# NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

February 28, 2012

# Precipitation and Snowpack

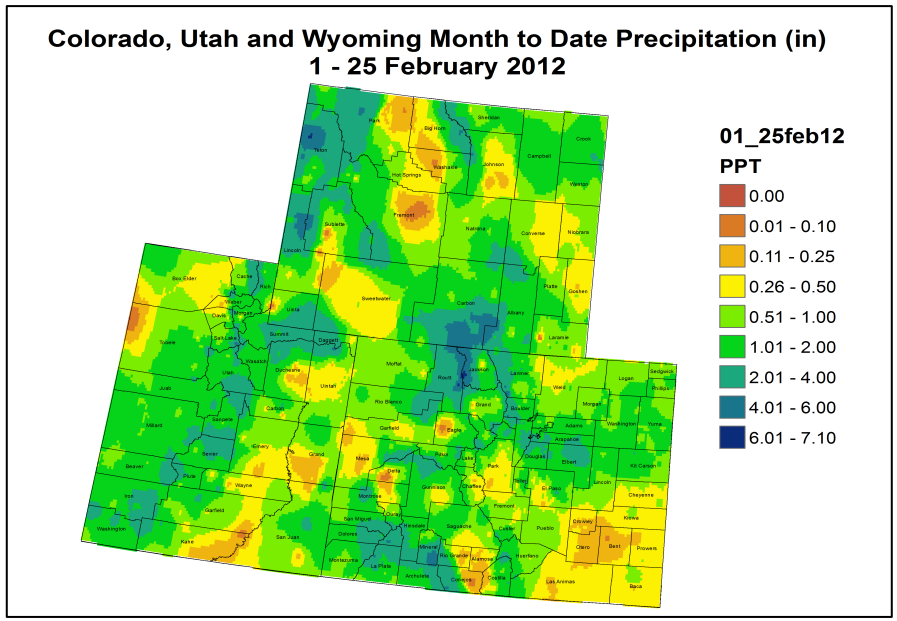



Fig. 1: February month-to-date precipitation in inches.

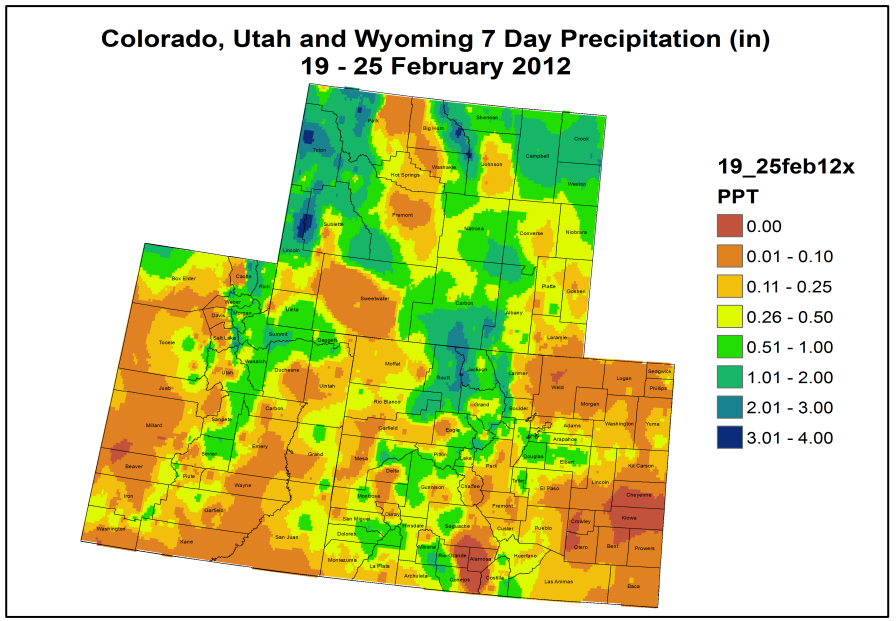



Fig. 2: February 19 – 25 precipitation in inches.

