# NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

September 27, 2011

# Precipitation and Snowpack

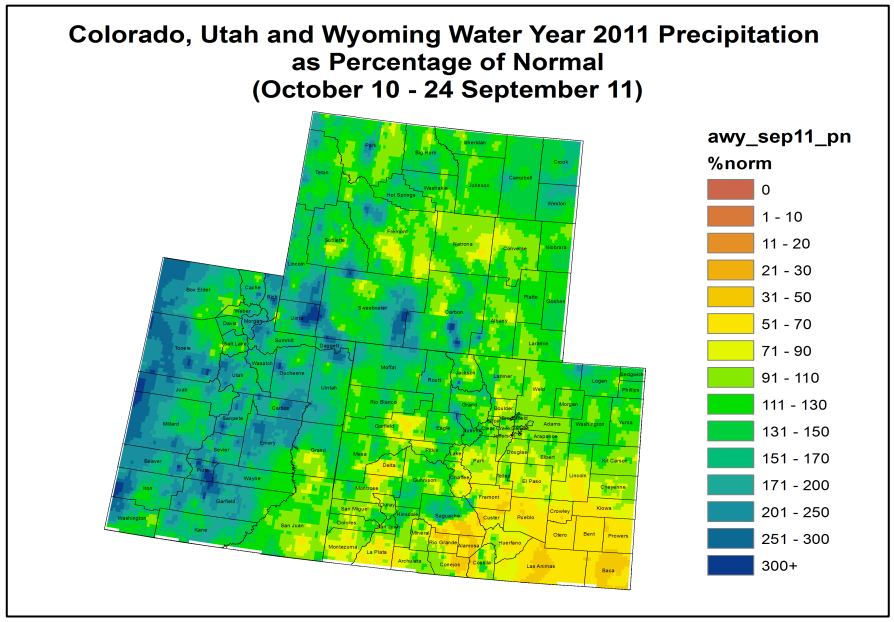



Fig. 1: Water-year-to-date precipitation as a percent of average.

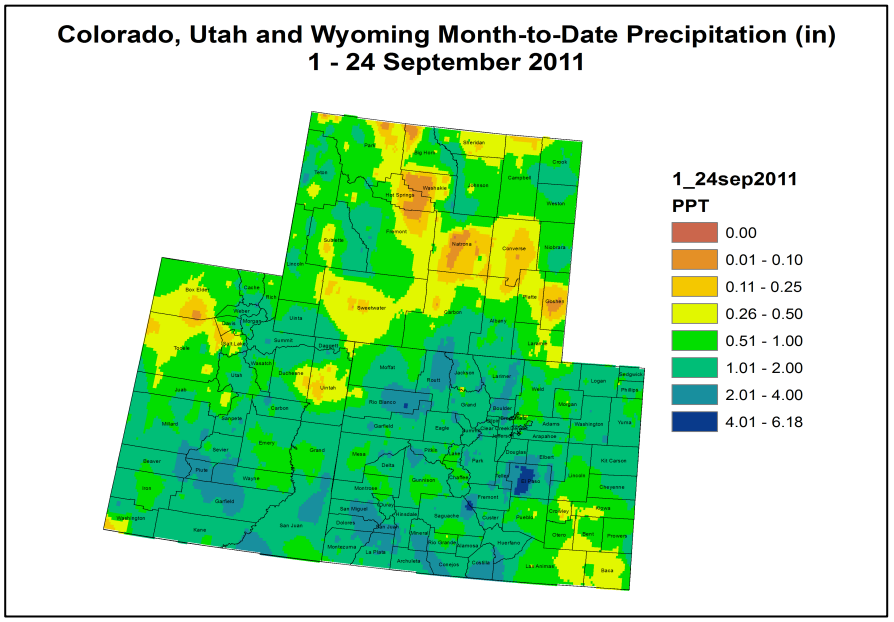



Fig. 2: September month-to-date precipitation in inches.

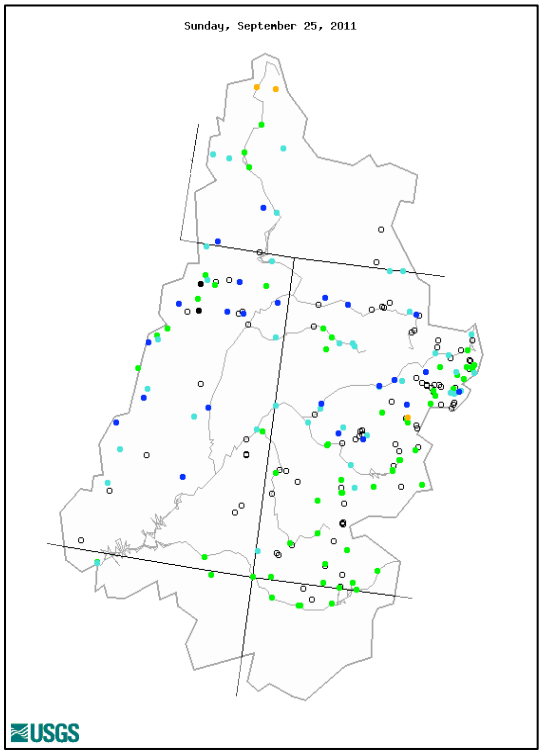
For the water year, most of the Upper Colorado River Basin (UCRB) has received near or above average precipitation (Fig. 1). The Upper and Lower Green River basins were the wettest, seeing nearly 300% of average in some spots, and the Four Corners region has been drier for the water year, with some areas receiving less than 90% of average. East of the UCRB, northeast Colorado has seen near average precipitation, water-year-to-date, while southeast CO and the San Luis Valley have been much drier, receiving less than 70% of average in many areas.

