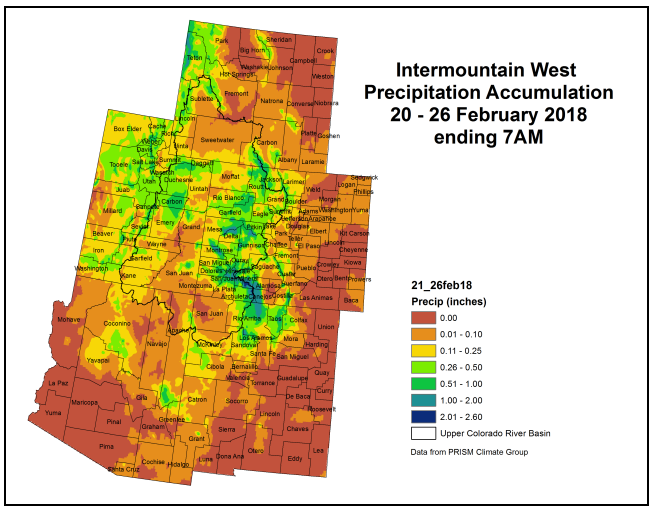
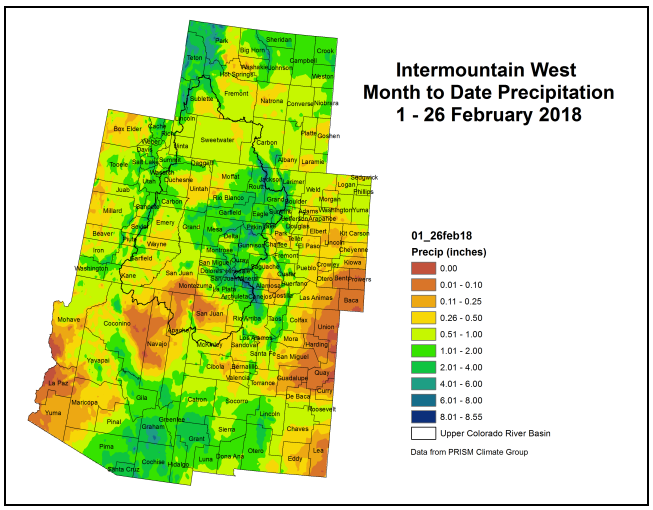
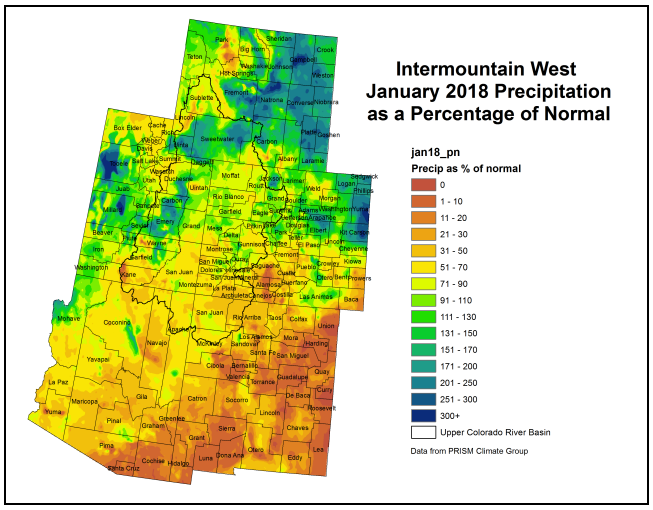
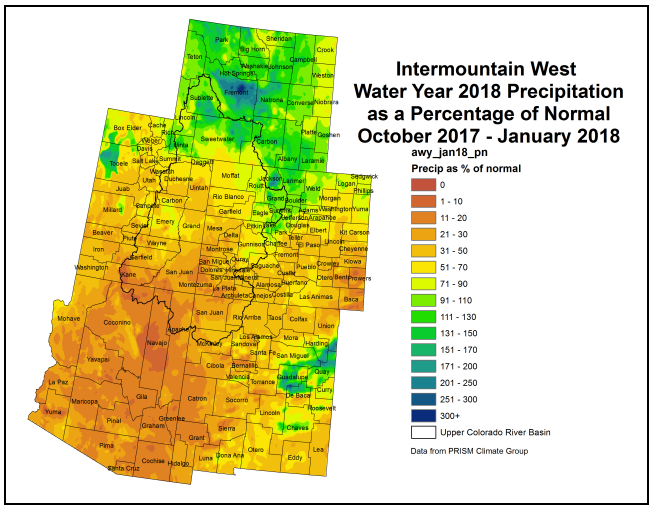
NIDIS Intermountain West
Drought Early Warning System
February 27, 2018