For the month of February so far, precipitation has favored the higher elevations of the Upper Colorado River Basin (UCRB, Fig. 1). Since the beginning of the month, the northern and central mountains of Colorado, the mountains of northeast Utah, and the San Juan mountains in southern CO have seen accumulations of around 2 to 4 inches, which is about average for this time of year. The lower elevations in southwest Wyoming and in eastern UT and western CO have been drier, with many areas receiving less than half an inch for the month. East of the basin, northeast CO has received between half an inch to 2 inches of moisture, while southeast CO and the San Luis Valley have received less than half an inch.

Last week, precipitation accumulations again favored the higher elevations with the Wasatch mountains in UT, the northern fringe of the basin in WY, and the northern mountains of CO receiving between half an inch to 2 inches of moisture (Fig. 2). The lower elevations and the southern part of the basin were drier, with some spotty totals between half an inch and an inch, but most areas seeing less than half an inch. Eastern CO was also relatively drier, with accumulations of less than a quarter inch in most areas for the week.

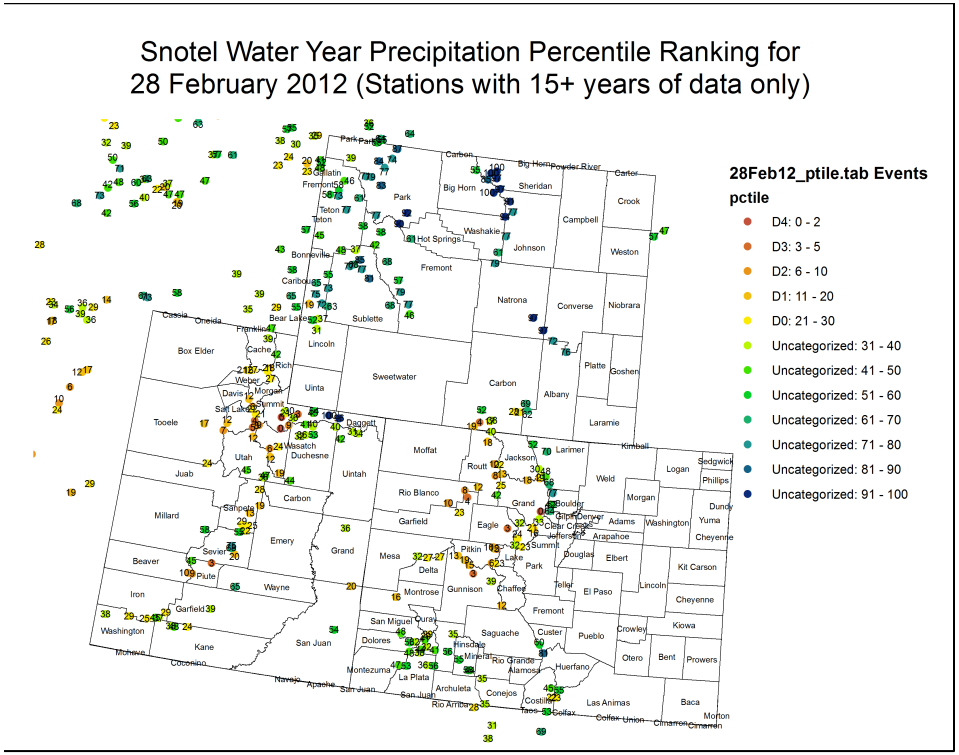



Fig. 3: SNOTEL WYTD precipitation percentiles (50% is median, 21 – 30% is Drought Monitor D0 category).

