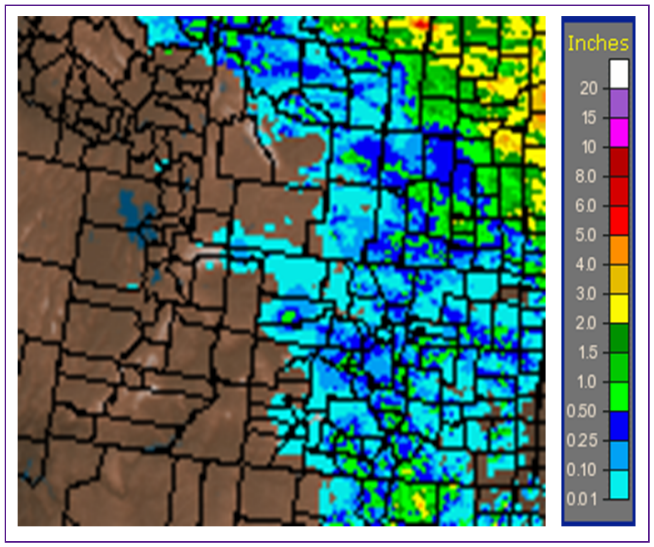
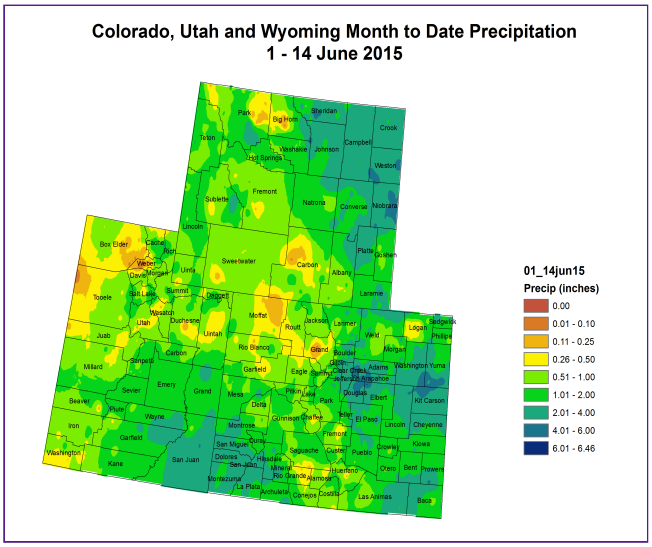
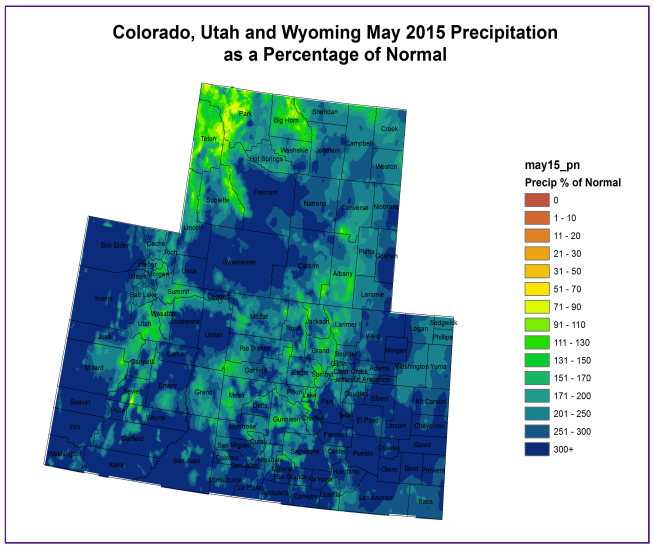
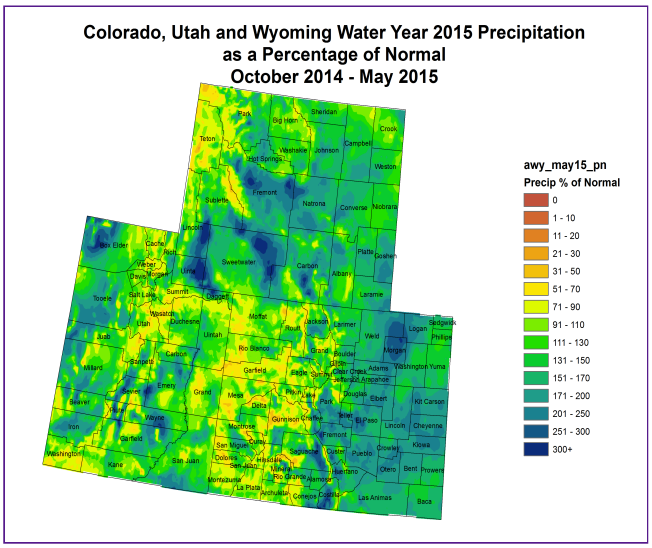
PRECIPITATION









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:

- Precipitation amounts were spotty, and, low for the most part, across the UCRB over the last week. The Four Corners area, the Upper Green Basin, and eastern Utah received just about zero radar-indicated precipitation.
- In western Colorado there were some spotty areas of more intense precipitation. Southern Rio Blanco County, and the high terrain between Lake and Pitkin Counties picked up over half an inch of rainfall. Most of the western slopes were between a trace and a quarter of an inch.

- The San Luis Valley and the Sangre de Cristos did pretty well for precipitation over the last week. There was a bull's-eye of precip in western Las Animas County of over two inches. Central Conejos and southern Rio Grande Counties also picked up over half an inch of precipitation.
- East of the divide precipitation was spotty and light in most areas. Most areas close to the foothills and the palmer divide picked up at least a tenth of an inch with totals tapering away from the higher terrain. Some stronger thunderstorms did hit the far southeast corner of the state in Prowers and Baca Counties producing over an inch of precipitation. A line of thunderstorms produced over half an inch of rain in east-central Colorado primarily effecting Elbert, Washington, and Yuma Counties.

May Precipitation:

- May was a very wet month across the entirety of Colorado and the Upper Colorado River Basin.
- There was less of an elevation gradient in precipitation than is climatologically normal. The high elevations of the Wasatch, Uintah, and Rocky Mountain Ranges picked up between 90 and 150 percent of their May average places, but lower elevations were above 300 percent of May average precipitation in many areas.
- The Upper Green River Basin in Wyoming received mostly above normal May precipitation. Higher elevations were between 90 and 150 percent of normal. Lower elevations were generally 150-300+ percent of normal for the month.
- Eastern Utah was nearly unanimously way above normal for the month of May. Higher elevations in the Wasatch and Uintah Ranges as well as parts of Grand and Emery County received a smaller fraction of their average precipitation than other areas in eastern Utah, but were still between 90 and 200% of May normals. The bulk of Duchesne, Uintah, and San Juan Counties were over 300 percent of normal for the month of May.
- Western Colorado percents of normal decrease with elevation, and increase from north to south. The San Juans picked up over 300 percent of normal for May across most of the range. In northwest Colorado May percents of average were more typically between 150 and 250 with isolated areas higher or lower.
- The central and north central Rockies received lower precents of May average precipitation than surrounding areas. In Lake and Summit Counties precipitation was between 70 and 200 percent of normal.
- The Rio Grande Basin received by and large over 300% of their average May precipitation.
- East of the Divide, precipitation percentages of normal were over 200 pretty much across the board. This is especially impressive as May is one of the wettest months across eastern Colorado, and the wettest month climatologically in some areas. Parts of Douglas, Jefferson, Boulder, and Larimer Counties that are a little higher in elevation only picked up 150-200% of May average precipitation.