Precipitation



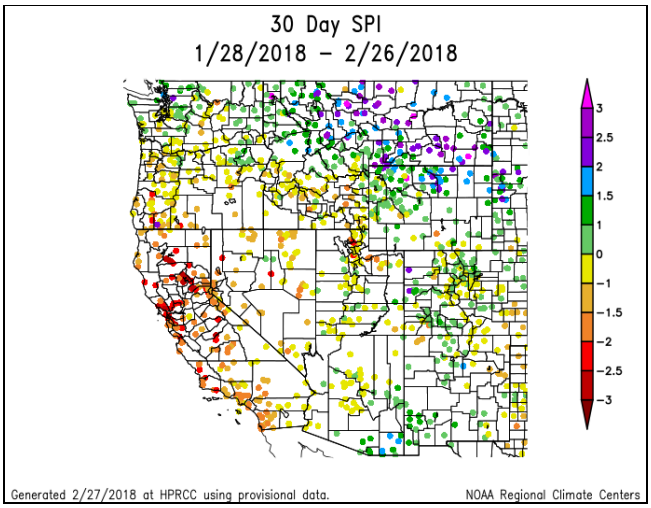


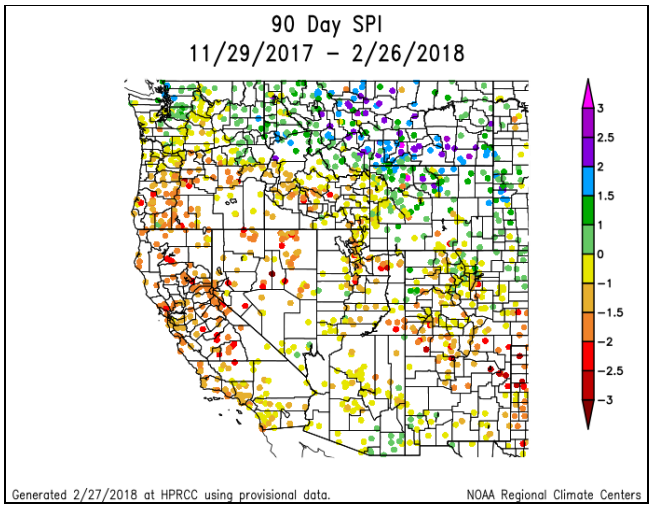


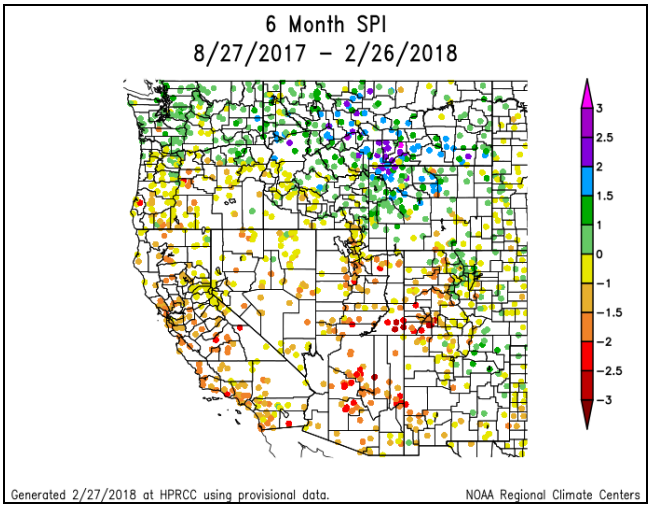


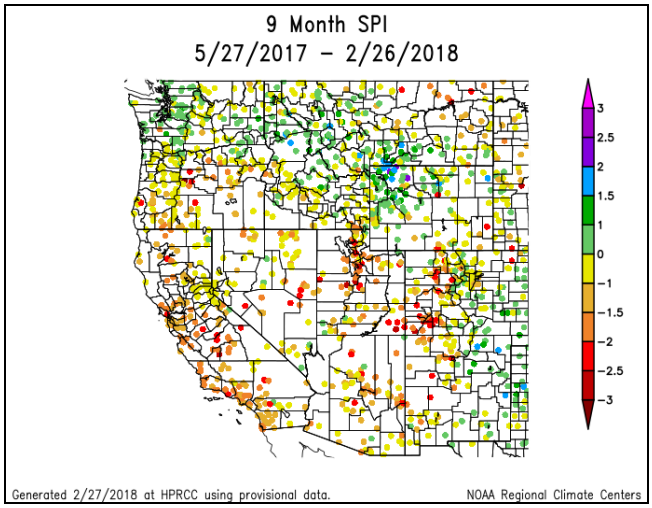
The images above use daily precipitation statistics from NWS COOP, CoCoRaHS, and CoAgMet stations. From top to bottom, and left to right: most recent 7-days of accumulated precipitation in inches; current month-to-date accumulated precipitation in inches; last month's precipitation as a percent of average; water-year-to-date precipitation as a percent of average.

Standardized Precipitation Index



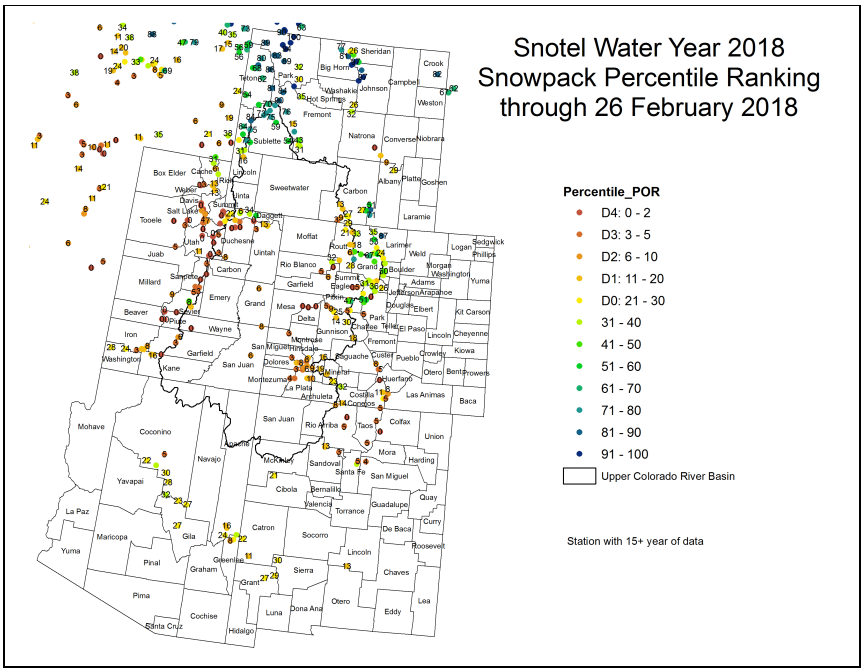




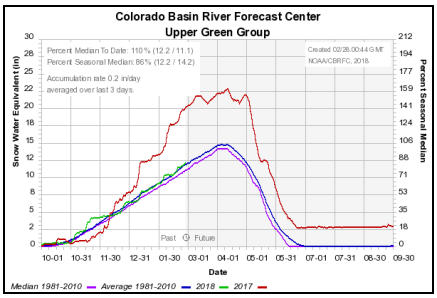


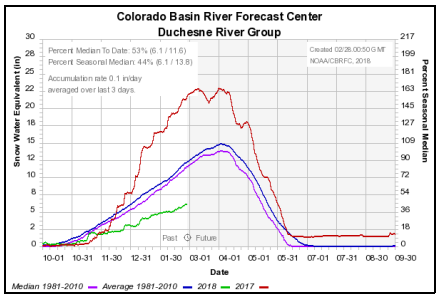
Standardized Precipitation Index standardizes precipitation accumulations for a specified time period into percentile rankings. -1.0 to -1.5 is equivalent to a D1 to D2. -1.5 to -2.0 is equivalent to a D2 to D3. -2.0 and worse is equivalent to a D3 to D4. 30- and 60-day SPIs focus on short-term conditions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

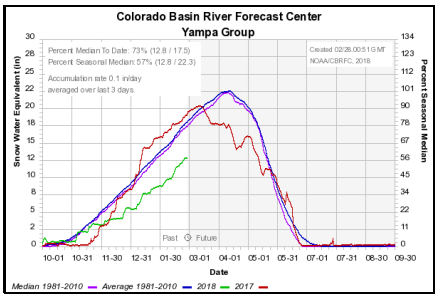
Snotel and Snowpack

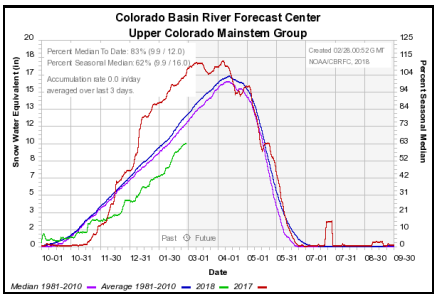


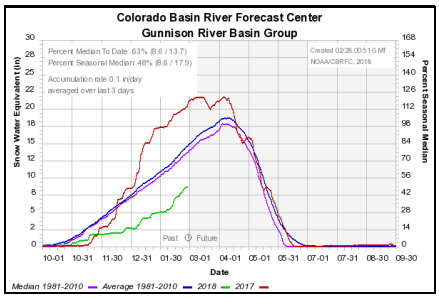
The above image shows SNOTEL snowpack percentiles for each SNOTEL site in the Intermountain West. The images below show accumulated snow water equivalent in inches (green) compared to average (blue) and last year (red) for several different sub-basins across the UCRB (and were created by the Colorado Basin River Forecast Center).

