Utah Water Supply Briefing

February 7th, 2022

Colorado Basin River Forecast Center

Presenter: Patrick Kormos - Hydrologist

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 (Precipitation)
2. Current Snowpack
3. 2022 Water Supply Forecasts
4. Early Season Forecast Error
5. Upcoming Weather
7. Contacts & Questions
2022 Water Year Precipitation October - December

- Much above normal precip.
  - October, December
- Much below normal precip.
  - November, January

<table>
<thead>
<tr>
<th>Forecast Group</th>
<th>Percent of WY normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bear</td>
<td>115</td>
</tr>
<tr>
<td>Weber</td>
<td>110</td>
</tr>
<tr>
<td>Six Creeks</td>
<td>110</td>
</tr>
<tr>
<td>Provo</td>
<td>115</td>
</tr>
<tr>
<td>Sevier</td>
<td>110</td>
</tr>
<tr>
<td>Duchesne</td>
<td>120</td>
</tr>
<tr>
<td>Virgin</td>
<td>120</td>
</tr>
</tbody>
</table>
January 9th-31st Precipitation: Record/Near Record Dry
Utah Weather Review - Precipitation

January 2022

Water Year Precipitation to Date (Jan. 31)

Water Year Precipitation, October 2021 - January 2022

Prepared by NOAA, Colorado Basin River Forecast Center
Salt Lake City, Utah, www.dartmouth.edu
Utah Current Snowpack - February 2

As of February 1, 2022

CBRFC Snow Groups (SNOTEL Stations)

- Bear: 105%
- Weber: 90%
- Six Creeks: 95%
- Provo: 95%
- Duchesne: 120%
- Sevier: 110%
- Virgin: 115%
Utah Current Snowpack

SNOTEL (Observed)
Utah Current Snowpack

SNOTEL (Observed)

Colorado Basin River Forecast Center
Bear River Drainage Group

02/03/2022 Percent Median: 100% (11.4 / 11.4)
Percent Seasonal Median: 61% (11.4 / 18.7)
3 Day Melt Rate: -0.3 in/day

This month

This Year’s SWE

Median SWE

Created 02/03/14:13 GMT
NOAA/CBRFC, 2022

Median 1991-2020 ~ 2022 ~
February 1 Forecast for April-July Volume

April-July Forecast Streamflow Volumes are in percent of 1991-2020 average

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

<table>
<thead>
<tr>
<th>Forecast Group</th>
<th>Median Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weber</td>
<td>85%</td>
</tr>
<tr>
<td>Bear</td>
<td>80%</td>
</tr>
<tr>
<td>Six Creeks</td>
<td>100%</td>
</tr>
<tr>
<td>Provo / Utah Lake</td>
<td>85%</td>
</tr>
<tr>
<td>Sevier</td>
<td>90%</td>
</tr>
<tr>
<td>Duchesne</td>
<td>90%</td>
</tr>
<tr>
<td>Virgin</td>
<td>75%</td>
</tr>
</tbody>
</table>
Utah Water Supply Forecasts - Weber

Weber River Basin Forecasts

January: 110% of Normal
February: 85% of Normal

- Forecasts range from 65-100% of normal
Utah Water Supply Forecasts - Weber

Weber - Oakley, Nr (OAWU1)
Period: Apr-Jul, Official 50% Forecast (2022-02-01): 109 kaf (98% Average, 112% Median)
ESP is Unregulated and No Precipitation Forecast Included

2022/02/01:
Max 1907: 254.23
Min 1934: 35.47
Average: 111
Median: 97
ESP: 109
Official 10: 160
Official 30: 129
Official 50: 109
Official 70: 83
Official 90: 80

~110% Fall SM

Above 10,000’
Model medians
Utah Water Supply Forecasts - Weber

Ogden - Pineview Reservoir, Ogden, Nr (PINU1)
Period: Apr-Jul, Official 50% Forecast (2022-02-01): 69 kaf (63% Average, 92% Median)
ESP is Unregulated and No Precipitation Forecast Included

