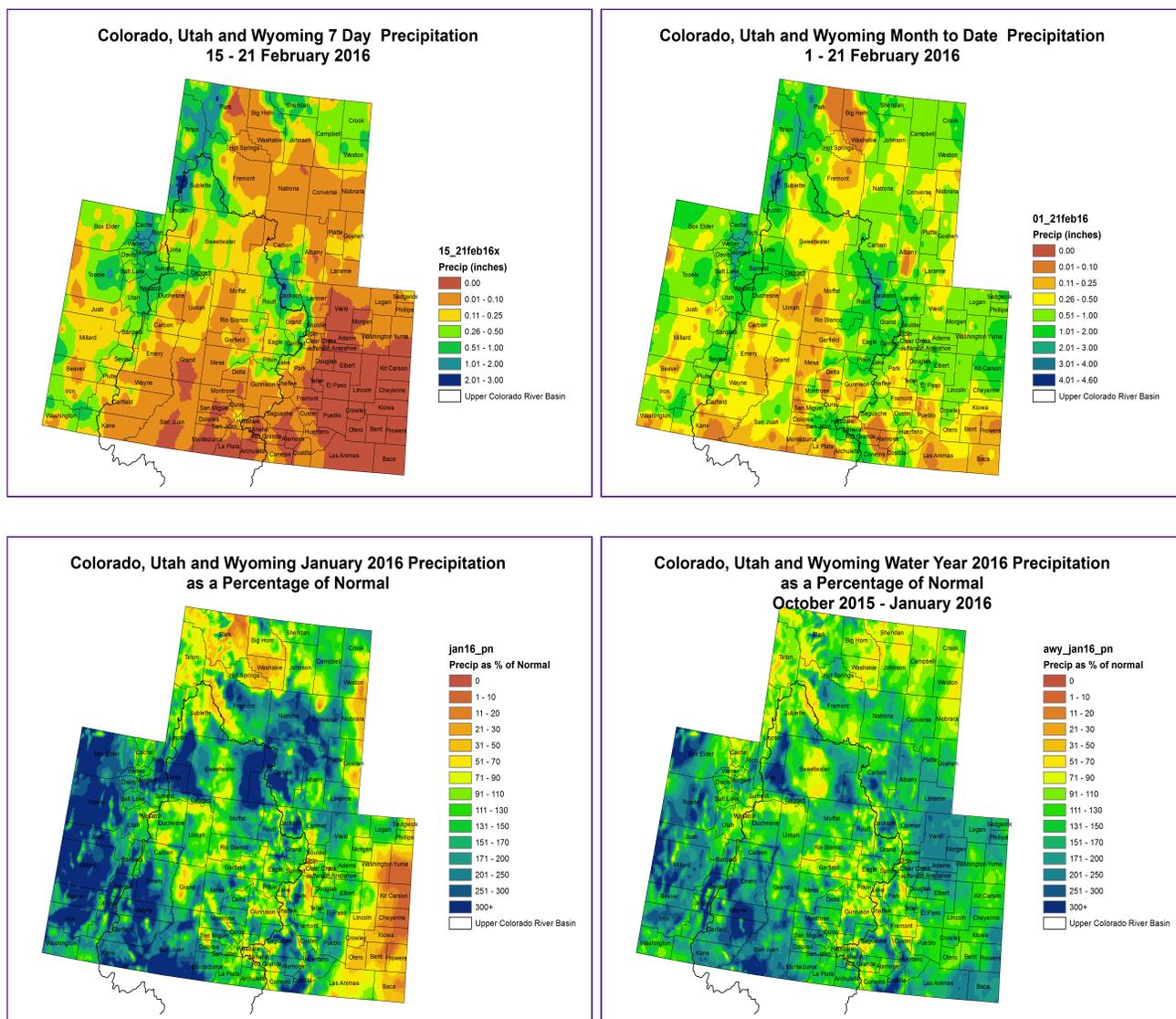


# PRECIPITATION



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 fell mainly for the higher elevation headwaters of the UCRB this past week, with little to no precipitation further downstream in Garfield and Mesa counties and continuing on into Utah.
- North in the Yampa and White river basins saw a similar story. Western Jackson County was the winner for this past week, seeing over 2" of precipitation, while areas in Moffat County only recieved up to 0.1".
- The Upper Green river basin recieved a moderate amount of

precipitation, generally between 0.1-0.5". Some areas, like eastern Sweetwater County and a small section of Eastern Lincoln/Western Sweetwater counties so less than 0.1".

- Eastern Utah was dry this past week, seeing less than 0.25" across the area, save for a moderate amount of precipitation in Daggett as well as northern Duchesne and Uintah counties.
- Southwest Colorado saw little to no precipitation this past week. The same can be said for the Rio Grande river basin as well as all of Colorado east of the divide. Nearly the entire high plains received no precipitation this past week.

### **January Precipitation:**

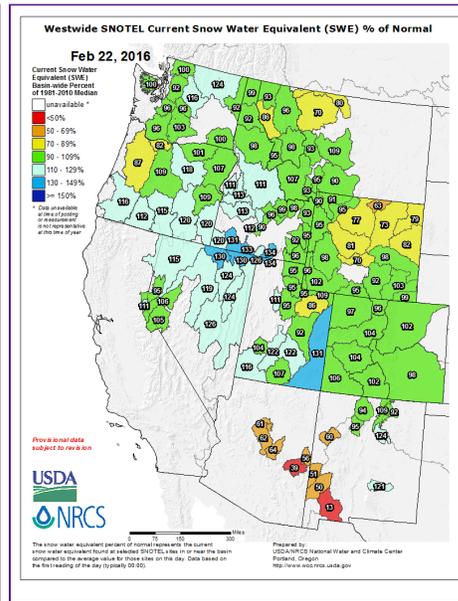
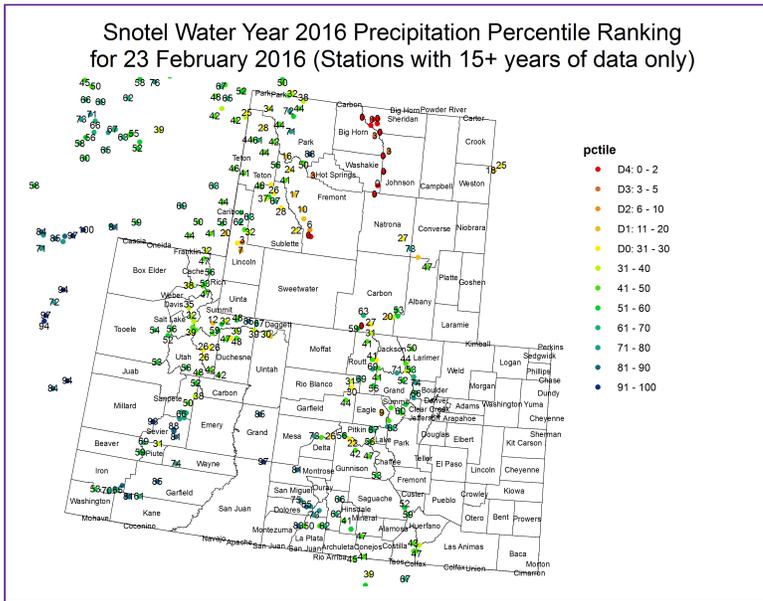
- January, the UCRB mainly saw at or above normal precipitation for the month.
- In the Upper Green River Basin, Sublette County was near normal, Sweetwater County saw areas with up to 200% of normal and there was an area of over 200% of normal for the month in Lincoln and Uinta counties.
- Eastern Utah saw near to slightly above normal precipitation in the northern areas, with over 200% of normal January precipitation in the southern parts of Utah.
- Western Colorado saw mostly near to above normal precipitation for the month. Mesa, Delta, Montrose and parts of Gunnison counties saw areas of over 200% of normal January precipitation.
- East of the Divide saw a month with normal to above normal precipitation from Logan County down to western Las Animas County, up to the Divide. East of this line was drying, with much of this area seeing less than 50% of normal January precipitation.

