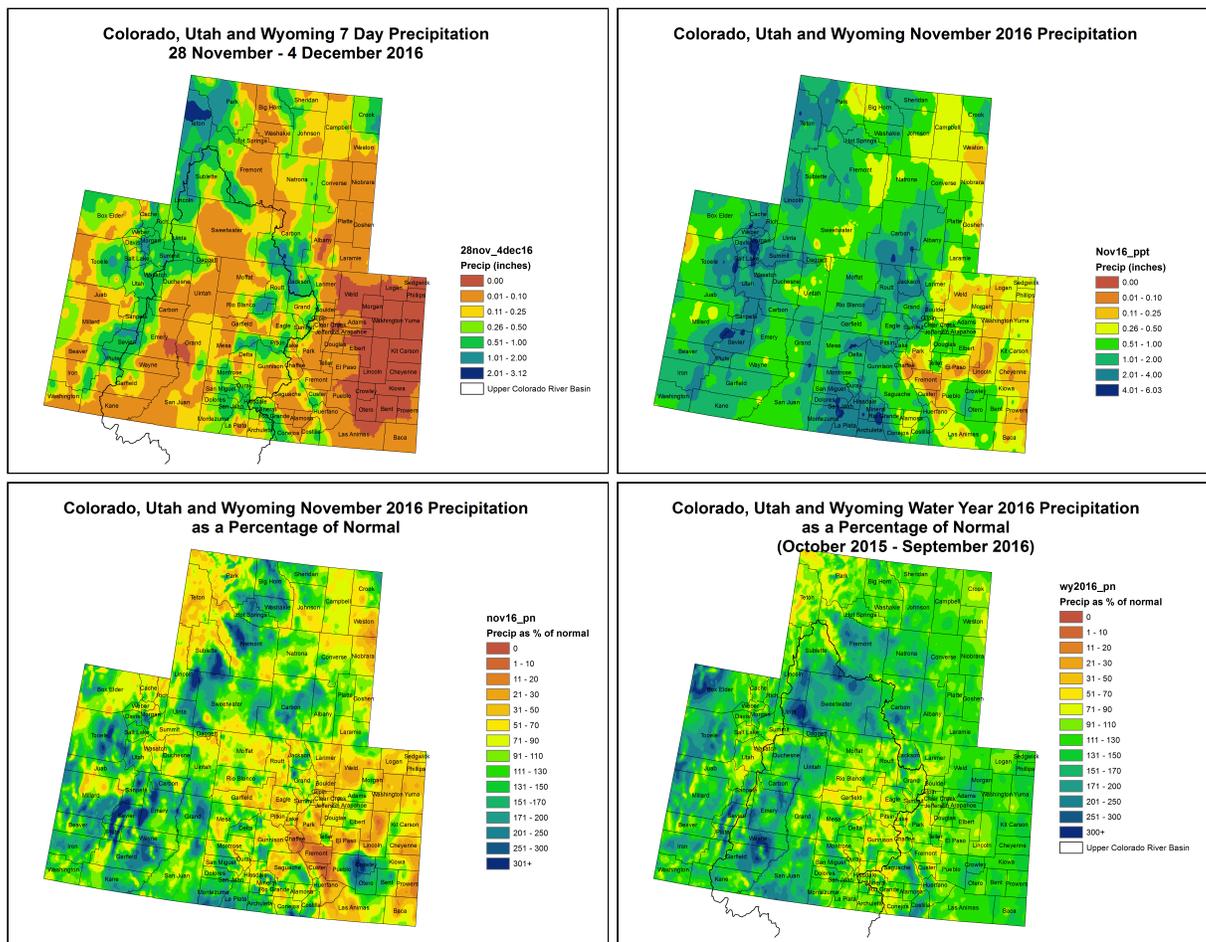


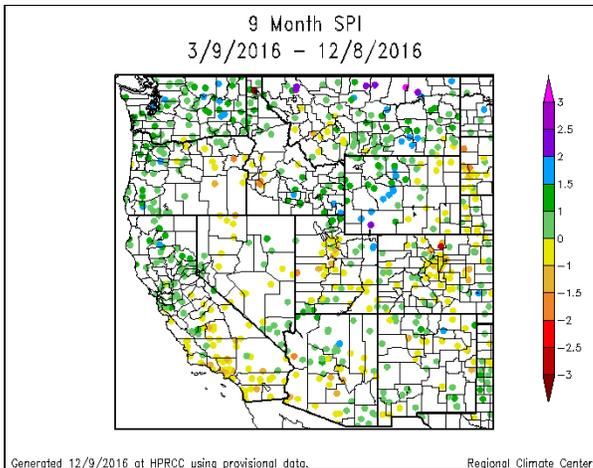
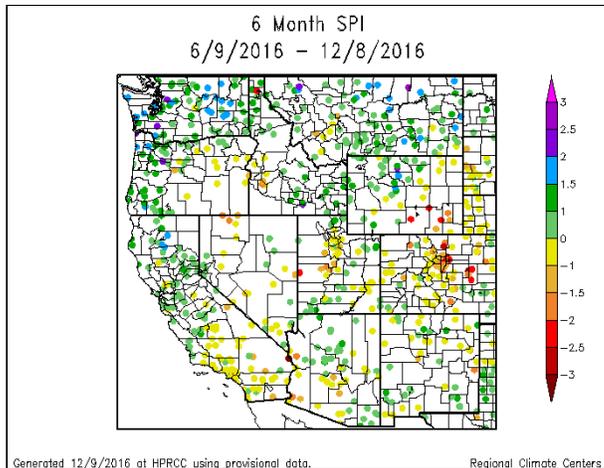
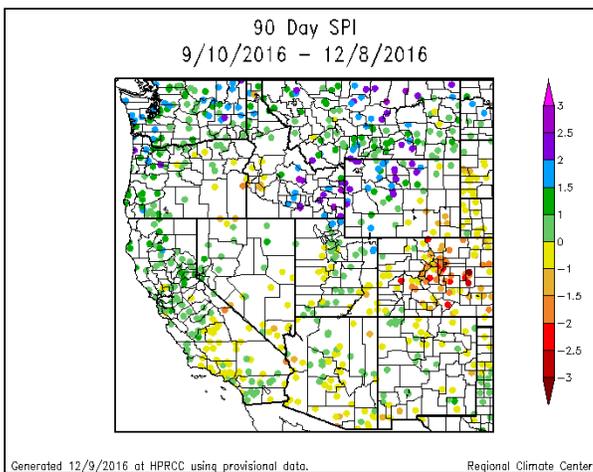
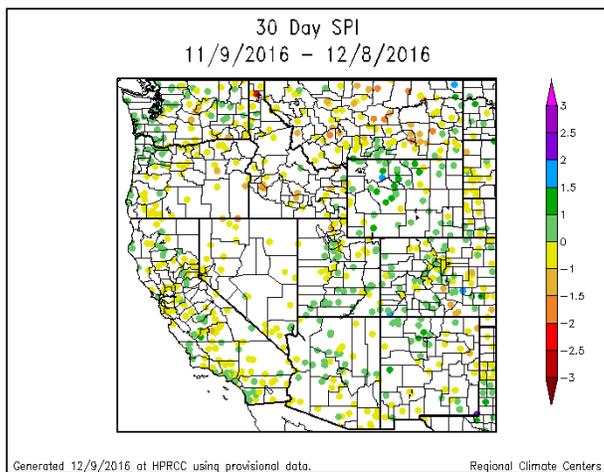
NIDIS Intermountain West Regional Drought Early Warning System December 6, 2016

