

March 20, 2023 Water Supply Forecast Discussion

The [Colorado Basin River Forecast Center \(CBRFC\)](#) geographic forecast area includes the Upper Colorado River Basin (UCRB), Lower Colorado River Basin (LCRB), and Eastern Great Basin (GB).

Water Supply Forecast Summary

The active weather pattern that began around mid-February continued through mid-March across the region. Precipitation was above to well above normal across most of the region during the first half of March. March 1-16 precipitation in the UCRB ranged from 80% of normal in the Colorado Headwaters above Kremmling to 275% of normal in the Duchesne River Basin. In the LCRB, March 1-16 precipitation ranged from 110% of normal in the Upper Gila River Basin to 285% of normal in the Virgin River Basin. Precipitation generally exceeded 200% of normal during the first half of March in the GB.

Mid-March snow water equivalent (SWE) conditions are above to much above normal across the CRB and GB. Above normal precipitation during the first half of March led to improvements in percent of normal SWE conditions. Mid-March CBRFC model SWE conditions are 110-210% of normal across the UCRB. Mid-March CBRFC model SWE conditions across the LCRB are much above normal (>200%) and exceeding expectations because La Niña conditions usually result in drier than average winter weather across the southwest US. Mid-March SWE conditions across the GB generally exceed 160% of normal. Around 20 SNOTEL stations across UT are reporting record mid-March SWE values.

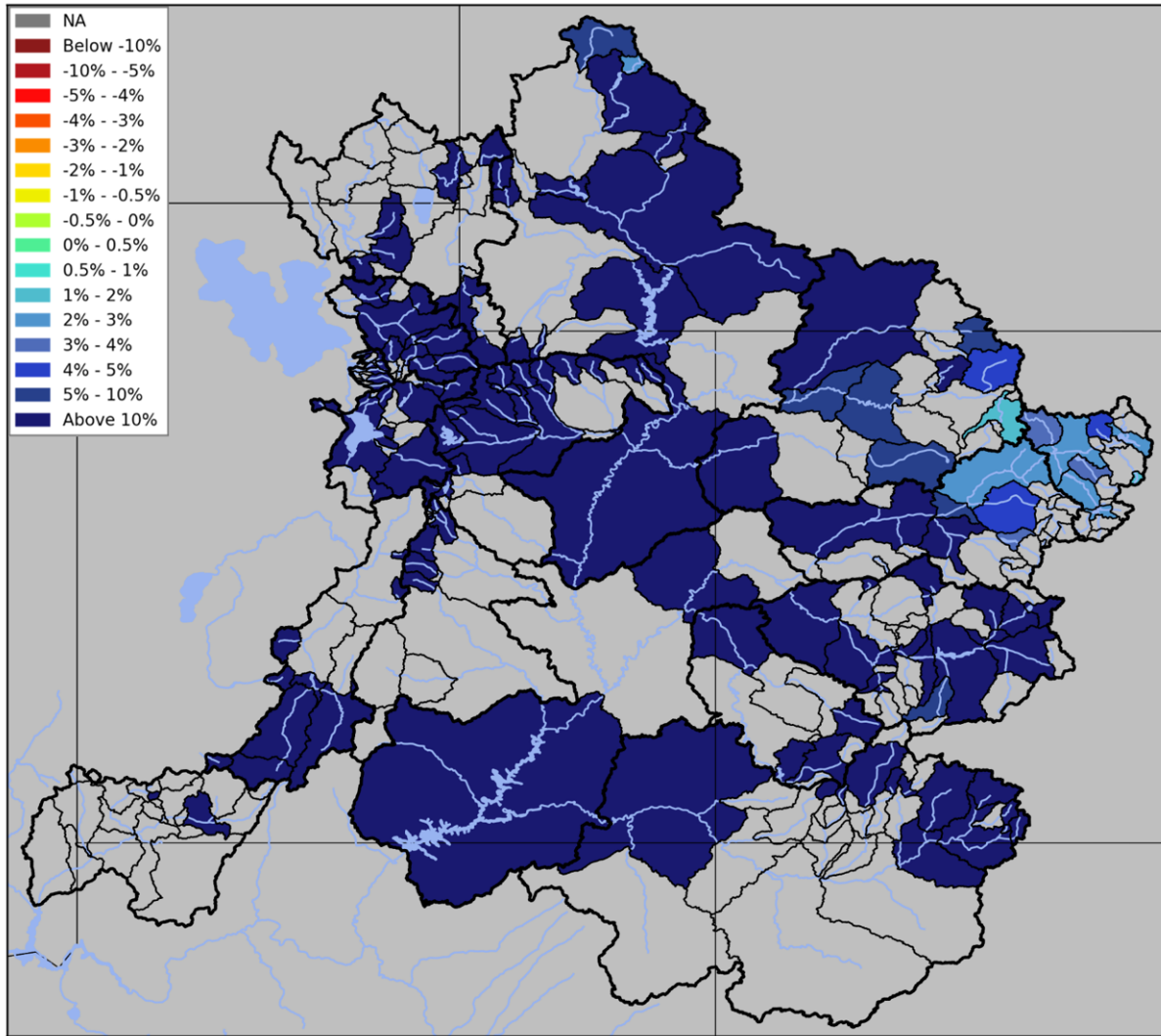
Water supply volume guidance increased in the UCRB and GB during the first half of March as a result of above normal precipitation. Mid-March forecasts of April-July unregulated inflow for some of the major reservoirs in the UCRB include Fontenelle Reservoir 710 KAF (97% average), Flaming Gorge 1100 KAF (114%), Blue Mesa Reservoir 830 KAF (131%), McPhee Reservoir 475 KAF (186%), and Navajo Reservoir 960 KAF (152%). The Lake Powell inflow forecast is 10.0 MAF (156% of average), which is a 2.0 MAF increase from the early March forecast.

