

# Utah Water Supply Briefing

April 7<sup>th</sup>, 2022

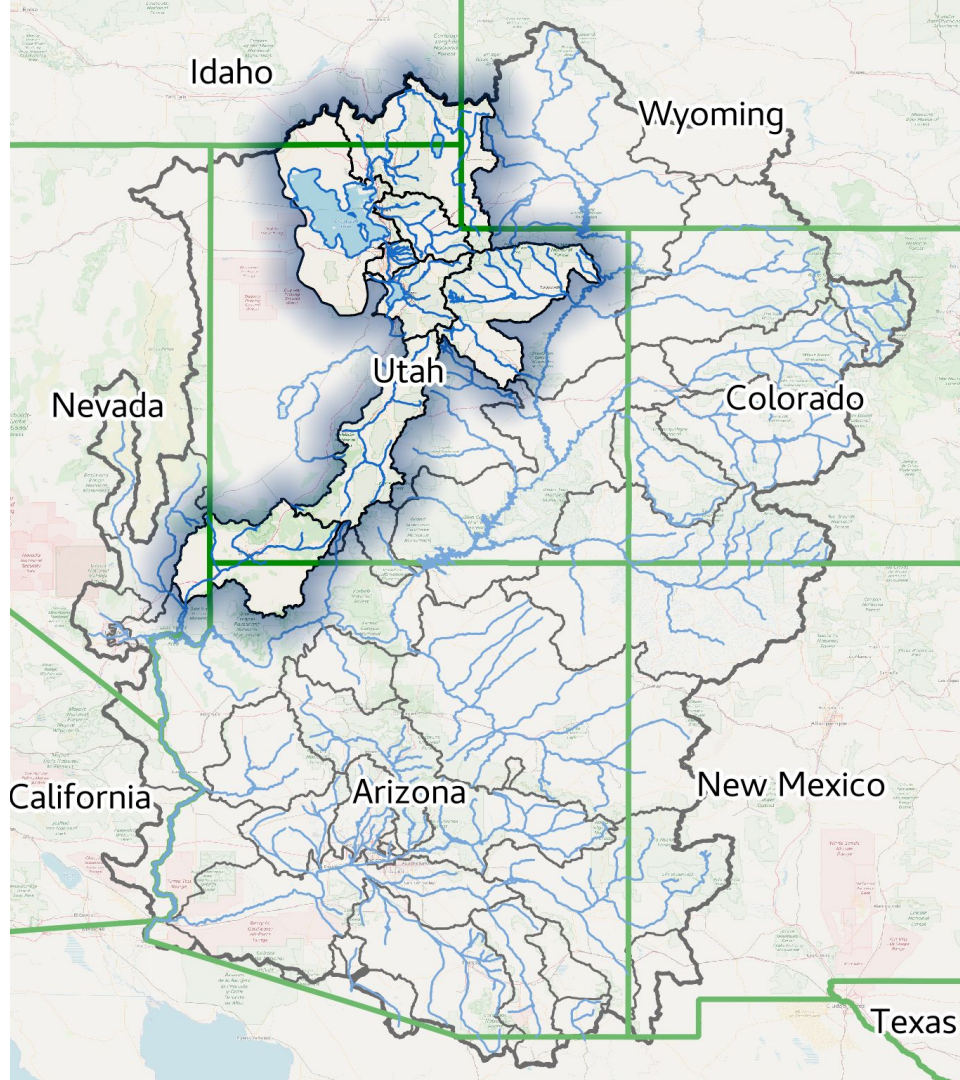
Colorado Basin River Forecast Center

Presenter: - Patrick Kormos

Utah Forecasters: Trevor Grout  
Brenda Alcorn  
Patrick Kormos

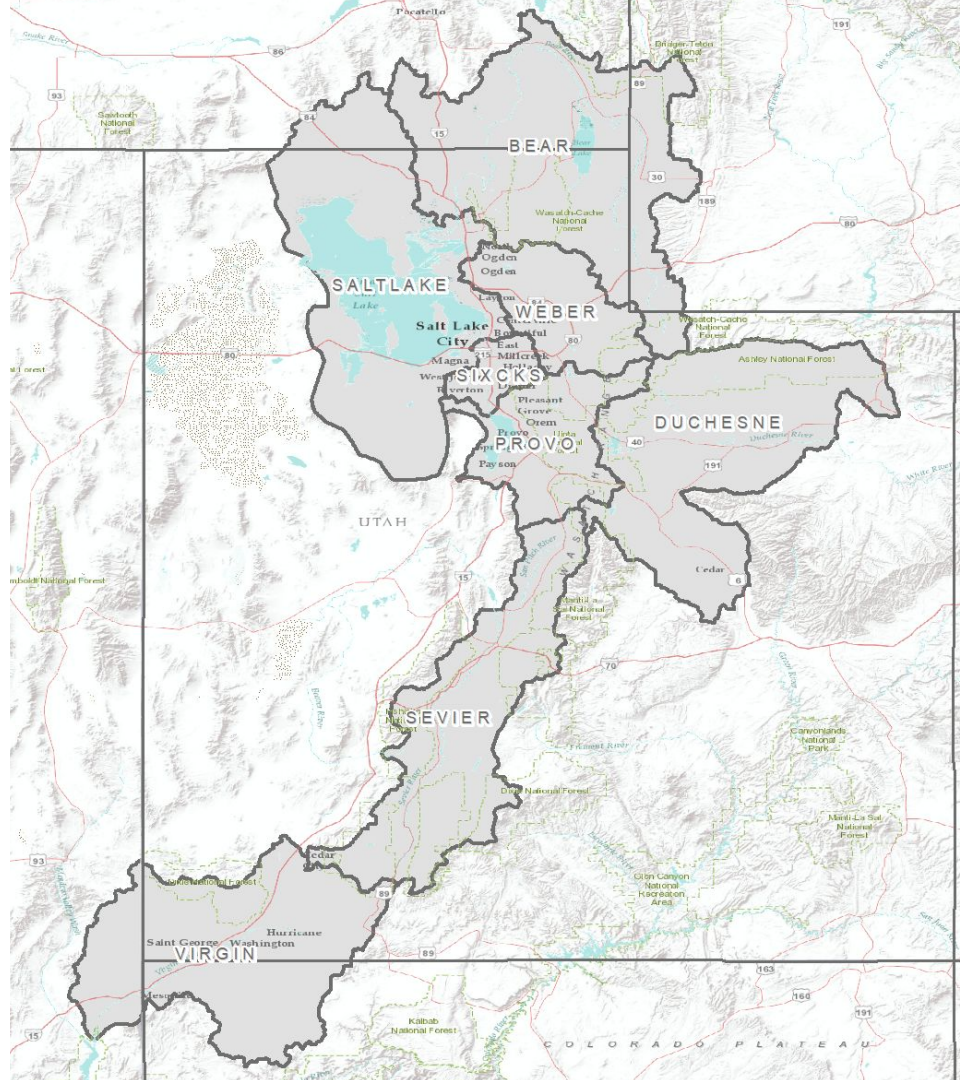
Questions: Type questions into the 'Questions'  
Box or Raise Hand

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

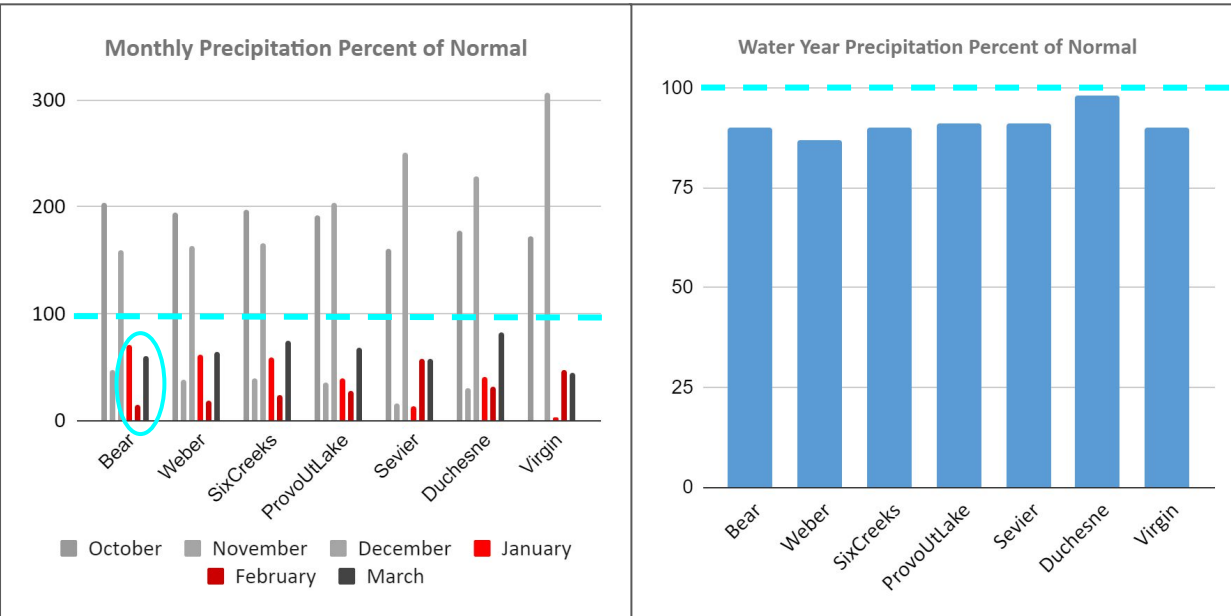


# Utah Water Supply Briefing

1. Weather Review
2. Current Snowpack
3. 2022 Water Supply Forecasts
4. Typical Forecast Error
5. Upcoming Weather
6. CBRFC Snow Operations
7. Contacts & Questions



