January 20, 2016 Water Supply Forecast Discussion

The Colorado Basin River Forecast Center (CBRFC) geographic forecast area includes the Upper Colorado River Basin, Lower Colorado River Basin, and Eastern Great Basin.

Seasonal Water Supply Forecasts:

Water Supply Forecast Summary (Mid January Update):

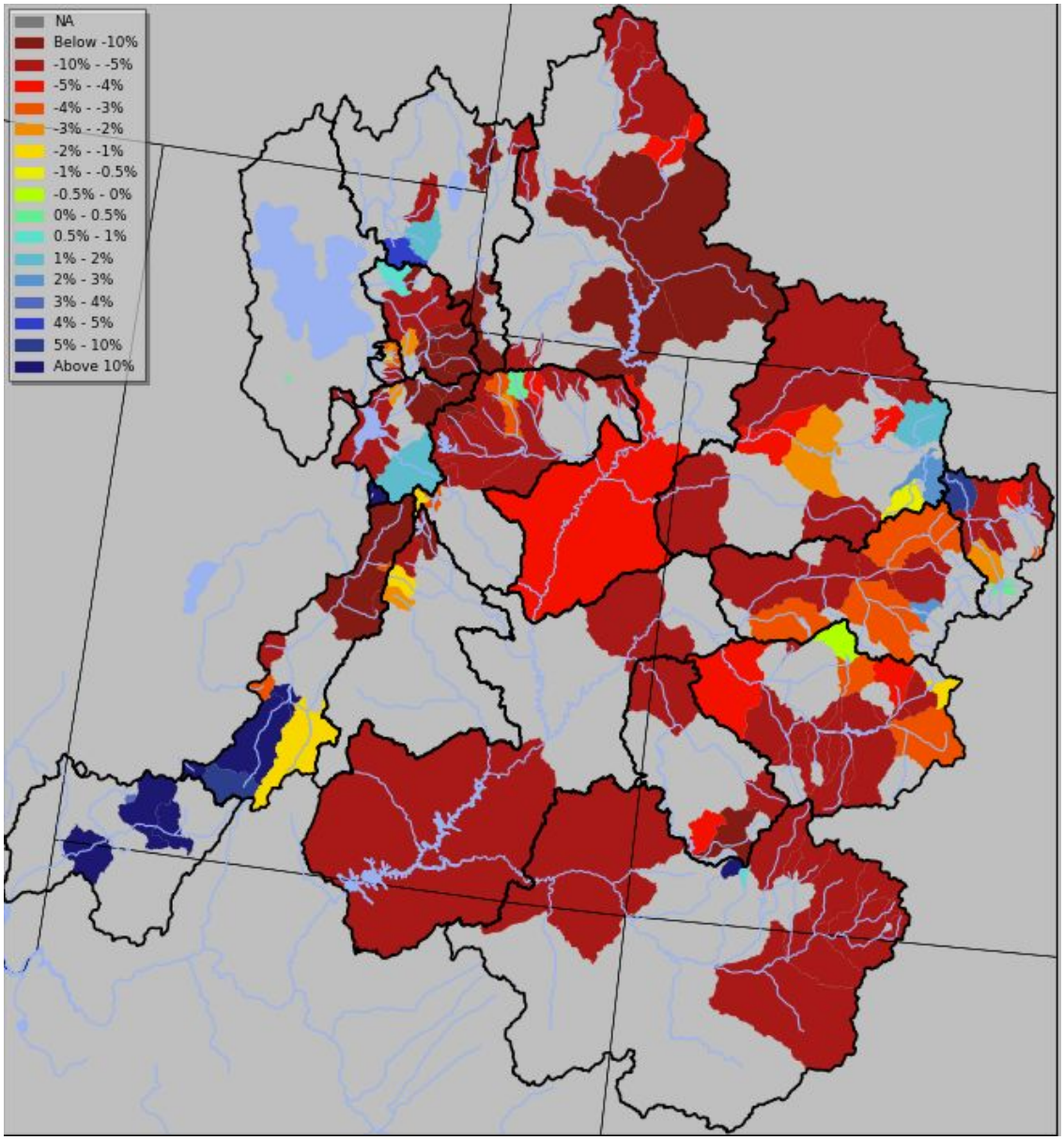
CBRFC raw model guidance has trended water supply forecasts downward over much of the upper Colorado River and eastern Great Basin forecast area since January 1st. Exceptions were the Virgin River Basin and few headwater basins in the Yampa and Great Basins. With the exception of the Yampa River Basin, precipitation during the first 18 days of January was much below average. Snow conditions in the dry areas fell compared to the historical median compared to January 1st, however many areas still have snow conditions close to or above median for this time of year.