Unusually cool and wet weather will continue across the region through the end of this week. Another atmospheric river event will bring significant precipitation to much of the area. By Thursday morning (March 23), the higher elevations of UT, western CO, and AZ are expected to receive at least an inch of precipitation. The heaviest precipitation will occur across central AZ, with a 25% chance that higher elevations of the headwaters of the Verde, Salt, and Little Colorado will receive over three inches of precipitation. High-elevation snowfall totals by Friday morning are expected to be in the 1-2 foot range across northern UT and northwestern CO, 2-5 foot range across southern UT and southwestern CO, and 1-3 foot range across central and northern AZ.

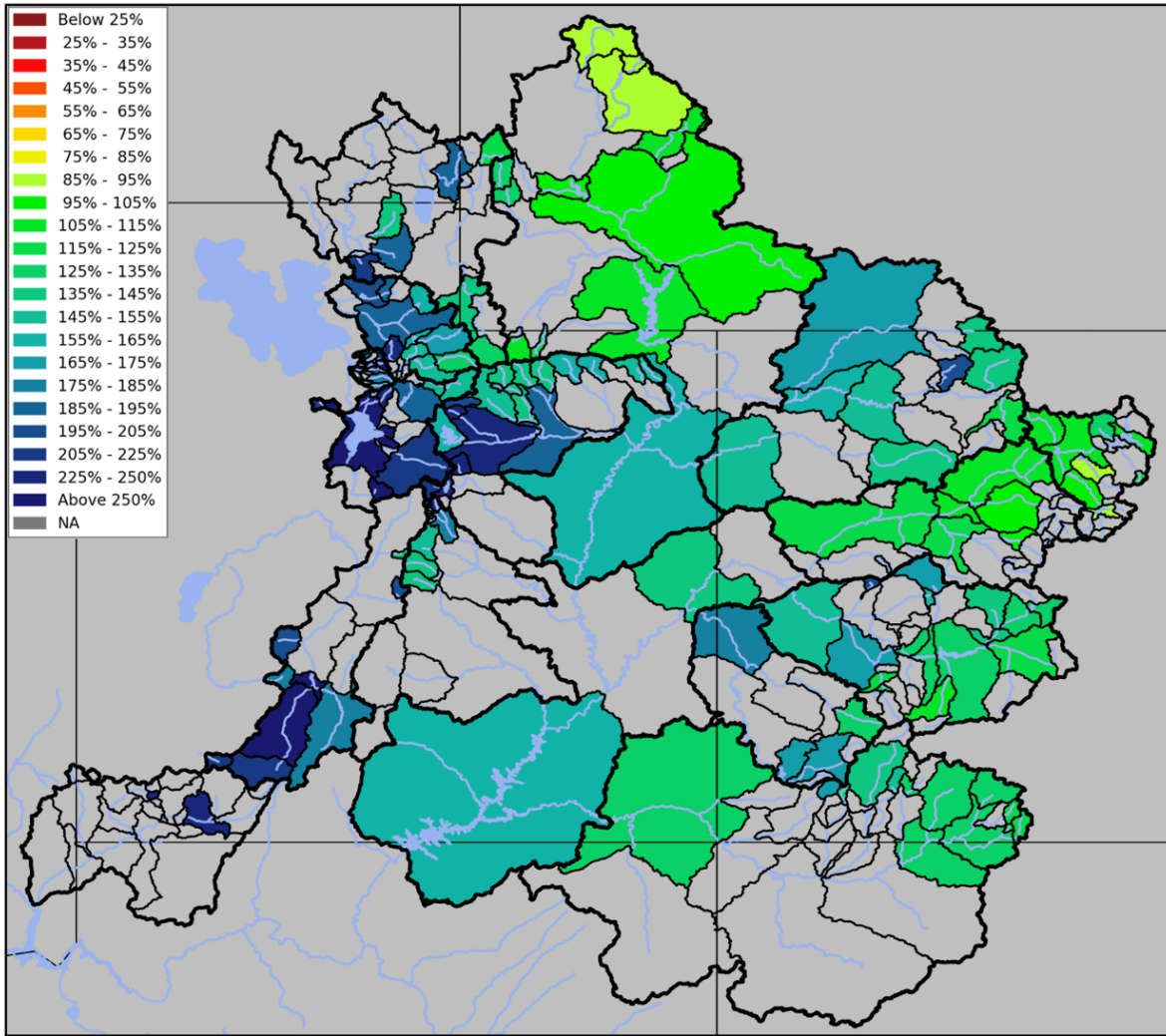
Seasonal Water Supply Forecasts

March 16 water supply guidance (% of normal) by basin:

April-July Water Supply Forecast Guidance Ranges Percent of 1991-2020 Average	
UPPER COLORADO RIVER BASIN	
<u>Basin</u>	<u>Forecast Range</u>
Lake Powell	156
Green River Basin	
Upper Green	85-130
Duchesne	135-230
Yampa/White	120-200
Price/San Rafael/Dirty Devil	135-245
Colorado River Headwaters	
Above Kremmling	90-130
Kremmling to Cameo	100-120
Southwest Colorado	
Gunnison	110-200
Dolores	130-180
San Juan	115-170
GREAT BASIN	
Bear	115-205
Weber	125-230
Six Creeks	150-270
Provo/Utah Lake	155-265
Sevier	130-350



Change in the April-July runoff volume forecast guidance from March 1 to March 16, 2023
(Change in April-July percent of average)



