

March 19, 2019 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:

Copious amounts of precipitation over a large part of the Colorado River Basin has resulted in another significant increase in anticipated water supply runoff volumes. In the Upper Colorado River Basin largest increases occurred in the San Juan, Dolores, and Gunnison River Basins with up to a 40 percent of average increase from forecasts issued in early March. Notable increases in the 10-20 percent of average range were widespread throughout the Yampa River Basin and on the Colorado River Mainstem and headwater tributaries. Farther north into the Upper Green River Basin of Wyoming changes were negligible as precipitation during the first half of March was generally near or below average.

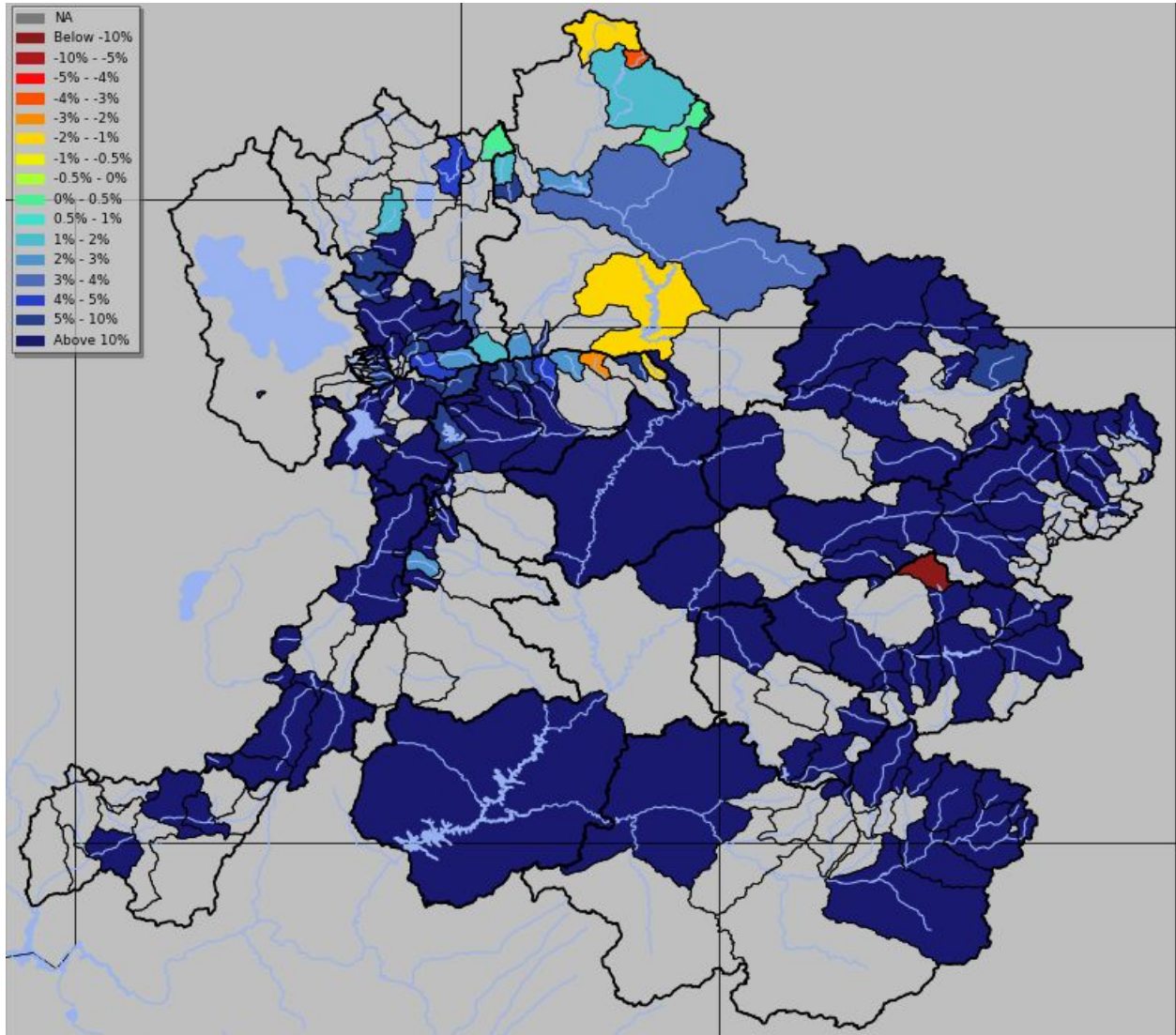
In the Lower Colorado River Basin largest increases to anticipated season runoff volumes occurred in the Virgin River Basin of southwest Utah and also the Gila River Basin in eastern Arizona and western New Mexico.

In the Great Basin precipitation was generally above average but resulted in smaller changes than in the Upper Colorado Basin. Latest model guidance is generally within 5-10 percent of average of the forecasts issued in early March.