The decrease in forecast volumes as a percent of the April-July average was most notable in parts of the Green River above Flaming Gorge, Weber River headwaters, and lower Sevier River Basin where model guidance reduced volumes 10 percent or greater. Decreases in the San Juan ranged in the 5-10 percent category with similar or less reduction elsewhere in the upper Colorado River Basin.

Model guidance indicates April-July runoff volumes to remain near or above average in the San Juan, Dolores River, and Virgin River Basins, near to below average in the Gunnison River Basin and Colorado headwaters, with near or below average volumes in the Yampa River Basin. Much below average runoff volumes are indicated in the Green River Basin above Flaming Gorge, the Duchesne River Basin, and throughout most of the Great Basin.

Mid January forecasts for some of the major upper Colorado River Basin reservoirs included Fontenelle with a decrease from 76 percent to 71 percent of average, Flaming Gorge from 71 percent to 67 percent of average, Blue Mesa from 90 percent to 87 percent of average, and Navajo Reservoir from 105 percent to 99 percent of average. Essentially no change was noted for McPhee reservoir which is at 114 percent of average. The Lake Powell inflow forecast decreased by 200 KAF, from 89 percent to 87 percent of average, and is now at 6.2 million acre-feet.

Model guidance increased seasonal volumes slightly In the Lower Colorado River Basin of Arizona where January-May volumes are expected to range from near to much above median due to the presence of the strong El Niño event underway. The El Niño event is also impacting forecasts in the Virgin River Basin.



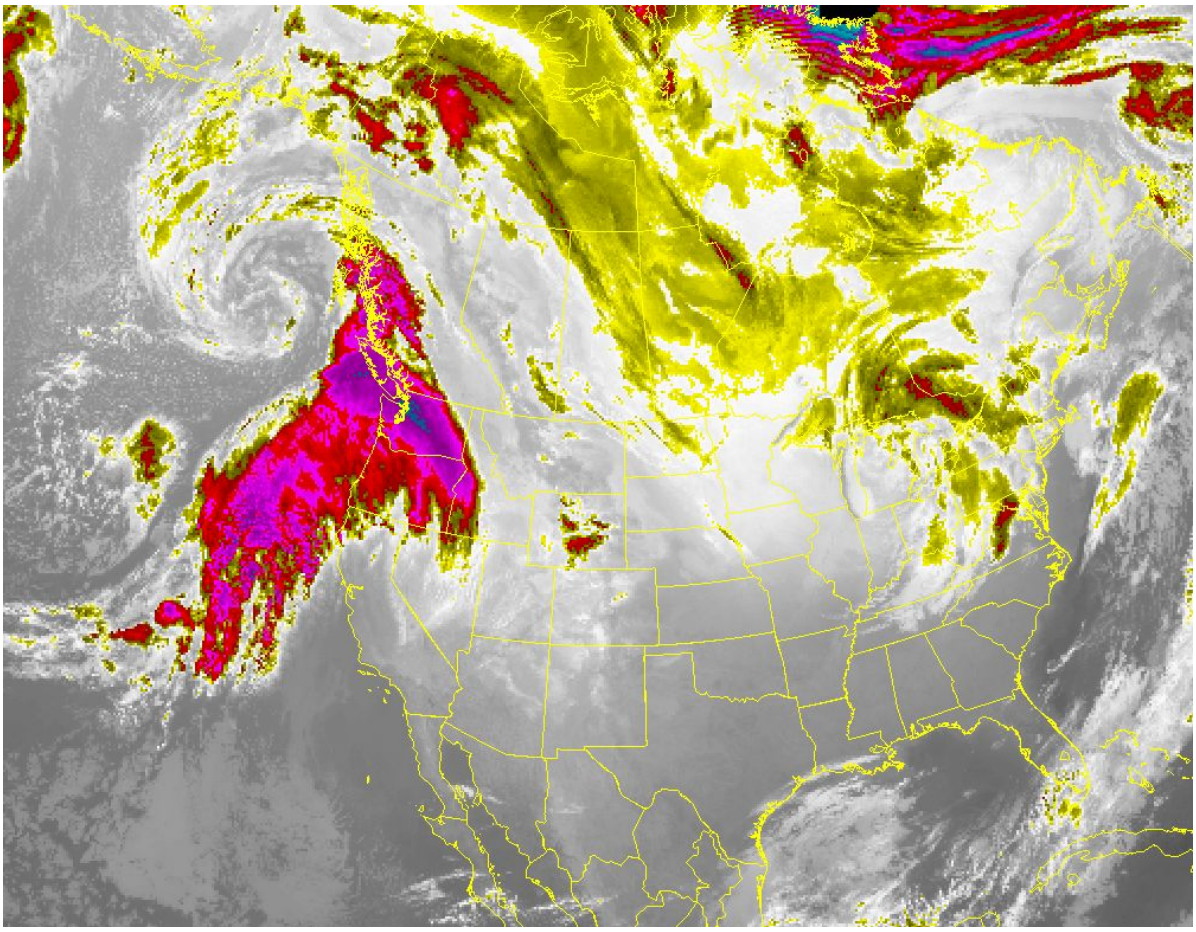
Trend in the April-July runoff volume forecasts since January 1st
(Change in April-July percent of average)