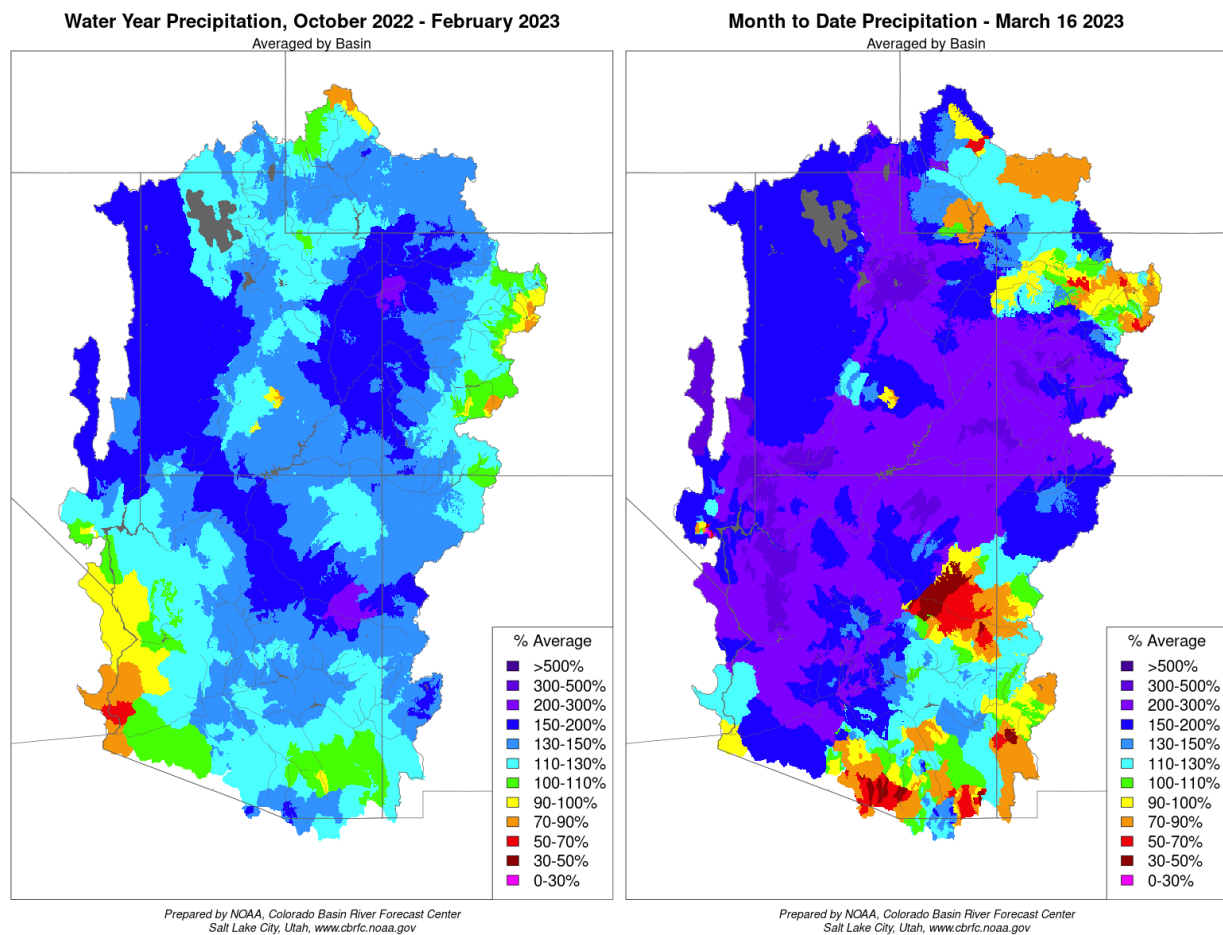
April-July runoff volume guidance as of March 16, 2023
(percent of 1991-2020 average)

For specific site water supply forecasts click [here](#).

Water Supply Discussion

Water Year 2023 Weather/Precipitation

The active weather pattern that began around mid-February continued through mid-March across the region. Precipitation was above to well above normal across most of the region during the first half of March. March 1-16 precipitation in the UCRB ranged from 80% of normal in the Colorado Headwaters above Kremmling to 275% of normal in the Duchesne River Basin. In the LCRB, March 1-16 precipitation ranged from 110% of normal in the Upper Gila River Basin to 285% of normal in the Virgin River Basin. Precipitation generally exceeded 200% of normal during the first half of March in the GB. Water year and March 1-16 precipitation is summarized in the figures and table below.



October-February (left) and March 1-16 (right) percent of average precipitation.

For CBRFC seasonal precipitation maps click [here](#).

For CBRFC monthly precipitation maps click [here](#).

