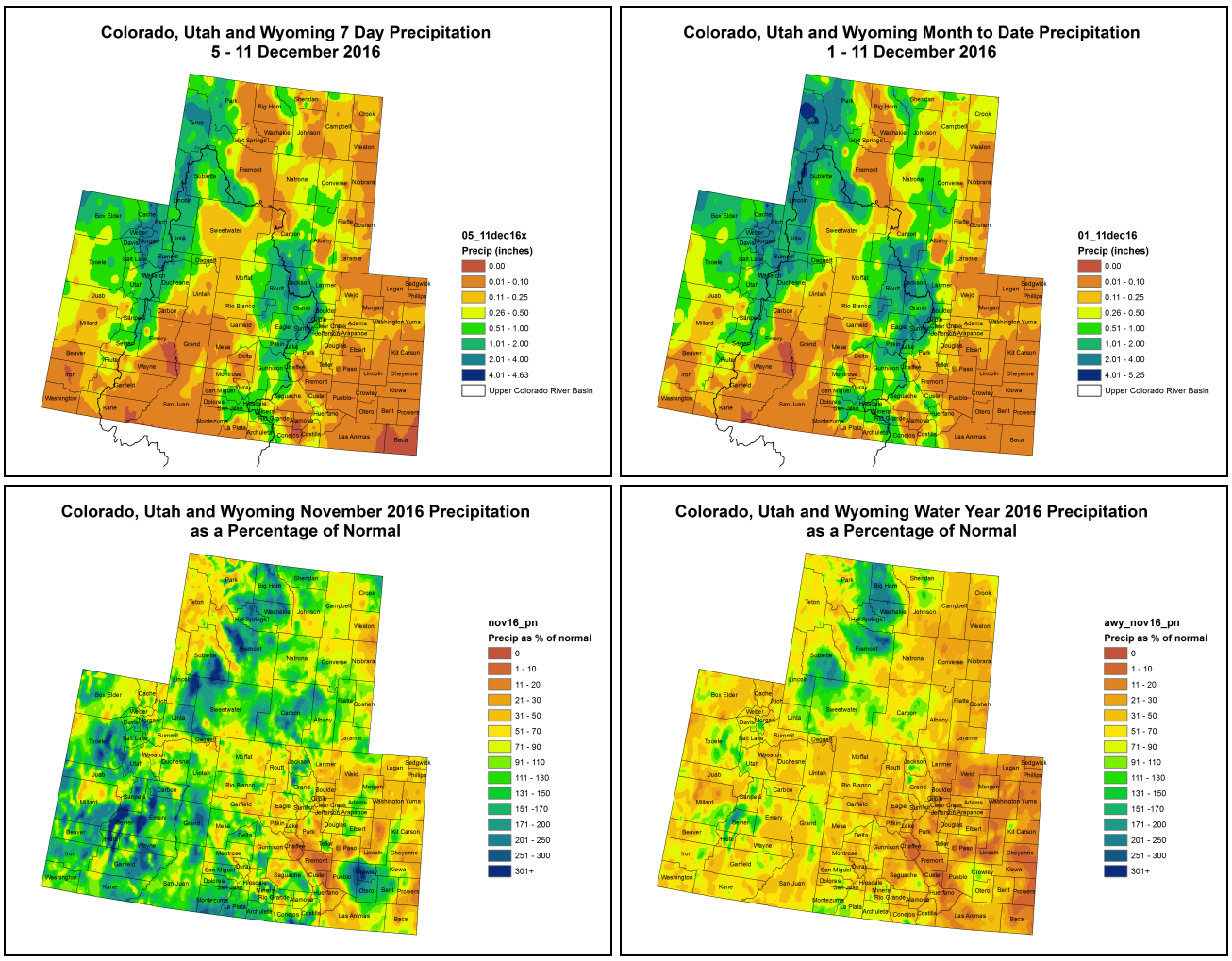
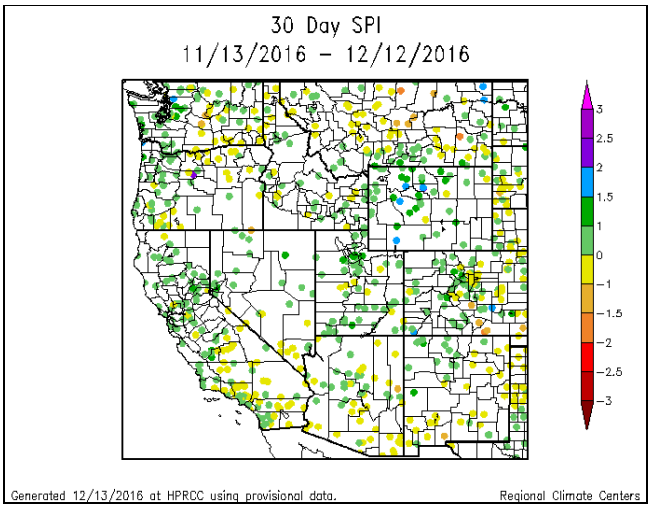
NIDIS Intermountain West
Regional Drought Early Warning System
December 13, 2016

