NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

August 9, 2011

Precipitation and Snowpack

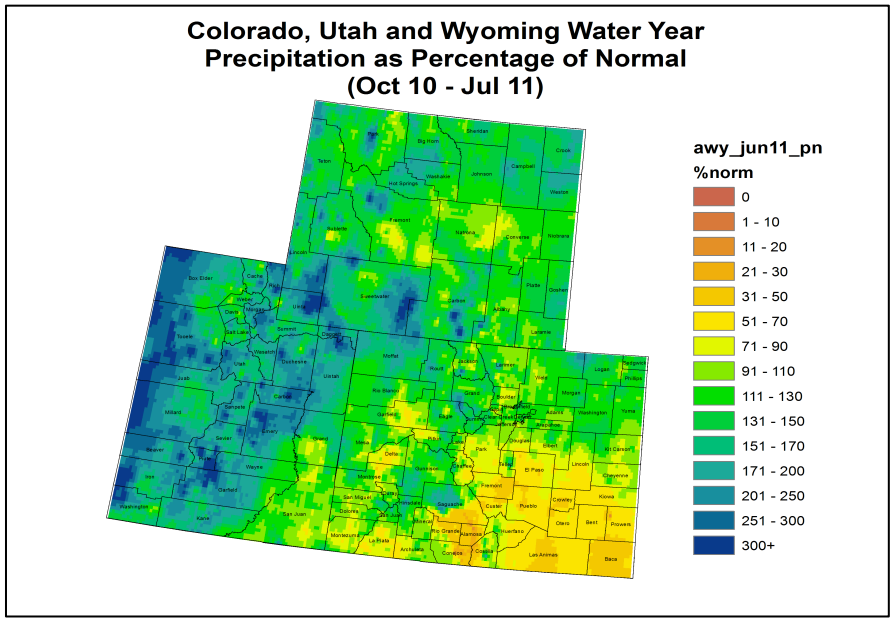


Fig. 1: Water-year-to-date precipitation as a percent of average.

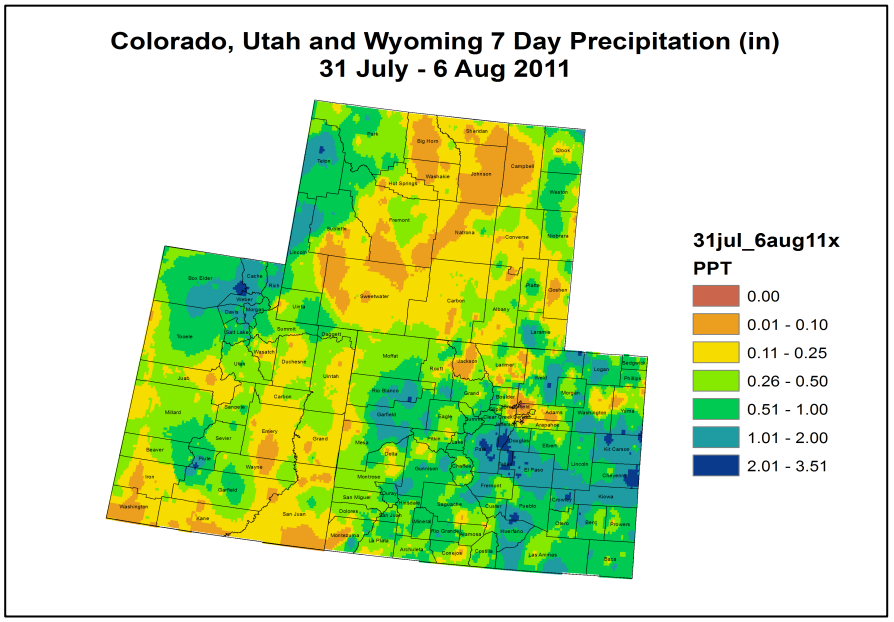


Fig. 2: July 31 – August 6 precipitation in inches.

