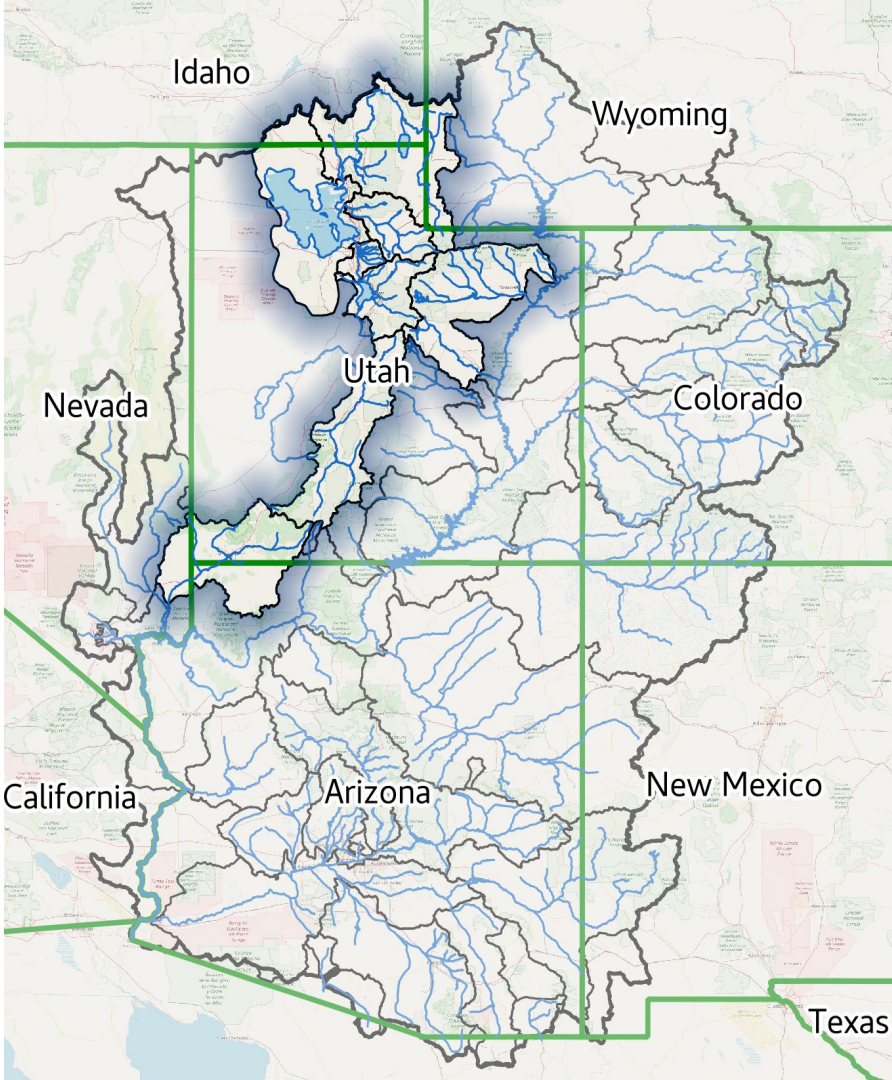
# Utah Water Supply Briefing

## Colorado Basin River Forecast Center

March 7, 2024

Presenter: Trevor Grout

Utah Forecasters: Brenda Alcorn
Trevor Grout
Wolfgang Hanft
Nanette Hosenfeld
Cody Moser



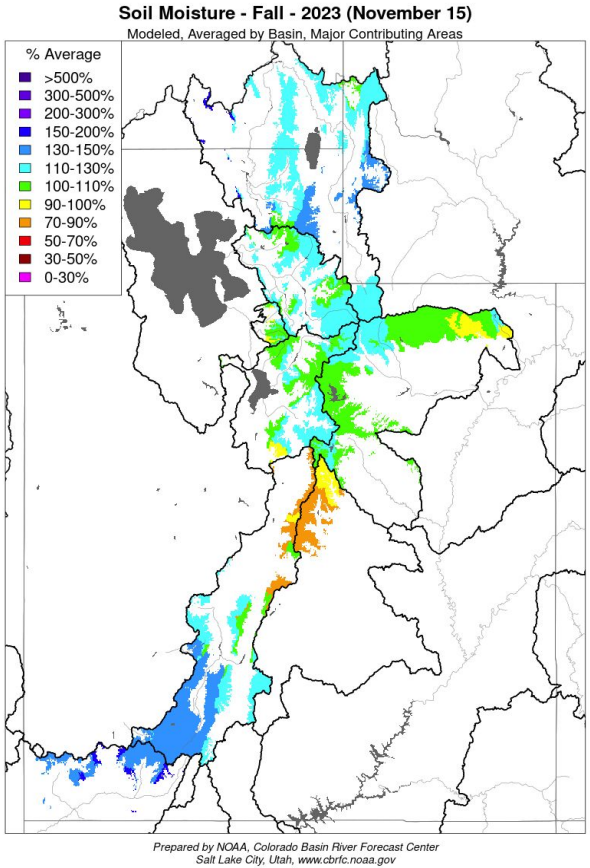
# Presentation Overview

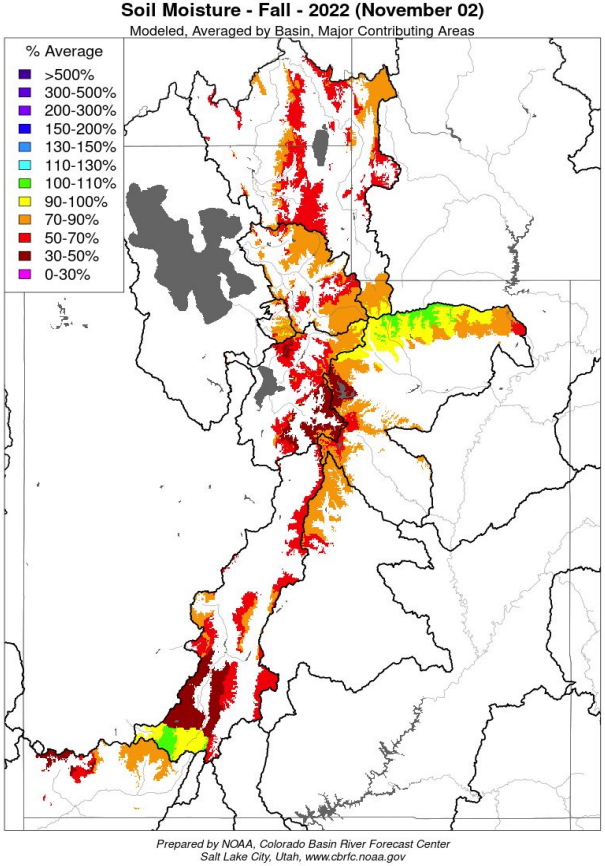
- Model Soil Moisture Conditions
- Precipitation Review
- Model Snow Conditions
- 2024 Water Supply Forecasts
- Early Season Forecast Error
- Upcoming Weather
- Contacts & Questions

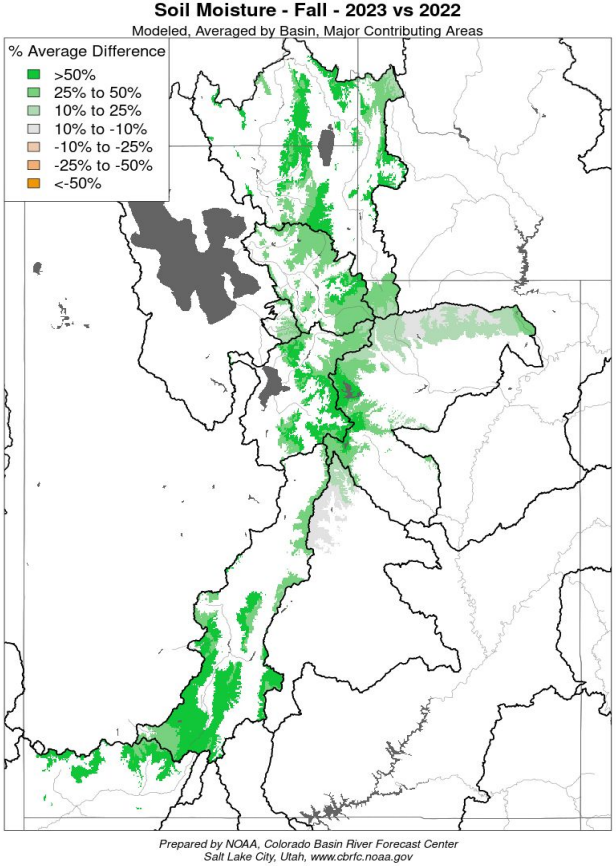
**Webinar recording & slides will be made available on CBRFC webpage.**

# Fall Model Soil Moisture Conditions: 2023 vs. 2022

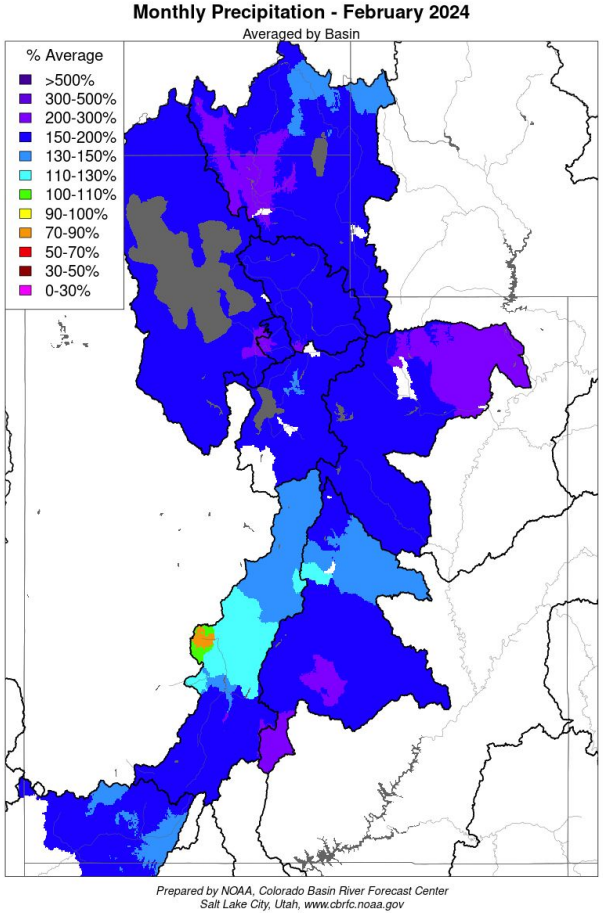
Near to above normal soils moisture conditions and better or similar conditions to last year.

