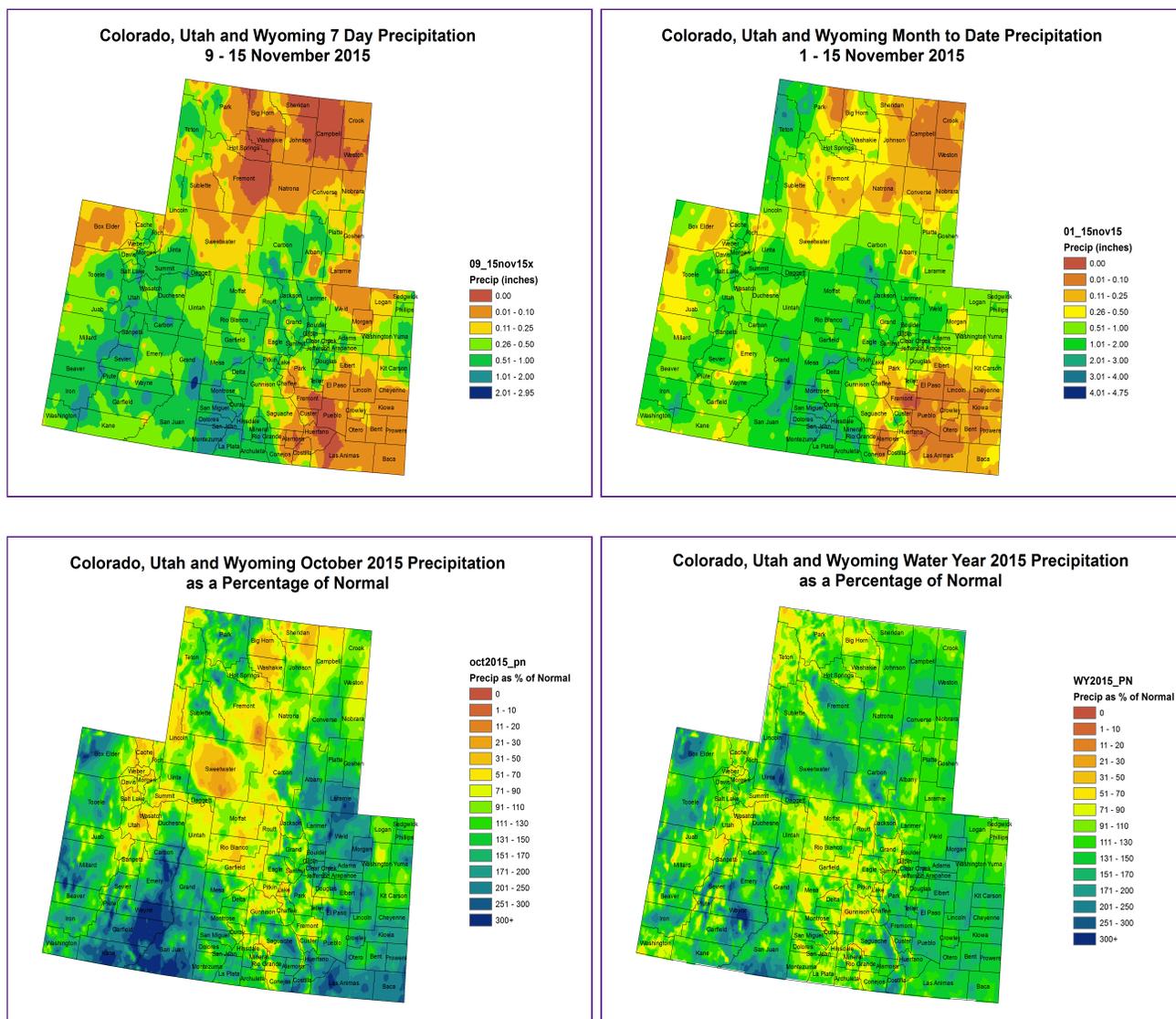


PRECIPITATION



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:

- The UCRB saw generally above 0.1" of precipitation over the last week, with some areas seeing up to 0.5". This map does not, however, take into account the precipitation that has fallen over the 16th and morning of the 17th.
- The Green River basin was mostly dry over the past week, with areas in Sweetwater, Fremont, Sublette, and southwest Lincoln counties receiving less than 0.1" of precipitation.
- Utah saw a widespread precipitation across the eastern portion of the state. Southern Grand and northern San Juan counties saw the most

- precipitation, up to 2" or greater in a small area.
- Southwest Colorado also experienced a fair amount of precipitation, with the Dolores River basin receiving over an inch over the past week.
- Just east of the San Juan Mountains, however, there was significantly less precipitation. Some areas in Pueblo, Fremont, Custer, Huerfano, and Las Animas counties as well as a small portion of Alamosa and Costilla counties saw no precipitation at all.
- The Denver metro area saw up to 0.5" of precipitation up to November 15th, as well as most precipitation overnight on the 16th/17th. Weld, Morgan, and Logan counties in northeast CO however was fairly dry over the past week.

October Precipitation:

- October in the Upper Colorado River Basin was a bit drier to the north and wetter to the south.
- The Green River basin was a mixture of wet and dry. Sweetwater County was well below normal for October. Sublette, southern Lincoln, and Uinta counties were above normal for the month.
- The Uintah and Wasatch ranges in northern Utah saw a below average month, with the exception of Duchesne County seeing up to 200% or normal precipitation.
- Southeastern Utah saw much above normal precipitation for the month, with most of the area above 200% of normal precipitation.
- Northwestern Colorado in Moffat, Rio Blanco, eastern Garfield, and Routt Counties saw below normal precipitation. Central and southwest Colorado were mostly above normal, with the exception of parts of Gunnison, Pitkin and Lake counties.
- Eastern Colorado was above normal across much of the region.