Water Year 2015 Precipitation (Oct-May):

- Following a very wet May in which lower elevations in the UCRB and eastern Colorado picked up lots of precipitation, and following a dry winter, the water year to date precipitation map looks similar to a topography map. This is because, for the most part, higher elevations have not received as high a fraction of their normal precipitation for the water year to date as low elevations.
- The Upper Green river basin shows a very mixed bag of conditions. Eastern Uinta and Lincoln Counties have received over 300% of their normal water year to date precipitation. Northeast Sublette County and northwest Lincoln County, however, have only received 50-70% of their normal water year to date precipitation.
- Over northeastern Utah the Wasatch and Uintah Mountain Ranges have by and large received only 50-90% of their normal water year to date precipitation. Lower elevations of eastern Utah show a wider variety of conditions all the way from western Grand County, which has picked up 70-90% of normal precipitation for the water year to date to southcentral Wayne County, which has picked up over 250% of normal precipitation for the water year to date. The most common percents of normal for the water year to date in eastern Utah are 90-150.
- Much of Western Colorado is still on the dry side with the most area in the 70-90% of normal range. Some of the areas that still show up very dry are in western Gunnison County, northern Delta County, and northern Mineral County where only 30-50% of normal precipitation for the water year to date has been received. There are wet areas as well such as eastern San Miguel County, which has had 170-200% of normal precipitation for the water year to date.
- Much of Western Colorado has seen below normal precipitation, with much of the area in the 50%-70% of normal range, and some spots through the basin seeing less than 50% of normal. Portions of Moffat, Routt, and Rio Blanco counties are near or slightly above normal.
- The Rio Grande Basin is still on the dry side at higher elevations. The Sangre de Cristo Range is hovering in the 50-90% of average ballpark for the water year to date, but the valley in western Costilla County is above 200% of average.
- Eastern Colorado is now above average for the water year to date across the board following a very wet May. Most of the region is between 130 and 200 percent of the normal for the water year to date. Morgan County is at over 250 percent of average for the water year to date following record rains in May. The driest area of eastern Colorado with respect to average is Phillips, northern Yuma, and eastern Washington Counties where only 110-130 percent of normal precipitation has been received for the water year to date.

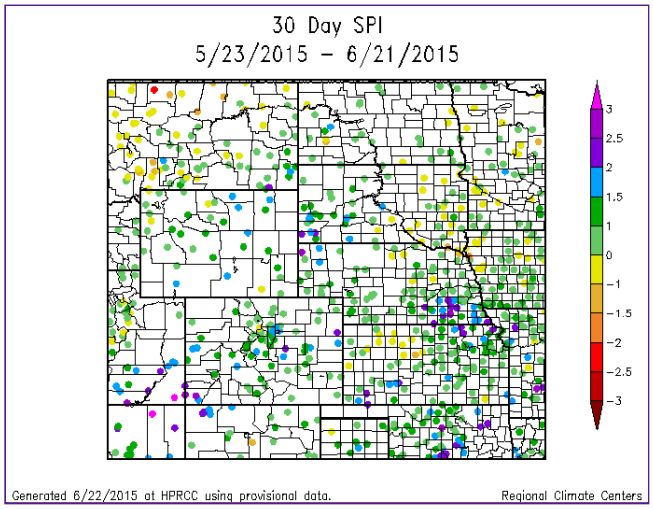
SNOTEL Precipitation Percentiles:

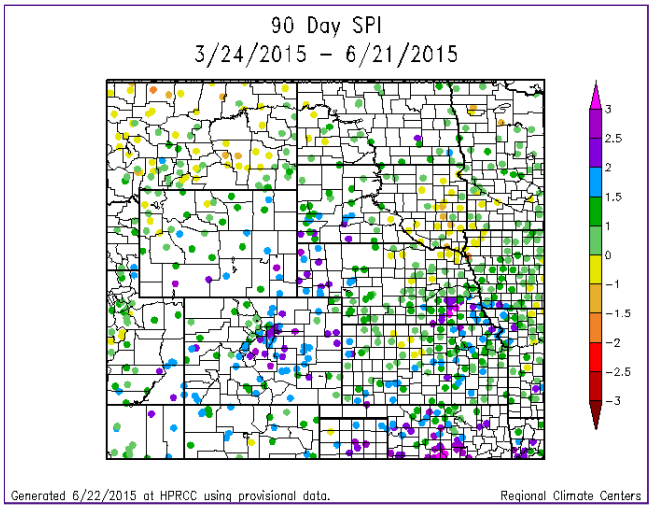
- SNOTEL year to date percentiles across much of the UCRB saw quite a rebound this last week.
- In the Upper Green the percentiles are mostly in the median range between the 32nd to the 59th. Some Snotel sites in eastern Sublette County area a bit lower, down to the 22nd.
- The Wasatch and Uintahs are 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.

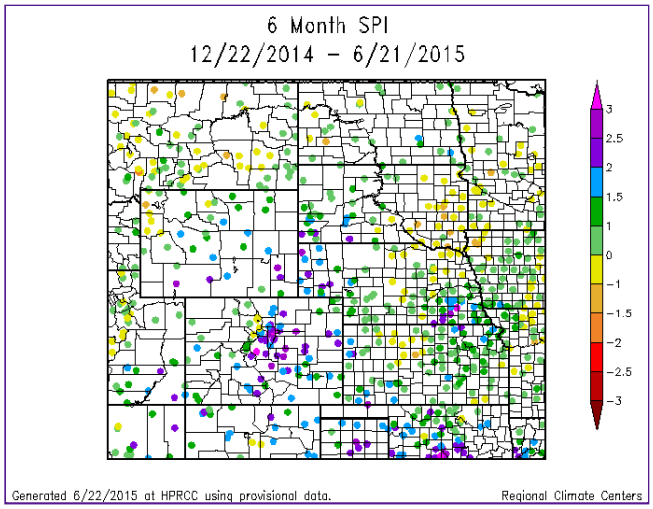
SWE Timeseries Graphs:

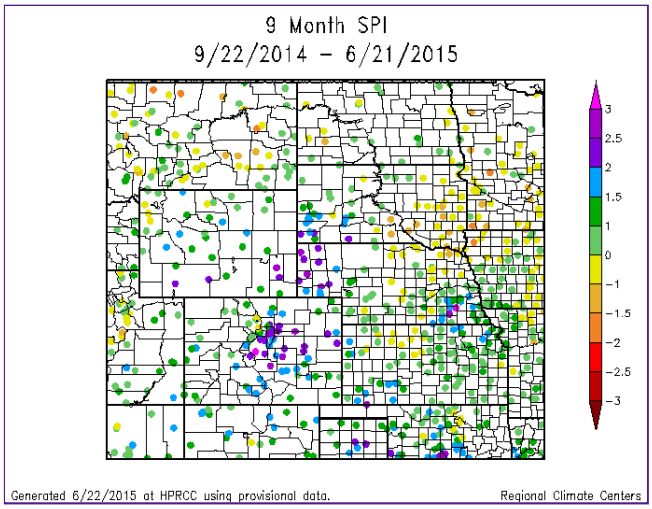
- All sub-basins are well into the melt season.
- The peak snowpack was 85% of normal.
- The peak snowpack was 63% of normal.
- The peak snowpack was 68% of normal.
- The peak snowpack was 79% of normal.
- The peak snowpack was 70% of normal.
- The peak snowpack was 67% of normal.