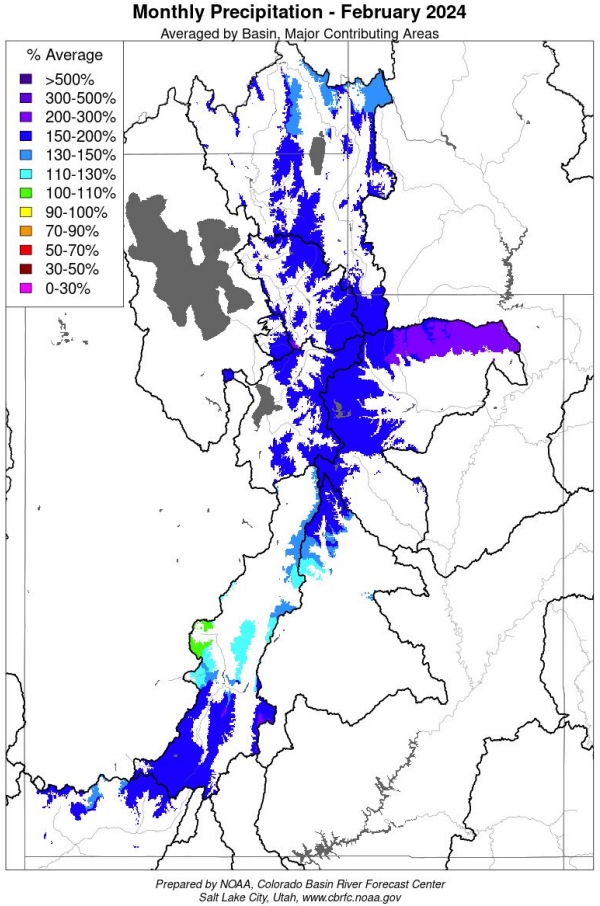


# February 2024 Precipitation Summary



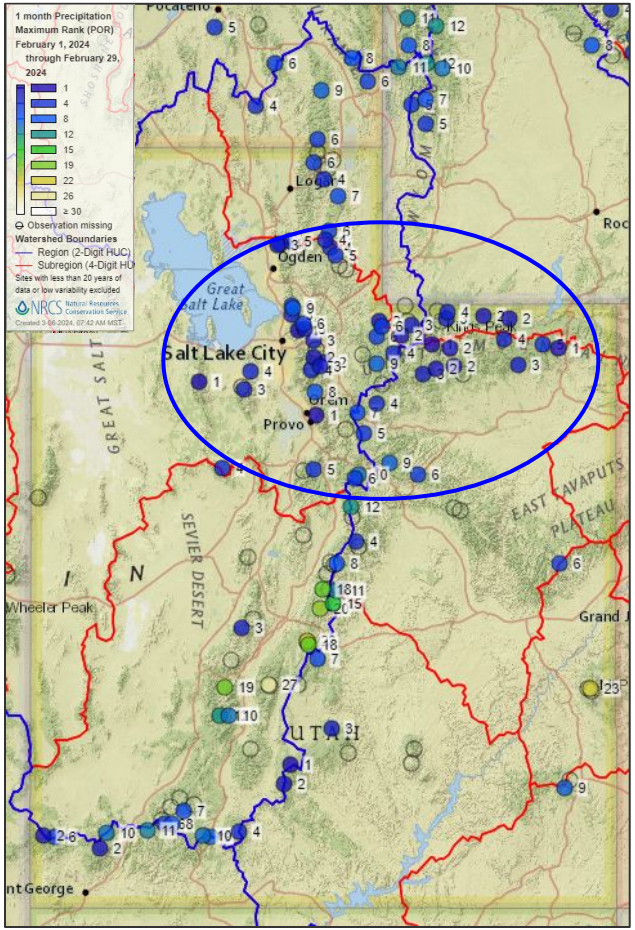




An active weather pattern during February resulted in above average (143%-199%) monthly precipitation across most of Utah high elevation areas

**Water Year 2024**
**CBRFC Precipitation (Major Contributing Areas)**
**Percent of 1991-2020 Average**

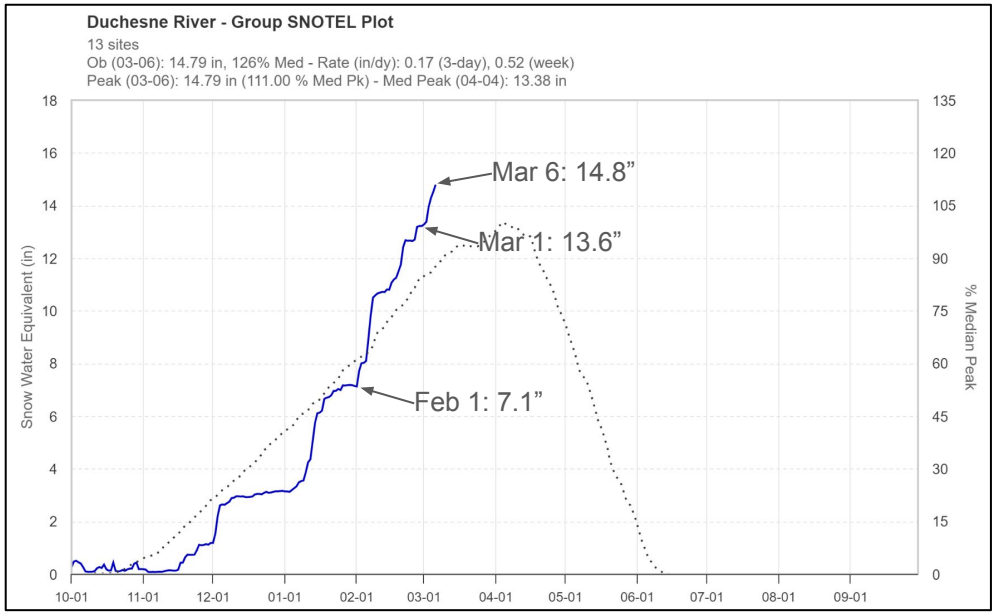
| UTAH | Feb | Oct-Feb |
|---|---|---|
| Bear | 163 | 111 |
| Weber | 181 | 111 |
| Six Creeks | 178 | 113 |
| Provo/Utah Lake | 170 | 106 |
| Duchesne | 199 | 102 |
| Price/San Rafael | 154 | 104 |
| Sevier | 143 | 87 |
| Virgin | 154 | 83 |

