

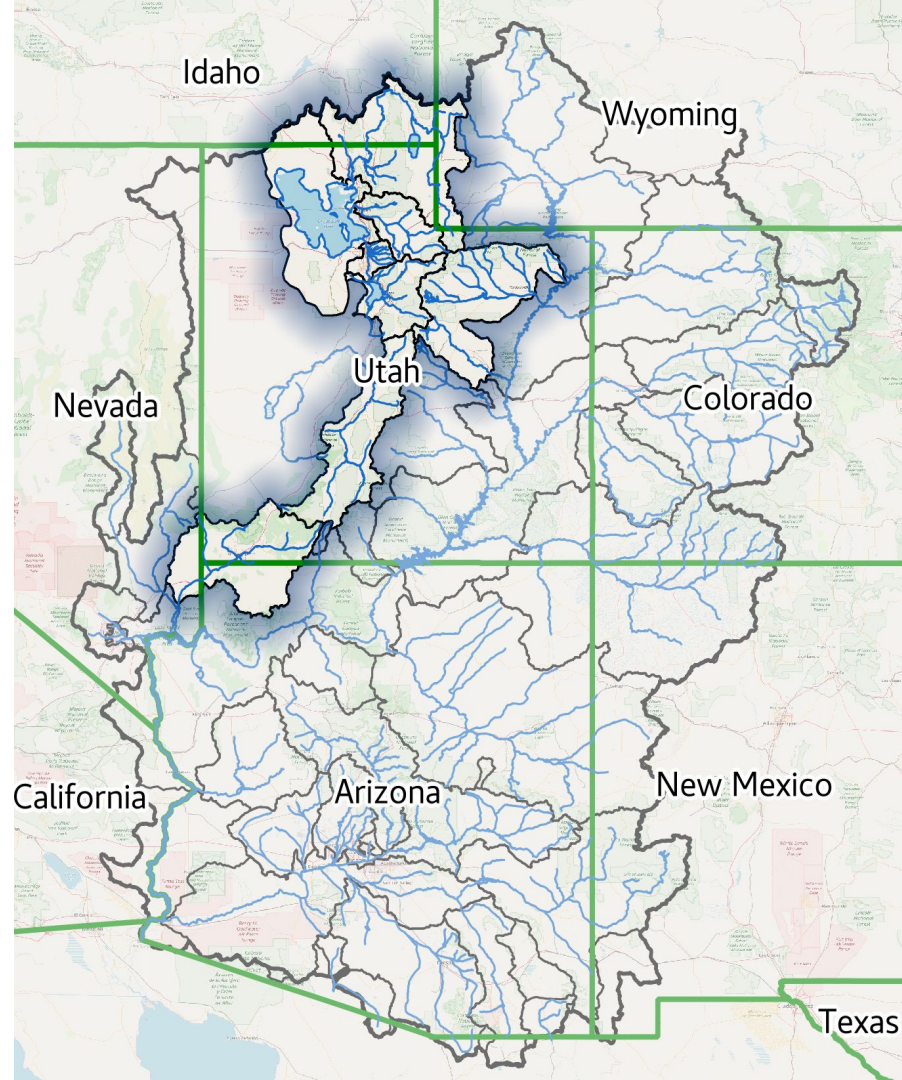
Utah Water Supply Briefing

Colorado Basin River Forecast Center

April 5, 2024

Presenter: Trevor Grout

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



Presentation Overview

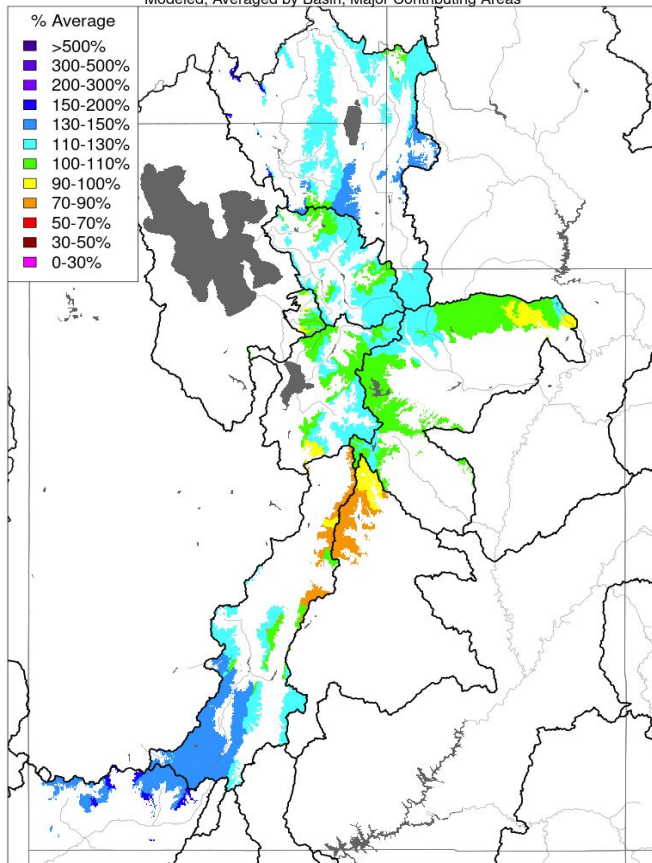
- Model Soil Moisture Conditions
- Precipitation Review
- Model Snow Conditions
- 2024 Water Supply Forecasts
- Forecast Error
- Upcoming Weather
- Contacts & Questions

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

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)

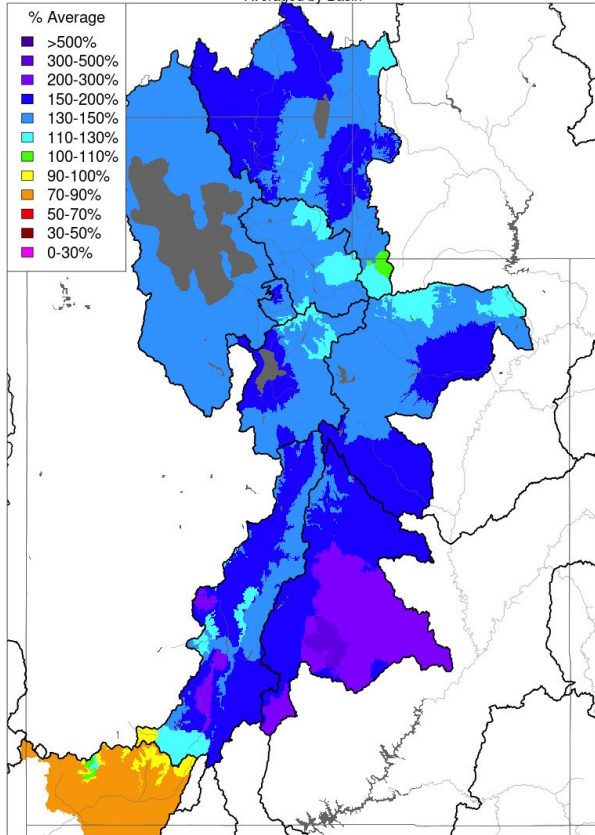
Great Basin / Utah: near to above normal

