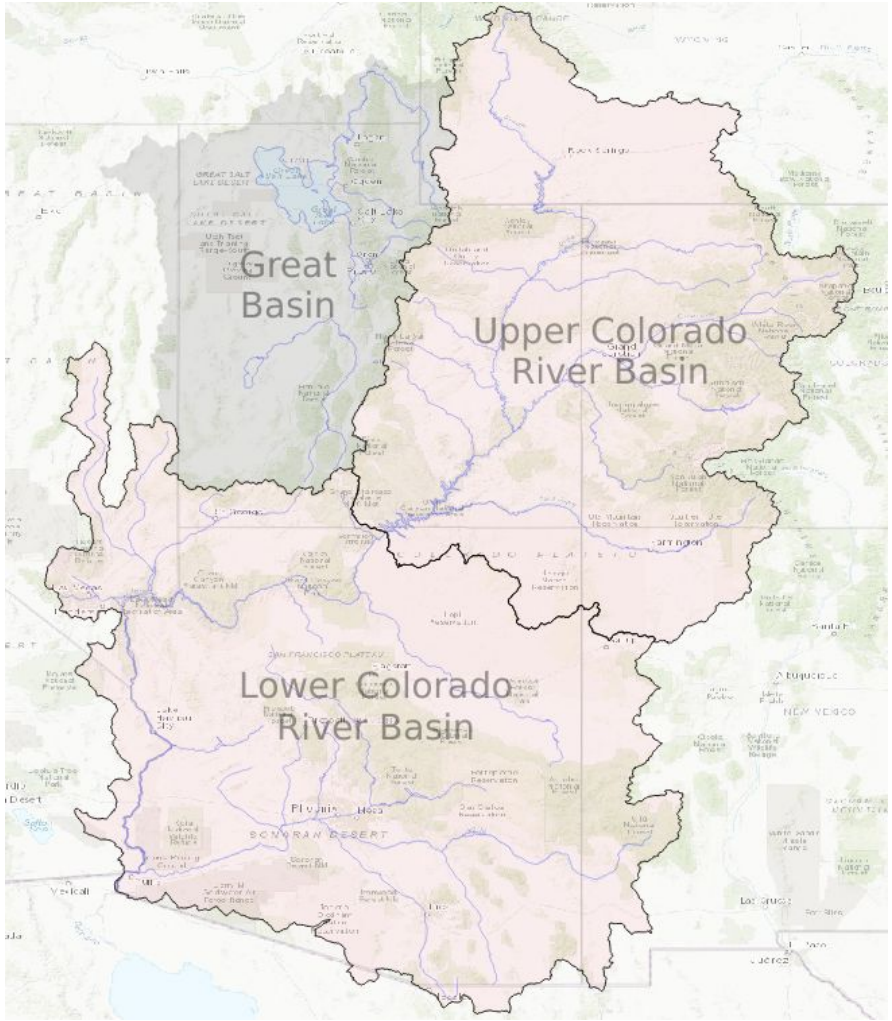
Colorado River Basin
Water Supply Briefing

February 7, 2020

Cody Moser - Hydrologist
Colorado Basin River Forecast Center

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

Please mute your phone until the question period



Today's Presentation

January & Water Year Precipitation Review

Soil Moisture Conditions

Early February SWE Conditions

ESP Method & Evolution Plot Overview

February Water Supply Forecasts

Early Season Forecast Error

Upcoming Weather

Contacts & Questions

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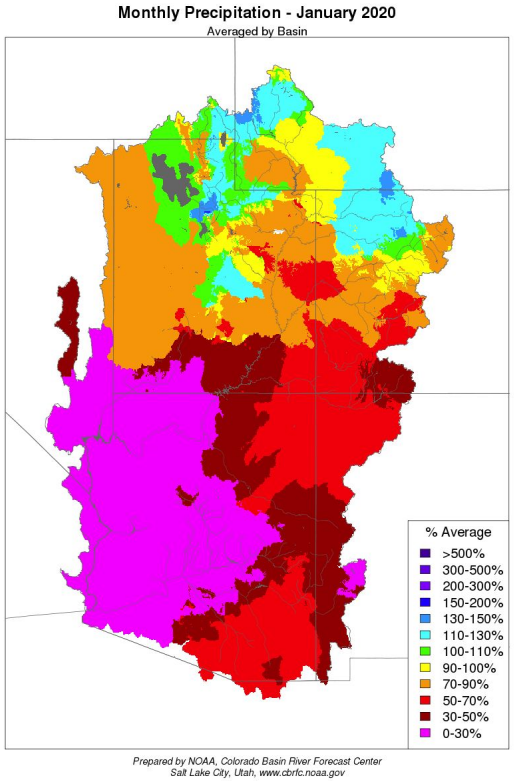
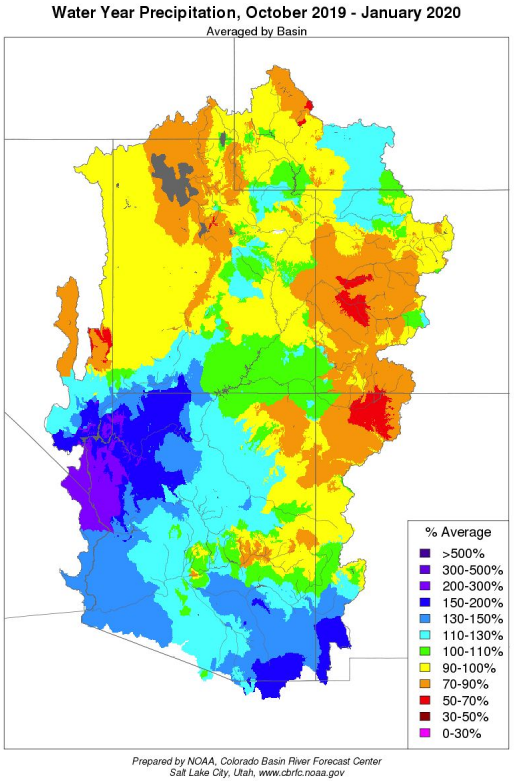
Precipitation Summary





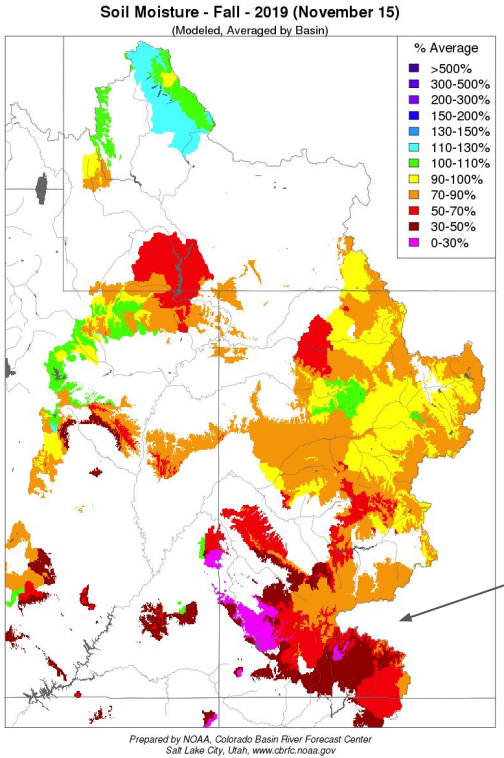
Northern mountainous basins benefited the most from January's weather pattern:
Upper Green, White/Yampa, Great Basin

