

May 20, 2015 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:

Quick Summary:

For the first time this season for many areas the CBRFC raw model guidance indicated an increase in April-July runoff volumes. This is due to the wet and cool weather that has dominated the first half of May. A series of very moist storm systems has resulted in widespread above average precipitation. In the first 20 days of May many areas have already received 150 to 250 percent of the total monthly average precipitation.

While the magnitude of the impacts from precipitation vary from place to place, April-July runoff forecasts remain much below average overall and that situation is unlikely to change. This is due to widespread record heat and record low snowpack conditions experienced during the winter. The significant lack of runoff expected from snowmelt this year makes the above average May precipitation perhaps even more beneficial by reducing water demand during a period when irrigation typically begins. May precipitation will also end up being a larger component of the April-July volumes where record low runoff was expected. Although runoff volume forecasts in these areas remain very low, some forecasts have nearly doubled due to the precipitation contribution, and other forecasts increased enough to no longer indicate record lows.

The cooler temperatures have also slowed high elevation snowmelt where snow remains. At times additional snow has also been received. The result is an increase in the forecasted June runoff volumes, particularly in parts of the upper Colorado River Basin.

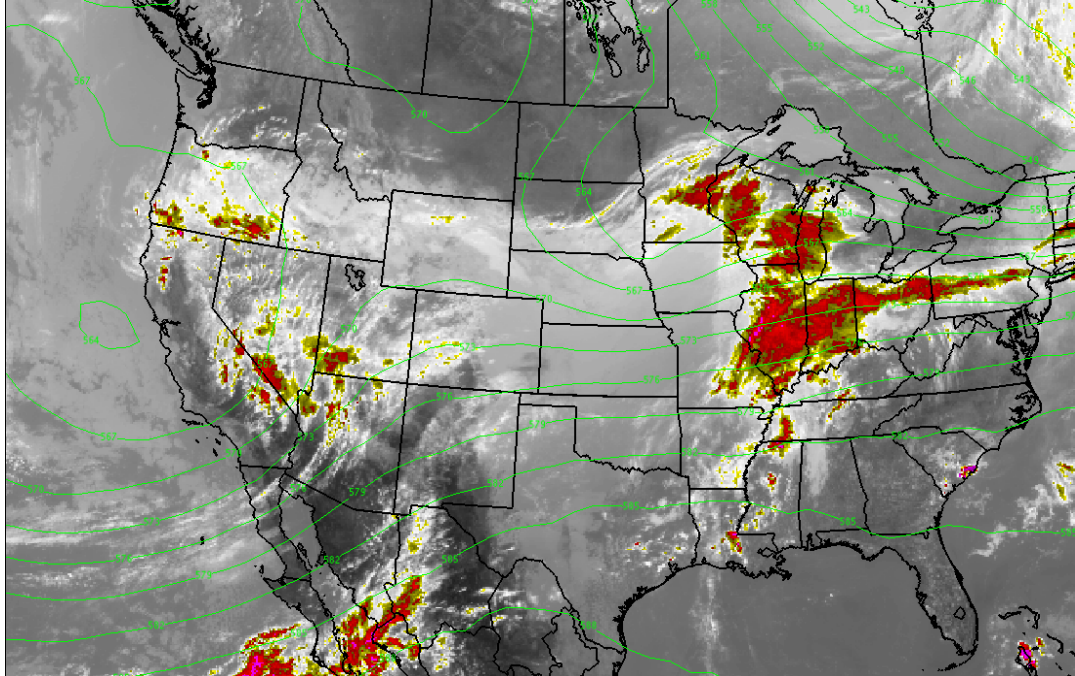
The mid May forecast updates for the major upper Colorado River Basin reservoirs all showed increases from the first of month forecasts. In the Green River Basin, Fontenelle inflow increased from 68 to 80 percent of average and Flaming Gorge inflow increased from 58 to 70 percent of average. In the Gunnison Basin, Blue Mesa inflow increased from 65 to 77 percent of average. In the Dolores River Basin, McPhee inflow increased from 37 to 53 percent of average and in the San Juan Basin the forecast for inflow to Navajo Reservoir increased from 31 to 41 percent of average. The Lake Powell inflow forecast increased 750 thousand acre-feet, from 42 to 52 percent of average, and is now at 3.75 million acre-feet. In the Great Basin, forecasts increased on average by 13% of the seasonal average. Pineview Reservoir inflow nearly doubled from 18 KAF to 34 KAF and is now at 30 percent of average.

