Colorado Basin River Forecast Center
National Weather Service

# Water Supply Forecast Discussion
# January 17, 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**

An active weather pattern during the first half of January resulted in colder temperatures and a series of storm systems that brought above average precipitation to the GB and UCRB. Drier than average weather persisted across the LCRB through the first half of January.

Snow water equivalent (SWE) conditions as a percent of normal (median) improved during the first half of January. Mid-January CBRFC model SWE conditions generally range between 65-115% of normal across the UCRB, 20-65% of normal across the LCRB, and 75-105% of normal across the GB.

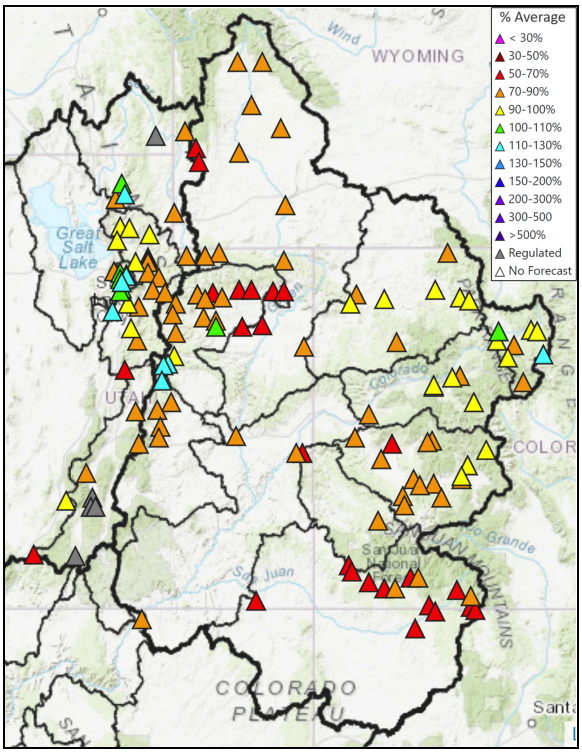
The water supply outlook has improved across the GB and UCRB due to above average precipitation during the first half of January. However, seasonal (April-July) water supply volumes remain below normal in the UCRB and near to below normal in the GB. LCRB January-May volume forecasts are generally closer to normal and take into account the current El Niño, which is expected to continue through the winter and typically results in increased chances of wetter than average winter weather across the LCRB.

A weather disturbance will bring another round of precipitation to northern UT and northwest CO through Thursday (January 18) morning. Precipitation amounts will be in the 0.50 to 0.75 inch range across higher elevations. High pressure will bring a brief break in precipitation on Friday. This brief break in the weather will be followed by another system that will move into the area this weekend. Precipitation will be focused across central AZ with precipitation amounts in the 0.50 inch range across higher terrain. Snow levels will be around 7,000 to 8,000 feet. Active weather is expected to continue into next week and favor the southern half of the area. During the last week of January the Climate Prediction Center (CPC) is forecasting increased chances of near/below normal precipitation and above normal temperatures.

**Water Supply Forecasts**

The water supply outlook has improved across the GB and UCRB due to above average precipitation during the first half of January. However, seasonal (April-July) water supply volumes remain below normal in the UCRB and near to below normal in the GB. LCRB January-May volume forecasts are generally closer to normal and take into account the current El Niño, which is expected to continue through the winter and typically results in increased chances of wetter than average winter weather across the LCRB.