[Click here for the latest water supply model guidance]

Water Supply Discussion

Weather Synopsis:

The weather pattern has been of a progressive nature the first half of January with storm systems moving into the western U.S. However they have been encountering a mean high pressure ridge, weakening and splitting, with some storm energy moving through areas north of Lake Powell and most storm energy farther south in southern Arizona.

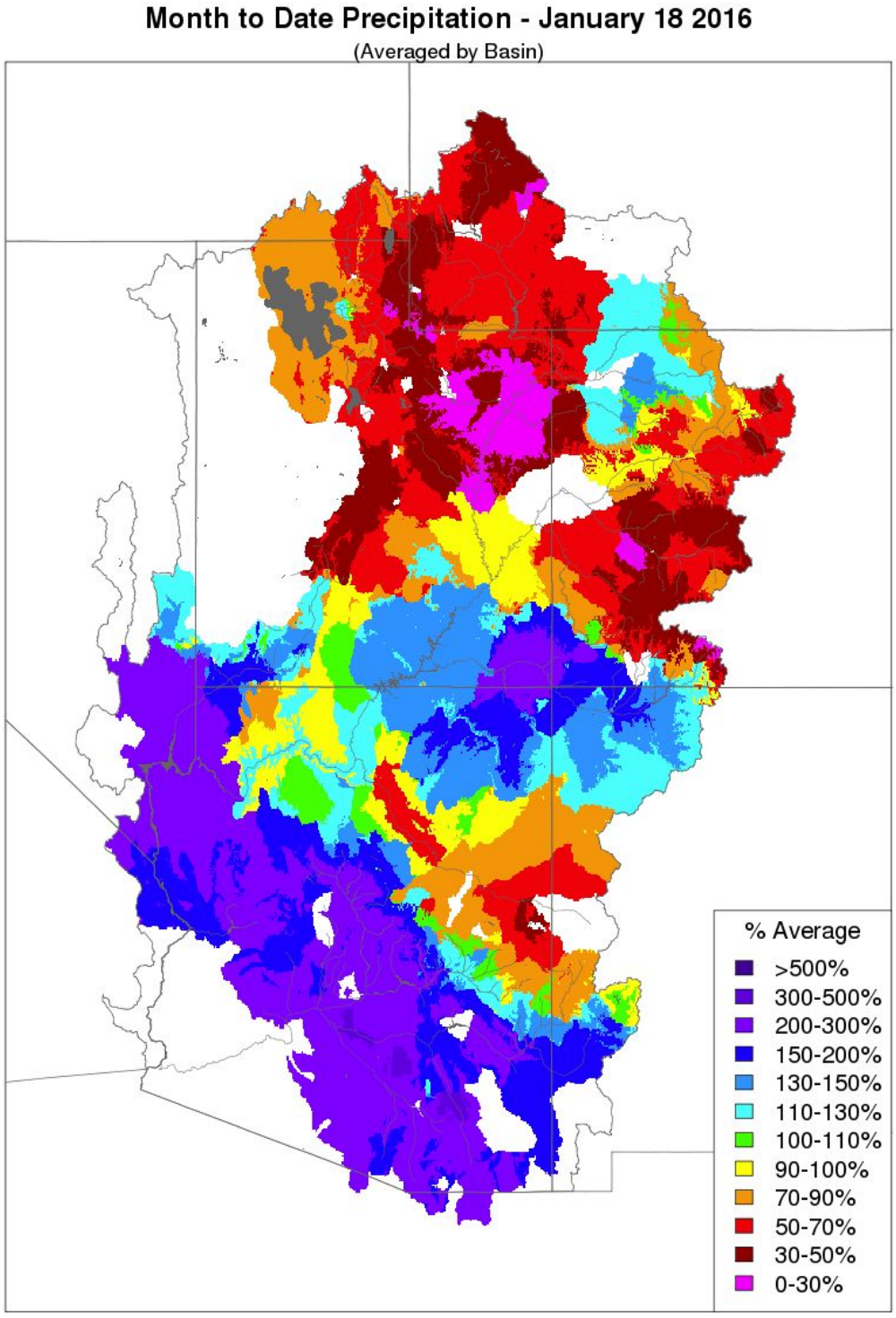


Satellite image for January 12th 2016 shows a storm system moving into a ridge that is centered over the Intermountain West. The storm weakened and split as it moved through the area.

Precipitation and Temperatures:

Precipitation for the first 18 days of January, while variable, was generally below average over the upper Colorado River and Eastern Great Basin. The exception to this included the Yampa River Basin, with a few areas, particularly