

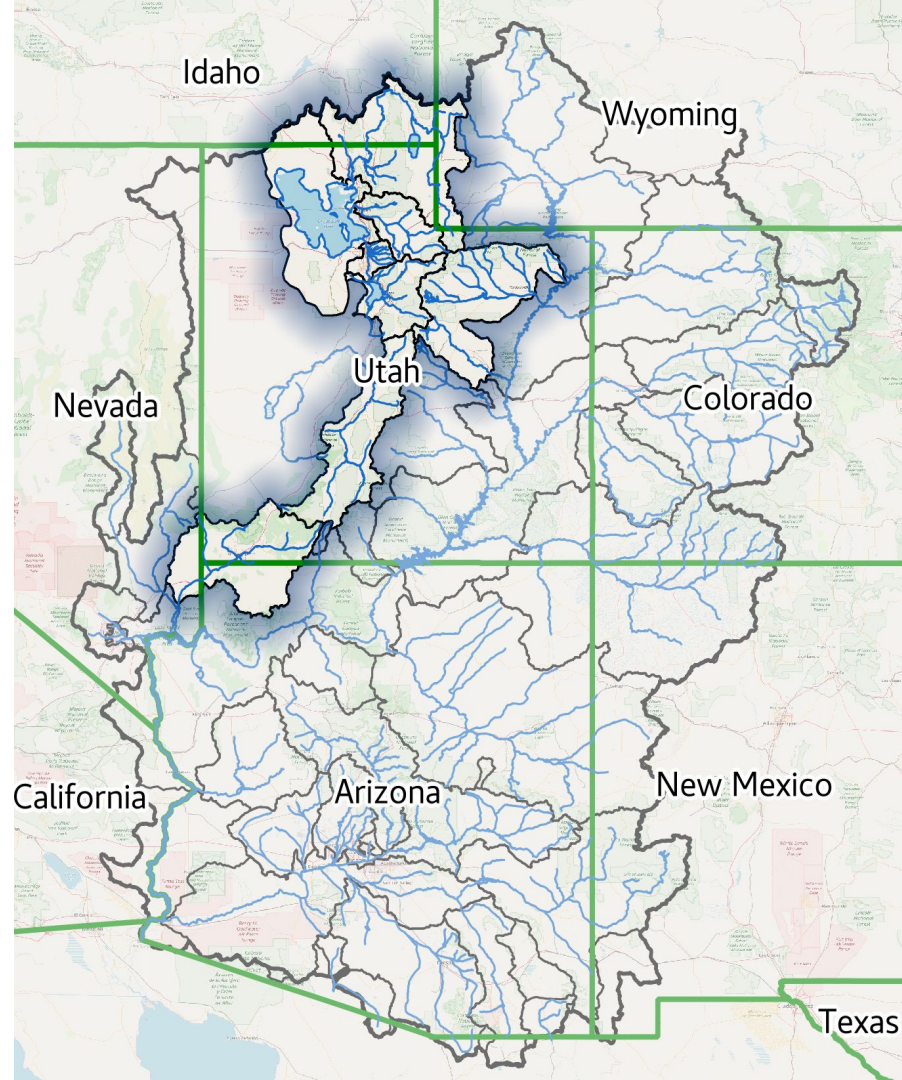
# Utah Water Supply Briefing

## Colorado Basin River Forecast Center

February 7, 2024

Presenter: Trevor Grout

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



# Presentation Overview

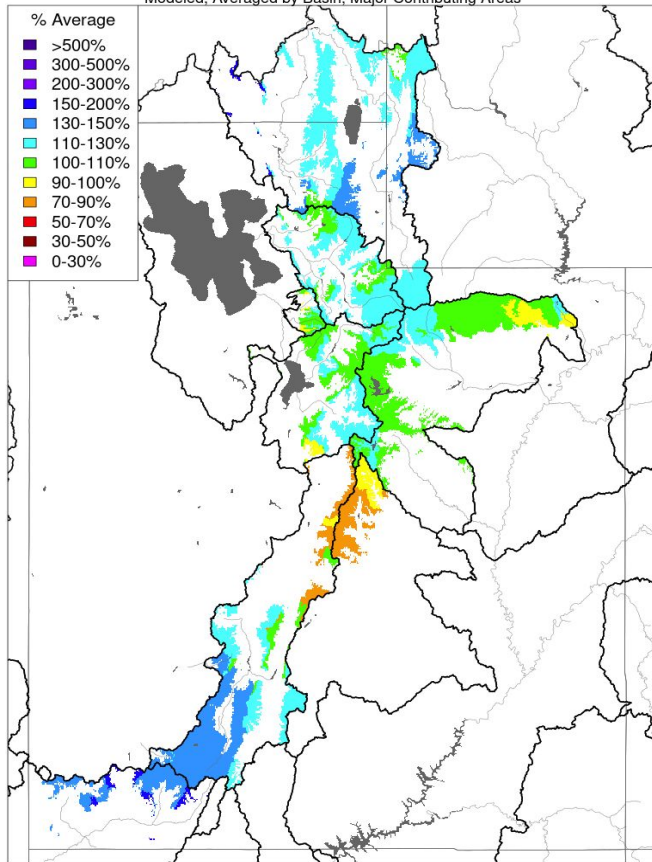
- Model Soil Moisture Conditions
- Precipitation Review
- Current Snow Conditions
- 2024 Water Supply Forecasts
- Early Season Forecast Error
- Upcoming Weather
- Contacts & Questions

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

# Fall 2023 Hydrologic Model Soil Moisture Conditions

## Soil Moisture - Fall - 2023 (November 15)

Modeled, Averaged by Basin, Major Contributing Areas



Prepared by NOAA, Colorado Basin River Forecast Center  
Salt Lake City, Utah, [www.cbrfc.noaa.gov](http://www.cbrfc.noaa.gov)

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

### Soil Moisture Impacts on Water Supply / Runoff

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**

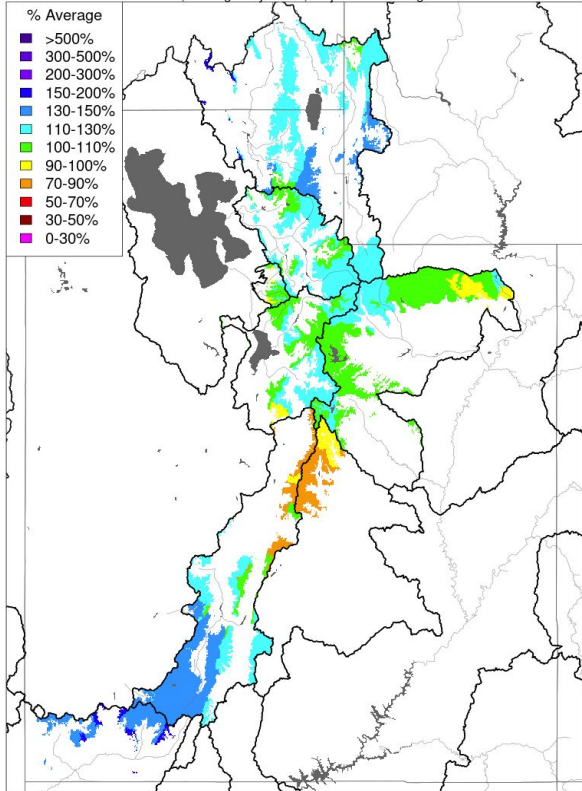
**The timing and magnitude of spring runoff is ultimately a result of snowpack conditions, spring weather, and soil moisture conditions.**

# Fall Model Soil Moisture Conditions: 2023 vs. 2022

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

### Soil Moisture - Fall - 2023 (November 15)

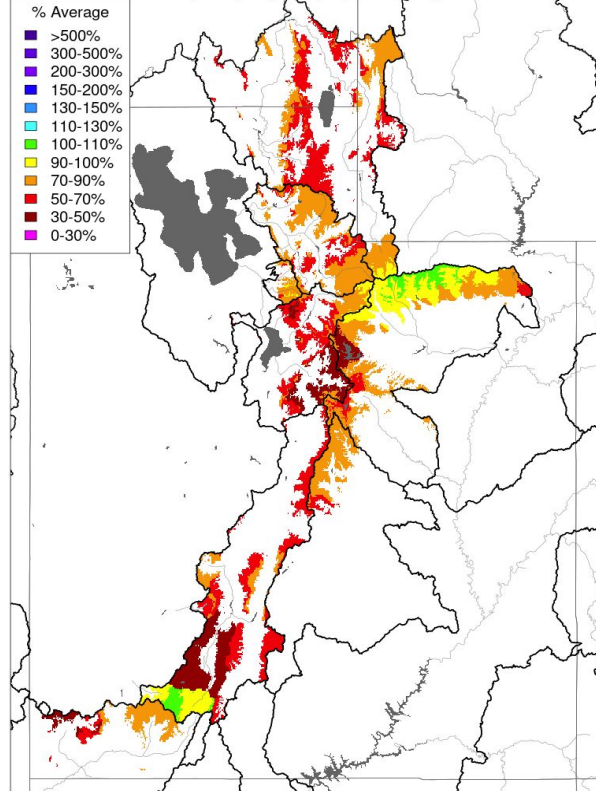
Modeled, Averaged by Basin, Major Contributing Areas



Prepared by NOAA, Colorado Basin River Forecast Center  
Salt Lake City, Utah, [www.cbrfc.noaa.gov](http://www.cbrfc.noaa.gov)

