# NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

June 21, 2011

# Precipitation and Snowpack

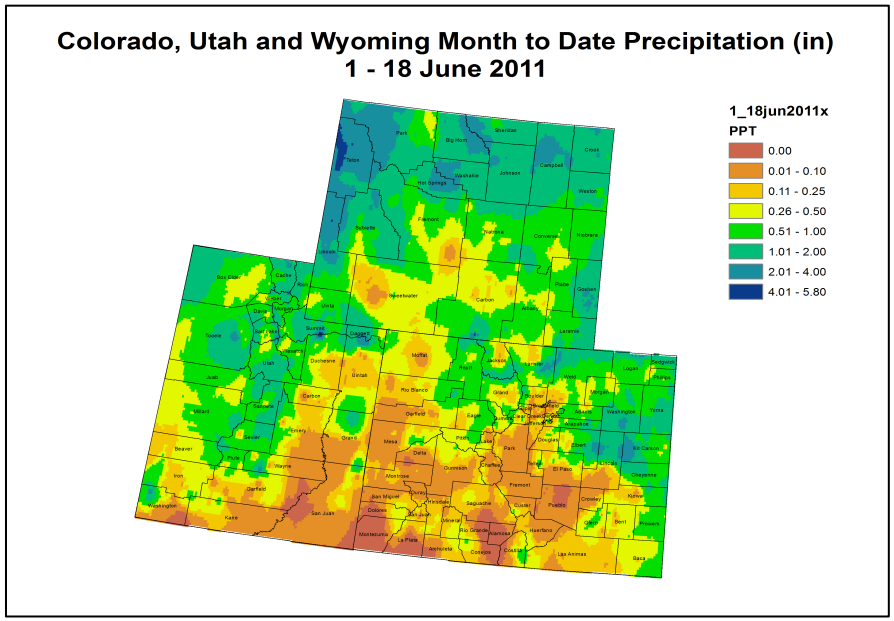



Fig. 1: June month-to-date precipitation in inches.

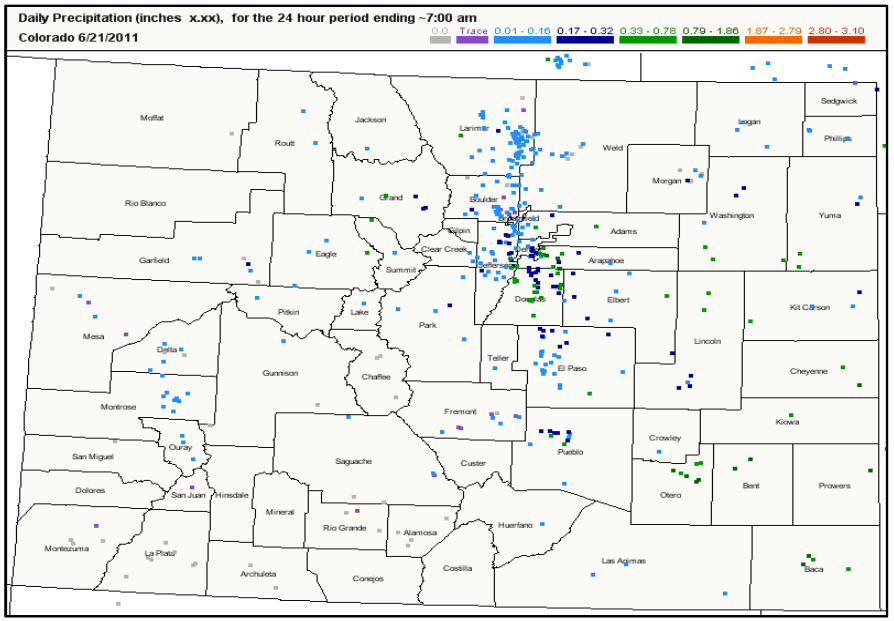



Fig. 2: 24-hour accumulated precipitation as of June 21st for CO.

For the month of June, through the 18th, the Upper Colorado River Basin (UCRB) has seen heavier amounts of precipitation in the northern higher elevations (from half an inch to over 2 inches) with much drier conditions (less than a tenth of an inch) in the valleys and Four Corners region (Fig. 1). Northeast and east central Colorado also received heavier amounts of between half an inch and two inches of moisture. The San Luis Valley has remained dry, seeing less than a tenth of an inch of moisture.

