NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

February 12, 2013

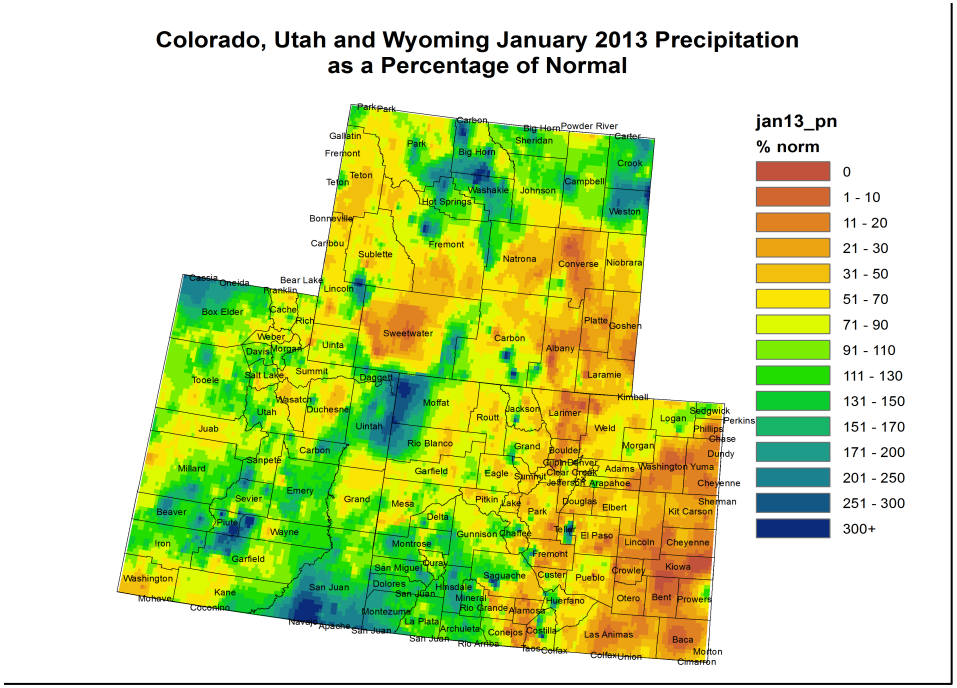


Fig. 1: January precipitation as a percent of average.

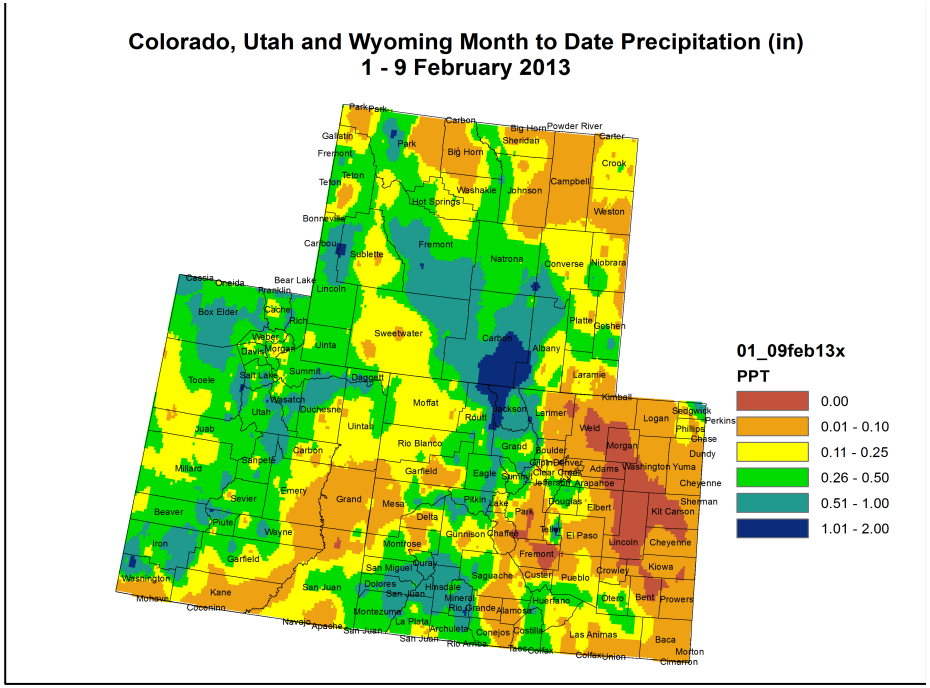


Fig. 2: February 1 – 9 precipitation in inches.

