Great Basin Water Supply Briefing

February 7th, 2019

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Please mute your phone until ready to ask questions
Weather review
   Quite a different start from than last year

Current Snowpack

Impacts of dry soils

2019 Water Supply Forecasts
   Select Forecast Site Review

February Forecast Error

Upcoming Weather

Contacts & Questions

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* Please mute your phone until the question period *
A much different start compared to last year

Water Year (October – January) Precipitation
A much different start compared to last year

February 6th Snow Conditions
(CBRFC hydrologic model)

Snow Conditions - February 06 2018
(Modeled, Major Contributing Areas)

% Median SWE
- >500%
- 300-500%
- 200-300%
- 150-200%
- 130-150%
- 110-130%
- 100-110%
- 90-100%
- 70-90%
- 50-70%
- 30-50%
- 0-30%

Snow Conditions - February 06 2019
(Modeled, Major Contributing Areas)

% Median SWE
- >500%
- 300-500%
- 200-300%
- 150-200%
- 130-150%
- 110-130%
- 100-110%
- 90-100%
- 70-90%
- 50-70%
- 30-50%
- 0-30%
Current Snow Conditions – (SNOTEL)

All areas similar or better than last year. Some areas have exceeded last year's peak.

February 6th, 2019

2019: +1.7 in

2019: +7.0 in

2019: +10.2 in
2018: Strong ridge / blocking pattern
Infrequent storms – extended dry periods

2019: Progressive pattern
Warmer Pacific / stronger southern jet stream

Mean atmospheric pattern
Dec 1 – Jan 15
2018 vs 2019
Dry soils entering the winter – May act to reduce some runoff volumes
Conditions contributing to dry soil moisture conditions

- Very low runoff volumes in 2018
- Dry summer over most runoff producing areas
- Little monsoonal impact last summer
• Very dry September (No monsoonal impact)
• Some rebound in baseflow due to a wet October
• Mix of conditions in November
February 1\textsuperscript{st} Water Supply Forecasts – Great Basin/Utah

April-July Forecast Streamflow Volumes (% of 1981-2010 average)
February 1st Water Supply Forecasts – Bear River Basin

Median Basin Forecast:
Jan – 70%
Feb – 85%

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

Forecast range: ~70%-100% of average
Increased 2% to 23% of average
February 1<sup>st</sup> Water Supply Forecasts – Weber River Basin

Median Basin Forecast:

- Jan – 75%
- Feb – 85%

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

- Forecast range: ~75%-105% of average
- Increased 2% to 25% of average
February 1\(^{st}\) Water Supply Forecasts – Six Creeks

Median Basin Forecast:
- Jan – 65%
- Feb – 90%

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

Forecast range: ~60-100% of average
Increased 20% to 35% of average
February 1st Water Supply Forecasts – Provo River/Utah Lake

Median Basin Forecast:
- Jan – 70%
- Feb – 100%

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

- Forecast range: ~80-100% of average
- Increased 20% to 40% of average
February 1st Water Supply Forecasts – Duchesne

Median Basin Forecast:
- Jan – 75%
- Feb – 100%

April-July Forecast Streamflow Volumes (% of 1981-2010 average)
- Increased 15 to 35% of average
- Forecast range: 75% - 115%

- Median Basin Forecast:
  - Duchesne: 97%
  - Red Fleet: 76%
  - Ashley: 80%
  - Neola: 80%
  - Starvation: 97%
  - Strawberry: 96%
  - Myton: 99%
  - Uinta: 104%
  - Yellowstone: 97%
  - Moon: 107%
  - Ashley Creek: 97%
  - Neola: 80%
  - Randlett: 87%
  - Tabiona: 104%
  - Strawberry: 96%
  - Tabiona: 96%
February 1st Water Supply Forecasts – Sevier/Virgin

