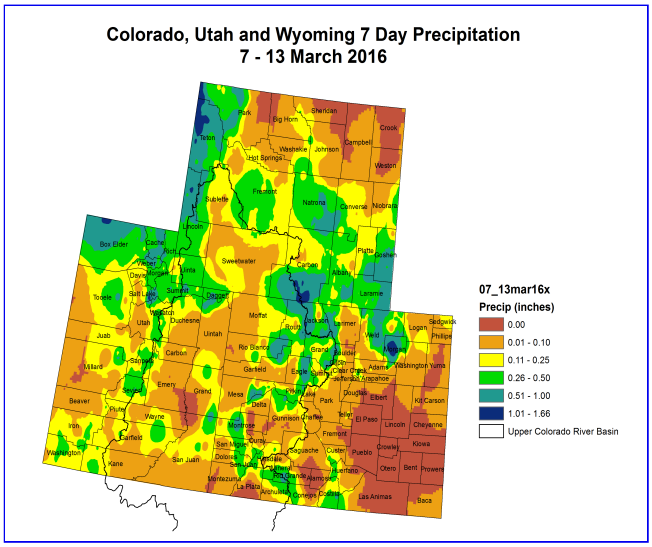
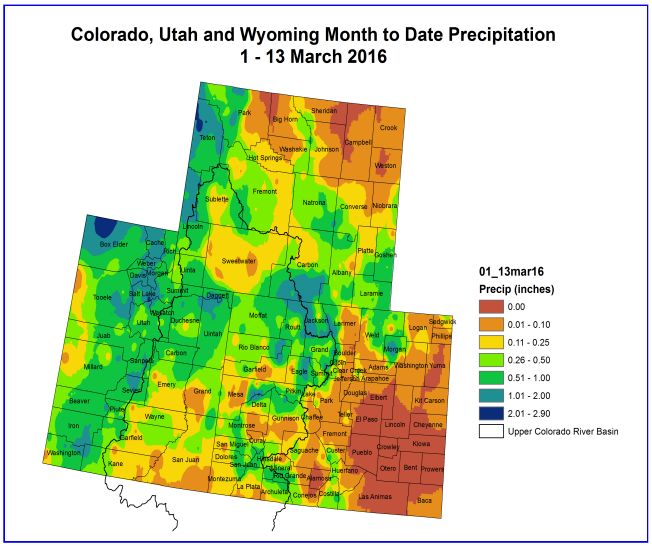
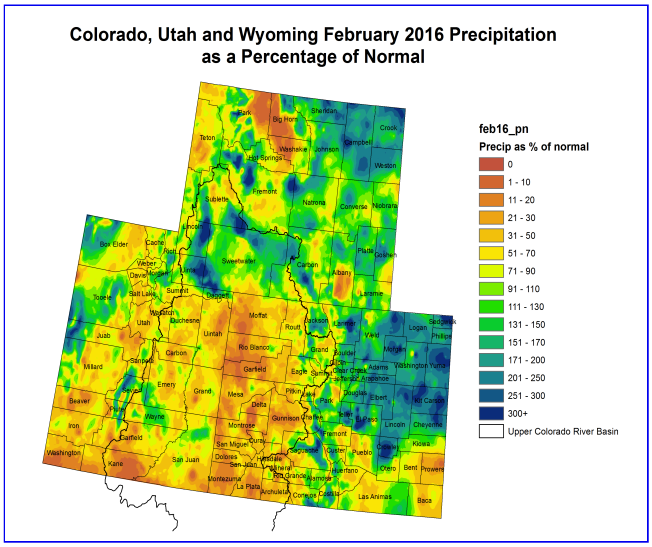
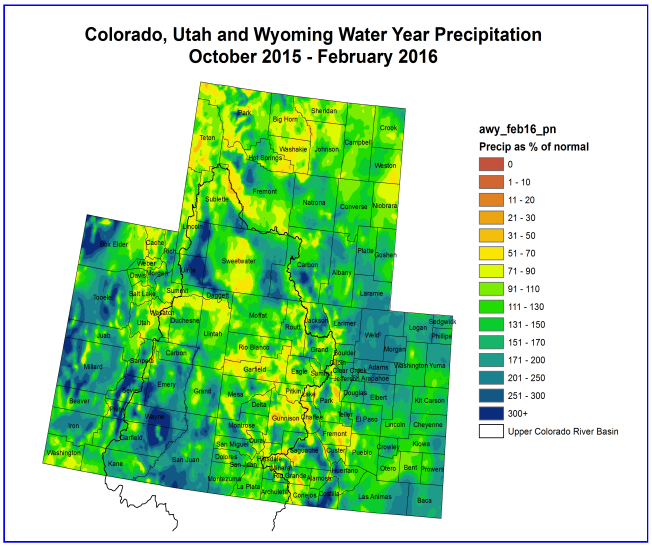
PRECIPITATION









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:

- Last week's precipitation was once again mostly in the higher elevations of the mountains.
- The Upper Green River Basin saw precipitation totals of less than 0.25" in Sweetwater and Sublette counties. Lincoln and Uinta counties saw up to 0.50" for the week.
- Northeastern Utah in Summit, Daggett, and northern Duchesne and Uintah counties saw up to 0.50" while the rest of eastern Utah received less than 0.25".
- In Western Colorado, precipitation amounts between 0.25" and

1.00" show up in Routt, Rio Blanco, Grand, Eagle, northern Gunnison counties, and parts of the San Juan Range.
- East of the Divide, precipitation mainly fell in Weld and Morgan counties and along the Divide. Southeastern Colorado was mainly shut out of precipitation, not receiving any at all.

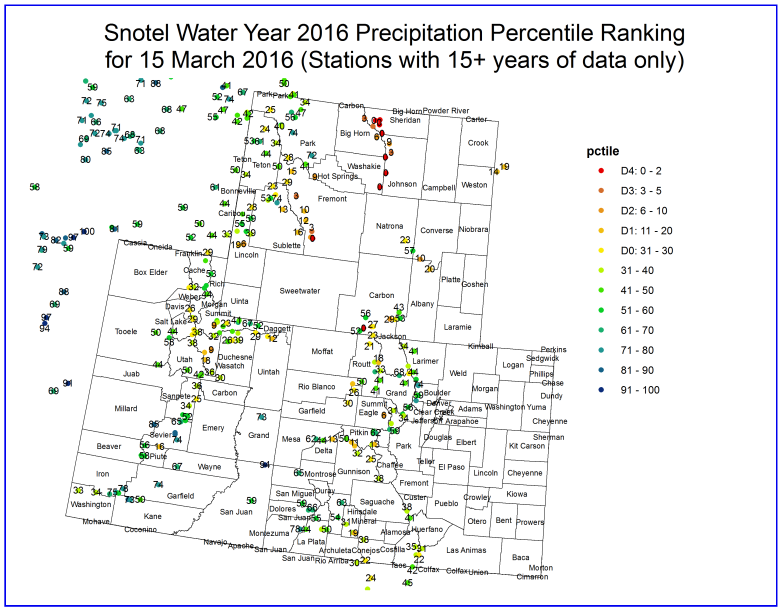
February Precipitation:

