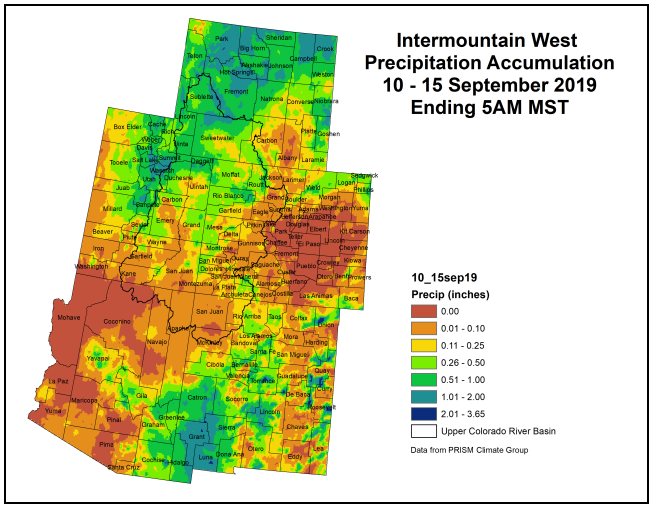
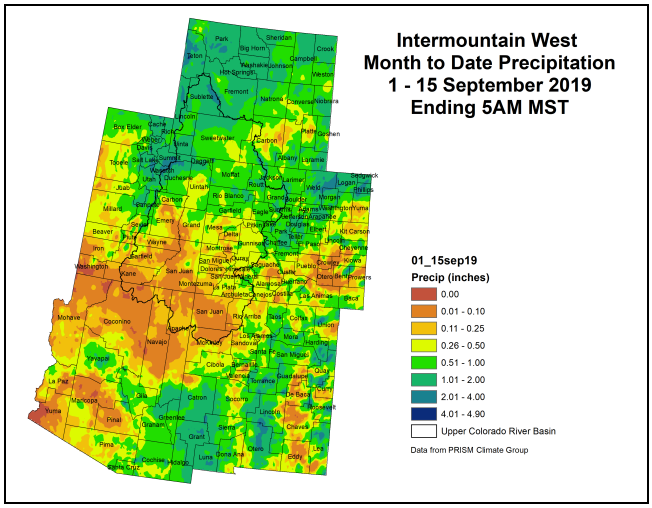
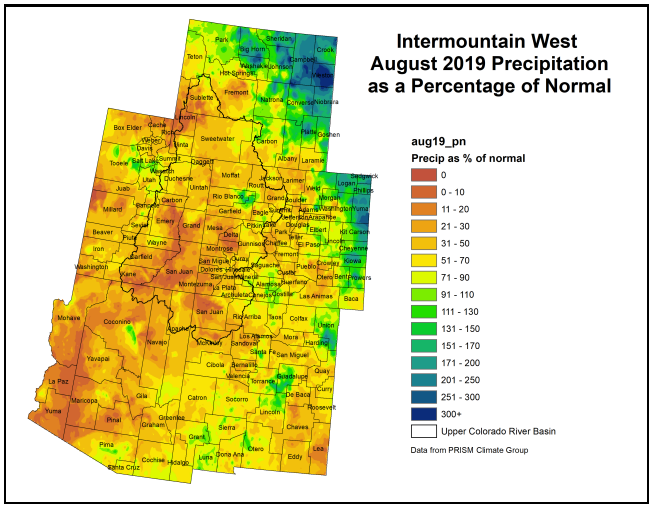
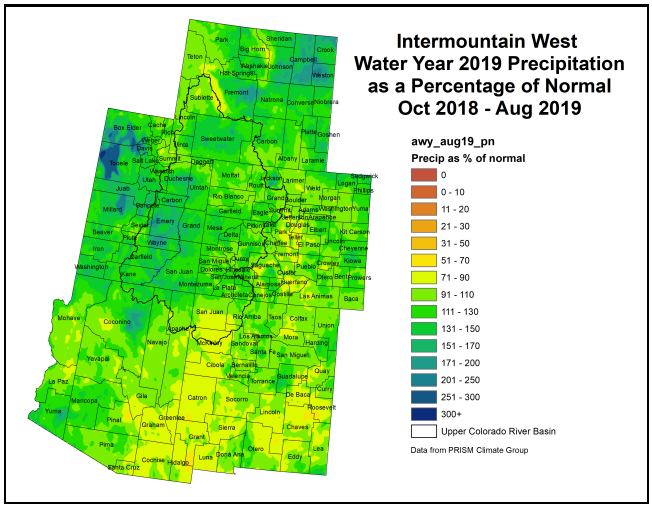
NIDIS Intermountain West
Drought Early Warning System
September 24, 2019

