June 1, 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:

Some significant increases occurred in water supply forecast volumes between May 1st and June 1st. This increase was most prominent in parts of the Yampa River Basin and Green River Basin of Wyoming where record precipitation occurred. Water supply volume forecasts also increased in much of the Duchesne River Basin, Weber River Basin, Bear River Basin, and parts of the San Juan and Dolores River Basins due to wetter than average conditions. Forecast volumes were decreased in the Virgin and Sevier River Basins where dry conditions occurred during May.

Elsewhere adjustments to water supply forecasts were smaller, generally within 10 percent of the April-July average. These adjustments were due to either slightly wet or dry conditions or due to April-May observed flows being greater or less than anticipated.

As of early June the greatest April-July volumes with respect to average are expected in the Yampa River Basin. Near average volumes are anticipated in the Colorado River headwaters. Lowest forecasts with respect to average exist in the Great Basin extending from the western Duchesne River Basin into the Spanish Fork Basin and Utah Lake Basin. Forecasts are generally below average elsewhere including the Gunnison, Dolores, and San Juan Basins.

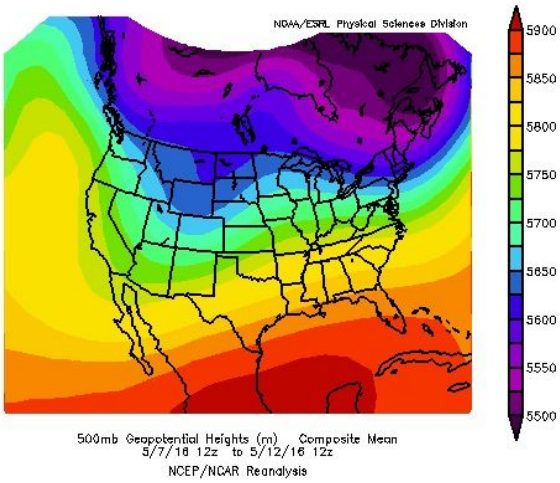
April-July inflow forecasts for some of the major reservoirs in the upper Colorado River Basin include Fontenelle Reservoir 650 KAF (90% of average), Flaming Gorge 1060 KAF (108% of average), Blue Mesa Reservoir 580 KAF (86% of average), McPhee Reservoir 230 KAF (78% of average), and Navajo Reservoir 545 KAF (74 % of average). Lake Powell is forecast to receive 6.5 MAF (91% of average) during the April-July period. These forecasts referenced are for the 50 percent exceedance probability.

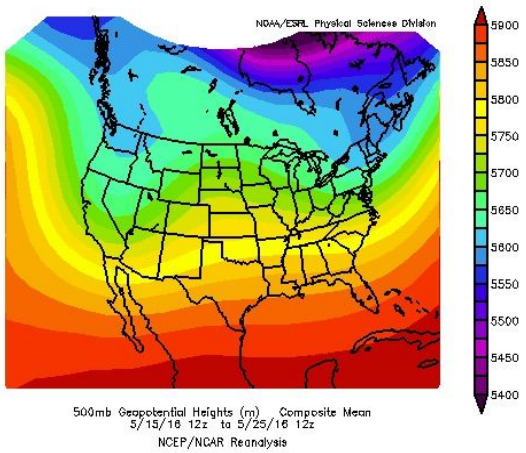
Click here for specific site water supply forecasts

Water Supply Discussion

Weather Synopsis:

Several storm systems moved through the western U.S. during the month of May. Largest precipitation impacts occurred during the first half of the month, particularly over the northern third of the CBRFC forecast area due large slow moving closed low pressure systems. The second half of the month was characterized by storms more convective in nature with widespread precipitation however precipitation impacts were more localized. A ridge of high pressure and above average temperatures rounded out the month of May.