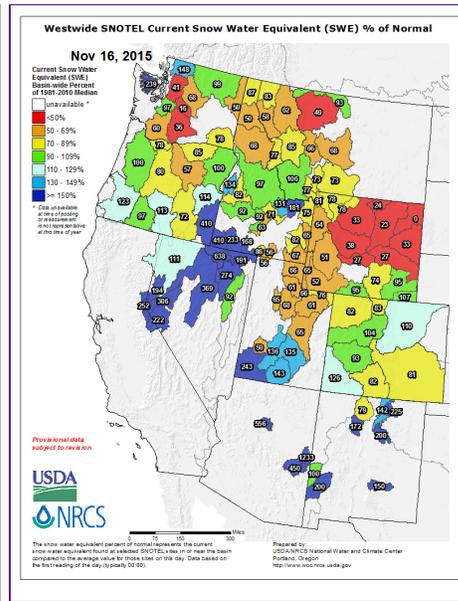
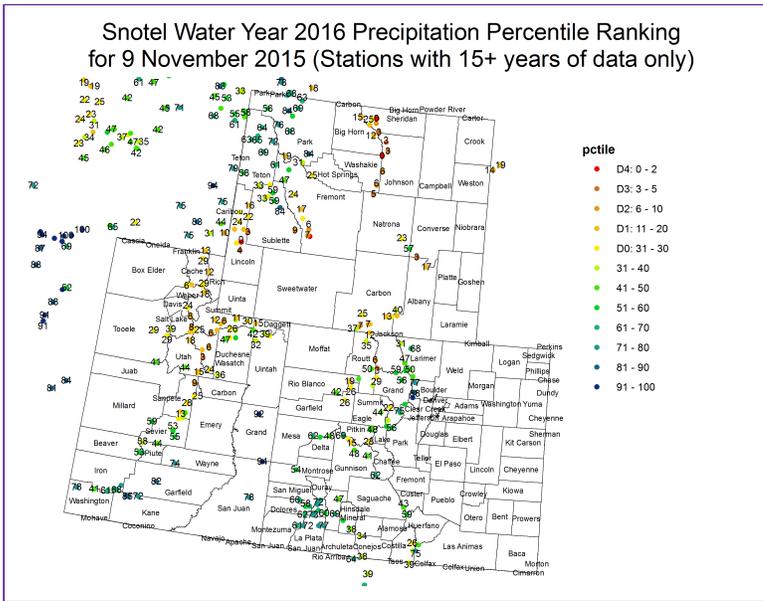
Water Year 2015 Precipitation (Oct-Sep):

- 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,

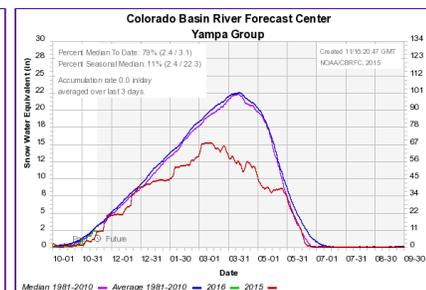
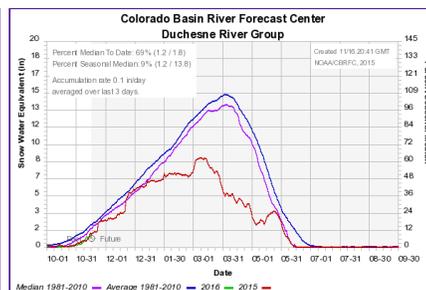
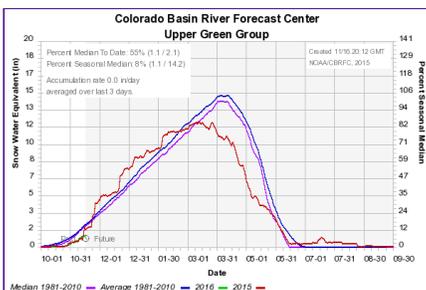
and southwest Saguache Counties. Here precipitation is less than 50% of average for the water year to date. Radar does tend to struggle in this area, so it may be worth taking another look at when our precipitation figures update. Most of western Colorado is just slightly dry. The area is between 75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

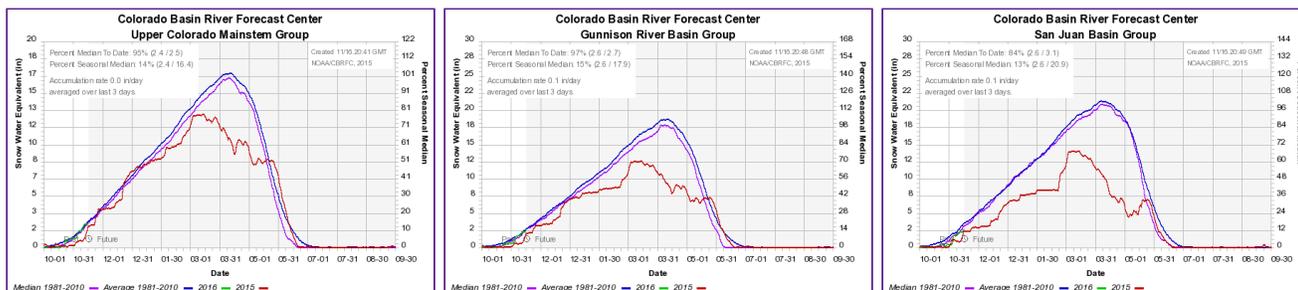
- The Rio Grande Basin is now showing a mixed bag of above and below normal water year to date conditions. Southern Costilla County is doing very well at over 150% of normal for the water year to date.

SNOTEL AND SNOWPACK



The top left image shows the Natural Resources Conservation Service's SNOTEL water-year-to-date precipitation percentile rankings. The top right image shows sub-basin averaged snow water equivalent accumulations as a percent of average. The images below show accumulated snow water equivalent in inches (green) compared to average (blue) and last year (red) for several different sub-basins across the UCRB (and were created by the Colorado Basin River Forecast Center).





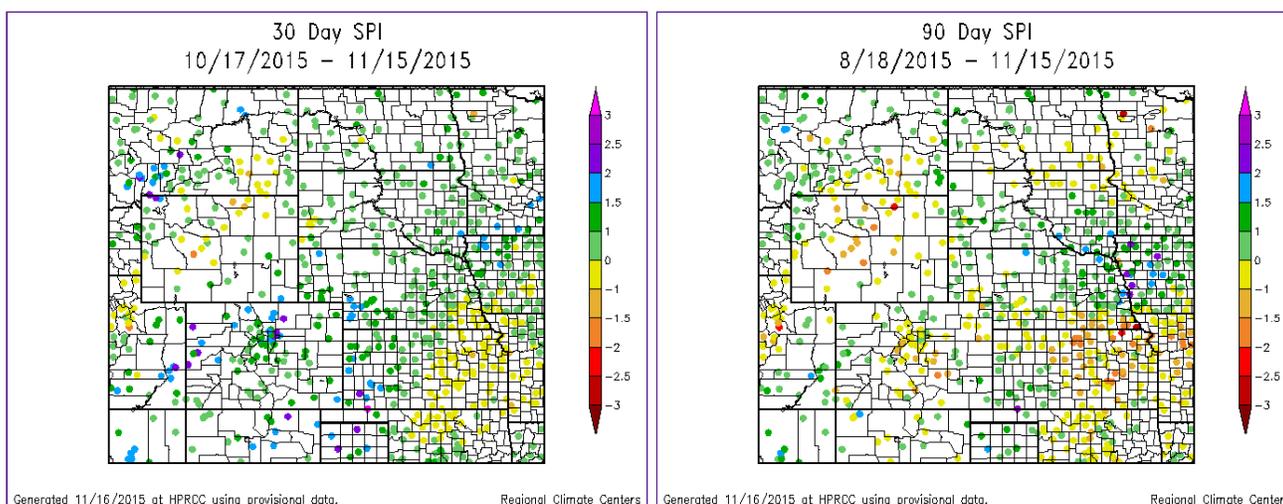
SNOTEL Precipitation Percentiles:

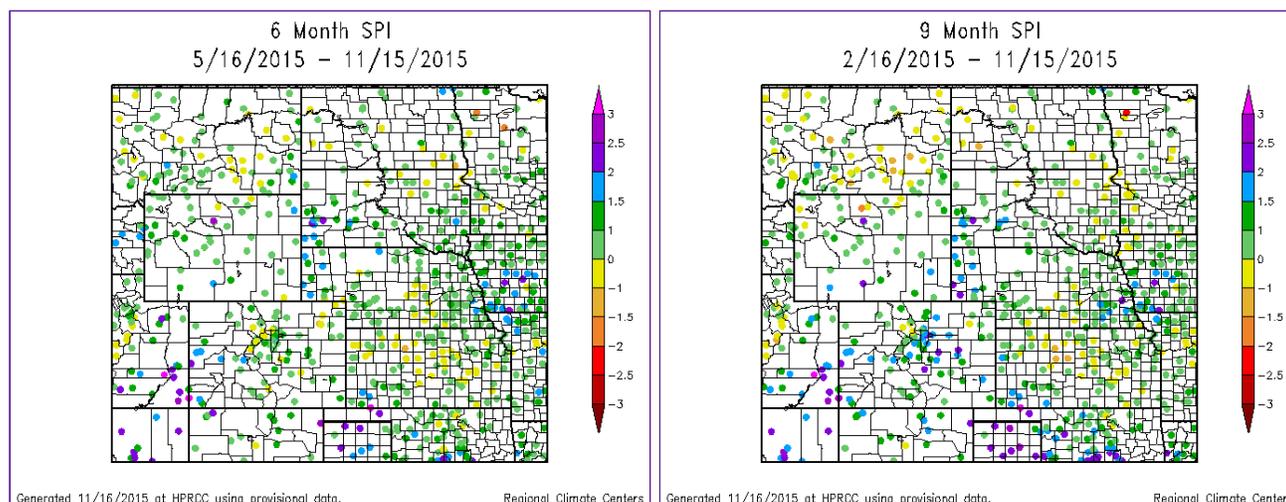
- SNOTEL water year to date precipitation percentiles have not been updated for this past week. Data is currently showing up to 9 November 2015.
- SNOTEL current water equivalent map for this week is 104% of normal for the UCRB. The rest of the regions in Colorado are above 80% of normal for this week, with the region encompassing the Dolores river basin is at 126% of normal.
- The Arkansas river basin in southeast CO is currently at 81% of normal.
- The Green River basin is faring worse in Wyoming, with current water equivalent between 50 and 60% of normal.

SWE Timeseries Graphs:

- The Upper Green Basin is at 55% of median snowpack for the season to date.
- The Duchesne is at 69% of median snowpack for the season to date.
- The Yampa River Basin is at 79% of median snowpack for the season to date.
- The Upper Colorado River Mainstem is at 95% of median snowpack for the season to date.
- The Gunnison Basin is at 97% of median snowpack for the season to date.
- The San Juan Basin is at 84% of median snowpack for the season to date.

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):

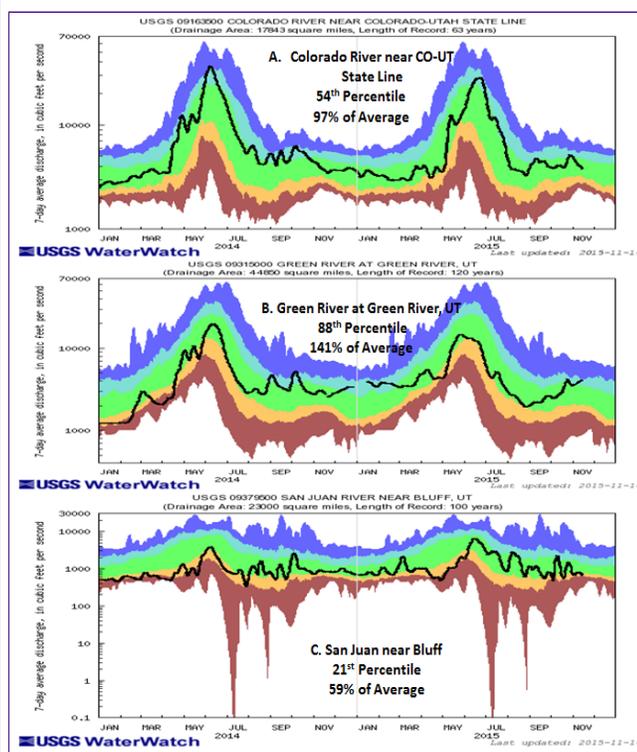
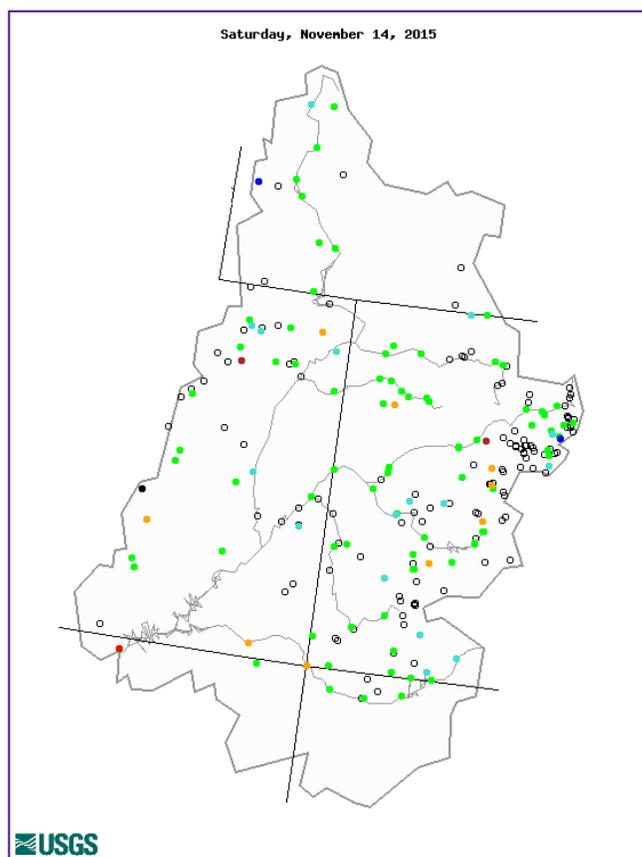
- SPIs across the UCRB are all positive in the short term. The headwaters saw SPI values at about +1 to +1.5, while further downstream SPIs increased further. Some stations in Rio Blanco and Mesa counties and further into Grand County UT saw SPIs nearing +2.5.
- Further north in the Upper Green River Basin, SPIs generally dropped off further north. In Fremont County one station is reporting near -2 SPI. Stations in southern Sweetwater County, however, are still reporting SPIs in the positives.
- Utah is also showing this north/south gradient in SPIs. Northcentral UT is mostly showing values around -1, while further south SPIs increase into the positives again save for one -1 station reading in western Wayne County.
- Southern Colorado SPIs are positive across the board, at generally +1 SPI. East of the divide, southeast CO has SPIs around +1, while the Denver metro and northcentral portion of the state are showing SPIs greater than +1.5, with a couple of stations in Weld and Adams counties showing SPIs greater than +2.