# February 2024 Precipitation Summary

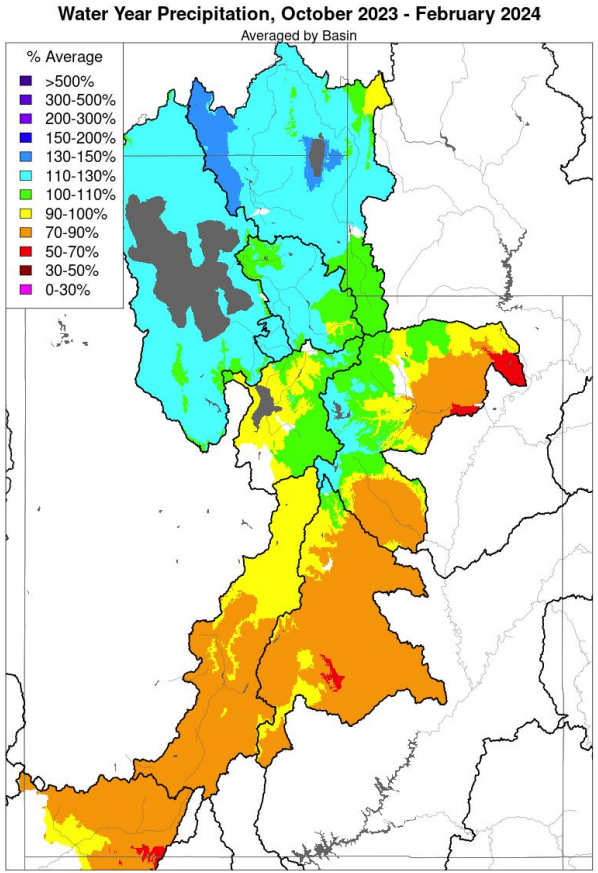


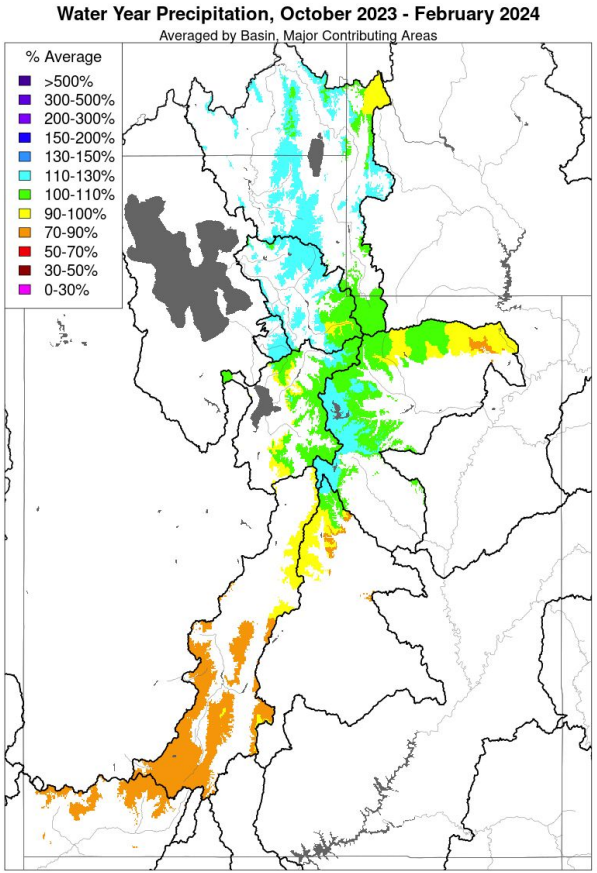

Many SNOTEL stations received February precipitation totals that rank in the top 5 of their period of record.

Most of these stations are located along the Wasatch Front and the Uinta Mountains.



# Water Year 2024 Precipitation Summary




Water year 2024 precipitation (October-February) is slightly below normal to above normal (83% - 113%)

**Water Year 2024**
**CBRFC Precipitation (Major Contributing Areas)**
**Percent of 1991-2020 Average**

| UTAH | Feb | Oct-Feb |
|---|---|---|
| Bear | 163 | 111 |
| Weber | 181 | 111 |
| Six Creeks | 178 | 113 |
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| Duchesne | 199 | 102 |
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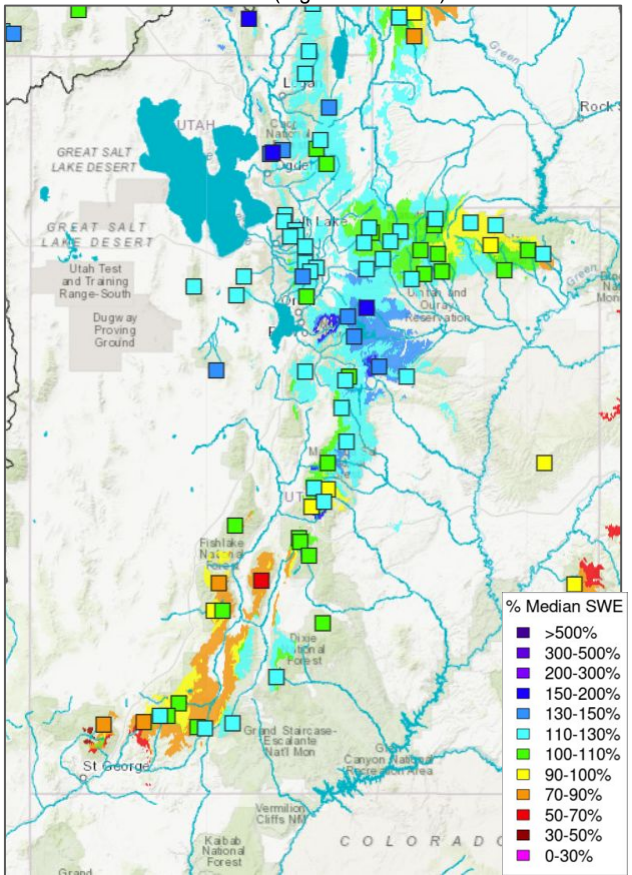
| Sevier | 143 | 87 |
| Virgin | 154 | 83 |

# Snowpack Conditions

## March 1 SWE Conditions

NRCS SNOTEL Observed (Squares)
CBRFC Model (Significant Areas)



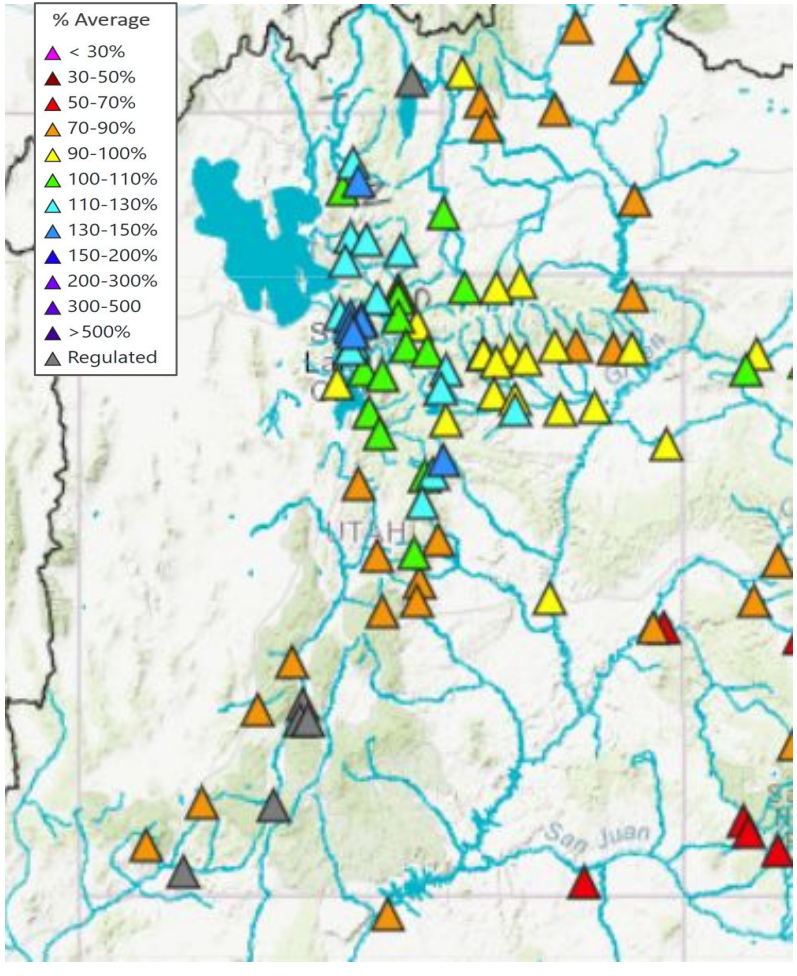

Utah river basins had improved SWE conditions during February. Many areas were above normal (83% - 119%).

**Water Year 2024**
**CBRFC Model SWE (Major Contributing Areas)**
**Percent of 1991-2020 Median**

| UTAH | | | |
|---|---|---|---|
| | Feb1 | Mar1 | Change |
| Bear | 92 | 111 | 19 |
| Weber | 86 | 115 | 29 |
| Six Creeks | 90 | 113 | 23 |
| Provo/Utah Lake | 85 | 119 | 34 |
| Duchesne | 70 | 110 | 40 |
| Price/San Rafael | 95 | 116 | 21 |
| Sevier | 81 | 98 | 17 |
| Virgin | 43 | 83 | 40 |

**SWE** = Snow Water Equivalent
The amount of water in snow.

# Utah Water Supply Forecasts: Overview




Utah April-July volume forecasts are range from slightly below normal to above normal.