Water Year 2020
Oct-Jan Precip Summary

Basin	Precip (% Avg)
Upper Green	90%
Duchesne	100%
Price/San Rafael	100%
Yampa/White	100%
Upper CO Mainstem	90%
Gunnison	85%
Dolores	85%
San Juan	85%
Lake Powell	90%
Virgin	120%
Verde	120%
Salt	110%
Little Colorado	110%
Upper Gila	110%

Soil Moisture Conditions

Upper Colorado River Basin

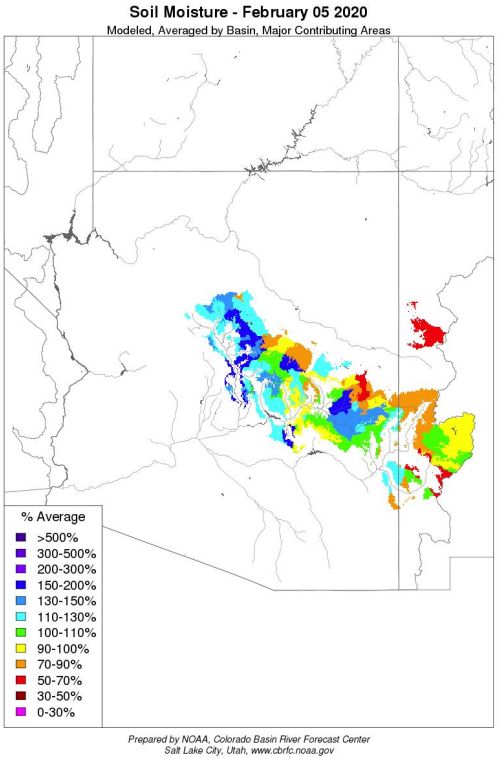


Hydrologic model soil moisture conditions entering the winter season are improved compared to a year ago, but still near to below average throughout most of the Upper Colorado Basin.

Water supply impacts are most pronounced when soil moisture conditions and snowpack conditions are both much above or much below average.

Much below average soil moisture conditions entering the winter season continue to negatively impact water supply forecasts in southwest Colorado.

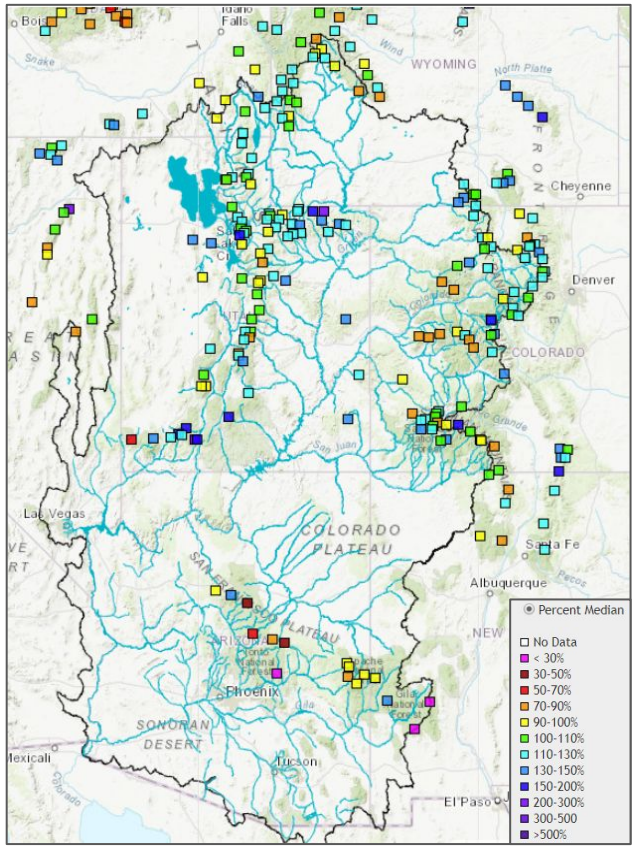
Lower Colorado River Basin



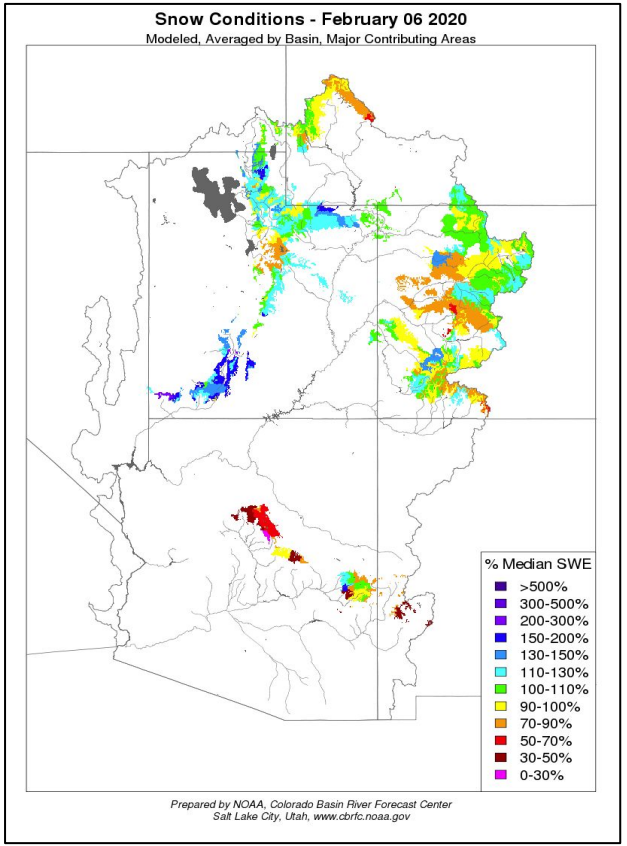
After the unfavorable 2019 monsoon season, winter soil moisture conditions have improved throughout the Lower Colorado River Basin and are currently near to above average.