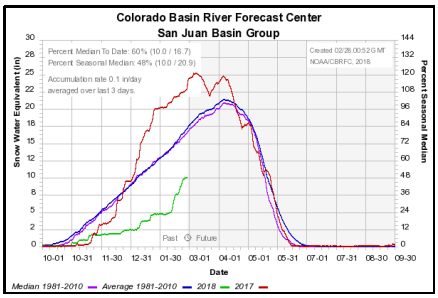




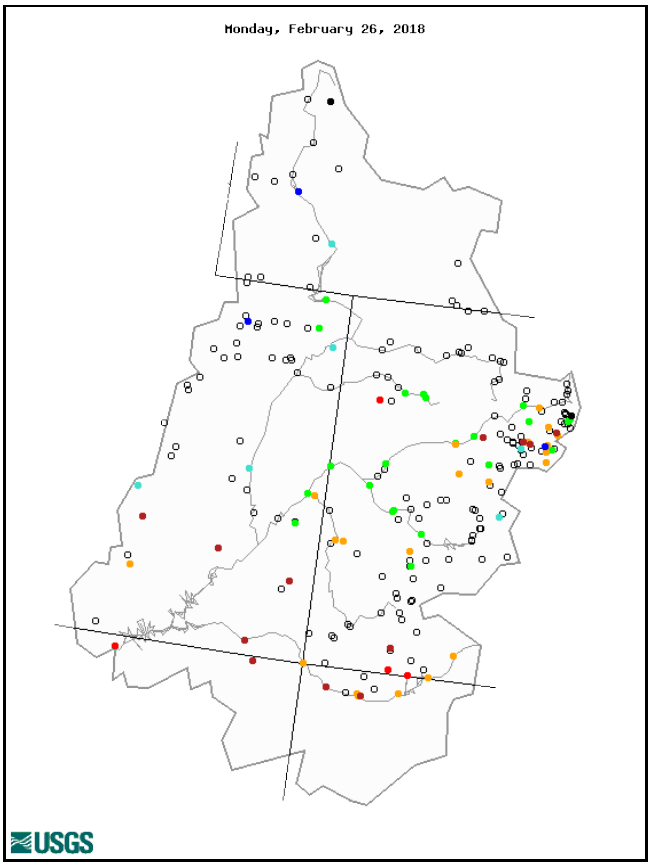


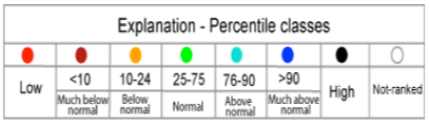


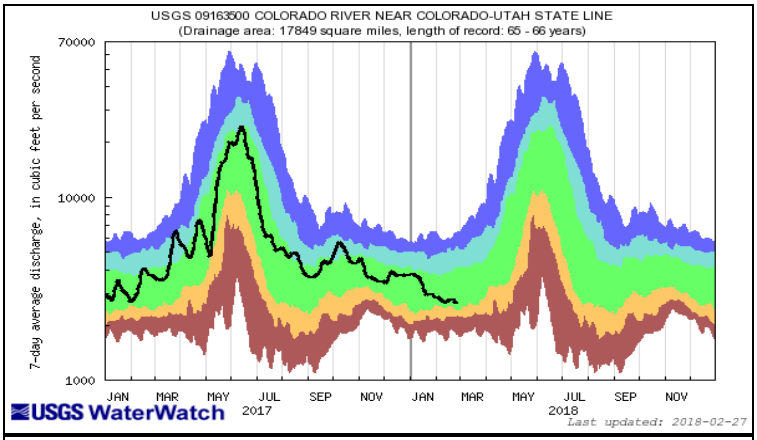


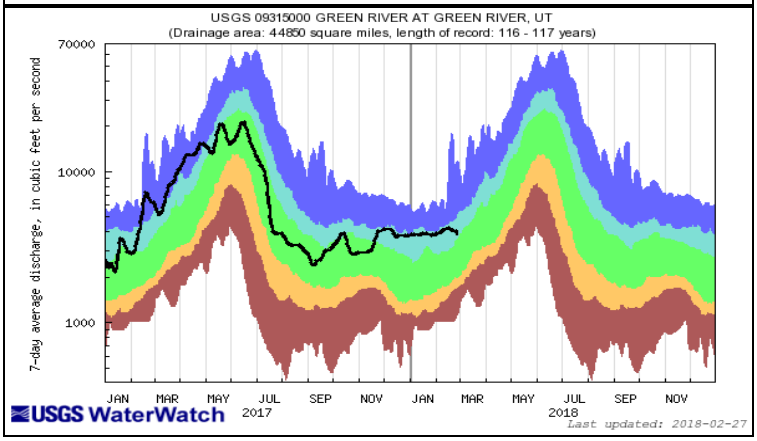


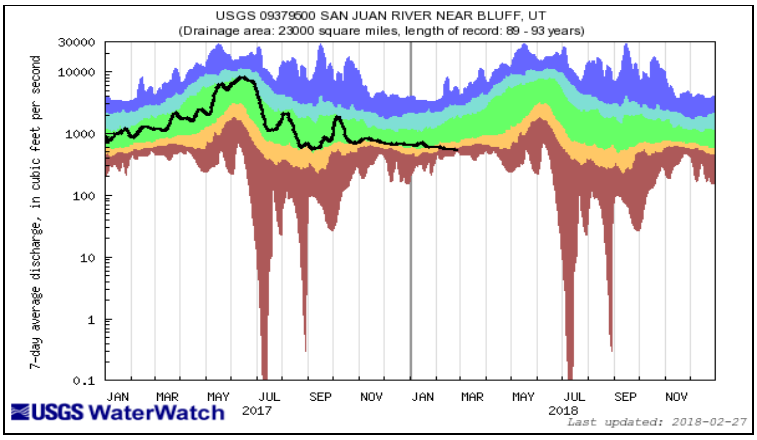
Streamflow


Monday, February 26, 2018
USGS


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

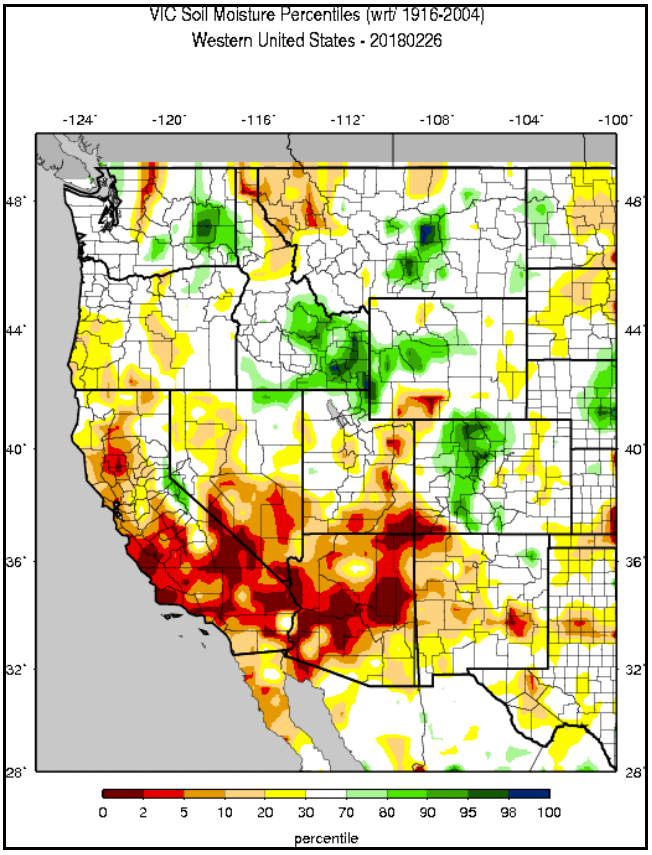

USGS 09163500 COLORADO RIVER NEAR COLORADO-UTAH STATE LINE
(Drainage area: 17849 square miles, length of record: 65 - 66 years)
7-day average discharge, in cubic feet per second
70000
10000
1000
JAN MAR MAY JUL SEP NOV JAN MAR MAY JUL SEP NOV
2017
2018
USGS WaterWatch
Last updated: 2018-02-27