**Water Year 2023
CBRFC Precipitation (Significant Runoff Areas)
Percent of 1991-2020 Average**

UPPER COLORADO RIVER BASIN

	Oct-Feb	Mar1-Mar16
Above Lake Powell	118	183
Green River Basin		
Above Fontenelle	96	156
Above Flaming Gorge	107	165
Yampa/White	129	123
Duchesne	124	274
Price/San Rafael/Dirty Devil	133	235
Colorado River Headwaters		
Above Kremmling	99	79
Eagle	103	85
Roaring Fork	113	145
Above Cameo	108	109
Southwest Colorado		
Gunnison	117	214
Dolores	131	255
San Juan	120	230
LOWER COLORADO RIVER BASIN		
Virgin	157	287
Little Colorado	141	156
Verde	144	218
Salt	129	125
Upper Gila	132	109
GREAT BASIN		
Bear	124	206
Weber	130	224
Six Creeks	140	230
Provo/Utah Lake	140	273
Sevier	137	191

Snowpack

Mid-March snow water equivalent (SWE) conditions are above to much above normal across the CRB and GB. Above normal precipitation during the first half of March led to improvements in percent of normal SWE conditions. Mid-March CBRFC model SWE conditions are 110-210% of normal across the UCRB. SWE conditions along Colorado's Western Slope are more favorable in the northern (White/Yampa) and southern (Gunnison, Dolores, San