### **Water Year 2016 Precipitation (Oct-Jan):**

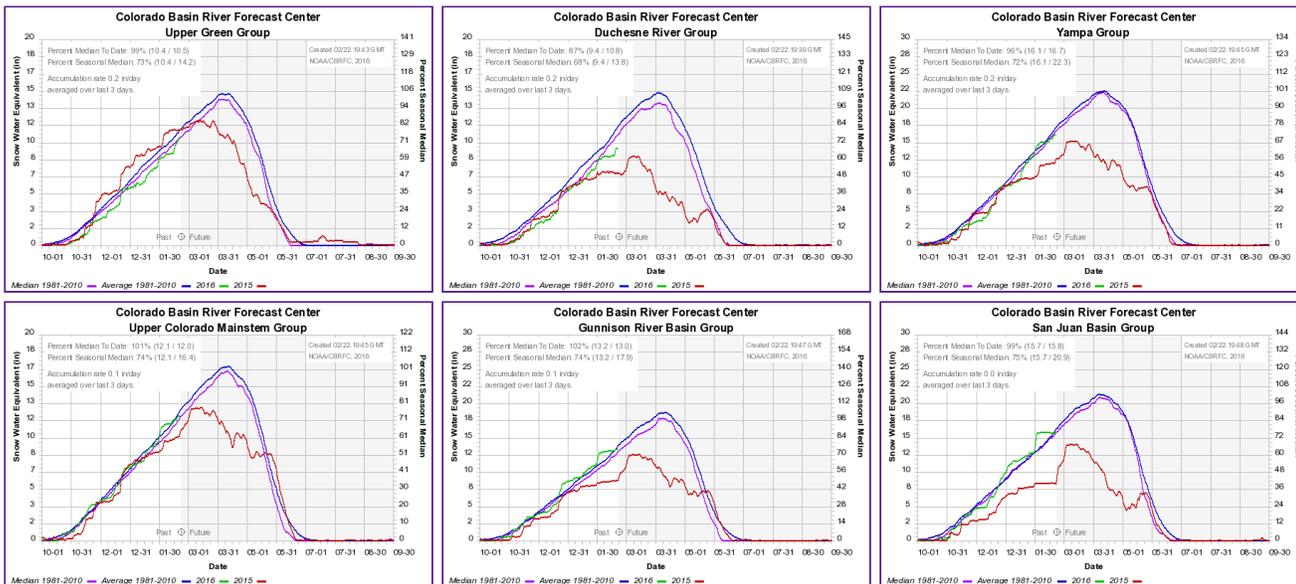
- Most of the UCRB and eastern Colorado has seen a near to above normal start to the 2016 Water Year through January.
- Most of the Upper Green Basin is seeing a normal start to the water year, with Lincoln and Uinta counties seeing much above normal.
- Eastern Utah is also starting off with a normal water year through January. Southern Utah has seen over 170% of normal precipitation through January.
- Western Colorado is mostly normal or slightly above normal to start the water year as well.
- Eastern Colorado has mostly seen a normal to above normal start to the water year. Southeastern and parts northeastern Colorado is over 170%.

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## **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, although we are now seeing more reports at or a little above median. Still, some stations are down to the 0th percentile.
- The Uinta Range is quite diverse, with some stations are approaching D0 with percentiles near 30%, whilst one station is reporting at the 86th percentile.
- In the Wasatch Range precipitation percentiles have dipped a bit over the past week. Now, many stations are below median, in the 20th to 30th percentiles. There are however still many stations reporting in the normal to above normal, especially further south. The highest percentile is at 98%.
- The northern Rockies in Colorado extending into Wyoming percentiles are generally in the normal