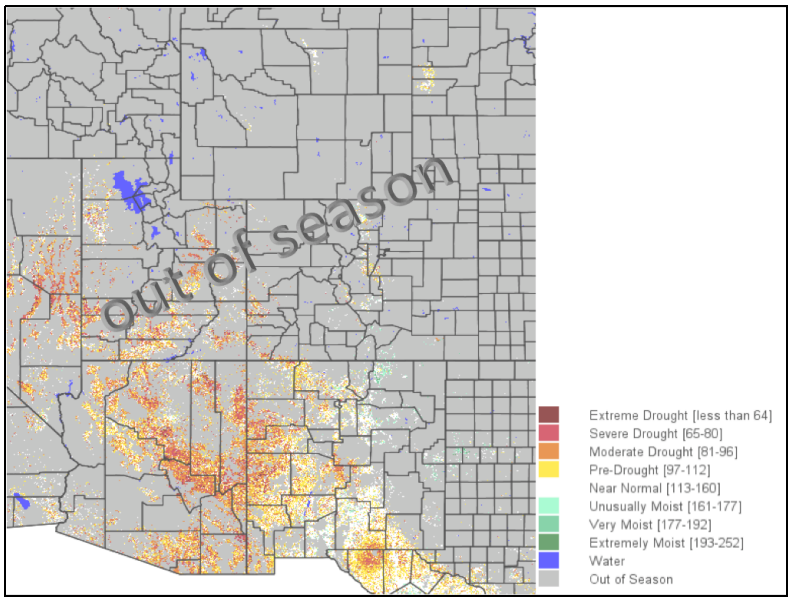

USGS 09315000 GREEN RIVER AT GREEN RIVER, UT
(Drainage area: 44850 square miles, length of record: 116 - 117 years)
7-day average discharge, in cubic feet per second
70000
10000
1000
JAN MAR MAY JUL SEP NOV JAN MAR MAY JUL SEP NOV
2017
2018
USGS WaterWatch
Last updated: 2018-02-27



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.

Surface Water

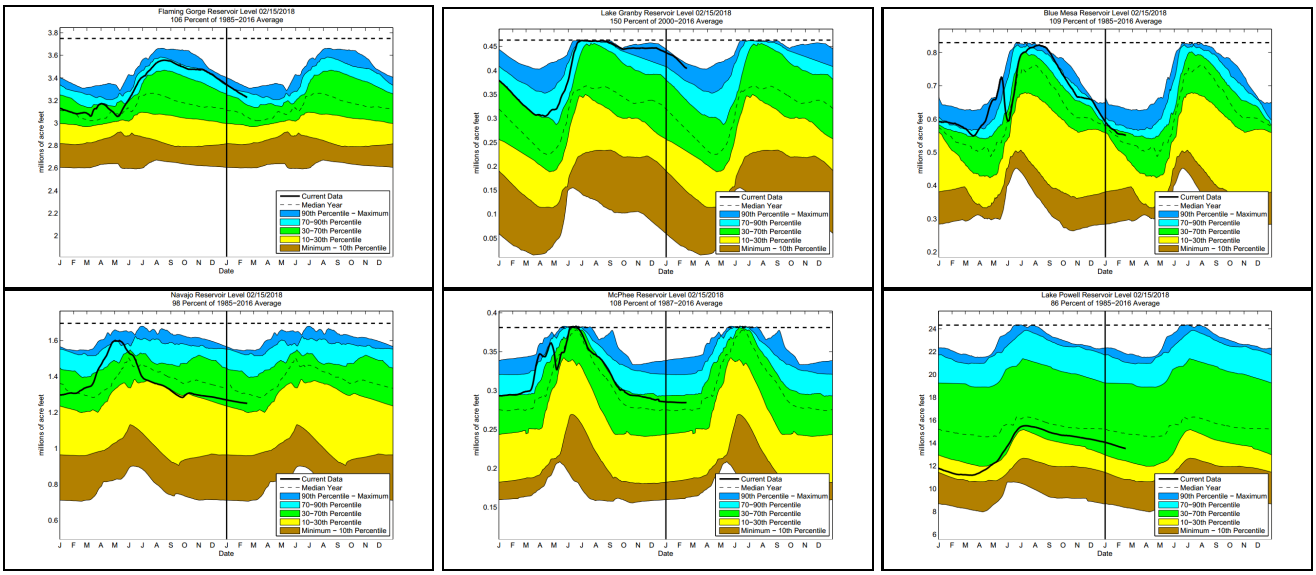




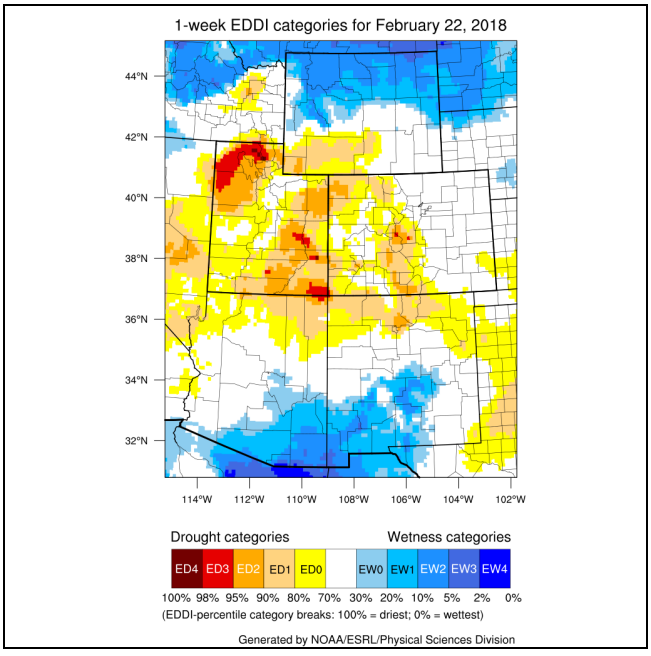
The top left image shows VIC modeled soil moisture as a percentile ranking. The top right image shows satellite-derived vegetation from the VegDRI product (which updates on Mondays).

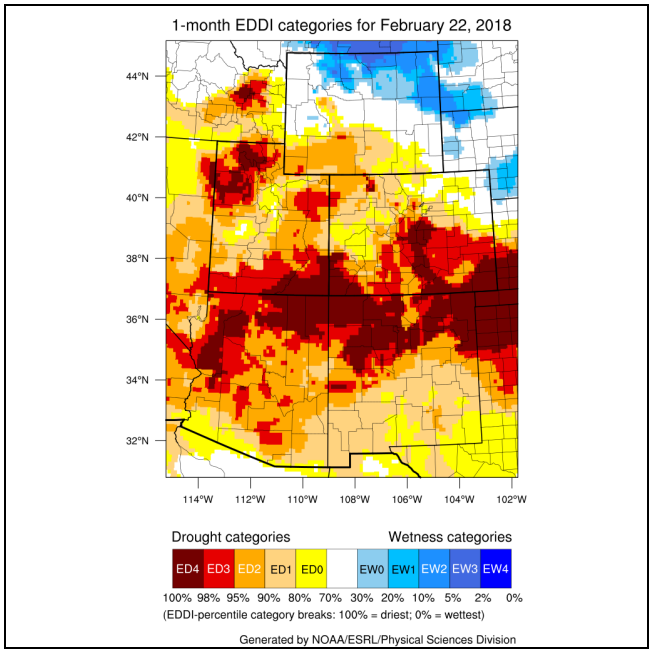
The graphs shown below are plots of reservoir volumes over the past full year and current year to date (black). The dashed line at the top of each graphic indicates the reservoir's capacity, and the background color-coded shading provides context for the range of reservoir