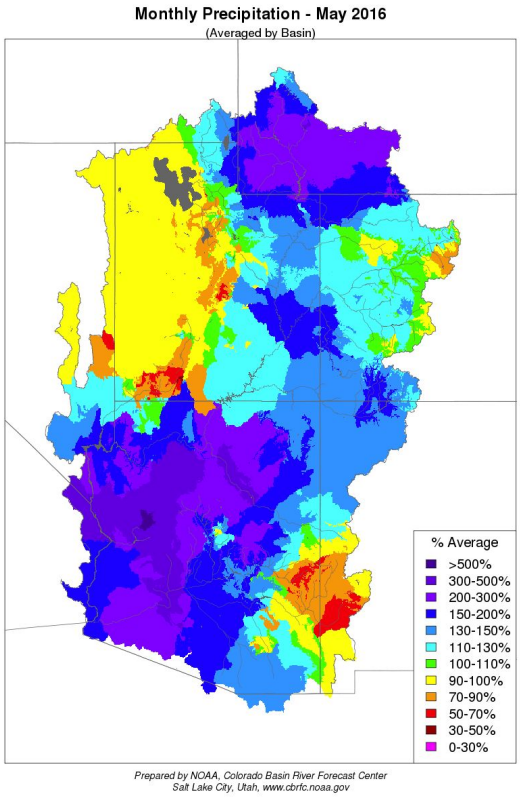
The upper atmospheric wind pattern at the 500 MB (~18,000 feet) level. Strong low pressure systems impacted the northern third of the CBRFC forecast area early in the month (left). Unsettled weather continued with a mean trough over the western U.S. during the second half of May (right).

Precipitation and Temperatures:

Most areas experienced average or better precipitation during the month of May. From the Yampa River Basin into parts of the Duchesne River Basin, Bear River Basin, and Green River Basin of Wyoming precipitation was much above average. Some areas in the Green River Basin of Wyoming received record precipitation for the month of May. These areas experienced an increase in seasonal water supply forecasts with some areas of the Yampa and Green River Basin experiencing significant increases.

Above average precipitation also occurred in parts of the Gunnison, Dolores, and San Juan River Basins, with a mix of near or below average precipitation in headwater areas of the Colorado and Gunnison River Basins. Near or below average precipitation occurred in the Virgin and Sevier River Basins extending northward into areas that drain into Utah Lake.

The water year precipitation (October-June) image below indicates a large area with greater than 150 percent of average precipitation from Lake Powell extending north into the Green River Basin of Wyoming and east into western Colorado. However much of this area is in lower elevations and not a significant contributor to the April-July runoff volumes. The exception is the lower elevation areas in the Green River Basin of Wyoming where the precipitation resulted in significant flows which did have a significant impact on the April-July runoff volumes. Higher elevations of the Yampa River Basin and in some of the eastern Colorado River headwaters near or above average water year precipitation was observed. This also holds true for much of the Bear River Basin , Virgin River Basin, and Dolores River Basin. Near to below average water year precipitation has been observed in much of the Gunnison, Colorado River tributaries downstream of Kremmling, and in central Utah river basins.



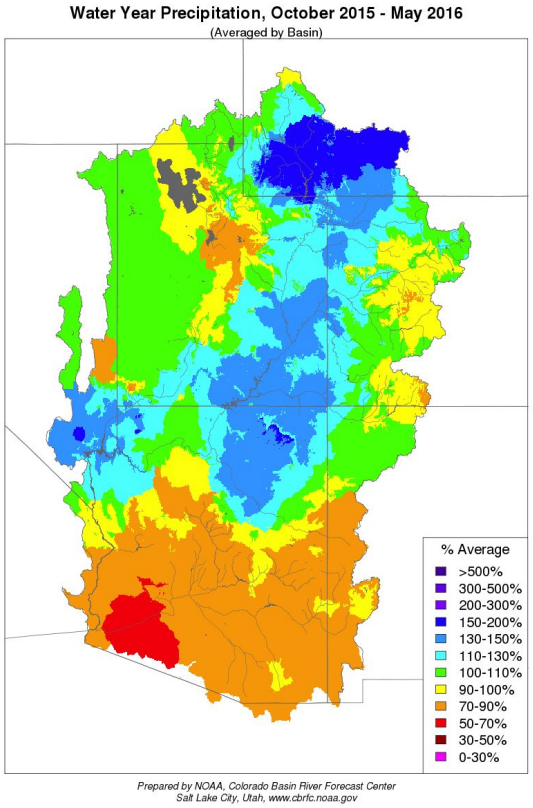


Image: Monthly and water year precipitation graphics
(Averaged by basins defined in the CBRFC hydrologic model)