Juan) basins compared to Colorado River headwater basins in west-central CO. Most SNOTEL stations in the White/Yampa River Basin are reporting mid-March SWE values that rank in the top five of the station's record and above the 90th percentile. Mid-March snowpack conditions are least favorable in the far northern Upper Green River Basin above Fontenelle Reservoir and the Colorado River headwaters above Dotsero, where SWE conditions are 110-120% of normal.

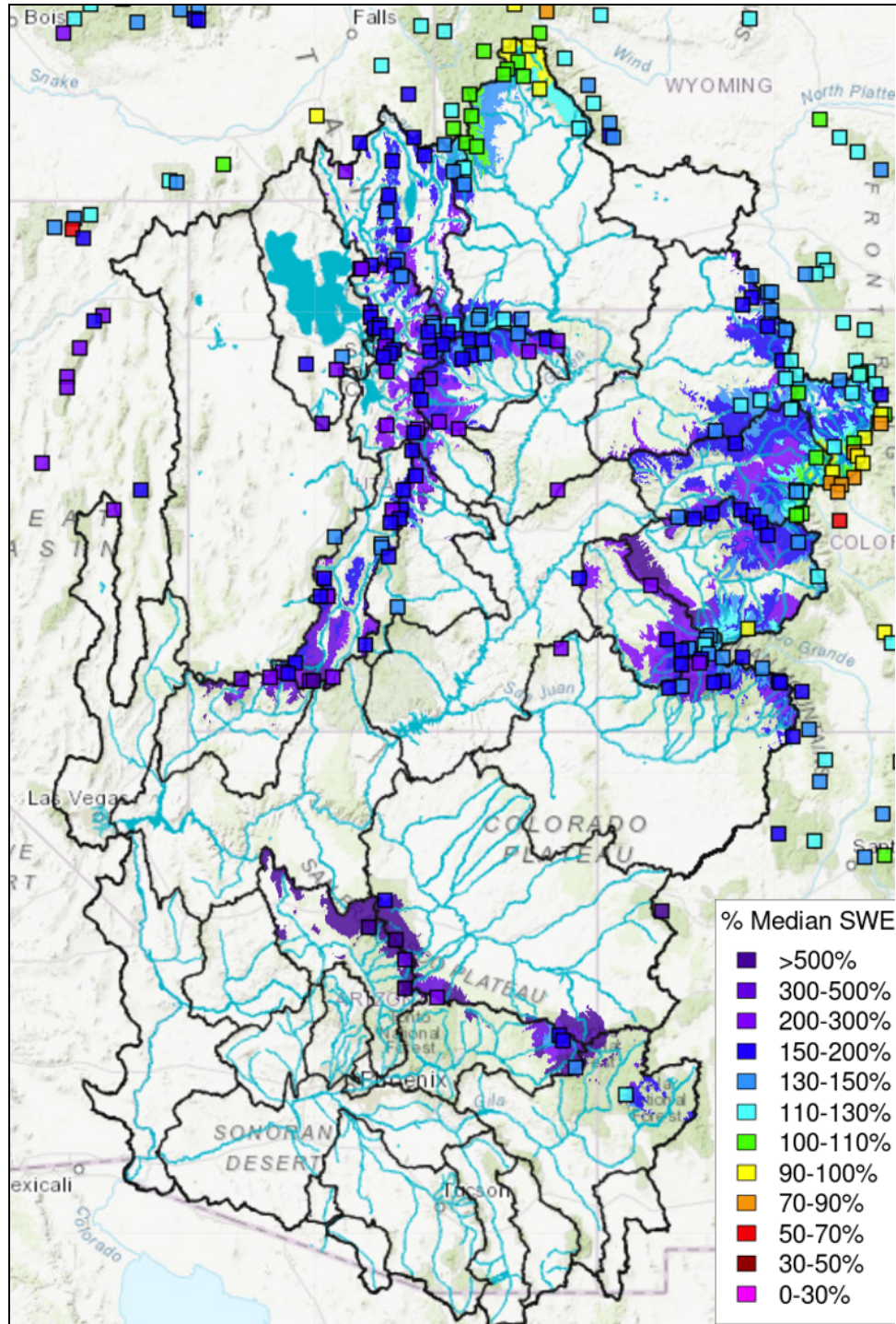
Across the LCRB, percent of normal SWE can be highly variable due to percentages being computed using smaller values, and precipitation type (rain vs. snow) having a large impact on percent of normal conditions. This year is a good example as winter temperatures across the LCRB have been below normal with more snow than normal observed at lower elevations leading to large percent of normal snowpack conditions. With that said, mid-March CBRFC model SWE conditions across the LCRB are much above normal (>200%) and exceeding expectations because La Niña conditions usually result in drier than average winter weather across the southwest US.

