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.

Last Week Precipitation:

- Last week in the northern portion of the UCRB was a drier week for much of the area. The Upper Green River Basin saw less than 0.10 inches over much of the area, with Lincoln County seeing up to 0.25 inches. Southern Uinta County and into northeastern Utah saw between 0.25 and 0.50 inches.
- Farther south in eastern Utah, from southern Uintah and Duchesne county saw better precipitation, between 0.25 and 0.50 inches, with San Juan County seeing up to 1.00 inches. There was an area in Wayne and Garfield Counties of over 1.00 inches.
Southwestern Colorado also saw beneficial precipitation, with much of the San Juan Mountains receiving between 1.00 inches and 2.00 inches. The Four Corners area had between 0.50 inches and 1.00 inches, this precipitation extended into western Montrose and Mesa Counties.

Farther north in western Colorado was drier, with much of the area from Montrose and Gunnison counties seeing less than 0.25 inches. Moffat, Rio Blanco, Routt and Garfield counties received less than 0.10". Eagle, Summit and parts of Grand counties did see some totals up to 0.50 inches.

East of the Divide was mostly dry with the exception of a few wet areas. The Central Mountains in northern Park, Clear Creek, Gilpin, western Boulder and Larimer, and Jefferson counties saw up to 1.00 inches of precipitation last week.

Morgan, Adams, Arapahoe, Elbert, El Paso and Lincoln Counties also saw totals between 0.25 and 1.00 inches, with eastern Elbert County seeing over 1.00 inch.

The rest of eastern Colorado saw less than 0.25 inches.

September Precipitation:

- September was a dry month for most areas. The UCRB saw about normal precipitation in Jackson county but was blow normal in most other areas.
- The Green River basin was a mixture of wet and dry. Sweetwater county was well below normal for September, with some areas in the SW approaching near record lows. Uinta and Lincoln counties, however, were nearly 150% of normal throughout.
- Daggett county in eastern Utah was very wet for September: about 150% of normal. There were areas in Duchesne, Uintah, Carbon, Emery, and Grand counties that were above normal as well. The SE corner of the state fared worse, however, with portions of San Juan county less than 10% of normal.
- Western Colorado was very dry for September. Worst hit was the SW, with areas of San Miguel, Dolores, and Montezuma counties receiving only about 10% of normal rainfall. The Rio Grande basin was also very dry, generally less than 50% of normal.
- Much of eastern Colorado was also very dry. The NE area of the state was the dryest east of the divide. The Denver metro area saw less than 20% of average precipitation, and areas in Boulder, Larimer, and Weld counties were at near record lows. Kit Carson county had a good September, however, with some areas up to 130% of normal.
- SE Colorado was generally wetter. Eastern Las Animas, Baca, and south Prowers counties were substantially moist for the month, greater than 200% of normal in places. Kiowa County also saw above average precipitation. Pueblo and western Las Animas counties were not so lucky, only receiving 30% or less of average rainfall.

Water Year 2015 Precipitation (Oct-Aug):

http://climate.colostate.edu/~drought/current_assessment.php
As a result of a very wet Spring, Colorado east of the divide is still above average across the board for the water year to date with a few small exceptions. Isolated areas of Custer and Huerfano Counties are showing below 100% of average.

The UCRB is mostly close to, but a little below normal for the water year to date.

Most of the Upper Green River Basin is between 50 and 90% of normal for the water year to date. Central Sweetwater County is in great shape at over 110% of normal.

Northeastern Utah is mostly between 75 and 100% of normal for the water year to date. Farther to the west over higher terrain percentages are a little lower at between 50 and 75%.

Southeastern Utah has balanced out to a fairly typical water year to date. The area is between 75 and 125% of normal.

AHAPS indicates a very dry band in Conejos, Río Grande, Mineral, and southwest Saguache Counties. Here precipitation is less than 50% of average for the water year to date. Radar does tend to struggle in this area, so it may be worth taking another look at when our precipitation figures update. Most of western Colorado is just slightly dry. The area is between 75 and 110% of normal for the water year to date.

The Rio Grande Basin is now showing a mixed bag of above and below normal water year to date conditions. Southern Costilla County is doing very well at over 150% of normal for the water year to date.