Precipitation



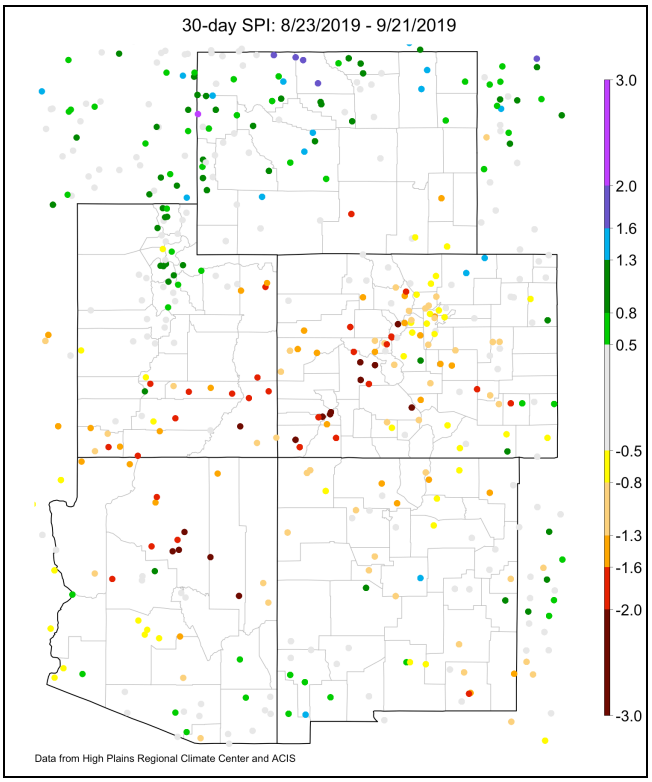


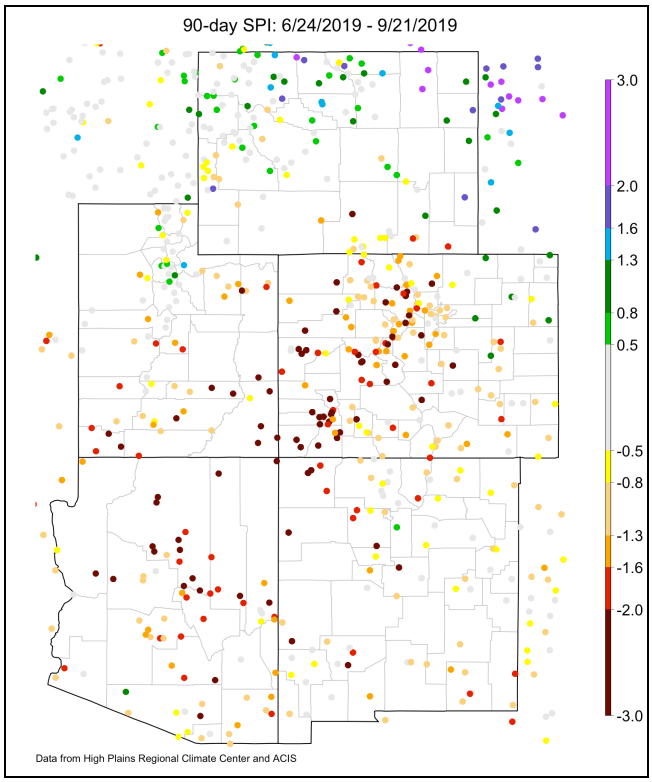


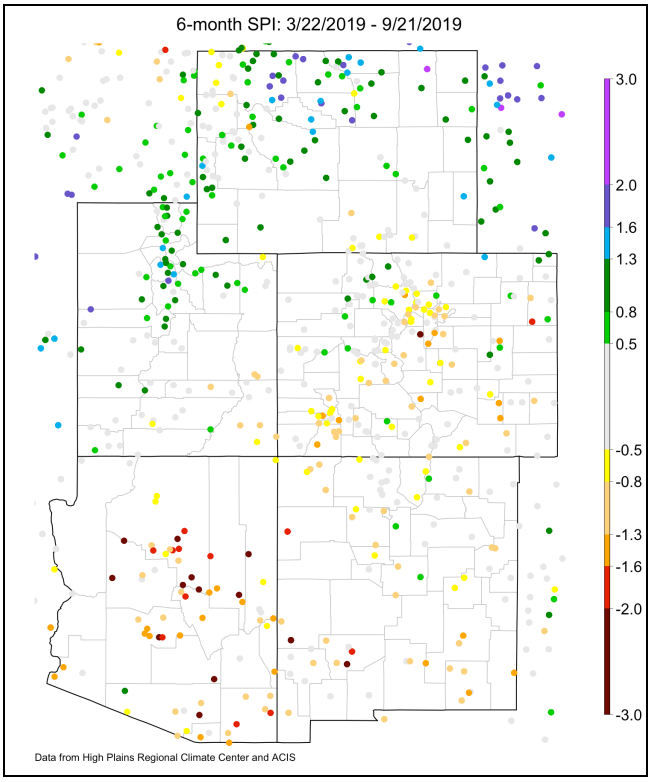


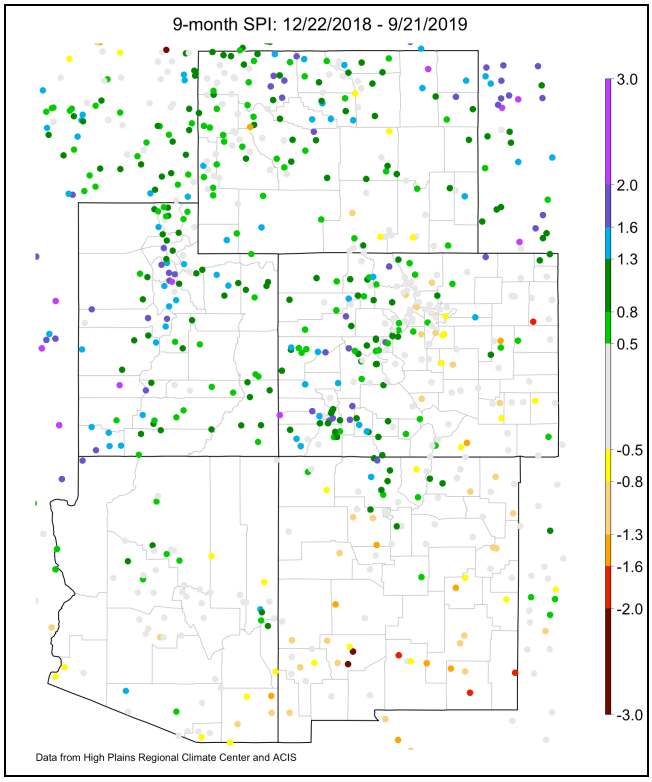
The images above use daily precipitation statistics from NWS COOP, CoCoRaHS, and CoAgMet stations. From top to bottom, and left to right: most recent 7-days of accumulated precipitation in inches; current month-to-date accumulated precipitation in inches; last month's precipitation as a percent of average; water-year-to-date precipitation as a percent of average.

Standardized Precipitation Index



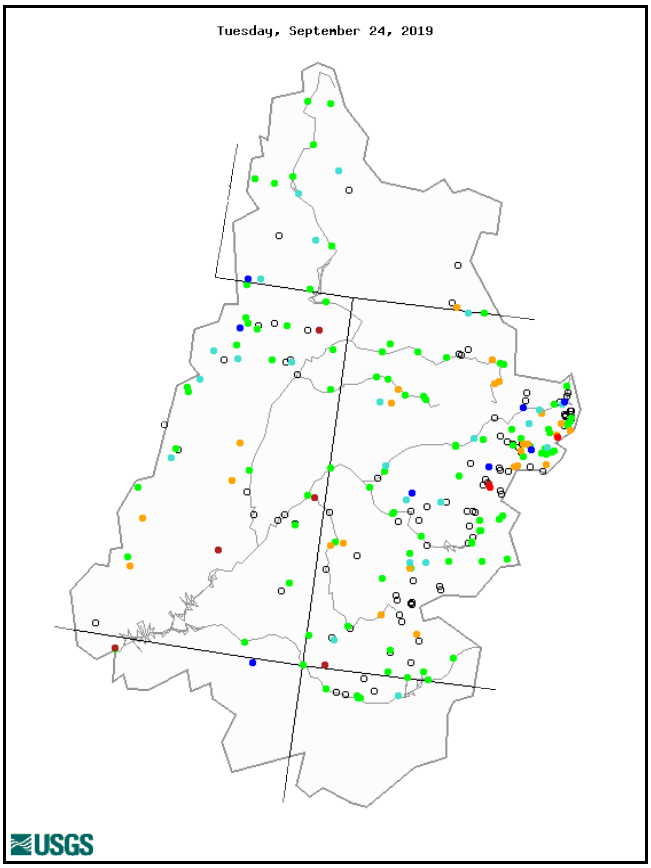




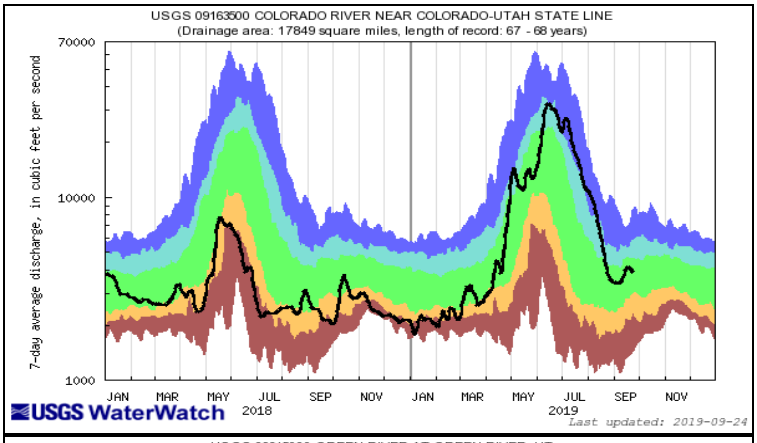


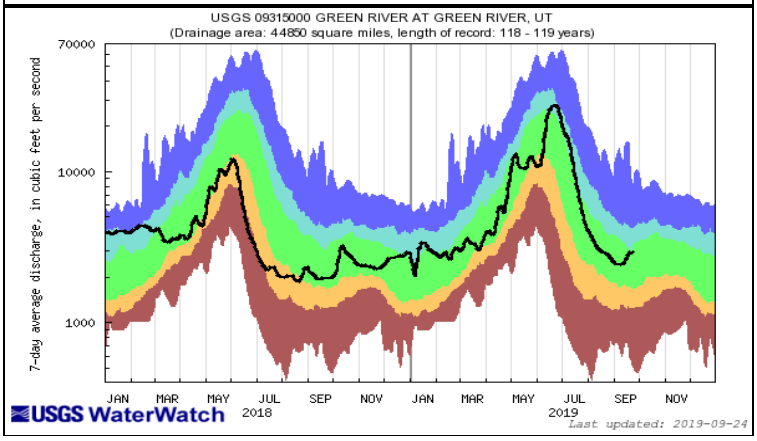
Standardized Precipitation Index standardizes precipitation accumulations for a specified time period into percentile rankings. Colors match the different drought categories with the U.S. Drought Monitor. 30- and 60-day SPIs focus on short-term conditions while 6- and 9-month SPIs focus on long-term conditions. SPI data provided by High Plains Regional Climate Center.