Sevier:
Forecast range: ~60%-130%
Increased 20 to 40% of average

Virgin:
Forecast range: ~70-90% of average
Increased 25% to 30% of average

Sevier:
Median Basin Forecast:
Sevier: Jan - 60%  Feb - 90%

Virgin:
Jan – 50%  Feb – 80%

April-July Forecast Streamflow Volumes (% of 1981-2010 average)
Click on Bear River- Stateline point
Model calibration period is 1981-2015

ESP:
- Start from today’s model conditions (snow and soil moisture)
- Use precipitation and temperature from each of those 35 years going forward
  → 35 possible runoff scenarios
- Median of those 35 scenarios is the 50% exceedance value
  → basis of Official 50% Forecast

Available on CBRFC web page by selecting sites from
list: https://www.cbrfc.noaa.gov/rmap/wsup/wsuplist.php
Forecast Evolution Plot
Weber – Oakley: 104 kaf / 88%

Forecaster accounted for upcoming storms
Forecast Evolution Plot
Little Cottonwood Creek: 37 kaf / 97%

Raw model guidance is now above average from recent storms.
Early February Storms
January Storms

Period: Apr-Jul, Official 50% Forecast (2019-02-01): 37 kaf (97% Average, 106% Median)
ESP is Unregulated and No Precipitation Forecast Included

2019/02/01:
Max 1983: 63.39
Min 1961: 19.27
Average: 38
Median: 35
ESP: 34.7
Official 10: 49
Official 30: 41
Official 50: 37
Official 70: 32
Official 90: 30

Median 1981-2010
Past
Future

Colorado Basin River Forecast Center
SBDU1 - SNOWBIRD (9640 ft)

02/06/2019 Percent Median: 13% (2.72 / 15.6)
Percent Seasonal Median: 13% (2.72 / 43.1)
Yield Rank 8, Dry Rank 23 (30 years)
Forecast Evolution Plot
Provo – Hailstone (Jordanelle Inflow) – 113 kaf / 103%

Provo - Hailstone, Nr (PVHU1)
Period: Apr-Jul, Official 50% Forecast (2019-02-01): 113 kaf (103% Average, 106% Median)
ESP is Unregulated and No Precipitation Forecast Included

Future weather
Wetter scenario
Drier scenario

Past / Future

Colorado Basin River Forecast Center
TRLU1 - TRIAL LAKE (9992 ft)
02/06/2019 Percent Median: 136% (17.7 / 13.0)
Percent Seasonal Median: 75% (17.7 / 23.5)
Wet Rank: 12, Dry Rank: 30 (41 years)

Median 1981-2019
2019
2018

2019/02/01:
Max 2011: 244.76
Min 1977: 23.99
Average: 110
Median: 107
ESP: 100
Official 10: 163
Official 30: 128
Official 50: 113
Official 70: 95
Official 90: 82
Forecast Evolution Plot
Rock Creek – Upper Stillwater Reservoir Inflow – 77 kaf / 104%

Forecaster accounted for upcoming storms.
Forecast Validation: Historical model error improves January to February

Historical Model Error
1981-2010

February forecast error is generally a improvement compared to the January error
-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
February 1\textsuperscript{st} – 6\textsuperscript{th} precipitation

The early February precipitation was taken into account for many of the water supply forecasts.
Upcoming Weather – Quick moving system impacting northern areas Feb 10-11
Potentially more potent system impacting entire area late next week Feb 15-16
Pattern remains progressive into the 3rd week of February
Upcoming Weather – Active pattern likely through at least mid month

Weak storm system impacting the northern areas Feb 10-11
Potentially a more significant storm impacting the entire area late next week (Feb 15-16)
Models suggest active weather possibly beyond that (less confidence)

An increase in snowpack over most areas between now and mid/late February stands a good chance.

Above average precipitation for the month of February appears likely.
2019 Water Supply Briefing Schedule

2019 monthly water supply briefings for the Great Basin/Utah

Thursday March 7th @ 1:30 pm MT
Thursday April 4th @ 1:30 pm MT
Tuesday May 7th @ 1:30 pm MT

Colorado Basin webinars are same dates at 11:00 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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