February 2017
Great Basin Water Supply Briefing

Feb 7, 2017
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Colorado Basin River Forecast Center
National Weather Service
NOAA

Please mute your phone until ready to ask questions
January weather - A game changer!

Current snowpack conditions

2017 water supply forecasts update and current trends

February forecasts – How good are they?

Upcoming weather – Potential impacts to water supply forecasts

Contacts & Questions

* Please mute your phone until ready to ask questions *
Fall Weather Impacts
Impacts to Soil Moisture entering Winter

Water Year Precipitation, October 2016 - November 2016
(Averaged by Basin)

Soil Moisture – Fall – 2016 (November 16)
(Modeled, Averaged by Basin)

Wet September & October

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

Impacts to Soil Moisture Entering Winter

Water Supply Impacts:

- Early season forecasts higher/lower by 3-10% of average
- Significant snowpack, like this year, lessens the impacts of dry soils on spring runoff
- Significant snowpack + wet soils could see more enhanced spring runoff
Narrow corridor of significant moisture transport in the atmosphere

Winter Weather
Mid December through January: “Atmospheric Rivers”

Sunday Jan 8th 2017
January Weather – Wow!

Active and wet pattern continued for most of the month
Drier conditions the last week of the month

January Atmospheric Pattern:

Strong onshore flow continued to transport significant moisture into the western U.S

Monthly Precipitation - January 2017
(Averaged by Basin)

Bear: 230% !!
Weber: 265% !!
Six Creeks: 195% !!
Provo/UT Lake: 260% !!

Game changer for water supply!
January Weather – Wow!

January SNOTEL Precipitation Rankings

Many SNOTEL locations had record or near precipitation for the month of January (35-39 years of record most sites)

<table>
<thead>
<tr>
<th>Location</th>
<th>January Observed (in)</th>
<th>% of Average</th>
<th>Anomaly (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bug Lake</td>
<td>10.0</td>
<td>267%</td>
<td>6.8</td>
</tr>
<tr>
<td>Little Bear</td>
<td>11.9</td>
<td>275%</td>
<td>8.0</td>
</tr>
<tr>
<td>Ben Lomand Peak</td>
<td>18.7</td>
<td>221%</td>
<td>10.1</td>
</tr>
<tr>
<td>Chalk Creek #1</td>
<td>10.5</td>
<td>245%</td>
<td>7.3</td>
</tr>
<tr>
<td>Trial Lake</td>
<td>10.5</td>
<td>245%</td>
<td>7.3</td>
</tr>
<tr>
<td>Thaynes Canyon</td>
<td>9.9</td>
<td>216%</td>
<td>6.2</td>
</tr>
<tr>
<td>Brighton</td>
<td>12.1</td>
<td>225%</td>
<td>7.5</td>
</tr>
<tr>
<td>Timp Divide</td>
<td>12.2</td>
<td>240%</td>
<td>7.7</td>
</tr>
</tbody>
</table>
Seasonal precipitation

Looking Very Good
Snow Conditions

SNOTEL (% median): February 3, 2017

CBRFC MODEL SNOW (% median):

Snow Conditions - February 03 2017
(Modeled, Major Contributing Areas)
February 1st Water Supply Forecasts – Bear River Basin

April-July Forecast Streamflow Volumes (% of 1981-2010 average)

- Bear Stateline
- Logan River
- Blacksmiths Fork
- Little Bear
- Smiths Fork
- Above Woodruff Narrows

143%
146%
189%
193%
155%
225%
151%
February 1st Water Supply Forecasts – Weber River Basin

April-July Forecast Streamflow Volumes (% of 1981-2010 average)

- Pineview Inflow: 204%
- Lost Creek Inflow: 172%
- Weber-Oakley: 129%
- Chalk Creek: 146%
- Weber-Gateway: 154%
- East Canyon Inflow: 137%
- South Fork Ogden: 135%
- Weber-Coalville: 135%
- Echo: 135%
- Rockport Inflow: 133%
- Weber-Oakley: 129%
- South Fork Ogden: 135%
- Weber-Gateway: 154%
- East Canyon Inflow: 137%
- Pineview Inflow: 204%
- Lost Creek Inflow: 172%
- Weber-Oakley: 129%
- Chalk Creek: 146%

