Colorado Basin
River Forecast Center
National Weather Service

Water Supply Forecast Discussion
March 19, 2024

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 Conditions Summary

Following above average February precipitation, storm activity continued into March, with most CRB and GB areas receiving near to above average precipitation during the first half of the month. Water year 2024 precipitation is generally near normal across northern areas of the UCRB and GB, but remains below normal across southern areas. Snow water equivalent (SWE) conditions as a percent of normal (median) improved since March 1 across the region. Mid-March CBRFC model SWE conditions generally range between 85-130% of normal across the UCRB and 120-125% of normal across the GB.

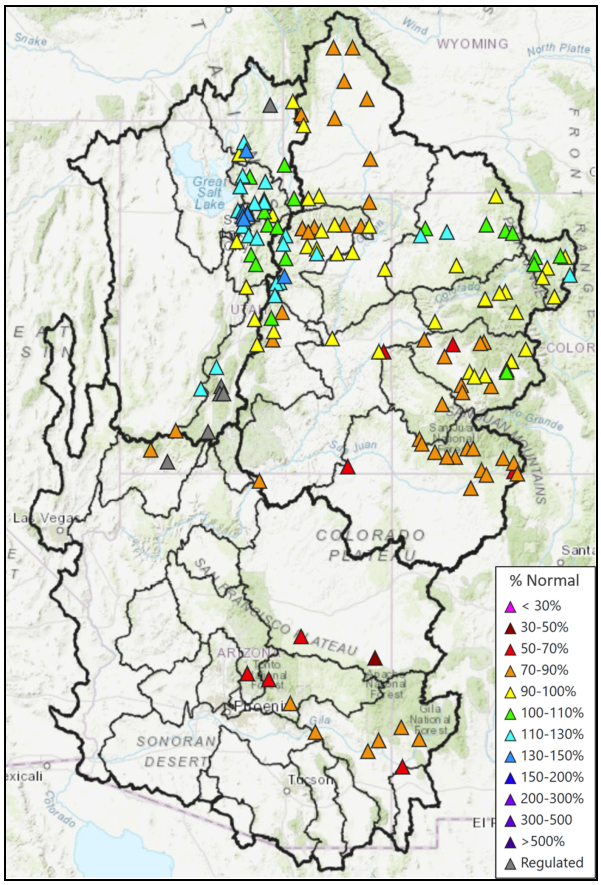
The water supply outlook has improved due to wetter than average weather during the first half of March. Seasonal (April-July) water supply volumes are most favorable in the GB, where water supply forecasts are generally near to above normal. UCRB seasonal volumes are variable, ranging from near to above normal across central areas, with below normal volumes forecast in northern and southern basins.

The current weather pattern will remain largely static through midweek. A ridge building over the UCRB will lead to a warming and drying trend. A low pressure system across the LCRB will result in a continuation of rain and snow showers through Wednesday (March 20). The low pressure system over the LCRB will weaken and move out of the area on Wednesday bringing much warmer and drier conditions. CRB and GB forecasted temperatures are 5-10 degrees above normal by the end of this week. A low pressure system is expected to move into the area this weekend/early next week and bring a period of cool, unsettled weather.

Water Supply Forecasts

The water supply outlook has improved due to wetter than average weather during the first half of March. Seasonal (April-July) water supply volumes are most favorable in the GB, where water supply forecasts are generally near to above normal. UCRB seasonal volumes are variable, ranging from near to above normal across central areas, with below normal volumes forecast in northern and southern basins. LCRB January-May volume forecasts are generally below normal due to poor antecedent soil moisture conditions and drier than average El Niño winter weather.

The water supply outlook is summarized in the figure and table below.