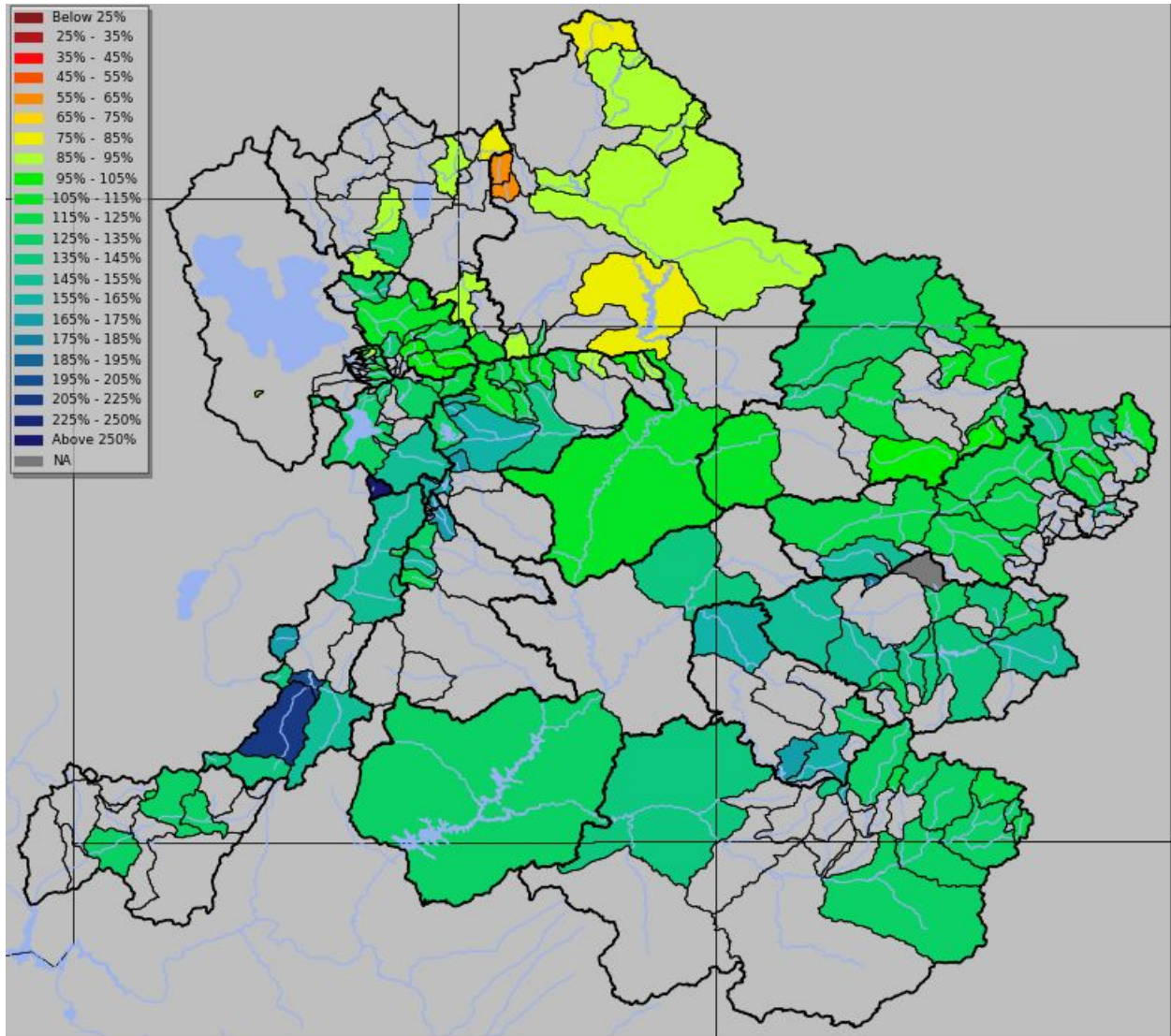
Currently only the Green River Basin of Wyoming and Bear River Basin are expecting runoff volumes less than average. All other locations in the Upper Colorado River Basin and Great Basin of Utah are expecting above average April-July runoff volumes with several forecasts exceeding 140 percent of average.

April-July unregulated inflow forecasts for some of the major reservoirs in the Upper Colorado River Basin include Fontenelle Reservoir 630 KAF (87% average) which is no change from March 1st, Flaming Gorge 830 KAF (85% of average) also no change from March 1st, Blue Mesa Reservoir 960 KAF (142% of average) a 32 percent of average increase, McPhee Reservoir 480 KAF (163% of average) a 51 percent of average increase, and Navajo Reservoir 970 KAF (132% of average) a 38 percent of average increase. The Lake Powell inflow forecast is 9.50 MAF (133% of average) an increase of 2.2 million acre-feet or 31% of average.

