

May 1, 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:

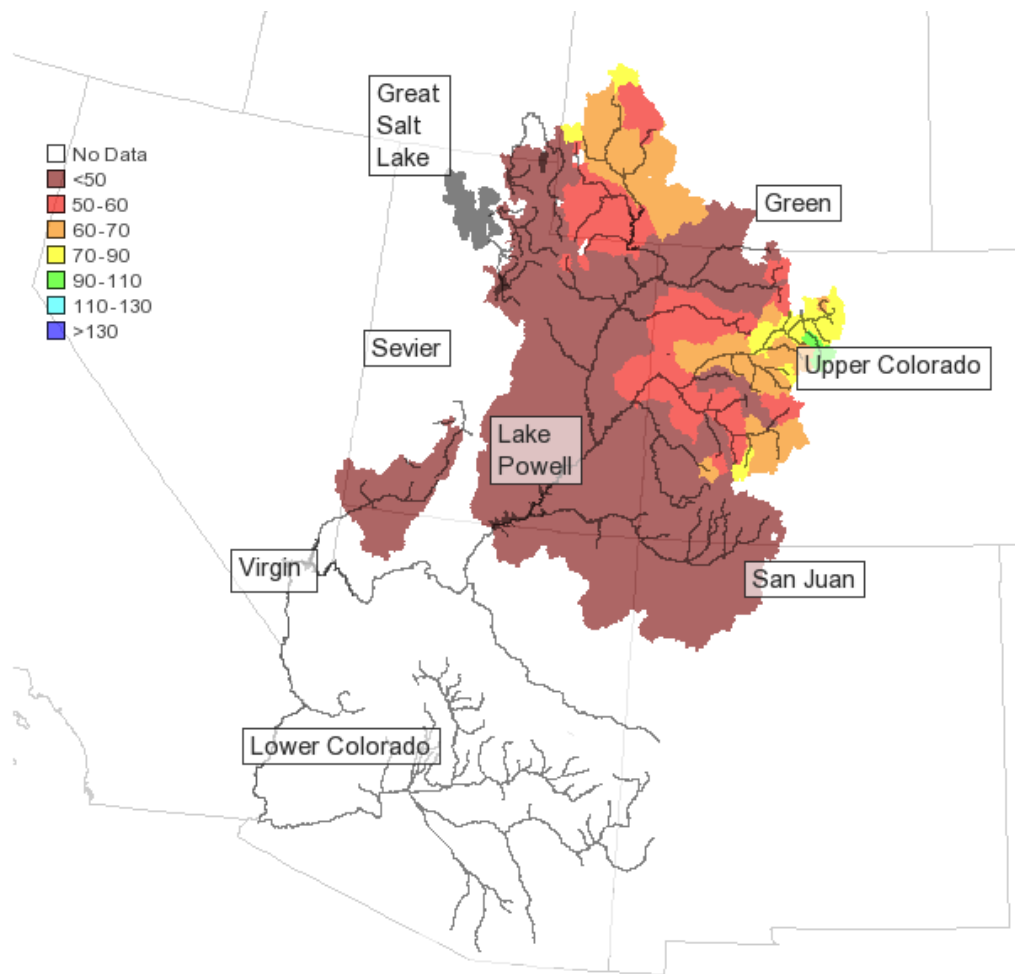
Quick Summary:

Water supply runoff volume forecasts decreased further over most areas between April 1st and May 1st. A few lower elevation forecast sites were increased slightly, but this was due primarily to rainfall received in April that impacted the April observed volumes. Forecasts issued in early May for the April-July period are a combination of the May-July anticipated runoff volumes and the April observed runoff volumes.

Decreases in forecasts were caused by another generally dry month at higher elevations along with poor snow conditions. Although more active weather occurred in April, above average precipitation amounts were generally limited to lower elevation areas while higher elevation areas were below average. The snowpack, that was near the lowest on record at many locations in early April, did not improve during the month. The snow has been depleted in many areas with only high elevation snow remaining as of early May. With the exception of some sites in the Colorado River headwaters and the Green River Basin above Fontenelle, the remaining snow is much below median.

February and March streamflow was above average in many areas due to record temperatures and early snow melt. Cooler temperatures reduced high elevation melt in April but snow that typically melts in April had already been depleted. The result was streamflow volumes in April that were less than March as a percent of average.

