February 3, 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

A ridge of high pressure settled over the region during the second week of January and persisted through the end of the month bringing very dry weather and a decrease in the spring water supply outlook. February 1st snow water equivalent (SWE) conditions generally range between 95-120% of normal across the Upper Colorado River Basin and 90-105% of normal across the Great Basin. Lower Colorado River Basin SWE conditions are 40-120% of normal.

Water supply forecast volumes have decreased across most basins over the past month. Upper Colorado River Basin water supply forecasts generally range between 60-115% of the 1991-2020 historical April-July average. Great Basin water supply forecasts are 60-105% of average. Lower Colorado River Basin water supply runoff volumes are 30-75% of normal.

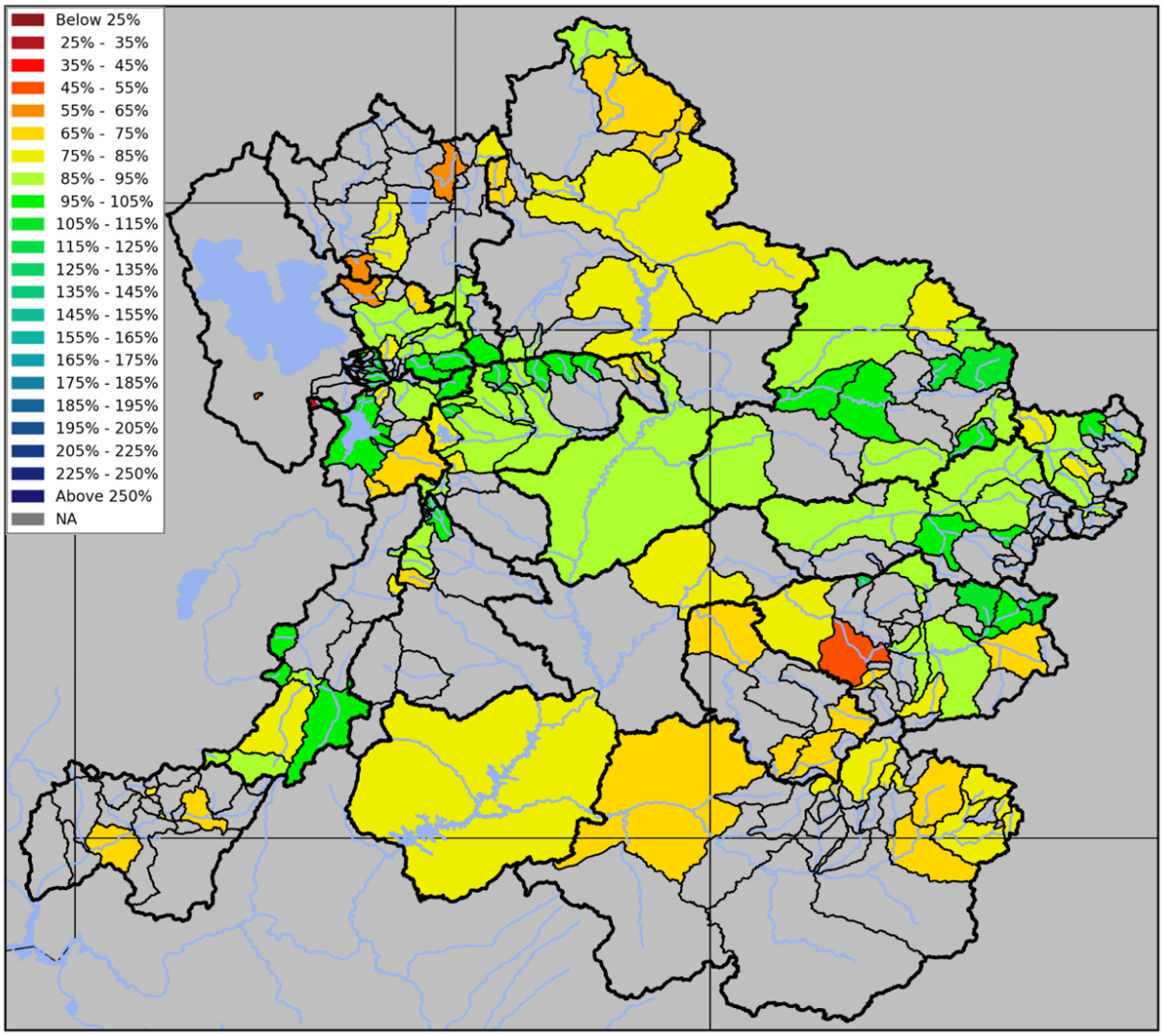
Water supply forecast ranges (percent of normal) by basin:

Basin	Water Supply Forecast Range
Upper Green	65-95%
Duchesne	75-105%
Yampa/White	85-115%
Upper Colorado Mainstem	80-105%
Gunnison	70-115%
Dolores	65-75%
San Juan	60-85%
Bear	60-105%
Weber	65-100%
Six Creeks	80-105%
Provo/Utah Lake	70-100%
Sevier	75-105%
Virgin	70-75%
Little Colorado	35-75%
Upper Gila	30-45%
Salt	55-70%
Verde	50%

