April 1, 2022 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

March consisted of fairly typical spring weather across the region and featured both warm/dry periods that generated snowmelt and more active cool/wet periods that brought rain to lower elevations and snow to higher elevations. Much of the region received moisture during March, but monthly precipitation totals were generally below average. January-March has been very dry across the region, with precipitation ranking in the bottom five of the historical gage record at most SNOTEL sites across Utah, southwest Wyoming, and western Colorado during the three-month period.

Below average March precipitation across much of the region led to declines in percent of normal SWE values across most basins over the past month. April 1 snow water equivalent (SWE) conditions generally range between 75-105% of normal across the Upper Colorado River Basin and 65-85% of normal across the Great Basin. Snow across the Lower Colorado River Basin has mostly melted out with the majority of SNOTEL stations across Arizona reporting less than an inch of SWE.

Water supply forecast volumes decreased over the past month across most of the Great Basin and Colorado River Basin as a result of below normal March precipitation. Upper Colorado River Basin water supply forecasts generally range between 40-100% of the 1991-2020 historical April-July average. Great Basin water supply forecasts are 30-80% of average. Lower Colorado River Basin January-May water supply runoff volume forecasts are 10-65% of the 1991-2020 historical median.

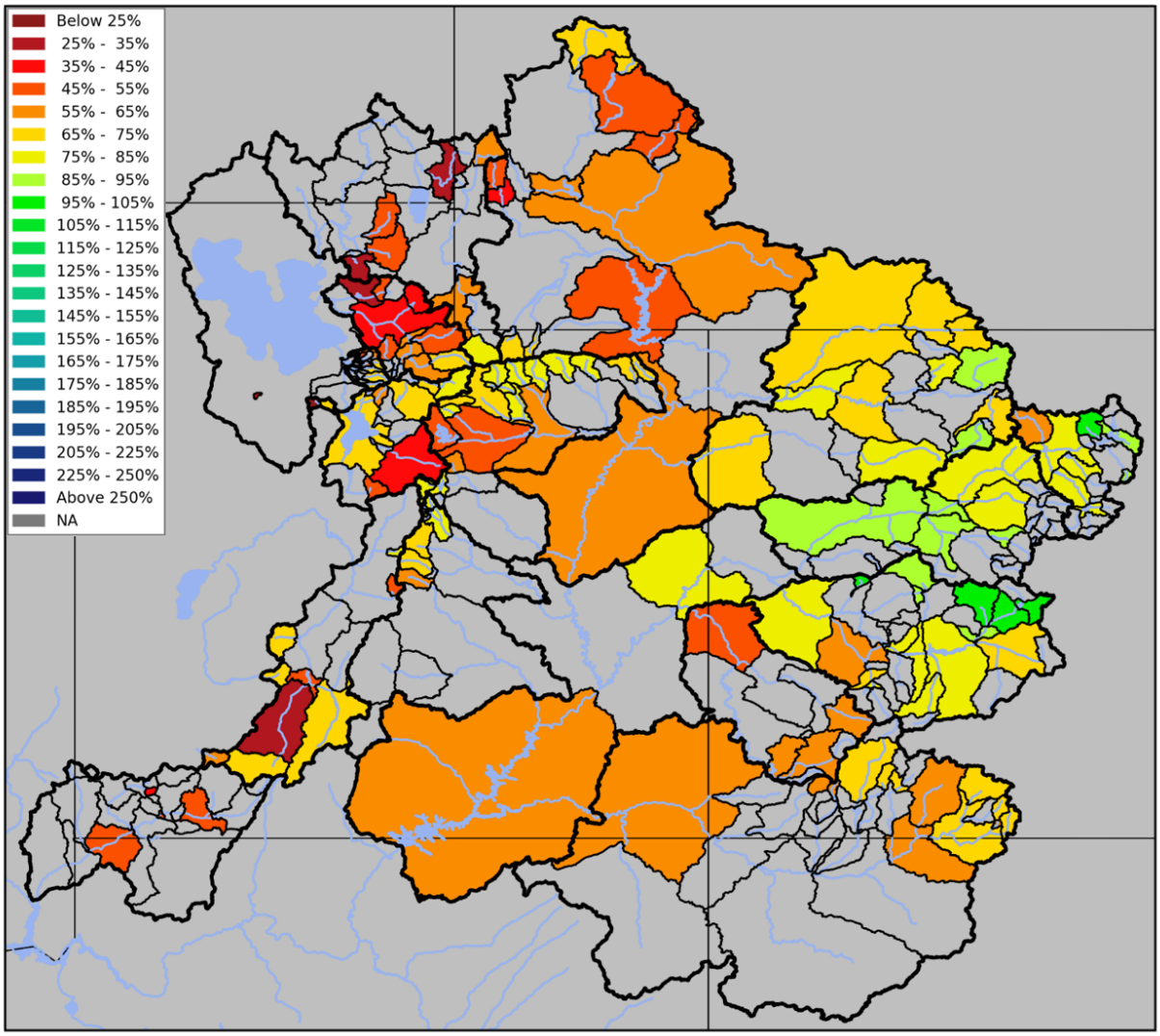
April 1 water supply forecast ranges (percent of normal) by basin:

Basin	Water Supply Forecast Range
Upper Green	40-75%
Duchesne	50-85%
Yampa/White	65-85%
Upper Colorado Mainstem	60-95%
Gunnison	70-100%
Dolores	50-65%
San Juan	55-75%
Bear	30-80%
Weber	30-70%
Six Creeks	50-75%
Provo/Utah Lake	50-75%
Sevier	50-75%
Virgin	35-55%
Little Colorado	10-35%
Upper Gila	30-50%
Salt	45-65%
Verde	45%

