NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

December 20, 2011

Precipitation and Snowpack

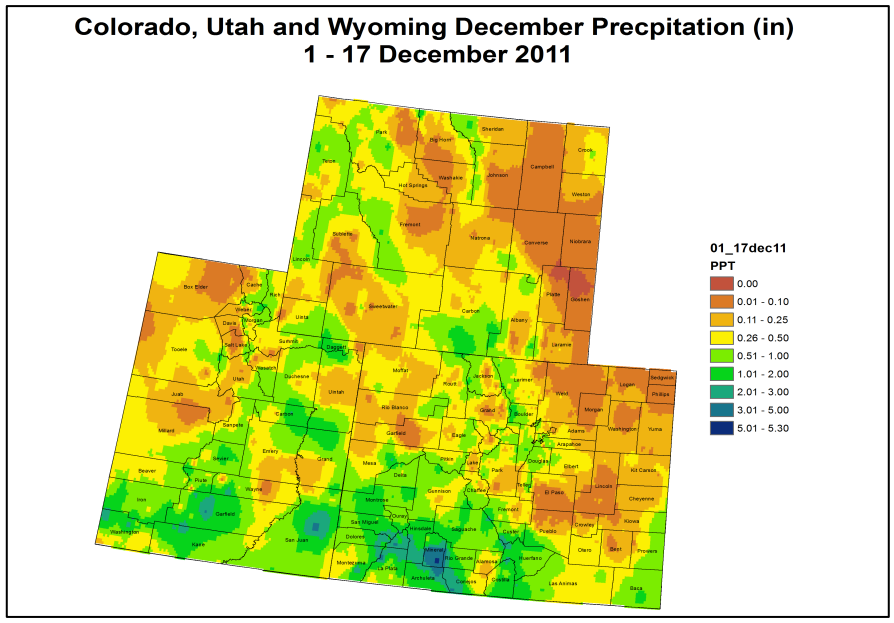


Fig. 1: December month-to-date precipitation in inches.

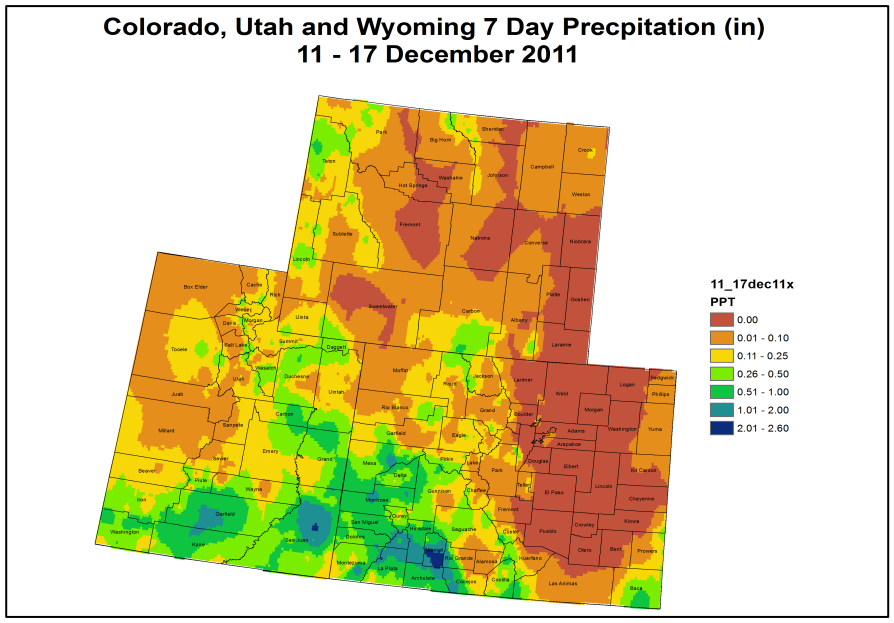


Fig. 2: December 11 – 17 precipitation in inches.

For the month of December so far, precipitation has favored the southern portion of the Upper Colorado River Basin (UCRB, Fig. 1). The San Juan mountains have received as much as 2 inches month-to-date, while the Four Corners region has seen between .25 and 1 inch of moisture. Spotty amounts over half an inch have fallen in the central and northern parts of the basin, though many areas have received less than .25 inches for the month so far. Northeast Colorado has also been somewhat drier, receiving less than .25 inches with the southeastern part of the state also being favored with more precipitation.

