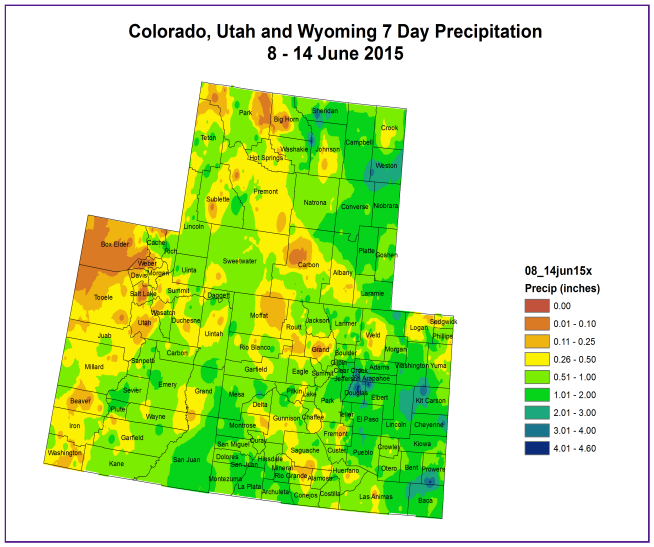
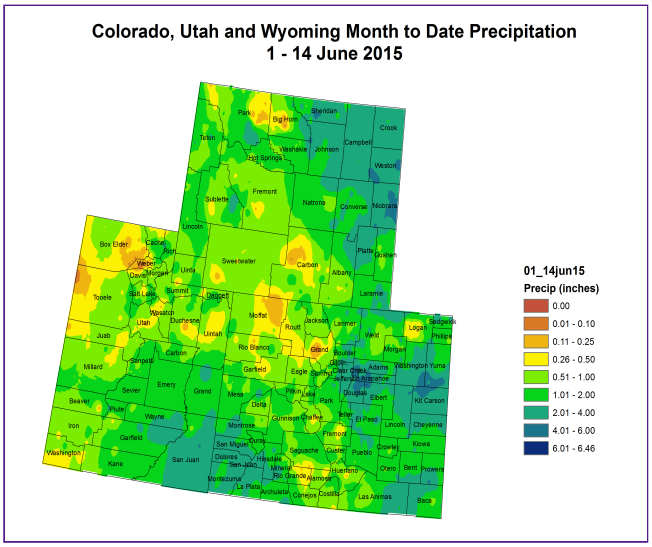
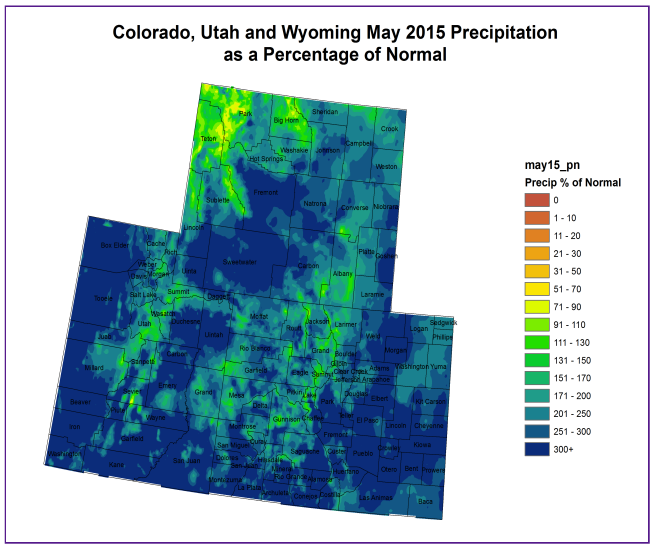
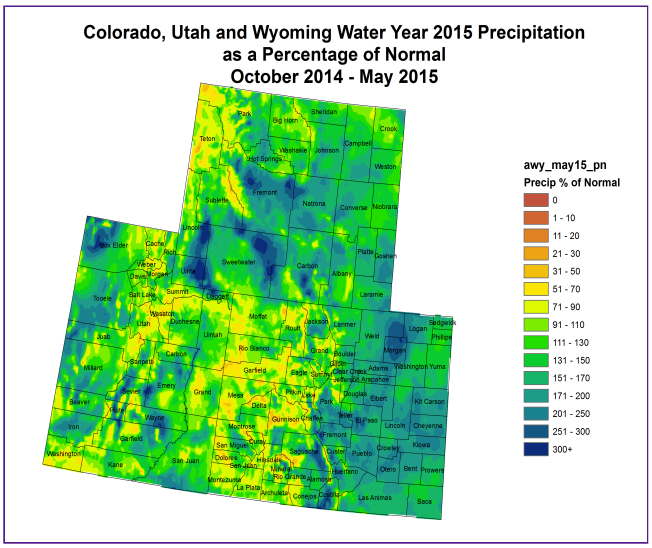
PRECIPITATION









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 Upper Green River basin had a fairly climatologicially average week receiving between 0.50 and 1.00" of precipitation in most locations. Some patches of area had only 0.26-0.50". The driest portion was southwest Sublette County, receiving as little as 0.01-0.10" in some areas.
- Northeast Utah is showing similar precipitation, but was a little bit drier. Most of northeast Utah received 0.25-1.00" of precipitation over the past week. The driest areas were along the Wasatch Range and in the Duchesne Basin.

- Conditions farther south in Utah were wetter last week, with southeastern Utah receiving between 1.00 to 2.00 inches over much of the area.
- Like much of the rest of the northern UCRB, northwest Colorado was mostly in the 0.25-1.00" range over the last week. Eastern Moffat County received less precipitation with only 0.11-0.25" recorded. Central Grand County was the driest area in northwest Colorado with as little as 0.01-0.10" recorded.
- In southwest Colorado there was a gradient from southwest to northeast with the area closest to the four corners picking up the most precipitation. The wettest areas, which received over an inch of rain, were in western Mesa and Montrose Counties, La Plata County, Archuletta County, and the portions of counties immediately adjacent to La Plata and Archuletta Counties to the north and west. The driest areas, which received less than a quarter of an inch, were eastern Montrose County and northern Rio Grande County.
- The San Luis Valley was mostly in the 0.50-1.00" range with some areas a little drier in the 0.25-0.50" range.
- The Central Rockies were sufficiently wet for this time of year picking up 0.50-1.00" of precipitation.
- Northeast Colorado saw an extremely wide variety of precipitation totals over the past week with all the convective activity. Some areas in nestled up against the foothills and Palmer Divide experienced very strong thunderstorm activity. Large portions of Douglas, Elbert, Arapahoe, Lincoln, and Kit Carson Counties received over 2.00" of precipitation with the maximum in Douglas County at over 4.00". Some areas farther north and east were missed by heavy rains. Logan County and central Weld County received only 0.26-0.50" of precipitation with some isolated areas even drier than that.
- Southeast Colorado also experienced some convective storms that were hit and miss. The wettest areas were in Baca and Prowers Counties, areas still D0, where totals eclipsed the 2.00" mark. Most of southeast Colorado picked up 0.50-2.00" over the last week with some drier pockets in Las Animas and Huerfano 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.

