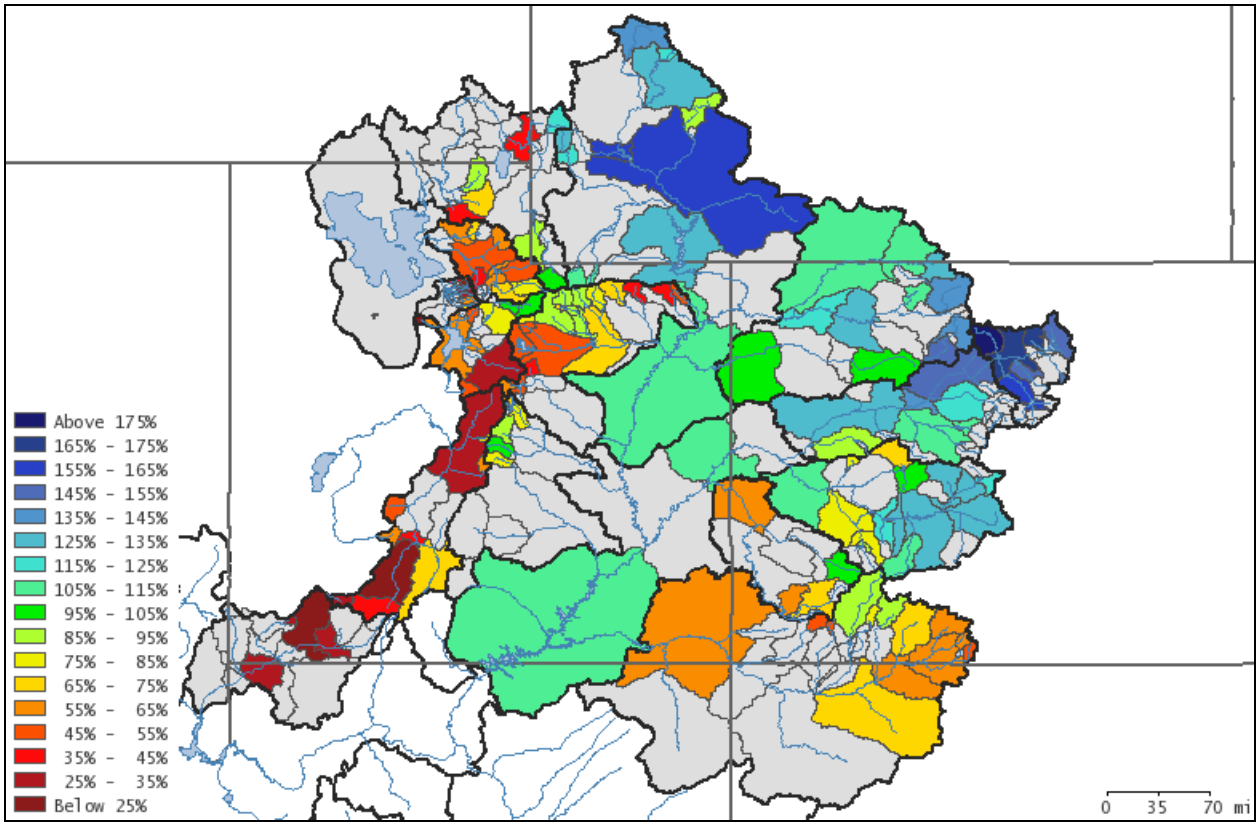
June 1, 2014 Water Supply Forecast Discussion

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:
Final water supply forecasts for the 2014 season indicate April-July runoff volumes to be much above average in the Green River Basin above Flaming Gorge Reservoir, Yampa River Basin, Colorado River Basin above Cameo, and much of the Gunnison River Basin especially above Blue Mesa Reservoir.

Near to below average conditions are forecast for the Dolores River Basin and some headwater locations in the Weber, Duchesne and Bear River Basins. Much below average runoff volumes are likely in the San Juan Basin, Virgin River Basin, and remaining Great Basin within Utah.