Most of the UCRB and eastern CO have received over half an inch of moisture for the month of September so far (Fig. 2). Many spots in the northern CO mountains, and in the Four Corners and San Juan region have seen more than 2 inches for the month. Southeast CO, Sweetwater County, WY and northeast UT have been relatively drier this month, receiving less than half an inch. Last week, most of the basin and surrounding areas received less than a tenth of an inch of precipitation.

# Streamflow and Water Supply

As of September 25th, 98% of the USGS streamgages in the UCRB recorded normal (25th – 75th percentile) or above normal 7-day average streamflows (Fig. 3), with 50% of the gages recording flows above the 75th percentile and only 3 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 84th and 94th percentiles, respectively (Fig. 4). The San Juan River near Bluff, UT is showing near normal streamflows, at the 53rd percentile.

All the major reservoirs' storage volumes in the UCRB have continued decreasing in September, with Flaming Gorge, Navajo, and Lake Powell 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, compared to 63% of capacity last year at this time.



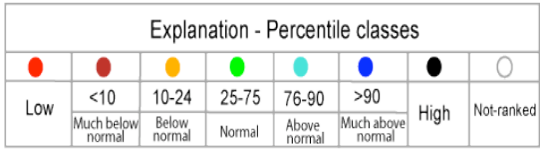




Fig. 3: 7-day average discharge compared to historical discharge for September 25th.

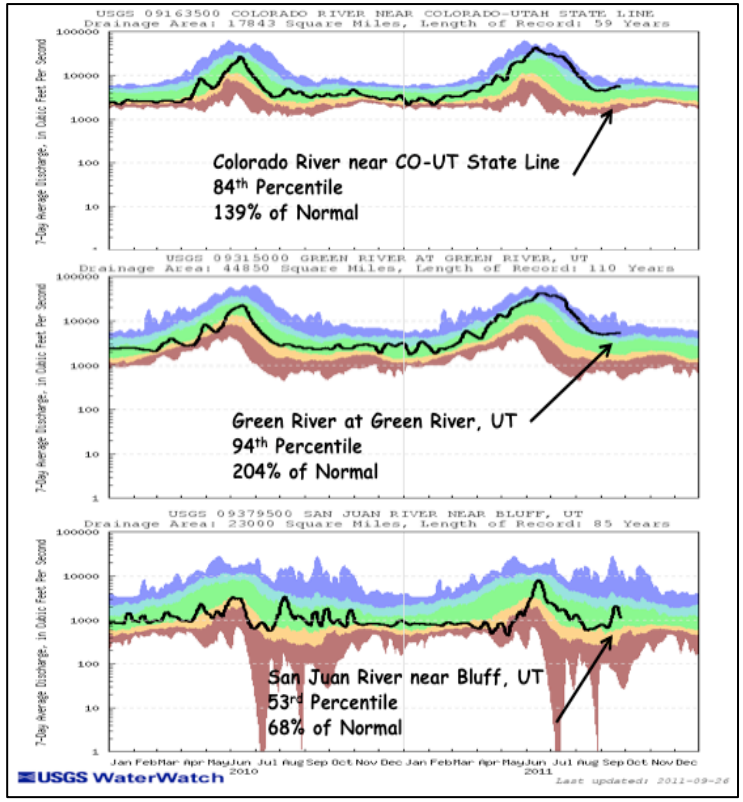



Fig. 4: USGS 7-day average discharge over time at the CO-UT stateline (top), Green River, UT (middle) and Bluff, UT (bottom).

# Water Demand

Last week, warmer than average temperatures were experienced in the western part of the UCRB with near average to slightly below average temperatures on the eastern side and east of the basin. This much needed cool down combined with ample precipitation has continued to help ease water demands and lower reference evapotranspiration (refET). Though high refET rates have dominated in southeast CO and the San Luis Valley for most of the summer, conditions have improved in both areas refET rates have lowered somewhat since the beginning of the month.