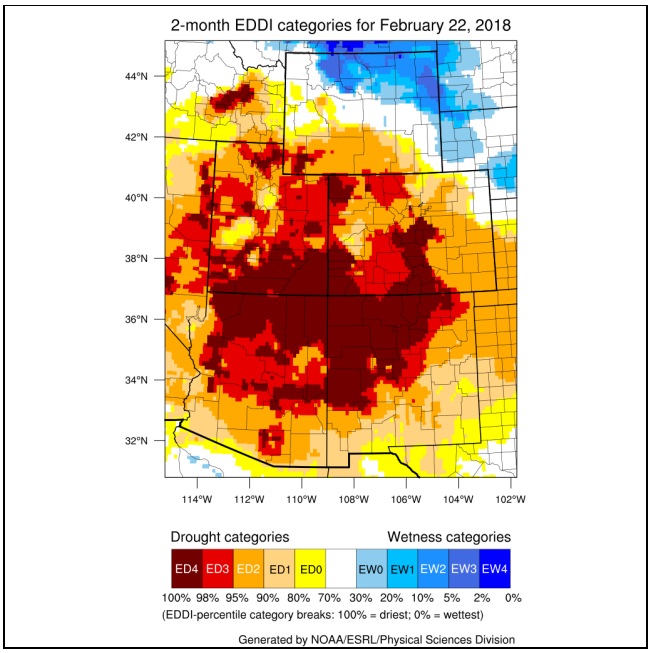
levels observed over the past 30 years. The data are obtained from the Bureau of Reclamation. Some of the reservoir percentiles don't line up at the new year due to differences in reservoir levels at the beginning of 1985 and the end of 2014. Dead storage has been subtracted. Note: Lake Granby data are obtained from the Colorado Division of Water Resources, and only goes back to the year 2000.

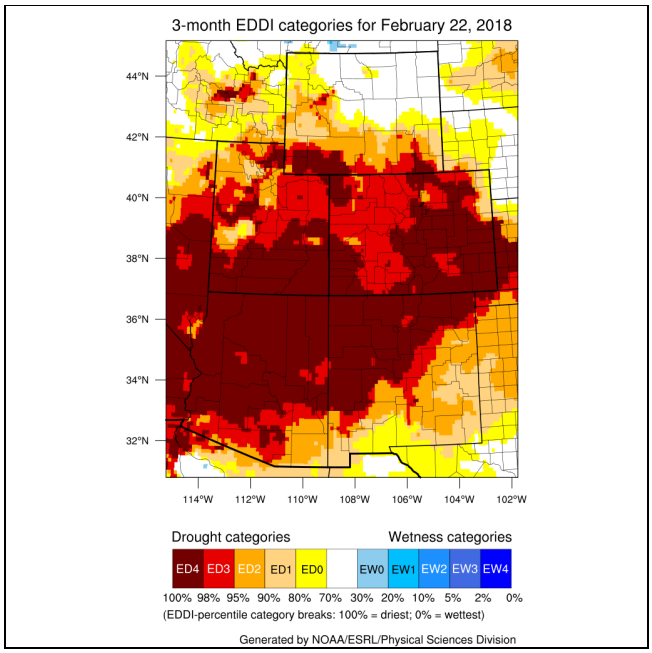


Evaporative Demand



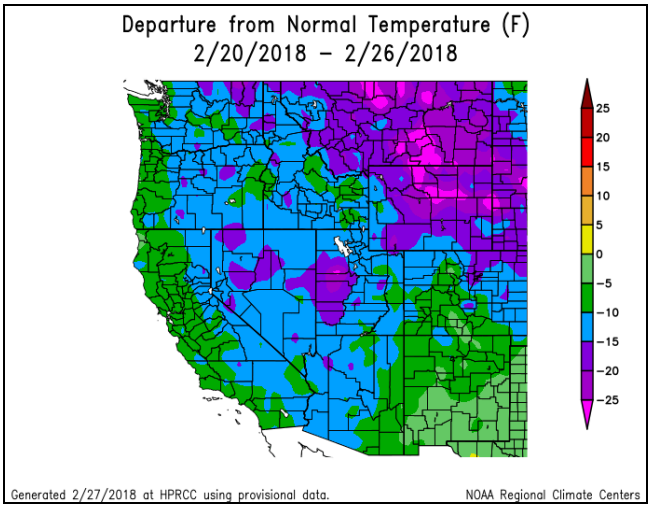


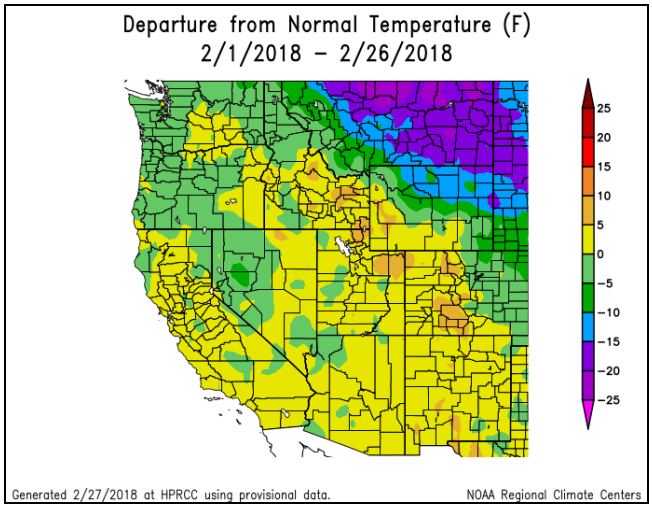




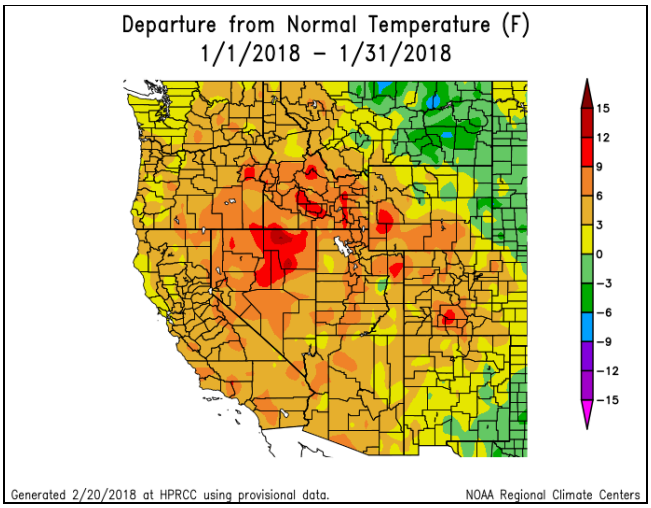
The above images are available courtesy of NOAA's Evaporative Demand Drought Index (EDDI). Drought classification listed is a function of the depth of reference evapotranspiration accumulated over a given period of record with respect to a climatology of 1981-2010. The drought categories displayed are in line with the US Drought Monitor's Percentile Ranking Scheme. 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