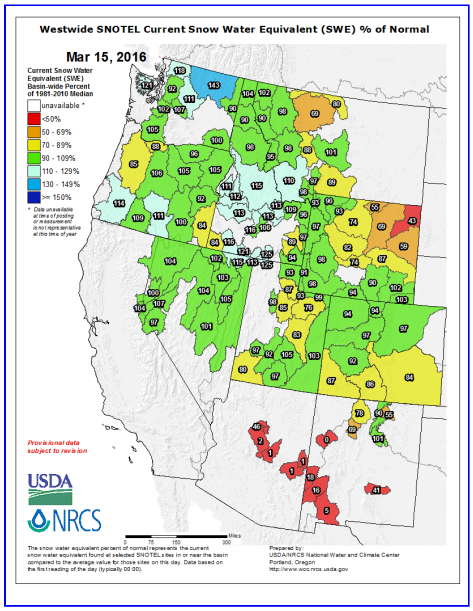
- For February, most of the UCRB saw much below precipitation, with the exception of the Upper Green.
- In the Upper Green River Basin, Sweetwater County saw mostly above normal precipitation with areas with up to 200% of normal. Lincoln and Uinta counties saw above 200% of normal over much of the area. Sublette County was a bit drier, with the valley seeing less than 90% of normal, while the higher elevations were near or above normal.
- Eastern Utah and western Colorado saw less than 70% of normal, with a large area in Western Colorado seeing less than 30% of normal. A few areas in eastern Utah, in San Juan, Wayne and Emery counties saw slightly above normal precipitation.
- East of the Continental Divide saw greater than 150% of normal February precipitation for most of eastern Colorado. The bulk of this precipitation, however, fell in the first week of February.
- In southeastern Colorado, Baca, Prowers, Bent, Pueblo, Huerfano and Las Animas all saw less than 70% of normal February precipitation.

Water Year 2016 Precipitation (Oct-Feb):

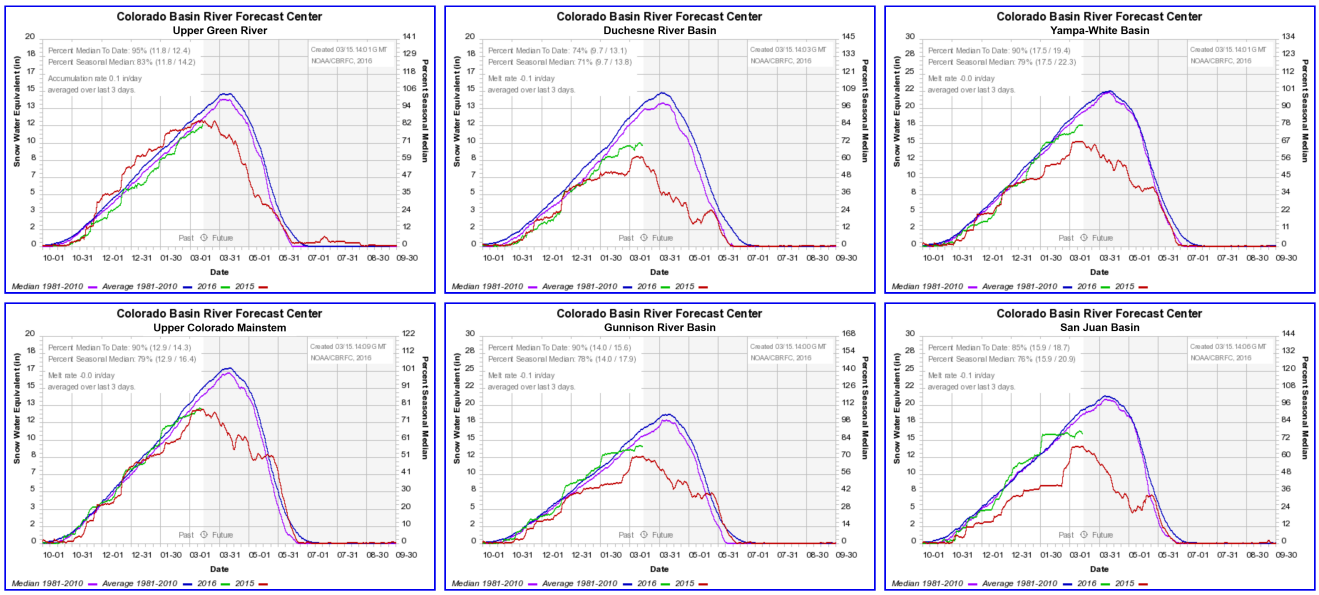
- Most of the UCRB and eastern Colorado has seen a near to above normal start to the 2016 Water Year through February.
- Most of the Upper Green Basin is seeing a normal start to the water year, with Lincoln and Uinta counties seeing much above normal. Central Sweetwater County has started to see slightly below normal precipitation.
- Eastern Utah is also starting off with a normal water year through February. Southern Utah has seen over 170% of normal precipitation through February.
- Western Colorado is mostly normal or slightly above normal to start the water year as well. Some dry areas in Rio Blanco, Garfield, Pitkin and Gunnison counties are starting to pop up after the dry February.
- Eastern Colorado has mostly seen a normal to above normal start to the water year. Southeastern and parts northeastern Colorado are over 170%.

SNOTEL AND SNOWPACK





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



SNOTEL Precipitation Percentiles:

- SNOTEL Water Year precipitation percentiles in the Upper Green Basin are still below the median at many stations, ranging between the 0th percentile to the 59th percentile. The higher percentile stations are along the western side of the basin.
- The Uinta Range is quite diverse. SNOTEL percentiles on the north side of the range are slightly below and above the median, while the south side of the range drop to below median.
- In the Wasatch Range precipitation percentiles at most stations are below median, in the 20th to 30th range. The southern SNOTEL sites in Utah are reporting much above the median precipitation for the water year.
- The northern Rockies in Colorado extending into Wyoming percentiles are starting to fall, with many

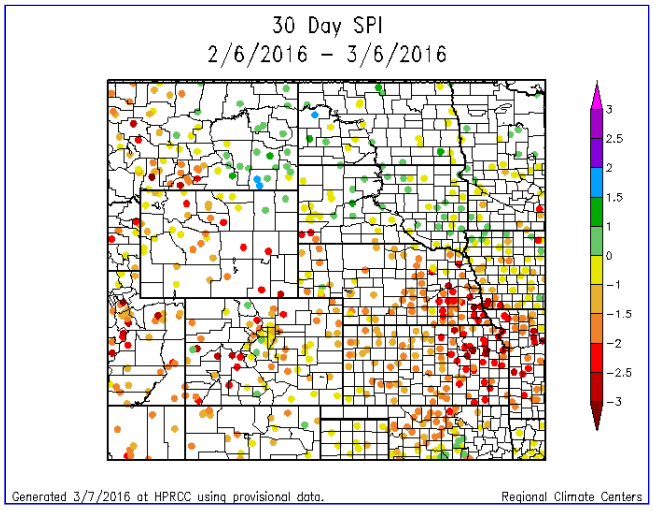
of the precipitation percentiles reporting below the median. Once into Grand County and the headwaters of the Colorado River, percentiles are still in the normal range, between the 40th and 70th percentile.