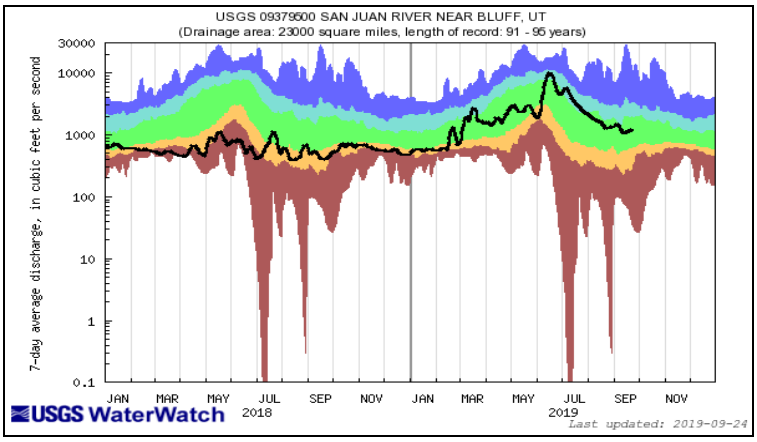
Streamflow



Explanation - Percentile classes							
Low	<10 Much below normal	10-24 Below normal	25-75 Normal	76-90 Above normal	>90 Much above normal	High	Not-ranked

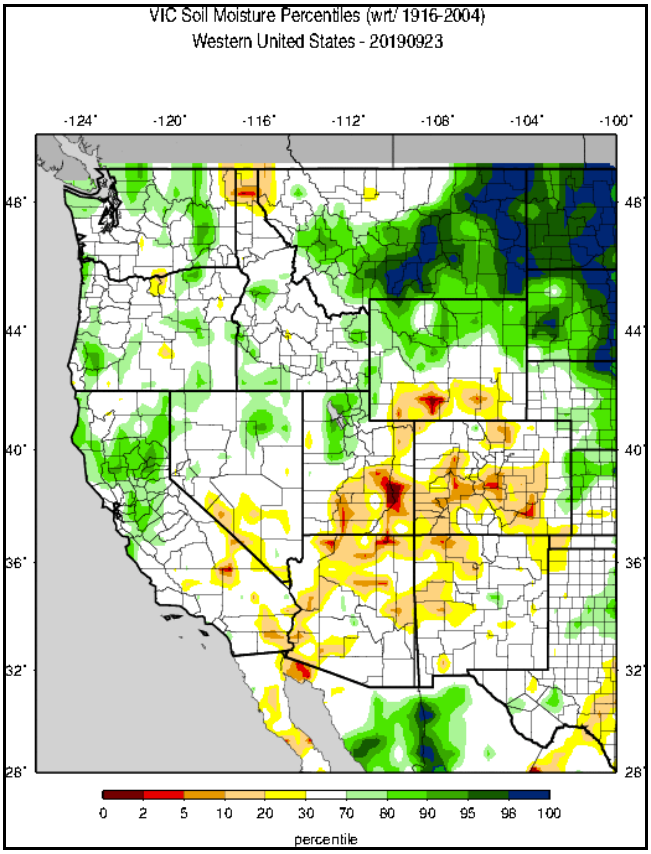


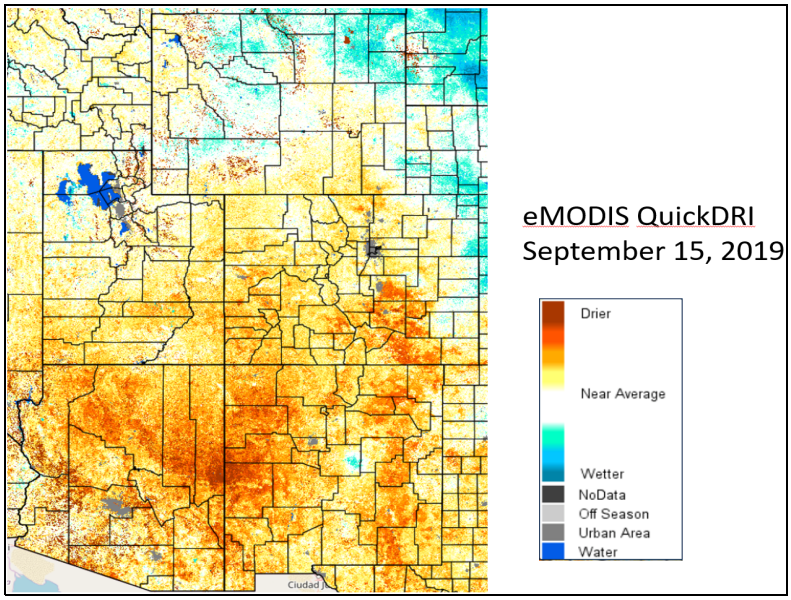




The top left image shows 7-day averaged streamflows as a percentile ranking across the UCRB. The top right image shows 7-day averaged discharge over time at three key sites around the UCRB: The Colorado River at the CO-UT state line; the Green River at Green River, UT; and the San Juan River near Bluff, UT. All streamflow data provided by United States Geological Survey.

Surface Water

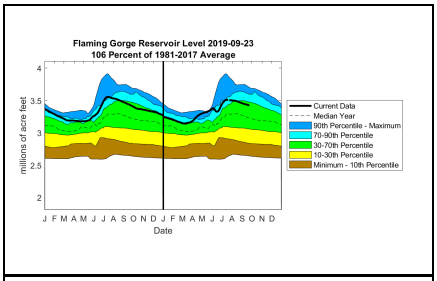


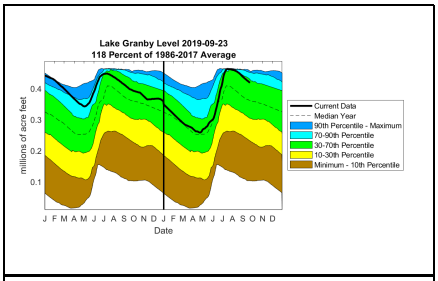


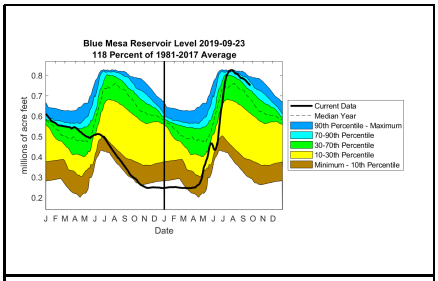
The top left image shows VIC modeled soil moisture as a percentile ranking. The top right image shows satellite-derived vegetation from the VegDRI product (which updates on Mondays).