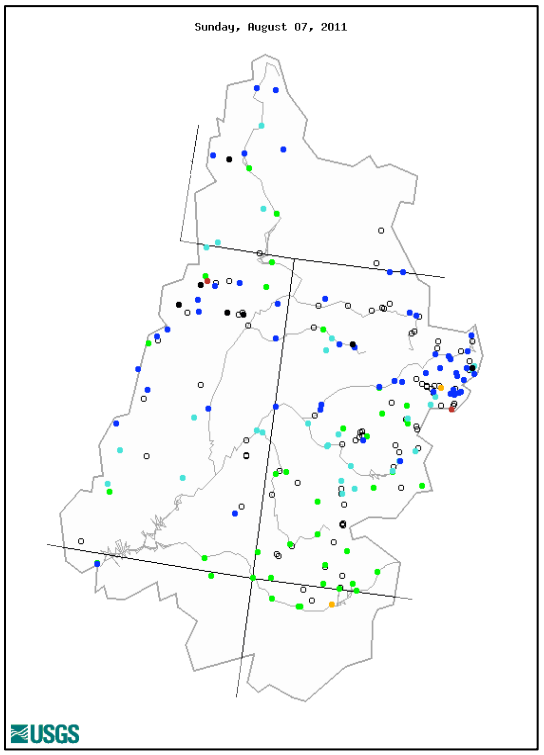
Water-year-to-date (WYTD), most of the Upper Colorado River Basin (UCRB) received near or above average precipitation (Fig. 1). The Upper and Lower Green River basins have received over 200% of their average WYTD precipitation in many spots. The southern portion of the UCRB has been drier, seeing around 70 to 100% of average precipitation. Northeast Colorado has received near average WYTD precipitation, but parts of southeast CO and the San Luis Valley have been very dry, with less than 50% of average for the water year.

Last week, the heaviest amounts of precipitation were concentrated over the areas most in need of moisture (Fig. 2). Around Park, Jefferson, Douglas, and Teller counties, amounts were as high as 3.5 inches, and many areas in the Arkansas River basin received between half an inch to 2 inches of precipitation. The higher elevations of the Rio Grande basin received between half an inch to 2 inches of moisture while the valley saw between a quarter to half an inch for the week. Much of the UCRB was relatively drier for the week, with many areas receiving less than a quarter inch of precipitation.

Streamflow and Water Supply

As of August 7th, about 96% of the USGS streamgages in the UCRB recorded normal (25th – 75th percentile) or above normal 7-day average streamflows with 66% of the gages recording flows above the 75th percentile (Fig. 3). 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 91st and 92nd percentiles, respectively (Fig. 4). Streamflow on the San Juan River near Bluff, UT is at the 38th percentile.

Flaming Gorge, Granby, Green Mountain, Dillon, and Blue Mesa reservoirs saw large storage volume increases for the month of July. Storage volumes at Green Mountain, McPhee, Navajo, Blue Mesa, and Lake Powell are now decreasing. All of the major reservoirs above Lake Powell are currently above their average August levels. Lake Powell's storage increased 7% for the month of July and is currently at 91% of average. Powell's current level is the highest August level it's been since 2001.



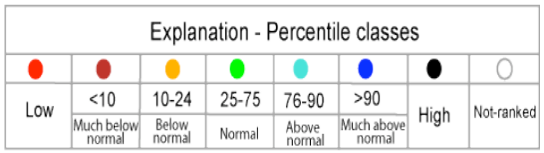


Fig. 3: 7-day average discharge compared to historical discharge for August 7th.