in the Little Snake River drainage, where above to much above average precipitation occurred. Also some areas along the western Wasatch Range in the northern Great Basin received near average precipitation. Very dry conditions were noted in the Duchesne River Basin, Gunnison River Basin, some of the Colorado River headwaters, and remaining Great Basin. Conditions were a mix in the San Juan River Basin with dry conditions in headwater areas and above average precipitation at lower elevations. Above average precipitation also occurred over the southwest third of Arizona with drier conditions elsewhere.

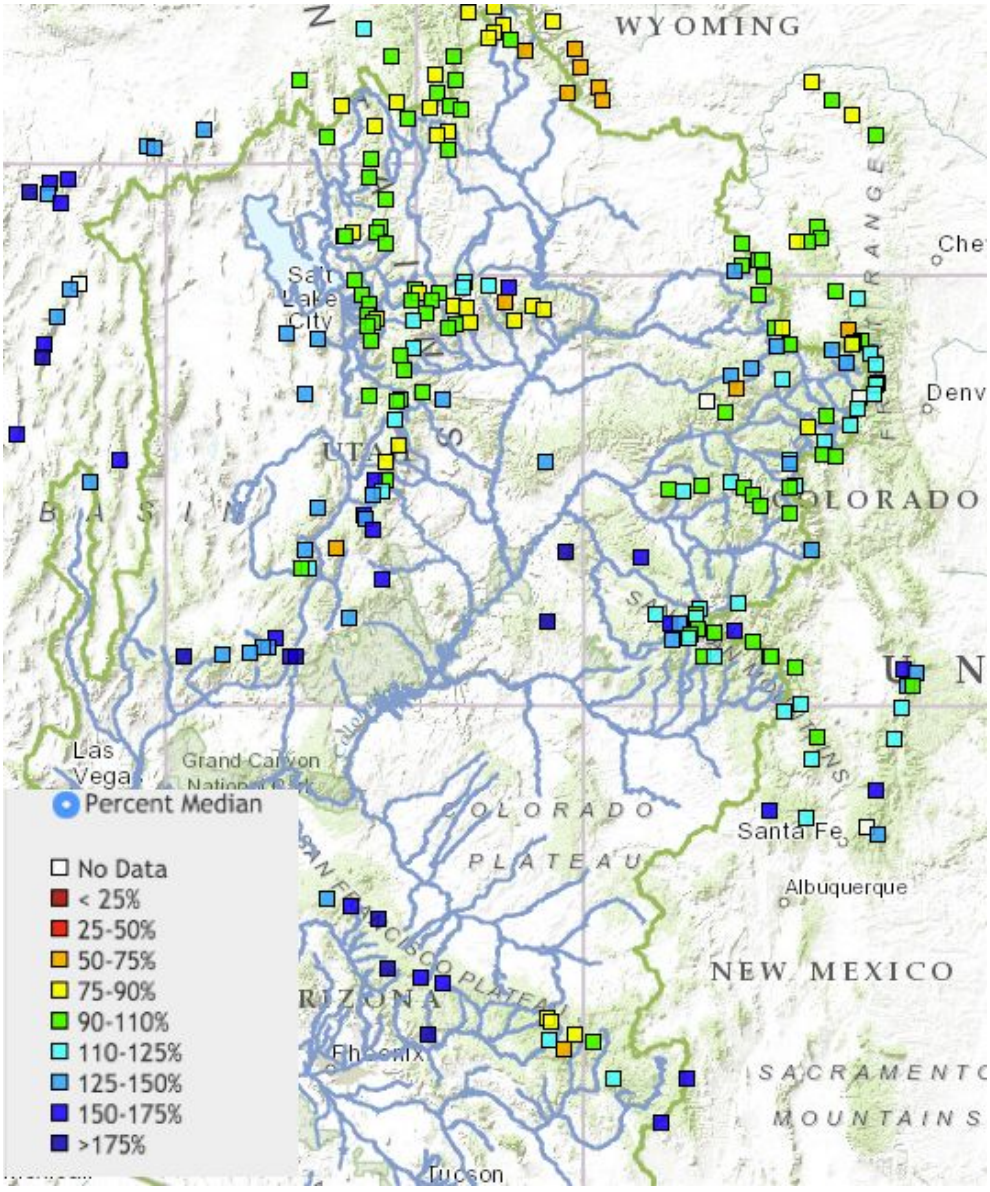
Temperatures started out cold early in the month with daily mean temperatures 10 to 20 degrees below average. Since then temperatures have varied with both near and above average periods. This has allowed for rainfall at times up to reach near the 6000 foot level.