# 2022 Water Year Precipitation October - March

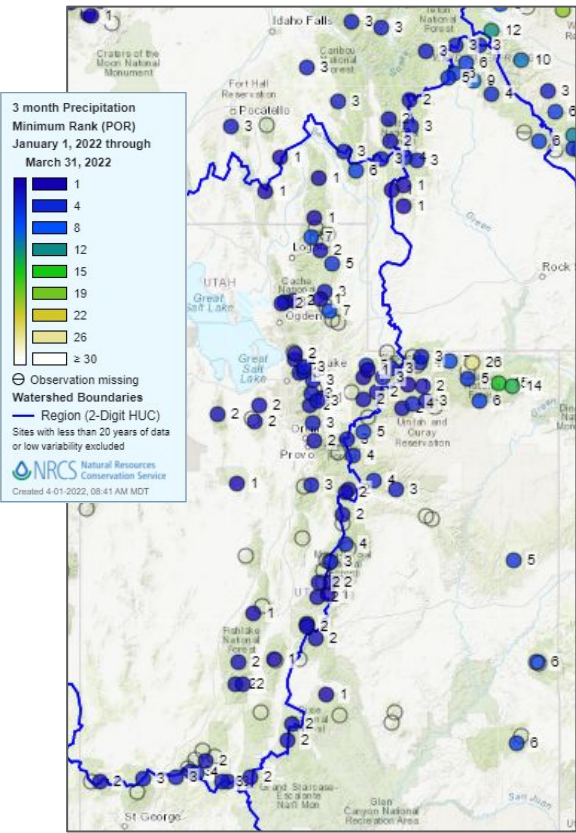


- March was the 3<sup>rd</sup> month in a row of below normal precipitation.
- Water year precipitation is btw 87-98 percent of normal

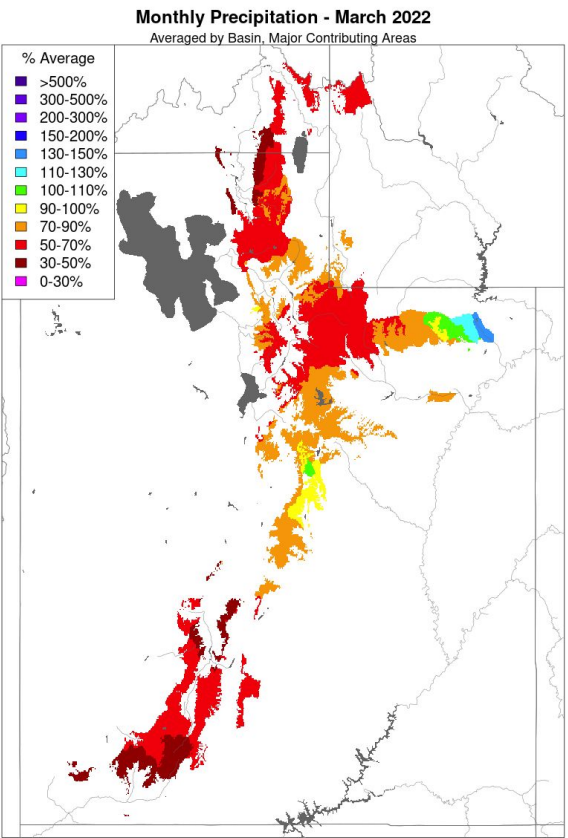
Forecast Group	Percent of WY normal
Bear	90
Weber	87
Six Creeks	90
Provo	91
Sevier	91
Duchesne	98
Virgin	90

# Utah Weather Review - Precipitation

January 1 - March 31  
Minimum Rank

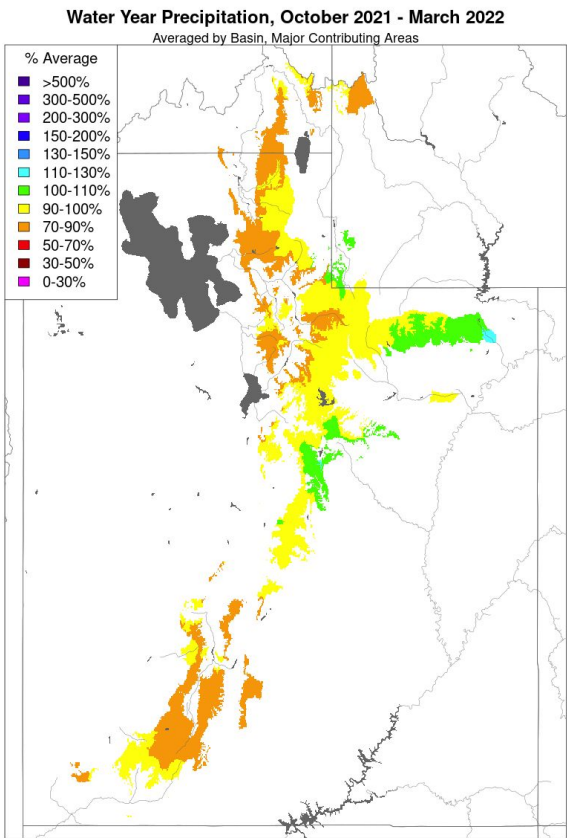


March 2022



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

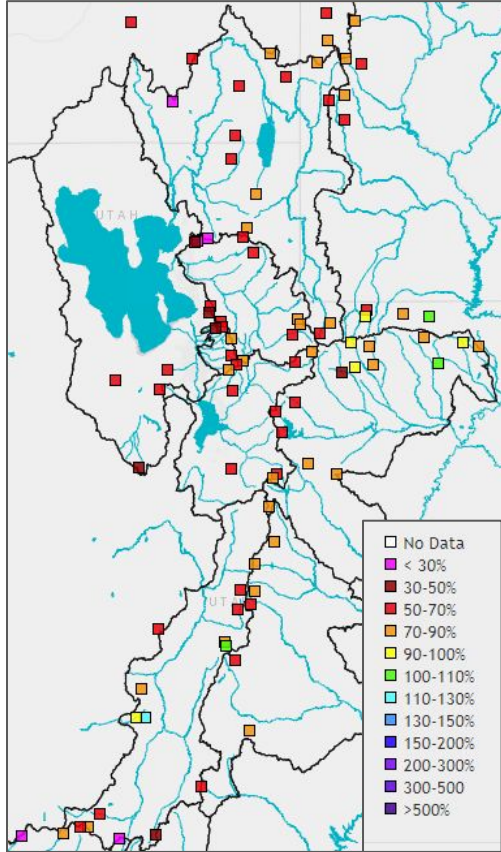
Water Year Precipitation



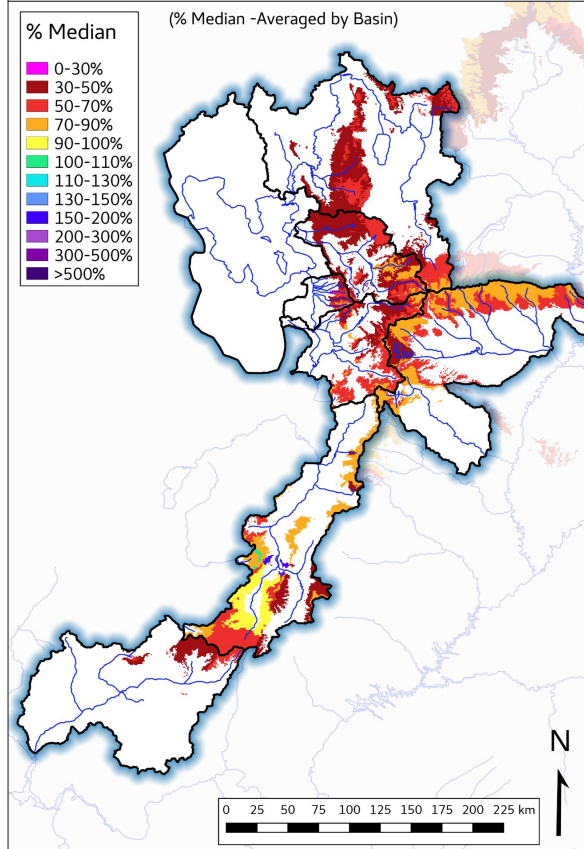
Prepared by NOAA, Colorado Basin River Forecast Center  
Salt Lake City, Utah, www.cbcrfc.noaa.gov

# Utah Current Snowpack - Early April

SNOTEL (Observed)



