April 1, 2020 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.

Water Supply Forecast Summary

The weather pattern during the month of March was favorable for bringing storm systems across the Lower Basin into southern Utah/Colorado, while generally missing much of the northern portions of Utah/Colorado and Wyoming. March maximum temperatures across the Great Basin and Colorado River Basin were near to below normal. This helped preserve snow, even at lower elevations, that will contribute to seasonal runoff volumes. Observed snow water equivalent (SWE) conditions as of early April are generally near to slightly above normal (median) across the Upper Colorado River Basin and Great Basin.

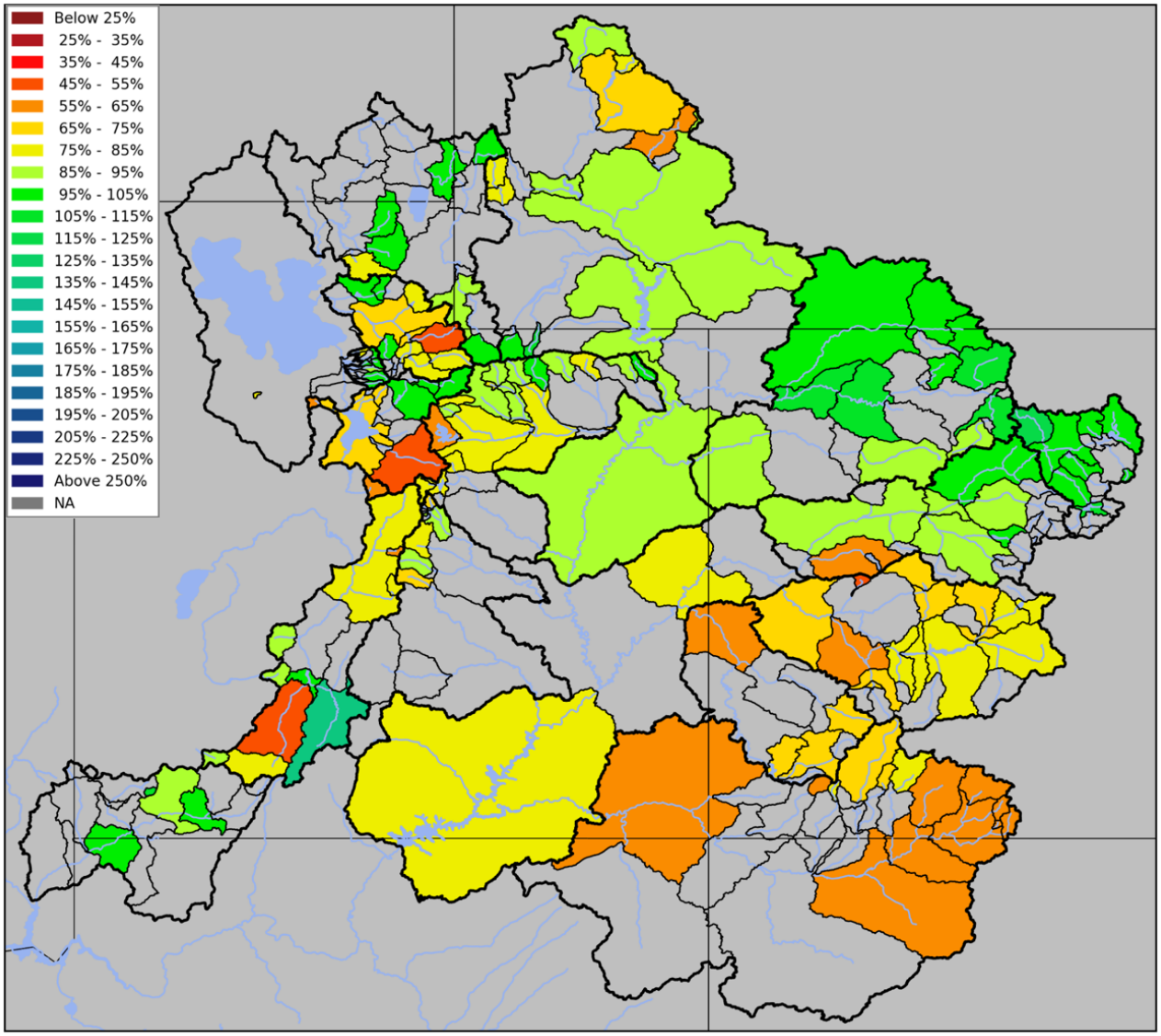
April-July water supply volume forecasts are generally near to below average throughout the Upper Colorado River Basin and Great Basin. The highest forecast volumes with respect to average are in the Upper Colorado River mainstem, White/Yampa, and Virgin basins, where volume forecasts are generally near the 1981-2010 historical average. Lower Colorado River Basin January-May volume guidance increased during the past month due to above average March precipitation. Most Lower Basin April 1 water supply forecasts are much above median.