April-July water supply volumes forecasts as a percent of the 1981-2010 average

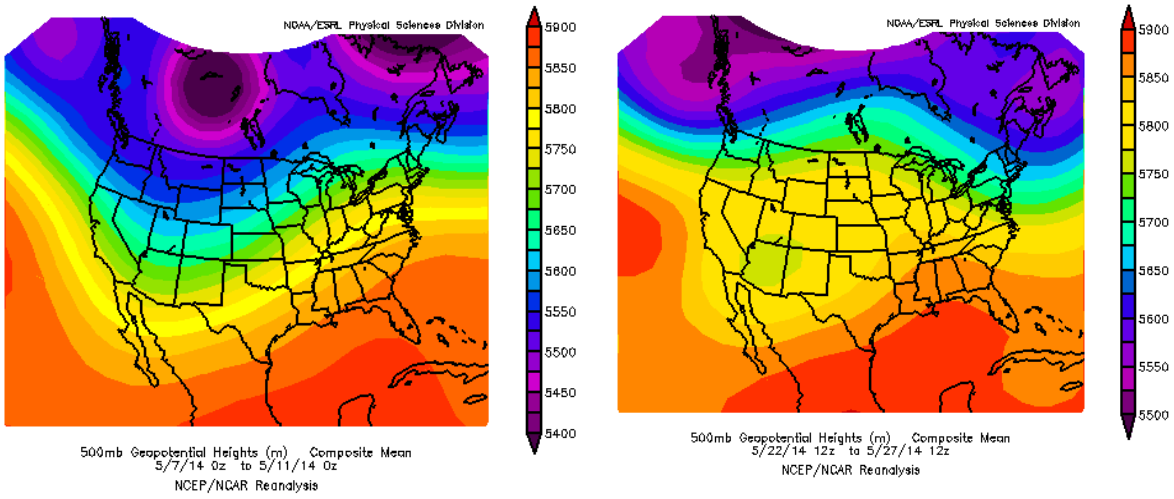
Click here for specific site water supply forecasts

Water Supply Discussion

Weather Synopsis:

May brought a mixed bag of weather with periods of cool and wet conditions and periods of warm dry weather typical of spring. During early May a cold winter like storm moved through the area and brought widespread precipitation with low snow levels. Snow melt slowed with the colder temperatures and streamflow levels dropped during this period. During the last week of the month a low pressure system moved through the southern half of the CBRFC area advecting mild and moist subtropical air northward ahead of it. The result was additional precipitation that was more of a convective nature similar to what is experienced during the late summer. In between weather systems, temperatures warmed and accelerated snow melt in all areas. Streamflow generally increased throughout the month.

Precipitation favored an area extending from the southern Sevier and Virgin River Basins in southwest Utah east and northeast to include lower desert basins in the Green and Colorado River region of southeast Utah. Much of western Colorado also received near to above average precipitation from northern parts of the San Juan Basin north to the Yampa River Basin. Areas north and south were much drier including the Green River basin above Flaming Gorge, Great Basin of northern Utah, and Arizona.