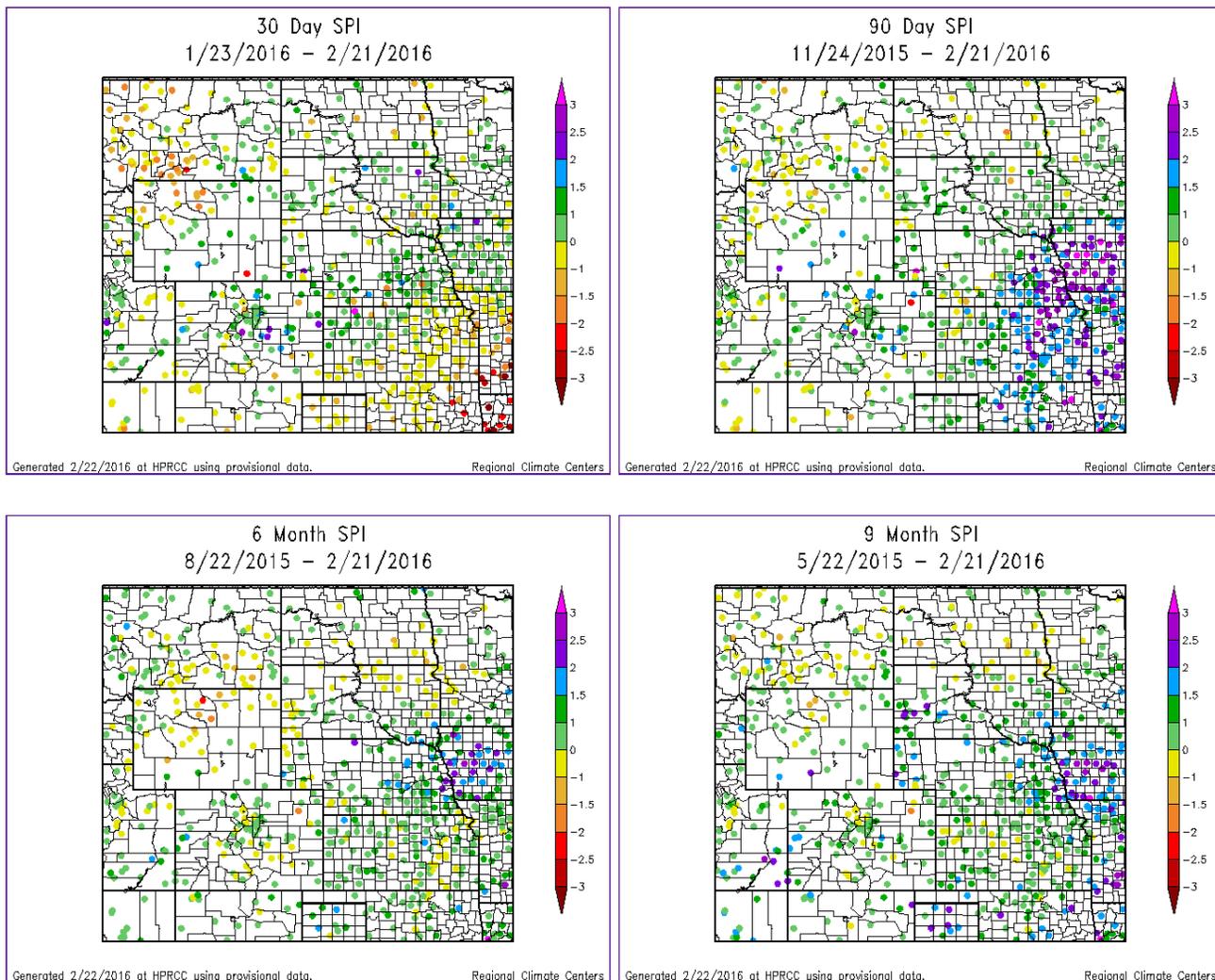
range. There is one station in Carbon County reporting 0th percentile, which may not be a true reading. Jackson, Grand, and Boulder counties all have the highest reporting Snotel sites, with the highest at 71%.

- The Rockies of central Colorado are still in the normal range. The anomalous station in Eagle is now reporting at 9%, while a couple other stations are in the 20's.
- The San Juans are well above the median for the water year to date, although they've dipped a bit this last week. Nevertheless, most are about the 60th percentile, while one has dropped to the 41st percentile.
- The Sangre de Cristos right around average at the 39th to 59th percentile.

### SWE Timeseries Graphs:

- The Upper Green Basin has rebounded a bit, now at 90% of median snowpack to date.
- The Duchesne basin is at 85% of median snowpack.
- The Yampa River Basin is at 96% of median snowpack to date.
- The Upper Colorado River Mainstem is now at 102% of median snowpack.
- The Gunnison Basin is at 108% of median snowpack for the season to date.
- The San Juan Basin is at 106% of median snowpack to date.

## STANDARDIZED PRECIPITATION INDEX



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

### **Short Term (30-day):**

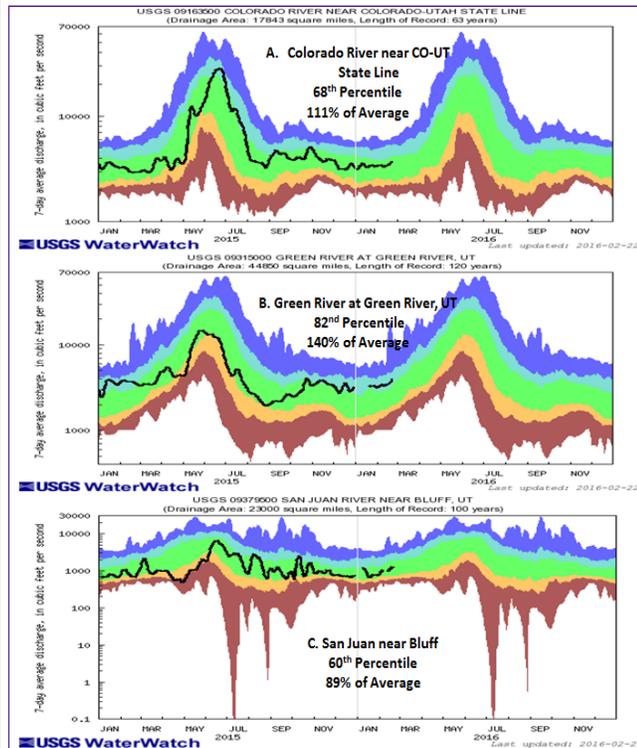
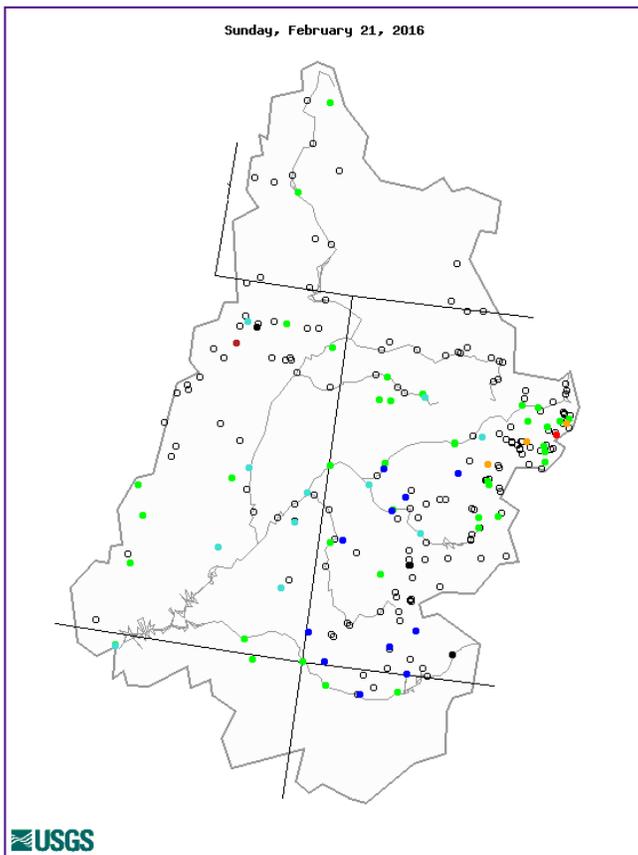
- SPIs in the UCRB are now mostly above normal (+1 to +1.5) over the past 30 days. One station in eastern Grand County is reporting -1.5 SPI.
- All SPIs in the Upper Green River Basin are in the normal to above normal range.
- All 30-day SPIs in eastern Utah are in the normal range.
- Western Colorado is mostly in the normal, -1 to +1, range for short term SPIs. One station in Mesa County, however, is at +2.
- The Rio Grande Basin is in the normal range.
- East of the divide, there is a large mix of SPIs in the short term. The southeast corner of the state appears to be the driest, with some stations in Las Animas and Otero counties at -1.5 SPI. There are a few stations at greater than +2.5 SPI. These stations are in Kit Carson, El Paso, and Park counties.