Last week, precipitation was concentrated over southwest CO and southeast UT, with accumulations ranging from .25 inches to over 2 inches in a few areas (Fig. 2). Far southeast CO has also received more beneficial moisture in the past week (over .25 inches) with additional precipitation currently accumulating (not shown on maps). Most of eastern CO received no precipitation for the week, and the northern portion of the UCRB was drier than average, receiving less than a tenth of an inch in many areas.

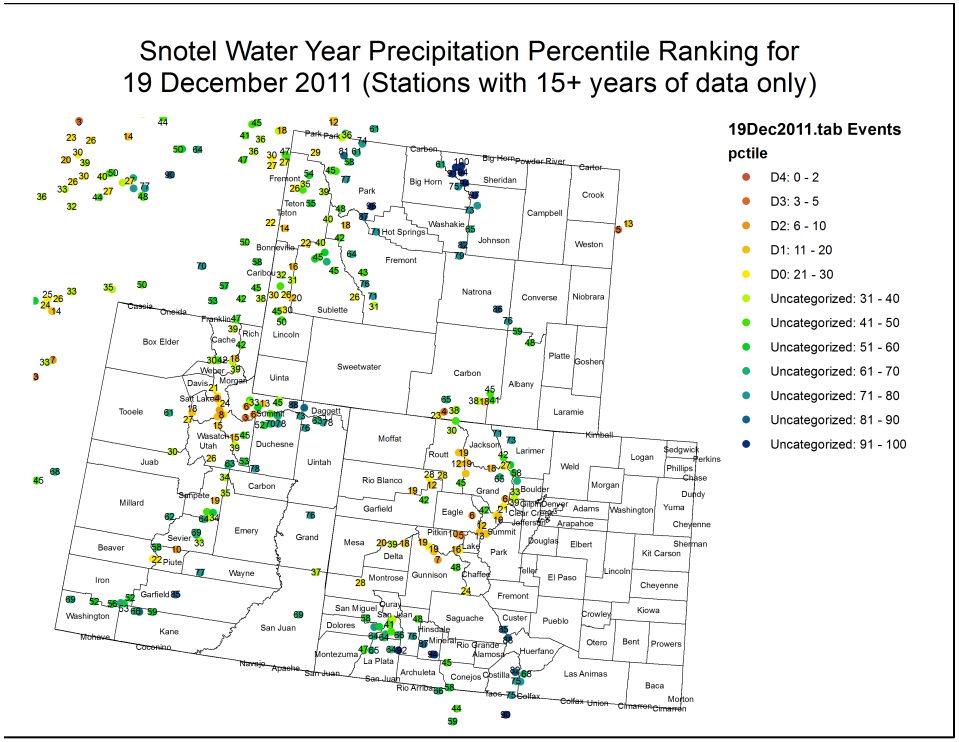


Fig. 3: SNOTEL WYTD precipitation percentiles (50% is median, 21 – 30% is Drought Monitor D0 category).