### Soil Moisture - Fall - 2022 (November 02)

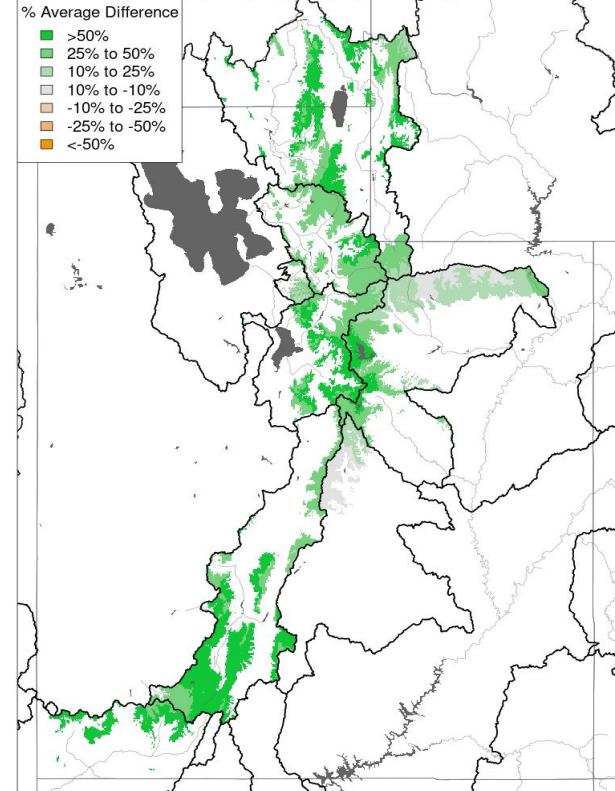
Modeled, Averaged by Basin, Major Contributing Areas



Prepared by NOAA, Colorado Basin River Forecast Center  
Salt Lake City, Utah, [www.cbrfc.noaa.gov](http://www.cbrfc.noaa.gov)

### Soil Moisture - Fall - 2023 vs 2022

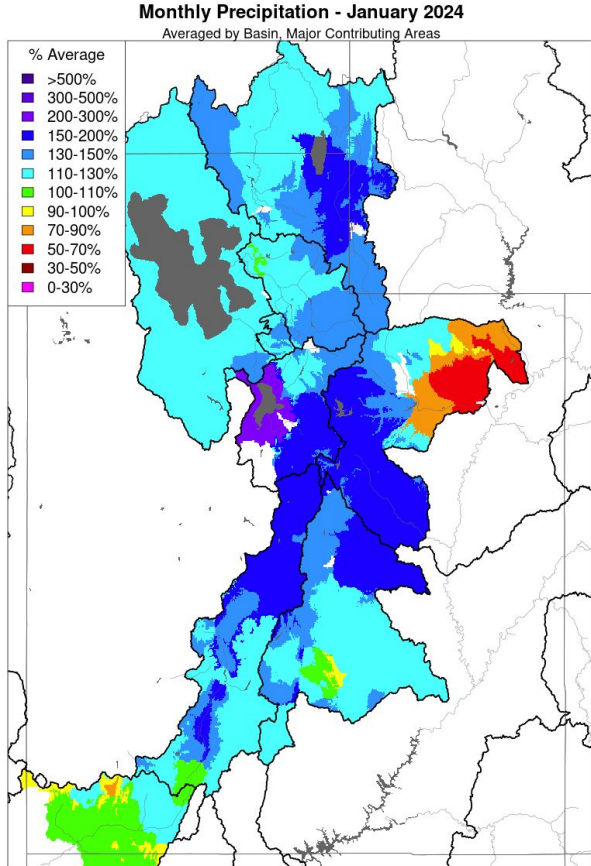
Modeled, Averaged by Basin, Major Contributing Areas



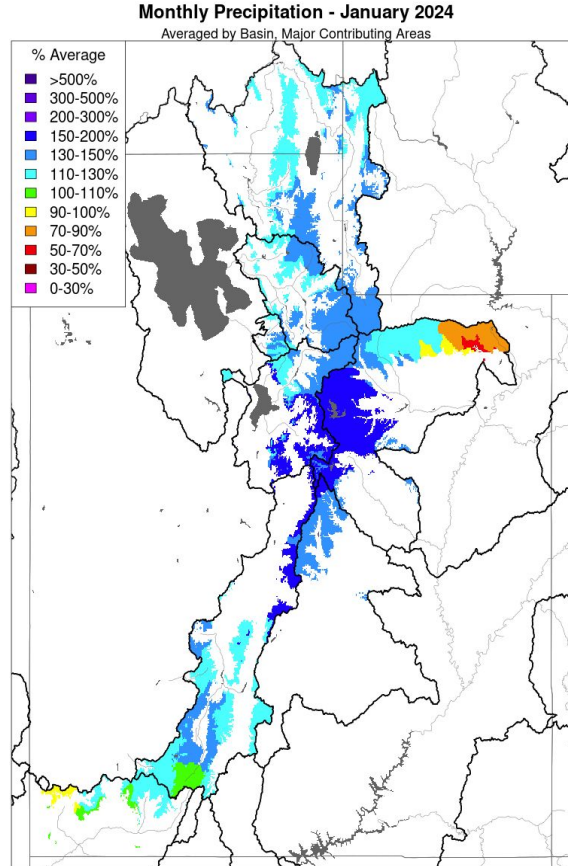
Prepared by NOAA, Colorado Basin River Forecast Center  
Salt Lake City, Utah, [www.cbrfc.noaa.gov](http://www.cbrfc.noaa.gov)



# January 2024 Precipitation Summary



Prepared by NOAA, Colorado Basin River Forecast Center  
Salt Lake City, Utah, [www.cbrfc.noaa.gov](http://www.cbrfc.noaa.gov)



Prepared by NOAA, Colorado Basin River Forecast Center  
Salt Lake City, Utah, [www.cbrfc.noaa.gov](http://www.cbrfc.noaa.gov)

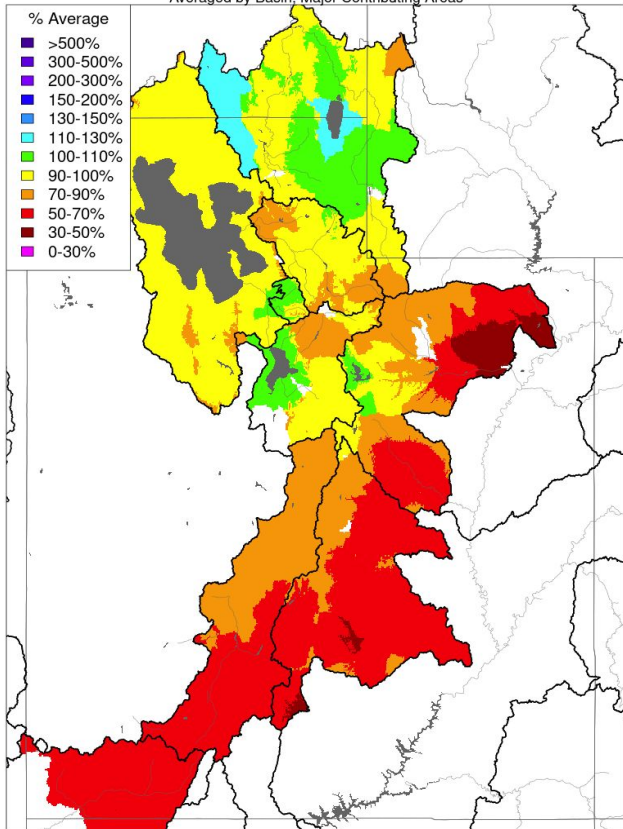
An active weather pattern during January resulted in generally above average (112%-152%) monthly precipitation across most Utah high elevation areas.

Water Year 2024 CBRFC Precipitation (Major Contributing Areas) Percent of 1991-2020 Average		
UTAH		
	Jan	Oct-Jan
Bear	126	97
Weber	131	92
Six Creeks	130	98
Provo/Utah Lake	134	90
Duchesne	124	76
Price/San Rafael	152	91
Sevier	129	71
Virgin	112	59

# Water Year 2024 Precipitation Summary

Water Year Precipitation, October 2023 - January 2024

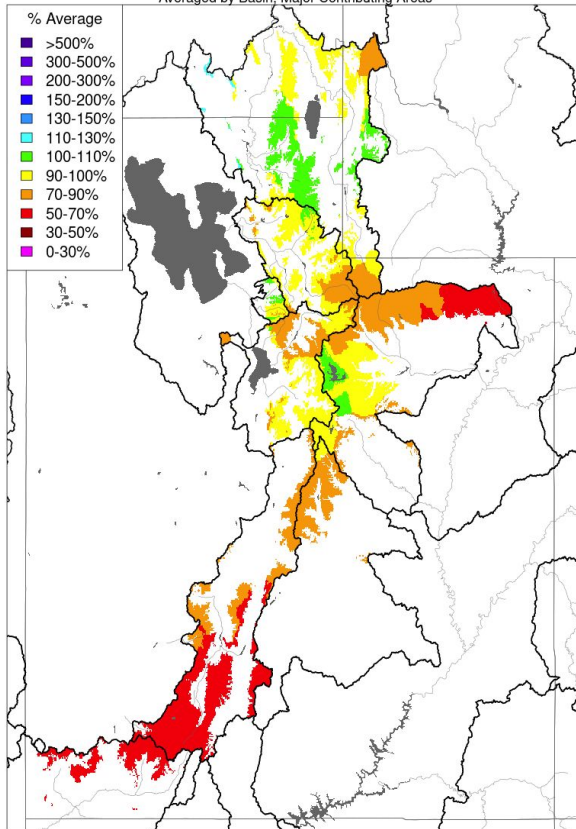
Averaged by Basin, Major Contributing Areas