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




**Colorado Basin River Forecast Center**
**Mid-January 2024 Water Supply Outlook**

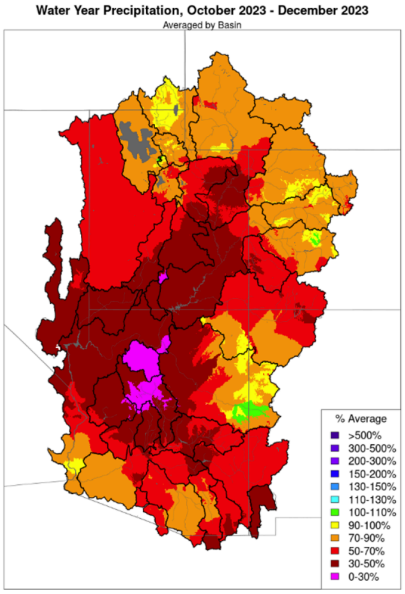
| Basin | Volume (KAF) | %Average (1991-2020) | Period |
|---|---|---|---|
| **UPPER COLORADO RIVER BASIN** | | | |
| Lake Powell | 4700 | 74 | Apr-Jul |
| **Green River Basin** | | | |
| Green-Flaming Gorge Reservoir | 690 | 72 | Apr-Jul |
| Yampa-Deerlodge | 1100 | 92 | Apr-Jul |
| Duchesne-Tabiona | 81 | 79 | Apr-Jul |
| **Colorado River Headwaters** | | | |
| Colorado-Kremmling | 830 | 95 | Apr-Jul |
| Eagle-Gypsum | 295 | 88 | Apr-Jul |
| Roaring Fork-Glenwood Springs | 560 | 85 | Apr-Jul |
| Colorado-Cameo | 2050 | 90 | Apr-Jul |
| **Southwest Colorado** | | | |
| Gunnison-Blue Mesa Reservoir | 545 | 86 | Apr-Jul |
| Dolores-McPhee Reservoir | 167 | 65 | Apr-Jul |
| San Juan-Navajo Reservoir | 390 | 62 | Apr-Jul |
| Animas-Durango | 275 | 71 | Apr-Jul |
| **GREAT BASIN** | | | |
| Bear-UT/WY State Line | 92 | 85 | Apr-Jul |
| Weber-Oakley | 97 | 87 | Apr-Jul |
| Big Cottonwood Creek | 34 | 100 | Apr-Jul |
| Provo-Woodland | 85 | 88 | Apr-Jul |
| Sevier-Hatch (*Regulated) | 30 | 63 | Apr-Jul |

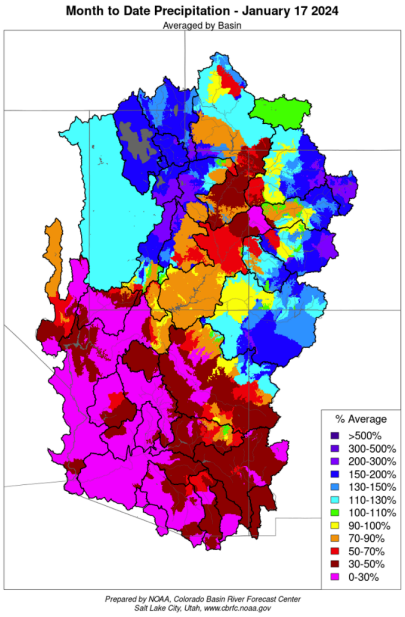
Mid-January 2024 CBRFC seasonal water supply summary.

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, with the most frequent storm activity occurring across the northern GB and northwest CO. An active weather pattern during the first half of January resulted in colder temperatures and a series of storm systems that brought above average precipitation to the GB and UCRB. Drier than average weather persisted across the LCRB through the first half of January, and notable because the current El Niño conditions typically (but not always) results in wetter than average winter weather in the LCRB. Water year 2024 precipitation is summarized in the figures and table below.