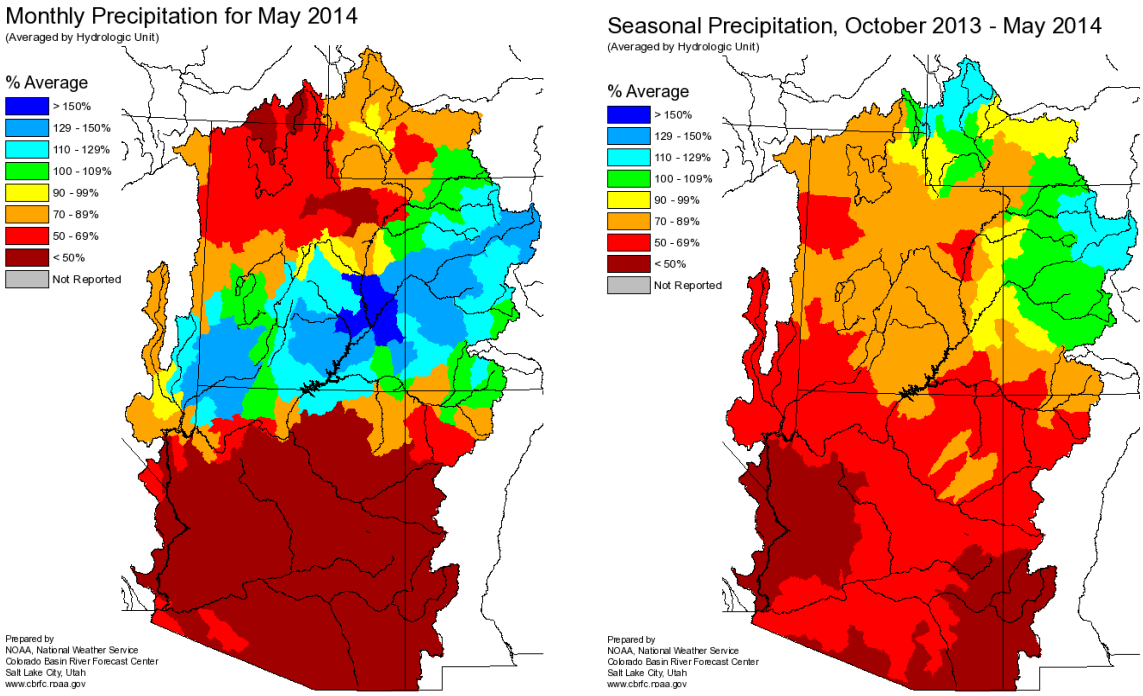


Mean upper air pattern during early and late May 2014

Precipitation and Temperatures:

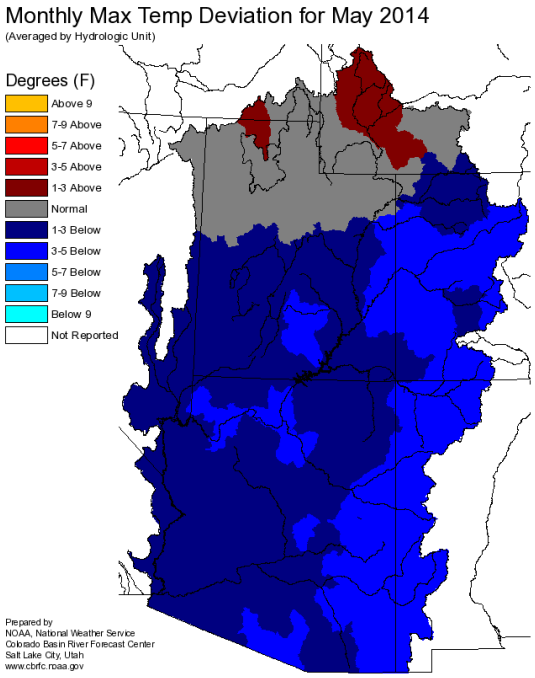
A large swath of near to above average precipitation was observed in the middle of the CBRFC area with dry conditions north and south. As can be seen in the images below, much below average precipitation extended from the Duchesne River Basin north to include the Green River Basin above Flaming Gorge, and west to include the Bear River, Weber River, Six Creeks and Provo River Basins. Much below average conditions were also observed in the Lower Colorado River Basin of Arizona. In between these areas near or above average precipitation occurred with the largest impacts to runoff forecasts in the Yampa River Basin headwaters and Colorado River headwaters above Kremmling.

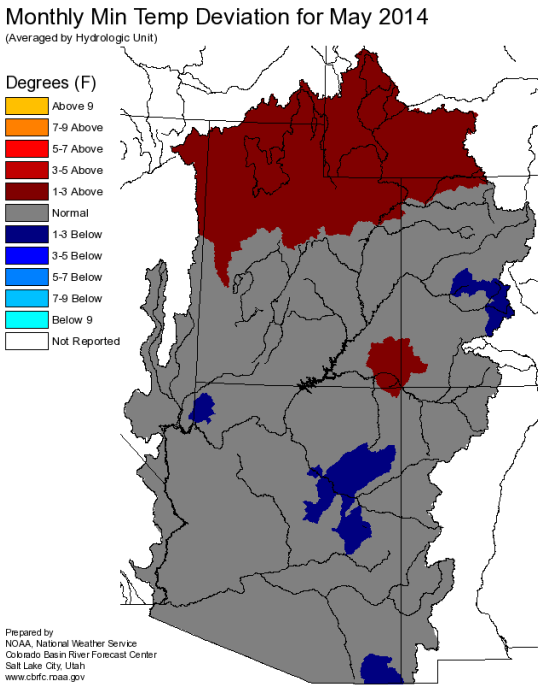
The seasonal October-May precipitation graphic continues to indicate above average seasonal precipitation in the areas favored by the winter storm pattern, particularly in the headwater areas of the Colorado River Basin above Cameo, Yampa River Basin, Green River Basin above Fontenelle and the extreme northern Bear River Basin. Near or above average seasonal precipitation occurred in much of the Gunnison River Basin, parts of the Dolores River Basin, and in Animas River Basin of the San Juan. Elsewhere conditions were much drier especially from the Virgin River Basin south into Arizona.