Only a few river basins in the Colorado River headwaters are forecast near average, with below to much below average conditions likely throughout the remaining eastern Great Basin and Colorado River Basin. Forecasts are for less than 45 percent of April-July runoff in many areas. Forecasts drop to below 25 percent of average in parts of the Sevier River Basin, Virgin River Basin, and Great Basin in northern Utah. Record low volumes are expected in some of the Six Creeks Basins near Salt Lake and lower elevations the Provo River Basin.



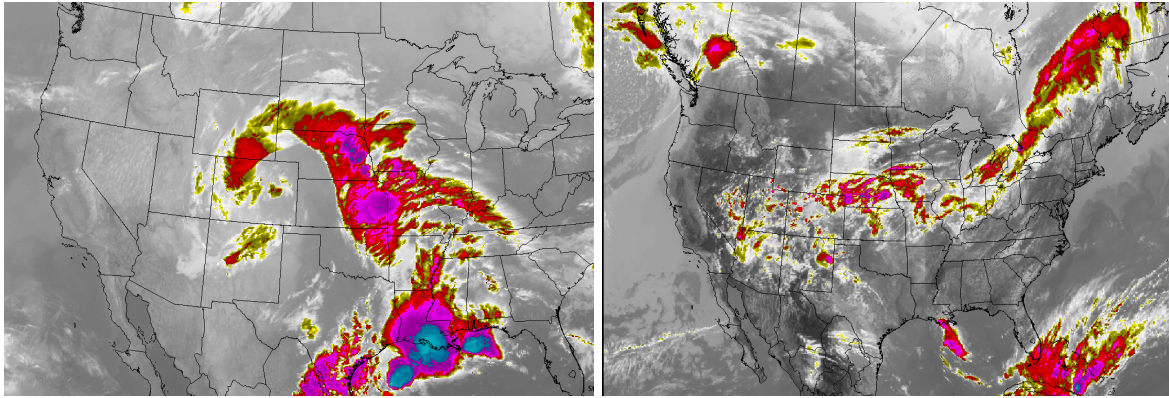
Upper Colorado Basin: April-July runoff volumes as a percent of 1981-2010 average

[Click here for specific site water supply forecasts](#)

Water Supply Discussion

Weather Synopsis:

Following several consecutive months with record warmth, temperatures in April were closer to average. This was due to a pattern change with several storm systems moving through the CBRFC forecast area during the month. April is typically an active month and one of the wettest for many locations. Even with several large storm systems precipitation still came up short of average in many areas, particularly in higher elevations that contribute directly to spring runoff volumes.



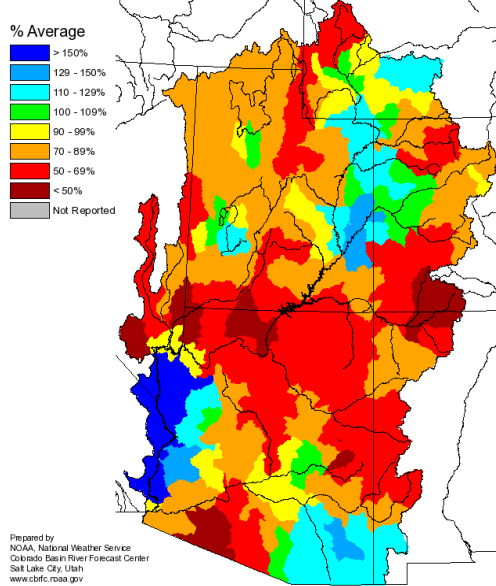
Left Image: A satellite image from April 18th 2015 shows a large storm system churning through Colorado. This system moved slowly through the region bringing very strong wind, rain, and snow. **Right Image:** A satellite image from May 4th 2015. Another closed low pressure system moved through the area during late April and early May and pulled in very moist air from the south leading to numerous showers and thundershowers.