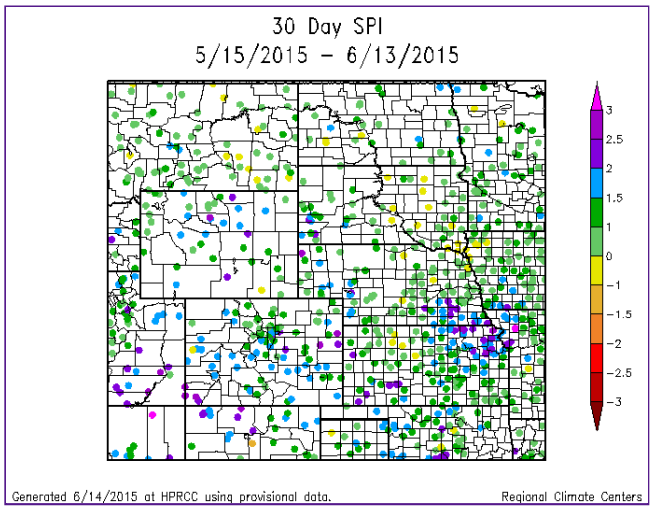
SNOTEL Precipitation Percentiles:

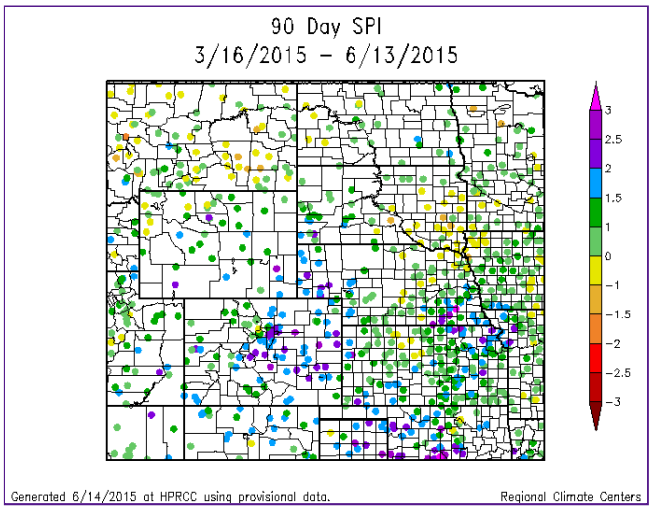
- SNOTEL year to date percentiles across much of the UCRB saw quite a rebound this last week.
- In the Upper Green the percentiles are mostly in the median range between the 32nd to the 59th. Some Snotel sites in eastern Sublette County area a bit lower, down to the 22nd.
- The Wasatch and Uintahs are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

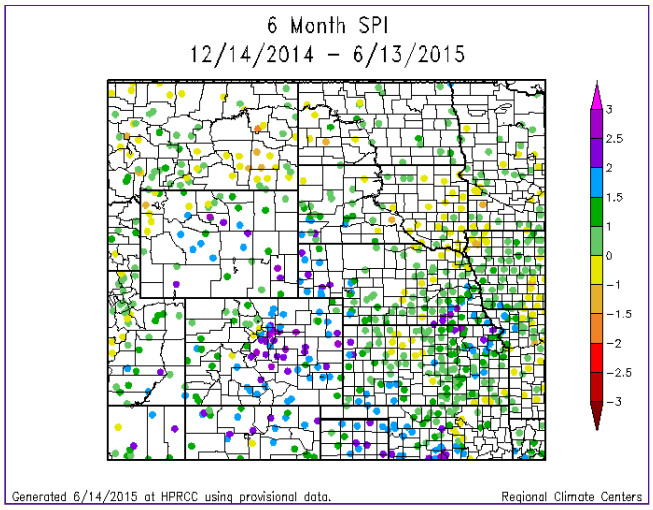
SWE Timeseries Graphs:

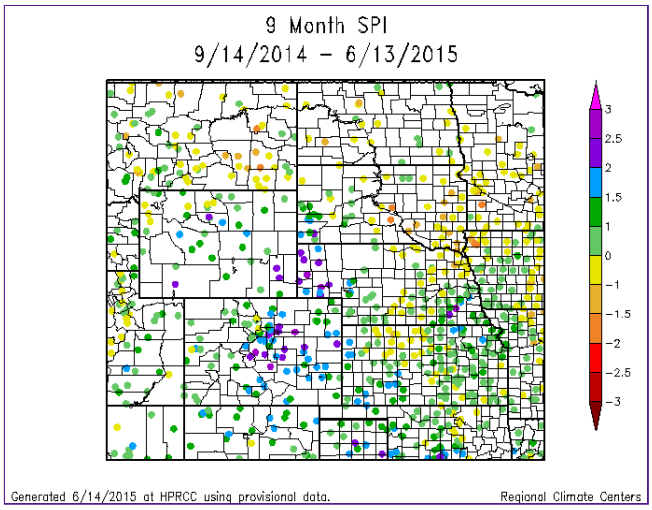
- All sub-basins are well into the melt season.
- The peak snowpack was 85% of normal.
- The peak snowpack was 63% of normal.
- The peak snowpack was 68% of normal.
- The peak snowpack was 79% of normal.
- The peak snowpack was 70% of normal.
- The peak snowpack was 67% of normal.

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):