Early February Snow Conditions

NRCS SNOTEL (Observed)



CBRFC (Model)



February 6th SWE Summary

Basin	SWE (% Median)
Upper Green	110%
Duchesne	115%
Price/San Rafael	100%
Yampa/White	110%
Upper CO Mainstem	105%
Gunnison	95%
Dolores	115%
San Juan	100%
Lake Powell	110%
Virgin	140%
Verde	95%
Salt	95%
Little Colorado	85%
Upper Gila	70%

Largest SWE decreases during January occurred in Lower Colorado Basin

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 = 146 kaf (thousand acre-feet)
2020 current model states + 1982 weather = 138 kaf
2020 current model states + 1983 weather = 230 kaf
.
.
.
2020 current model states + 2015 weather = 177 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)

$$\% \text{ Average} = \frac{\text{Most Probable Volume}}{\text{Average Observed Volume } (1981 - 2010)}$$

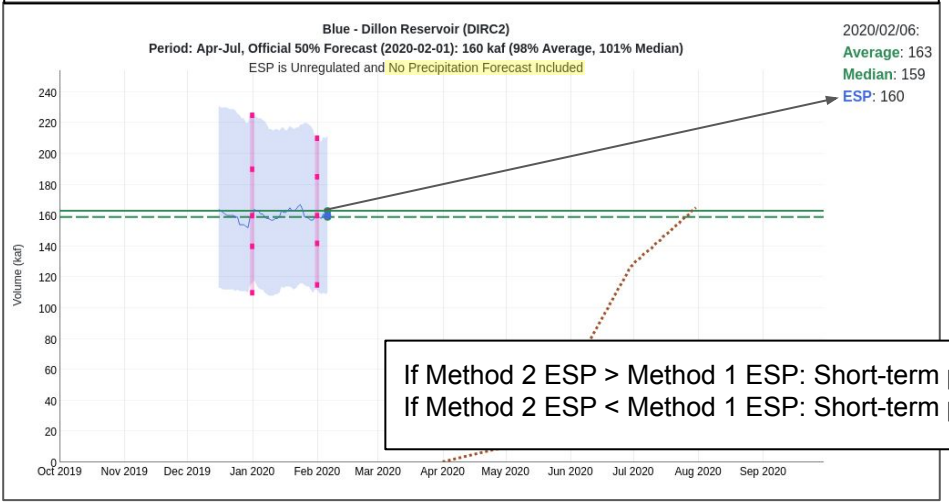
*Updated Daily

ESP Future Weather Scenarios

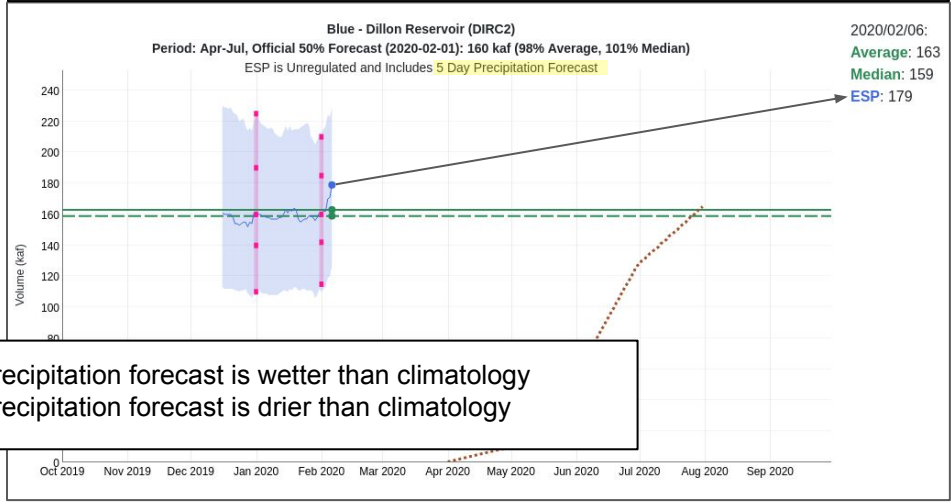
ESP Methodology: current hydrologic model states (soil moisture, snow)
+ future weather (precip/temp) scenarios based on historical (1981-2015) observations
= April-July streamflow volume