Precipitation



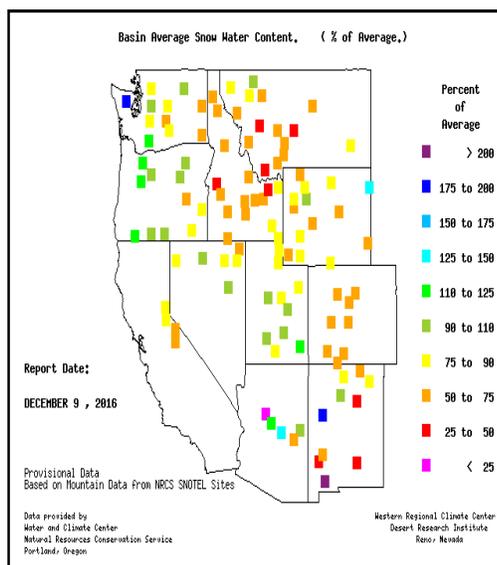
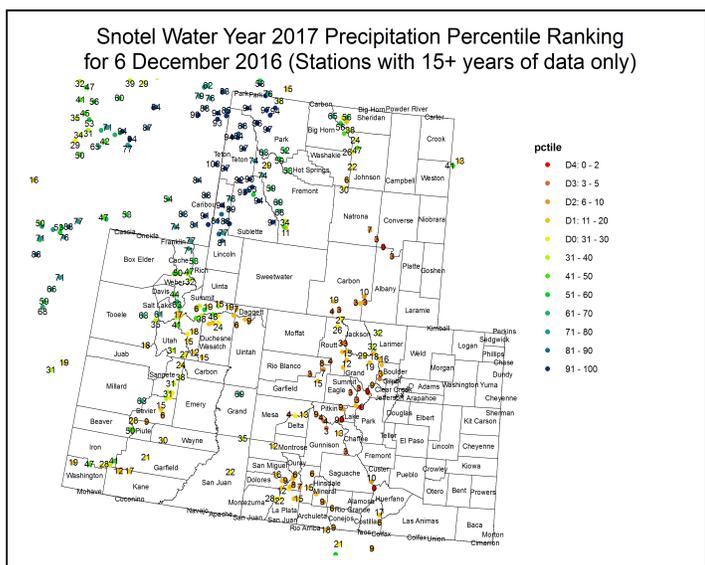
The images above use daily precipitation statistics from NWS COOP, CoCoRaHS, and CoAgMet stations. From top to bottom, and left to right: most recent 7-days of accumulated precipitation in inches; current month-to-date accumulated precipitation in inches; last month's precipitation as a percent of average;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

Standardized Precipitation Index



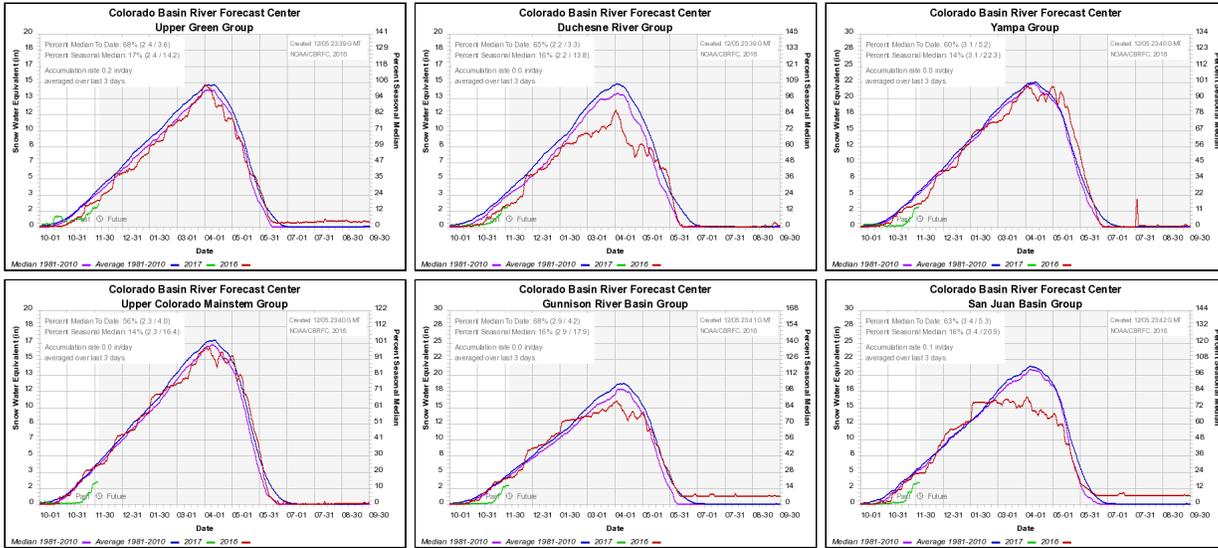
Standardized Precipitation Index standardizes precipitation accumulations for a specified time period into percentile rankings. -1.0 to -1.5 is equivalent to a D1 to D2. -1.5 to -2.0 is equivalent to a D2 to D3. -2.0 and worse is equivalent to a D3 to D4. 30- and 60-day SPIs focus on short-term conditions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

