

Colorado River Basin Water Supply Briefing

January 8, 2021

Cody Moser - Hydrologist
Colorado Basin River Forecast Center

Please mute your phone until the question period



Today's Presentation

Precipitation Review

Soil Moisture Conditions

Current Snowpack

2021 Water Supply Forecasts

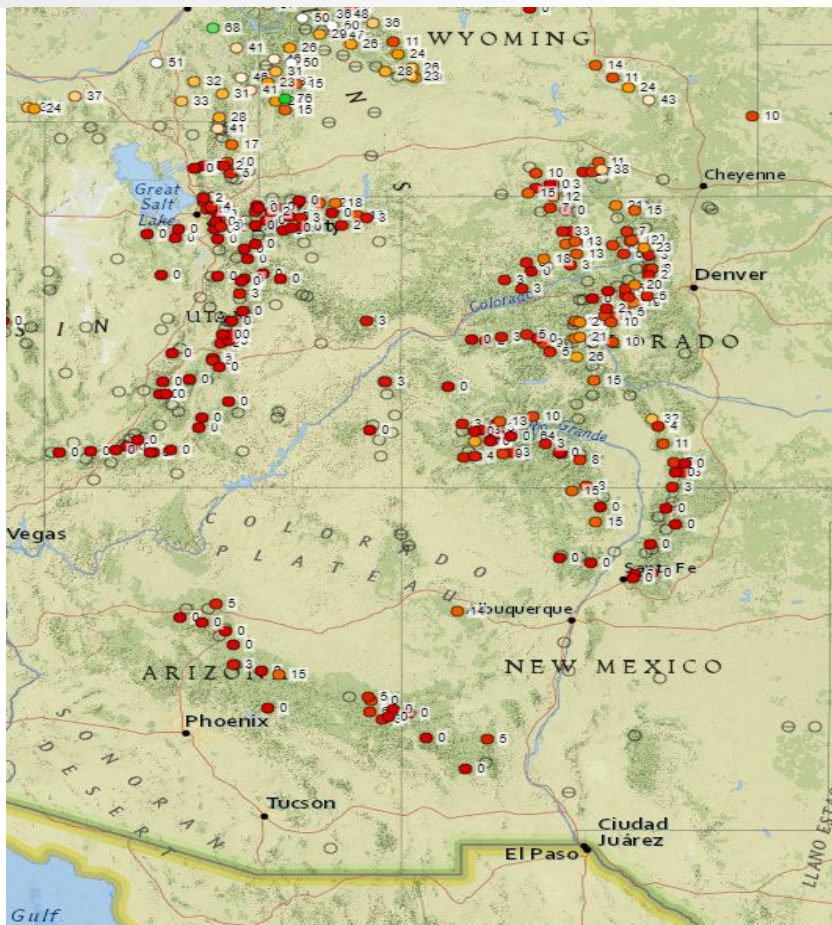
Early Season Forecast Error

Upcoming Weather

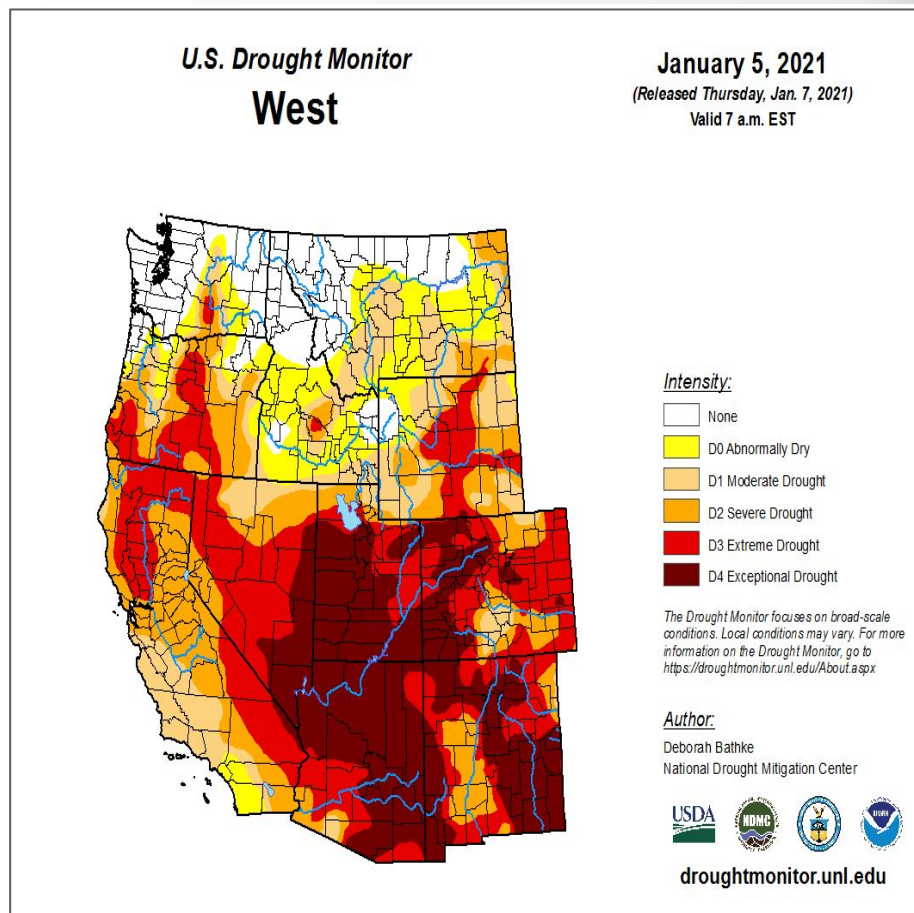
Contacts & Questions

**Webinar recording & slides will be
made available on CBRFC webpage**

April - September 2020: One of the Driest / Drought Intensifies

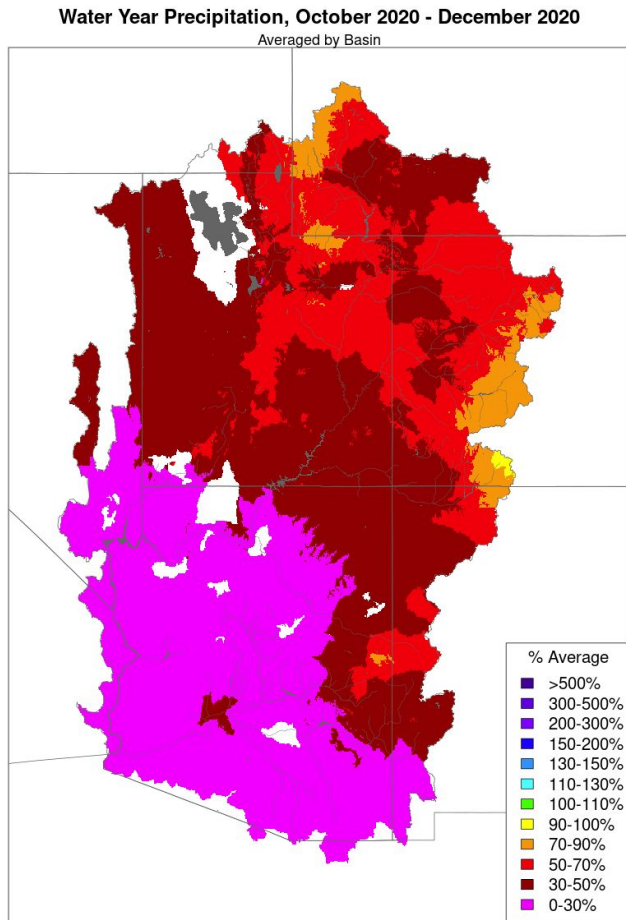


Precipitation percentiles from April-September 2020. Note the large number of sites below the 10th percentile.



Extensive area in the Extreme to Exceptional Drought heading into new year

Water Year 2021 (October - December) Precipitation



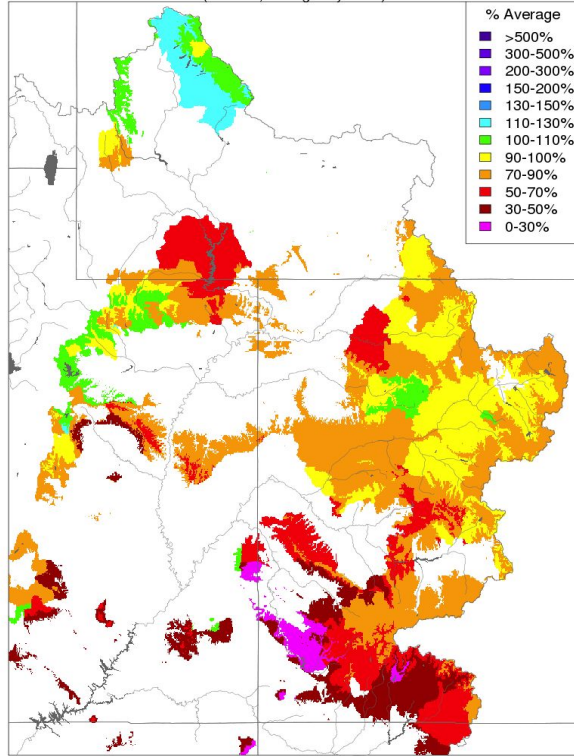
Prepared by NOAA, Colorado Basin River Forecast Center
Salt Lake City, Utah, www.cbrfc.noaa.gov

Water Year 2021 Oct-Dec Precip Summary

<u>Basin</u>	<u>Precip (% Avg)</u>
Upper Green	75%
Duchesne	60%
Price/San Rafael	60%
Yampa/White	60%
Upper CO Mainstem	70%
Gunnison	70%
Dolores	60%
San Juan	70%
Lake Powell	65%
Virgin	45%
Verde	15%
Salt	40%
Little Colorado	35%
Upper Gila	40%

Soil Moisture Conditions - Upper Colorado 2019 vs. 2020

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

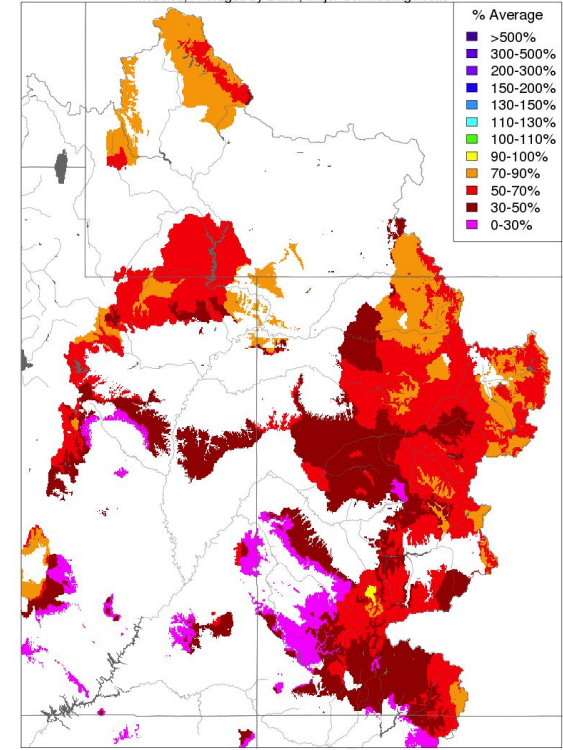


Prepared by NOAA, Colorado Basin River Forecast Center
Salt Lake City, Utah, www.cbrfc.noaa.gov

Current soil moisture conditions are worse off than they were a year ago due to near record low April-October 2020 precipitation across the region.

Model soil moisture is generally in the bottom 5 across the Upper Colorado over the 1981-2020 40-year period. The San Juan and Dolores are generally in the bottom 3 with some areas being record dry.

