

NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

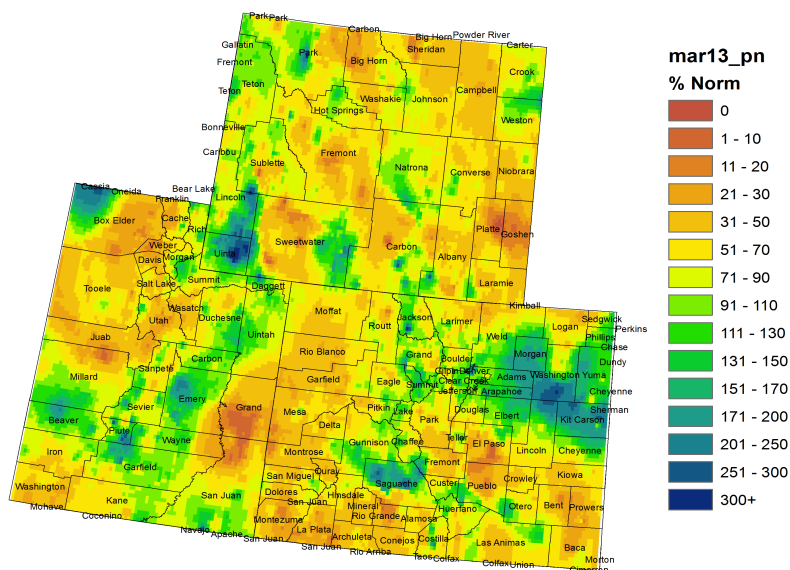
April 2, 2013

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Colorado, Utah and Wyoming March 2013 Precipitation as Percentage of Normal



Colorado, Utah and Wyoming 7 Day Precipitation (in) 25 - 31 March 2013

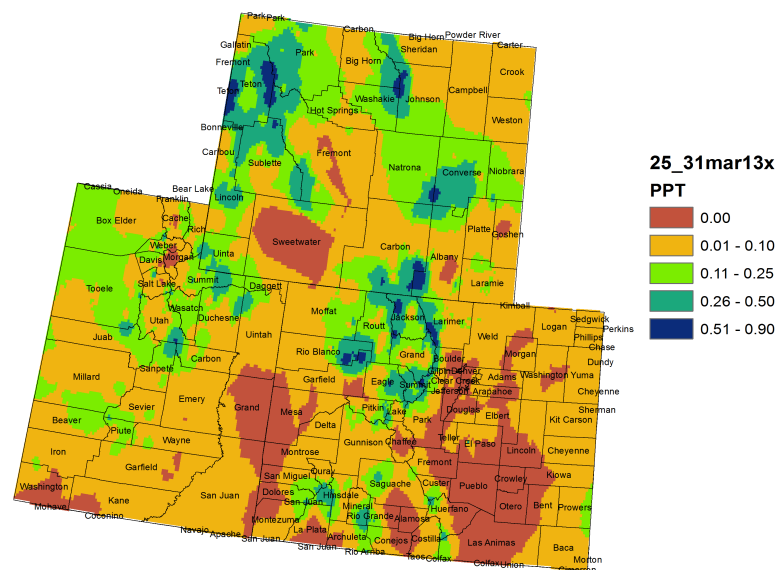


Fig. 1: March precipitation as a percent of average.

Fig. 2: March 25 – 31 precipitation in inches.

Precipitation

Last month, the majority of the Upper Colorado River Basin (UCRB) received below average precipitation (Fig. 1). Some areas of southwest Wyoming, eastern Utah and the northern and central Colorado mountains received near to slightly above average precipitation for the month of March. Sweetwater County, WY, western CO and the Colorado River valley in eastern UT were much drier, receiving less than 50% of average precipitation for the month. East of the basin, parts of the CO Front Range and northeast CO received above average precipitation while far northern CO and most of the Arkansas valley received below average precipitation last month.