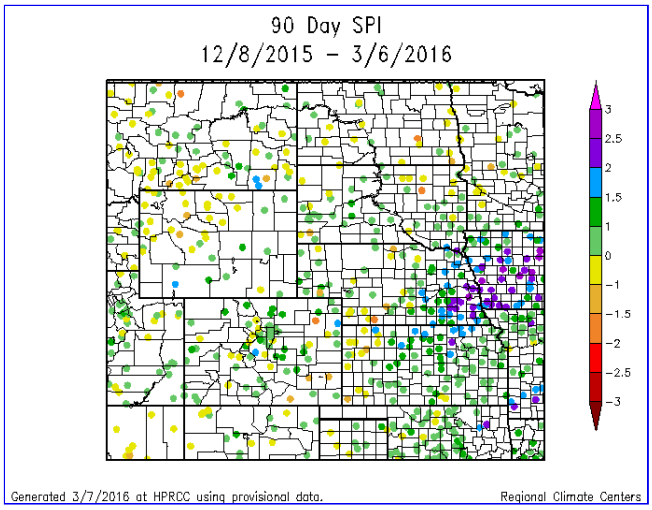
- The Rockies of central Colorado are still in the normal range, starting to dip below the 50th percentile.
- The San Juans are well above the median for the water year to date. Most are in the 60th to 75th percentile range.
- The Sangre de Cristos near average at the 22nd to 53rd percentile.

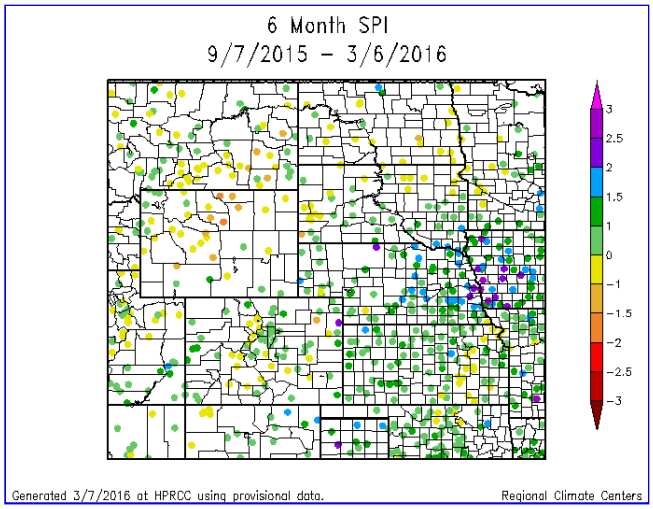
SWE Timeseries Graphs:

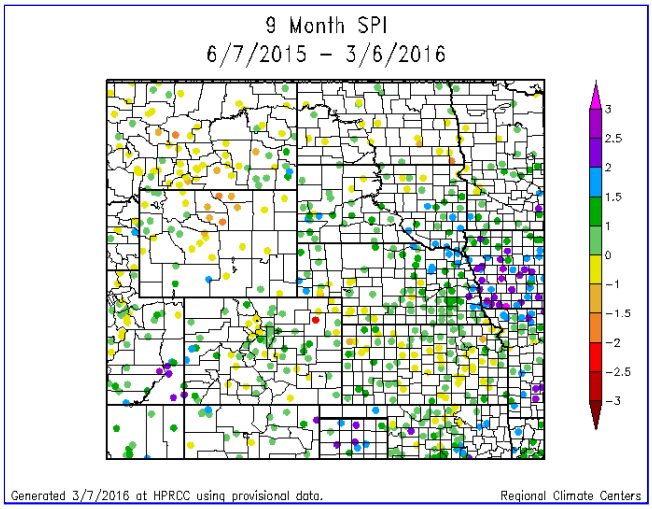
- The Upper Green Basin is at 95% of the median to date.
- The Duchesne basin rebounded a bit early in the week, but then started to decrease again, now at 74% of median to date.
- The Yampa River Basin increased early in the week, then held steady, no at 90% of median snowpack.
- The Upper Colorado River Mainstem melted a bit this week, now at 90%.
- The Gunnison Basin has had a very dry February, and is reporting 90% of median snowpack to date.
- The San Juan Basin has also been very dry in February and started to melt during the first week of March. After an increase early last week, melt occurred once again. The basin is currently at 85% of median to date.

STANDARDIZED PRECIPITATION INDEX









Standardized Precipitation Index standardizes precipitation accumulations for a specified time period into percentile rankings. -1.0 to -1.5 is equivalent to a D1 to D2. -1.5 to -2.0 is equivalent to a D2 to D3. -2.0 and worse is equivalent to a D3 to D4. 30- and 60-day SPIs focus on short-term conditions while 6- and 9-month SPIs focus on long-term conditions. SPI data provided by High Plains Regional Climate Center.

Short Term (30-day): (3/6)

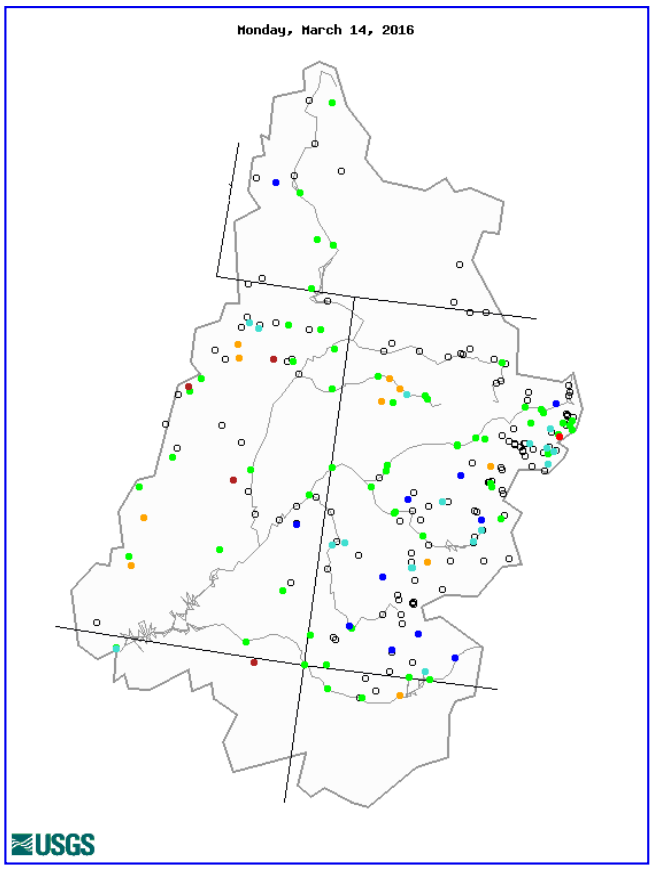
- 30-day SPIs in the UCRB and eastern Colorado have decreased greatly in the last week, with most SPIs below 0.
- All SPIs in the Upper Green River Basin are in the 0 to -1.5 range.
- 30-day SPIs in eastern Utah are between -1 and -3.
- Western Colorado is mostly in the -1 to -3 range. The driest showing up in Gunnison and Delta counties. Routt County is showing an SPI in the 0 to -1 range.
- The Rio Grande Basin is between -1 and -1.5 SPI.
- East of the divide, SPIs range from 0 to -2.5. Northeastern Colorado has the driest group of SPIs in the -1 to -2 range with an SPI in Weld County down to -2.5. The Denver Metro area and much of southeast Colorado is showing most SPIs between 0 and -1.5.