| Water Year 2024<br>CBRFC Precipitation (Major Contributing Areas)<br>Percent of 1991-2020 Average | | |
|---|---|---|
| **UPPER COLORADO RIVER BASIN** | | |
| | Oct-Dec | Jan1-Jan16 |
| Above Lake Powell | 74 | 167 |
| **Green River Basin** | | |
| Above Fontenelle | 76 | 128 |
| Above Flaming Gorge | 77 | 148 |
| Yampa/White | 83 | 186 |
| Duchesne | 61 | 165 |
| Price/San Rafael/Dirty Devil | 70 | 239 |
| **Colorado River Headwaters** | | |
| Above Kremmling | 75 | 198 |
| Eagle | 87 | 160 |
| Roaring Fork | 88 | 149 |
| Above Cameo | 82 | 167 |
| **Southwest Colorado** | | |
| Gunnison | 81 | 163 |
| Dolores | 62 | 146 |
| San Juan | 58 | 144 |
| **LOWER COLORADO RIVER BASIN** | | |
| Virgin | 40 | 45 |
| Little Colorado | 50 | 50 |
| Verde | 33 | 28 |
| Salt | 54 | 57 |
| Upper Gila | 59 | 37 |
| **GREAT BASIN** | | |
| Bear | 85 | 162 |
| Weber | 79 | 179 |
| Six Creeks | 86 | 167 |
| Provo/Utah Lake | 73 | 181 |
| Sevier | 51 | 147 |

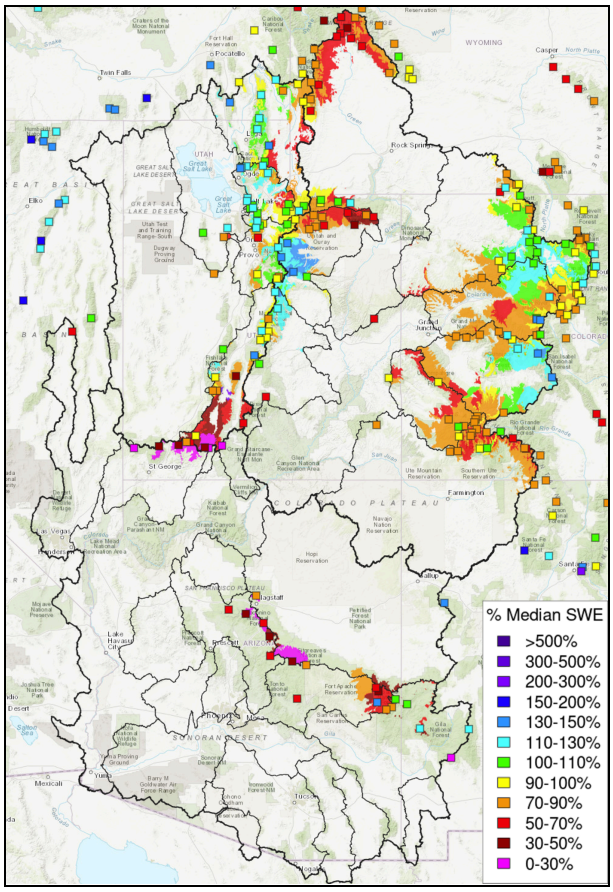
CBRFC observed precipitation maps: Daily | Monthly | Water Year

**Snow**

Snow water equivalent (SWE) conditions as a percent of normal (median) improved during the first half of January across the GB and CRB. UCRB mid-January CBRFC model SWE conditions range between 65-115% of normal. UCRB SWE conditions are most favorable and slightly above normal across portions of central UT (Price/San Rafael/Dirty Devil basins), but this area typically does not contribute a significant amount of spring runoff to the UCRB system. SWE conditions are generally better across northwest CO compared to southwest CO. UCRB SWE conditions are the least favorable in the Upper Green and Duchesne River Basins, where mid-January SWE conditions are below the 15$^{th}$ percentile at the majority of SNOTEL stations.

Mid-January CBRFC model SWE conditions across the LCRB are less than 70% of normal. LCRB SWE conditions are most favorable across portions of the Salt and Upper Gila River Basins in higher elevation areas near the AZ/NM border. LCRB SWE conditions are poor and generally around the 25$^{th}$ percentile at SNOTEL stations across central AZ and southwest UT.

Mid-January SWE conditions are near normal across much of the GB, ranging between 75-105% of normal, and generally better when compared to the UCRB. SWE conditions are summarized in the figure and table below.