Precipitation

For the month of January, precipitation around the Upper Colorado River Basin (UCRB) ranged between 30% to over 200% of average (Fig. 1). The southern portion of the basin fared the best, with most of southeast Utah and southwest Colorado receiving between 100% and 300% of average for the month. The northern and central mountains of CO were a bit drier, around 50% to 90% of average, and Wyoming was also a bit drier, with Sweetwater County receiving less than 50% of average last month. East of the basin, eastern CO was ver dry, with most areas receiving between 10% to 70% of average.

Since the beginning of February, much of the higher elevations of the UCRB have received beneficial moisture (Fig. 2). The San Juan mountains in southwest CO, and the Wasatch and Uintah ranges in UT have received between .25 and 1.00 inches of precipitation. The northern CO mountains have received between .25 and 2.00 inches of moisture. The lower elevations in the UCRB mostly saw less than .25 inches. The eastern CO lower elevations have remained relatively dry since the beginning of the month, receiving less than .10 inches in most places.

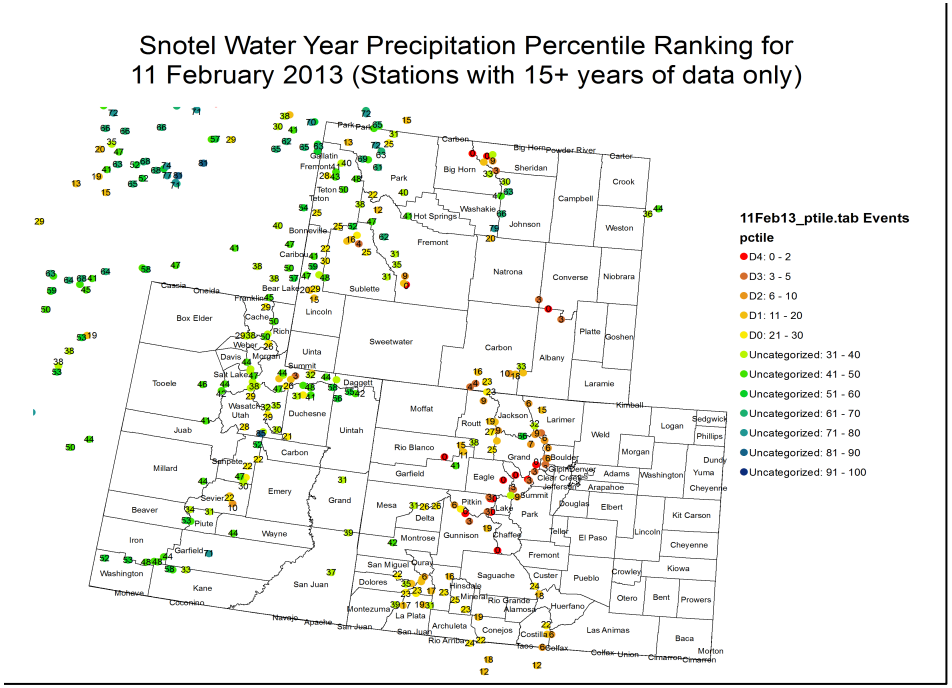


Fig. 3: WYTD SNOTEL precipitation percentiles (50th percentile is median, 30th percentile is D0 drought category) as of February 11th.