Precipitation and Temperatures:

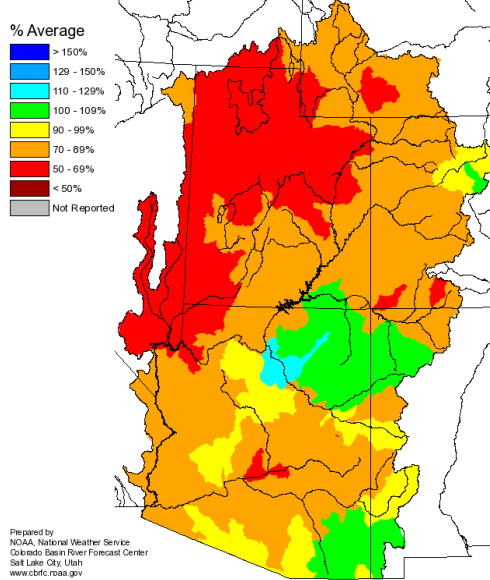
Precipitation was a bit of a mixed bag in April with near or above average amounts received in many valley locations. While lower elevations generally did okay higher elevations that contribute greatest to April-July spring runoff volumes fared worse. Precipitation amounts in these areas were below or much below average. The worst of these areas included the San Juan Basin, parts of the Yampa River Basin, Green River Basin above Fontenelle Reservoir, and Virgin River Basin in southwest Utah.

For the Colorado River Basin above Lake Powell seasonal October-April precipitation is generally below to much below average. Only the Colorado River headwaters are near average. A few areas in the Lower Colorado River Basin of Arizona, including the Gila River Basin and parts of the Little Colorado River Basin, received near to above average precipitation due to a few winter storm systems, particularly in January.

Monthly Precipitation for April 2015
(Averaged by Hydrologic Unit)



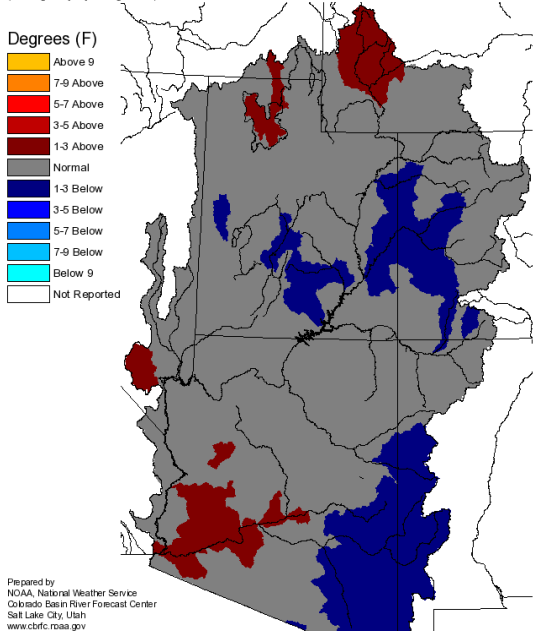
Seasonal Precipitation, October 2014 - April 2015
(Averaged by Hydrologic Unit)



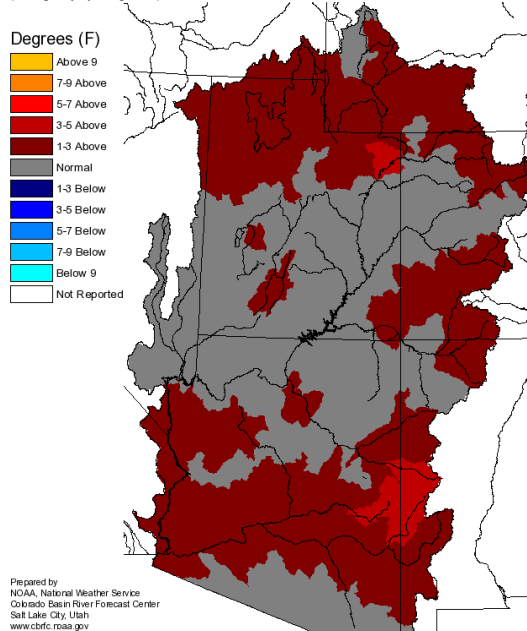
Monthly and seasonal precipitation graphics

Maximum and minimum temperatures were near average over much of the area for April. This broke a streak of four consecutive months with widespread above average temperatures. The winter season of 2015 will be noteworthy for the record warm temperatures that occurred. Numerous daily, monthly, and seasonal warm temperature records were established. This combined with sparse precipitation played havoc with snowpack conditions and resulted in very low and in some cases record low streamflow volume forecasts.