Seasonal Water Supply Forecasts:



Trend in the April-July runoff volume forecast guidance from March 1 to March 18, 2019.
(Change in April-July percent of average)



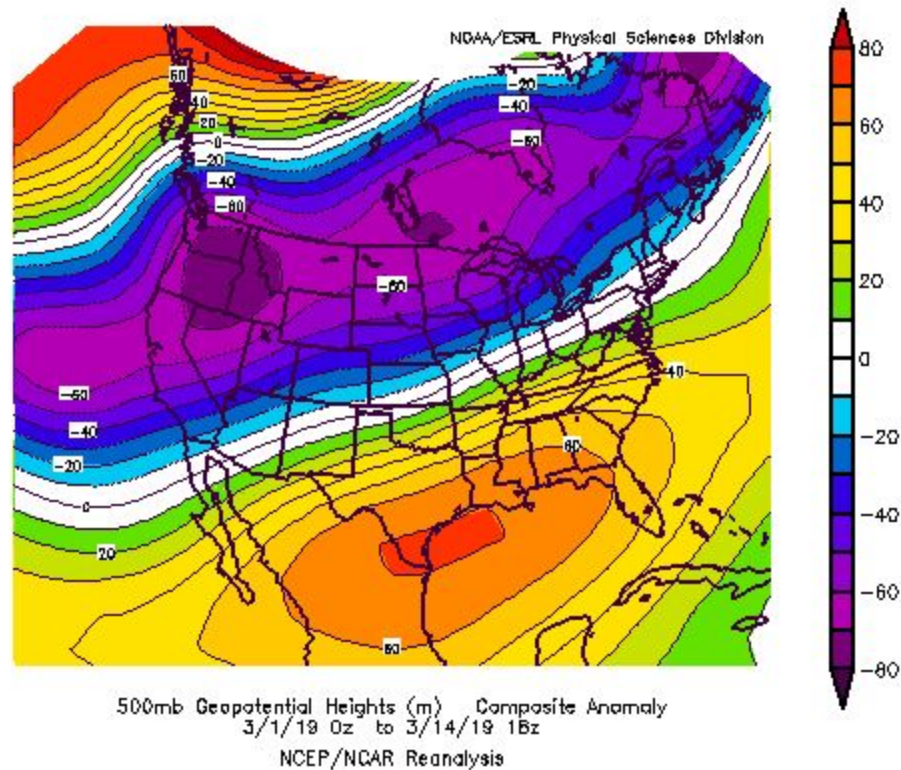
April-July runoff volume guidance as of March 18, 2019.
(percent of 1981-2010 average)

For specific site water supply forecasts, refer to: <https://www.cbrfc.noaa.gov/rmap/wsmap/wsulist.php>

Water Supply Discussion

Weather Synopsis:

The anomalous trough pattern that occurred during the month of February across the Western U.S. has persisted into the first half of March. This pattern has allowed multiple storm systems with a good Pacific moisture tap to traverse the Colorado River Basin over the past two weeks. The storms have particularly targeted Utah and Colorado, where plentiful moisture in west-to-southwest flow produced very impressive storm totals in the orographically favored mountain areas. Many SNOTEL sites in Utah and Colorado are having one of the best starts to March with regard to precipitation (generally above the 90th percentile).



500mb Height Anomaly for the first two weeks of March. The negative values (cool colors) show an anomalous trough across the Western U.S., a pattern that has persisted from the beginning of February.