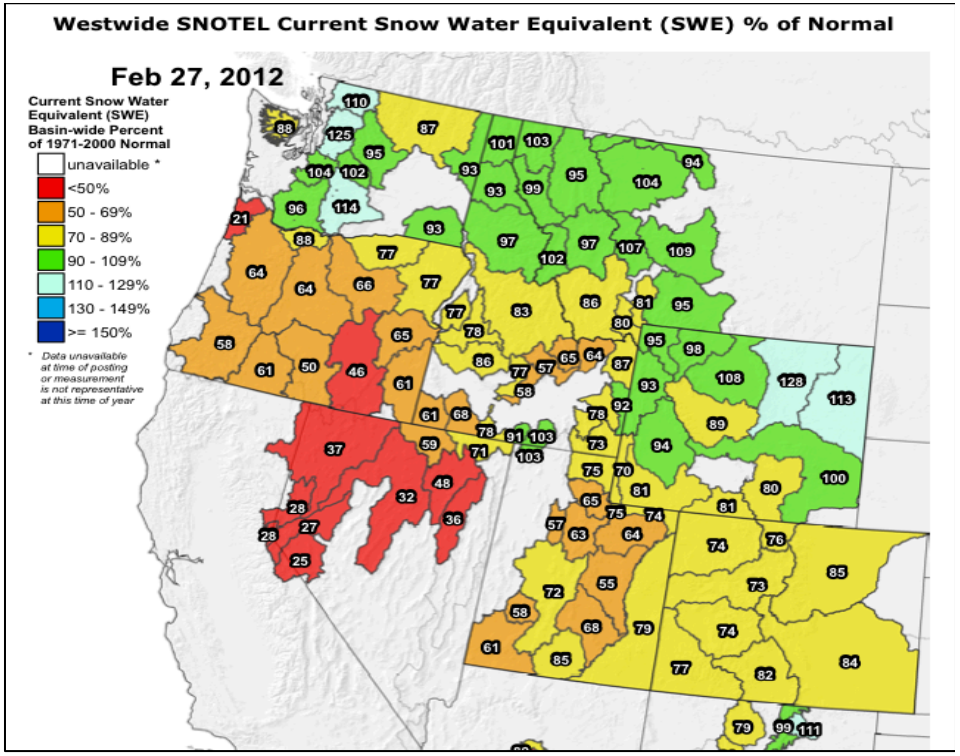



Fig. 4: Basin snow water equivalent (SWE) as a percent of average.

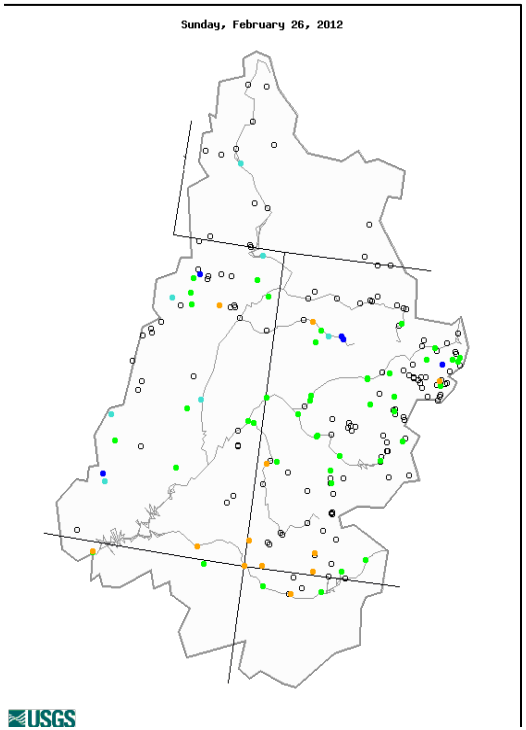
Water-year-to-date (WYTD), SNOTEL precipitation percentiles are low for much of the Yampa and Colorado headwaters basins, and along the Wasatch range in UT (Fig. 3). Percentiles in those areas range from the single digits to around the 20$^{th}$ percentile, with deterioration seen around the Wasatch mountains and some improvements in the Yampa basin this past week. The Gunnison basin is also dry, recording between the 20$^{th}$ and 30$^{th}$ percentiles. SNOTEL percentiles in the Upper Green basin in WY are generally above the 50$^{th}$ percentile, and most in the San Juan basin in southern CO are near the 50$^{th}$ percentile.

Snowpack conditions around the UCRB are all below normal (Fig. 4) with most of the sub-basins recording 80% of average or less for snowpack. The sub-basins in western CO, southwest WY, and eastern UT are showing snowpack values around 75% of average, while some areas in northeast UT are drier, with less than 70% of average snowpack. The northern part of the basin, in WY, is currently over 90% of average for snowpack.

# Streamflow

As of February 26th, 81% of the USGS streamgages in the UCRB recorded normal (25th – 75th percentile) or above normal 7-day average streamflows (Fig. 5). About 17% of the gages in the basin are recording above normal flows, while about 18% 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 over 65 in the past couple weeks, indicating warmer temperatures causing some early season melting. There are currently 12 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 and are now recording at the low end of the normal range at the 30th percentile. The San Juan River near Bluff, UT is now recording below normal flows at the 19th percentile. The Green River near Green River, UT is recording above normal flows at the 77th percentile, though flows there have also dropped.