### **Long Term (6-month):**

- 6-month SPIs in the UCRB are now more in the normal range of SPIs, mostly between -1 and +1 SPI. One station in Mesa County is reporting at +2.
- The Upper Green River basin in Wyoming is also mostly in the normal range, with one station in northern Sweetwater County reporting down to -1.5 SPI.
- Eastern Utah is in the normal range as well, although the more positive stations are in the southern portion of the state.
- Southwest Colorado and the Rio Grande river basin are both reporting in the normal range for the long term 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 at -1.5 SPI.

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## **STREAMFLOW**



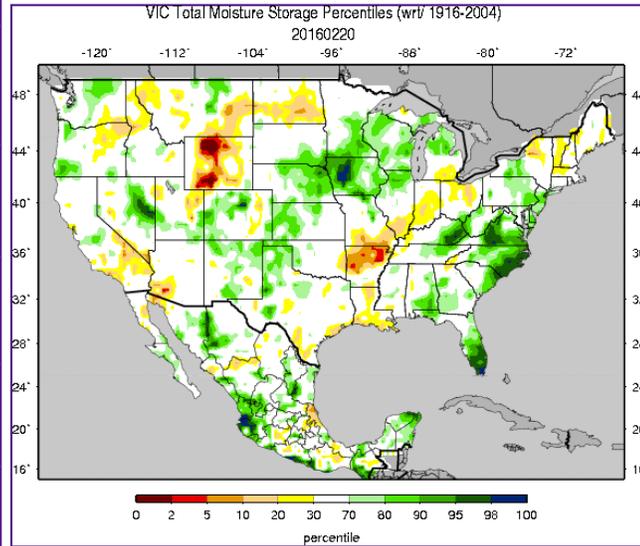
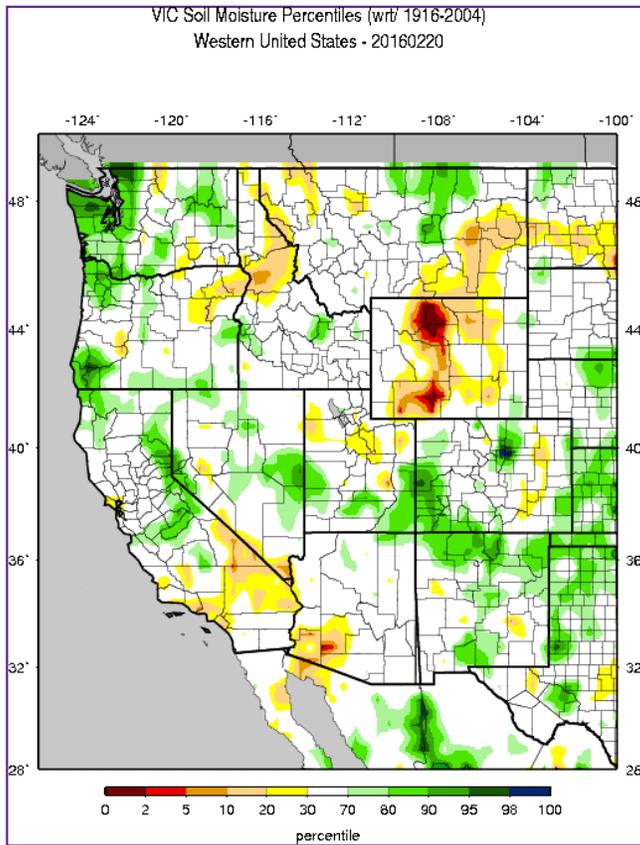
Explanation - Percentile classes							
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		

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.

