NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

September 6, 2011

Precipitation and Snowpack

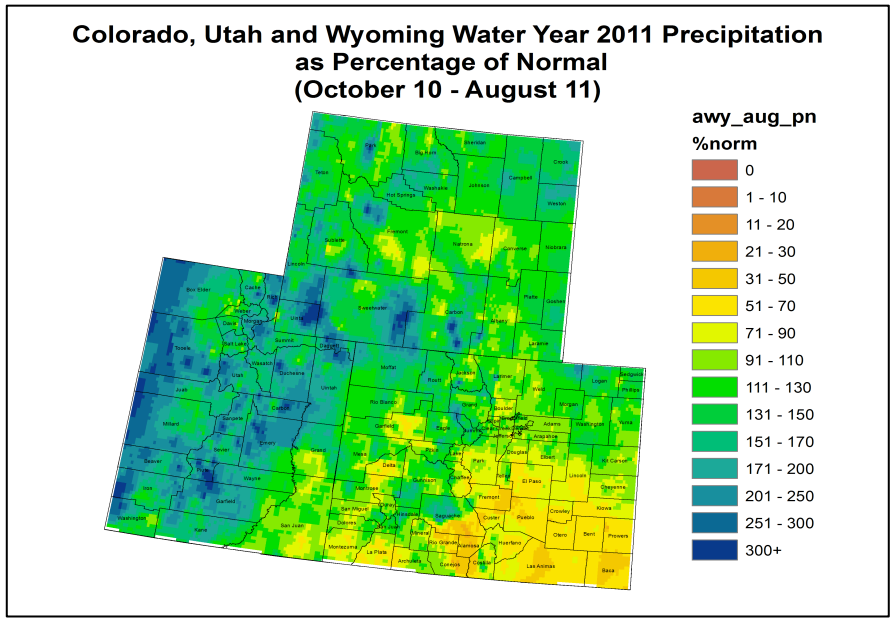


Fig. 1: Water-year-to-date precipitation as percent of average.

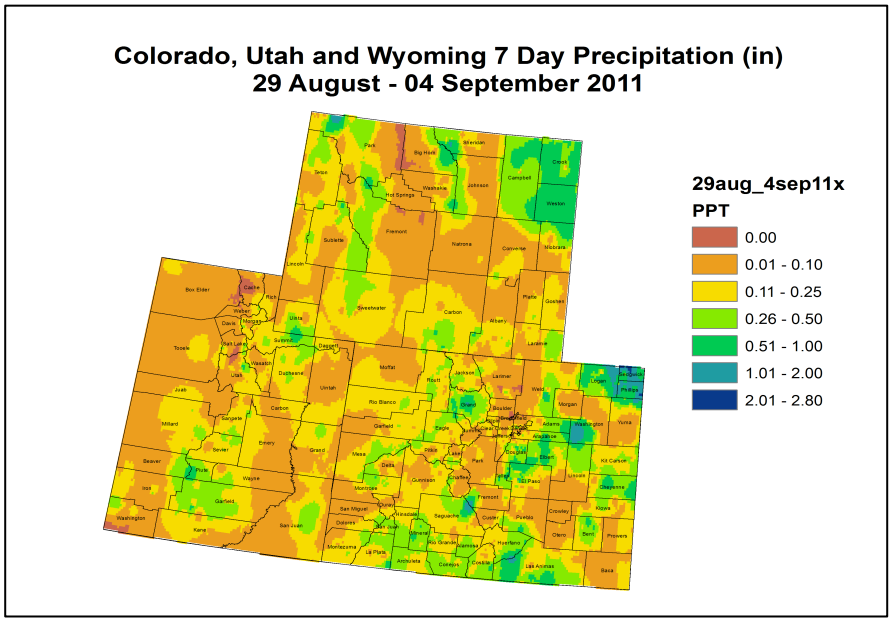


Fig. 2: August 29 – September 4 precipitation in inches.

