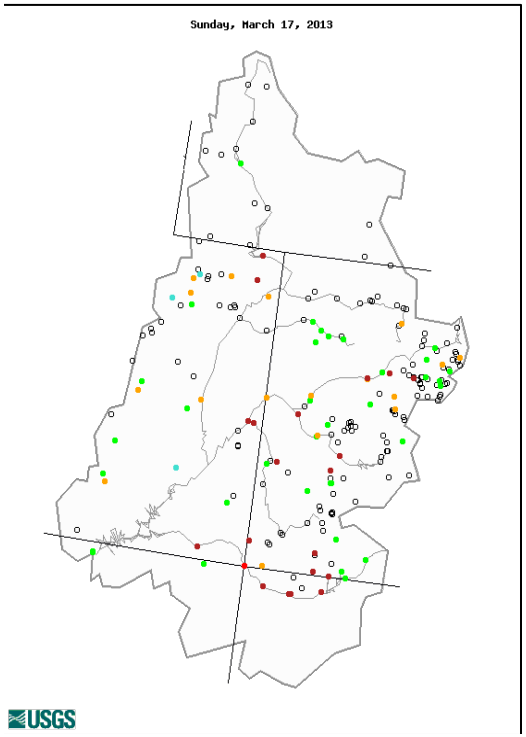
Water-year-to-date SNOTEL precipitation percentiles in the UCRB are below the median throughout the entire basin (Fig. 3). Along the Wasatch and Uintah ranges in UT and up to the Upper Green in WY, most percentiles range from the teens to 30s, with a few that are now recording below the 10th percentile. The northern and central CO mountains are below the 20th percentile at most locations, with several sites recording below the 5th percentile. Percentile rankings in southwest CO in the San Juan mountains are mostly in the teens and single digits.

Accumulated snowpack is currently less than normal across the entire UCRB (Fig. 4), and most of the sub-basins saw a slight decrease in percent of normal from last week. Sub-basins in western CO range between 77% to 83% of normal snowpack. Southern UT basins are over 80% of normal while snowpack in the sub-basins of northern UT and southwest WY range between 70% and 80% of normal.

Streamflow

As of March 17th, about 49% of the USGS streamgages in the UCRB recorded normal (25th – 75th percentile) to above normal 7-day average streamflows (Fig. 5), an increase from 38% last week. This increase is likely due to warmer temperatures and melting. About 29% percent of the gages in the basin are recording much below normal or low (i.e. lowest on record) streamflows, and only 3 gages are reporting above normal flows. 76 gages are now reporting again (out of frozen conditions), an increase from 45 gages one month ago.

Flows on the three key gages around the basin have seen variable conditions this past week (Fig. 6). Flows on the Colorado River near the CO-UT state line stayed near steady with below normal flows at the 15th percentile. The Green River at Green River, UT site saw a large increase in flows last week and is now recording in the below normal range at the 21st percentile. The San Juan River near Bluff, UT saw a slight drop in flows over the past week and is reporting in the much below normal range at the 5th percentile.



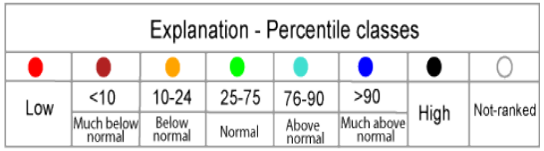


Fig. 5: 7-day average discharge compared to historical discharge for March 17th.