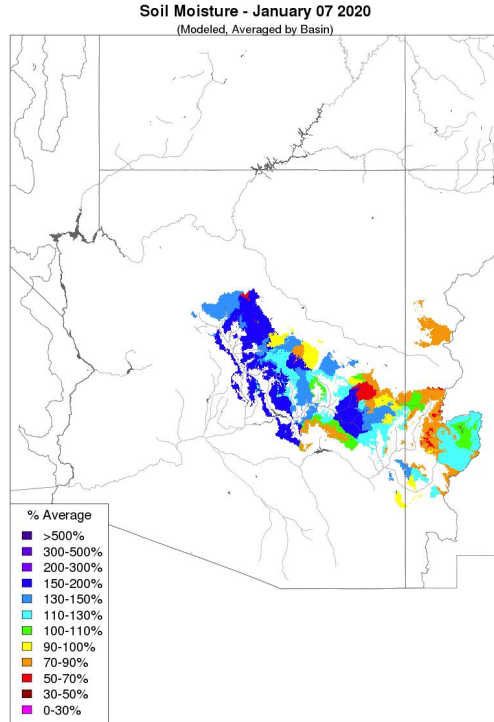
Soil Moisture - Fall - 2020 (November 15)
Modeled, Averaged by Basin, Major Contributing Areas



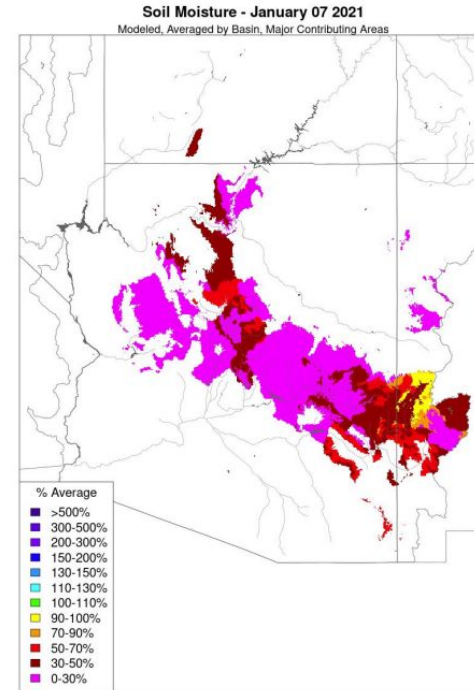
Prepared by NOAA, Colorado Basin River Forecast Center
Salt Lake City, Utah, www.cbrfc.noaa.gov

Soil Moisture Conditions - Lower Colorado

After another unfavorable summer monsoon season and then the very dry autumn, early January soil moisture conditions across Arizona are very dry.



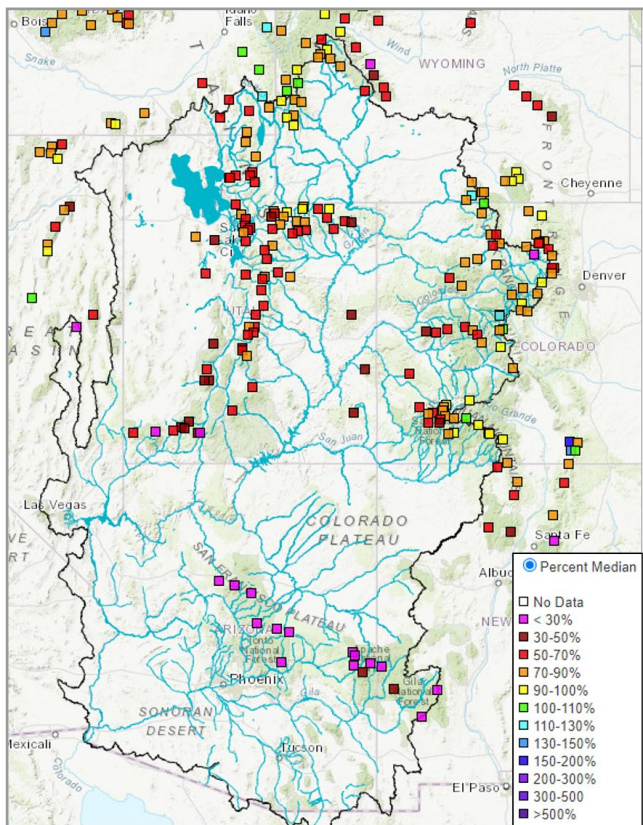
Prepared by NOAA, Colorado Basin River Forecast Center
Salt Lake City, Utah, www.cbrfc.noaa.gov



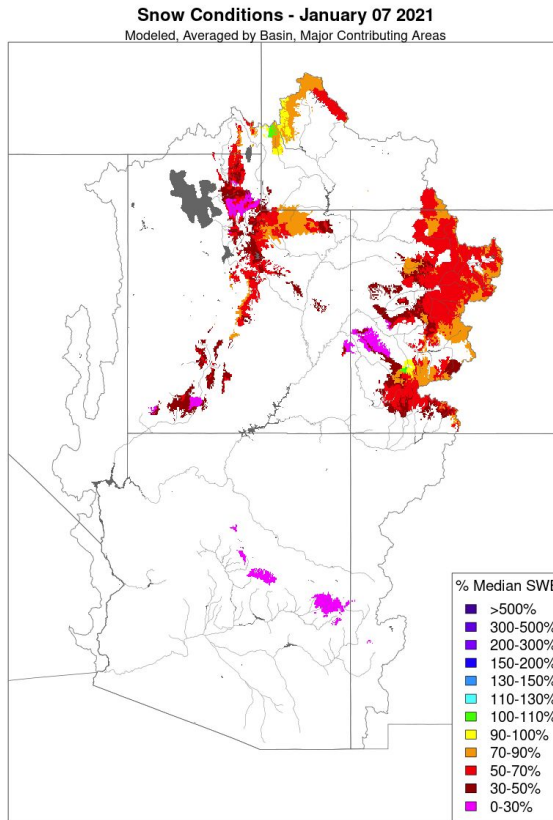
Prepared by NOAA, Colorado Basin River Forecast Center
Salt Lake City, Utah, www.cbrfc.noaa.gov

Early January Snow Conditions

SNOTEL (Observed)



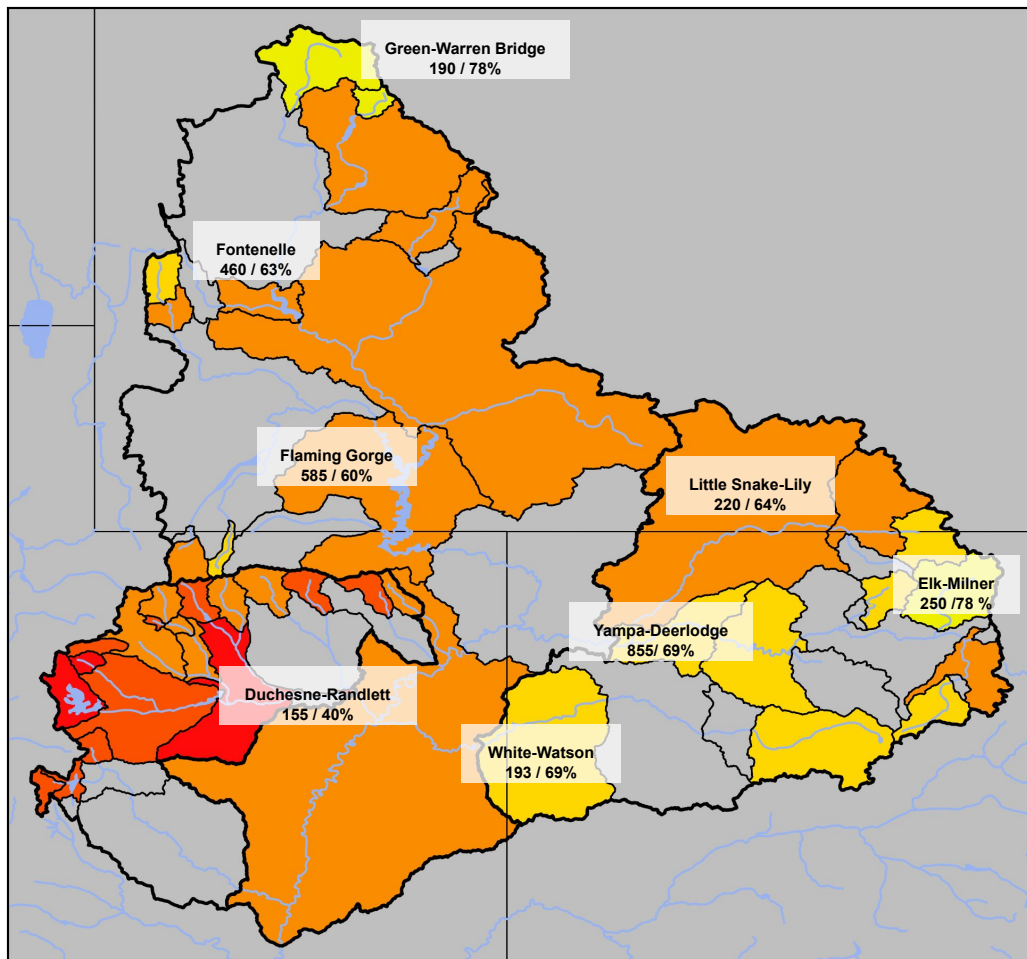
CBRFC (Model)



Jan 7 SWE Summary (SNOTEL)

<u>Basin</u>	<u>SWE (% Median)</u>
Upper Green	80%
Duchesne	70%
Price/San Rafael	60%
Yampa/White	80%
Upper CO Mainstem	75%
Gunnison	70%
Dolores	70%
San Juan	80%
Lake Powell	75%
Virgin	40%
Verde	10%
Salt	15%
Little Colorado	5%
Upper Gila	15%

Jan 1st Water Supply Forecasts: Green, Yampa, White, Duchesne



January 1st 2021 Forecasts

Volume (kaf) / % of 1981-2010 avg

Forecast Ranges

Upper Green: 60 - 80%

Yampa/White: 60 - 80%

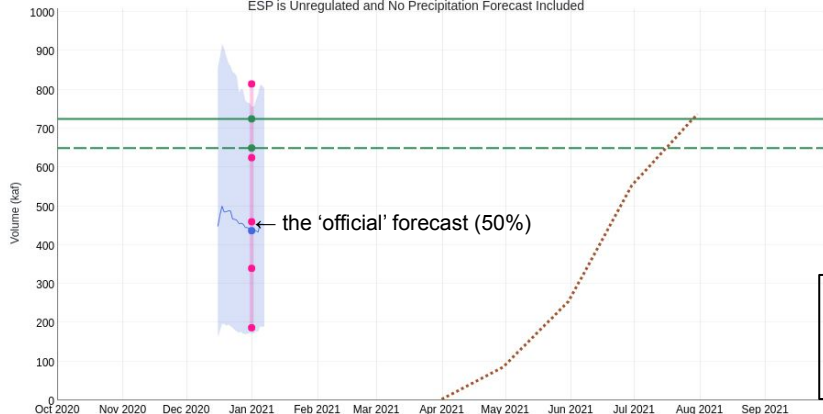
Duchesne: 40 - 60%

Upper Green Water Supply Forecasts & Snow Conditions

Green - Fontenelle Reservoir, Fontenelle, Nr (GBRW4)

Period: Apr-Jul, Official 50% Forecast (2021-01-01): 460 kaf (63% Average, 71% Median)

ESP is Unregulated and No Precipitation Forecast Included



2021/01/01:

Average: 725

Median: 650

ESP: 437

Official 10: 815

Official 30: 625

Official 50: 460

Official 70: 340

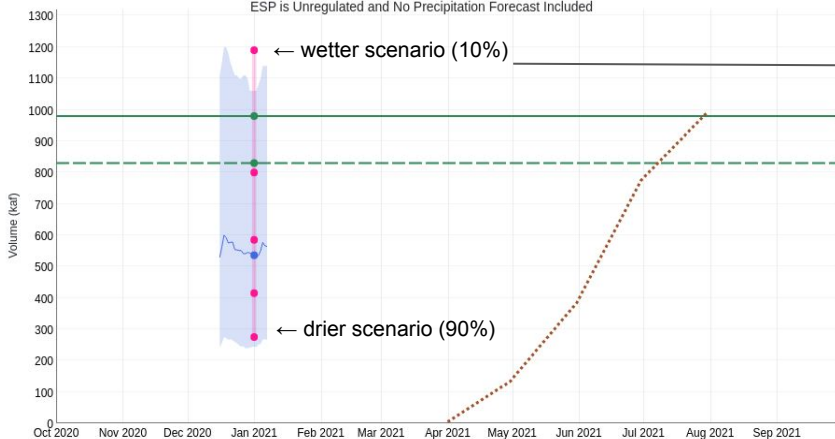
Official 90: 187

Conditions over the Wind River mountains, a major contributor to streamflow, are dry resulting in low water supply forecasts.