Snotel and Snowpack

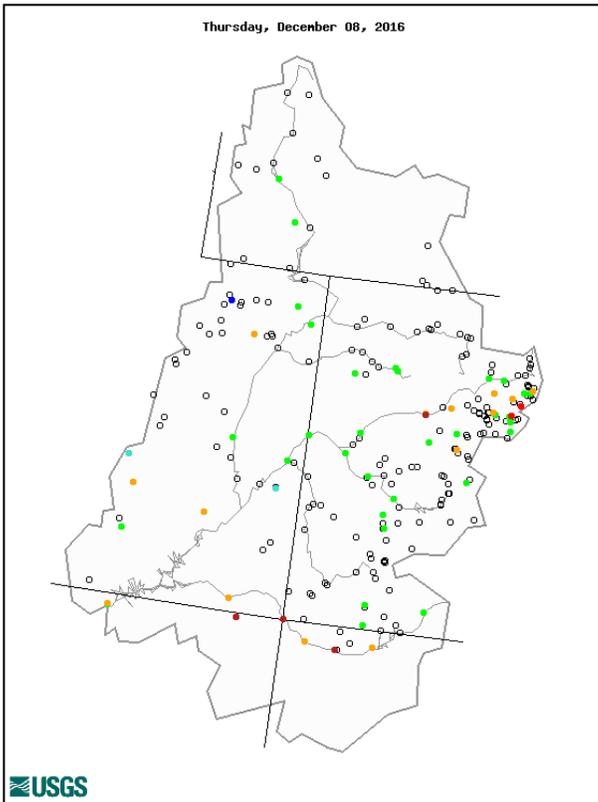


The top left image shows the Natural Resources Conservation Service's SNOTEL water-year-to-date precipitation percentile rankings. The top right image shows sub-basin averaged snow water equivalent accumulations as a percent of average. The images below show accumulated

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).