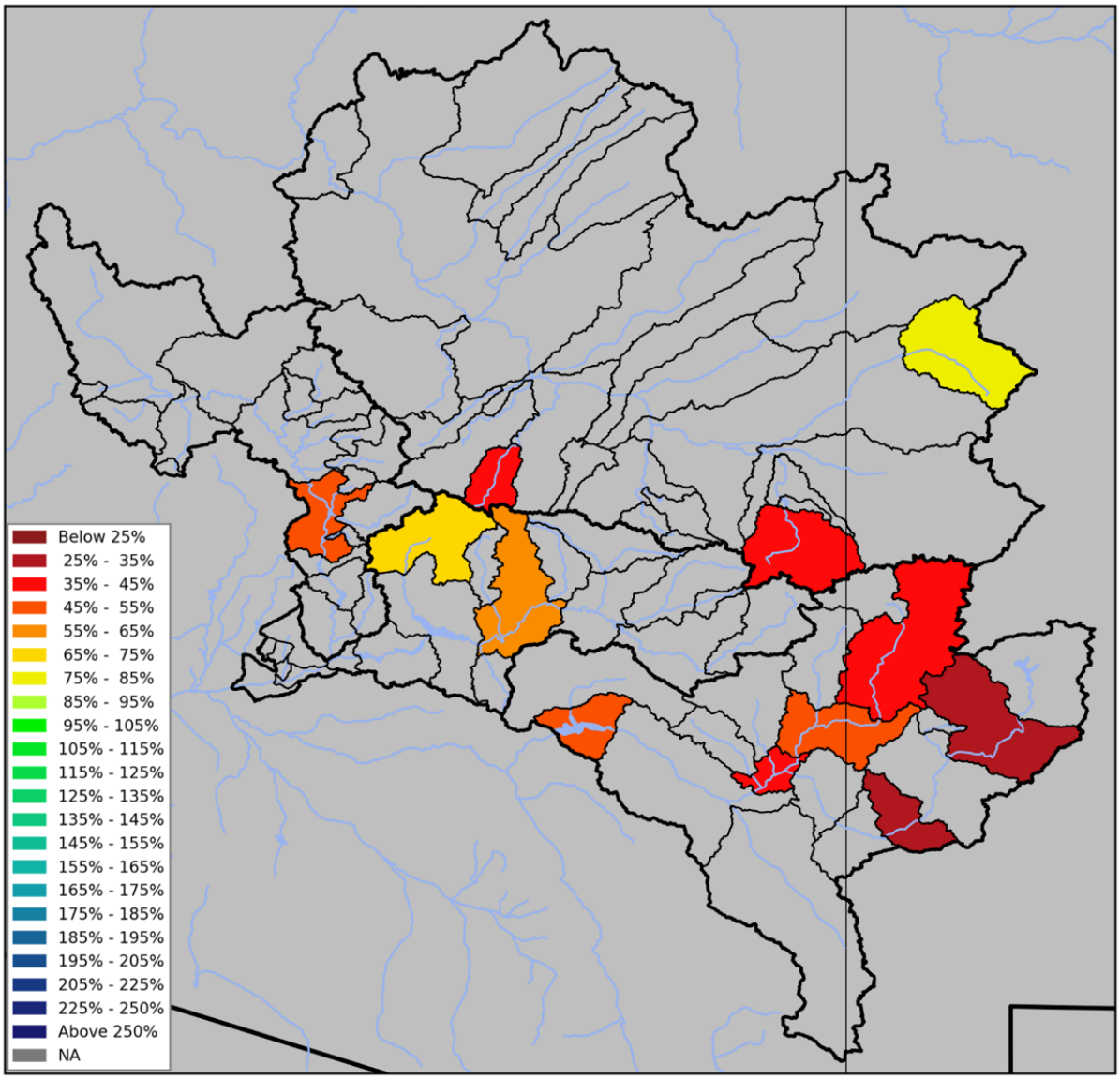
April-July unregulated inflow forecasts for some of the major reservoirs in the Upper Colorado River Basin include Fontenelle 615 KAF (84% average), Flaming Gorge 750 KAF (78%), Green Mountain 255 KAF (91%), Blue Mesa 585 KAF (92%), McPhee 185 KAF (73%), and Navajo 455 KAF (72%). The Lake Powell inflow forecast is 5.0 MAF (78% of average), which is a 20 percent decrease from January.

The ridge of high pressure will remain largely in place for the next two weeks. Mostly dry weather is expected across the region, with light precipitation (<0.25”) possible across higher elevations of the Bear, Upper Green, White/Yampa, Upper Colorado, Gunnison, and San Juan Basins. Spring runoff volume guidance will likely continue to decrease through the middle of February given the dry weather outlook.