Green - Flaming Gorge Reservoir (GRNU1)

Period: Apr-Jul, Official 50% Forecast (2021-01-01): 585 kaf (60% Average, 70% Median)

ESP is Unregulated and No Precipitation Forecast Included



2021/01/01:

Average: 980

Median: 830

ESP: 536

Official 10: 1190

Official 30: 800

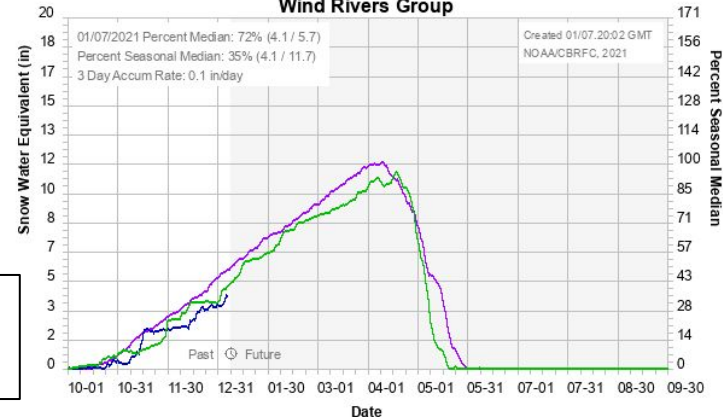
Official 50: 585

Official 70: 415

Official 90: 275

Colorado Basin River Forecast Center

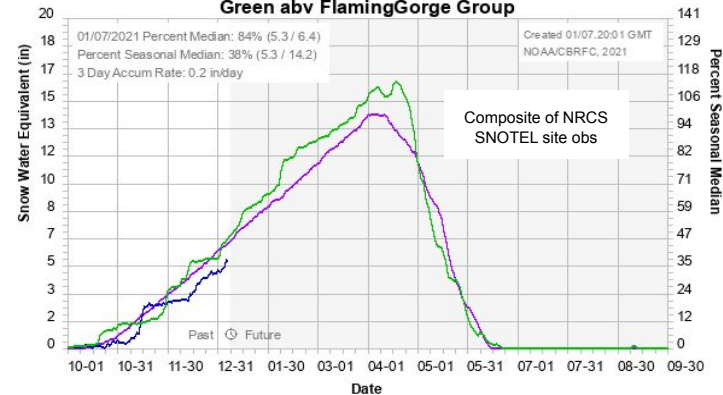
Wind Rivers Group



Median 1981-2010 2021 2020

Colorado Basin River Forecast Center

Green abv FlamingGorge Group



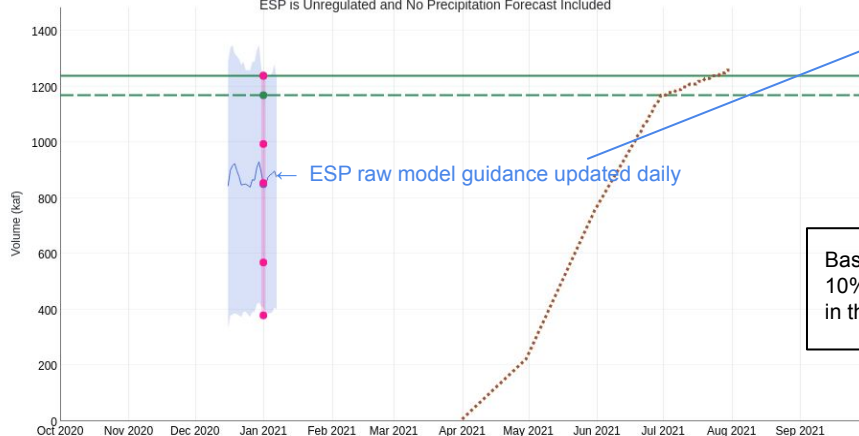
Median 1981-2010 2021 2020

Yampa & Duchesne Water Supply Forecasts & Snow Conditions

Yampa - Deerlodge Park (YDLC2)

Period: Apr-Jul, Official 50% Forecast (2021-01-01): 855 kaf (69% Average, 73% Median)

ESP is Unregulated and No Precipitation Forecast Included



2021/01/01:

Average: 1240

Median: 1170

ESP: 851

Official 10: 1240

Official 30: 995

Official 50: 855

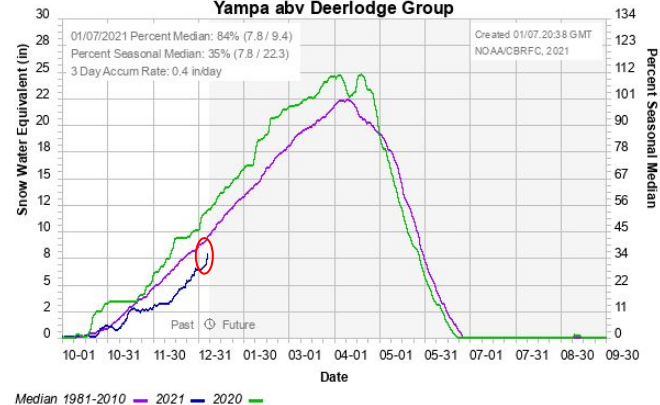
Official 70: 570

Official 90: 380

Based on current conditions there is a 10% chance for average streamflow in the Yampa River Basin.

Colorado Basin River Forecast Center

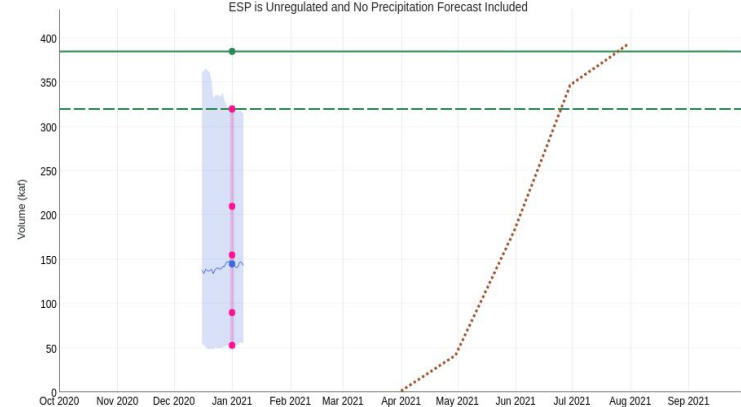
Yampa abv Deerlodge Group



Duchesne - Randlett, Nr (DURU1)

Period: Apr-Jul, Official 50% Forecast (2021-01-01): 155 kaf (40% Average, 48% Median)

ESP is Unregulated and No Precipitation Forecast Included



2021/01/01:

Average: 385

Median: 320

ESP: 145

Official 10: 320

Official 30: 210

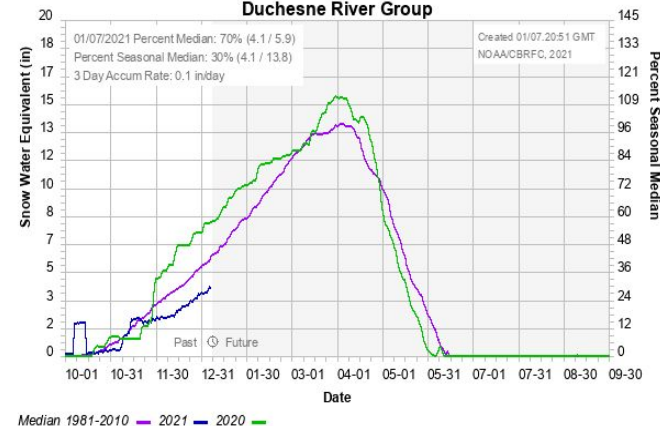
Official 50: 155

Official 70: 90

Official 90: 53

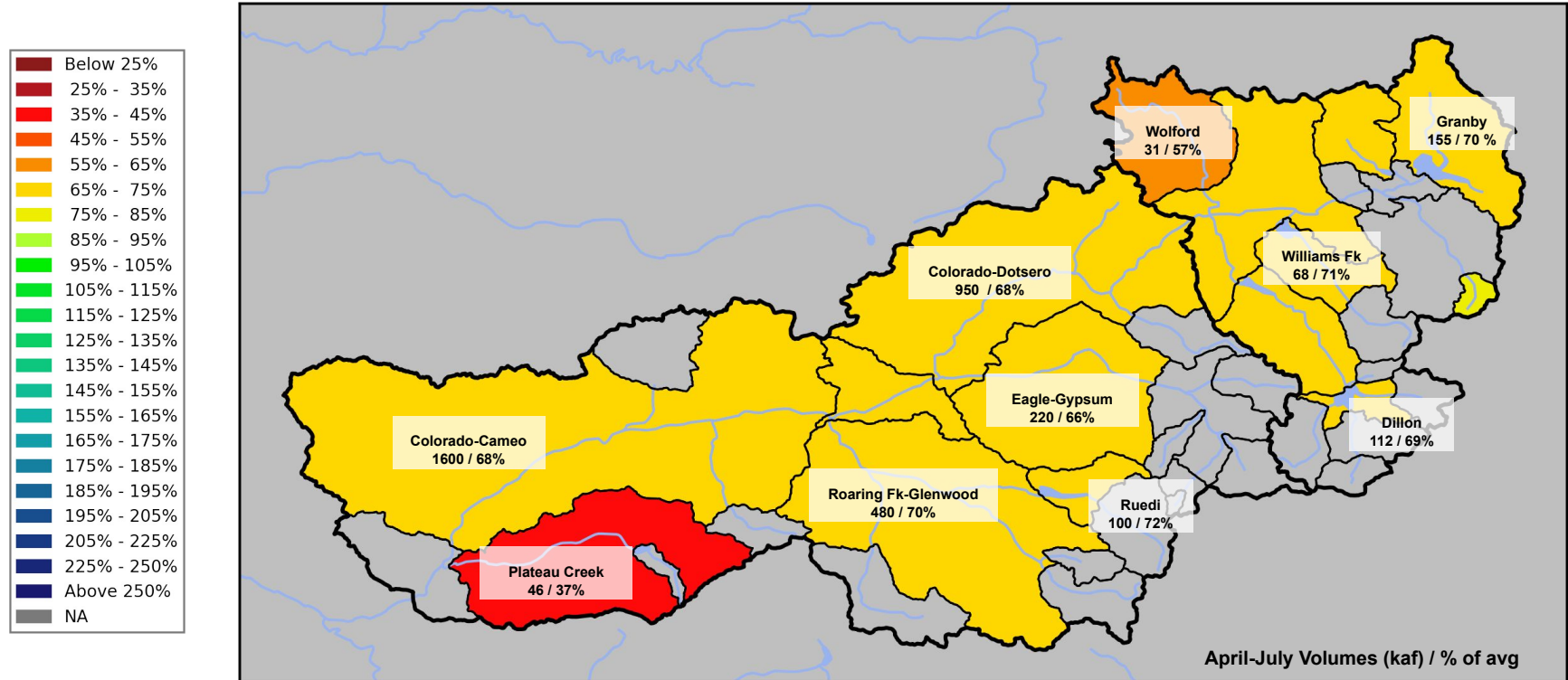
Colorado Basin River Forecast Center

Duchesne River Group



Jan 1st Water Supply Forecasts: Upper Colorado River Mainstem

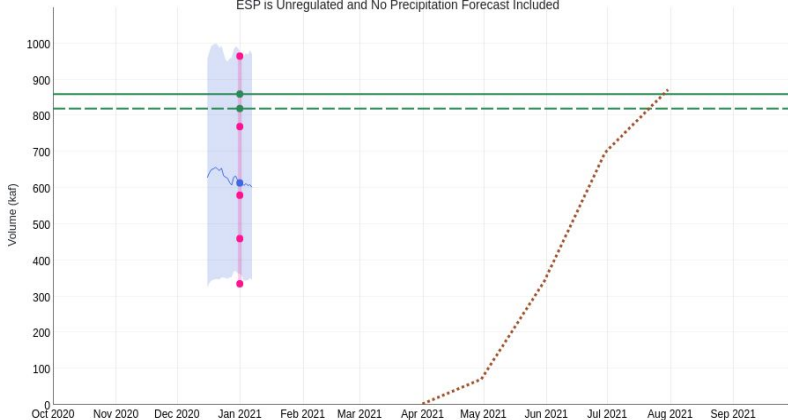
Forecast Ranges: Granby to Kremmling: 60 - 80% of average
Kremmling to Cameo: 40 - 70% of average