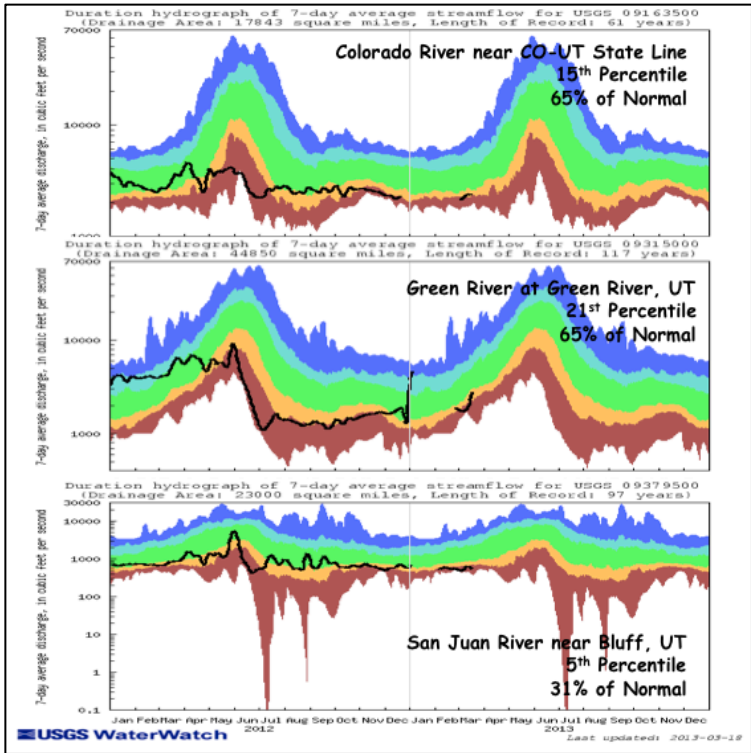


Fig. 6: USGS 7-day average discharge over time at the CO-UT stateline (top), Green River, UT (middle) and Bluff, UT (bottom).

Water Supply and Demand

Last week, the UCRB experienced warmer than average temperatures with the northern and western fringes seeing temperatures 6 to 9 degrees greater than average. East of the basin, the rest of CO also saw warmer than average temperatures ranging from near average to 6 degrees above average. The VIC soil moisture model continues to show dry soils through most of WY with near normal soil moisture in far southwest WY (Fig. 7). A large improvement in soil moisture is showing up over northeast UT and western CO, but this is likely only due to warmer temperatures causing snow to melt and infiltrate the soils in the model. When SWE is combined with soil moisture, lower percentiles still show up (Fig. 7). Dry soils below the 10th percentile show up over most of southern and eastern CO.

Last month, most of the major reservoirs in the UCRB saw slight decreases in volume, which is normal for this time of year. Blue Mesa has stayed near steady for most of the calendar year though it usually decreases this time of year. McPhee decreased in volume, though it normally increases slightly in February. Lake Granby saw large volume decreases last month. Flaming Gorge is the only major reservoir near its March average, while the rest of the reservoirs range between 51% (Lake Granby) and 89% (Green Mountain) of average.

Precipitation Forecast

An upper level ridge currently over the west coast will slowly migrate over the UCRB on Wednesday and lead to mostly dry conditions. The ridge will continue moving east on Wednesday and will allow the next trough to begin spreading moisture into the western part of the basin. Precipitation will become widespread on Wednesday evening with the potential for moderate to heavy snowfall across the high mountains of central and southern CO through the day Thursday. Expect precipitation amounts to be limited by the quick movement of the system, with most valley areas receiving around 0.25 inches of liquid accumulation through Friday morning. The exception to this may be in the mountain ranges of central/southern CO where liquid accumulations of 0.50 to 1.00 inches will be possible before the storm begins to move out (Fig. 8). This storm will be quickly followed by yet another strong trough dropping in from the northwest through the day on Saturday. Moisture with this feature appears to be more limited, however anticipate unsettled weather to persist across the basin through the weekend and possibly into early next week, with low confidence in the placement and amount of precipitation expected.