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):

- A few SPIs are starting to show up in the below normal range, but most SPIs are still above normal on the 30-day timescale.
- The Upper Green river basin is showing wet SPIs between 0 and +2.
- Northeast Utah is showing average SPIs between -1 and 1. The drier SPIs are farther west.
- Southeast Utah is showing very wet SPIs mostly between +1 and +3 <.
- Northwest Colorado is showing slightly wet SPIs between 0 and +1.
- Southwest Colorado is showing very wet SPIs between +1 and +3.
- North central Colorado is showing wet SPIs between 0 and +2. One SPI in Grand County is between -1 and 0.
- South central Colorado is showing wet SPIs between 0 and +2.
- East of the divide, all SPIs are still wet, between 0 and +2.5 on the 30-day timescale. The wettest SPIs are in Elbert and Yuma Counties.

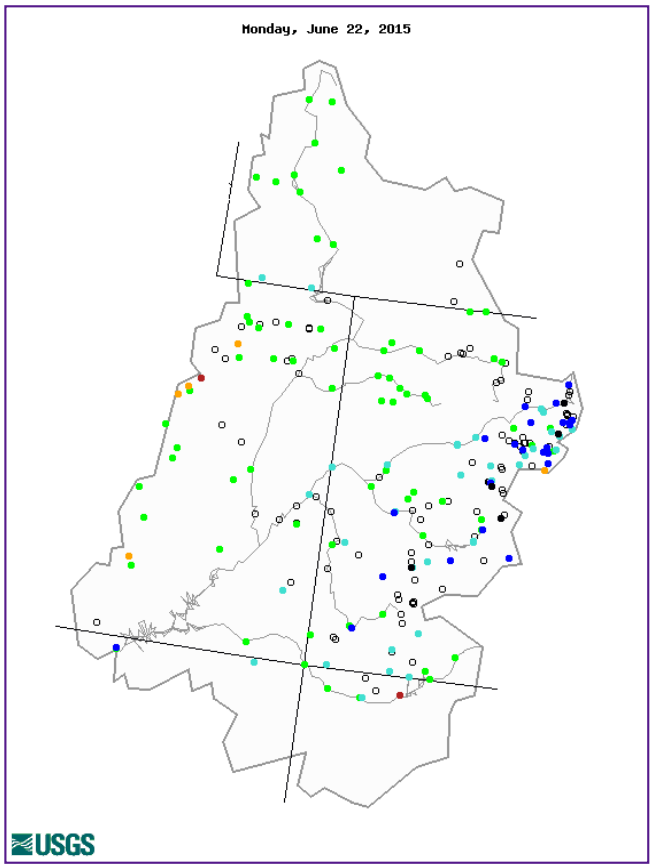
Long Term (6-month):

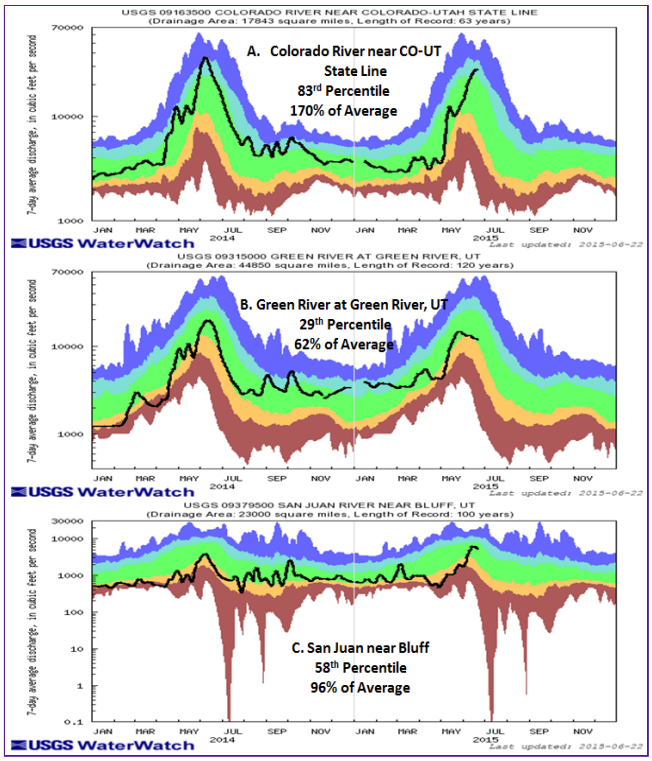
- On the 6-month timescale SPIs are fairly similar in the UCRB to the 1-month timescale. There is more dryness on longer timescales than what is shown as a poor snow year left the Wasatch and Uintah Ranges fairly dry.
- The Upper Green has SPIs ranging from 0 to +2.5.
- NE Utah shows some longer term dryness with SPIs ranging from -1 to +1.
- Southeast Utah is now wet with SPIs between 0 and +2.5.
- Western Colorado is showing SPIs mostly between 0 and +1. One in Mesa County is between +1.5 and +2. Grand and Summit

Counties still show SPIs between -1 and 0.

- In central Colorado SPIs are generally very positive between +1.5 and +3. Northern Jefferson County, and western Park County are above +3.
- Eastern Colorado, all SPIs are wet, even on the 6-month timescale. They range from 0 to +2.5.
- The Rio Grande basin is wet at the 6-month timescale with SPIs from +1 to +2.5.

STREAMFLOW





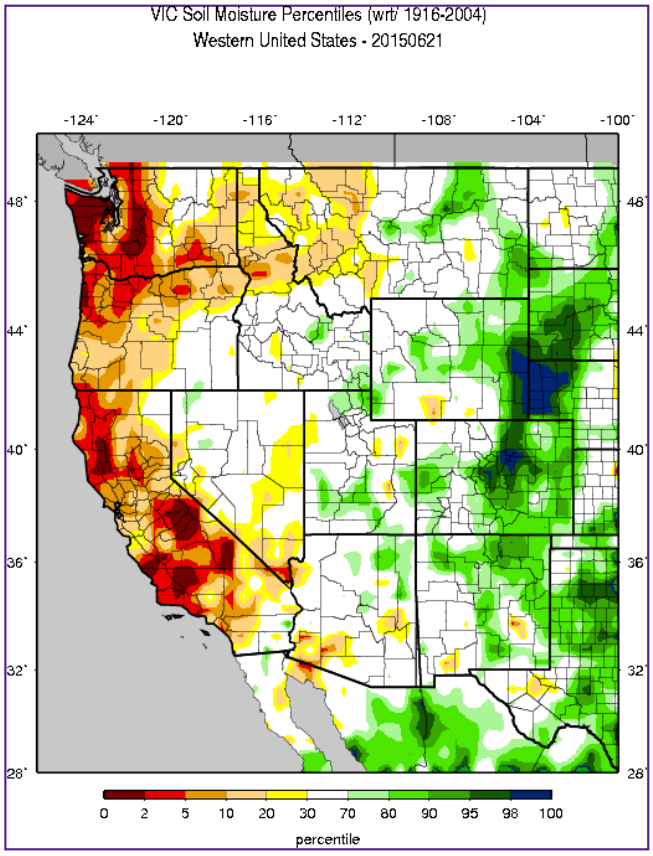
Explanation - Percentile classes							
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		