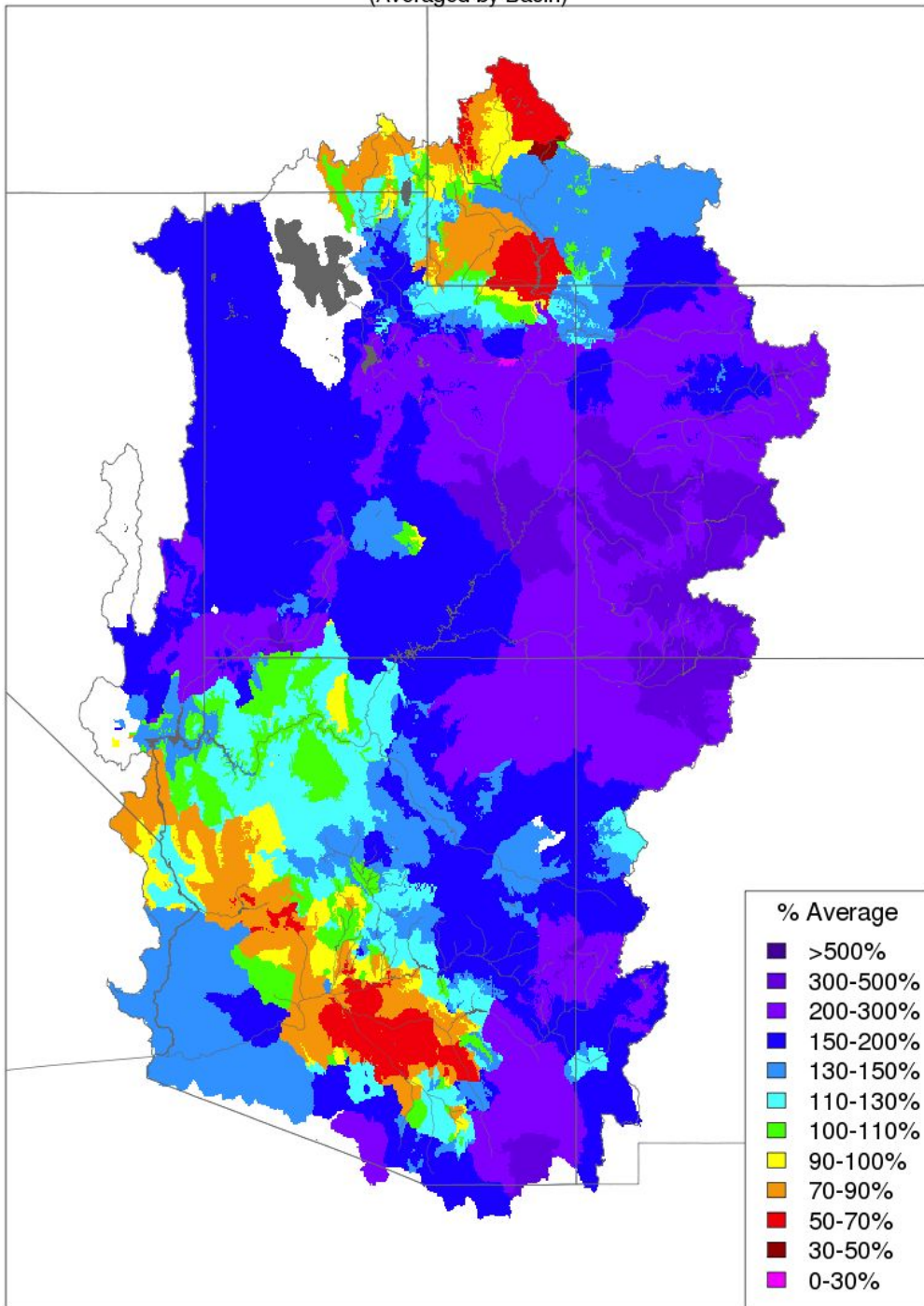
Precipitation:

With a very active storm pattern across the Western U.S. through the first half of March, precipitation has been well above average over much of the Upper Colorado River and Great Basins. Nearly all the higher elevation areas of Utah and Colorado have month-to-date precipitation of 150-400% of average. In parts of the San Juan Basin nearly 14 inches of precipitation was received in the first 15 days of the month. Most SNOTEL sites within the Gunnison, Dolores, and San Juan Basins are at the highest or 2nd highest precipitation amounts for the first half of March and some have already eclipsed the monthly record for March.

Mountain areas of the Green River Basin in Wyoming have been less impacted by these March systems, with 50-100% of average precipitation. The Lower Colorado River Basin has generally seen above normal precipitation. The Virgin River Basin along with the Salt and Upper Gila Basins were particularly favored by the storms over the first two weeks (150-300% of average). Overall, this will go down as one of the wettest starts to March, particularly across Colorado.

Month to Date Precipitation - March 19 2019

(Averaged by Basin)



Prepared by NOAA, Colorado Basin River Forecast Center
Salt Lake City, Utah, www.cbrfc.noaa.gov

March 1-18, 2019 percent of average precipitation.

