NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

October 18, 2011

Precipitation and Snowpack

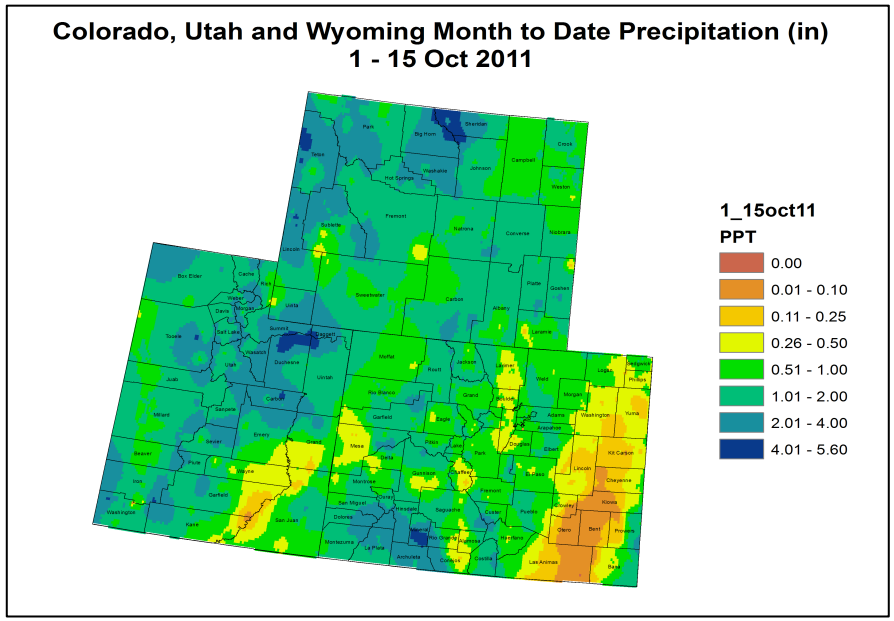


Fig. 1: October month-to-date precipitation in inches.

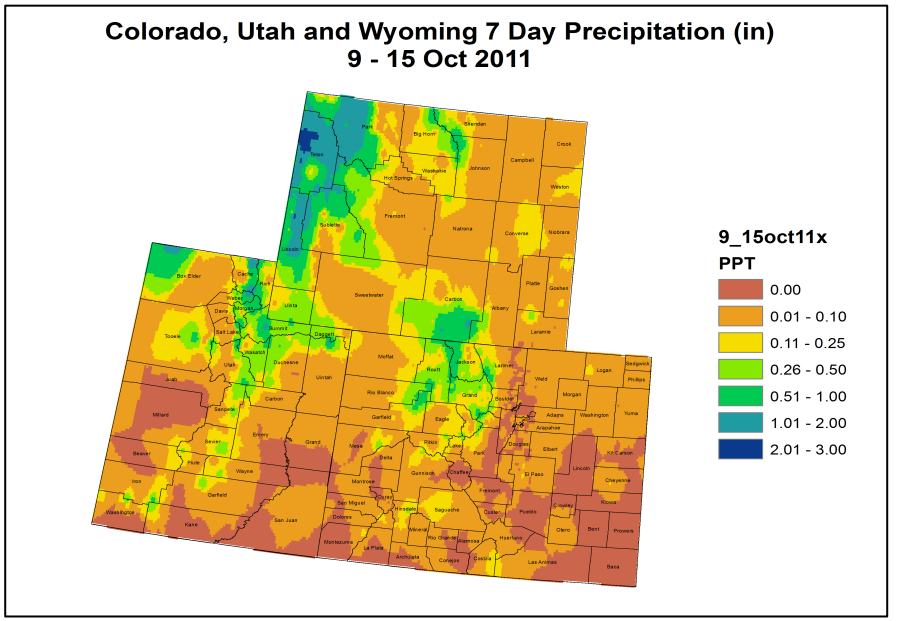


Fig. 2: October 9 – 15 precipitation in inches.