CBRFC Model Snow, Significant Areas - Apr 4, 2022



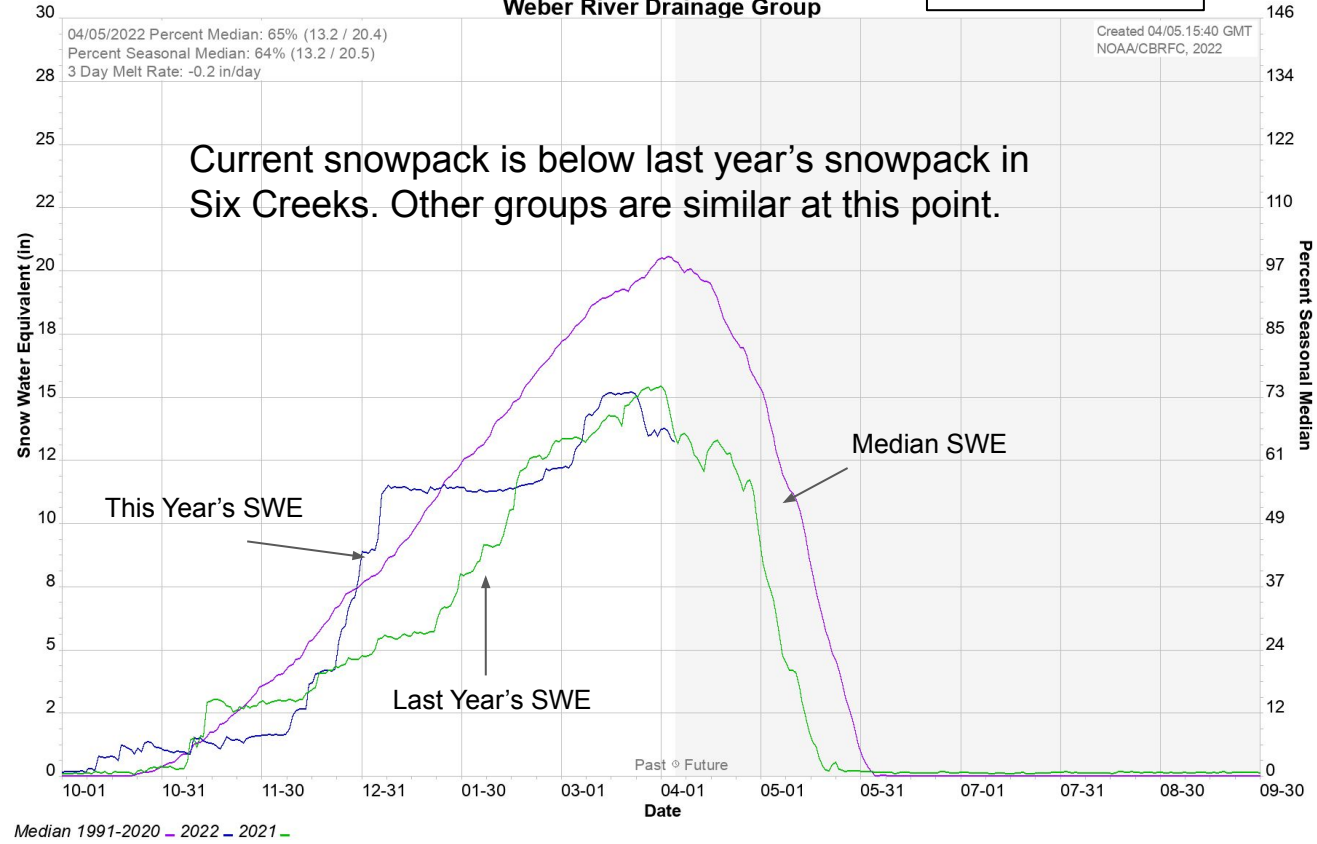
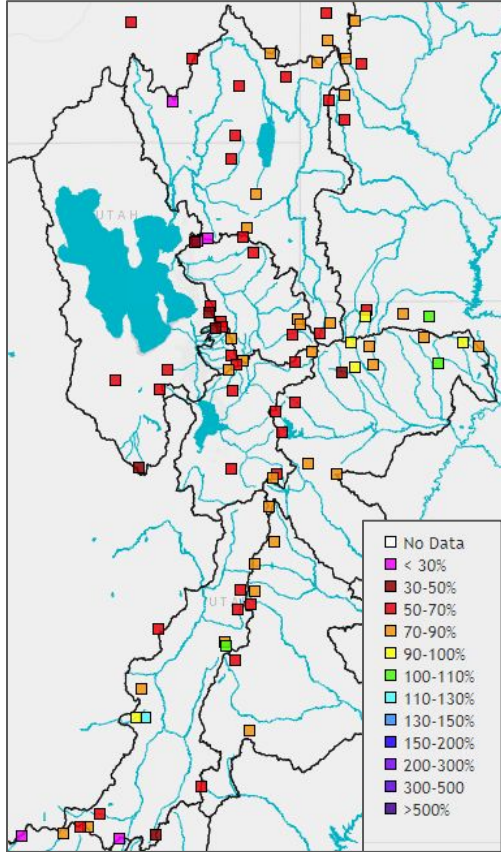
As of April 1, 2022  
CBRFC Snow Groups (SNOTEL Stations)

Bear	70%
Weber	65%
Six Creeks	70%
Provo	75%
Duchesne	85%
Sevier	90%
Virgin	75 %

# Utah Current Snowpack

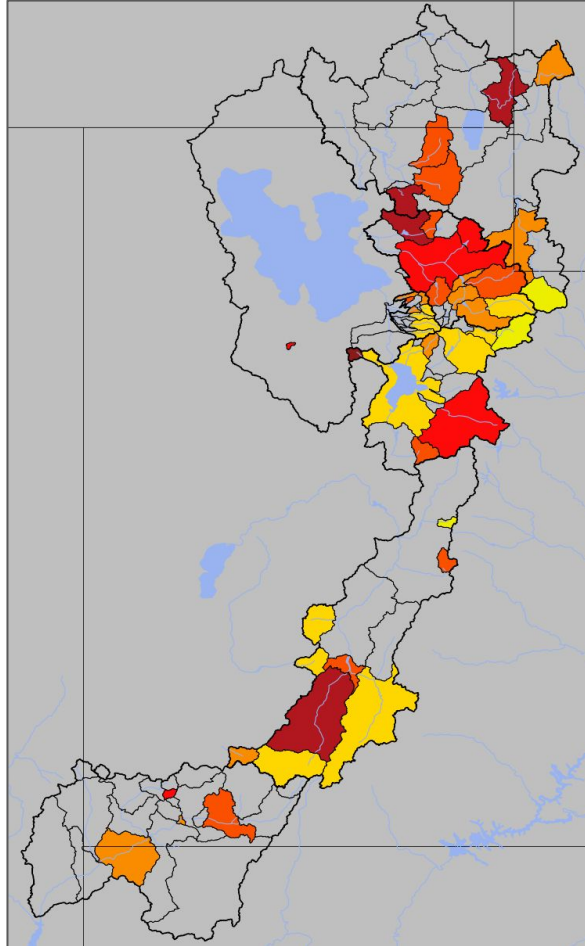
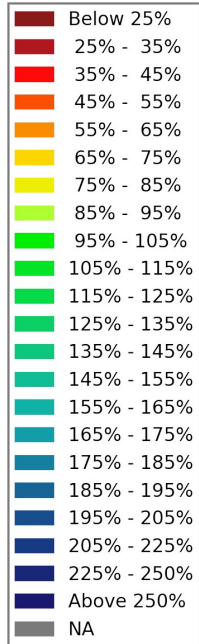
13 sites  
5,800-10,000'

Colorado Basin River Forecast Center  
Weber River Drainage Group



# Utah Water Supply Forecasts - Overview

Percent of Average

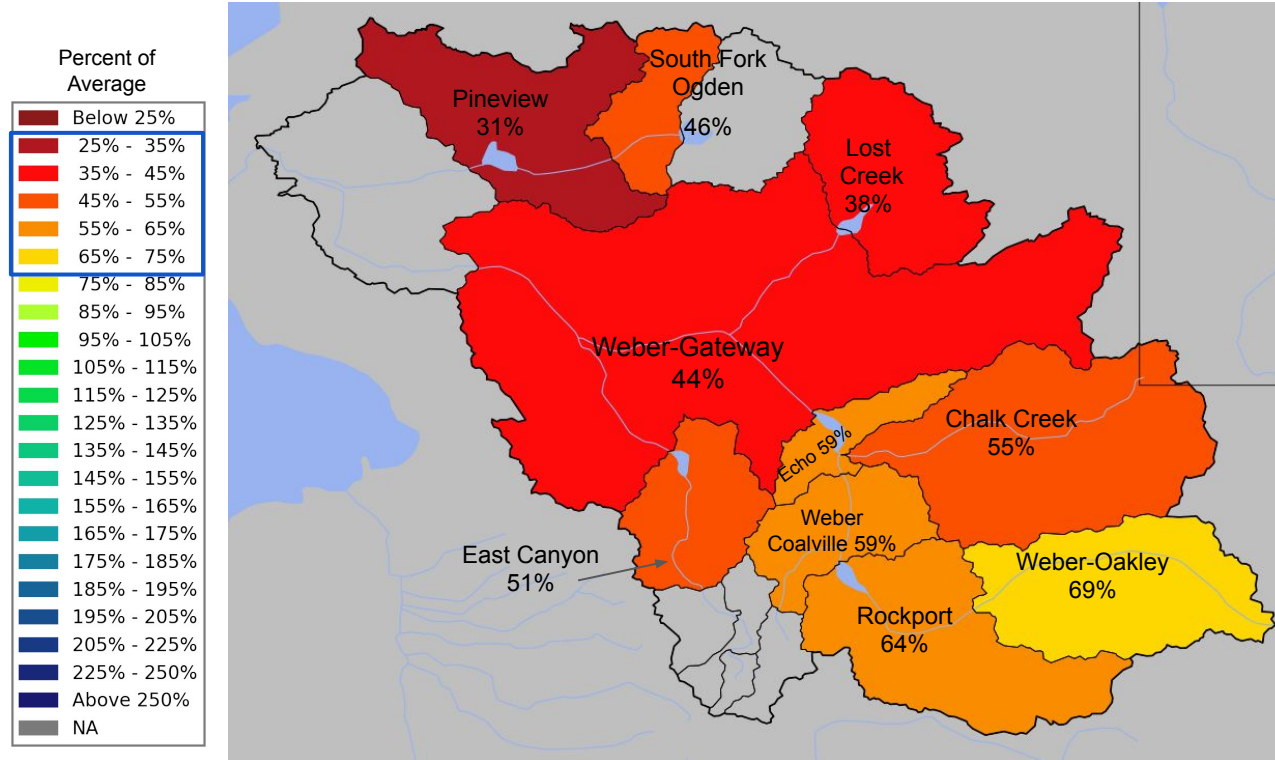


- April 1 Forecast for April-July Volume
- April-July Forecast Streamflow Volumes are in percent of 1991-2020 average
- 10% declines in forecasts from Mar. 1

Median value of the ...  
 ...individual forecasts (in % of average)  
 ...by Forecast Group.

