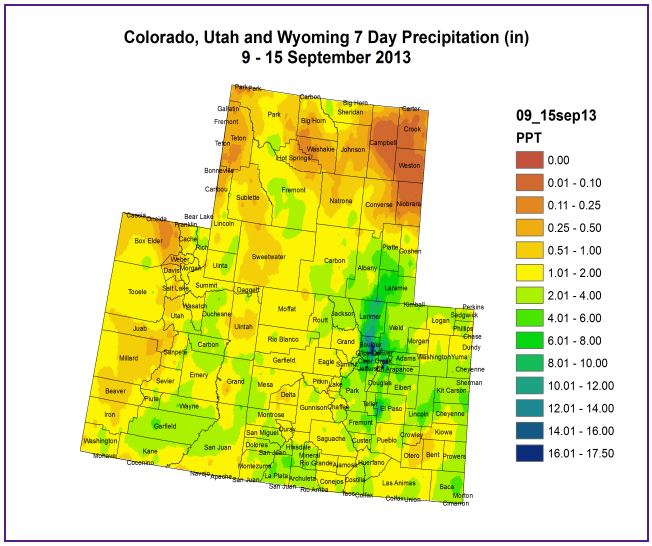
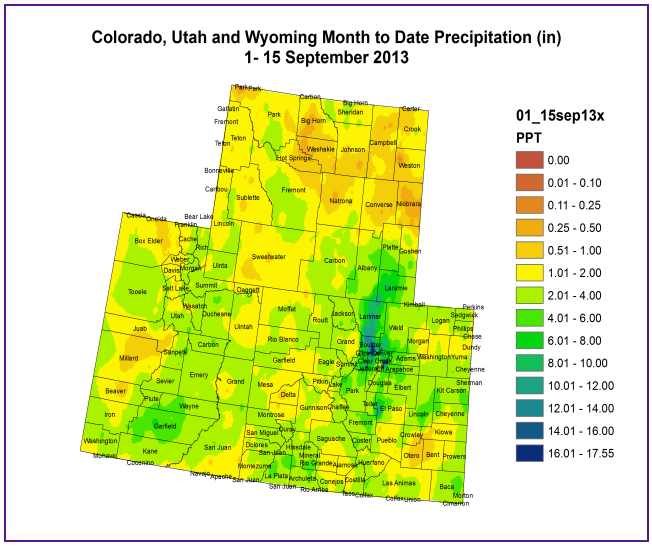
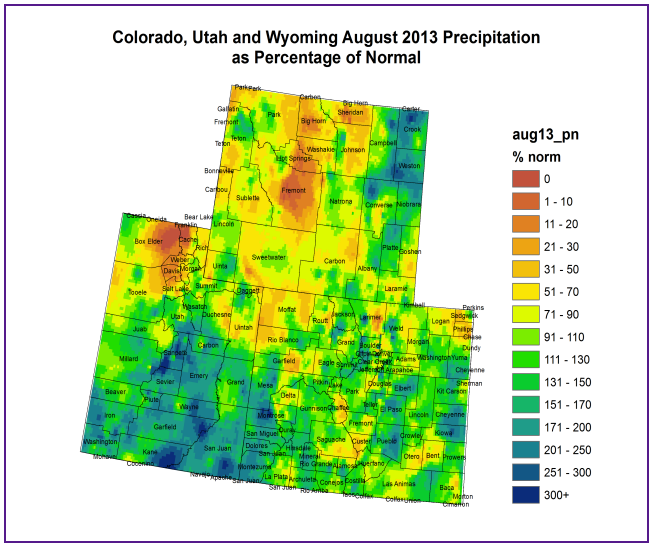
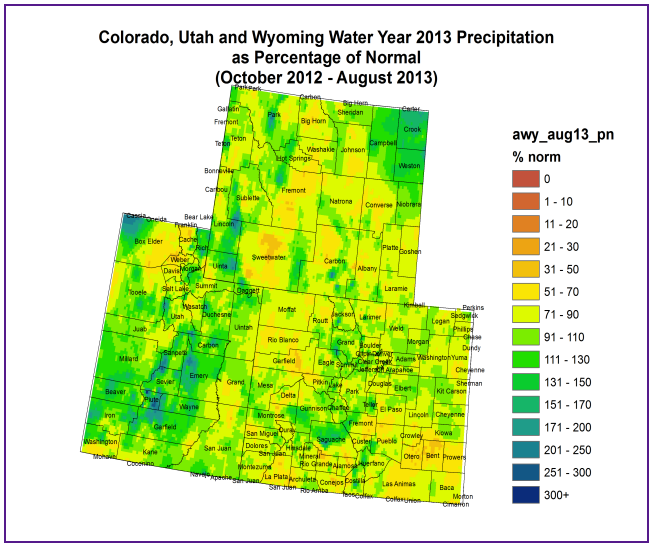
PRECIPITATION









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.

WYTD Precipitation:

- Much of northeastern UT and western WY have seen near average precipitation for the water year with some drier areas in the Wasatch mountains and in Sweetwater County, WY
- Most areas of eastern UT and western CO have received between 70% and 110% of average precipitation for the water year, with some spotty areas less than 70% of average
- The Four Corners region ranges from 50% to 110% of average
- The northern and central CO mountains are near average for the water year

- Most of northeast CO is 70% to 110% of average
- Most areas of southeast CO are below average, with some regions around the Arkansas River valley between 30% and 50% of average