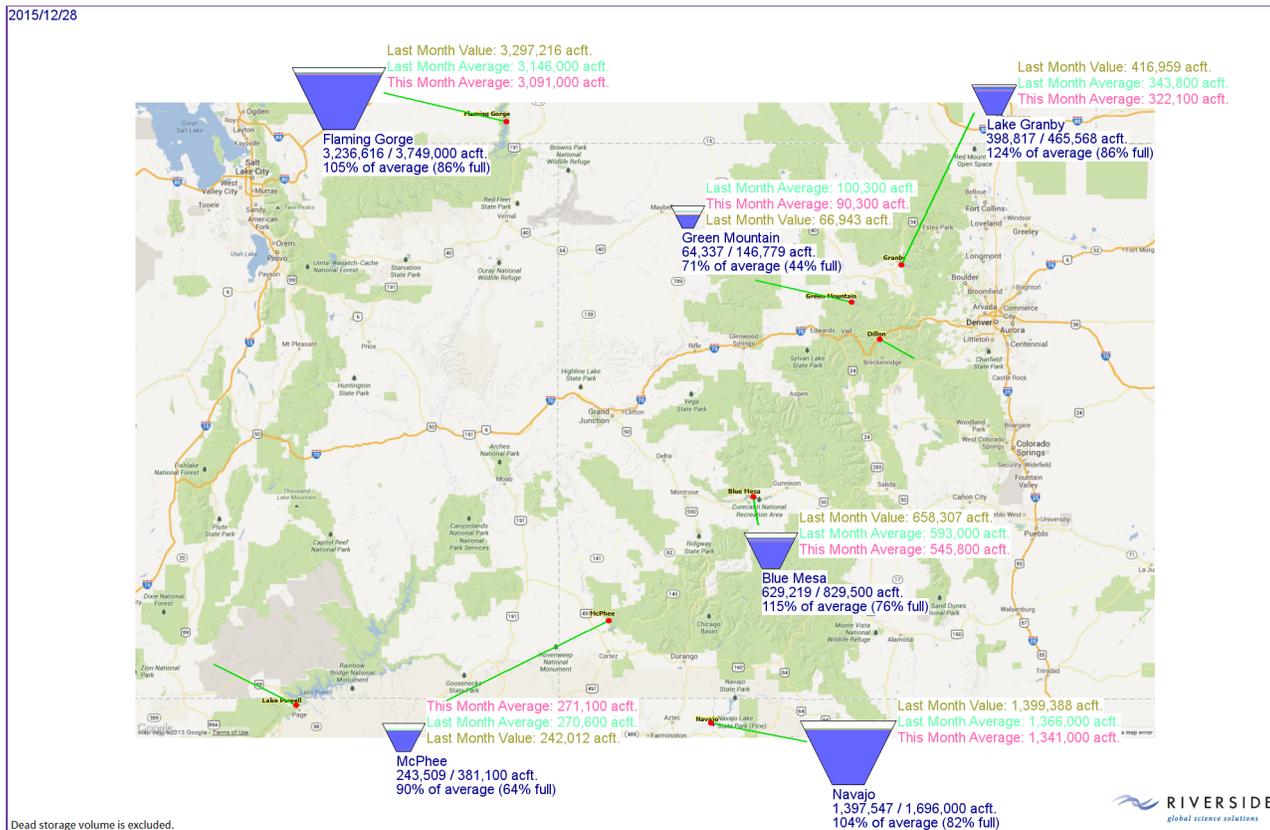
**Streamflow Statistics:**

- The majority of stream gages in the UCRB are now ice-affected and not reporting. Only 46 out of 140 gages are reporting.
- 79% of gages are reporting in the normal to much above normal range for the 7-day average streamflow.
- 21% of gages reporting are in the below normal range. No gages are reporting much below or lowest.
- The Colorado River at the CO-UT state line is now at 111% of normal and in the 68th percentile.
- The Green River at Green River, Utah is reporting at 140% of 7-day average, which corresponds to the 82nd percentile.
- The San Juan River near Bluff, Utah is has increased to 89% of average, which corresponds to the 60th percentile.

# SURFACE WATER



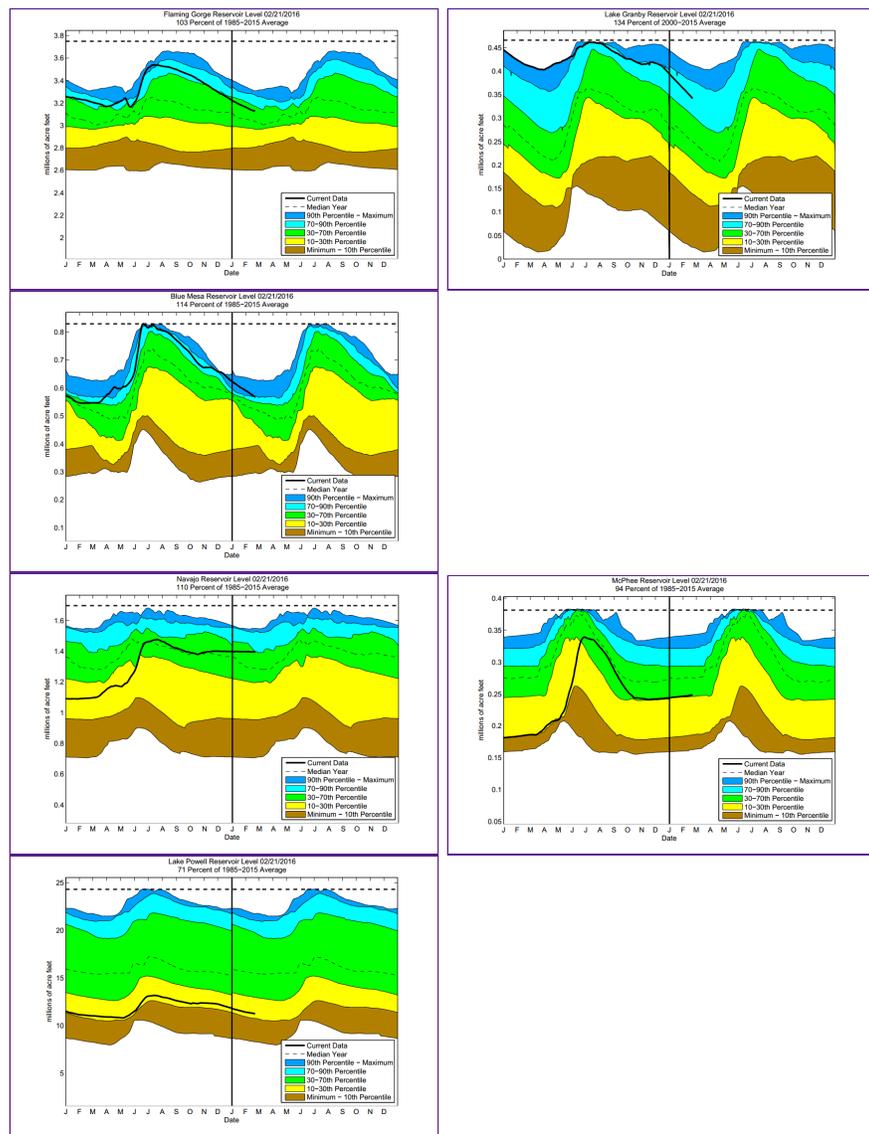
The top left image shows VIC modeled soil moisture as a percentile ranking. The top right image shows VIC+SWE.



The above image shows last month's and this month's current volumes of the major

The above image shows last month's and this month's current volumes of the major reservoirs in the UCRB, with percent of average and percent of capacity.

The graphs shown below are plots of reservoir volumes over the past full year and current year to date (black). The dashed line at the top of each graphic indicates the reservoir's capacity, and the background color-coded shading provides context for the range of reservoir levels observed over the past 30 years. The data are obtained from the Bureau of Reclamation. Some of the reservoir percentiles don't line up at the new year due to differences in reservoir levels at the beginning of 1985 and the end of 2014. Dead storage has been subtracted. Note: Lake Granby data are obtained from the Colorado Division of Water Resources, and only goes back to the year 2000.