2 Methods Used For ESP Future Weather Scenarios

Method 1:
Future Weather = Climatology



Method 2:
Future Weather = 5-day Precip & Temp Forecast + Climatology

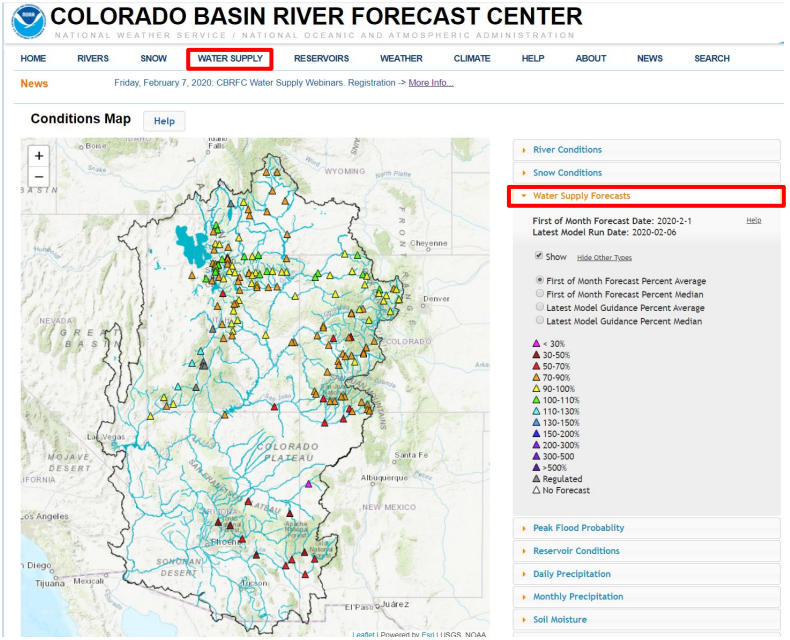


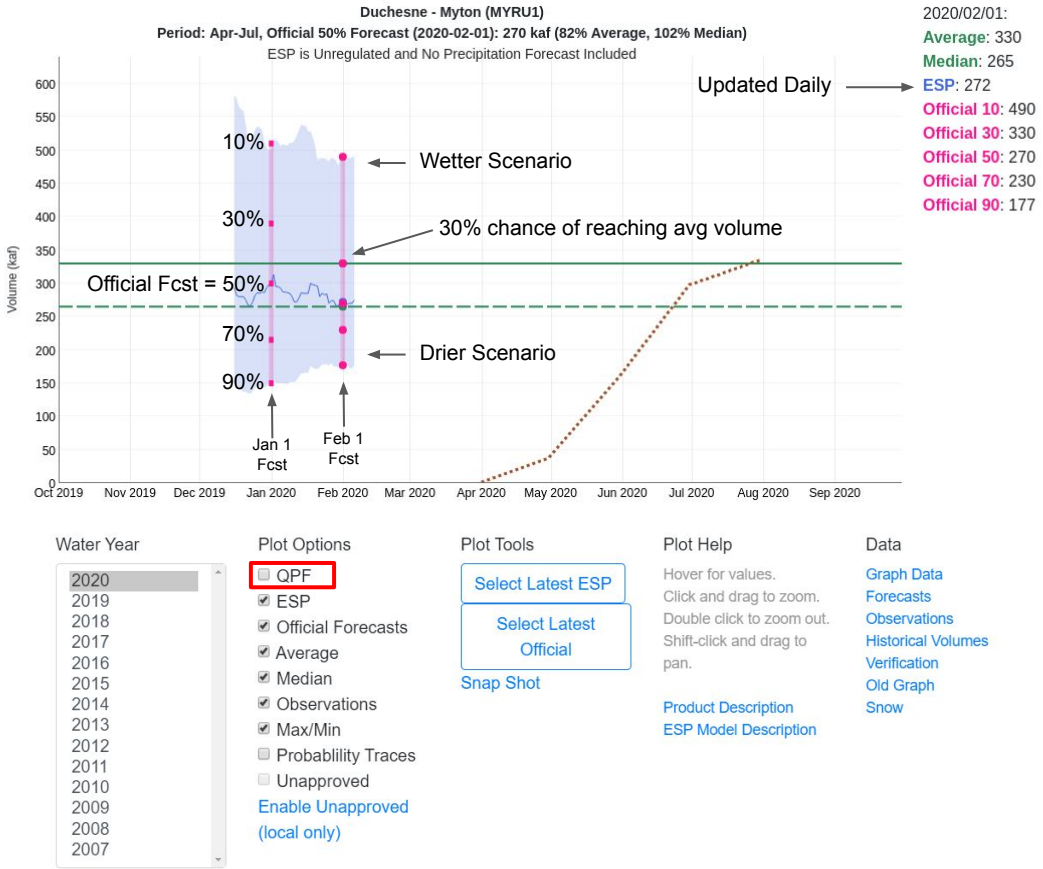
If Method 2 ESP > Method 1 ESP: Short-term precipitation forecast is wetter than climatology
If Method 2 ESP < Method 1 ESP: Short-term precipitation forecast is drier than climatology

*Updated Daily

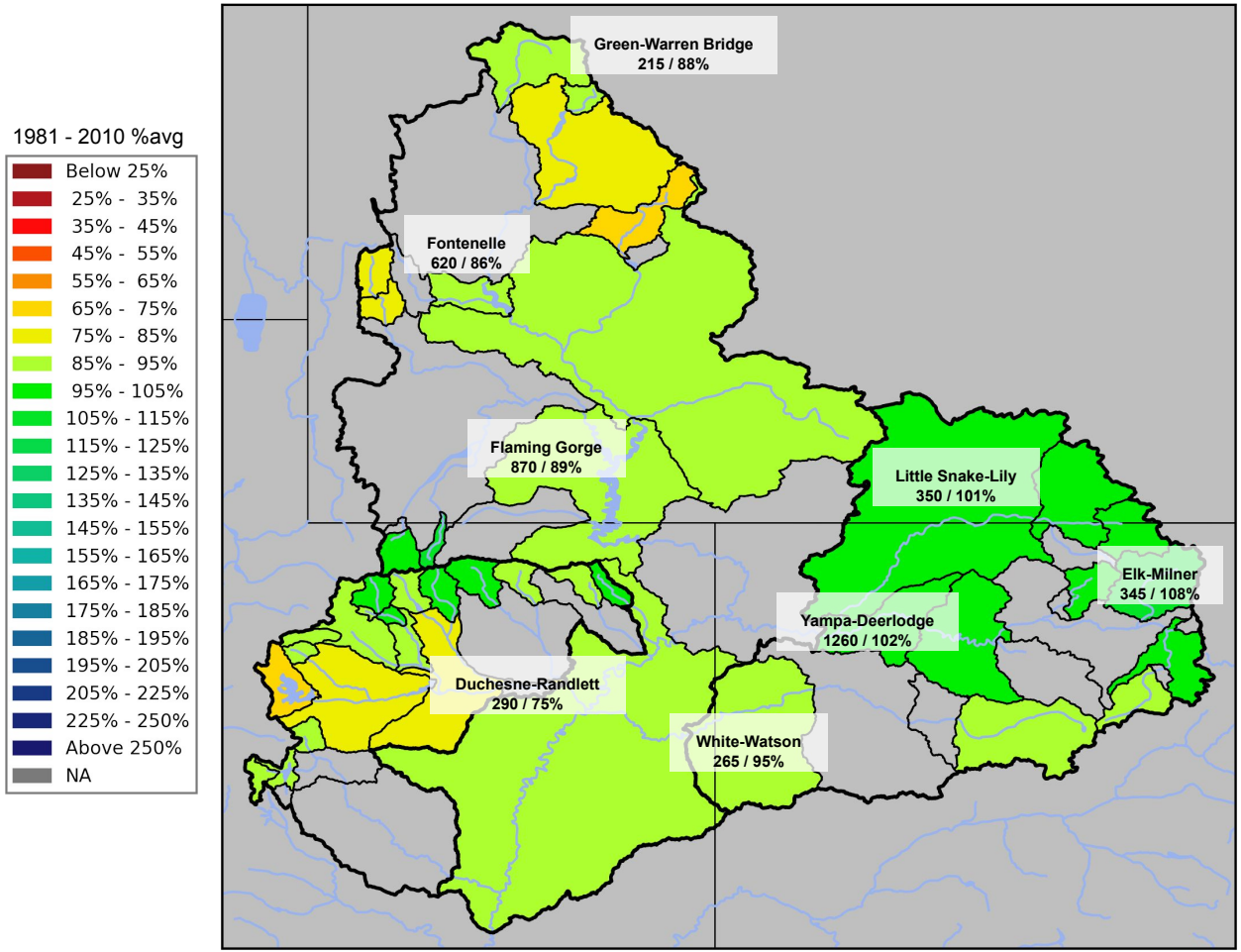
Water Supply Forecast Evolution Plot Overview

https://www.cbrfc.noaa.gov/





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



February 1st Forecasts

Volume (kaf) / % of 1981-2010 avg

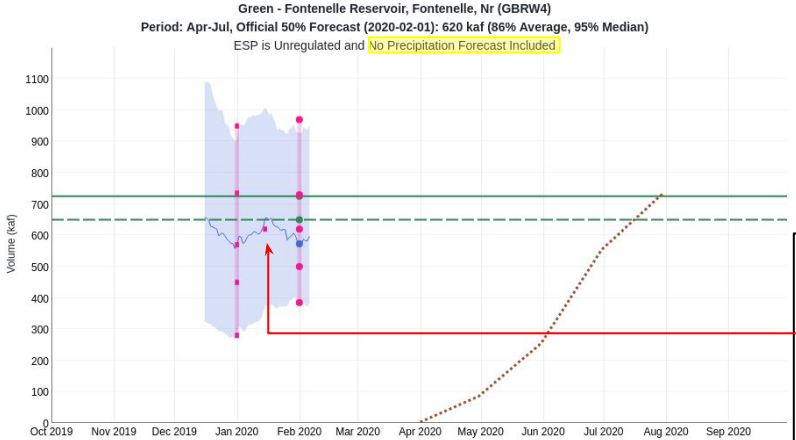
Forecast Ranges & (1-month Trend)

Upper Green: 75 - 105% avg
(0 - 10% increase)

