NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

October 4, 2011

Precipitation and Snowpack

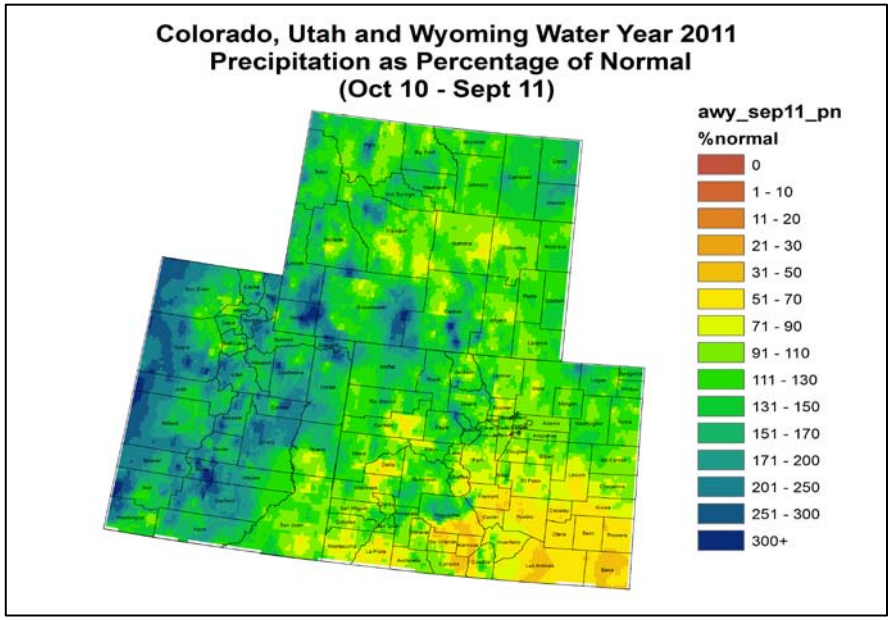


Fig. 1: Water Year precipitation as percent of normal.

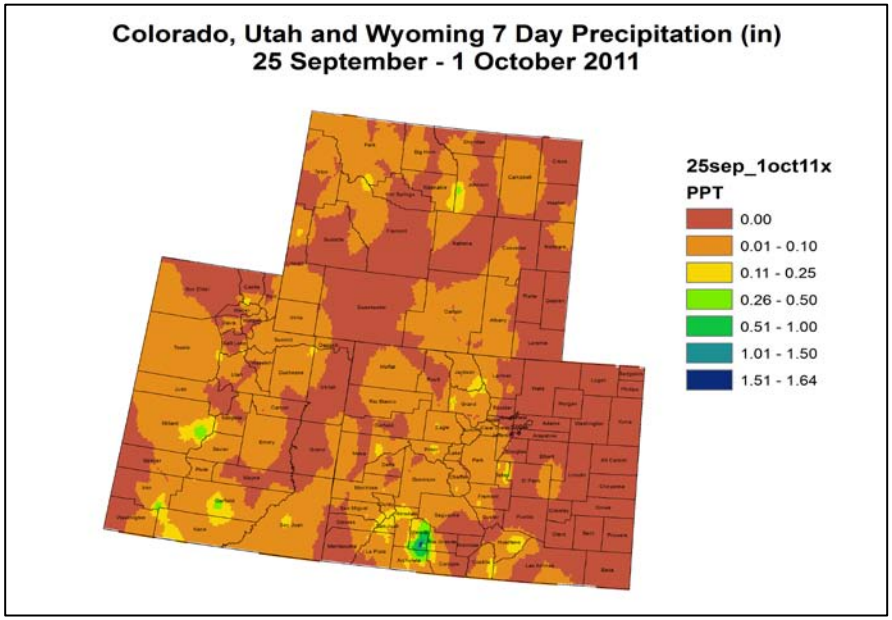


Fig. 2: September 25 – October 1 precipitation in inches.