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

March 2024 Precipitation Summary

Monthly Precipitation - March 2024

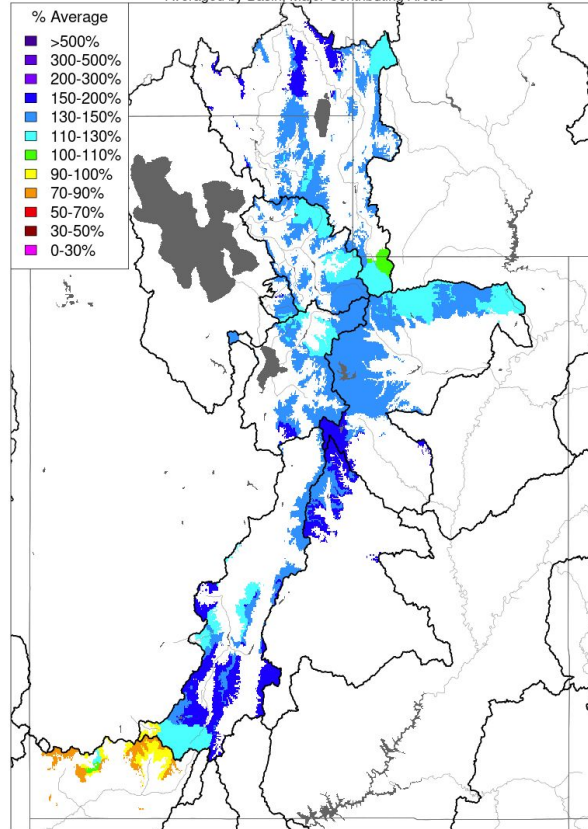
Averaged by Basin



Prepared by NOAA, Colorado Basin River Forecast Center
Salt Lake City, Utah, www.cbrfc.noaa.gov

Monthly Precipitation - March 2024

Averaged by Basin, Major Contributing Areas



Prepared by NOAA, Colorado Basin River Forecast Center
Salt Lake City, Utah, www.cbrfc.noaa.gov

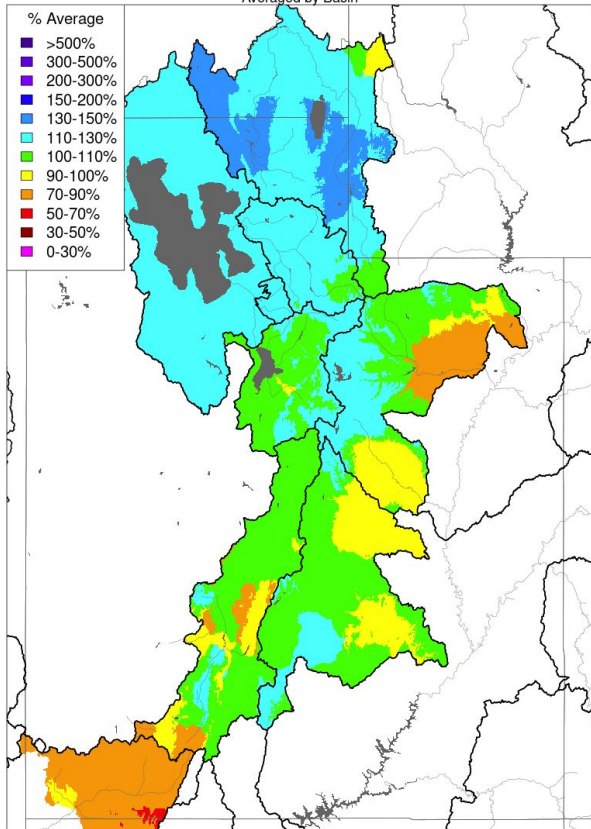
Like February, there was an active weather pattern in March which resulted in average to above average monthly precipitation across high elevation areas

Water Year 2024		
CBRFC Precipitation (Major Contributing Areas)		
Percent of 1991-2020 Average		
	UTAH	
	Mar	Oct-Mar
Bear	139	116
Weber	133	115
Six Creeks	137	118
Provo/Utah Lake	136	111
Duchesne	132	107
Price/San Rafael	157	113
Sevier	139	98
Virgin	97	86

Water Year 2024 Precipitation Summary

Water Year Precipitation, October 2023 - March 2024

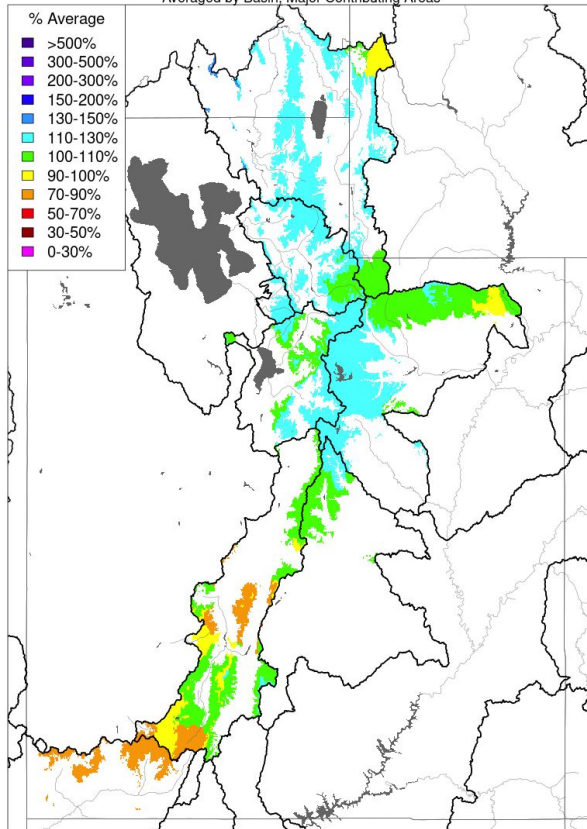
Averaged by Basin



Prepared by NOAA, Colorado Basin River Forecast Center
Salt Lake City, Utah, www.cbrfc.noaa.gov

Water Year Precipitation, October 2023 - March 2024

Averaged by Basin, Major Contributing Areas



Prepared by NOAA, Colorado Basin River Forecast Center
Salt Lake City, Utah, www.cbrfc.noaa.gov

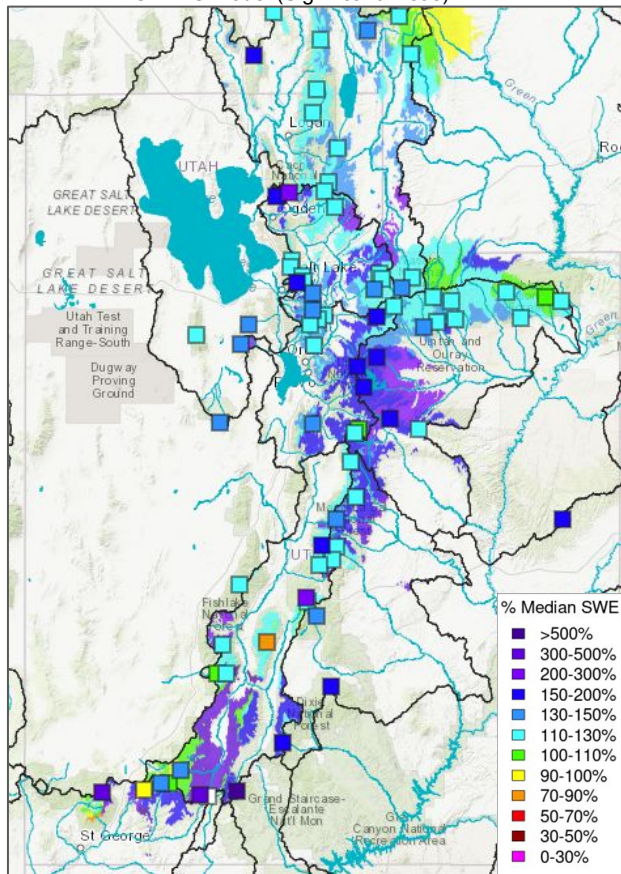
Water year 2024 precipitation
(October-March) ranges from slightly below
normal to above normal

Water Year 2024 CBRFC Precipitation (Major Contributing Areas) Percent of 1991-2020 Average		
	UTAH	
	Mar	Oct-Mar
Bear	139	116
Weber	133	115
Six Creeks	137	118
Provo/Utah Lake	136	111
Duchesne	132	107
Price/San Rafael	157	113
Sevier	139	98
Virgin	97	86