[Click here for the latest water supply model guidance](#)

Water Supply Discussion

Weather Synopsis:

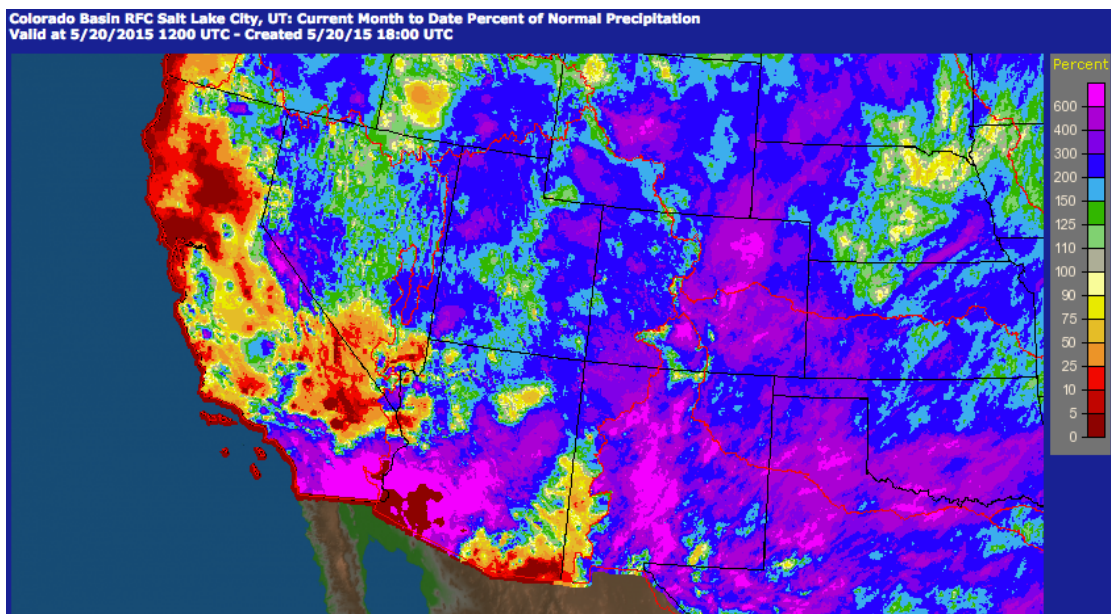
A pattern change to cooler wetter weather occurred in April and that pattern continued into May. A series of closed low pressure systems, not uncommon during spring, moved through the CBRFC forecast area during the first half of the month. The airmass was very moist and widespread, sometimes heavy, precipitation occurred over much of the forecast area. Much above average precipitation occurred over much of the CBRFC forecast area the first half of the month. The wet cool pattern is anticipated to continue into the final week of May.



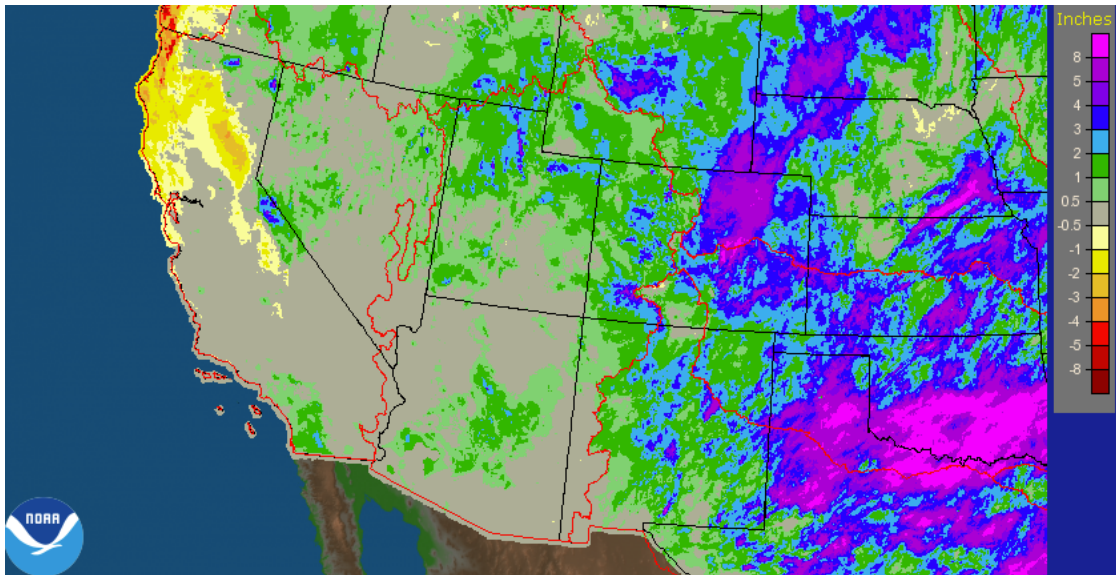
Satellite image for May 20th 2015 shows another storm system poised to move into the CBRFC forecast area during the Memorial Day weekend.