Virgin River Basin water supply forecasts increased by as much as 40% during the past month as a result of a wet March. April 1 SWE is generally 130-170% of normal over the Virgin Basin. Volume forecasts during the past month generally remained the same or increased slightly (5-10%) in the Duchesne, Dolores, and San Juan basins. The improvement in forecast guidance was due to above average precipitation and increased snowpack in these areas during March. Water supply volume forecasts generally declined around 5% in the White/Yampa and Upper Colorado River mainstem due to below average March precipitation. Green River and Gunnison March precipitation was more variable, and water supply forecasts followed the trend of observed March precipitation.

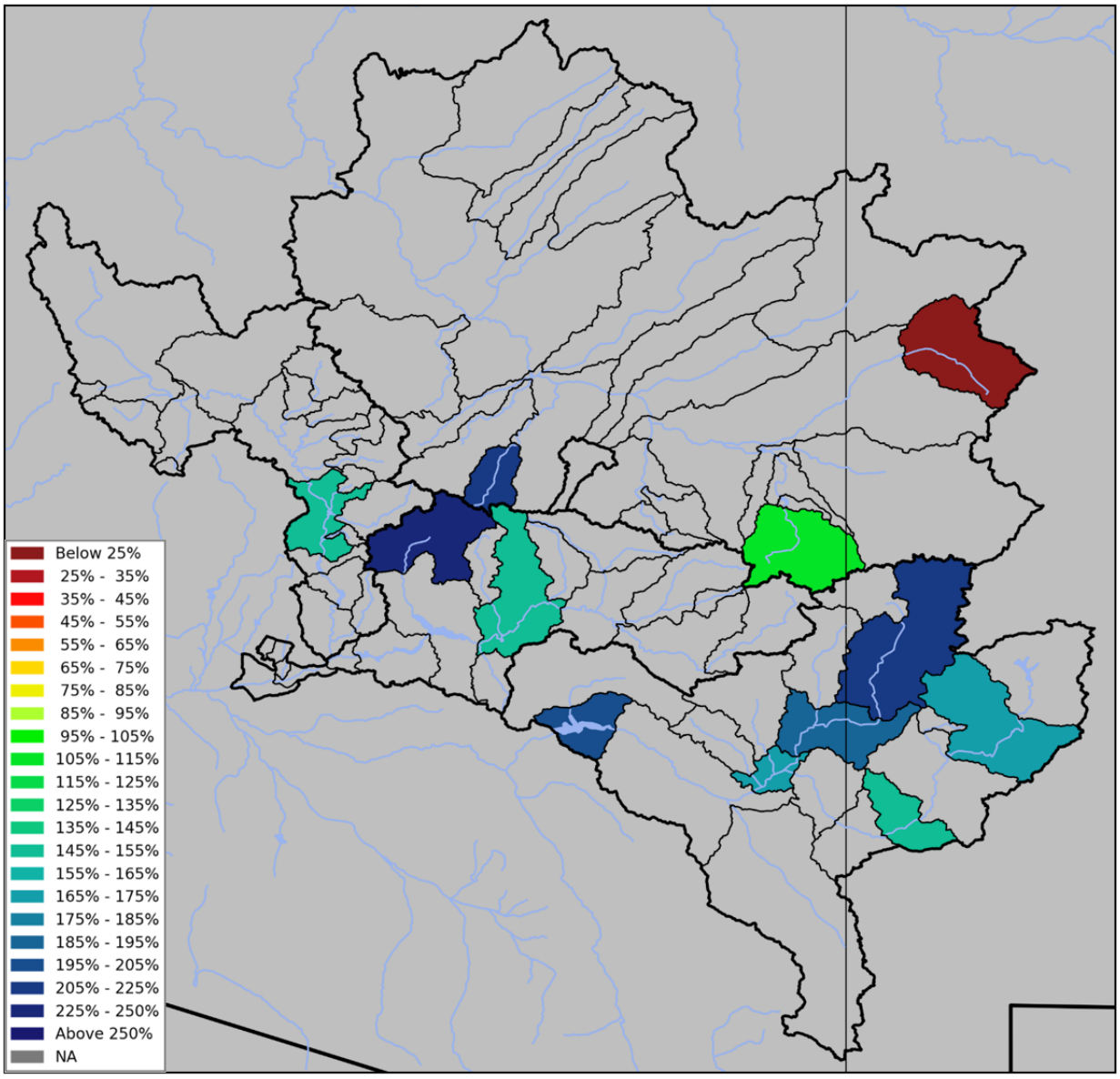
April-July unregulated inflow forecasts for some of the major reservoirs in the Upper Colorado River Basin include Fontenelle Reservoir 650 KAF (90% average), Flaming Gorge 880 KAF (90% of average), Blue Mesa Reservoir 525 KAF (78% of average), McPhee Reservoir 200 KAF (68% of average), and Navajo Reservoir 440 KAF (60% of average). The Lake Powell inflow forecast is 5.6 MAF (78% of average), a two percent decrease from March 1.