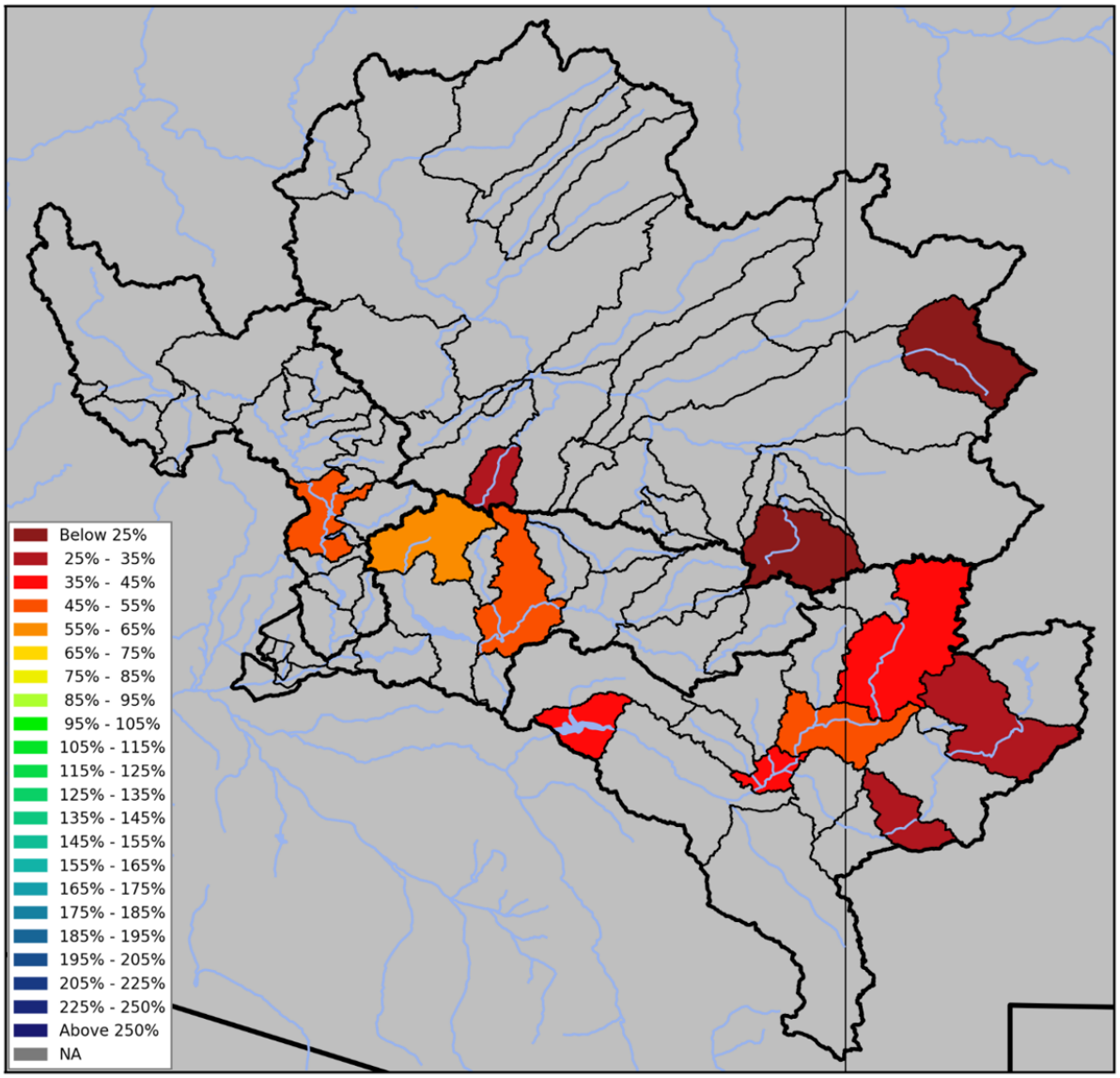
April-July unregulated inflow forecasts for some of the major reservoirs in the Upper Colorado River Basin include Fontenelle 435 KAF (59% average), Flaming Gorge 520 KAF (54%), Green Mountain 230 KAF (82%), Blue Mesa 530 KAF (83%), McPhee 152 KAF (60%), and Navajo 390 KAF (62%). The Lake Powell inflow forecast is 4.1 MAF (64% of average), which is a five percent decrease from March.

Warm and dry conditions are expected across the region through the start of this weekend. A shift into an active weather pattern is expected later this weekend into next week. Most of the region will see several periods of precipitation next week, with higher terrain likely to receive over an inch of precipitation.

Seasonal Water Supply Forecasts



Upper Colorado, Great, Virgin River Basins
April 2022 April-July forecast volumes as a percent of the 1991-2020 average
(50% exceedance probability forecast)



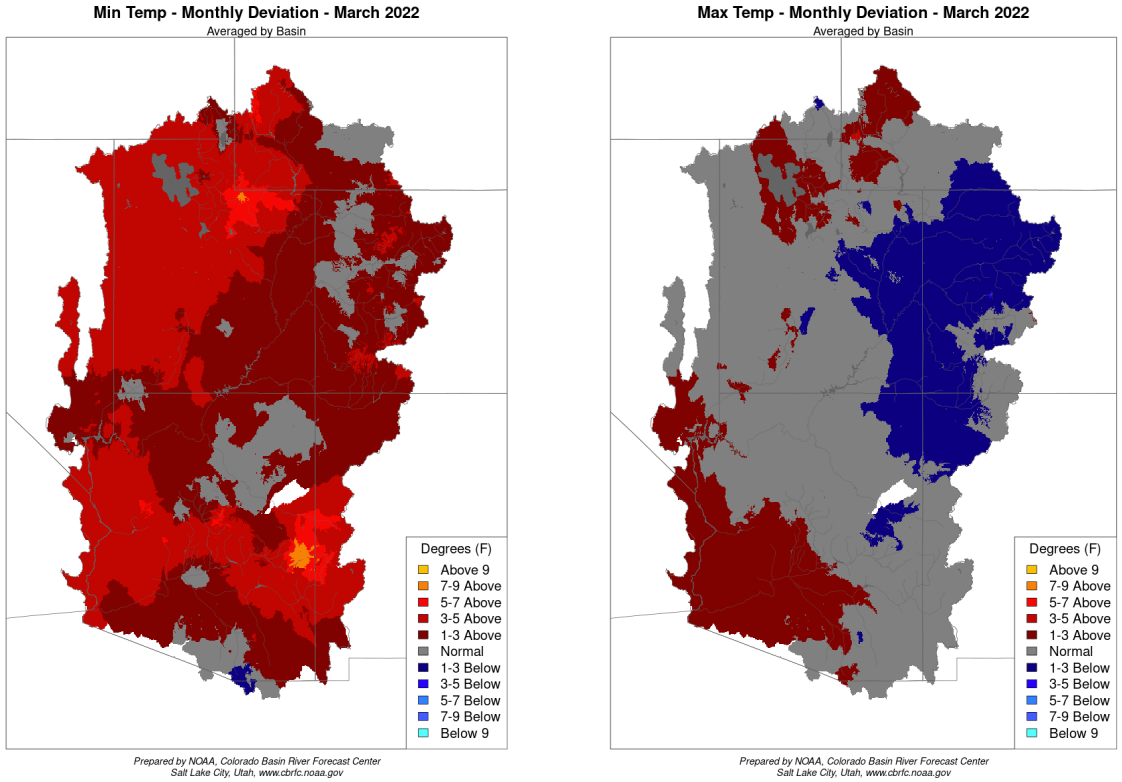
Lower Colorado River Basin (AZ/NM)
April 2022 January-May forecast volumes as a percent of 1991-2020 median
(50% exceedance probability forecast)