Weber	55%
Bear	50%
Six Creeks	65%
Provo / Utah Lake	60%
Sevier	65%
Duchesne	75%
Virgin	50%

# Utah Water Supply Forecasts - Weber



## Weber River Basin Forecasts

January: 110% of Normal

February: 85% of Normal

March: 65% of Normal

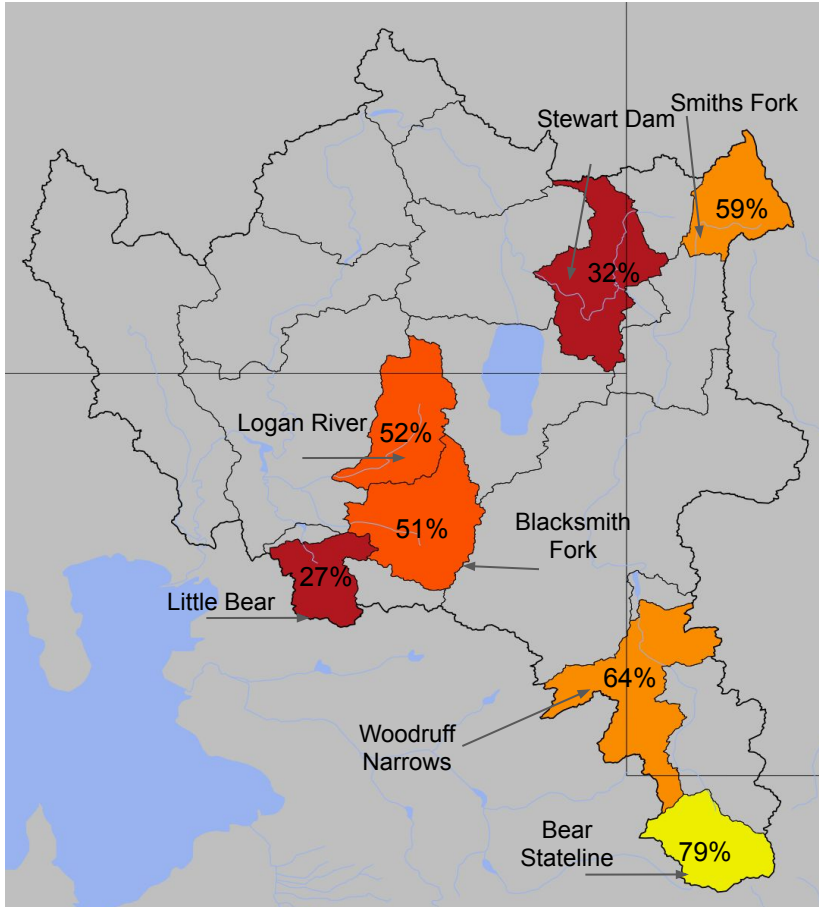
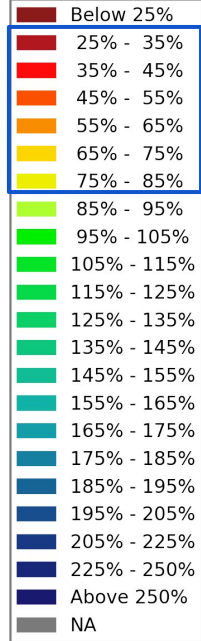
April: **55%** of Normal

- Forecasts range from 30-70% of normal



# Utah Water Supply Forecasts - Bear

Percent of Average



## Bear River Basin Forecasts

January: 95% of Normal

February: 80% of Normal

March: 60% of Normal

April: 50% of Normal

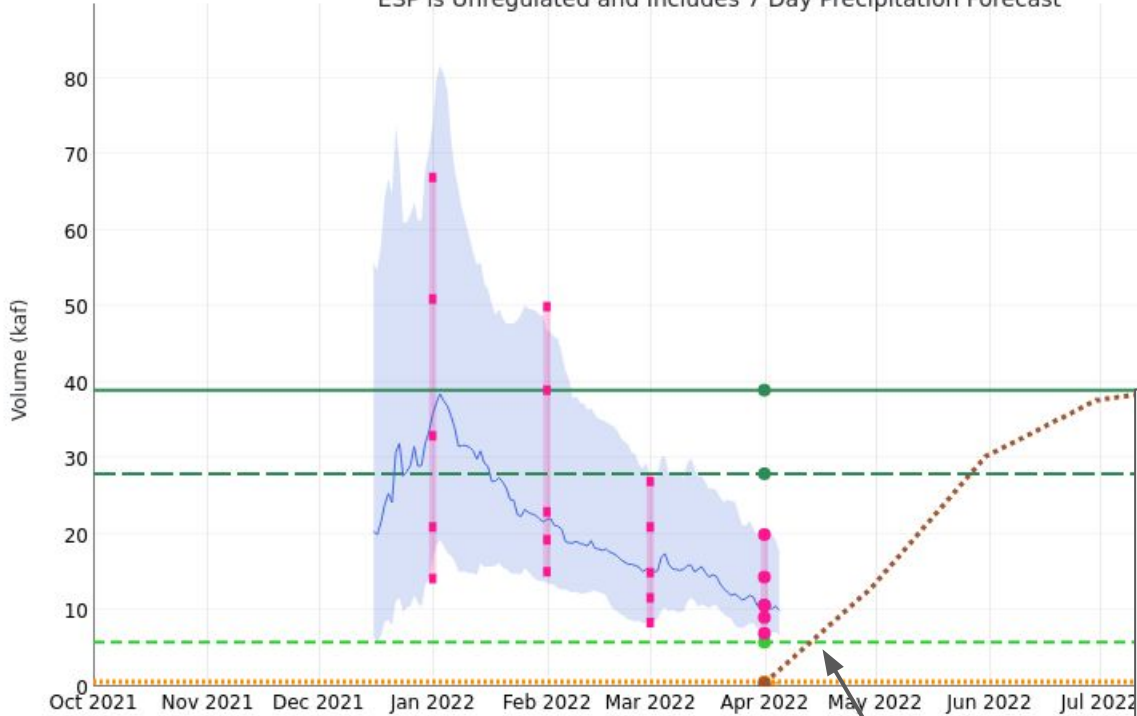
- Forecasts range from 25-80% of normal

# Utah Water Supply Forecasts - Bear

## Little Bear - Paradise (PRZU1)

Period: Apr-Jul, Official 50% Forecast (2022-04-01): **10.7 kaf (27% Average, 38% Median)**

ESP is Unregulated and Includes 7 Day Precipitation Forecast



2022/04/01:

**Min 2021:** 5.83

**Average:** 39

**Median:** 28

**Observed Total:** 0.65

**Normal Accumulation:** 0.43

**ESP:** 10.7

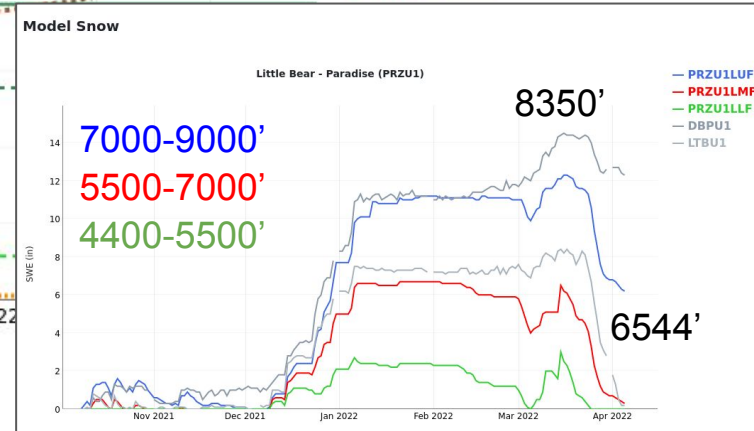
**Official 10:** 20

**Official 30:** 14.4

**Official 50:** 10.7

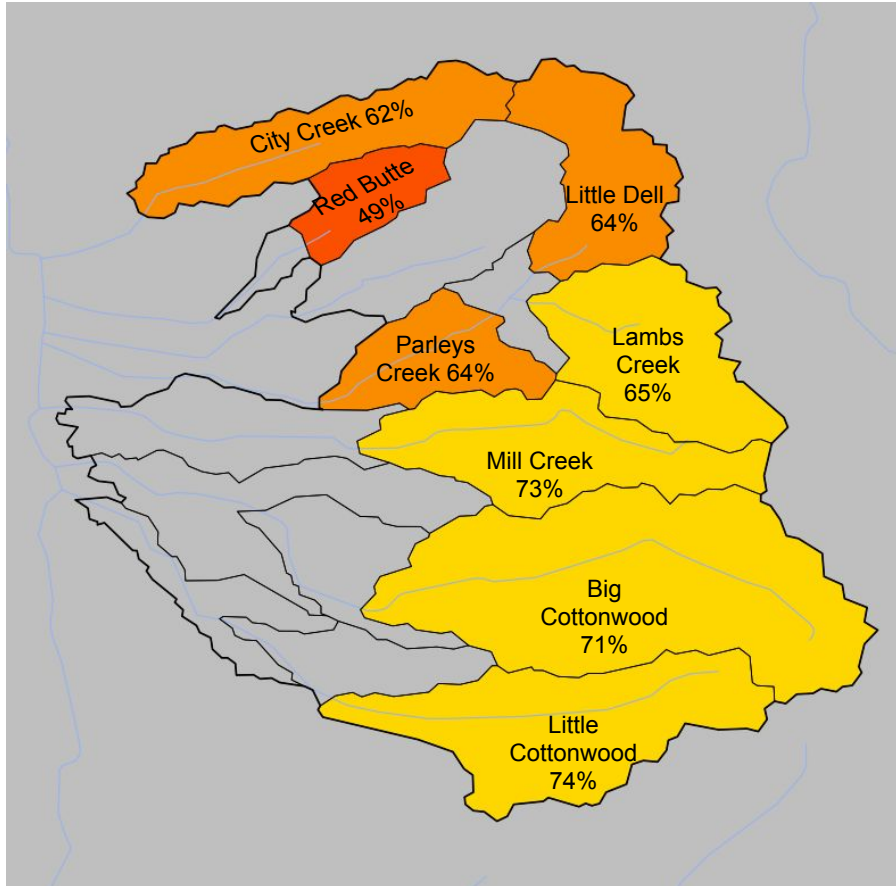
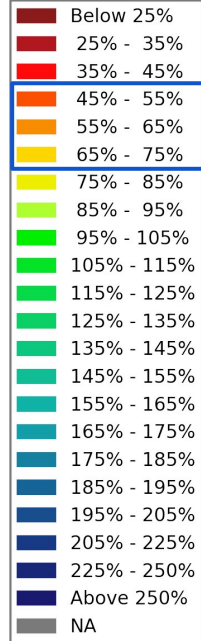
**Official 70:** 9.1