**SNOTEL Precipitation Percentiles:**

- SNOTEL year to date percentiles across much of the UCRB saw quite a rebound this last week.
- In the Upper Green the percentiles are mostly in the median range between the 32nd to the 59th. Some Snotel sites in eastern Sublette County area a bit lower, down to the 22nd.
- The Wasatch and Uintahs are still showing drier percentiles ranging from the 0 to 63rd, but mostly in the 0-20 range. May of the percentiles that were the 0th are no in the single digits and teens.
- The northern mountains in Colorado west of the Continental Divide are showing percentiles between the 11th and the 53rd. The Percentiles in the teens and 20s are mainly in eastern Rio Blanco, Garfield and Routt counties.
- The lower elevations of the Colorado and Gunnison are still seeing percentiles below the 39th percentile, however sites along the divide are in the normal range.
- The San Juans are reporting mostly below the 40th percentile, with a number of snotel sites in the northern San Juans above the 50th percentile.
- The Sangre de Cristo mountains in SE Colorado are near average with percentiles ranging from 35th to 69th.
- The South Platte stations are all mainly at or above the median.

**SWE Timeseries Graphs:**

- All sub-basins are well into the melt season.
- The peak snowpack was 85% of normal.
- The peak snowpack was 63% of normal.
The peak snowpack was 68% of normal.
- The peak snowpack was 79% of normal.
- The peak snowpack was 70% of normal.
- The peak snowpack was 67% of normal.

**STANDARDIZED PRECIPITATION INDEX**

Standardized Precipitation Index standardizes precipitation accumulations for a specified time period into percentile rankings. -1.0 to -1.5 is equivalent to a D1 to D2. -1.5 to -2.0 is equivalent to a D2 to D3. -2.0 and worse is equivalent to a D3 to D4. 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.

**Short Term (30-day):**

- Most of the northern UCRB is now seeing dry SPIs in the 0 to -1 range. Routt, Grand and Summit Counties are showing SPIs down to -1.5.
- Northern and southeastern Utah in the Wasatch Range is showing SPIs at 0 to +1.5, while the northeastern portion of the state is at 0 to -1.
- Mesa County and the Four Corners area is showing SPIs in the 0 to
The San Luis Valley has dried out on the 30-day times scale, with SPIs at 0 to -1.

East of the Divide is now showing dry SPIs with the exception of Otero and Prowers counties, 0 to +1. The rest of Colorado is showing SPIs between 0 and -1.5, the driest showing up in Chaffee, Park, Pueblo, Weld, Logan, and Washington counties.

**Long Term (6-month):**

- The UCRB is most wet on the 6-month timescale, which catches the wet spring. Most SPIs in the basin are between +1 and +2.5. The recent dryness has brought those wet SPIs down a bit. Dry SPIs in Grand County, CO are showing up, 0 to -1.
- Colorado east of the divide is also still showing wet SPIs, although recent dryness has started to bring the down. Most SPIs are between 0 and +2. A dry, 0 to -1, SPI is showing up in Washington County.

**STREAMFLOW**

[Map and graphs showing streamflow data for different locations in Colorado.]
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.

**Streamflow Statistics:**

- The majority of streamflows in the UCRB are within the average range for 7-day average streamflow.
- 73% of the gages are in the normal range, with 10% above normal and 3% much above normal.
- 13% of streamgages are reporting below normal, with 1% much below normal and 1% in the low flow class.
- 7-day Average streamflow in the Colorado River at the CO-UT state line is at 105% of average and in the 64th percentile.
- The Green River near Green River, UT is at 91% of average and in the 52nd percentile, a slight increase from last week.
- The San Juan River near Bluff has increased with recent rains to the 83rd percentile and 153% of normal.

**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 above image shows last month's and this month's current volumes of the major reservoirs in the UCRB, with percent of average and percent of capacity. 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.
VIC:

- Soil moistures across the UCRB continue to dry out.
- In the Upper Green River basin, very dry soils are still present, especially in Sweetwater county where pockets in the eastern and western portions of the county are in the 2nd to 5th percentile, with the rest of the county below the 30th percentile.
- The Duchesne River basin is below the 20th percentile, with areas between the 0 and 5th percentile starting to show up.
- Southern Utah, in San Juan County and into western Colorado including Mesa, Montrose, San Miguel, and Dolores counties is showing wet soils above the 70th percentile.
- Dry soils continue in Routt and Grand counties in the 10th to 20th percentile.
- The San Luis Valley is also starting to show drying soils between the 10th and 30th percentile.
- Eastern of the Divide, Las Animas and eastern Pueblo counties shows soils between the 5th and 30th percentile.
- Eastern Colorado in Logan, Morgan, Weld, Yuma and Kit Carson counties has soil moisture in the 10th to 20th percentile.