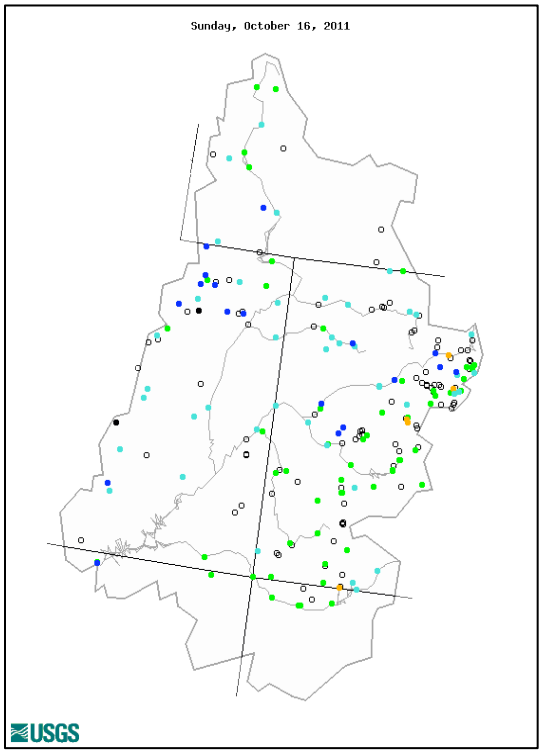
With the beginning of the new water year, precipitation has favored the northwestern portion of the Upper Colorado River Basin (UCRB), with over 1 inch of accumulations in the Upper and Lower Green River basins since the beginning of the month (Fig. 1). The San Juan mountains in southern Colorado have also received generous moisture, with some areas seeing over 2 inches for the month. The Colorado River valley just above Lake Powell has been drier, receiving less than a quarter inch. The higher elevations in the UCRB have already begun to accumulate winter snowpack. East of the basin, much of eastern CO has been relatively drier, receiving less than a quarter inch, while some spots along the Front Range saw between .5 and 1 inch.

Last week, most of the UCRB and eastern CO were fairly dry, with precipitation accumulations of less than a tenth of an inch (Fig. 2). The northern mountains of CO and the Wasatch mountains in Utah fared better, receiving over a quarter inch of moisture for the week. Many areas in the Four Corners region and southeast CO received no precipitation last week.

Streamflow and Water Supply

As of October 16th, 97% of the USGS streamgages in the UCRB recorded normal (25th – 75th percentile) or above normal 7-day average streamflows (Fig. 3), with 51% of the gages recording flows above the 75th percentile and 5 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 show above normal 7-day average streamflows, at the 82nd and 85th percentiles, respectively (Fig. 4). The San Juan River near Bluff, UT is showing near normal streamflows, at the 47th percentile.

All of the major reservoirs in the UCRB are near or above their October averages. Blue Mesa, Granby and Green Mountain's levels are decreasing more than average for this time of year, while Navajo and Lake Powell's levels have stayed fairly consistent for the month. Lake Powell's volume is currently 90% of average and 72% of capacity.



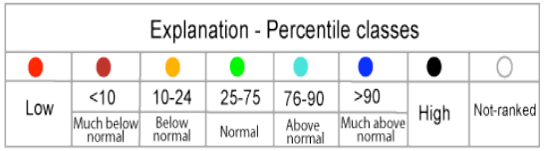


Fig. 3: 7-day average discharge compared to historical discharge for October 16th.

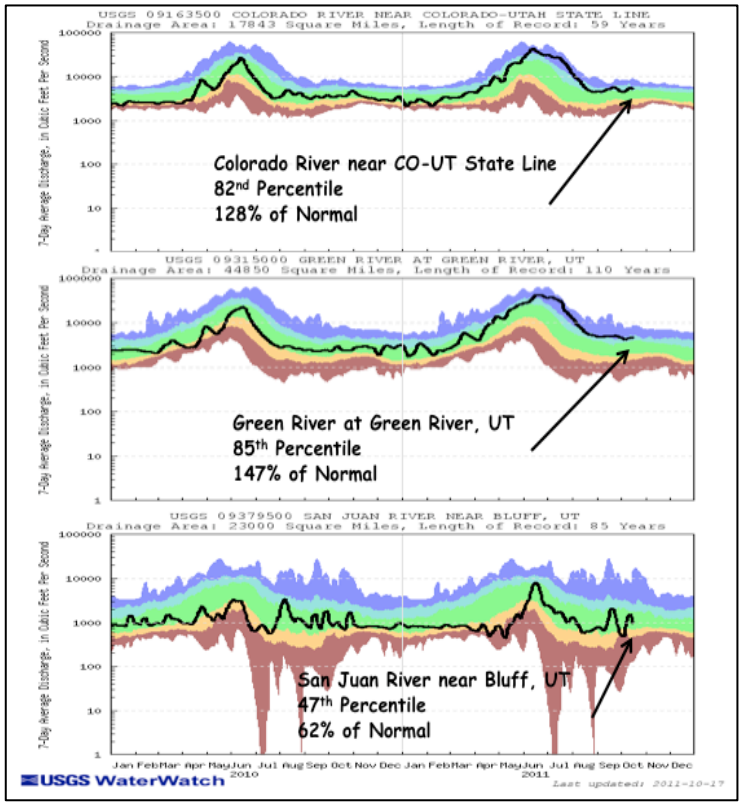


Fig. 4: USGS 7-day average discharge over time at the CO-UT stateline (top), Green River, UT (middle) and Bluff, UT (bottom).