Snowpack Conditions

April 1 SWE Conditions

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



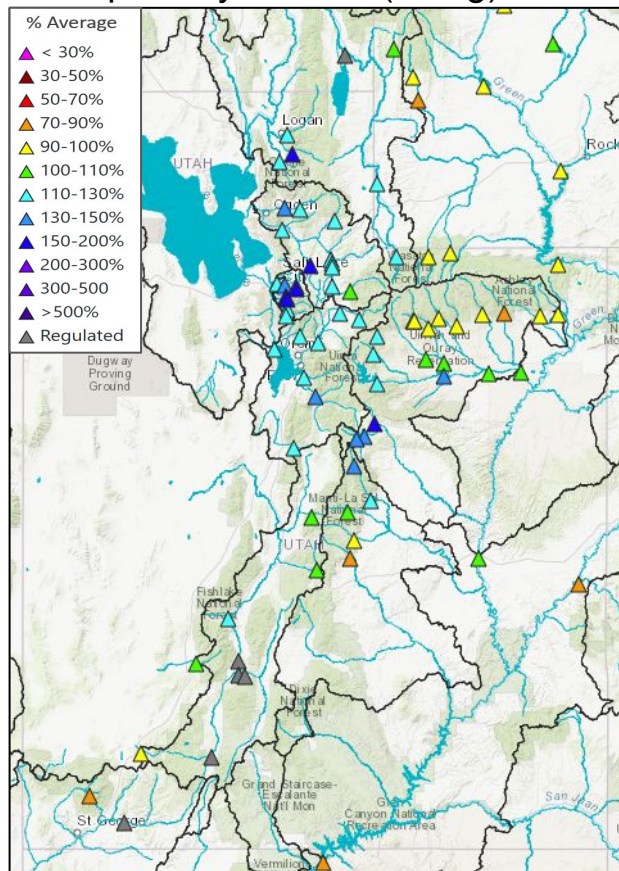
Utah river basins had improved SWE conditions during March with above average SWE on Apr 1.

Water Year 2024 CBRFC Model SWE (Major Contributing Areas) Percent of 1991-2020 Median			
	UTAH		
	Mar1	Apr1	Change
Bear	111	118	7
Weber	115	132	17
Six Creeks	113	134	21
Provo/Utah Lake	119	136	17
Duchesne	110	128	18
Price/San Rafael	116	150	34
Sevier	98	123*	25
Virgin	83	113*	30

SWE = Snow Water Equivalent. The amount of water in snow.
* Peak SWE normally in March for many locations

Utah Water Supply Forecasts: Overview

April 1 Forecast April-July Volume (%avg)



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

Forecasts are more favorable in areas that have:

- better soil moisture conditions
- better snowpack conditions

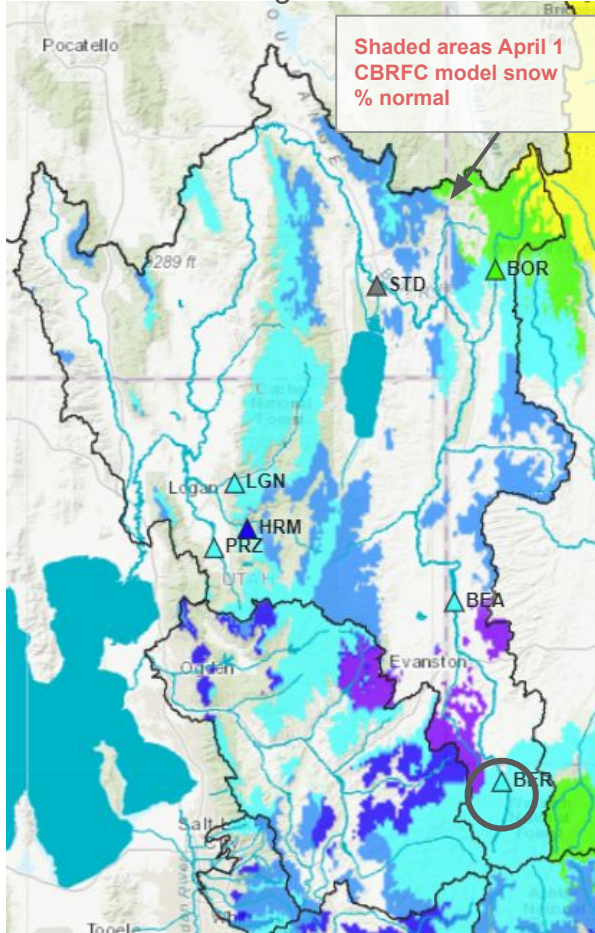
Colorado Basin River Forecast Center Water Supply Forecasts April 1, 2024

UTAH			
<u>Basin</u>	<u>Volume (KAF)</u>	<u>%Normal (1991-2020)</u>	<u>Period</u>
Bear-UT/WY State Line	120	110	Apr-Jul
Weber-Oakley	120	108	Apr-Jul
Big Cottonwood Creek	42	124	Apr-Jul
Provo-Woodland	110	115	Apr-Jul
Duchesne-Tabiona	110	107	Apr-Jul
Sevier-Hatch (*Regulated)	46	96	Apr-Jul
Virgin-Virgin (*Regulated)	55	98	Apr-Jul

KAF = thousand acre-feet

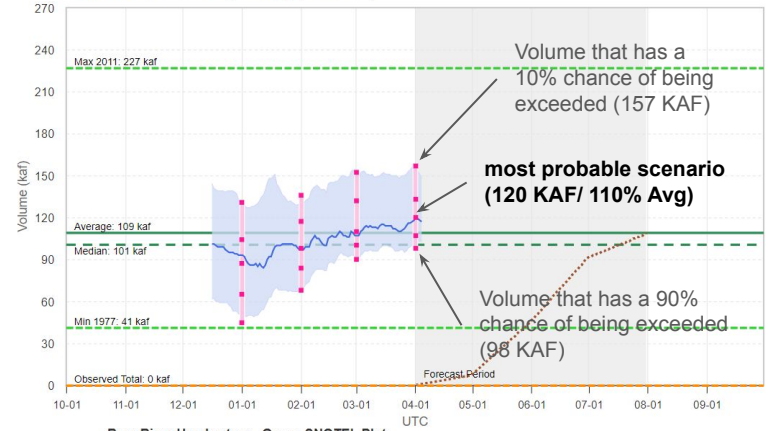
Bear River Basin

Forecast Range: 100% -150%



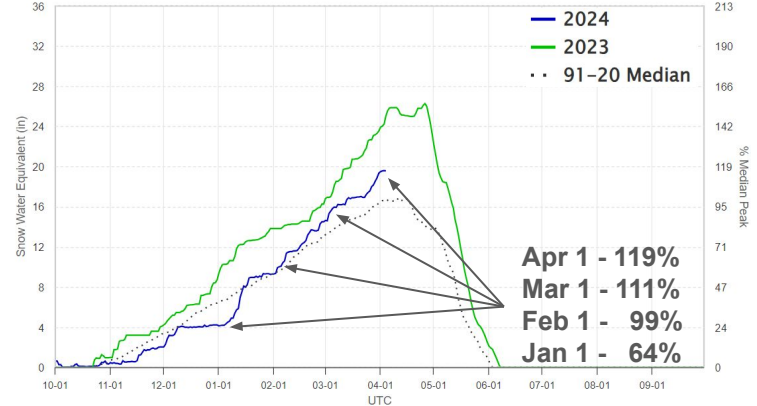
2024 Water Supply Forecast - Bear - Utah-Wyoming State Line, Nr (BERU1)

ESP is Unregulated and No Precipitation Forecast Included
 Official 50% Fcst (2024-04-01): 120 kaf (110% Avg, 119% Med), (62% of Yrs Below Fcst, 31 Highest Flow / 81 Tot Yrs)
 ESP 50% Fcst (2024-04-04): 117 kaf (107% Avg, 116% Med), (60% of Yrs Below Fcst, 33 Highest Flow / 81 Tot Yrs)
 Observed Volume: 0.23 kaf (0% Average, 0% Median)