More storms and precipitation events have targeted UT this winter compared to southwest WY, and western CO, and SWE conditions in the GB generally reflect better conditions when compared to the UCRB. Mid-March SWE conditions across the GB range from 160% of normal in the Bear River Basin to 215% of normal in the Provo/Utah Lake Basin. A majority of SNOTEL stations in UT are reporting mid-March SWE values that rank in the top five of the station's record and above the 85th percentile. Around 20 SNOTEL stations across UT are reporting record mid-March SWE values.

March SWE conditions are summarized in the table and figure below.

**Water Year 2023
CBRFC Model SWE (Significant Runoff Areas)
Percent of 1991-2020 Median**

UPPER COLORADO RIVER BASIN			
	Mar1	Mar16	Change
Above Lake Powell	135	154	19
Green River Basin			
Above Fontenelle	99	110	11
Above Flaming Gorge	116	129	13
Yampa/White	148	158	10
Duchesne	157	182	25
Price/San Rafael/Dirty Devil	183	208	25
Colorado River Headwaters			
Above Kremmling	111	118	7
Eagle	109	113	4
Roaring Fork	119	132	13
Above Cameo	117	128	11
Southwest Colorado			
Gunnison	133	157	24
Dolores	157	196	39
San Juan	129	158	29
LOWER COLORADO RIVER BASIN			
Virgin	239	305	66
Little Colorado	342	561	219
Verde	486	600	114
Salt	175	215	40
Upper Gila	206	287	81
GREAT BASIN			
Bear	149	162	13
Weber	165	187	22
Six Creeks	168	189	21
Provo/Utah Lake	191	217	26
Sevier	184	191	7



Mid-March percent median SWE -
 NRCS SNOTEL observed (squares) and CBRFC hydrologic model significant runoff areas.