Water Demand

Near average temperatures were experienced across most of the UCRB and eastern CO last week, with warmer than average temperatures observed in southern WY. With the cooler fall conditions and continuous widespread precipitation throughout the drought stricken areas of southeast CO, water demands have eased. The VIC model shows poor soil moisture conditions where long term dryness has prevailed for much of the year over southeast CO (Fig. 5). Most of the UCRB shows near average soil moisture with the Wasatch range in UT and the mountains near the Colorado Headwaters showing very wet soils. Near normal to slightly wet soil conditions are showing up in the southern portion of the UCRB. Satellite imagery of vegetation conditions show dry vegetation in the Four Corners region, the San Luis Valley, and southeast CO, though some improvements are showing up in these drought stricken areas. Vegetation conditions are moist for most of the northern part of the UCRB and slightly drier than average in parts of northeast CO.

Precipitation Forecast

A dry northwest flow will be over the UCRB today and will lead to clear skies over most of the region through Wednesday. Dry conditions will persist through much of the week with only a slight increase in clouds on Wednesday night associated with a minor upper level disturbance. Another weak disturbance will move across the area on Friday evening and spark a few snow showers over the mountains of northern and central CO. A lack of moisture associated with this system will severely limit precipitation chances, and any showers that do form will result in little if any accumulation. Brisk northwest flow aloft will follow Friday's minor weather system and bring a return to dry conditions for the entire basin through the weekend. The next Pacific disturbance is expected to begin affecting the western mountains of WY sometime Monday evening, with cooler and unsettled conditions possible across the northern portion of the UCRB as early as Tuesday.