Long Term (6-month):

- Long term SPIs are still being influenced by the wet spring, but are increasingly showing influence by the dry late summer/early autumn we also experienced. SPIs in the headwaters of the UCRB are showing plenty of -1's with SPIs increasing substantially further downstream into Mesa County and Utah.
- The Green River basin is still positive at all stations. Nearly all stations are around +1, with a station in eastern Sweetwater County at near +2.

- Utah is, for the most part, positive as well. The southwest portion of the station has been very wet for the long term. One station in eastern Wayne County is still at near +3 SPI. Stations in the Wasatch Range in central UT are still holding on to slightly negative SPI values, however.
- Much of Colorado is still positive in the long term. There remain areas east of the divide that are negative, such as stations in Summit, Clear Creek, and Gilpin counties as well as the northeast corner of CO.

STREAMFLOW



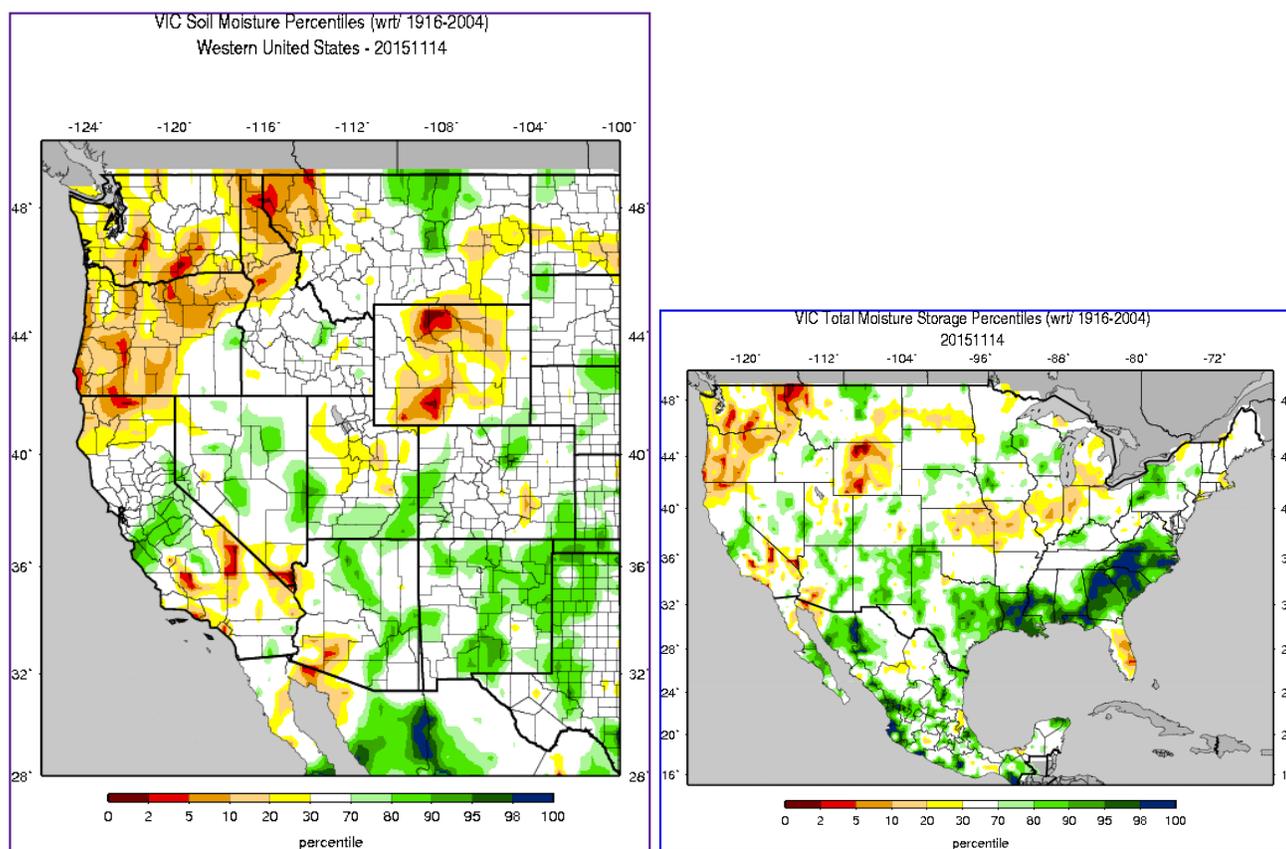
Explanation - Percentile classes							
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		

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:

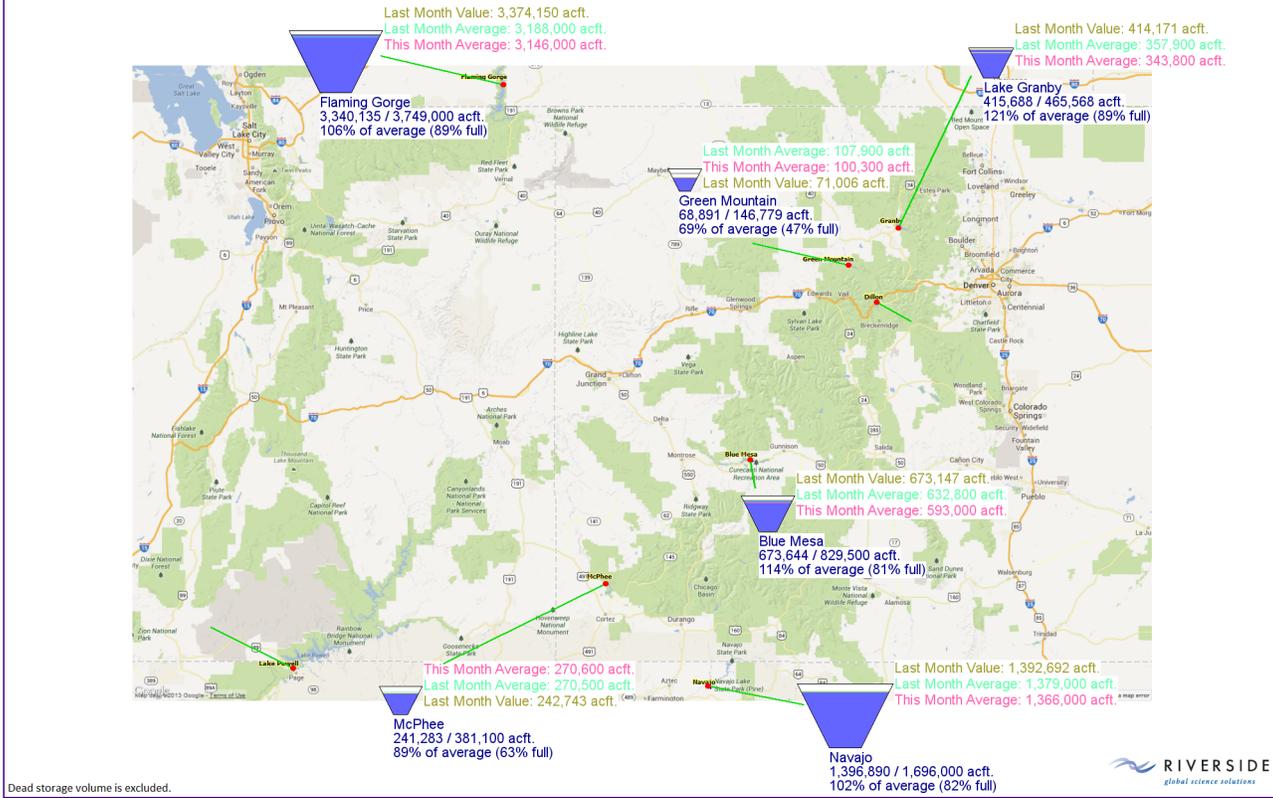
- There are 126 stream gages in the UCRB that are still reporting, out of about 140 gages.
- 86% of gages are reporting in the normal to much above normal range for the 7-day average streamflow.
- 12% of gages are below normal and 2% of gages in the basin are much below normal.
- The Colorado River at the CO-UT state line is at 97% of average and in the 54th percentile.
- The Green River near Green River, UT is at 141% of average and in the 88th percentile.
- The San Juan River near Bluff has been up and down for much of the late summer and fall in particular. The gage is now reporting at 59% of average, the 21st percentile.

SURFACE WATER



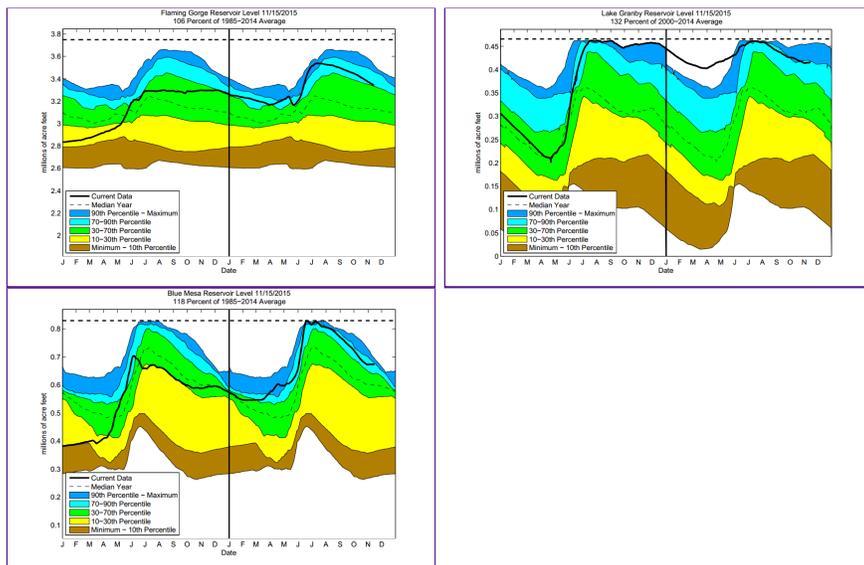
The top left image shows VIC modeled soil moisture as a percentile ranking. The top right image shows VIC+SWE.

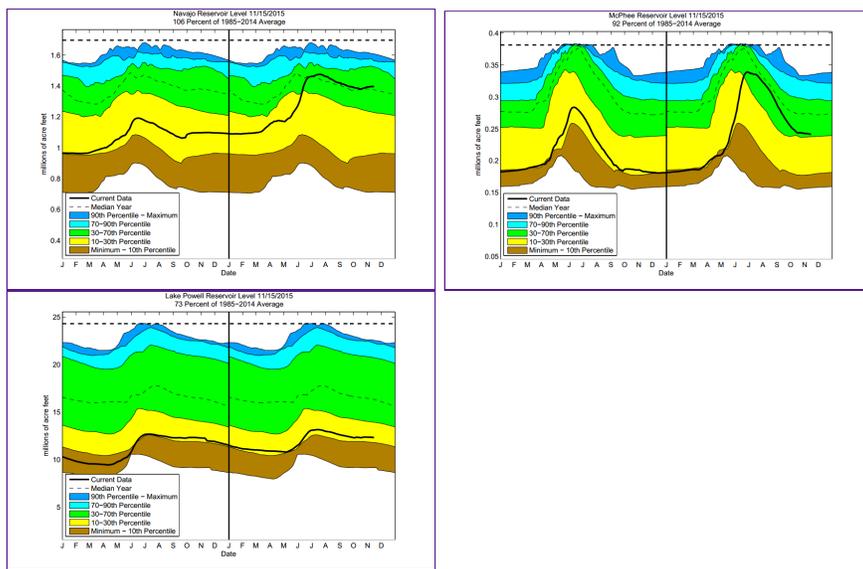
2015/11/16



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:

- The UCRB soil moisture profile is still at or above normal. Profiles become wetter further downstream, with Garfield and Mesa counties in the 70th to 90th percentiles.
- The Green River Basin in Wyoming continues to be very below normal in Sweetwater county and into Fremont County, in some places down below the 2nd percentile.
- Wyoming is showing a gradient in the north/south direction for soil moisture profiles. Places in Uintah, Duchesne, Emery and Carbon counties show soil moistures down into the 20th percentile, while the southeast corner of the state shows many areas in the 80th to 90th percentiles.
- Much of Colorado is at or above normal in terms of soil moisture profiles. The Denver metro + northcentral portion of the state as well as southeast CO are above normal, while an area encompassing eastern El Paso and Pueblo and all of Crowley County is below normal at the 5th to 20th percentile.