Upper Colorado Mainstem Water Supply Forecasts & Snow Conditions

Colorado - Kremmling, Nr (KRM2)

Period: Apr-Jul, Official 50% Forecast (2021-01-01): 580 kaf (67% Average, 71% Median)
ESP is Unregulated and No Precipitation Forecast Included



2021/01/01:

Average: 860

Median: 820

ESP: 614

Official 10: 965

Official 30: 770

Official 50: 580

Official 70: 460

Official 90: 335

Kremmling

WY21 fcst: 580 kaf

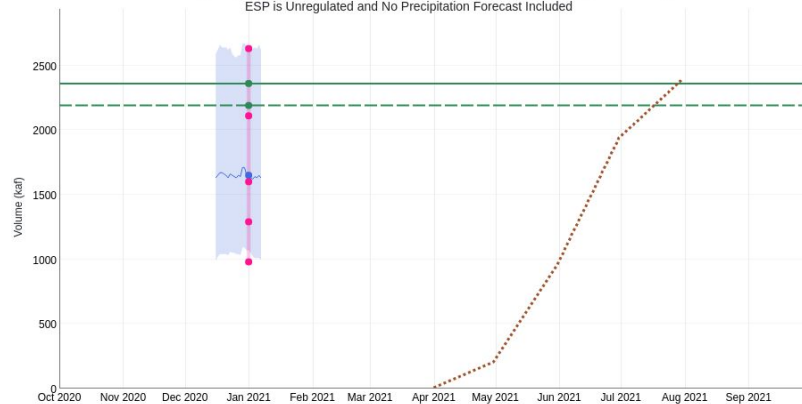
WY20 obs: 782 kaf

WY19 obs: 1110 kaf

WY18 obs: 566 kaf

Colorado - Cameo, Nr (CAMC2)

Period: Apr-Jul, Official 50% Forecast (2021-01-01): 1600 kaf (68% Average, 73% Median)
ESP is Unregulated and No Precipitation Forecast Included



2021/01/01:

Average: 2360

Median: 2190

ESP: 1650

Official 10: 2630

Official 30: 2110

Official 50: 1600

Official 70: 1290

Official 90: 980

Cameo

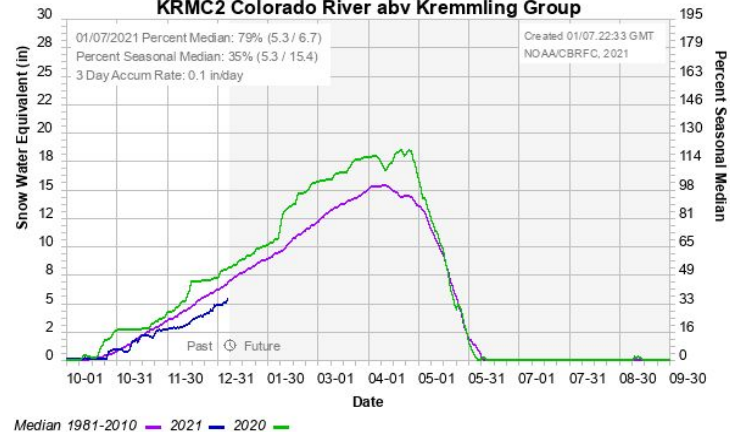
WY21 fcst: 1600 kaf

WY20 obs: 1710 kaf

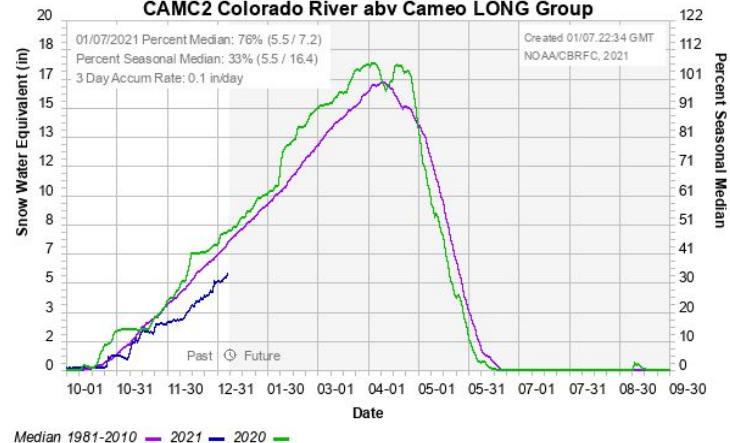
WY19 obs: 3200 kaf

WY18 obs: 1300 kaf

Colorado Basin River Forecast Center KRM2 Colorado River abv Kremmling Group

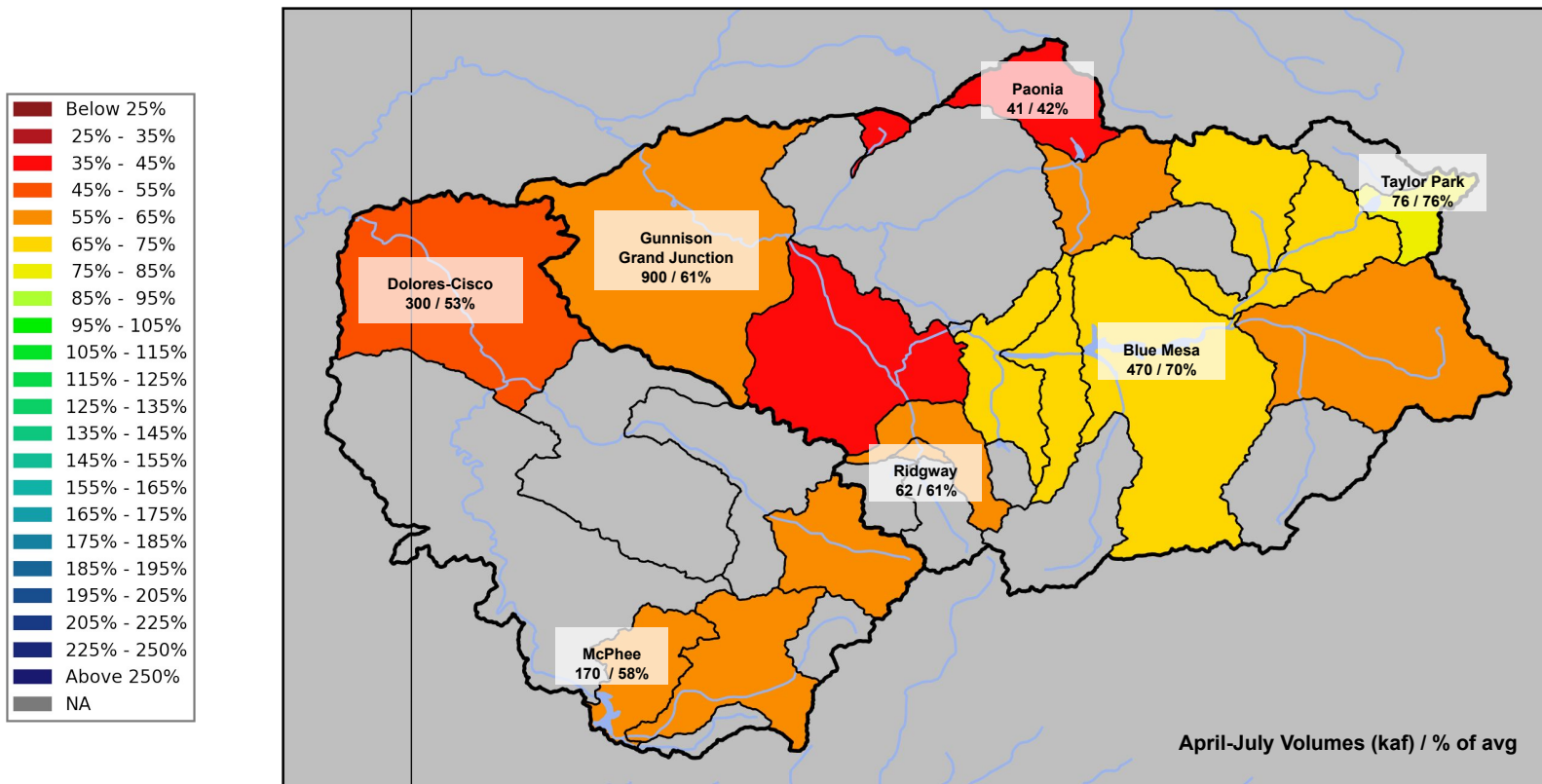


Colorado Basin River Forecast Center CAMC2 Colorado River abv Cameo LONG Group



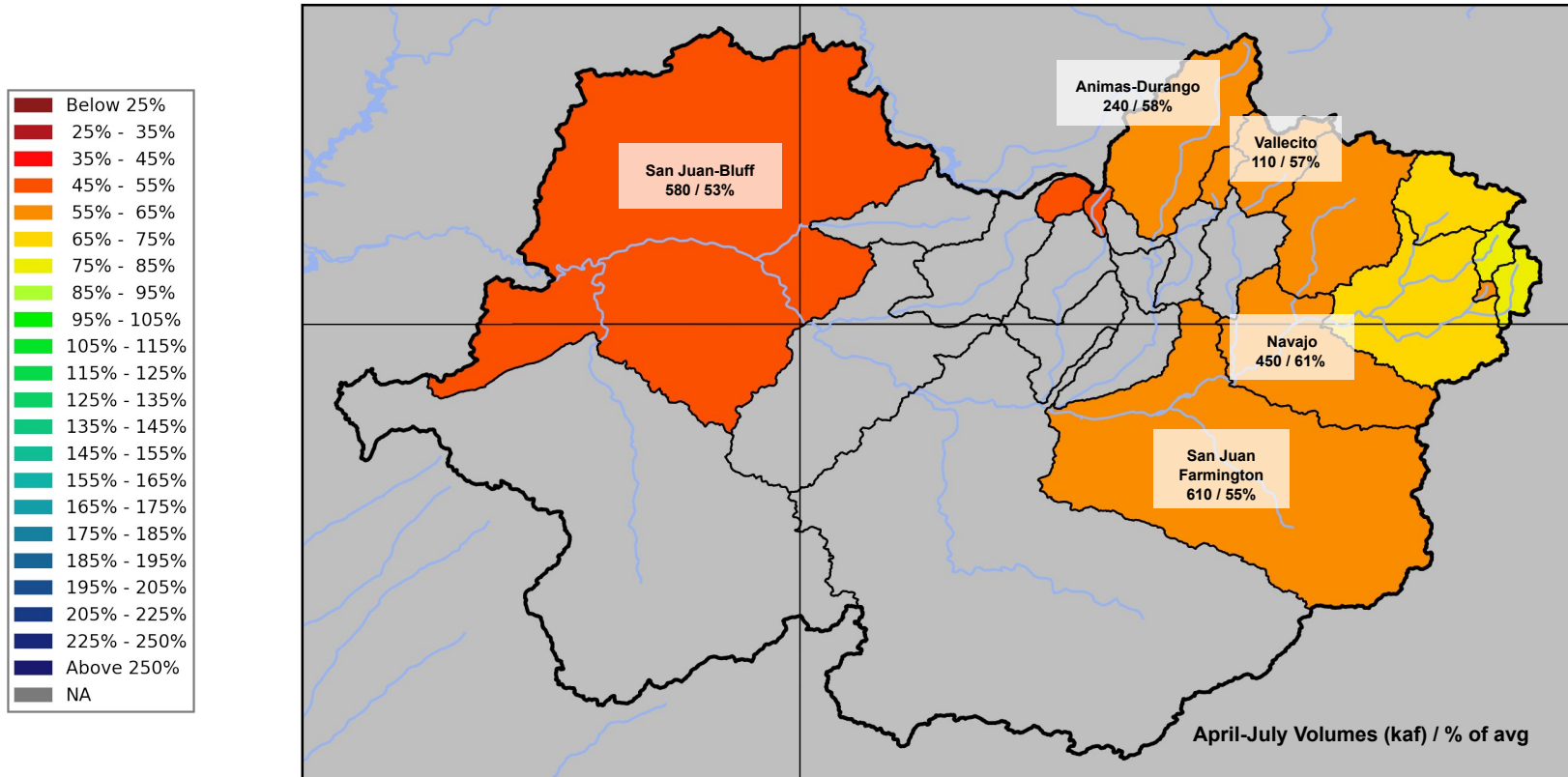
Jan 1st Water Supply Forecasts: Gunnison, Dolores