Forecasts are more favorable in areas that have:
-better soil moisture conditions
-better snowpack conditions

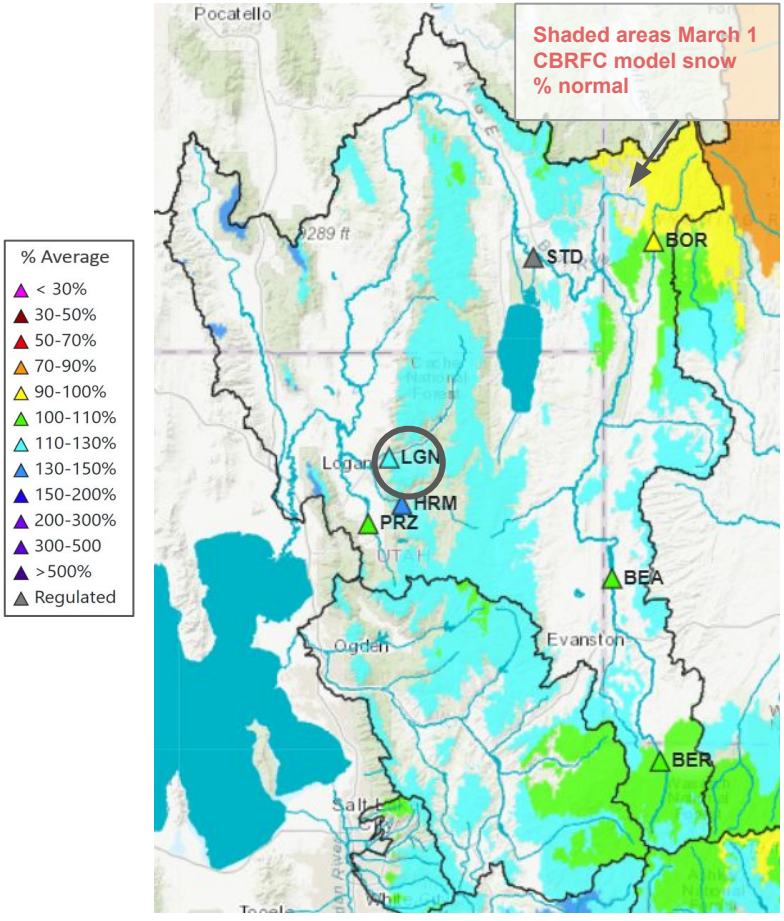
**Colorado Basin River Forecast Center Water Supply Forecasts**
**March 1, 2024**

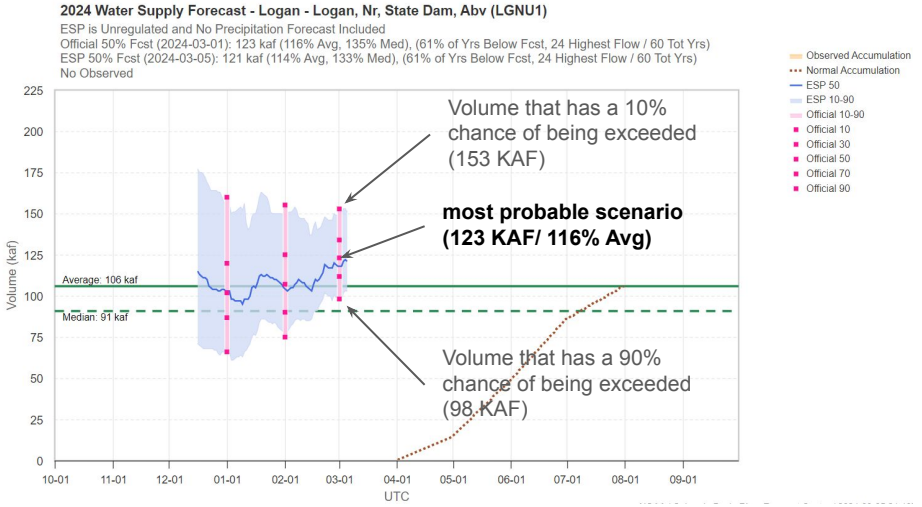
| UTAH | | | |
|---|---|---|---|
| **Basin** | **Volume (KAF)** | **%Normal (1991-2020)** | **Period** |
| Bear-UT/WY State Line | 110 | 101 | Apr-Jul |
| Weber-Oakley | 111 | 100 | Apr-Jul |
| Big Cottonwood Creek | 38 | 112 | Apr-Jul |
| Provo-Woodland | 100 | 104 | Apr-Jul |
| Duchesne-Tabiona | 100 | 97 | Apr-Jul |
| Sevier-Hatch (*Regulated) | 42 | 88 | Apr-Jul |
| Virgin-Virgin (*Regulated) | 50 | 89 | Apr-Jul |