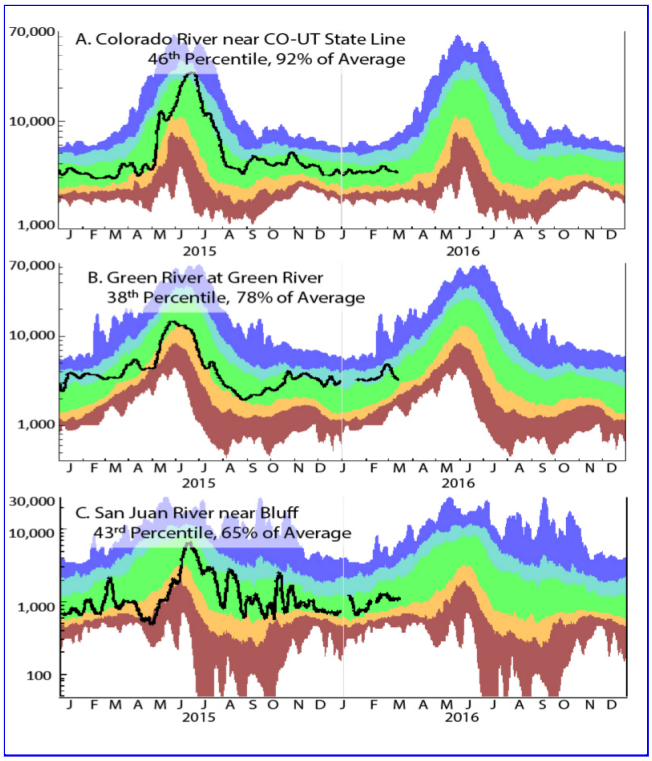
Long Term (6-month): (3/6)

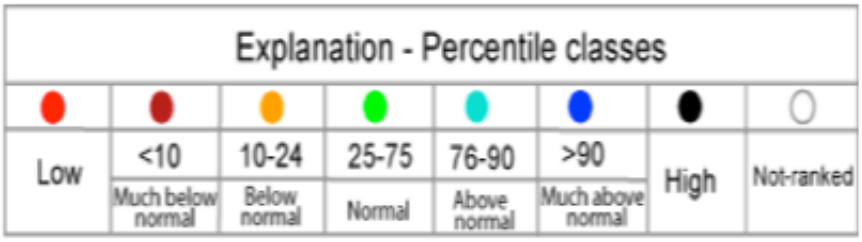
- 6-month SPIs in the UCRB are now more in the normal range of SPIs, mostly between -1 and +1.5 SPI.
- The Upper Green River basin in Wyoming is also mostly in the normal range (-1 to +1), with a station in Sweetwater County between -1 and -1.5.
- Eastern Utah is in the normal range as well. More positive stations are in the southern portion of the state, including an SPI up to +2.
- Western Colorado is also in the -1 to +1 normal range. SPIs in Mesa County are showing a little wetter over the past 6 months, up to +1.5.
- Southwest Colorado and the Rio Grande river basin are both reporting in the normal range for the long term SPIs, showing more 0 to -1 than positive SPIs.

- Colorado east of the divide is again in the normal range for the most part. Washington County is the stand-out, with its station reporting in the -1.5 to -1 SPI range.

STREAMFLOW







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

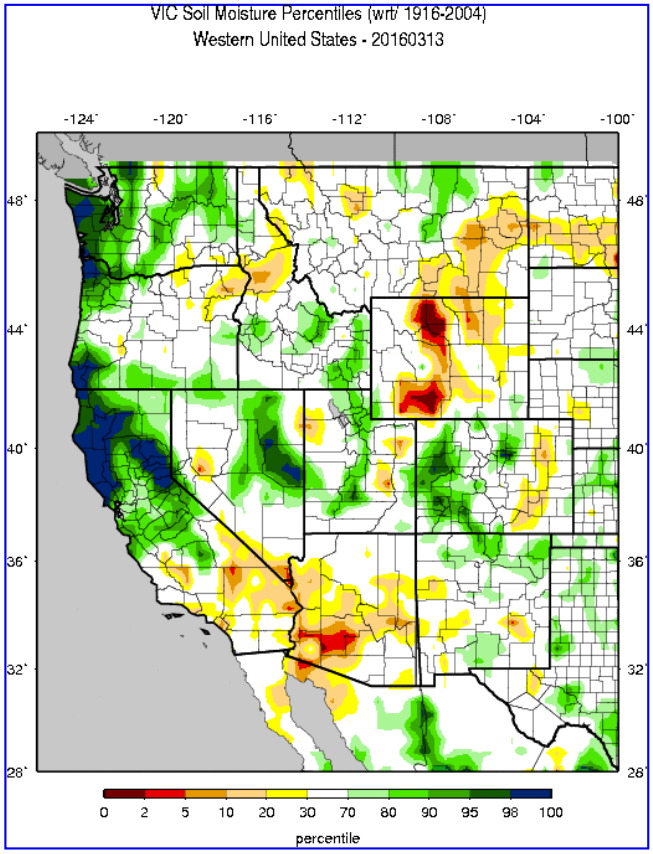
Streamflow Statistics:

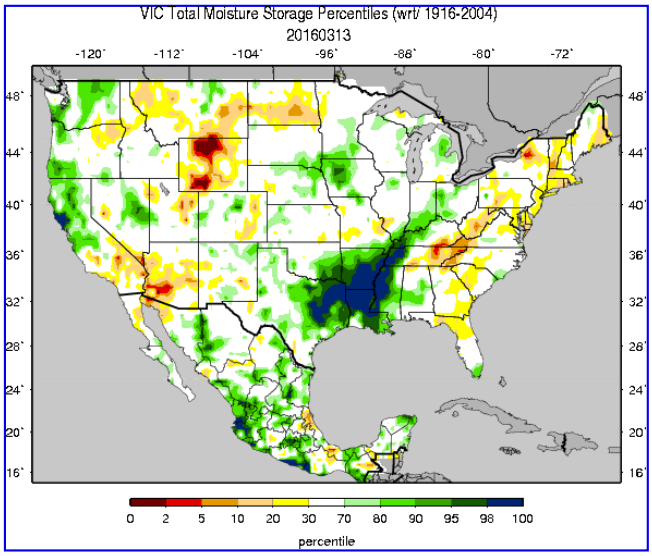
- With the above average temperatures over the past few weeks many gages in the UCRB have become unfrozen with 98 of the 140 gages in the basin now reporting.
- 85% of gages are reporting in the normal to much above normal range for the 7-day average streamflow. 1% of gages are reporting

highest on record for the 7-day average for 3/8.