Monthly Max Temp Deviation for April 2015
(Averaged by Hydrologic Unit)



Monthly Min Temp Deviation for April 2015
(Averaged by Hydrologic Unit)

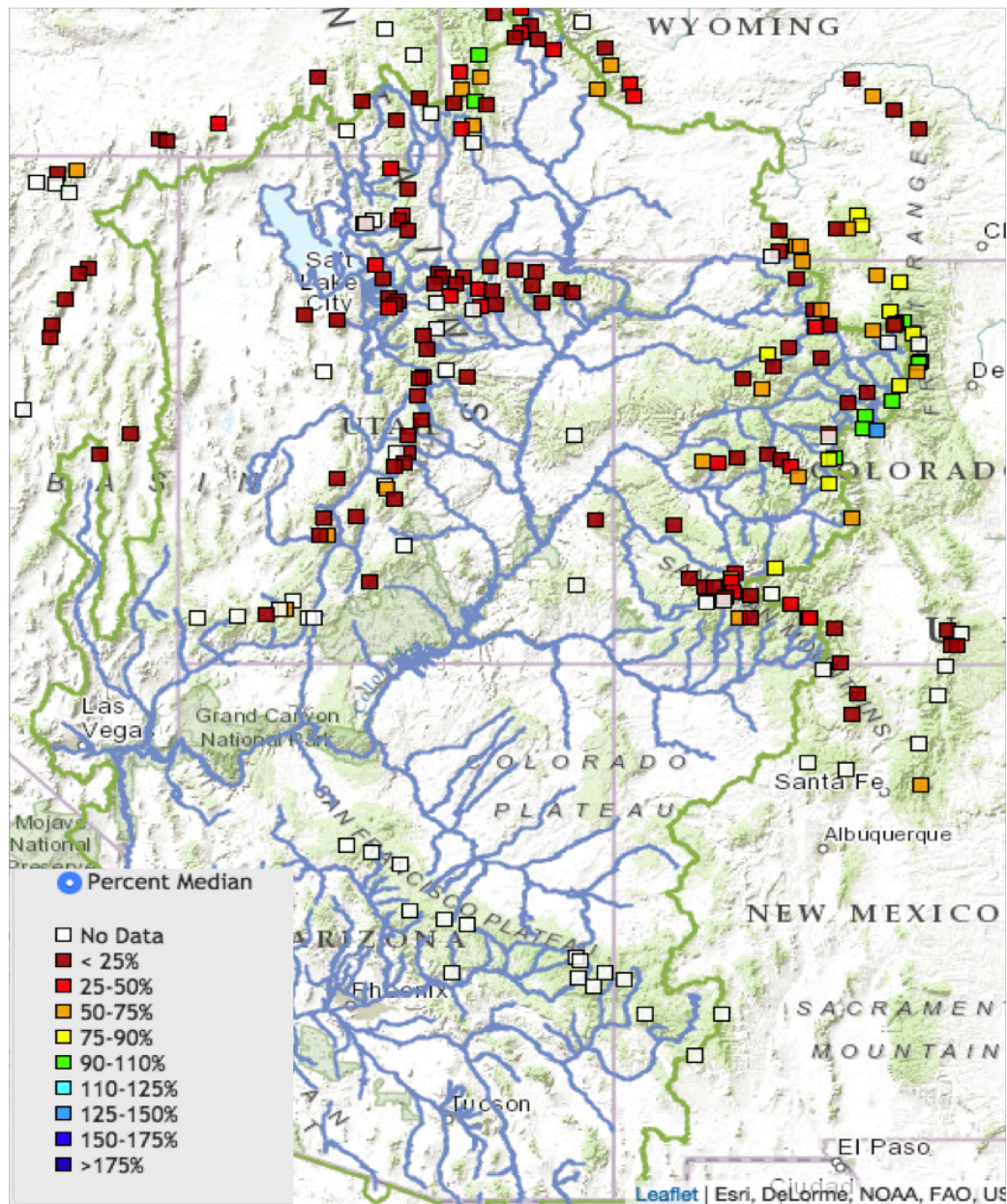


Monthly maximum and minimum temperature departure from average.

Snowpack:

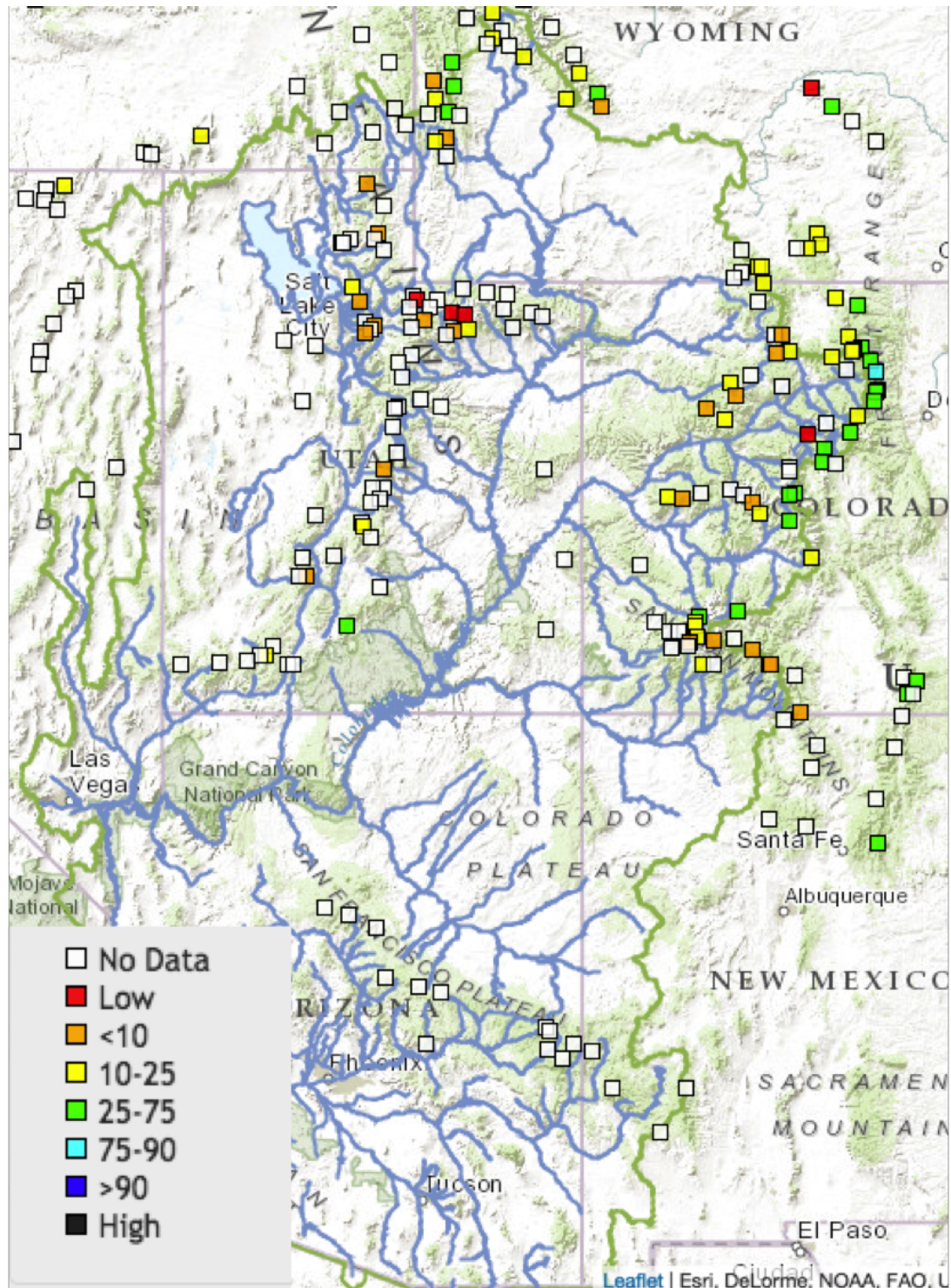
Snowpack conditions near average exist only at a few sites in the Colorado River headwaters and Green River Basin above Fontenelle. Elsewhere snow conditions are dismal at best with many sites at record lows and many already melted out. Snow conditions even within individual river basins have been highly variable throughout the winter due to record warm temperatures, rain falling instead of snow, and extended periods of below average precipitation. As of early May, low and middle elevation snow has been depleted with minimal snowpack remaining only at the highest elevations.

The map below shows conditions of SNOTEL sites across the CBRFC area as of May 5, 2015. For more details and daily updates, please refer [here](#).



Percent median snow conditions as of May 5, 2015

The snow percentile map displayed below indicates where the current snow measurement ranks in the historical record for each site. Sites in red are at their lowest in over 30 years of record as of May 5, 2015. Those sites indicated with orange rank between the 2nd and 4th lowest on record (typically between 30-37 years). Sites indicated in white represent locations where the snowpack has already melted out.