Forecast Ranges: Gunnison: 40 - 80% of average
Dolores: 50 - 60% of average



Jan 1st Water Supply Forecasts: San Juan

Forecast Range: 45 - 80% of average

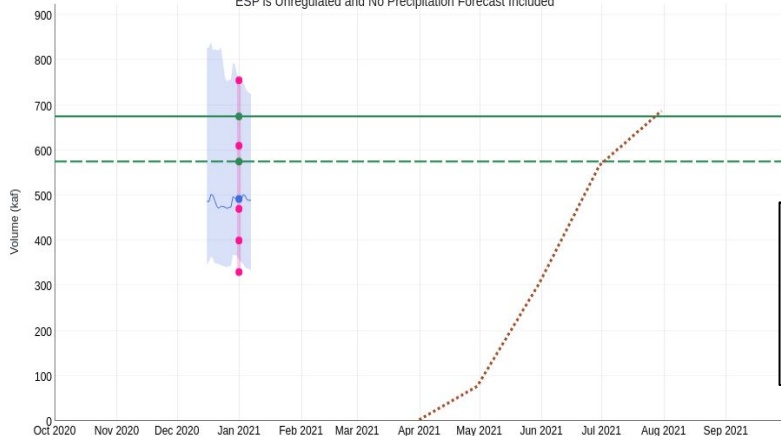


Southwest Colorado Water Supply Forecasts & Snow Conditions

Gunnison - Blue Mesa Reservoir (BMD2)

Period: Apr-Jul, Official 50% Forecast (2021-01-01): 470 kaf (70% Average, 82% Median)

ESP is Unregulated and No Precipitation Forecast Included



2021/01/01:

Average: 675

Median: 575

ESP: 492

Official 10: 755

Official 30: 610

Official 50: 470

Official 70: 400

Official 90: 330

Blue Mesa

WY21 fcst: 470 kaf

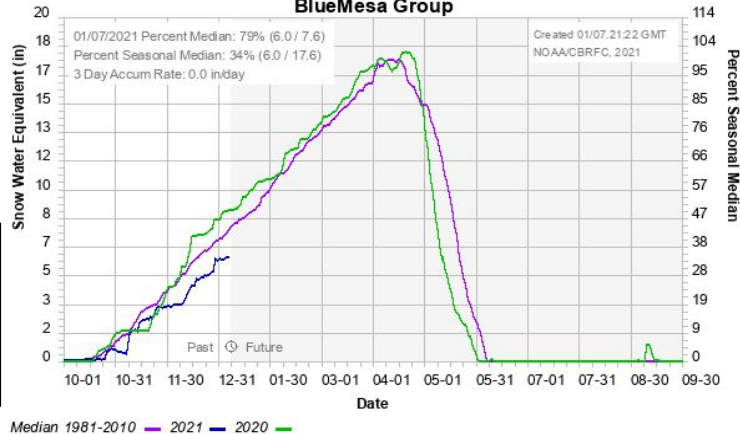
WY20 obs: 387 kaf

WY19 obs: 1090 kaf

WY18 obs: 239 kaf

Colorado Basin River Forecast Center

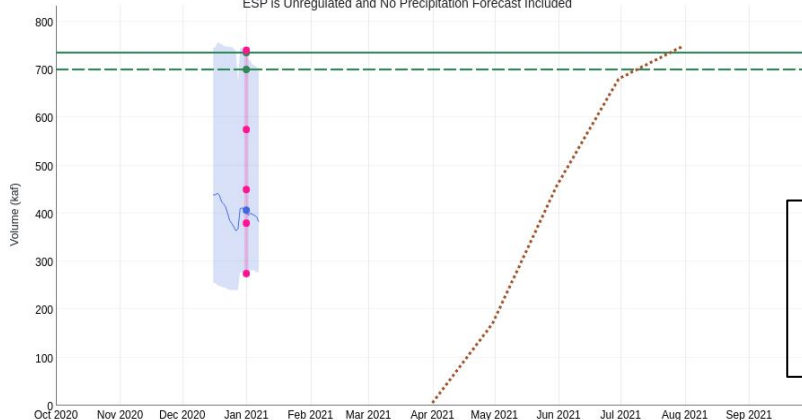
BlueMesa Group



San Juan - Navajo Reservoir, Archuleta, Nr (NVRN5)

Period: Apr-Jul, Official 50% Forecast (2021-01-01): 450 kaf (61% Average, 64% Median)

ESP is Unregulated and No Precipitation Forecast Included



2021/01/01:

Average: 735

Median: 700

ESP: 407

Official 10: 740

Official 30: 575

Official 50: 450

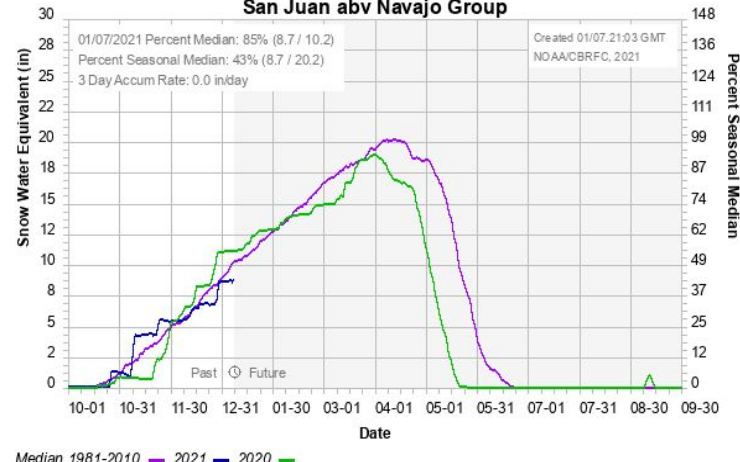
Official 70: 380

Official 90: 275

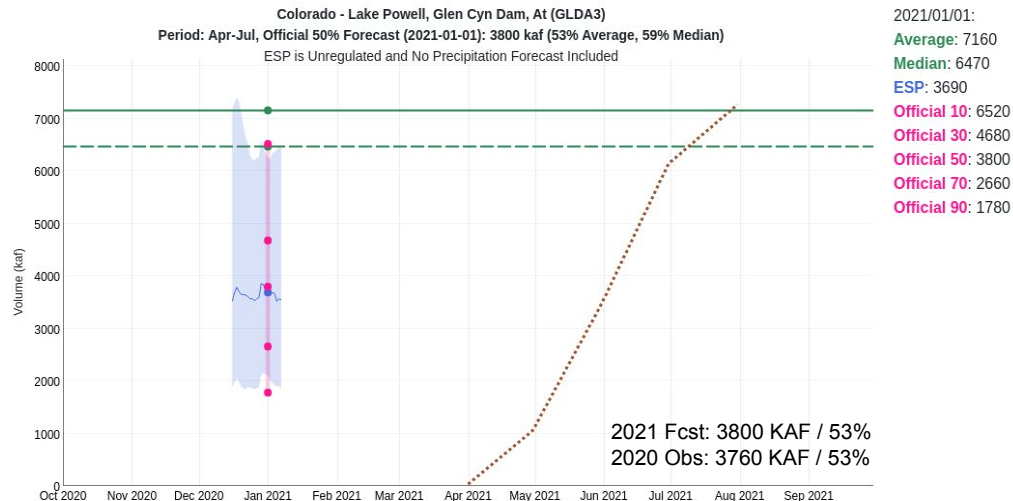
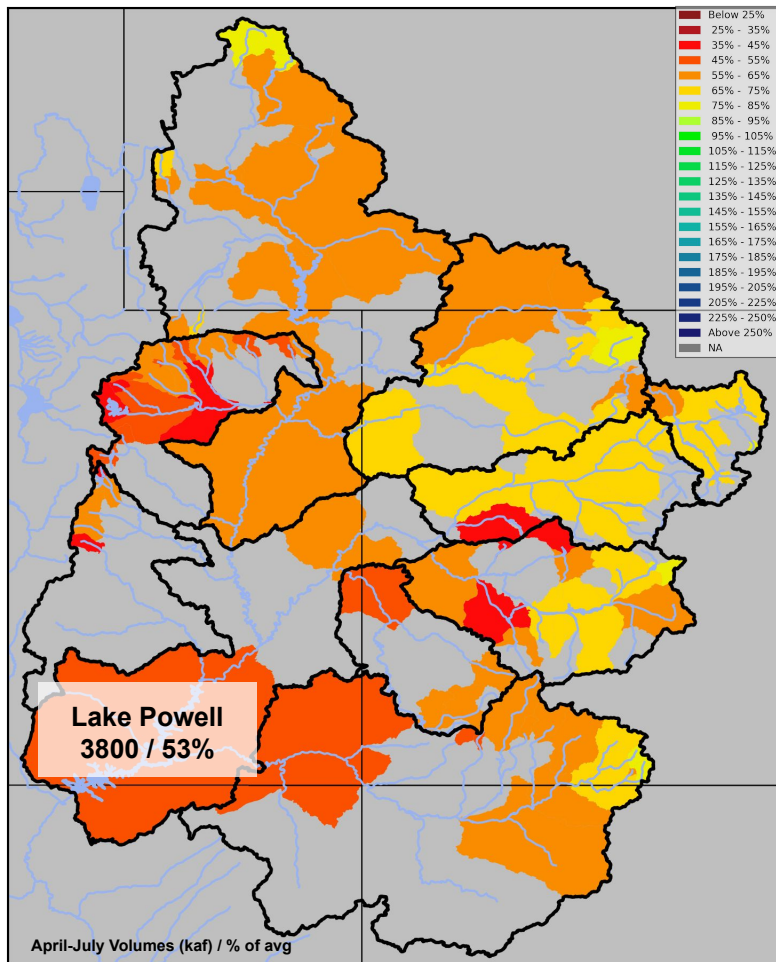
Forecast guidance has decreased since January 1 and is expected to continue to decrease through at least the middle of the month due to a dry weather forecast.

Colorado Basin River Forecast Center

San Juan abv Navajo Group



Jan 1st Water Supply Forecasts: Upper Colorado (Lake Powell)



Lake Powell summarizes the hydrologic conditions throughout the Upper Colorado River Basin.