Last week, most of the UCRB was relatively dry (Fig. 2). The northern CO higher elevations received more than .25 inches of moisture for the week and some spotty, isolated accumulations of .10 to .50 inches fell over the San Juans, the Wasatch range, and the Uintahs, and in the higher elevations in western WY. Most of the rest of the basin received less than .10 inches. East of the basin, most of eastern CO received less than .10 inches of moisture with a large region of southeast CO receiving no moisture for the week.

Snotel Water Year Precipitation Percentile Ranking for 1 April 2013 (Stations with 15+ years of data only)

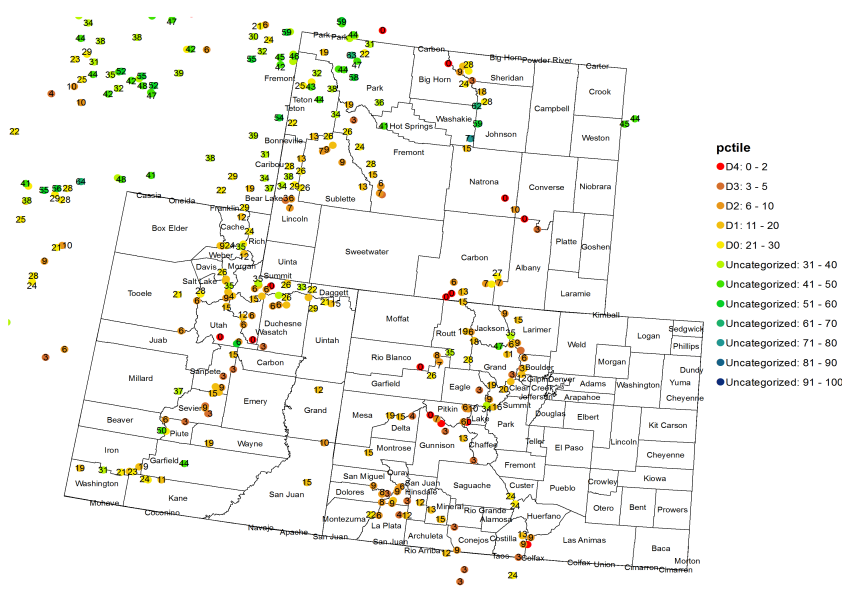


Fig. 3: WYTD SNOTEL precipitation percentiles (50th percentile is median, 30th percentile is D0 drought category) as of April 1st.

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 large decreases in percents of normal over the past week. Sub-basins in western CO range are between 72% and 81% of normal snowpack. Eastern UT basins are under 70% of normal while snowpack in the sub-basins of northern UT and southwest WY range between 70% and 80% of normal.