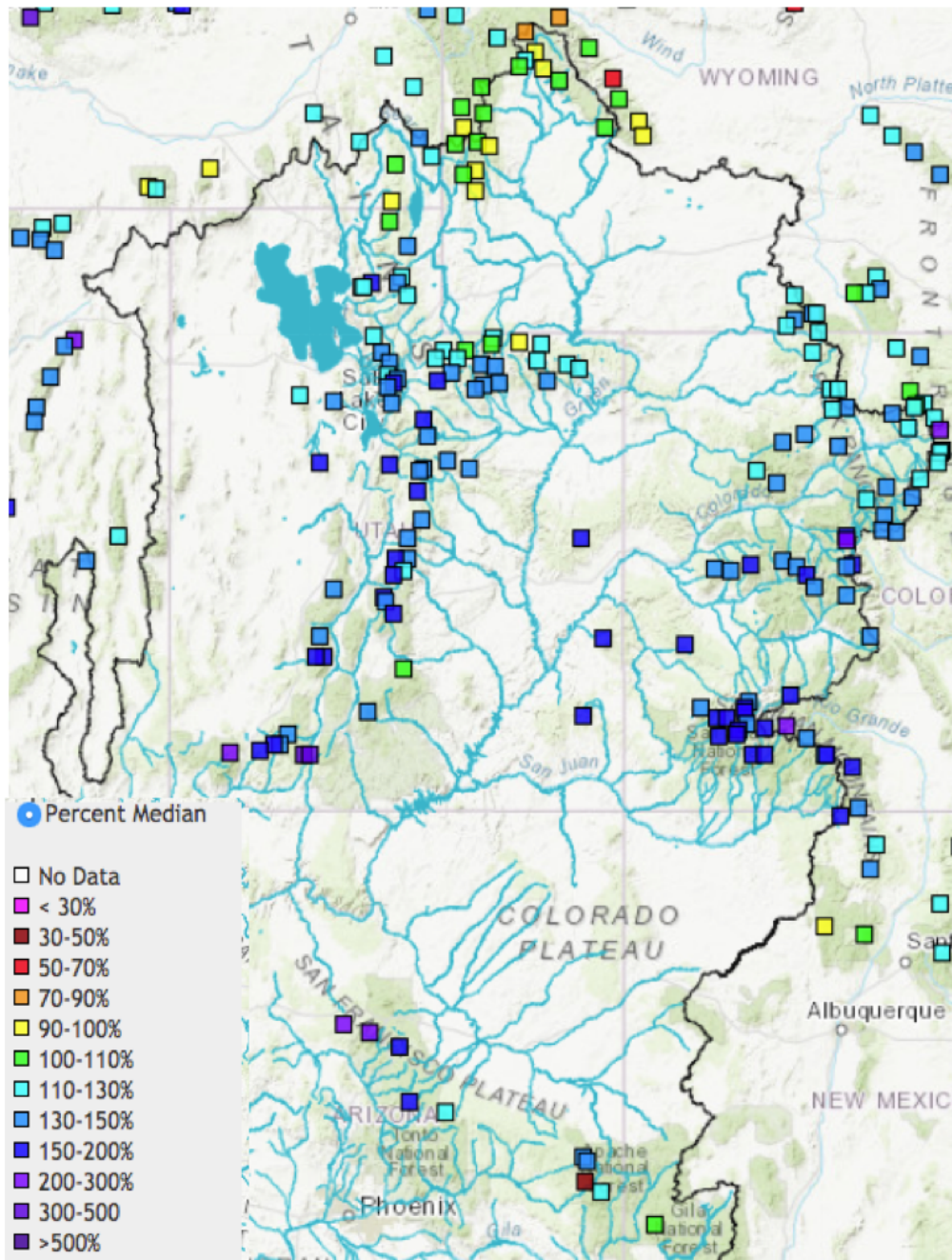
Snowpack:

Snow conditions are either at record levels or in the top 3 of record for several SNOTEL sites in western Colorado and central and southwest Utah as of March 19th. Most of these sites have between 33 and 41 years of record. In addition the vast majority of SNOTEL sites throughout the Upper Colorado River Basin of Colorado and Utah and the Great Basin south of the Bear River Basin have exceeded the normal seasonal peak snowpack that typically occurs anywhere between early and mid April.

Those areas with the highest percent of normal (median) snowpack for this time of year include the San Juan Basin with up to 185 percent of normal, the Dolores River Basin with 170 to 180 percent of normal, the Gunnison Basin with 150 to 175 percent of normal, and parts of the Colorado River Mainstem basins with 130 to 160 percent of normal. The western Duchesne River Basin and tributaries of the Green and Colorado Rivers in central Utah have snowpack levels in excess of 150 percent of normal. The Provo and Weber River Basins of northern Utah are generally in the 120 to 150 percent of normal range. Near to slightly below normal snowpack exists in parts of the Bear River Basin and upper Green River Basin of Wyoming.