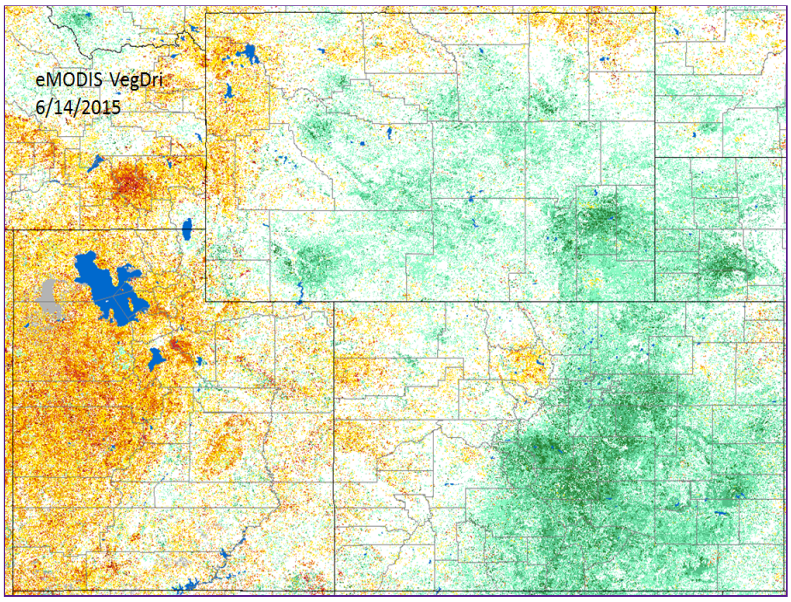
The top left image shows 7-day averaged streamflows as a percentile ranking across the UCRB. The top right image shows 7-day averaged discharge over time at three key sites around the UCRB: The Colorado River at the CO-UT state line; the Green River at Green River, UT; and the San Juan River near Bluff,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

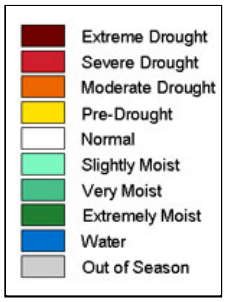
Streamflow Statistics:

- Flows are still very high in the headwaters of the Colorado and the Gunnison River Basins.
- 94% of the gages in the UCRB are reporting in the normal to much above normal range for 7-day average streamflow. 3% of the gages in reporting record high flows for the last 7 days.
- Only 6% of the gages are recording below normal for 7-day average streamflow.
- Streamflow on the Colorado River near the CO-UT state line is now at the 83rd percentile, 170% of average. It appears to be peaking currently.
- The Green River at Green River, UT has shown a slight decrease in flow and now in the below average flow. Currently the river is at the 29th percentile, or 62% of average. Flows appear to have peaked at this site several weeks ago a little lower than normal and a little earlier than normal.
- Flows along the San Juan have flirted with the lowest 10 percentile for much of the last four months, but have made a heroic late season recovery. Flows at the San Juan near Bluff, UT are now at the 58th percentile and 96% of average. This flow appears to have peaked for the year over the past week.

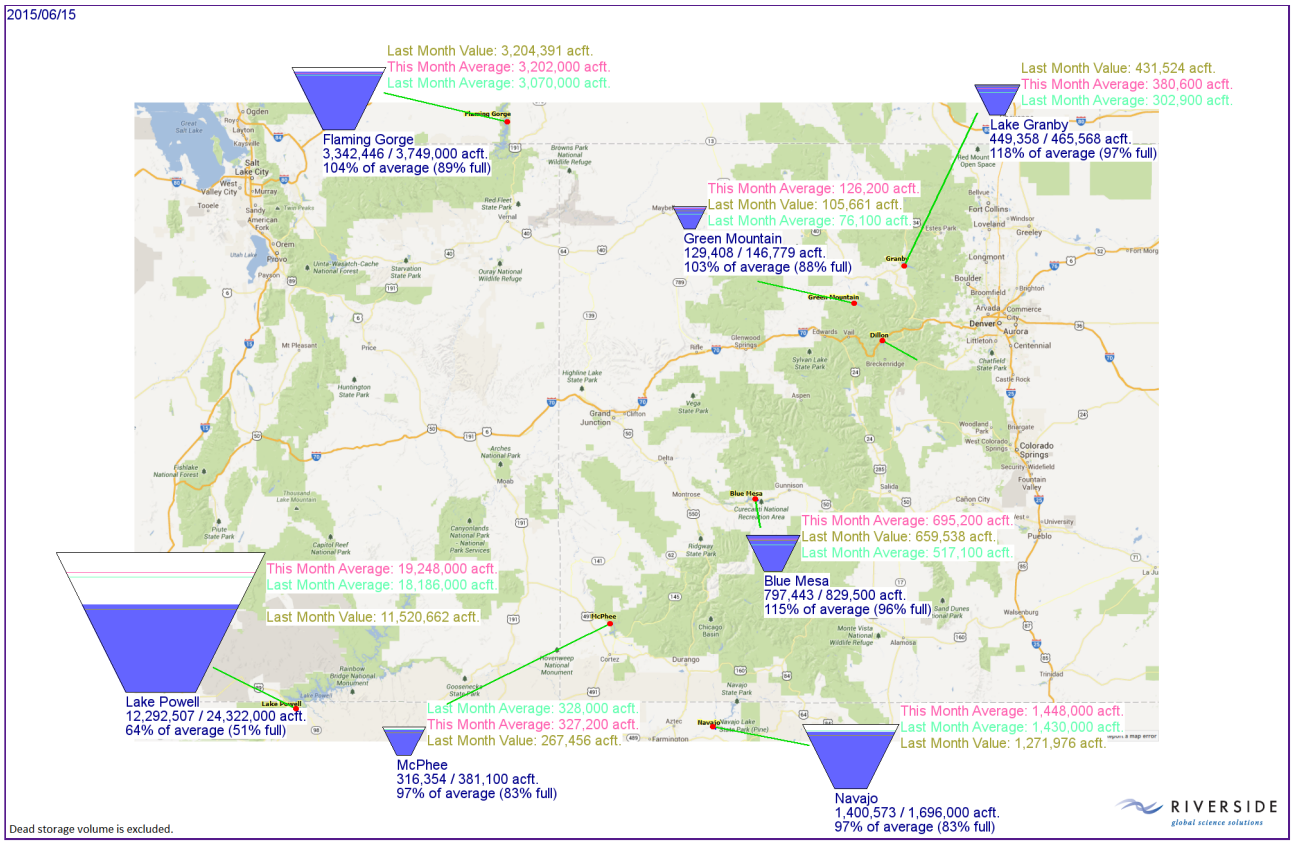
SURFACE WATER



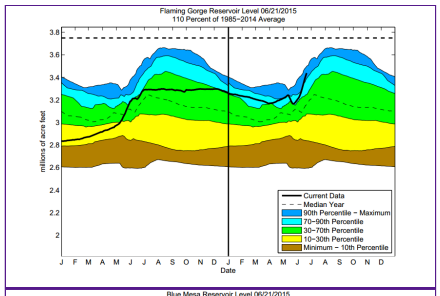


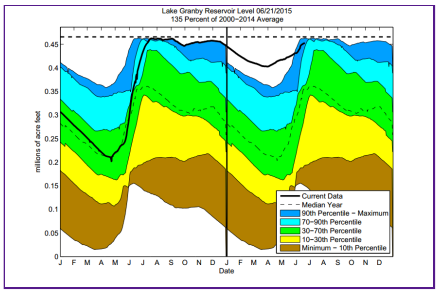


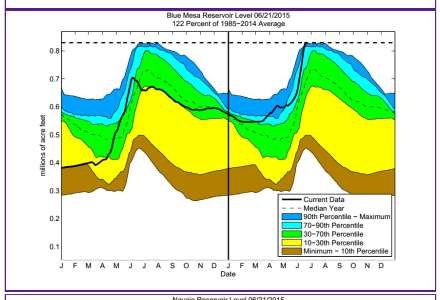
The top left image shows VIC modeled soil moisture as a percentile ranking. The top right image shows satellite-derived vegetation from the VegDRI product (which updates on Mondays).