Precipitation:

Precipitation for the first 20 days of May was well above average with most areas receiving 150 to 200 percent of average and some areas up to 400 percent of average. When compared to the monthly average for May several locations in the Great Basin, Gunnison Basin, San Juan Basin, and parts of the Green River Basin, particularly the Duchesne River Basin will see final monthly totals in excess of 150 to 300 percent of average.



May 1-20 percent of average precipitation.

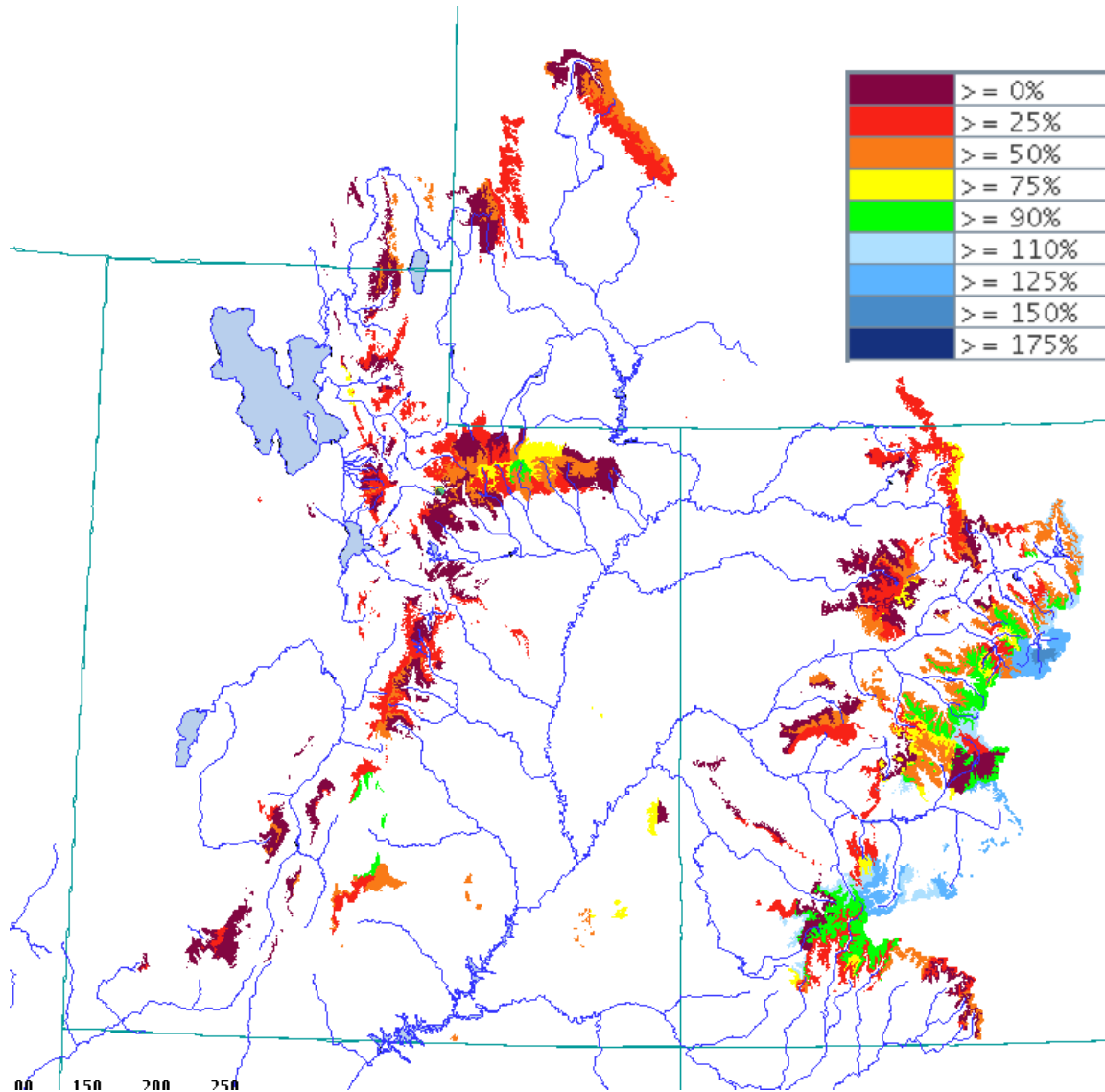


May 1-20 precipitation departure from average.