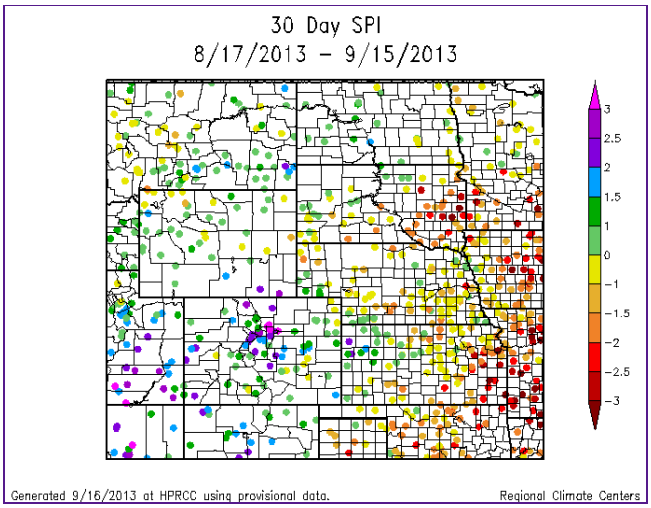
August Precipitation:

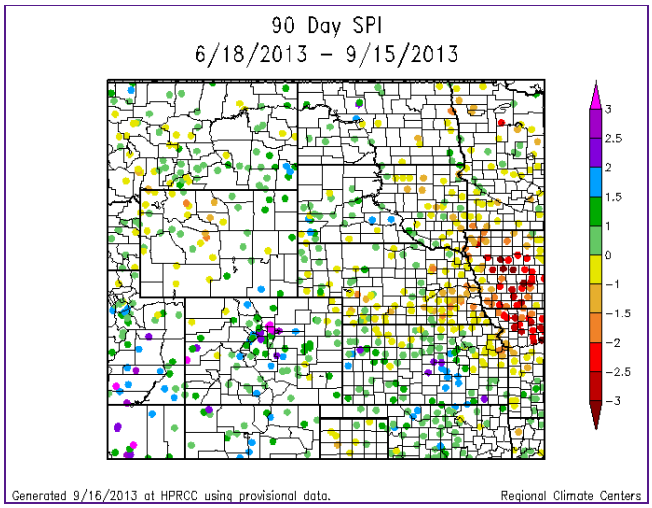
- The southern half of the UCRB saw near to above average precipitation for the month, while the northern part of the basin received below average precipitation
- Spotty areas in the northern part of the basin received near to above average precipitation. However, much of the northern region received between 30% and 70% of average precipitation
- In the southern half, the central and western sides of the basin received over 150% of average precipitation in most areas
- All along the east side of the basin, precipitation mostly ranged between 90% and 130% of average
- Most areas of eastern CO and eastern WY received near to above average precipitation for the month, with a few spotty areas drier than average

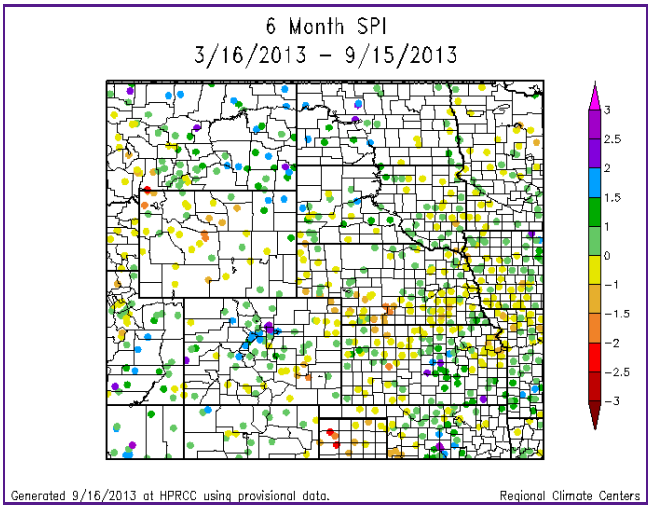
Last Week Precipitation:

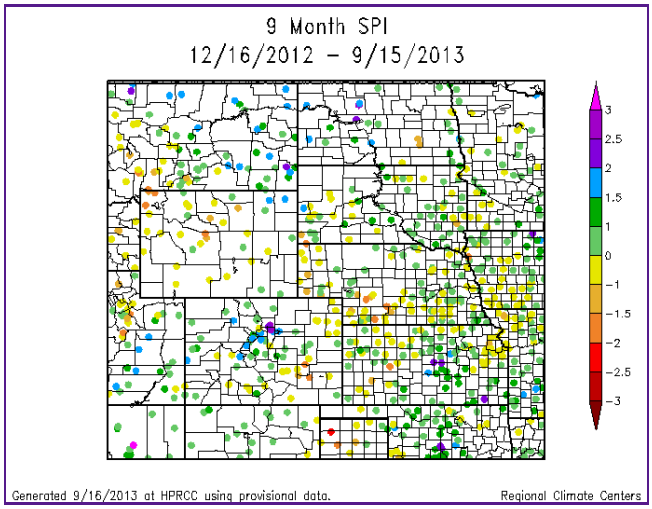
- Widespread and near-continuous precipitation fell across the southern portion of the UCRB last week. 1-2" fell over the Yampa/White basins, while farther to the south the San Juans saw 2-4" with isolated areas up to 6". The Green River basin saw lesser amounts in the range of 0.25" up to 4" in Fremont county, Wyoming.
- The Front Range urban corridor experienced flooding on many of the northern tributaries to the South Platte river. Larimer and Boulder counties experienced the most precipitation which ranged from 2 to 17.5" of precipitation over the week. That is near the annual normal precipitation for Boulder, where the heaviest amounts fell last week. Farther on the plains experienced 1 -6". The southern foothills also picked up considerable amounts of precipitation ranging from 2-8" with the heaviest amounts in NW El Paso and Fremont counties. Farther down the Arkansas did not pick up as much with the D4 area only receiving 0.51-1.00" of precipitation. Baca county in extreme SE Colorado was an exception with 2-4" of precipitation, there was also an isolated area of 4-6" in eastern Baca county. Western Las Animas up into Huerfano received 2-4" as well.