Monthly and water year precipitation graphics

Temperatures were cooler than average over most of the CBRFC for May, especially in the areas near or south of the storm track. The impact of this was more runoff being pushed from May into June for many forecast points.



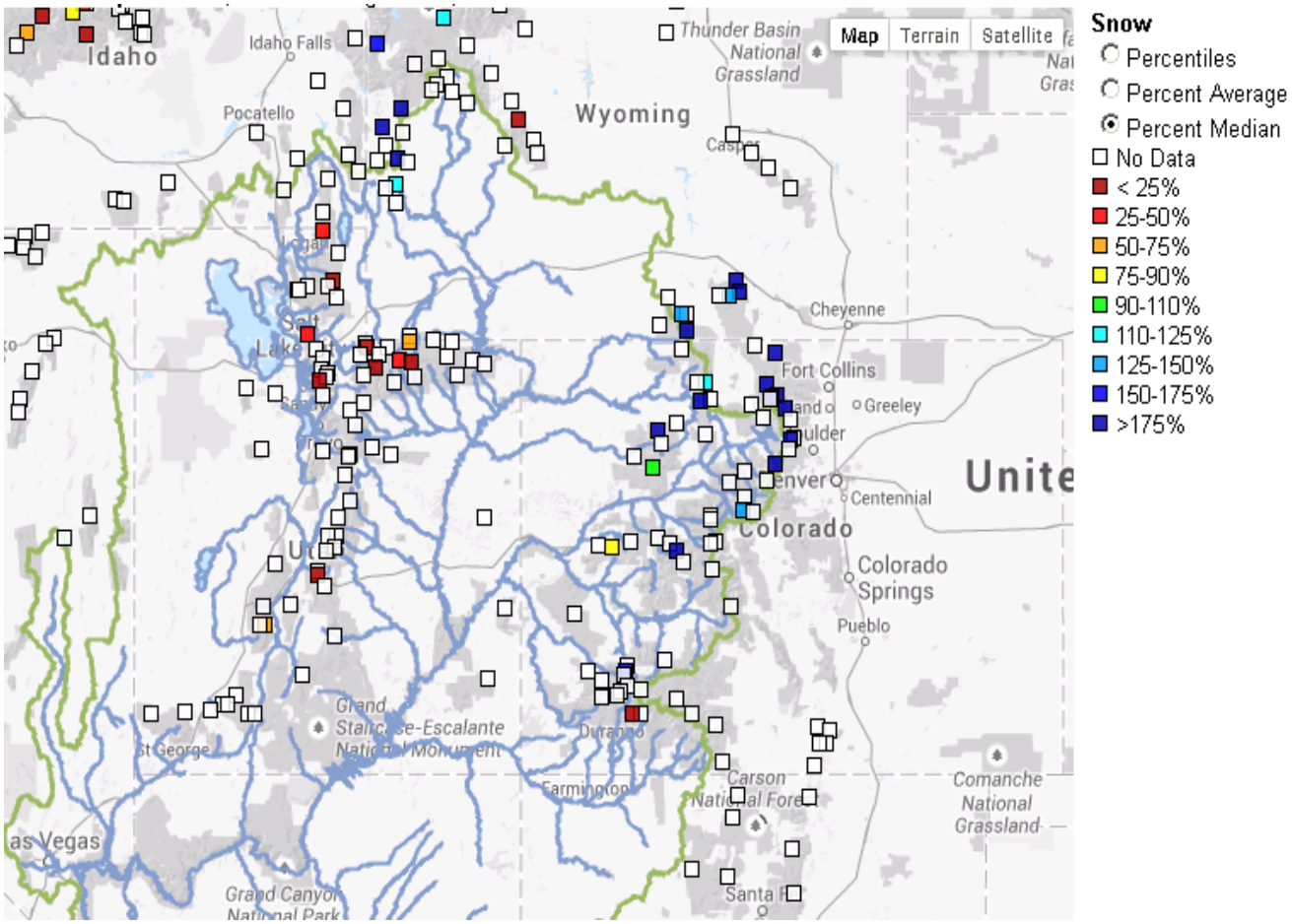


Monthly maximum and minimum temperature departure from average.