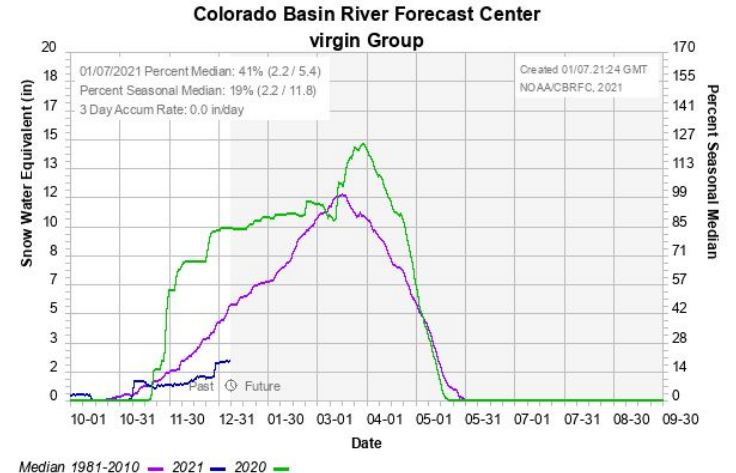
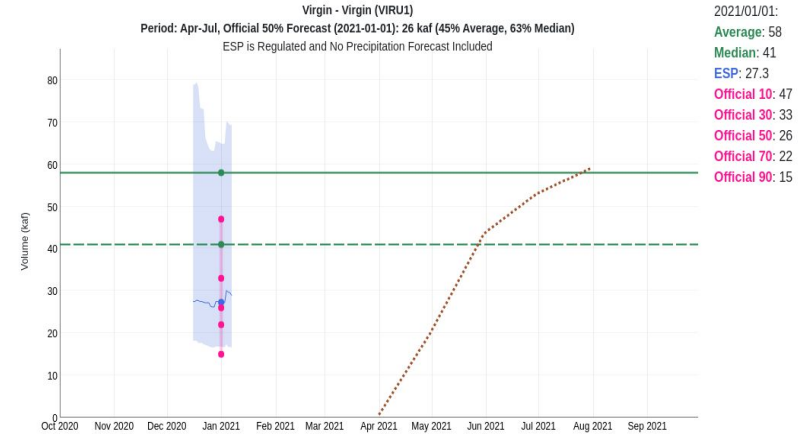
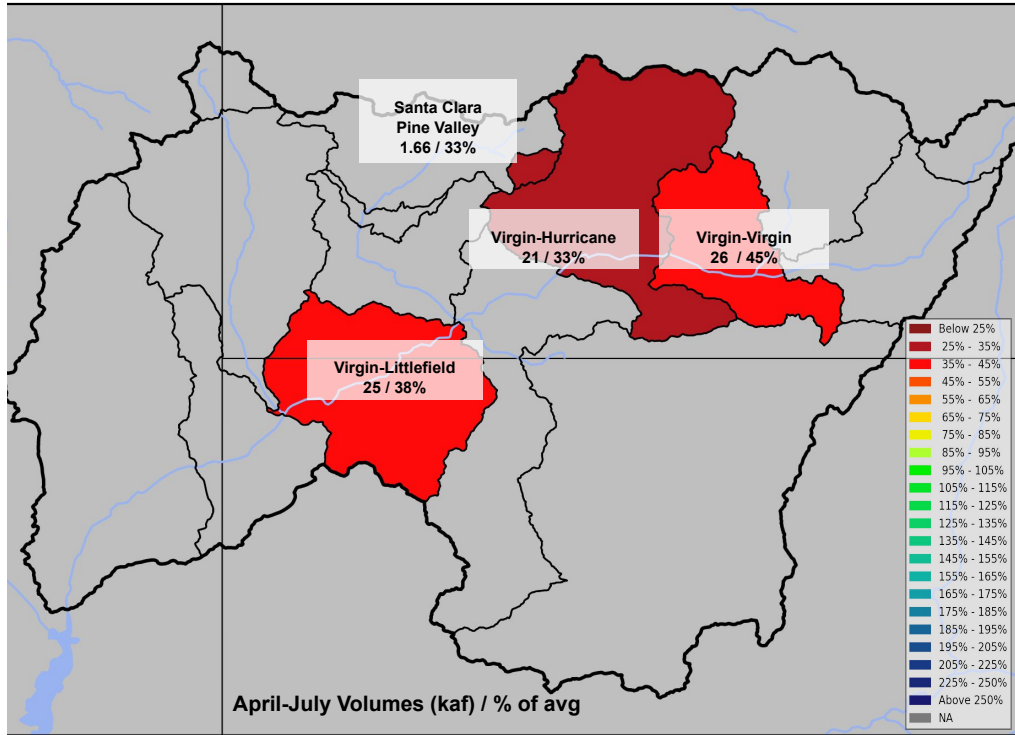
5 Lowest Historical Years: April-July Volume / % avg

- 2002: 946 KAF / 13%
- 1977: 1208 KAF / 17%
- 2012: 2063 KAF / 29%
- 2013: 2558 KAF / 36%
- 2018: 2602 KAF / 36%

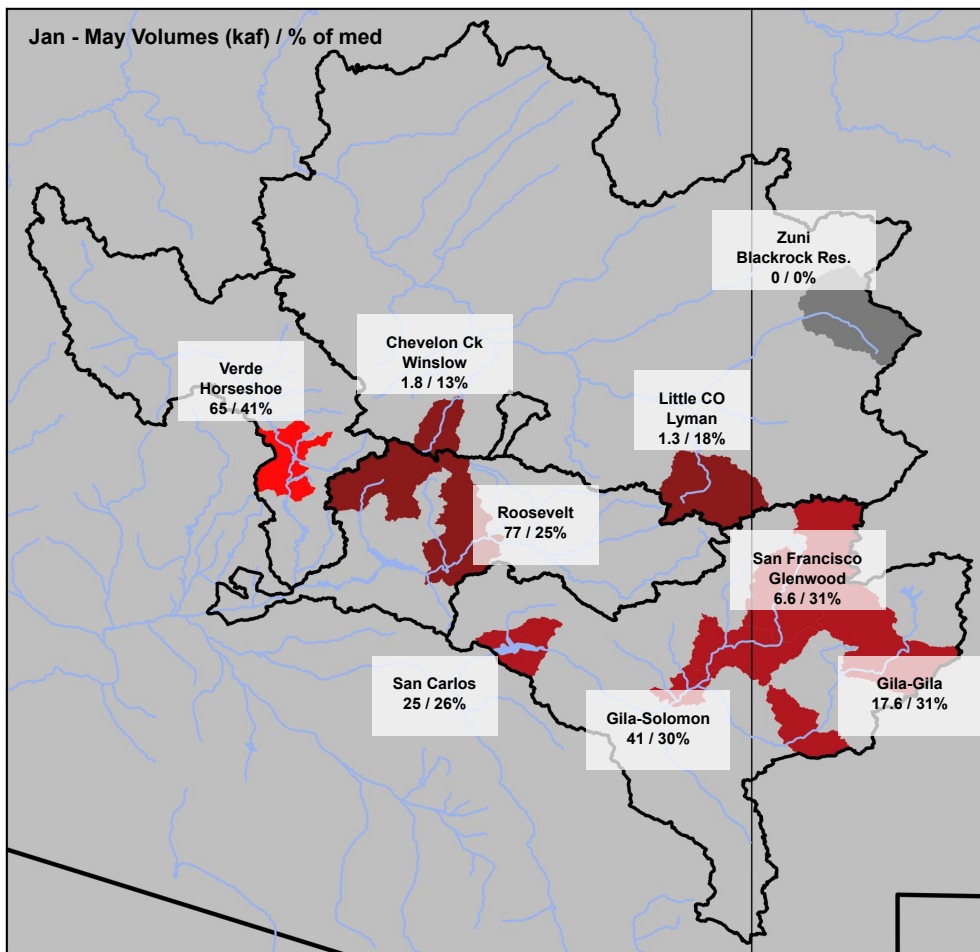
* Currently a ~30% chance to be in the bottom five

Jan 1st Water Supply Forecasts: Virgin River Basin

Forecast Range: 30 - 45% of average



Jan 1st Water Supply Forecasts: Lower Colorado River Basin



January - May Forecast Period
% of 1981-2010 Median

Forecast Ranges

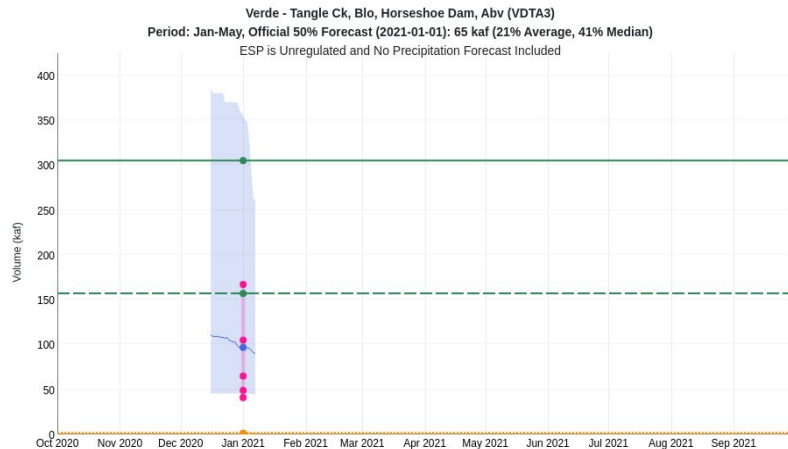
Little Colorado: 10 - 20%

Upper Gila: 25 - 35%

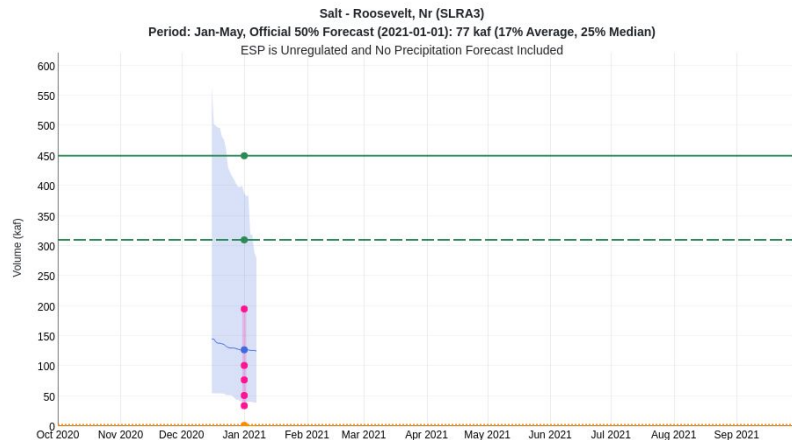
Salt: 15 - 25%

Verde: 40%

Lower Colorado Water Supply Forecasts & Snow Conditions

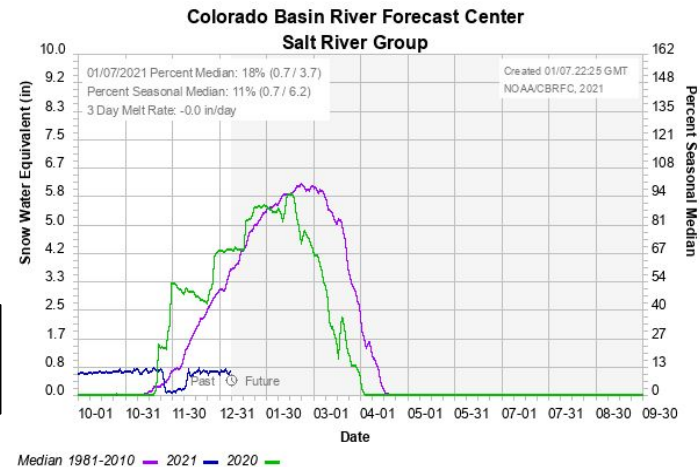
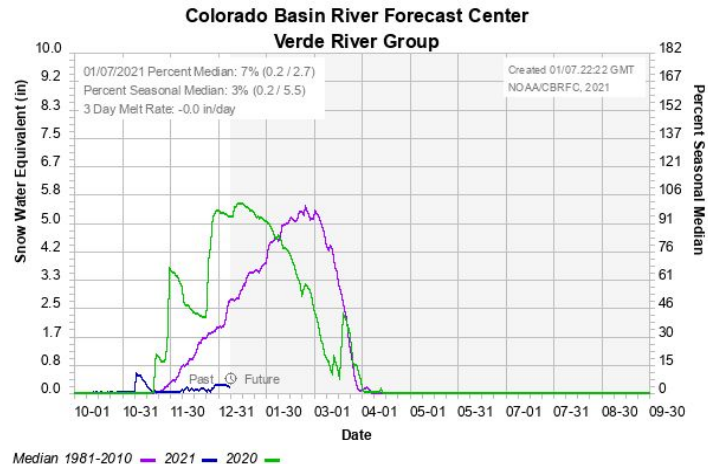