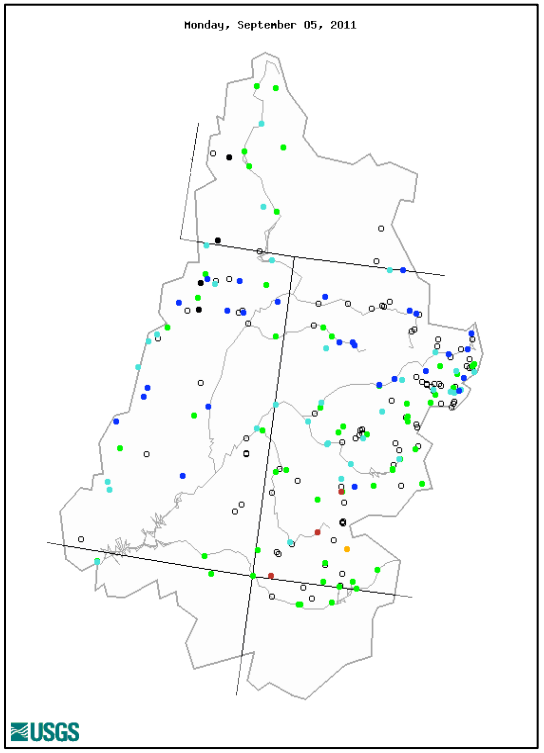
Water-year-to-date (WYTD), most of the Upper Colorado River Basin (UCRB) has received near or above average precipitation (Fig. 1). The Upper and Lower Green River basins have received over 150% of their average WYTD precipitation in many spots. The southern portion of the UCRB has been drier, seeing around 70 to 100% of average. A few of the lower elevations in the central part of the UCRB have dried, with WYTD totals falling to 50 – 70% of average. Northeast CO has received near average precipitation for the water year, while southeast CO and the San Luis Valley have received less than 50% of average in many areas.

Showers were very isolated and spotty last week over the UCRB and surrounding areas (Fig. 2). There were isolated accumulations of a quarter to half an inch throughout the UCRB, though most areas saw less than a quarter inch for the week. Many areas in northeast CO and in drought stricken southern CO received over half an inch and up to an inch of moisture. Some areas still in severe drought received less than a tenth of an inch.

Streamflow and Water Supply

As of September 5th, about 97% of the USGS streamgages in the UCRB recorded normal (25th – 75th percentile) or above normal 7-day average streamflows (Fig. 3), with 52% of the gages recording flows above the 75th percentile and only 4 gages recording below normal flows. 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 80th and 91st percentiles, respectively (Fig. 4). Streamflow on the San Juan River near Bluff, UT is at the 42nd percentile.

All the major reservoirs' storage volumes in the UCRB have been decreasing since late July, with Green Mountain, Lake Granby, and Lake Dillon seeing only minor decreases. All of the major reservoirs above Lake Powell are currently near or above their average September levels. Only Navajo Reservoir is below last year's levels. Lake Powell's volume is currently 89% of average and 73% of capacity.



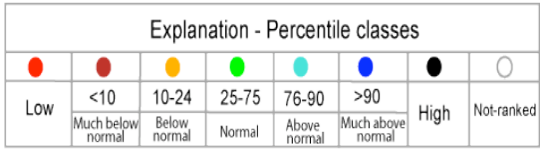


Fig. 3: 7-day average discharge compared to historical discharge for September 5th.