Southeastern CO had seen some moisture as of the 18th, though nothing greater than an inch and with little drought improvement in the area. However, many areas of the Arkansas basin, currently in the D3 drought category, did see heavy amounts of precipitation over the past two days. Much of Otero, Bent, Prowers and the northern portion of Baca counties received between 1 and 2 inches of precipitation for the past two days (Fig. 2). Areas further north and northwest, still in D0 to D2 drought categories, also received ample amounts of moisture from this most recent system.

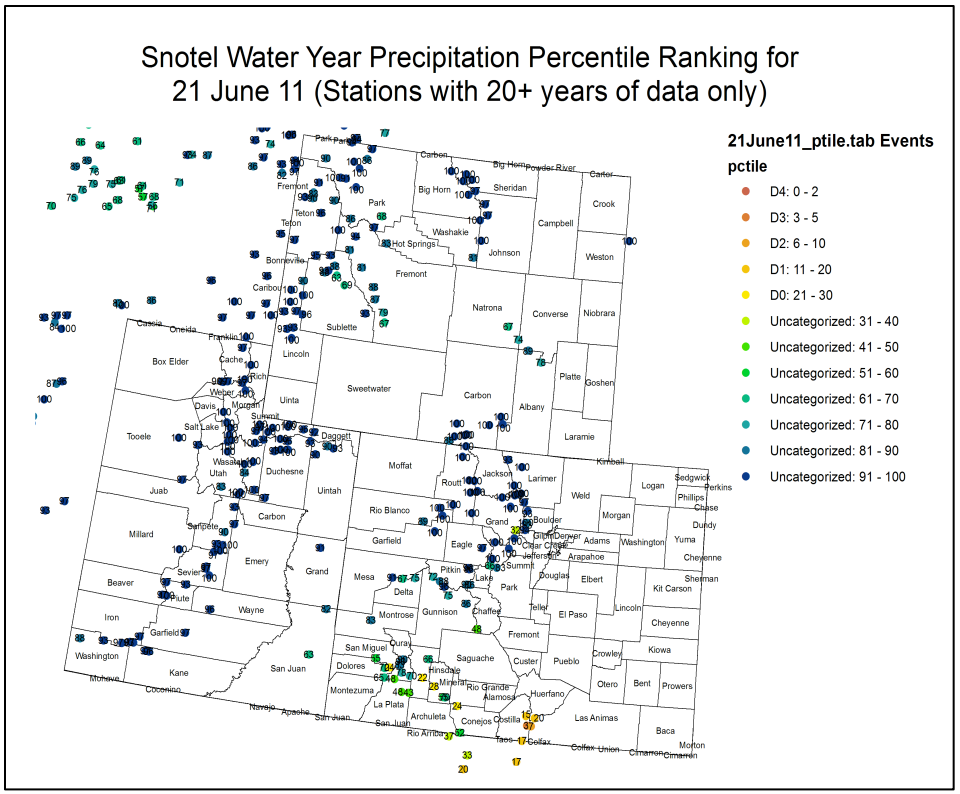



Fig. 3: SNOTEL WYTD precipitation percentiles (50% is median, 21-30% is Drought Monitor's D0 category).