Prepared by NOAA, Colorado Basin River Forecast Center  
Salt Lake City, Utah, [www.cbrfc.noaa.gov](http://www.cbrfc.noaa.gov)

Water Year Precipitation, October 2023 - January 2024

Averaged by Basin, Major Contributing Areas



Prepared by NOAA, Colorado Basin River Forecast Center  
Salt Lake City, Utah, [www.cbrfc.noaa.gov](http://www.cbrfc.noaa.gov)

Water year 2024 precipitation (October-January) is near normal to below normal (59% - 98%)

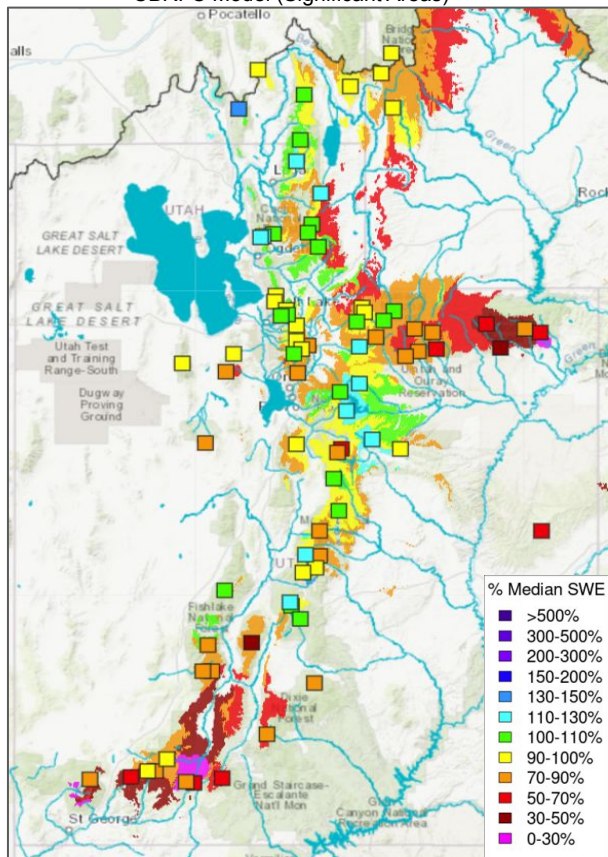
Water Year 2024  
CBRFC Precipitation (Major Contributing Areas)  
Percent of 1991-2020 Average

UTAH		
	<u>Jan</u>	<u>Oct-Jan</u>
Bear	126	97
Weber	131	92
Six Creeks	130	98
Provo/Utah Lake	134	90
Duchesne	124	76
Price/San Rafael	152	91
Sevier	129	71
Virgin	112	59

# Snowpack Conditions

## February 1 SWE Conditions

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



Utah river basins had improved SWE conditions during January but February 1 conditions generally remained below normal (43%-95%)

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

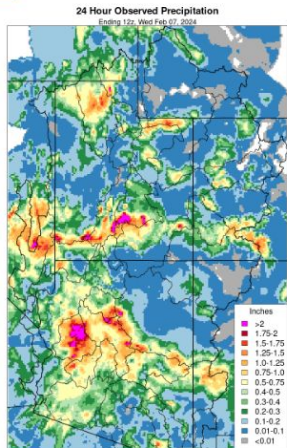
UTAH			
	Jan1	Feb1	Change
Bear	68	92	24
Weber	58	86	28
Six Creeks	72	90	18
Provo/Utah Lake	50	85	35
Duchesne	42	70	28
Price/San Rafael	54	95	41
Sevier	44	81	35
Virgin	11	43	32

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

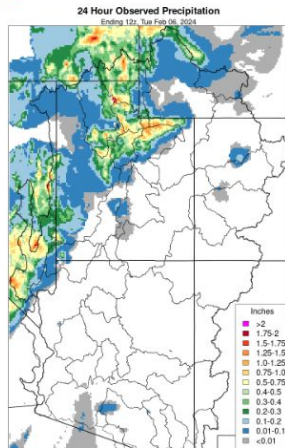


# February Observed Precipitation/Snow

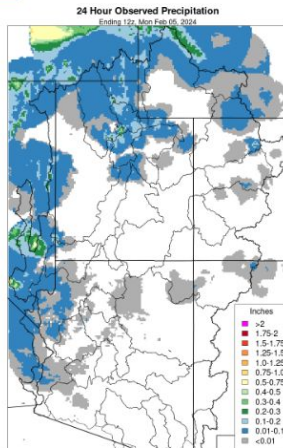
07



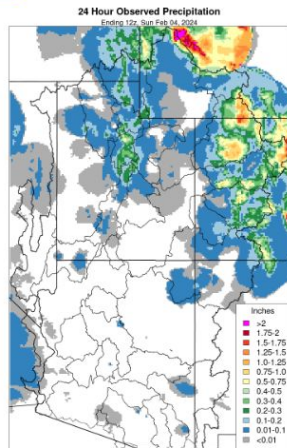
06



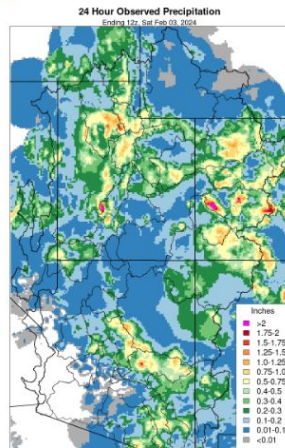
05



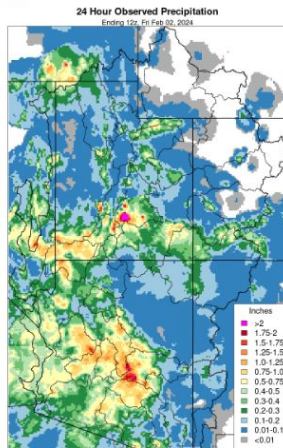
04



03



02



Inches

- >2
- 1.75-2
- 1.5-1.75
- 1.25-1.5
- 1.0-1.25
- 0.75-1.0
- 0.5-0.75
- 0.4-0.5
- 0.3-0.4
- 0.2-0.3
- 0.1-0.2
- 0.01-0.1
- <0.01

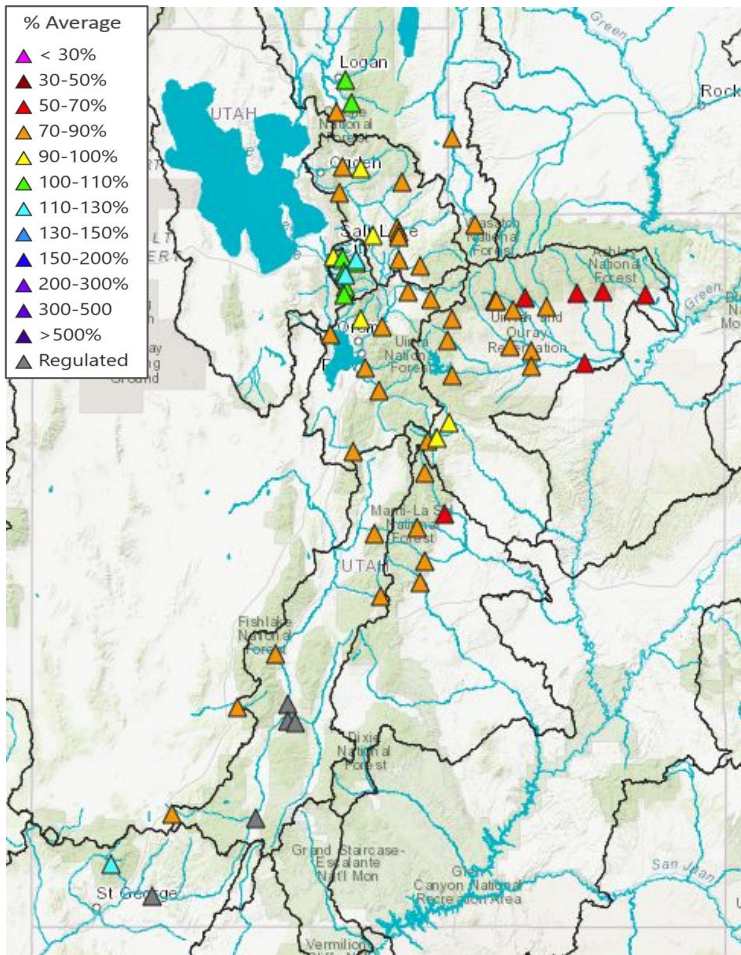
Continued active weather  
Additional snow accumulation

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

UTAH			
	Feb1	Feb6	Change
Bear	92	100	8
Weber	86	98	12
Six Creeks	90	101	11
Provo/Utah Lake	85	100	15
Duchesne	70	92	22
Price/San Rafael	95	104	9
Sevier	81	92	11
Virgin	43	68	25



# Utah Water Supply Forecasts: Overview



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

Forecasts are more favorable in areas that have:

- better soil moisture conditions
- better snowpack conditions

## Colorado Basin River Forecast Center Water Supply Forecasts February 1, 2024

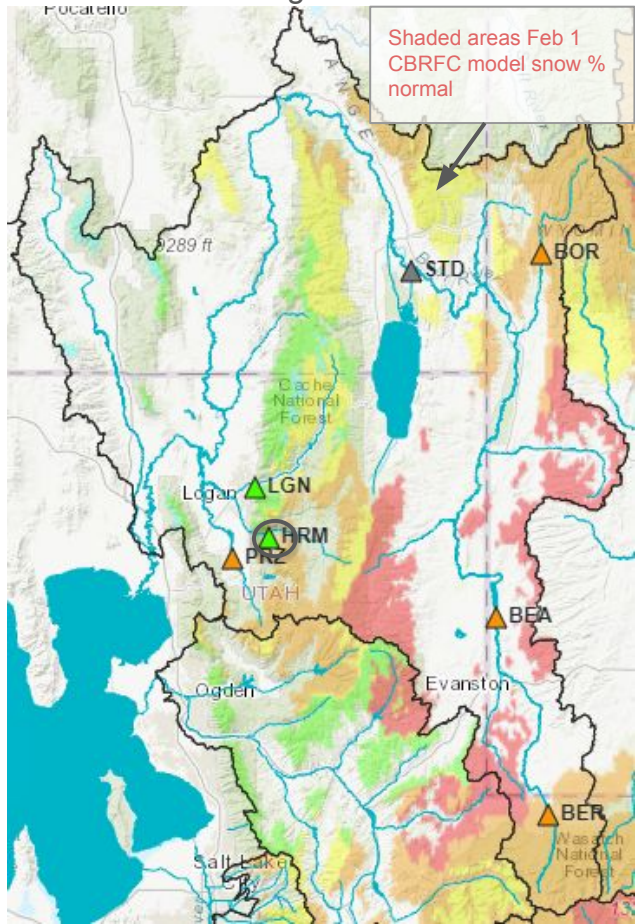
UTAH			
Basin	Volume (KAF)	%Normal (1991-2020)	Period
Bear-UT/WY State Line	98	90	Apr-Jul
Weber-Oakley	97	87	Apr-Jul
Big Cottonwood Creek	36	106	Apr-Jul
Provo-Woodland	86	90	Apr-Jul
Duchesne-Tabiona	80	78	Apr-Jul
Sevier-Hatch (*Regulated)	37	77	Apr-Jul
Virgin-Virgin (*Regulated)	63	112	Apr-Jul

KAF = thousand acre-feet

# Bear River Basin

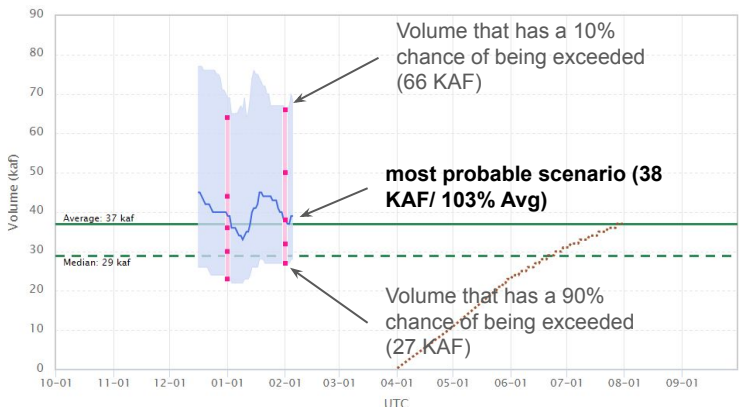
Forecast Range: 80-105%

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

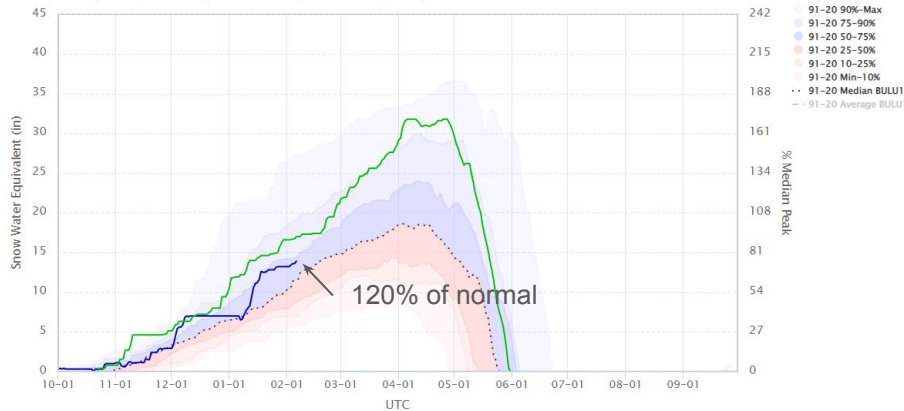


2024 Water Supply Forecast – Blacksmith Fork – Hyrum, Nr, Upnl Dam, Abv (HRMU1)

ESP is Unregulated and No Precipitation Forecast Included  
 Official 50% Fcst (2024-02-01): 38 kaf (103% Avg, 131% Med), (46% of Yrs Below Fcst, 58 Highest Flow / 106 Tot Yrs)  
 ESP 50% Fcst (2024-02-05): 39 kaf (104% Avg, 133% Med), (48% of Yrs Below Fcst, 56 Highest Flow / 106 Tot Yrs)  
 No Observed



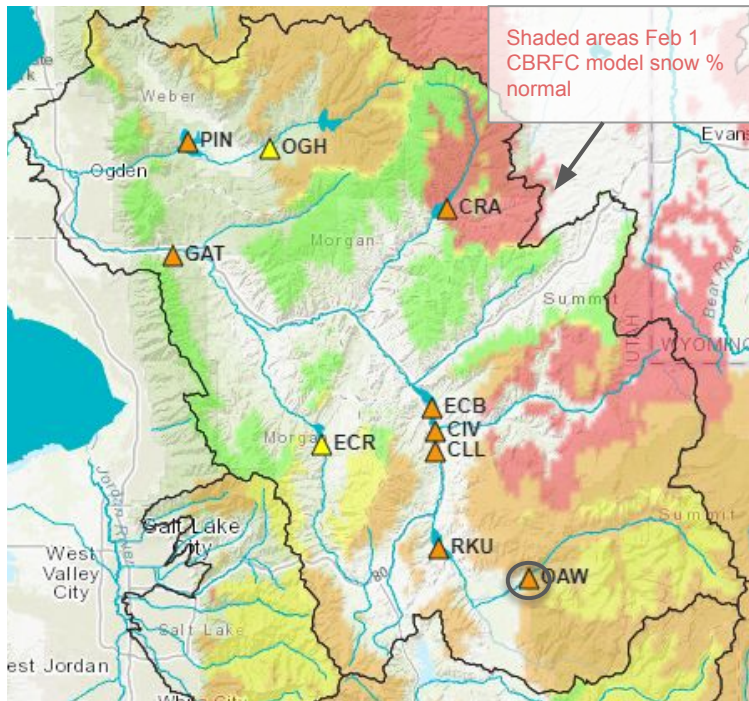
SNOTEL Plot – Bug Lake (BULU1) – 7950 ft  
 Ob (02-06): 13.90 in, 120% Med – Rate (in/dy): 0.10 (3-day), 0.23 (week)  
 Percentile: 69, Wet Rank: 14, Dry Rank: 33, Tot Yrs: 46  
 Peak (02-06): 13.90 in (75.00% Med Pk) – Med Peak (04-03): 18.60 in





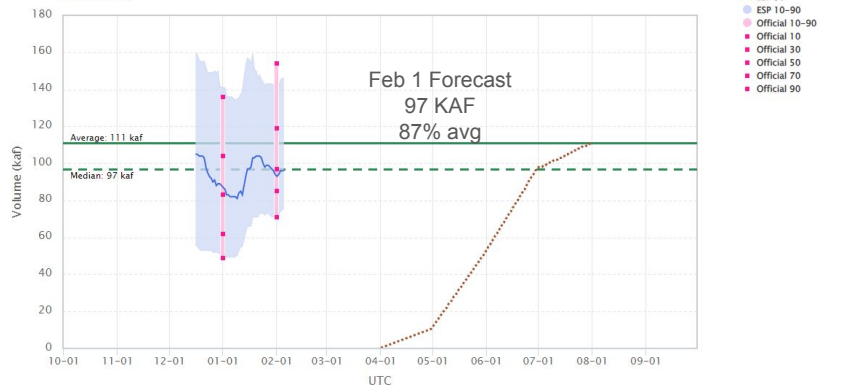
# Weber River Basin

Forecast Range: 80-95%



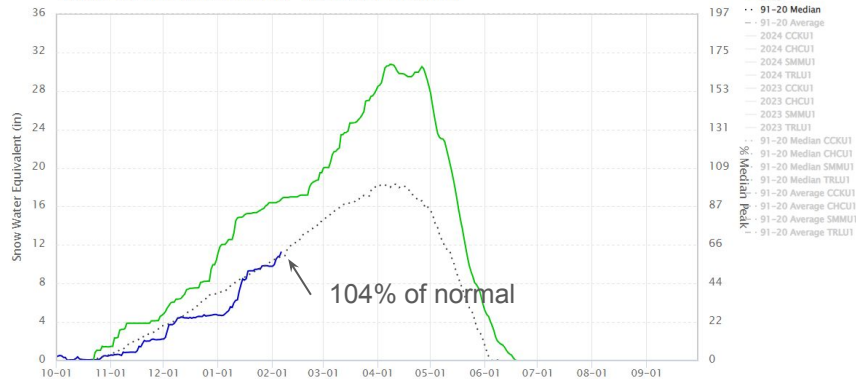
## 2024 Water Supply Forecast – Weber – Oakley, Nr (OAWU1)