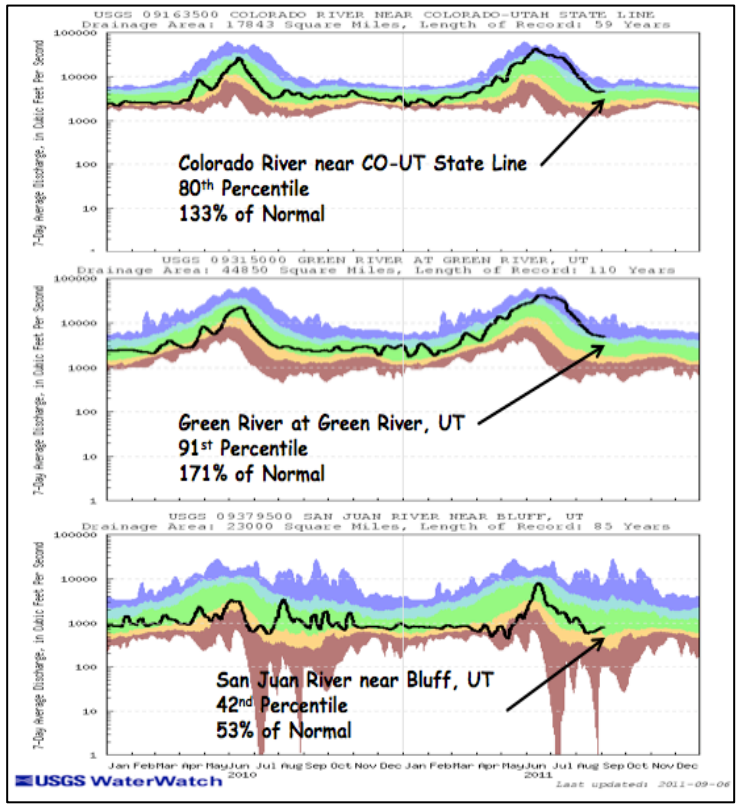


Fig. 4: USGS 7-day average discharge over time at the CO-UT stateline (top), Green River, UT (middle) and Bluff, UT (bottom).

Water Demand

Last week, warmer than average temperatures continued to dominate over the UCRB, across the Front Range, and over eastern plains of 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 near 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 few weeks.

The VIC model shows improved soil moisture conditions for the San Luis Valley, though this is likely only from short-term precipitation input into the model. Poor soil moisture conditions are still seen in parts of southeast CO and in northeast CO and southern WY; deteriorating conditions are now being seen in eastern UT. Satellite imagery of vegetation conditions show very dry vegetation with little growth in the San Luis Valley and southeast CO (Fig. 6). Vegetation conditions are moist for the northern portion of the UCRB, slightly dry in the Four Corners area, and slightly drier than average for northeast CO.

Precipitation Forecast

A weak but persistent upper level disturbance will impact the UCRB today through the end of the week. It will combine with sub-tropical moisture from the southwest to bring numerous showers and a few thunderstorms to the area. Cooler temperatures associated with the trough will limit convective instability, so expect precipitation to be more in the form of widespread light showers rather than isolated downpours. The best chance for precipitation will be over the southeastern parts of the basin including the San Juans and central CO mountains, with a chance of some light snow accumulations above 11,000 ft. By this weekend the upper level trough is replaced by a ridge of high pressure with southwesterly flow aloft over the UCRB. Temperatures will moderate under this pattern with enough moisture present to spawn isolated showers and thunderstorms favoring the mountains in the southern parts of the basin.