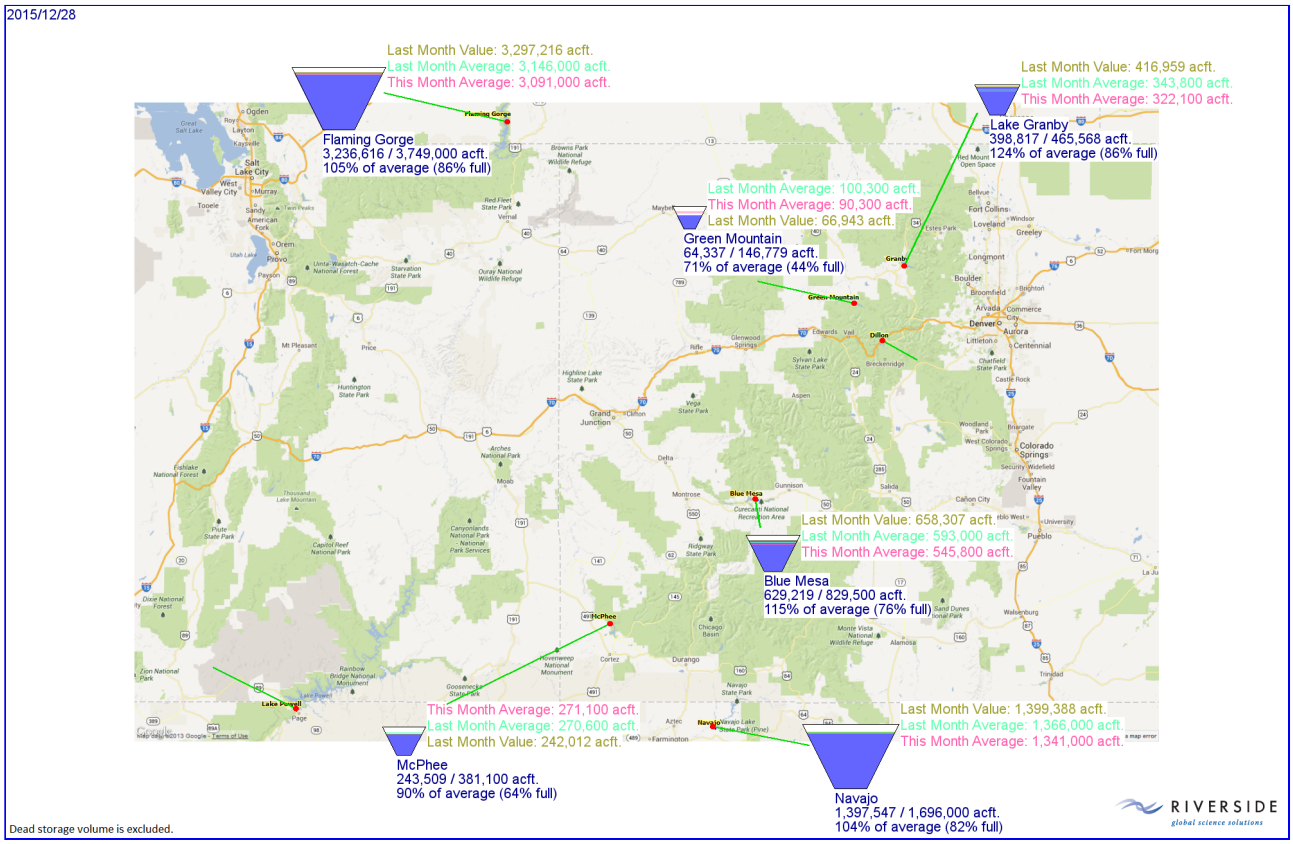
- 12% of gages reporting are in the below normal range to much below normal range. 1 gage is reporting lowest on record.
- The Colorado River at the CO-UT state line is now at 92% of normal and in the 46th percentile.
- The Green River at Green River, Utah is reporting at 78% of 7-day average, which corresponds to the 38th percentile.
- The San Juan River near Bluff, Utah is has is reporting at 65% of average, which corresponds to the 43rd percentile.

SURFACE WATER

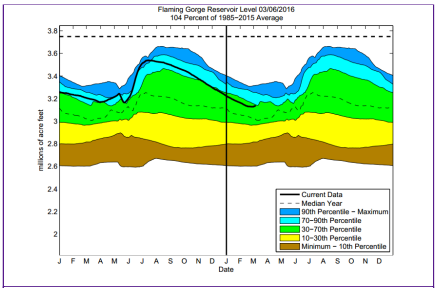


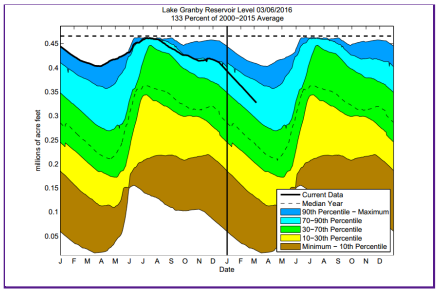


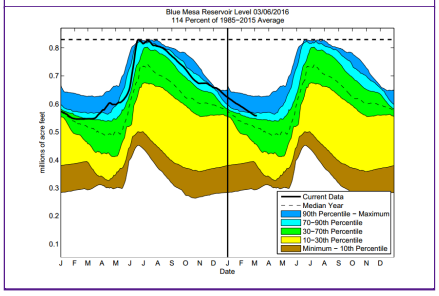
The top left image shows VIC modeled soil moisture as a percentile ranking. The top right image shows VIC+SWE.

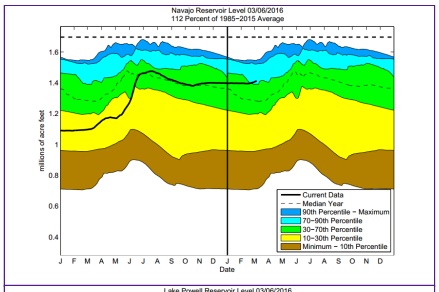


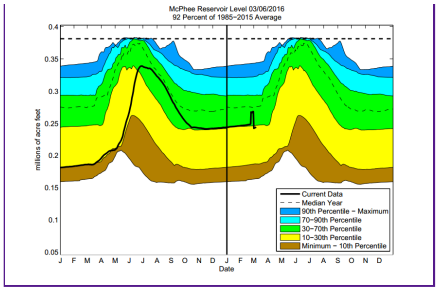
The above image shows last month's and this month's current volumes of the major reservoirs in the UCRB, with percent of average and percent of capacity.
The graphs shown belo are plots of reservoir volumes over the past full year and current year to date (black). The dashed line at the top of each graphic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

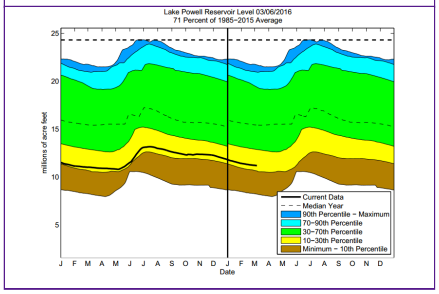












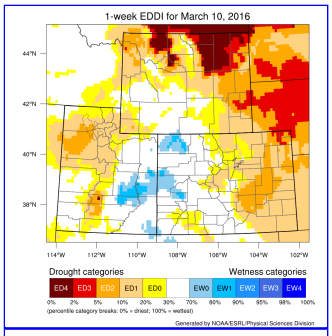
VIC:

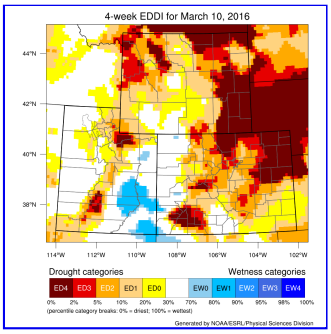
- Modeled soils moisture in the Green River Basin in Wyoming continues to be much below normal. Most of eastern Sweetwater County soil moisture is below the 2nd percentile. All of Sweetwater, and now parts of Sublette and Uinta Counties are below the 20th percentile.
- Southeast Utah is showing above average soil moisture for this time of year, while northeast Utah is still showing at or below average soil moisture, although areas like Uintah County and Emery County are showing soil moisture between the 5th and 30th percentile.
- Western Colorado is now showing soils in the 70th to 95th percentile as a result of the melt that has been going on. Once current snowpack is included, the area drops to the normal range.
- The high elevation areas of the Rocky Mountains have soil moistures mostly in the normal range. Jackson County is showing some areas in the 70th-80th percentile range.
- East of the divide, the high plains are generally in the normal range for soil moisture. Some areas, like Washington and Crowley into Pueblo and Las Animas counties are down near the 20th percentile. The Denver metro area is showing soils over the 98th percentile. These wet soils continue up into eastern Boulder and Larimer as wells as Weld counties, where they're generally above the 80th percentile.

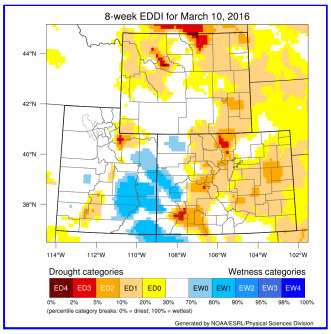
Reservoirs (based on the graphs below the map): (3/6)

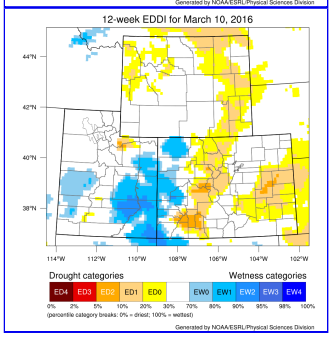
- Flaming Gorge is at 104% of average.
- Lake Granby is at 133% of average.
- Green Mountain is at 71% of average.
- Blue Mesa is at 114% of average.
- Navajo is at 112% of average.
- McPhee is at 95% of average. The sharp increase on the graph has been confirmed as bad data.
- Lake Powell is 71% of average.

EVAPOTRANSPIRATION



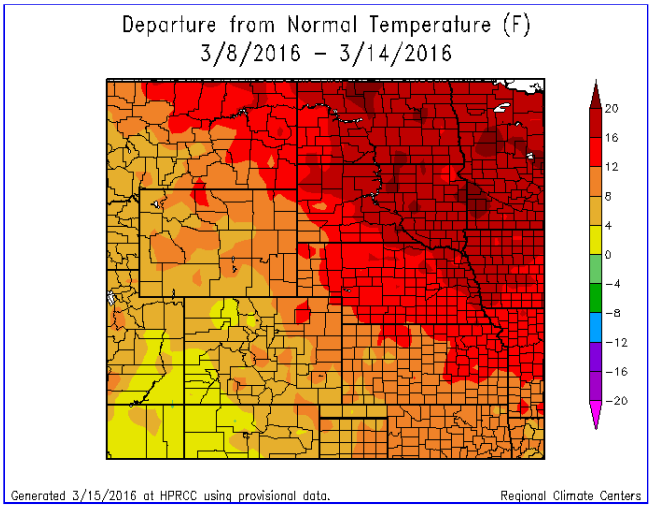


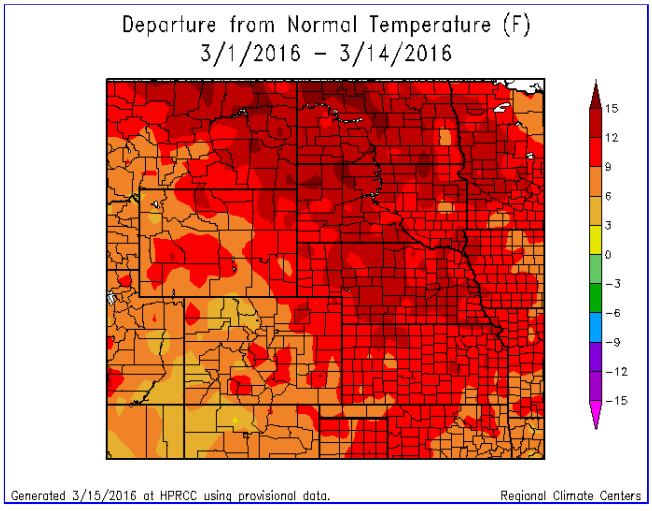




The above images are available courtesy of NOAA's Evaporative Demand Drought Index (EDDI). Drought classification listed is a function of the depth of reference evapotranspiration accumulated over a given period of record with respect to a climatology of 1981-2010. The drought categories displayed are in line with the US Drought Monitor's Percentile Ranking Scheme http://droughtmonitor.unl.edu/AboutUs/ClassificationScheme.aspx. Data used to generate these maps come from the North American Land Data Assimilation System Phase-2 (NLDAS-2) project, which assimilates observations of temperature, wind speed, radiation, and vapor pressure deficit. The date indicates the last day of the period of record, and the week number indicates the window size for the period of record..

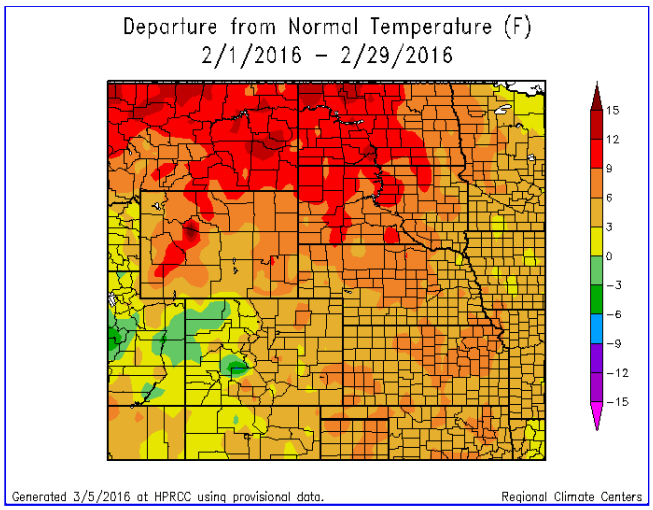
TEMPERATURE





All images show temperature departures from average over different time periods (last 7

days on top left; month-to-date on top right; last full month on bottom). Temperature departure maps provided by HPRCC ACIS.