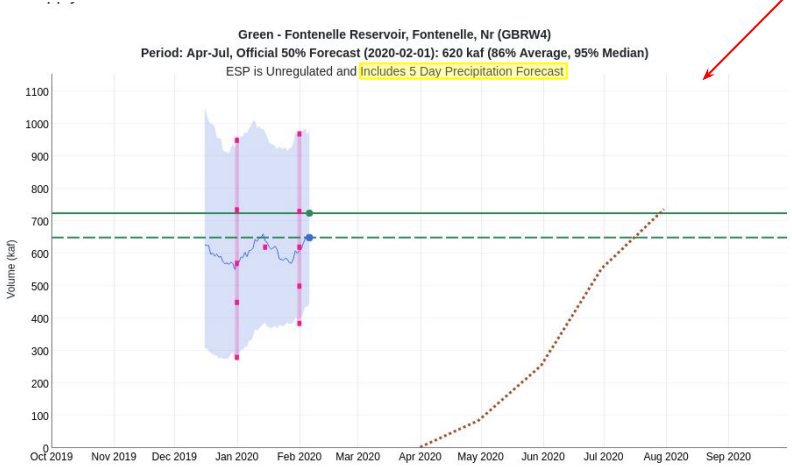
Yampa/White: 90 - 110% avg
(+/- 5%)

Duchesne: 70 - 100% avg
(+/- 10%)

Upper Green Water Supply Forecasts & Snow Conditions



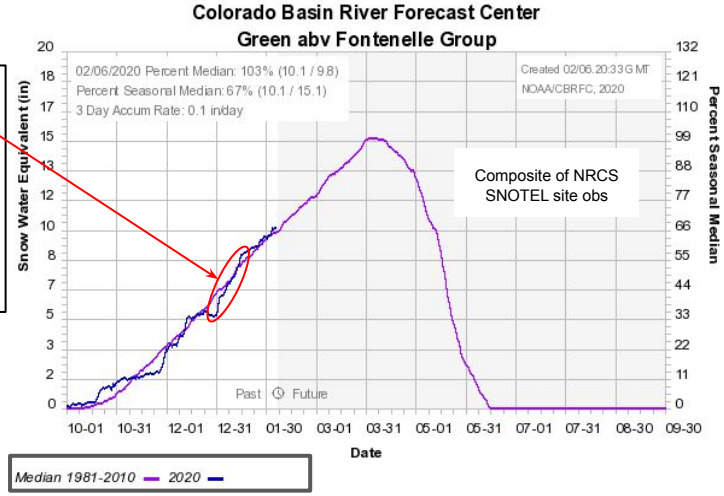
2020/02/01:
Average: 725
Median: 650
ESP: 573
Official 10: 970
Official 30: 730
Official 50: 620
Official 70: 500
Official 90: 385



2020/02/06:
Average: 725
Median: 650
ESP: 649

- SWE increased from 85% to 108% median during the first half of January
  - this was accounted for in the mid-month forecast update

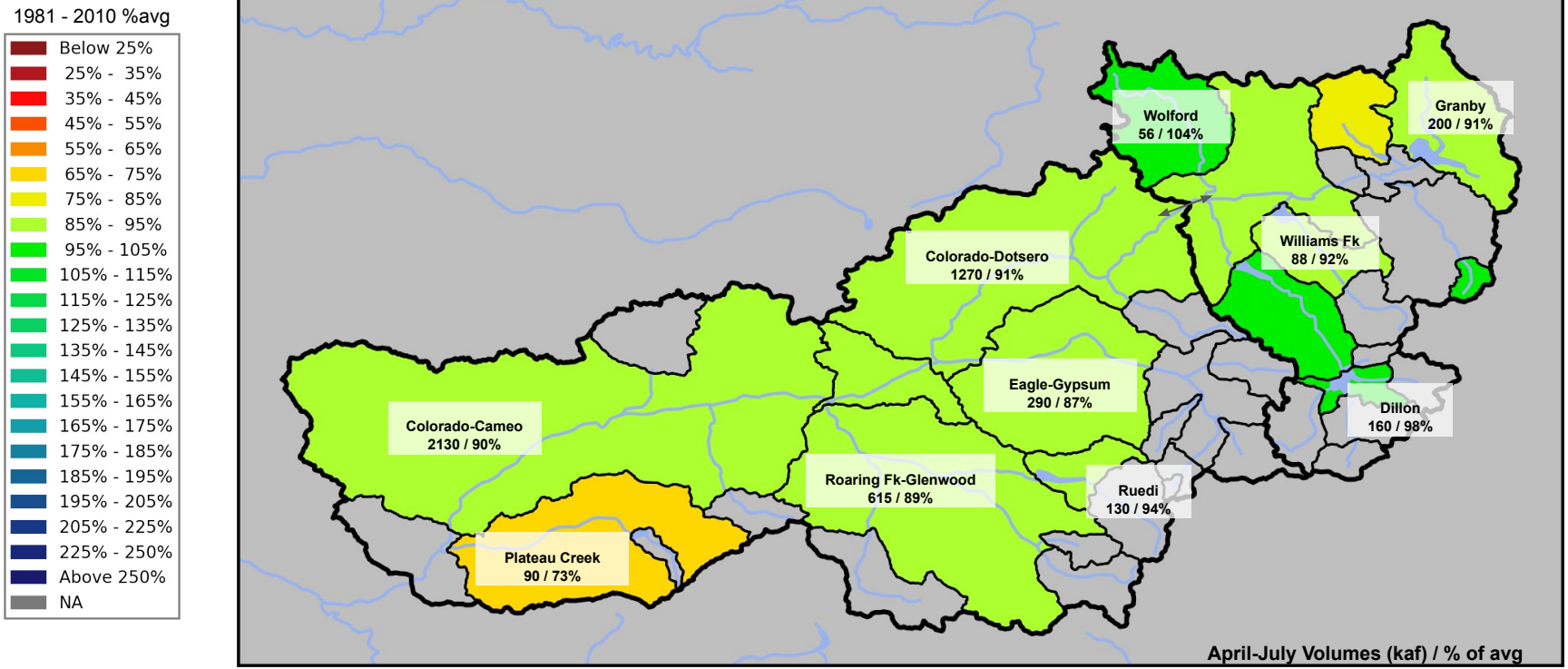
- Drier second half of the January caused ESP guidance to drop
  - Feb 1 official forecast did not drop in anticipation of another wet period the first half of February