**Official 90:** 7



# Utah Water Supply Forecasts - Six Creeks

Percent of Average



## Six Creeks Basin Forecasts

January: 115% of Normal

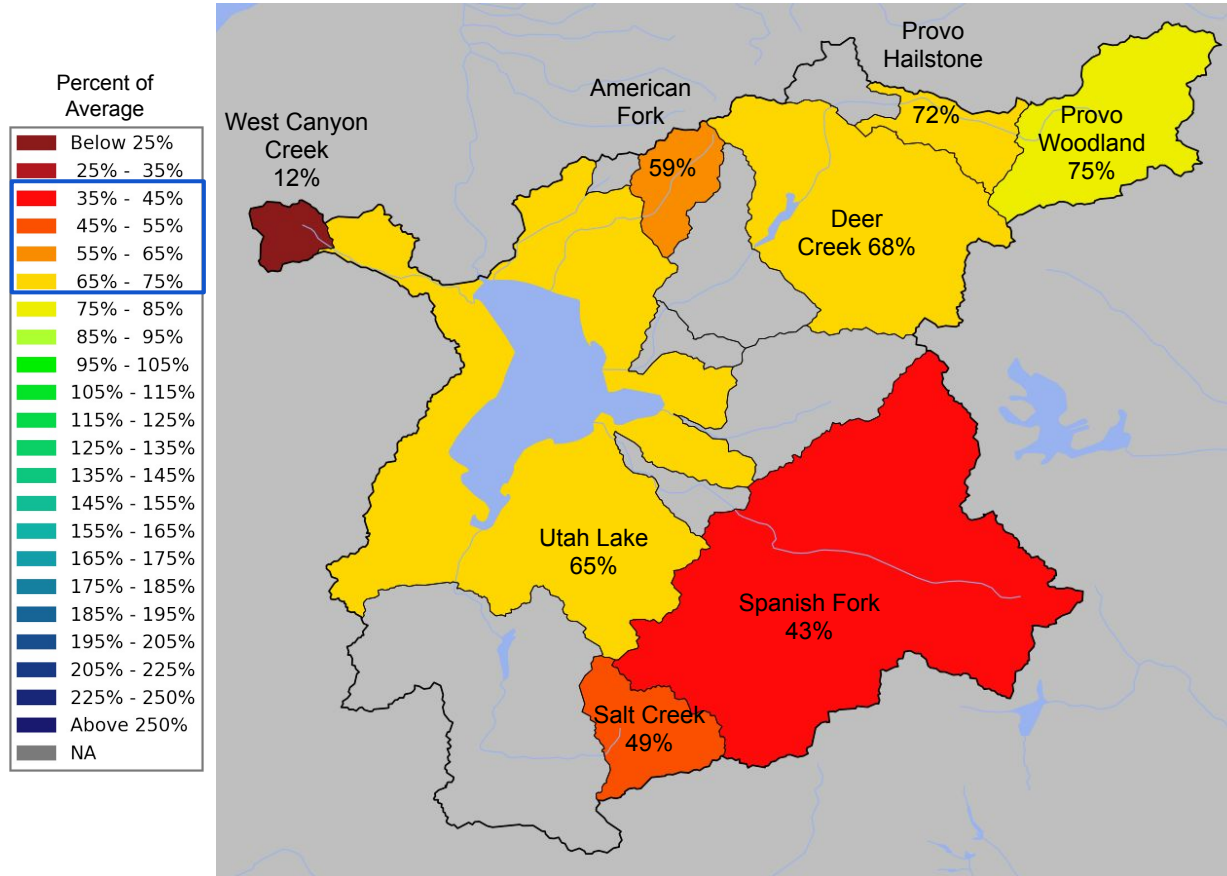
February: 100% of Normal

March: 75% of Normal

April: **65%** of Normal

- Forecasts range from 50-75% of normal

# Utah Water Supply Forecasts - Utah Lake Basin



## Utah Lake Basin Forecasts

January: 110% of Normal

February: 85% of Normal

March: 70% of Normal

April: **60%** of Normal

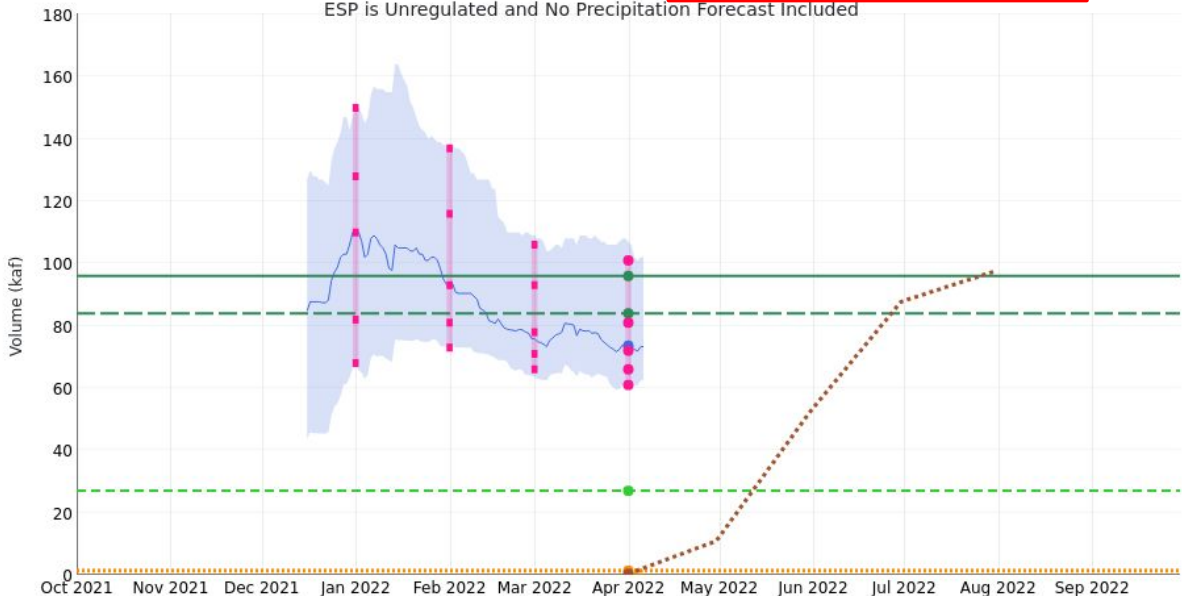
- Forecasts range from 40-75% of normal

# Utah Water Supply Forecasts - Provo

## Provo - Woodland, Nr (WOOU1)

Period: Apr-Jul, Official 50% Forecast (2022-04-01) **72 kaf (75% Average, 86% Median)**

ESP is Unregulated and No Precipitation Forecast Included



2022/04/01:

**Min 1977:** 26.99

**Average:** 96

**Median:** 84

**Observed Total:** 1.34

**Normal Accumulation:** 0.36

**ESP:** 73.6

**Official 10:** 101

**Official 30:** 81

**Official 50:** 72

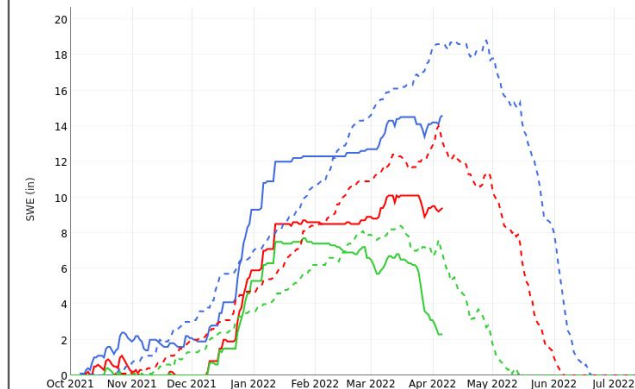
**Official 70:** 66

**Official 90:** 61

- WOOU1HUF 9,500'-11,000'
- WOOU1HMF 8,500'-9,500'
- WOOU1HLF 7,000'-8,500'
- - WOOU1HUF Medi
- - WOOU1HMF Med
- - WOOU1HLF Medi