Seasonal Water Supply Forecasts



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



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

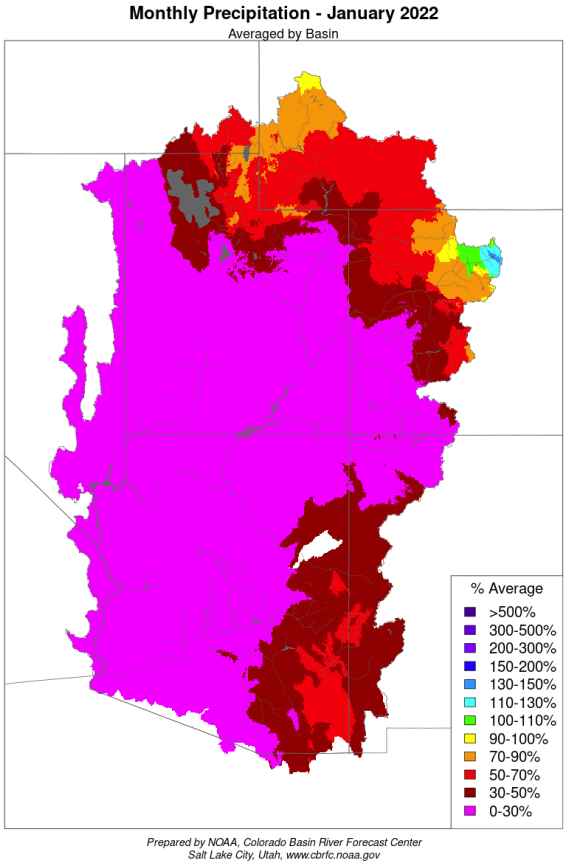
For specific site water supply forecasts click here

Water Supply Discussion

January Precipitation

The wet and active weather pattern that began during the second week of December continued through the first week of January. The most significant storm/precipitation during the month occurred over January 3rd-8th, with widespread 1-3” precipitation amounts across northern basins (Upper Green, Bear, Weber, White/Yampa, Upper Colorado headwaters) and a handful of locally higher 4-6+” amounts reported across the Great Basin and Upper Colorado River Basin. This was the last significant event of a very wet period lasting around five weeks (December 6th-January 8th).

A ridge of high pressure settled over the region during the second week of January and persisted through the end of the month. As a result, the weather during the last three weeks of January brought mostly very dry weather to the region, although periods of northwesterly flow did bring modest precipitation to northern basins including the Bear in northern Utah, Upper Green in southwest Wyoming, and White/Yampa/Upper Colorado River headwaters in northwest Colorado. January was extremely dry across the southern half of Utah and southwest Colorado (Gunnison/Dolores/San Juan) where the majority of SNOTEL stations reported monthly precipitation values falling in the driest three in the past 30 years. Almost all SNOTEL stations across southwest Wyoming, Utah, and western Colorado reported record/near record low precipitation below the 10th percentile during the last three weeks of January with Arizona SNOTEL station precipitation below the 25th percentile.The Colorado River headwaters above Kremmling was the only area with above average January precipitation.



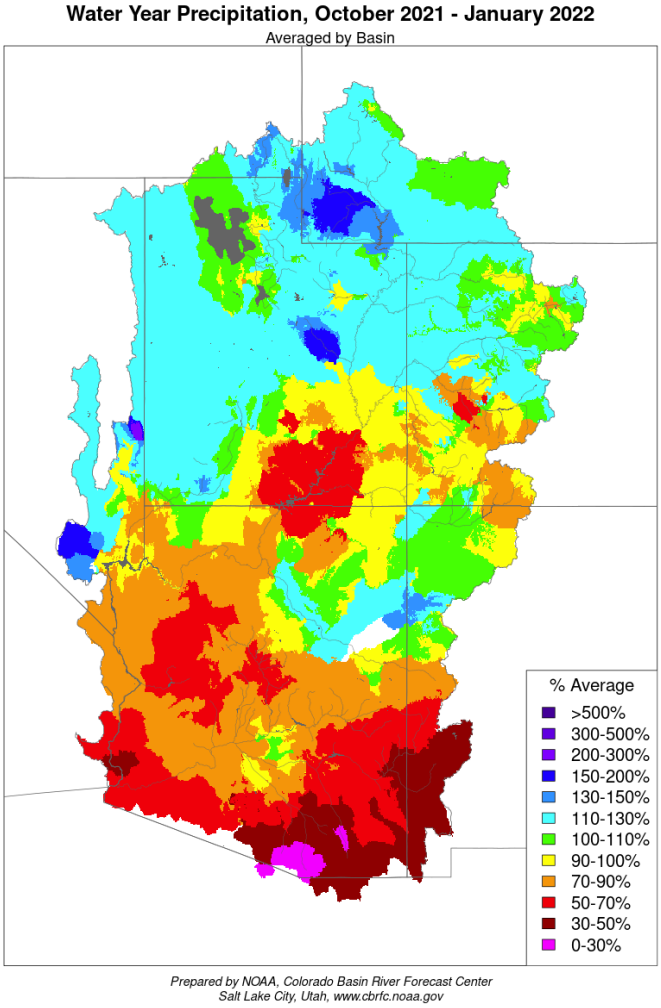
January 2022 percent of normal precipitation.
(Averaged by basins defined in the CBRFC hydrologic model)

Water Year Precipitation

Water year precipitation has been highly variable from month-to-month. October and December precipitation was above to much above average over most of the region while November and January precipitation was below to much below average. Precipitation at SNOTEL sites during the second week of December into early January was generally above the 85th percentile, while precipitation during the last three weeks of January fell below the 10th percentile.