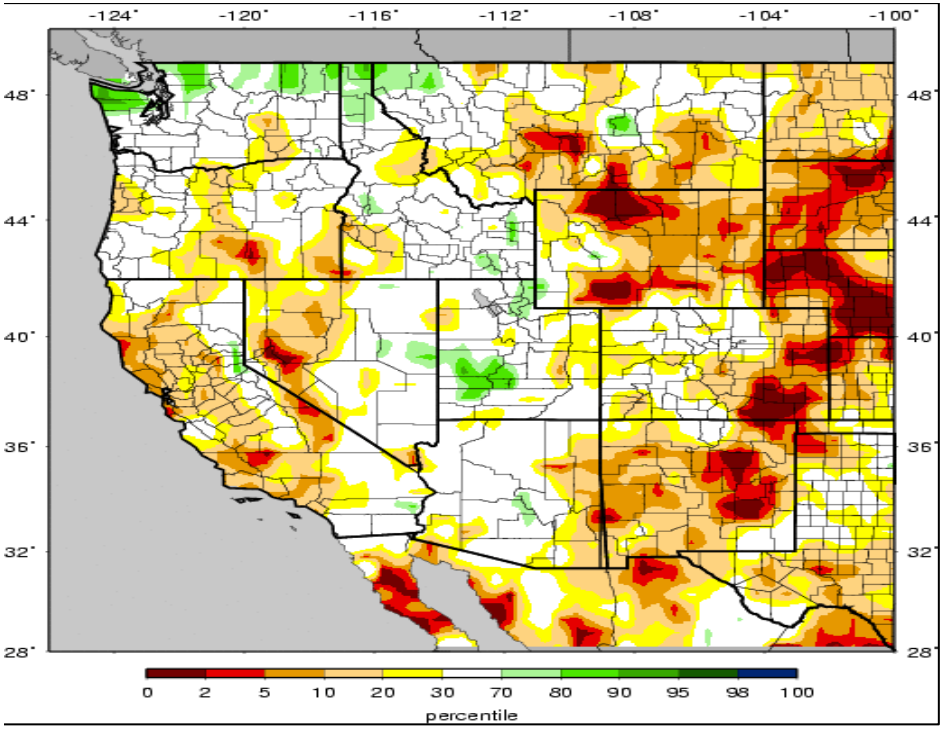
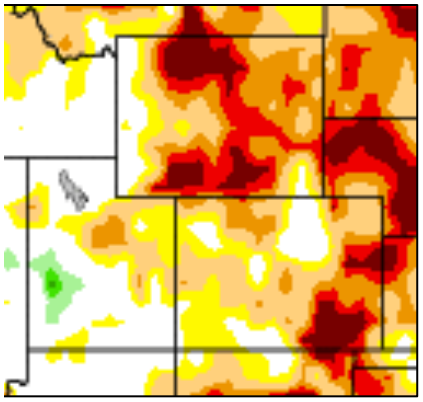


Fig. 7: VIC modeled soil moisture percentiles for the western U.S. as of March 17th. The map below combines soil moisture and SWE.