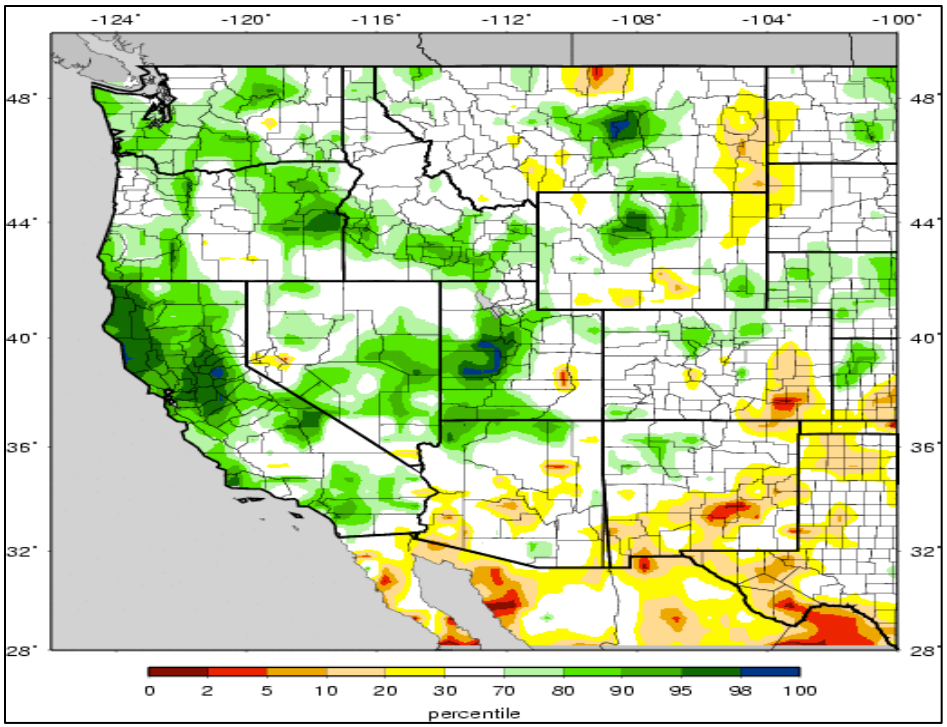
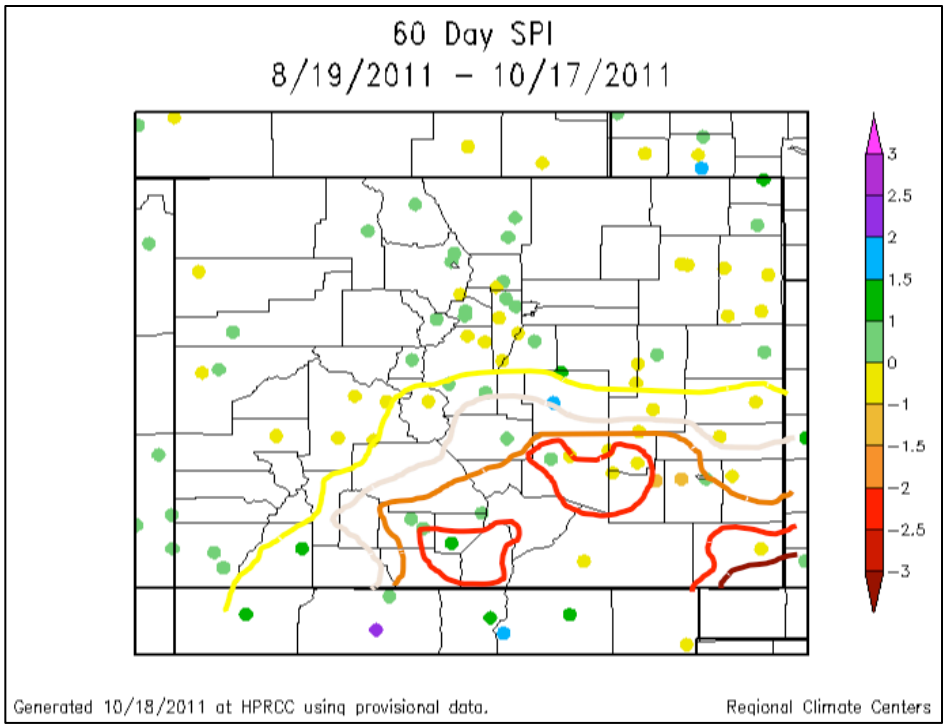


Fig. 5: VIC soil moisture percentiles as of October 16th.