For specific site water supply forecasts click here

Water Supply Discussion

March Weather/Precipitation

March consisted of fairly typical spring weather across the region and featured both warm/dry periods that generated snowmelt and more active cool/wet periods that brought rain to lower elevations and snow to higher elevations. Two periods of above normal temperatures near the beginning (March 1-3) and end (March 26-29) of the month led to snowmelt below around 9,500 feet, which is not uncommon for this time of year. March minimum temperatures were mostly above average across the region while March maximum temperatures were near average.

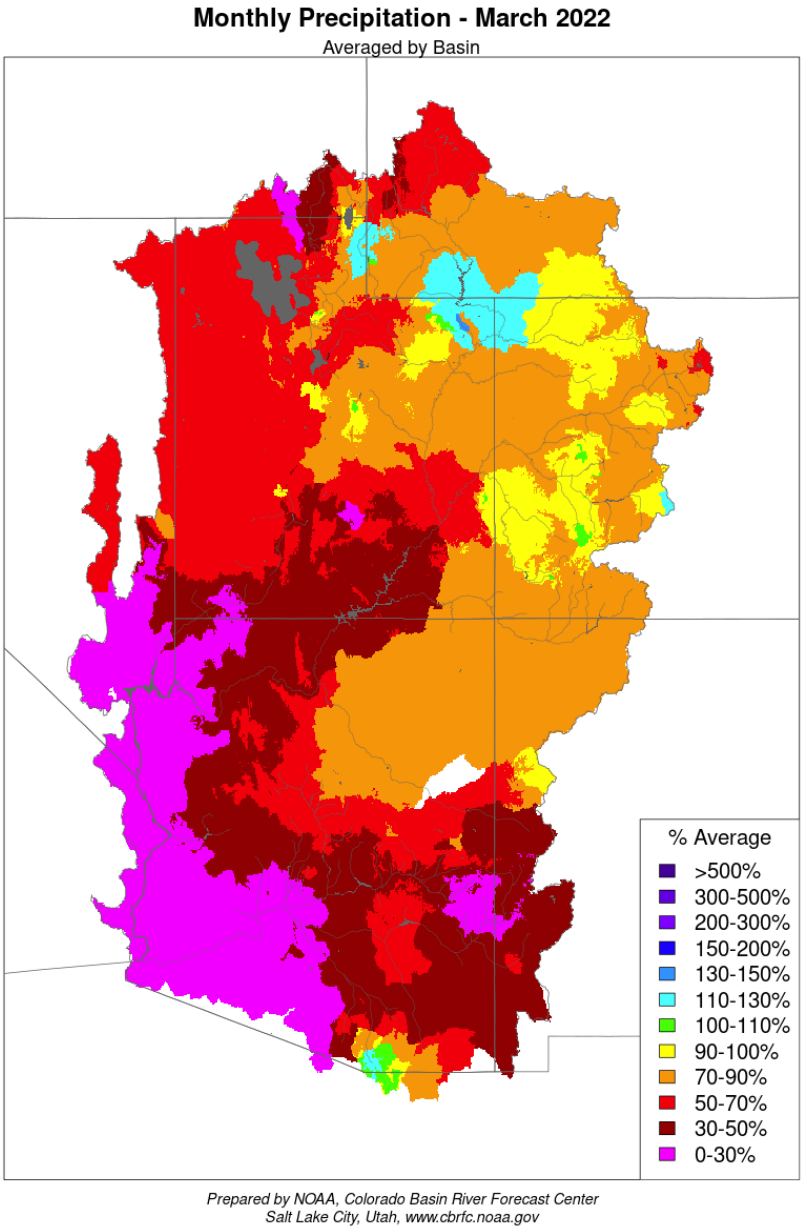


March minimum temperature (left) and maximum temperature (right) departure from the 1991-2020 average.

Much of the region received moisture during March, but monthly precipitation totals were generally below average. Across western Colorado March precipitation was around 70-90% of average. A few small areas received near to above average monthly precipitation, most notably along the western interior of Colorado and around the Utah-Wyoming-Colorado border near the confluence of the mainstem of the Green River with the Duchesne/White/Yampa Rivers. SNOTEL stations in the eastern Uintas reported March precipitation values around 100-150% of average, however the Wyoming Range just north of this area in southwest Wyoming received much less precipitation during March with SNOTEL stations generally 30-50% of average and ranking in the driest five on record for the month. The Upper Green River Basin in southwest Wyoming has had a very dry extended period, with precipitation during February and March ranking as the driest on record at most SNOTEL stations in the Upper Green River Basin.

March precipitation was mostly below normal across the Great Basin and generally ranged between 50-80% of average at SNOTEL stations. Precipitation during February and March ranked in the driest three at most SNOTEL locations across the northern Great Basin.