Water supply volume guidance in the Great Basin is most favorable in the Bear and Six Creeks basins, where forecasts are near to below average. Conditions in the Provo and Utah Lake Basins range from near normal in the headwaters of the Provo to below and much below normal for Utah Lake and Spanish Fork locations. The water supply outlook in the Weber River Basin is near to below average, with notable increases (5-10%) at East Canyon and Pineview reservoir inflows. Sevier River Basin forecasts generally increased in the past month due to above average March precipitation.

Seasonal Water Supply Forecasts



Upper Colorado, Great, Virgin River Basins: April 2020 April-July forecast volumes as a percent of 1981-2010 average.



Lower Colorado Basin (AZ/NM): April 2020 January-May forecast volumes as a percent of 1981-2010 median.

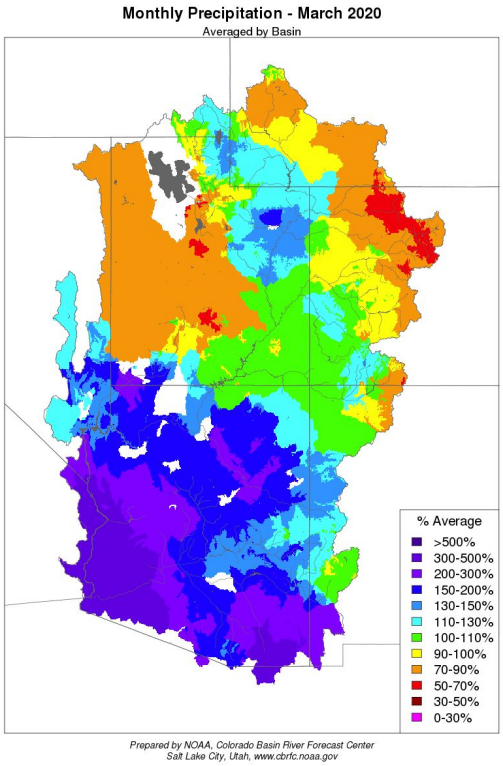
For specific site water supply forecasts click here

Water Supply Discussion

Weather Synopsis / March Precipitation & Temperature

The weather pattern during the month of March was favorable for bringing storm systems across the Lower Basin into southern Utah/Colorado, while generally missing much of the northern portions of Utah/Colorado and Wyoming. A slow moving cutoff low pressure system produced multiple days of heavy precipitation from March 10-12 over much of Arizona and southern Utah. Widespread 2-4 inches of precipitation fell over this period across the western half of Arizona (Bill Williams, Agua Fria, Verde basins) with 2-3 inches in the mountainous areas of southern Utah (Virgin basin). Another storm system on March 18-19 moved northeastward from Arizona into southern Colorado, producing another round of impressive precipitation. These two storm systems were generally too far south to significantly impact the northern half of Utah/Colorado and Wyoming, with the exception of the Uinta mountain range. A late month storm system on March 24-25 over the Great Basin targeted northern Utah and Wyoming, producing modest precipitation amounts.

March precipitation was variable across the Great Basin and Upper Colorado River Basin. Precipitation was near normal across the Upper Green Basin in Wyoming and the Bear/Weber basins in northern Utah. Precipitation was below average across the Upper Colorado mainstem and White/Yampa basins in northwest Colorado and the Six Creeks basin in Utah. Basins in southwestern Colorado (San Juan, Dolores) in addition to the Lower Green in northeast Utah fared better with slightly above (110-130%) average precipitation. As mentioned earlier, the Lower Basin saw much above average precipitation amounts during March with many SNOTEL locations in the Verde and Salt basins in the 80-90th percentile (or 150-200% of average). March maximum temperatures across the Great Basin and Colorado River Basin were near to below normal. This helped preserve snow, even at lower elevations, that will contribute to seasonal runoff volumes.



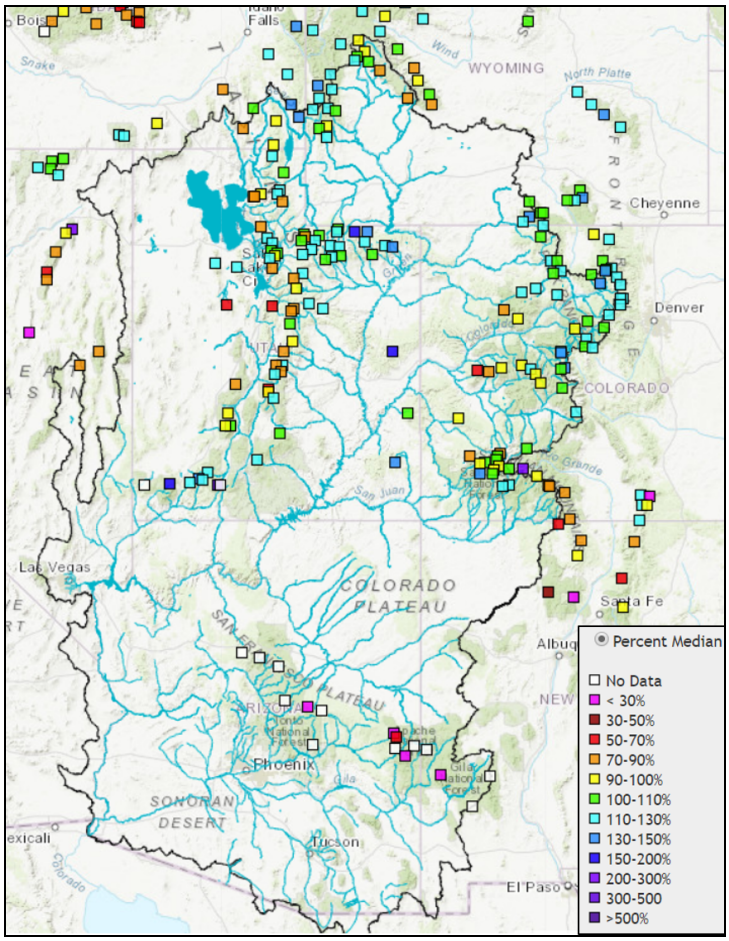
March 2020 percent of average precipitation.
(Averaged by basins defined in the CBRFC hydrologic model)