Snowpack:

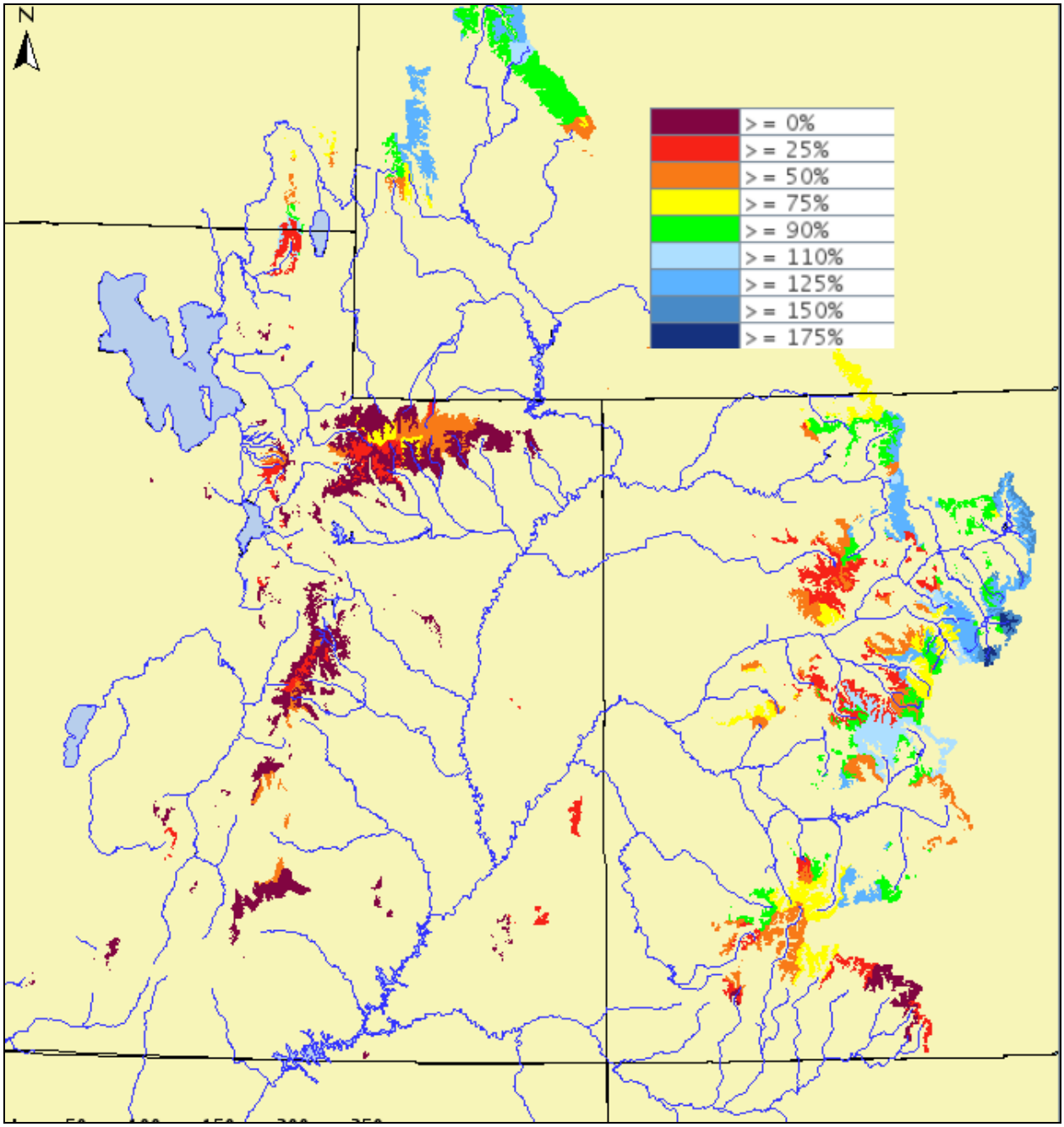
Snow melt occurred throughout May, accelerating during warmer periods and particularly at the end of the month due to higher average temperatures and a higher sun angle. Typically many SNOTEL sites have melted out by early June and it's difficult assign a meaningful statistic, such as percent of median, to any geographical region late in the season. Observations are either few, values are low, or the historical medians for a particular date are very low. Nevertheless, the June 3rd percent of median snow map is displayed below to indicate where snow still exists at SNOTEL sites. These areas continue to be those where largest snowpack conditions existed throughout the winter and spring season including the Colorado River headwater above Kremmling, parts of the Yampa River Basin, and Green River above Flaming Gorge.

Percent median snow condition as of June 3, 2014



The image below is the modeled snow water equivalent that exists in the CBRFC hydrologic model. It shows areas where greater than 2 inches of SWE exist within the model and how they compare to the model historical average.
This image may be more meaningful in evaluating the snow conditions than the traditional SNOTEL plot above at this time of year.