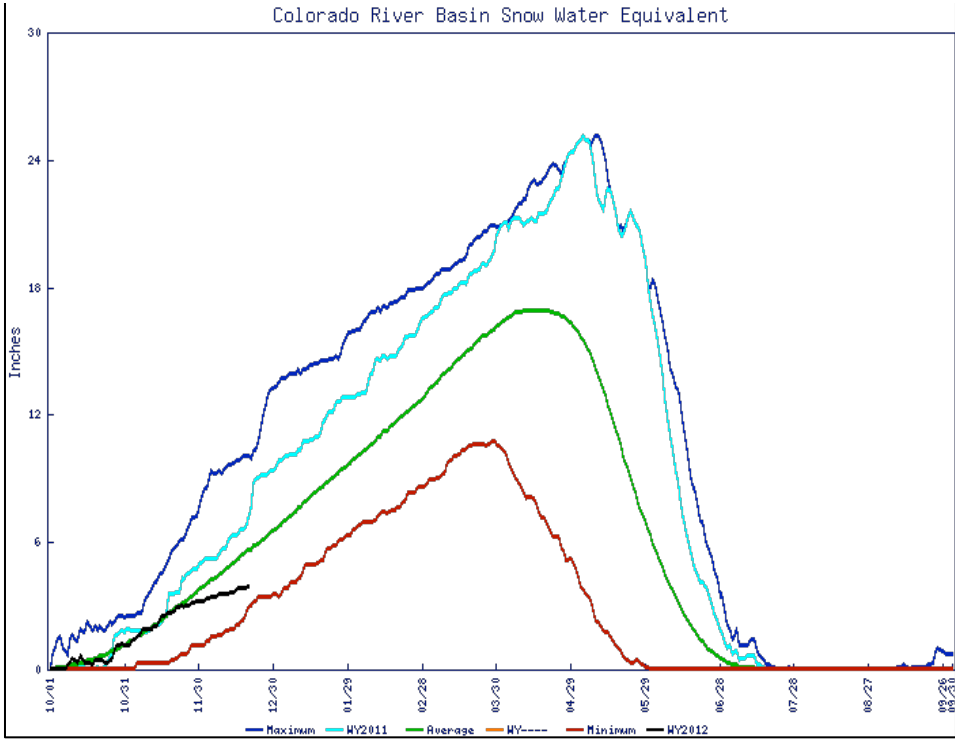


Fig. 4: Colorado headwaters WYTD snow water equivalent accumulation (black line) compared to the average (green).

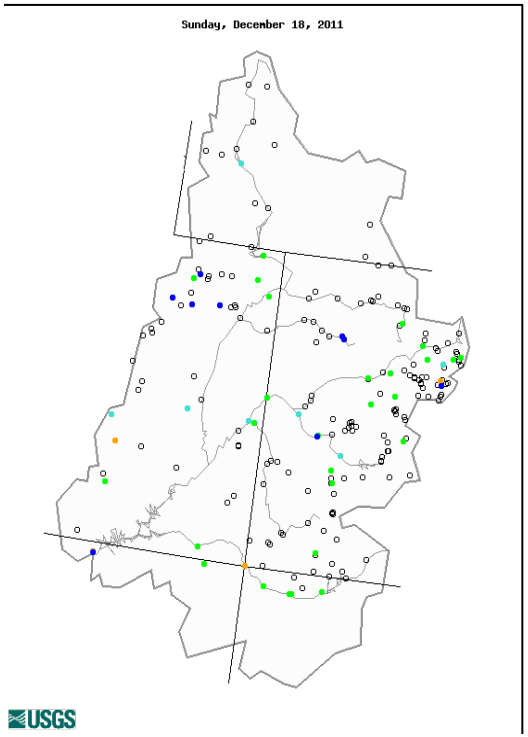
Water-year-to-date (WYTD), SNOTEL precipitation is near average for the southern part of the UCRB and now below average for much of the northern portions of the basin (Fig. 3). The lowest percentiles are currently being observed around the Gunnison basin in CO, near the Colorado River headwaters, and along the Wasatch range in UT, with many sites recording below the 20th percentile. The San Juan mountains are seeing more significant snowpack this year, with most sites above the 60th percentile. Some sites along the Duchesne River in UT and along the northern edge of the UCRB in WY are also maintaining snowpack accumulations near or above the 50th percentile.

Around the headwaters of the Colorado River, very little snow has accumulated since the beginning of December (Fig. 4). Earlier in the water year, larger amounts of snow were quickly accumulating, similar to last year at this time. With accumulations stagnating, the headwaters region (along with many other central and northern regions of the UCRB) is now experiencing below average snowpack.

Streamflow

As of December 18th, 90% of the USGS streamgages in the UCRB recorded normal (25th – 75th percentile) or above normal 7-day average streamflows (Fig. 5). About 34% of the gages in the basin are recording above normal flows, while 10% of the gages in the basin are recording below normal flows. The number of reporting gages in the basin has decreased from over 100 in mid-November to just below 50, as many portions of the rivers are freezing over. There are currently only 3 gages recording below normal flows and are scattered across the basin.

Key gages on the Colorado River at the CO-UT state line and the San Juan River near Bluff, UT are all currently recording flows in the normal range at the 68th and 43rd percentiles, respectively (Fig. 6). The gage on the Green River at Green River, UT had been recording above normal flows, but as of last week has become "ice affected" and is not currently recording streamflow.



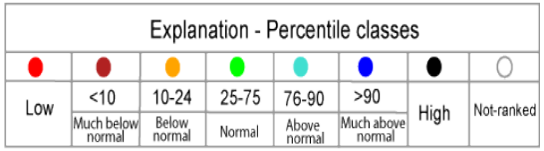


Fig. 5: 7-day average discharge compared to historical discharge for December 18th.