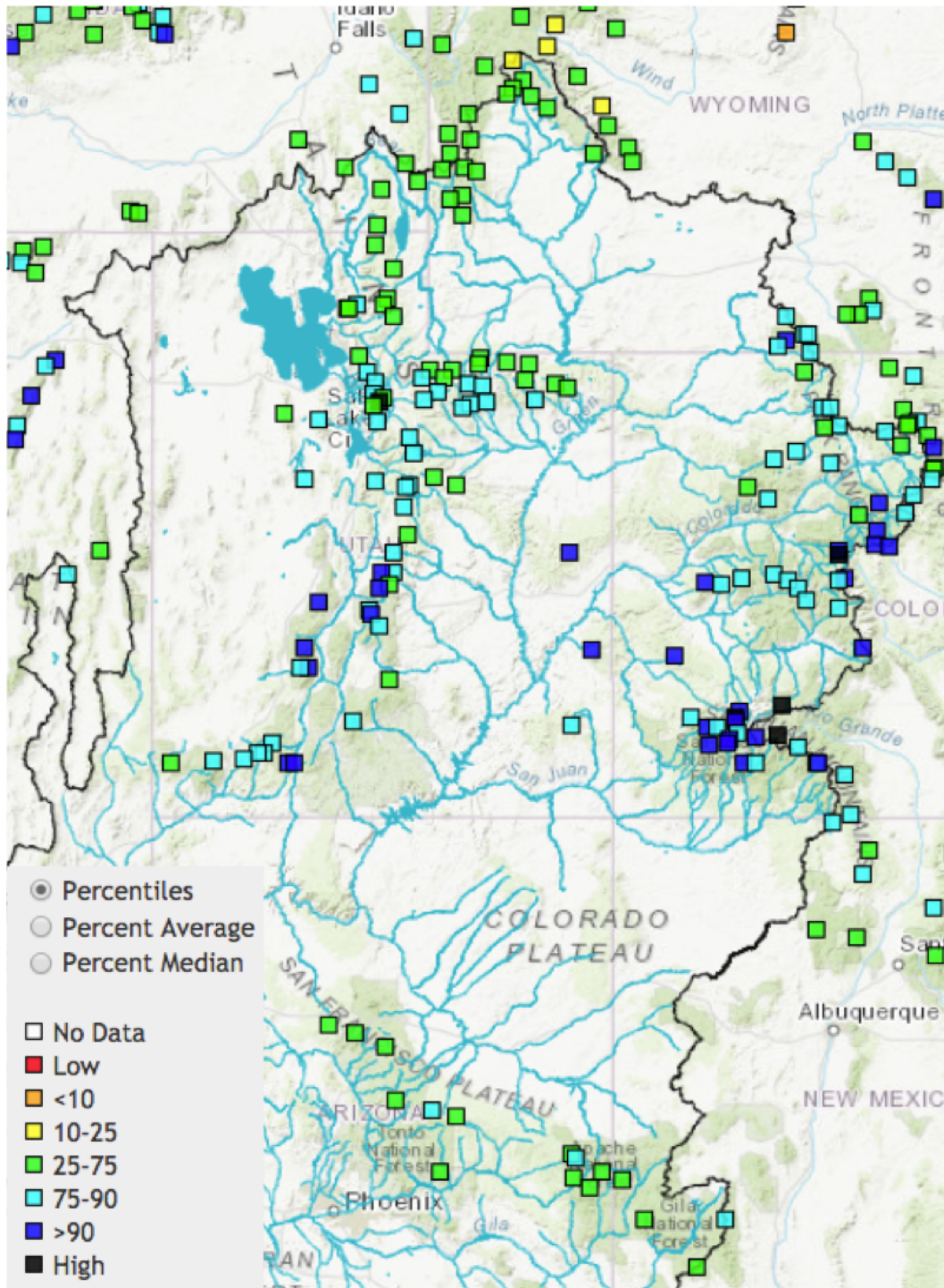
The maps below show the SNOTEL sites as a percent of normal (historical median) and also as a historical ranking for their period of record. The snow as represented in the CBRFC hydrologic model is also displayed.

The image below shows the SNOTEL sites as a percent of their historical median as of March 19th 2019. Those sites in the dark blue currently exceed 150 percent of median (or normal) for this time of year while those in the dark purple are at 200 percent or more of normal.



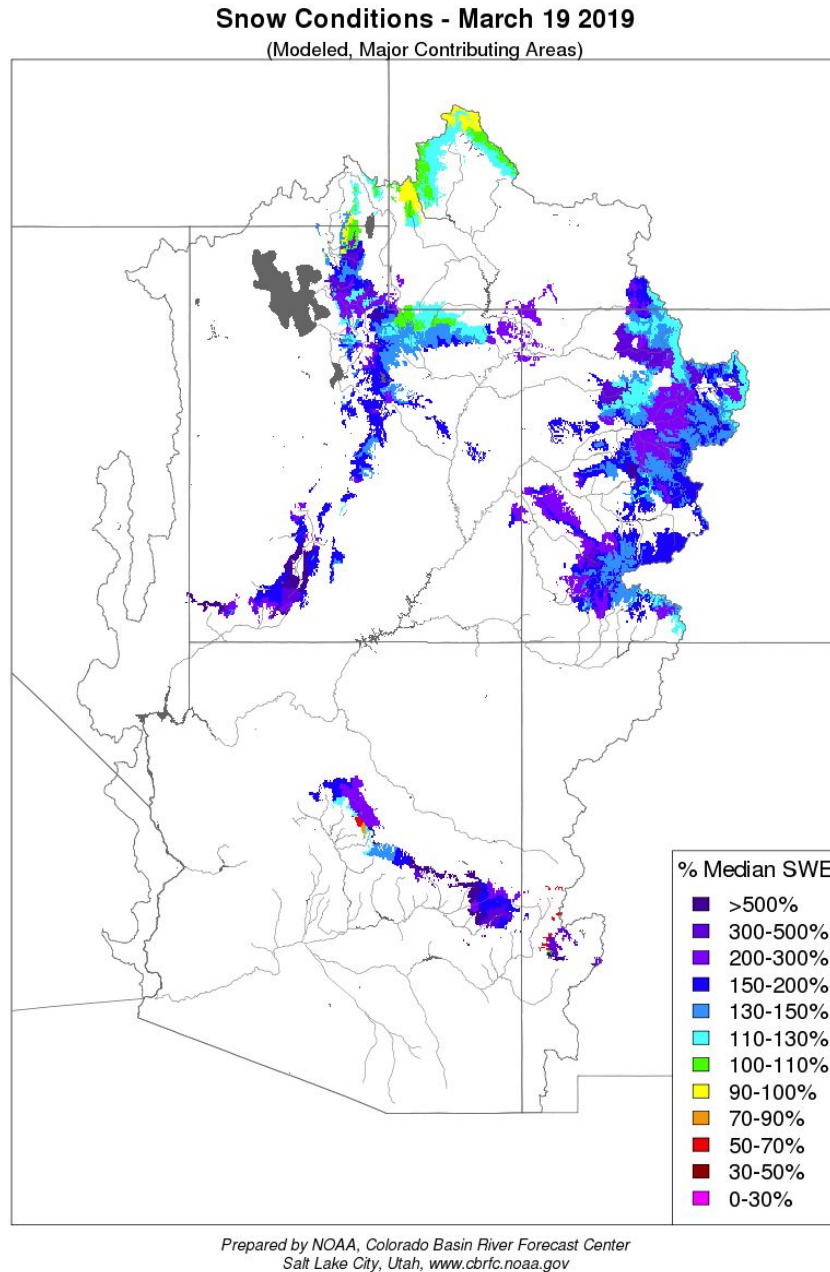
Percent median snow conditions as of March 19, 2019