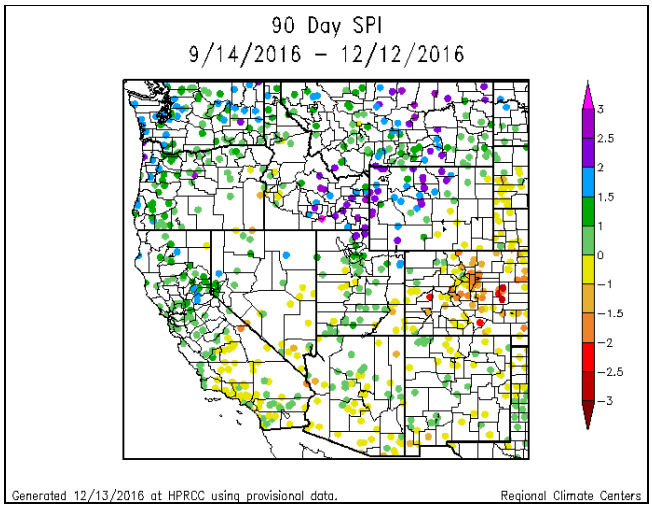
Precipitation

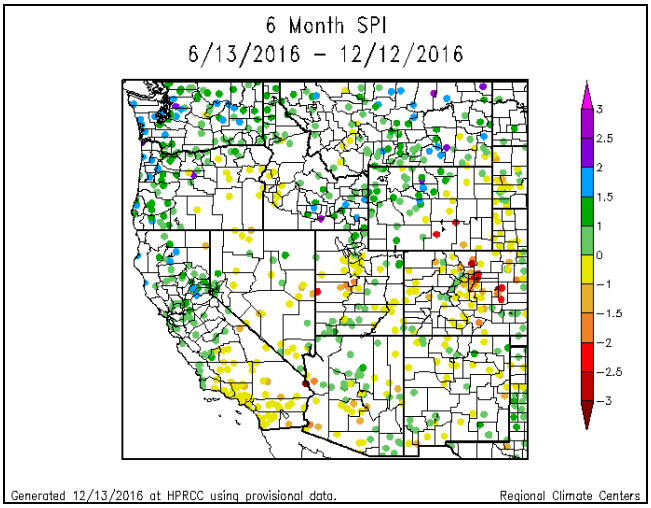


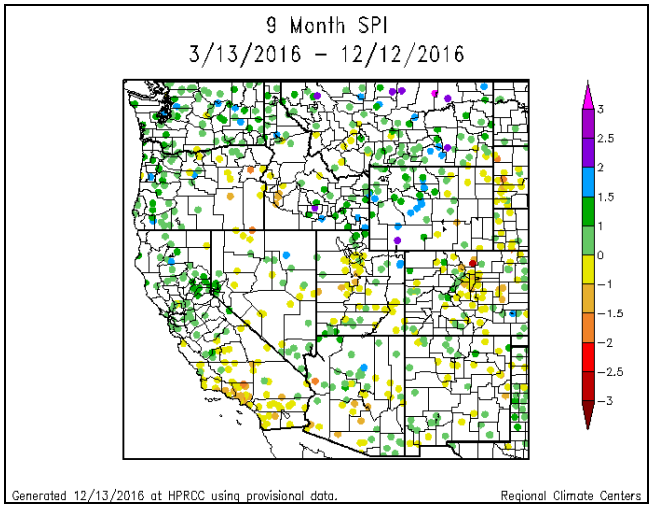
The images above use daily precipitation statistics from NWS COOP, CoCoRaHS, and CoAgMet stations. From top to bottom, and left to right: most recent 7-days of accumulated precipitation in inches; current month-to-date accumulated precipitation in inches; last month's precipitation as a percent of average;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

Standardized Precipitation Index



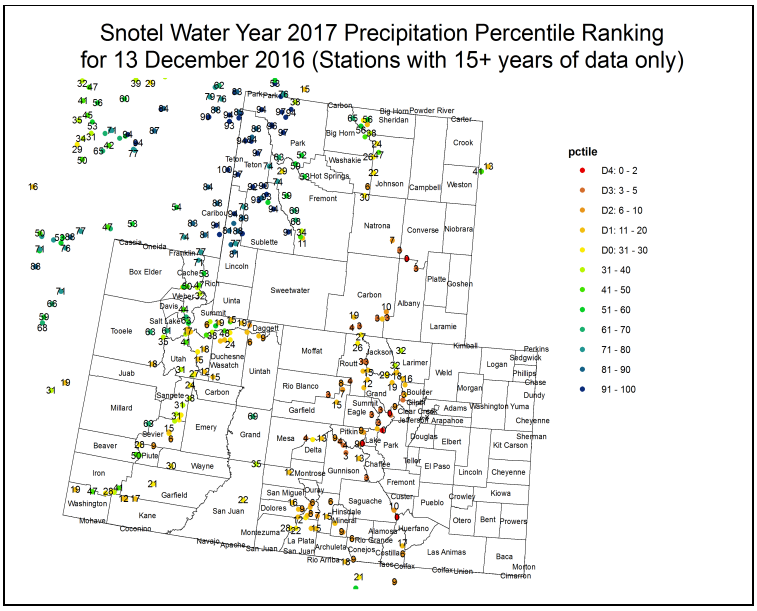


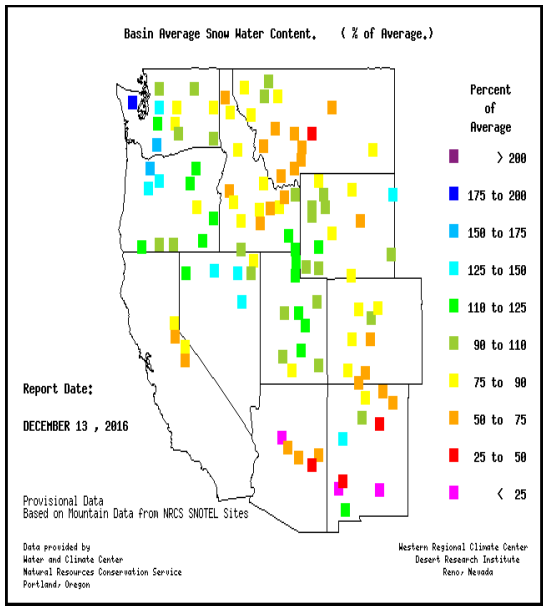




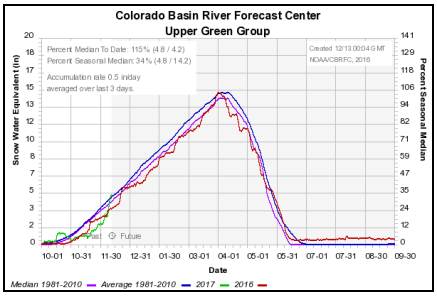
Standardized Precipitation Index standardizes precipitation accumulations for a specified time period into percentile rankings. -1.0 to -1.5 is equivalent to a D1 to D2. -1.5 to -2.0 is equivalent to a D2 to D3. -2.0 and worse is equivalent to a D3 to D4. 30- and 60-day SPIs focus on short-term conditions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

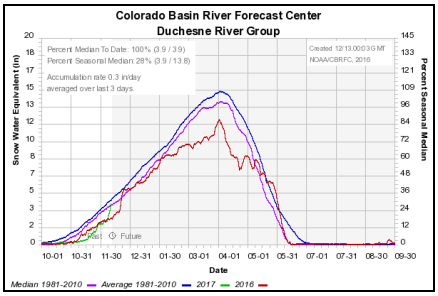
Snotel and Snowpack

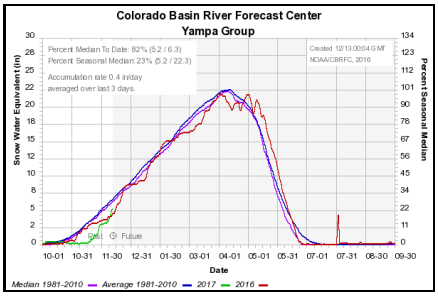


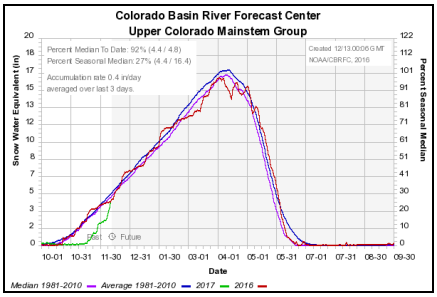


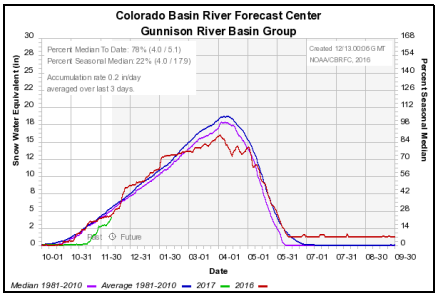
The top left image shows the Natural Resources Conservation Service's SNOTEL water-year-to-date precipitation percentile rankings. The top right image shows sub-basin averaged snow water equivalent accumulations as a percent of average. The images below show accumulated snow water equivalent in inches (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).