January's dry weather led to declines in water year precipitation across most of the region. Water year precipitation is generally near to slightly above (100-130%) average across the Great Basin and slightly below to slightly above average (80-130%) across the Upper Colorado River Basin. Lower Colorado River Basin water year precipitation is variable, with near to above average conditions across northeast and portions of south central Arizona and below to much below average precipitation elsewhere.

Within the Upper Colorado River Basin, near to above average water year precipitation was observed for much of the Upper Green River Basin southwards to the divide of the Roaring Fork and Gunnison River Basins in west central Colorado. Water year precipitation is near to slightly below average across southwest Colorado including the southern half of the Gunnison and headwaters of the Dolores, Animas, and San Juan Rivers.



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

Snowpack

February 1st snow water equivalent (SWE) conditions are generally near to slightly above normal across the Upper Colorado River Basin and Great Basin despite the region seeing extremely dry weather during the last three weeks of January. The fact that February 1st SWE conditions are near normal across much of the region after record dry precipitation during the last three weeks of January highlights how wet it was in December through early January.

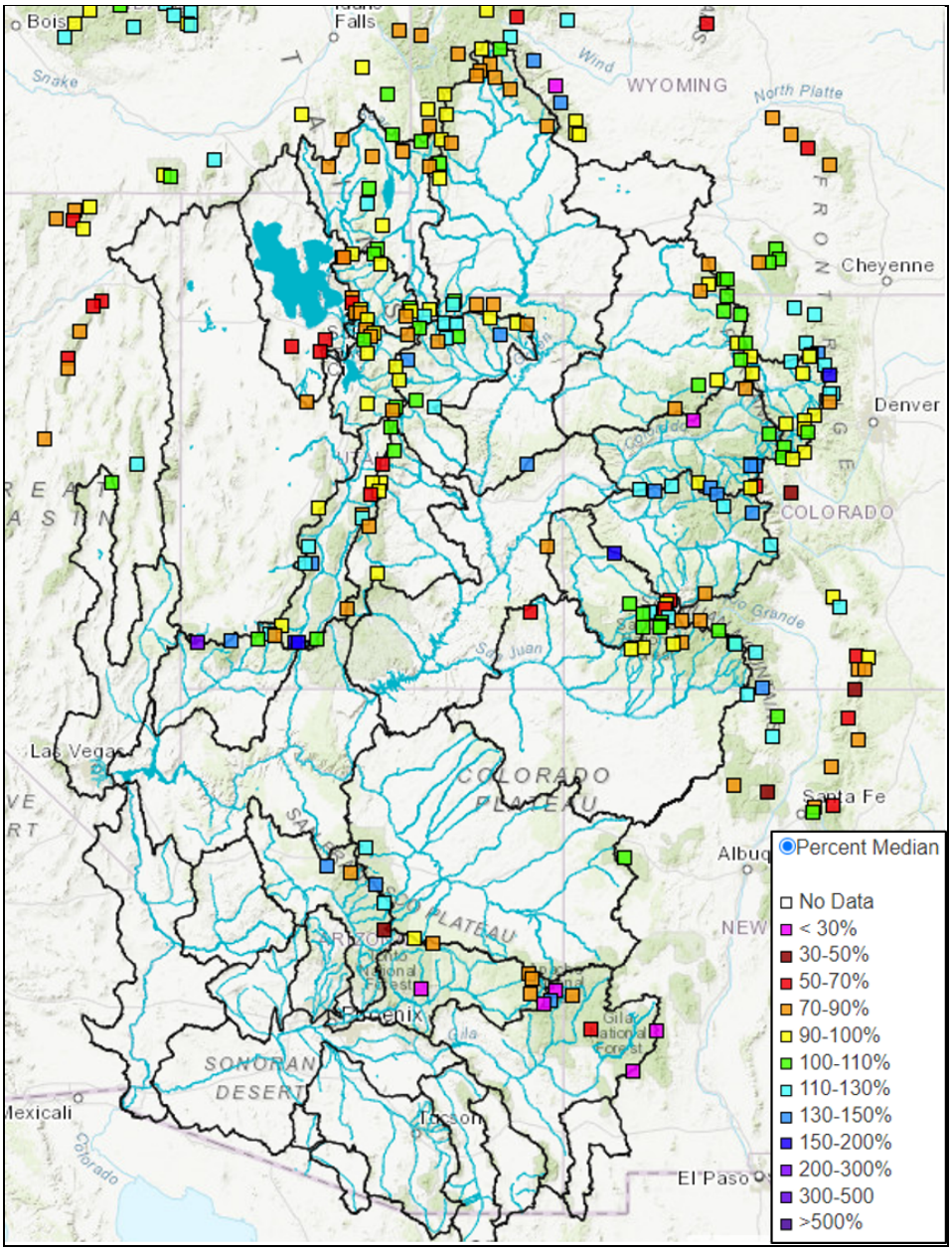
SWE conditions as a percent of normal declined across the Great and Colorado River Basins over the past month with the largest declines in southern basins. Northern basins including the Bear, Upper Green, and Upper Colorado River headwaters had smaller declines in percent of normal SWE conditions due primarily to the significant January 3rd-8th precipitation event as well as modest precipitation later in the month (January 20th-27th) associated with northwesterly flow.