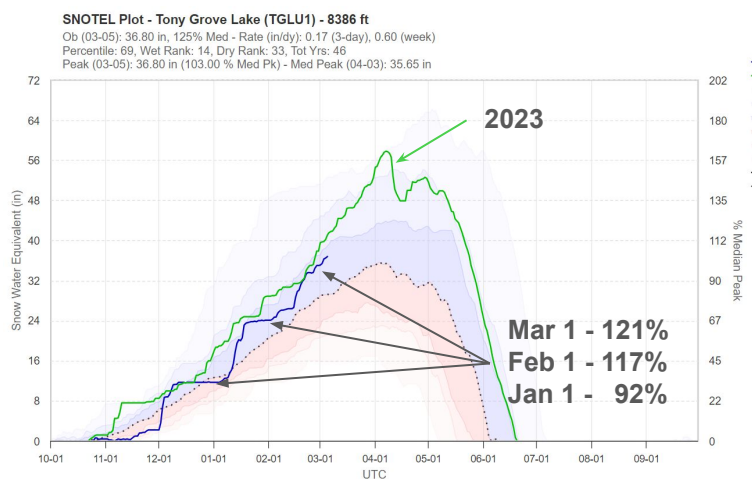
**KAF** = thousand acre-feet

# Bear River Basin

Forecast Range: 98% -135%

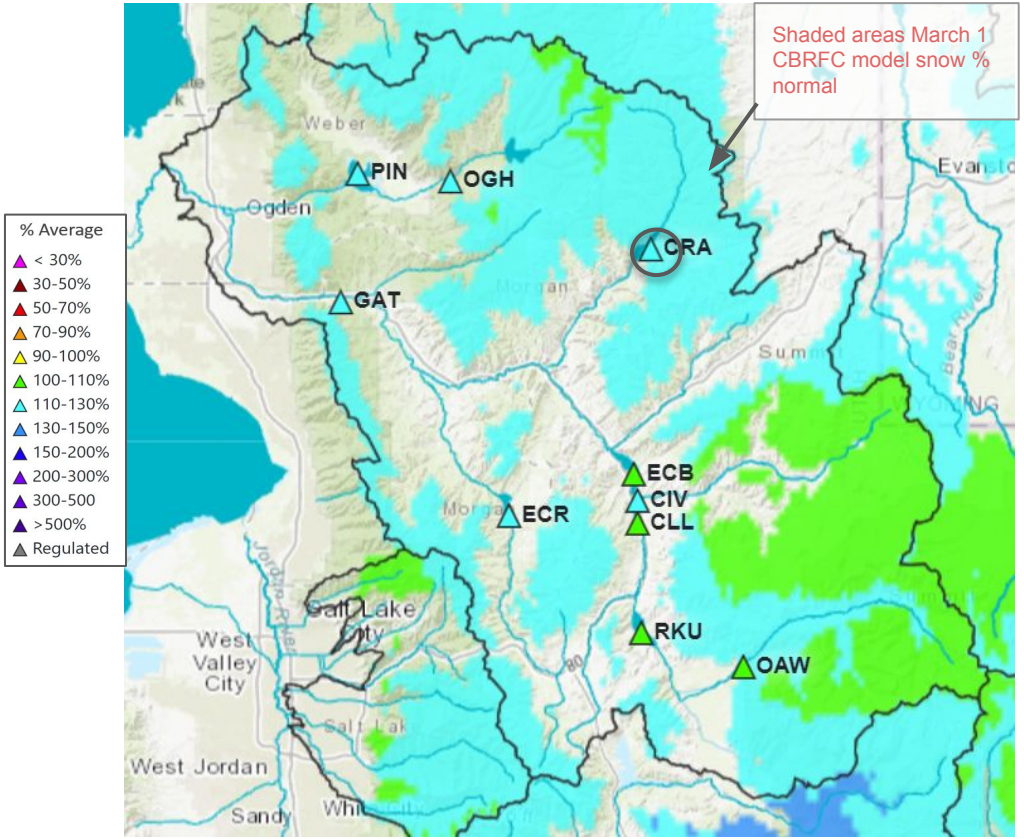


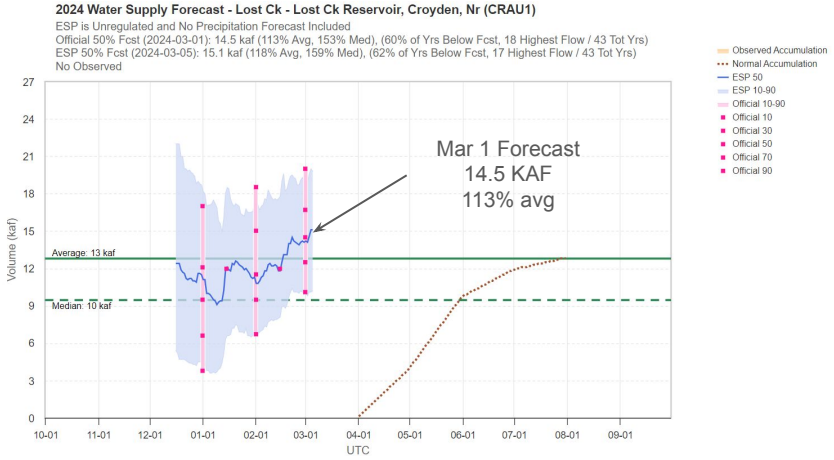



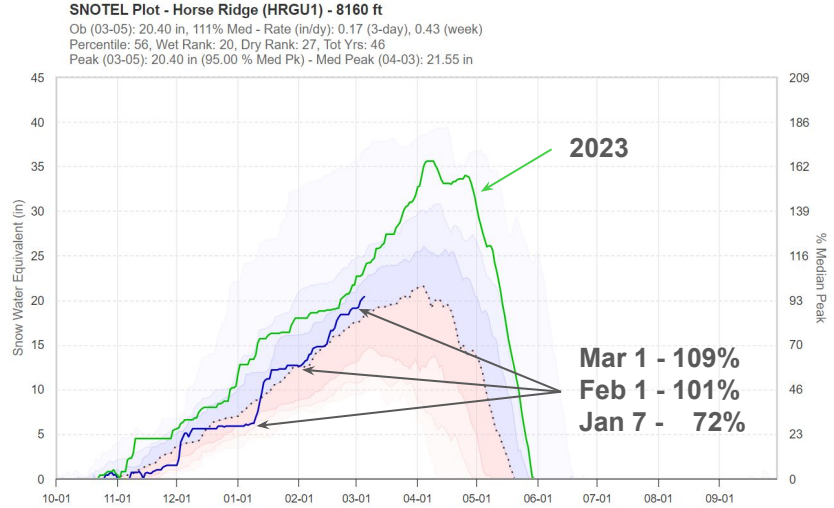



# Weber River Basin

Forecast Range: 100% -122%

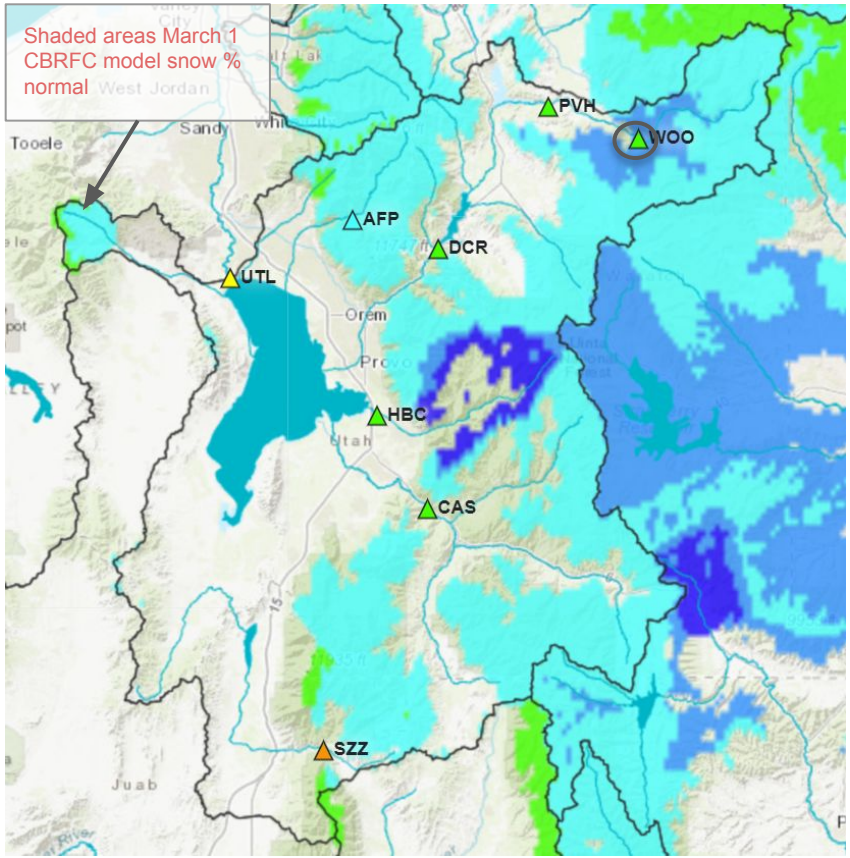


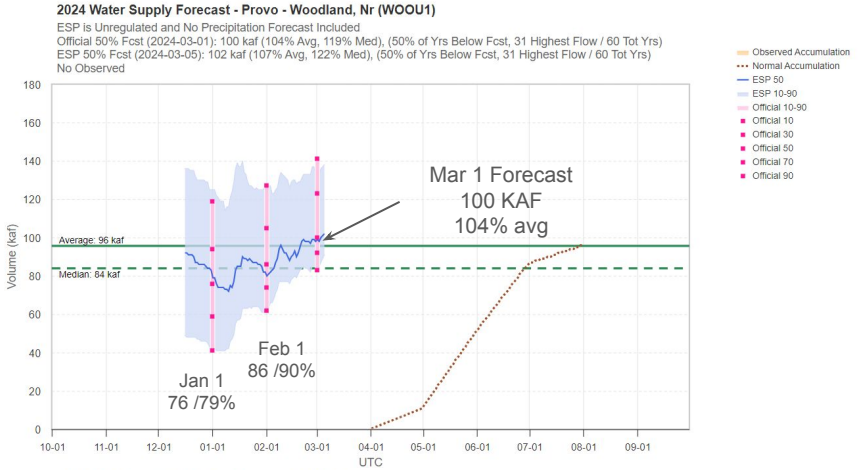



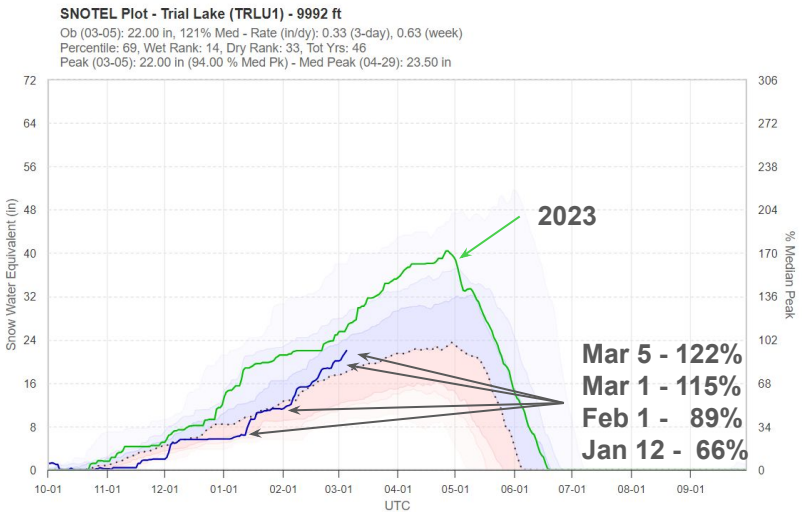
# Provo River Basin

Forecast Range: 82% -108%



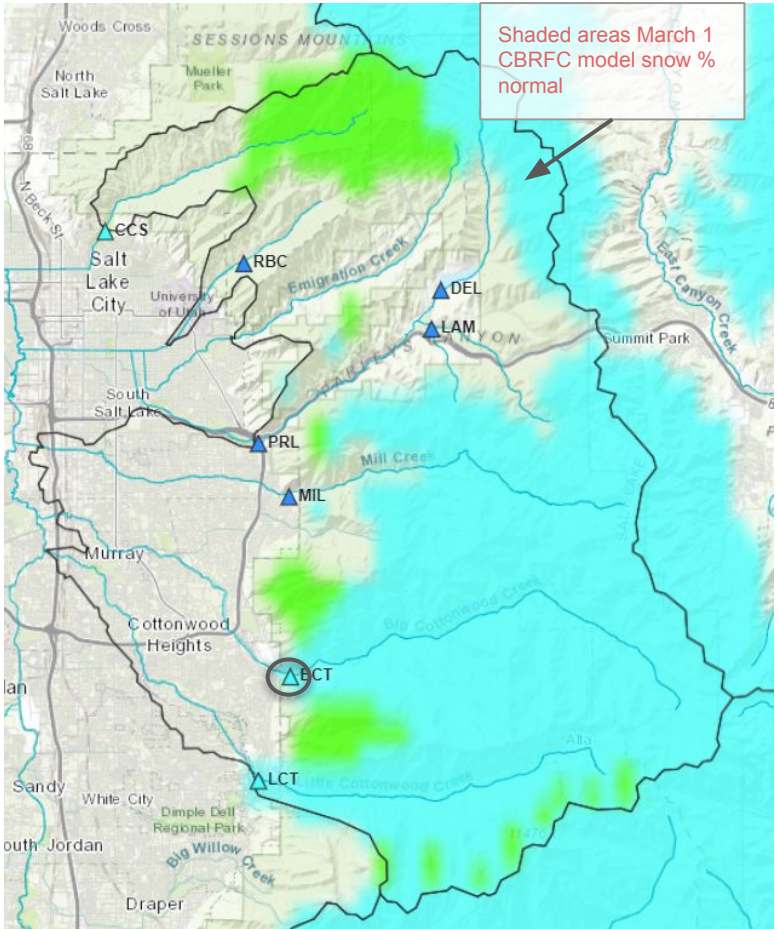

% Average
- < 30%
- 30-50%
- 50-70%
- 70-90%
- 90-100%
- 100-110%
- 110-130%
- 130-150%
- 150-200%
- 200-300%
- 300-500
- >500%
- Regulated