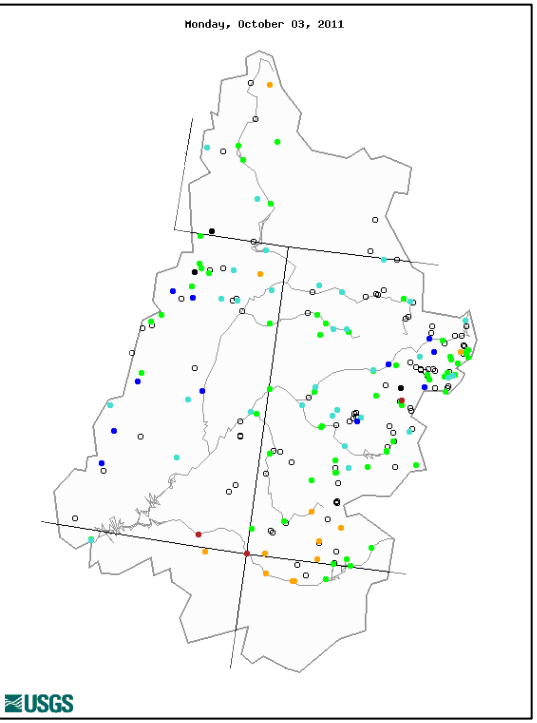
For the water year, most of the Upper Colorado River Basin (UCRB) received near or above average precipitation (Fig. 1). The Upper and Lower Green River basins were the wettest, seeing nearly 300% of average in some areas. The Four Corners area was drier for the water year receiving 90-110% of normal. Northeast Colorado received near average precipitation for the water year. Southeast Colorado and the San Louis Valley were much drier, receiving 70% or less of their average water year precipitation.

Most of the UCRB received less than a tenth of an inch of precipitation the last 7 days(Fig. 2). Mineral County, CO in the San Juan mountains received up to 1.6 inches of precipitation in this period, however this data point is questionable. A few scattered hundredths fell October 2nd and 3rd along the Front Range and in southeast Colorado, which are not shown in Figure 2.

Streamflow and Water Supply

As of October 3rd, 73% of the USGS streamgages in the UCRB recorded normal (25th – 75th percentile) or above normal 7-day average streamflows (Fig. 3), with 32% of the gages recording flows above the 75th percentile. Only 11% of gages recording below normal flows, mainly in the San Juan Basin. The remaining 16% of gauges are Non-ranked. Key gages on the Colorado River near the CO-UT state line and the Green River at Green River, have above normal 7-day average streamflows, 75th and 92nd percentiles, respectively (Fig. 4). The San Juan River near Bluff, UT has dropped significantly to below average streamflow, at the 11th percentile.

All the major reservoirs' storage volumes in the UCRB continued decreasing in September, with Flaming Gorge, Lake Powell and Navajo Reservoir 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 average, 97% of the October average. Lake Powell's volume is currently 90% of average and 72% of capacity, compared to 63% of capacity last year at this time.



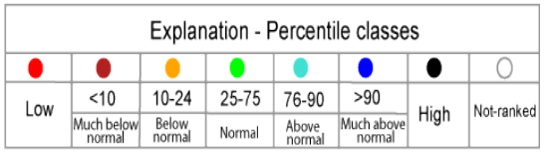


Fig. 3: 7-day average discharge compared to historical discharge for October 3rd.