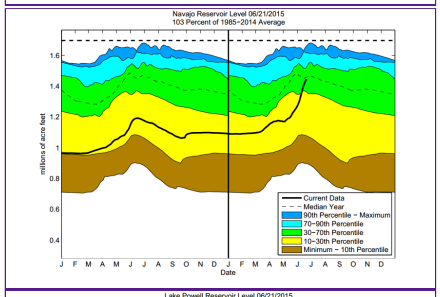


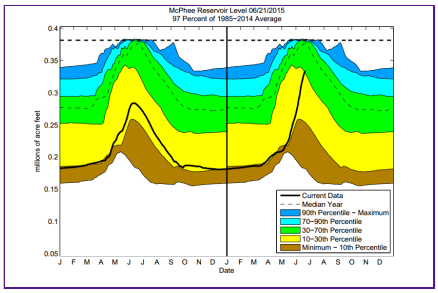
The above image shows last month's and this month's current volumes of the major reservoirs in the UCRB, with percent of average and percent of capacity.
The graphs shown belo are plots of reservoir volumes over the past full year and current year to date (black). The dashed line at the top of each graphic 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.

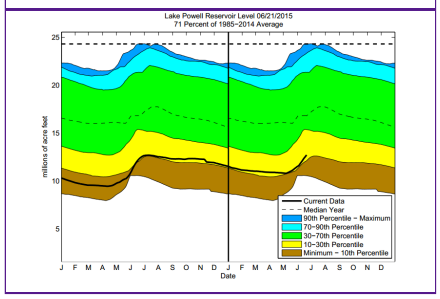












VIC:

- Soils are mostly in the average range in the Upper Green River Basin. A blemish of dry soil in the 5th-30th percentile range still shows up in southeastern Sweetwater County. Western Uinta and Lincoln Counties in far southwest Wyoming are above the 70th percentile.
- Soils in northeastern UT are mostly in the average range. The southern part of Wasatch range is showing wetter soils, in the 70th to 90th percentile. A couple patches below the 30th percentile have now shown up in Duchesne and Uintah Counties.
- Southeast Utah is also showing soil moisture mostly in the normal range. The wettest soil conditions with respect to average extend from the southern edge of the Wasatch Range into Garfield County and then down into San Juan County. Southeast Emery County is now showing dry soils between the 10th and 30th percentile.
- Western CO soils are in the normal to above normal range. Most of Mesa, Garfield, Delta, Montrose, and Rio Blanco Counties are above the 70th percentile. Soil moisture is between the 90 and 95th percentile in western Mesa County.

- The San Juan Mountain region is now completely in the normal to above normal range.
- The San Luis Valley is mostly in showing some wet soils, in the 70th to 80th percentile. Some of the valley farther to the west is just in the normal range.
- Eastern Colorado is showing almost completely wet soil conditions. Soils in northeast Colorado have dried from above the 98th percentile back into the 70-90th percentile range. Southeast Colorado is also mostly in the 70-90th percentile range with central Crowley County all the way back in the normal range.
- The wettest remaining soils are mostly along the northern Front Range and Palmer Divide. Jefferson, Adams, Arapahoe, and Douglas Counties all still show soils above the 98th percentile.

VegDri (6/14 No Update this Week):

- The VegDri shows moist conditions over central and western Sweetwater County.
- The Upper Green River Basin shows mostly normal vegetative health conditions with some isolated areas of pre to moderate drought along the northwest flank of the basin.
- The Wasatch Mountains are depicted in pre to moderate drought. The Uintah Mountains are doing better now, but are still holding on to a fair amount of pre-drought.
- The VegDRI indicates a mixed bag of drought to moist conditions in the Duchesne River Basin.
- In southeast Utah vegetative health is depicted mostly in pre-drought. This area doesn't have a lot of vegetation.
- VegDRI is shown in the pre-drought range in most of far northwestern Colorado. Far southwestern Colorado has mostly rebounded into the normal range.
- In northwest Colorado, vegetative health is primarily depicted in the normal range, but starting to show some pre drought conditions, especially in Moffat and Rio Blanco Counties. Eastern Grand County is hanging on to pre-drought vegetative conditions as well.
- The high mountain valleys in central Colorado are depicted as especially moist. This includes Chaffee, Park, Teller, Fremont, and Custer Counties. This area of very moist vegetation extends onto the Front Range mainly along the Palmer Divide into El Paso, Elbert, Douglas, Jefferson, Adams, and Arapahoe Counties.
- Northeastern Colorado is primarily showing moist vegetation with the exception of isolated areas in Sedgwick, Phillips, Yuma and Washington counties where conditions are shown as pre-drought to normal.
- In southeast Colorado conditions are now mostly moist now. Towards the southeast corner of the state conditions taper towards normal with some extremely isolated areas of pre-drought.

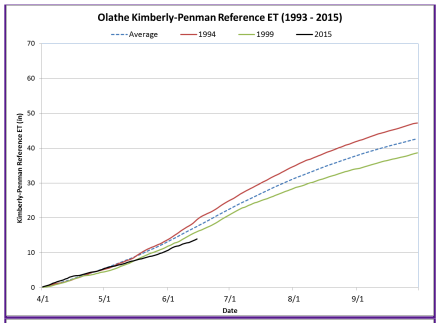
Reservoirs:

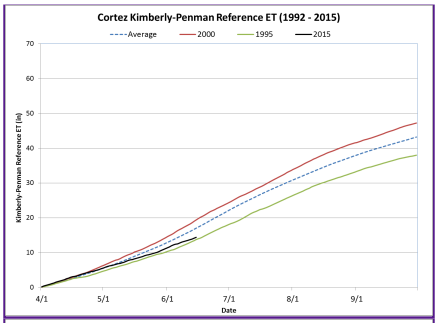
- Flaming Gorge is at 110% of its late June average and continuing to

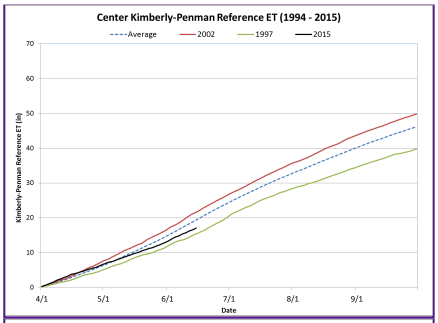
fill.

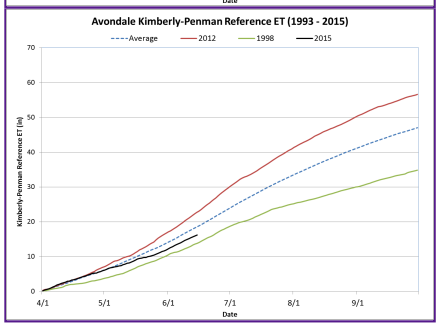
- Green Mtn is 103% of the June average.
- Lake Granby is at 135% of its late June average and slowly creeping towards the full mark.
- Blue Mesa is now 100% full.
- Navajo has recovered well to 103% of its late June average.
- McPhee has made a very nice recovery over the last month to 97 pecent of its late June average (still below the median).
- Lake Powell is doing slightly better this year from last year and is at 71 percent of its late June 1985-2014 average.