The VIC model shows poor soil moisture conditions where long term dryness has prevailed for much of the year (over southeast CO) and where short term dryness has popped up (in southwest WY). 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. Satellite imagery of vegetation conditions show very dry vegetation in the Four Corners region, the San Luis Valley, and southeast CO (Fig. 5). Vegetation conditions are moist for the northern portion of the UCRB and slightly drier than average for northeast CO.

# Precipitation Forecast

The large upper level ridge that has brought warm and dry conditions to the UCRB for the last week will continue to dominate the weather for the rest of this week. As a result dry conditions and above average temperatures can be expected to persist across most of the region through Friday. By Saturday sub-tropical moisture from the remains of Hurricane Hilary is expected to encroach on the southern portions of the UCRB. There is still a great deal of uncertainty in the amount of moisture that will be realized from this system, but it is likely that scattered showers will form over the San Juans and other elevated terrain in the south throughout the weekend. Rainfall will also be possible over areas in central CO and UT through Sunday if this system comes in stronger than expected. Forecast models are indicating a large scale pattern shift for early next week as the high pressure ridge currently over the inter-mountain west moves eastward and a Pacific trough begins to shift inland over the west coast. While significant uncertainty exists this far in the future, expect an end to above average temperatures with unsettled conditions possible as early as next Tuesday.

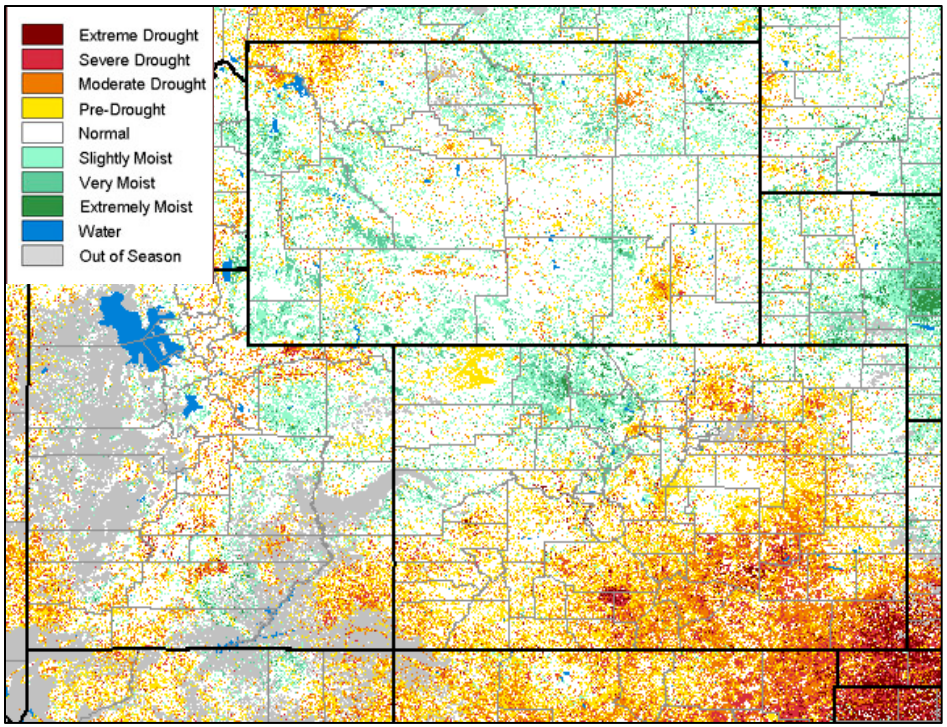



Fig. 5: September 25th VegDRI map, based on satellite-derived observations of vegetation.