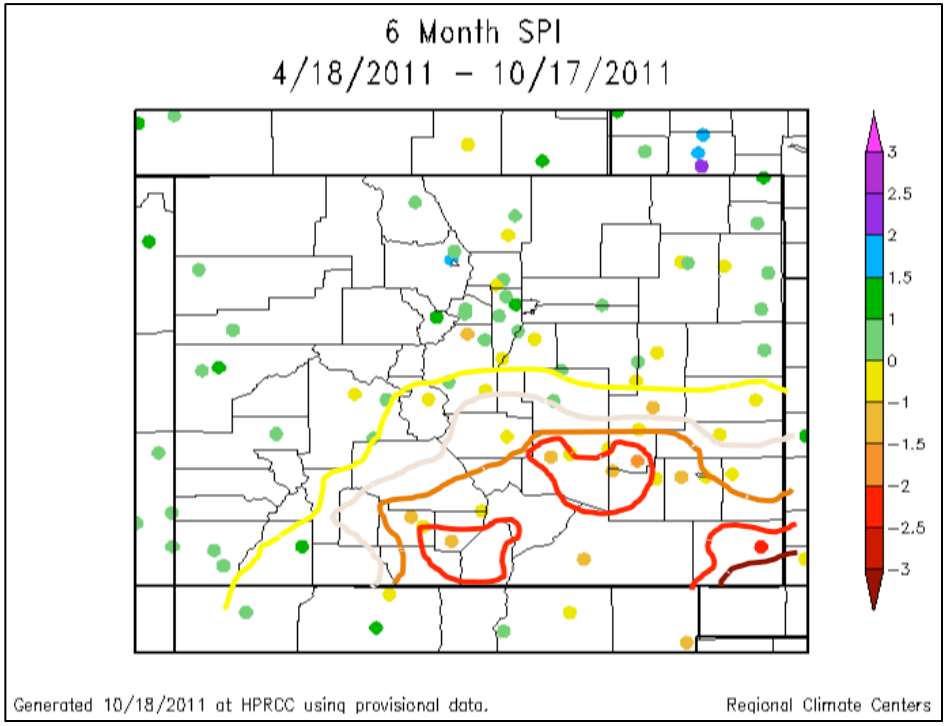
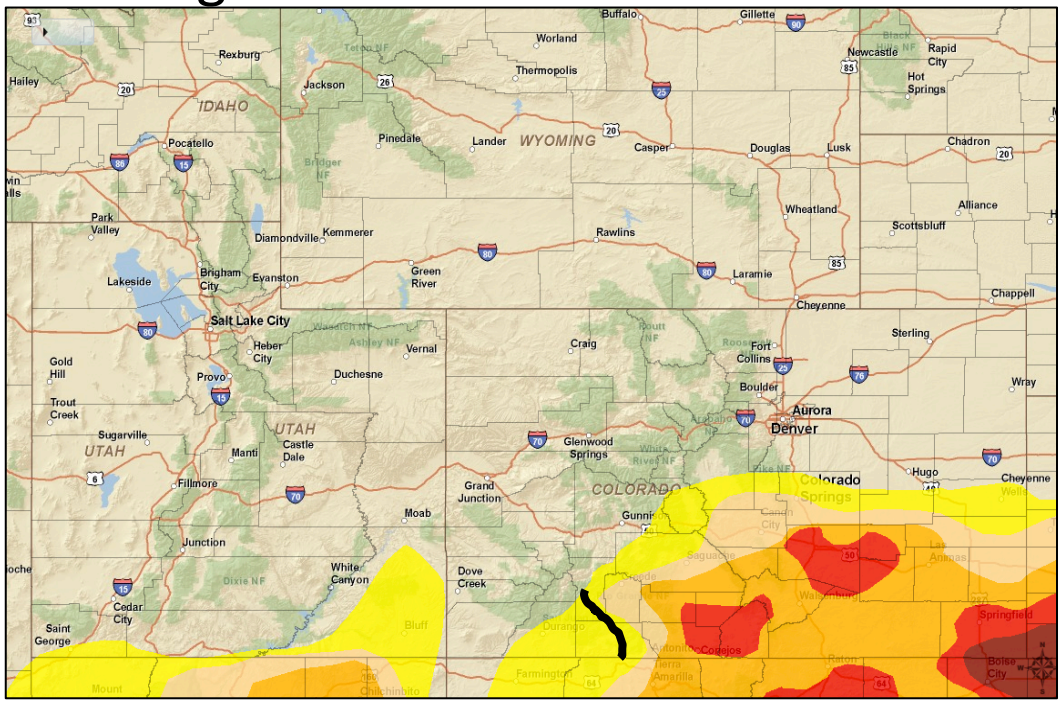
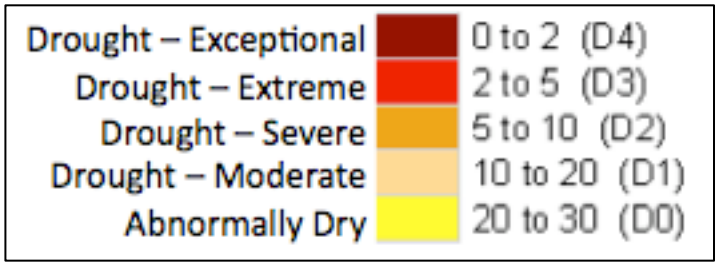


Fig. 6: 60-day (top) and 6-month (bottom) standardized precipitation index (SPI) over CO with USDM drought categories overlaid.

Drought and Water Discussion





Drought categories and their associated percentiles

Fig. 7: October 11th release of U.S. Drought Monitor for the UCRB

More slight improvements are recommended in the southeastern portion of the UCRB to the current U.S. Drought Monitor (USDM) map (Fig. 7, black line). Over 2 inches of precipitation have fallen in that area since the beginning of the month, and SPIs in La Plata County, CO are positive on all time scales (Fig. 6). The line could probably be adjusted in northwest NM as well, but we will defer to the USDM author and state experts there on how to resolve that. The D0 in southeast UT still looks justified as this area has not received nearly as much recent moisture.

Status quo is recommended for the rest of CO, east of the UCRB. Although many of the drought stricken areas received no precipitation last week, short- and long-term SPIs don't show a need for D2 or D3 expansion, and the D0 line appears to be well placed at this time (Fig. 6). The VIC soil moisture model does show short-term dryness popping up in Lincoln, Cheyenne, and Kiowa Counties. These areas will be closely monitored for possible degradations (expansion of D0 and D1) in the near future.