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.

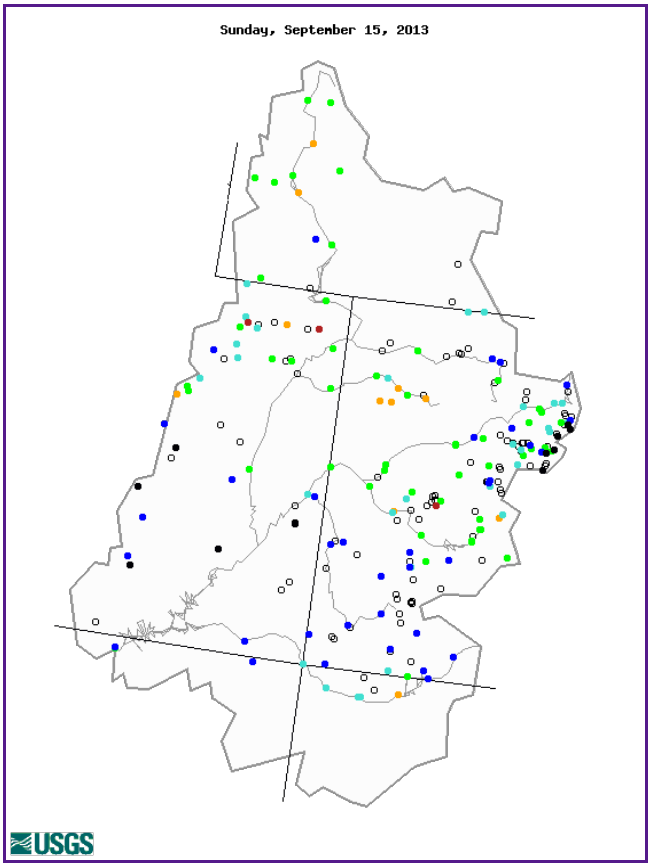
Short Term (30-day):

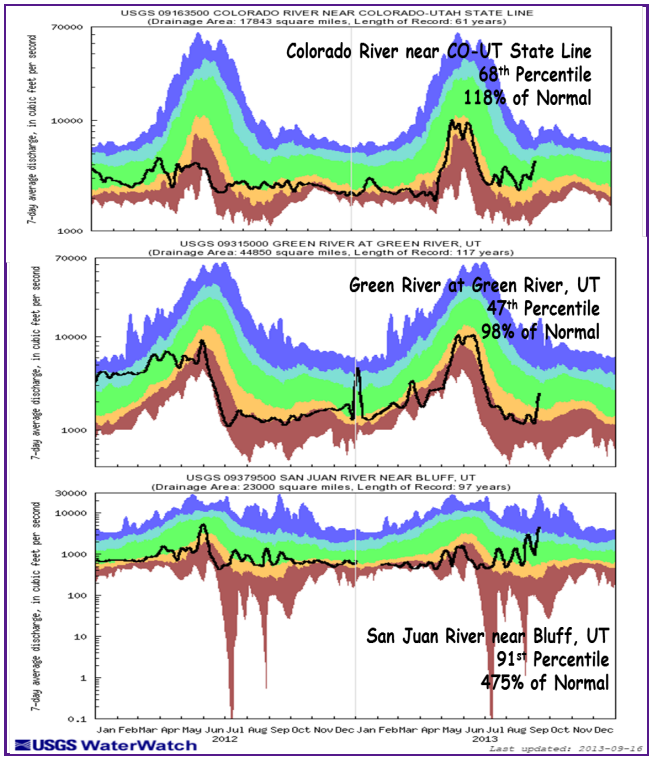
- Most of the basin shows near average to above average conditions with SPI's in the northern portion of the basin between 0 and 1.5. In the southern portion of the UCRB much above normal conditions on the short term with SPI's between 0 and 3. One station in Delta county is reporting below normal at 0 to -1.
- The Four Corners region shows wet SPI's between 1 and 3.
- East of the basin is variable on the short term. Many station in the flood zone are reproting SPI's 1.5.
- Areas remaining slighly dry include Phillips, Sedgwick, Yuma, southern Lincoln, Crowley and Otero, with SPI's only down to -1.

Long Term (6-month):

- Dry conditions continue to linger on the longer time frame.
- The Green river basin is reporting below normal with SPI's mainly between 0 and -1.
- Variable conditions around the 4 corners but dry SPI's only down ot -1, while others are up to +1.5.
- East of the divide, the NE plains (Phillips, Sedgwick, Washington and Yuma) and lower Arkansas (S. Lincoln, Pueblo, Crowley, Otero, Las Animas) show lower SPI's in the 0 to -2 range. Higher SPI's show up in between those drier areas. The norhtern Front Range and Colorado headwaters areas show the highest SPI's ranging from 0 to +3.

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		

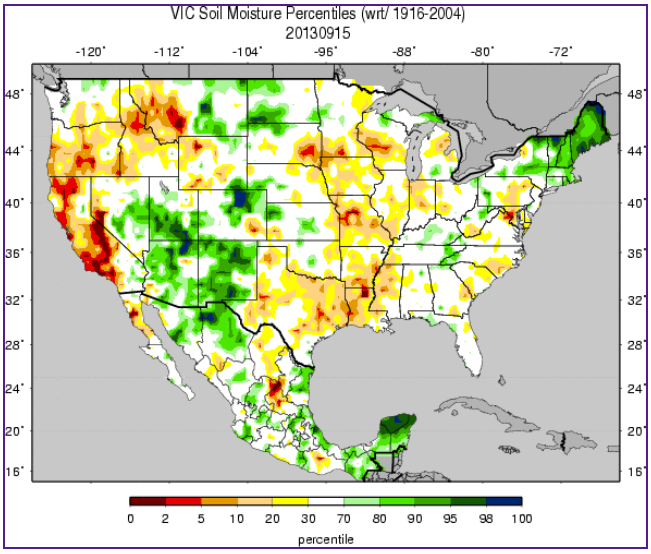
The top left image shows 7-day averaged streamflows as a percentile ranking across the UCRB. The top right image shows 7-day averaged discharge over time at three key sites around the UCRB: The Colorado River at the CO-UT state line; the Green River at Green