Colorado Basin River Forecast Center
Mid-March 2024 Water Supply Outlook

Basin	Volume (KAF)	%Normal (1991-2020)	Period
UPPER COLORADO RIVER BASIN			
Lake Powell	5400	85	Apr-Jul
Green River Basin			
Green-Flaming Gorge Reservoir	850	88	Apr-Jul
Yampa-Deerlodge	1320	111	Apr-Jul
Duchesne-Tabiona	102	99	Apr-Jul
Colorado River Headwaters			
Colorado-Kremmling	890	102	Apr-Jul
Eagle-Gypsum	315	94	Apr-Jul
Roaring Fork-Glenwood Springs	580	89	Apr-Jul
Colorado-Cameo	2130	94	Apr-Jul
Southwest Colorado			
Gunnison-Blue Mesa Reservoir	575	91	Apr-Jul
Dolores-McPhee Reservoir	200	78	Apr-Jul
San Juan-Navajo Reservoir	460	73	Apr-Jul
Animas-Durango	310	81	Apr-Jul
LOWER COLORADO RIVER BASIN			
Virgin-Virgin (*Regulated)	50	88	Apr-Jul
Little Colorado-Chevelon Creek	7.6	55	Jan-May
Verde-Above Horseshoe Dam	95	62	Jan-May
Salt-Roosevelt	181	73	Jan-May
Upper Gila-San Carlos Reservoir	59	81	Jan-May
GREAT BASIN			
Bear-UT/WY State Line	114	105	Apr-Jul
Weber-Oakley	110	99	Apr-Jul
Big Cottonwood Creek	40	117	Apr-Jul
Provo-Woodland	102	106	Apr-Jul
Sevier-Hatch (*Regulated)	45	93	Apr-Jul

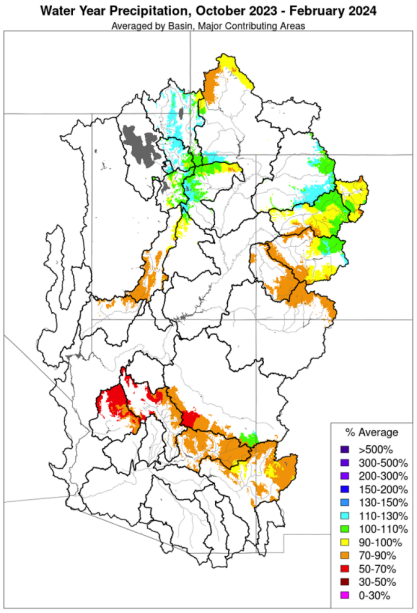
Apr-Jul runoff volumes as a percent of the 1991-2020 average.
Jan-May runoff volumes as a percent of the 1991-2020 median.

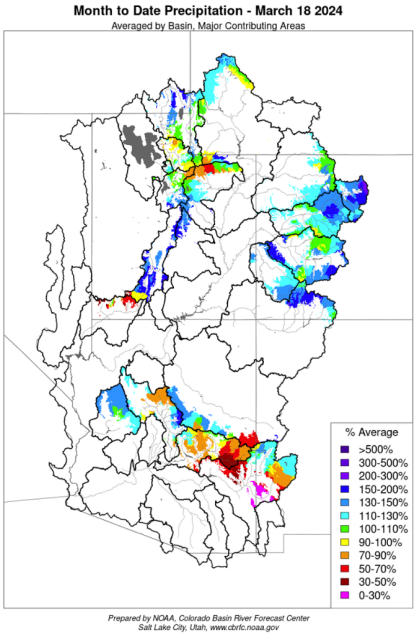
Mid-March 2024 seasonal water supply summary.

CBRFC water supply forecast Map | List

Water Year Precipitation

Precipitation during the first three months (October-December) of water year 2024 was below average across the region. Active weather during much of January and February resulted in above average precipitation across the CRB and GB. Storm activity continued into March, with most areas receiving near to above average precipitation during the first half of the month. Water year 2024 precipitation across significant runoff producing areas is generally near normal across northern basins of the UCRB and GB, below normal across southern basins, and summarized in the figures and table below.