ESP is Unregulated and No Precipitation Forecast Included  
 Official 50% Fcst (2024-02-01): 97 kaf (87% Avg, 100% Med), (33% of Yrs Below Fcst, 80 Highest Flow / 119 Tot Yrs)  
 ESP 50% Fcst (2024-02-05): 96 kaf (86% Avg, 99% Med), (31% of Yrs Below Fcst, 82 Highest Flow / 119 Tot Yrs)  
 No Observed



## Weber Basin Headwaters – Group SNOTEL Plot

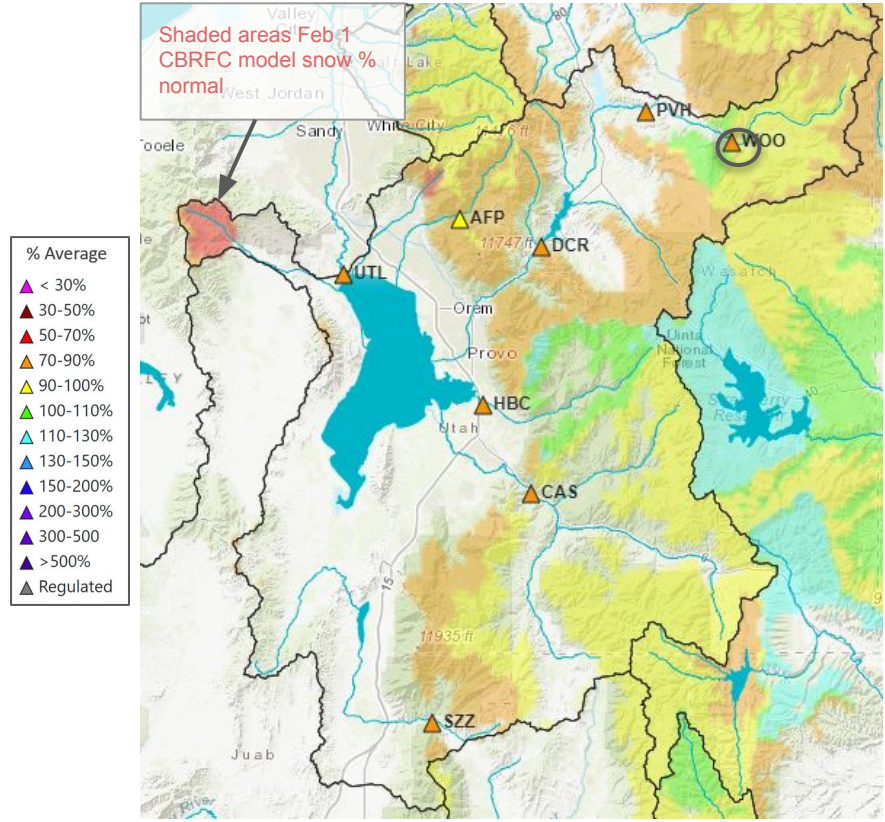
CCKU1,CHCU1,SMMU1,TRLU1  
 Ob (02-06): 11.32 in, 104% Med – Rate (in/dy): 0.18 (3-day), 0.51 (week)  
 Peak (02-06): 11.32 in (62.00% Med Pk) – Med Peak (04-11): 18.31 in





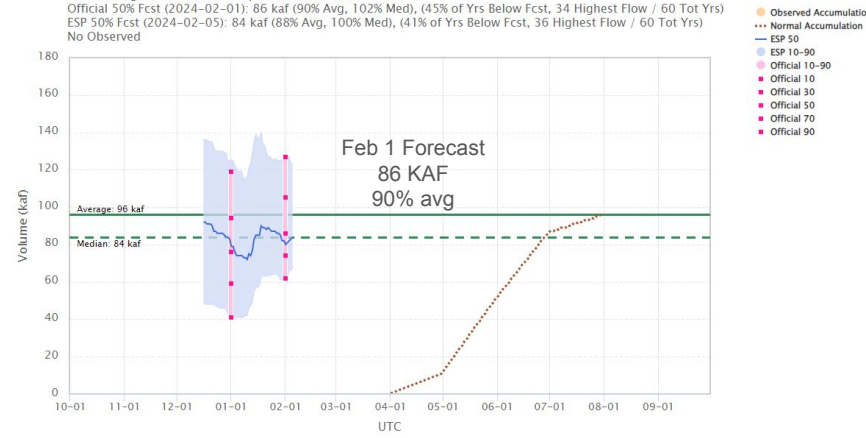
# Provo River Basin

Forecast Range: 70-95%



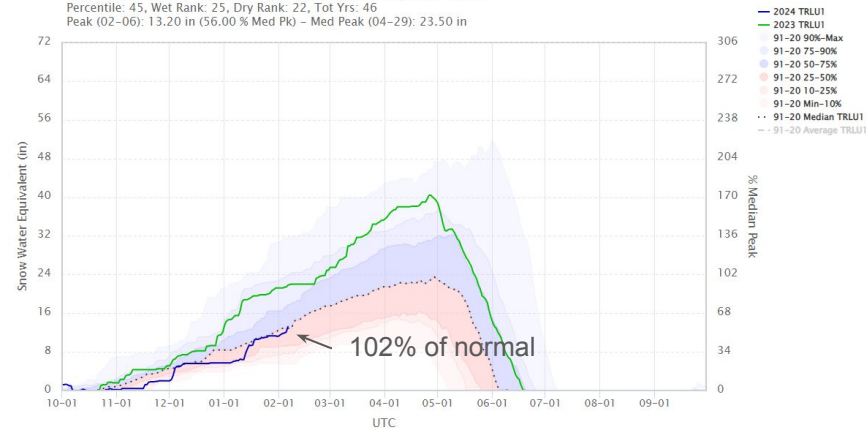
## 2024 Water Supply Forecast – Provo – Woodland, Nr (WOOU1)

ESP is Unregulated and No Precipitation Forecast Included  
 Official 50% Fcst (2024-02-01): 86 kaf (90% Avg, 102% Med), (45% of Yrs Below Fcst, 34 Highest Flow / 60 Tot Yrs)  
 ESP 50% Fcst (2024-02-05): 84 kaf (88% Avg, 100% Med), (41% of Yrs Below Fcst, 36 Highest Flow / 60 Tot Yrs)  
 No Observed



## SNOTEL Plot – Trial Lake (TRLU1) – 9992 ft

Ob (02-06): 13.20 in, 102% Med – Rate (in/dy): 0.43 (3-day), 0.67 (week)  
 Percentile: 45, Wet Rank: 25, Dry Rank: 22, Tot Yrs: 46  
 Peak (02-06): 13.20 in (56.00% Med Pk) – Med Peak (04-29): 23.50 in

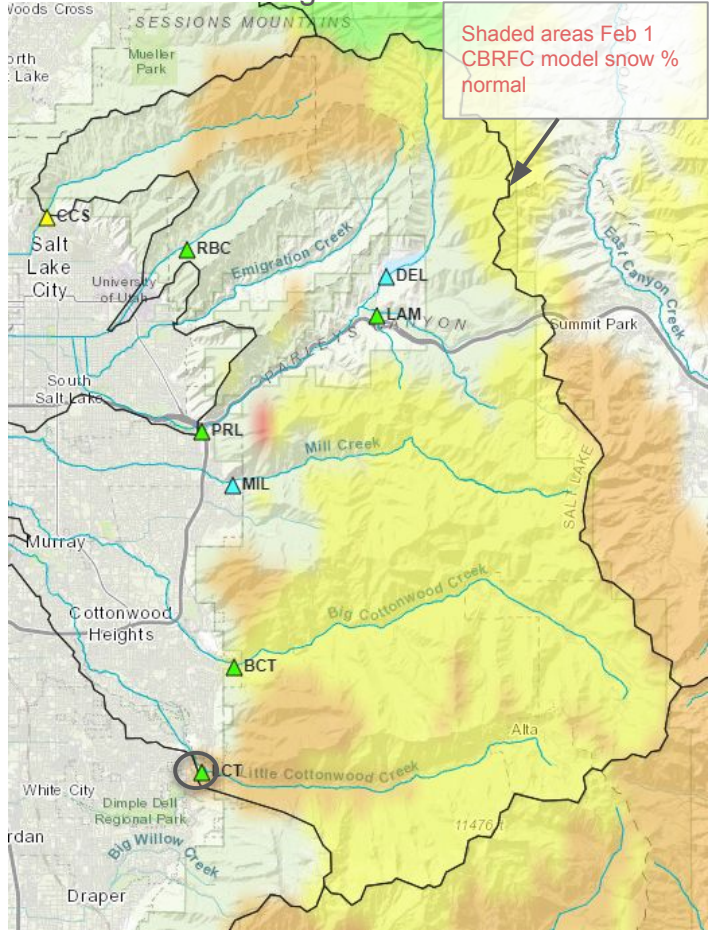


# Six Creeks Basin

Forecast Range: 100-110%

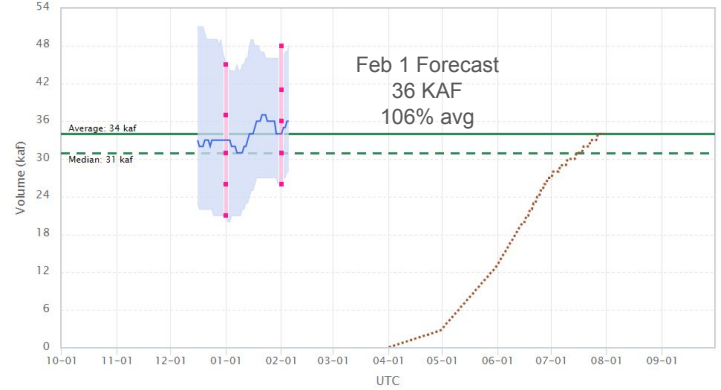
Shaded areas Feb 1  
CBRFC model snow %  
normal