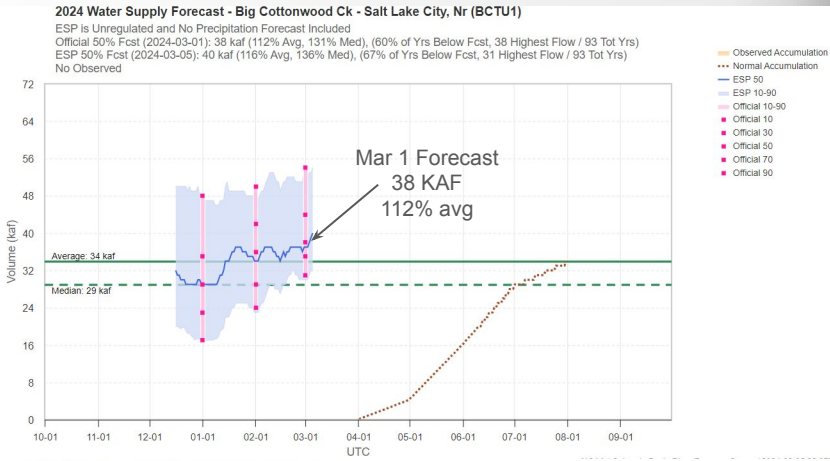


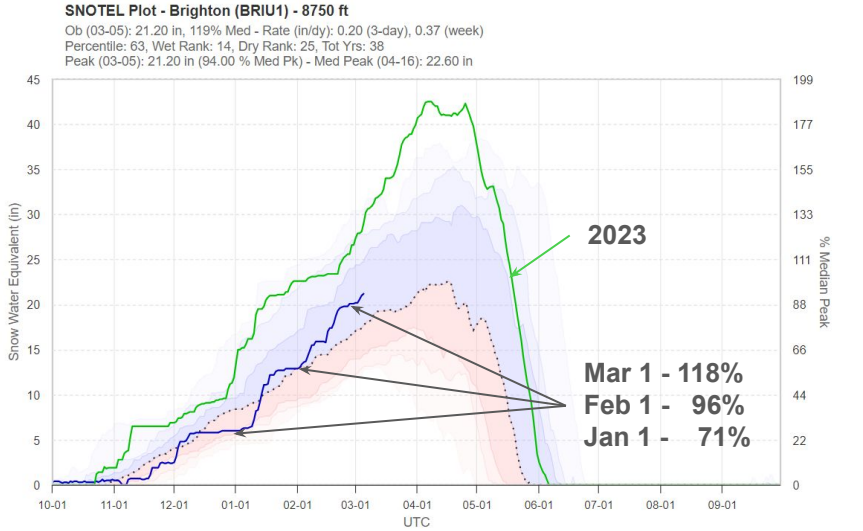



# Six Creeks Basin

Forecast Range: 111% - 135%

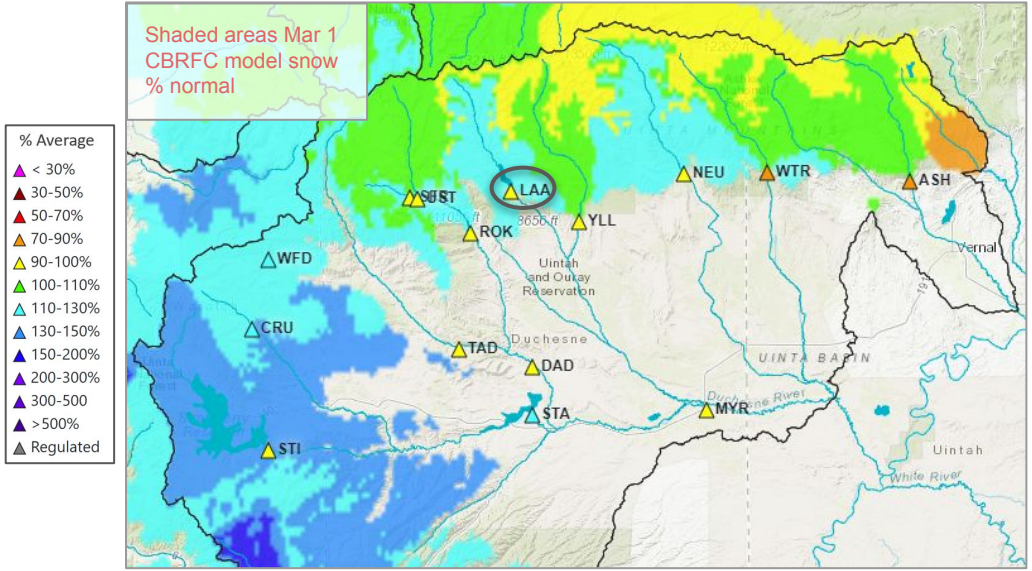


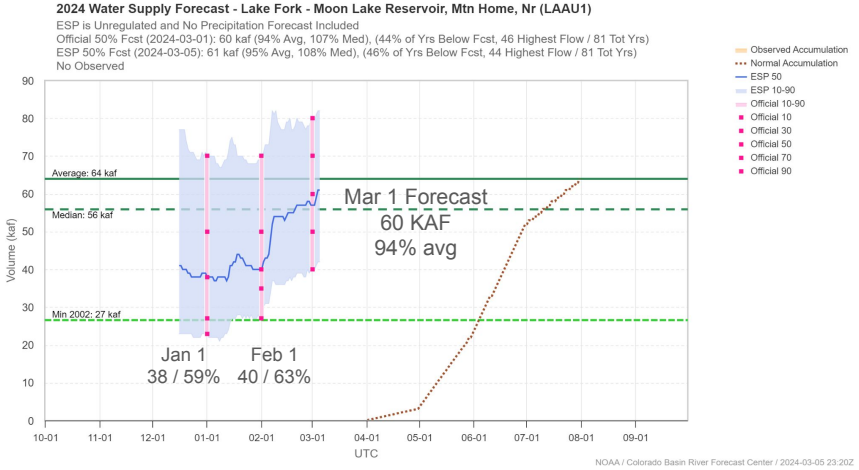



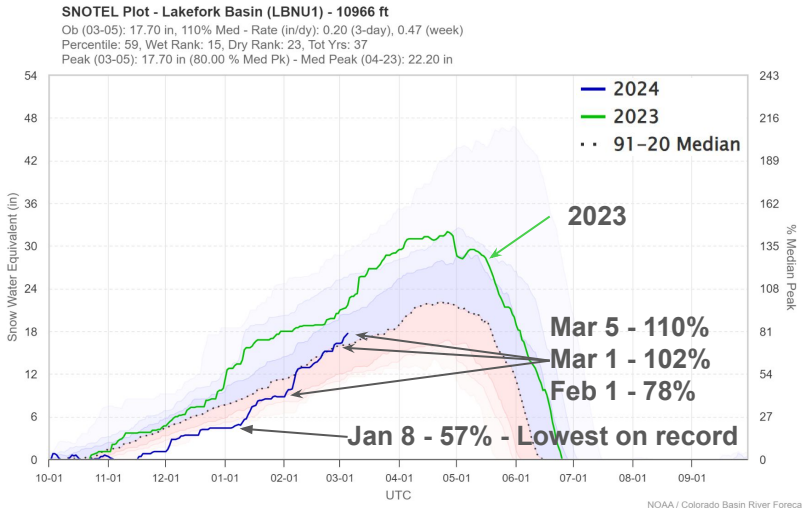



# Duchesne River Basin

Forecast Range: 90% -115%

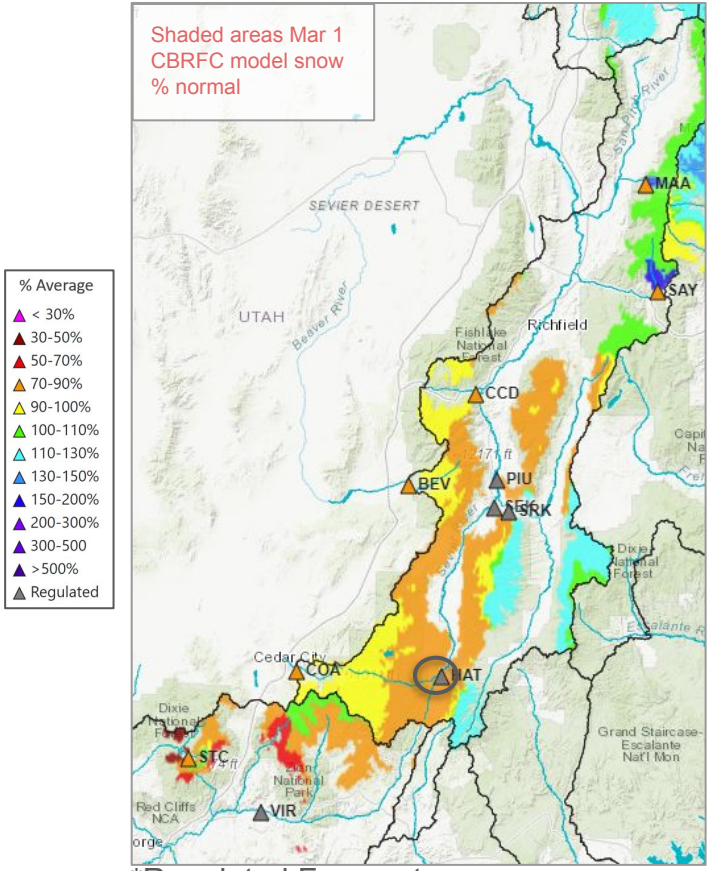


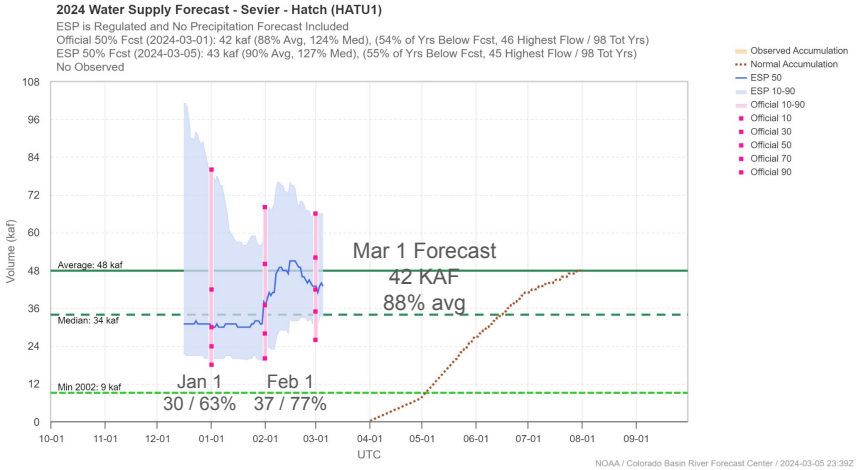



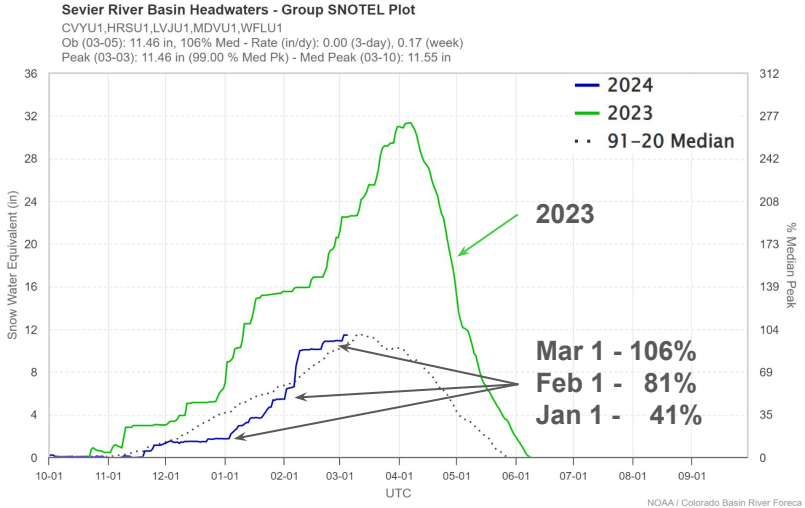
# Virgin and Sevier River Basins

Forecast Range: 75% -125%



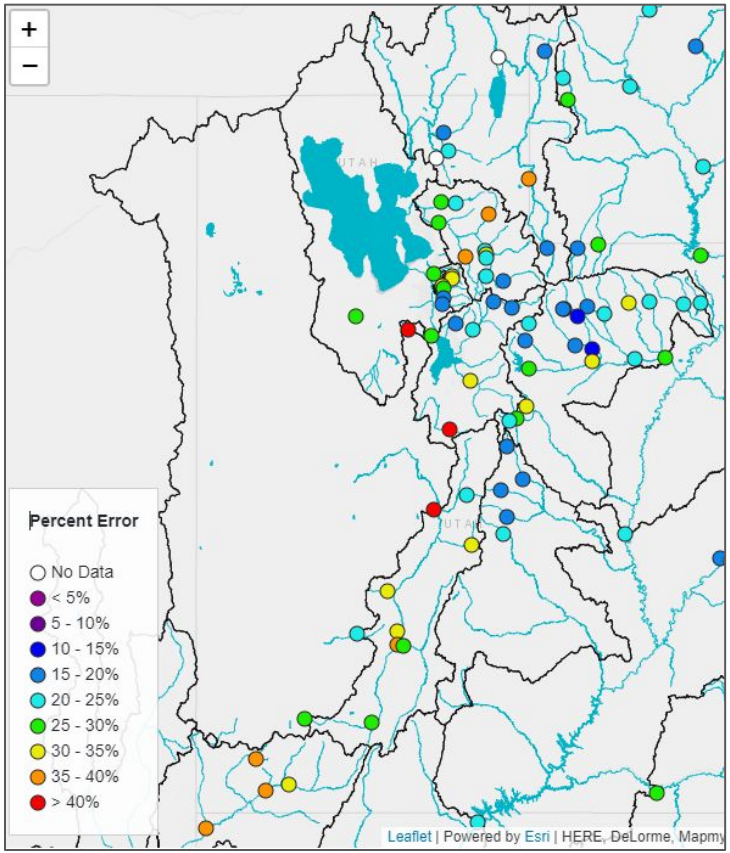

*Regulated Forecasts



# Historical Forecast Verification

March Forecast Error: April-July Volume




| Location | Mar 1 Forecast Error |
|---|---|