January 1-18 percent of average precipitation

Snowpack:

Snow conditions improved some at some SNOTEL sites in the Yampa River Basin since early January. In many areas of the upper Colorado River Basin and eastern Great Basin they decreased slightly when compared to their historical median from earlier in the month. However conditions remain favorable over many areas particularly in the San Juan River Basin, parts of the upper Sevier River Basin, and Virgin River Basin. Snow conditions are more variable elsewhere with a mix of below and above median measurements. A higher frequency of sites are indicating below or much below median conditions in the Green River above Flaming Gorge and throughout the Great Basin of northern Utah and southern Idaho.

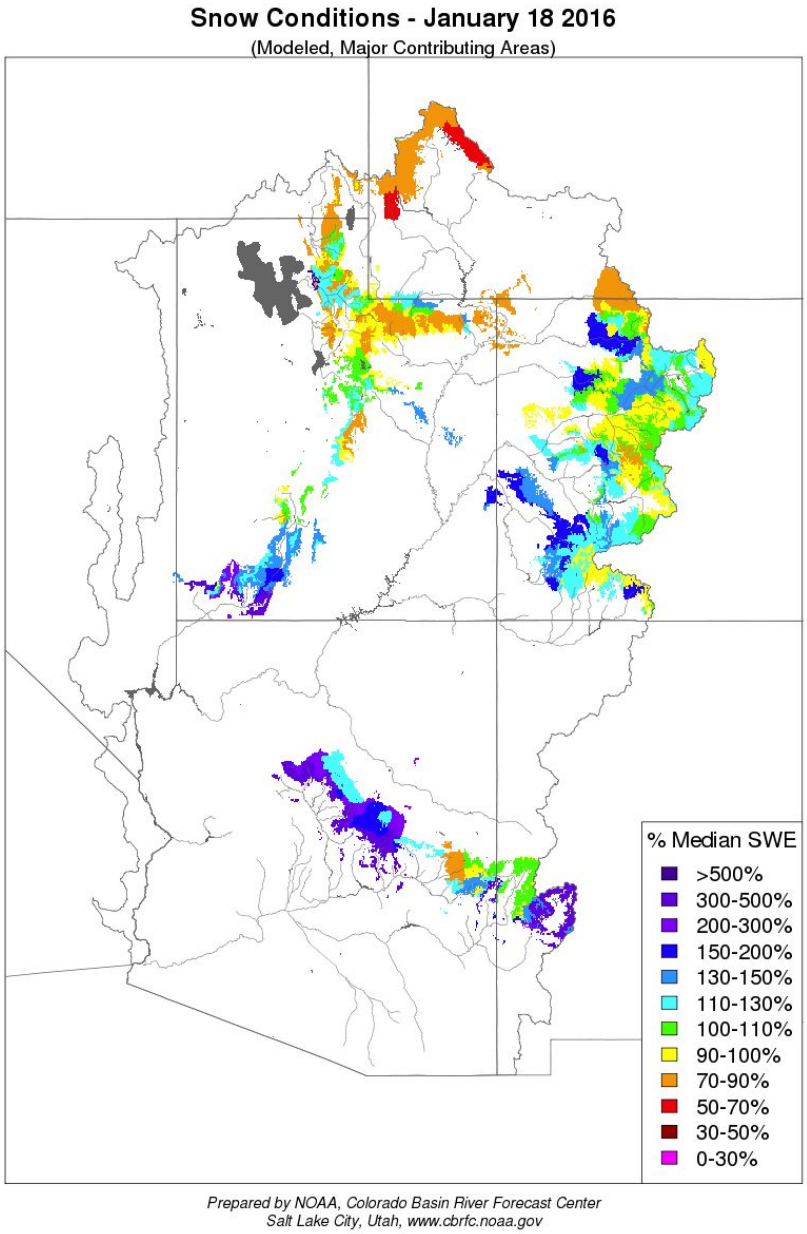


SNOTEL Sites - Percent Median Snow condition as of January 18,, 2016

For the latest snow conditions click here