Upper Colorado February 1st SWE conditions are most favorable along the divide of the Roaring Fork and Gunnison Basins (~130% of normal) and the Duchesne River Basin (115%), and near average elsewhere across the Upper Colorado River Basin: Upper Colorado headwaters/mainstem (110%), White/Yampa (105%), Dolores (105%), San Juan (100%), Upper Green (95%).

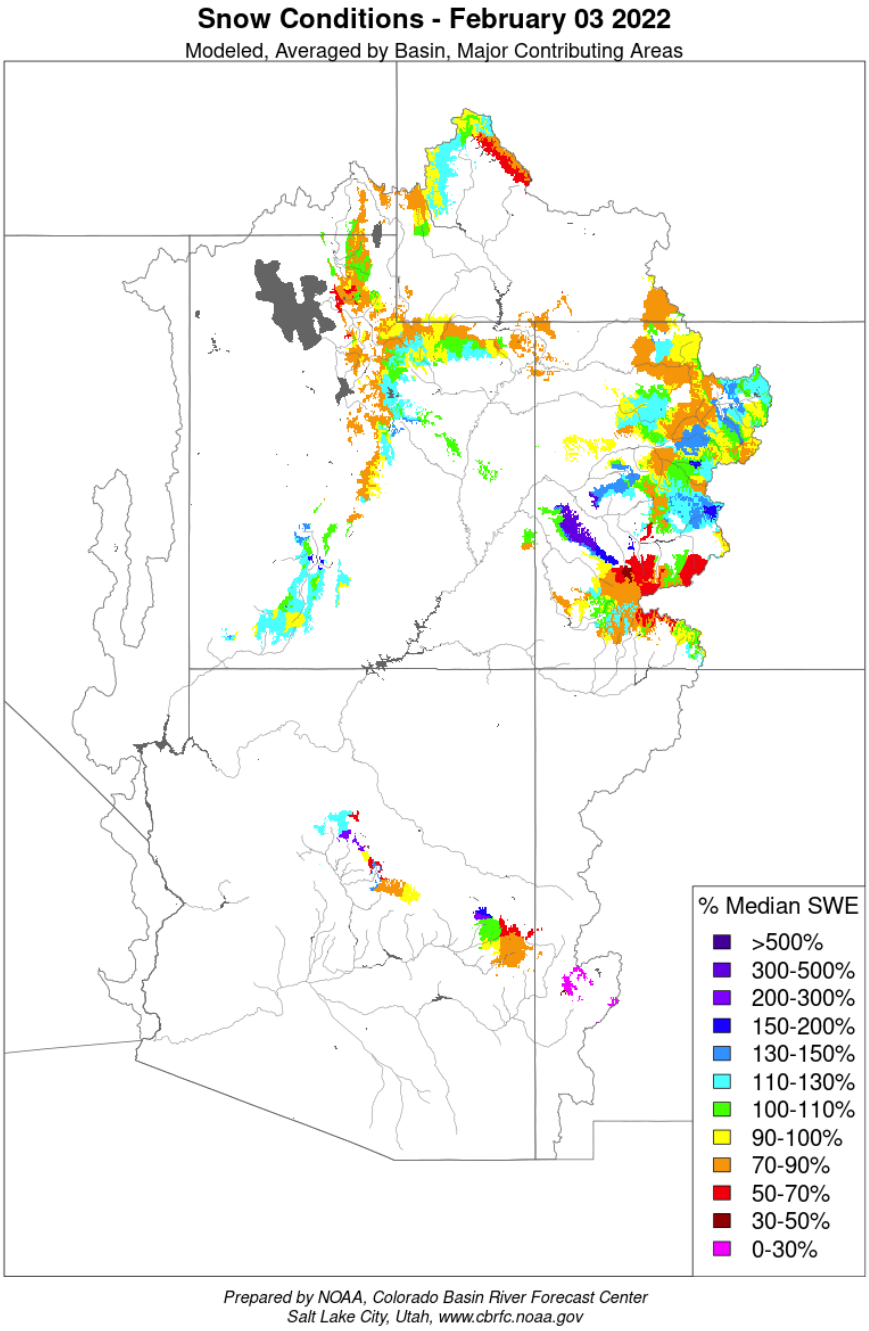
Snowpack conditions in the Lower Colorado River Basin are more variable and tend to fluctuate more frequently over time. February 1st Lower Colorado River Basin SWE conditions range from 40-120% of normal and are most favorable in the Virgin River Basin (120%); Verde (110%); Little Colorado (80%); Salt (70%); Upper Gila (40%).