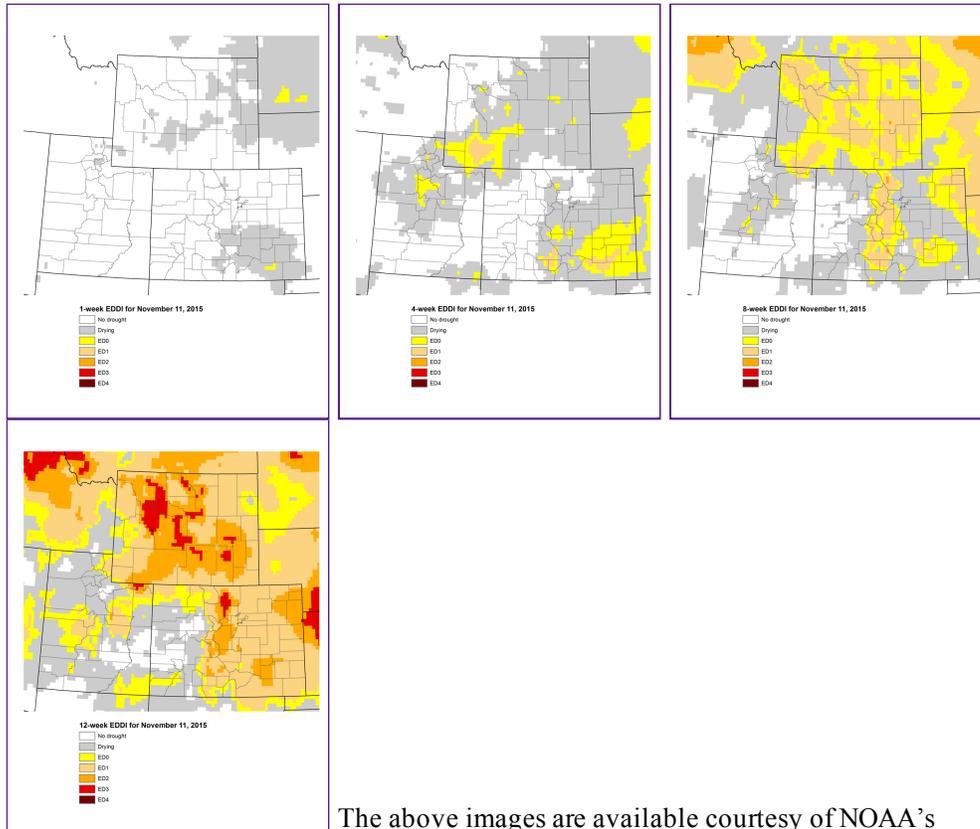
VegDri:

- The VegDri is mostly out of season and is not depicted. The VegDri will return in April or May.

Reservoirs:

- Flaming Gorge is at 107% of the November average and 90% full.
- Lake Granby is at 121% of the November average.
- Green Mountain is now down to 70% of the November average and 48% full.
- Blue Mesa is at 114% of November average.
- Navajo is at 102% of November average, 81% full.
- McPhee is at 89% of its November average.
- Lake Powell percent of average is missing, but 73% of full.

EVAPOTRANSPIRATION



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>. 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..

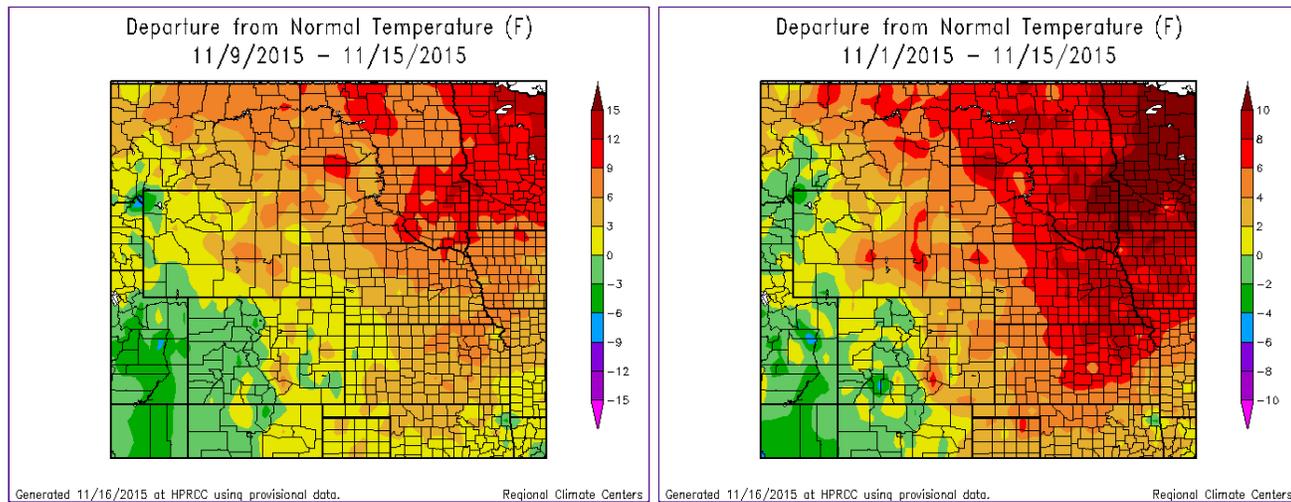
Reference Evapotranspiration:

- 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

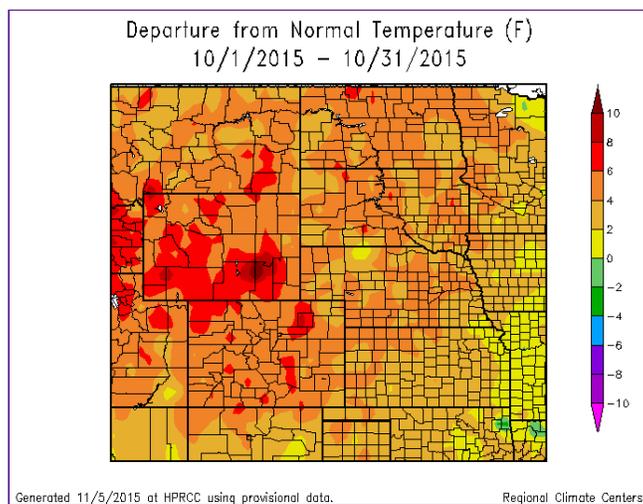
through the growing season.