**VIC:**

- 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 have seen a bit of

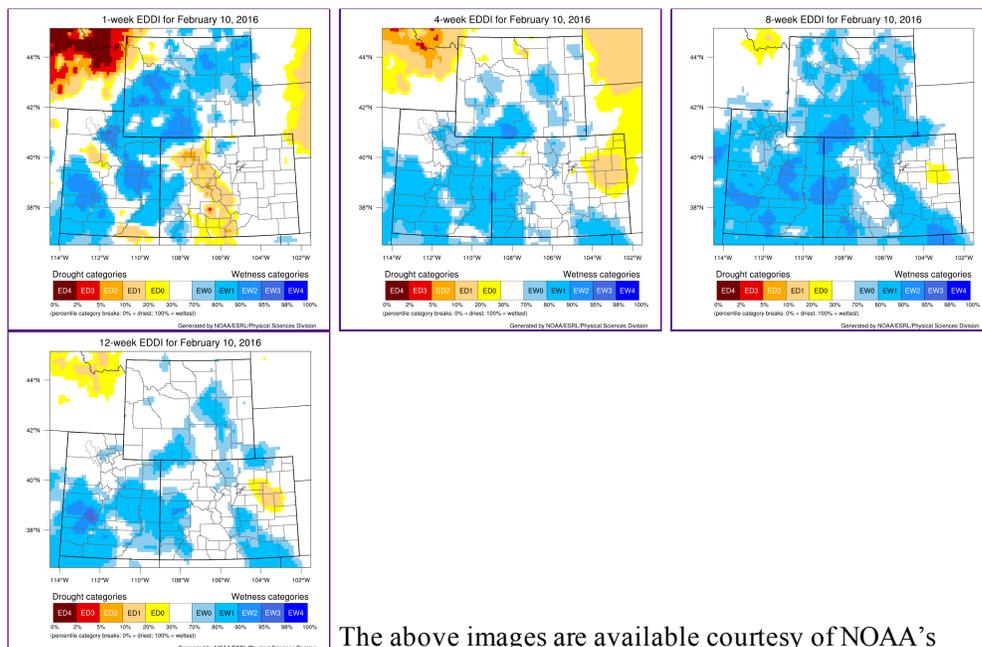
improvement up to the 20-30th percentiles.

- Western Colorado still has soils at or even well above average for soil moisture. Mesa County in particular has soil moistures above the 95th percentile in it's southwest corner.
- 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 is generally in the normal range for soil moistures. Some areas, like Washington and Crowley into Pueblo counties are down near the 20th percentile, while 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):

- Flaming Gorge is at 105% of average.
- Lake Granby is at 124% of average.
- Green Mountain is at 71% of average.
- Blue Mesa is at 115% of average.
- Navajo is at 104% of average.
- McPhee is at 90% of average.
- Lake Powell is 71% of average.

## EVAPOTRANSPIRATION



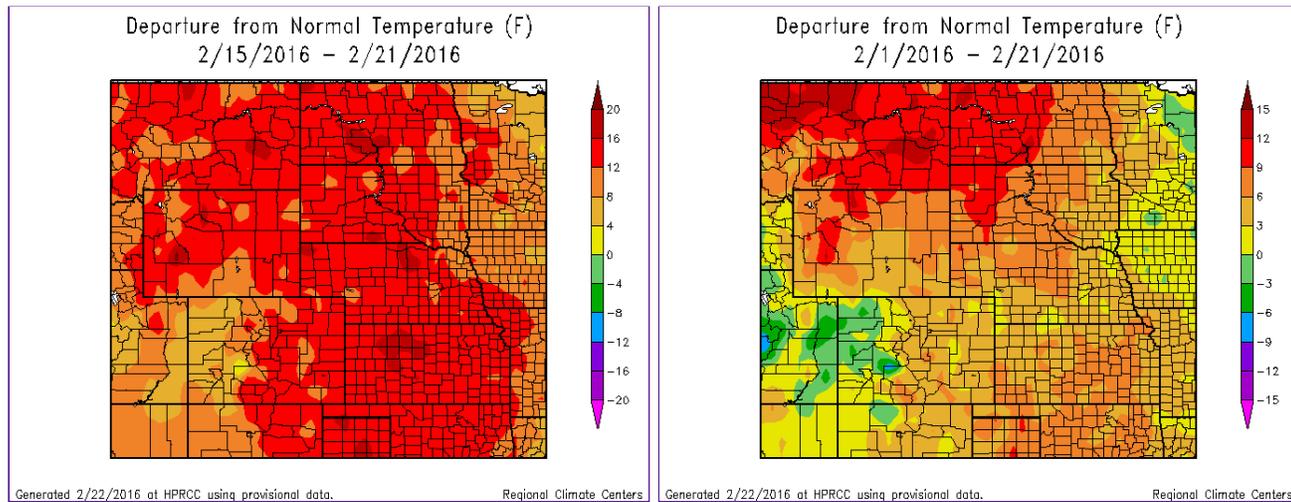
The above images are available courtesy of NOAA's

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

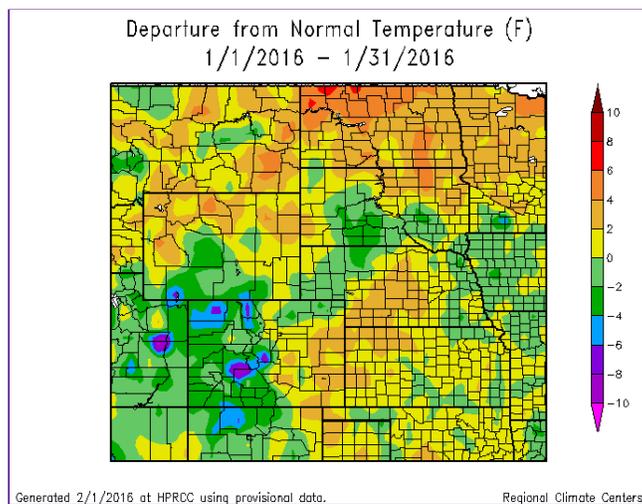
<http://droughtmonitor.unl.edu/AboutUs/ClassificationScheme.aspx>. Data used to

generate these maps come from the North American Land Data Assimilation System Phase-2 (NLDA-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 were above normal over the past week, generally 4 to 8 degrees above normal.
- The Upper Green River basin in Wyoming was also well above normal, between 8 and 16 degrees warmer than the week's average.
- Eastern Utah was above normal, mostly between 4 and 8 degrees warmer than normal. Southern Duchesne County was the warmest at more than 12 degrees above normal.
- Western Colorado was mostly in the 4 to 8 degrees above normal