Modeled snow from the CBRFC hydrologic model as of June 3 2014.

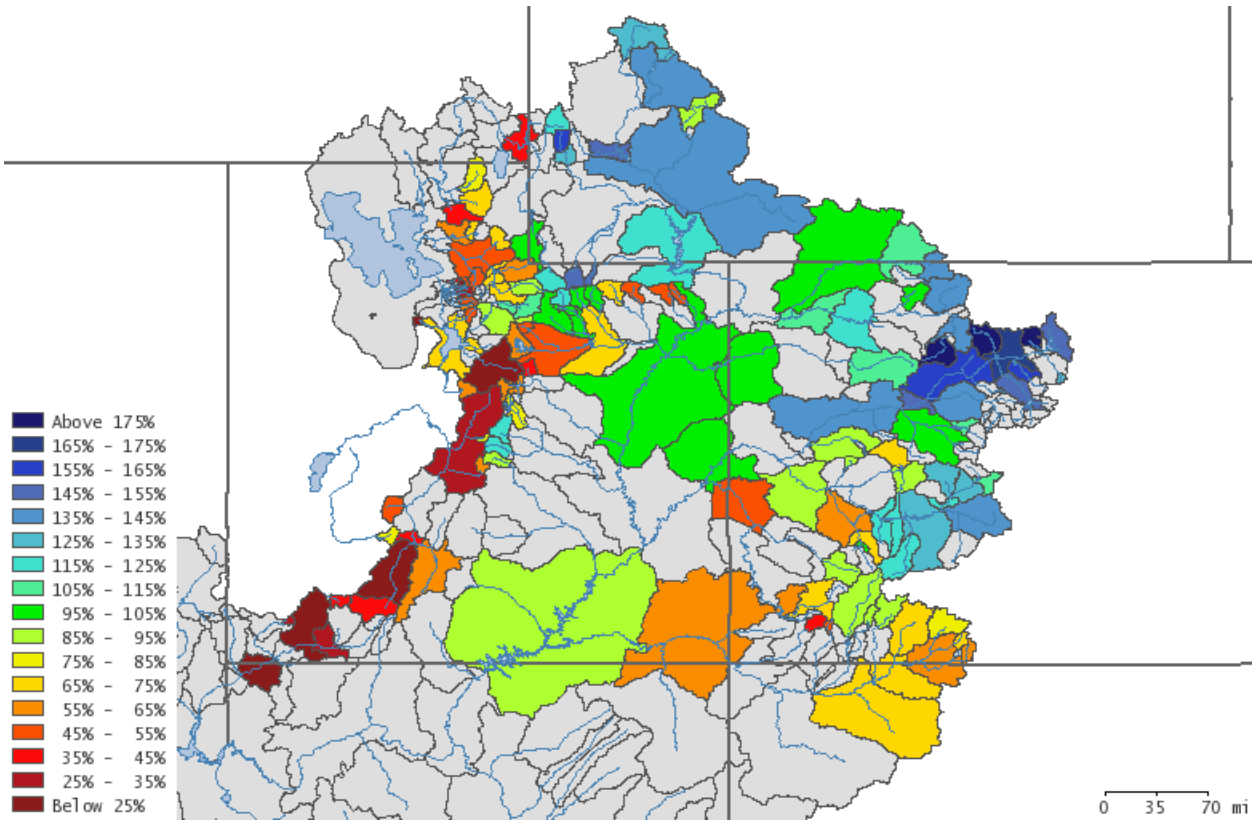


Streamflow Volumes:

April-May unregulated streamflow volumes are displayed as a percent of average in the map below. Much above average runoff volumes have occurred during the April-May period in the Colorado River Basin headwaters above Kremmling. Above average volumes have occurred on many streams in the Green River above Flaming Gorge, Yampa Basin, and Gunnison above Blue Mesa. Above average runoff volumes have also been observed in parts of the Bear River Basin.

Near or slightly below average runoff was observed in western parts of the Duchesne River Basin and along the Animas River and Vallecito River in the San Juan Basin. Elsewhere streamflow volumes have generally been below average with less than 25 percent of average observed in the Virgin River Basin.

Many areas experienced higher percent of average values in April compared to May as low and some mid elevation snow melted during April and cooler temperatures prevailed in May.