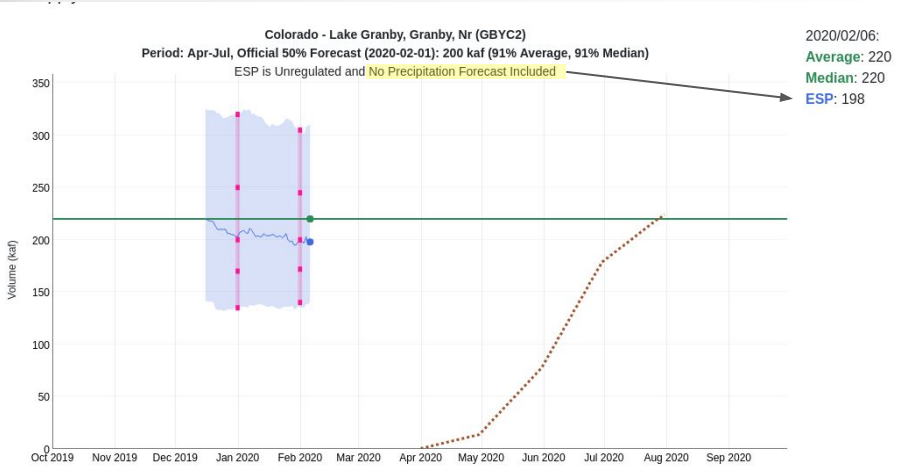
Feb 1st Water Supply Forecasts: Upper Colorado River Mainstem

Forecast Ranges & (1-month Trend):

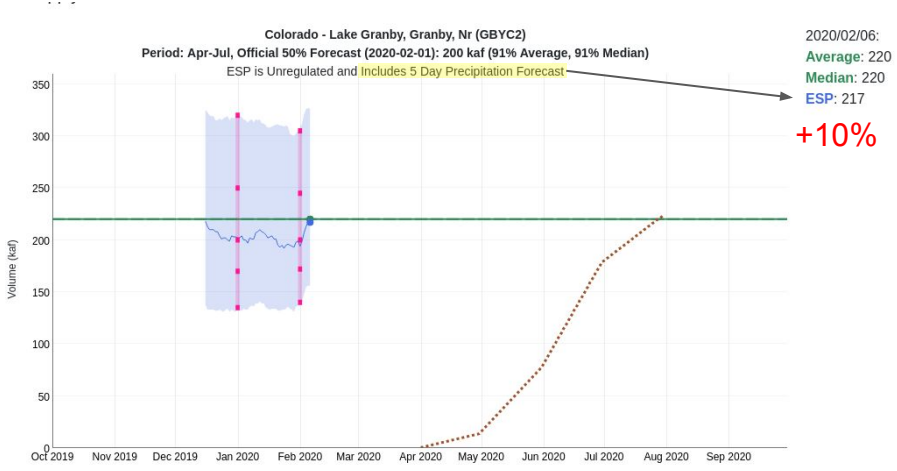
Granby to Kremmling: 80 - 105% avg (+/- 5%)
Kremmling to Cameo: 75 - 95% avg (0 - 4% increase)