SWE across the Great Basin remains fairly uniform with slightly better conditions in northern (Bear) and southern (Sevier) basins, where February 1st SWE is 105% of normal. SWE conditions across the central Great Basin (Weber/Six Creeks/Provo) are around 90% of normal.

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



SNOTEL percent median observed SWE - February 3, 2022.



CBRFC hydrologic model percent median SWE - February 3, 2022.

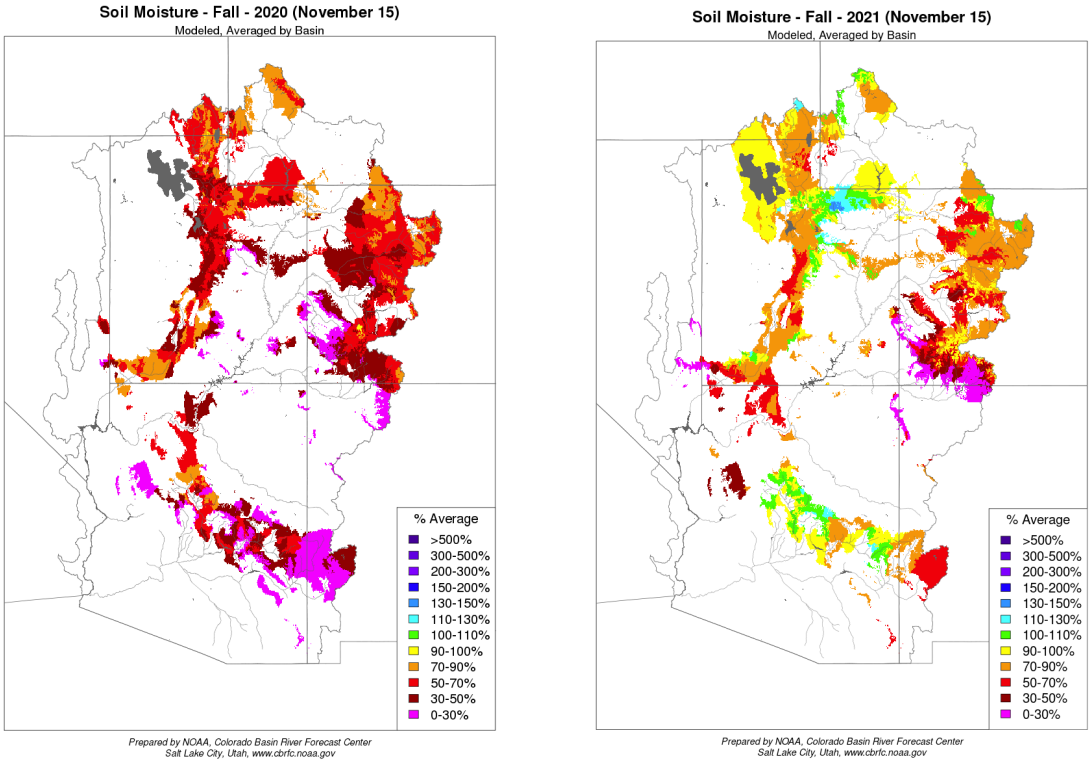
For updated SNOTEL information refer to click here

For CBRFC hydrologic model snow click here

Soil Moisture

CBRFC hydrologic model soil moisture states 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 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.

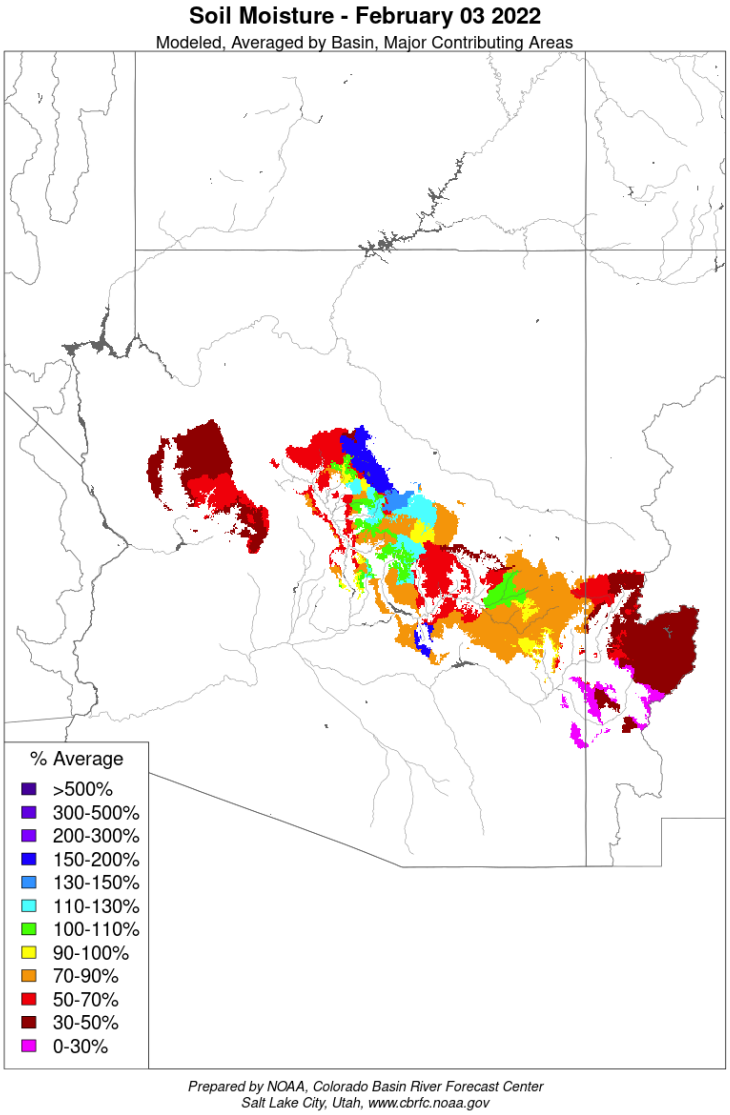
A wet monsoon season and above average October precipitation improved soil moisture conditions, especially across Utah and Arizona. Fall (antecedent) soil moisture conditions are improved from a year ago but remain below average across many of the major runoff producing areas. Larger than normal antecedent 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.