Observed unregulated streamflow volumes for the April-May period expressed as a percent of average. Data are provisional and subject to revision.

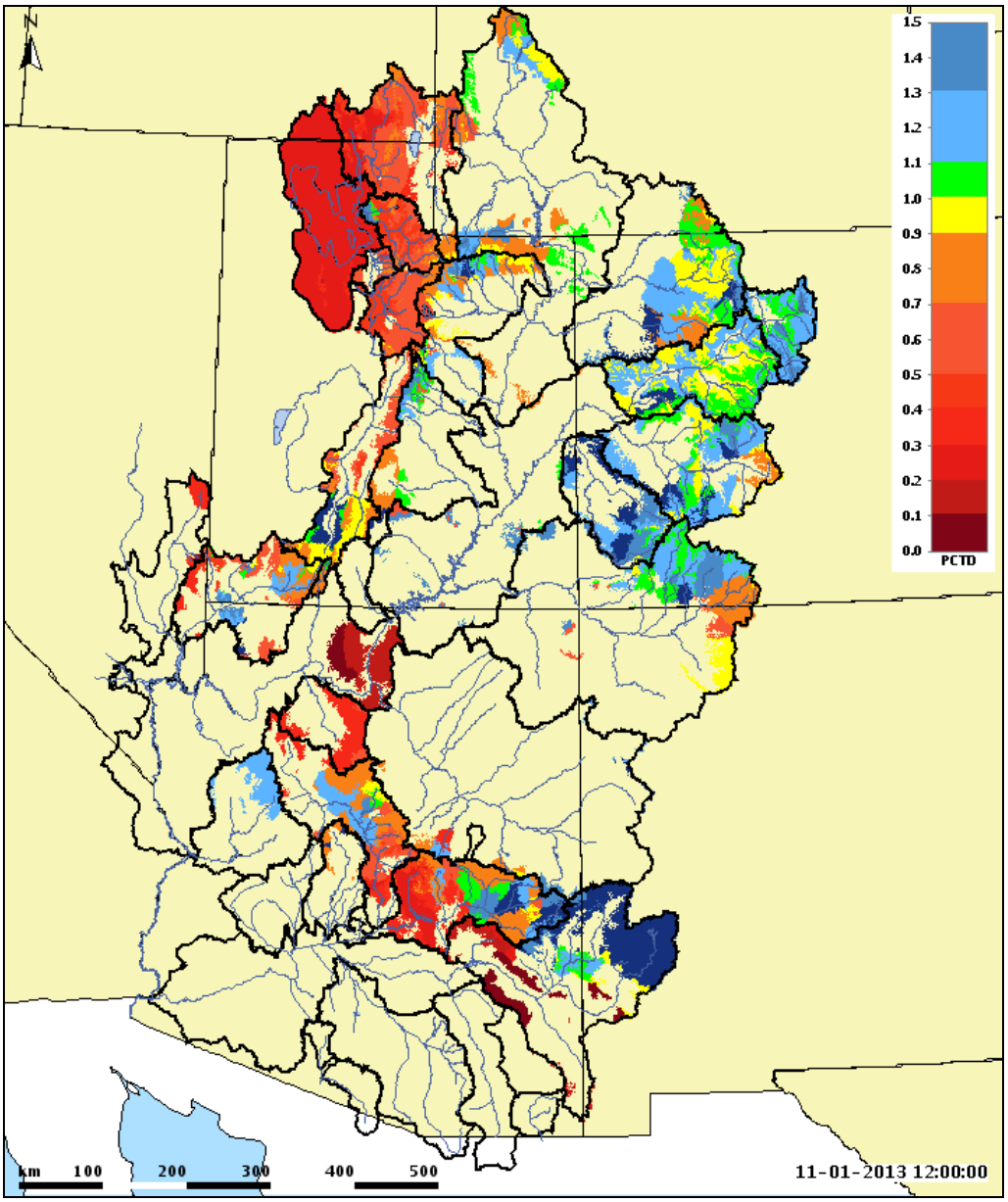
Soil Moisture:

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 1st were above average over much of the Upper Colorado Basin, and parts of the headwaters of

the Salt and Gila Basins. Elsewhere conditions were below average.