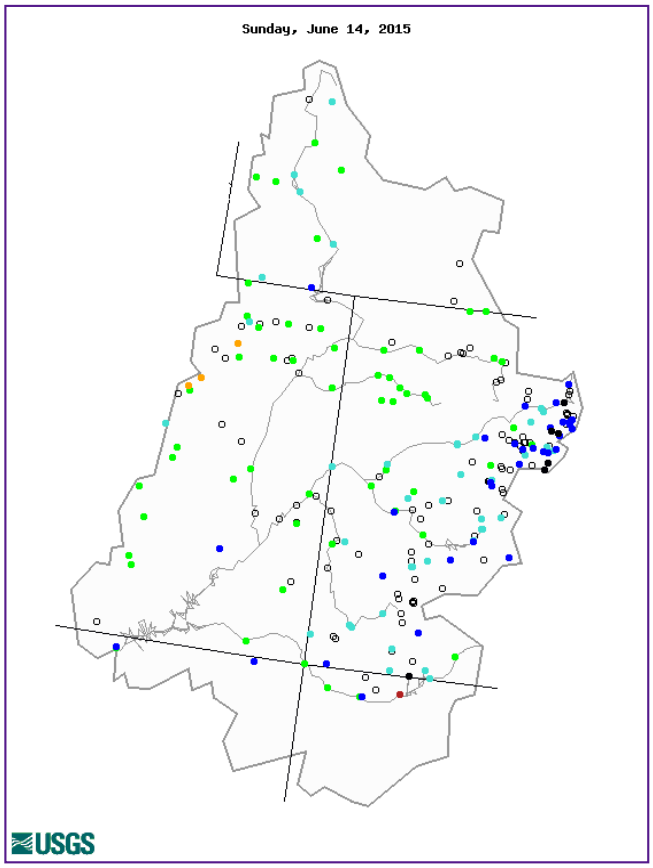
- All SPI's are showing up positive in the UCRB on the 30-day timescale. All SPI's are above normal in eastern Colorado on the 30-day timescale.
- The Upper Green river basin is showing wet SPI's between +1 and +2.
- Northeast Utah is showing wet SPI's between 0 and +2.5
- Southeast Utah is showing very wet SPI's mostly between +1.5 and +3 with one lower SPI between 0 and +1 in northwest San Juan County.
- Northwest Colorado is showing wet SPI's between 0 and +2.
- Southwest Colorado is showing very wet SPI's between +2 and +3. The one exception is in Mesa County where one station is between

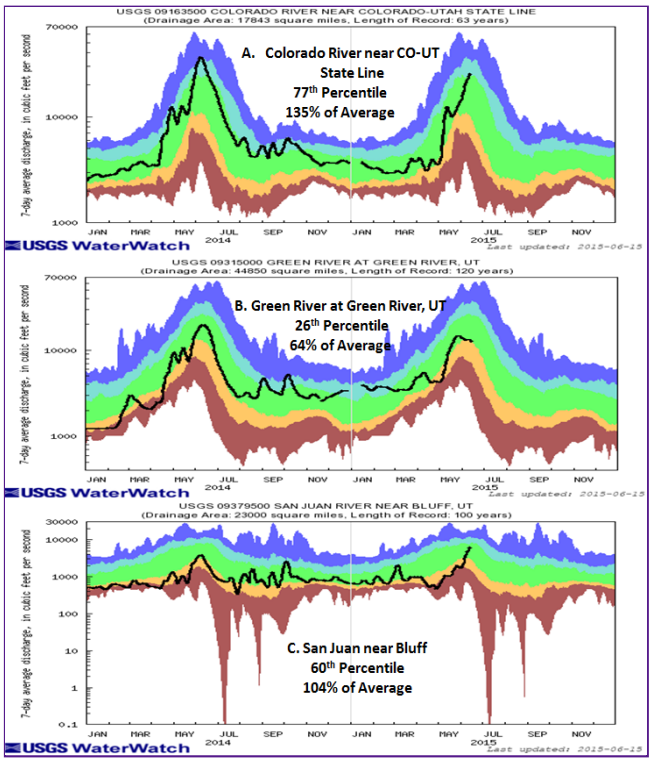
-1 and 0. This station is missing some data.
- North central Colorado is showing wet SPI's between 0 and +2.
- South central Colorado is showing wet SPI's between 0 and +2.
- East of the divide, all SPI's are wet, between 0 and +3 on the 30-day timescale.

Long Term (6-month):

- On the 6-month timescale SPI's are more down to earth for the UCRB, and are between -1 and +2 for the most part. Because the bulk of this precipitation came later in the year lower elevations are a little better off than higher elevations.
- The Upper Green has SPI's ranging from 0 to +2.5.
- NE Utah shows some longer term dryness with SPI's ranging from -1 to +1.5
- Southeast Utah is now mostly wet with SPI's between 0 and +2.5.
- Western Colorado saw some improvement with the majority if SPI's between 0 and +2. Grand, Summit, and Gunnison Counties have sparse SPI's still between -1 and 0.
- In central Colorado SPI's are generally very positive between +1.5 and +3. Northern Jefferson County is above +3.
- Eastern Colorado, all SPI's are wet, even on the 6-month timescale. They range from 0 to +3 < .
- The Rio Grande basin is wet for long term SPI's, +1.5 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.

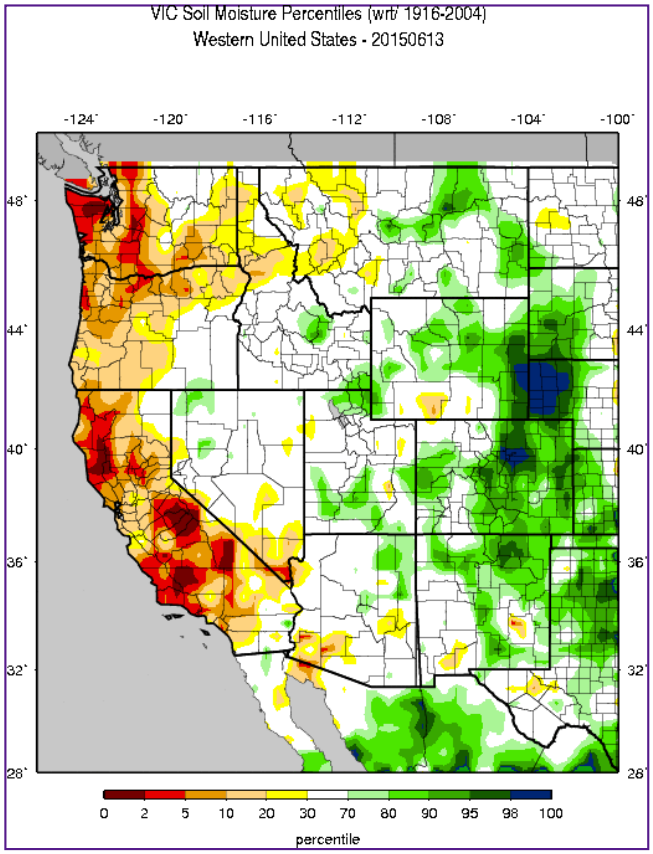
Streamflow Statistics:

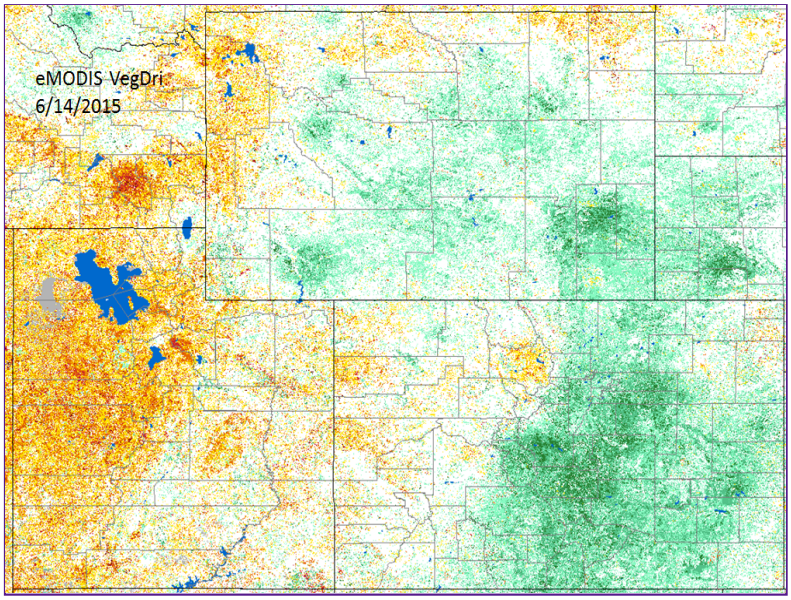
- With high elevation snowmelt in full force across the eastern UCRB most streamflows are now well above their 7-day average.
- 96% of the gages in the UCRB are reporting in the normal to much above normal range for 7-day average streamflow. 5 percent of the gages in reporting record high flows for the last 7 days.
- Only 4% 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 77th percentile, 135% of average. It is still trending upwards and has not peaked.
- 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 26th percentile, or 64% of average. Flows appear to have

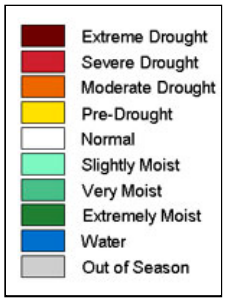
peaked at this site several weeks ago a little lower than normal and a little earlier than normal.

- 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 60th percentile and 104% of average. All indications from upstream are that these flows have not yet peaked yet despite being about a week past the average time of peak flow.

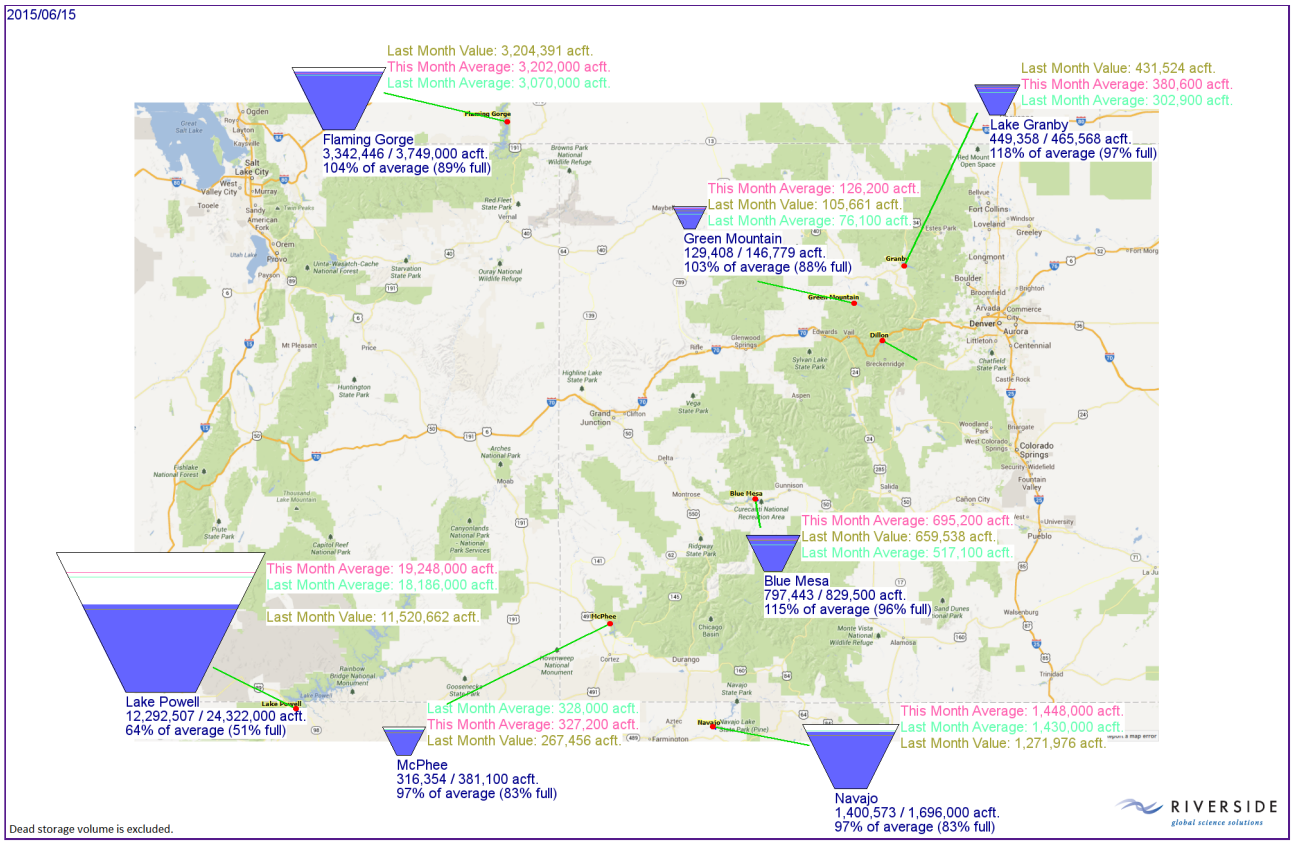
SURFACE WATER



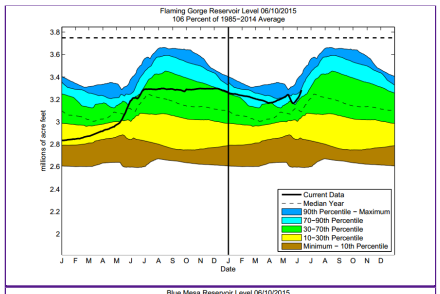


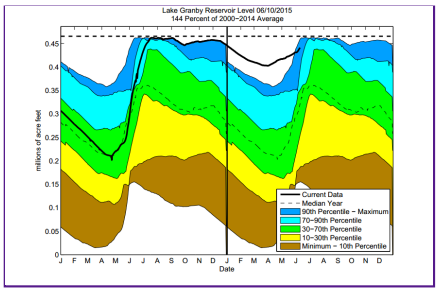


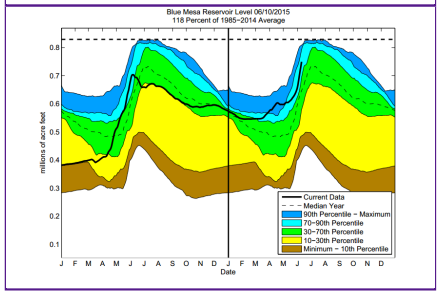
The top left image shows VIC modeled soil moisture as a percentile ranking. The top right image shows satellite-derived vegetation from the VegDRI product (which updates on Mondays).