The snow condition as represented by the hydrologic forecast model is depicted in the image below. The below median conditions can be seen from the Green River Basin above Flaming Gorge extending into parts of the Great Basin and Duchesne River Basin. Several high elevation areas in the upper Colorado River Basin are also indicating

snow conditions that are lower with respect to median compared to lower elevations. Typically snow falls above the 10 to 11 thousand foot level in October. Dry and warm conditions this past October delayed the snow accumulation at these high elevations. Therefore the snow conditions are trailing lower elevations when compared to the historical median.



Snow conditions as seen by the hydrologic model on January 18, 2016
Trimmed to show those areas with the greatest contribution to seasonal runoff volumes.

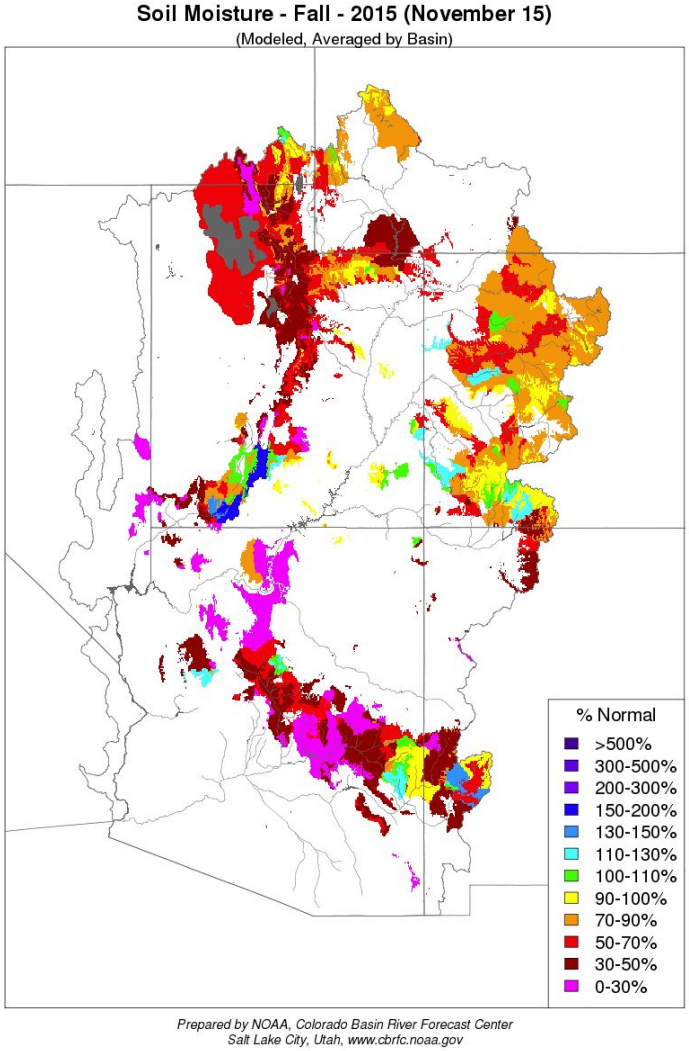
Soil Moisture:

Soil moisture conditions in the higher elevation headwater areas are important entering the winter, prior to snowfall, as it influences the efficiency of the snowmelt runoff the following spring. Modeled soil moisture conditions as of November 15th were generally below or much below average. Soil moisture was exceptionally low in much of

the Great Basin of central and northern Utah. Soil moisture conditions were more favorable in parts of the San Juan and Dolores River Basin as well as parts of the Sevier and Virgin River Basins in southwest Utah. There were also a few isolated basins near or above average in the Bear, Duchesne, Gunnison, and White River Basins but generally conditions were not as favorable.

Soil moisture conditions tend to fluctuate more in the Lower Colorado River Basin in the winter due to the frequency of rain events and possibility of melting snow. Soil conditions in the fall are less informative than they are in the northern basins that remain under snowpack throughout the winter season.

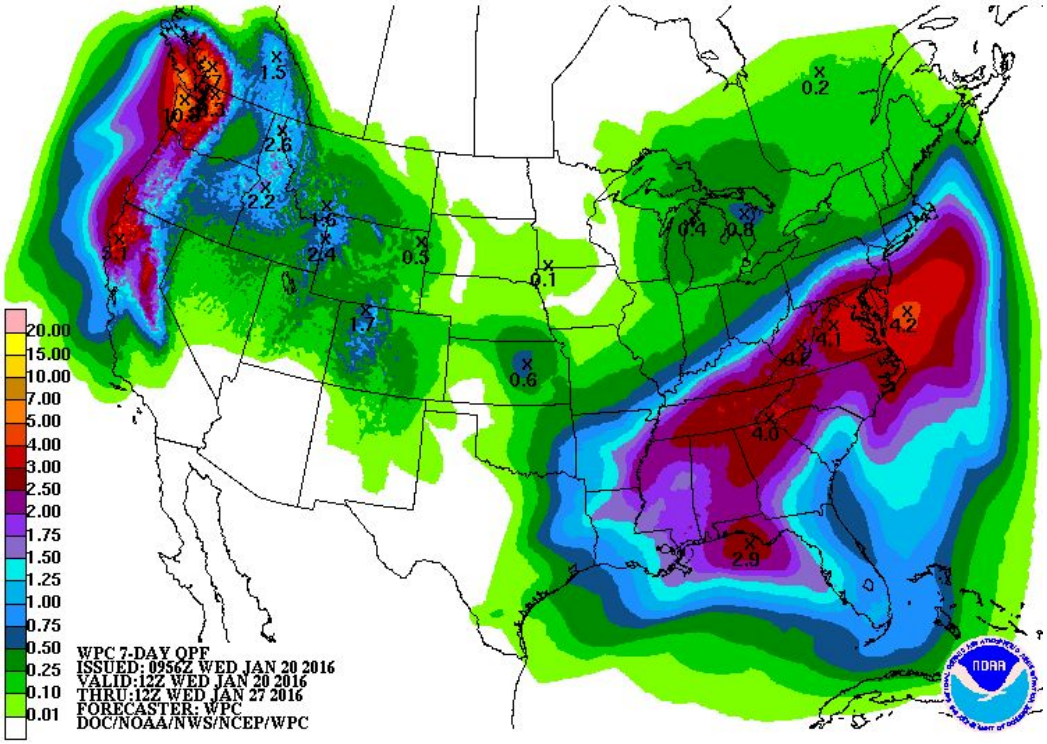
In the map below, areas in the blue are above the historical model soil moisture average while those in the yellow, orange, and red are below average. Only the higher elevation areas that have greatest impact to runoff volumes are displayed. The areas in white are not included.



Modeled soil moisture entering the winter season (as of November 15 2015)

Weather Outlook:

The pattern continues to be progressive with meteorological models suggesting storm systems moving through the CBRFC forecast area every 3-5 days. However most storms continue to lack strong organization and tend to weaken and split as they move into the area. Additional precipitation is likely between now and the end of the month but amounts may be on the light side and not widespread across the CBRFC forecast area. There is a potential for heavier precipitation indicated by meteorological models at the very end of the month but confidence is not high that far into the future.