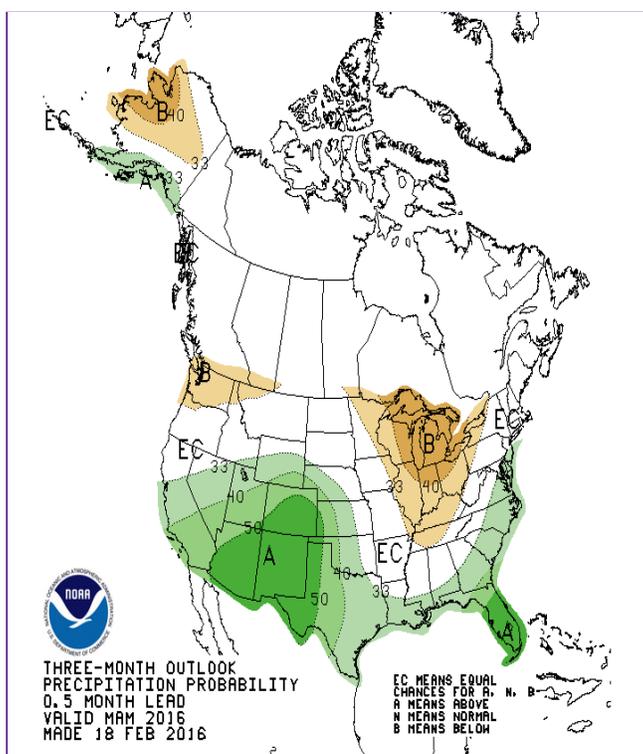
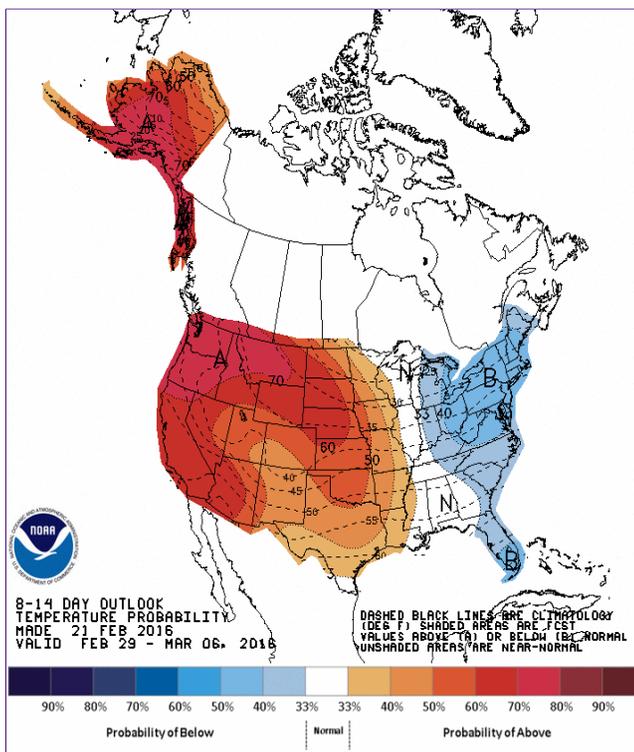
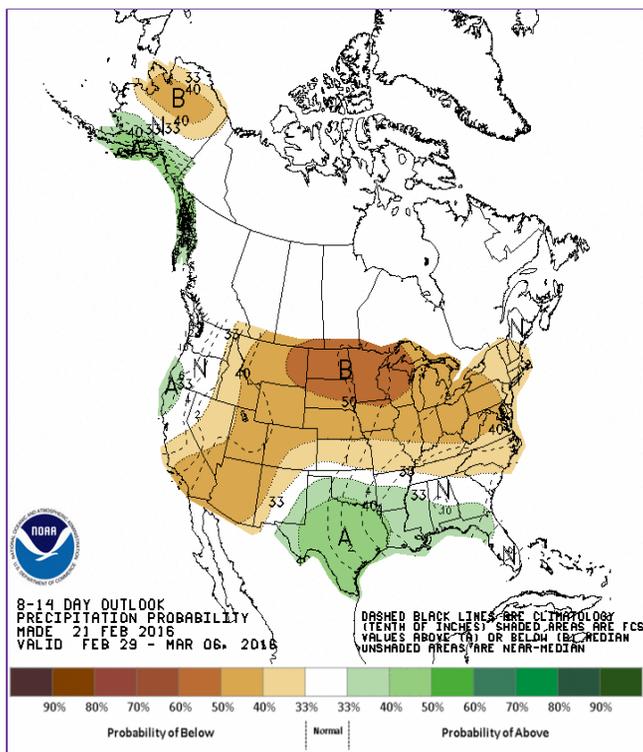
range, while an area in southeast Gunnison and northwest Saguache counties were about normal.

- Colorado east of the divide was very much above normal for temperatures over the past week. All areas were more than 4 degrees warmer than normal, while most were at least 12 degrees above average.