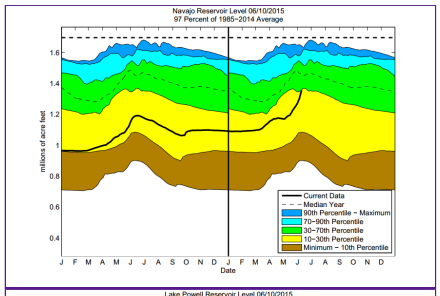


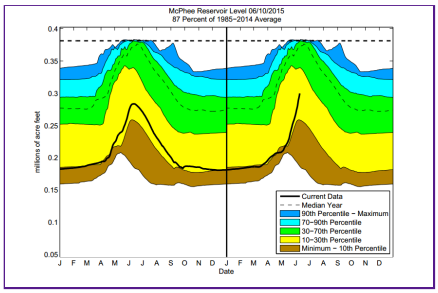
The above image shows last month's and this month's current volumes of the major reservoirs in the UCRB, with percent of average and percent of capacity.
The graphs shown belo are plots of reservoir volumes over the past full year and current year to date (black). The dashed line at the top of each graphic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

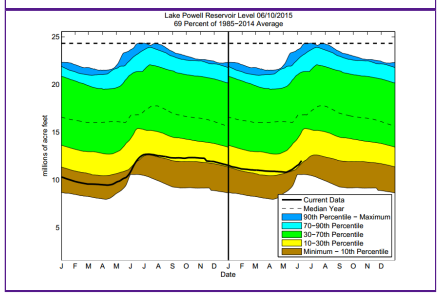












VIC:

- 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.
- Southeast Utah is also showing soil moisture mostly in the normal range. The wettest soil conditions with respect to average are in eastern Garfield County and southeast San Juan County, and are between the 80th and 90th 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.
- 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 90th percentile. Some of the valley farther to the west is just in the normal range.
- Eastern Colorado is showing almost completely wet soil conditions. Much of NE Colorado has soil moisture percentiles above the 80th percentile, with a large area in NE Colorado above the 90th percentile focused in Arapahoe, Adams, Morgan, Jefferson, Denver, Broomfield, and Weld Counties. Soils over SE Colorado are now above the 70th percentile, with a small area of normal soil moisture.

VegDri:

- The VegDri shows moist conditions over central and western Sweetwater County.
- The Upper Green River Basin shows mostly normal vegetative

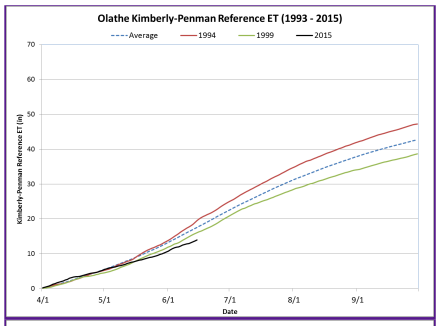
health conditions with some isolated areas of pre to moderate drought along the northwest flank of the basin.

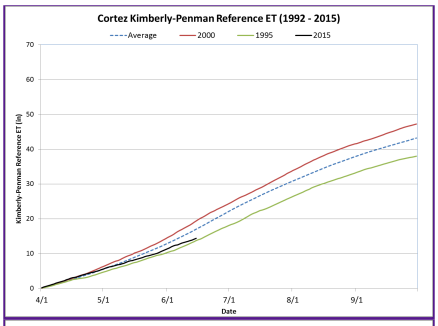
- The Wasatch Mountains are depicted in pre to moderate drought. The Uintah Mountains are doing better now, but are still holding on to a fair amount of pre-drought.
- The VegDRI indicates a mixed bag of drought to moist conditions in the Duchesne River Basin.
- In southeast Utah vegetative health is 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.

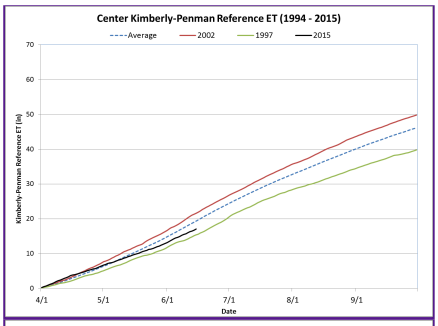
Reservoirs:

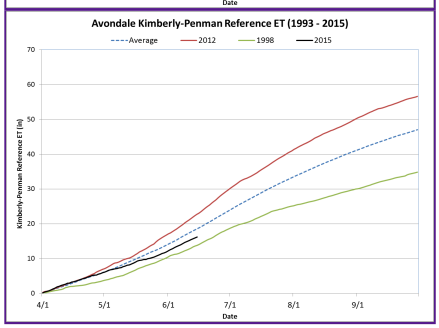
- Flaming Gorge is 104% of the June average.
- Green Mtn is 103% of the June average.
- Lake Granby is 118% of the June average.
- Blue Mesa is 115% of the June average.
- Navajo is 97% of the June average.
- McPhee is 97% of the June average.
- Lake Powell is 64% of the June average and is 51% full, up from 48% full from last week.