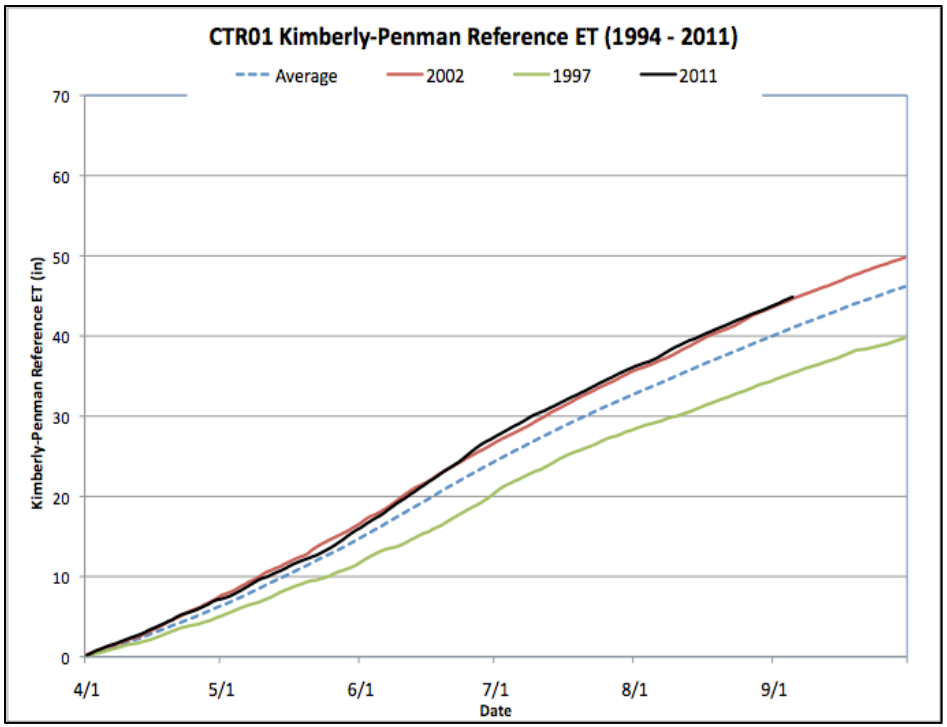


Fig. 5: Reference evapotranspiration since April 1st at Center, CO in the San Luis Valley.