The snow percentile image displayed below indicates where the current snow measurement ranks in the historical record (typically 33-41 years) for each site. Those sites in black are the highest on record. Most of those in the dark blue are in the top 3 of historical record.



Snow Percentile Image: Historical SNOTEL ranking as of March 19, 2019

The image below is the representation of snow in the CBRFC hydrologic model. The snow represented in the model closely mirrors the SNOTEL image.



Snow representation from the CBRFC hydrologic model March 19, 2019.

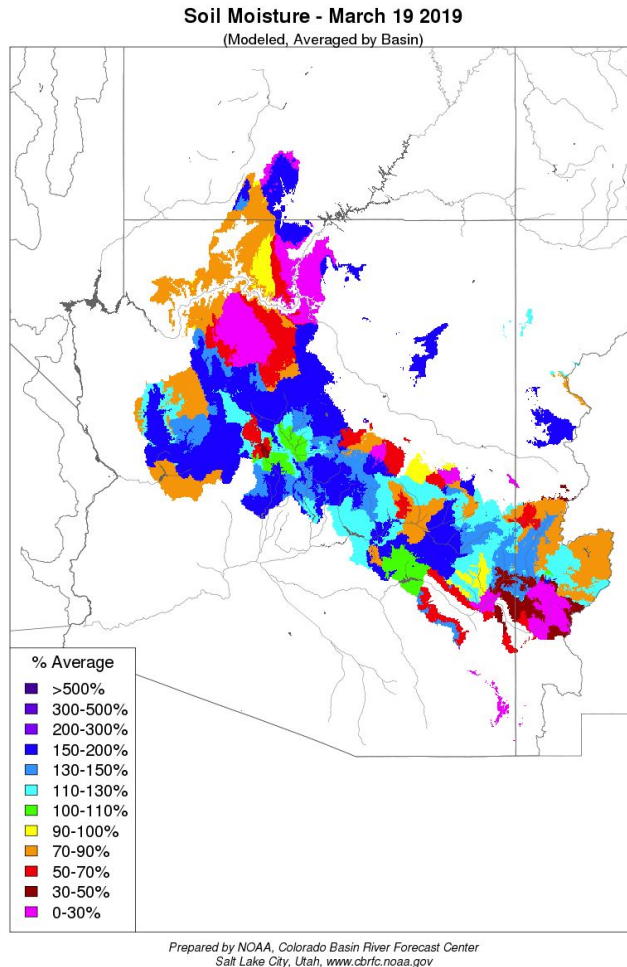
For updated SNOTEL information refer to: <https://www.cbrfc.noaa.gov/lmap/lmap.php?interface=snow>

For CBRFC hydrologic model snow, refer to:
<https://www.cbrfc.noaa.gov/rmap/grid800/index.php?type=monthly&area=cbrfc&year=2017&month=1&day=&hour=&t>

[ype=snow](#)

Soil Moisture:

Soil moisture conditions have continued to stay above average over most of the Lower Colorado River Basin due to recent rainfall and snowmelt. This is true particularly in the Verde, parts of the Agua Fria, Salt, and Bill Williams River Basins. These areas are likely to experience efficient runoff due to additional rainfall and / or snowmelt that may occur over the next several weeks.