- 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



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:

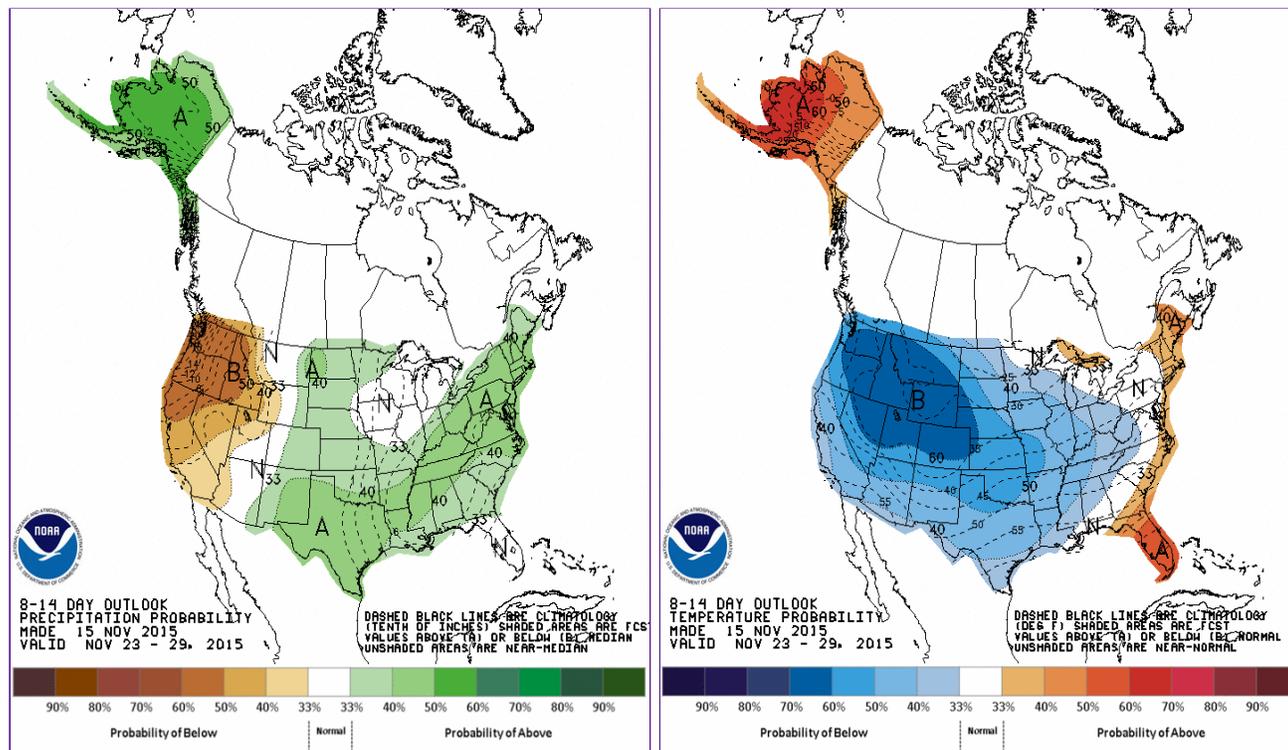
- Temperatures were very close to normal for the UCRB last week, if not a little below normal.
- The Green River Basin also saw temperatures at about normal: +/- 3 degrees.
- Utah was cooler than normal for the past week, generally between -3 and -6 degrees below average. A portion of northeast Emery County was near 9 degrees below normal.
- Temperatures were for the most part warmer than normal east of the

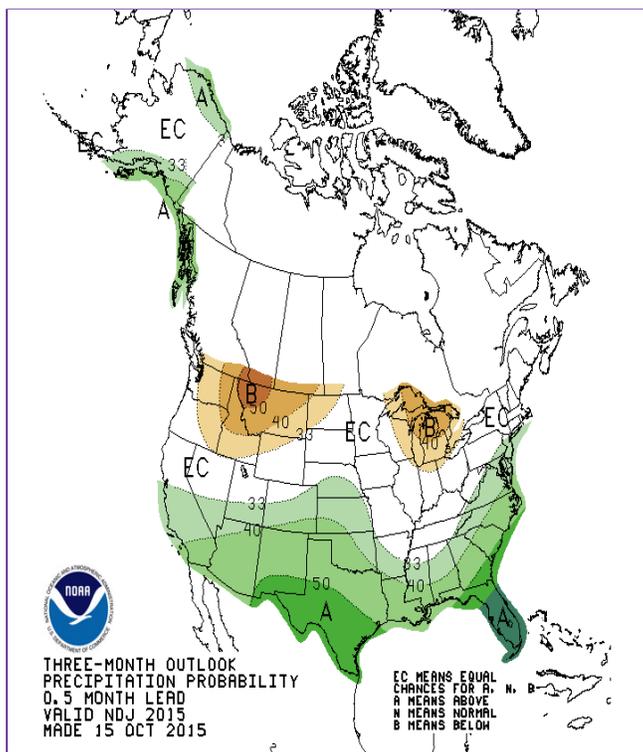
divide in Colorado. Western Pueblo and eastern Huerfano counties looked to be the warmest, with one small area greater than 6 degrees above the week's average.

October Temperatures:

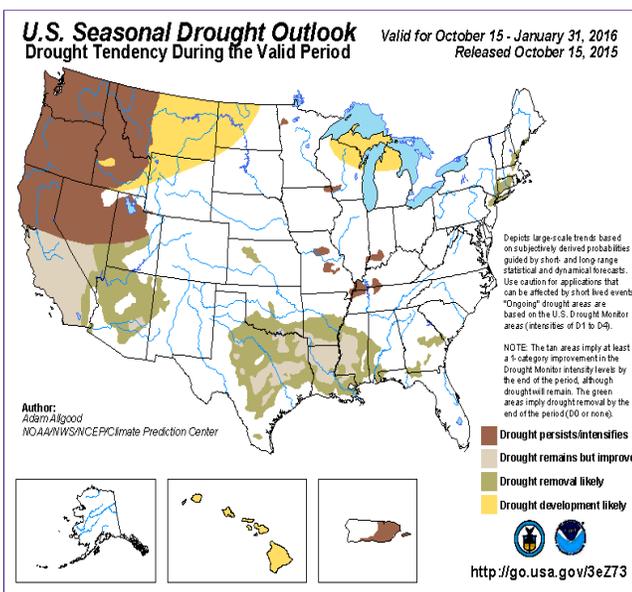
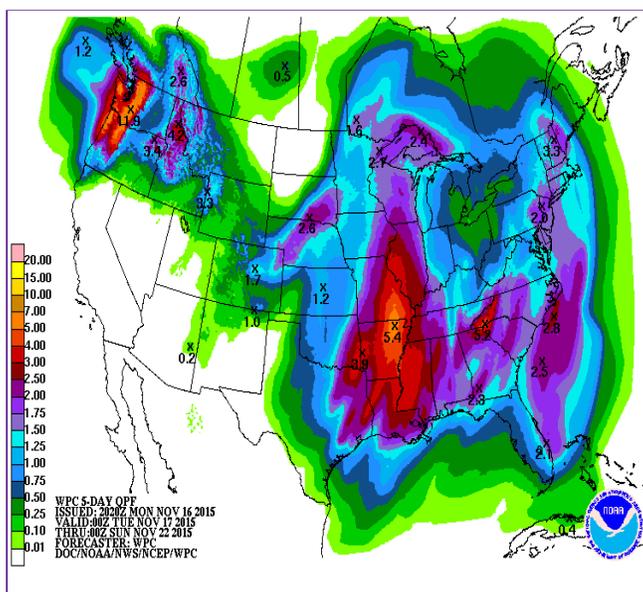
- The UCRB and Colorado saw much above normal temperatures through the entire region for October.
- The Green River basin was 6 to 8 degrees above normal, with a pocket in Lincoln County that was up to 10 degrees warmer than normal.
- Northeastern Utah was mostly 4 to 6 degree above normal, and areas in the western Wasatch Range and Duchesne County 6 to 8 degrees warmer than normal.
- Southeastern Utah was also 4 to 6 degrees warmer than normal, with San Juan County 2 to 4 degrees above normal.
- Western Colorado was in the 4 to 6 degrees above normal range, with Moffat and Rio Blanco counties seeing 6 to 8 degrees warmer than normal.
- Eastern Colorado saw mostly 4 to 6 degrees warmer than normal. Morgan, Weld, Pueblo and El Paso counties saw areas between 6 to 10 degrees warmer than normal.