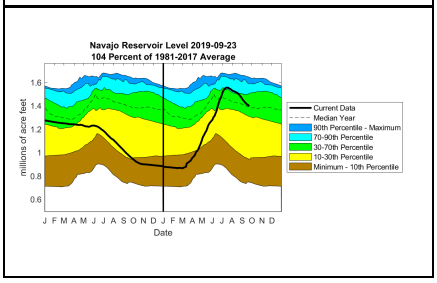
The graphs shown below are plots of reservoir volumes over the past full year and current year to date (black). The dashed line at the top of each graphic indicates the reservoir's capacity, and the background color-coded shading provides context for the range of reservoir

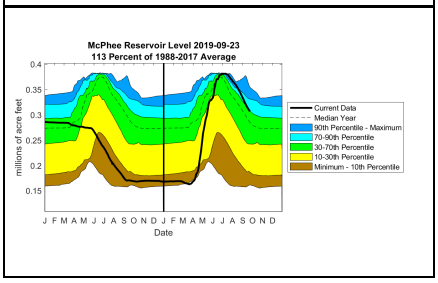
levels observed over the past 30 years. The data are obtained from the Bureau of Reclamation. Some of the reservoir percentiles don't line up at the new year due to differences in reservoir levels at the beginning of 1985 and the end of 2014. Dead storage has been subtracted. Note: Lake Granby data are obtained from the Colorado Division of Water Resources, and only goes back to the year 2000.