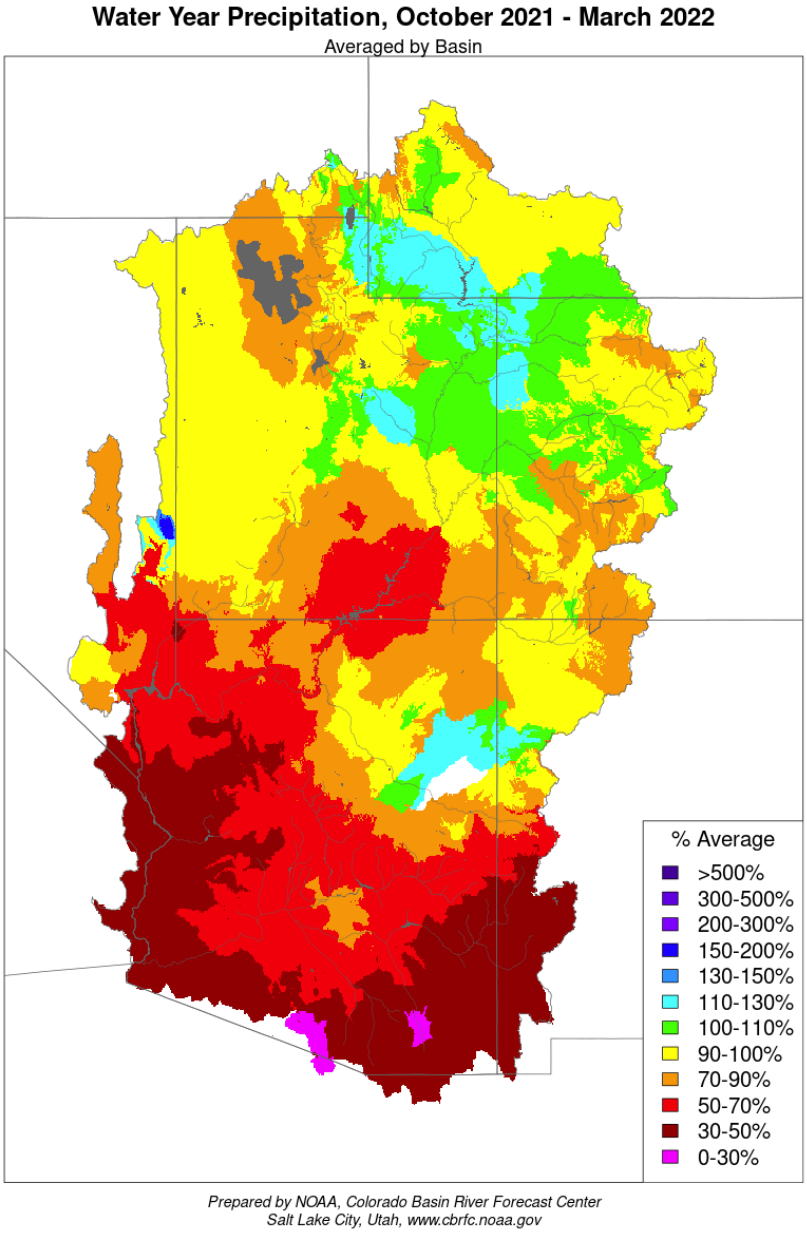
March precipitation across the Lower Colorado River Basin was variable with most basins receiving below average monthly precipitation. Virgin River Basin March precipitation was 40-65% of average. A number of SNOTEL stations across central Arizona along the divide of the Verde/Salt/Little Colorado basins received near average precipitation during March. March precipitation across the Upper Gila River Basin in west central Arizona was below normal (30-50% of average).



March 2022 percent of normal precipitation.
(Averaged by basins defined in the CBRFC hydrologic model)

Water Year Precipitation

Water year precipitation has been highly variable from month-to-month and is shown in the image below. October and December precipitation was above to much above average over most of the region while November, January, February, and March precipitation was below to much below average. After a very wet December, the January-March three month period has been very dry across the region. January-March precipitation was around 35-55% of average across Utah, southwest Wyoming, and Arizona, and around 50-85% of average across western Colorado. Furthermore, January-March precipitation ranks in the bottom five of the historical gage record at most SNOTEL sites across Utah, southwest Wyoming, and western Colorado.



Water Year 2022 percent of normal precipitation.
(Averaged by basins defined in the CBRFC hydrologic model)

Snowpack

April 1 snow water equivalent (SWE) conditions are generally near to below the 1991-2020 normal (median) across the region and are summarized in the below table. Below average March precipitation and snowmelt across much of the region led to declines in percent of normal SWE values in most basins over the past month.

Upper Colorado River Basin April 1 SWE conditions range from 75-105% of normal and did not change significantly in the past month. Upper Colorado River Basin SWE conditions continue to be most favorable along the divide of the Roaring Fork and Gunnison River Basins in western Colorado, where SWE conditions are around 105% of normal. SWE conditions are 80-90% of normal in the Duchesne, White/Yampa, Dolores, and the headwaters of the Upper Colorado River. The very dry January-March weather across southwest Wyoming has led to a steady decline in snowpack conditions across the Upper Green River Basin, where April 1 SNOTEL SWE conditions are around 75% of normal and ranked in the bottom five of the historical gage record.