Water Year 2024 CBRFC Precipitation (Major Contributing Areas) Percent of 1991-2020 Average		
UPPER COLORADO RIVER BASIN		
	Oct-Feb	Mar1-Mar17
Above Lake Powell	96	126
Green River Basin		
Above Fontenelle	92	112
Above Flaming Gorge	99	107
Yampa/White	108	115
Duchesne	102	94
Price/San Rafael/Dirty Devil	104	147
Colorado River Headwaters		
Above Kremmling	95	153
Eagle	103	133
Roaring Fork	98	118
Above Cameo	98	135
Southwest Colorado		
Gunnison	95	118
Dolores	83	132
San Juan	82	146
LOWER COLORADO RIVER BASIN		
Virgin	83	79
Little Colorado	79	115
Verde	74	120
Salt	82	80
Upper Gila	88	81
GREAT BASIN		
Bear	111	131
Weber	111	101
Six Creeks	113	113
Provo/Utah Lake	106	107
Sevier	87	143

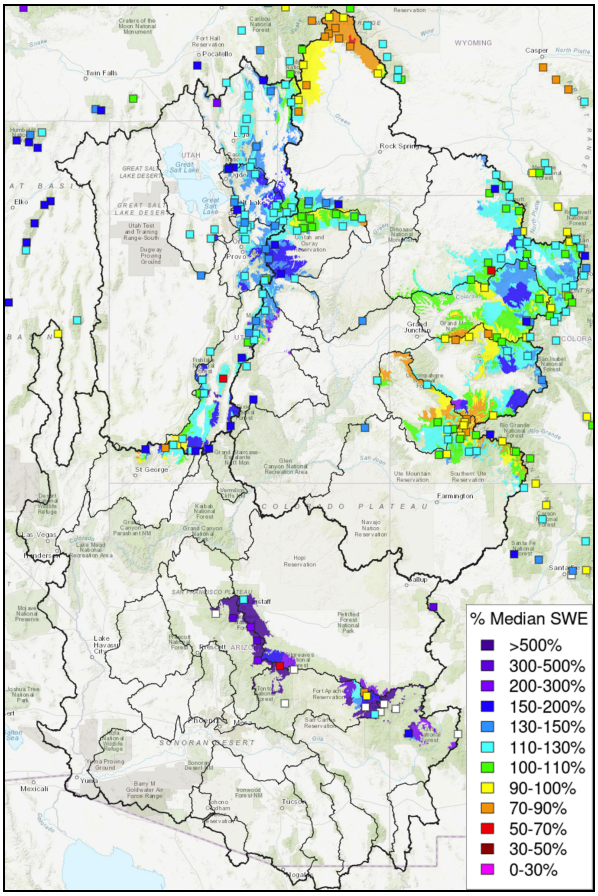
CBRFC observed precipitation maps: Daily | Monthly | Water Year

Snow

Snow water equivalent (SWE) conditions as a percent of normal (median) improved during the first half of March due to wetter than average weather. UCRB mid-March SWE conditions range between 85-130% of the 1991-2020 median. Snowpack conditions are least favorable across the Upper Green headwaters above Fontenelle Reservoir, where SWE is below the 25th percentile at a number of SNOTEL sites. SWE across the western slope of CO generally ranges between 100-115% of normal, with considerable improvements since March 1 across southwest CO (Dolores/San Juan basins). UCRB SWE conditions are most favorable across portions of central UT (Price/San Rafael/Dirty Devil basins), although this area typically does not contribute a significant amount of spring runoff to the UCRB system.

Mid-March CBRFC model SWE conditions across the LCRB are near to much above normal, and highly variable due to percentages being computed using smaller values. SWE conditions are near normal across southwest UT and greater than 150% of normal across central AZ/west-central NM.

GB mid-March SWE conditions range between 120-125% of normal. GB snowpack conditions are generally more evenly distributed and better as a percent of normal when compared to the UCRB. SWE conditions are summarized in the figure and table below.