Snow Percentile Map: Historical ranking as of May 5, 2015

Streamflow:

An increase in streamflow was observed in February due to record warm conditions and early snow melt. This carried into March as record heat continued and snow melt accelerated. This resulted in much above average runoff for many streams in March. April temperatures were closer to normal across the CBRFC area. With much of the snow that usually melts in April already gone due to the very warm March, streamflow volumes as a percent of average were less than those observed during March.

Many sites in the Great Basin had April volumes that ranked in the bottom five of their historical record, with some in the Six Creeks Basin recording the lowest ever. The Colorado River headwaters above Kremmling still saw much above average volumes during April, but not as much above as the March volumes were.

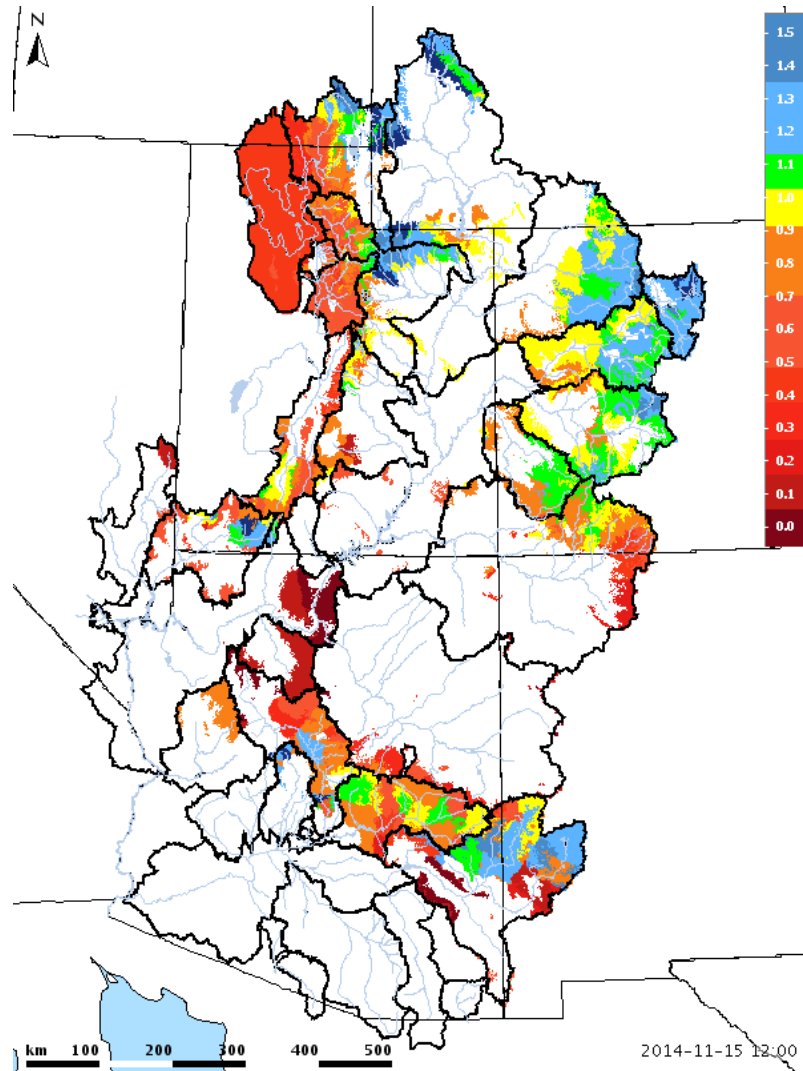
Soil Moisture:

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, Weber River, Provo River, and Six Creeks Basins. The Sevier River, San Juan River, and most of the Virgin River also had below average soil moisture conditions entering the winter. In Arizona, conditions varied but most areas were below average.

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 because they contribute very little to the runoff volumes.

Any positive impact of above average soil moisture has been reduced in areas where snowpack conditions are much below average such as in the Duchesne River Basin.