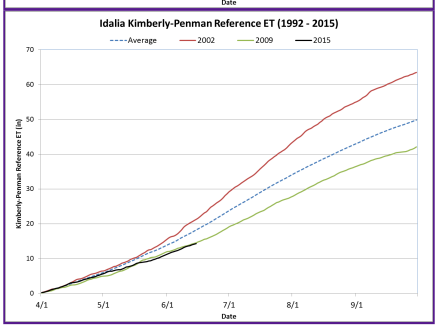
EVAPOTRANSPIRATION

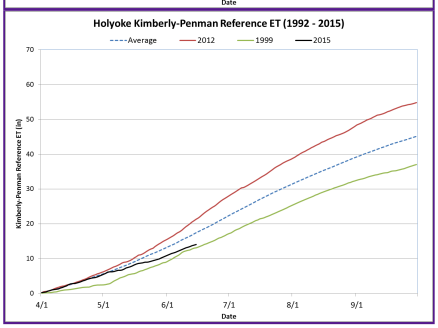


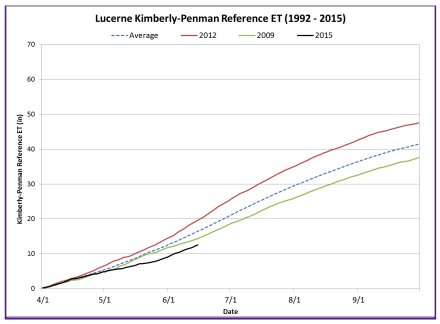










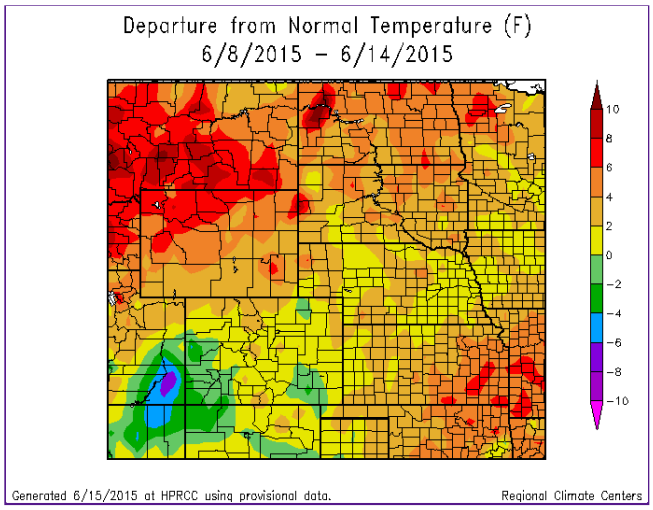


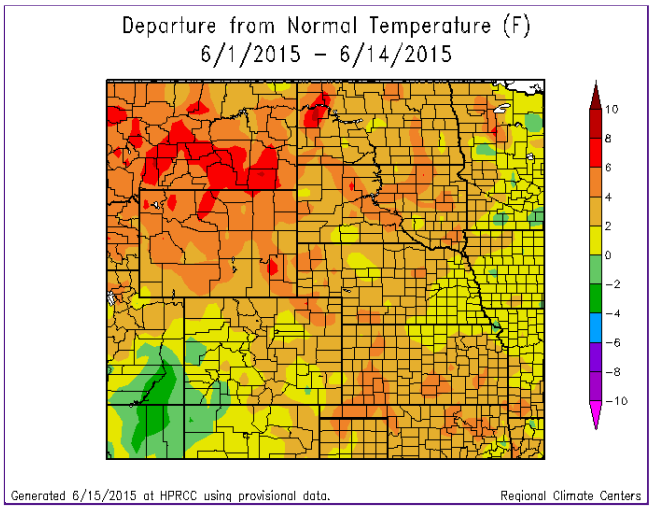
The above images are of reference evapotranspiration (ET) from CoAgMet sites across Colorado. Reference ET assumes the amount of water that will evaporate from a well-irrigated crop. Higher ET rates occur during hot, dry, and windy conditions. Lower ET rates are more desirable for crops. See a map of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

Reference Evapotranspiration:

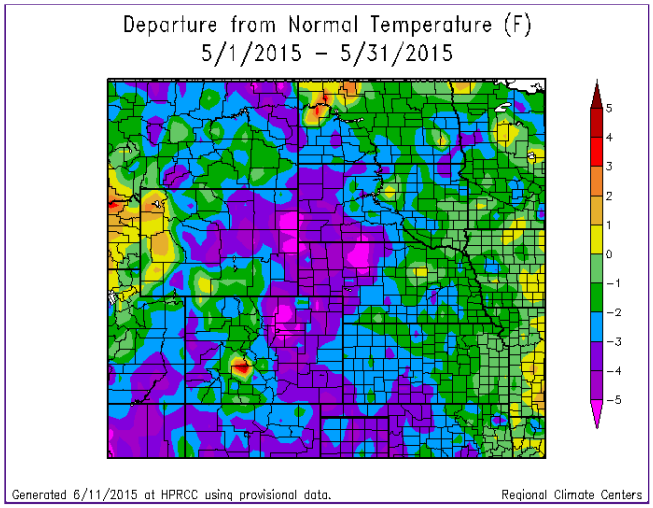
- Olathe: ET started the growing season at higher than average ET rates. It tapered instead of accelerating through late April and early May. Now it is tracking below the track taken during the record low ET year.
- Cortez: ET began a little above normal, but has been tracking below normal since early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

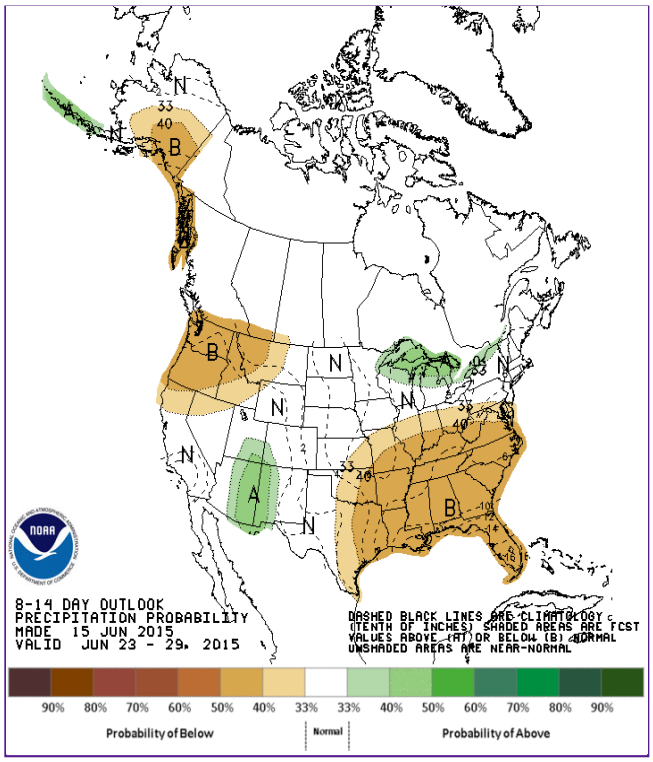
- There was a very obvious temperature anomaly gradient in the UCRB from north to south over the last week. Temperatures were above normal in the northern part of the basin and below normal in the southern part of the basin.
- The Upper Green Basin saw temperatures 2 to 6 degrees above normal. The warmest temperature anomalies are in northern Sublette County where temperatures were 6-8 degrees above average.
- Northeast Utah and northeast Colorado were 0-4 degrees above normal over the past week. Southeast Utah and southwest Colorado were 0-8 degrees below average. The coolest temperature anomalies were in central San Juan County, UT where temperatures were 6-8 degrees below average.
- The San Luis Valley was 0-4 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 this week with