Snowpack:

With the exception of the Colorado River headwaters the snowpack never achieved normal levels and was in fact near record lows in many areas, particularly the Great Basin and Virgin River Basin. The recent cool and wet weather has acted to delay the melt of what high elevation snow remains with some minor increases noted. Snow typically begins melting in April and the delay in the melt has caused a few areas, primarily in the Gunnison and San Juan River Basins, to indicate snow water equivalent near average. However the averages are lower at this time of year than April and the large deficits from the average seasonal peak snow remain. The primary effect of the delayed melt may result in larger June runoff volumes than anticipated earlier this month.

The latest snow conditions in the CBRFC forecast model are indicated below. Only areas with greater than 2 inches of Snow Water Equivalent are indicated.



Percent of average snow in the CBRFC Forecast Model as of May 20th 2015

For the latest snow conditions click [here](#)

Soil Moisture:

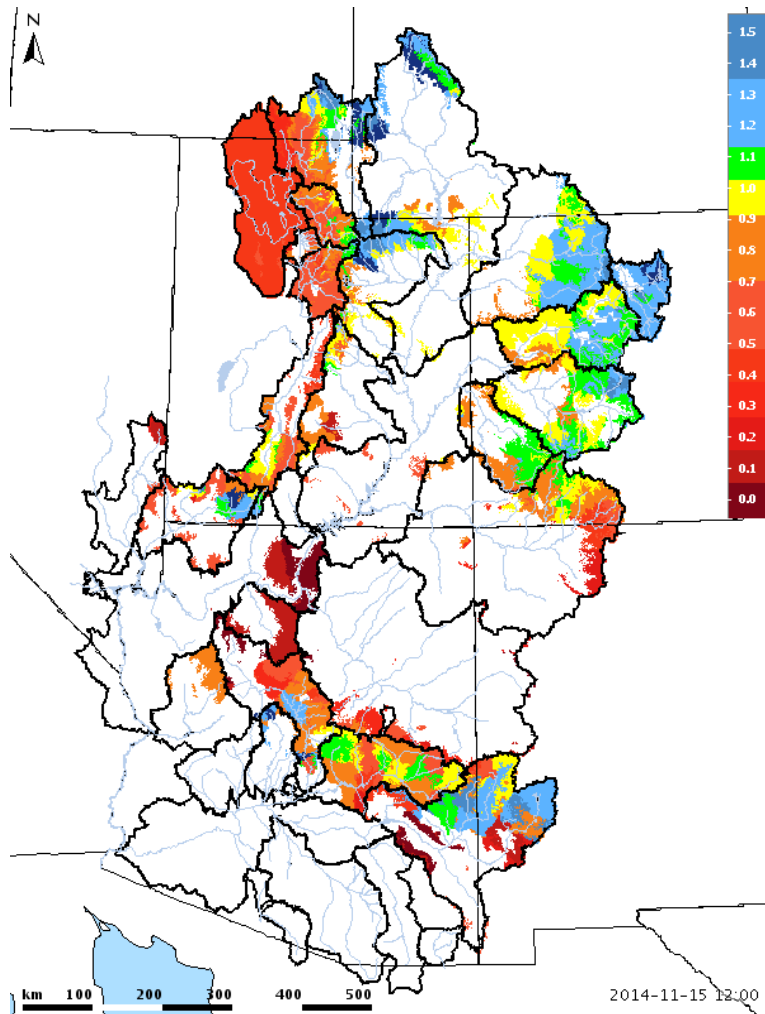
Soil moisture conditions in the higher elevation headwater areas are important entering the winter, prior to snowfall, as it influences the efficiency of the snowmelt runoff the following spring. Modeled soil moisture conditions as of November 15th were above average over much of the Green River Basin above Fontenelle, headwaters of the Yampa and White River Basins, and the Colorado River headwaters above Kremmling. Above average soil moisture also existed over much of the Uinta Mountain range that drains into the Bear River, Duchesne River, and Green River above Flaming Gorge.