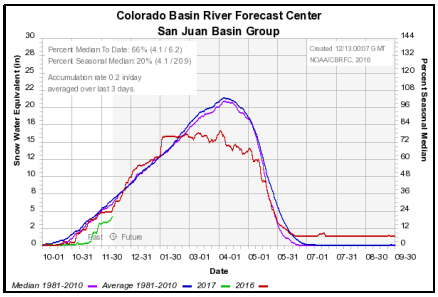




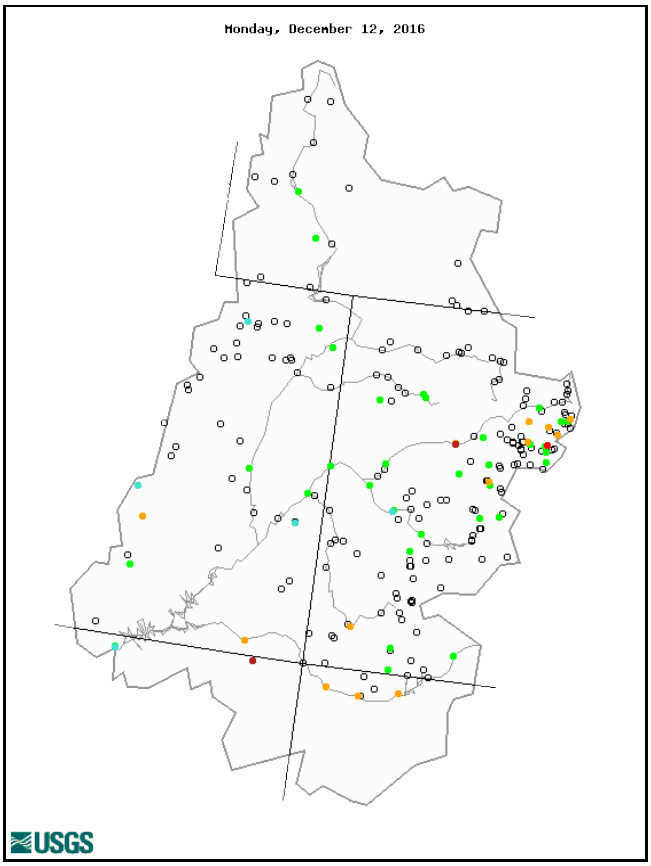


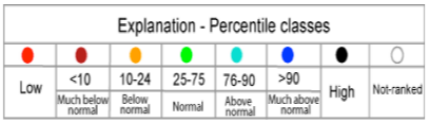


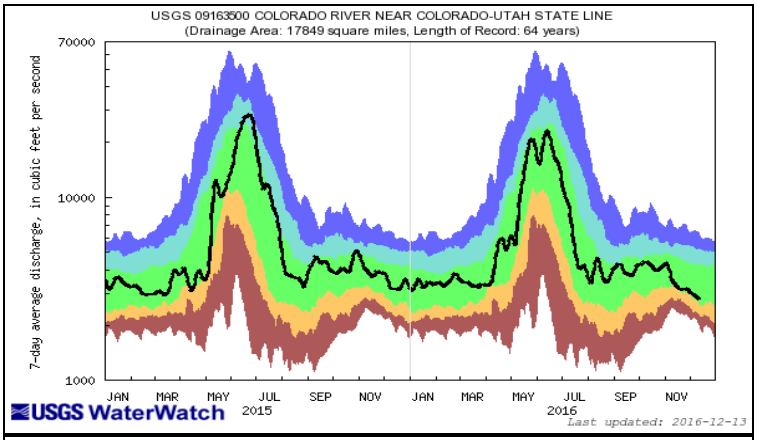


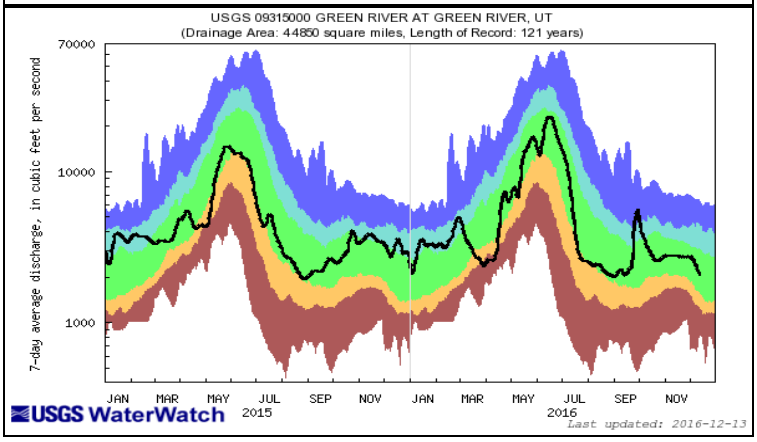


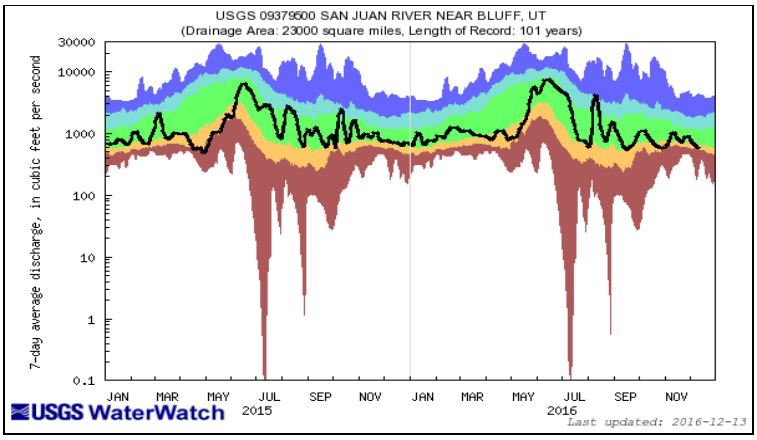
Streamflow


Monday, December 12, 2016
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

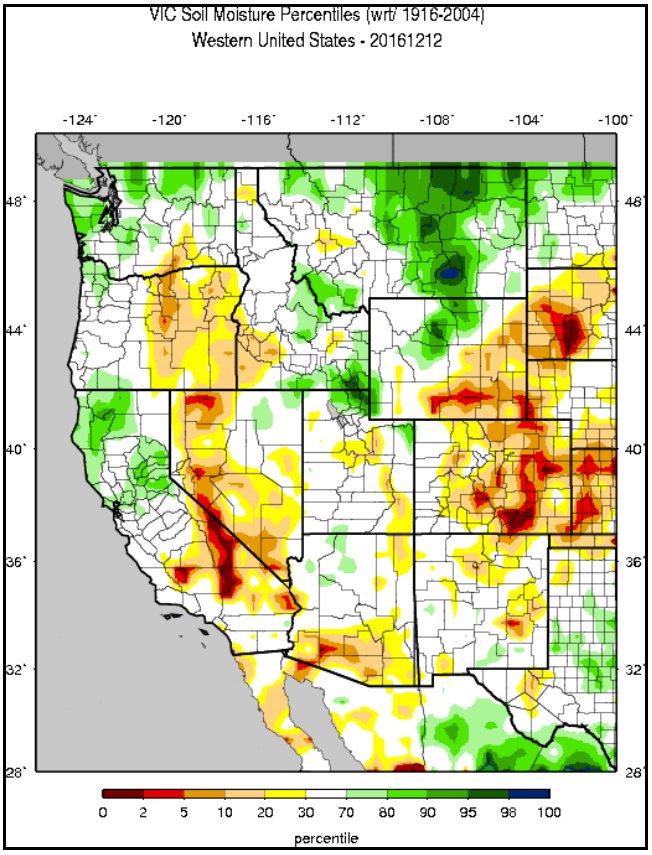

USGS 09163500 COLORADO RIVER NEAR COLORADO-UTAH STATE LINE
(Drainage Area: 17849 square miles, Length of Record: 64 years)
7-day average discharge, in cubic feet per second
70000
10000
1000
JAN MAR MAY JUL SEP NOV JAN MAR MAY JUL SEP NOV
2015
2016
USGS WaterWatch
Last updated: 2016-12-13

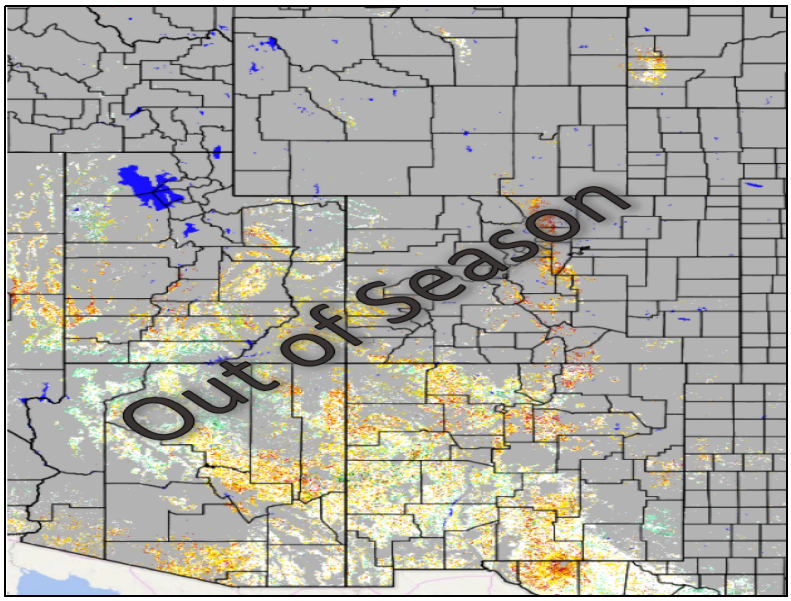

USGS 09315000 GREEN RIVER AT GREEN RIVER, UT
(Drainage Area: 44850 square miles, Length of Record: 121 years)
7-day average discharge, in cubic feet per second
70000
10000
1000
JAN MAR MAY JUL SEP NOV JAN MAR MAY JUL SEP NOV
2015
2016
USGS WaterWatch
Last updated: 2016-12-13



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