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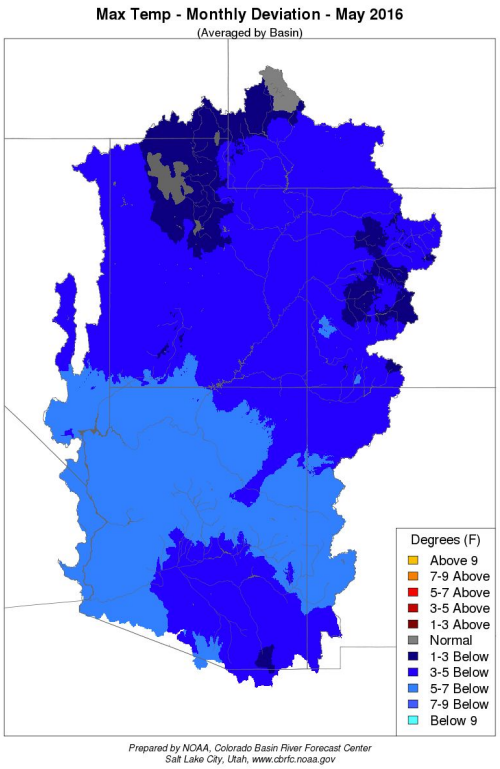
May was a cool month due to the frequent storms and extended periods with cloud cover. That acted to slow the higher elevation snow melt and resulted in many higher elevation areas having near or above normal (median) snow conditions for the late May period. This acted to push more of the seasonal runoff volumes into the late May and June periods and also resulted in some significant streamflow increases as warmer temperatures made their way into the western U.S. at the end of May.