Upper Colorado Mainstem: Granby Inflow ESP Guidance & SWE Conditions

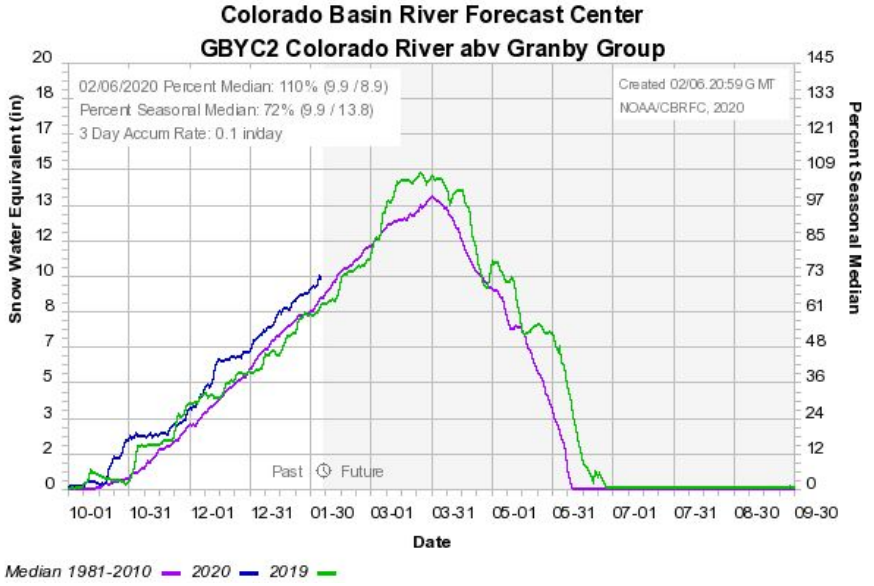


2020/02/06:
Average: 220
Median: 220
ESP: 198



2020/02/06:
Average: 220
Median: 220
ESP: 217

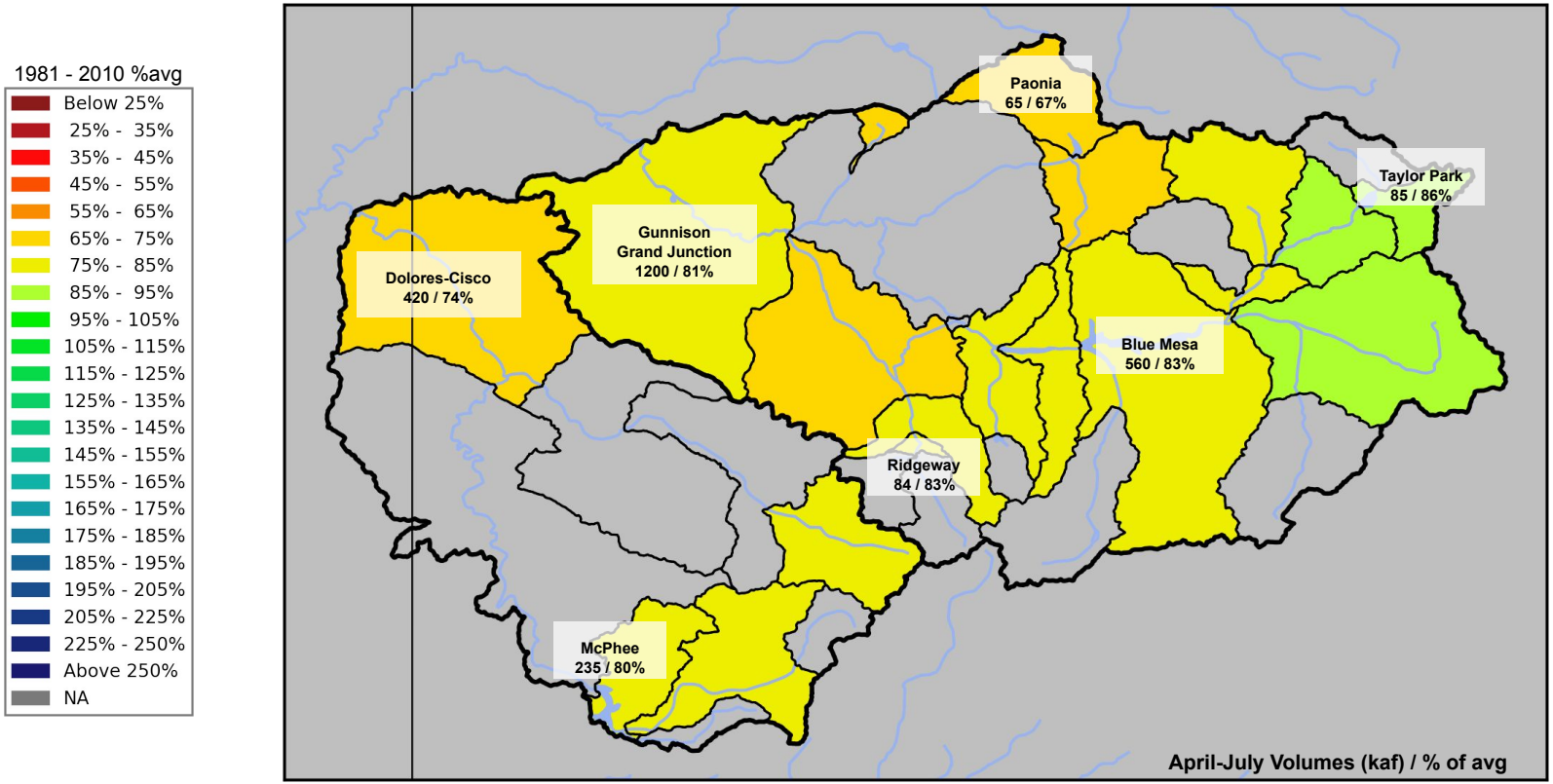
+10%



Feb 1st Water Supply Forecasts: Gunnison, Dolores

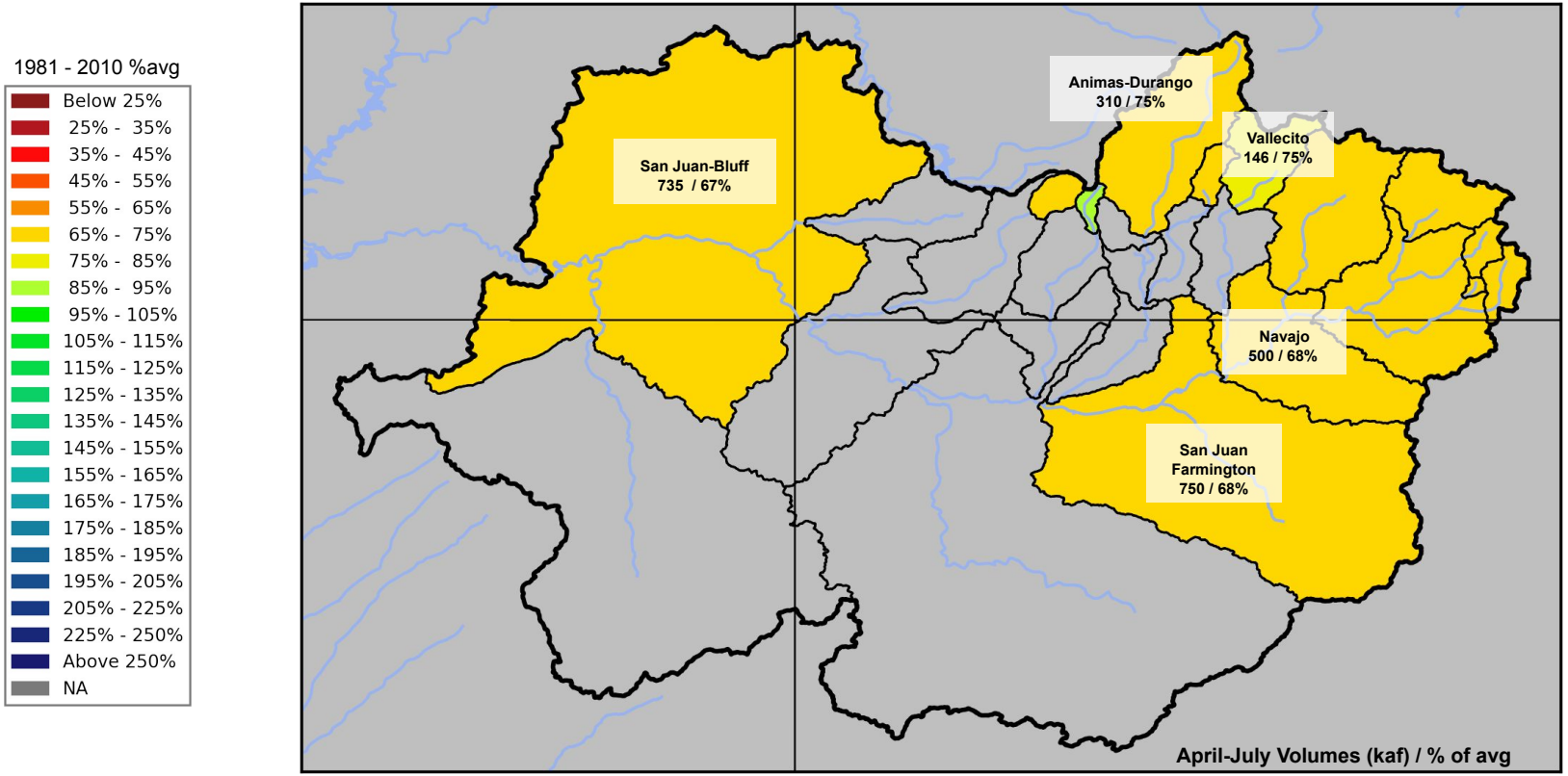
Forecast Ranges & (1-month Trend):

Gunnison:	65 - 90% avg	(0 - 11% decrease)
Dolores:	75 - 85% avg	(5 - 10% decrease)

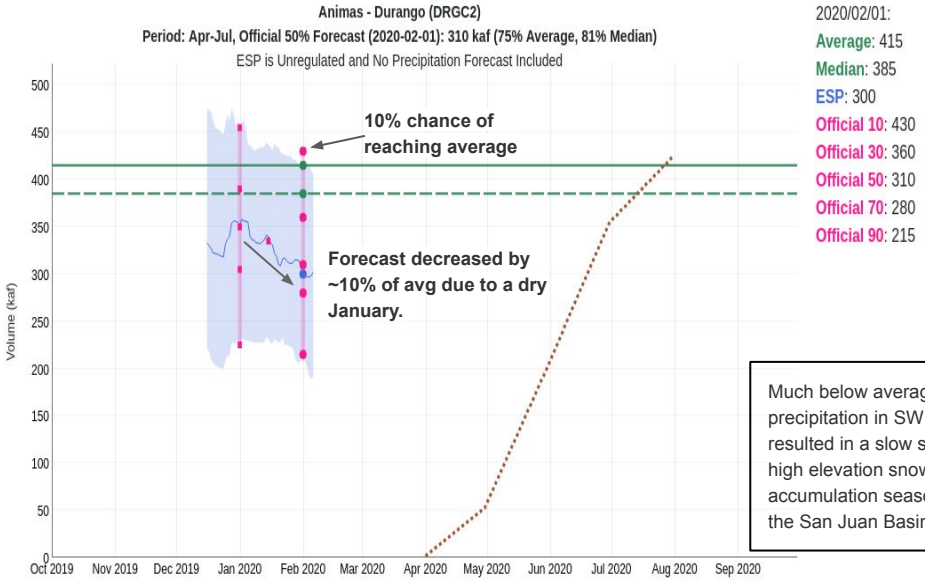


Feb 1st Water Supply Forecasts: San Juan

Forecast Range & (1-month Trend):
65 - 85% of average (5 - 10% decrease)