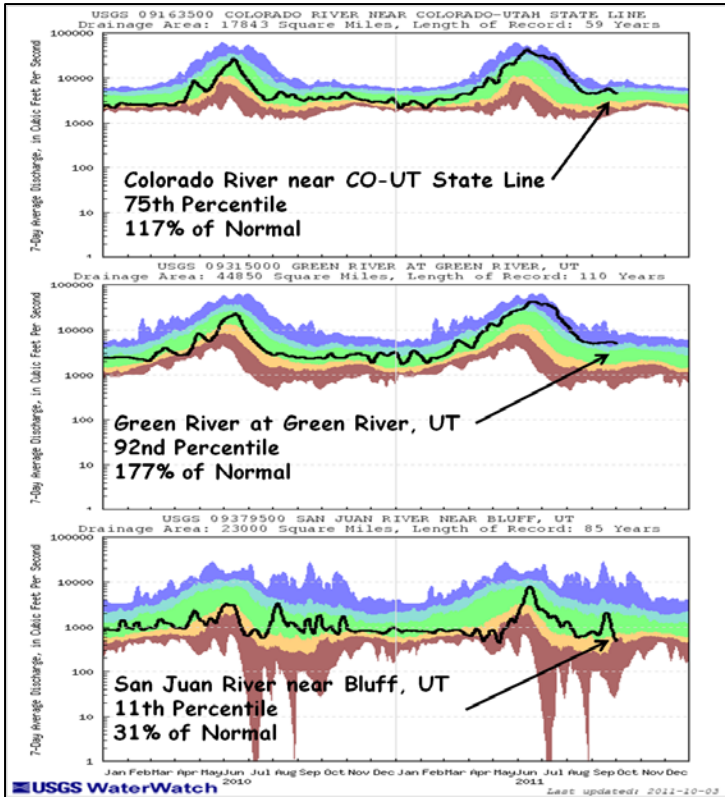


Fig. 4: USGS 7-day average discharge over time at the CO-UT stateline (top), Green River, UT (middle) and Bluff, UT (bottom).

Water Demand

Last week, warmer than average temperatures dominated across the UCRB and eastern Colorado. The increased temperatures and little precipitation has not helped to ease water demands and lower reference evapotranspiration (refET) in the San Louis Valley and southeast CO. With cooler temperatures and some precipitation, mid-September refET rates in the San Louis Valley dropped below 2002 rates for the first time since May. However, with warmer temperatures and little precipitation to end September, the refET increased again to finish near the maximum year of 2002 (Fig. 5).

The VIC model shows decreased soil moisture conditions for most of the UCRB and eastern Colorado for the past 2 weeks. Poor soil moisture conditions are still prevalent throughout much of southeast CO. Southern WY is now showing very dry soils, while the Wasatch mountains in UT and the northern mountains of CO continue to show moist soils. Satellite imagery of vegetation conditions show very dry vegetation in the Four Corners region, the San Luis Valley, and southeast CO (Fig. 6). Vegetation conditions are moist for the northern portion of the UCRB and slightly drier than average for northeast CO.