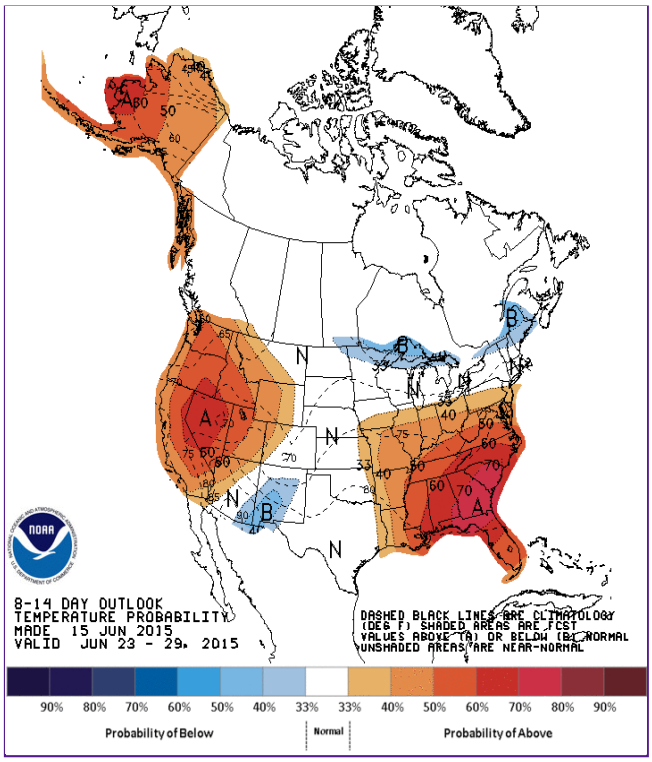
the exception of northern Morgan and eastern Weld Counties where temperatures were 0-2 degrees below average.
- Temperatures in southeast Colorado were within 2 degrees of average on either side of the average last week.

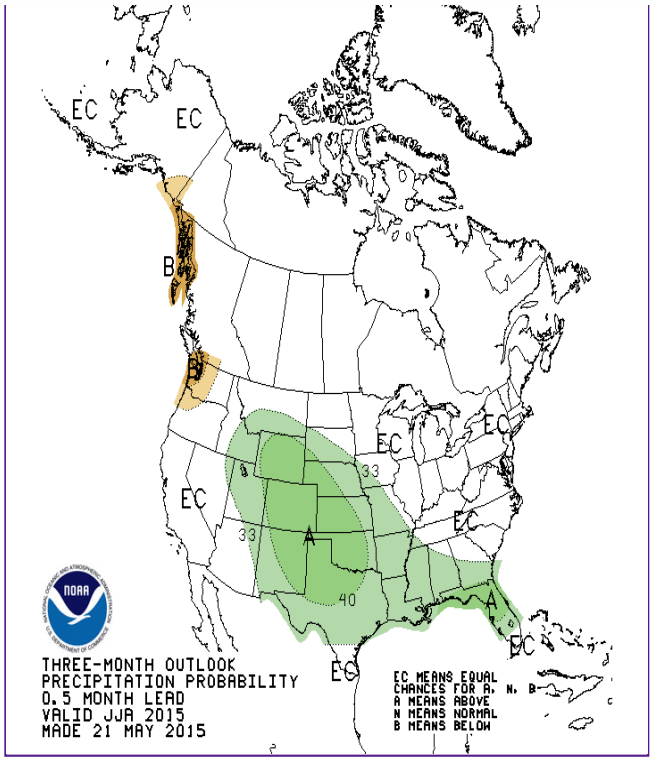
May Temperatures:

- 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.

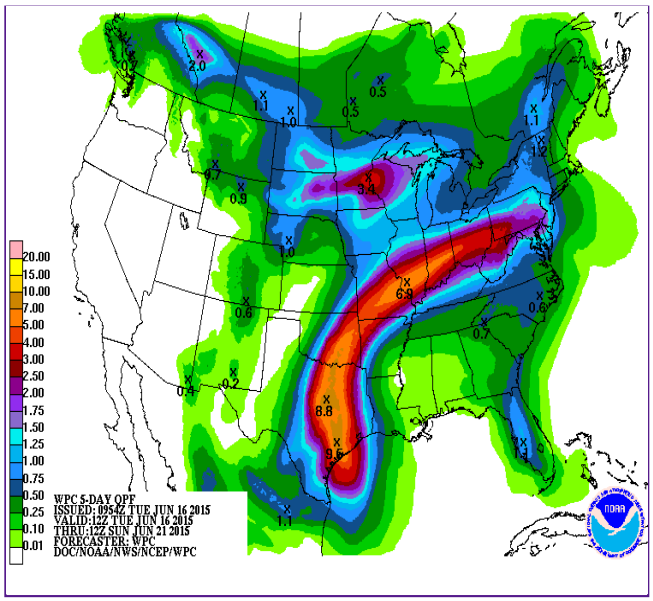
FORECAST AND OUTLOOK

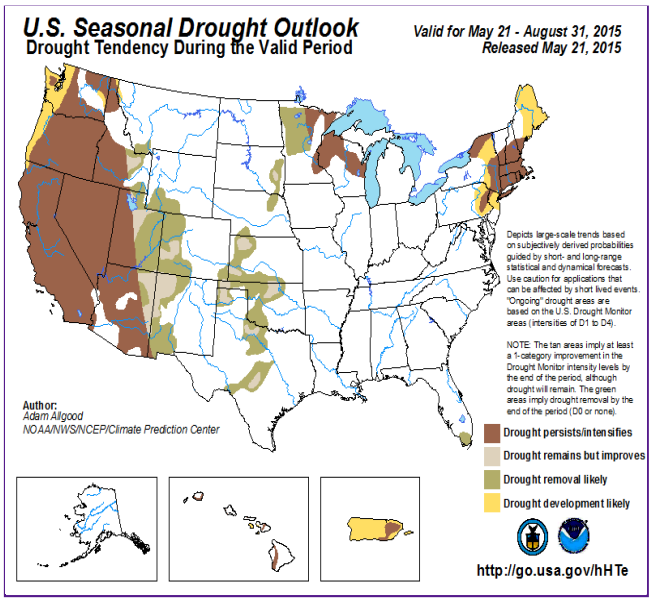






The top two images show Climate Prediction Center's Precipitation and Temperature outlooks for 8 - 14 days. The middle image shows the 3 months Precipitation outlook. The bottom left image shows the Hydrologic Prediction Center's Quantitative Precipitation Forecast accumulation for the five days between 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: (6/16)

- The next three days of weather will be mostly warmer and drier than the UCRB has become accustomed to over the last two months. Afternoon thunderstorms will be possible for much of the high elevations of the Rockies. The highest precipitation totals are expected over south and central Colorado, but average out to under half an inch for the area. East of the divide, some stronger thunderstorms can be expected for the northeast quadrant of the state Tuesday and Wednesday, but precipitation is unlikely to be widespread. Temperatures, which took a dip east of the divide on Monday, will rebound to above average by Thursday.
- This weekend and early next week the UCRB and Colorado east of the divide are forecast to be under a warm ridge of high pressure. This could be the first real heat wave of the summer season, so it will be interesting to see how vegetation responds following the cooler, wetter conditions across the basin over the last two months. Precipitation totals are not forecast to be above a tenth of an inch anywhere within the basin from Friday of this week through Monday of next week. Temperatures will be above average with loads of sunshine as the summer solstice is very near.