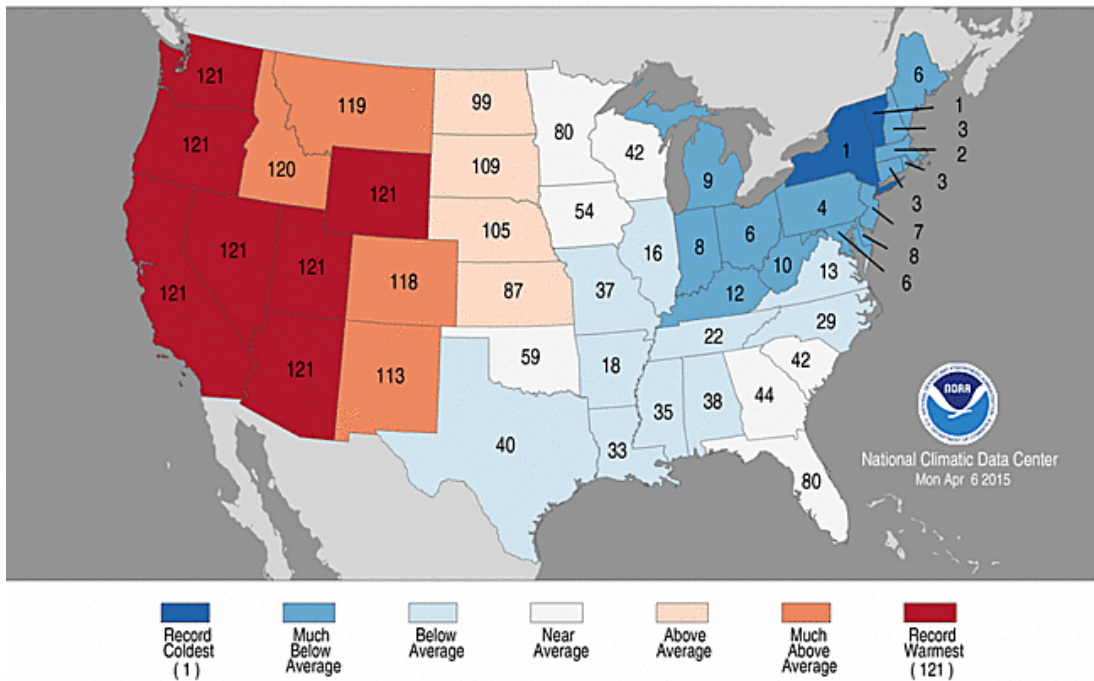
Climate Outlook:

Following the warmest winter on record, temperatures over the CBRFC have trended towards record highs into March, though temperatures were closer to average in April. Through March, calendar year statewide average temperatures were at record highs in Wyoming, Utah, Arizona, Nevada, and California, and above average in Colorado and New Mexico.

Statewide Average Temperature Ranks

January–March 2015

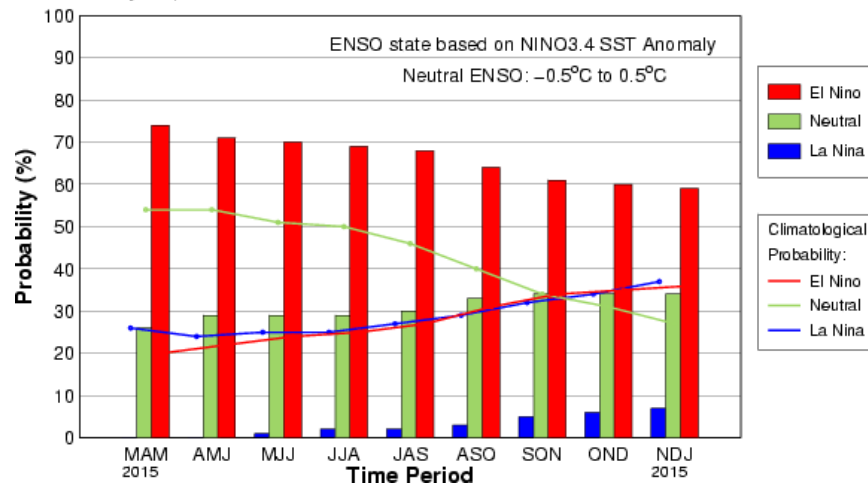
Period: 1895–2015



NOAA National Climate Data Center Statewide Average Temperature Ranks. Those states in red had the warmest January - March temperatures on record for the 1895-2015 period.