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



2024 Water Supply Forecast – Little Cottonwood Ck – Salt Lake City, Nr (LCTU1)

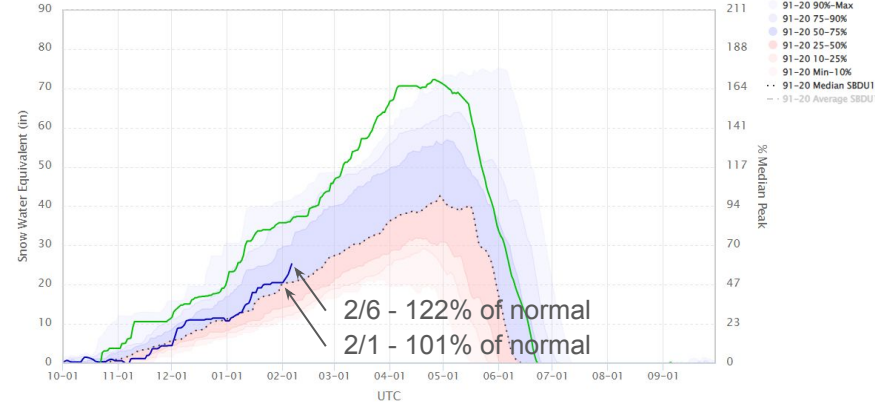
ESP is Unregulated and No Precipitation Forecast Included  
 Official 50% Fcst (2024-02-01): 36 kaf (106% Avg, 116% Med), (53% of Yrs Below Fcst, 31 Highest Flow / 64 Tot Yrs)  
 ESP 50% Fcst (2024-02-05): 36 kaf (105% Avg, 113% Med), (53% of Yrs Below Fcst, 31 Highest Flow / 64 Tot Yrs)  
 No Observed



- Observed Accumulation
- Normal Accumulation
- ESP 50
- ESP 10-90
- Official 10-90
- Official 10
- Official 30
- Official 50
- Official 70
- Official 90

SNOTEL Plot – Snowbird (SBDU1) – 9177 ft

Ob (02-06): 25.30 in, 1.22% Med – Rate (in/dy): 0.90 (3-day), 1.60 (week)  
 Percentile: 57, Wet Rank: 15, Dry Rank: 21, Tot Yrs: 35  
 Peak (02-06): 25.30 in (59.00 % Med Pk) – Med Peak (04-29): 42.60 in

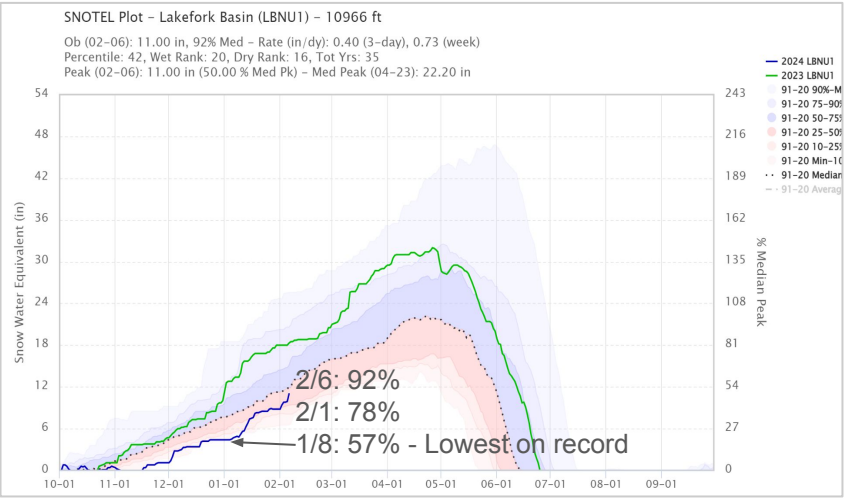
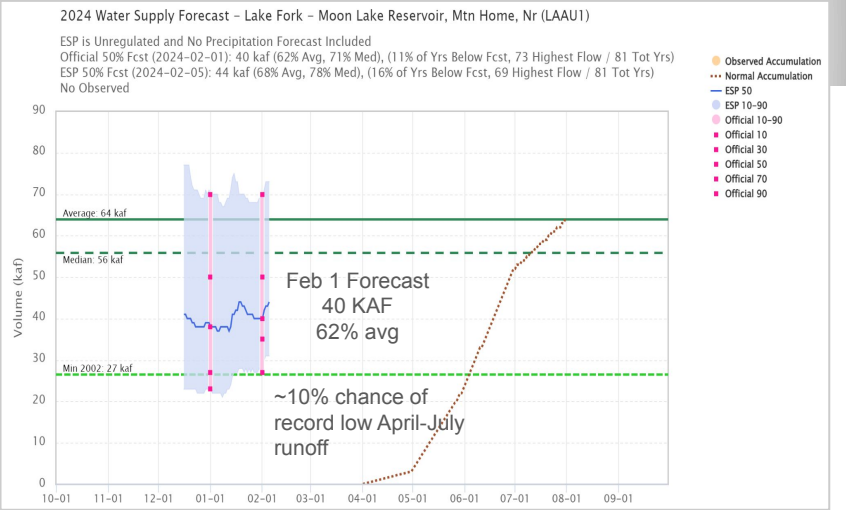
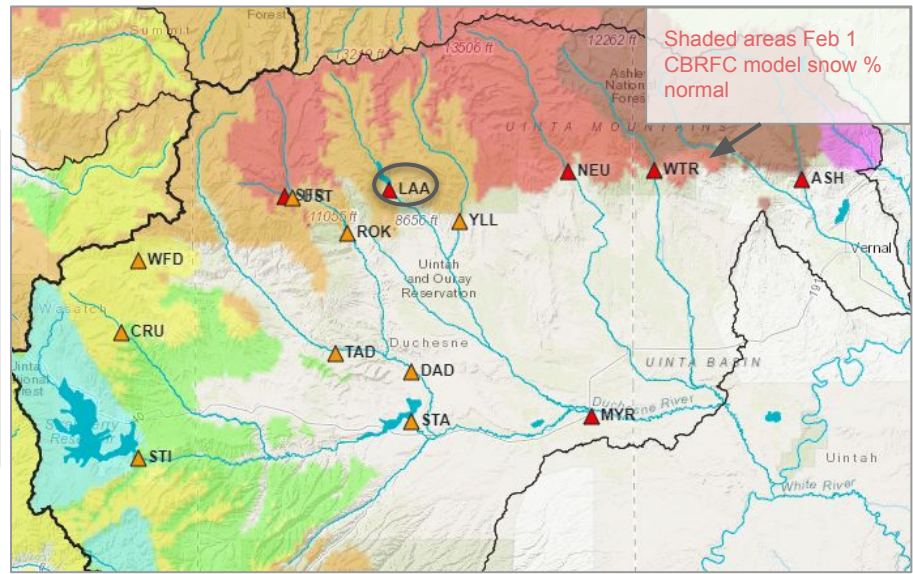


- 2024 SBDU1
- 2023 SBDU1
- 91-20 90%-Max
- 91-20 75-90%
- 91-20 50-75%
- 91-20 25-50%
- 91-20 10-25%
- 91-20 Min-10%
- 91-20 Median SBDU1
- 91-20 Average SBDU1