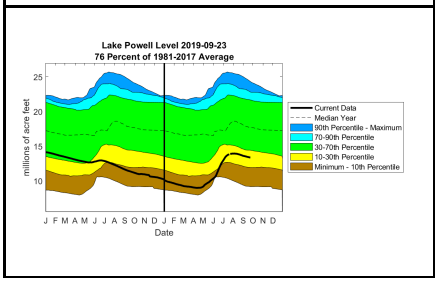




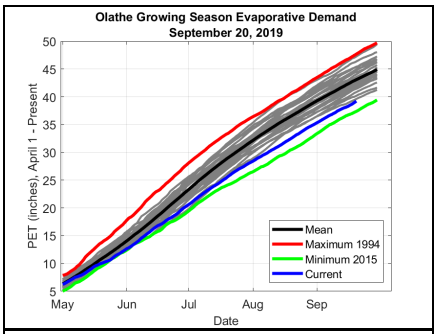


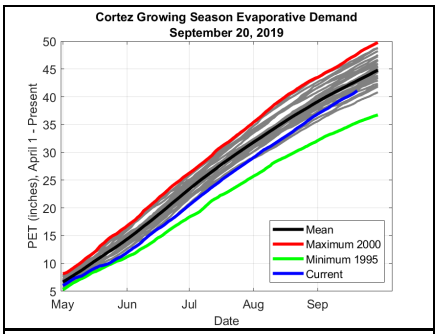


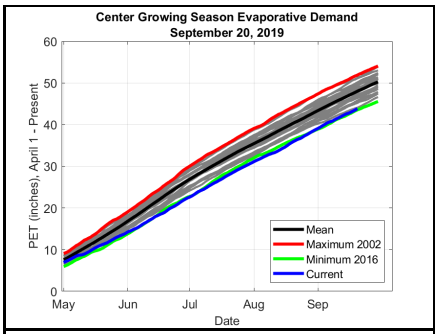


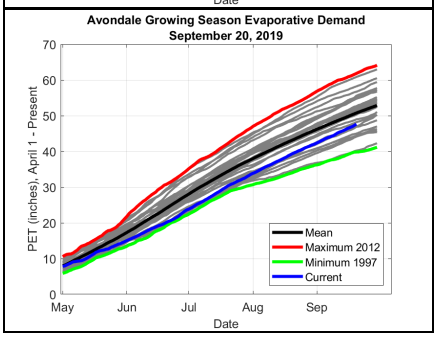


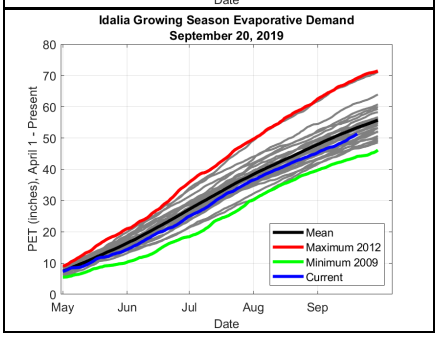
Evaporative Demand

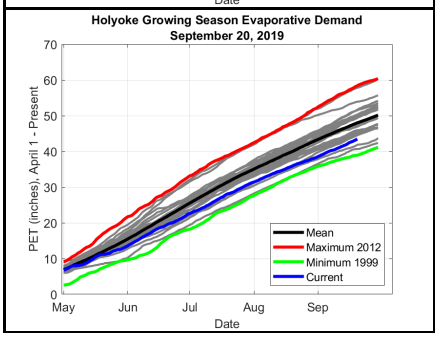


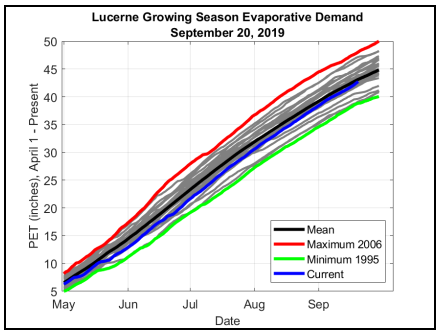




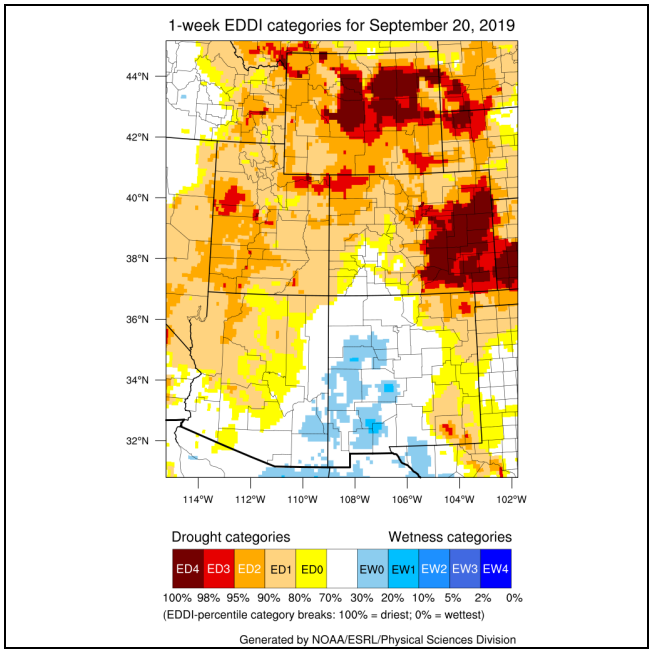


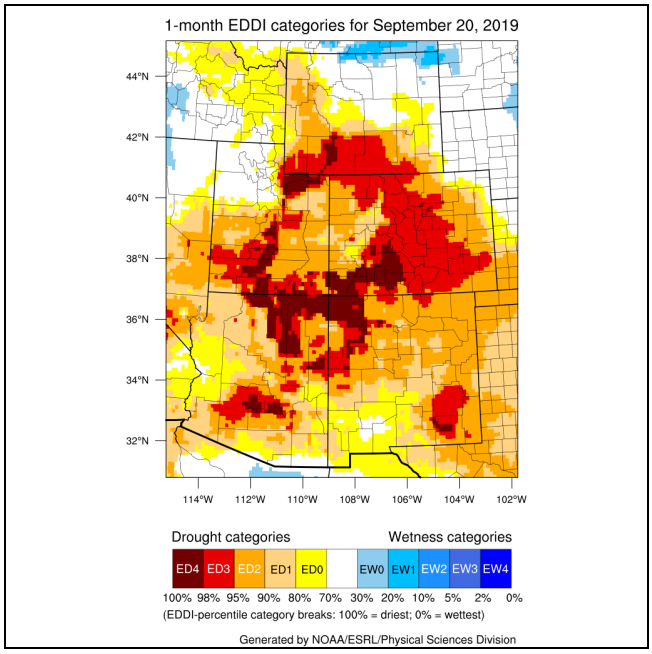


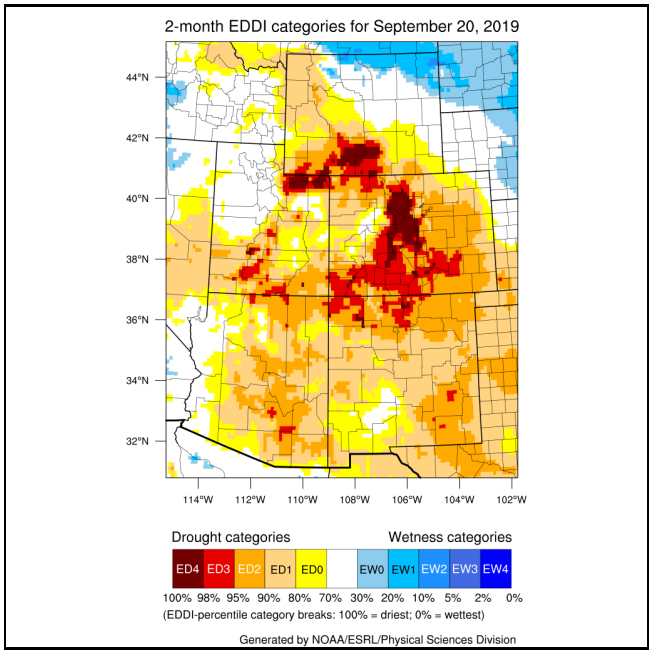


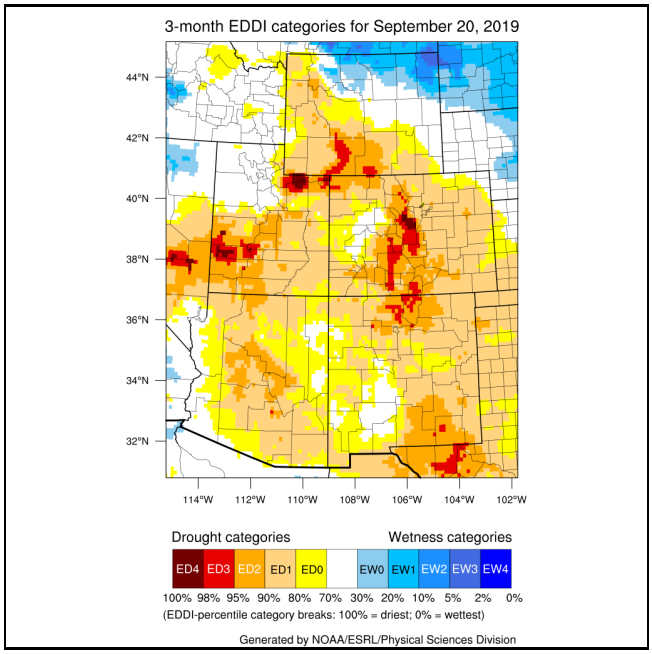


The above images are of reference evapotranspiration (ET) from CoAgMET sites across Colorado. Reference ET assumes the amount of water that will evaporate from a well-irrigated crop. Higher ET rates occur during hot, dry, and windy conditions. Lower ET rates are more desirable for crops. See a map of locations for the above ET sites.



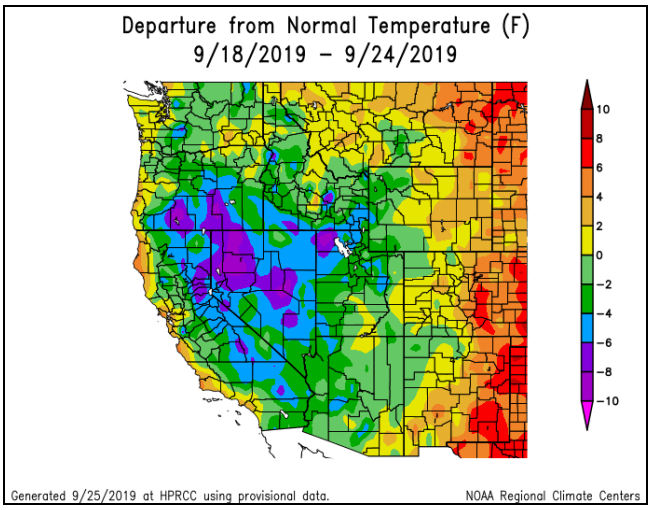


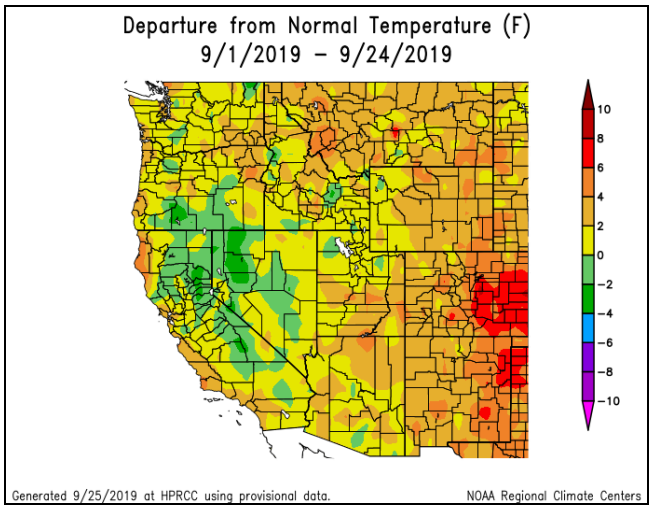




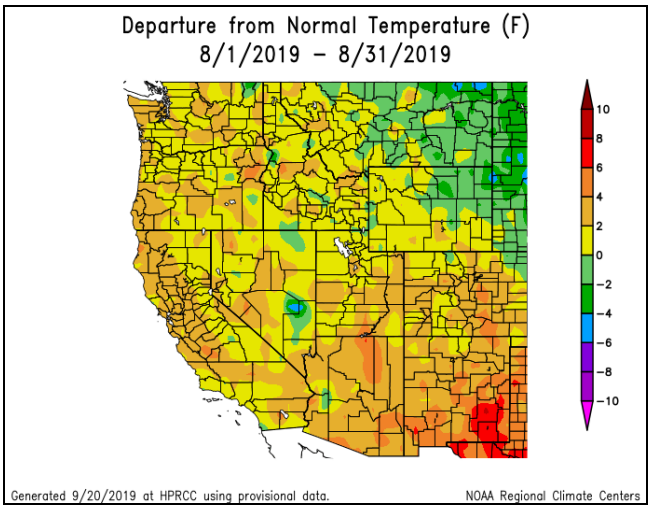
The above images are available courtesy of NOAA's Evaporative Demand Drought Index (EDDI). Drought classification listed is a function of the depth of reference evapotranspiration accumulated over a given period of record with respect to a climatology of 1981-2010. The drought categories displayed are in line with the US Drought Monitor's Percentile Ranking Scheme. Data used to generate these maps come from the North American Land Data Assimilation System Phase-2 (NLDAS-2) project, which assimilates observations of temperature, wind speed, radiation, and vapor pressure deficit. The date indicates the last day of the period of record, and the week number indicates the window size for the period of record.