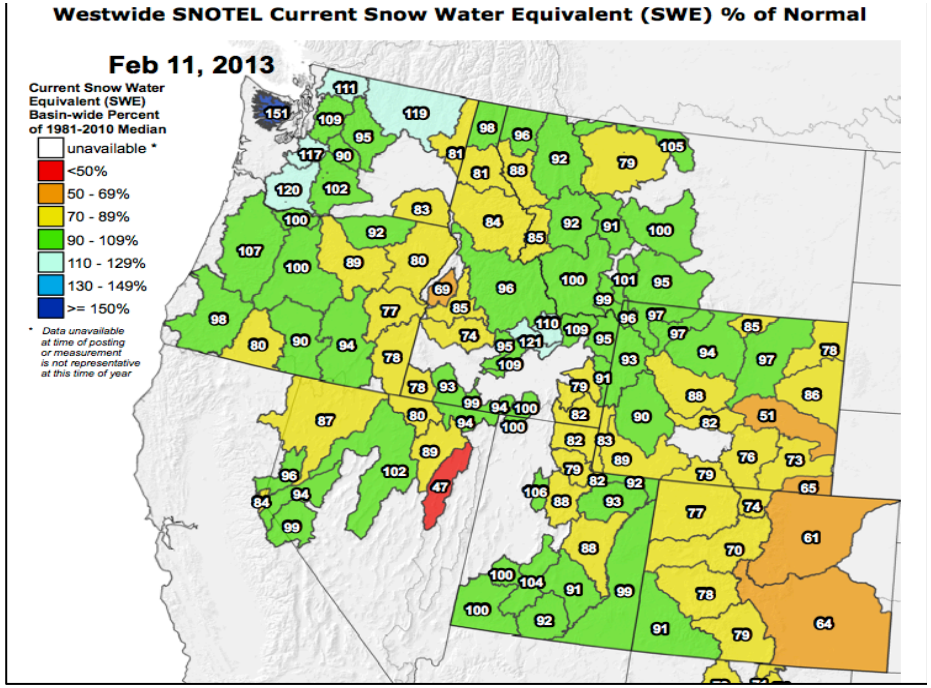


Fig. 4: Basin-averagd snow water equivalent as a percent of normal (median), as of February 11th.

Snowpack

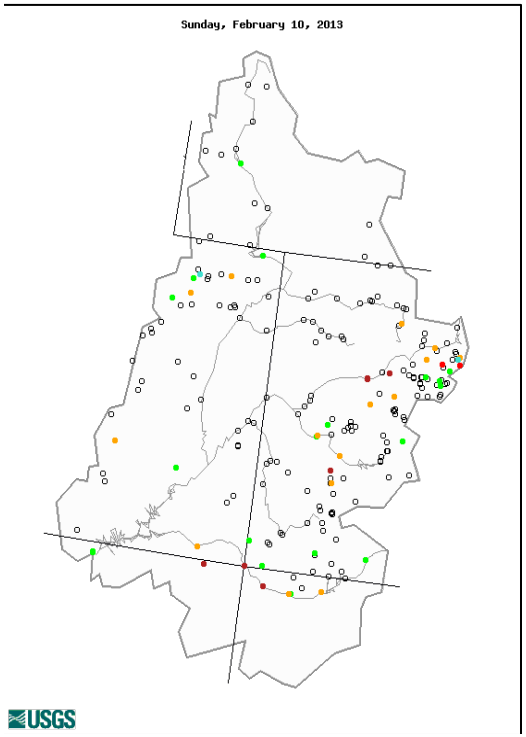
Water-year-to-date SNOTEL precipitation percentiles in the UCRB are closer to the median on the west side of the basin and much lower on the east side of the basin (Fig. 3). Along the Wasatch and Uintah ranges in UT, most percentiles range from 30 to 55, with some slightly lower percentiles in the Upper Green River basin in southwest WY. The northern and central CO mountains are showing precipitation 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 to 20s.

Accumulated snowpack is currently less than normal on the east side of the UCRB and near normal on the west side of the basin (Fig. 4). Sub-basins in western CO have increased in the past two weeks to 70% - 91% of normal snowpack. The San Juan basin at the Four Corners has seen the biggest improvement in the past two weeks. Northeast UT and southwest WY basins are around 90% - 100% of normal snowpack.

Streamflow

As of February 10th, about 46% of the USGS streamgages in the UCRB recorded normal (25th – 75th percentile) to above normal 7-day average streamflows (Fig. 5). About 20% percent of the gages in the basin are recording much below normal or low (i.e. lowest on record) streamflows, and two gages recorded above normal flows. Many of the gages throughout the basin are under frozen conditions. However, the number of reporting stations (not ice-affected) has increased from a low of 19 near the beginning of the calendar year, to 45 gages.

Two of the three key gages across the basin are still ice affected and not reporting (Fig. 6). Flows on the Colorado River near the CO-UT state line have been ice affected since late December. Though flows on the Green River at Green River, UT had increased to near normal conditions at the end of the year, it is now under frozen conditions, which also happened this time last year. The San Juan River near Bluff, UT has very recently come out of frozen conditions and is reporting much below normal flows at the 15th percentile.



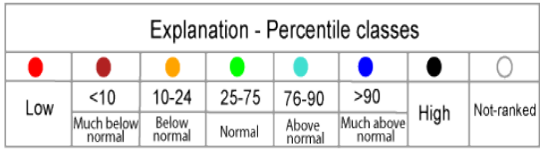


Fig. 5: 7-day average discharge compared to historical discharge for February 10th.