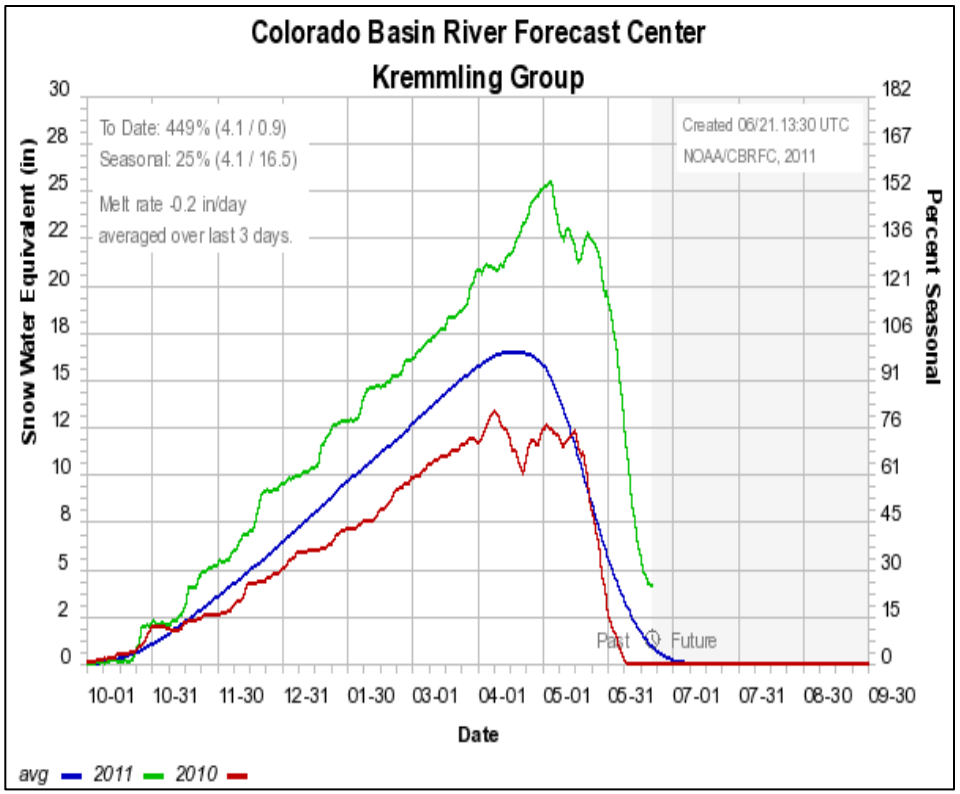



Fig. 4: SNOTEL WYTD accumulated snow water equivalent as a percent of average.

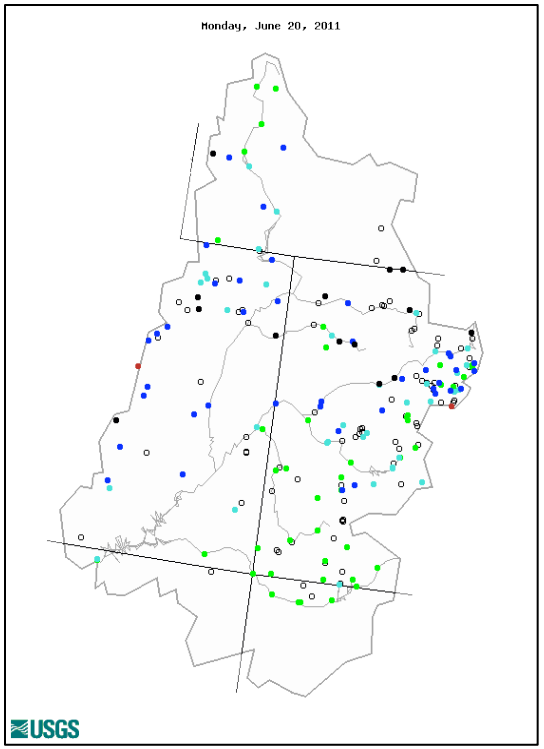
The majority of the SNOTEL sites in the UCRB are showing very high (and in many cases, record high) percentile rankings for water-year-to-date (WYTD) precipitation (Fig. 3). The Rio Grande and San Juan basins in southern CO are the driest, though the higher elevations of the San Juan basin have improved somewhat from the earlier part of the water year. Several sites in the Upper Rio Grande basin are below the 30$^{th}$ percentile.

After a near record season high for snowpack in the UCRB, the majority of lower elevation SNOTEL sites have now completely melted their accumulated snowpack for the season. Many of the higher elevation sites are still well above their average snowpack for this time of year. Though snowmelt had been increasing, the melt rate at many sites has slowed over the past week as temperatures cooled and new snow fell. Melt rates were high for much of June, but decreased with cooler temperatures in new snow, as can be seen with the sites above Kremmling, CO (Fig. 4).

# Streamflow

As of June 20th, about 97% of the USGS streamgages in the UCRB recorded normal (25th – 75th percentile) or above normal 7-day average streamflows with 64% of the gages recording flows above the 75th percentile (Fig. 5). As of June 21st, 2 gages along the Green River in UT were still exceeding the National Weather Service flood stage. Many of the gages in the northern part of the UCRB are still recording real-time flows at or above the 99th percentile.