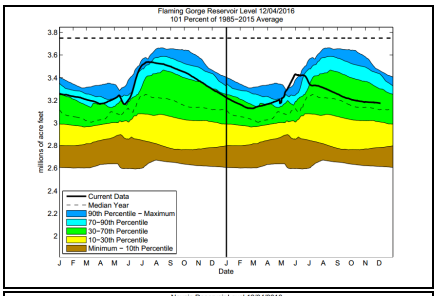


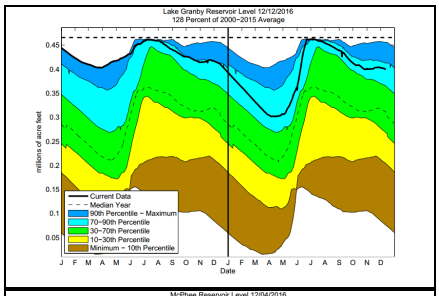


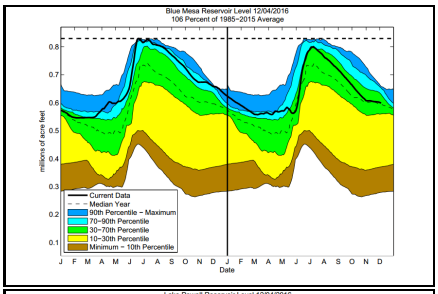
The top left image shows VIC modeled soil moisture as a percentile ranking. The top right image shows satellite-derived vegetation from the VegDRI product (which updates on Mondays).

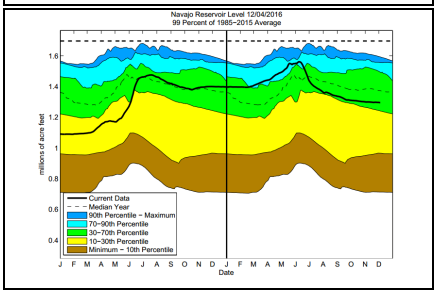
The graphs shown below are plots of reservoir volumes over the past full year and current year to date (black). The dashed line at the top of each graphic indicates the reservoir's capacity, and the background color-coded shading provides context for the range of reservoir

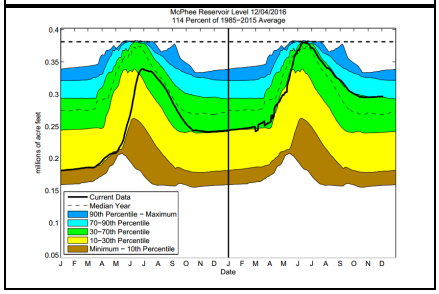
levels observed over the past 30 years. The data are obtained from the Bureau of Reclamation. Some of the reservoir percentiles don't line up at the new year due to differences in reservoir levels at the beginning of 1985 and the end of 2014. Dead storage has been subtracted. Note: Lake Granby data are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