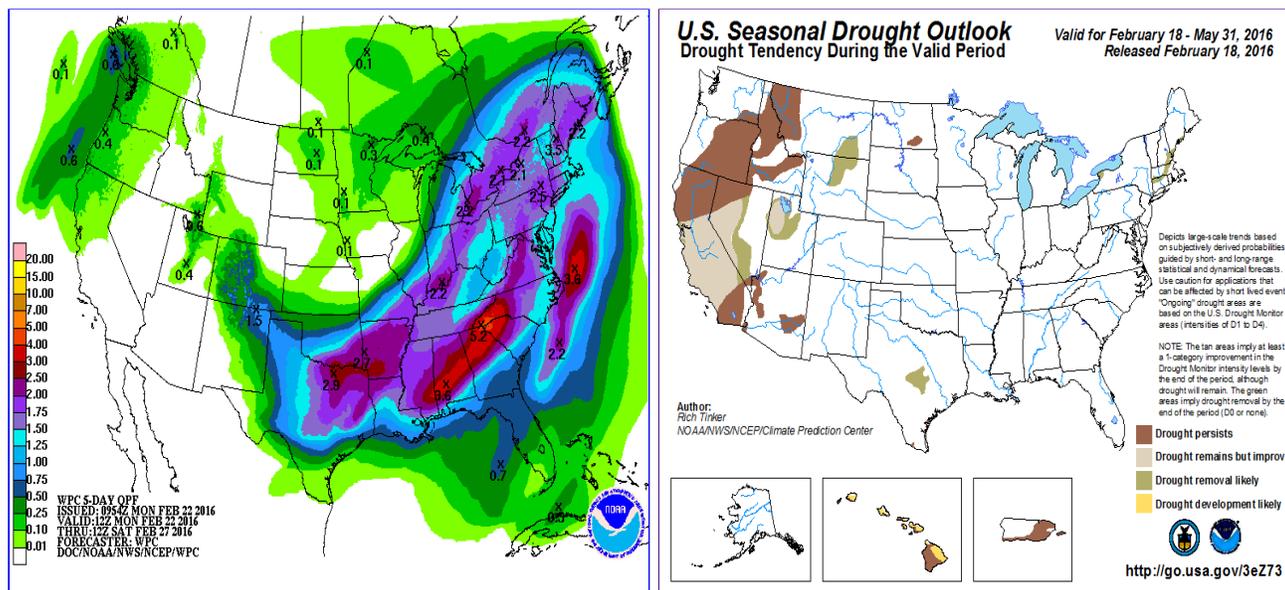
### **January Temperatures:**

- The UCRB for January was in the normal to slightly cooler than normal range, with temperatures between 2 to -4 degrees from normal.
  - Further north in the Yampa and North Platte river basins temperatures were, on average, below normal with spots in Moffat and Jackson counties nearing 8 degrees below normal.
  - The Upper Green River Basin in Wyoming saw temperatures mostly below normal in Uinta, Sweetwater, and Fremont counties, and at or above normal in Lincoln and Sublette counties.
  - Eastern Utah was at or below normal for January temperatures. Eastern Carbon and northeastern Emery counties were the coolest, down to 10 degrees below average.
  - Southwest Colorado was slightly below normal for temperatures, while an area in southeast Gunnison/northwest Saguache counties was fairly far below normal at 8 degrees or colder than their January average.
  - Colorado east of the divide was at or above normal for temperatures in January. The coldest area was southern Park County at 8 degrees below normal, while most of the high plains, save for the far northeastern part of the state, were between 0 and 4 degrees above normal.
- 

## **FORECAST AND OUTLOOK**



The top two images show Climate Prediction Center's Precipitation and Temperature outlooks for 8 - 14 days. The middle image shows the 3 months Precipitation outlook. The bottom left image shows the Hydrologic Prediction Center's Quantitative Precipitation Forecast accumulation for the five days between Tuesday 12Z and ending Sunday 12Z. The bottom right image shows the Climate Prediction Center's most recent release of the U.S. Seasonal Drought Outlook.



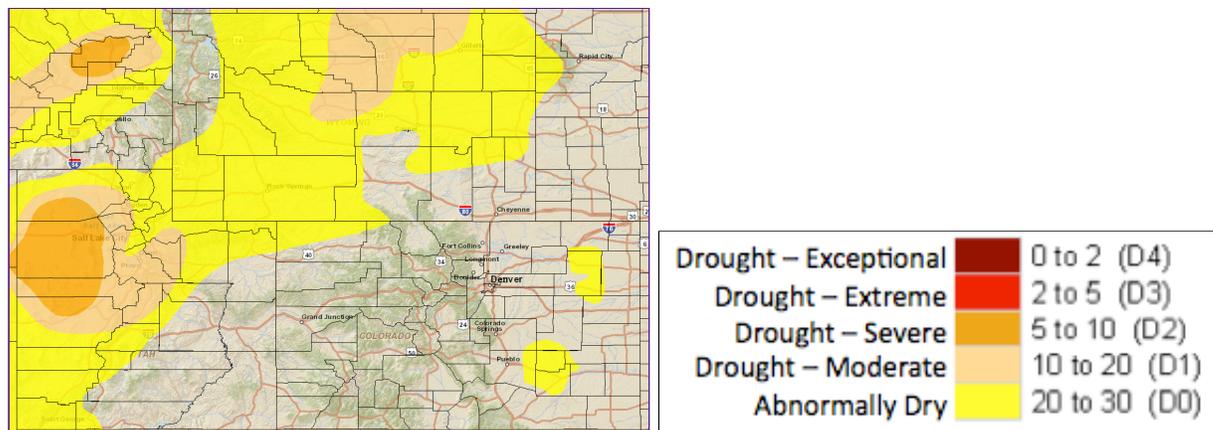
### Short Term: (2/23)

- Currently temperatures are above average in the southern and western portions of the UCRB with areas farther north and east still rebounding from a cold frontal passage on Monday. As the week continues on the warmer temperatures from the southwest will be advected up into the rest of the basin and eastern Colorado. No precipitation should be expected between Tuesday and Friday.
- This weekend the northern end of the basin will be clipped by a shortwave off to the northeast. This will bring a slight cool-down to northeast Colorado and precipitation totals of less than 0.25" to the northern Rockies.
- Early to mid next week models are showing possibility of a polar airmass moving in from the north bringing much cooler temperatures to the eastern UCRB and eastern Colorado along with up to 0.50" of precipitation for the northern Rockies. Some light snowfall will be possible across much of Colorado.

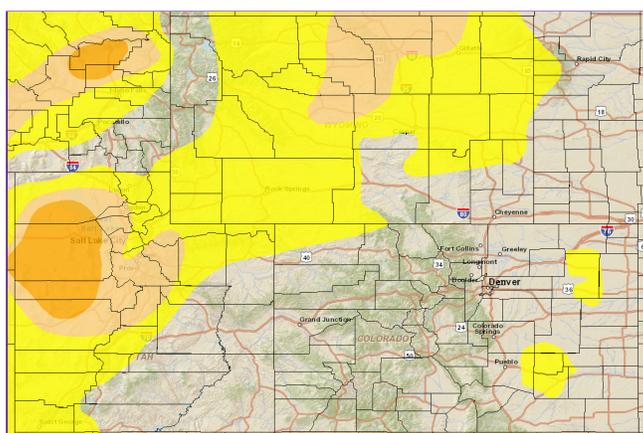
### Longer Term:

- The 8-14 day precipitation outlook shows increased chances for below average precipitation for the entirety of the UCRB and eastern Colorado. These chances are strongest west of the Continental Divide, and north of the Palmer Divide.
- The 8-14 day temperature outlook shows increased chances for above average temperatures for the entirety of the UCRB and eastern Colorado. These chances are strongest extreme northeast Colorado and weakest in the far southern reach of the UCRB.
- 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: February 23, 2016

Warm and fairly dry conditions persisted again this week for the Upper Colorado River basin and Colorado, with high pressure dominating the region. Temperatures were generally 4 to 8 degrees above normal across the entire area, and in many spots were more than 12 degrees above their average. The high elevation portion of the Rockies in northern Colorado were the big winners for precipitation this past week, especially western Jackson County. The high plains, however, were almost completely dry. The short term forecast for most of the region is looking similar to these past couple of weeks.

Warm and dry as well as windy conditions have put a small dent in short term SPIs; however the UCRB is still showing short term SPIs at or above normal. This exists in longer term (6 and 9 month) SPIs as well. Some stations on the high plains, such as the one in Washington County, are still showing low SPI values in the long term. Current basin-wide Snotel water equivalent percent of median numbers for high elevations are also all within the normal range, while VIC modeled soil moisture profiles continue to show at or above normal moisture for much of Colorado (the very dry anomaly in Sweetwater County, Wyoming is still present).

## Recommendations:

**UCRB:** Status quo.

**Eastern Colorado:** Status quo. We will continue to keep an eye on areas in the high plains.

Given two weeks of warm, dry, and windy conditions and a forecast that looks quite similar for next week, some areas of D0 expansion may be in store.