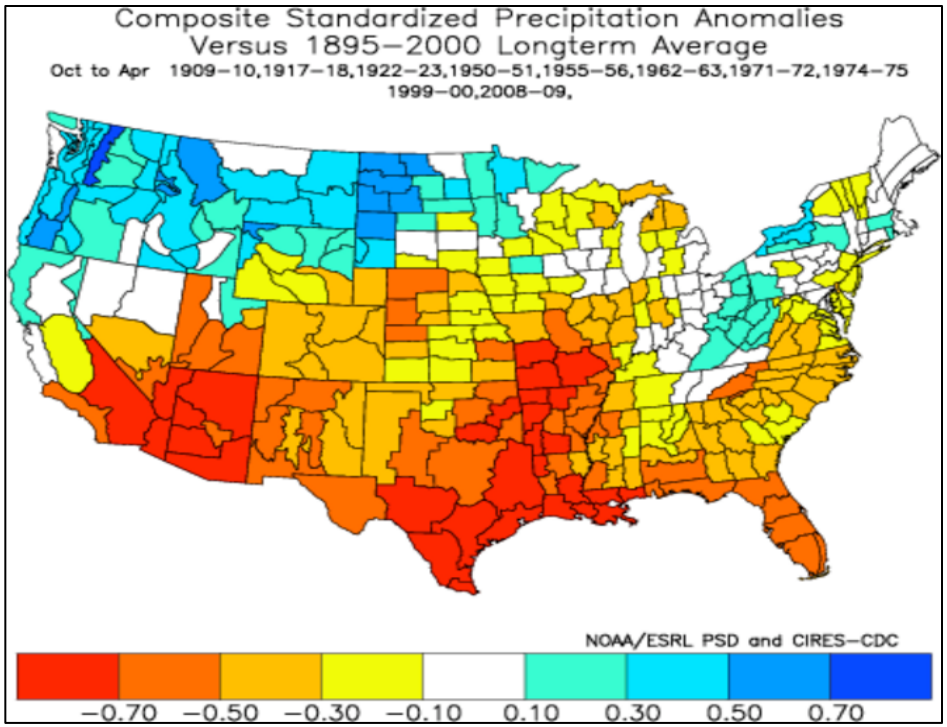



Fig. 6: Standardized precipitation anomalies for October – April, representative of 2nd year Las Niñas.

# Seasonal Outlook by Klaus Wolter

La Niña has returned after an ENSO-neutral summer with enhanced trade winds near the dateline and below normal sea surface temperatures in the central tropical Pacific Ocean. Though first year Las Niñas are generally associated with a wetter than average winter over most of the UCRB, a composite of second year Las Niñas shows that most of the UCRB is likely to see a drier than normal winter (Fig. 6). This could be exacerbated by a negative North Atlantic Oscillation (NAO) phase, which also favors dryness in the fall. Drier conditions are expected for the lower elevations and eastern CO. The higher elevations could receive near average snowfall for the season, though there is high statistical uncertainty in this longer-term forecast. Even with the uncertainty, it is very unlikely that the UCRB will have a repeat of last year's near record high snowpack for this winter.

# Drought and Water Discussion

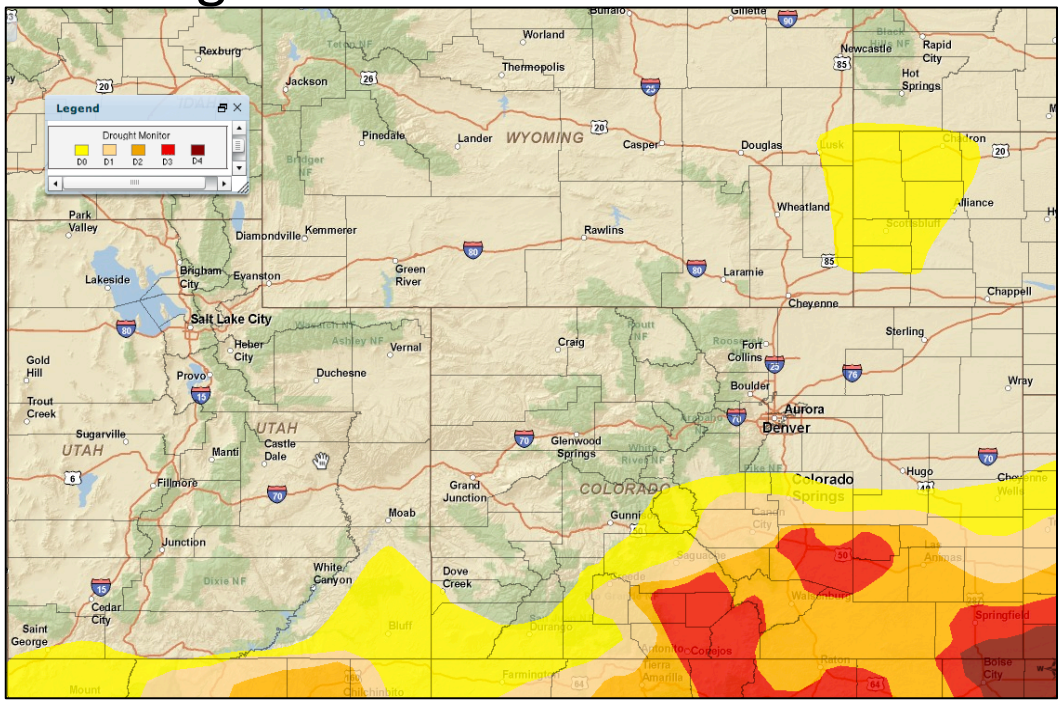



Fig. 7: September 20th release of U.S. Drought Monitor for the UCRB

| | |
|---|---|
| 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

Status quo is recommended this week for the current U.S. Drought Monitor (USDM) map over the UCRB and over eastern CO (Fig. 7). Most of the region received very little precipitation for the week (which is typical for this time of year) and the higher amounts of precipitation that did fall (particularly in southeast CO) did little to warrant improvements at this time.