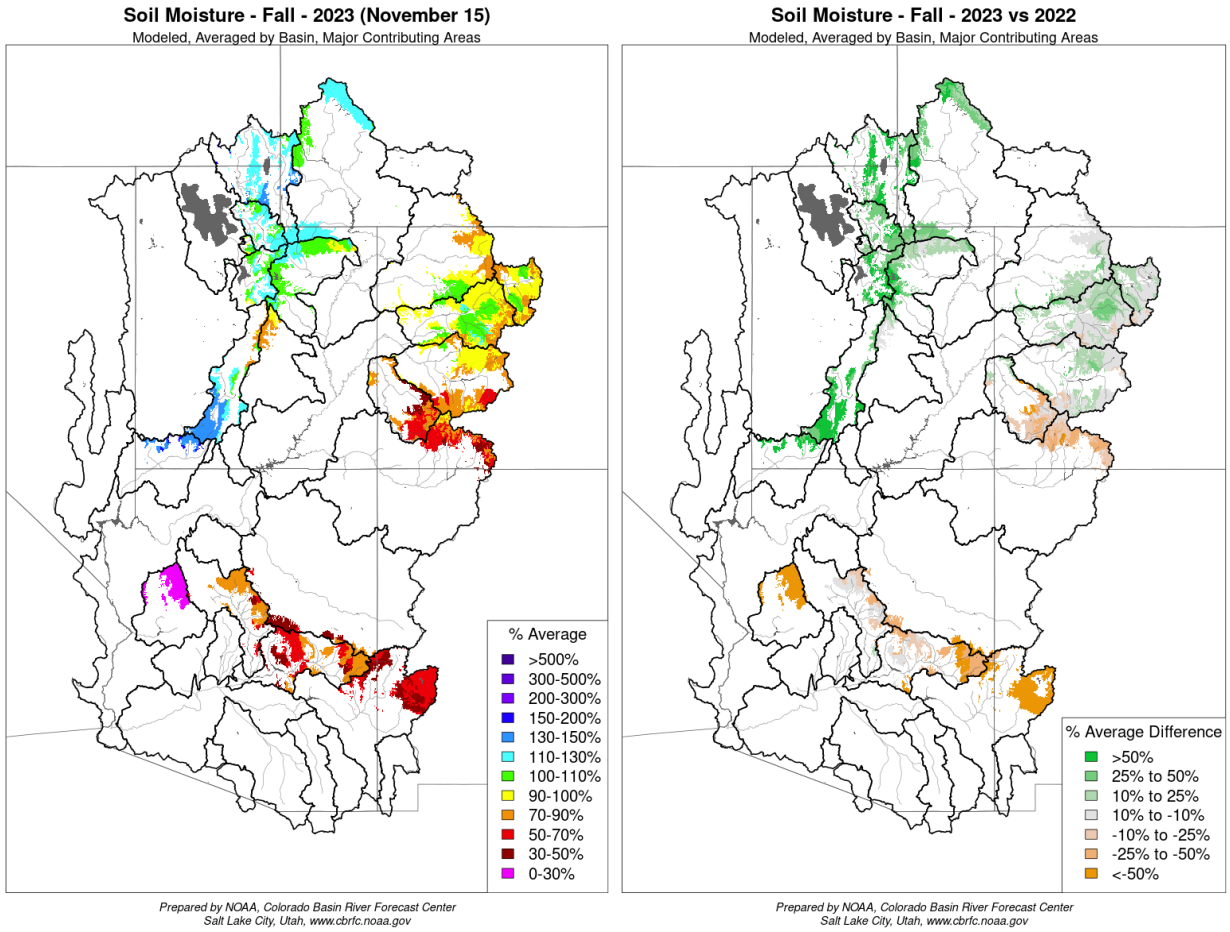


Water Year 2024 CBRFC Model SWE (Major Contributing Areas) Percent of 1991-2020 Median			
UPPER COLORADO RIVER BASIN			
	Mar1	Mar18	Change
Above Lake Powell	97	108	11
Green River Basin			
Above Fontenelle	81	86	5
Above Flaming Gorge	91	98	7
Yampa/White	108	115	7
Duchesne	110	113	3
Price/San Rafael/Dirty Devil	116	131	15
Colorado River Headwaters			
Above Kremmling	100	113	13
Eagle	98	106	8
Roaring Fork	92	102	10
Above Cameo	96	107	11
Southwest Colorado			
Gunnison	95	104	9
Dolores	84	103	19
San Juan	84	101	17
LOWER COLORADO RIVER BASIN			
Virgin	83	104	21
Little Colorado	82	254	172
Verde	93	300+	>200
Salt	104	153	49
Upper Gila	117	263	146
GREAT BASIN			
Bear	111	119	8
Weber	115	124	9
Six Creeks	113	124	11
Provo/Utah Lake	119	125	6
Sevier	98	122	24

Left: March 18, 2024 SWE - NRCS SNOTEL observed (squares) and CBRFC hydrologic model.