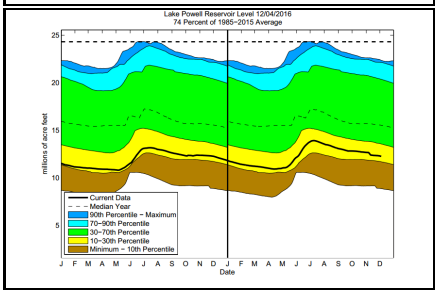




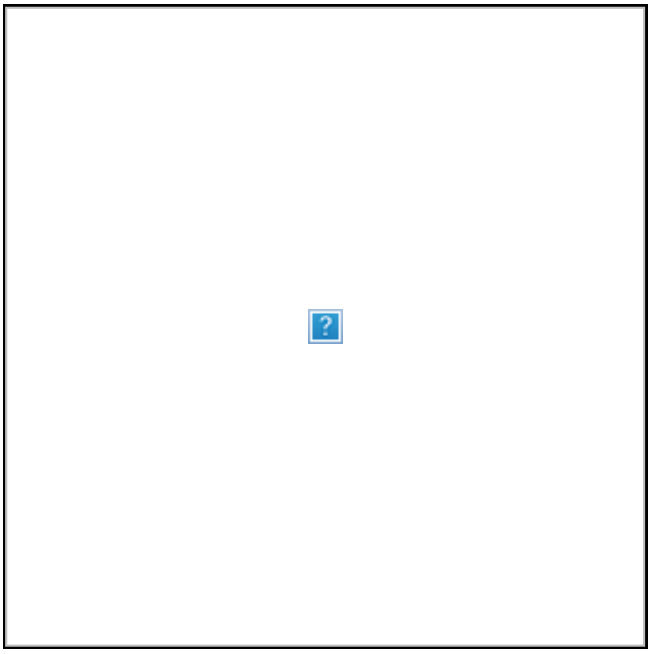


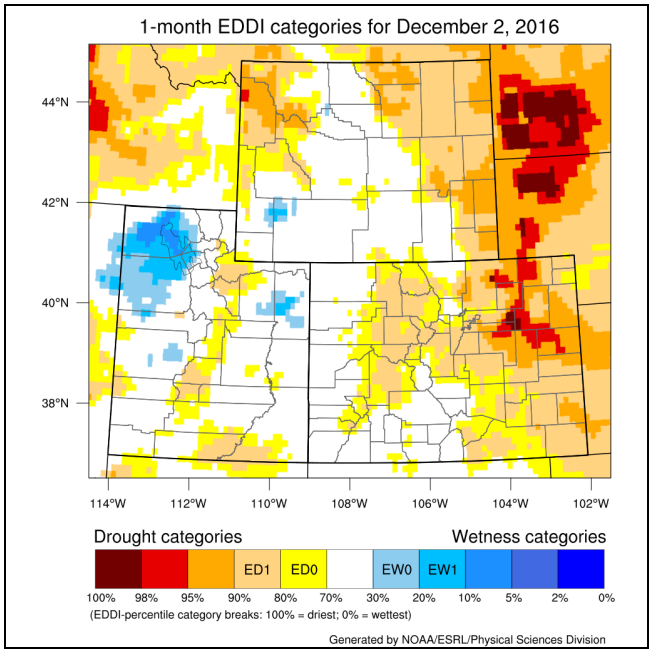


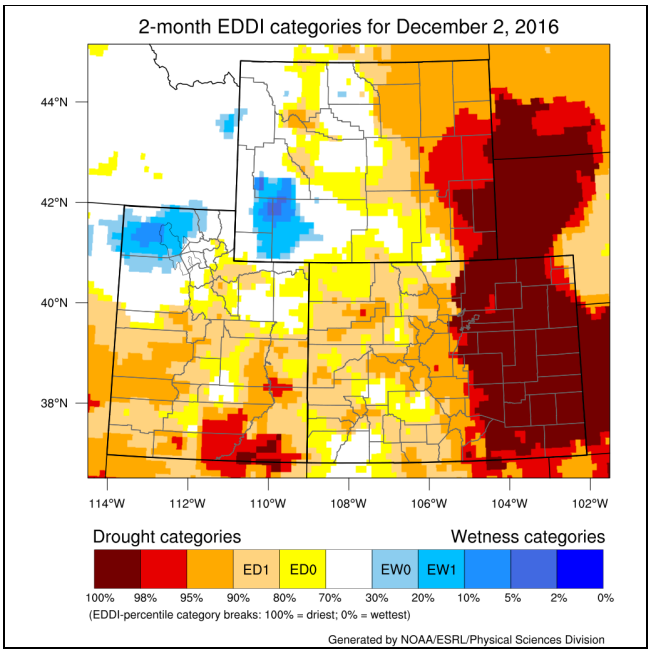


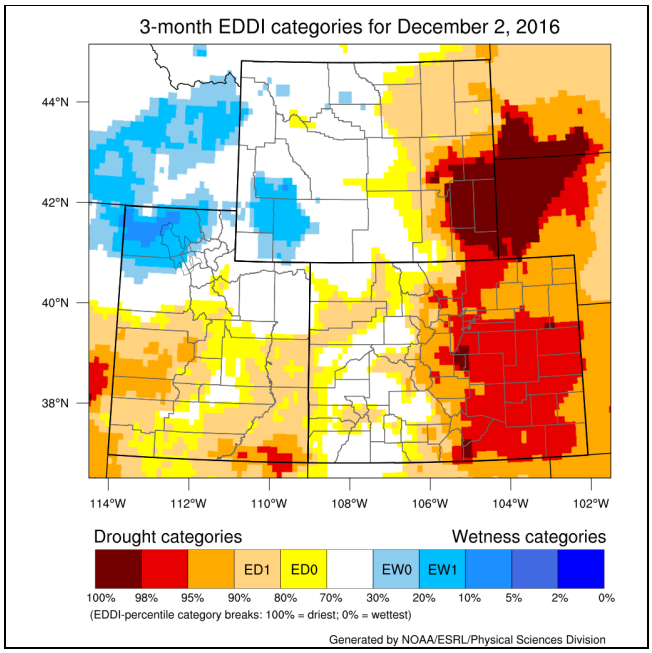


Evaporative Demand



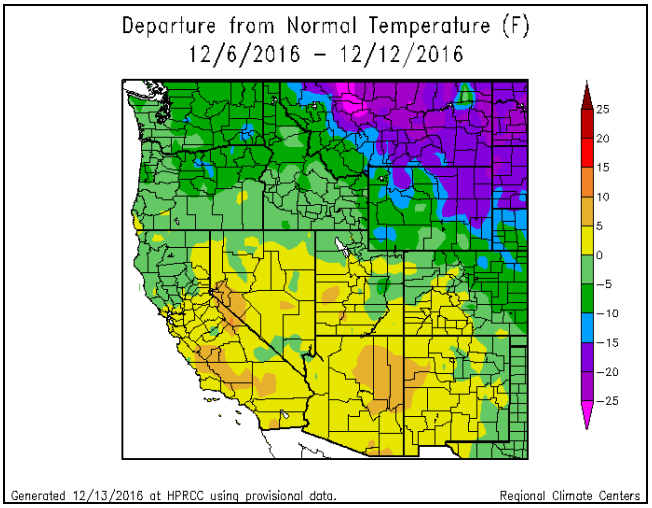


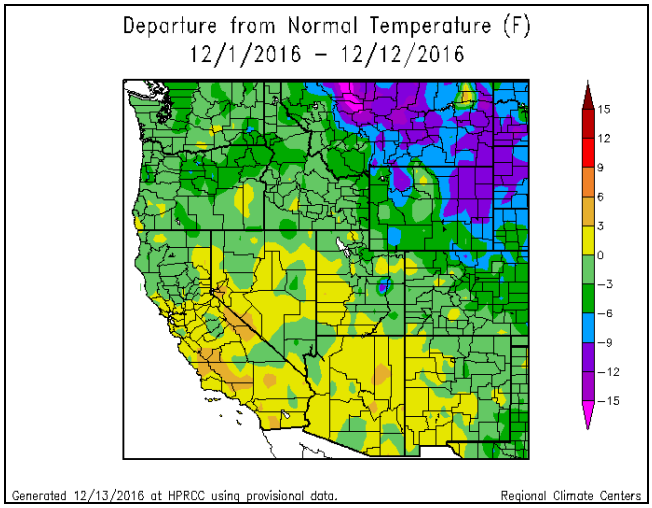




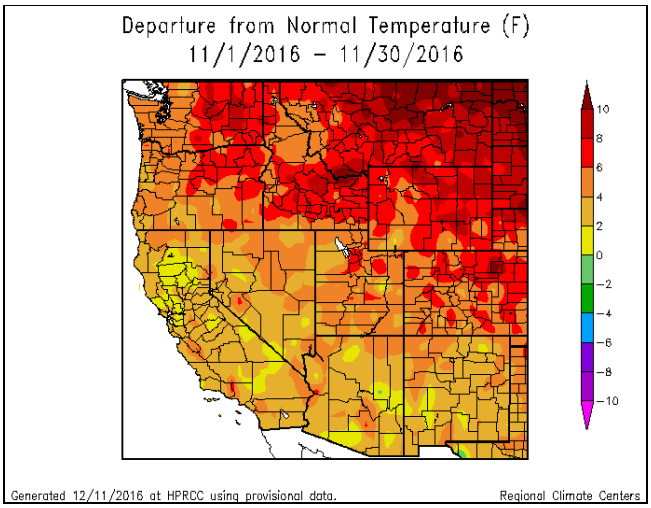
The above images are available courtesy of NOAA's Evaporative Demand Drought Index (EDDI). Drought classification listed is a function of the depth of reference