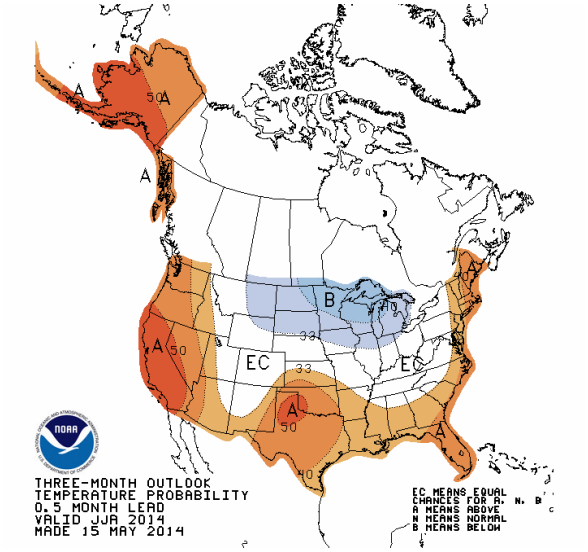
The soil moisture conditions are having an impact on forecasts, particularly in areas where the modeled soil moisture is well above average and snow conditions are near or above average. The above average soil moisture is acting to keep the forecasts at a higher level than they would be if soil moisture conditions were closer to average. The combination of above average soil moisture and above average snow conditions in the Colorado above Cameo, Gunnison above Blue Mesa, and the Yampa Basin has resulted in much above average runoff forecasts. The opposite is occurring in the Great Basin where dry soils and near to below average snowpack have combined to create low runoff volume forecasts.

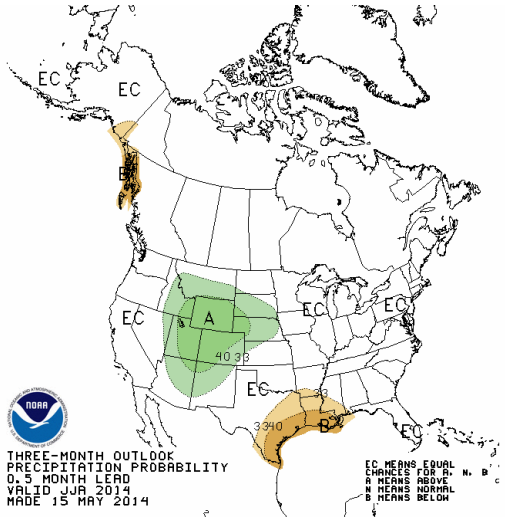
In the map below areas in blue are above the historical model soil moisture average while those in the red and orange are below average



Climate Outlook:

The El Niño Southern Oscillation (ENSO) condition is now forecast to become an El Niño event this summer and fall. El Niño can mean wetter condition in the Lower Colorado River Basin in the winter. The latest Climate Prediction Center (CPC) seasonal outlook suggests an increased possibility of above average precipitation over much of the CBRFC in the summer, particularly the July-August period. There is a higher chance of above normal temperatures in extreme southwest Utah (Virgin River Basin) and southern Arizona. The vast majority of the CBRFC is forecast to have equal chances for above or below average temperatures this summer.





Conclusion:

There were many minor adjustments to the April-July forecast volumes from those issued in early May. Some of this was due to April and May observed flows coming in either a little greater or less than anticipated. Above average precipitation in May impacted forecasts in the Yampa Basin River headwaters and the Colorado River Basin headwaters above Kremmling. In these areas forecasts volumes were increased. For the Colorado Basin above Kremmling many forecast are in the top 5 of their historical record. April-May observed volumes in these areas have already been significant with several sites in the top 2 of their historical record. Forecasts were also increased slightly in the Virgin and Sevier River Basins due to above average May precipitation. However April-July volumes are still expected to be much below average in these areas.

The dry weather in the northern Great Basin of Utah (Weber, Provo, Six Creeks, and Bear River Basins) and Green River Basin above Flaming Gorge also impacted forecasts. Many April-July volumes were decreased from the May 1st forecasts, however the runoff scenarios are vastly different between these two areas. Much above average April-July volumes are still expected in the Green River Basin above Flaming Gorge, with near to below average volumes likely in the Great Basin.

Forecasts generally decreased in the Dolores River Basin as runoff in April and May did not meet expectations. In the San Juan Basin forecasts either remained unchanged or decreased slightly. The Lake Powell inflow forecast did not change from that issued on May 1st and remains at 7.55 MAF

End Of Month Reservoir Content Tables

- Green River Basin
- Upper Colorado River Basin
- San Juan River Basin
- Great Salt Lake Basin
- Sevier Basin
- Virgin River Basin

Basin Conditions and Summary Graphics

- Green River Basin
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