Snowpack

Observed snow water equivalent (SWE) conditions as of early April are generally near to slightly above normal (median) across the Upper Colorado River Basin and Great Basin. SWE conditions as a percent of the 1981-2010 median improved the most during March in the Virgin River Basin in southern Utah after a wet March. As of April 1, SWE is generally 130-170% of normal over the Virgin Basin. With the exception of the highest elevations of the Salt basin, snowpack has almost entirely melted out across the mountainous areas of the Lower Colorado River Basin (Arizona).

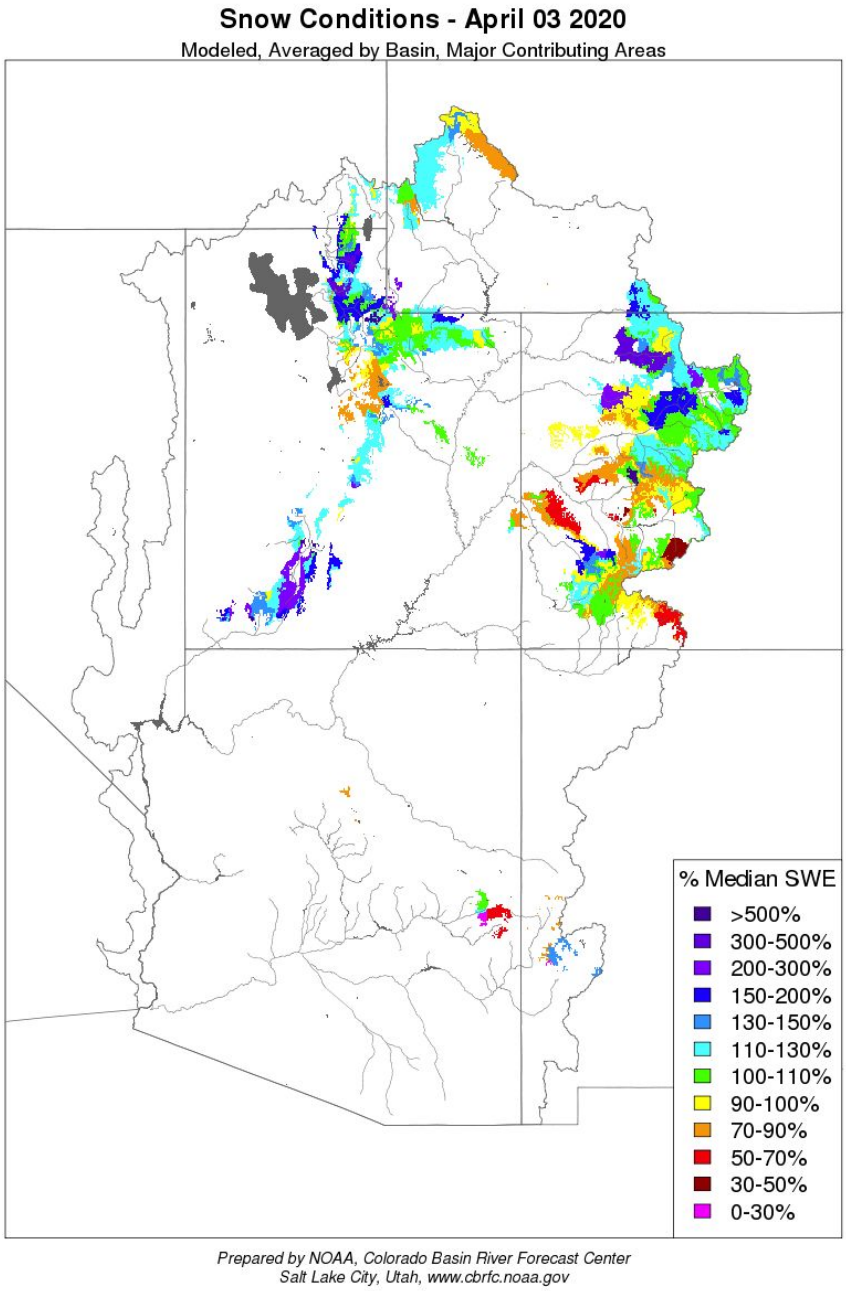
Upper Colorado River Basin SWE conditions as a percent of the 1981-2010 median improved during March in the Duchesne, Lower Green, and southwest Colorado (Gunnison, Dolores, and San Juan) basins. Duchesne SWE conditions are currently slightly above normal while the Lower Green, Gunnison, Dolores, and San Juan basins are near the early April historical median. Snow conditions in the Upper Green, White/Yampa, and Upper Colorado River mainstem declined slightly during March due to below average precipitation. SWE conditions as of early April remain above normal in the Upper Colorado River mainstem and near normal in the Upper Green and White/Yampa basins.