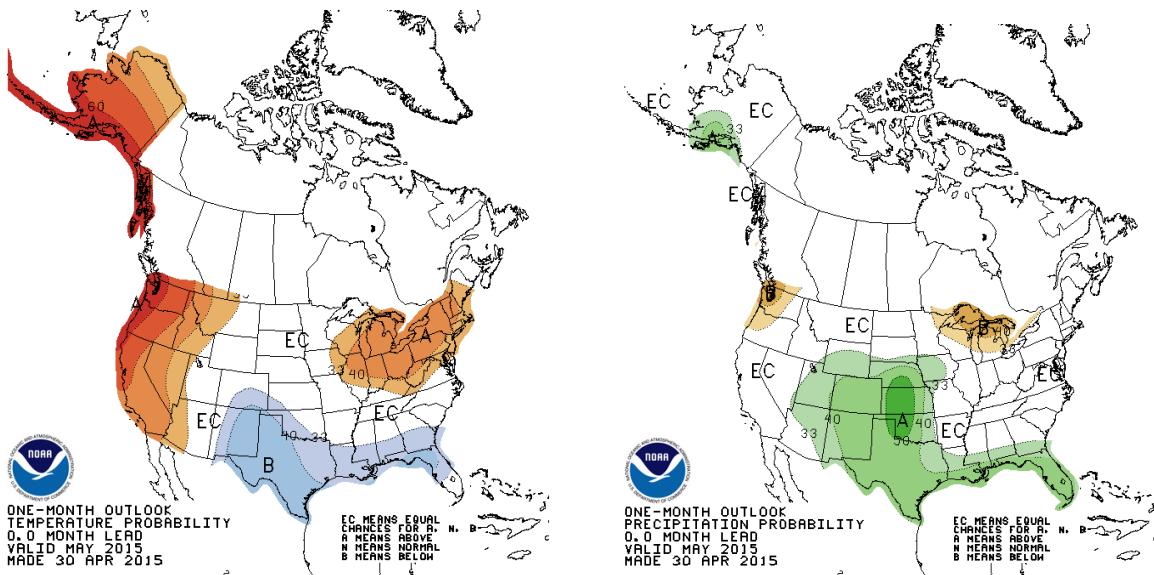
A weak El Niño Southern Oscillation (ENSO) condition currently exists. Climate models indicate approximately a 70% chance that El Niño conditions will persist through summer, and approximately a 60% chance that El Niño conditions will persist through 2015. It is important to note that climate models, particularly those that are statistically based, projecting ENSO conditions tend to have less skill this time of year due to increased climatic variability in the ENSO region and weaker coupling between the ocean and atmosphere as sea surface temperature gradients decrease. ENSO climate modelers often refer to this period as the “Spring Predictability Barrier”. Over the CBRFC region, ENSO conditions most strongly correlate with winter precipitation in the Lower Colorado River Basin, and Southern Arizona in particular. It is not expected that ENSO conditions will have a significant impact to the CBRFC forecast area over the remainder of the water year, or to water supply forecasts in the region.

Early-Apr CPC/IRI Consensus Probabilistic ENSO Forecast



The CPC/IRI forecast graphic shows the probability of El Niño throughout 2015. The vertical red columns indicate the probability of El Niño remains near or better than 60% through 2015.

The latest one-month outlook issued by the Climate Prediction Center (CPC) indicates equal chances for warmer, normal, or cooler temperature conditions throughout much of the CBRFC region, with a slightly higher chance for above normal temperatures in the Southwest Arizona region. Latest CPC guidance also suggests an increased chance for above normal precipitation conditions throughout much of the CBRFC region, particularly over Colorado and the Four Corners region. More details regarding the CPC's guidance is in the graphics below.



The latest CPC one month outlook, and other useful CPC products, may be found [here](#).

Conclusion:

The 2015 runoff is likely to go down as one of the lowest runoff years on record for many streams in the CBRFC forecast area, particularly in the Great Basin, Duchesne River Basin, Virgin River Basin, and San Juan River Basin.

Even though a more active weather pattern developed in April and has so far extended into early May, the impact of the warm dry winter was significant and evident in peak snowpack conditions that were among the lowest on record in many locations. Especially hard hit were areas that have experienced several below average runoff years recently including parts of the Great Basin, Duchesne River Basin, Virgin River Basin, Lower Colorado River Basin, and San Juan River Basin.

With the exception of a few tributaries in the the Colorado River headwaters below or much below average April-July runoff conditions are expected. Record low or near record low runoff volumes are possible in the Six Creeks Basins and lower elevations of the Provo River Basin.

End Of Month Reservoir Content Tables

[Green River Basin](#)

[Upper Colorado River Basin](#)

[San Juan River Basin](#)

[Great Salt Lake Basin](#)

[Sevier Basin](#)

Basin Conditions and Summary Graphics

[Green River Basin](#)

[Upper Colorado River Basin](#)

[San Juan River Basin](#)

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[Virgin River Basin](#)