Westwide SNOTEL Current Snow Water Equivalent (SWE) % of Normal

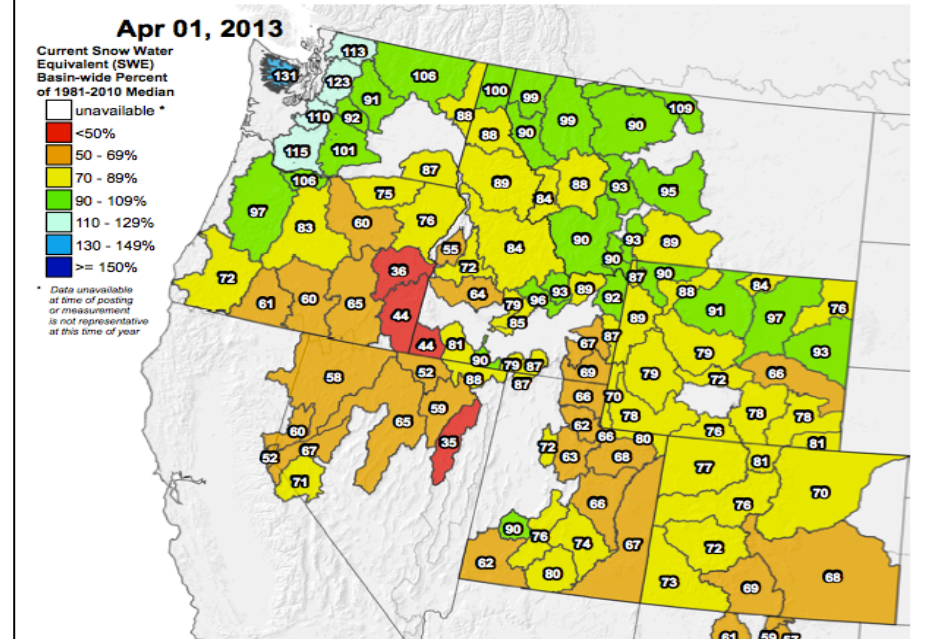
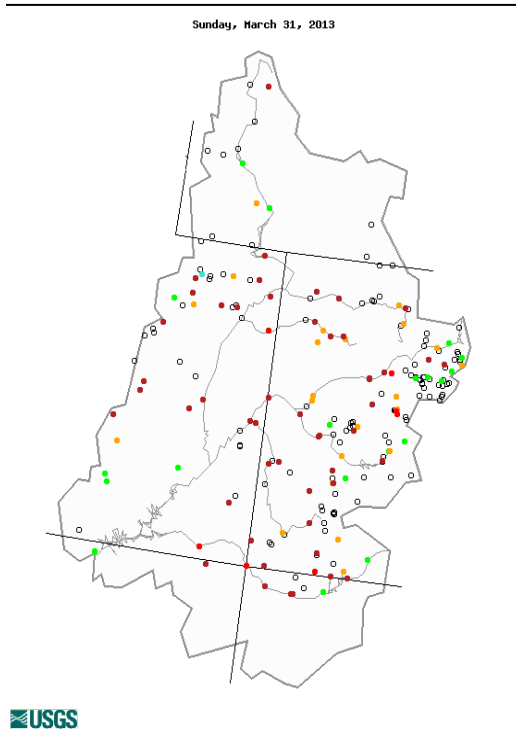


Fig. 4: Basin-averaged snow water equivalent as a percent of normal (median), as of April 1st.

Streamflow

As of March 31st, about 21% of the USGS streamgages in the UCRB recorded normal (25th – 75th percentile) to above normal 7-day average streamflows (Fig. 5), a decrease from 49% last week. This decrease is likely due to much cooler temperatures. About 57% percent of the gages in the basin are recording much below normal or low (i.e. lowest on record) streamflows, and only 1 gage is reporting above normal flows (and that is solely due to reservoir releases above that gage). Lower flows are a combination of extended drought and colder temperatures. 100 gages are now reporting again, an increase from 57 gages one month ago.

Flows on two of the three key gages around the basin saw large decreases in flow over the past week (Fig. 6). Flows on the Colorado River near the CO-UT state line and on the Green River at Green River, UT are in the much below normal range, falling from the 12th and 22nd percentiles, respectively, both to the 3rd percentile. The San Juan River near Bluff, UT has dropped to the 1st percentile, and is recording a new record low for the latest 7-day period for that site.



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: 7-day average discharge compared to historical discharge for March 31st.