Great Basin SWE conditions did not change significantly during the past month when compared to the percent of historical median. Early April snowpack conditions remain above normal in the Six Creek basin, and near normal in the Bear, Weber, Provo/Utah Lake, and Sevier basins. Early April observed (SNOTEL) conditions as a percent of the 1981-2010 historical median are shown in the image below.



Observed (SNOTEL) percent median SWE conditions as of April 3, 2020.

The image below is the representation of early April CBRFC model snow conditions in areas that provide the greatest contribution of April-July runoff. Model snow conditions closely correlate to SNOTEL conditions throughout the Colorado River and Great Basins.



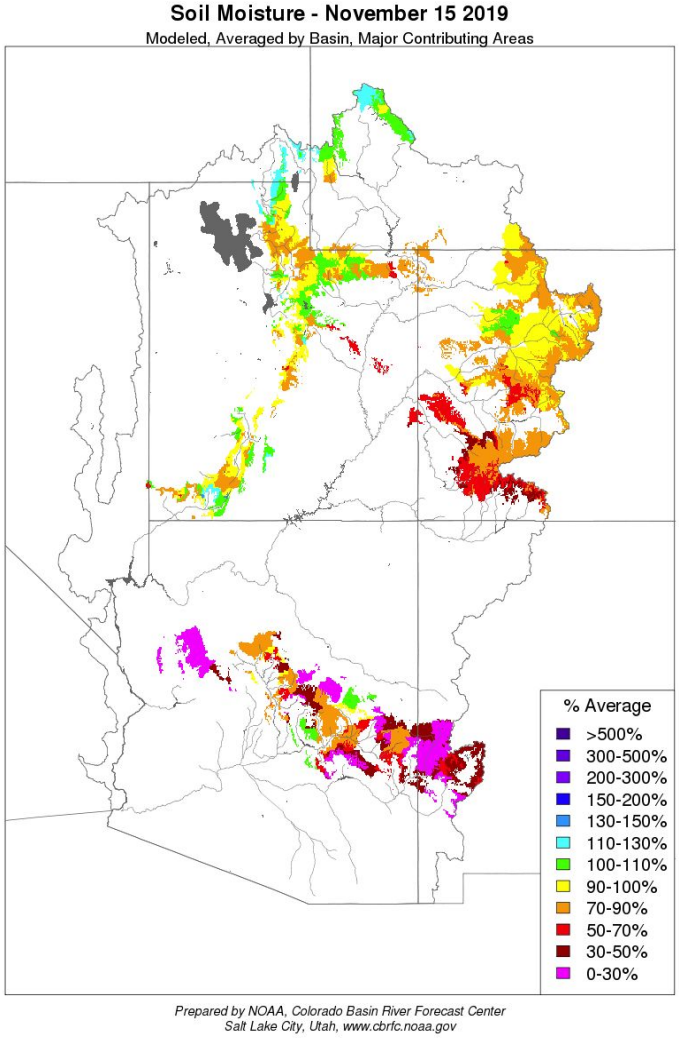
CBRFC hydrologic model snow conditions in significant runoff areas as of April 3, 2020.

For updated SNOTEL information refer to click here
For CBRFC hydrologic model snow click here

Soil Moisture

CBRFC hydrologic model soil moisture parameters are adjusted in the fall after the irrigation season and prior to the winter snowpack accumulation to accurately reflect observed baseflow conditions. CBRFC model fall soil moisture conditions impact early season water supply forecasts and potentially the efficiency of spring runoff. Above average fall soil moisture conditions have a positive impact on early season water supply forecasts while below average conditions have a negative impact. The impacts are most pronounced when soil moisture conditions and snowpack conditions are both much above or much below average.