Temperature

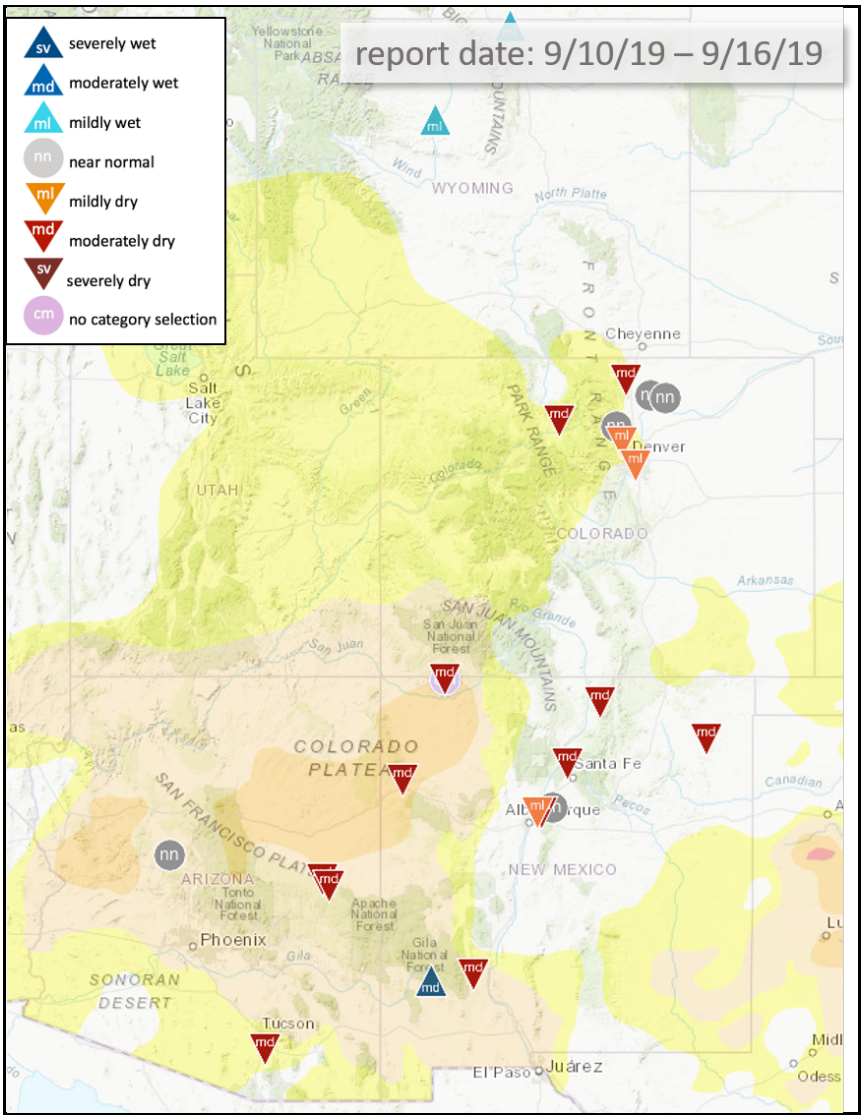




All images show temperature departures from average over different time periods (last 7 days on top left; month-to-date on top right; last full month on bottom). Temperature departure maps provided by HPRCC ACIS.



Condition Monitoring and Impacts



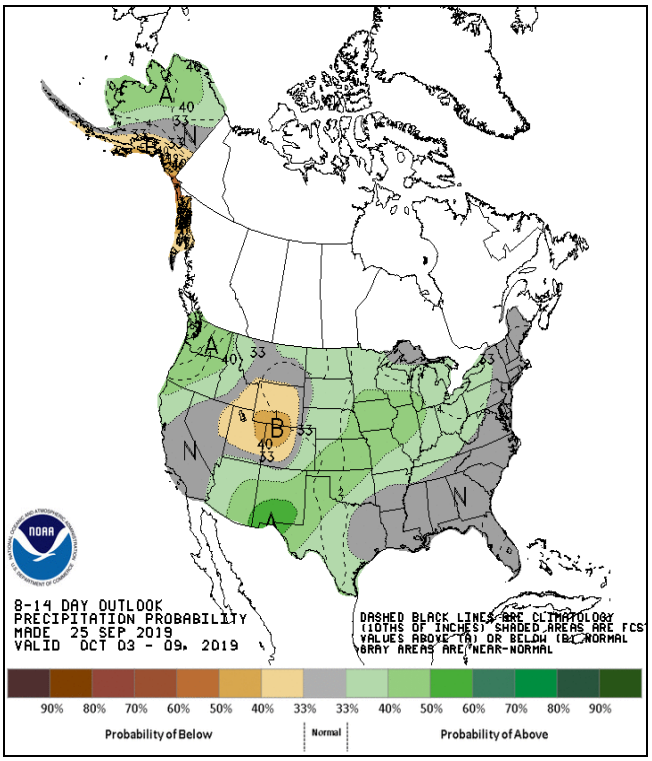
Map of current condition monitoring reports submitted to CoCoRaHS in the last week overlaid on the current U.S. Drought Monitor depiction. Specific impacts reports from local experts listed below.

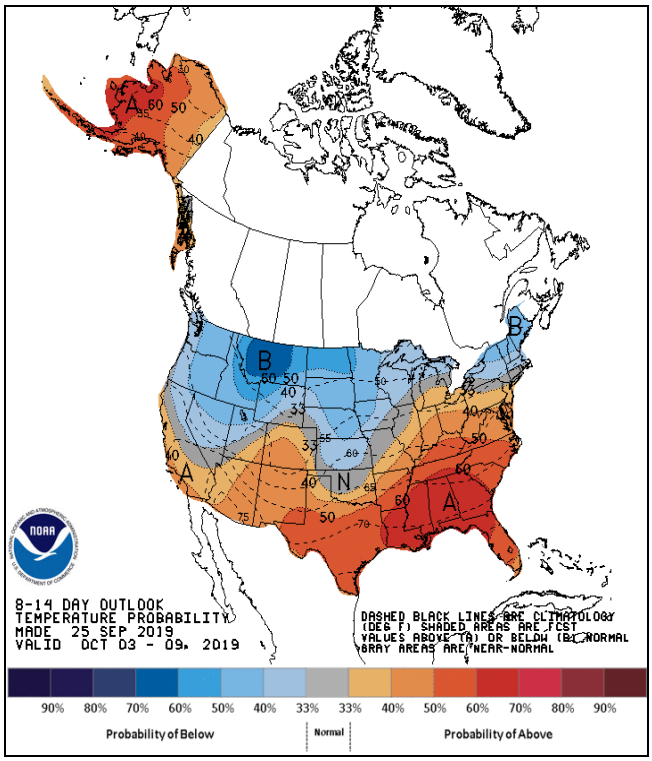
Impacts in Salt Lake City area:

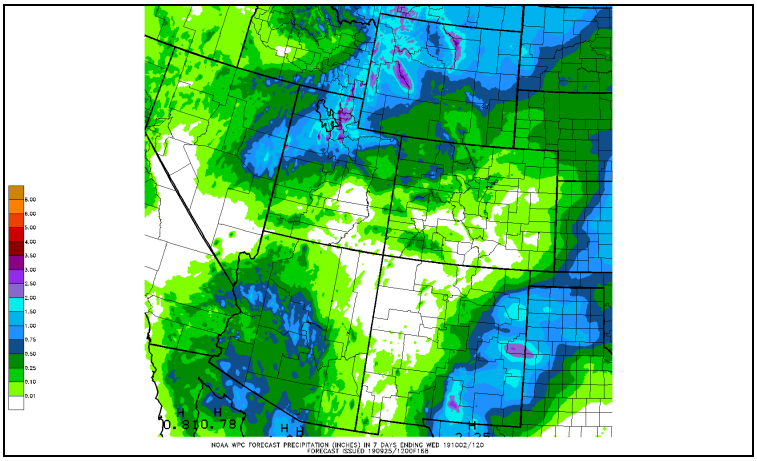
We had some very strong thunderstorms move through Salt Lake County last Tuesday and are forecasted to receive more precipitation tonight and tomorrow. On Tuesday, 0.81” of rain was recorded at SLC International Airport and 1.32” at Alta. So far in Salt Lake City, we have seen 1.11” of rain compared to an average of 0.52”. The Wasatch Mountains in Salt Lake County and Summit County have also seen well above average amounts of rain this month. Alta has received 2.46” this month (1.32” average) and Park City has received 1.25”, so far in September, which is just a little below the record of 1.36” in 2006 through September 15th.