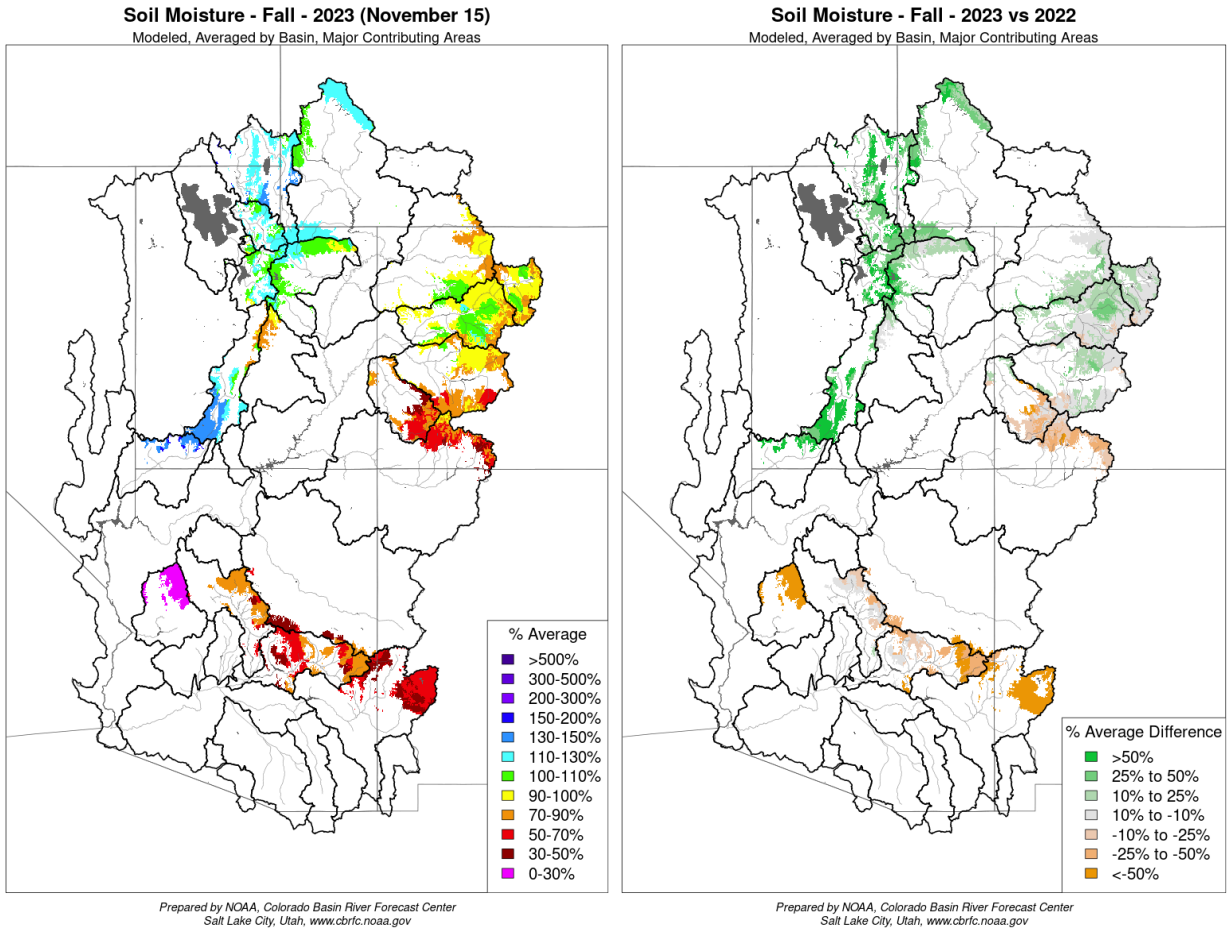



| Water Year 2024<br>CBRFC Model SWE (Major Contributing Areas)<br>Percent of 1991-2020 Median | | | |
|---|---|---|---|
| **UPPER COLORADO RIVER BASIN** | | | |
| | Jan1 | Jan17 | Change |
| Above Lake Powell | 60 | 88 | 28 |
| **Green River Basin** | | | |
| Above Fontenelle | 49 | 67 | 18 |
| Above Flaming Gorge | 53 | 76 | 23 |
| Yampa/White | 71 | 97 | 26 |
| Duchesne | 42 | 74 | 32 |
| Price/San Rafael/Dirty Devil | 54 | 113 | 59 |
| **Colorado River Headwaters** | | | |
| Above Kremmling | 66 | 96 | 30 |
| Eagle | 68 | 86 | 18 |
| Roaring Fork | 69 | 87 | 18 |
| Above Cameo | 68 | 90 | 22 |
| **Southwest Colorado** | | | |
| Gunnison | 66 | 94 | 28 |
| Dolores | 52 | 79 | 27 |
| San Juan | 53 | 75 | 22 |
| **LOWER COLORADO RIVER BASIN** | | | |
| Virgin | 11 | 19 | 8 |
| Little Colorado | 6 | 31 | 25 |
| Verde | 0 | 18 | 18 |
| Salt | 33 | 65 | 32 |
| Upper Gila | 32 | 38 | 6 |
| **GREAT BASIN** | | | |
| Bear | 68 | 96 | 28 |
| Weber | 58 | 95 | 37 |
| Six Creeks | 72 | 103 | 31 |
| Provo/Utah Lake | 50 | 90 | 40 |
| Sevier | 44 | 77 | 33 |

Left: January 17, 2024 SWE - NRCS SNOTEL observed (squares) and CBRFC hydrologic model.
Right: trend in CBRFC hydrologic model January 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 15$^{th}$ 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.