Right: trend in CBRFC hydrologic model SWE conditions.
Current snow conditions: SNOTEL | CBRFC Model

Soil Moisture

Above normal spring 2023 runoff was followed by a drier than normal Southwest monsoon season across much of the region. June-October precipitation was generally below the 15th percentile across most of AZ and southwest CO, resulting in below normal fall (antecedent) soil moisture conditions that are worse compared to a year ago. However, northern areas including the GB, Upper Green, and much of northwest CO received above normal summer/fall precipitation, leading to above normal fall soil moisture conditions that are improved from a year ago.



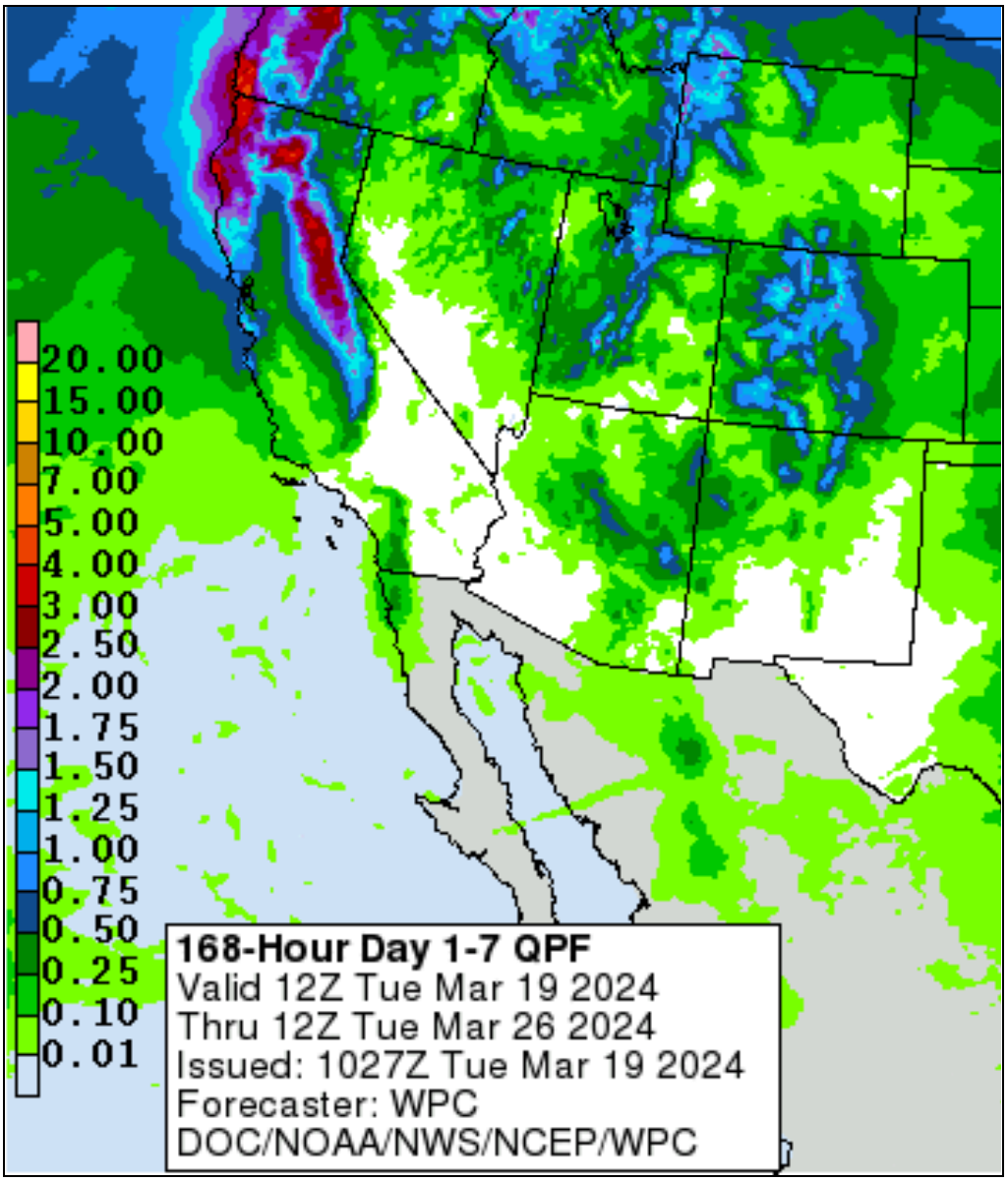
November 2023 CBRFC hydrologic model soil moisture conditions -
as a percent of the 1991-2020 average (left) and compared to November 2022 (right).