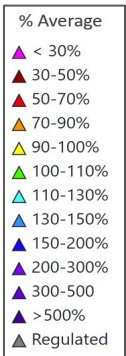
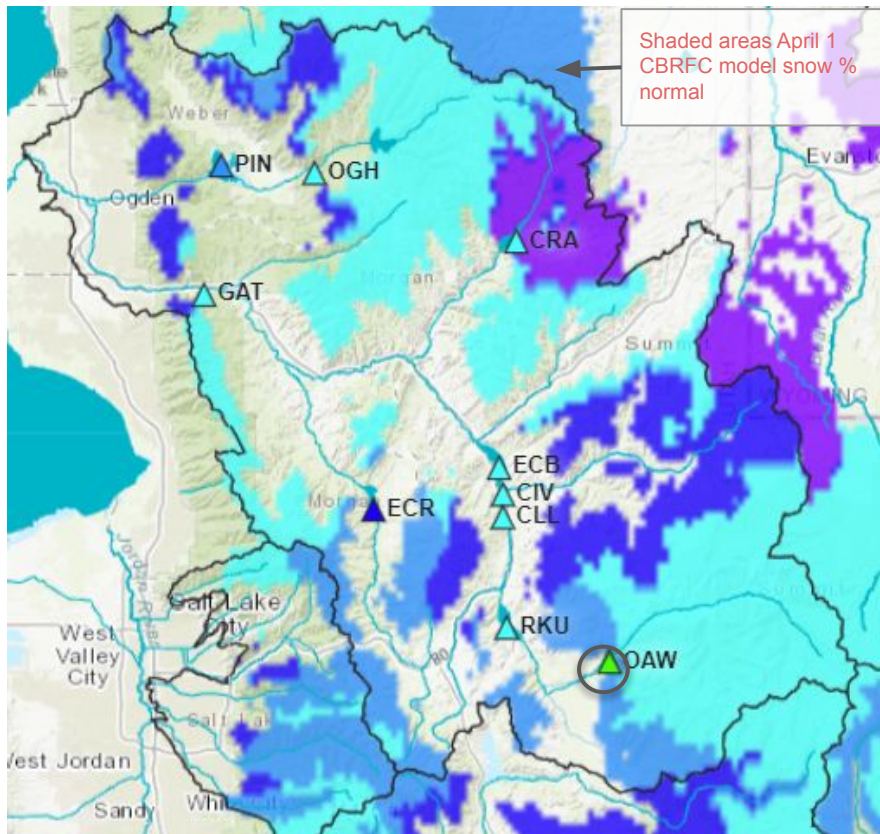
Bear River Headwaters - Group SNOTEL Plot

CHCU1_HFKU1_LLKU1
 Ob (04-04): 19.57 in, 116% Med - Rate (in/dy): 0.00 (3-day), 0.35 (week)
 Peak (04-03): 19.60 in (116.00 % Med Pk) - Med Peak (04-11): 16.87 in



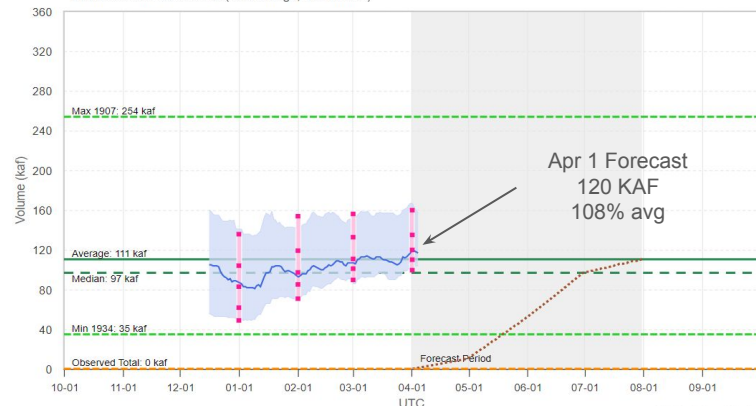
Weber River Basin

Forecast Range: 110% - 150%



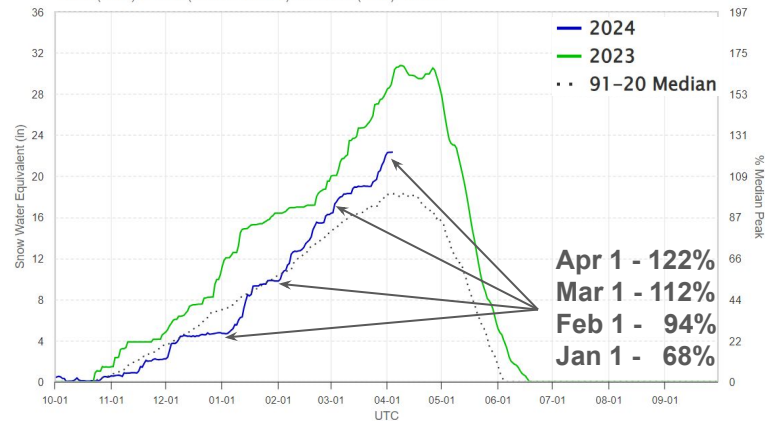
2024 Water Supply Forecast - Weber - Oakley, Nr (OAWU1)

ESP is Unregulated and No Precipitation Forecast Included
 Official 50% Fcst (2024-04-01): 120 kaf (108% Avg, 124% Med), (50% of Yrs Below Fcst, 60 Highest Flow / 119 Tot Yrs)
 ESP 50% Fcst (2024-04-04): 117 kaf (105% Avg, 120% Med), (47% of Yrs Below Fcst, 63 Highest Flow / 119 Tot Yrs)
 Observed Volume: 0.47 kaf (0% Average, 0% Median)



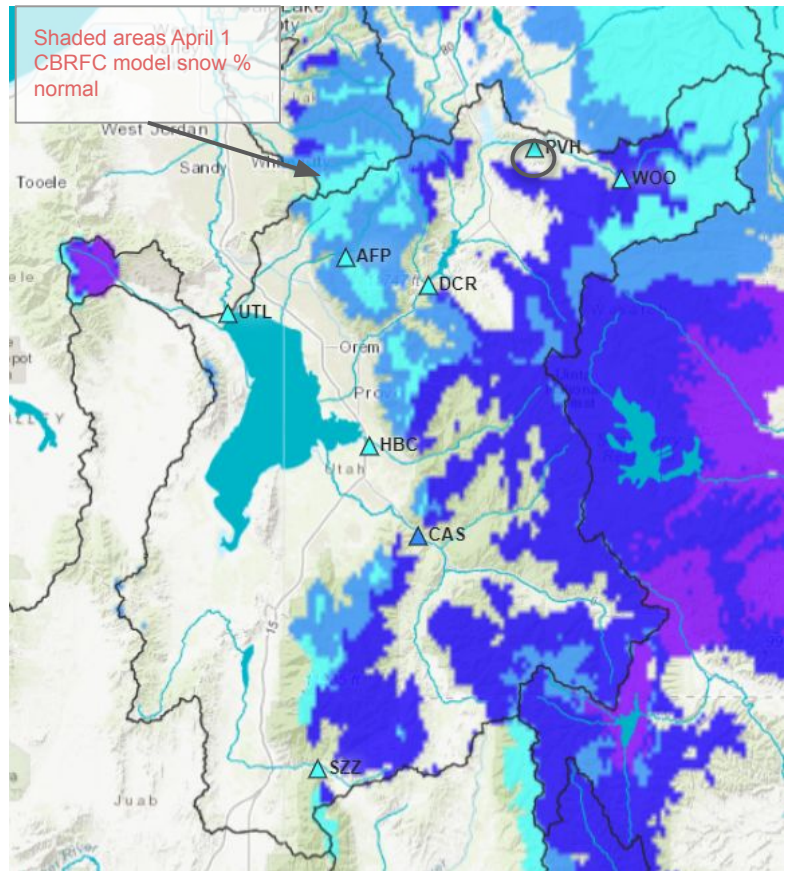
Weber Basin Headwaters - Group SNOTEL Plot