# Duchesne River Basin

Forecast Range: 55-80%

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

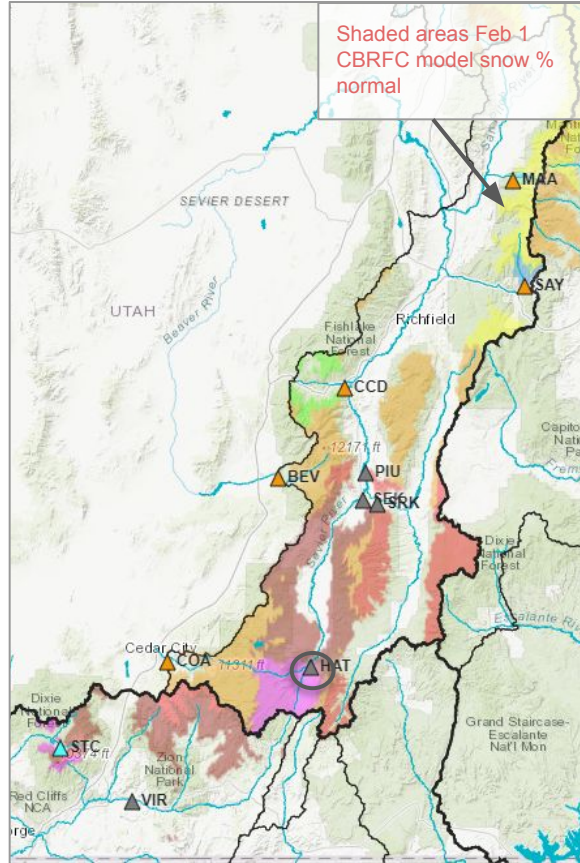




# Virgin and Sevier River Basins

Forecast Range: 60-115%

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

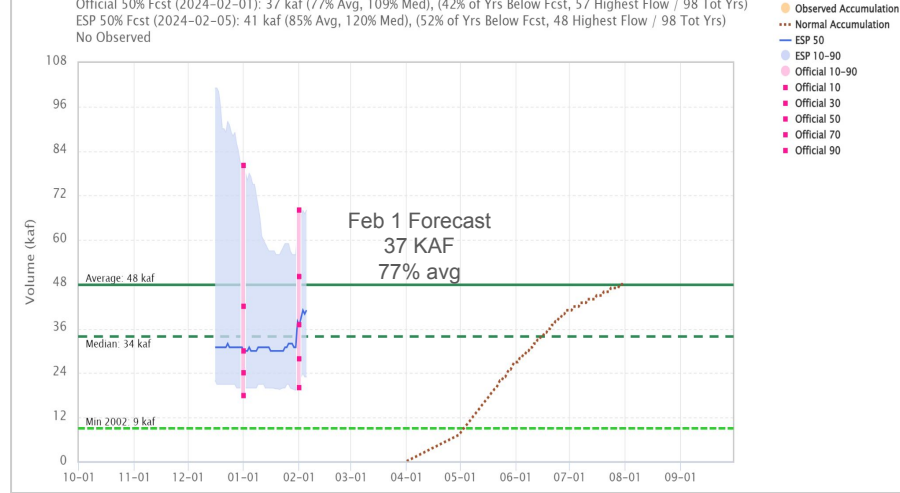


\*Regulated Forecasts

Shaded areas Feb 1  
CBRFC model snow %  
normal

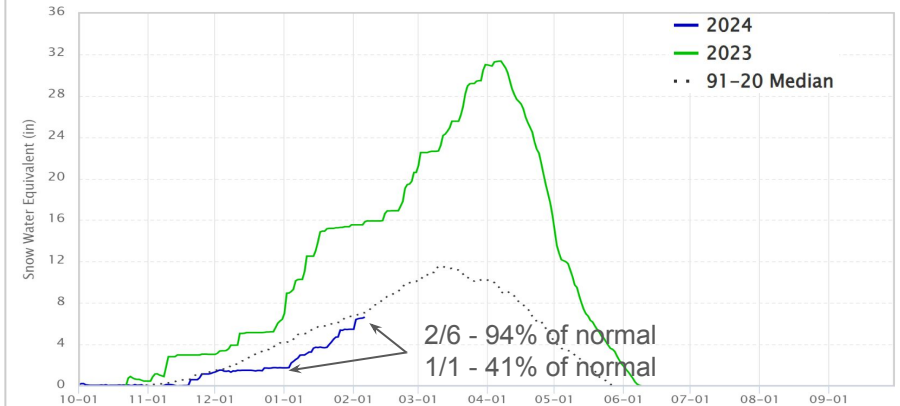
## 2024 Water Supply Forecast – Sevier – Hatch (HATU1)

ESP is Regulated and No Precipitation Forecast Included  
 Official 50% Fcst (2024-02-01): 37 kaf (77% Avg, 109% Med), (42% of Yrs Below Fcst, 57 Highest Flow / 98 Tot Yrs)  
 ESP 50% Fcst (2024-02-05): 41 kaf (85% Avg, 120% Med), (52% of Yrs Below Fcst, 48 Highest Flow / 98 Tot Yrs)  
 No Observed



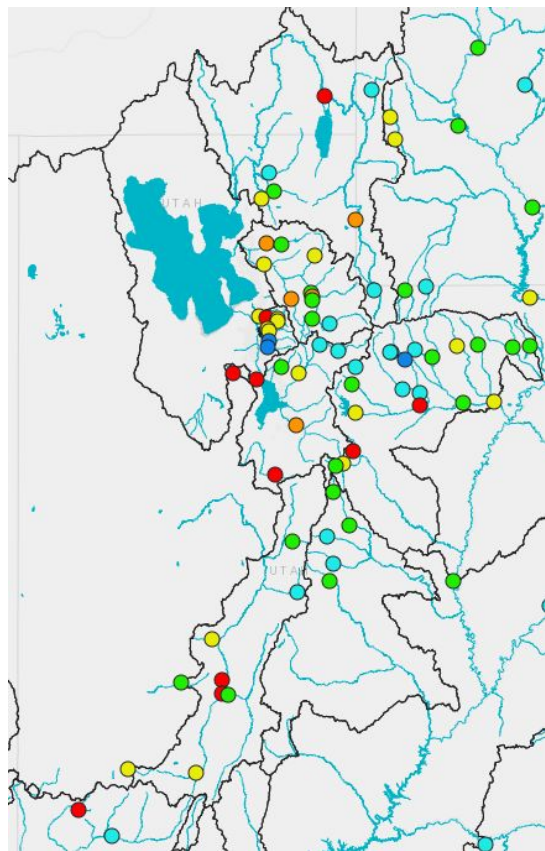
## Sevier River Basin Headwaters – Group SNOTEL Plot

CVYU1\_HRSU1\_LVJU1\_MDVU1\_WFLU1  
 Ob (02-06): 6.64 in, 94% Med – Rate (in/dy): 0.04 (3-day), 0.39 (week)  
 Peak (02-06): 6.64 in (57.00% Med Pk) – Med Peak (03-10): 11.55 in



# Historical Forecast Verification

## February Forecast Error: April-July Volume



### Percent Error

- No Data
- < 5%
- 5 - 10%
- 10 - 15%
- 15 - 20%
- 20 - 25%
- 25 - 30%
- 30 - 35%
- 35 - 40%
- > 40%

### Location

BEAR - UTAH-WYOMING STATE  
BEAR - WOODRUFF NARROWS  
LOGAN - LOGAN- NR  
WEBER - OAKLEY- NR  
WEBER - ROCKPORT RES  
BIG COTTONWOOD CK  
PROVO - WOODLAND- NR  
PROVO - DEER CK RES  
VIRGIN - VIRGIN

### Average Feb 1 Forecast Error

22%  
39%  
23%  
21%  
26%  
19%  
22%  
31%  
22%

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

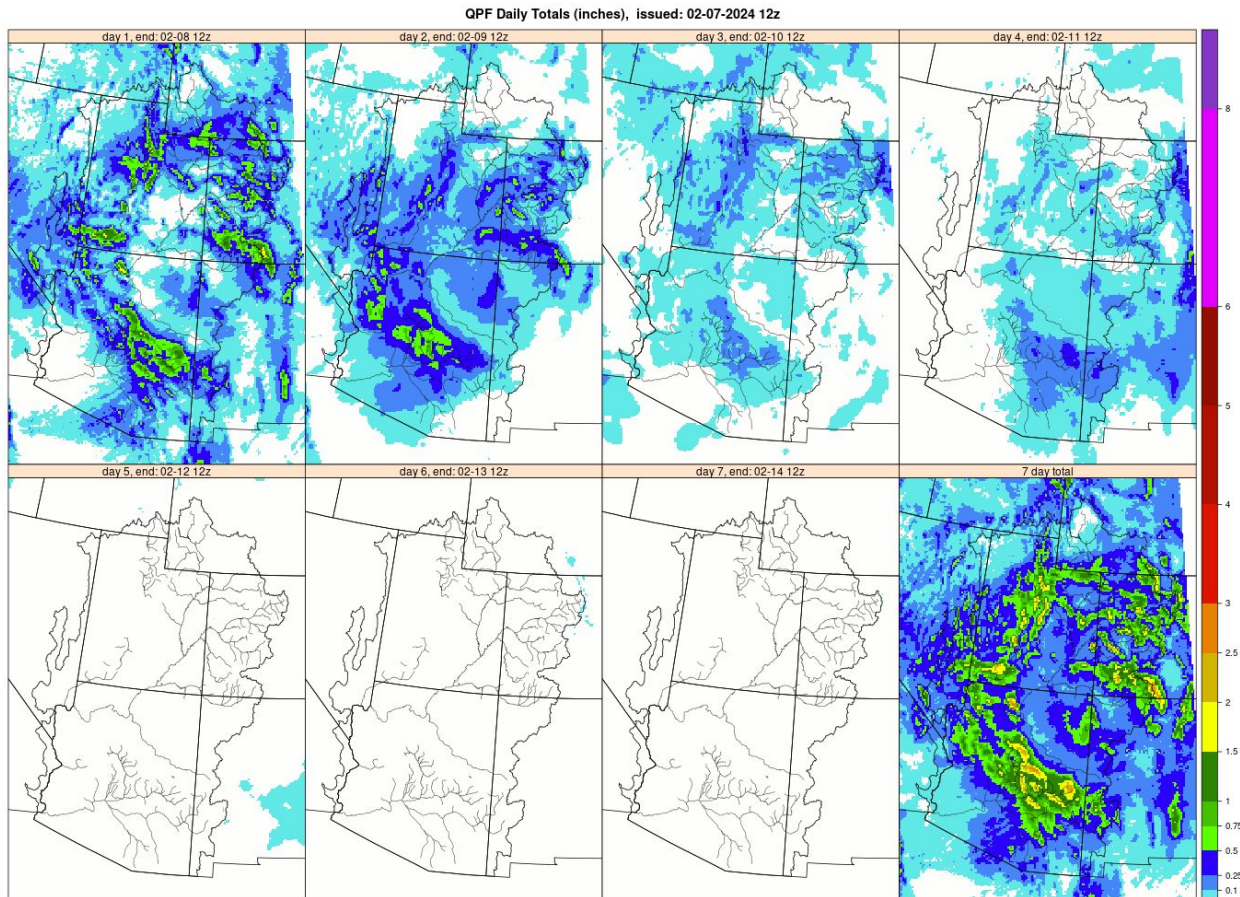
Future weather is the primary source of early season water supply forecast error/uncertainty.