Colors indicate streamflow volumes compared to the 1981-2010 average:
- Below 25%
- 25% - 35%
- 35% - 45%
- 45% - 55%
- 55% - 65%
- 65% - 75%
- 75% - 85%
- 85% - 95%
- 95% - 105%
- 105% - 115%
- 115% - 125%
- 125% - 135%
- 135% - 145%
- 145% - 155%
- 155% - 165%
- 165% - 175%
- Above 175%
- NA
February 1st Water Supply Forecasts – Six Creeks

April-July Forecast Streamflow Volumes (% of 1981-2010 average)

- City Creek: 103%
- Little Dell Inflow: 120%
- Emigration: 140%
- Red Butte: 110%
- Mill Creek: 103%
- Parleys Creek: 123%
- Lambs Creek: 117%
- Big Cottonwood: 122%
- Little Cottonwood: 126%
- Parleys Inflow: 117%
- Emigration: 140%
- City Creek: 103%
- Little Dell Inflow: 120%
- Emigration: 140%
- Red Butte: 110%
- Mill Creek: 103%
- Parleys Creek: 123%
- Lambs Creek: 117%
- Big Cottonwood: 122%
- Little Cottonwood: 126%

Legend:
- Below 25%
- 25% - 35%
- 35% - 45%
- 45% - 55%
- 55% - 65%
- 65% - 75%
- 75% - 85%
- 85% - 95%
- 95% - 105%
- 105% - 115%
- 115% - 125%
- 125% - 135%
- 135% - 145%
- 145% - 155%
- 155% - 165%
- 165% - 175%
- Above 175%
- NA
February 1st Water Supply Forecasts – Provo River / Utah Lake

April-July Forecast Streamflow Volumes (% of 1981-2010 average)

- Provo River
  - Woodland
  - Inflow
- Spanish Fork
- American Fork
- Deer Creek Inflow
- Utah Lake Inflow
- West Canyon Creek
- Provo Hailstone
- Provo Woodland

- 148%
- 149%
- 169%
- 160%
- 145%
- 119%

- Below 25%
- 25% - 35%
- 35% - 45%
- 45% - 55%
- 55% - 65%
- 65% - 75%
- 75% - 85%
- 85% - 95%
- 95% - 105%
- 105% - 115%
- 115% - 125%
- 125% - 135%
- 135% - 145%
- 145% - 155%
- 155% - 165%
- 165% - 175%
- Above 175%
- NA
Changes in water supply forecasts between Jan 1st and Feb 1st

- Bear River Basin: 28 to 79% of average increase
- Weber River Basin: 24 to 92% of average increase
- Six Creeks (SLC): 1 to 33% of average increase
- Provo River / UT Lake: 15 to 70% of average increase
Plots are available at: https://www.cbrfc.noaa.gov
Select WATER SUPPLY from the top menu
Click on desired location for pop-up, click again for full screen
Forecast Evolution Plot – Ogden near Pineview Reservoir

- **230 kaf / 204% average**
  - Uses 30 year (1981-2010) climatological precipitation into future

- **244 kaf / 216% average**
  - Uses 5 days of deterministic Quantitative Precipitation Forecast (QPF) then 30 year climatological precipitation beyond that
April-July 2017 Official Forecast (as of 2/1/17)

152 KAF / 129% avg

Observed Historical Years
2011: 223 KAF
1986: 216 KAF
2008: 128 KAF

The latest (2017-02-06) 50% ESP forecast is 170 kaf.
April-July 2017 Official Forecast (as of 2/1/17)

48 KAF / 126% avg

Observed Historical Years
1983: 63 KAF
2011: 54 KAF
1995: 52 KAF
2006: 48 KAF

Forecast Target Period

51 kaf / 134%
Forecast Evolution Plot – Provo River near Woodland

April-July 2017 Official Forecast (as of 2/1/17)