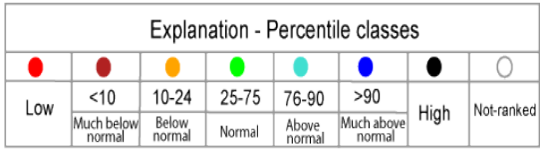




Fig. 5: 7-day average discharge compared to historical discharge for February 26th.

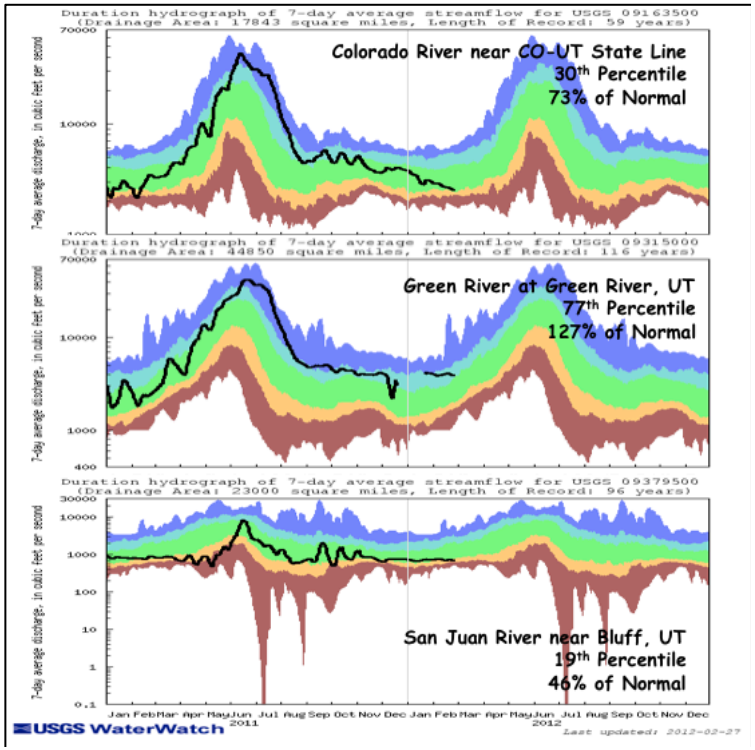



Fig. 6: USGS 7-day average discharge over time at the CO-UT stateline (top), Green River, UT (middle) and Bluff, UT (bottom).

# Water Supply and Demand

Much of the UCRB cooler than average temperatures last week, with some areas in northeast UT and southwest WY experiencing warmer than average temperatures. Since the beginning of the month, much of the northern part of the basin has experienced temperatures 2 to 8 degrees warmer than average. 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.

All of the major reservoirs above Lake Powell are above their February averages. Most reservoirs saw storage decreases in January, which is normal for this time of year. However, some showed decreases less than what is normal for this time of year. In February, Lake Powell, Navajo, and McPhee have seen very minor decreases while Dillon has increased slightly. Lake Powell is currently at 85% of average and 64% of capacity (compared to 56% one year ago).

# Precipitation Forecast

A potent winter storm currently impacting the UCRB will begin to eject northeastward through Tuesday evening, but not before bringing a decent round of snowfall to the majority of the basin. Most of the heavy precipitation should end with the passage of this feature; however, brisk westerly flow on the backside of this system should keep snow showers going over high mountain areas until the next storm begins to move into the basin on Thursday. Snowfall amounts with this next strong storm will be tempered by its quick movement across the region. The mountains of central CO will benefit the most from this series of storms, where liquid accumulations of up to 1.50 inches could fall by Friday (Fig. 8). Elsewhere, expect amounts of around 1.00 inches of liquid along high mountan areas with valley locations receiving around 0.50 inches. Ridging will move into the region for the weekend with light snow showers lingering over the northern mountains through Friday. The next chance of precipitation will hold off until next week as another Pacific storm approaches the west coast.