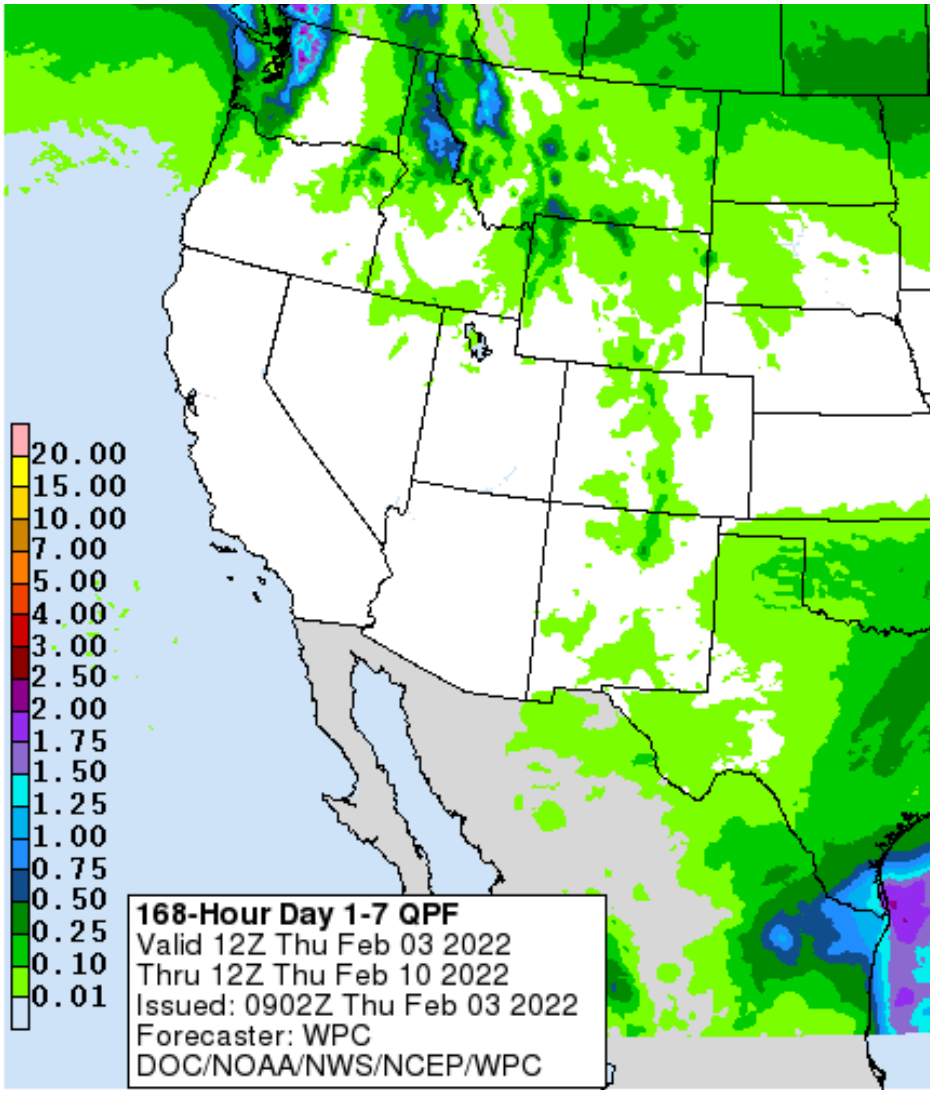
Model soil moisture conditions across the Lower Colorado River Basin have improved considerably from a year ago as a result of above average monsoon season precipitation and recent storm activity that occurred during December and January. Early February model soil moisture across the Lower Colorado River Basin is variable with near to above average conditions across central Arizona (portions of the Salt, Verde, and Agua Fria River Basins) and below to much below average conditions as you move away from central Arizona.