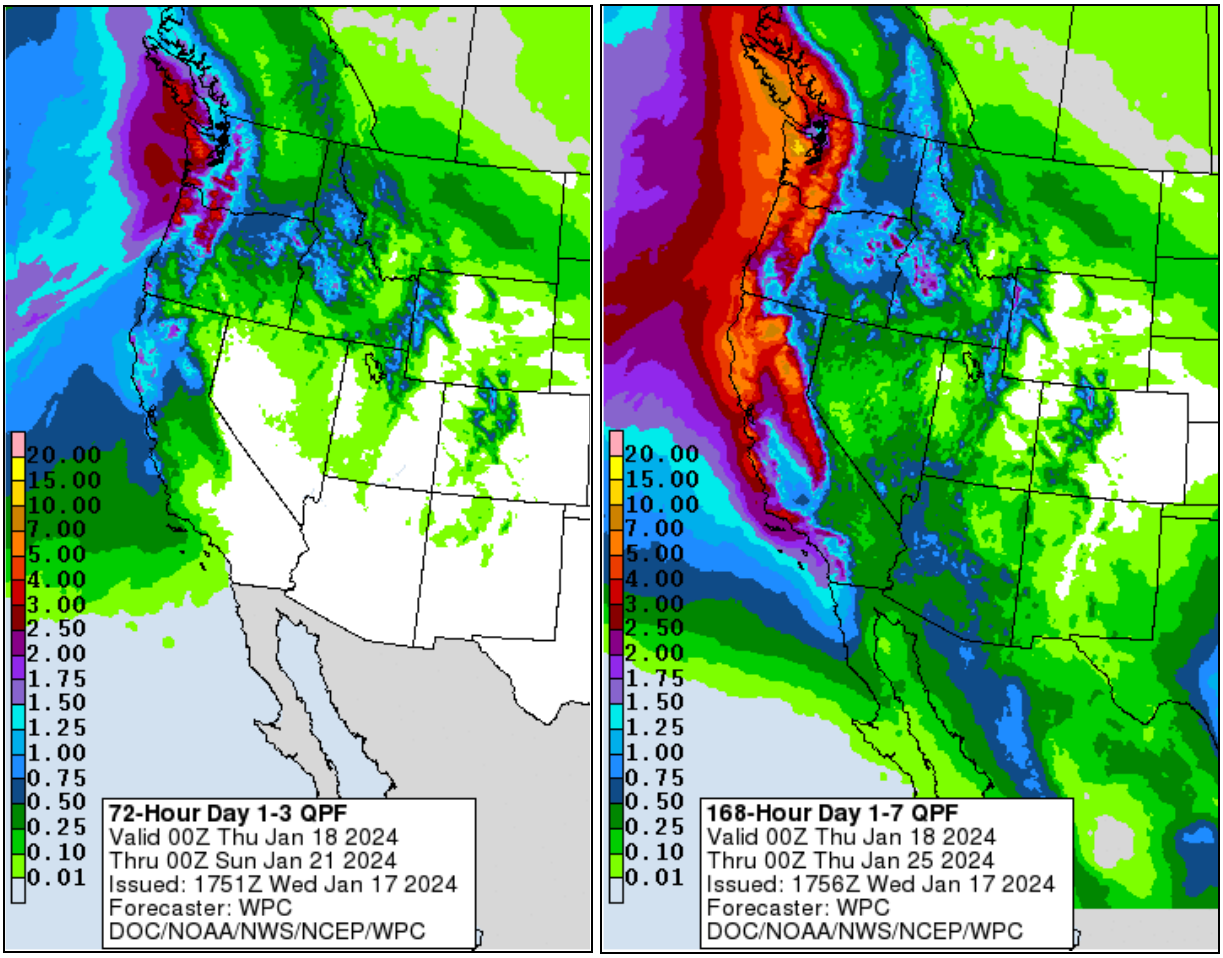

November 2023 CBRFC hydrologic model soil moisture conditions -
as a percent of the 1991-2020 average (left) and compared to November 2022 (right).