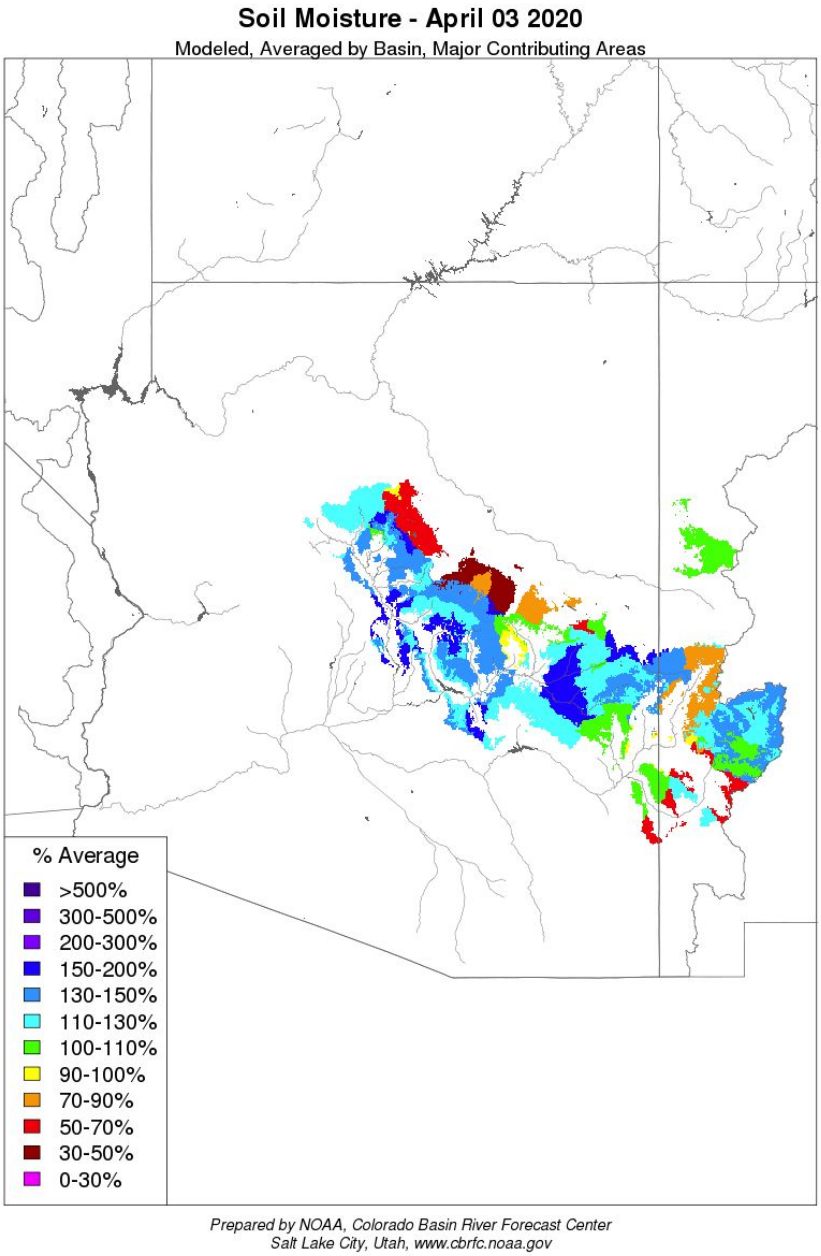
Modeled soil moisture conditions as of November 15, 2019 were variable across the Upper Colorado River Basin and Great Basin, with conditions generally declining from north to south. In the Great Basin, soil moisture conditions were near average. Within the Upper Colorado River Basin, the Upper Green and Duchesne basins entered the winter with the most favorable soil moisture conditions, while the White, Yampa, and Colorado River mainstem basins entered the winter with below average soil moisture conditions. The Gunnison, Dolores, and San Juan basins in southwest Colorado entered the winter season with much below average soil moisture conditions, primarily due to the poor 2019 monsoon season.



CBRFC hydrologic model soil moisture entering the winter season (percent of 1981-2010 average).

Soil moisture conditions tend to fluctuate more in the Lower Colorado River Basin of Arizona and New Mexico 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.