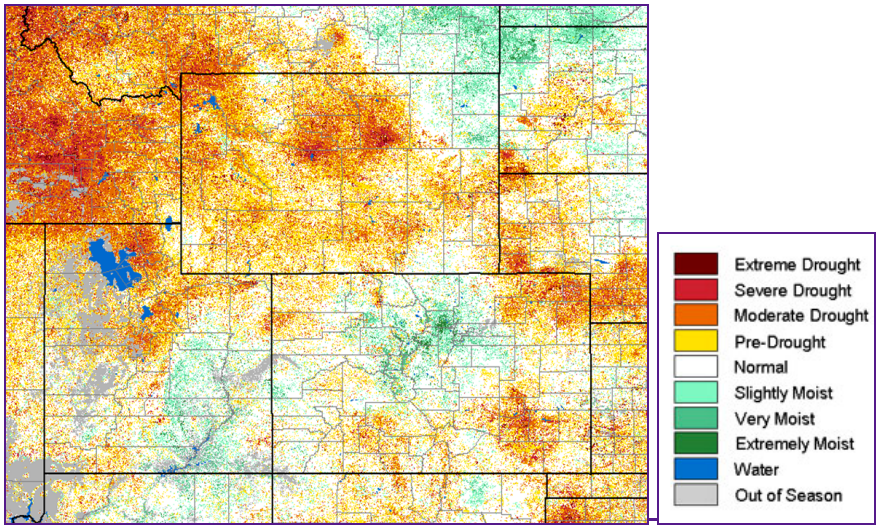
River, UT; and the San Juan River near Bluff, UT. All streamflow data provided by United States Geological Survey.

Streamflow Statistics:

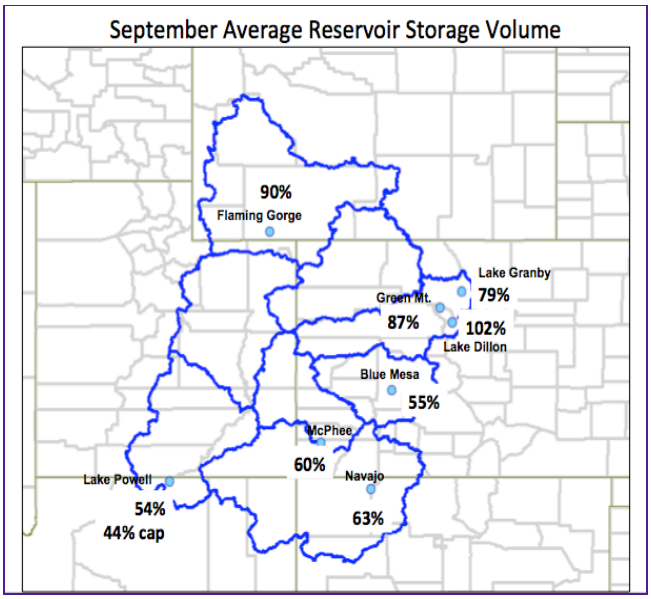
- 66% of gages recording normal to above normal 7-day average streamflows
- 4% of gages recording much below normal or Low 7-day average streamflows
- 25% of the gages are recording high flows for the 7 day average streamflow, up from 1% last week.
- The Colorado River at the CO-UT state line saw an increase in flows last week and is currently recording in the near normal range at the 68th percentile up from the 38th last week (118% of normal).
- The Green River at Green River, UT saw an increase in flows to the normal range. It is reporting in the 47th percentile (98% of normal).
- Flows on the San Juan River near Bluff, UT saw a large increase from last week and is now in the much above normal streamflow category and reporting in the 91st percentil, 475% percent of normal!!

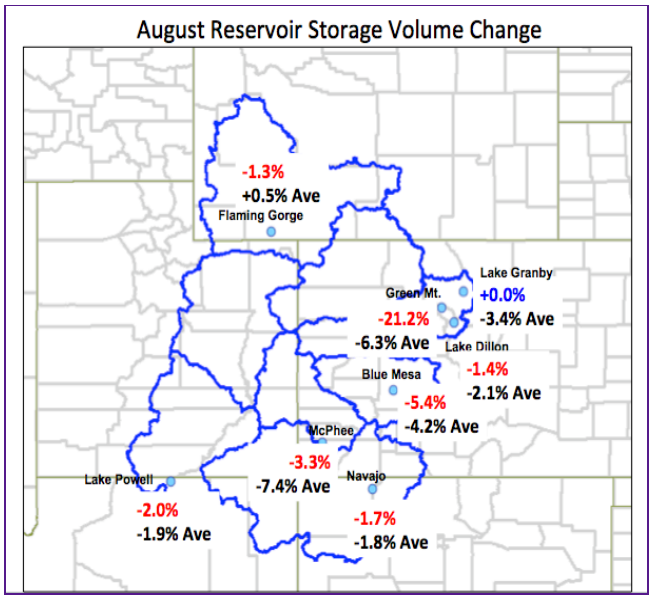
SURFACE WATER





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 left image shows the percent of average volumes of the major reservoirs in the UCRB. The above right image shows the percent change in volume over a specific time period for the reservoirs.