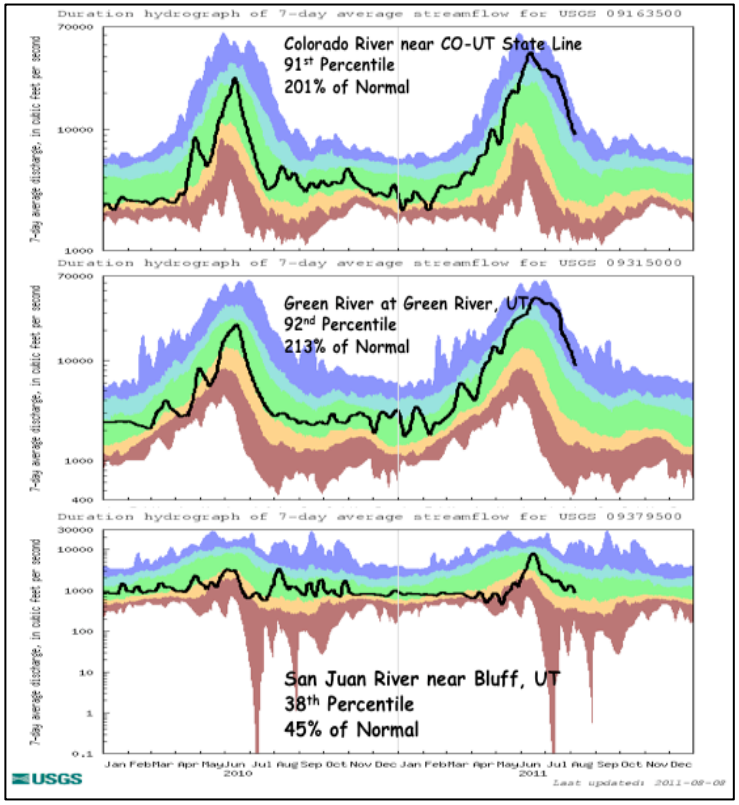


Fig. 4: USGS 7-day average discharge over time at the CO-UT stateline (top), Green River, UT (middle) and Bluff, UT (bottom).

Water Demand

For the first week of August, near average temperatures were observed across most of the UCRB, with warmer than average temperatures east of the UCRB and much warmer temperatures in southeast CO. The warmer temperatures have contributed to higher reference evapotranspiration (refET) in drought stricken areas. In the Four Corners, refET is currently just above average, on track with the drier years. In the San Luis Valley refET is currently tracking above the highest refET year, during the drought of 2002 (Fig. 5)—so precipitation falling there could be quickly lost to the atmosphere again. Very high refET rates are also seen in the Arkansas River basin, though improvements have been seen over the past couple of weeks.

Soil moisture conditions remain poor for the San Luis Valley and southeast CO. Soil moisture is above average throughout much of UT and throughout northern CO. Satellite imagery of vegetation conditions show very dry vegetation with little growth in the San Luis Valley and southeast CO (Fig. 6). Vegetations conditions are moist for the northern portion of the UCRB, slightly dry in the Four Corners area, and are near average for northeast CO.

Precipitation Forecast

A dry airmass ushered in by flow from the west/northwest will keep monsoonal moisture suppressed well to the south and limit the development of showers everywhere but the highest peaks and along the continental divide through Thursday. This dry pattern will begin to break down on Friday with a return of monsoonal moisture to extreme southern portions of the UCRB. This will lead to scattered showers in the San Juan mountains and parts of the Four Corners this weekend. Areas in the north and west will likely not see much convection until later in the weekend when the sub-tropical high pressure and associated moisture plume builds further north. Forecast models continue to show an aggressive return of deep monsoonal moisture by early next week, but there is some question as to how far north it will extend. Current guidance suggests that the best chances of precipitation will be confined to the southeastern portions of the UCRB, over the San Juans and areas in southeastern CO. The flow aloft should remain fairly brisk through all periods, so the risk of slow moving storms capable of generating flash floods will be lower.