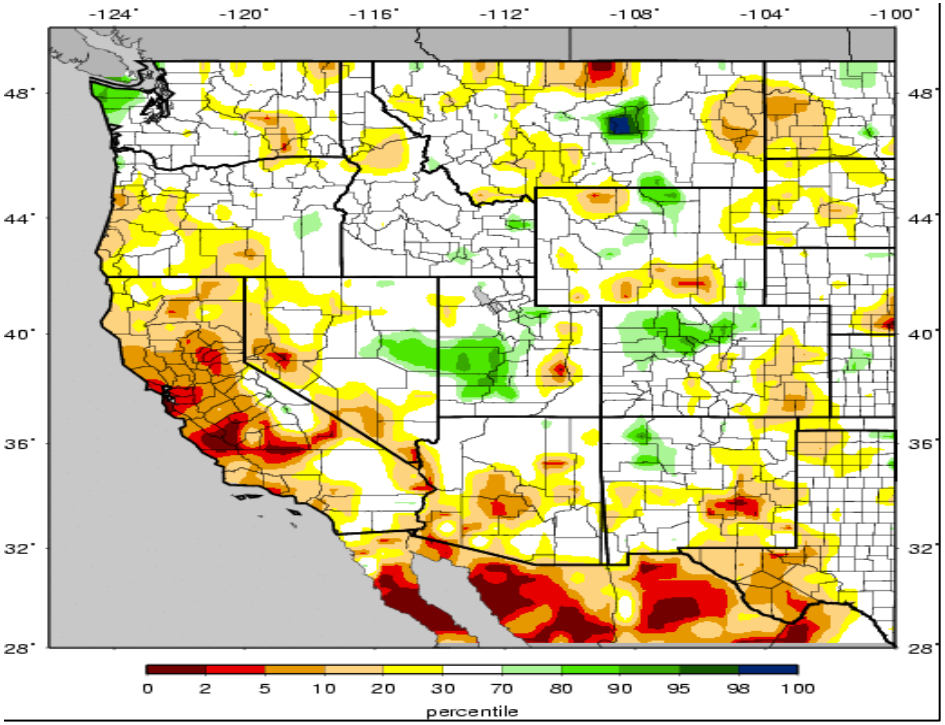



Fig. 7: VIC soil moisture percentiles as of February 26th.

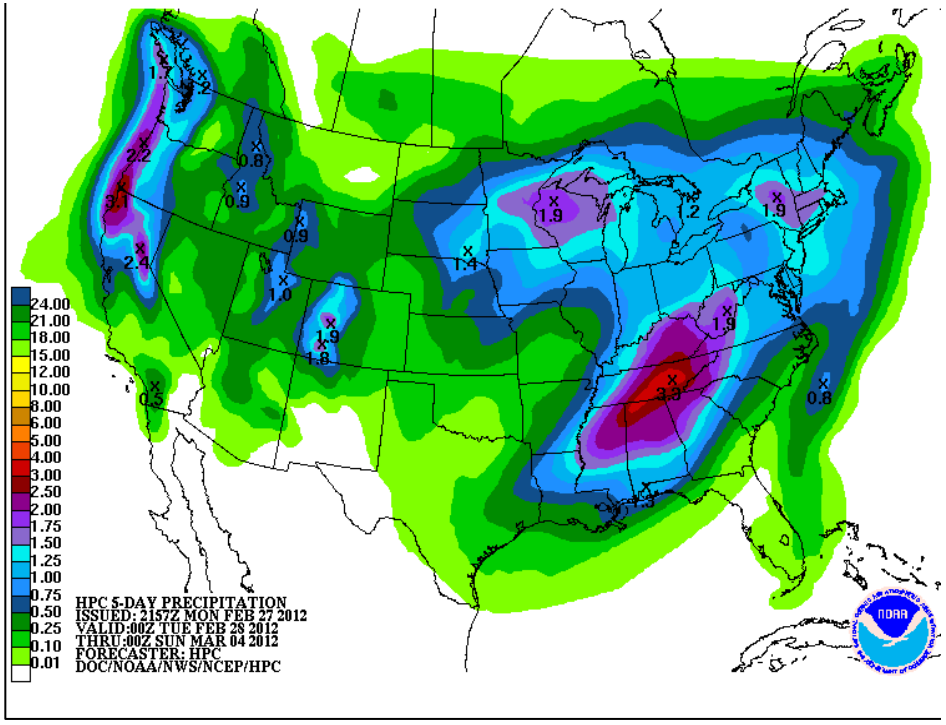



Fig. 8: HPC Quantitative Precipitation Forecast (QPF) through 0Z Sunday.