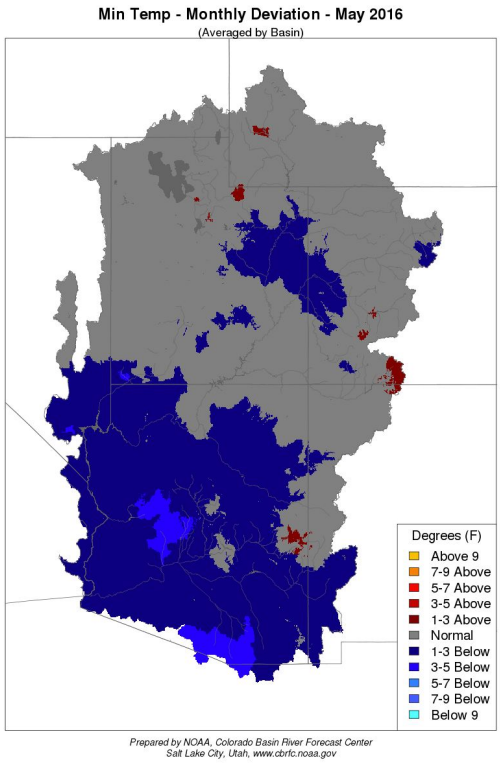


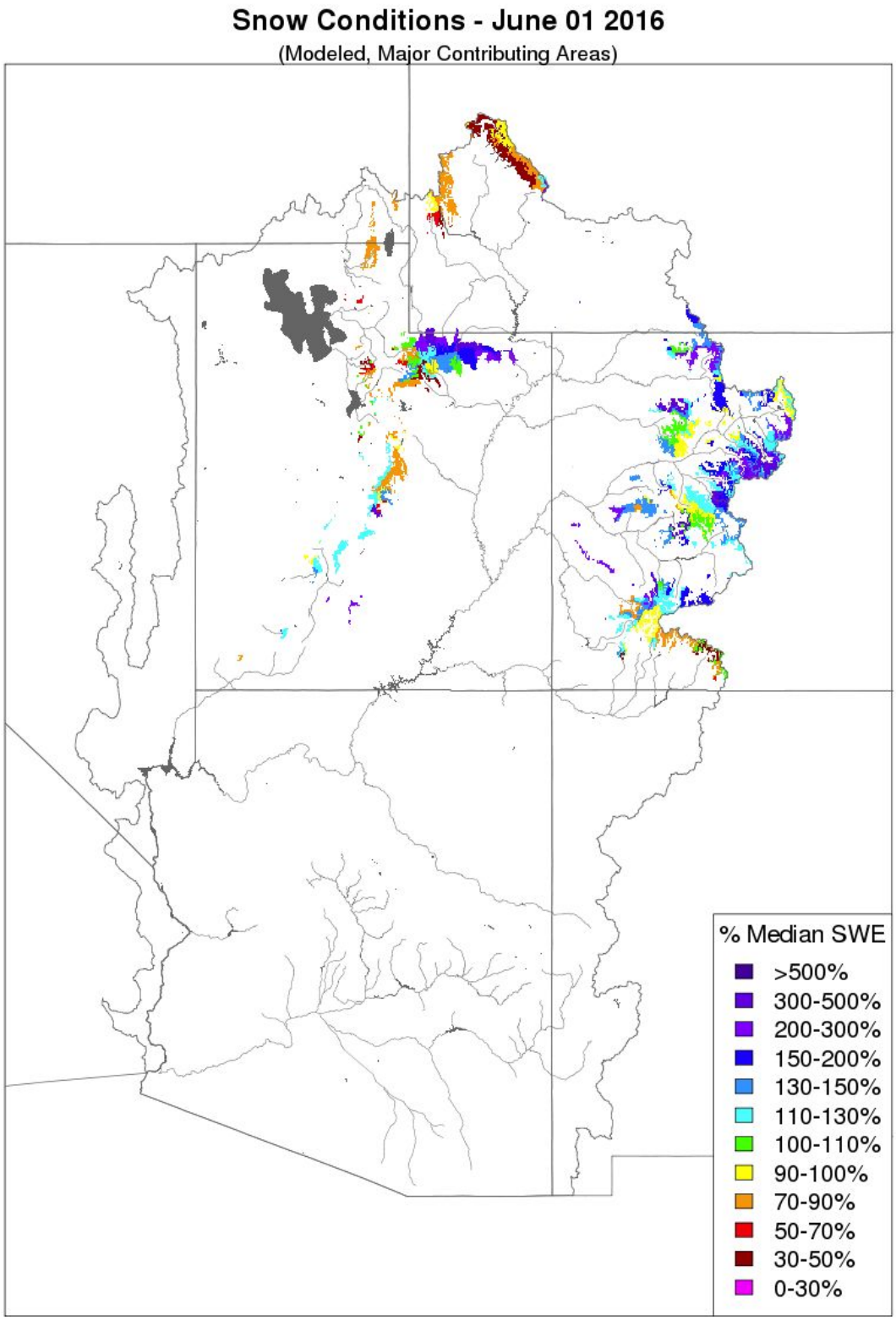
Image: Monthly maximum and minimum temperature departure from average for May 2016.
(Averaged by basins defined in the CBRFC hydrologic model)

Snowpack:

At this point in the season with snow melt underway conditions tend to be highly variable from place to place and from day to day. Snow has melted out at most snow measuring sites and where snow remains the daily normal (median) is becoming quite small. When trying to view snow compared to normal large fluctuations occur from day to day depending on how quickly the melt is occurring. Therefore care must be exercised during the melt period when evaluating the snow conditions. For example, snow conditions that are above normal for early May do not suggest these locations ever reached the annual peak snow for the season. Many sites in fact did fall short of the seasonal peak that typically occurs in April.

The image below shows the snow in the CBRFC hydrologic model. This is limited to highest elevations where snow remains. Snow conditions in the higher elevations in the Yampa River Basin, Colorado River headwaters, and southern drainages of the Gunnison River Basin remain near or above the historical median for early June. The Uinta Mountain range in northeast Utah also has above median snow for early June. Elsewhere snow has been depleted or is likely to melt off significantly during the next couple of weeks due to summertime temperatures.