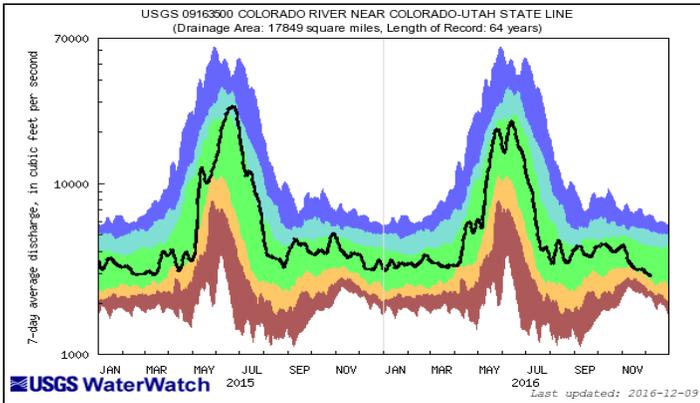


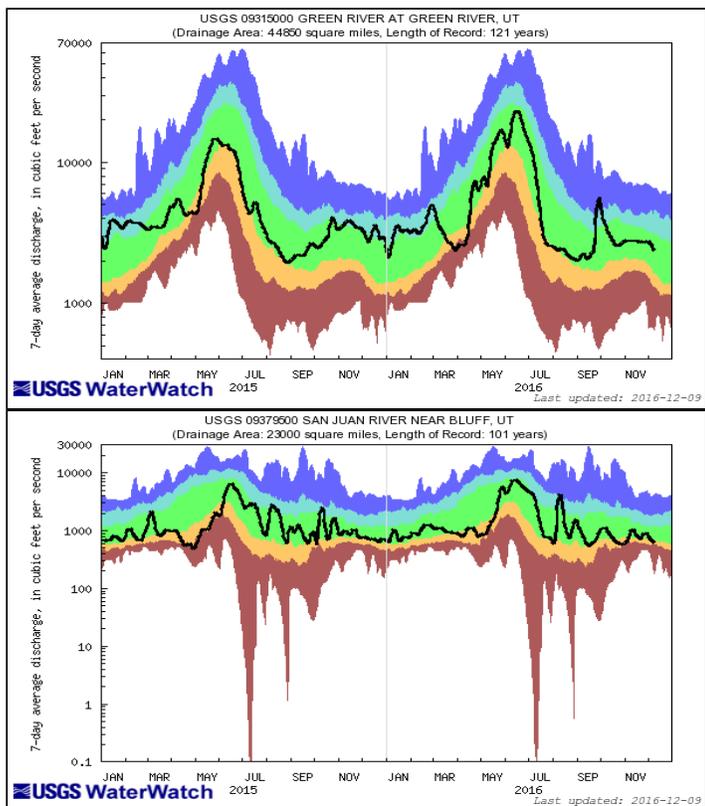
Streamflow



Explanation - Percentile classes

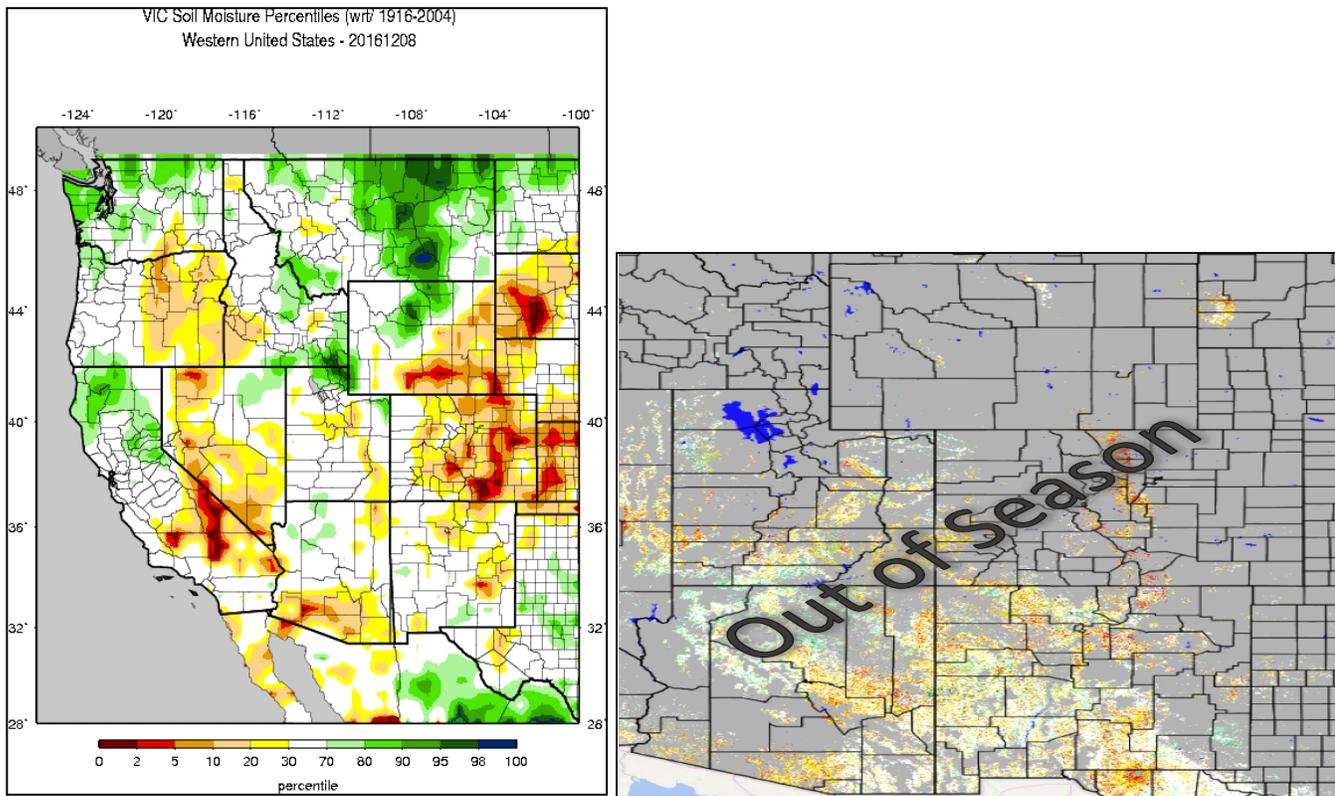
Low	<10 Much below normal	10-24 Below normal	25-75 Normal	76-90 Above normal	>90 Much above normal	High	Not-ranked





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.

