Utah Water Supply Briefing

May 7th, 2021

Colorado Basin River Forecast Center

Presenters: Patrick Kormos - Hydrologist

Utah Forecasters: Brent Bernard, Zach Finch, 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. Last Month Weather Review
- 2. Current Snowpack
- 3. 2021 Water Supply Forecasts
- 4. Forecast Error
- 5. Upcoming Weather
- 6. CBRFC Hydro Science Update
- 7. Contacts & Questions



Utah Weather Review - Precipitation up to May 1, 2021



Utah Weather Review - Monthly and Water Year Precipitation



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



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Utah Weather Review - Percentile Rank, POR March 1- May 1, 2021





- SNOTEL Stations along the entire Wasatch Crest from North to South have had Much Below Average Precipitation.
- The majority of stations are in 10th Percentile or lower for the full Period of Record.

Utah Current Snowpack - May 2021





As of May1, 2021 CBRFC Snow Groups (SNOTEL Stations)

- Bear: 60% of WY normal
- Weber: 55% of WY normal
- Six Cr: 75% of WY normal
- Provo: 35% of WY normal
- Duchesne: 55% of WY normal
- Sevier: 45% of WY normal
- Virgin: 20% of WY normal

Utah Current Snowpack



Median 1981-2010 _ 2021 _ 2020 _

Utah Weather Review - New Record Low Flows, April Observations



- April streamflow in northern Utah have set new record lows at:
 - Provo Hailstone
 - Virgin nr Hurricane
 - Lost Creek
 - Parley's Creek
 - City Creek
 - American Fork
 - Big Brush Creek
- Several others gages rank 2nd lowest:
 - SF Ogden
 - Little Bear
 - Emigration
 - Currant Creek
 - Virgin at Virgin
 - White River

May 1, 2021 - Utah Water Supply Forecasts - Overview



- May 1 Forecast for April-July Volume in 1000's acre feet (KAF)
- April-July Forecast Streamflow Volumes are in percent of <u>1981-2010 average</u>
- April Observations are Added into Forecast

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

Bear	35
Weber	25
Six Creeks	30
Provo / Utah Lake	35
Sevier	30
Duchesne	40
Virgin	25

May 1, 2021 - Utah Water Supply Forecasts - Bear





January: **55**% of Normal February: **50**% of Normal March: **60**% of Normal April: **50**% of normal

Bear River Basin Forecasts

May: **35**% of normal

- Forecasts range from 10-55% of normal
- >10% drops in all basins
- >20% drops in Smiths Fork, Stewart, Logan, Hyrum, Little Bear

Utah Water Supply Forecasts - Bear

Little Bear at Paradise



May 1, 2021 - Utah Water Supply Forecasts - Weber River Basin



Utah Water Supply Forecasts - Weber



May 1, 2021 - Utah Water Supply Forecasts - Six Creeks





Six Creeks Basin Forecasts

January:40% of NormalFebruary:40% of NormalMarch:50% of NormalApril:35% of Normal

May: **30**% of Normal

- Forecasts range from 25-50% of average
- >10% drops in all basins except City Creek (9% drop)
- >20% drop in Mill Creek, Big Cottonwood, and Red Butte

Utah Water Supply Forecasts - Six Creeks





May 1, 2021 - Utah Water Supply Forecasts - Provo - Utah Lake



Provo River Basin Forecasts

January:**50**% of NormalFebruary:**50**% of NormalMarch:**45**% of NormalApril:**40**% of Normal

May:	35% of N	Normal
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- Forecasts range from 20-50% of normal
- >10% drop in all basins except American Fork (7.5% drop)

Utah Water Supply Forecasts - Provo/Utah Lake

Provo Woodland



May 2021 - Utah Water Supply Forecasts - Duchesne



Duchesne River Basin

January: 50% of Normal February: 50% of Normal March: 50% of Normal April: 45% of Normal May: 40% of Normal • Forecasts range from

20-50% of normal

Price River Basin

January:50% of NormalFebruary:50% of NormalMarch:45% of NormalApril:45% of NormalMay:31% of Normal

Utah Water Supply Forecasts - Duchesne



May 2021 - Utah Water Supply Forecasts - Sevier and Virgin



Sevier River Basin Forecasts (regulated i.e. predicted Obs)			
January:	40 % of Normal		
February	: 40 % of Normal		
March:	45 % of Normal		
April:	45 % of Normal		
May:	30 % of normal		