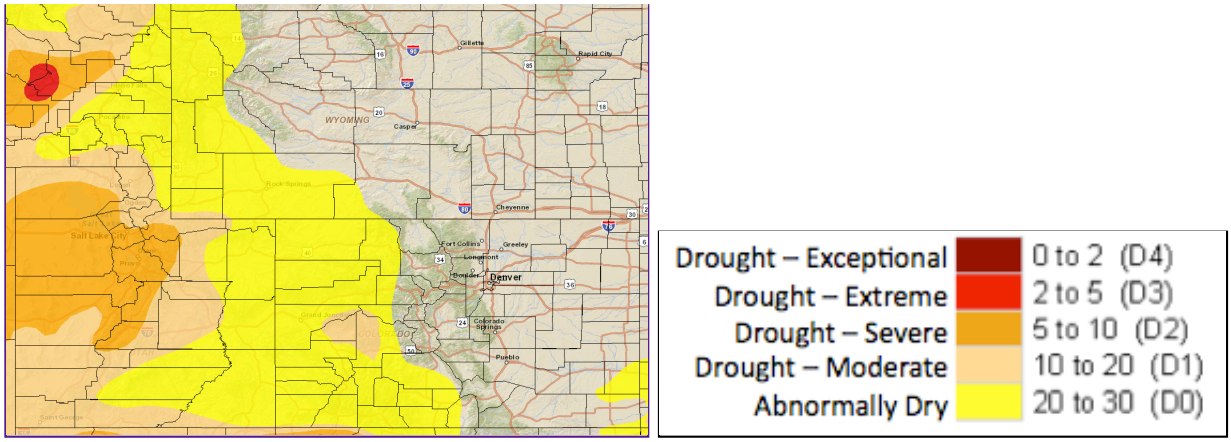
Longer Term:

- The 8-14 day precipitation outlook shows increased chances for above average precipitation for the southern Upper Colorado River Basin. The rest of the UCRB, and Colorado east of the divide, are forecast equal chances of above and below average precipitation.
- 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 southeast portion. The chances for above average temperatures are most highly enhanced in the northwest corner of the basin. Colorado east of the divide is showing equal chances of above and below average temperatures on the 8-14 day

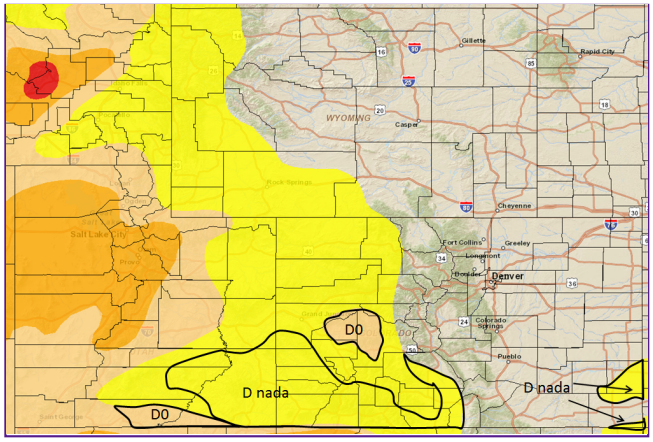
timescale.

- 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 June to August period. These chances are forecast above 40% for all of Colorado except the four corners, extreme northeast Utah, and the eastern portion of the Upper Green River Basin.
- The seasonal drought outlook indicates that drought removal is likely for the areas of the UCRB in a current drought category of D1 or D0. Areas currently in D2, or that were only removed from D2 two weeks ago, are forecast to see improvement. Drought removal is also forecast as likely where D0 remains over southeastern Colorado.

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 16, 2015:

This week's drought discussion for the region will have a heavy focus on the southern UCRB. While the timing of precipitation over the past six months in the San Juan Basin left the ski resorts high and dry, the anomalous push in moisture this late Spring seems to have healed the

hydrologic system. The San Juan River near Bluff, UT has to be our graph of the week as it made a heroic late-season comeback and is now peaking both late and above average. Following a very wet May, the four corners area has received an additional 2.00-4.00" of precipitation since the beginning of the month of June. VegDRI vegetative health and VIC modeled soil moisture are now at or above the normal range. 30-day SPI's are well above average, and SPI's are positive in the region going back nine months. This includes the snow season, but SPI's are biased towards lower elevations. McPhee Reservoir in the area is feverishly filling its way out of the below normal range. Even Lake Powell, which will not see a full recovery on any seasonal timescale if ever, has received enough of a boost to now be over 50% full.

The San Luis Valley may have been overlooked in some of our previous drought discussions as well. This is because it has sat in the middle of two droughts of different characteristics, and because it will almost never be one of the stand-out locations on our weekly precipitation maps. The fact of the matter is the San Luis Valley has been consistently above average on precipitation and below average on evaporative demand since the middle of April as well. Flows along the Rio Grande have recovered into the normal range.

Eastern Colorado experienced nearly average temperatures and some heavy thunderstorms in areas, but most of the heavy thunderstorms hit areas that are nowhere near in drought. Our remaining D0 as of last week in extreme southeast Colorado did receive an additional 1.00-3.00" of precipitation over the week, and we are recommending this D0 be stripped.

Recommendations:

UCRB: It is recommended that D1 be downgraded to D0 in western Gunnison, eastern Delta, and nearby potions of Mesa and Montrose Counties. The only indicator that still backs a D1 depiction is the water year to date precipitation. This is windowed favorably for dryness because it includes a very dry late fall, but not a cool, wet August and September.

It is recommended that D1 be downgraded to D0 in central and southern Kane County UT, and the southwest corner of San Juan County, UT.

One could argue for a full removal of D0 in western Colorado, but with hotter, drier weather on the way we won't be quite so aggressive. It is recommended that D0 be removed from the southern and southeastern portions of the San Luis Valley. This inclueds eastern Saguache County and all but extreme western Alamosa County on the eastern edge of recommended improvements. Rio Grande County has been drier that its surrounding in June and is recommended to stay D0.

Dnada is recommended for Archuletta, La Plata, Montezuma, and Dolores Counties, southern Conejos, Rio Grande, Mineral, Mesa, Hinsdale, and San Juan (CO) Counties, and southwest Montrose and San Miguel

Counties in the state of CO.

Dnada is recommended for the majority of San Juan County in UT with the omission of extreme southwest San Juan County, and the eastern flank of Garfield and Wayne Counties.

Eastern CO: It is recommended that all remaining drought classification be removed from southeast Colorado.