Key gages on the Colorado River near the CO-UT state line and the Green River at Green River, UT have above normal 7-day average streamflow at the 92nd and 96th percentiles, respectively (Fig. 6). Streamflow on the San Juan River near Bluff, UT is at the 66th percentile and recently peaked, with the higher flows largely due to the increased releases from Navajo Reservoir. Flows along the San Juan are now expected to return to below normal levels in response to decreased releases from Navajo.



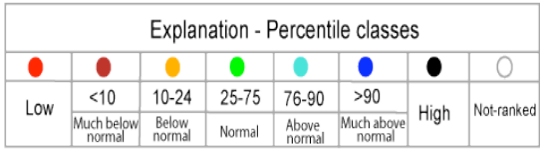




Fig. 5: 7-day average discharge compared to historical discharge for June 20th.

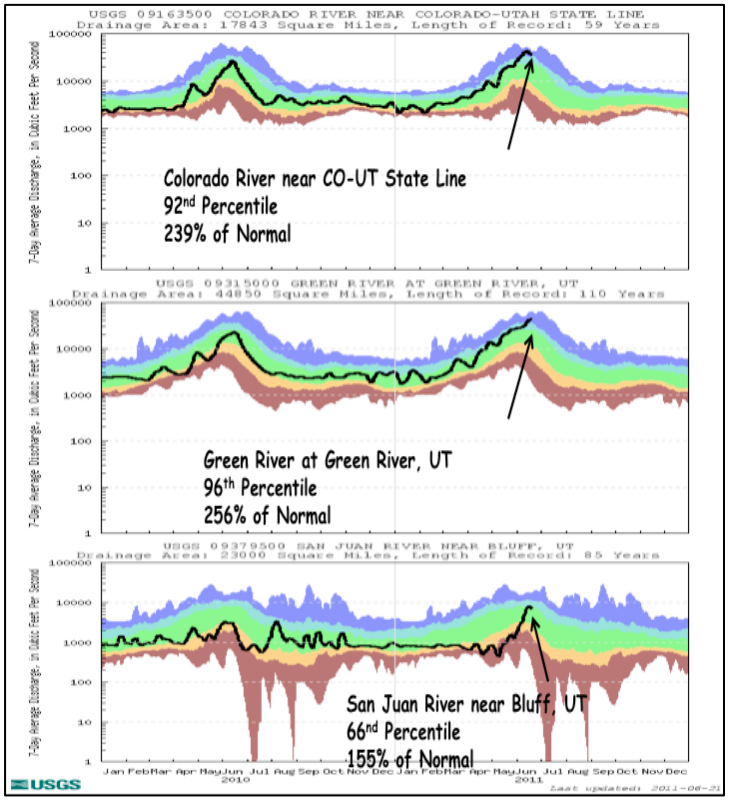



Fig. 6: USGS 7-day average discharge over time at the CO-UT stateline (top), Green River, UT (middle) and Bluff, UT (bottom).

## Water Supply and Demand

Last week, near average temperatures were prevalent over the UCRB, with warmer than average temperatures over southeast CO and cooler than average temperatures over northern UT and southwest WY. Soil moisture conditions remain poor for southeastern CO and the San Luis Valley. Soil moisture is above average along the Wasatch range in UT and has significantly improved over northeastern CO (Fig. 7).

All of the major reservoirs in the UCRB have experienced rapid storage increases in June. Daily inflows into Flaming Gorge, Blue Mesa, and Lake Powell are all well above their averages for this time of year. Inflows into Navajo have begun to decrease over the past week. Green Mountain, Granby and Dillon have experienced very large increases in storage volume in the last few weeks, as increased flows in the Colorado Headwaters region have responded to record snowpack amounts. Lake Powell has also seen large increases in volume and is now at 77% of average. Forecasted inflows into Lake Powell for June will likely make this the second wettest June since records began at Lake Powell.

## Precipitation Forecast

As high pressure builds from the west, above normal temperatures are expected over the next few days for the UCRB and eastern plains of CO. Any recent new snow accumulations in the higher elevations will quickly melt out. A secondary peak flow on many rivers in the northern portion of the UCRB could also be possible with these much warmer temperatures. As the end of the week approaches, the ridge will flatten out as a disturbance moves into the area. Convective showers over the eastern CO plains are expected late Thursday and into Friday. A surface low forming over the eastern plains could pull moisture from the east and current QPF totals could be too conservative (Fig. 8). Insignificant precipitation totals are expected for the UCRB. This pattern of warm, dry southwesterly flow is expected to persist into next week.