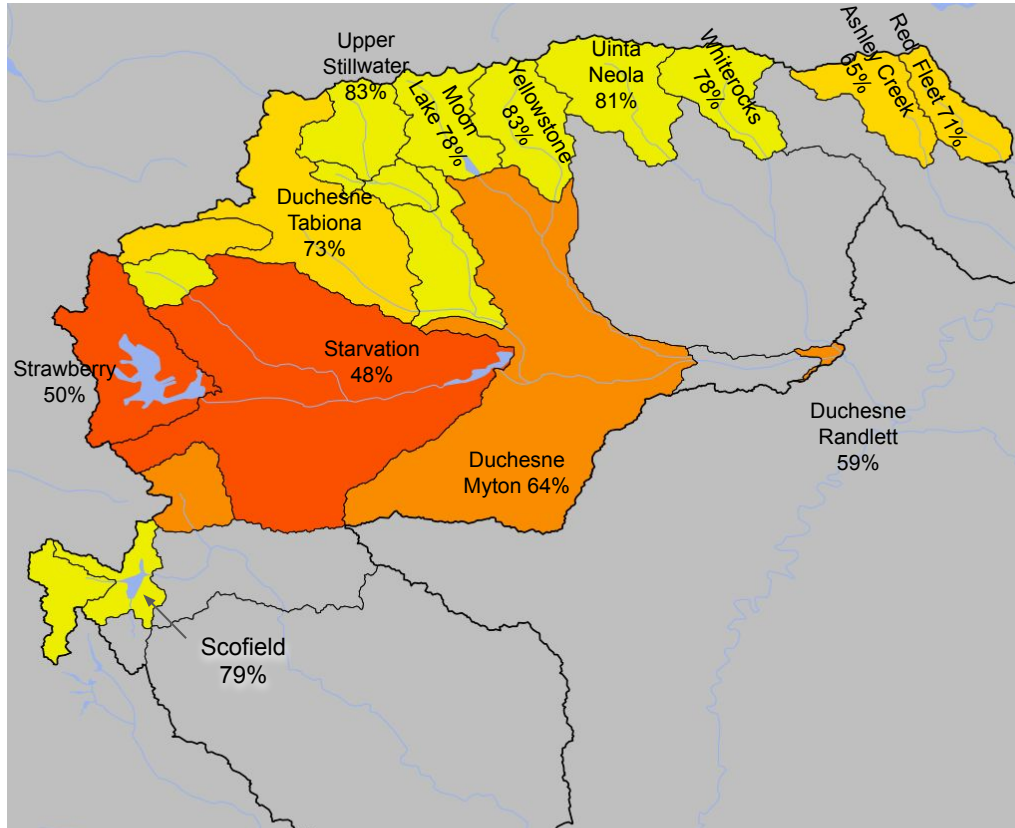
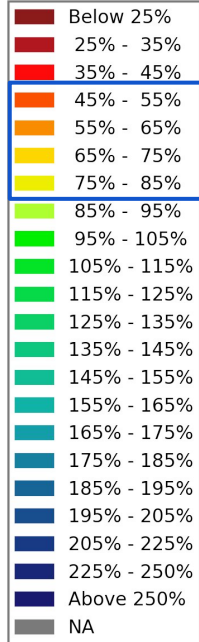
## Model Snow

Provo - Woodland, Nr (WOOU1)



# Utah Water Supply Forecasts - Duchesne

Percent of Average



## Duchesne River Basin

January: 110% of Normal

February: 90% of Normal

March: 75% of Normal

April: **75%** of Normal

- Forecasts range from 50-85% of normal

## Price River Basin

January: 125% of Normal

February: 85% of Normal

March: 80% of Normal

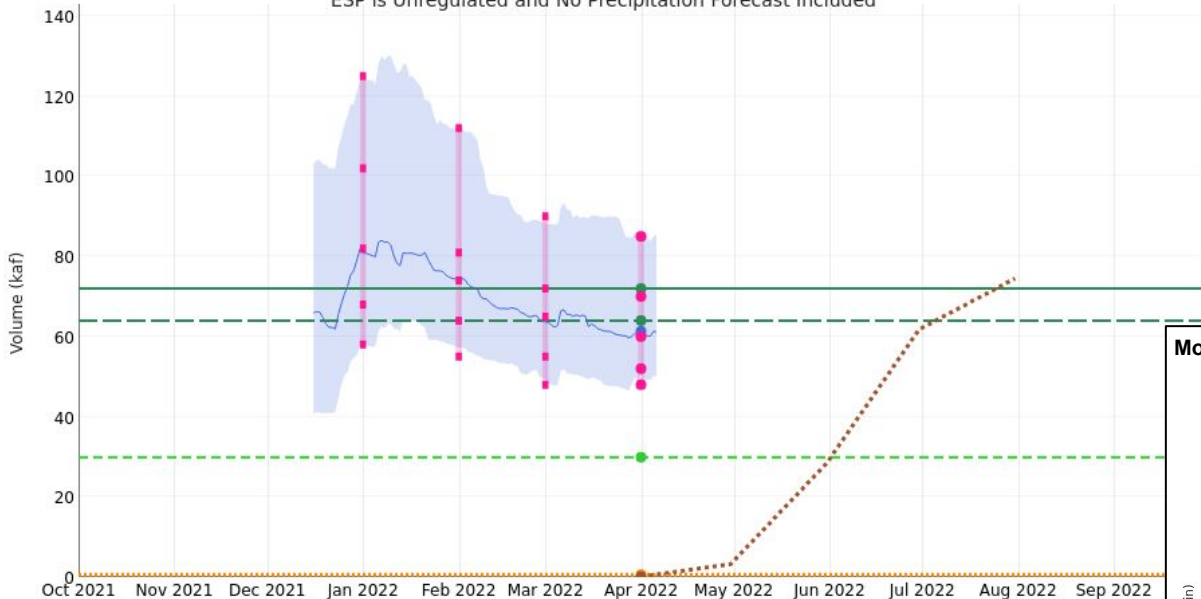
April: **80%** of Normal

# Utah Water Supply Forecasts - Duchesne

## Rock Ck - Upper Stillwater Reservoir (USTU1)

Period: Apr-Jul, Official 50% Forecast **2022-04-01): 60 kaf (83% Average, 94% Median)**

ESP is Unregulated and No Precipitation Forecast Included



2022/04/01:

**Min 1977:** 29.9

**Average:** 72

**Median:** 64

**Observed Total:** 0.61

**Normal Accumulation:** 0.11

**ESP:** 61.3

**Official 10:** 85

**Official 30:** 70

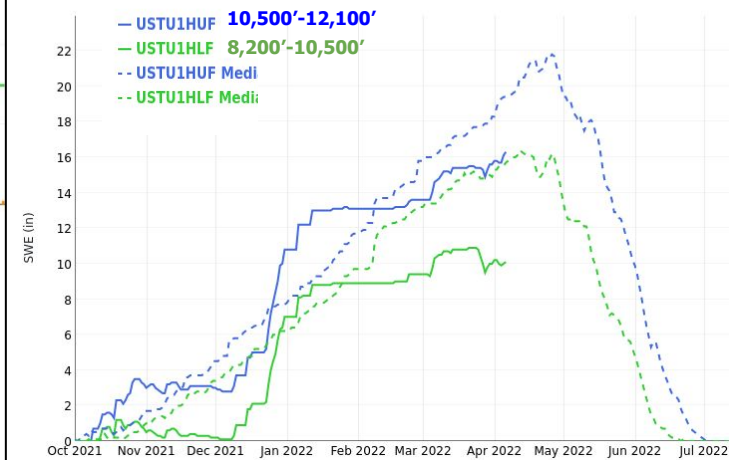
**Official 50:** 60

**Official 70:** 52

**Official 90:** 48

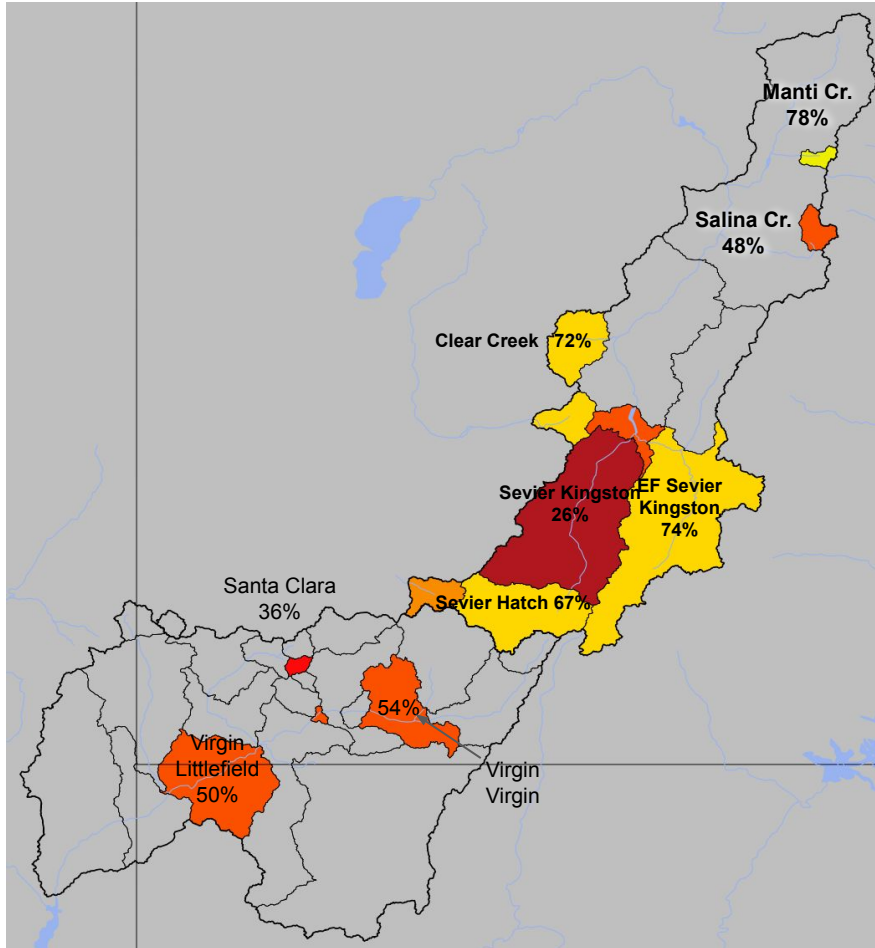
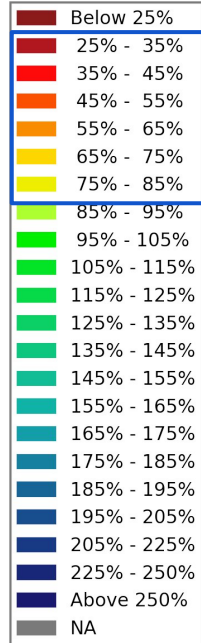
## Model Snow

### Rock Ck - Upper Stillwater Reservoir (USTU1)



# Utah Water Supply Forecasts - Sevier and Virgin

Percent of Average



## Sevier River Basin Forecasts (regulated)

January: 105% of Normal  
February: 90% of Normal  
March: 75% of Normal  
April: **65%** of Normal