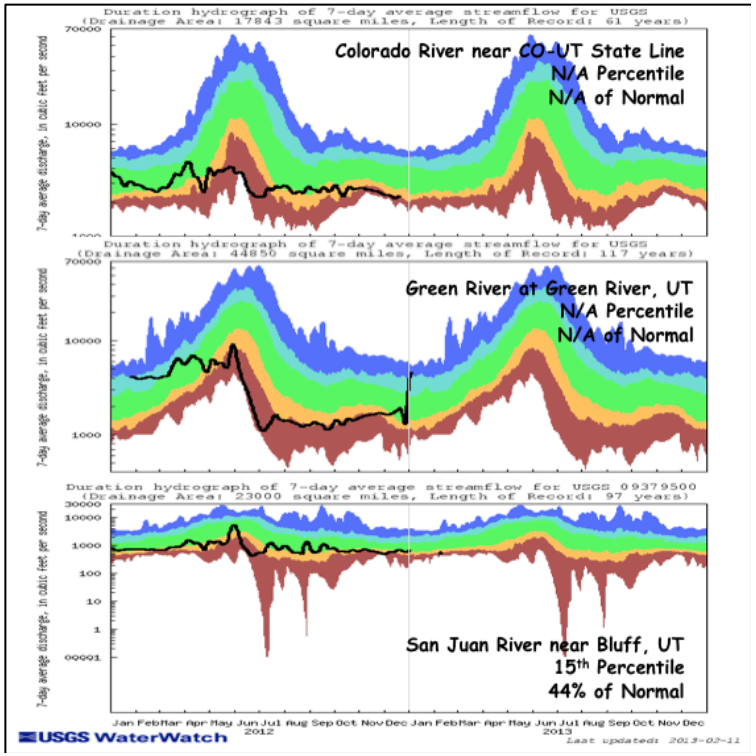


Fig. 6: USGS 7-day average discharge over time at the CO-UT stateline (top), Green River, UT (middle) and Bluff, UT (bottom).

Water Supply and Demand

After a cooler than average January throughout the entire UCRB, several spots in the basin have experienced near to above average temperatures for the first week of February, though northeast UT was still cooler than average. Warmer than average temperatures were experienced across most of eastern CO. 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). Soil dryness is below the 20th percentile in northeast UT and parts of western CO. Soil moisture has improved over the Four Corners, and shows near normal conditions when including SWE (Fig. 7). Dry soils also show up in southeast CO and far eastern CO with near normal soil moisture in north-central CO and around the Rio Grande Basin in southern CO.

For the month of January, most of the major reservoirs in the UCRB saw minor volume decreases, though Blue Mesa Reservoir saw a very slight increase since the beginning of the month. Navajo, Flaming Gorge, and Green Mountain all saw smaller volume decreases than what is normal. Lake Granby saw larger volume decreases than what is normal for this time of year. McPhee normally begins increasing this time of year, but is currently still decreasing. Flaming Gorge volume is slightly above its February average while the rest of the reservoirs are between 60% and 80% of average for February.

Precipitation Forecast

The UCRB will be underneath moderate north to northwest flow aloft as last weekend's trough slowly migrates eastward. A series of disturbances will combine with limited moisture embedded in the flow to generate persistent light snow showers over the northeastern portions of the basin through the end of the work week. The first of these disturbances is expected to pass over the region on Wednesday, with another one following on late Thursday. Precipitation amounts should remain light for this event, generally ranging from 0.10 to 0.25 inches of liquid over northwestern CO and northern UT, with up to 0.50 inches over favored north slopes of the Park, Flattop and Elkhead ranges of CO (Fig. 8). A transient ridge will cross the area through the weekend, bringing warmer temperatures and mostly dry conditions before the next trough begins to approach the basin on Sunday. Anticipate unsettled conditions for early next week as this system brings yet another chance of snow to much of the UCRB.