VIC:

- Vast improvements to the VIC soil moisture product this week with recent widespread heavy rains.
- Southern Wyoming remains dry with soil percentiles less than the 20th percentile for the southern portion of the state
- In SE Colorado, the southern Lincoln, Crowley, Otero, Bent and Prowers counties continue to report soil moisture percentiles below the 20th percentile.
- A small portion of eastern Utah remains in dry soil moisture conditions, mainly in the 10-20th percentile range.
- NE Colorado and southern Utah are now reporting soil moisture in the 70th and greater percentiles.
- Much of the rest of the basin and Colorado show near normal soils.

VegDRI:

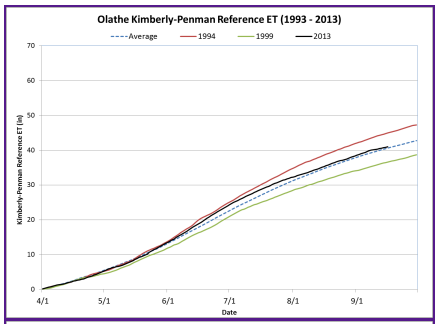
- The northern portion of the UCRB continues to show dry vegetation conditions through the Green, Wasatch, Uintas, Yampa and White basins.
- The four corners is still showing slightly poor vegetation conditions, but improved over the past few weeks. SE Utah is showing moist vegetation conditions.
- The lower Arkansas and extreme NE Colorado (eastern Weld, Logan, Phillips, Sedgwick, Yuma and Washington) continue to show dry vegetation conditions, even with recent rains.
- The Rio Grande is mainly in the pre- to moderate drought conditions.

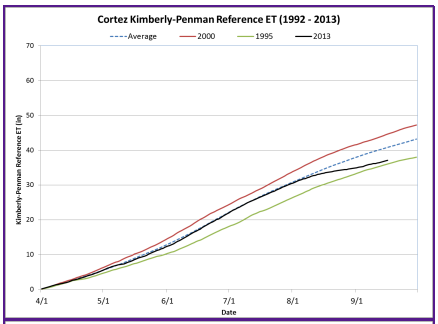
- Larimer, Boulder, Gilpin, Clear Creek, Jefferson, Doughlas, Elbert, Arapahoe and Adams counties are all showing moist vegetation conditions after a week of continous rain and flooding.

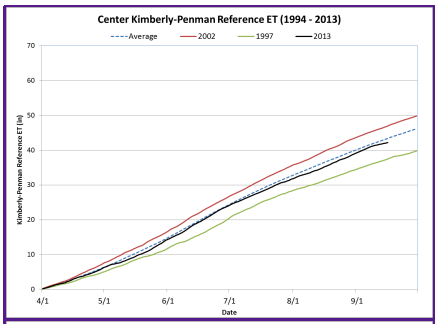
Reservoirs:

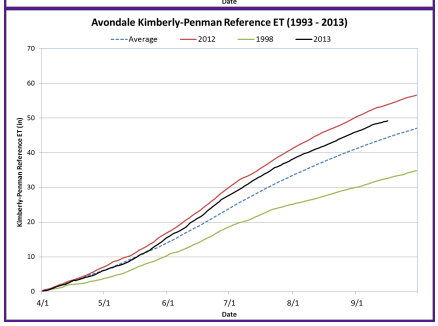
- Most of the reservoirs saw a near normal decrease in volume for the month of August
- Lake Granby stayed near steady last month, while Green Mountain saw very large volume decreases
- Lake Dillon showing near average volume for September
- Flaming Gorge, Green Mountain, and Lake Granby slightly below their September averages
- Remaining reservoirs showing volumes between 50% and 70% of average
- Lake Powell currently at 44% of capacity