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.

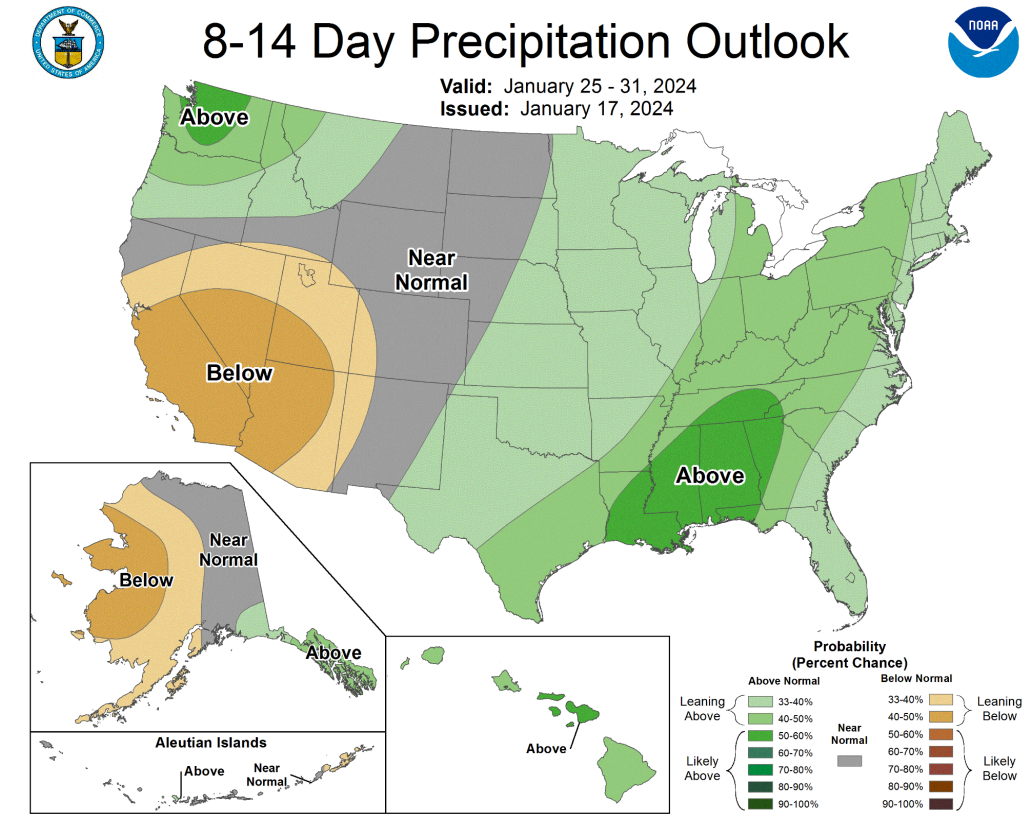
CBRFC hydrologic model soil moisture conditions are available here.