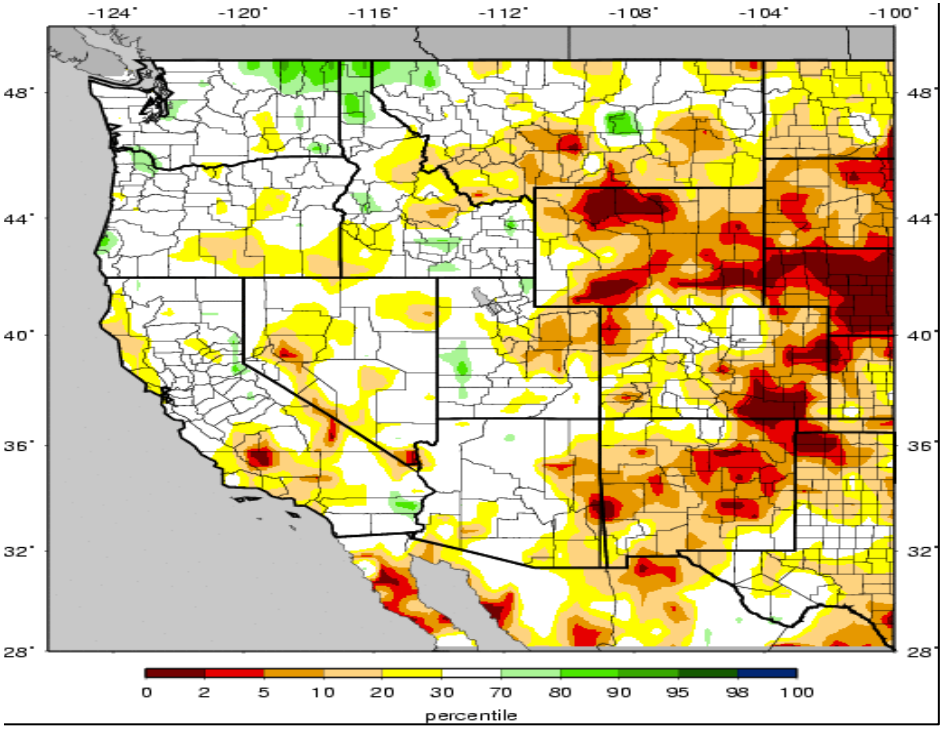
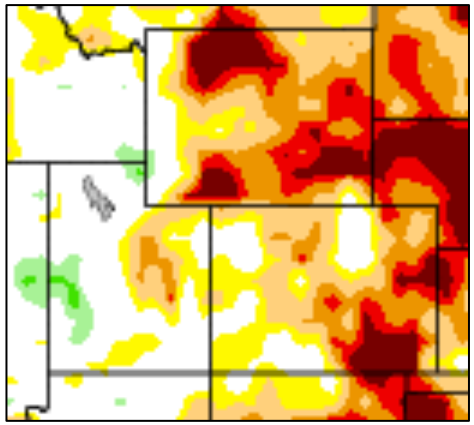


Fig. 7: VIC modeled soil moisture percentiles for the western U.S. as of February 10th. The map below combines soil moisture and SWE.