Soil moisture conditions were below average over the lower Bear River Basin, Weber River Basin, Provo River Basin, and Six Creeks Basins. The Sevier, San Juan, and most of the Virgin River Basins had below average soil moisture

conditions entering the winter. In the Lower Colorado River Basins of Arizona conditions vary with most areas below average. However in this area, the January-May runoff volumes are primarily influenced by the frequency and magnitude of winter rain events.

In the map below, areas in blue are above the historical model soil moisture average while those in the red and orange are below average. Only the higher elevation areas are displayed. The areas in white are not included.

Recent rainfall has improved soil moisture conditions at low and mid elevation areas void of snow cover. The resulting impact may be greater efficiency in runoff from additional rain and snowmelt for the near future.

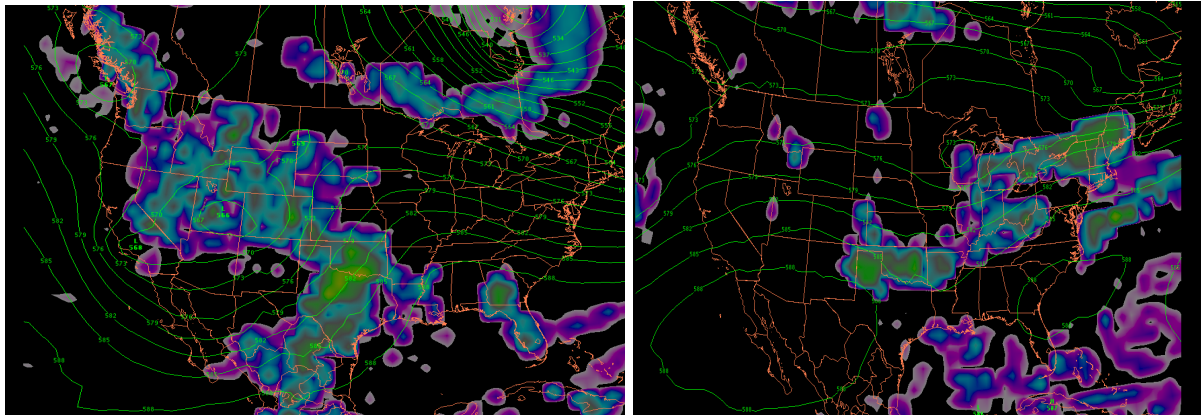


Modeled soil moisture entering the winter season (as of November 15 2014)

Weather Outlook:

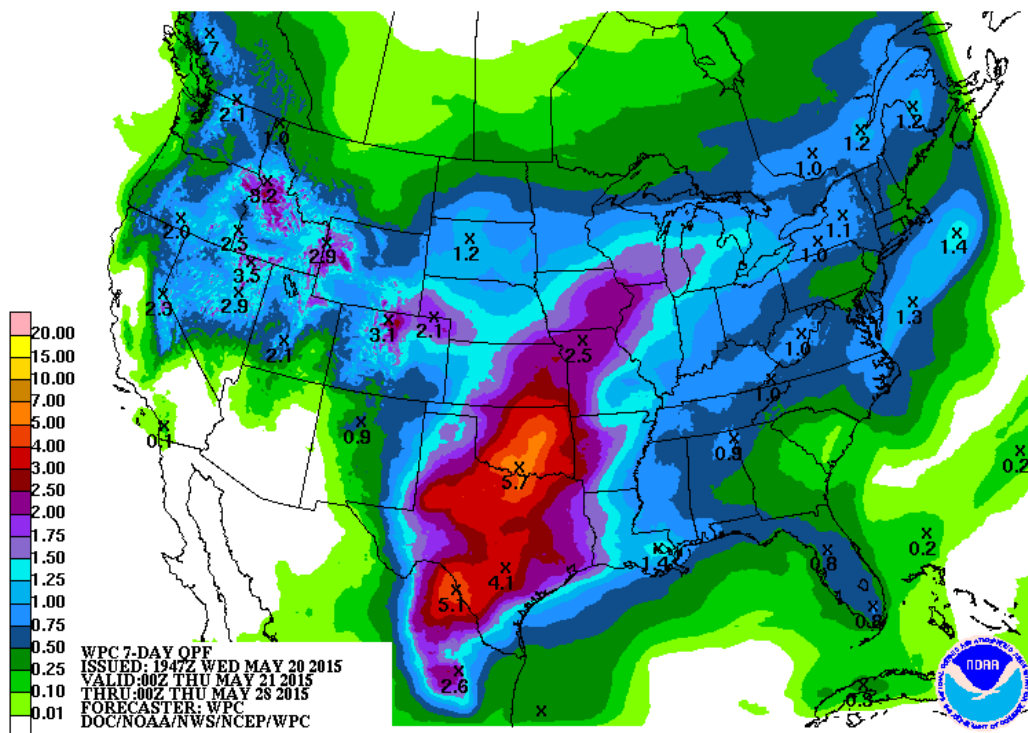
The wet weather pattern is expected to continue into at least the final week of May. Another closed low pressure system will move through the CBRFC forecast area over the Memorial Day weekend bringing widespread precipitation. Beyond the holiday weekend confidence is lower but the potential for additional precipitation exists. Temperatures may climb to more seasonal levels by the final weekend of the month which would increase the snow