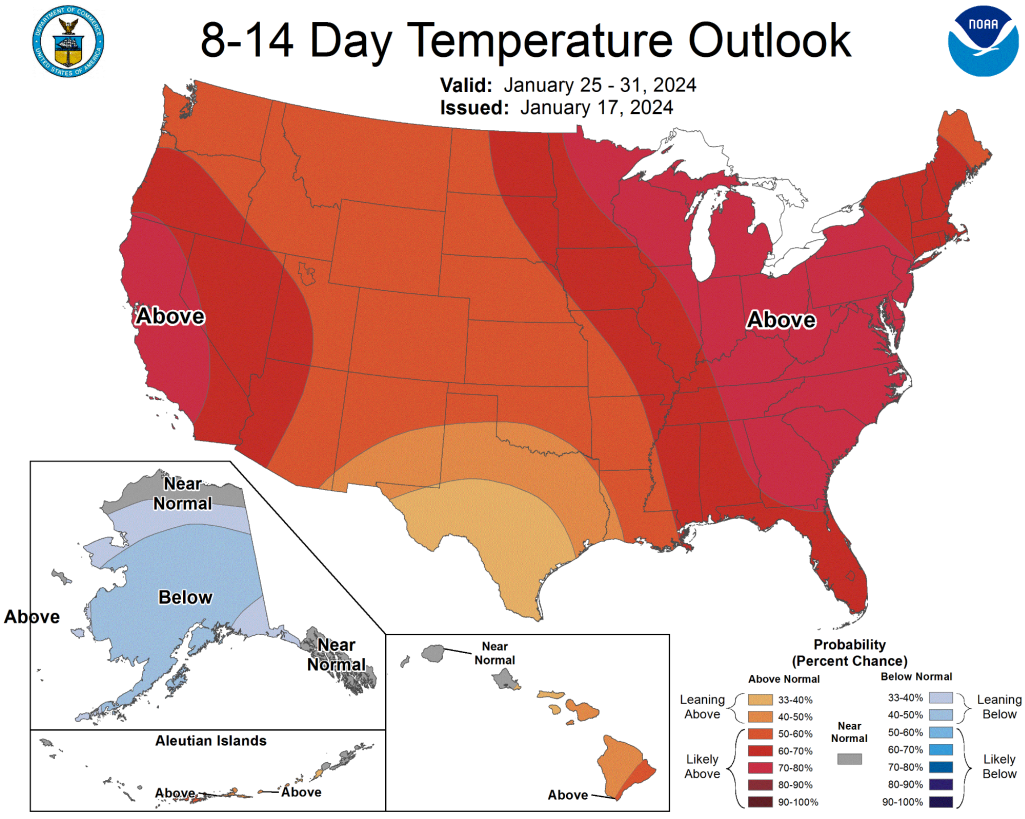
**Upcoming Weather**

A weather disturbance will bring another round of precipitation to northern UT and northwest CO through Thursday (January 18) morning. Precipitation amounts will be in the 0.50 to 0.75 inch range across higher elevations. High pressure will bring a brief break in precipitation on Friday. This brief break in the weather will be followed by another system that will move into the area this weekend. Precipitation will be focused across central AZ with precipitation amounts in the 0.50 inch range across higher terrain. Snow levels will be around 7,000 to 8,000 feet. Active weather is expected to continue into next week and favor the southern half of the area. During the last week of January the Climate Prediction Center (CPC) is forecasting increased chances of near/below normal precipitation and above normal temperatures.




NWS Weather Prediction Center precipitation forecast for January 18-21, 2024 (left), and January 18-25, 2024 (right).




Climate Prediction Center precipitation and temperature probability forecasts for January 25-31, 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