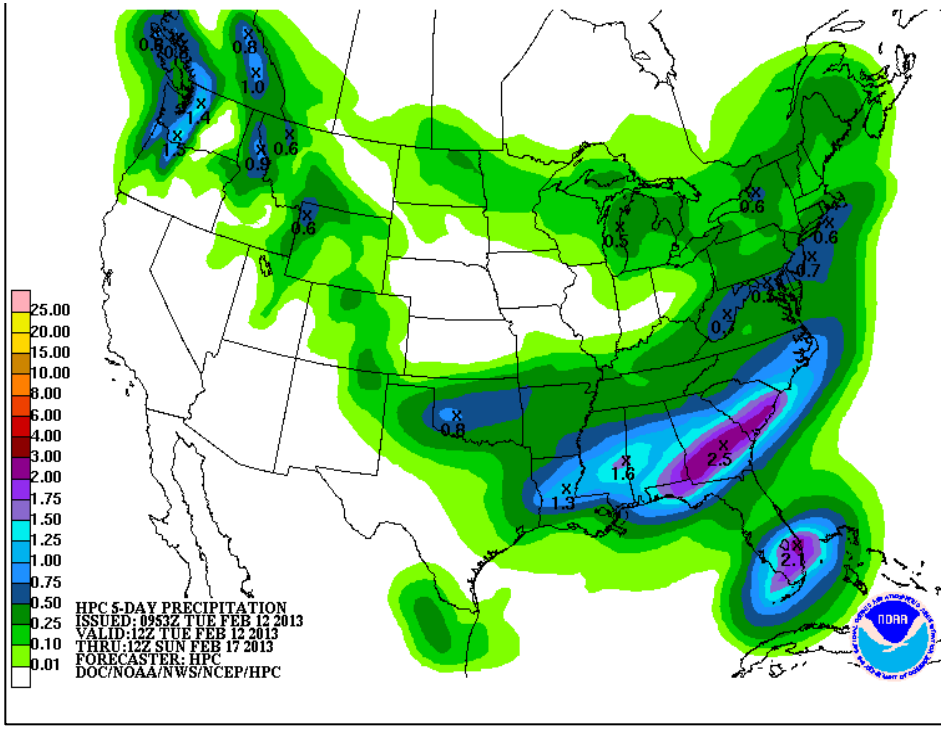
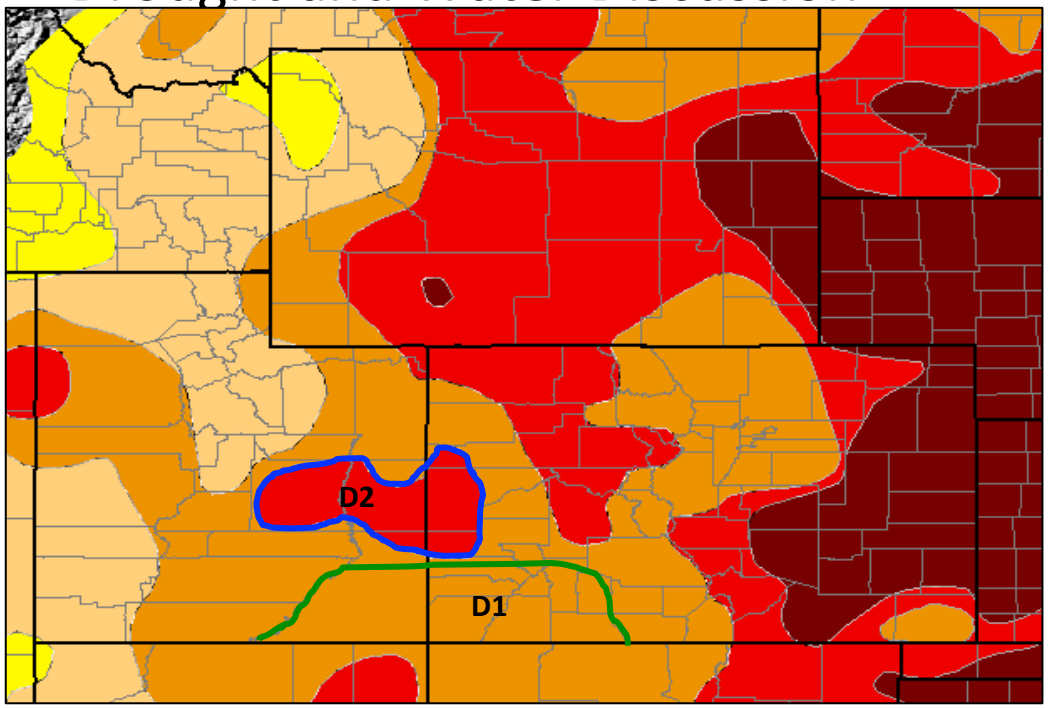
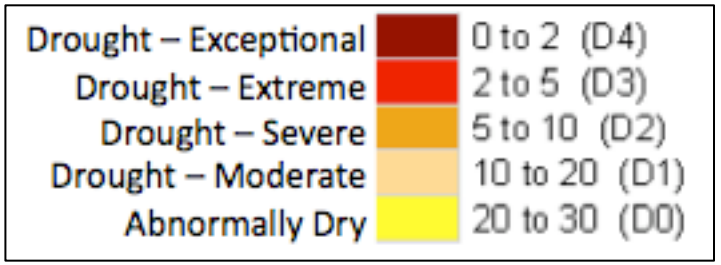


Fig. 8: Quantitative precipitation forecast (QPF) by the Hydrologic Prediction Center out to 12UTC Sunday.

Drought and Water Discussion





Drought categories and
their associated percentiles

Fig. 9: February 5th release of U.S. Drought Monitor for the UCRB.

UCRB: Some improvements are recommended for the UCRB in the current depiction of the U.S. Drought Monitor (USDM) map. The D3 currently over Mesa County, CO and extending westward into eastern UT should be removed (Fig. 9, blue shape). Standardized precipitation indices (SPIs) in this area are positive to -1 on shorter time scales and around -1.5 on the 120 day and 6 month time scales. The few SNOTEL precipitation percentiles WYTD in the area are in the 20s and 30s. Improvements are also recommended for the Four Corners region (Fig. 9, green line). This area has received much beneficial moisture since the beginning of January, bringing their seasonal totals much closer to normal. SNOTEL precipitation percentiles are in the teens and 20s and short term SPIs out to the 6 month time scale are positive or at worst -1. We defer to the USDM author and other local experts on how to resolve those improvements further south into Arizona and New Mexico.

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