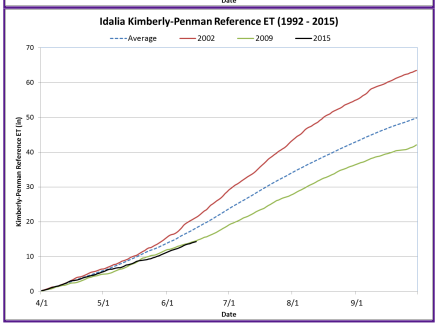
EVAPOTRANSPIRATION

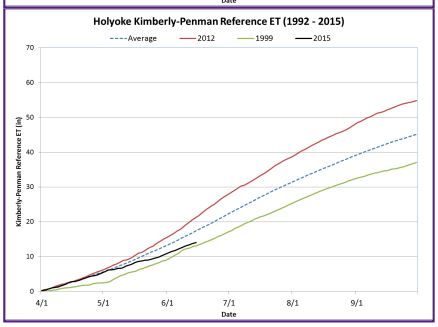


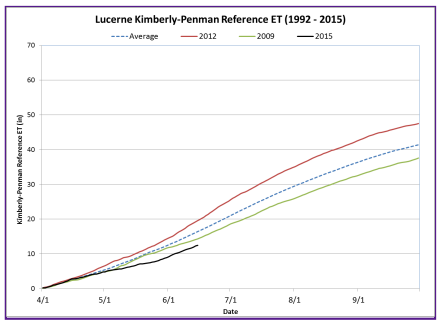












The above images are of reference evapotranspiration (ET) from CoAgMet sites across Colorado. Reference ET assumes the amount of water that will evaporate from a well-irrigated crop. Higher ET rates occur during hot, dry, and windy conditions. Lower ET rates are more desirable for crops. See a map of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

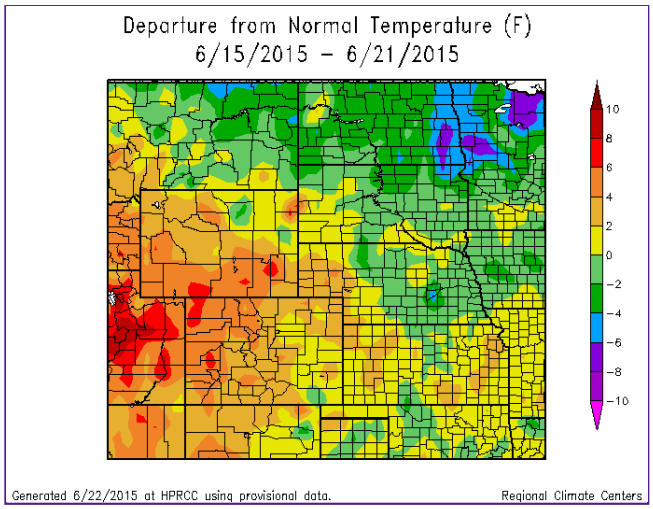
Reference Evapotranspiration:

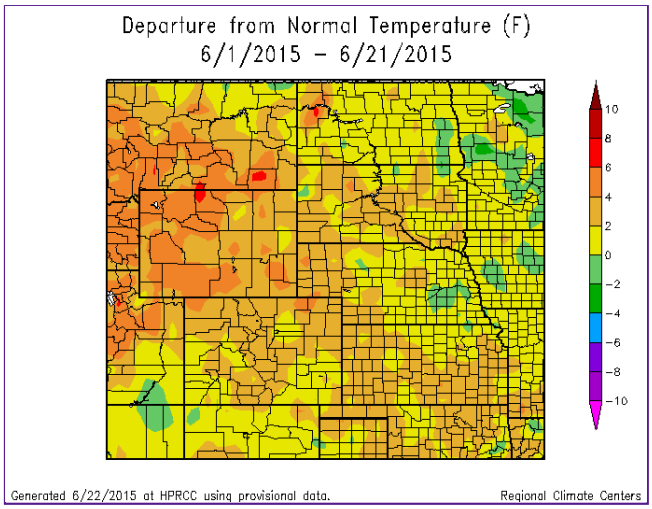
- Olathe: ET started the growing season at higher than average ET rates. It tapered instead of accelerating through late April and early May. Now it is tracking below the track taken during the record low ET year.
- Cortez: ET began a little above normal, but has been tracking below normal since early May.
- Center: Early season ET was higher than the tack taken during the record year, but has slowed considerably, and is now tracking

below average.

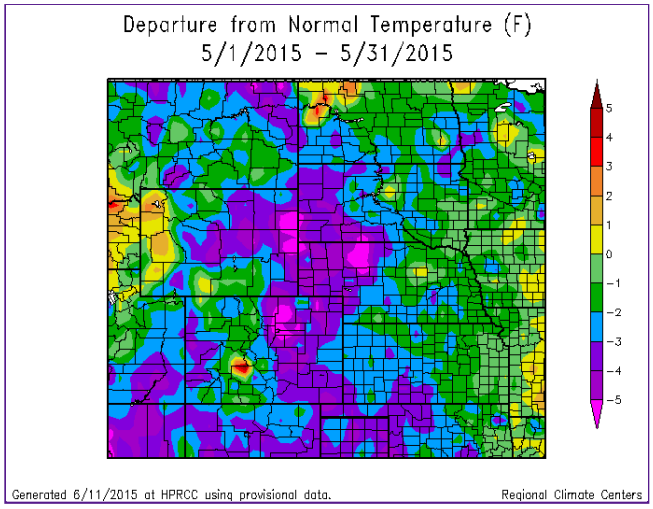
- Avondale: ET began just above average, but has slowed to below normal.
- Idalia: ET started near average, but with cooler and cloudier conditions is now tracking alongside the record low ET year of 2009.
- Holyoke: ET started around normal and has dropped below normal since the second week of May.
- Lucerne: ET has been tracking lower than the previous record low year in 2009 since the second week of May. ET rates over the past week alone have been trending parallel to the normal line.

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:

- It was a hot week for Colorado east of the divide, and a hotter week

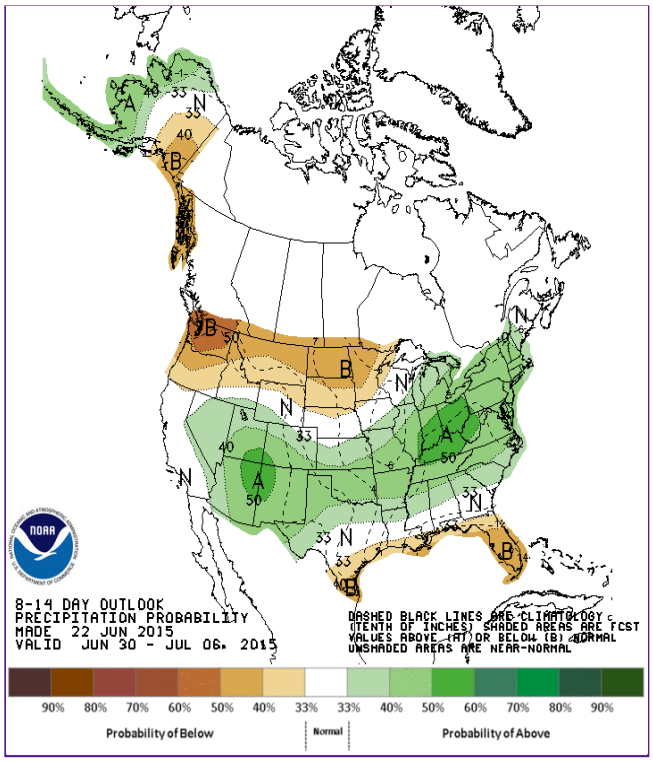
for the UCRB, especially farther to the west.