2021/01/01:
Average: 305
Median: 157
Observed Total: 1.28
ESP: 96.9
Official 10: 167
Official 30: 105
Official 50: 65
Official 70: 49
Official 90: 41



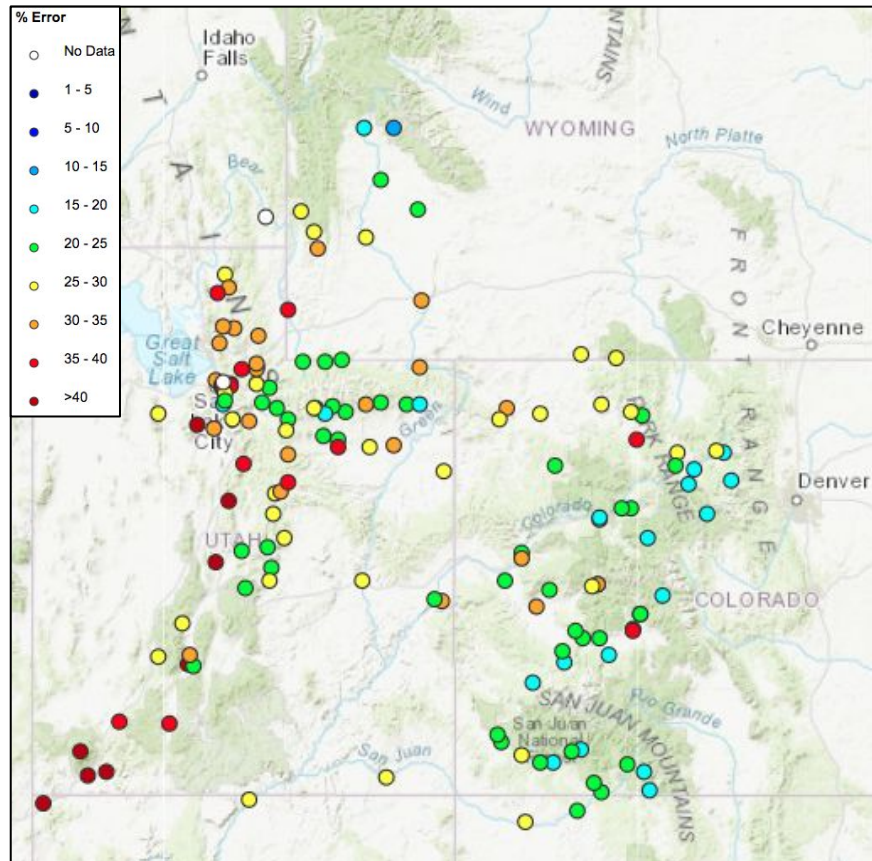
2021/01/01:
Average: 450
Median: 310
Observed Total: 1.38
ESP: 127
Official 10: 195
Official 30: 101
Official 50: 77
Official 70: 51
Official 90: 34

Jan-May forecast period;
start showing accumulated
volume on Jan 1st.



Historical (1981-2010) Forecast Verification

January Forecast Error: April-July Volume



Location

Green River - Warren Bridge	19%
Fontenelle Reservoir	28%
Yampa River - Deerlodge	27%
Blue River - Dillon Reservoir	16%
Colorado River - Cameo	21%
Blue Mesa Reservoir (Gunnison)	23%
McPhee Reservoir (Dolores)	25%
Navajo Reservoir (San Juan)	25%
Lake Powell	27%
Virgin River at Virgin	44%

Avg January Forecast Error

Forecasts are better than just going with average
Error tends to decrease each month into the spring

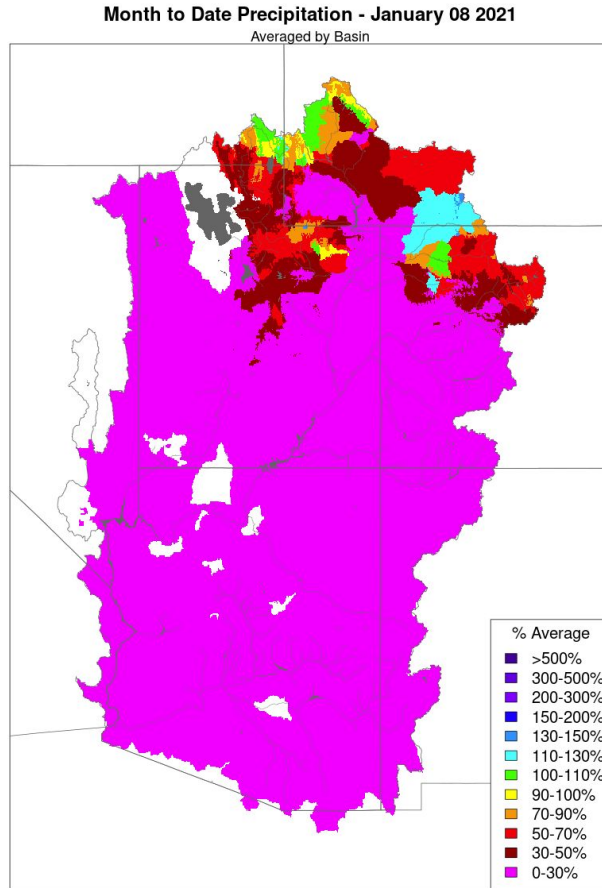
Where Forecasts are Better:

- 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

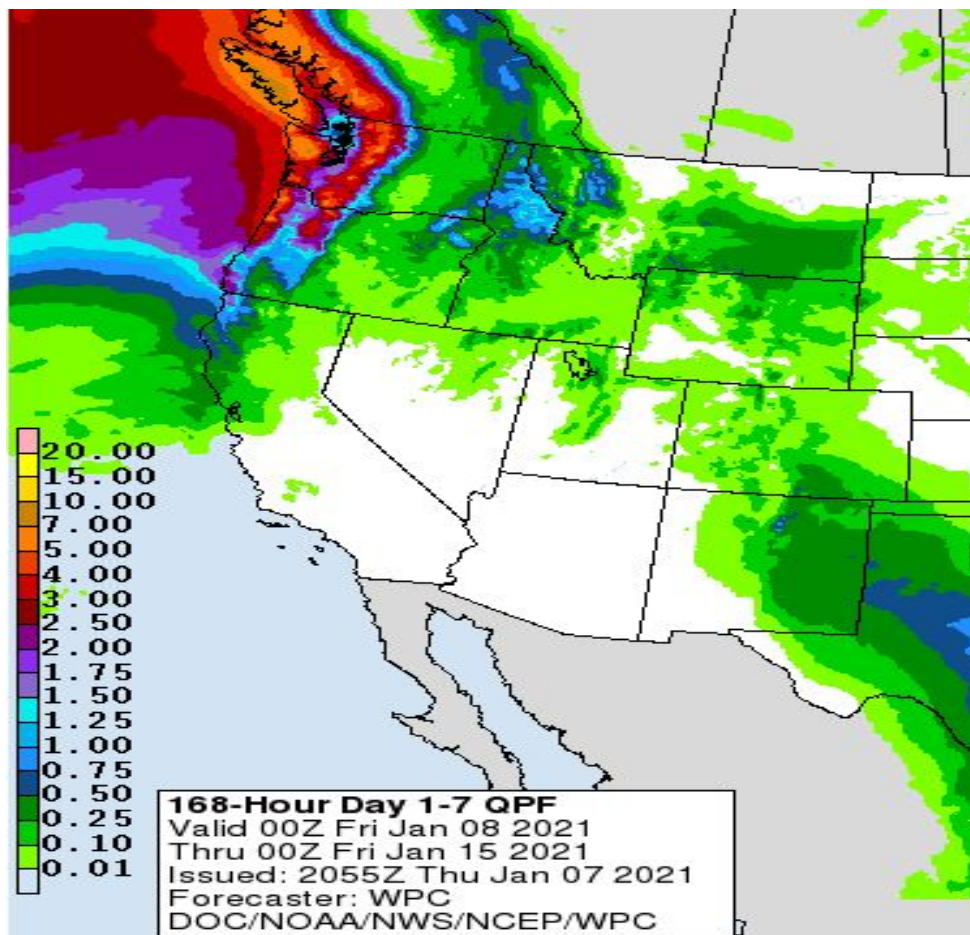
January 2021 Month-To-Date Precipitation



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

Recent precipitation during the first week of January has had a positive impact to water supply guidance in parts of the Upper Green, White/Yampa, and Upper Colorado headwaters.

Upcoming Weather: WPC January 8-14 Precipitation Outlook



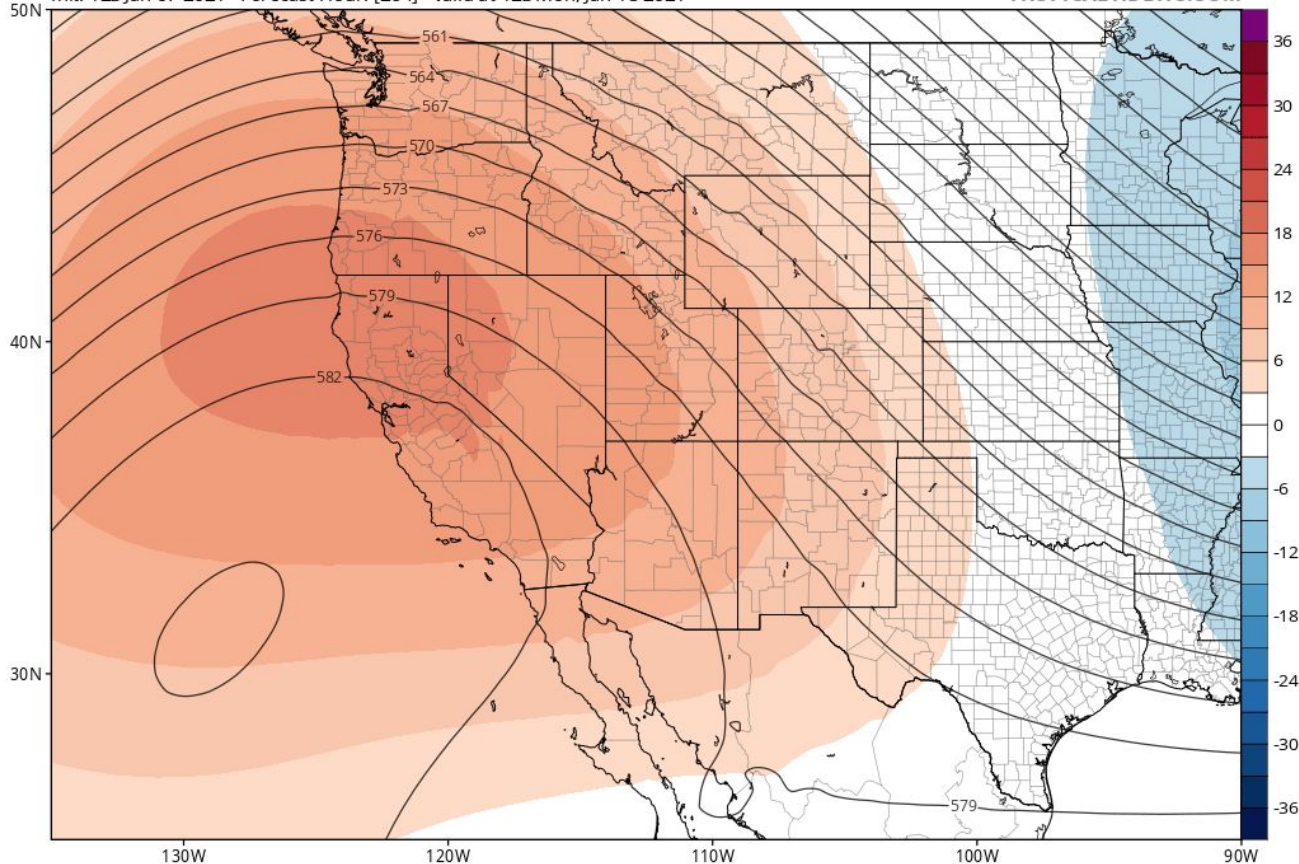
- Short wave moves through Utah and Colorado Saturday and Sunday
- Less than a half inch is forecast in the upper most elevations
- Otherwise, ridging will dominate the weather pattern.

