CBRFC
Water Year 2020
Early Season Water Supply Outlook

December 18, 2019

Cody Moser
Hydrologist

Phone: 1-877-929-0660
Passcode: 1706374

Please mute your phone until the question period
2020 Early Season Water Supply Outlook

Observed precipitation over the past several months

Soil moisture conditions entering winter

Current snow conditions

2020 water supply - early season model guidance

Water supply forecast evolution plot overview

Upcoming weather outlook

2020 water supply webinar schedule

Forecast points of contact

Phone: 1-877-929-0660
Passcode: 1706374

Please mute your phone until the question period
Water Year 2019

Monthly Precipitation - June 2019

Water Year 2020

Monthly Precipitation - October 2019

Water Year 2020

Monthly Precipitation - November 2019
Fall Soil Moisture Conditions (Model) - 2019 / 2020 Comparison

Soil Moisture - Fall - 2018 (November 15)
(Modelled, Averaged by Basin)

Soil Moisture - Fall - 2019 (November 15)
(Modelled, Averaged by Basin)

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

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

Prepared by NOAA, Colorado Basin River Forecast Center
Salt Lake City, Utah, www.cbrf.noaa.gov
Current Observed Snow Conditions - SNOTEL (NRCS)
Current CBRFC Model Snow Conditions - 2019 / 2020 Comparison

Snow Conditions - December 17 2018
(Modeled, Major Contributing Areas)

Snow Conditions - December 17 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%

Prepared by NOAA, Colorado Basin River Forecast Center
Salt Lake City, Utah, www.cbrfc.noaa.gov
Water Supply - Early Season Model Guidance

At this point in time…

- Ideally model soil moisture & snow states are accurate and representative of current conditions.
- Model guidance is still heavily influenced by soil moisture.
- Early season forecast errors are generally 20-40% and typically improve through the spring; the primary source of forecast uncertainty is future weather.
- Snowpack - don’t put too much weight into mid-December conditions.
  - Typically around 30-35% of the seasonal snow has occurred by mid-December
  - Historical median (or normal) snowpack values are still small compared to later in the season
Ensemble Streamflow Prediction (ESP) Overview

ESP Methodology: current hydrologic model states (soil moisture, snow) + future weather (precip/temp) scenarios based on historical (1981-2015) observations = April-July streamflow volume

Example: Dillon Reservoir (Inflow)

2020 current model states + 1981 weather = 119 kaf (thousand acre-feet)
2020 current model states + 1982 weather = 175 kaf
2020 current model states + 1983 weather = 216 kaf
.
.
.
2020 current model states + 2015 weather = 198 kaf

Final result is 35 different possibilities of April-July streamflow volume
- use statistical analysis to determine probabilistic outcomes:
  - volume that has 50% chance of occurring (most probable)
  - volume that has 10% chance of occurring (less likely)
  - volume that has 90% chance of occurring (more likely)

*Updated Daily
Lake Powell summarizes the hydrologic conditions throughout the Upper Colorado River Basin.
ESP Model Guidance: Sevier, Virgin, Lower Colorado

**Sevier & Virgin**
April-July Runoff Volumes
% of 1981-2010 **Average**

- Little Colorado: 80-100%
- Sevier: 90-130%
- Verde: 135%
- Salt: 105-135%
- Virgin: 90-105%
- Upper Gila: 95-120%

**Lower Colorado**
January-May Runoff Volumes
% of 1981-2010 **Median**

- Lower Colorado: 80-100%
ESP Model Guidance: Great Basin

April-July Runoff Volumes % of 1981-2010 Average

Provo/Utah Lake: 70-100%

Bear: 90-105%

Weber: 85-100%

Six Creeks: 80-95%
Water Supply Forecast Evolution Plot Overview

Water Supply Forecast

Colorado - Lake Powell, Glen Cyn Dam, At (GLDA3)
Period: Apr-Jul, ESP 50% Forecast (2019-12-17): 5620 kaf (79% Average, 87% Median)
ESP is Unregulated and Includes 5 Day Precipitation Forecast

10% (wetter future weather scenario)

90% (drier future weather scenario)

50% (Most Probable)

2019/12/17:
Max 1984: 15316.11
Min 2002: 963.96
Average: 7160
Median: 6470
ESP: 5620
Upcoming Weather: Precipitation Outlook December 18\textsuperscript{th}-24\textsuperscript{th}

December 18-22

Expect ESP volume guidance to decrease over the next 5 days

December 23-24

Positive impact to water supply
Upcoming Weather: December 23-26

Weather models in agreement with timing & position of storm system next week.
1-3 inches storm total over Arizona higher terrain (snow levels ~8,000 ft).
Most basins expected to receive some precipitation.
Active weather expected to continue beyond event.
Upcoming Weather: 8-14 Day Outlook (December 25-31)

Increased probability of above average precipitation
El Niño Southern Oscillation (ENSO)

Current Conditions: ENSO Neutral

ENSO-neutral is favored during the Northern Hemisphere winter continuing through spring 2020.
Water supply forecasts are issued starting in January; model guidance is now available on our website (forecast evolution plots).