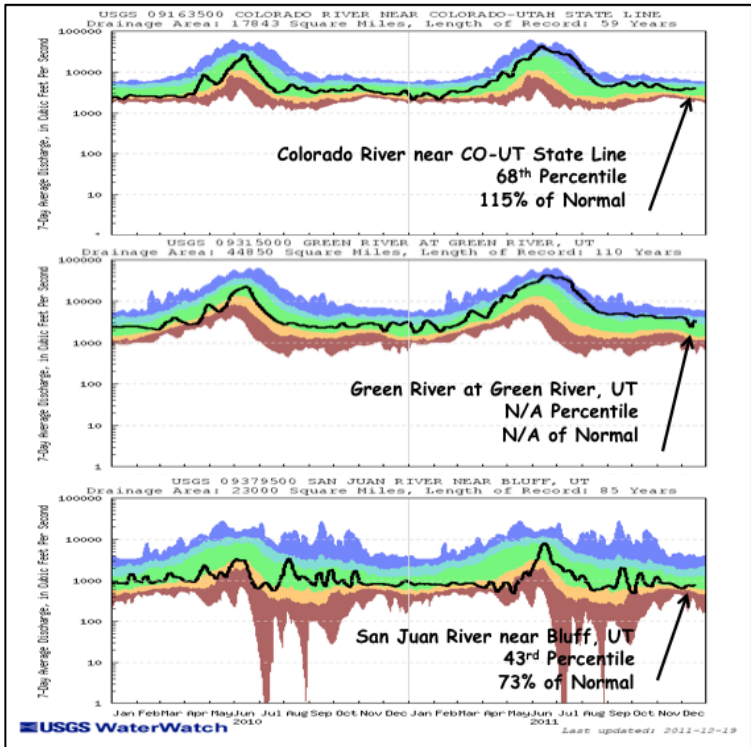


Fig. 6: USGS 7-day average discharge over time at the CO-UT stateline (top), Green River, UT (middle) and Bluff, UT (bottom).

Water Supply and Demand

Last week, much of the UCRB saw near average temperatures with below average temperatures in the San Juan mountains and warmer temperatures in the Yampa-White basin. Eastern Colorado experienced near average to slightly above average temperatures for the week. The VIC model continues to show dry soil moisture conditions in southeast CO and in UT around the Colorado River valley (Fig. 7). Even though snowpack conditions are deteriorating, wet soils can still be seen in the northern CO mountains.

All of the major reservoirs above Lake Powell are above their December averages. Except for Navajo and Lake Granby, all of the major reservoirs in the UCRB are above their storage levels for the same time last year. Flaming Gorge, Granby, Navajo and Dillon have stayed near steady for the month, while Blue Mesa and Lake Powell have seen larger decreases. Lake Powell is currently at 67% of capacity and 86% average.

Precipitation Forecast

The UCRB is currently between a low pressure system exiting the region to the southeast and another potent storm approaching from the northwest. Conditions over the basin will remain mostly cold and dry as this next system approaches the area on Tuesday evening. Forecast models are consistent in sweeping a cold front southward across the basin through the day on Wednesday, with snowfall breaking out shortly after frontal passage. Despite the strength of this system, expect snowfall amounts to remain on the light to moderate side due to the lack of a decent moisture source. The mountains of northeast UT, and central and northern CO will benefit the most, with liquid accumulations reaching 0.50 inches by Thursday morning. Elsewhere, expect precipitation to be light with liquid accumulations generally less than 0.25 inches across valley locations and 0.25 to 0.50 inches of liquid over the southern mountain ranges Fig. 8). The storm will quickly exit the area on Thursday, followed by dry northerly flow. Another weaker system is forecast to brush the northern fringes of the basin late Friday, but only a few showers are expected over the higher terrain of CO and WY. The jet-stream then shifts well to the north of the area over the weekend, leaving most of the UCRB under a weak ridge with dry conditions and near average temperatures moving into next week.