Virgin River Basin Forecasts

January:35% of NormalFebruary:40% of NormalMarch:40% of NormalApril:25% of Normal

May: **25%** of Normal

Historical (1981-2010) Forecast Verification



Location	May Forecast Error
BEAR - UTAH-WYOMING STATE	13%
BEAR - WOODRUFF NARROWS	27%
LOGAN - LOGAN- NR	12%
WEBER - OAKLEY- NR	11%
WEBER - ROCKPORT RES	16%
BIG COTTONWOOD CK	13%
PARLEYS CK	24%
PROVO - WOODLAND- NR	14%
PROVO - DEER CK RES	18%
VIRGIN - VIRGIN	15%

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

Upcoming Weather: WPC May 6-13 Precipitation Outlook



- Temps well above normal (10-20 degrees) today.
- Trough will move across the north over the weekend into Monday.
- Cooler temps and scattered showers are expected. However, precip amounts are forecasted to be light, generally less than 0.5 inches.

Upcoming Weather: 8-14 Day Outlook (May 14-20)

There is slightly elevated odds for below normal precip and above normal temps. No prolonged period of troughing and anomalously wet conditions is foreseen. The hope of a Miracle May is fading quickly.

Precipitation Outlook



Temperature Outlook



Summary

- Water year precipitation and basin snow are much below normal across the state, as is soil moisture.
- April precipitation was below normal.
- Snow has been melting in April (in most basins) across Utah instead of accumulating.
- April streamflow observations have been very low
- All water supply forecasts are below normal and have decreased.
- Water Supply Forecasts reflect:
 - Lack of precipitation
 - Extremely dry soil conditions
 - Slow snowpack depletion (cool periods followed by warm periods)
- Weather models indicating a dry spring pattern through the middle of the month.
 - Currently there is no indication of a transition to wet conditions that would stop the decline of model guidance (water supply forecasts).



CBRFC Model Snow Plots

Model daily snow water equivalent (SWE) for each basin elevation zone in CBRFC model

View total segment areas by turning on 'Basin' Boundaries















Plot of the time series of model snow for basin zones

- Select Basin Zones
- Select Water Year
- Select Snotel Stations
- Select Plot Options
 - Median, Maximum, Minimum of Model Snow
 - SNOTEL Median
 - Percent of Median Peak SWE



Plot of the time series of model snow for basin zones

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 - SNOTEL Median
 - Percent of Median Peak SWE
 - Percent Daily Median



Bear - Utah-Wyoming State Line, Nr (BERU1)

Summary

- Tools are available to look at CBRFC model snow
- Easily compare model snow to measured snow at points in and around that zone (SNOTEL)
- Compare current or past years to median, maximum, or minimum daily snow values

SWE (in)

— BERU1HLF

-- BERU1HUF Median -- BERU1HLF Median

2021 Water Supply Webinar Schedule

*All Times Mountain Time (MT)

Colorado River Basin

Friday	Jan 8th	10 am
Friday	Feb 5 th	10 am
Friday	Mar 5th	10 am
Wednesday	Apr 7 th	10 am
Friday	May 7th	10 am

<u>Great Basin</u>

Friday	Jan 8th	11:30 am
Friday	Feb 5 th	11:30 am
Friday	Mar 5th	11:30 am
Wednesday	Apr 7 th	11:30 am
Friday	May 7 th	11:30 am

CBRFC Contacts & WY21 Basin Focal Points

Michelle Stokes

Hydrologist In Charge

John Lhotak

Development and Operations Hydrologist

Paul Miller

Service Coordination Hydrologist

Cass Goodman Computer Systems Analyst

Valerie Offutt Administrative Assistant

firstname.lastname@noaa.gov

Ashley Nielson

Upper Green, Yampa San Juan, Dolores, Powell

Patrick Kormos Lower Green, Duchesne Weber, Provo

Cody Moser

Upper CO Mainstem, Gunnison

Brent Bernard

Bear, Sevier, Six Creeks

Zach Finch

Lower Colorado River Basin

Brenda Alcorn

Senior Hydrologist

Craig Peterson

Senior Hydrometeorologist

Tracy Cox Hydrometeorologist

CBRFC Webpage https://www.cbrfc.noaa.gov/

CBRFC Operations cbrfc.operations@noaa.gov 801-524-4004

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