- Forecasts range from 25-80% of normal

## Virgin River Basin Forecasts

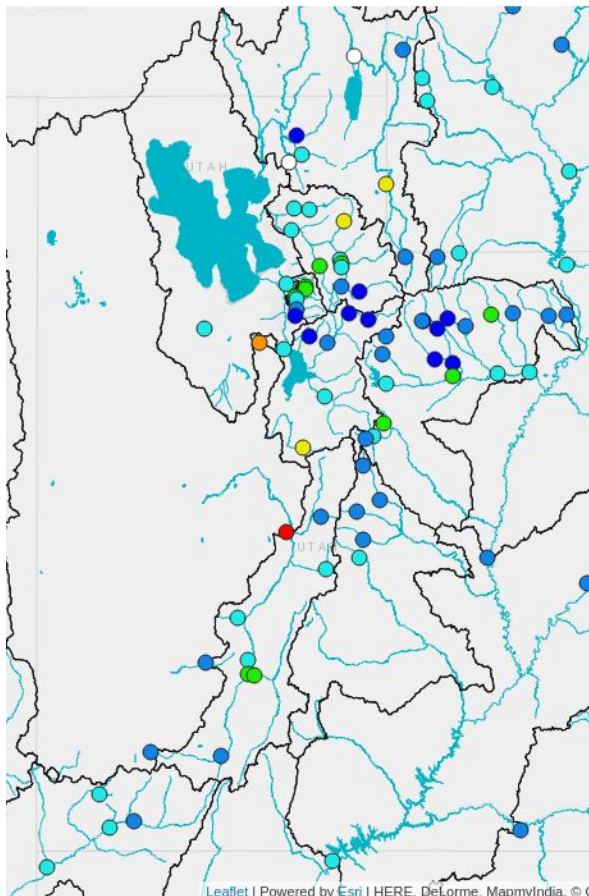
January: 90% of Normal  
February: 75% of Normal  
March: 60% of Normal  
April: **50%** of Normal

- Forecasts range from 35-55% of normal



# Historical (1981-2010) Forecast Verification

## April Forecast Error: April-July Volume



### 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

### April 1 Forecast Error

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

Forecasts are better than just going with average  
 Error tends to decrease each month into the spring

### Where Forecasts are Better:

- Headwaters
- Primarily snow melt basins
- Known diversions / demands

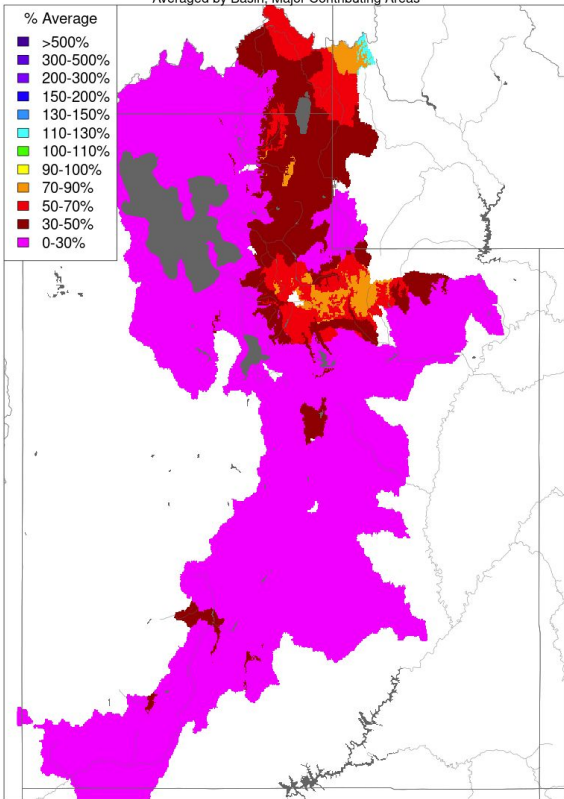
### Where Forecasts are Worse:

- Lower elevations (rain or early melt)
- Downstream of diversions / irrigation
- Little is known about diversions / demands

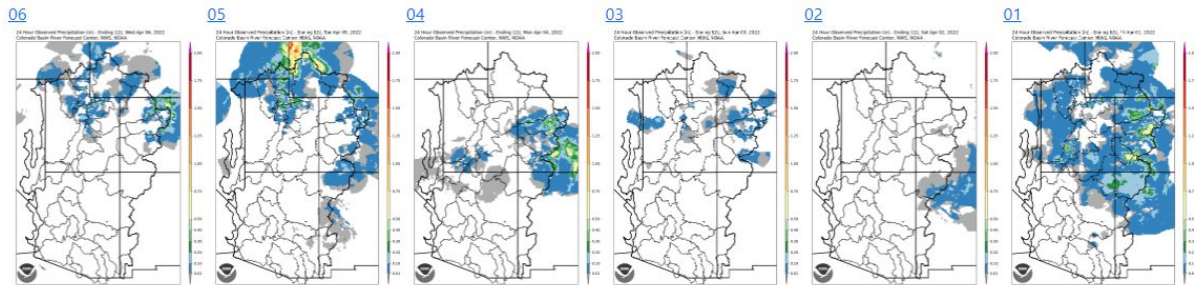
# April 2022 Month-To-Date Precipitation

## Month to Date Precipitation - April 07 2022

Averaged by Basin, Major Contributing Areas

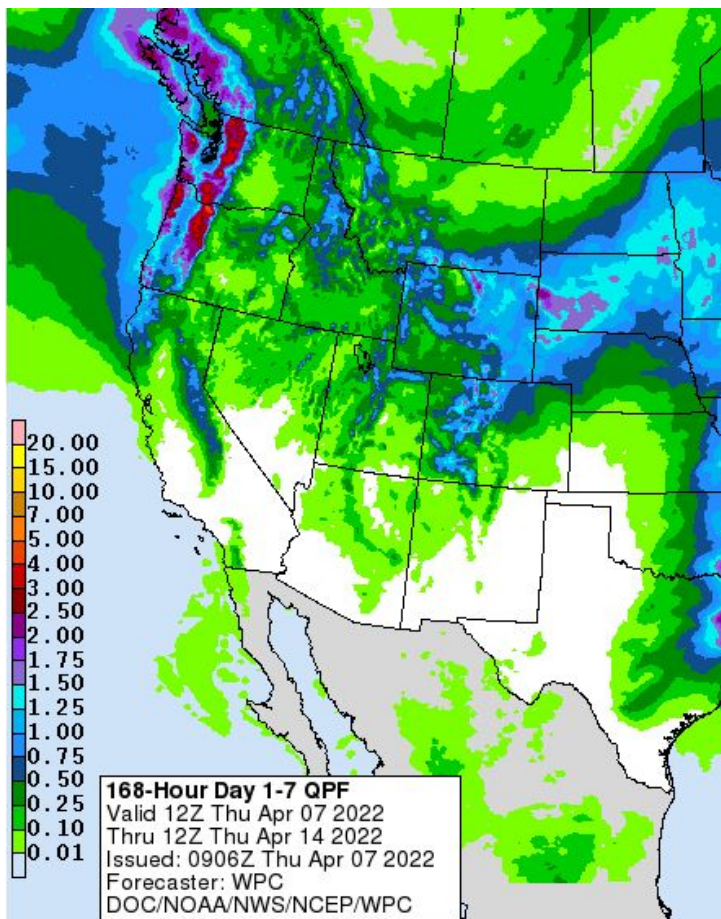


Prepared by NOAA, Colorado Basin River Forecast Center  
Salt Lake City, Utah, [www.cbrfc.noaa.gov](http://www.cbrfc.noaa.gov)



Early April has had some precipitation in the northern half of the basin.

## Upcoming Weather: WPC April 7-14 Precipitation Outlook



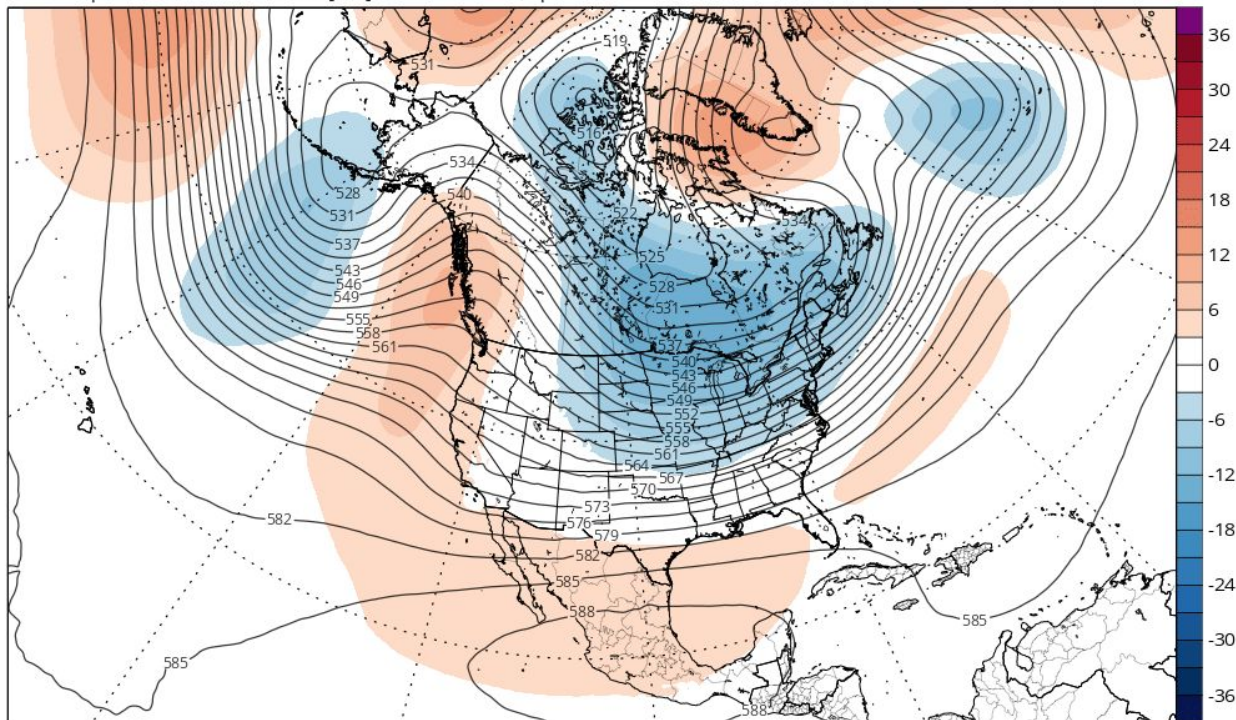
- Dry and warm conditions to start the forecast period
- A pattern change starting this weekend will bring precipitation and below average temperatures next week
  - Around 1" expected for the high terrain
  - Generally around 0.10" - 0.50" elsewhere
- Best chances of precipitation are Monday through Wednesday, with another round possible at the end of the week