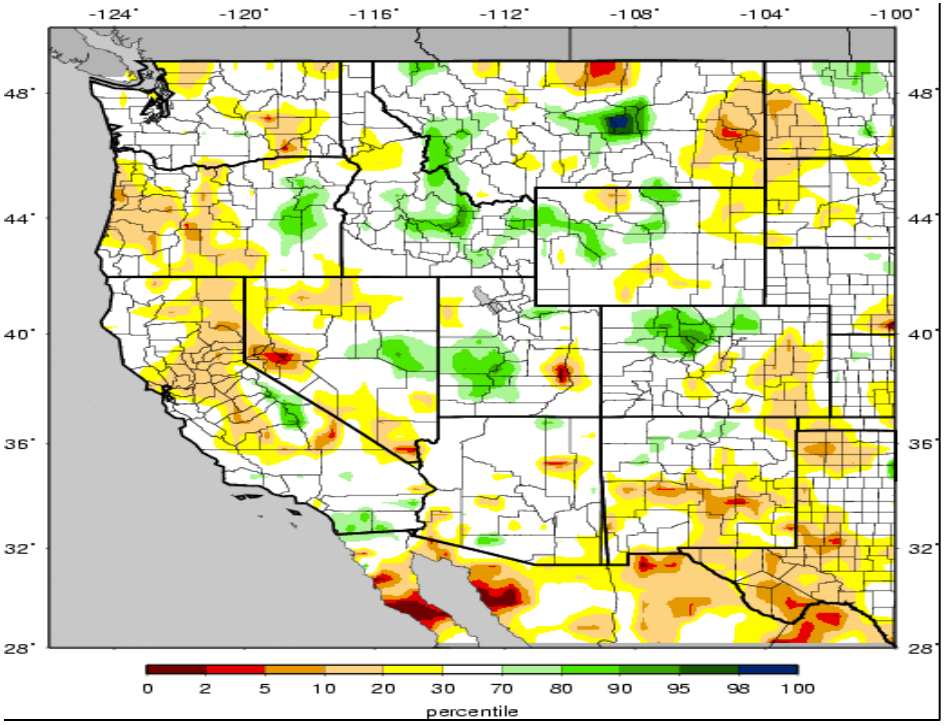


Fig. 7: VIC soil moisture percentiles as of December 18th.