evapotranspiration accumulated over a given period of record with respect to a climatology of 1981-2010. The drought categories displayed are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

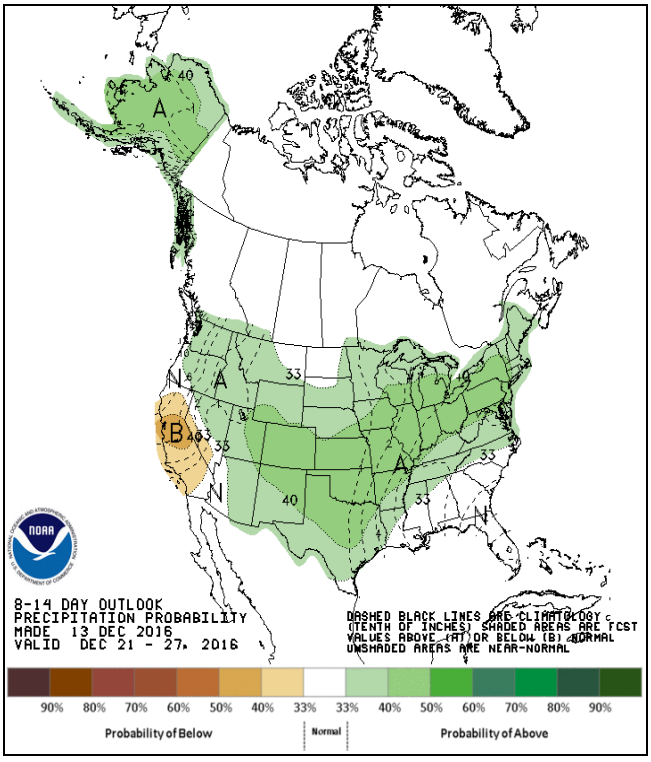


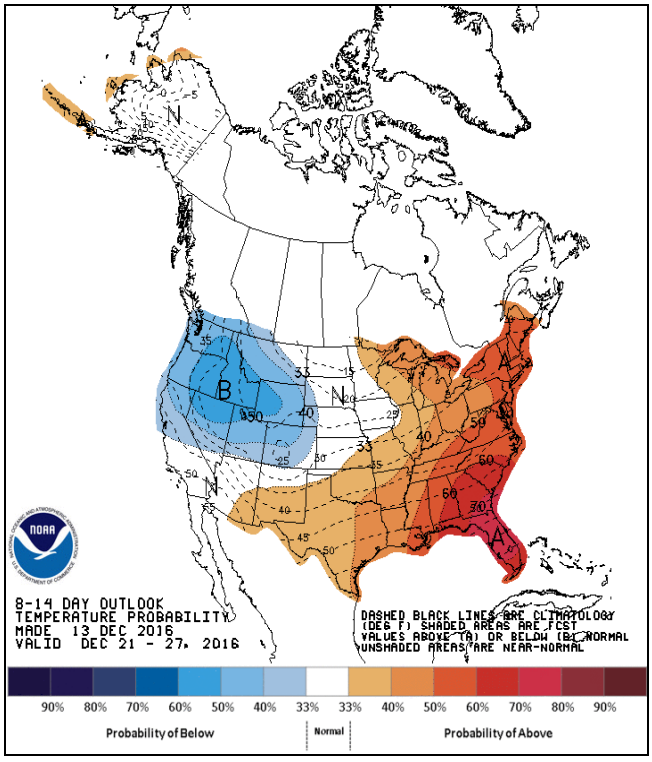


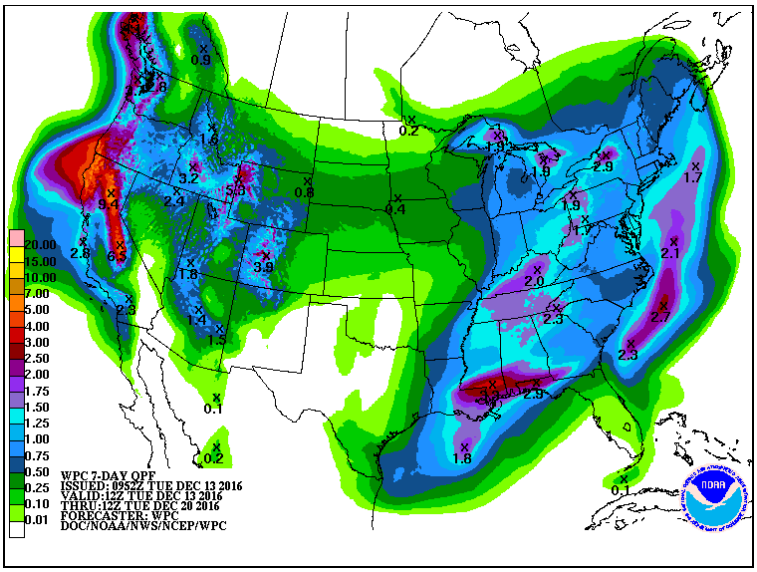
All images show temperature departures from average over different time periods (last 7 days on top left; month-to-date on top right; last full month on bottom). Temperature departure maps provided by HPRCC ACIS.