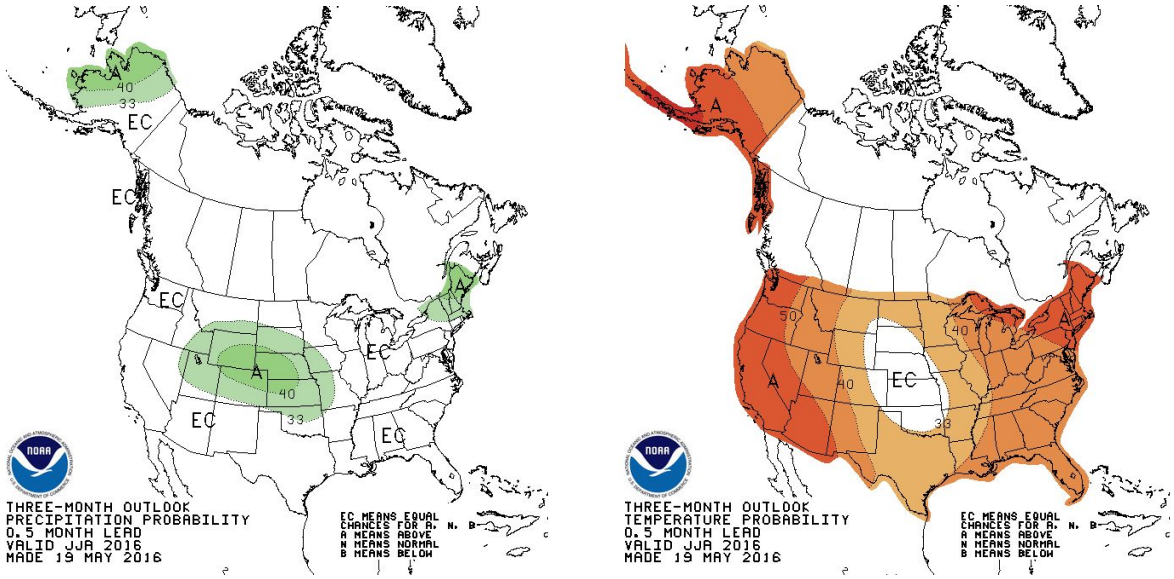
The image below shows the snow as represented by the CBRFC hydrologic model as of June 1st 2016.



Modeled Snow: Snow representation from the CBRFC hydrologic June 1st 2016

Climate Outlook: El Niño Southern Oscillation (ENSO) conditions have been weakening considerably over the past 4 weeks with negative temperature anomalies observed near the equator in the eastern Pacific Ocean. La Niña conditions are increasingly likely by fall of 2016.

The Climate Prediction Center outlooks are shown here for information only. This information is not incorporated into the water supply forecasts. The CPC guidance indicates enhanced chances of above average precipitation over the Colorado River and Great Basins during the summer, June through August period. There is also enhanced chances for above average temperatures over the Great Basin, Upper Colorado River Basin, and Lower Colorado River Basin during this same time period.



Climate Prediction Center April-May outlooks as of May 19 2016
Left: Probability of above / below average precipitation Right: Probability of above / below average temperature

Conclusion:

Due to a wet and cool May water supply forecasts generally increased between May 1st and June 1st in many areas. Greatest increases occurred in the Yampa River Basin and Green River Basin of Wyoming. Some forecasts increased as much as 40 percent of the April-July average. Increases also occurred in the Duchesne River Basin, some of the Colorado River headwater basins, and parts of the San Juan Basin. Forecasts decreased some in the Sevier River Basin, Utah Lake Basin, and Virgin River Basin.

Many forecasts also changed by less than 10 percent of the April-July average. Some of this can be attributed to April-May observed runoff volumes that were either greater or less than anticipated.

Overall the lowest water supply forecast volumes with respect to average exist in the Great Basin extending south into the Virgin River Basin while the highest forecast volumes are in the Yampa River Basin.

This is the final forecast discussion for 2016.

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
Great Salt Lake Basin
Sevier River Basin
Virgin River Basin