Observationally, conditions in the forests of the Wasatch Mountains in Salt Lake County are finally starting to noticeably moisten.

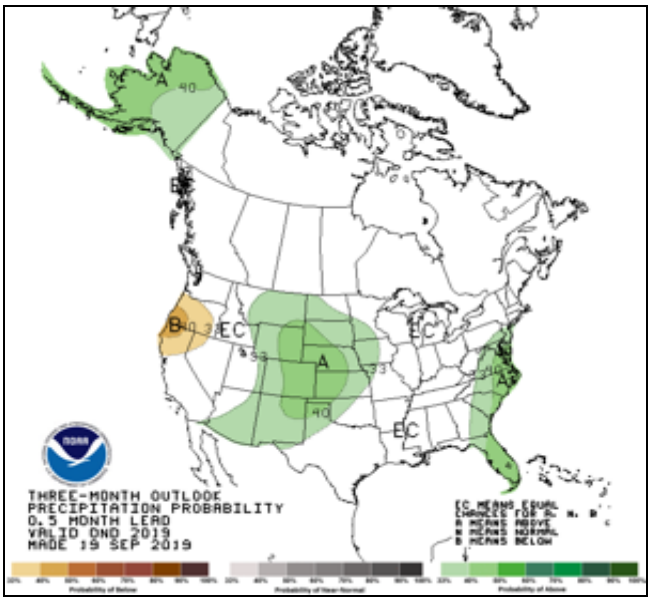
Outlook

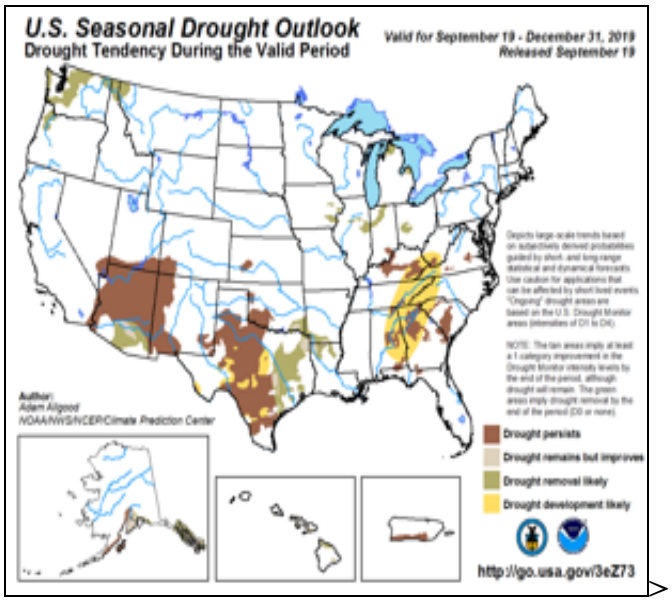




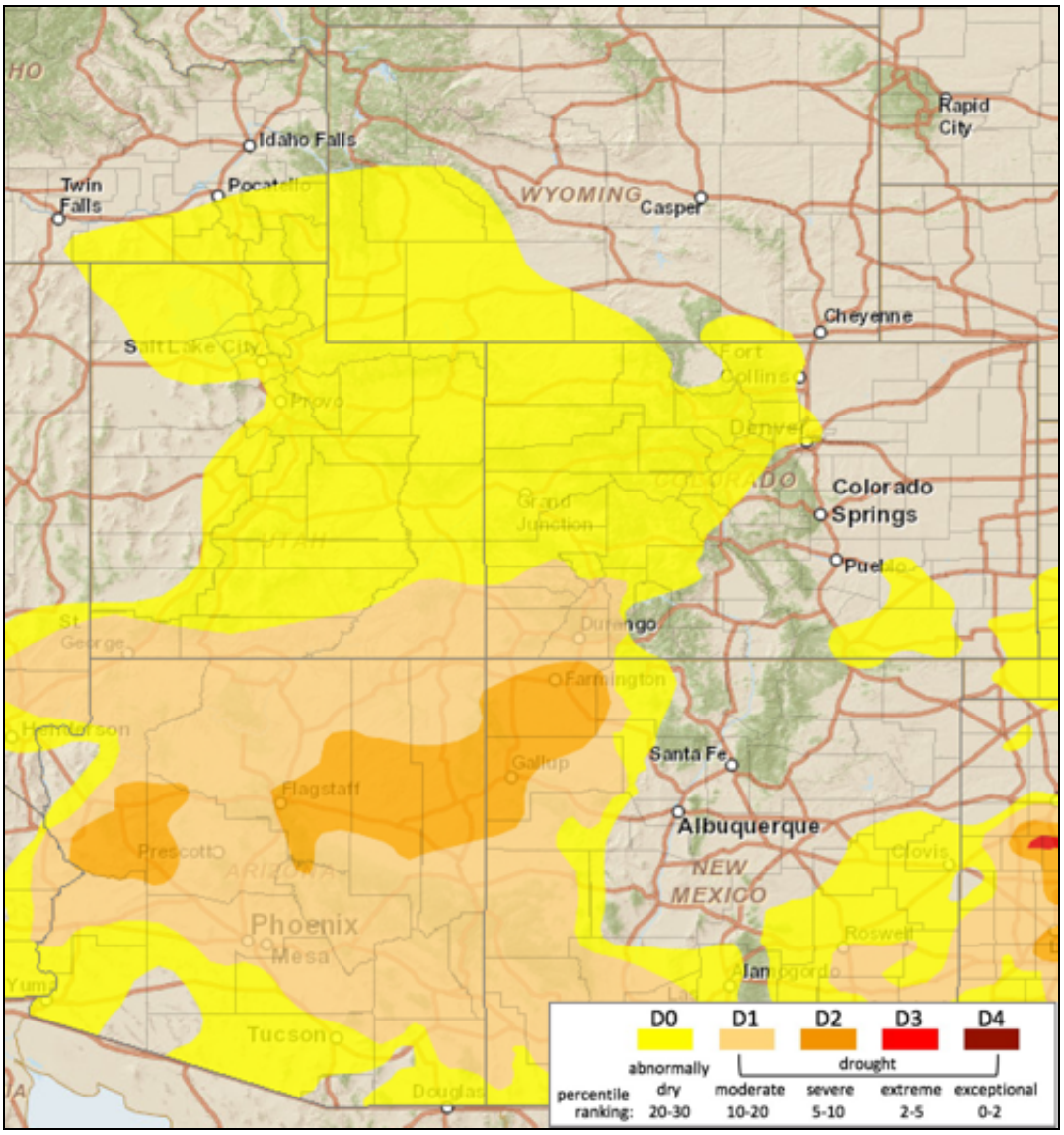


The top two images show Climate Prediction Center's Precipitation and Temperature outlooks for 8 - 14 days. The middle image shows the Weather Prediction Center's Quantitative Precipitation Forecast accumulation for seven days. The bottom left image shows the 3-month precipitation outlook from Climate Prediction Center, and the bottom right image shows the Climate Prediction Center's most recent release of the U.S. Seasonal Drought Outlook.