Departure from Normal Temperature (F)
11/1/2016 – 11/30/2016
10
8
6
4
2
0
-2
-4
-6
-8
-10
Generated 12/11/2016 at HPRCC using provisional data.
Regional Climate Centers

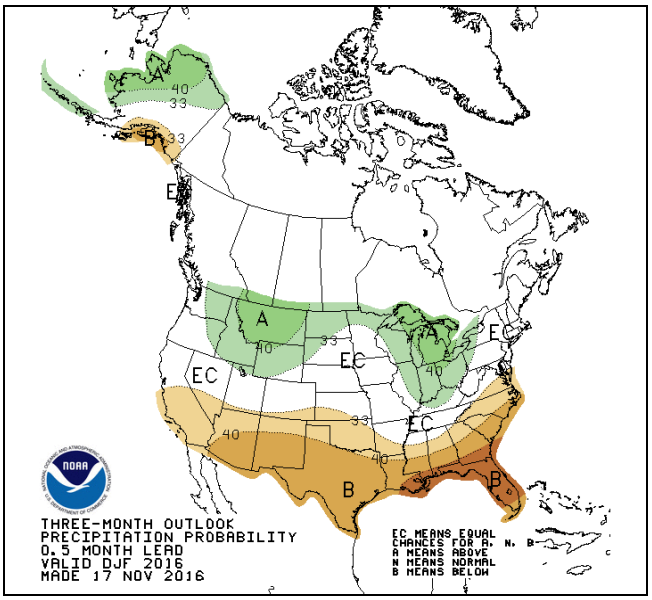
Outlook

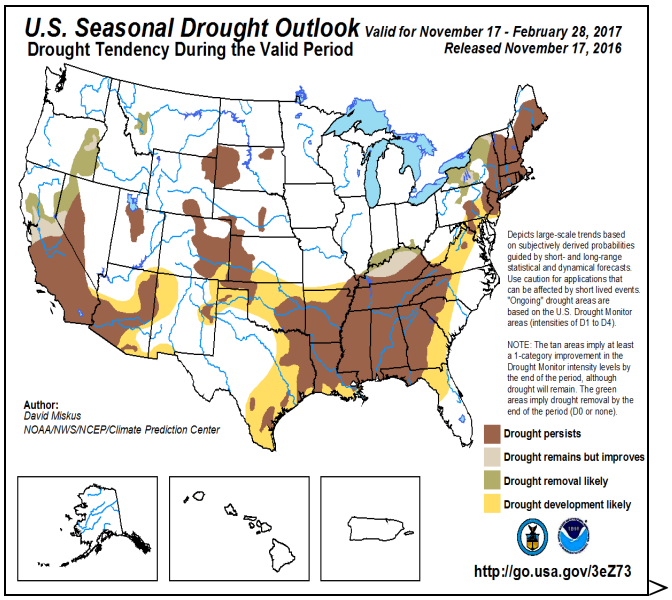

8-14 DAY OUTLOOK
PRECIPITATION PROBABILITY
MADE 13 DEC 2016
VALID DEC 21 - 27, 2016
DASHED BLACK LINES ARE CLIMATOLOGY
(TENTH OF INCHES) SHADED AREAS ARE FCST
VALUES ABOVE (A) OR BELOW (B) NORMAL
UNSHADED AREAS ARE NEAR-NORMAL
90% 80% 70% 60% 50% 40% 33% 33% 40% 50% 60% 70% 80% 90%
Probability of Below
Normal
Probability of Above


8-14 DAY OUTLOOK
TEMPERATURE PROBABILITY
MADE 13 DEC 2016
VALID DEC 21 - 27, 2016
DASHED BLACK LINES ARE CLIMATOLOGY
(DEG F) SHADED AREAS ARE FCST
VALUES ABOVE (A) OR BELOW (B) NORMAL
UNSHADED AREAS ARE NEAR-NORMAL
90% 80% 70% 60% 50% 40% 33% 33% 40% 50% 60% 70% 80% 90%
Probability of Below
Normal
Probability of Above

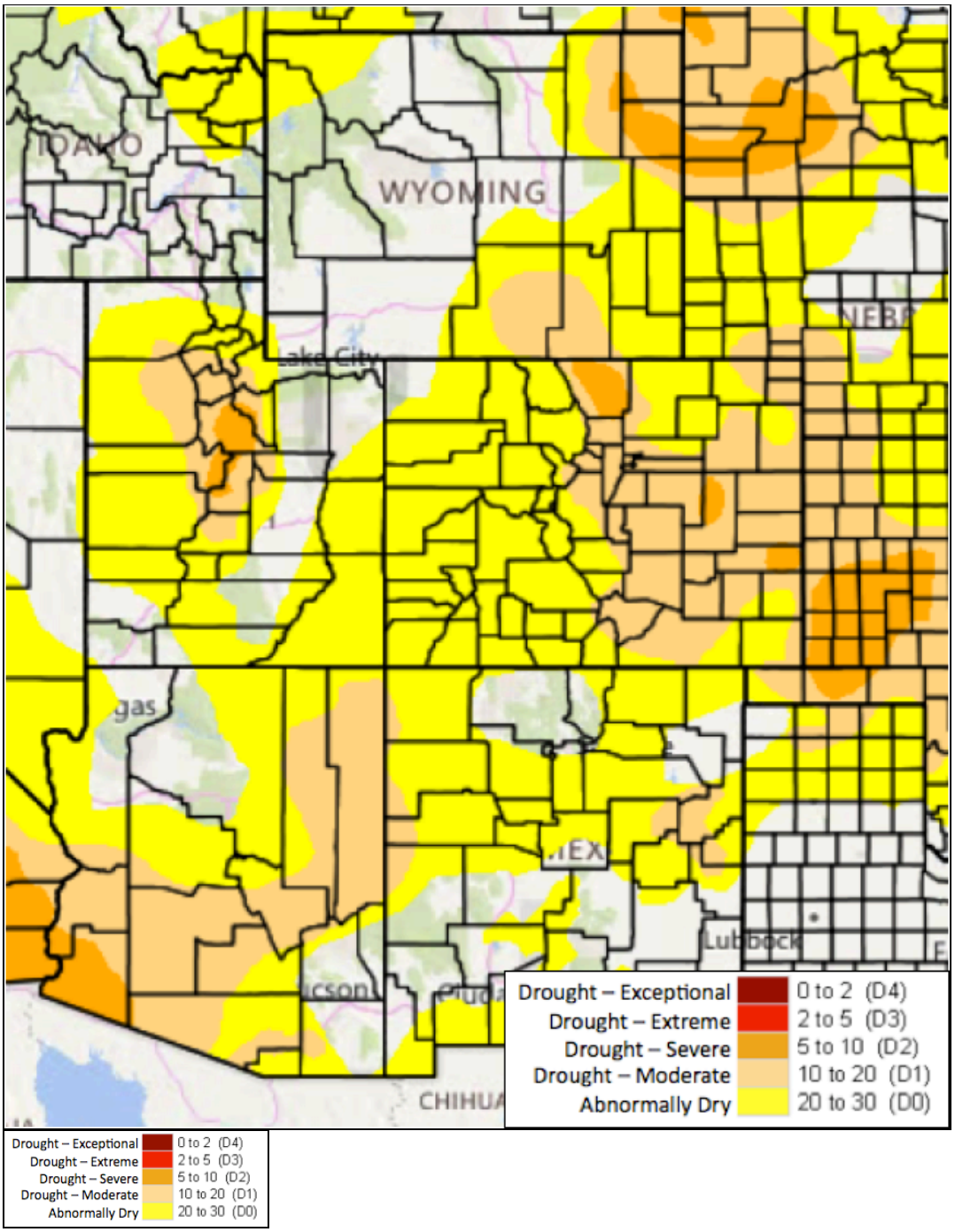


The top two images show Climate Prediction Center's Precipitation and Temperature outlooks for 8 - 14 days. The middle image shows the Weather Prediction Center's Quantitative Precipitation Forecast accumulation for seven days. The bottom left image shows the 3-month precipitation outlook from Climate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