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: (11/17)

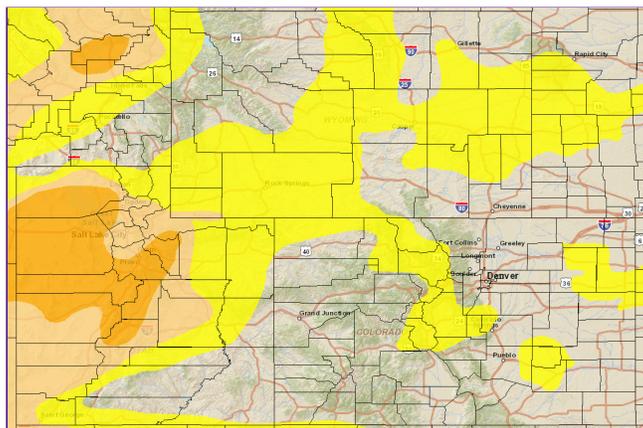
- Currently, an energetic wave that brought ample snowfall to the San Juan Range, central Rockies, the Front Range from north Denver to Colorado Springs, and a corridor of the eastern plains is exiting the region. Unlike recent cases where a high pressure ridge built in immediately after a few small systems will come in from the

northwest this week.

- Tonight and tomorrow morning temperatures will warm slightly across the UCRB and eastern Colorado as some light snow lingers over the northern Rockies of Colorado.
- Tomorrow afternoon another front whisks its way in from the northwest bringing some snow to the Upper Green and Yampa Basins while bringing more wind to eastern Colorado.
- The next front in the train comes not long after on Thursday evening. This one will stretch a little farther south, but once again, the main beneficiaries will be the Upper Green Basin and the Yampa-White Basins. Eastern Colorado will see more wind and another cool down in temperatures.
- By Friday evening the Rockies in Wyoming are forecast to receive over 2" of precipitation in some areas and the northern Rockies in Colorado could pick up over an inch. The river basin averages in the Yampa and Upper Green will likely be around a quarter of an inch. Areas farther south in the UCRB are expected to stay dry. The northern Front Range and eastern plains of Colorado are forecast to see a couple light fits of snow over the next three days.
- A calmer, warming, and dry trend should be expected for eastern Colorado for Saturday through early next week, but the mid-week time frame next week could bring more inclement weather.

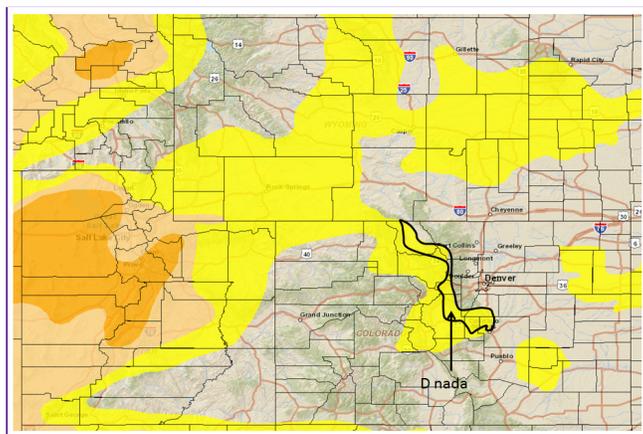
Longer Term:

- The 8-14 day precipitation outlook shows increased chances for below normal precipitation across the north and northwest portions of the UCRB and increased chances of above average precipitation for the eastern UCRB and all of Colorado east of the divide.
- The 8-14 day temperature outlook shows increased chances for below normal temperatures across the entirety of the UCRB and eastern Colorado. These chances increase in magnitude from south to north.
- 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.



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)

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: November 17, 2015

More winter precipitation was the story for this past week. A handful of storms that dumped rain and snow across the central Rockies, Front Range, and San Juan Mountains contributed to positive short term SPIs and little to no drying across the UCRB and much of Colorado, as reflected in the 1-week Evaporative Demand Drought Index (EDDI). These snowfalls over the past 7 days have substantially helped some areas east of the divide that are currently in D0 (see recommendations below). Southeast Colorado missed out on most of this precipitation, however, save for overnight precipitation on the 16th into the 17th. Temperatures on the whole were within roughly 3 degrees above and below normal for the last week, with the warmest compared to average areas existing in the eastern portion of the state.

Snowfall accumulations are currently at or slightly below normal across much of the central Rockies and UCRB, while the San Juans have enjoyed above-normal accumulations as the winter season gets rolling. The Upper Colorado mainstem, for example, is at about 95% of average currently. Streamflows have also remained healthy for the Colorado River near the CO-UT border (97% of average) and the Green River at Green River, UT (141% of average). Looking ahead, the Yampa and Green River basins look to be the big winners in terms of precipitation over the next seven days, with a chance for more precipitation for the headwaters of the UCRB as well as the eastern half of the state over the two-week time window.

Recommendations:

UCRB: Status quo.

Eastern Colorado: Given the widespread precipitation over the last week and very good 30 day SPIs/near-normal 90 day SPIs, we believe that a portion of the D0 currently in southern Douglas and northwestern El Paso counties, extending northwest through the eastern portions of Clark and western Summit, and finally up into the eastern part of Jackson County should be relieved of its D0. This area also includes northeast Grand as well as southwest Larimer counties. All told, this area has received near 1" of precipitation or more over the past week. Short term EDDI indexes in this area add to this conclusion. We will need to continue to keep a close eye on the rest of the eastern portion of the state, given a chance for cooler and wet conditions possible over the next couple of weeks.