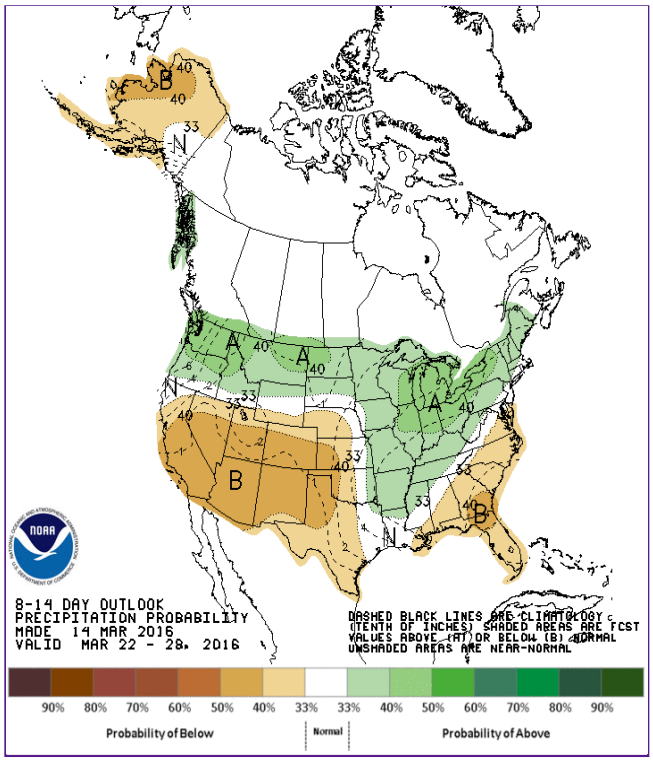
Last Week Temperatures:

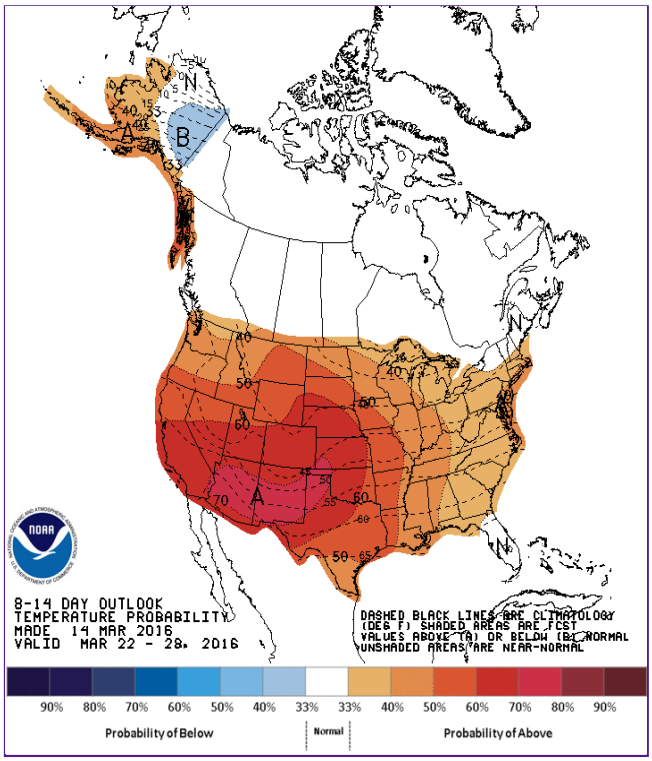
- Temperatures in the UCRB and Colorado are all above normal for another week.
- The Upper Green River basin in Wyoming along with northeastern Utah into northwestern Colorado to southeast Colorado was warmer than normal by 4 to 8 degrees..
- The Four Corners area saw temperatures 0 to 4 degrees above normal.
- Northeastern Colorado was 8 to 12 degrees above normal.

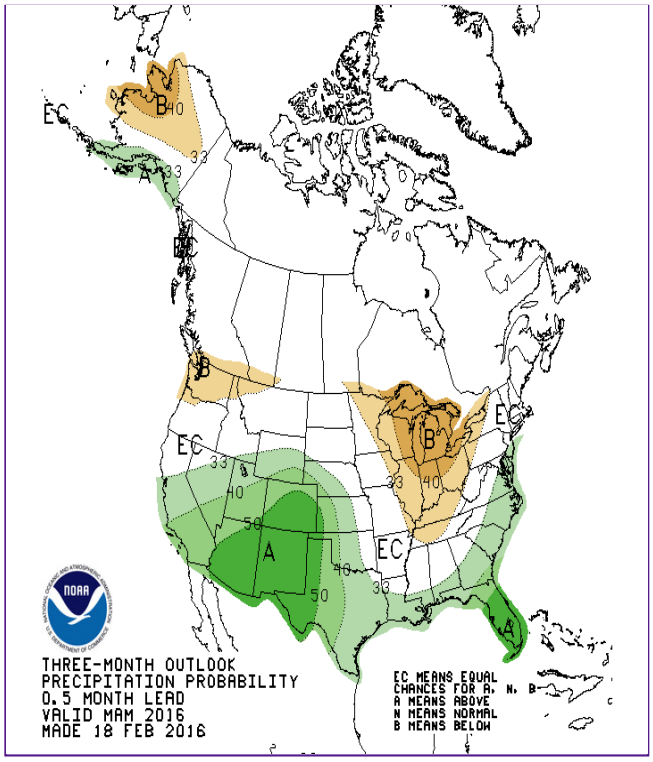
February Temperatures:

- The UCRB saw February temperatures in the normal range for the most part. The warmest anomalies were in the Upper Green River Basin, and the coolest anomalies were in the Gunnison and Green River Valleys.
- The Upper Green River Basin was 0-12 degrees above average for the month of February. The highest anomalies were in Sweetwater County where temperatures were 9-12 degrees above normal.
- Eastern Utah experienced normal February temperatures. Anomalies for the month ranged from -3 to +3 degrees for the most parts with a few isolated spots being more extreme on either side.
- In western Colorado the cooler temperature anomalies were in line with the river valleys. The Upper Gunnison was 3-9 degrees below average for the month of February. Most of the western portion of the state was within three degrees of normal for the month.
- Colorado east of the divide was predominantly 3-6 degrees above normal for the month of February with all temperature anomalies above zero.