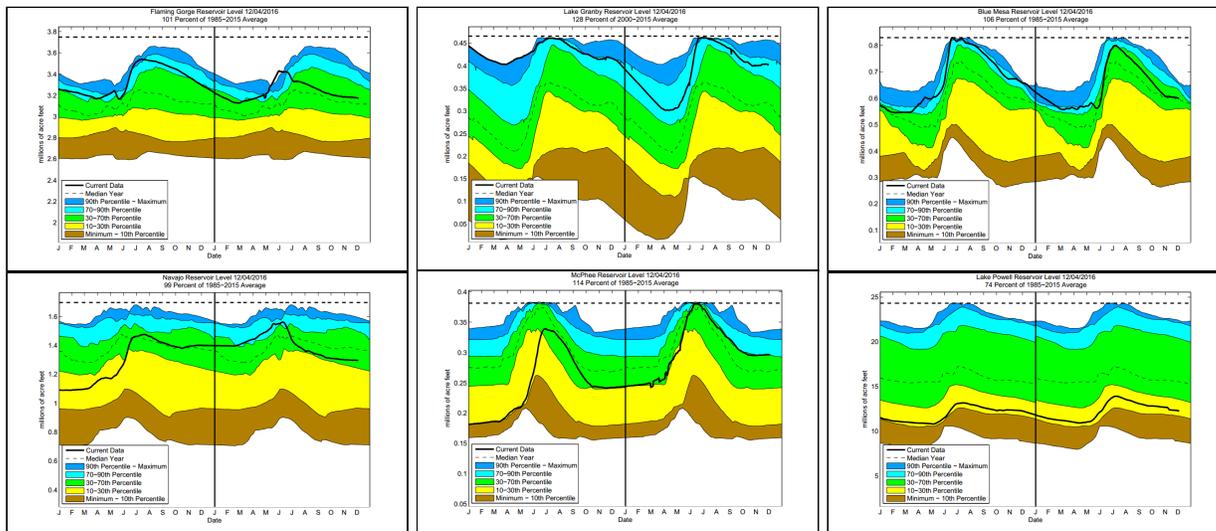
Surface Water



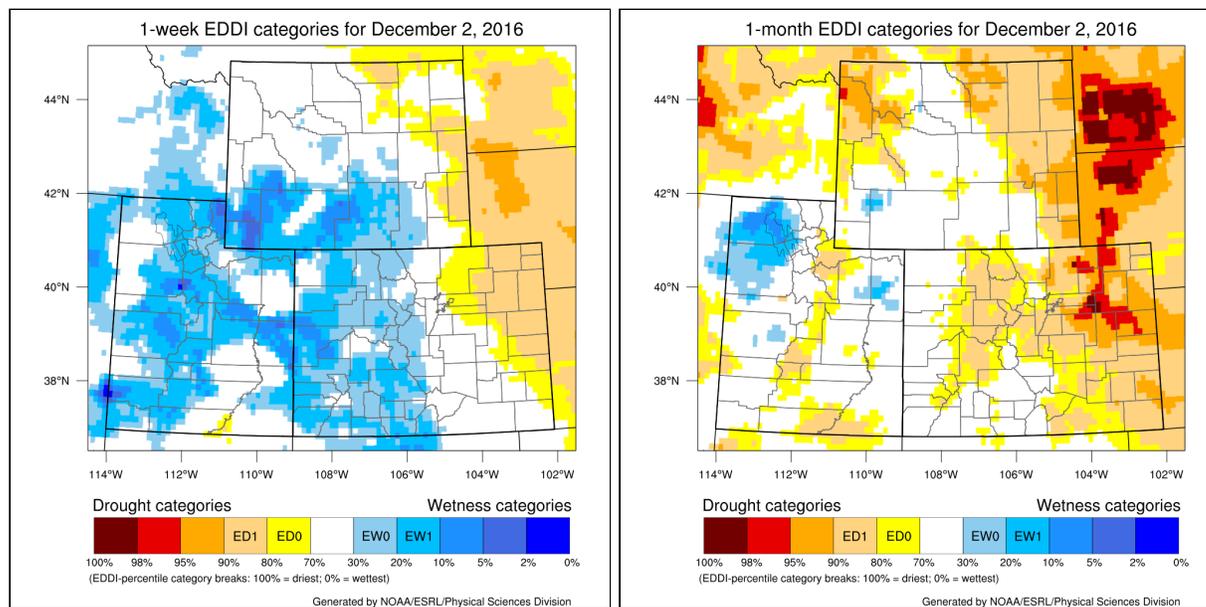
The top left image shows VIC modeled soil moisture as a percentile ranking. The top right

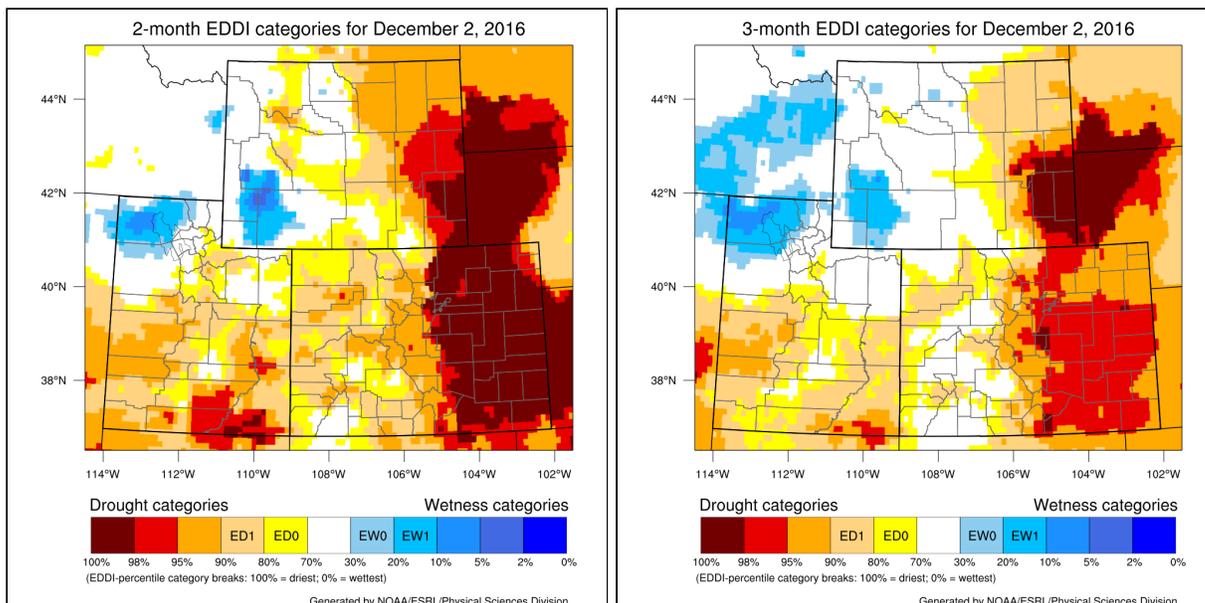
image shows satellite-derived vegetation from the VegDRI product (which updates on Mondays).

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.



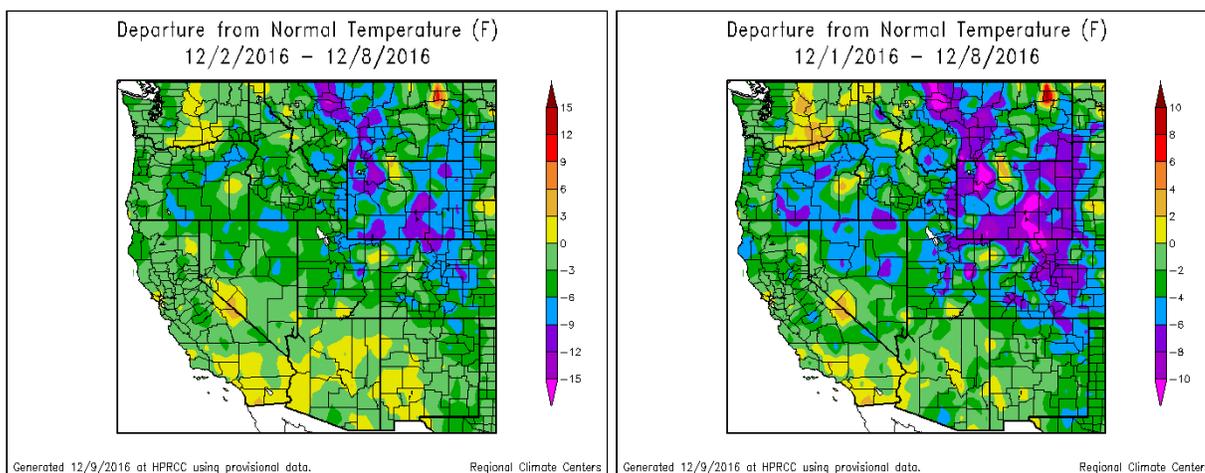
Evaporative Demand



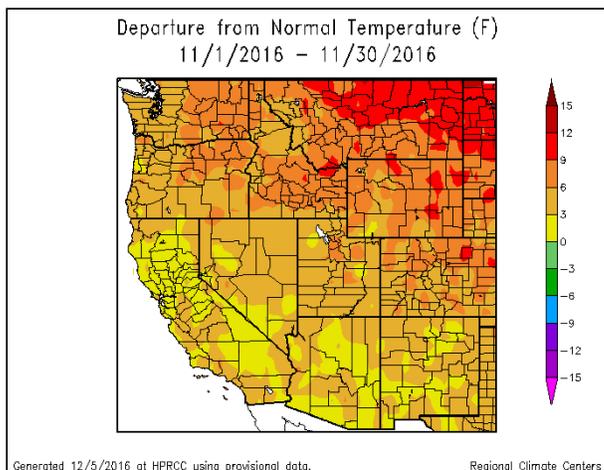


The above images are available courtesy of NOAA’s Evaporative Demand Drought Index (EDDI). Drought classification listed is a function of the depth of reference evapotranspiration accumulated over a given period of record with respect to a climatology of 1981-2010. The drought categories displayed are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