2022/02/01:
Max 2011: 300.18
Min 1992: 12.14
Average: 109
Median: 75
ESP: 69.4
Official 10: 140
Official 30: 107
Official 50: 69
Official 70: 54
Official 90: 38

Above 8,000'

~70% Fall SM
Utah Water Supply Forecasts - Bear

Bear River Basin Forecasts

January: 95% of Normal
February: 80% of Normal
- Forecasts range from 60-105% of normal
Utah Water Supply Forecasts - Six Creeks

Six Creeks Basin Forecasts

January: 115% of Normal
February: 100% of Normal
- Forecasts range from 80-105% of normal
Utah Water Supply Forecasts - Utah Lake Basin

Utah Lake Basin Forecasts

January: 110% of Normal
February: 85% of Normal
- Forecasts range from 70-100% of normal
Utah Water Supply Forecasts - Utah Lake Basin

Above 9,500'
Spanish Fork - Castilla, Nr (CASU1)

Period: Apr-Jul, Official 50% Forecast (2022-02-01): 38 km³ (70% Average, 119% Median)

ESP is Unregulated and No Precipitation Forecast included

2022/02/01:
Max 1984: 251.76
Min 2002: 7.72
Average: 54
Median: 32
ESP: 37.5
Official 10: 65
Official 30: 49
Official 50: 38
Official 70: 28
Official 90: 23

Above 8,500’
Utah Water Supply Forecasts - Duchesne

Duchesne River Basin

- January: 110% of Normal
- February: 90% of Normal
  - Forecasts range from 85-105% of normal

Price River Basin

- January: 125% of Normal
- February: 85% of Normal
Utah Water Supply Forecasts - Duchesne

Upper Stillwater Reservoir

Rock Ck - Upper Stillwater Reservoir (USTU1)
Period: Apr-Jul, Official 50% Forecast (2022-02-01): 74 kaf (103% Average, 116% Median)
ESP is Unregulated and No Precipitation Forecast Included

2022/02/01:
Average: 72
Median: 64
ESP: 74.3
Official 10: 112
Official 30: 81
Official 50: 74
Official 70: 64
Official 90: 55

CBRFC Model Snow (2/4)
10,500'-12,100': 110% median
8,200'-10,500': 92% median
Above 10,500'
Utah Water Supply Forecasts - Sevier and Virgin

Sevier River Basin Forecasts (regulated)

January: 105% of Normal
February: 90% of Normal
- Forecasts range from 75-105% of normal

Virgin River Basin Forecasts

January: 90% of Normal
February: 75% of Normal
- Forecasts range from 70-75% of normal
Historical (1981-2010) Forecast Verification

Forecasts are better than just going with average error. 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

<table>
<thead>
<tr>
<th>Location</th>
<th>February Forecast Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEAR - UTAH-WYOMING STATE</td>
<td>20%</td>
</tr>
<tr>
<td>BEAR - WOODRUFF NARROWS</td>
<td>38%</td>
</tr>
<tr>
<td>LOGAN - LOGAN- NR</td>
<td>22%</td>
</tr>
<tr>
<td>WEBER - OAKLEY- NR</td>
<td>19%</td>
</tr>
<tr>
<td>WEBER - ROCKPORT RES</td>
<td>25%</td>
</tr>
<tr>
<td>BIG COTTONWOOD CK</td>
<td>18%</td>
</tr>
<tr>
<td>PARLEYS CK</td>
<td>32%</td>
</tr>
<tr>
<td>PROVO - WOODLAND- NR</td>
<td>20%</td>
</tr>
<tr>
<td>PROVO - DEER CK RES</td>
<td>26%</td>
</tr>
<tr>
<td>VIRGIN - VIRGIN</td>
<td>34%</td>
</tr>
</tbody>
</table>
A ridge over the Eastern Pacific will keep most of the basin dry.

A trough will dig to the east of the basin mid-week, bringing a chance of light precipitation to the Uintas:
- <0.25" of precipitation in the forecast

The ridge moves over the western US towards the end of the week.
Upcoming Weather: February 14-20

- A ridge will build over the eastern Pacific into next week
- A series of troughs will move over the basin next week, bringing chances of precipitation to most of the basin
- High uncertainty in precipitation amounts and placement
Upcoming Weather: 8-14 Day Outlook (February 14-20)

Slightly elevated odds of above average precipitation east of Utah.
Slightly elevated odds of above average temperatures across southwestern basins.