Currently, soil moisture states (also represented by baseflow) in the model have a larger influence on hydrologic guidance compared to later in the season.

As we progress into the winter, snowpack conditions will have a larger impact on forecasts in the Upper Colorado and Great Basins.

Winter rain events will have largest impacts on Lower Colorado River Basin forecasts.
## 2020 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>Wednesday</td>
<td>Wednesday Jan 8(^{\text{th}}) 10 am</td>
</tr>
<tr>
<td>Friday</td>
<td>Friday Feb 7(^{\text{th}}) 10 am</td>
</tr>
<tr>
<td>Friday</td>
<td>Friday Mar 6(^{\text{th}}) 10 am</td>
</tr>
<tr>
<td>Tuesday</td>
<td>Tuesday Apr 7(^{\text{th}}) 10 am</td>
</tr>
<tr>
<td>Thursday</td>
<td>Thursday May 7(^{\text{th}}) 10 am</td>
</tr>
</tbody>
</table>

Peak flow forecast webinar Wednesday, March 18th, 10 am MT

Additional briefings scheduled as needed

All registration information has been posted to the CBRFC web page
CBRFC Webinar Registration & Email List

Exercise Wednesday, December 18th, 10 am MT. CBRFC Early Season Water Supply Outlook Webinar. Registration: More Info.

2020 Water Supply Forecast Webinar Schedule and Registration:

- CBRFC Water Supply Forecast Webinars - Water Year 2020
  - The Colorado Basin River Forecast Center (CBRFC) produces water supply forecasts for the Colorado River and eastern Great Basin.
  - CBRFC conducts December through June webinars explaining the forecasts and current conditions.
  - The webinar is composed of two parts: (1) a telephone conference call and (2) a web-based presentation.
  - The conference call can be joined by dialing the number below prior to the start of the webinar and entering the provided access code when prompted.
  - Webinar Dial-In Information (same for all webinars):
    Conference Call Phone Number: 1-877-929-0596
    Access Code: 176574

  - To view the web-based presentation, you need to register prior to the webinar. Follow the links below to register for a webinar:
    - Early Season Water Supply Outlook Webinar [click to register]:
      Wednesday, December 18th at 10 am MT

- Colorado River Basin Water Supply Webinars:
  - Tuesday, February 7th at 10 am MT
  - Thursday, March 11th at 10 am MT

- Great Basin Water Supply Webinars:
  - Tuesday, April 8th at 10 am MT
  - Thursday, May 7th at 10 am MT

- Peak Flow Webinar:
  - Wednesday, March 18th at 10 am MT

A notification email will be sent if a date or time change occurs. Additional webinars are scheduled as needed.

The webinar slides will be available from the CBRFC [presentations page] soon after each briefing.

Join the CBRFC Email List and Google Group

To subscribe to our Google Group email list, just click here.
Or you can request to join by sending an email to cbRFC.webmasters@noaa.gov
In the subject line please include: email notification list.
If you would like to add any information about your area of interest and association or agency you represent please do so in the body of the email.
This information would help us maintain a more comprehensive contact list.

This list is used to provide notification when webinars are scheduled, water supply forecasts are updated, and for other news of interest to our stakeholders regarding CBRFC operations.

For questions or comments, including suggestions on additional CBRFC products or services we might provide, please contact us at cbRFC.webmasters@noaa.gov.
CBRFC Contacts

**Basin Focal Points (Forecasters)**

Brenda Alcorn - Upper Green, White, Yampa, Duchesne  
brenda.alcorn@noaa.gov

Tracy Cox - San Rafael, Price  
tracy.cox@noaa.gov

Cody Moser – Upper Colorado Mainstem  
cody.moser@noaa.gov

Ashley Nielson – San Juan, Gunnison, Dolores, Lake Powell  
ashley.nielson@noaa.gov

Zach Finch – Virgin, Lower Colorado Basin  
zach.finch@noaa.gov

Patrick Kormos – Bear, Weber  
patrick.kormos@noaa.gov

Brent Bernard – Six Creeks, Provo, Sevier  
brent.bernard@noaa.gov

Michelle Stokes – Hydrologist In Charge  
michelle.stokes@noaa.gov

Paul Miller – Service Coordination Hydrologist  
paul.miller@noaa.gov

John Lhotak – Development and Operations Hydrologist  
john.lhotak@noaa.gov

Craig Peterson - Senior Hydro/Met  
craig.peterson@noaa.gov

CBRFC Webpage  
[https://www.cbrfc.noaa.gov/](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](https://www.cbrfc.noaa.gov/present/present.php)

Questions?