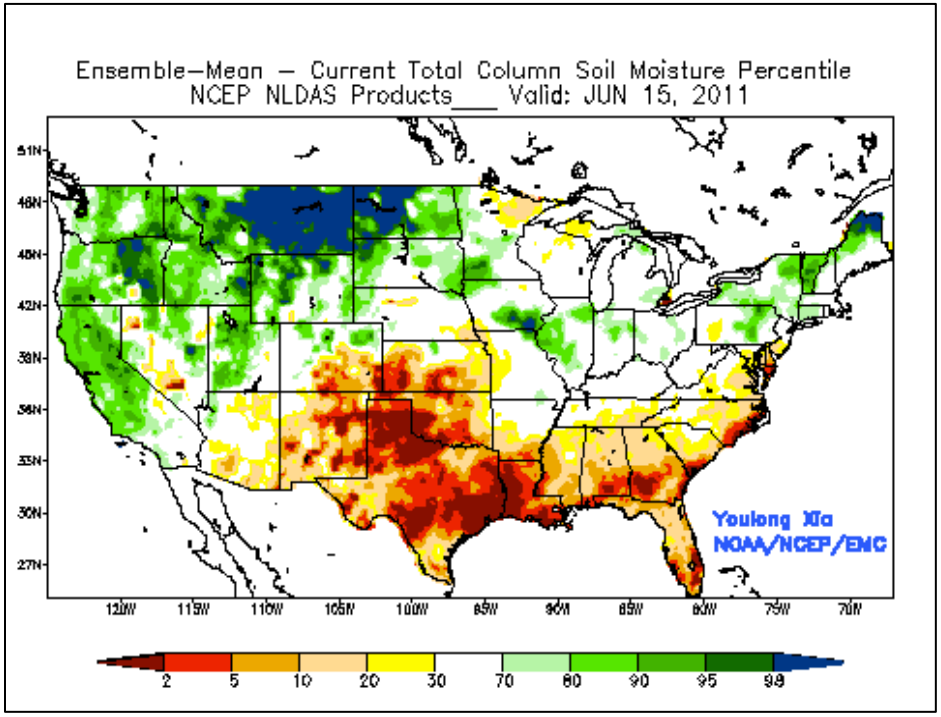



Fig. 7: NLDAS total column soil moisture percentiles for June 15th.