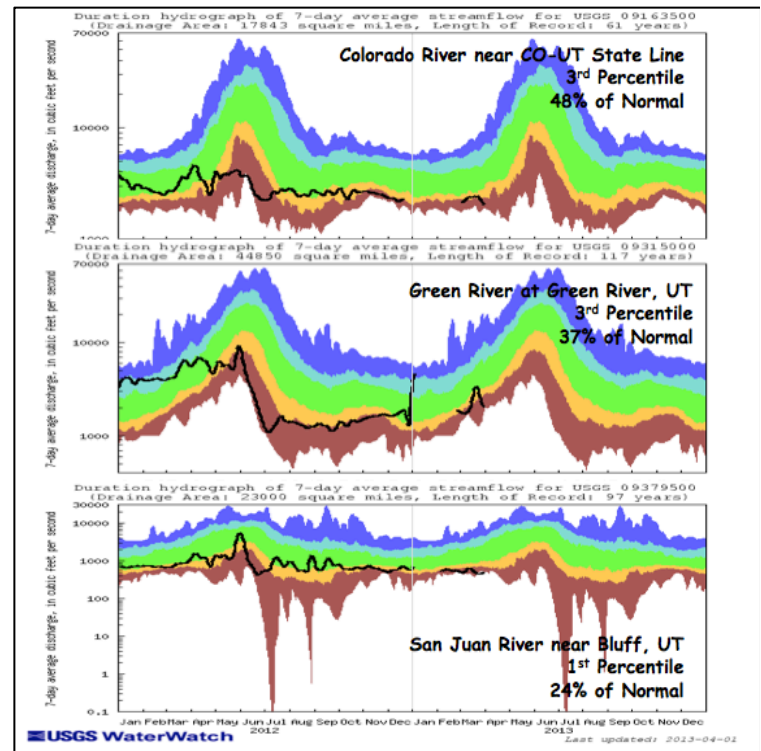


Fig. 6: USGS 7-day average discharge over time at the CO-UT stateline (top), Green River, UT (middle) and Bluff, UT (bottom).

Water Supply and Demand

Last week, the UCRB experienced temperatures very near average, with slightly cooler than average temperatures in the northern part of the basin and slightly warmer than average temperatures to the south. East of the basin, eastern CO saw cooler than average temperatures, ranging from near average to 10 degrees below 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). The VIC model is being largely controlled by temperature changes for much of the basin and showed a decline in soil moisture in the last couple weeks (due to colder temperatures). When SWE is combined with soil moisture, much lower percentiles show up for western CO and northeast UT (Fig. 7). Dry soils below the 10th percentile show up over most of southern, with some improvement showing up over northeast CO.

Last month, most of the major reservoirs in the UCRB saw volume decreases. Flaming Gorge and Blue Mesa saw slight volume increases, while Green Mountain has begun to see volume increases in the past couple of weeks. Lake Granby decreased by a larger percent than is normal. For the month of April, Flaming Gorge and Green Mountain are near average while the remaining reservoirs are all below average, ranging from 47% of average (Lake Granby) to 83% of average (Blue Mesa).

Precipitation Forecast

The UCRB is currently situated underneath a weakening low pressure system centered over Utah. This low center will slowly translate across the region through Wednesday and bring a continued chance of light precipitation in the 0.10 to 0.25 inch range through Wednesday (Fig. 8), which will quickly be followed by a ridge of high pressure building in from the southwest. Precipitation chances will remain low through the rest of the work week as the atmosphere dries out and temperatures gradually climb above normal. The next feature to affect the basin is set to arrive late on Friday, with showers and a few thunderstorms possible by early this weekend. Additional energy dropping in from the northwest will reinforce this initial disturbance and lead to the persistence of unsettled conditions through the weekend and into early next week. Precipitation amounts with these next features appears to be light at first, with the potential for more significant accumulations later in the extended period.