CCKU1,CHCU1,SMMU1,TRLU1
 Ob (04-04): 22.35 in, 122% Med - Rate (in/dy): 0.01 (3-day), 0.42 (week)
 Peak (04-04): 22.35 in (122.00 % Med Pk) - Med Peak (04-11): 18.31 in



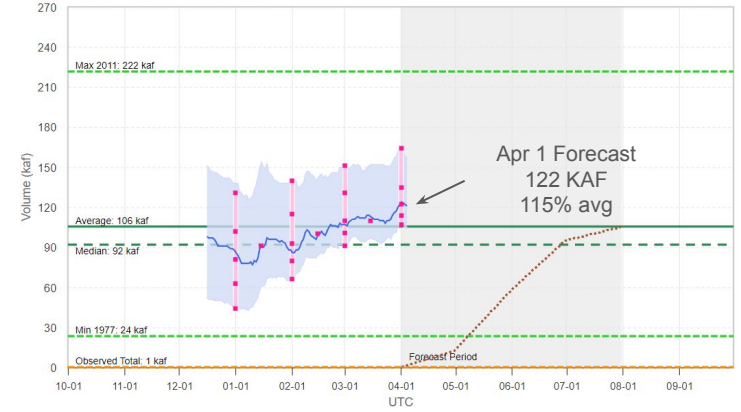
Provo River Basin

Forecast Range: 110% - 135%



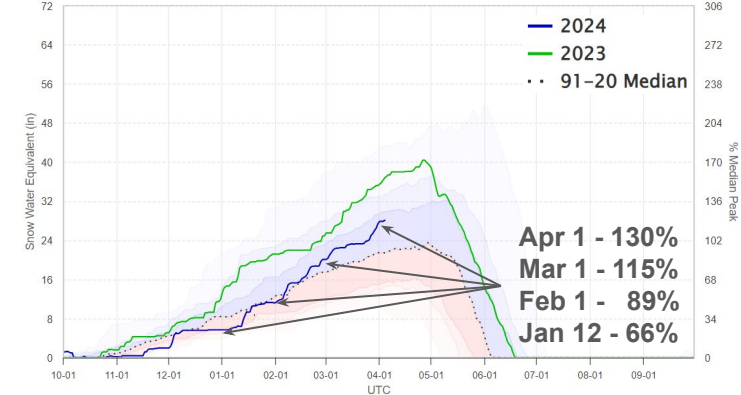
2024 Water Supply Forecast - Provo - Hailstone, Nr (PVHU1)

ESP is Unregulated and No Precipitation Forecast Included
 Official 50% Fcst (2024-04-01): 122 kaf (115% Avg, 133% Med), (61% of Yrs Below Fcst, 28 Highest Flow / 70 Tot Yrs)
 ESP 50% Fcst (2024-04-04): 121 kaf (114% Avg, 132% Med), (61% of Yrs Below Fcst, 28 Highest Flow / 70 Tot Yrs)
 Observed Volume: 0.84 kaf (1% Average, 1% Median)



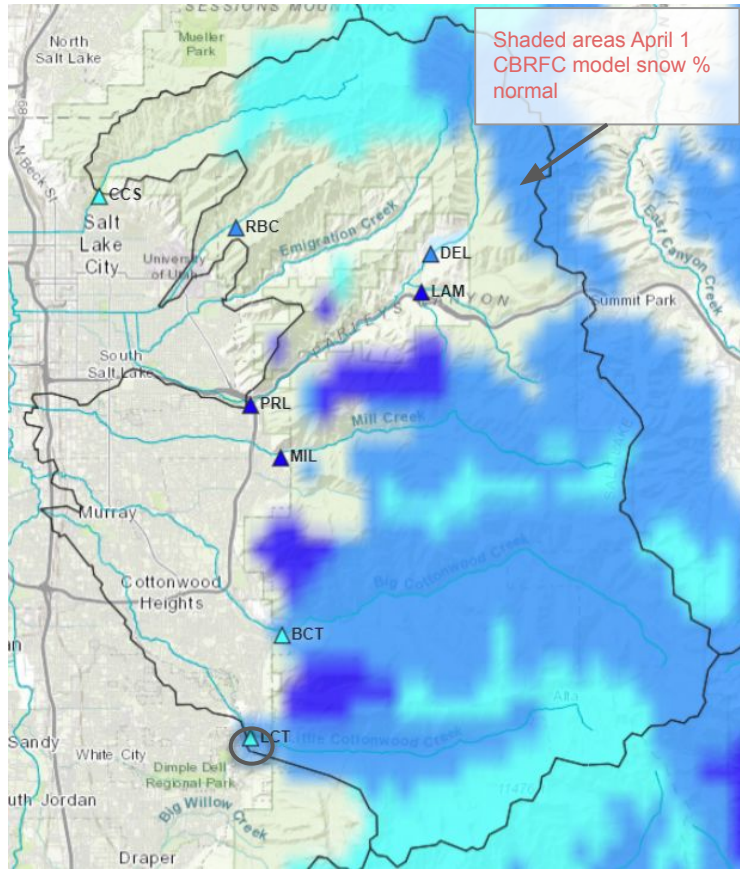
SNOTEL Plot - Trial Lake (TRLU1) - 9992 ft

Ob (04-04): 28.10 in, 131% Med - Rate (in/dy): 0.07 (3-day), 0.70 (week)
 Percentile: 65, Wet Rank: 16, Dry Rank: 31, Tot Yrs: 46
 Peak (04-04): 28.10 in (120.00 % Med Pk) - Med Peak (04-29): 23.50 in

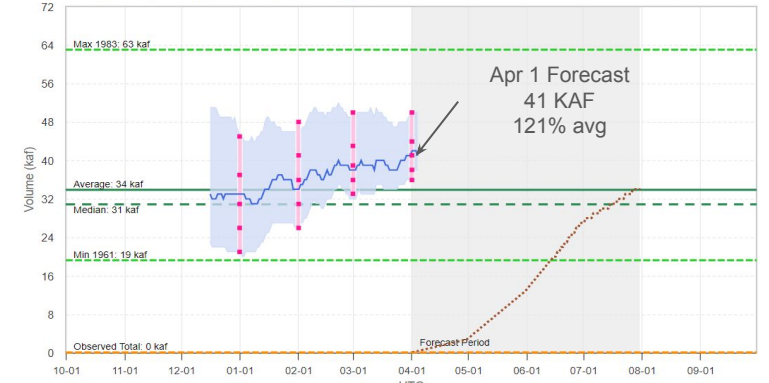


Six Creeks Basin

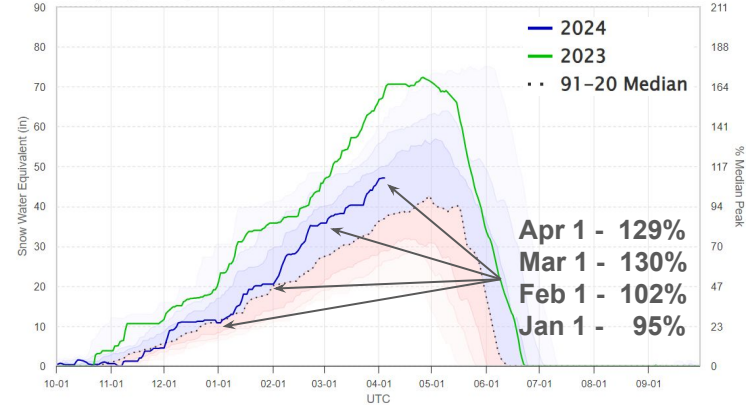
Forecast Range: 120% - 165%



2024 Water Supply Forecast - Little Cottonwood Ck - Salt Lake City, Nr (LCTU1)
 ESP is Unregulated and No Precipitation Forecast Included
 Official 50% Fcst (2024-04-01): 41 kaf (121% Avg, 132% Med), (62% of Yrs Below Fcst, 25 Highest Flow / 64 Tot Yrs)
 ESP 50% Fcst (2024-04-04): 41 kaf (121% Avg, 133% Med), (62% of Yrs Below Fcst, 25 Highest Flow / 64 Tot Yrs)
 Observed Volume: 0.16 kaf (0% Average, 1% Median)