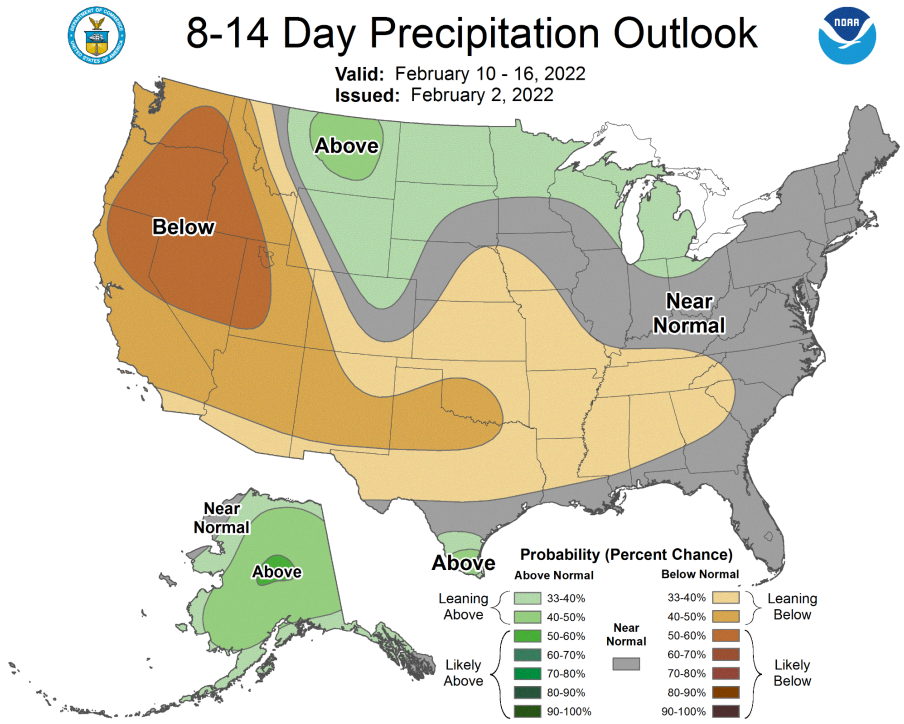
Lower Colorado River Basin (AZ/NM) model soil moisture - February 3, 2022.

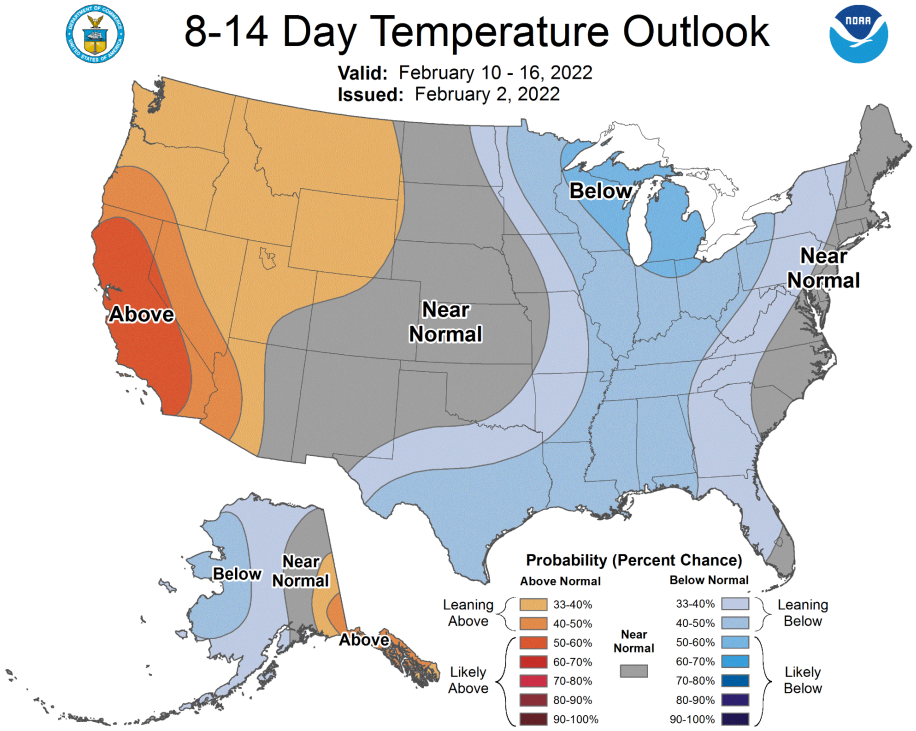
Upcoming Weather

The ridge of high pressure that has resulted in below average precipitation across the area will remain largely in place for the next two weeks. A series of weak weather disturbances will brush by the area into next week. These will be mostly dry, though there is the potential for some light precipitation across the higher elevations of the Bear, Upper Green, White/Yampa, Upper Colorado, Gunnison, and San Juan Basins. Total precipitation accumulations are expected to remain below 0.25 inches. The main impact from these disturbances will be a number of dry cold fronts that will drop temperatures for a day or two. The high pressure ridge will shift slightly eastward next week leading to a continuation of below normal precipitation and above normal temperatures in areas not impacted by inversions.



NWS Weather Prediction Center precipitation forecast for Feb 3-10, 2022.





NWS Climate Prediction Center precipitation and temperature probability forecasts for Feb 12-18, 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

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