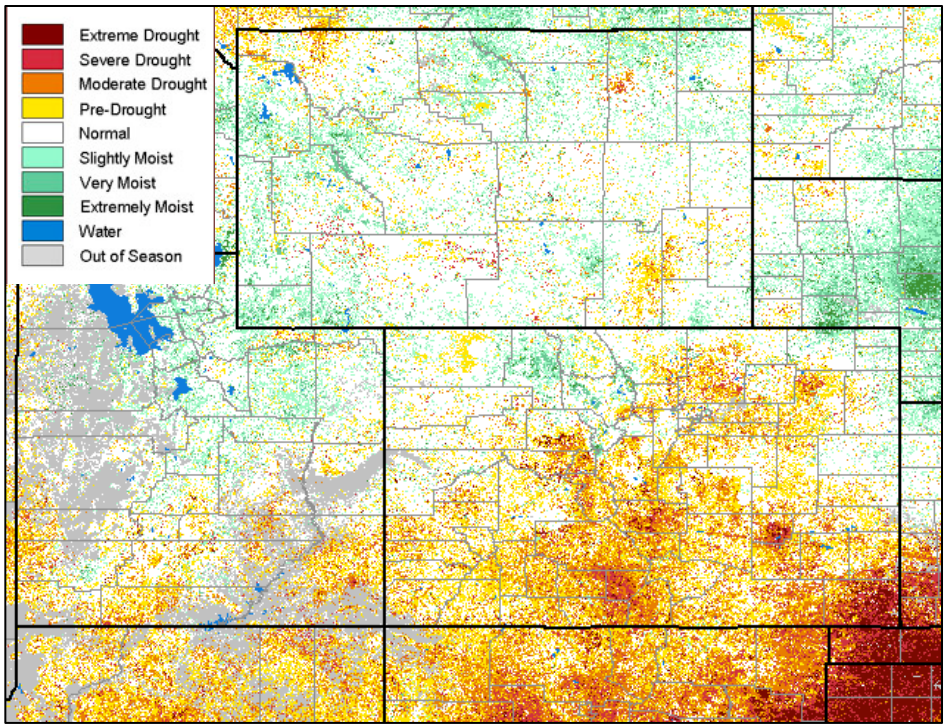
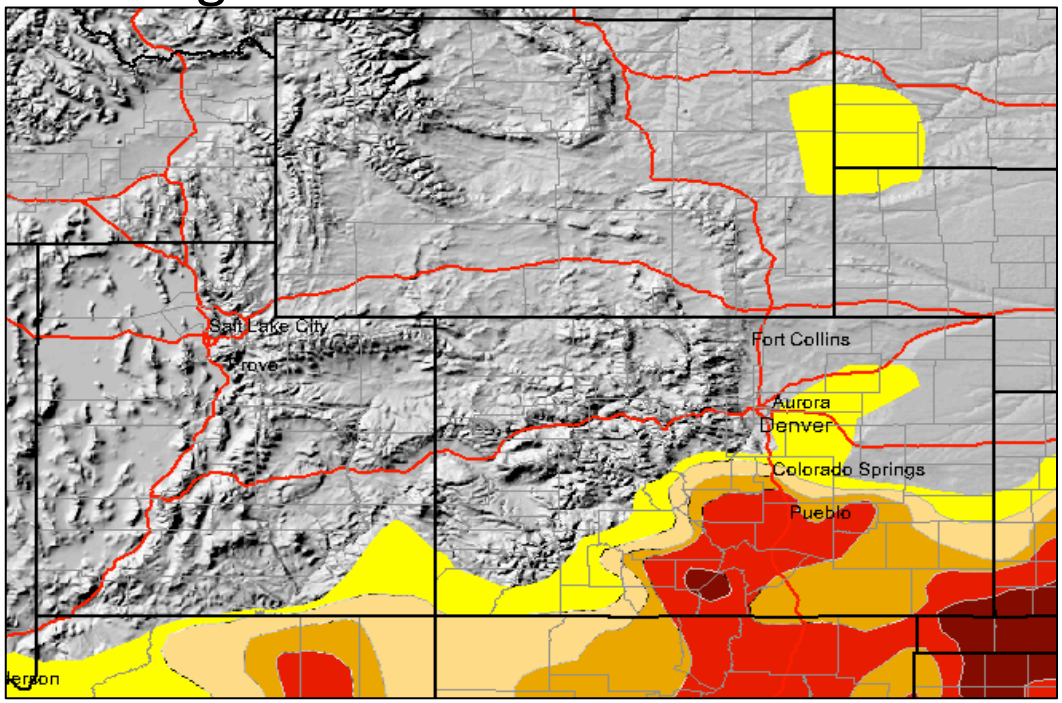
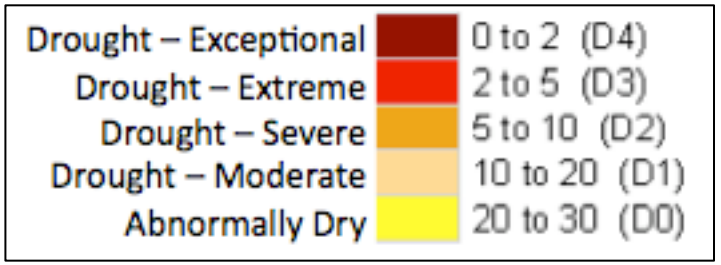


Fig. 6: September 4th VegDRI map, based on satellite-derived observations of vegetation.

Drought and Water Discussion





Drought categories and their associated percentiles

Fig. 7: August 30th release of U.S. Drought Monitor for the UCRB

Status quo is recommended this week for the current U.S. Drought Monitor (USDM) map over the UCRB and eastern CO (Fig. 7).

Spotty precipitation has fallen over some of the drought stricken areas in southeast CO. However, totals were not quite enough to warrant further improvements at this time. Though the San Luis Valley has received more precipitation in the past week and the D4 could possibly be removed soon, drier conditions are still being observed on the valley floor, the VegDRI still shows very dry vegetation, and refET rates are still extremely high. Therefore, we are recommending that D4 stay at this time.

More short-term dryness is being observed in northeast CO (i.e. Larimer and Weld counties), but at this time, it is recommended to hold off on any further D0 expansion and wait to see how things respond over the next week.