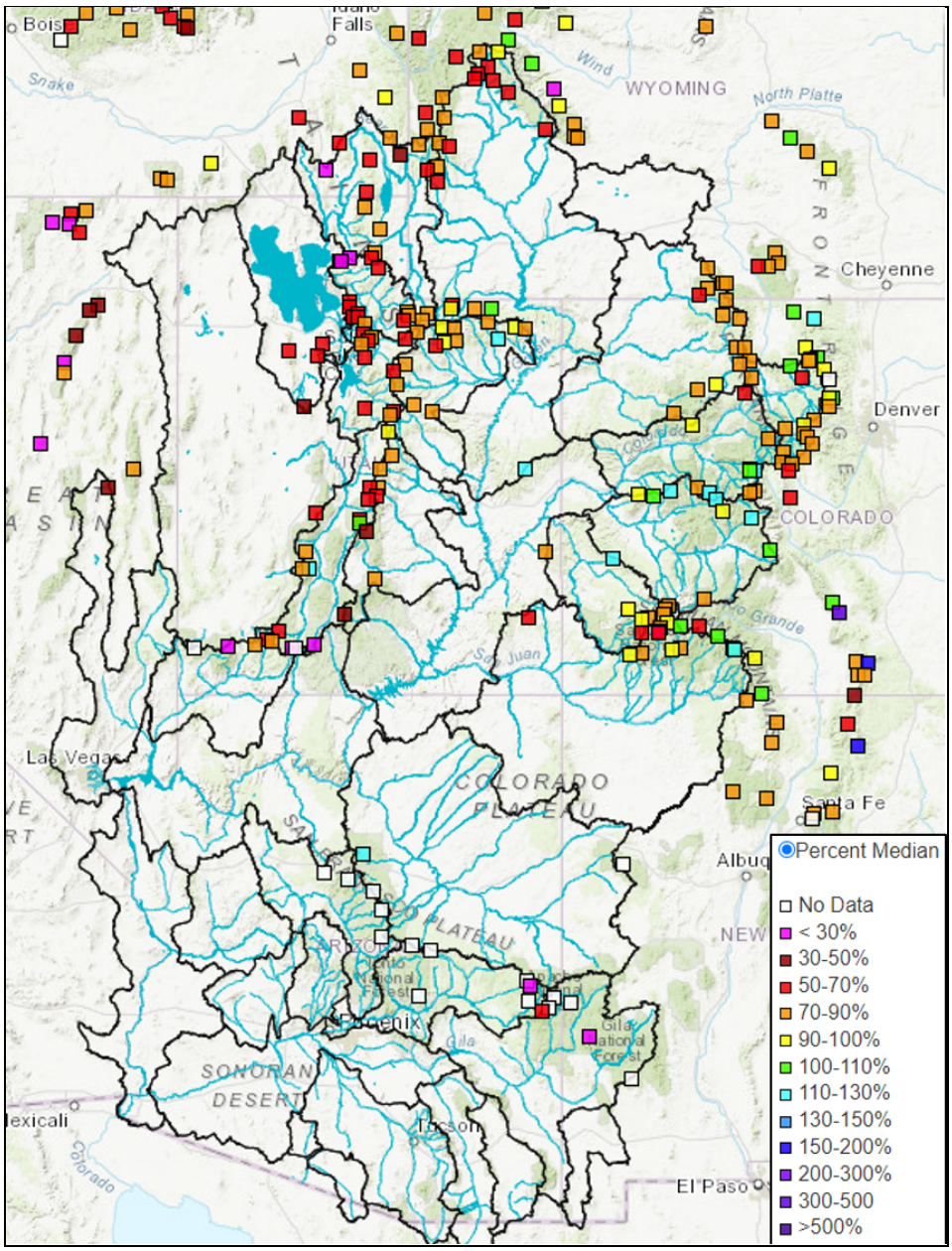
Below average March precipitation across the Great Basin led to modest declines in SWE conditions over the past month. April 1 SWE conditions range from 65-85% across the Great Basin, with conditions generally increasing from north to south and faring the best across the Sevier River Basin in south central Utah. Northern Great Basin (Bear, Weber, Provo/Utah Lake) early April snowpack conditions are poor with April 1 SWE values generally below the 25th percentile.

Snowpack conditions across the Lower Colorado River Basin are more variable and tend to fluctuate more frequently over time, with April 1 SWE conditions often based on just a few SNOTEL stations that haven't melted out. Early April snow across the Lower Colorado River Basin has mostly melted out with the majority of SNOTEL stations across Arizona reporting less than an inch of SWE. Most of the remaining SWE across the Lower Colorado River Basin exists in the Virgin River Basin in southwest Utah, where April 1 SWE is near normal. There are also a few higher elevation SNOTEL stations along the divide of the Verde and Little Colorado basins in central Arizona reporting greater than five inches of SWE.

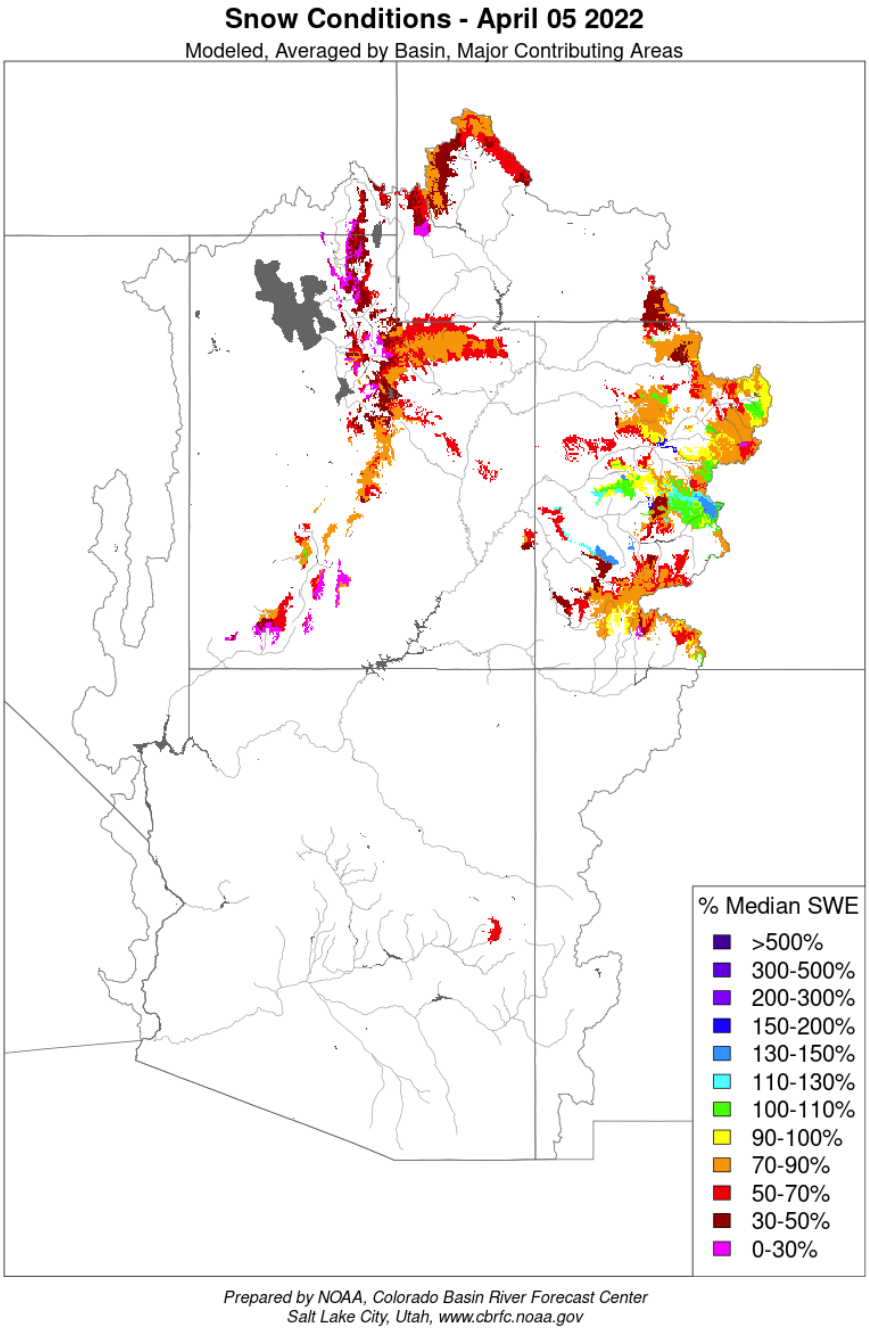
March 1 - April 1 basin SWE summary (NRCS SNOTEL):