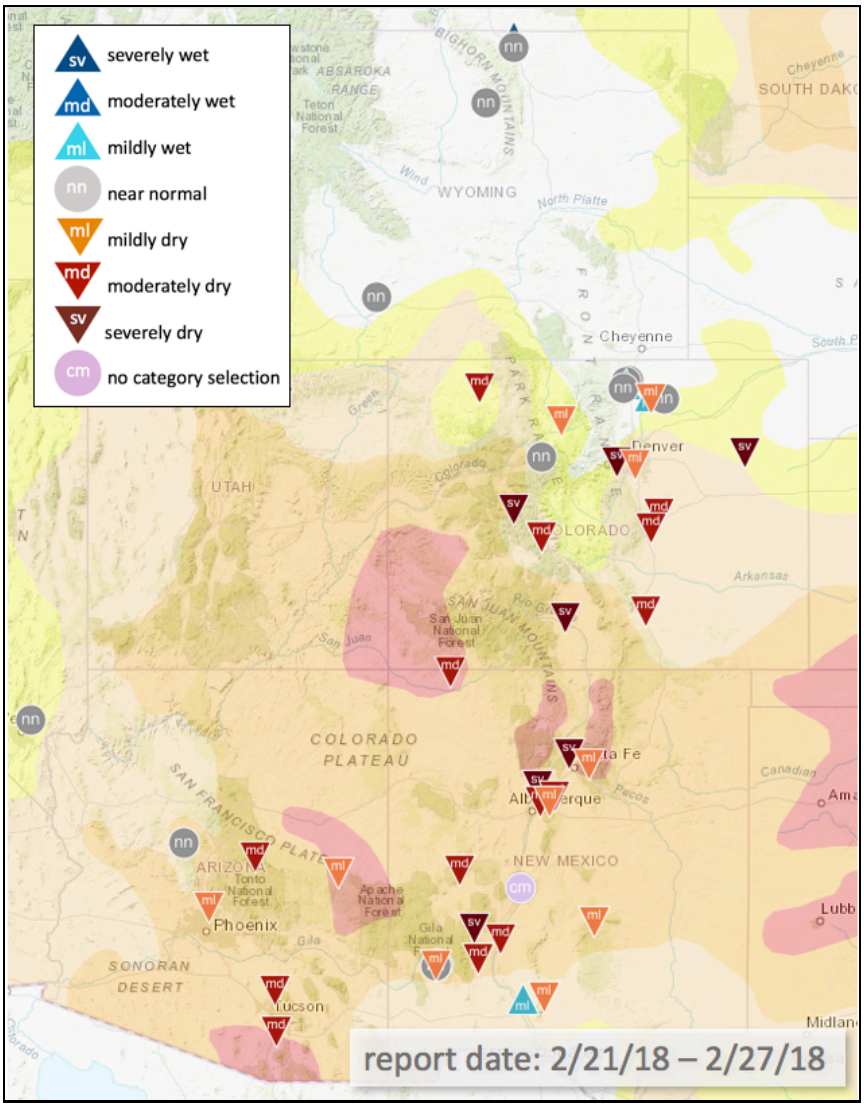




All images show temperature departures from average over different time periods (last 7 days on top left; month-to-date on top right; last full month on bottom). Temperature departure maps provided by HPRCC ACIS.



Condition Monitoring and Impacts



Map of current condition monitoring reports submitted to CoCoRaHS in the last week overlaid on the

current U.S. Drought Monitor depiction. Specific impacts reports from local experts listed below.

Baca County, CSU Research Center

Most of the wheat is still green. But it needs to rain soon as conditions are getting worse each day. Baca County is in severe drought conditions, but not yet extreme drought. Person reporting recently went to western Oklahoma and conditions were worse there than in Colorado.

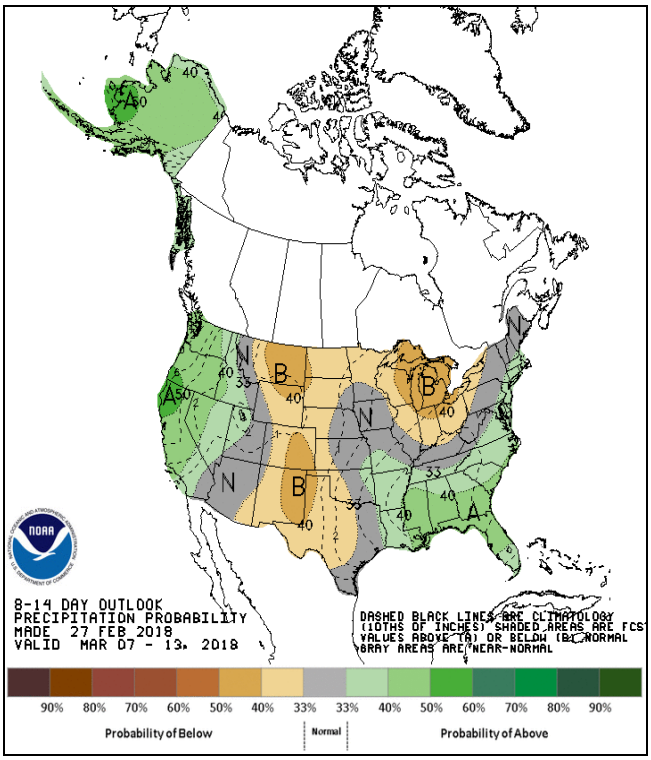
Springfield, CO FSA

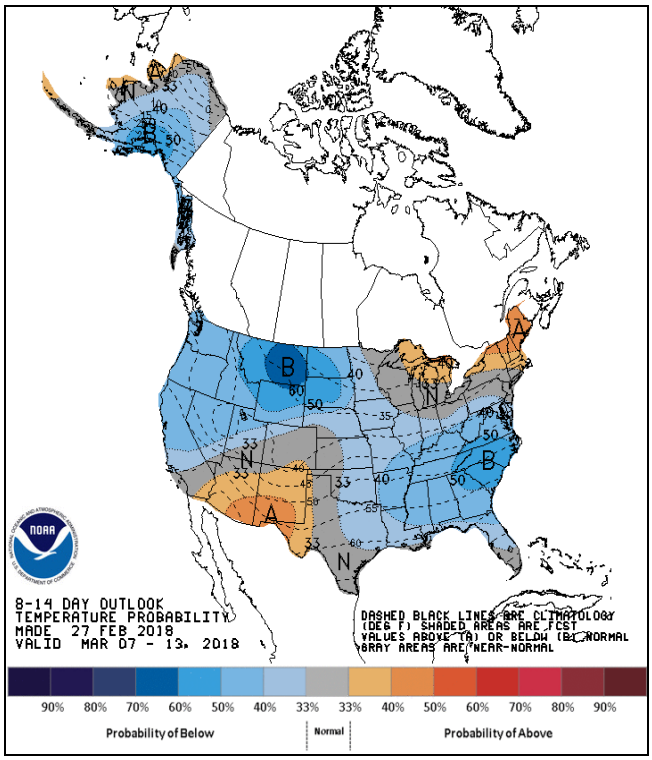
After taking a drive through the county, were pleasantly surprised to look at results from a soil probe. In northeast Baca County, moisture was found down to an 8 inch depth. In southwest portion, it was down to a foot below the surface. Wheat and pastures look good. Top soil isn't blowing near as bad as it has in past years. Nothing compared to what they saw in 2011 and 2012. Conditions could easily go D3 in the spring if some moisture doesn't come soon, but not there yet.