| BEAR - UTAH-WYOMING STATE | 18% |
| BEAR - WOODRUFF NARROWS | 36% |
| LOGAN - LOGAN- NR | 19% |
| WEBER - OAKLEY- NR | 17% |
| WEBER - ROCKPORT RES | 24% |
| BIG COTTONWOOD CK | 19% |
| PROVO - WOODLAND- NR | 16% |
| PROVO - DEER CK RES | 23% |
| VIRGIN - VIRGIN | 31% |

Error tends to decrease each month into the spring

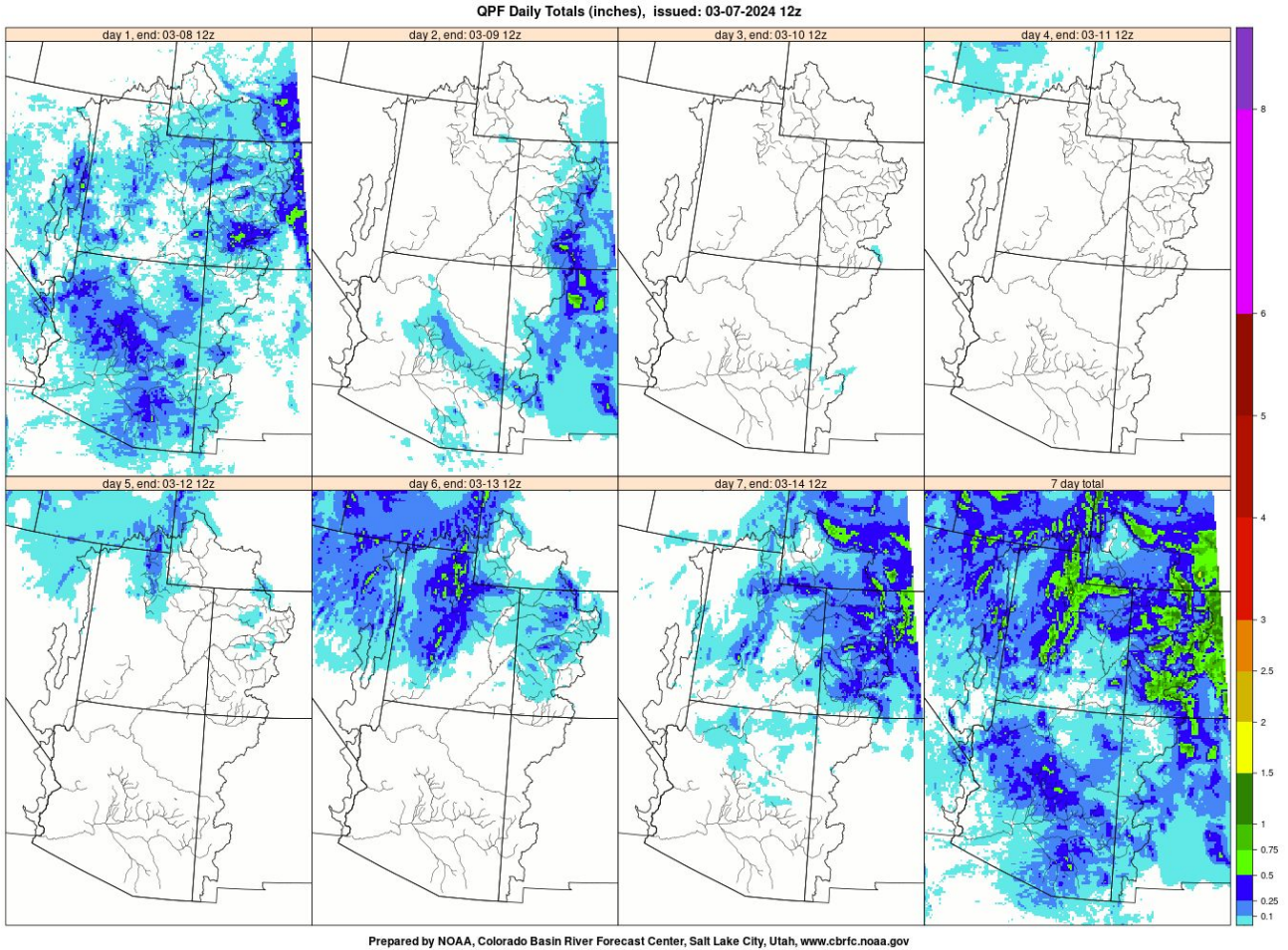
Where Forecasts are Better:
- -Headwaters
- -Primarily snow melt basins
- -Known diversions / demands

Where Forecasts are Worse:
- -Lower elevations (rain or early melt)
- -Downstream of diversions / irrigation
- -Little is known about diversions / demands

Future weather is the primary source of early season water supply forecast error/uncertainty.