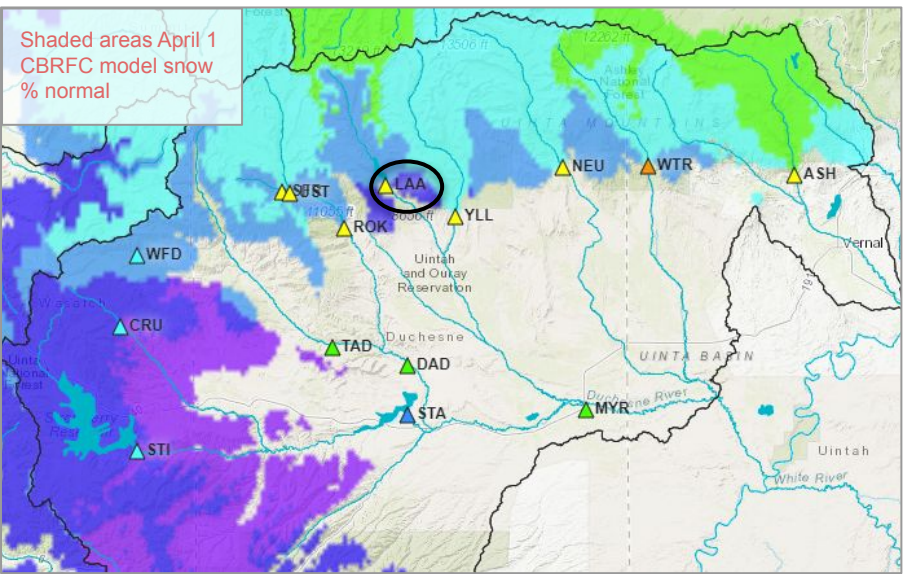


SNOTEL Plot - Snowbird (SBDU1) - 9177 ft
 Ob (04-04): 47.10 in, 127% Med - Rate (in/day): 0.03 (3-day), 0.70 (week)
 Percentile: 68, Wet Rank: 11, Dry Rank: 25, Tot Yrs: 35
 Peak (04-03): 47.10 in (111.00 % Med PK) - Med Peak (04-29): 42.60 in



Duchesne River Basin

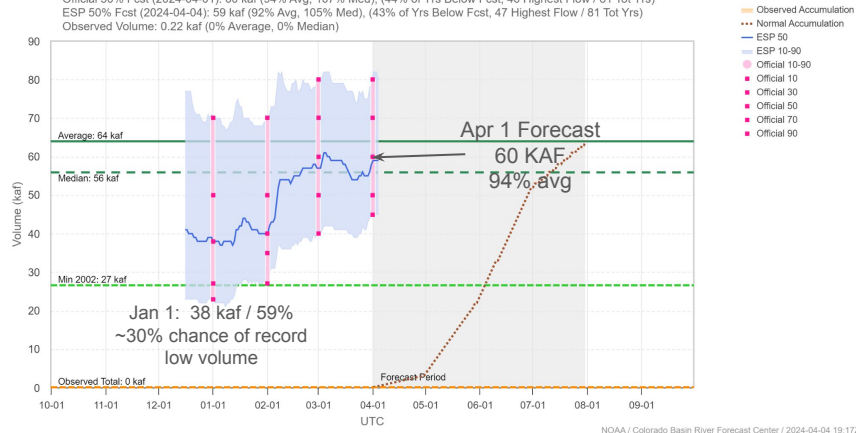
Forecast Range: 90% -135%



Best conditions are in the Strawberry River drainage. Due to a slow start to the snow season, high elevation snow (~11,000+ ft) is lagging behind lower elevations as a percent of normal.

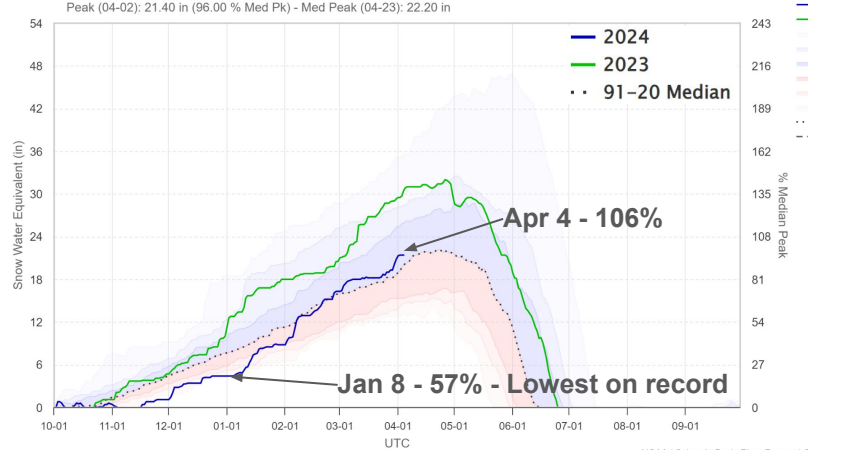
2024 Water Supply Forecast - Lake Fork - Moon Lake Reservoir, Mtn Home, Nr (LAAU1)

ESP is Unregulated and No Precipitation Forecast Included
 Official 50% Fcst (2024-04-01): 60 kaf (94% Avg, 107% Med), (44% of Yrs Below Fcst, 46 Highest Flow / 81 Tot Yrs)
 ESP 50% Fcst (2024-04-04): 59 kaf (92% Avg, 105% Med), (43% of Yrs Below Fcst, 47 Highest Flow / 81 Tot Yrs)
 Observed Volume: 0.22 kaf (0% Average, 0% Median)



SNOTEL Plot - Lakefork Basin (LBNU1) - 10966 ft

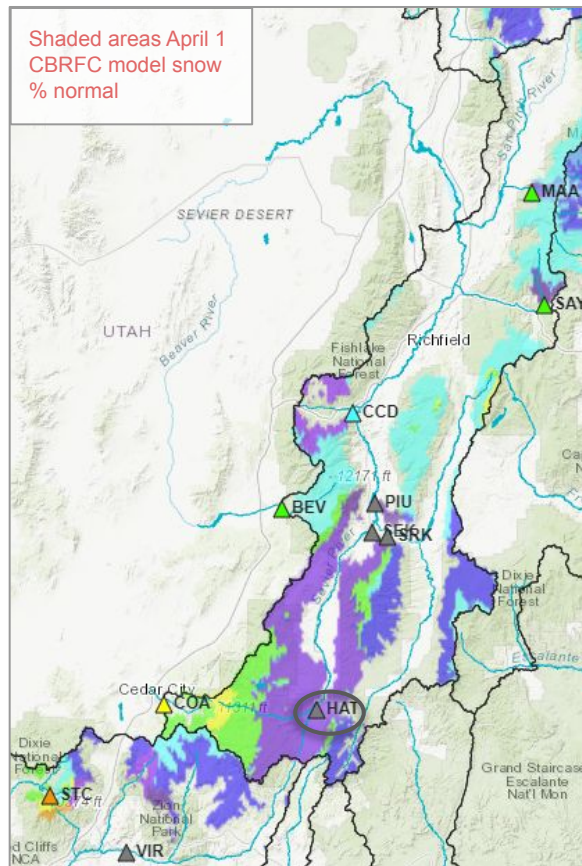
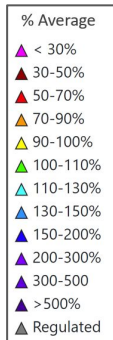
Ob (04-04): 21.40 in, 106% Med - Rate (in/dy): 0.00 (3-day), 0.70 (week)
 Percentile: 61, Wet Rank: 14, Dry Rank: 23, Tot Yrs: 36
 Peak (04-02): 21.40 in (96.00 % Med Pk) - Med Peak (04-23): 22.20 in