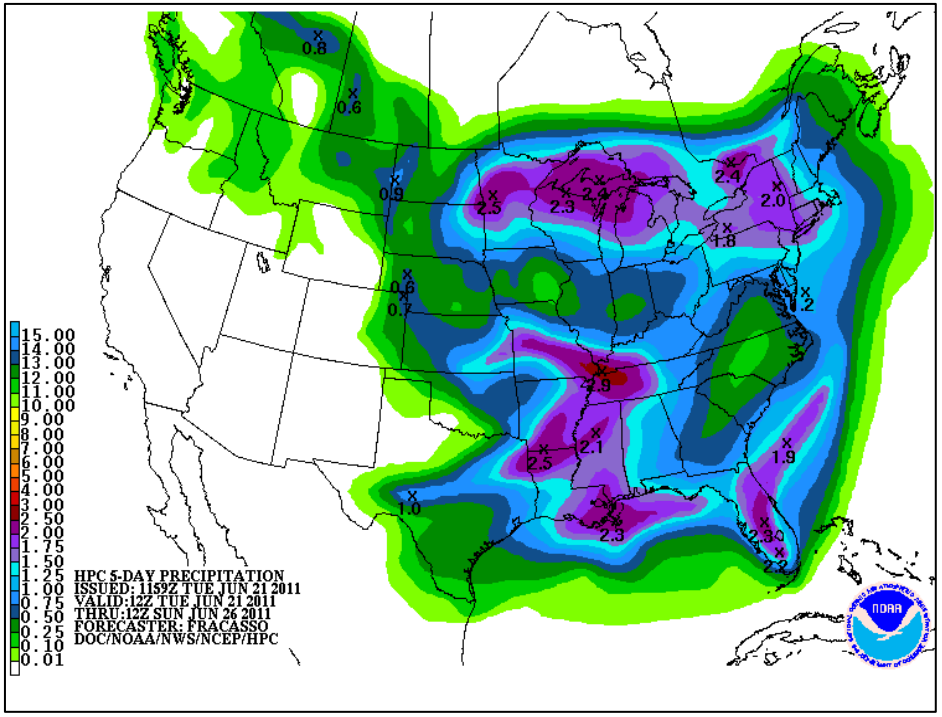
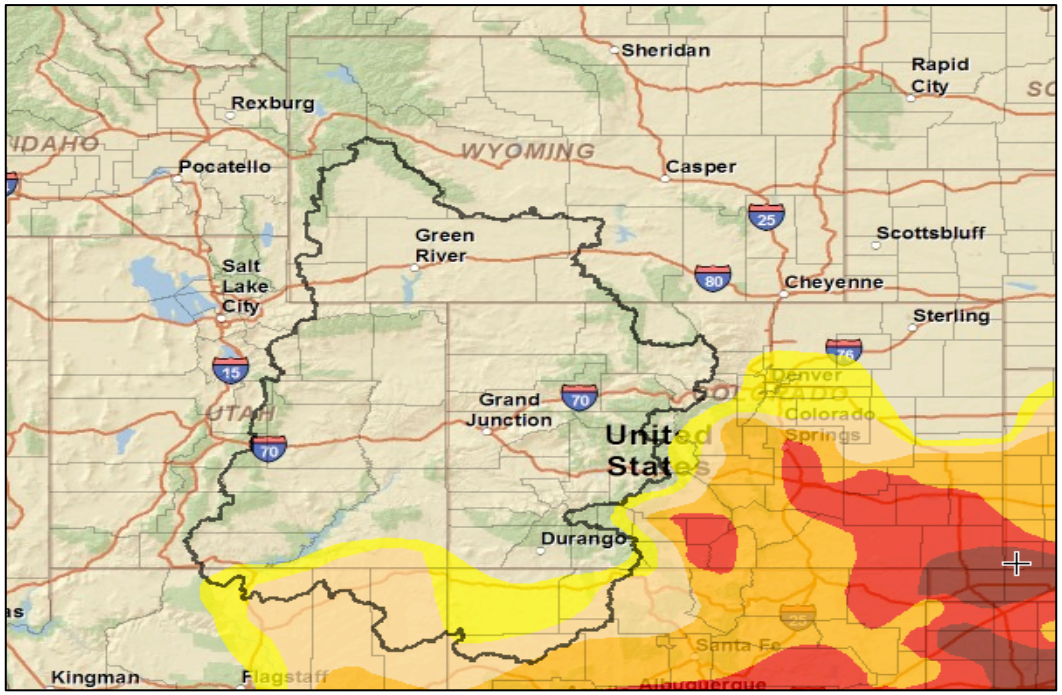
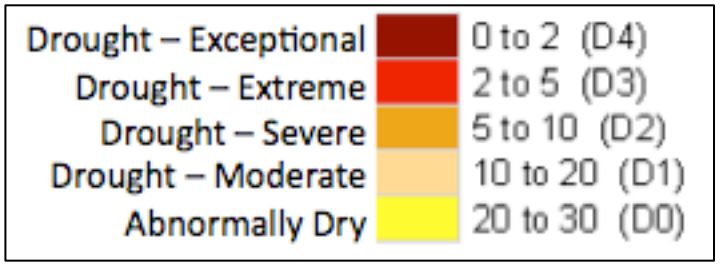



Fig. 8: HPC quantitative precipitation forecast 5-day accumulations for June 21 – 26.

# Drought and Water Discussion




Drought categories and their associated percentiles

Fig. 9: June 14th release of U.S. Drought Monitor for the UCRB

Status quo is being recommended for the UCRB in the current U.S. Drought Monitor (USDM) map (Fig. 9), though the Four Corners region is being watched closely as dryness continues and the threat of wildfires increases.

Some improvements are being recommended for CO east of the UCRB. With large precipitation accumulations over Otero, Bent, and Prowers counties, a one-category improvement could be justified. Overall, large changes should be limited as evapotranspiration has been high in the area and the longer-term impacts might not immediately diminish from this recent rain event. One-category improvements could also be justified to the north—particularly a scaling back of the D0 in Weld, Jefferson, Adams, and Arapahoe counties.