# Upcoming Weather: 7-Day Precipitation Forecast

Active weather will continue this week with daily chances of precipitation through Saturday

1-2" of precipitation with locally higher amounts possible

Drier conditions expected next week





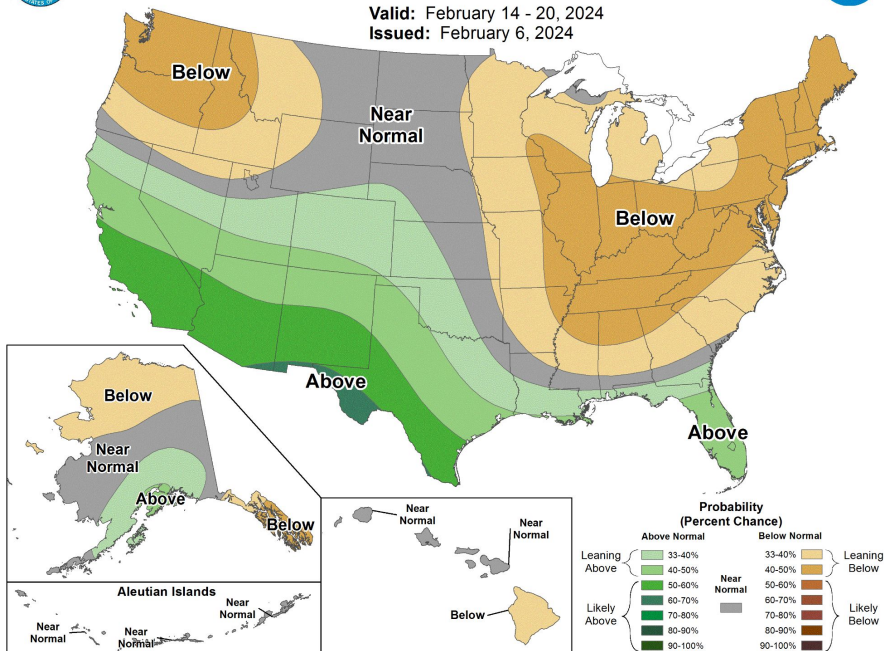
# Upcoming Weather: 8-14 Day Outlook (February 14-20)

Increased chances of above average precipitation except for far northern basins  
 Increased chances of below average temperatures basin wide



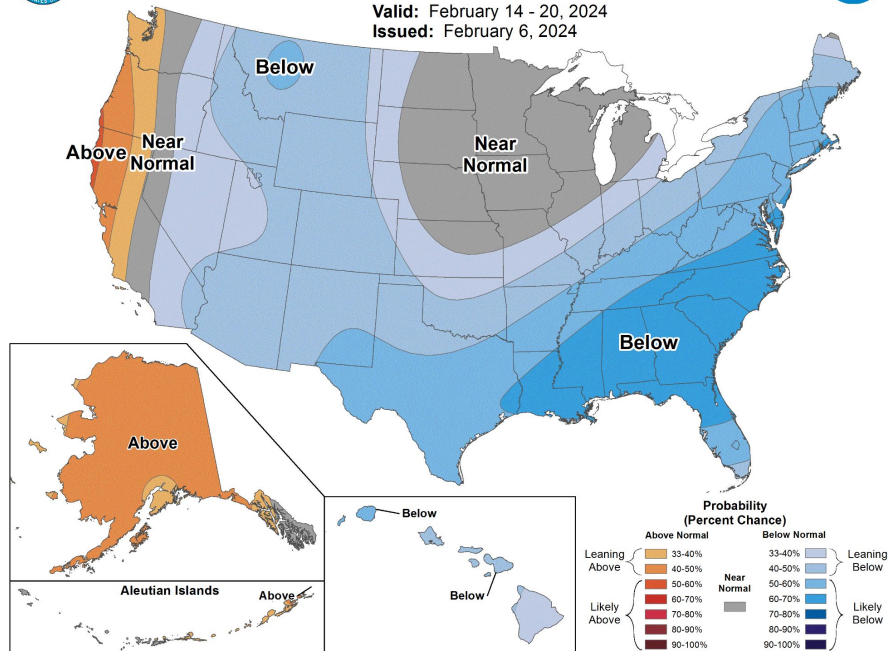
## 8-14 Day Precipitation Outlook

Valid: February 14 - 20, 2024  
 Issued: February 6, 2024



## 8-14 Day Temperature Outlook

Valid: February 14 - 20, 2024  
 Issued: February 6, 2024



# Summary

- Soil Moisture:
  - Near to above normal
  - Better conditions than last year
- Snow (Feb 6):
  - Most basins slightly above normal to slightly below normal (92%-104%)
  - Below normal: Virgin (68%)
- February 1 Water Supply Forecasts
  - Improvement from January 1
  - Generally below normal
- Weather forecast
  - Active weather will continue this week

<b>Watershed</b>	<b>Forecast Feb 2024 Median</b>	<b>Forecast Jan 2024 Median</b>
Bear River Basin	84%	80%
Weber River Basin	87%	74%
Six Creeks Basin	107%	92%
Provo River Basin	88%	75%
Duchesne River Basin	73%	62%
Virgin and Sevier River Basins	83%	68%

# 2024 Water Supply Webinar Schedule

*\*All Times Mountain Time (MT)*

## Colorado River Basin

Monday	<del>Jan 9<sup>th</sup></del>	<del>10 am</del>
Tuesday	<del>Feb 7<sup>th</sup></del>	<del>10 am</del>
Tuesday	Mar 7 <sup>th</sup>	10 am
Friday	Apr 7 <sup>th</sup>	10 am
Friday	May 5 <sup>th</sup>	10 am

## Utah/Great Basin

Monday	<del>Jan 9<sup>th</sup></del>	<del>11:30 am</del>
Tuesday	Feb 7 <sup>th</sup>	11:30 am
Tuesday	Mar 7 <sup>th</sup>	11:30 am
Friday	Apr 7 <sup>th</sup>	11:30 am
Friday	May 5 <sup>th</sup>	11:30 am

Peak flow forecast webinar Monday, March 20<sup>th</sup>, 10 am MT

Additional briefings scheduled as needed

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



# CBRFC Webinar Registration & Email List



Home Rivers ▾ Snow ▾ Water Supply ▾ Reservoirs ▾ Weather ▾ Climate ▾ Help ▾ About ▾ **News ▾**

[cbrfc.noaa.gov](http://cbrfc.noaa.gov)

Webinars

Email Updates

## CBRFC Water Supply Forecast Webinar Schedule & Registration - Water Year 2024

The Colorado Basin River Forecast Center (CBRFC) produces water supply forecasts for the Colorado River Basin and the eastern Great Basin. CBRFC conducts December through May webinars explaining the forecasts and current conditions.

Follow the links below to register for a webinar.

### Early Season Water Supply Outlook Webinar

- [Wednesday December 13 @ 10:00 am MT](#)

### Colorado River Basin Water Supply Webinars

- [Monday January 8 @ 10:00 am MT](#)
- [Wednesday February 7 @ 10:00 am MT](#)
- [Thursday March 7 @ 10:00 am MT](#)
- [Friday April 5 @ 10:00 am MT](#)
- [Tuesday May 7 @ 10:00 am MT](#)

### Utah Water Supply Webinars

- [Monday January 8 @ 11:30 am MT](#)
- [Wednesday February 7 @ 11:30 am MT](#)
- [Thursday March 7 @ 11:30 am MT](#)
- [Friday April 5 @ 11:30 am MT](#)
- [Tuesday May 7 @ 11:30 am MT](#)

### Peak Flow Webinar

- [Wednesday March 20 @ 10:00 am MT](#)

A notification email will be sent if a date or time change occurs. Additional webinars are scheduled as needed. The webinar slides will be available on the [CBRFC presentations page](#) soon after each briefing.

## Email Updates

### Available Email Lists

- General Stakeholders
- Water Supply: Green River Basin Forecasts
- Water Supply: Upper Colorado Mainstem Forecasts
- Water Supply: San Juan, Gunnison and Dolores River Basins Forecasts
- Water Supply: Eastern Great Basin Forecasts
- Special forecasts for the Dolores River Basin
- Special forecasts for the San Juan River Basin
- Special forecasts for CUWCD
- Upper Basin Reclamation Reservoirs
- Utah Reservoir Forecasts

### Addition Requests

- [Request](#) to be on one of our lists by emailing [cbrfc.webmasters@noaa.gov](mailto:cbrfc.webmasters@noaa.gov)

# CBRFC Contacts & Water Year 2024 Basin Focal Points

## **Basin Focal Points (Forecasters)**

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