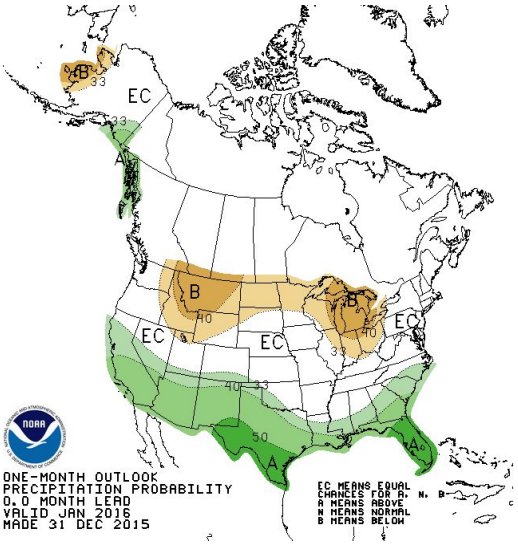


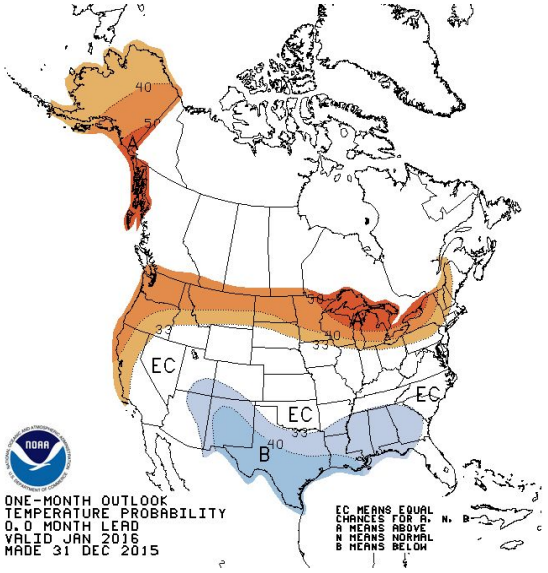
Precipitation outlook for January 20 - January 27 from the Weather Prediction Center.

Climate Outlook:

A strong El Niño Southern Oscillation (ENSO) condition currently exists across most of the equatorial Pacific Ocean. Positive sea surface temperature anomalies greater than 2 degrees celsius extend from 170 degrees West eastward to the coast of South America. El Niño is expected to remain strong through the Northern Hemisphere winter of 2015-2016, with a transition to ENSO-neutral conditions anticipated during late spring or early summer 2016. The current El Niño is anticipated to be among the 3 strongest on record dating back to 1950.

The Climate Prediction Center indicates enhanced chances of above normal precipitation over the southern half of the CBRFC forecast area for January 2016 with below average precipitation over the extreme north to include the Bear River Basin and Green River Basin of Wyoming. The potential for above below temperatures exist over the San Juan Basin and part of the Lower Colorado River Basin of Arizona during January.





Conclusion:

The first half of January saw above average precipitation in the Yampa River Basin, lower elevations of the San Juan River Basin, and the southwest third of Arizona. There were pockets of near to above average precipitation in the Great Basin, but most of the area was dry along with the Gunnison, Dolores, and Duchesne River Basins.

Even though snowpack conditions, as a percent of median, generally decreased since early January, they remain favorable in many areas of the Colorado River Basin and eastern Great Basin. Areas where snowpack conditions are a bit more variable and not as favorable include the Green River Basin of Wyoming extending into the Great and Duchesne River Basins of northern Utah. Some of the better snow conditions exist farther south in the San Juan River Basin, Dolores River Basin, Virgin River Basin, and parts of the Sevier River Basin.

Model guidance indicated a slight decrease in April-July runoff volumes compared to early January guidance throughout much of the upper Colorado River Basin and eastern Great Basin. There were exceptions that included a few headwater areas in the Yampa River Basin, and a couple of areas in the Great Basin.

Model guidance indicated some increase in seasonal runoff values in the Lower Colorado River Basin from early January. Seasonal volume forecasts in these areas are being influenced by the strong El Niño event expected to last into the spring. Above average volumes are expected in the Virgin River Basin with near to much above median volumes anticipated in the Salt, Verde, and Gila River Basins of Arizona.