CBRFC model fall soil moisture conditions impact early season water supply forecasts and the efficiency of spring runoff. 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. The timing and magnitude of spring runoff is ultimately a result of snowpack conditions, spring weather, and soil moisture conditions.

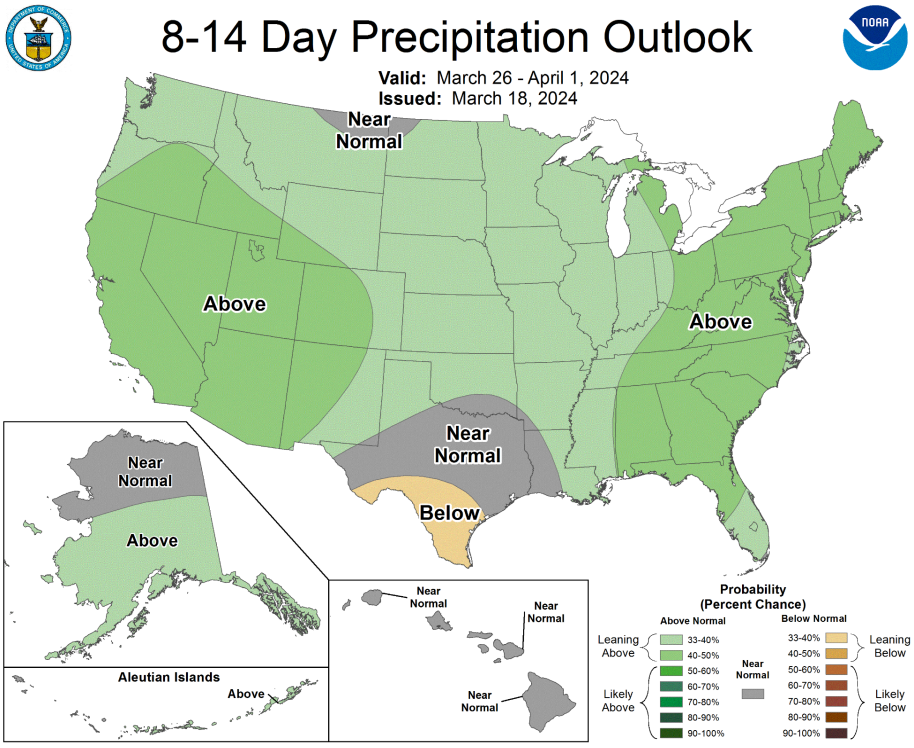
CBRFC hydrologic model soil moisture conditions are available here.