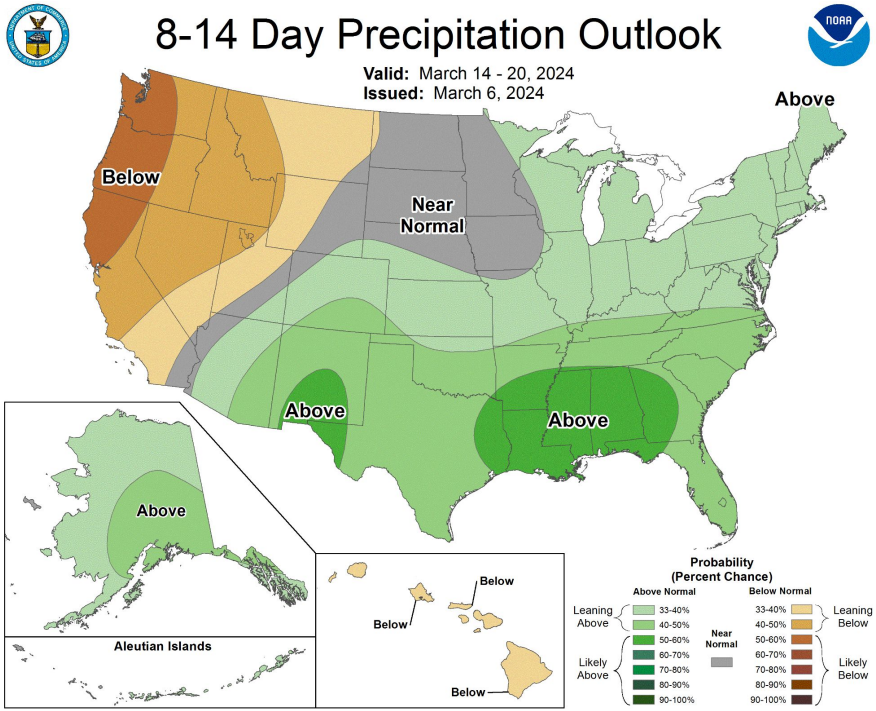
# Upcoming Weather: 7-Day Precipitation Forecast

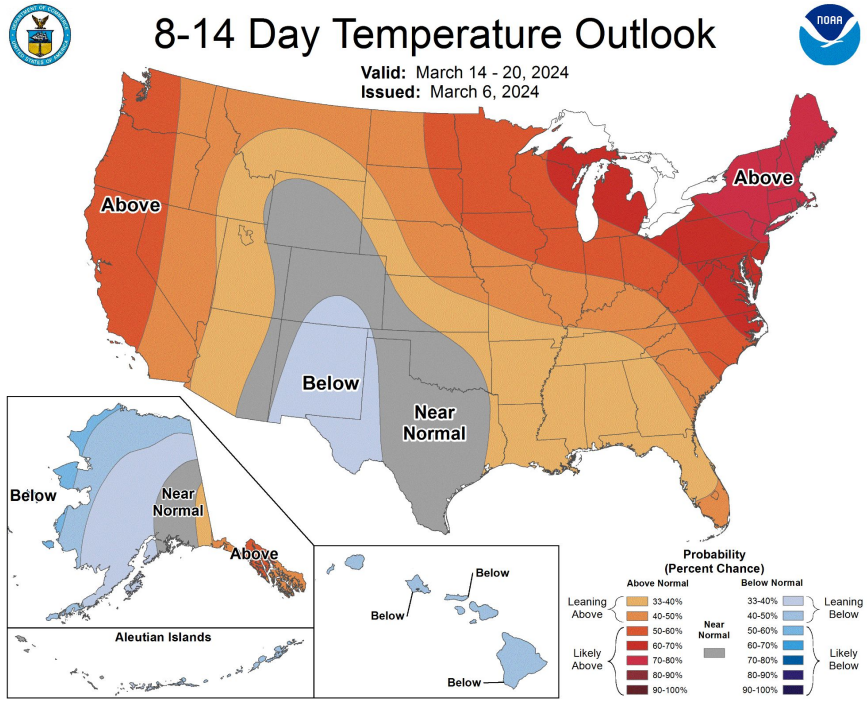
Unsettled weather pattern with multiple weather systems over the next week



# Upcoming Weather: 8-14 Day Outlook (March 14-20)

Slightly increased chances of below normal precipitation over most of Utah
Slightly increased chances of above normal temperatures across much of Utah



# Summary

- Soil Moisture:
  - Near to above normal for most of Utah
  - Better conditions than last year

- Model SWE (March 1):
  - Improvement from Feb 1
  - Many areas now normal to above normal (98%-119%)
  - Virgin watershed below normal (83%)

- Water Supply Forecasts (March 1)
  - Improvement from Feb 1
  - Many areas near normal to above normal
  - Virgin/Sevier watersheds slightly below normal

| Water Supply Forecasts (April - July) Summary | | | |
|---|---|---|---|
| **Watershed** | **March 2024 Median** | **Feb 2024 Median** | **Jan 2024 Median** |
| Bear River Basin | 102% | 84% | 80% |
| Weber River Basin | 107% | 87% | 74% |
| Six Creeks Basin | 133% | 107% | 92% |
| Provo River Basin | 104% | 88% | 75% |
| Duchesne River Basin | 98% | 73% | 62% |
| Virgin and Sevier River Basins | 87% | 83% | 68% |

# 2024 Water Supply Webinar Schedule

**All Times Mountain Time (MT)*

## Colorado River Basin

| | | |
|---|---|---|
| ~~Monday~~ | ~~Jan 9th~~ | ~~10 am~~ |
| ~~Tuesday~~ | ~~Feb 7th~~ | ~~10 am~~ |
| ~~Thursday~~ | ~~Mar 7th~~ | ~~10 am~~ |
| Friday | Apr 5th | 10 am |
| Tuesday | May 7th | 10 am |

## Utah/Great Basin

| | | |
|---|---|---|
| ~~Monday~~ | ~~Jan 9th~~ | ~~11:30 am~~ |
| ~~Tuesday~~ | ~~Feb 7th~~ | ~~11:30 am~~ |
| Thursday | Mar 7th | 11:30 am |
| Friday | Apr 5th | 11:30 am |
| Tuesday | May 7th | 11:30 am |

Peak flow forecast webinar Wednesday, March 20th, 10 am MT

Additional briefings scheduled as needed

Webinar schedule & registration information has been posted to the CBRFC web page

# CBRFC Contacts & Water Year 2024 Basin Focal Points

## Basin Focal Points (Forecasters)

Brenda Alcorn - Green, Duchesne, White/Yampa
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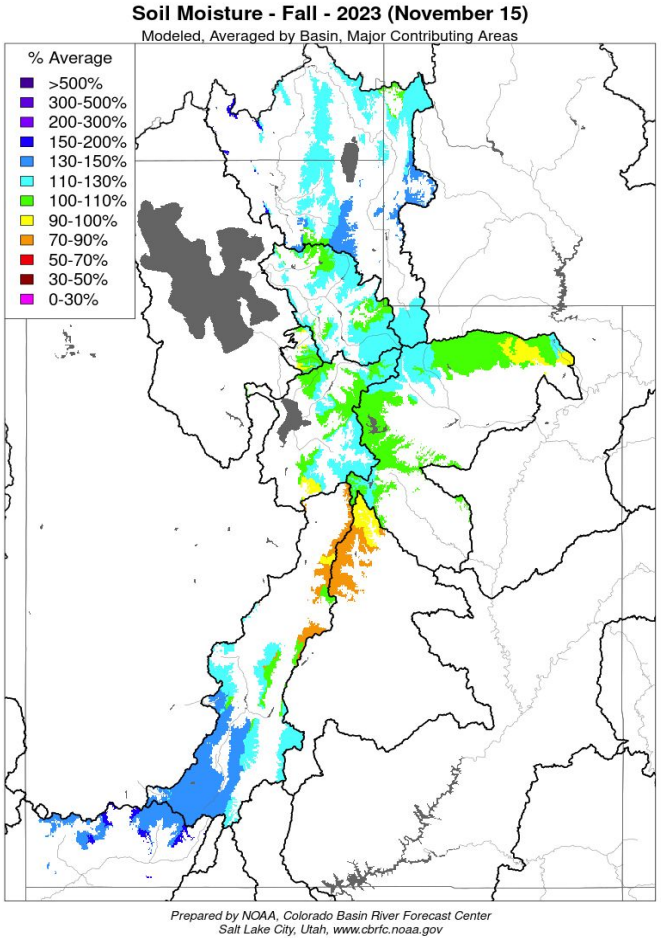
**CBRFC Webpage**
https://www.cbrfc.noaa.gov/

**CBRFC Water Supply Presentations**
https://www.cbrfc.noaa.gov/present/present.html

# Fall 2023 Hydrologic Model Soil Moisture Conditions




The map shows the model soil moisture conditions from the lower soil zone in CBRFC's hydrologic model, and is a result of past hydrologic conditions including but not limited to:

- -previous year(s) runoff
- -summer/fall precipitation

CBRFC hydrologic model soil moisture is adjusted (if necessary) every fall after irrigation season has ended and before winter.
Data used to make adjustments:

- -Early November streamflow observations (baseflow)
- -Reservoir inflows
- -July-October precipitation
- -Past season(s) runoff conditions

<u>Soil Moisture Impacts on Water Supply / Runoff</u>
Above normal soil moisture conditions → positive impact (increased runoff efficiency)
Below normal soil moisture conditions → negative impact (decreased runoff efficiency)

**Great Basin / Utah: near to above normal**

**The timing and magnitude of spring runoff is ultimately a result of snowpack conditions, spring weather, and soil moisture conditions.**