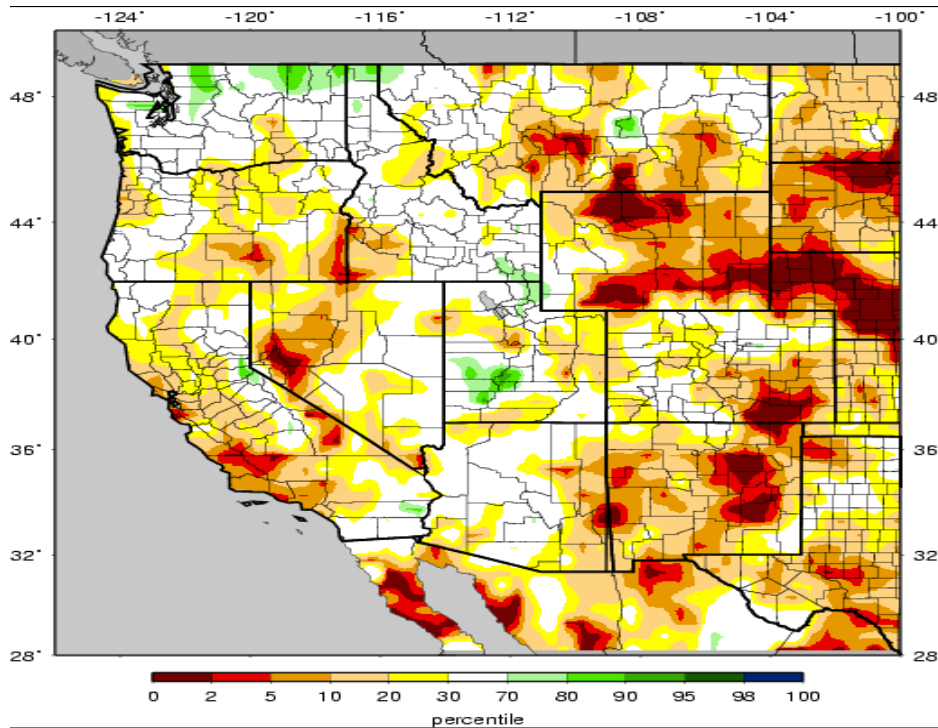


Fig. 7: VIC modeled soil moisture percentiles for the western U.S. as of March 31st. The map below combines soil moisture and SWE.

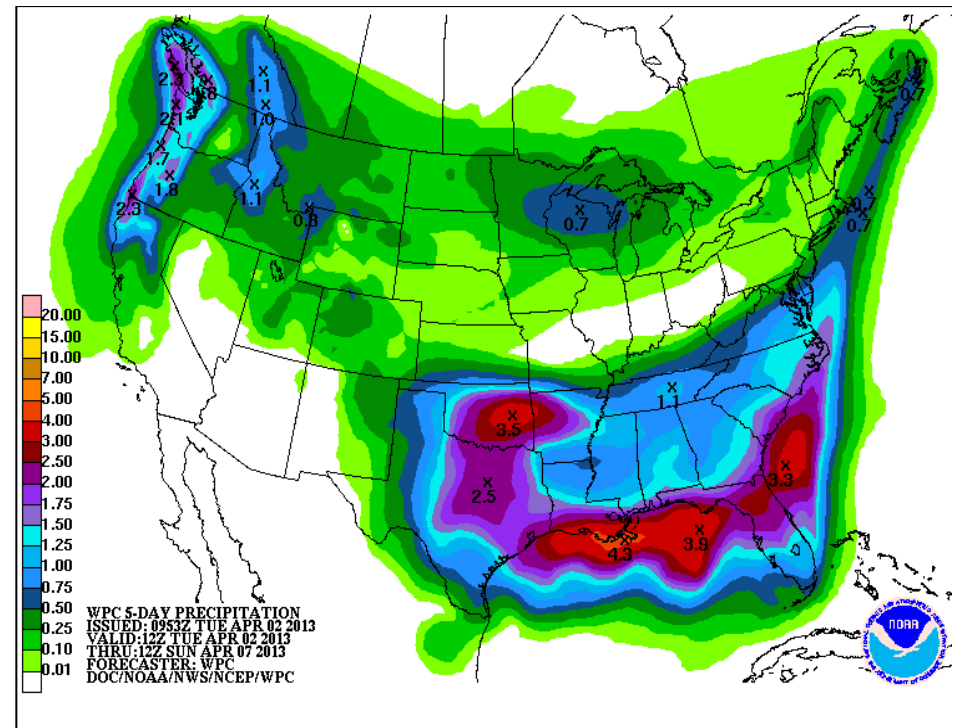
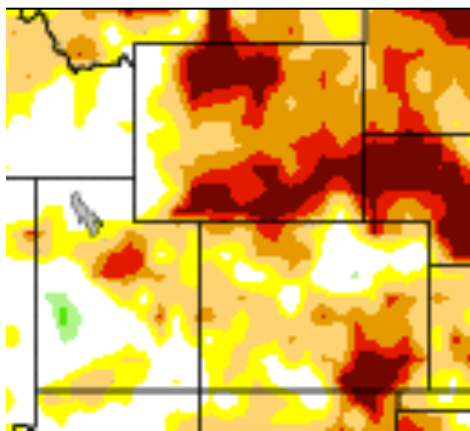


Fig. 8: Quantitative precipitation forecast (QPF) by the Hydrologic Prediction Center out to 12UTC Sunday.