148 KAF / 148% avg

Observed Historical Years
2011: 205 KAF
1983: 147 KAF
1982: 147 KAF
1980: 114 KAF

The latest (2017-02-06) 50% ESP forecast is 172 kaf.
Plot Created 2017-02-06 14:26:23, NOAA / NWS / CBRFC
Forecasts in the forecast target period include observed values.
Forecast Evolution Plot – Provo River near Woodland

April-July 2017 Official Forecast
(as of 2/1/17)

96 KAF / 139% avg

Observed Historical Years
1984: 252 KAF
2011: 143 KAF
1982: 133 KAF

114 kaf / 165%

The latest (2017-02-06) 50% ESP forecast is 114 kaf.
Plot Created 2017-02-06 15:53:34, NOAA / NWS / CBRFC
Forecasts in the forecast target period include observed values.
Forecast Validation: How good are forecasts in February?

Historical Model Error
1981-2010

- February forecast error a general improvement over January
- significant snow accumulation period remains
- Forecasts are better than just going with average
- Error tends to decrease each month into the spring

Where We Do Better:
- Headwaters
- Primarily snow melt basins
- Known diversions / demands

Where We Do Worse:
- Lower elevations (rain or early melt)
- Downstream of diversions / irrigation
- Little is known about diversions / demands

Map is available at:
https://www.cbrfc.noaa.gov/arc/verif/verif.php

From Water Supply drop down menu
→ select Historical Verification Map
Upcoming Weather and Impacts to Water Supply Forecasts

Water Vapor Satellite Image This Morning - A wet week ahead for northern Utah

Feb 7th 2017

Very Moist Air
Upcoming Weather and Impacts to Water Supply Forecasts

Satellite Image This Morning - A wet week ahead for northern Utah

Feb 7th 2017
Upcoming Weather and Impacts to Water Supply Forecasts

Meteorological Model Guidance: Tonight through early Wednesday rain valleys / snow mountains (~6500 feet)
Fairly potent system with some 3-4 inch precipitation amounts possible in northern Utah

Feb 7th 2017

Areas of forecast Precipitation

Long stretch of moisture to impact the region
Upcoming Weather and Impacts to Water Supply Forecasts

Meteorological Model Guidance: A lull in precipitation later Wednesday into Friday.

Weekend Storm
Upcoming Weather and Impacts to Water Supply Forecasts

Meteorological Model Guidance: Increasing precipitation Friday into the Weekend, colder air, lowering snow levels

Feb 11th 2017
Upcoming Weather and Impacts to Water Supply Forecasts

Meteorological Model Guidance: Next week appears to be on the dry side. Long range guidance suggest the pattern could become more active again by the weekend of the 18th.
Upcoming Weather and Impacts to Water Supply Forecasts

Precipitation Forecasts the Friday-Saturday storm
Upcoming Weather and Impacts to Water Supply Forecasts

Precipitation Forecast: 7 day total (Feb 6th-Feb 13th)
Best start for the snowpack in years, many SNOTEL sites rank in the top 2-5 of record for this time of year (period of record 36-39 years for most)

Dramatic increase in water supply forecasts over those from January 1st

We could still be impacted by abnormally dry spring weather, but impacts would be less in the Bear and Weber (90% or better chance we will see average or better runoff).

A wet week lies ahead for the mountain locations, especially northern Utah (Weber, Bear, Provo headwaters).

Water Supply Forecasts are not likely to decrease in the short term and probably increase in parts of the Bear and Weber Basin and higher elevation headwaters.
2017 water supply briefing schedule

- 2017 monthly water supply briefings for the Great Basin
  - Tuesday Mar 7th @ 1:30 pm MT
  - Thursday Apr 5th @ 1:30 pm MT
  - Friday May 5th @ 1:30 pm MT

- Colorado River Basin webinars are same dates at 11 am MT

- Peak flow briefing early March. Additional briefings scheduled as needed.

- Date/Times are subject to change. All registration information has been posted to the CBRFC web page.
Please contact us with any questions

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