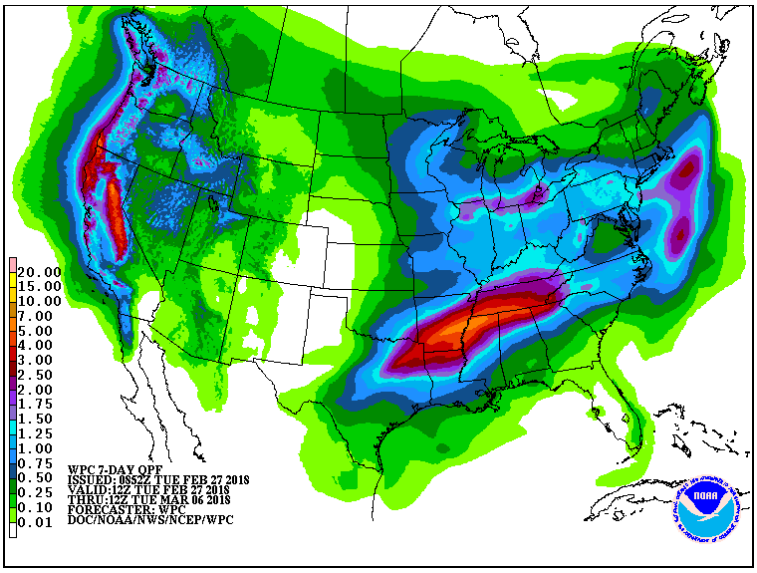
Northern Colorado Mountains

Two separate reports that SNOTEL shows decent numbers for northern Colorado mountains. But the SNOTELS are higher elevation and aren't capturing how bad the snowpack is at the lower-to-mid elevation foothills areas. Snowpack is much worse than what's depicted by SNOTEL as you go lower in elevation.

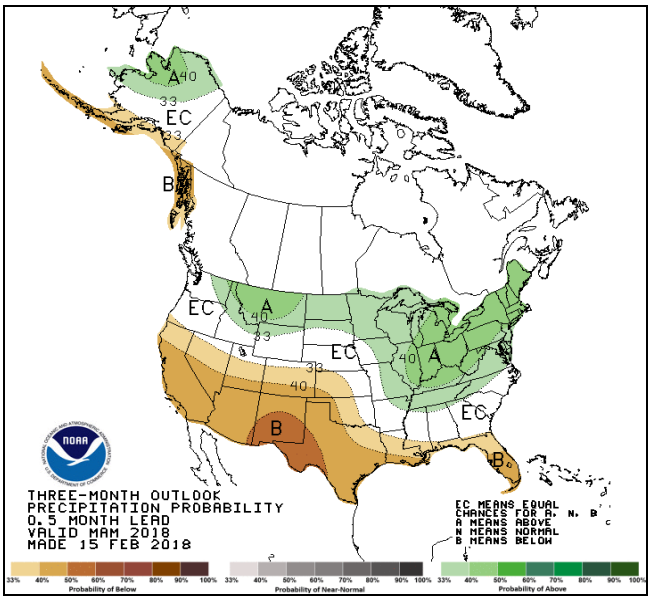
Outlook

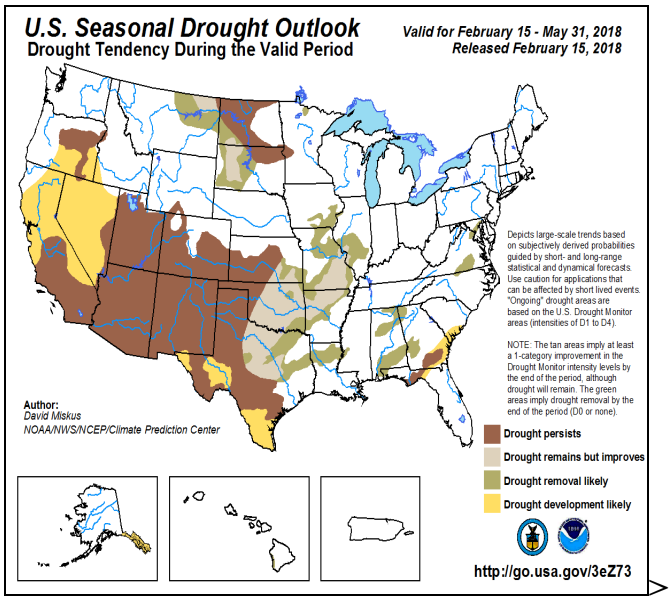




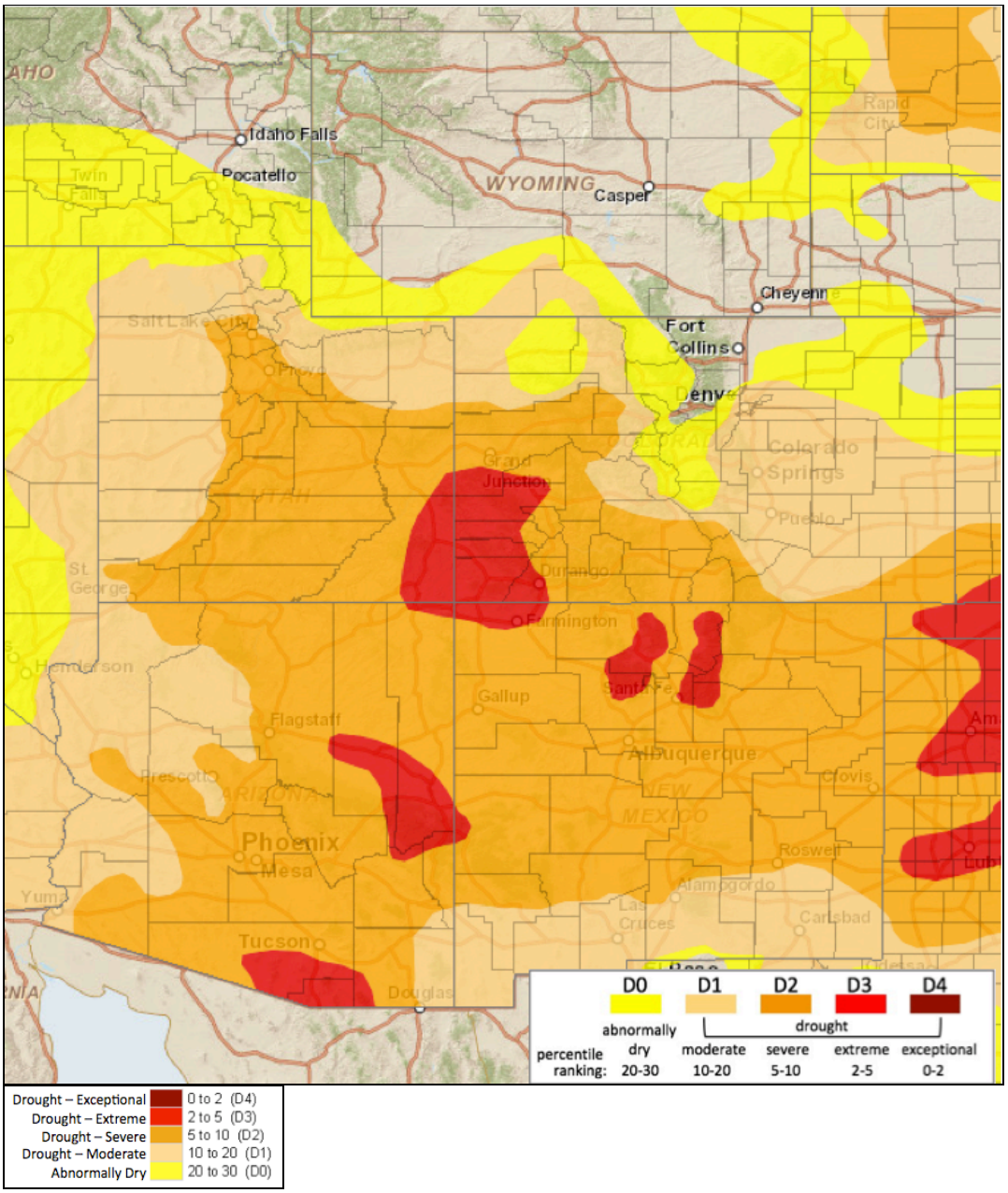


The top two images show Climate Prediction Center's Precipitation and Temperature outlooks for 8 - 14 days. The middle image shows the Weather Prediction Center's Quantitative Precipitation Forecast accumulation for seven days. The bottom left image shows the 3-month precipitation outlook from Climate Prediction Center, and the bottom right image shows the Climate Prediction Center's most recent release of the U.S. Seasonal Drought Outlook.