Basin	Mar1 %Median SWE	Apr1 %Median SWE
Upper Green	80	74
Duchesne	91	88
White/Yampa	86	83
UC Headwaters	93	89
Roaring Fork	108	106
Gunnison	106	103
Dolores	93	89
San Juan	101	103
Bear	79	68
Weber	73	64
Provo/UT Lake	76	70
Sevier	96	87

The images below show observed snow conditions and CBRFC hydrologic model snow conditions.



SNOTEL percent median observed SWE - April 6, 2022.



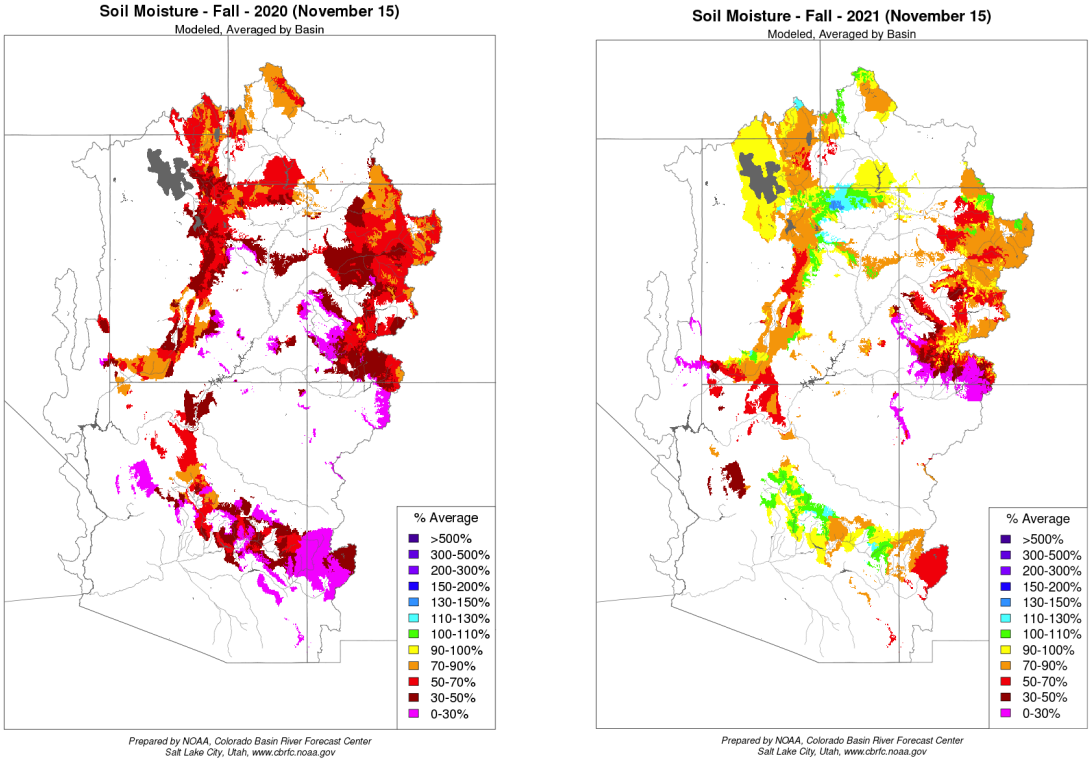
CBRFC hydrologic model percent median SWE - April 5, 2022.

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

Soil Moisture

CBRFC model fall soil moisture conditions impact early season water supply forecasts and 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. The timing and magnitude of spring runoff is ultimately a result of SWE conditions, spring weather (precipitation/temperature), and antecedent soil moisture conditions.