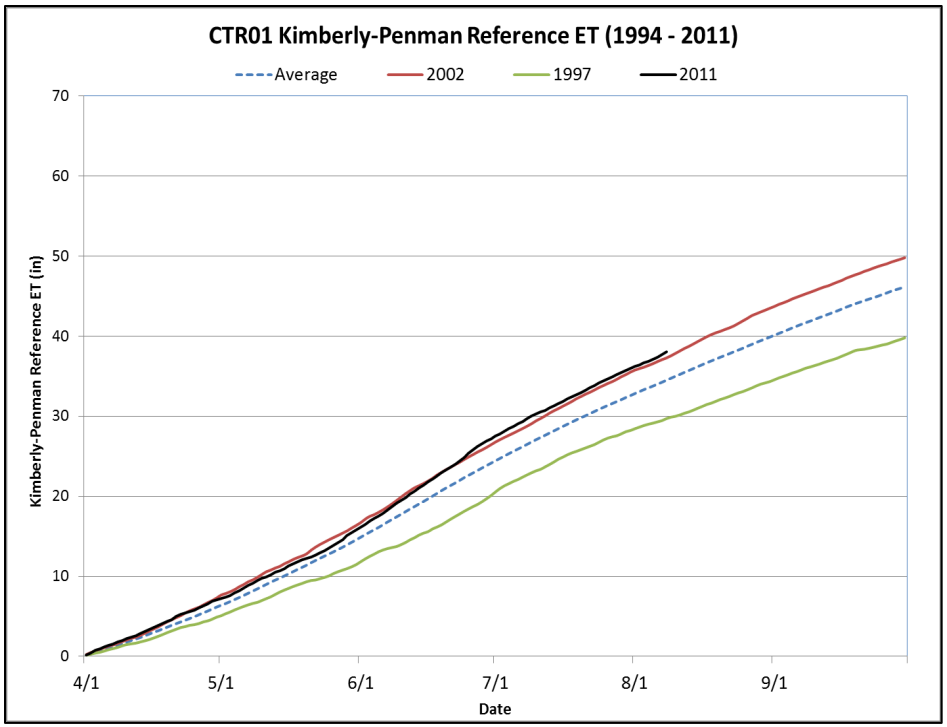


Fig. 5: Reference evapotranspiration since April 1st at Center, CO in the San Luis Valley.