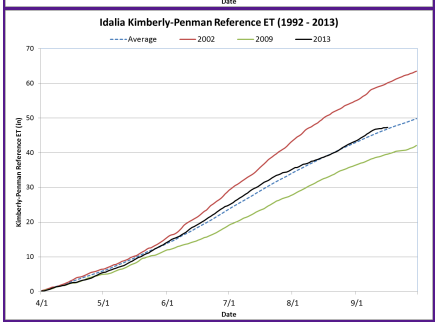
EVAPOTRANSPIRATION

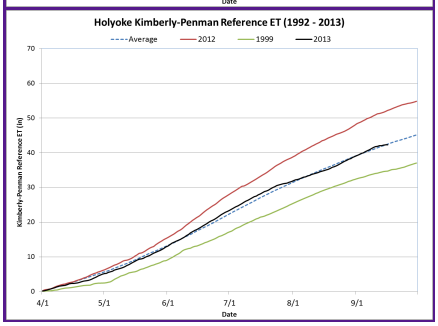


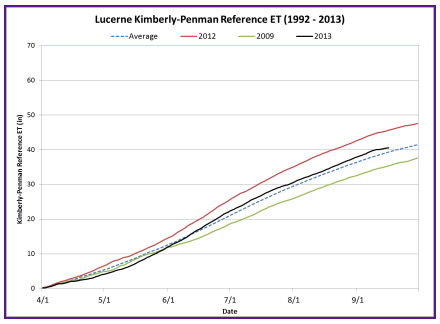










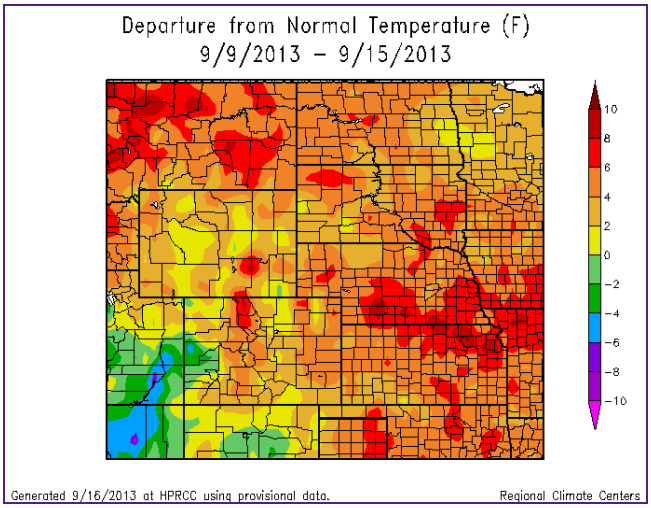


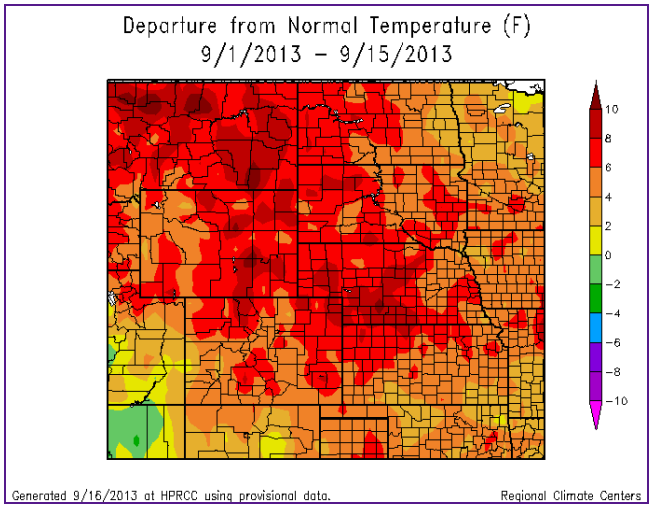
The above images are of reference evapotranspiration (ET) from CoAgMet sites across Colorado. Reference ET assumes the amount of water that will evaporate from a well-irrigated crop. Higher ET rates occur during hot, dry, and windy conditions. Lower ET rates are more desirable for crops. See a map of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

Reference ET:

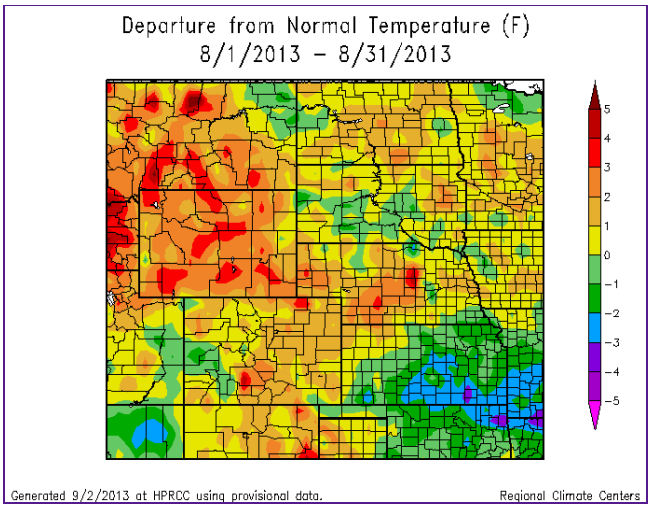
- Olathe: ET has dropped over the past week and is now very near normal for the growing season to date.
- Cortez: ET was near average for July. Slower ET rates have helped lower that to below average for most of August, currently much lower than average and approaching the low year of 1995.
- Center: ET has been below average since the beginning of July and slowed even more over the past week.
- Avondale: ET rates have been well above average for most of the growing season, though still below the record ET year of 2012. ET rates have slowed somewhat since late July but are still above average for the growing season.
- Idalia: ET was above average for July. ET rates slowed and ET have been close to average for the past few weeks and is now just slighly above normal for the growing season after the past week over low ET rates.
- Holyoke: ET rates dropped to slightly below average after being slightly above average for July. ET has been near average for the past couple of weeks
- Lucerne:ET has been slightly above average since late June but saw a decrease in daily rates over the past week, as did many stations across the state.
- ET rates over the past week dropped significantly compared to last week with cloudy and rainy conditions over widespread areas.

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.



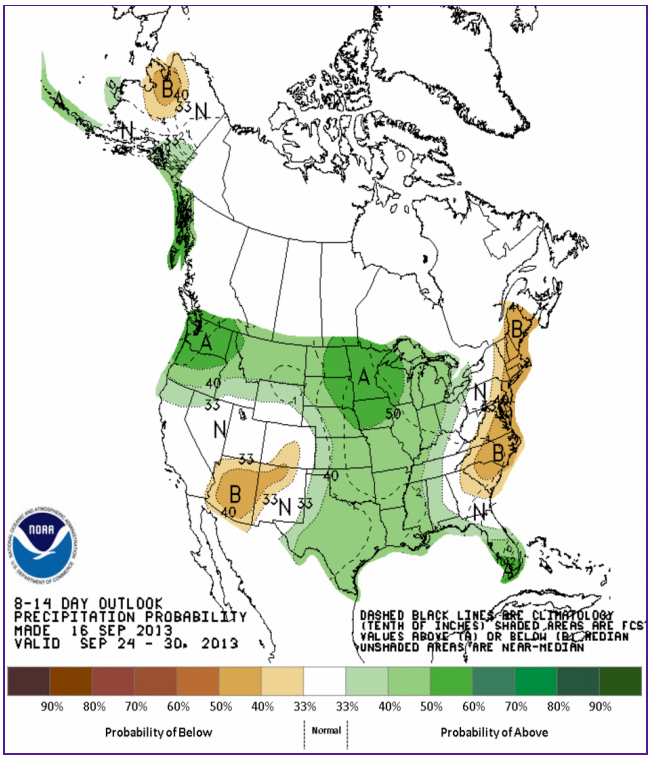
Last Week Temperatures:

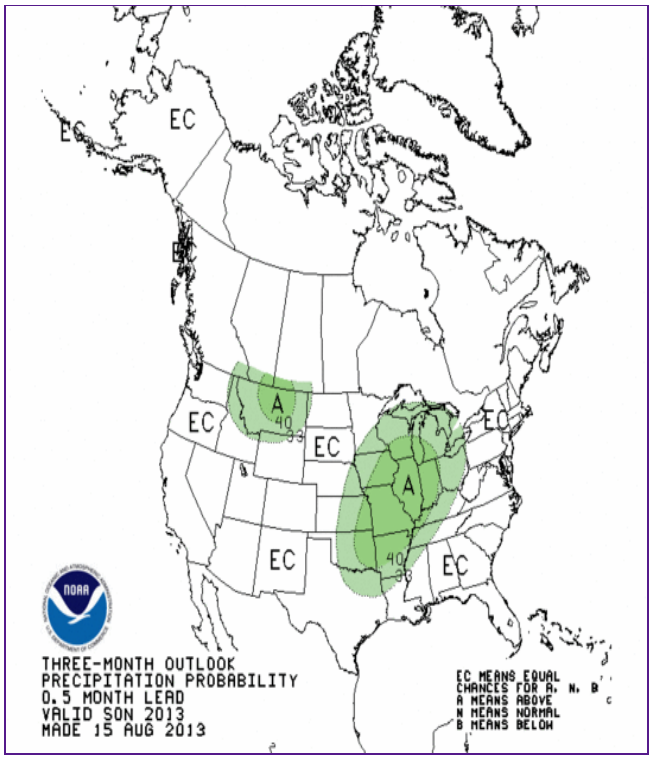
- The northern portion of the UCRB saw near normal to 4 degrees above normal temperature for the past week.
- The southern portion of the UCRB saw temperatures 0 to 6 degrees below normal for the week.
- East of the UCRB, even with prolonged cloud cover, saw temperatures normal to 6 degrees above normal for the week.

Last Month Temperatures:

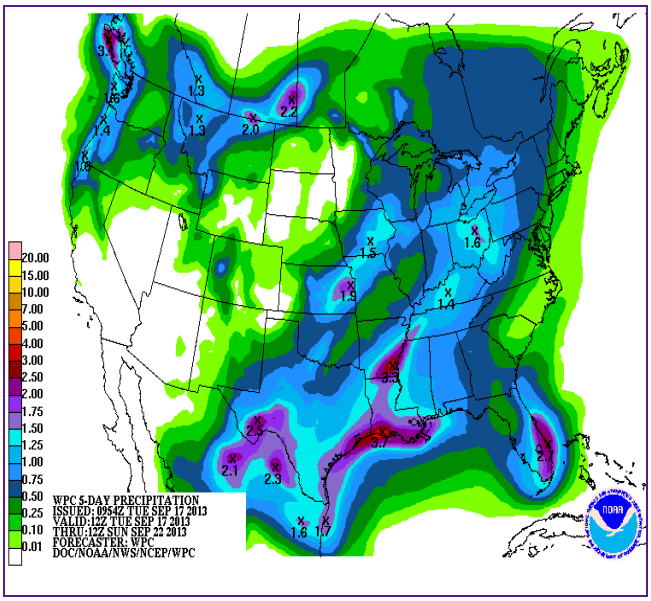
- The northern portion of the basin saw warmer than average temperatures, ranging between 0 and 4 degrees above average
- The southern porition of the basin was closer to average, with temperatures -1 below average to +1 above average
- Most of WY was much warmer than average
- Eastern CO was mostly 1 to 2 degrees warmer than average

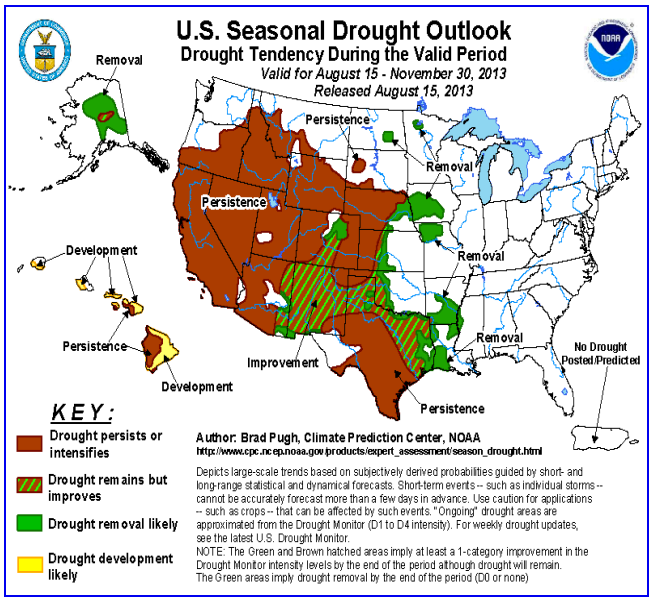
FORECAST AND OUTLOOK





The top two images show Climate Prediction Center's Precipitation outlooks for 8 - 14 days (top left) and 3 months (top right). 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.





This Week:

- The UCRB can expect scattered showers through Wednesday. After that, high pressure builds bringing clear skies and chilly mornings.
- Slighly less precipitation is forecast east of the divide which saw

widespread precipiation and flooding last week.