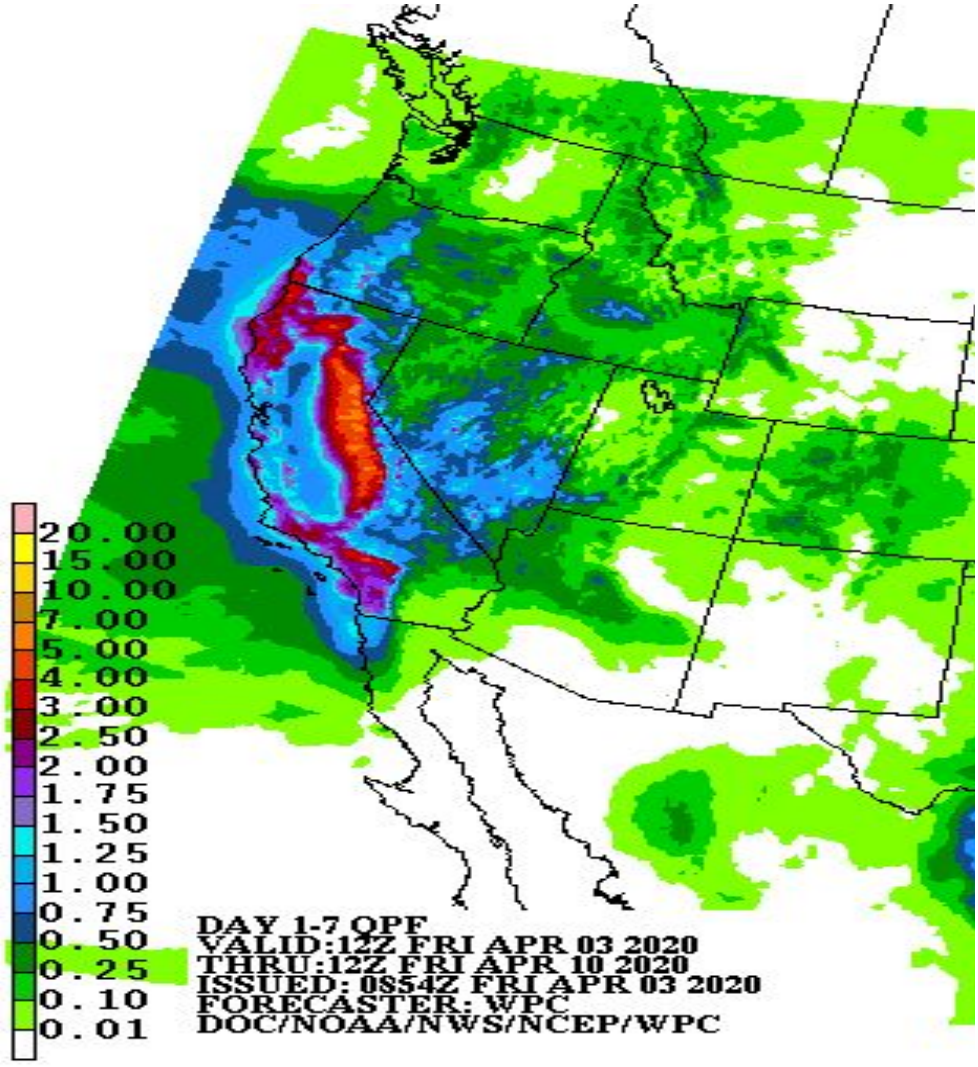
After the unfavorable 2019 monsoon season, winter soil moisture conditions have improved significantly throughout the Lower Colorado River Basin during the past several months due to a combination of above average water year (October-March) precipitation and snowmelt runoff. Lower Colorado River Basin early April soil moisture conditions are generally above average, as shown in the image below.



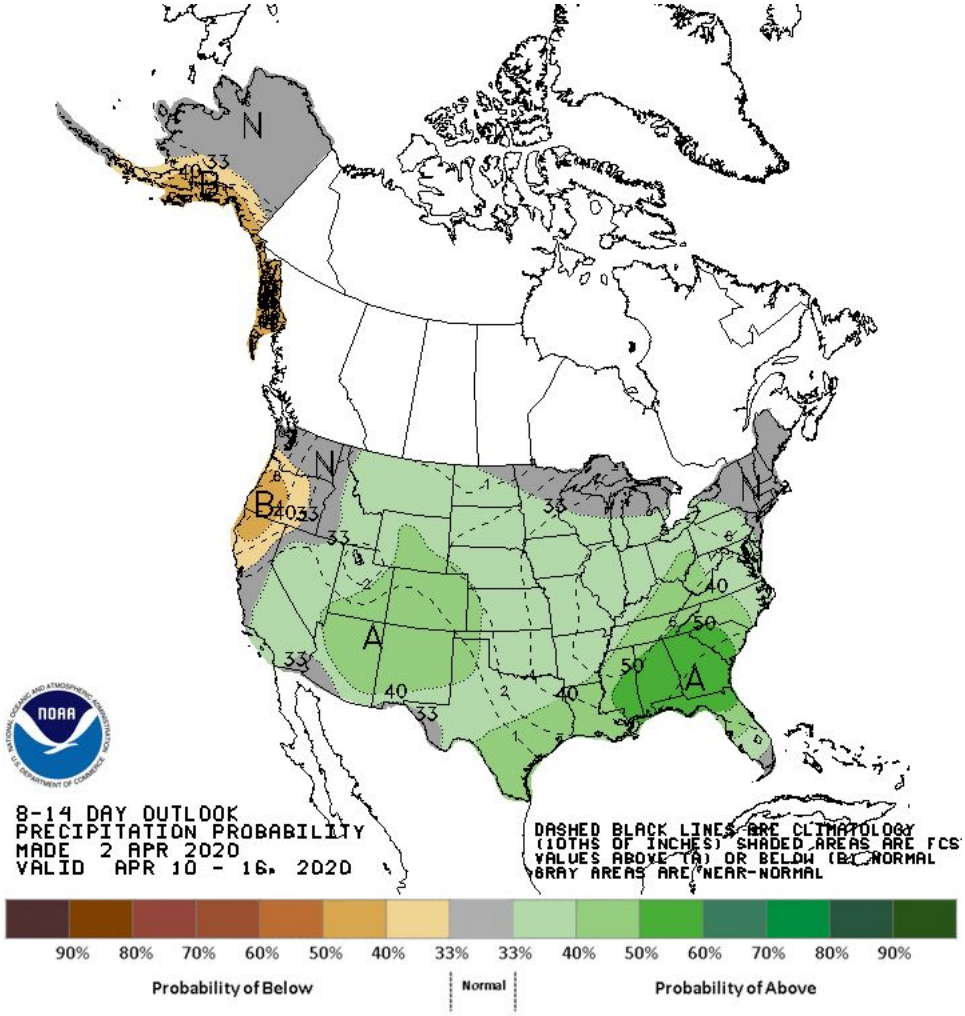
Lower Colorado River Basin (AZ/NM) model soil moisture as of April 3, 2020.