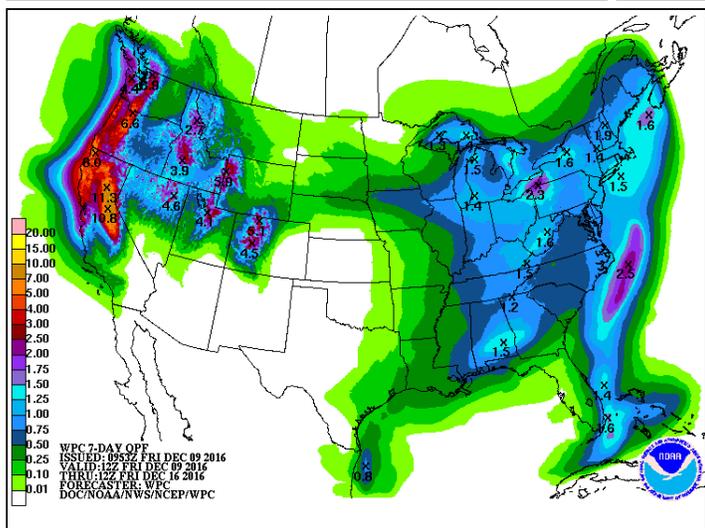
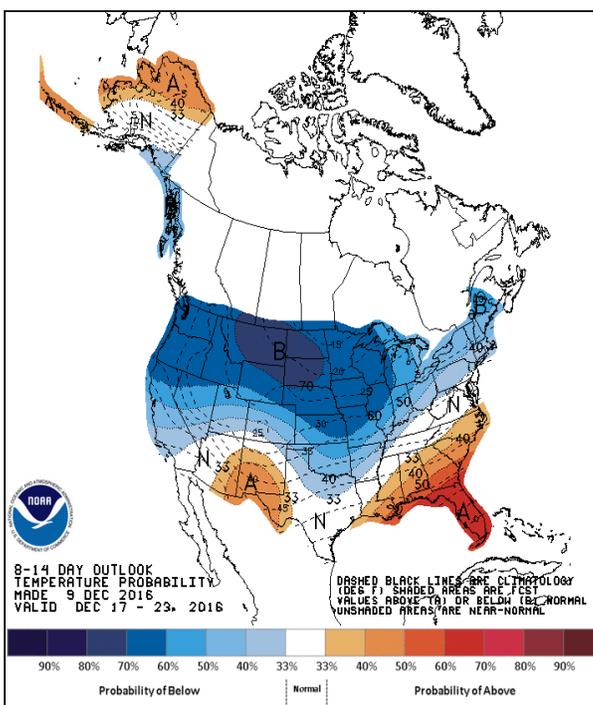
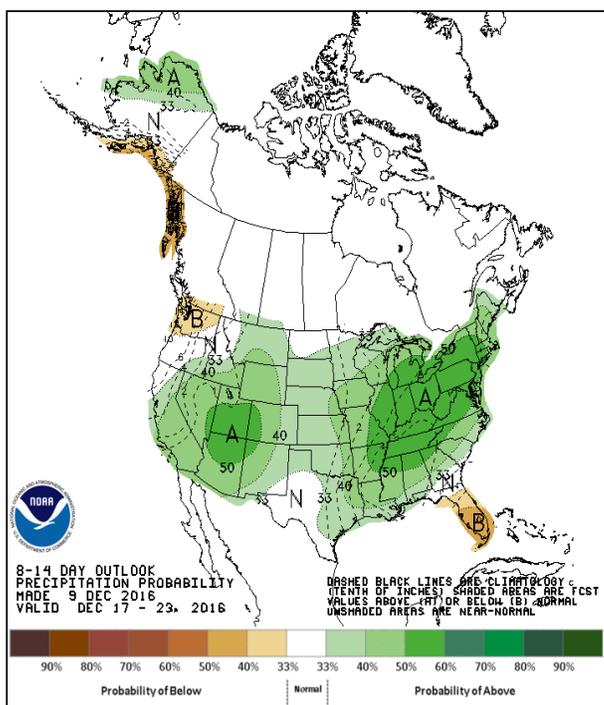
Temperature



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.