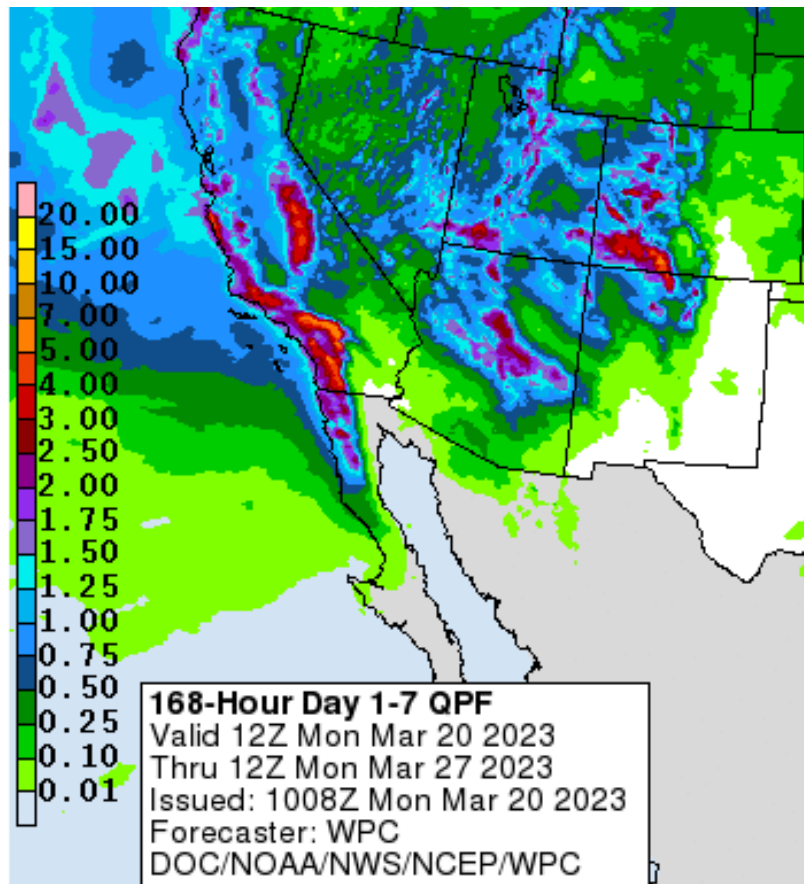
For updated SNOTEL information refer to click [here](#).

For CBRFC hydrologic model snow click [here](#).

Upcoming Weather

Unusually cool and wet weather will continue across the region through the end of this week. Another atmospheric river event will bring significant precipitation to much of the area. By Thursday morning (March 23), the higher elevations of UT, western CO, and AZ are expected to receive at least an inch of precipitation. The heaviest precipitation will occur across central AZ, with a 25% chance that higher elevations of the headwaters of the Verde, Salt, and Little Colorado will receive over three inches of precipitation. Snow levels will oscillate through the event. During the day on Tuesday when the heaviest precipitation is falling across AZ, snow levels are forecast to be in the 7,000-9,000 foot range. A cold front will bring unseasonably cold temperatures to the area on Wednesday and snow levels are expected to drop to the 4,000-5,000 foot range across UT and CO and between 5,000 and 7,000 feet across AZ. High-elevation snowfall totals by Friday morning are expected to be in the 1-2 foot range across northern UT and northwestern CO, 2-5 foot range across southern UT and southwestern CO, and 1-3 foot range across central and northern AZ.

An active weather pattern will continue into next week. Temperatures will be 15 to 20 degrees below seasonal norms across most of the area this weekend. There is disagreement among various weather models in regards to the exact details of how the weather will unfold next week. However, there seems to be a general consensus that the cool, wet pattern will continue across the area. In the 8-14 day period, the Climate Prediction Center (CPC) is forecasting increased chances of below-normal temperatures across the entire area and above normal precipitation across the western half of UT and northwest AZ.



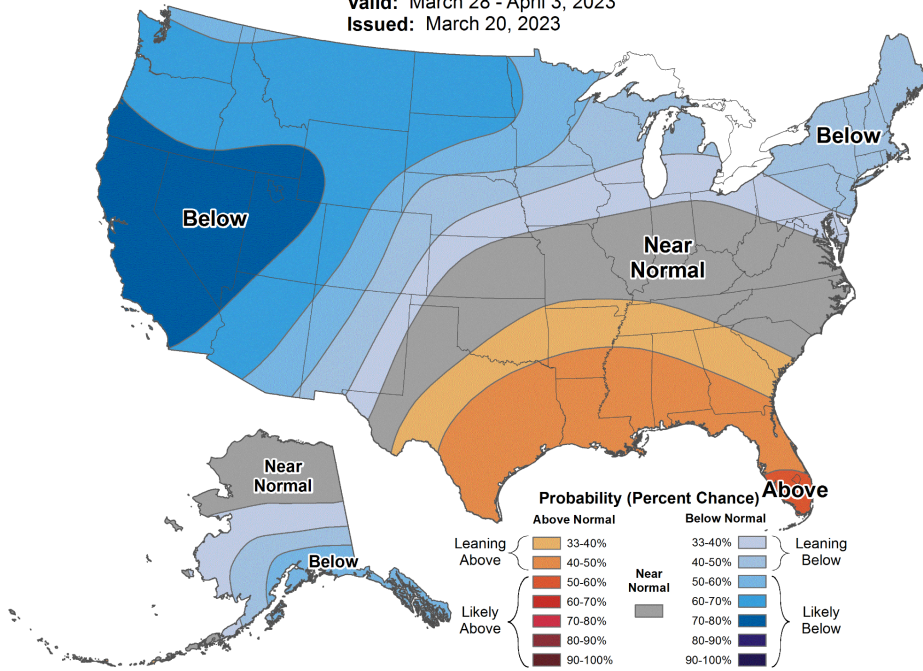
Weather Prediction Center precipitation forecast for March 20-27, 2023.