Longer Term:

- The 8-14 day outlook shows a good chance of near normal temperatures across the region and near normal to below normal precipitation. The four corners and Rio Grande areas show the highest chances of drying out.
- The three month outlook shows equal chances for wet, dry, or normal conditions for the region
- The drought outlook shows the possibility for some drought improvement in southern CO with drought persistence throughout the rest of the region

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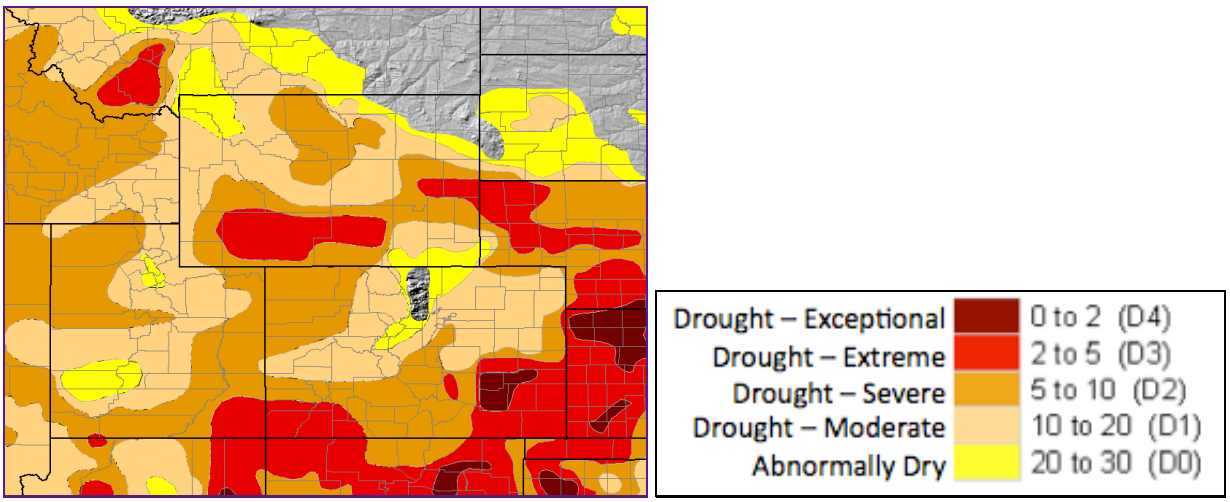
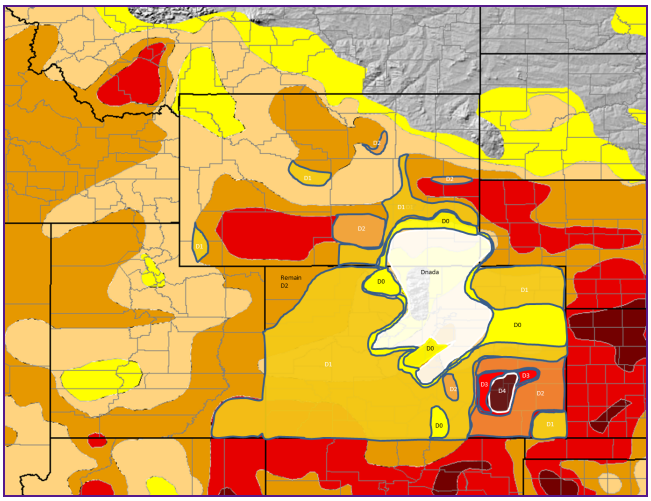
U.S. DROUGHT MONITOR



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: September 17, 2013

Widespread precipitation fell over much of the UCRB and in particular the Front Range foothills east of the divide. Widespread flooding was realized from this storm on the Cache la Poudre, South Platte, Big Thompson and St. Vrain rivers where communities were left stranded as roads collapsed making them impassable. This was a historic (estimates are currently 100 year flood) for the Front Range and as such, many improvements are warranted. In some cases, 3 cateogory improvements are being recommended. 3" of moisture would be approximately 20% of the normal annual precipitation at many of these locations and some areas (Boulder) saw upwards of 18" over the week. This was not convective activity, it was more tropical in nature but fell for several days in succession which caused the flooding problems on these rivers. Time of year is also a huge consideration as the timing allows for excellent soil moisture storage going into the fall when ET rates are not consuming as much water as during the height of the growing season.

Recommendations**

Please see the map for clarity as there are many changes being recommended.

UCRB:

Widespread expansion of D1 across the west slope of Colorado, with the exception of extreme NW Colorado which should remain D2. D1 should also replace D3 conditions around the four corners area. Removal of drought completely from southern Summit. In Wyoming, slight trimming of the D2 in SW Wyoming. The SE Utah is an extisting change from the Drought Monitor author which we drew in.

East of Divide in Colorado: Drought removal for Larimer, Boulder, Gilpin, Jefferson, Lake, western Weld, Northern Park, western Arapahoe, western Adams, Douglas, western Elbert, northern El Paso, central Teller and central Fremont. D0 should skirt this area as well as remain in portions of Teller and Park which did not recieve quite as much moisture to warrant a 3 category improvement.

Reduction to D0 for southern Yuma and Washington and northern Lincoln and Kit Carson counties.

Improvement to D0 for Jackson county (North Platte basin).

Improvement to D1 for Baca county (extreme SE Colorado).

Trimming of the D4 in Crowley, Otero, Kiowa and Bent, D4 should remain in eastern Crowley and Otero as well as western Bent and Kiowa.

Improvement of the D3 in El Paso to D2.

Improvement of D3 to D2 surrounding the D4 (with the excpetion of Baca which gets 2 category improvement) in southern Lincoln, southern Cheyenne, eastern Kiowa, Bent, Prowers and eastern Las Animas.

Improvement of D2 to D0 in western Las Animas up into Huerfano county.

Wyoming:

Trimming of the D3 in Carbon county.

Trimming of D2 to D1 in northern Fremont county.

Expanion of D2 in Johnson county.

Removal of drought in southern Albany, Platte Goshen and Laramie counties with reduction to D0 around these areas .

Split the D2 into 2 separated by the D1 in Converse and northern Albany counties.

Trim the northern edge of D3 in Converse and Niobrara counties.