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:**

- By and large, it was a dry week across the UCRB and eastern Colorado. That being said, the southern San Juans and areas east of the Wasatch Range did pick up some beneficial moisture.
- The Upper Green River Basin received mainly 0-0.10" of precipitation, but areas close to the Uintah Range received upwards of a quarter inch.
- The Duchesne River Basin received some good rainfall with much of Duchesne and Uintah Counties receiving 0.50-1.00". Parts of Carbon and Emery Counties received over an inch.
- In southwest Colorado most of La Plata County and southern Hinsdale County received over an inch of rainfall.
- Northwest Colorado was much drier than areas south and west, and for the most part picked up less than a tenth of an inch of rainfall. There was a staunch gradient in Moffat and Rio Blanco Counties with the western end receiving over 0.50”.
- Eastern Colorado was very dry across the board and received less than 0.10” over the week. The eastern plains had no rainfall whatsoever.

**September Precipitation:**

- September was a dry month for most areas. The UCRB saw about normal precipitation in Jackson county but was below 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):**

- 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, Rio 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.

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**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.

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**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 -2 range. Routt, Grand and Summit Counties are showing SPIs down to -1.5. Lake County has the worst SPI in this area in the -2 to -2.5 range.
- The southern portion the UCRB is faring much better on the 30-day timescale. Most SPIs are in the 0 to +1 range with a few in the -1 to 0 range. One very dry SPI is showing up in eastern San Juan County, UT at -1 to -1.5.
- SPIs in the San Luis Valley are in the normal range.
- SPIs east of the divide are mostly dry and in the 0 to -1.5 range. There are patchy areas with SPIs above zero on this timescale. Most of these are in the southeast corner of the state, but Elbert, Jefferson, and Fremont Counties are all showing some SPIs in the 0 to +1 range.
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. Look for these SPIs to drop like a rock over the next six weeks.
- 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

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.
- 61% of the gages are in the normal range, with 5% above normal and 2% much above normal.
- 27% of streamgages are reporting below normal, with 5% 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 98% of average and in the 54th percentile.
- The Green River near Green River, UT is at 97% of average and in the 56th percentile, a slight increase from last week.
- The San Juan River near Bluff has been yoyoing like crazy this fall. It is back down to the 15th percentile at 37% of average.

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...
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:

- Over the last month there have been substantial basin-wide decreases in soil moisture with respect to climatological averages.
- 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 0 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.
- There is a large soil moisture anomaly gradient in southeast Utah. Soils go from the 2-5th percentile range in Emery County to the 90-95th percentile range in San Juan County.
- Northwest Colorado is showing soils mainly in the 10-30th percentile range. The driest areas are in northern Grand and northern Eagle Counties.
- In southwest Colorado soils remain mostly in the normal range. One lone wet spot above the 70th percentile is depicted in western Mesa County.
- Wetness levels of soils in the San Luis Valley soils are between the 10th and 30th percentile.
- Soils in Colorado east of the divide are either dry or in the normal range. No wet spots remain. The driest areas (5-20th percentile) include western Las Animas County, eastern Pueblo County, eastern Kit Carson County, southern Yuma County, and northwest Washington County.

VegDri:

- The VegDri’s influence is limited to just several more weeks as it is quickly going out of season.
- The VegDri is showing a mix of moist and dry conditions through the basin. A confusing number of areas show moist vegetation.
overlaid on top of dry soils. This likely due to the lack of cold weather the basin has experienced thus far this fall. A product showing NDVI would probably pick up on this, and show conditions as being anomalously favorable.

- 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 theWasatch and Uintah ranges are showing 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 gray is showing up, meaning vegetation is out of season.
- Northwestern 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.
- Vegetative health is mostly normal or slightly moist in southwest and southern Colorado. A few streaks of pre-drought are depicted.
- Eastern Colorado is again showing a mixture of conditions. Weld, Sedgewick, Phillips, 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. Powell, McPhee, and Green Mountain are the exceptions.
- Flaming Gorge is at 107% of the October average.
- Lake Granby is at 117% of the October average.
- Green Mountain is down to 78% of the October average, a figure that has been falling fast.
- Blue Mesa is at 109% of October average.
- Navajo is at 100% of October average.
- McPhee is at 90% of its average for October.
- Lake Powell is at 67% of the October average, 51% of full.

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**EVAPOTRANSPERSION**
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 normal.
- 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**

![Temperature Departure Maps](http://climate.colostate.edu/~drought/current_assessment.php)

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:

- Once again, temperatures were ubiquitously above average for the UCRB and for eastern Colorado.
- The Upper Green River Basin experienced temperatures 6-12 degrees above normal.
- The Eastern Utah experienced temperatures 6-12 degrees above normal with patches in Uintah and San Juan Counties only 3-6 degrees above normal.
- Western Colorado experienced temperatures 6-12 degrees above normal.
- The Eastern Colorado experienced temperatures 6-12 degrees above normal with patches in Crowley, Otero, Lincoln, Douglas, Prowers, and Kiowa Counties only 3-6 degrees above normal. The far northeast corner of the state was only 3-6 degrees above normal as well.