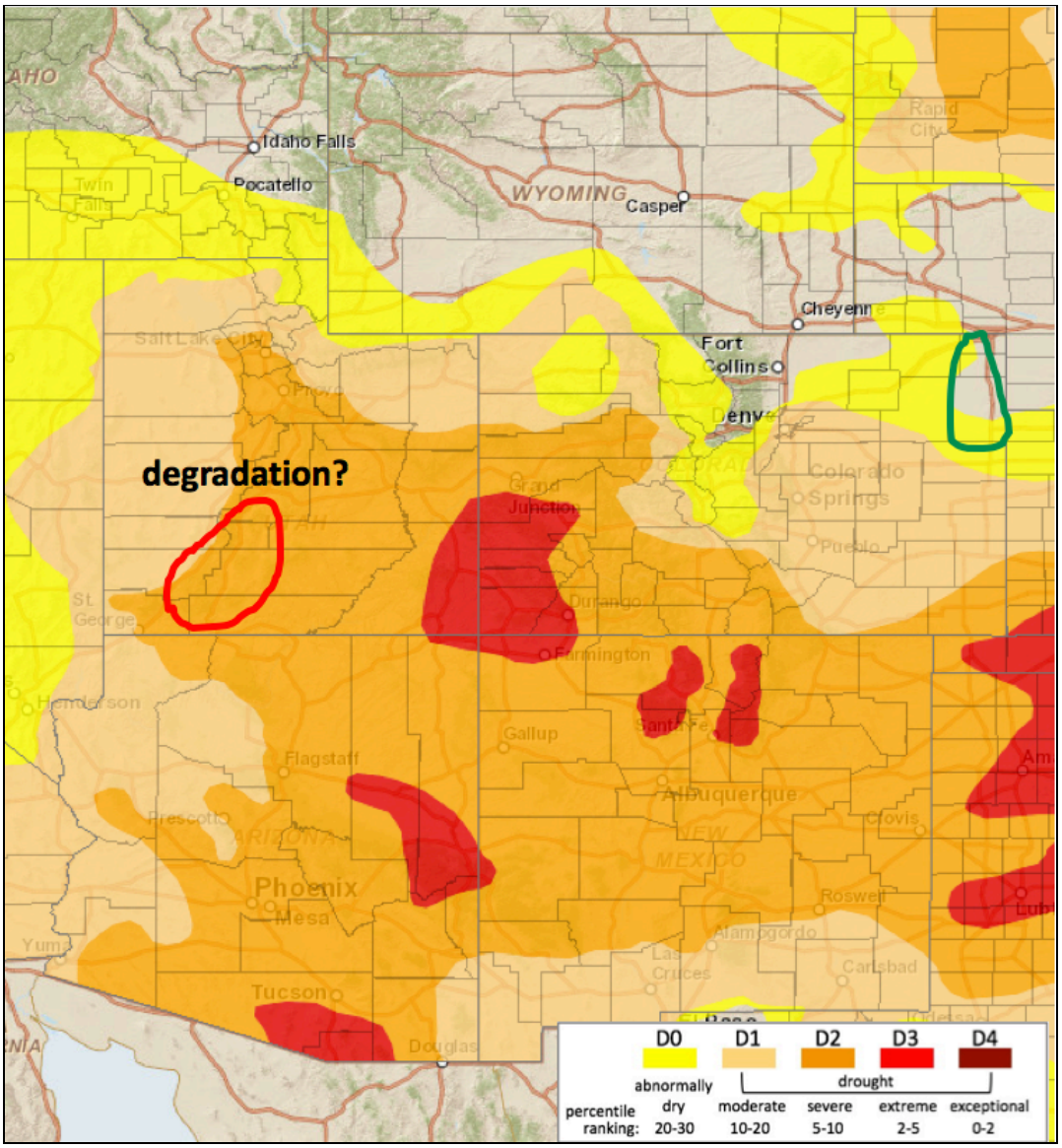




Summary and Recommendations



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 27, 2018

More snow in the high elevation mountains last week have helped boost the February totals for the Upper Colorado River Basin. The San Juans have continued to receive beneficial moisture after a very dry 4 months (back to the beginning of the water year). While snowpack in the San Juans is still very low and will likely not see a full recovery this winter, these recent storms have helped keep extreme drought at bay. While the Upper Rio Grande and the Sangre de Cristos to the east are also still very much of concern, they have received what looks to be close to average precipitation for the month. In Utah, the situation is not as good, where many SNOTEL sites are still reporting a 3rd percentile or less ranking for WYTD precipitation and snowpack. These areas, along the southwestern boundary of the Upper Colorado River Basin, could possibly be considered for worsening drought conditions.

East of the Continental Divide, an active weather pattern has persisted,

bringing windy and dry conditions, and much cooler temperatures. In fact, across the IMW, we've seen widespread cooler than average temperatures - a deviation from the much warmer than average temperatures that have dominated most of winter.

As we look forward to spring, weekly snowpack accumulations will become critical for future runoff and water supply. Streamflow forecasts are below average for most of the southern basins in the IMW, and generally improve looking to the north. Temperature anomalies are always important, but have major implications this time of year. Warm anomalies could impact the timing of peak snowpack and snowmelt. If there is an early peak and no major accumulations, expect to see widespread increasing drought conditions throughout the mountains, and particularly in the southern portion of the Upper Colorado River Basin.

For the plains, winter crops are still in wait-and-see mode. They are likely doing well in northeast Colorado, but could be struggling more in southeast CO. A topic of concern in the coming months will be grass fires. Late summer precipitation helped grow the fuels, and with warm temperature anomalies, low relative humidities, and windy conditions, all the ingredients are there for large fires. Winds may also have an impact on how the crops fare in the next couple of months.

Recommendations

UCRB: Possible degradations should be considered for the western boundary of the UCRB in southern UT (see red outline). SNOTEL sites are showing 0-3rd percentile rankings for precipitation and snowpack. Status quo is recommended for the rest of the basin.

Eastern Colorado: The U.S. Drought Monitor author has already proposed some improvements in northeast CO (green shape) and a possible introduction of D3 in Baca County in southeast CO (red shape). We are in agreement with the improvements, but we recommend holding off on D3 introduction into southeast CO at this time. Impact reports from southeast CO are that they need moisture soon, but for now the crops still look okay, and conditions are notably worse as you cross the border into Oklahoma panhandle.