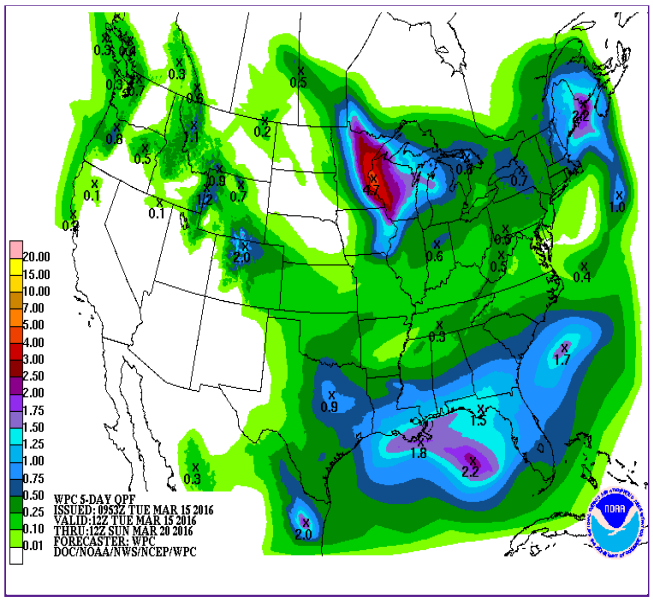
FORECAST AND OUTLOOK

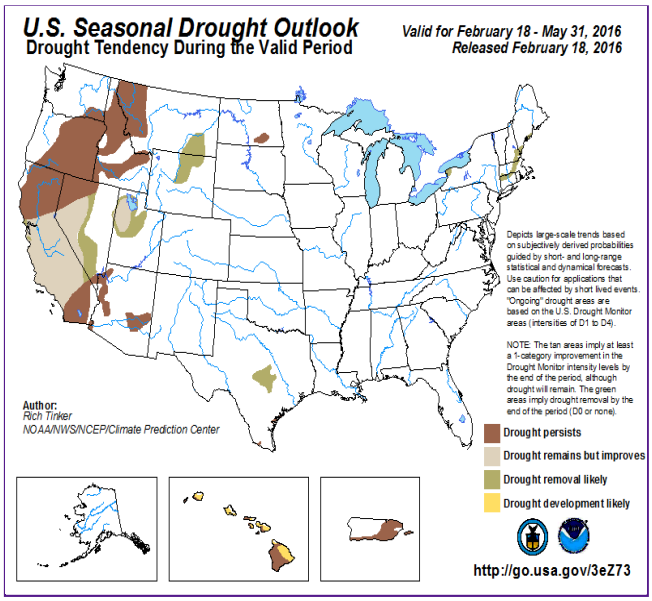






The top two images show Climate Prediction Center's Precipitation and Temperature outlooks for 8 - 14 days. The middle image shows the 3 months Precipitation outlook. The bottom left image shows the Hydrologic Prediction Center's Quantitative Precipitation Forecast accumulation for the five days between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





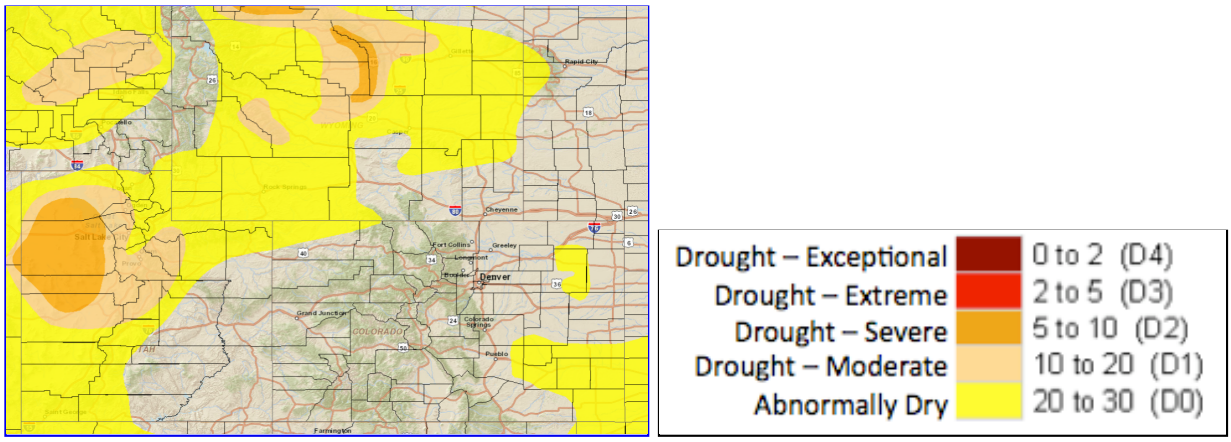
Short Term: (3/15)

- Moisture will continue in the UCRB, mainly in northwestern Colorado through early Wednesday. Additional disturbances will result in some precipitation Thursday ad Friday, again favoring the northern and central Rockies in Colorado. Dryness will return over the weekend, bringing above normal temperatures.
- Eastern Colorado may be impacted from the late week disturbances on Thursday night and Friday with dryness returning to the area for the weekend. Wind will continue through Wednesday along the plains.

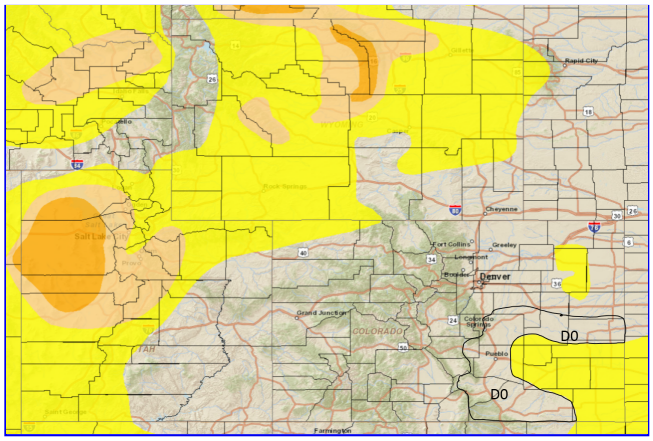
- **Longer Term:**

- The 8-14 day precipitation outlook shows increased chances for below average precipitation for the entirety of the UCRB and eastern Colorado.
- The 8-14 day temperature outlook shows greatly increased chances for above average temperatures for the UCRB and eastern Colorado.
- The Climate Prediction Center March through May shows increased chances for above average precipitation across the entirety of the UCRB and eastern Colorado due to a strong El Nino. These chances are most strongly enhanced for southern and eastern Colorado.
- The seasonal drought outlook for Colorado and the UCRB shows no likely drought development over the next three months.

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: March 15, 2016

The Upper Colorado River Basin had another week of above normal temperatures of between 0 to 8 degrees warmer than normal. Portions of the basin saw some beneficial precipitation in the early period of the drought monitor week and some more widespread precipitation in western Colorado late in the drought monitor week. Snowpack in most sub-basins within the UCRB have seen a decrease, however remains near the median for this time of year. With the near normal snowpack, the recent precipitation and the early season precipitation still holding on, no changes to the drought monitor in the UCRB will be recommended.

Eastern Colorado continues to see warm and dry conditions, especially south of Interstate 70, where a large portion of the area has yet to see precipitation in the month of March. Snowpack in the eastern side of the Sangre de Cristo Mountains in Huerfano and Las Animas counties has decreased to less than 50% of the median. Crop conditions in this area are continuing to decrease after an early start to the season. North of I-70 is still dry, however, soil moisture is holding on thanks to better precipitation the past 90 days.

Recommendations:

UCRB: Status quo. We continue to watch the area for possible introduction of D0.

Eastern Colorado: Expansion of the D0 in southeast Colorado is recommended. Most of this area has received no precipitation this month, and very little since the beginning of February. Much above normal temperatures has also contributed to drying soils and decreasing crop conditions.