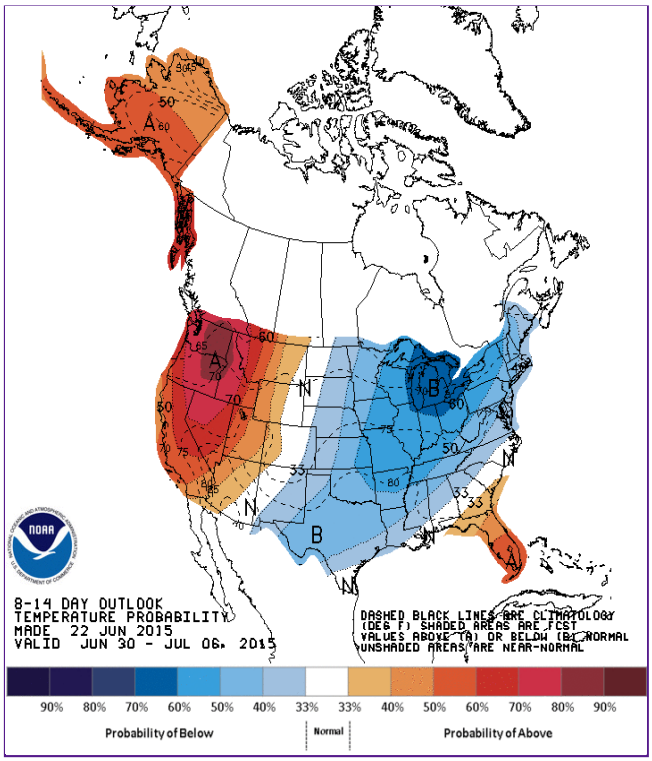
- The Upper Green Basin saw temperatures 4 to 6 degrees above normal. Eastern Sweetwater County was 6-8 degrees above normal.
- Eastern Utah was well above normal for the week with temperature anomalies mostly in the 4-8 degree range. Extreme southeast Utah was only 2-4 degrees above normal. The Wasatch Range was mostly 8-10 degrees above normal.
- The western slopes of Colorado were mainly 2-6 degrees above normal for the week. Temperatures were 6-8 degrees above normal in western Moffat County, and parts of Montrose and Delta Counties.
- The San Luis Valley was 2-4 degrees above average for the week.
- The northern and central Rockies were 0-4 degrees above average for the week.
- Northeast Colorado was 0-4 degrees above average over the last week.
- Temperatures in southeast Colorado were mostly 0-4 degrees above average as well. The exception was eastern Las Animas, and western Baca Counties, where temperatures were still 0-2 degrees below normal.

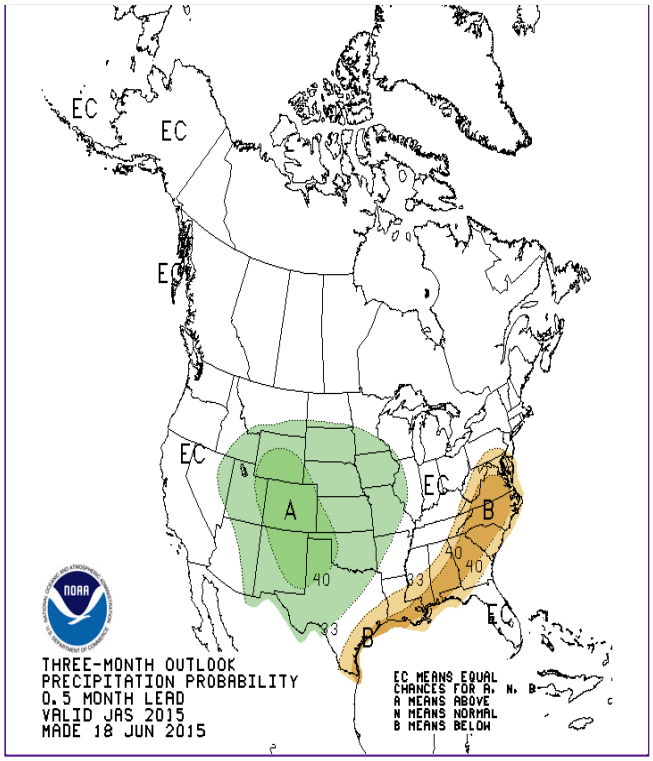
May Temperatures:

- The month of April saw mostly below normal temperatures across the UCRB. Sublette County, and northern Lincoln County were 0 to 2 degrees above normal, but the rest of the basin was below normal.
- Eastern Utah experienced temperatures 0 to 4 degrees below normal for the month of May. Temperatures were closest to normal in the far west of the basin along the Wasatch Range. A small area of eastern Utah near Lake Powell was 4-6 degrees below normal for the month.
- Western Colorado was 0-4 degrees below normal for the month of may with temperatures closes to normal close to the continental divide.
- East of the Divide temperatures for the month of May were 2-6 degrees below normal. The coolest temperature anomalies were along the northern Front Range and in Crowley and Otero Counties in southeastern Colorado.
- There is one area in southern Gunnison and northern Saguache Counties that is showing above average temperatures for the month of May. This is believed to be caused by a malfunctioning weather station.