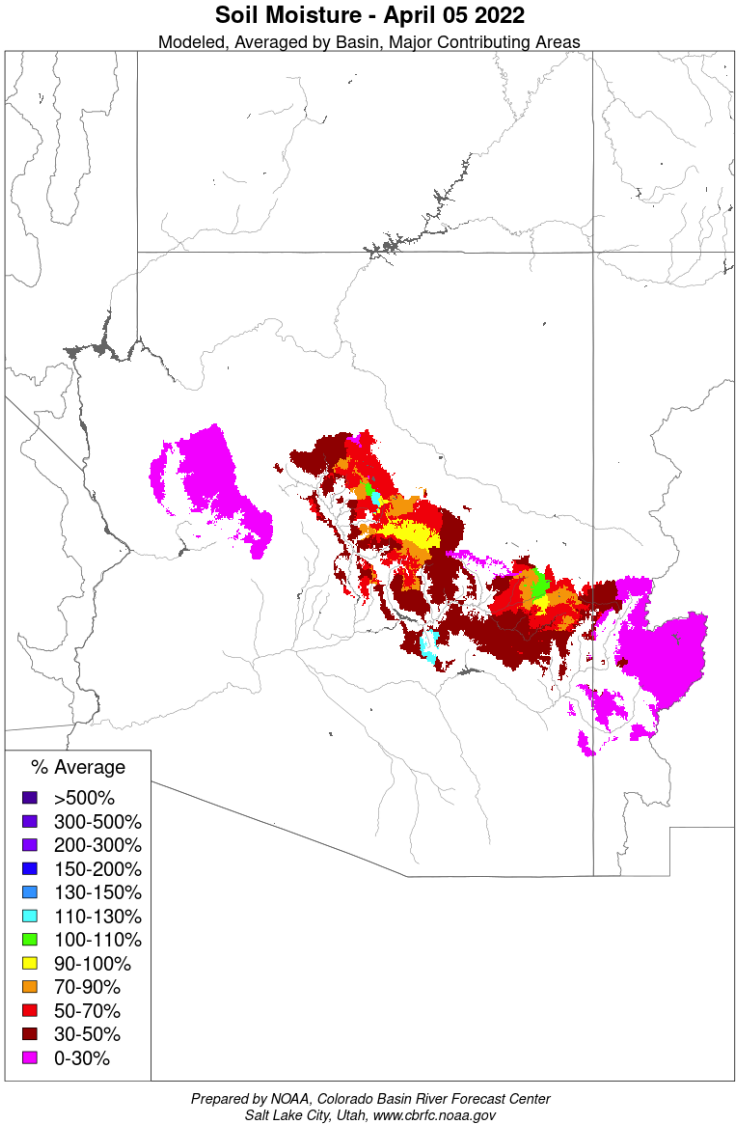
A wet monsoon season and above average October precipitation improved soil moisture conditions, especially across Utah and Arizona. Fall (antecedent) soil moisture conditions are improved from a year ago but remain below average across many of the major runoff producing areas. Larger than normal antecedent soil moisture deficits exist across much of western Colorado and are expected to negatively impact early spring runoff efficiency. Fall model soil moisture conditions are closer to normal across southwest Wyoming and Utah and even above normal in parts of the Duchesne River Basin.



Comparison of November 2020 (left) and November 2021 (right) CBRFC hydrologic model soil moisture conditions entering the winter season.

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. Basins with above average soil moisture conditions can be expected to experience more efficient runoff from rainfall or snowmelt while basins with below average soil moisture conditions can be expected to have lower runoff efficiency until soil moisture deficits are fulfilled.

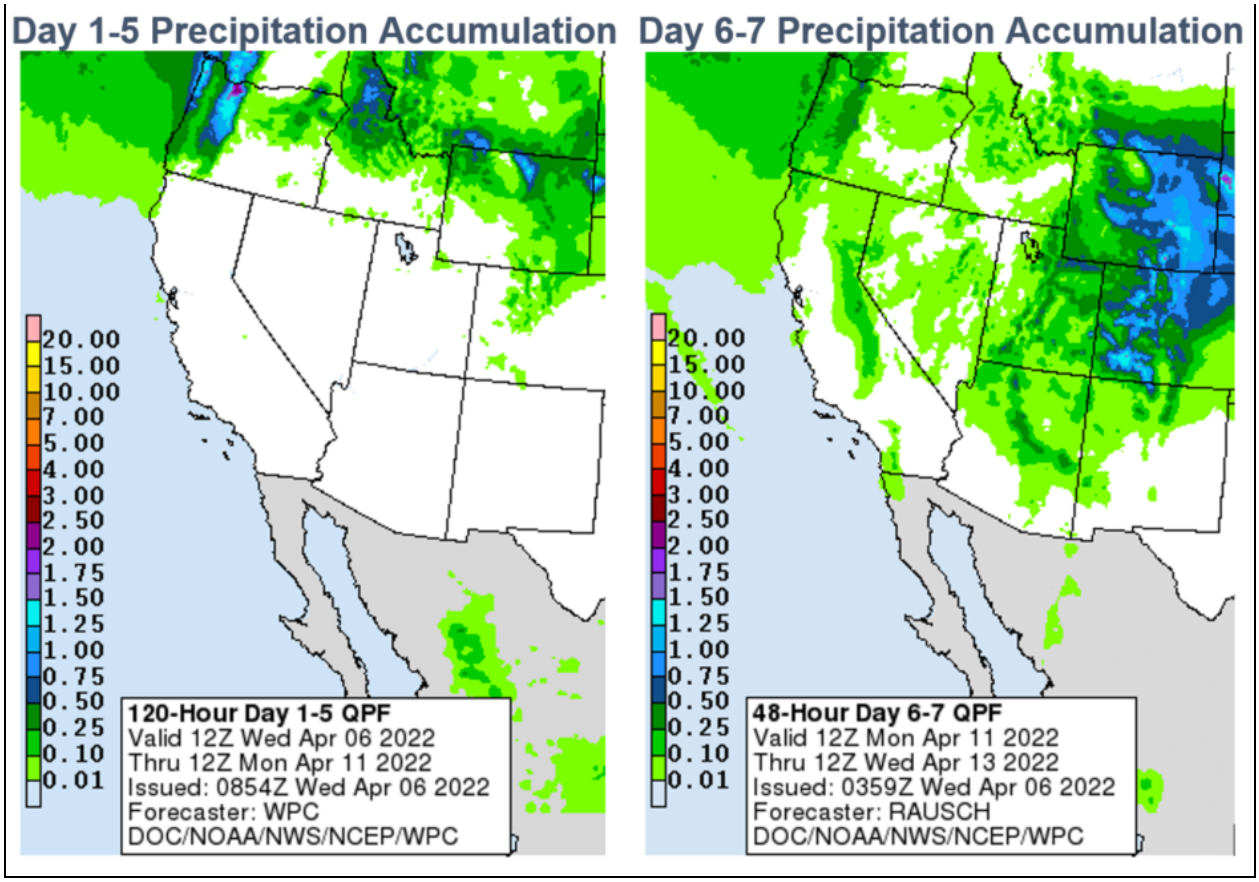
Model soil moisture conditions across the Lower Colorado River Basin have improved from a year ago as a result of above average monsoon season precipitation and storm activity that has occurred during the water year. However, below normal January-March precipitation across Arizona and southwest New Mexico has led to declines in soil moisture conditions over the past several months. Early April model soil moisture conditions are mostly below normal across the Lower Colorado River Basin.