Upcoming Weather

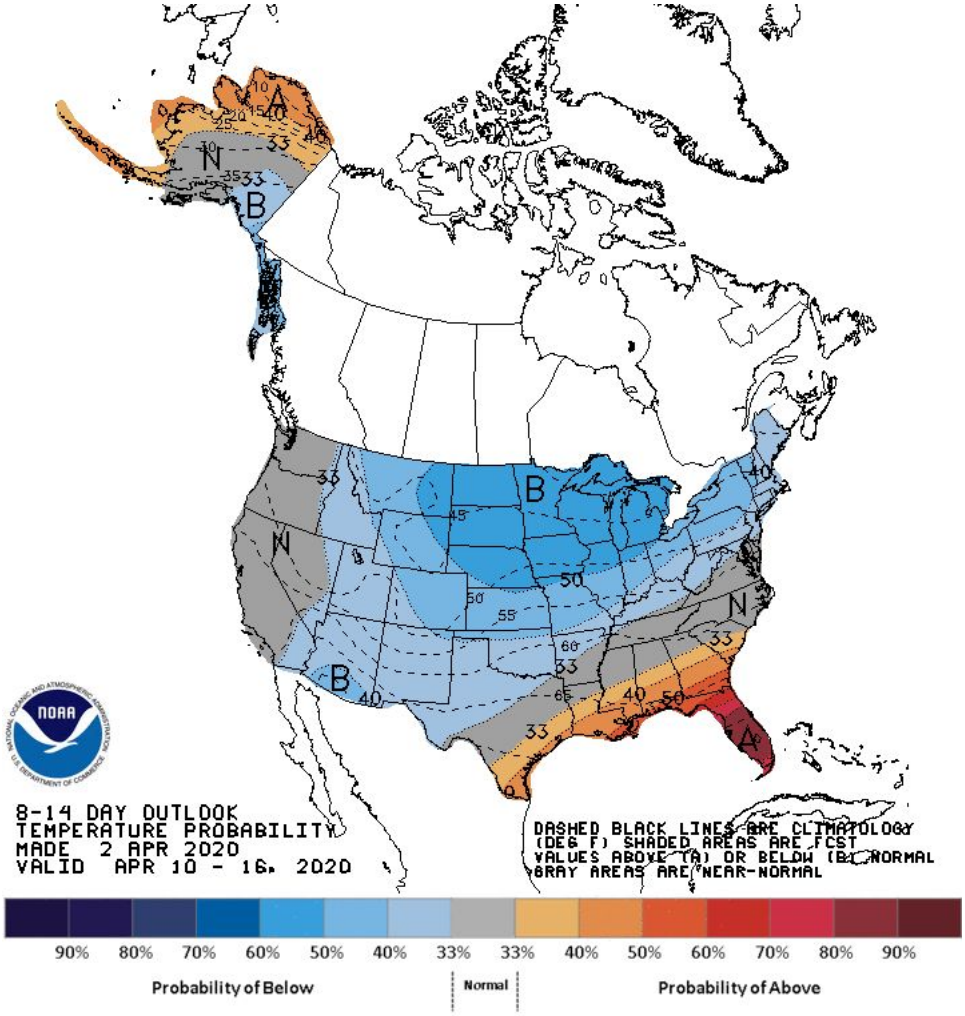
A cutoff low pressure system will develop off the California coast this weekend into early next week. An increase in ridging and southwesterly flow across the Colorado River Basin will bring a period of warming to much of the region, with near to slightly above normal temperatures expected. The cutoff system is forecast to slowly move eastward into Arizona and then into southern Colorado by Tuesday through Thursday of next week (April 7-9). Precipitation chances will increase across Arizona into portions of Utah/Colorado as this system moves through the region. Overall, only modest precipitation amounts are expected at this time.The weather pattern becomes more uncertain in the 8-14 day period (April 10-16); however, a weak mean trough across the Intermountain West suggests slightly increased odds for below normal temperatures and above normal precipitation.



NWS Weather Prediction Center precipitation forecast for April 3-10, 2020.



NWS Climate Prediction Center precipitation probability forecast for April 10-16, 2020.



NWS Climate Prediction Center temperature probability forecast for April 10-16, 2020.

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

End Of Month Reservoir Content Tables

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