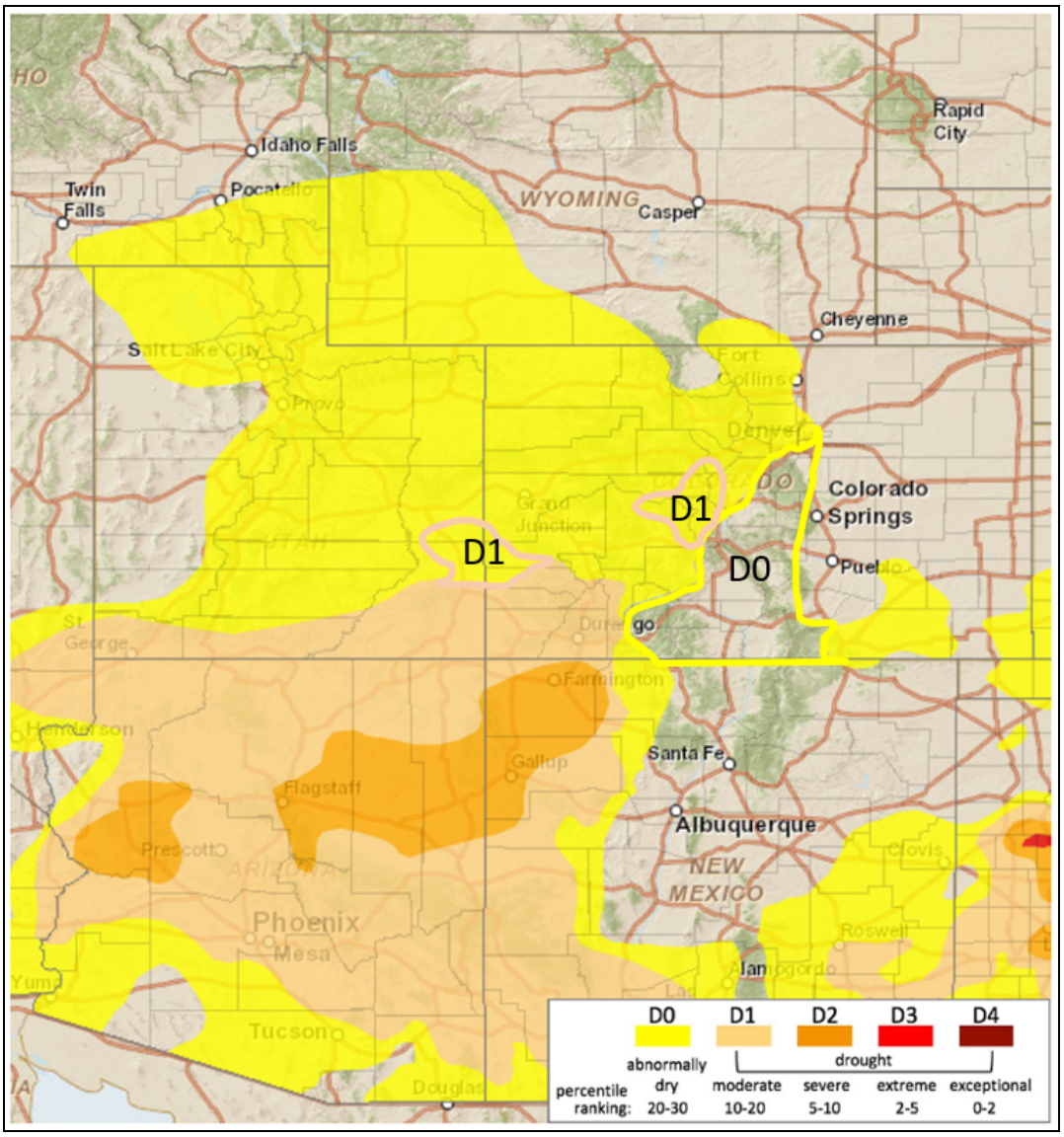




Summary and Recommendations



Above is the most recent release of the U.S. Drought Monitor map for the UCRB region. Below shows the proposed changes for this week, with supporting text.



Summary: September 24, 2019

Fall is upon us across the Intermountain West (IMW) with high elevation foliage beginning to turn brilliant shades of yellow. Cooler air was felt across the region with temperatures below normal across the western portion of the Upper Colorado River Basin (UCRB). East of the Continental Divide, temperatures were still well above average, but cooling down from the late summer's heat nonetheless. Even as our days remain warm, the mercury dips lower and lower at night.

Unfortunately, as the seasons turn, it becomes less and less likely to close monsoon season precipitation deficits in a short amount of time. It was another dry week for most of the UCRB and eastern Colorado, with the rains falling in areas not in drought. The Four Corners area is again facing 90-day SPIs of D3 or D4-level dryness, much like last summer.

A wet winter and cool, wet spring saved the UCRB from what could have been a devastating season. Despite the extreme short-term dryness, impacts

have been heavily mitigated by residual moisture. The 2019 fire season has been minuscule compared to 2018. Surface water supplies are regressing, but still mostly well within the normal range. Soil moisture models are now showing root zone dryness at 20th percentile or worse for the southern end of the basin.

This time of year typically begins an unofficial "off season" for regional drought. Existing droughts remain, but as the weather cools, crops are harvested, and seasonal flora return to dormancy, we wait to see how the next winter's snowpack will build. While its impacts may have been limited to the more vulnerable sectors (such as rangeland), it is important to note our extreme monsoon season deficits on the Drought Monitor as we enter the dormant season.

The short-term outlook shows promise for the IMW. Widespread totals of over one inch are expected in southern and central Arizona. Northern Utah and Western Wyoming are also expected to see precipitation amounts totaling 0.50-2.00". Some of this will be snow for the upper reaches of the Teton and Uintah Mountains. East of the divide, moisture may clip the region as cooler air moves in on Friday, but totals are expected to be below a quarter of an inch. The 8-14-day outlook suggests an increased chance of above normal temperatures for SE CO and NM, and an increased chance of below normal temperatures for WY, UT, and NE CO. Precipitation is more likely than normal to be above average east of the Continental Divide. The three-month outlook is suggesting a tilt towards wetter than normal conditions too. However, this outlook was dead wrong over the summer.

Recommendations:

UCRB: It is recommended that D1 be expanded in areas where D4 and D3-level 90 and 120-day SPIs have been realized. We would be recommending worse were it not for a cool, wet spring. We endorse expansion of D1 in northern San Juan County, UT up into southern Grand County. On the Colorado side, this could include western San Miguel County, western Montrose County, and extreme southwest Mesa county. It is recommended that D1 be placed over the Collegiate Range, which straddles Gunnison and Pitkin Counties on the west side, and Lake and Chaffee Counties on the east side.

Eastern Colorado (bleeding into UCRB): A large addition of D0 is recommended this week for south and central Colorado. The expansion would connect D0 in western Colorado to D0 in southeast Colorado, encompassing the entire San Luis Valley and stretching the NM border. The east end of this line would be drawn at the foothills of the Front Range and Wet Mountains, but would not extend into Colorado Springs or Pueblo.