melt at the higher elevations.



LEFT: The ECMWF forecast model showing the low pressure system moving through the CBRFC forecast area during the Memorial Day holiday weekend. The shaded areas indicate precipitation. RIGHT: The ECMWF model for the final weekend of May indicating a weak ridge over the area and warmer temperatures. Models are not consistent how things may evolve during this period

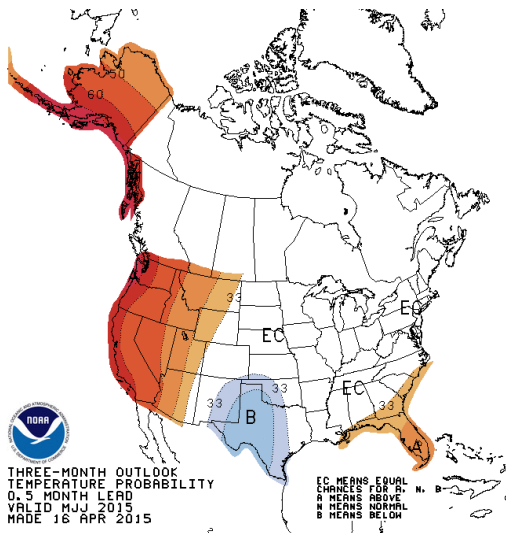
The latest precipitation forecast from the Weather Prediction Center suggests many areas receiving between .50 to 1.5 inches of precipitation with a few areas in the 2-3 inch range over the next 7 days.



Precipitation outlook for May 21 - May 28 from the Weather Prediction Center.

Climate Outlook:

A weak El Niño Southern Oscillation (ENSO) condition currently exists and is expected to persist throughout 2015. However due to the expected weak strength of this event widespread impacts to precipitation and temperatures are not anticipated at this time. Impacts over the CBRFC forecast area not expected to affect water supply forecasts at this point in the season. The Climate Prediction Center indicates enhanced chances of above normal precipitation during the May-July 2015 period over much of the Colorado River and eastern Great Basin. There are equal chances for above or below normal temperatures over the Upper Colorado River Basin during the same period with a greater chance for above average temperatures across the Great Basin and Lower Colorado River Basin.



Conclusion:

Record warm temperatures during the winter season combined with much below average precipitation resulted in record low snowpack over much of the CBRFC forecast area. A wetter and cooler pattern change occurred in April and continued into May.

The cooler weather has reduced snow melt at high elevations, however snow had already melted out in many locations. Much above average precipitation has been received during May and additional precipitation is likely into the final week of the month. While the above average precipitation will not make up for the lack of snow it has been beneficial by reducing early season water demand during an especially low runoff year.

The wet May has reversed the season long decreasing trend in runoff volume forecasts. Model guidance indicated increases in April-July runoff volumes in the Great Basin and upper Colorado River Basin. Largest increases, as a percent of seasonal average, occurred in the Gunnison, Dolores, and San Juan River Basins. Elsewhere impacts from the precipitation were greatest where snowmelt contributions were to be the smallest and near record low volumes were anticipated, including the Duchesne and some locations in the Great Basin.

However, with the exception of the Colorado River headwaters April-July runoff volumes are still expected to be much below average throughout the CBRFC forecast area due to the lack of snow received during this past winter.