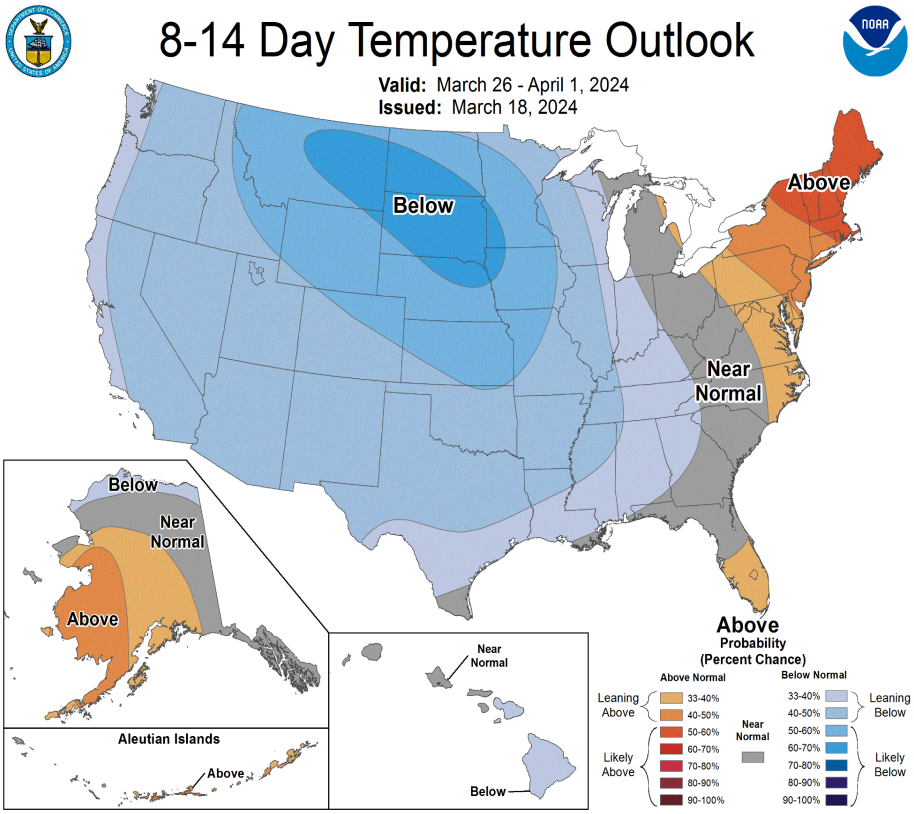
Upcoming Weather

The current weather pattern will remain largely static through midweek. A ridge building over the UCRB will lead to a warming and drying trend. A low pressure system across the LCRB will result in a continuation of rain and snow showers through Wednesday (March 20). The low pressure system over the LCRB will weaken and move out of the area on Wednesday bringing much warmer and drier conditions. CRB and GB forecasted temperatures are 5-10 degrees above normal by the end of this week. A low pressure system is expected to move into the area this weekend/early next week and bring a period of cool, unsettled weather. Above normal precipitation and below normal temperatures are favored for the remainder of March.



NWS Weather Prediction Center precipitation forecast for March 19-26, 2024.





Climate Prediction Center precipitation and temperature probability forecasts for March 26-April 1, 2024.

CBRFC Web Links

Official Water Supply Forecasts: Map | List
Latest Water Supply Model Guidance: Map | List
Snowpack Conditions: SNOTEL | CBRFC Model
Monthly Precipitation: Map | Image
Soil Moisture: Map | Image
7-Day Precipitation Forecast: Map | Image
Climate Forecasts: Image
Water Supply Briefing Webinars: Registration

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