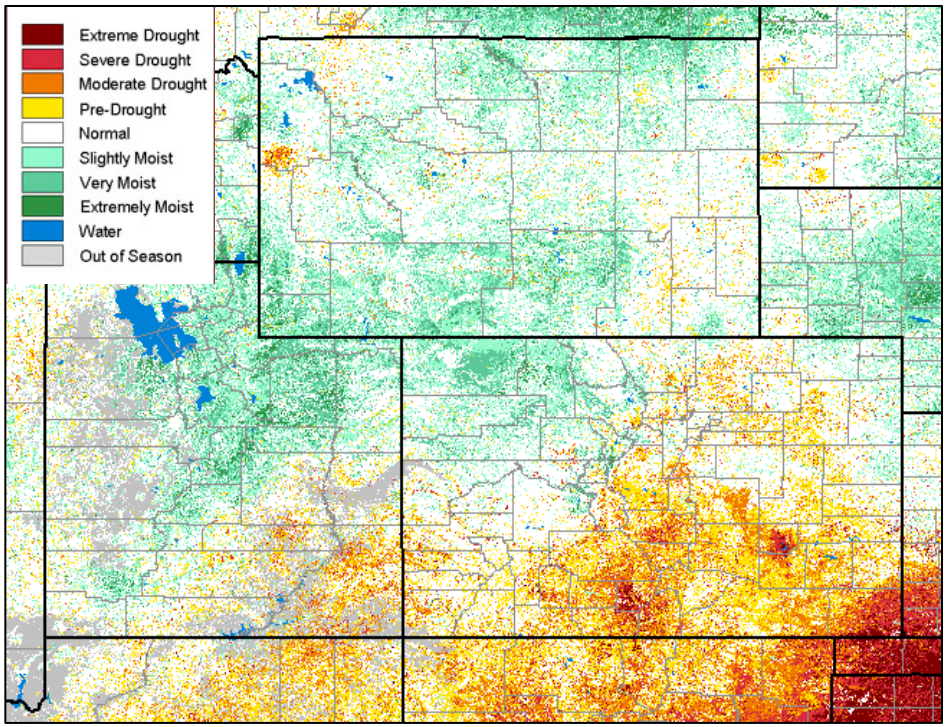
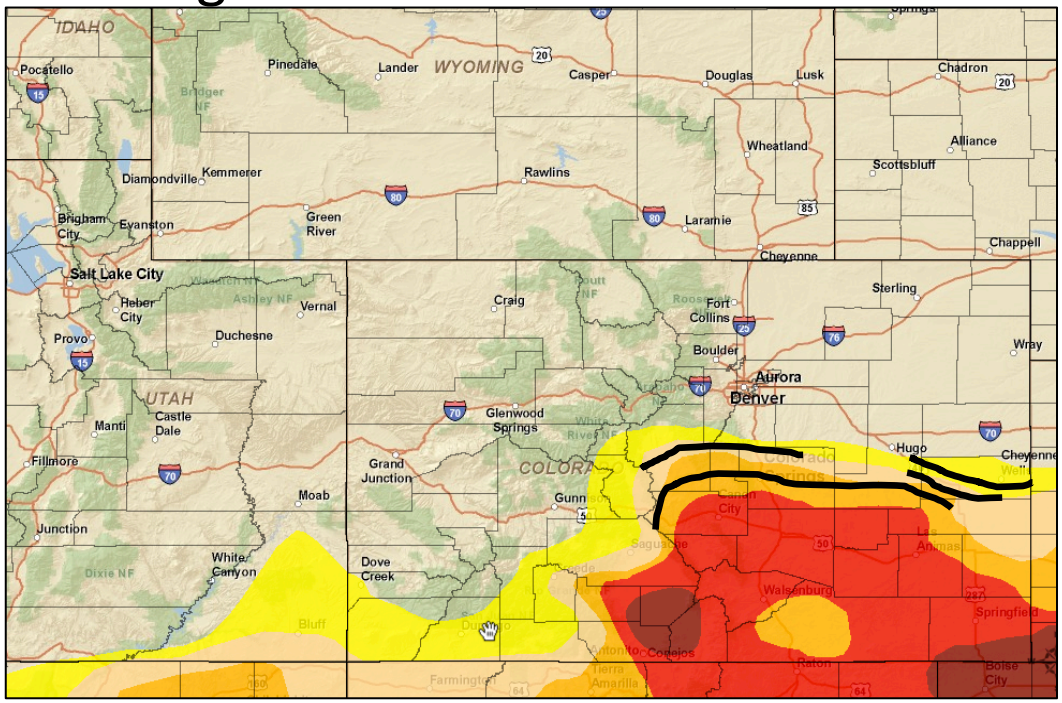


Fig. 6: August 7th VegDRI map, based on satellite-derived observations of vegetation.

Drought and Water Discussion



Drought – Exceptional	0 to 2 (D4)
Drought – Extreme	2 to 5 (D3)
Drought – Severe	5 to 10 (D2)
Drought – Moderate	10 to 20 (D1)
Abnormally Dry	20 to 30 (D0)

Drought categories and their associated percentiles

Fig. 7: August 2nd release of U.S. Drought Monitor for the UCRB

No changes are recommended in the UCRB for the current U.S. Drought Monitor (USDM) map (Fig. 7).

Due to heavy rains in Park, Jefferson, Douglas, and Teller counties last week, a slight trimming of the D0 – D2 lines is recommended in that area (Fig. 7, black lines), with a complete removal of D1 from Jefferson and Douglas counties suggested. Also due to several weeks of beneficial rains in Cheyenne County, it is recommended to only keep D0 and D1 in the southwestern portion of the county (Fig. 7, black lines).

There is some disagreement regarding D4 in the San Luis Valley. Data are sparse in the region, but the Alamosa COOP station shows that conditions are extremely dry, the VegDRI shows extreme drought conditions, and several locals have reported they have never seen it drier. However, streamflow conditions and the surrounding mountains are in better condition, and other local experts report that conditions in the valley have improved since July.