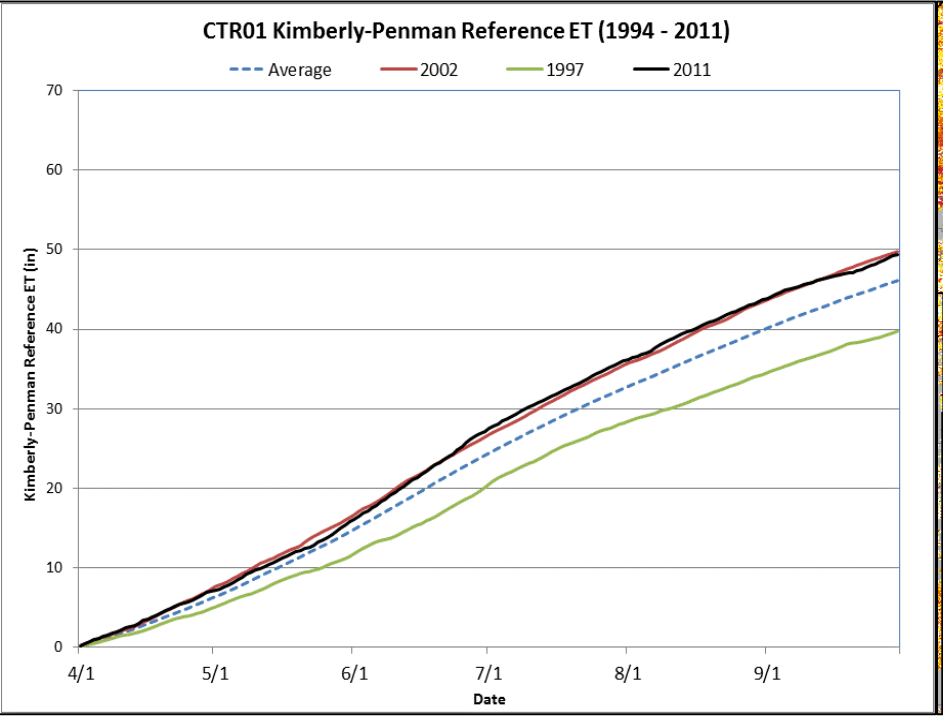


Fig. 5: Reference evapotranspiration since April 1st at Center, CO in the San Luis Valley.

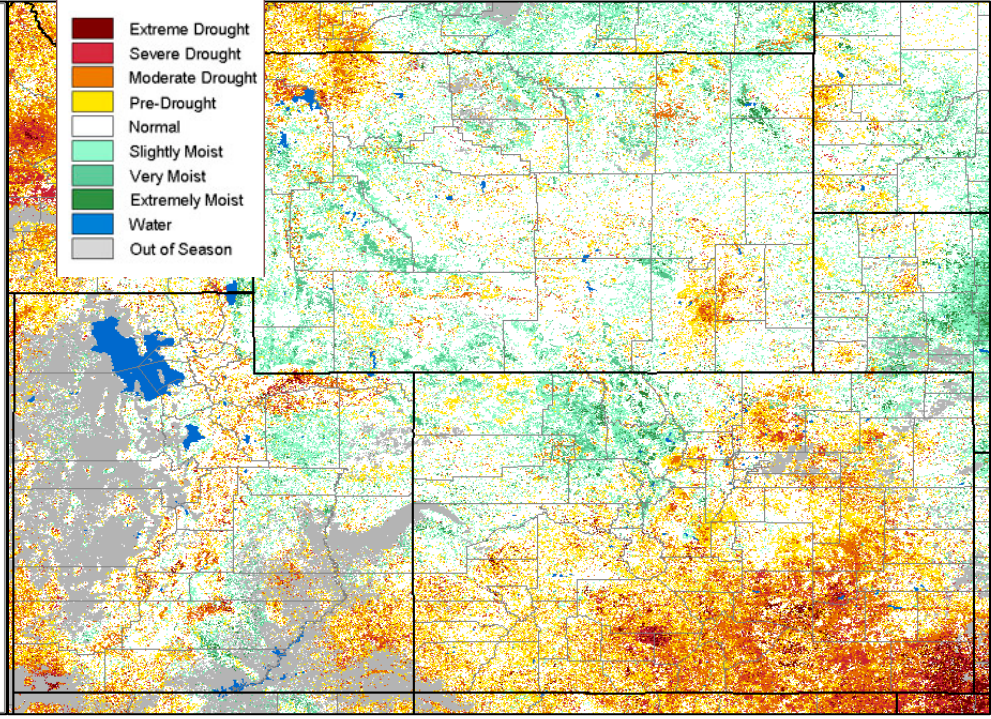
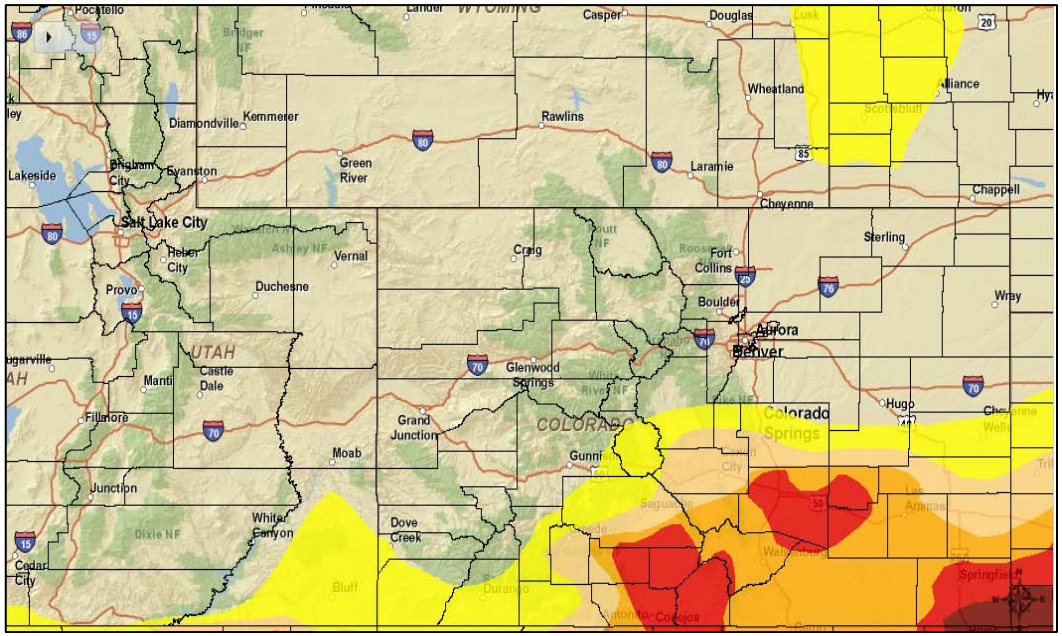