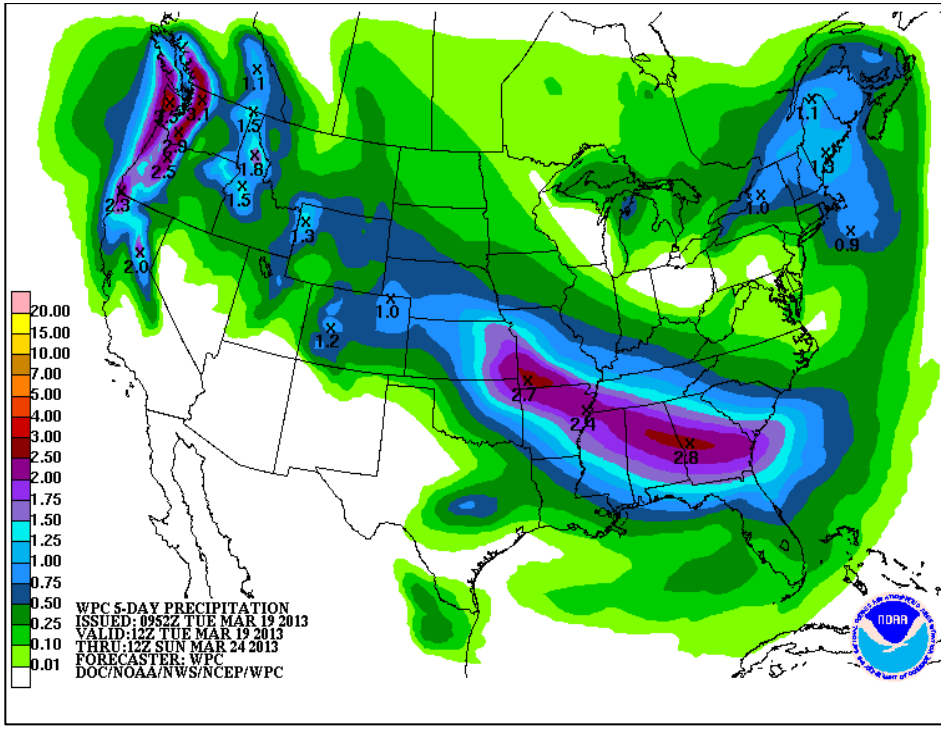
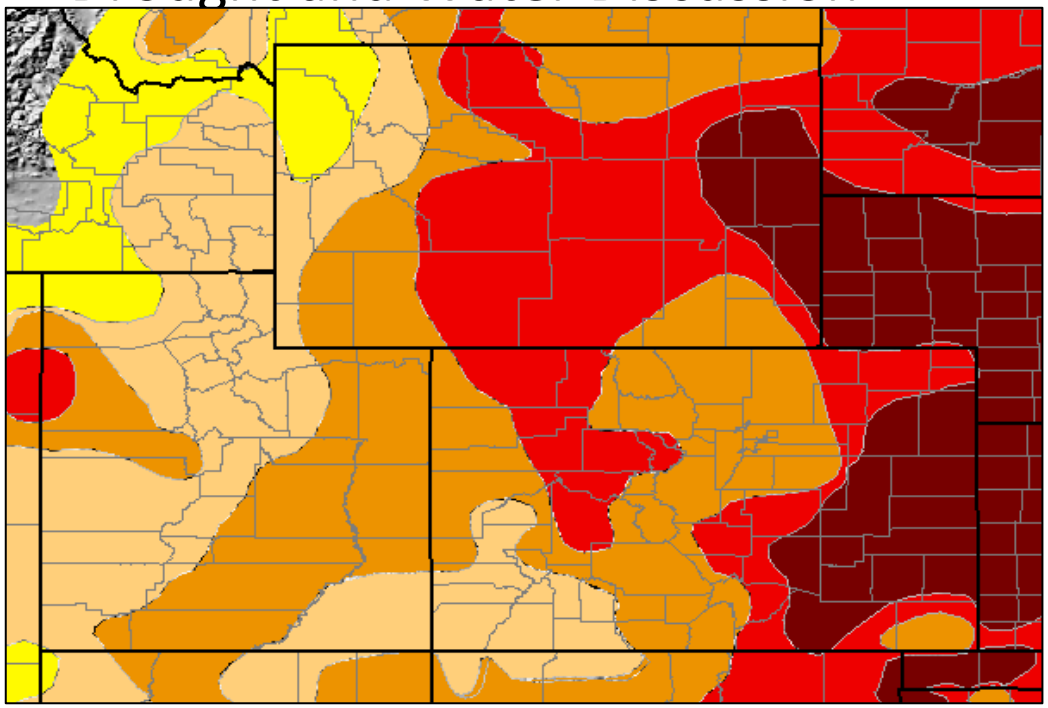
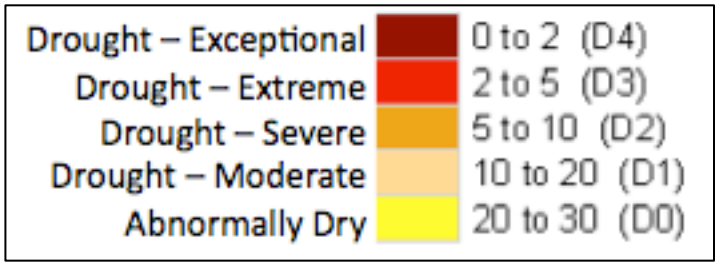


Fig. 8: Quantitative precipitation forecast (QPF) by the Hydrologic Prediction Center out to 12UTC Sunday.

Drought and Water Discussion





Drought categories and
their associated percentiles

Fig. 9: March 12th release of U.S. Drought Monitor for the UCRB.

UCRB: Status quo is recommended for the UCRB in the current depiction of the U.S. Drought Monitor (USDM) map (Fig. 9). Much of the basin will be closely monitored over the next couple of weeks, as this is a critical time for snowpack—low accumulations and warm temperatures could lead to quickly deteriorating drought conditions, but colder temperatures and continued accumulations could help minimize the impacts. Status quo will be recommended until the timing of peak snowpack and melting is more clear.

Eastern CO: Status quo is also recommended for the rest of CO. There will likely be no winter wheat south of Kit Carson County, with fair to poor conditions (though the winter wheat is greening) to the north. Snow has been localized along the eastern plains, and the region is dealing with strong winds, warm temperatures, and blowing dust.