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.

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: (10/20)

- Currently a deep low pressure trough is spinning over the southwest United States and is advancing toward the UCRB. The influence of this system is already being felt over the region with widespread cloud cover, cooling temperatures in the northwest portion of the basin, and precipitation falling in the San Juans and isolated areas of eastern Utah.

- With cooler air already settling in west of the divide highs are only expected to make 65 today in Grand Junction and 59 in Price, UT. Eastern Colorado will reach the mid-70s and 80s. Tomorrow highs reach the same level west of the divide, but will be 20 degrees cooler east of the divide.

- A significant precipitation event is expected for the UCRB and eastern Colorado this week as this storm slowly propagates through south of the Colorado Rockies. By early Friday morning it is expected that the bulk of the UCRB will receive over a quarter of an inch of precipitation with totals well in excess of an inch in parts of the San Juans and northwestern Rockies, such as near Rabbit Ears Pass. In the Central Rockies and east of the divide this event figures to be even more productive. The northeastern portion of the state should receive 0.50-1.00" of precipitation, and the southeast corner of the state should receive 1.00-1.50" of rainfall. There is much more forecast bust potential in northeast Colorado than southeast Colorado for this storm.

- Some light precipitation is expected to persist, especially over the central Rockies through Friday and Saturday, but most areas will receive less than a tenth of an inch after Friday morning.

- The air behind this weather system will not be very cold, but there also is not an expectation of a clean high pressure ridge forming in behind it. Early next week look for partially to mostly cloudy conditions in the eastern UCRB and Colorado east of the divide with some light precipitation expected, especially in the Sangre de Cristos. The area most likely to clear back up early next week is the...
southwest portion of the UCRB.

**Longer Term:**

- The 8-14 day precipitation outlook shows increased chances for above normal precipitation for the western portion of the UCRB and increased chances of below normal precipitation for southeast Colorado. In central and northern Colorado there are equal chances of above and below normal precipitation.
- 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. Chances of above average temperatures are remarkably high across the region.
- The Climate Prediction Center November through January precipitation outlook shows increased chances for above average precipitation across the southern fraction of the UCRB. Northern Basins such as the Upper Green, Duchesne, Yampa, and White are forecast equal chances of above and below normal precipitation. East of the divide the CPC is forecasting increased chances of above normal precipitation except for the northern Front Range and a sliver of the eastern plains near the Nebraska panhandle. Chances for above normal precipitation are strongest in the southeast corner of the state.
- The seasonal drought outlook for November through January indicates that drought improvement and removal are likely for the southwest portion of the UCRB by the end of January, but drought is likely to persist or intensify where it exists in the northern Wasatch and Uintah Ranges.

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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 20, 2015:

The pervading expansion of D0 looks to continue this week for eastern Colorado and the Upper Colorado River Basin. Temperatures were hot once again across the entire region, almost uniformly 6-12 degrees above normal. Last week brought some welcome rains to the San Juans in southwest Colorado and to eastern Utah, but the central Rockies, the Upper Green Basin, and eastern Colorado all stayed mostly, or completely dry. Vegetative health as depicted by the VegDri has worked itself into a state of total disagreement with both the VIC soil moisture model and the Evaporative Demand Drought Index over the south and central Rockies, a region were SPIs are very favorable at > 6 months and low at <3 months. Streamflows appear to still be mostly in the normal range in the Upper Gunnison and Upper Arkansas basins where this disagreement maximizes. A few gages near Crested Butte are in the below normal range.

The combination of a promising forecast with good long-term SPIs and healthy reservoirs will inhibit the recommended introduction of D1 in the driest parts of the region this week. The VIC model is showing some very dry root zone soils across much of the Upper Colorado River Basin and eastern Colorado. This depiction is much less kind than two months back and is consistent with high potential ET shown by EDDI over the last 8 or 12 weeks. These model data are corroborated by difficulties in eastern Colorado planting winter wheat. The upcoming precipitation event looks very promising for southern and southeast Colorado, but very boom or bust for areas east of the Continental Divide and north of the Palmer Divide. If it comes up bust it's time to start adding D1 to northeast Colorado.

Recommendations:

**UCRB:** It is recommended that D0 be introduced in northern Routt County and northeastern Moffat County. It is also recommended that the D0 on the southern end of the central Rockies be extended southward through all of Chaffee County, the northeast corner of Saguache County. The eastern side of this line would extend down from Teller County through the majority of Freemont County and the northwest portion of Custer County.
**Eastern CO**: USD Draft #1. We were thinking status quo largely based on the precipitation forecast, but Brad's extension of D0 to the Kansas border looks reasonable. We support it.