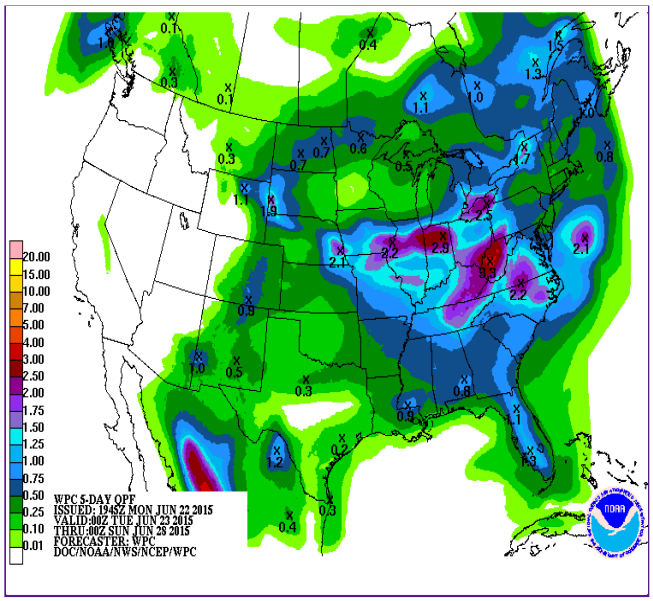
FORECAST AND OUTLOOK

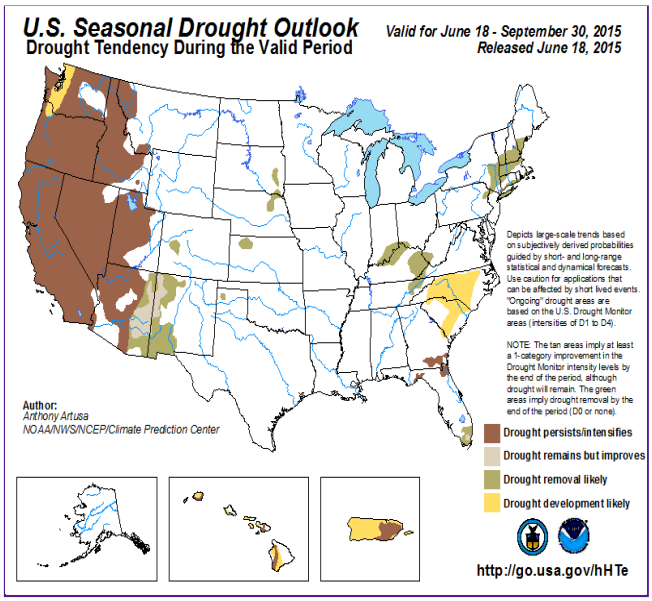






The top two images show Climate Prediction Center's Precipitation and Temperature outlooks for 8 - 14 days. The middle image shows the 3 months Precipitation outlook. The bottom left image shows the Hydrologic Prediction Center's Quantitative Precipitation Forecast accumulation for the five days between 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: (6/23)

- Currently, the UCRB is sitting well south of the jet stream with a high pressure ridge expected to magnify over the region over the next few days. Temperatures will be hot, and the air will be dry. Areas in the valleys in the UCRB should expect highs in the high 90s or low 100s. These temperatures will scale with elevation. Highs in the 80s should be seen in subalpine environments and 70s or lower in high alpine environments. Because the air is so dry, temperatures will cool off nicely at night true to form this time of year. No precipitation is expected in the next three days over the UCRB with the exception of the potential for some high elevation thunderstorms in the far southeast portion of the basin.
- East of the divide, temperatures will also be high, but not quite as high, and there is more moisture in the air with dewpoints expected to be in the low 50's across the Front Range. Some thunderstorms are likely to develop off of the high terrain, especially in the southern portion of the state, and move eastward out over the plains. That being said, no widespread heavy precipitation is expected. Other than some isolated storms totals should be under a quarter of an inch.
- Over the weekend this pattern is not expected to move a great deal. The ridge axis may shift a little bit westward leading to a slight cool down east of the divide, and some increased chances of thunderstorms in the southern portion of Colorado and southeaster portions of the UCRB. This should hold through the beginning of next week with no major changes expected. Time to check out the pool!

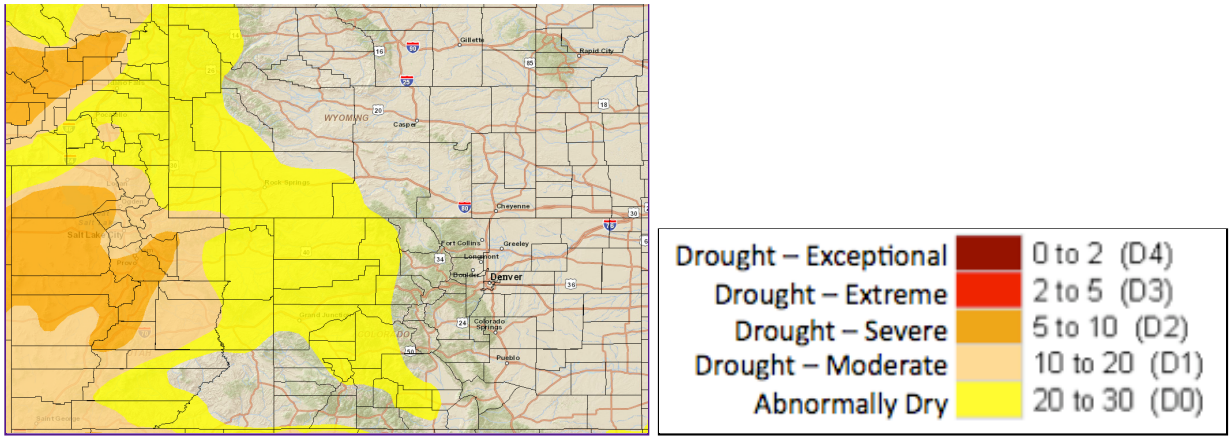
Longer Term:

- The 8-14 day precipitation outlook shows increased chances for above average precipitation for the Upper Colorado River Basin. These chances increase towards the Four Corners Region. Southeast

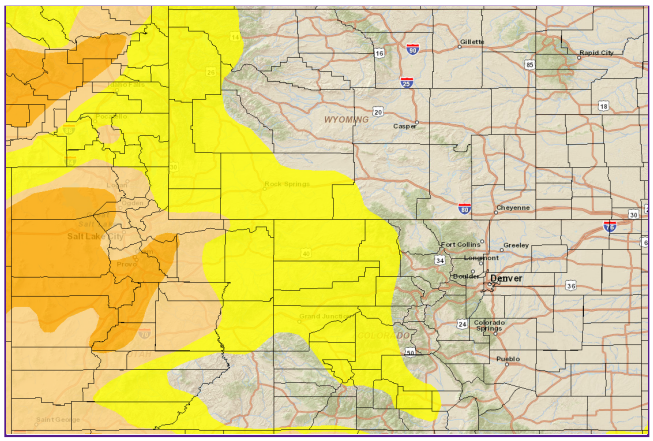
Colorado is forecast increased chances of above average precipitation as well. Equal chances are forecast for the northeast corner of the state.

- The 8-14 day temperature outlook shows increased chances of above average temperatures for the majority of the UCRB with the exception of the far eastern portion. The chances for above average temperatures increase towards the western edge of the basin. Colorado east of the divide is showing mostly equal chances of above and below average temperatures on the 8-14 day timescale with slightly increased chances of below average temperatures on the far eastern edge of the state.
- The Climate Prediction Center 3-month precipitation outlook shows increased chances for above normal precipitation for the entirety of the UCRB, and the area in Colorado east of the divide for the July to September period. These chances are forecast above 40% for most of the UCRB and Colorado east of the divide. The likelihood of above average precipitation is forecast slightly lower in the southwest portion of the UCRB, and for extreme northeast CO.
- The seasonal drought outlook indicates that drought is expected to persist or intensify in the western portion of the UCRB through the end of September, but drought development is not likely for the eastern portion of the basin, or for Colorado east of the divide.

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 June 23, 2015:

It was a hot, dry, and sunny week for the Upper Colorado River Basin, and for Colorado east of the divide. Indications are that the next week will bring more of the same. Following a very wet May that was highly anomalous for parts of the UCRB it appears that basin can take a few weeks of hot, dry, sunny weather without warranting degradations. The hydrologic system still appears to be doing well with reservoirs and streamflows high and root zone soil moisture mostly in the average, or above average range. Where conditions have been drier the drought monitor appears to be representing current conditions well already. We will track plant health and soil moisture closely over the next few weeks, especially in the alpine and subalpine zones. No improvements appear to be warranted this week either. In western Colorado some isolated thunderstorm activity did lead to over half an inch of precipitation in places currently classified as D0. Specifically, this happened in south Rio Blanco and south Rio Grande Counties. Given the hot and sunny nature of the past week these storms probably didn't shift the precipitation - ET balance very dramatically.

Recommendations:

UCRB: status quo

Eastern CO: status quo