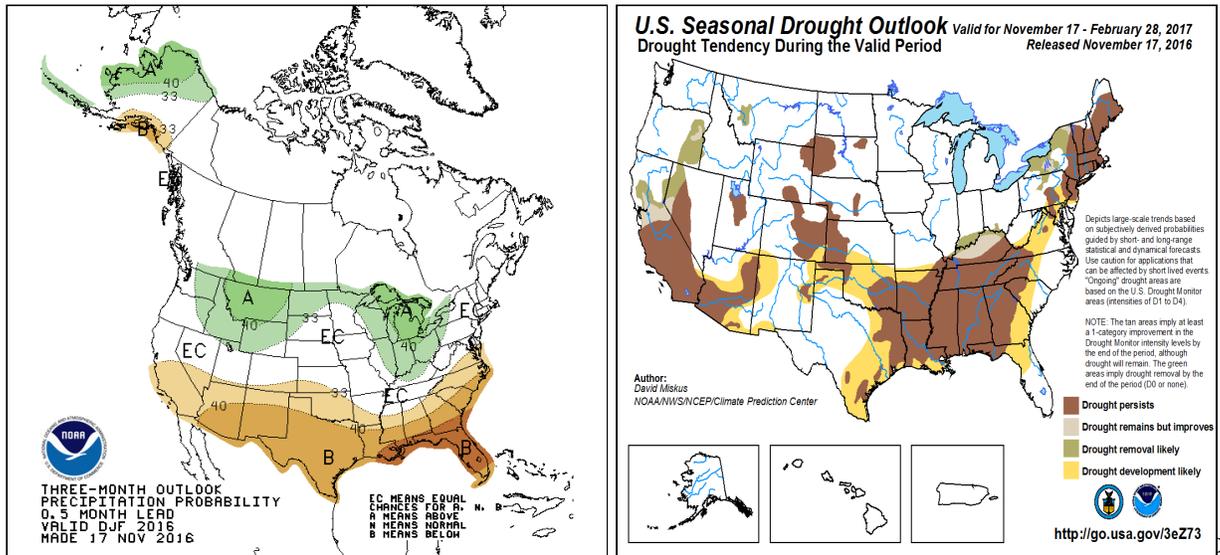


Outlook

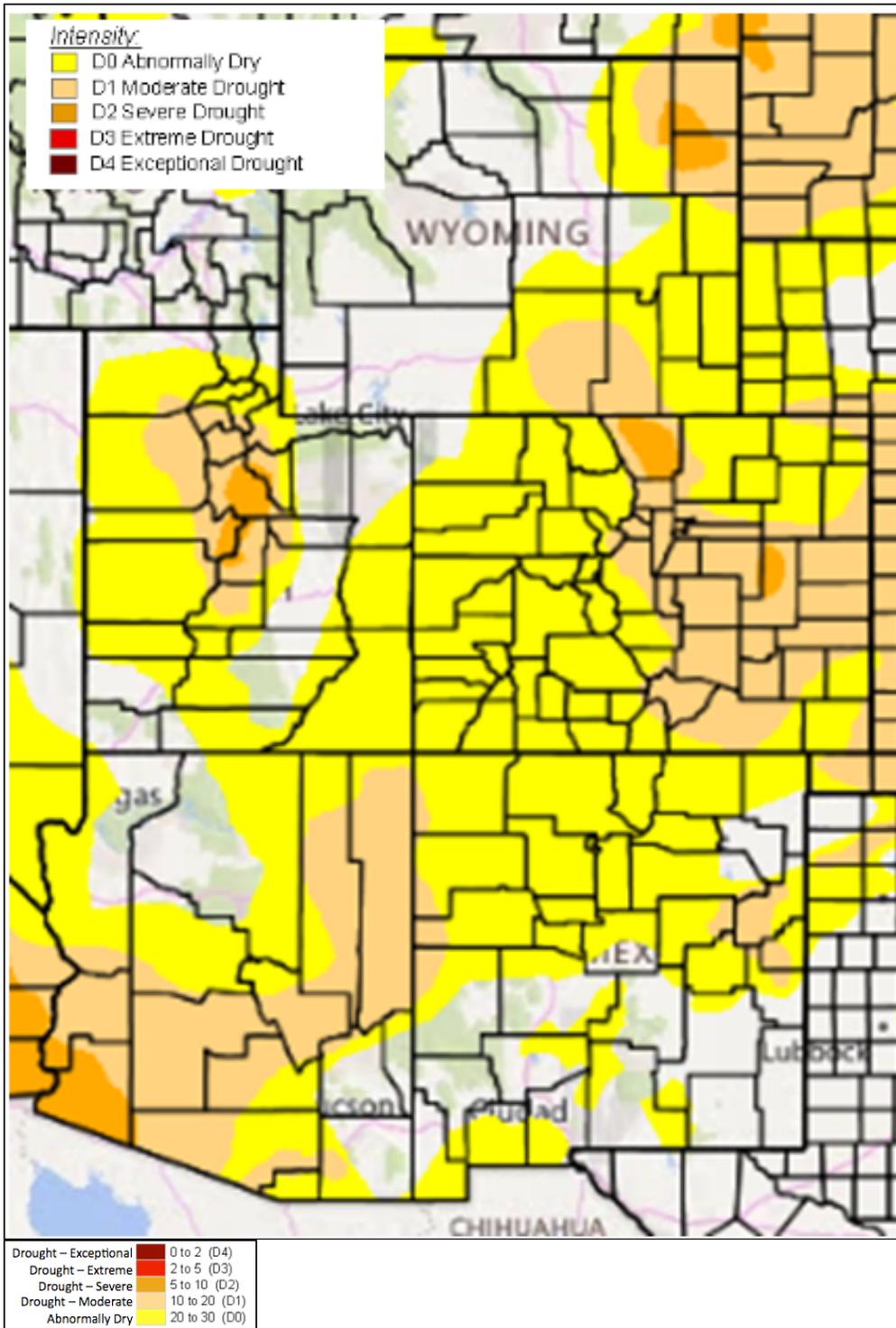


The top two images show Climate Prediction Center's Precipitation and Temperature outlooks for 8 - 14 days. The middle image shows the Weather Prediction Center's Quantitative Precipitation Forecast accumulation for seven days. The bottom left image shows the 3-month