# Upcoming Weather: April 14-20

GEFS 500mb Geopotential Height & Anomaly (dam) (based on CFSR 1981-2010 Climatology)

Init: 06z Apr 07 2022 Forecast Hour: [246] valid at 12z Sun, Apr 17 2022

TROPICALTIDBITS.COM



- Chances of precipitation will come to an end by next weekend
- Ridging will likely occur over the Eastern Pacific, and remain in place for the rest of the forecast period

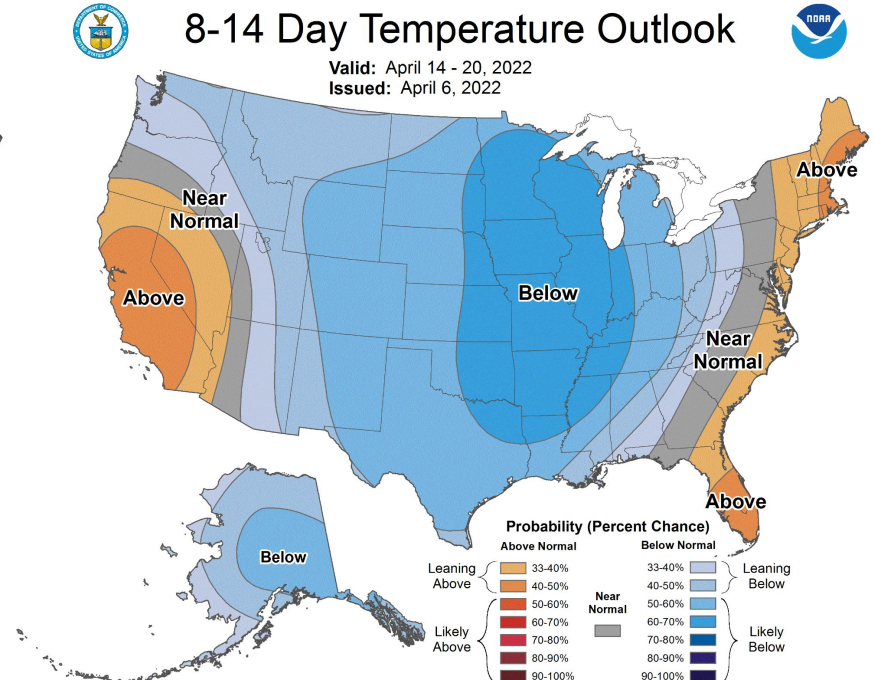
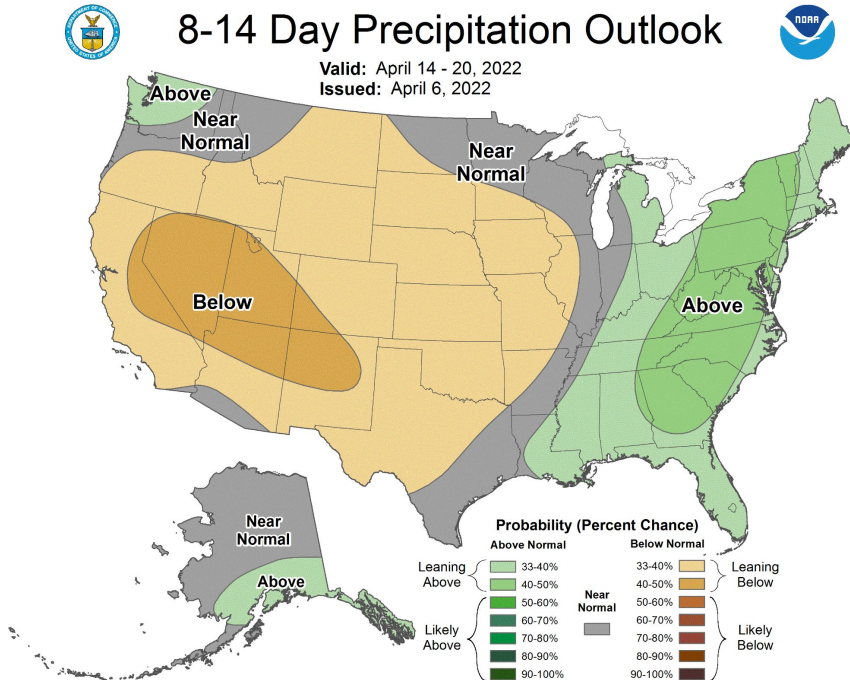
# Upcoming Weather: 8-14 Day Outlook (April 14-20)

Elevated odds of below average precipitation across all basins.

Near average temperatures likely in western regions, to below average temperatures in eastern regions.

## Precipitation Outlook

## Temperature Outlook





# CBRFC Winter/Spring Snow Operations Overview



- Twice monthly CBRFC model snow update based on NRCS SNOTEL precipitation during snow accumulation season
  - Long (~30-40 years), reliable observed precipitation dataset at mid/high elevation points across western US
  - Crucial component of CBRFC hydrologic model calibration process
- CBRFC model SWE vs. ASO Inc. SWE analysis (select basins in Colorado)
  - High resolution snapshot of estimated SWE
  - Newer dataset (<5 years) with limited and inconsistent coverage
  - Ongoing evaluation
- CBRFC model snow vs. satellite snow: areal extent/snow covered area analysis
  - Data collection/reliability requires days with no/few clouds
  - CBRFC used historical (2000-2020) satellite snow covered area data during latest snow model calibration
  - Used qualitatively in real time model to help validate model snow states
- Awareness of current dust on snow conditions
  - Dust on snow conditions impact snowmelt rate/timing/magnitude
- Awareness of ice/backwater impacts, field measurements of flow post river ice, rating curve adjustments
  - Observed streamflow rises and fluctuations due to snowmelt help validate model snow states
- Quality control of event precipitation type (rain vs. snow) and amount across various elevation bands
- Hydrologic model review to ensure high quality forecasts of both daily streamflow and seasonal volumes
  - Validation of CBRFC hydrologic model states (snow and soil moisture)



# Summary

- January-March precipitation amounts have been below normal. Water year precipitation is now below normal
- Snowpack conditions have continued to decline since the end of January (percent of median).
  - Below average March precipitation
  - Mid-late March snowmelt
- Water Supply Forecasts have declined from March 1
- Mean forecast errors are generally below 20% (see Historical Verification for site specific info)
- We've had some precipitation in April. We will get more April precipitation, longer term forecasts suggest below normal April precipitation (through April 20).
- We use many data sources to keep the model on track / provide the best 10 day and seasonal water supply forecasts.

# 2022 Water Supply Webinar Schedule

*\*All Times Mountain Time (MT)*

## Colorado River Basin

Friday	Jan 7 <sup>th</sup>	<del>10 am</del>
Monday	Feb 7 <sup>th</sup>	<del>10 am</del>
Monday	Mar 7 <sup>th</sup>	<del>10 am</del>
Thursday	Apr 7 <sup>th</sup>	<del>10 am</del>
Friday	May 6 <sup>th</sup>	10 am

## Great Basin

Friday	Jan 7 <sup>th</sup>	<del>11:30 am</del>
Monday	Feb 7 <sup>th</sup>	<del>11:30 am</del>
Monday	Mar 7 <sup>th</sup>	<del>11:30 am</del>
Thursday	Apr 7 <sup>th</sup>	11:30 am
Friday	May 6 <sup>th</sup>	11:30 am



Additional briefings scheduled as needed

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



# CBRFC Contacts & WY22 Basin Focal Points

## Basin Focal Points (Forecasters)

Brenda Alcorn - Green, Duchesne, White/Yampa  
[brenda.alcorn@noaa.gov](mailto:brenda.alcorn@noaa.gov)

Ashley Nielson – Gunnison, San Juan, Dolores, Lake Powell  
[ashley.nielson@noaa.gov](mailto:ashley.nielson@noaa.gov)

Cody Moser – Upper Colorado Mainstem  
[cody.moser@noaa.gov](mailto:cody.moser@noaa.gov)

Patrick Kormos – Great Basin/Sevier  
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Trevor Grout - Virgin, Lower Colorado  
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Tracy Cox - Hydrometeorologist  
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Nanette Hosenfeld - Senior Hydrometeorologist  
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Wolfgang Hanft - Hydrometeorologist  
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Michelle Stokes – Hydrologist In Charge  
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Paul Miller– Service Coordination Hydrologist  
[paul.miller@noaa.gov](mailto:paul.miller@noaa.gov)

John Lhotak – Development and Operations Hydrologist  
[john.lhotak@noaa.gov](mailto:john.lhotak@noaa.gov)

**CBRFC Webpage**  
<https://www.cbrfc.noaa.gov/>

**CBRFC Operations**  
[cbrfc.operations@noaa.gov](mailto:cbrfc.operations@noaa.gov)  
801-524-4004

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