VegDri:

- The VegDri is showing a mix of moist and dry conditions through the basin.
- Vegetation in SW Wyoming around the Green River basin is still mostly showing moist conditions in Sweetwater and Sublette counties. Some pre-drought is starting to show up in Uinta, Lincoln and western Sublette counties.
- Northern Utah in the Wasatch and Uintah ranges is starting to show pre to moderate drought conditions, with the Duchesne River basin is showing mostly moist vegetation, with some pre-drought conditions.
- Southern Utah is showing moist conditions, however more grey is showing up, meaning vegetation is out of season.
Northeastern Colorado is now showing more pre and moderate drought for vegetative health, especially in Moffat, Routt, Grand, Summit, Eagle and Rio Blanco counties. Northwestern Moffat County show moist vegetation still.

Through the Gunnison Rio Grande basins, some pre-drought is now showing up, while the San Juan Mountains has mostly moist vegetation.

Eastern Colorado is again showing a mixture of conditions. Weld, Sedgewick, Crowley, southern Pueblo, Las Animas and Bent counties are showing moderate drought conditions. Normal to moist conditions show up over the rest of the area with some pre-drought vegetation health starting to show. Adams and the South Platte Basin are starting to go out of season.

Reservoirs:

- Most reservoirs in the UCRB are at or above there October average.
- Flaming Gorge is at 108% of the October average.
- Lake Granby is at 118% of the October average.
- Green Mountain is down to 85% of the October average.
- Blue Mesa is at 111% of October average.
- Navajo is at 100% of October average.
- McPhee is at 91% of its average for October.
- Lake Powell is at 67% of the October average, 51% of full.

EVAPOTRANSPIRATION
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 [http://droughtmonitor.unl.edu/AboutUs/ClassificationScheme.aspx](http://droughtmonitor.unl.edu/AboutUs/ClassificationScheme.aspx). 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.

**Reference Evapotranspiration:**

- Olathe finished the growing season with cumulative ETs below the previous all-time low year of 1999.
- Cortez saw ETs following roughly the low year of 1995, if not a little above, since summer, and has ended well below normal.
- Center began seeing an increase in ET since mid-July, but has still ended the growing season below average.
- Avondale tracked along a normal rate for the growing season, save for a dip from early to late May, and thus has ended slightly below
Idalia ET was tracking at roughly the low year of 2009 for almost the entire growing season until late August, when ETs started to increase substantially. Cumulatively, however, Idalia has ended below normal.

Holyoke ET started around normal and dropped below normal since the second week of May. It continued to track at a normal rate through the growing season.

Lucerne had been tracking lower than the previous record low year in 2009 since the second week of May. It has completed the growing season at nearly the same cumulative ET as 2009.

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.

Last Week Temperatures:

- Last week saw another week with above normal temperatures for
the UCRB and eastern Colorado

- SW Wyoming along the Green River saw 6 to 8 degrees above normal, with portions of Sweetwater County 8 to 10 degrees above normal.
- Northern Utah in the Wasatch Range saw temperatures 6 to 10+ above normal for the week. Farther south in Utah saw temperatures 2 to 6 degrees above normal.
- Western Colorado ranged from 4 to 8 degrees above normal, the warmest (6 to 8) was from central Colorado into Garfield and Rio Blanco counties.
- East of the divide, temperatures ranged from 4 to 10+ degrees above normal. The warmest area of 10+ degrees above normal was in El Paso and Pueblo counties, with an area of 8 to 10 degrees above normal caught southern Elbert, Lincoln and Las Animas Counties. The area in central Colorado that saw 6 to 8 degrees above normal continued east through Washington, Elbert, Lincoln, Kit Carson and Cheyenne counties. Northern Larimer and Weld counties also saw 6 to 8 degrees above normal.

**September Temperatures:**

- The UCRB for September was generally about 2 to 4 degrees above normal. Jackson county was slightly cooler and almost near normal.
- The Green River basin was 2 to 6 degrees above normal throughout.
- Easter Utah was also fairly warm for September. Duchesne, Emery, Wayne, and Garfield counties saw the largest departure from normal temperatures in the area.
- SW Colorado was generally 2 to 4 degrees warmer than normal. South-central Saguache county was over 6 degrees above normal.
- Eastern Colorado saw very warm temperatures for September. All areas east of the divide were at least 4 degrees above average.