Upcoming Weather: January 13-18: Persistent Western Ridge

GEFS Mean 500mb GPH & Anomaly (dam) from 12z13Jan2021 to 12z18Jan2021 (Days 7-11)

Init: 12z Jan 07 2021 Forecast Hour: [264] valid at 12z Mon, Jan 18 2021

TROPICALTIDBITS.COM

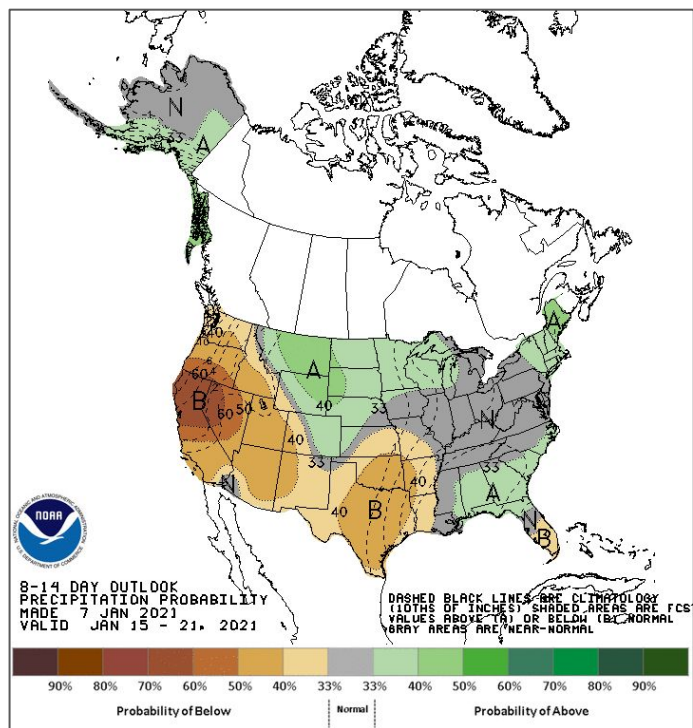


- Ridge to persist through the third week of January
- Northwest flow could allow weak storm systems to clip the northern areas by late next week.

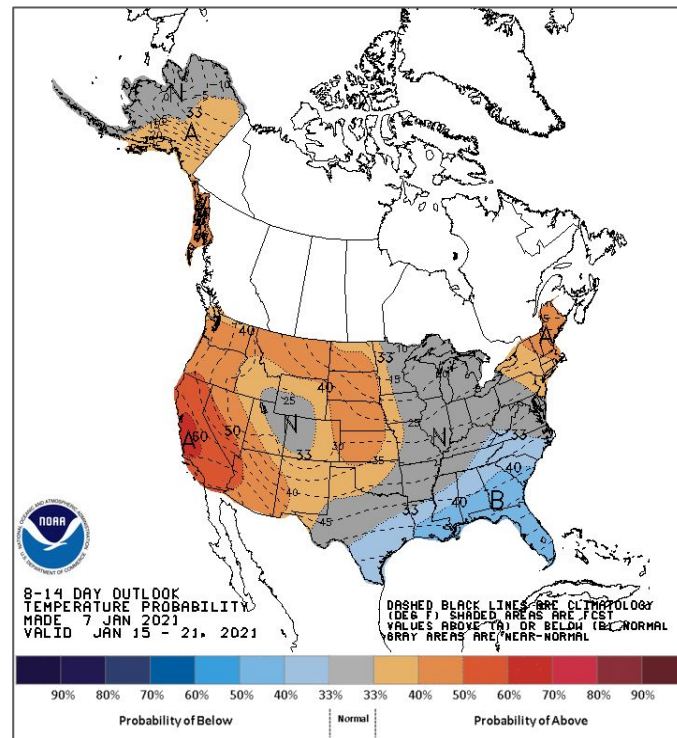
Upcoming Weather: 8-14 Day Outlook (January 15-21)

Elevated odds of below average precipitation (especially across Utah and Lower Colorado) & above average temperature.

Precipitation Outlook

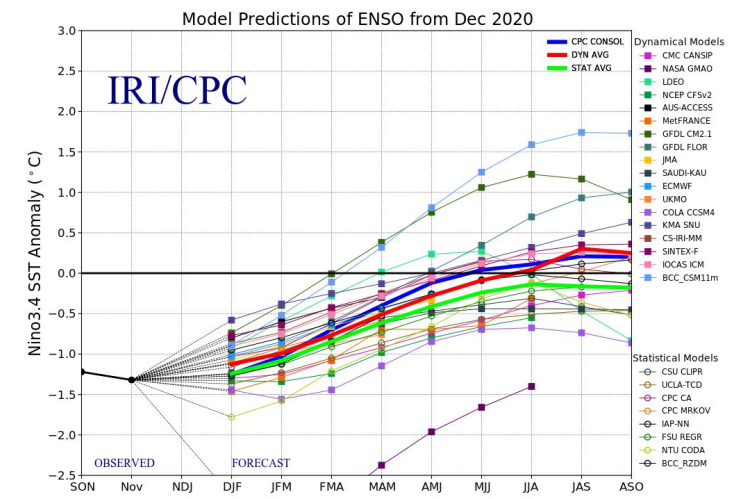
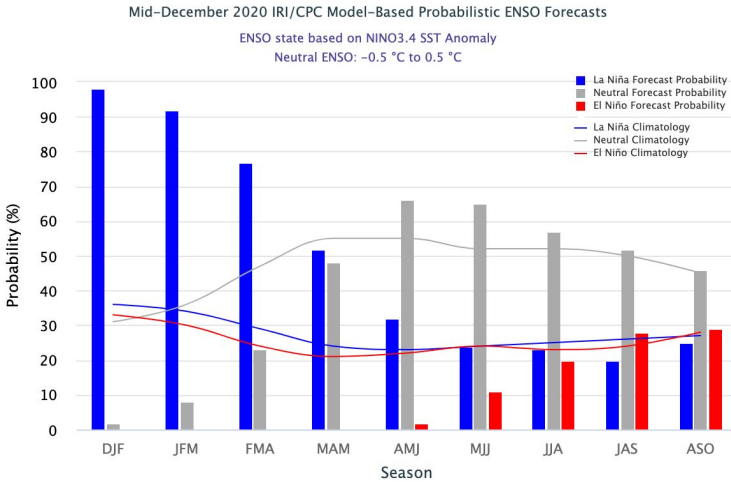
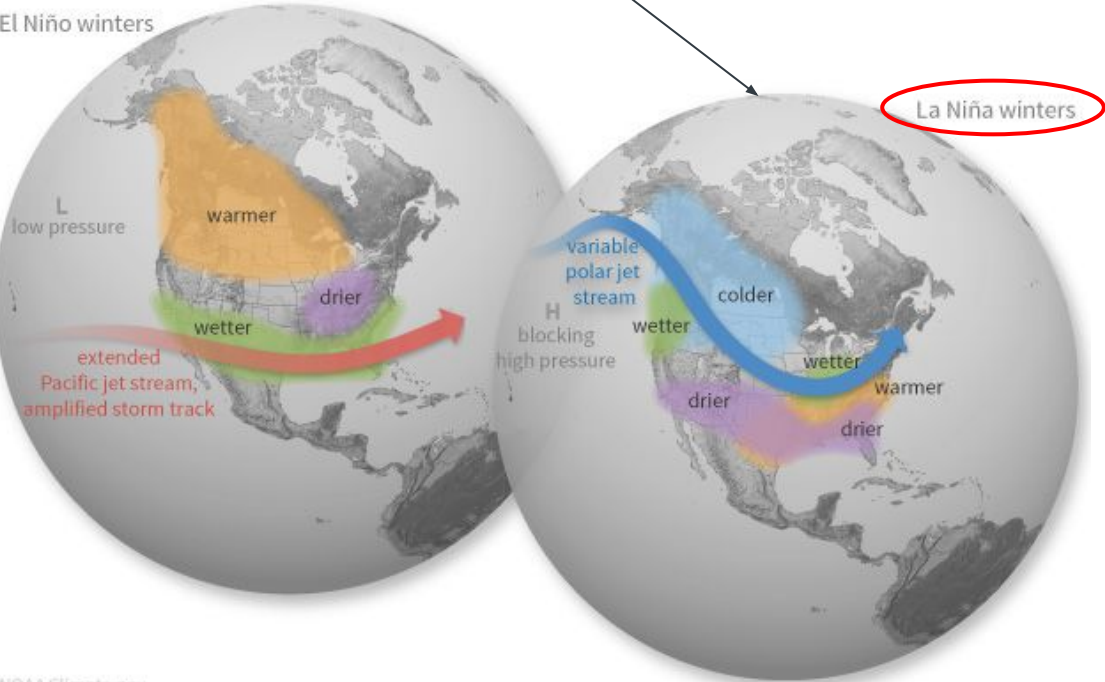


Temperature Outlook



El Niño Southern Oscillation (ENSO) Status

- **La Niña** is likely to continue through the Northern Hemisphere winter 2020-21 (~95% chance during January-March), with a potential transition during the spring 2021 (~50% chance of Neutral during April-June).
 - Increased chances of drier winter weather in Arizona/LCRB
 - Much weaker correlation/winter weather signal elsewhere in basin



Summary

- Near/record dry April-December 2020 period across the majority of the Colorado River Basin
- Near/record low antecedent soil moisture conditions entering the water year 2021 snow accumulation & runoff season
- Slow start to the snow season
 - Current snowpack (SWE) conditions are below to well below normal across the majority of the region
 - Early January is a little less than halfway (~40-50%) through the snow accumulation season
- January water supply forecasts (% of normal):
 - Upper Colorado: 40-80%
 - Lower Colorado: 10-40%
- Drier than normal conditions expected over the next two weeks
 - Best chance for precipitation will be across northern higher elevation basins
 - Water supply volume guidance expected to decrease in most basins
- Given the dry conditions, an above normal snowpack or a wet spring will be needed to see near average water supply volumes.

2021 Water Supply Webinar Schedule

**All Times Mountain Time (MT)*

Colorado River Basin

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

Great Basin

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

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

Additional briefings scheduled as needed

Webinar schedule & registration information has been posted to the CBRFC web page



COLORADO BASIN RIVER FORECAST CENTER

NATIONAL WEATHER SERVICE / NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

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Thursday December 17, 2020, 1:00 pm MT: CBRFC Early Season Water Supply Outlook Webinar. Register for the 2021 Water Supply Forecast Webinar Schedule and Registration -> [More Info...](#)

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CBRFC Water Supply Forecast Webinar Schedule & Registration - Water Year 2021

The Colorado Basin River Forecast Center (CBRFC) produces water supply forecasts for the Colorado River Basin and the east. CBRFC conducts December through May webinars explaining the forecasts and current conditions.

Follow the links below to register for a webinar.

Early Season Water Supply Outlook Webinar

[Thursday Dec 17 @ 1 pm MT](#)

Colorado River Basin Water Supply Webinars

[Friday January 8th @ 10 am MT](#)

[Friday February 5th @ 10 am MT](#)

[Friday March 5th @ 10 am MT](#)

[Wednesday April 7th @ 10 am MT](#)

[Friday May 7th @ 10 am MT](#)

Utah Water Supply Webinars

[Friday January 8th @ 11:30 am MT](#)

[Friday February 5th @ 11:30 am MT](#)

[Friday March 5th @ 11:30 am MT](#)

[Wednesday April 7th @ 11:30 am MT](#)

[Friday May 7th @ 11:30 am MT](#)

Peak Flow Webinar

[Thursday March 18th @ 10 am MT](#)

email cbrfc.webmasters@noaa.gov
subject line: **email notification 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.

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.

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