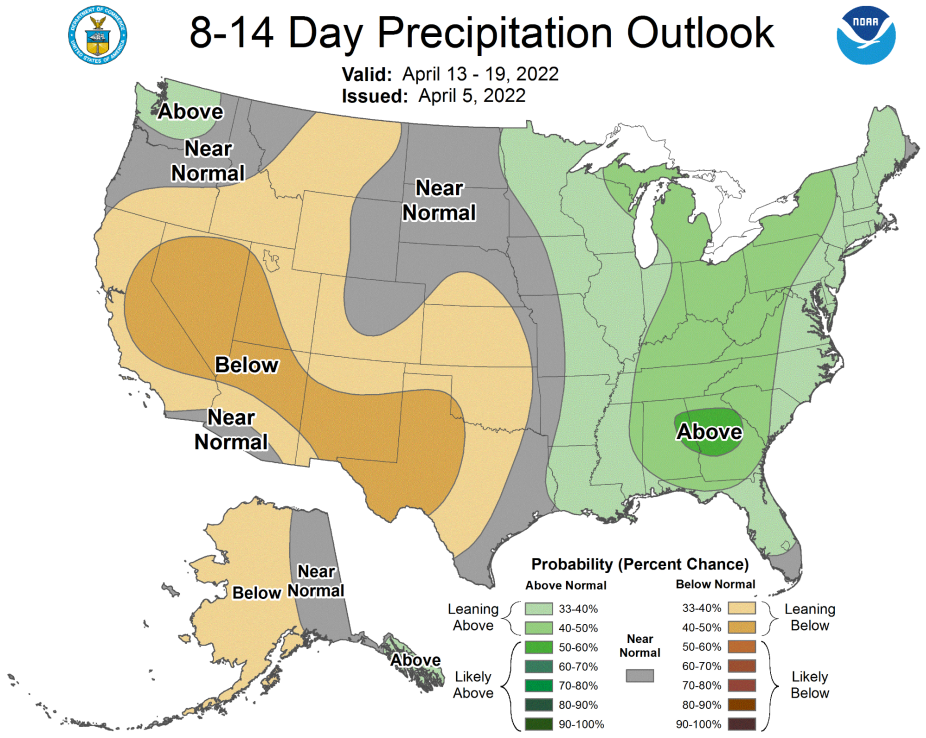
Lower Colorado River Basin (AZ/NM) model soil moisture - April 5, 2022.

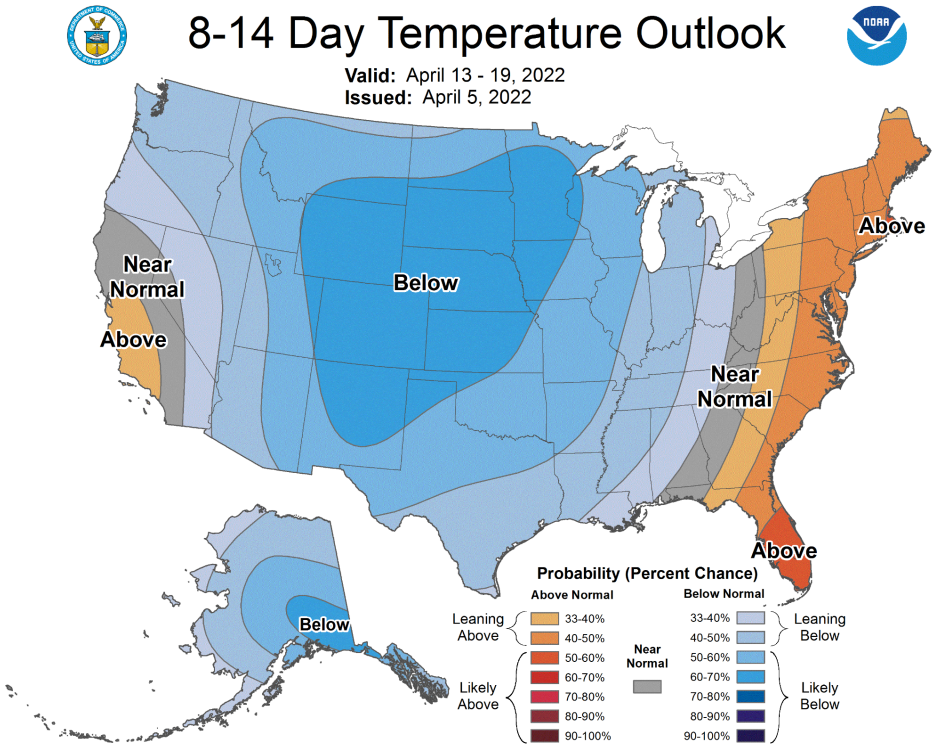
Upcoming Weather

Dry and warm conditions are expected across the region through the start of this weekend due to an upper-level ridge over the western US. By the end of this weekend, this ridge will move east, allowing for a shift into an active weather pattern next week. Most of the region will see several periods of precipitation next week, with higher terrain likely to receive over an inch of precipitation. Elsewhere will likely receive between 0.25 to 0.50 inches of precipitation. Below average temperatures will accompany this period of active weather. In the long range forecast beyond next week, a return to drier weather is likely to occur as another ridge is favored to set up over the Eastern Pacific, though temperatures should remain below average across the region.



NWS Weather Prediction Center precipitation forecast for April 6-13, 2022.





NWS Climate Prediction Center precipitation and temperature probability forecasts for April 13-19, 2022.

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

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