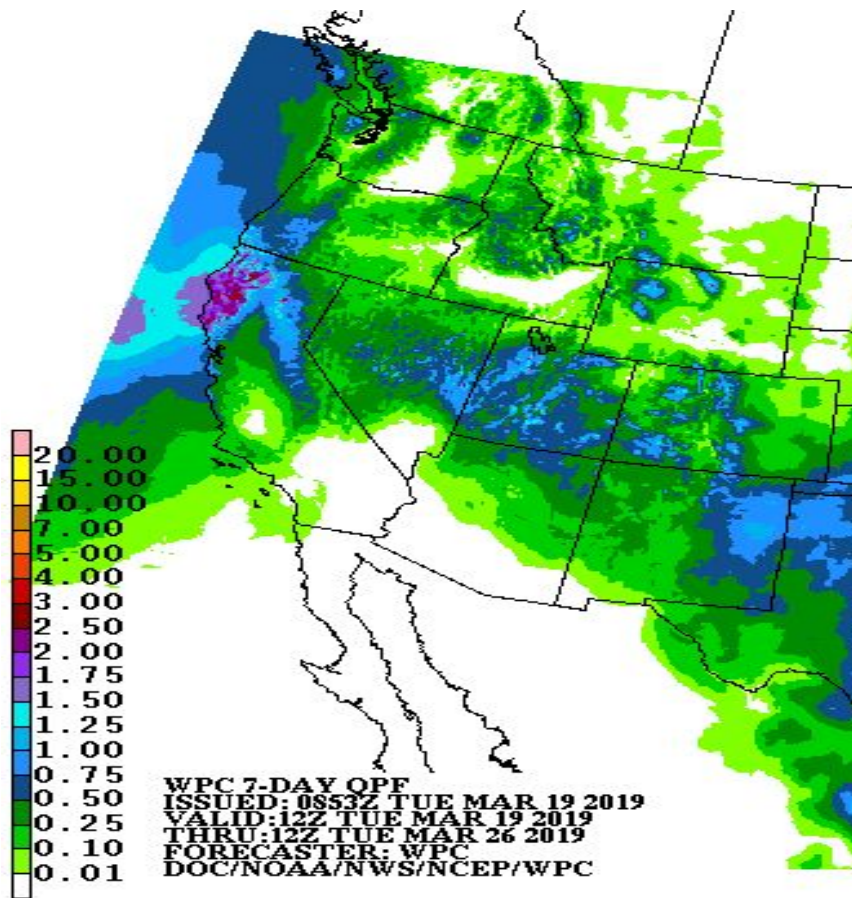


Soil moisture representation from the CBRFC hydrologic model March 15, 2019.

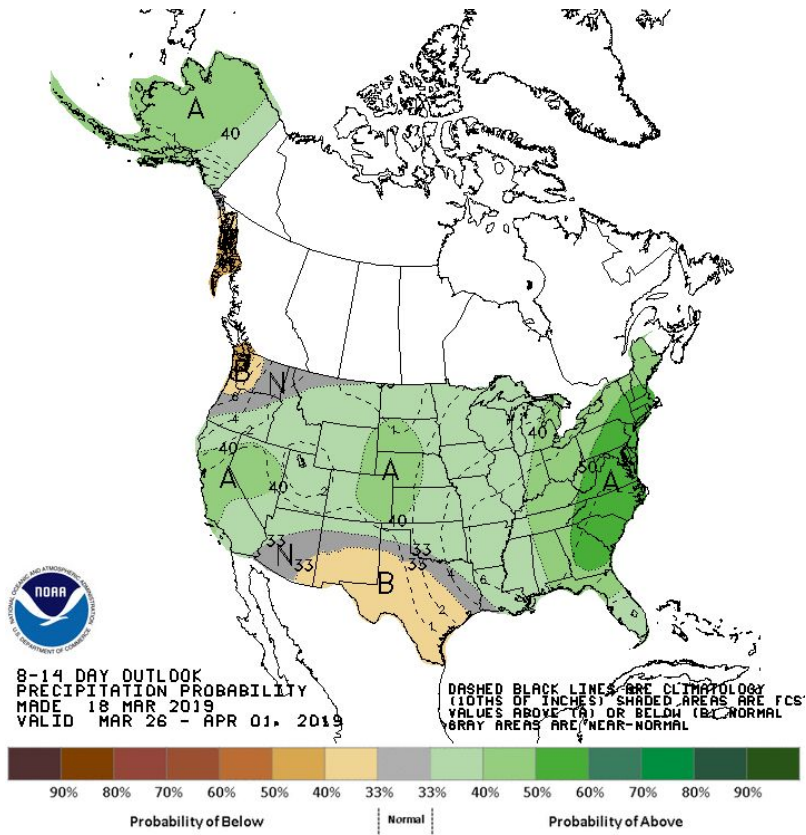
Upcoming Weather:

The weather models indicate that a series of storm systems will move across mainly Utah and Colorado through the weekend. While these systems do not have as much moisture as previous storms of the past two weeks, they will nonetheless generally add 1-2 inches of SWE for locations above 6500-7000 feet, and keep temperatures near to slightly below normal. The pattern across the Western U.S. remains progressive with a brief transitory ridge (warm-up) during the first half of next week, followed by a quick moving storm system affecting mainly the Upper Colorado Basin by the middle of the week. At this time, there are no signs of sustained ridging across the

Intermountain West through the end of March that would induce a longer period of above normal temps.



NWS Weather Prediction Center precipitation forecast for March 19-26, 2019.



NWS Climate Prediction Center precipitation probability forecast for March 26 - April 1, 2019.

For our online publication that contains basin conditions, summary graphics, and end of month reservoir content tables, refer to: <https://www.cbrfc.noaa.gov/wsupsup/pub2/map/html/cpub.php>