8-14 Day Temperature Outlook



Valid: March 28 - April 3, 2023
Issued: March 20, 2023



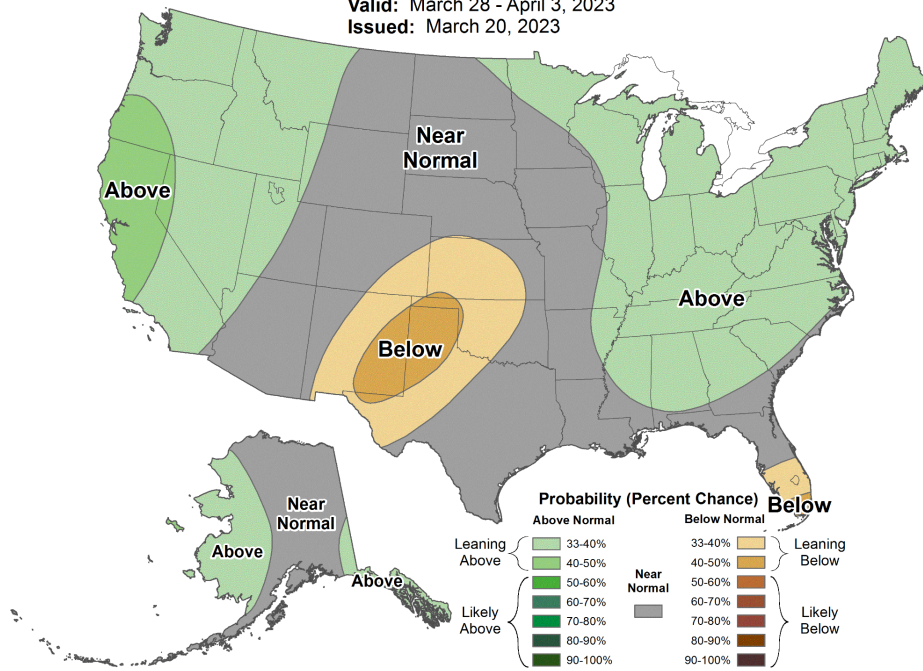
NWS Climate Prediction Center temperature probability forecast for March 28-April 3, 2023.



8-14 Day Precipitation Outlook



Valid: March 28 - April 3, 2023
Issued: March 20, 2023



NWS Climate Prediction Center precipitation probability forecast for March 28-April 3, 2023.

For CBRFC's beginning of the month online publication that contains basin conditions, summary graphics, and end of month reservoir content tables, refer to the following links.

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](#)

Acronyms & Abbreviations

CBRFC - Colorado Basin River Forecast Center

CPC - Climate Prediction Center

CRB - Colorado River Basin

ENSO - El Niño/Southern Oscillation

ESP - Ensemble Streamflow Prediction

GB - Great Basin

KAF - Thousand Acre-Feet

LCRB - Lower Colorado River Basin

MAF - Million Acre-Feet

NWS - National Weather Service

QPF - Quantitative Precipitation Forecast

SNOTEL - Snow Telemetry

SWE - Snow Water Equivalent

UCRB - Upper Colorado River Basin

WPC - Weather Prediction Center