# Drought and Water Discussion

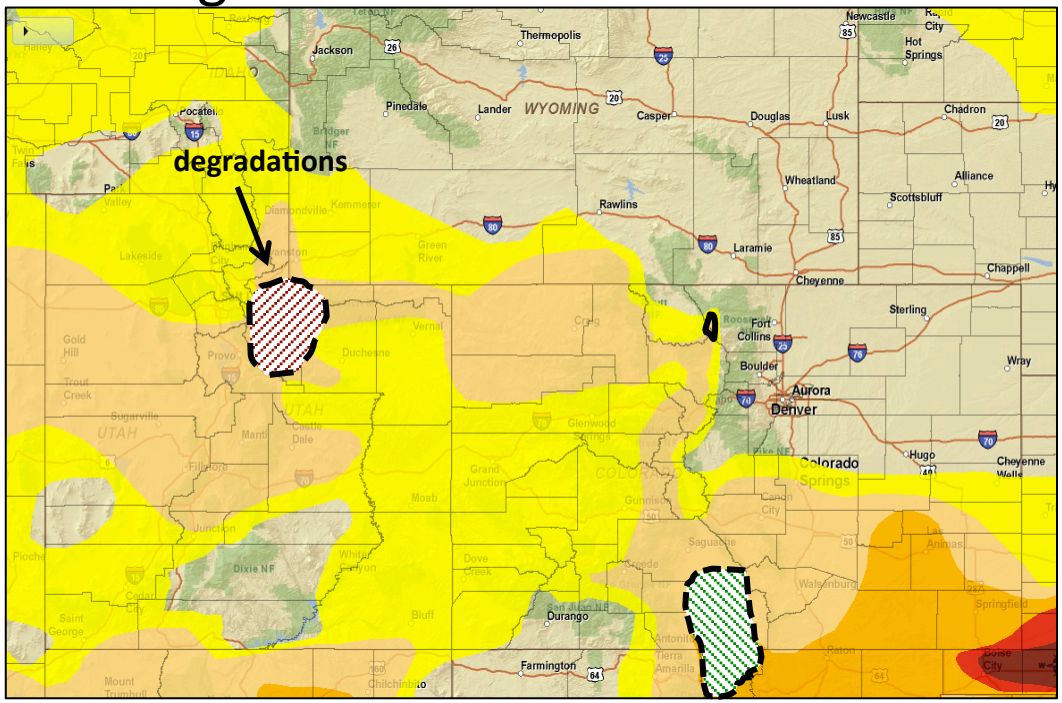
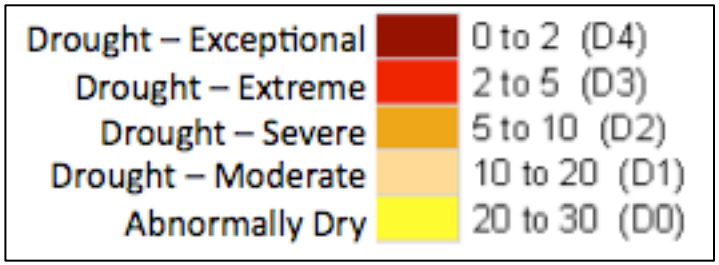



Fig. 9: February 21st release of U.S. Drought Monitor for the UCRB




Drought categories and
their associated percentiles

A couple of changes are recommended to the current depiction of the U.S. Drought Monitor (USDM) map (Fig. 9). With near average precipitation in the higher elevations of CO for the month, and some decent accumulations as of this morning in some of the lower elevations, status quo is recommended for the eastern and southern portions of the UCRB. However, one minor extension of the D1 in western Larimer County seems erroneous, so can be removed (Fig. 9, solid black). On the western edge of the UCRB, conditions are still extremely poor in the Wasatch Mountains, even with recent precipitation (that has only been near or slightly below average). Therefore, we defer to the USDM author on any degradations that may be justified in the area (Fig. 9, red hatched area).

East of the basin, the USDM author has removed D2 from the San Luis Valley (Fig. 9, green hatched area), mainly due to observed improvements in New Mexico. Status quo is recommended for the rest of southeast CO.