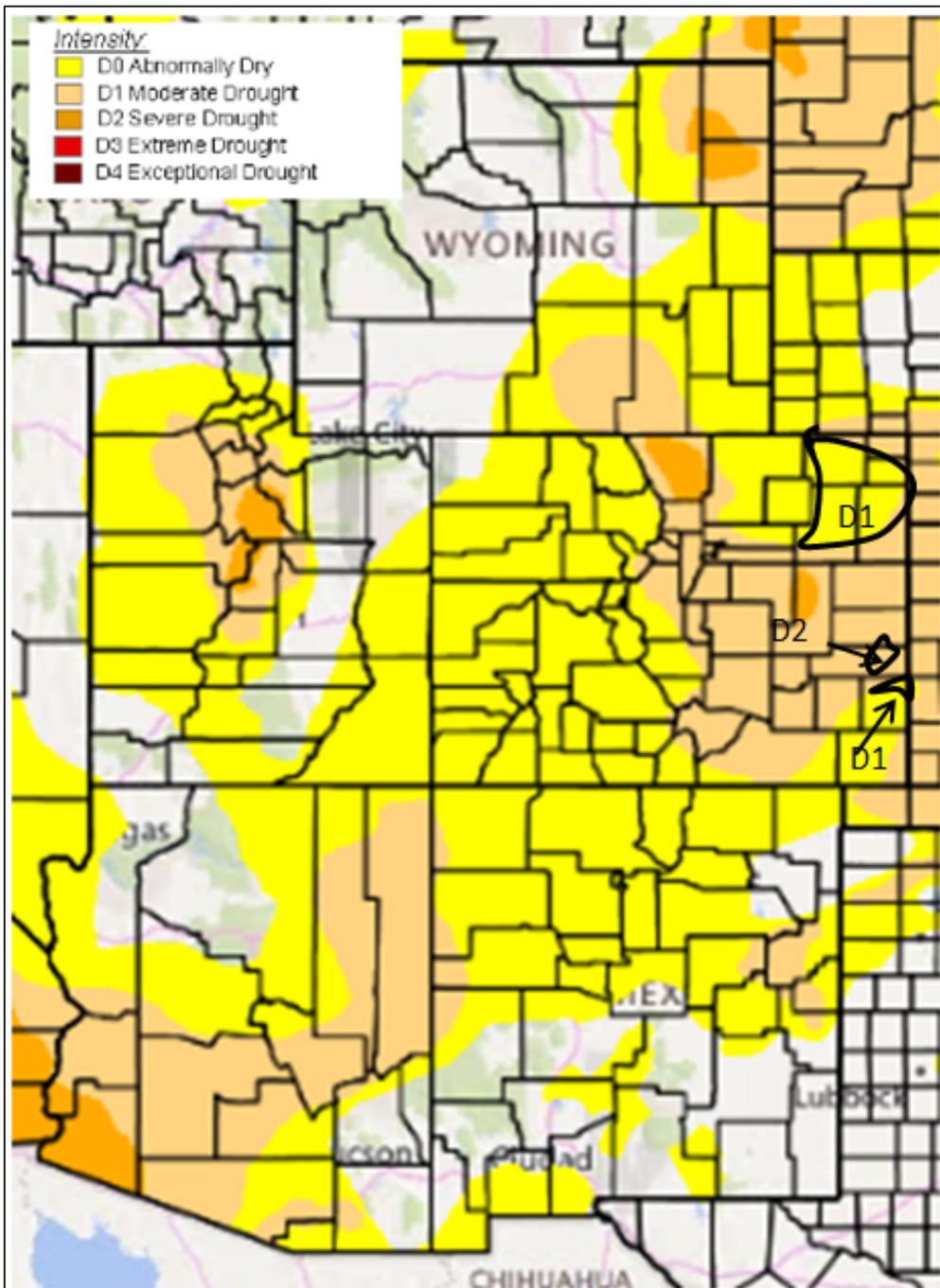
precipitation outlook from Climate Prediction Center, and the bottom right image shows the Climate Prediction Center's most recent release of the U.S. Seasonal Drought Outlook.



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: December 6, 2016

The persistent pattern of high pressure and very anomalously warm temperatures across the Upper Colorado River Basin and eastern Colorado finally broke the week before Thanksgiving. Since then, the area has been dominated by cool, northwesterly flow with fits of arctic air drooping down from the north, a pattern quite characteristic of La Nina. The large shift in weather has led to improvements across much of the northern and central portions of the Upper Colorado River Basin. Cool northwesterlies do not do these same favors for the San Juans, Sangre de Cristos, and south and eastern plains of Colorado. Cooler temperatures retard drought development, for these areas, but dry, windy conditions now prevail.

The snowpack season was delayed by warm, subtropical high pressure. Since the switch in prevailing flow three weeks into November basin snowpack numbers have begun to recover. Snowpack is forecast to continue to improve

for the next seven days basin-wide, and from the Colorado Mainstem north through the next two weeks.

Streamflow is mostly in the normal range for the basin at this time of year save for some gages along the San Juan, and in the head waters of the Colorado Mainstem. As expected, many high-elevation stream gages have now iced up. Large Reservoirs such as Flaming Gorge, Navajo, Lake Dillion, Lake Granby, and Blue Mesa are showing near-normal or above normal storage for this time of year. Lake Powell is perennially below normal.

As suggested previously, neither the warm, dry, calm conditions of yore, nor cool, windy, northwesterly flow of late are particularly conducive to drought relief in eastern Colorado. Snowpack for the season to date in the South Platte is 49% of average, and snowpack for the season to date in the Arkansas Basin is 56% of average. Soil moisture is well below average for eastern Colorado following a hot, dry fall. Given local vegetation has gone dormant, temperatures have cooled, and long-term water supplies from streams and reservoirs are healthy large-scale degradations beyond D1 are unlikely in the coming months. This being said, between soil moisture and snowpack now well below average, there is a short-term water supply hole that the area will hope to crawl out of before the growing season of 2017 reaches full tilt.

Recommendations

UCRB: Status quo is recommended. Snowpack for the season to date is still generally between 60 and 80 percent of normal, very much a lingering concern. Since both current conditions and the weather outlook are good news we can hold off on advance of D1 west of the Continental Divide.

Eastern Colorado: It is recommended that D1 be expanded in northeast Colorado into northern Washington County, northeast Yuma County, Phillips County, and eastern Logan County. Winter Wheat germination has been very spotty in these areas. Dr. Heim made a play for this degradation a few weeks back, and we resisted; it's time for us to fall in line.

It is recommended that D1 be added to northern Prowers County. This area was wetter during the summer, and has thus held onto D0, but the dry fall is now making its mark on local vegetation.

It is recommended that a small patch of D2 be added in Kiowa County east of Eads. We have evidence via CoCoRaHS and on-the-ground impact reports that major precipitation has been lower in this area than surrounding areas since the beginning of June. Grass in this area is in very poor shape.