Virgin and Sevier River Basins

Forecast Range: 90% -140%

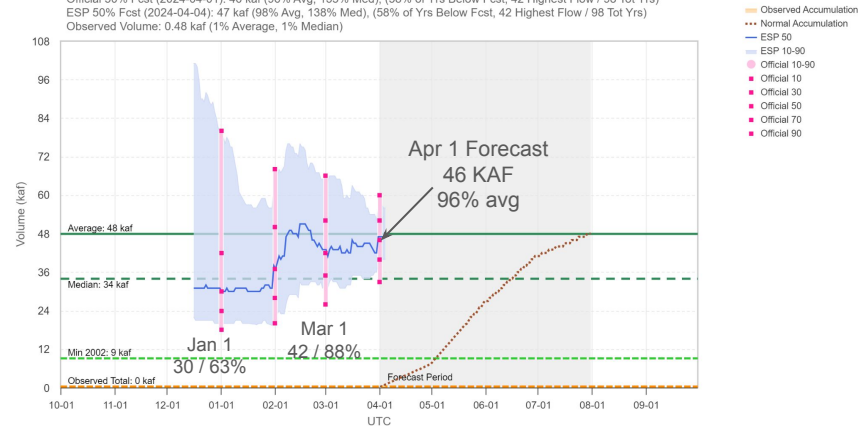
Shaded areas April 1
CBRFC model snow
% normal



*Regulated Forecasts

2024 Water Supply Forecast - Sevier - Hatch (HATU1)

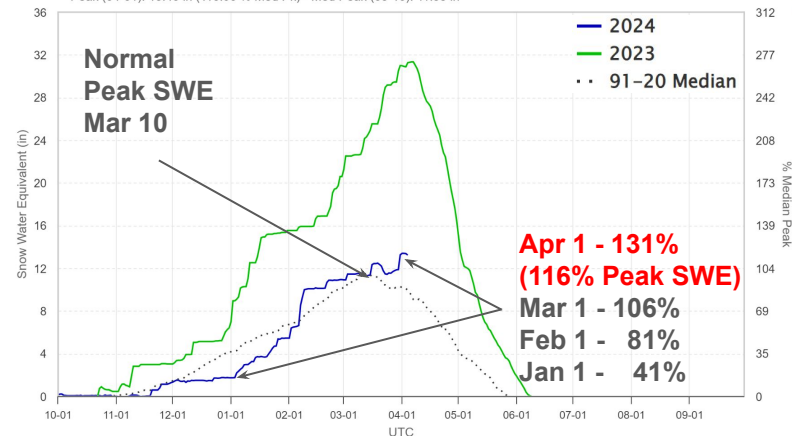
ESP is Regulated and No Precipitation Forecast Included
 Official 50% Fcst (2024-04-01): 46 kaf (96% Avg, 135% Med), (58% of Yrs Below Fcst, 42 Highest Flow / 98 Tot Yrs)
 ESP 50% Fcst (2024-04-04): 47 kaf (98% Avg, 138% Med), (58% of Yrs Below Fcst, 42 Highest Flow / 98 Tot Yrs)
 Observed Volume: 0.48 kaf (1% Average, 1% Median)



NOAA / Colorado Basin River Forecast Center / 2024-04-04 20:26Z

Sevier River Basin Headwaters - Group SNOTEL Plot

CVYU1,HRSU1,LVJU1,MDVU1,WFLU1
 Ob (04-04): 13.24 in, 132% Med - Rate (in/dy): -0.05 (3-day), 0.46 (week)
 Peak (04-01): 13.40 in (116.00 % Med Pk) - Med Peak (03-10): 11.55 in

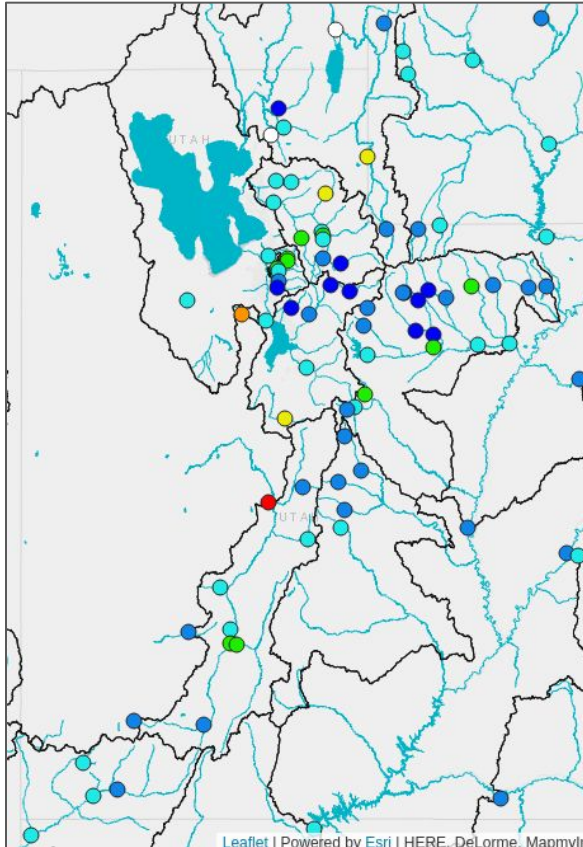
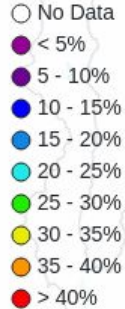


NOAA / Colorado Basin River Forecast

Historical Forecast Verification

April 1 Forecast Error: April-July Volume

Percent Error



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

Apr 1 Forecast Error

15%
31%
14%
14%
19%
16%
13%
19%
17%

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 still a large portion of the April 1 water supply forecast error/uncertainty.