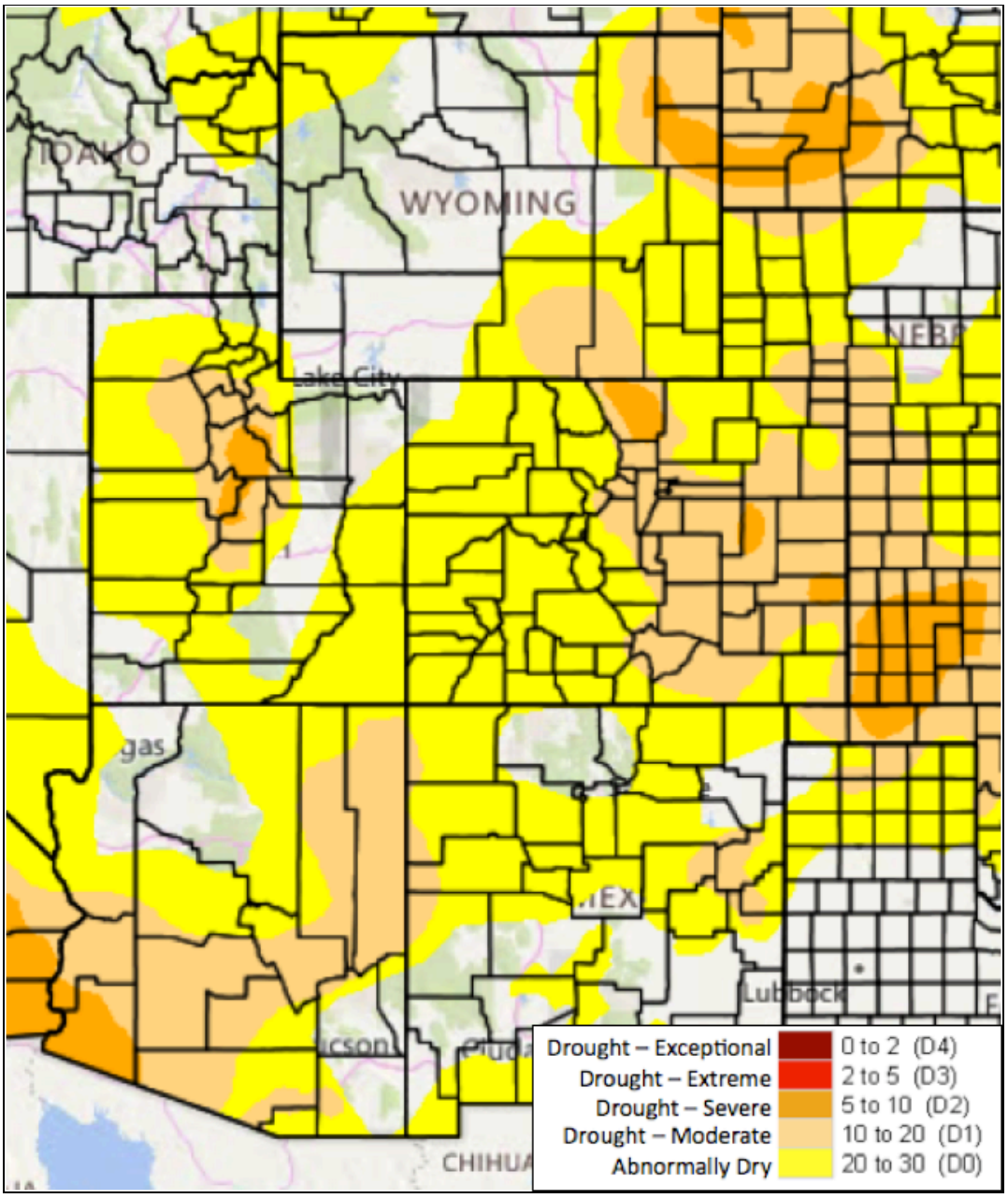




Summary and Recommendations



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: December 13, 2016

Last week, beneficial precipitation continued to accumulate in the higher elevations of the UCRB, particularly in the northern mountains around the Upper Green River basin and around the Colorado River Headwaters. Precipitation amounts ranged between 0.50 inches to almost 4 inches. Thanks to the recent upswing in storm activity, most of the smaller sub-basins are now showing snowpack accumulations closer to the median for this time of year. Much of this precipitation has missed the Four Corners area, southern Utah, and eastern Colorado, where totals were mostly less than 0.25 inches for the week. However, 30-day SPIs for the entire region remain in fair condition, with the exception of some D1-D2 level SPIs just east of the Sangre de Cristos in southern Colorado.

Longer term precipitation deficits still remain a concern, particularly for the eastern plains of Colorado. With streamflows predominantly showing near normal conditions and good water supply, the biggest concern is focused around dryland crops and pastures, and this is where most of the impacts are being reported.

After an abnormally warm fall, December temperatures have mostly stayed below normal for the entire Intermountain West region. This will help with snowpack accumulations in the mountains. Over the next two weeks, below normal temperatures should continue. Precipitation outlooks show most of the UCRB receiving over half an inch of moisture for the next week and an increased likelihood of above normal precipitation for the week after.

The pattern shift that appears to continue to dominate over the next couple of weeks should help the UCRB stay in good condition as we officially enter the winter season. The biggest concern will remain east of the Continental Divide. The eastern plains of Colorado will continue to be closely monitored for any possible further deteriorating conditions.

Recommendations

UCRB: Status quo is recommended. Even with recent accumulations, the D0 designation throughout the region appears to remain valid when looking at all the data. The exception would be the Dirty Devil basin, around Wayne, Garfield, and Kane counties in southern UT. Based on all the variables, this area could be considered for improvement and removal of D0. But given the minimal precipitation that fell in the last week, we recommend waiting for a week when a storm event warrants the removal.

Eastern Colorado: Status quo is recommended. Conditions continue to be closely monitored for possible degradations. We believe that currently, given the convergence of all data and reported impacts, widespread D1 (with the isolated pockets of D2) remains appropriate.