Precipitation Outlook

Temperature Outlook
Science Update: New 30 year averages

- 1981-2010 vs. 1991-2020 Seasonal Streamflow Normals Comparison
  - CBRFC unregulated streamflow definition
  - Great Basin
    - April-July Volume
    - Change In Average (%Difference)
  
  \[
  \%\text{Difference} = \frac{\text{New Value} - \text{Old Value}}{\text{Old Value}} \times 100
  \]

  - New Value: 1991-2020
  - Old Value: 1981-2010
Unregulated Flow

- Most CBRFC water supply forecasts in Utah are unregulated flow forecasts
  - Exception: Sevier River Basin and Stewart Dam in the Bear are regulated flow forecasts

- CBRFC unregulated flow definition:
  - Unregulated flow accounts for measured diversions and reservoir regulation
    - Diversions that are usually larger in magnitude
    - Data available in near real-time
    - Long historical period of record
  - Unregulated flow does not account for unmeasured depletions or unmeasured return flow
    - Non-real time data
    - Lack of historical data
    - Challenging to measure
1981-2010 vs. 1991-2020 Comparison: April-July Change in Average (%Difference)

<table>
<thead>
<tr>
<th>Basin</th>
<th>%Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duchesne</td>
<td>-16 to 0</td>
</tr>
<tr>
<td>Price/San Rafael</td>
<td>-19 to 0</td>
</tr>
<tr>
<td>Bear</td>
<td>-17 to -1</td>
</tr>
<tr>
<td>Weber</td>
<td>-15 to -4</td>
</tr>
<tr>
<td>Six Creeks</td>
<td>-20 to -6</td>
</tr>
<tr>
<td>Provo/UT Lake</td>
<td>-34 to -1</td>
</tr>
<tr>
<td>Virgin</td>
<td>-14 to 0</td>
</tr>
<tr>
<td>Sevier</td>
<td>-22 to 0</td>
</tr>
<tr>
<td>Lake Powell</td>
<td>-11</td>
</tr>
</tbody>
</table>

Thanks to October and December precipitation, the water year precipitation is above normal.

Snowpack conditions are near normal. High elevation Uintas snowpack is above normal.

Fall soil moisture was below normal in general (Duchesne and Uinta Headwaters are the exception)

January precipitation was below normal across Utah.

Water Supply Forecasts have declined from January in response to lack of January precipitation.

The weather looks dry for the next week, with a possible pattern change next week

It is still relatively early in the water year.
# 2022 Water Supply Webinar Schedule

*All Times Mountain Time (MT)*

<table>
<thead>
<tr>
<th>Colorado River Basin</th>
<th>Great Basin</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Friday</strong> Jan 7&lt;sup&gt;th&lt;/sup&gt;</td>
<td><strong>Friday</strong> Jan 7&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Monday</strong> Feb 7&lt;sup&gt;th&lt;/sup&gt;</td>
<td><strong>Monday</strong> Feb 7&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Monday</strong> Mar 7&lt;sup&gt;th&lt;/sup&gt;</td>
<td><strong>Monday</strong> Mar 7&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Thursday</strong> Apr 7&lt;sup&gt;th&lt;/sup&gt;</td>
<td><strong>Thursday</strong> Apr 7&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Friday</strong> May 6&lt;sup&gt;th&lt;/sup&gt;</td>
<td><strong>Friday</strong> May 6&lt;sup&gt;th&lt;/sup&gt;</td>
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</tbody>
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Peak flow forecast webinar Thursday, March 17<sup>th</sup>, 10 am MT

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  
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Ashley Nielson – Gunnison, San Juan, Dolores, Lake Powell  
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Cody Moser – Upper Colorado Mainstem  
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Patrick Kormos – Great Basin/Sevier  
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Paul Miller – Service Coordination Hydrologist  
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John Lhotak – Development and Operations Hydrologist  
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801-524-4004

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