Upcoming Weather: 7-Day Precipitation Forecast

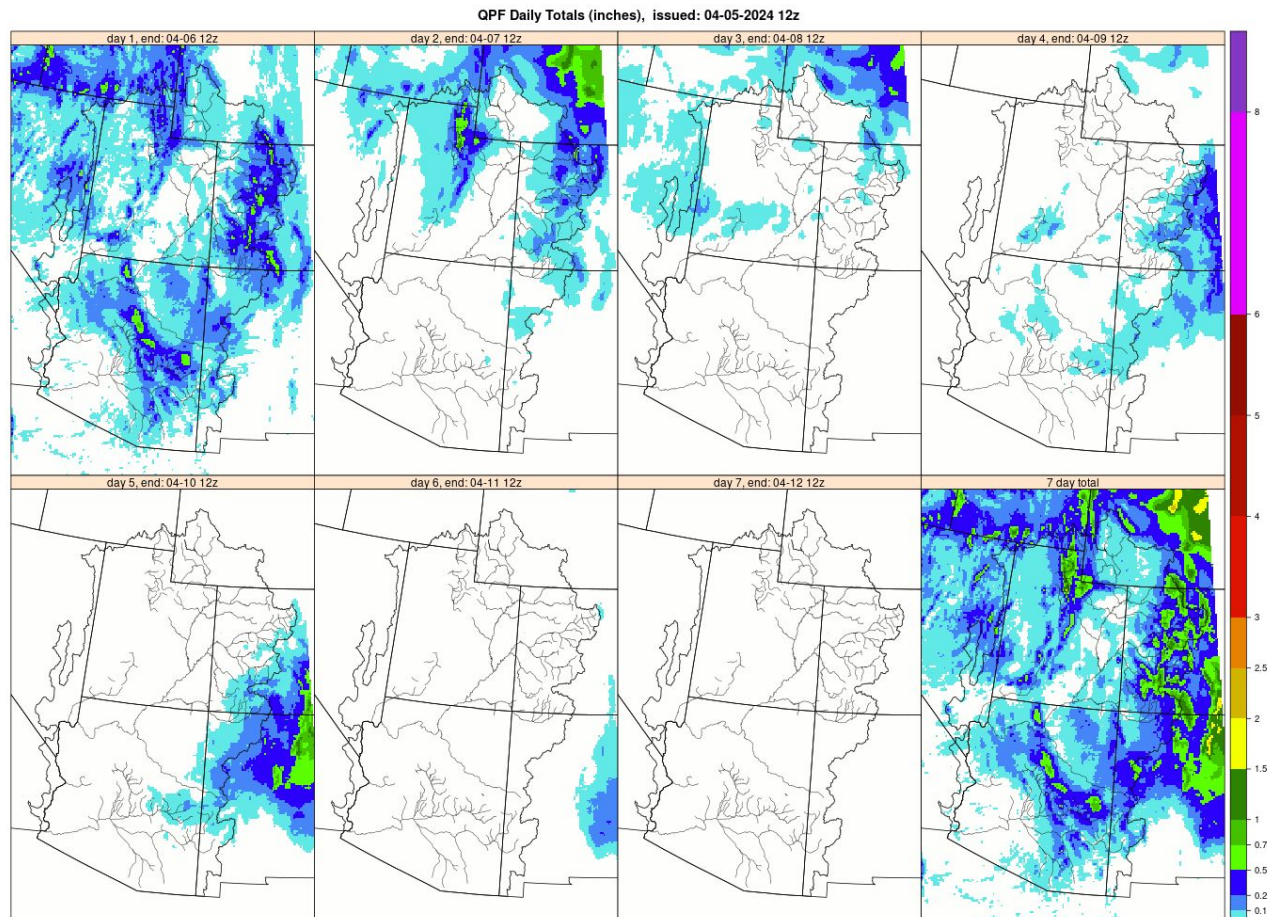
Active weather today and tomorrow across Utah.

A break in precipitation is expected by next week.

7-Day Forecast Precipitation Totals

Northern Utah: up to 1”

Southern Utah: < 0.5”



Upcoming Weather: 8-14 Day Outlook (April 12-18)

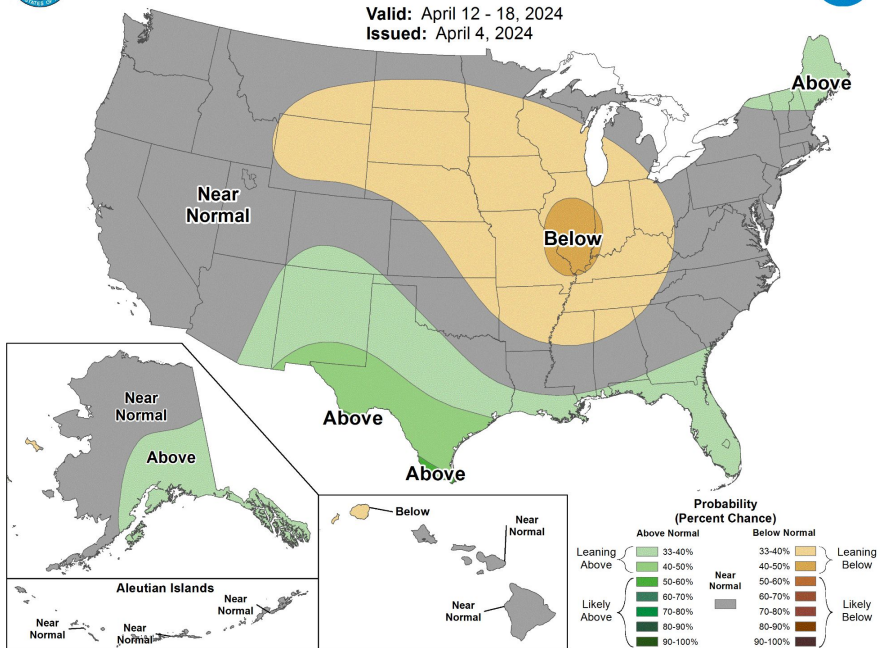
Near normal precipitation favored over most of the western US.

Above average temperatures likely.



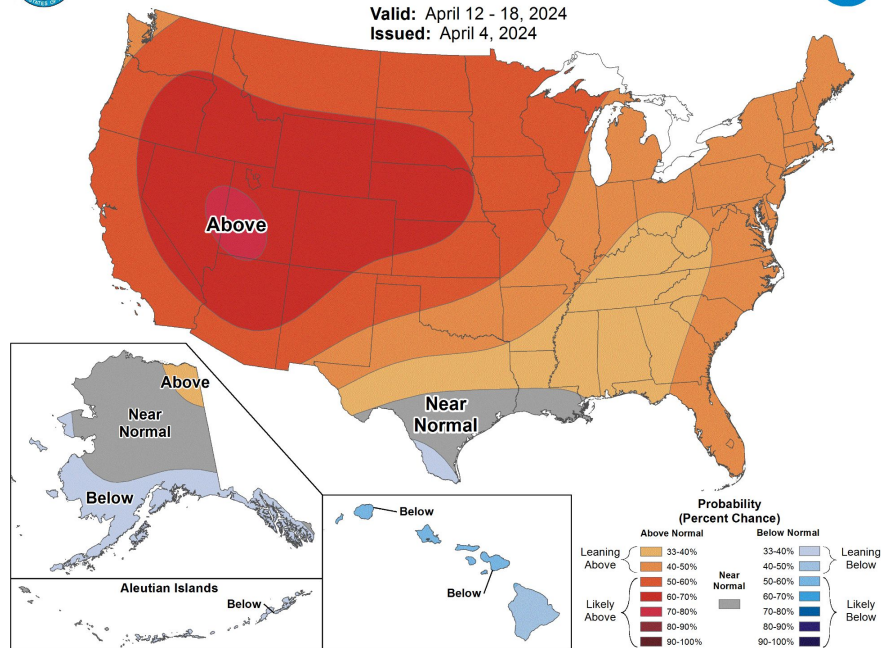
8-14 Day Precipitation Outlook

Valid: April 12 - 18, 2024
Issued: April 4, 2024



8-14 Day Temperature Outlook

Valid: April 12 - 18, 2024
Issued: April 4, 2024



Summary

- Soil Moisture:
 - Near to above normal for most of Utah
 - Better conditions than last year
- Model SWE (April 1):
 - Continued improvement from March 1
 - Above normal throughout the state
- Water Supply Forecasts (April 1)
 - Normal to above normal April-July volumes

Water Supply Forecasts (April - July) Summary				
Watershed	April 2024 Median	March 2024 Median	Feb 2024 Median	Jan 2024 Median
Bear River Basin	118%	102%	84%	80%
Weber River Basin	120%	107%	87%	74%
Six Creeks Basin	149%	133%	107%	92%
Provo River Basin	118%	104%	88%	75%
Duchesne River Basin	103%	98%	73%	62%
Virgin and Sevier River Basins	103%	87%	83%	68%

2024 Water Supply Webinar Schedule

**All Times Mountain Time (MT)*

Colorado River Basin

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

Utah/Great Basin

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

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)

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