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**FORECAST AND OUTLOOK**
The top two images show Climate Prediction Center's Precipitation and Temperature outlooks for 8 - 14 days. The middle image shows the 3 months Precipitation outlook. The bottom left image shows the Hydrologic Prediction Center's Quantitative Precipitation Forecast accumulation for the five days between Tuesday 12Z and ending Sunday 12Z. The bottom right image shows the Climate Prediction Center's most recent release of the U.S. Seasonal Drought Outlook.
Short Term: (10/13)

- At low elevations today's highs are forecast to be in the 80s over the southern portion of the basin and the mid 70s in the northern portion. These highs will probably scale by about -5F/1000ft of elevation rise. There is little difference in temperatures east and west of the divide under a high pressure regime. No precipitation is anticipated in the domain.
- Under a clean high pressure regime a small rise in temperatures is expected tomorrow, but the weather will be largely persistent between now and midday Friday for the UCRB and Colorado east of the divide.
- Friday night a front moves in bringing some slightly cooler air. On Saturday low pressure and moisture moves in from the southwest. This will cool down the UCRB by about ten degrees from current readings, less so over high elevations. Between Friday evening and Sunday evening most of the Upper Colorado River Basin should see between 0.25" and 0.75" of precipitation with some areas receiving more in favorable upslope regimes. North of the Uintahs totals will be lower, and east of the divide conditions are expected to cool, but remain dry.
- In the 5-7 day time frame models show the development of a low pressure trough in the lee of the Rockies from Alberta down to northern Colorado. The main wave is currently forecast to move out Monday night with some redevelopment over southeast Colorado on Tuesday. An increase in winds across eastern Colorado looks to be a safe bet. Rain on Tuesday is not out of the question depending on if and where the more southward redevelopment occurs.

Longer Term:

- The 8-14 day precipitation outlook shows increased chances for above normal precipitation for the entirety of the UCRB and Colorado east of the divide. These chances are most highly
enhanced for the Four Corners region and the northeast corner of Colorado.

- The 8-14 day temperature outlook shows increased chances for above normal temperatures for the entirety of the UCRB and Colorado east of the divide. These chances are lowest in the southwest corner of the domain and highest in the northeast corner of the domain.

- The Climate Prediction Center October through December precipitation outlook shows increased chances for above average precipitation across all of the UCRB with the exception of the Upper Green Basin. These chances increase in the southeast portion of the basin. East of the divide, the Climate Prediction Center is calling for a wetter than average October through December. These chances are best for southeast Colorado.

- The seasonal drought outlook indicates that drought improvement and removal are likely for the western portion of the UCRB by the end of November. No drought development is likely over this time frame.

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**U.S. DROUGHT MONITOR**

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 for October 13, 2015:

The Upper Colorado River Basin and Colorado saw another week with above average temperatures. Precipitation over the last week was spotty, with the southern portion of the basin the only area to see anything widespread and beneficial. Northwestern Colorado has been dry this month, seeing less than 0.10 inches through October 11th. The continued hot and dry weather are starting to show up on the VIC soil moisture and VegDRI vegetation health products. 30-day and 90-day SPIs are mostly in the 0 to -1 range in Grand, Jackson, Routt and Rio Blanco counties. In the central mountains of Colorado SPIs are now down to -1.5 and -2 for the last 90-days, however bump up to the 0 to -1 SPI during the last 30 days with the precipitation at the beginning of October. The San Juan Mountains and Four Corners areas are showing positive SPIs the last 30 days.

Eastern Colorado saw some beneficial precipitation last week, although most of this fell on areas that are not depicted as abnormally dry. Some of the D0 areas had received precipitation during the beginning of October, which was reflected in the VIC soil moisture, however it wasn't enough to bring up the SPIs on the short-term or help the vegetative health, so no improvements are recommended.

Recommendations:

**UCRB**: D0 introduction from the D0 in Grand County, into most of Routt and Moffat counties, down to Rio Blanco Counties, connecting to the D0 that currently exists in Moffat and Rio Blanco counties. This degradation is based on the low SPIs for both 30 and 90-day time scale and the degrading vegetation health and soil moisture conditions.

**Eastern CO**: Status quo. We are still watching eastern Weld County to fill in the D0, however with 0.25 to 0.50 inches the last week, we are sticking with status quo.