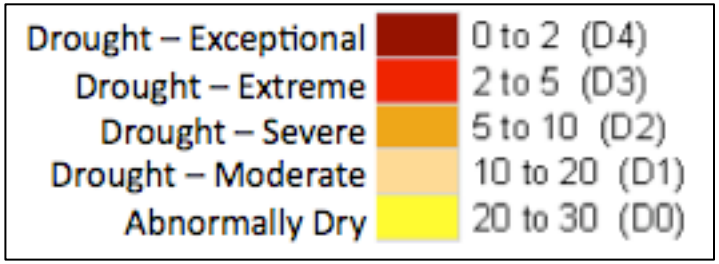
Fig. 6: October 2nd VegDRI map, based on satellite-derived observations of vegetation.

Precipitation Forecast

Strong southwest flow has developed over the UCRB as the persistent ridge that has dominated the weather over the past weeks continues to creep eastward today. Meanwhile, a large trough of low pressure will begin to migrate eastward through the week and bring a dramatic change to weather conditions by the weekend. Expect scattered showers to increase in coverage over southern and western portions of the basin through tomorrow with areas around the San Juan Mountains picking up over 1 inch of liquid precipitation by Thursday. The mountains of eastern Utah and western Wyoming are also in line to pick up between 0.25 and 0.50 inches of liquid, with the rain/snow line hovering around 10,000 feet through the middle of the week. By Friday the main upper level disturbance will begin to impact the UCRB, and result in snow levels plummeting well below 8000 feet as early as Thursday evening. Accumulating snow will be likely over most mountain locales with snow possible in many valley locations as well. Additional liquid accumulation will range from 0.25 inches over lower elevations to 1.5 inches in the San Juan Mountains, where over a foot of snow could fall through Saturday to kick off the accumulation season. Forecast models are still varying widely on the evolution of this storm system beyond Saturday, with the potential of precipitation to linger across the basin through the weekend. Drier conditions can be expected to return to the UCRB early next week with temperatures moderating to near seasonal averages.

Drought and Water Discussion





Drought categories and their associated percentiles

Fig. 7: September 27th release of U.S. Drought Monitor for the UCRB

Despite most of the UCRB being dry now for 17 days, with cooler and unsettled weather on tap for he next several days, status quo is being recommended for the current U.S. Drought Monitor (Fig. 7). However, the conditions will be closely monitored and evaluated. With the very low soil moisture from the VIC soil model and low SPIs in the UCRB portion of southwest WY, coordination with Wyoming may be needed to start to introduce at least D0 into that area.