Drought and Water Discussion

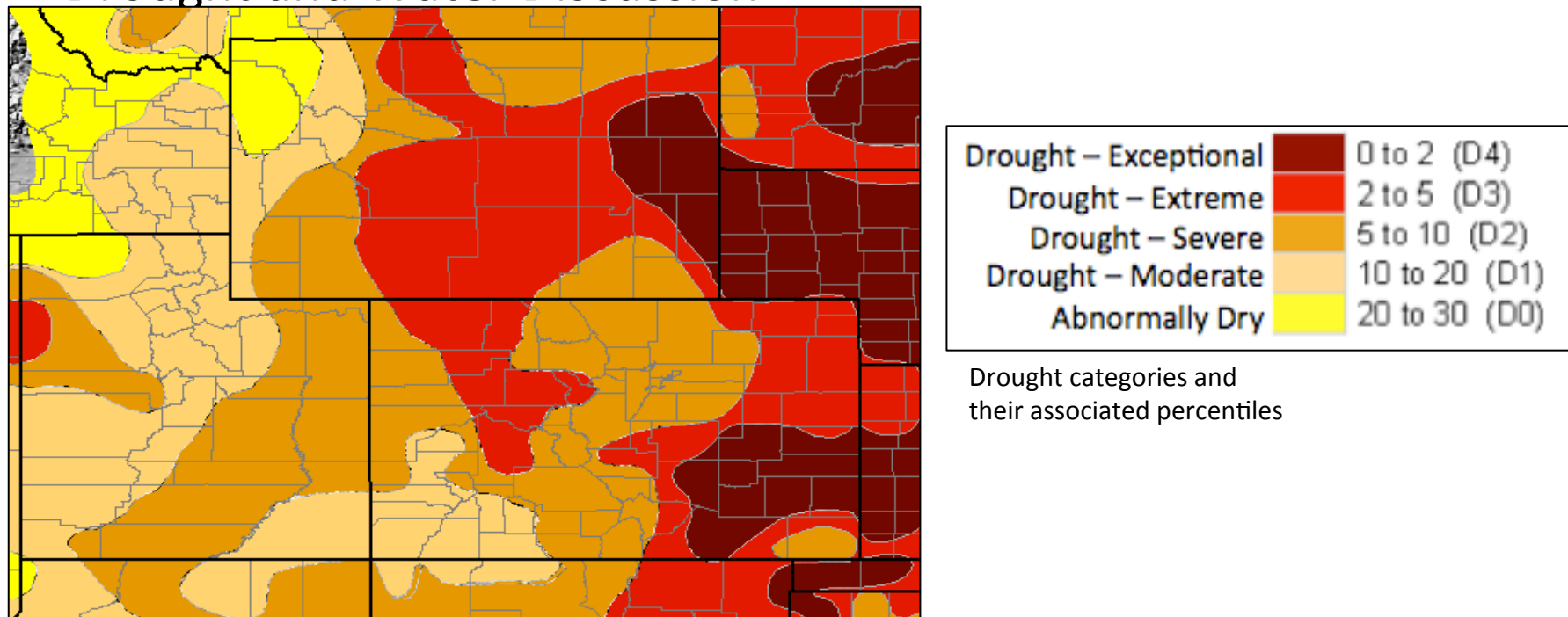


Fig. 9: March 26th release of U.S. Drought Monitor for the UCRB.

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 is closely being monitored, 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. Below average precipitation over the past month has exacerbated dry conditions, but temperatures have stayed near to below average, which has delayed most of the early melting. Status quo will be recommended until the timing of peak snowpack and melting is more clear.

Eastern CO: Status quo is recommended for the rest of CO.