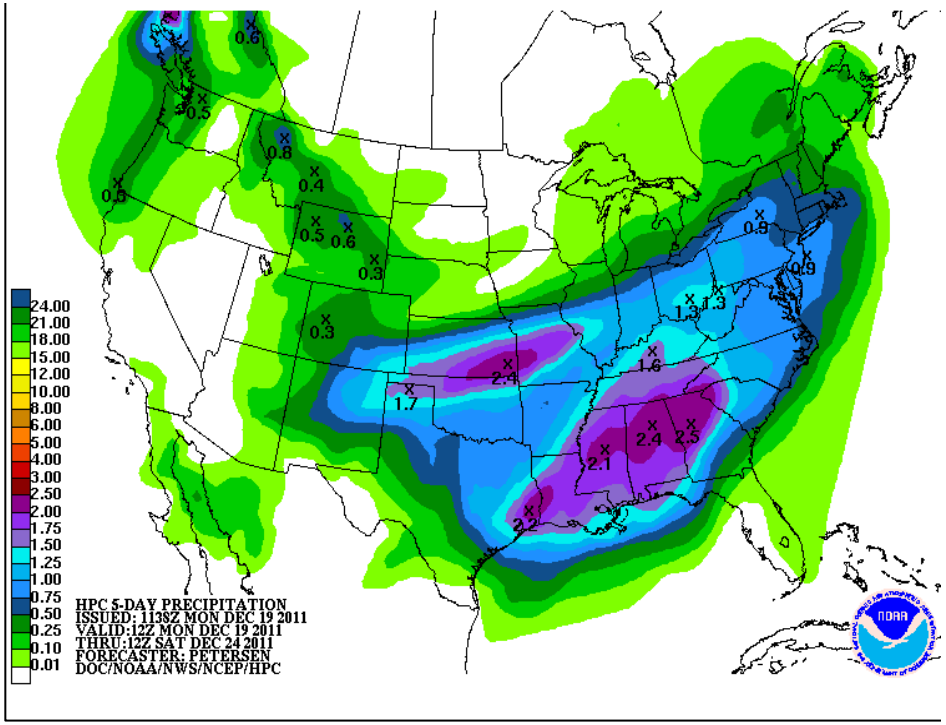
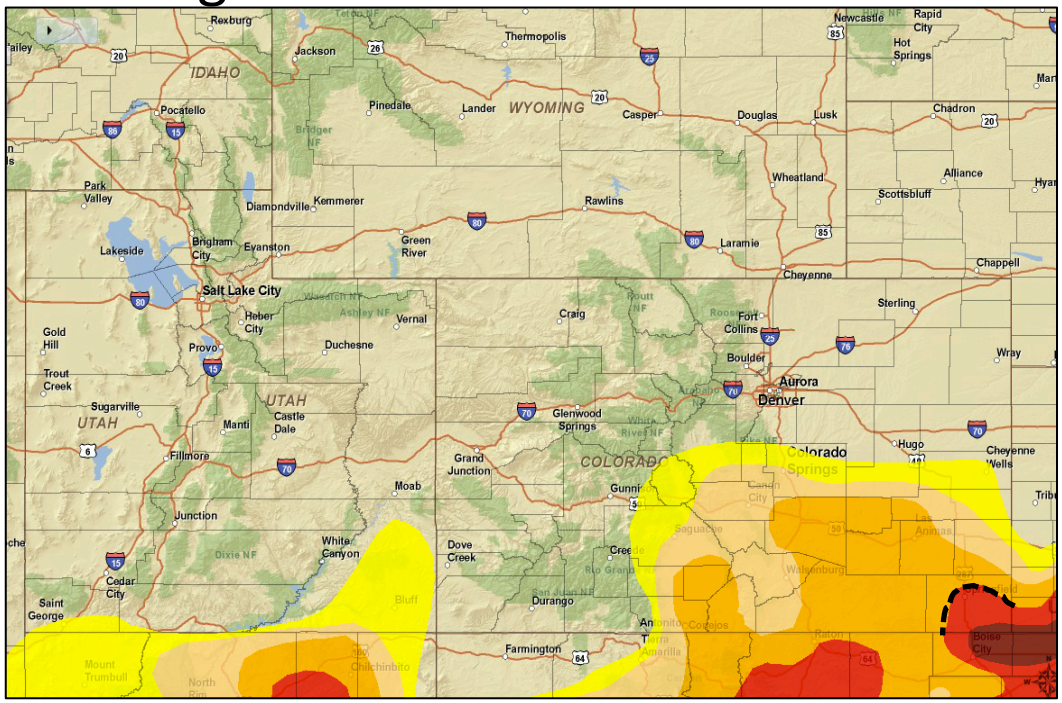
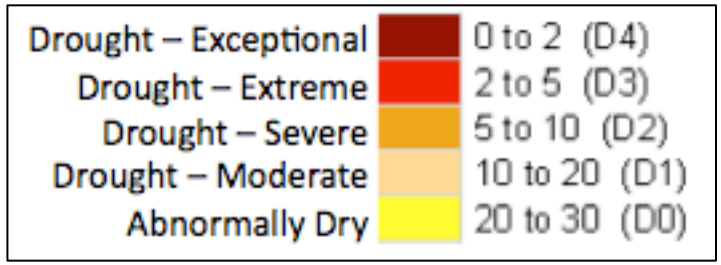


Fig. 8: HPC Quantitative Precipitation Forecast (QPF) through 12Z Saturday.

Drought and Water Discussion





Drought categories and their associated percentiles

Fig. 9: December 13th release of U.S. Drought Monitor for the UCRB

Dry conditions are currently being observed along the Continental Divide at Grand and Summit counties in the UCRB, and could warrant the introduction of D0 to the U.S. Drought Monitor (USDM) map in the near future (Fig. 9). Snowpack in this area is below average for this time of year, with SNOTEL precipitation at many sites below the 20th percentile. However, it is still early in the season and no impacts are currently being reported, so status quo is recommended at this time—close monitoring will continue, and conditions will be reassessed in a couple weeks for a possible D0 introduction. Status quo is also recommended for the rest of the UCRB.

After a large blizzard moved across southeast CO in the past two days, dropping more than an inch of liquid over most of the area (in addition to decent accumulations for the rest of the week), it is recommended that D4 and D3 be completely removed from Baca County (Fig. 9, dashed line). Further improvements will likely be warranted across the surrounding counties, but it is recommended that those be held off until next week when the magnitude of the effects can be fully assessed.