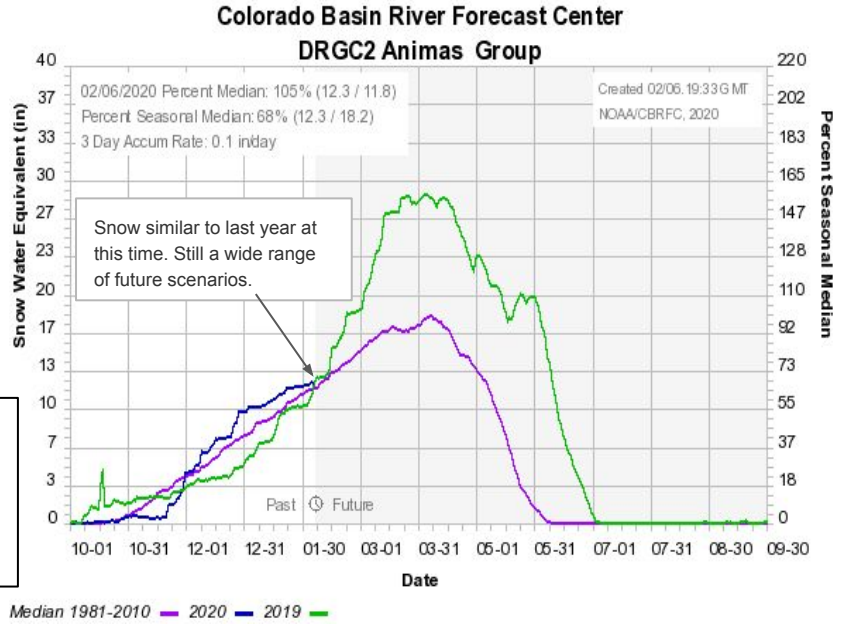


San Juan River Basin: Animas-Durango ESP Guidance & SWE Conditions

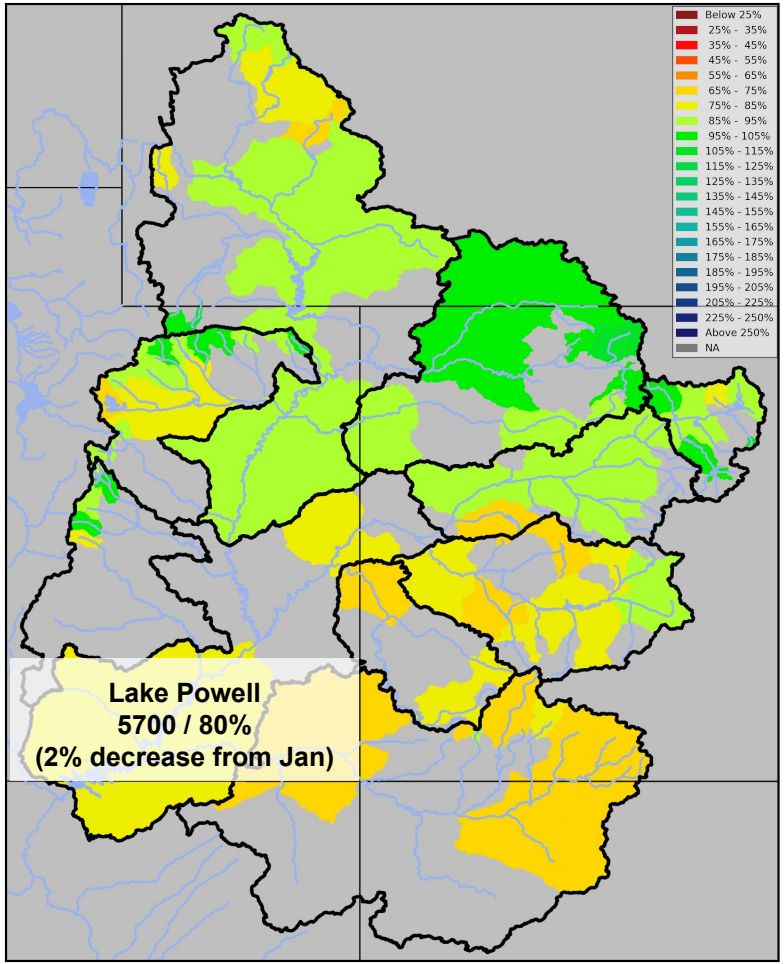


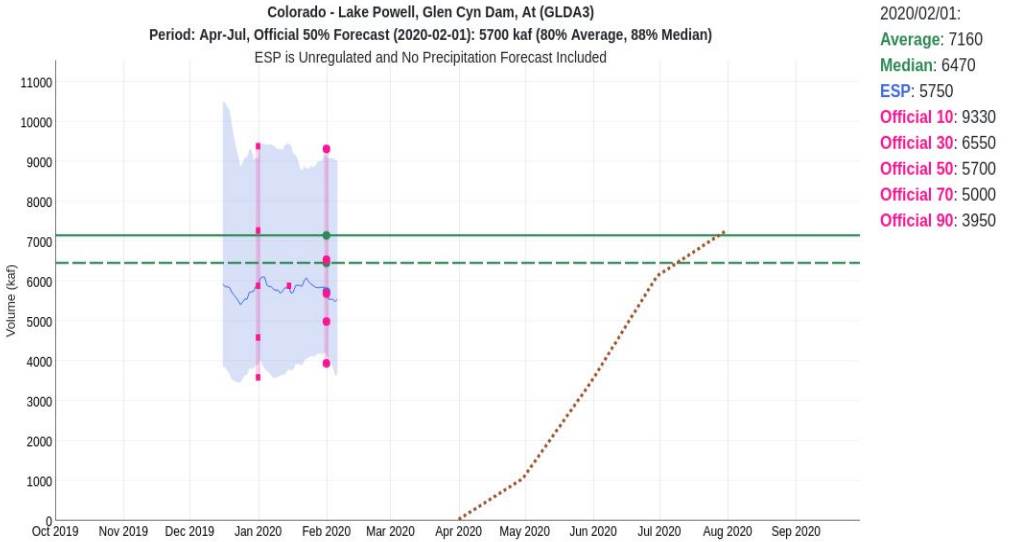
2020/02/01:
Average: 415
Median: 385
ESP: 300
Official 10: 430
Official 30: 360
Official 50: 310
Official 70: 280
Official 90: 215

Much below average October precipitation in SW Colorado resulted in a slow start to the high elevation snow accumulation season, especially the San Juan Basin



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

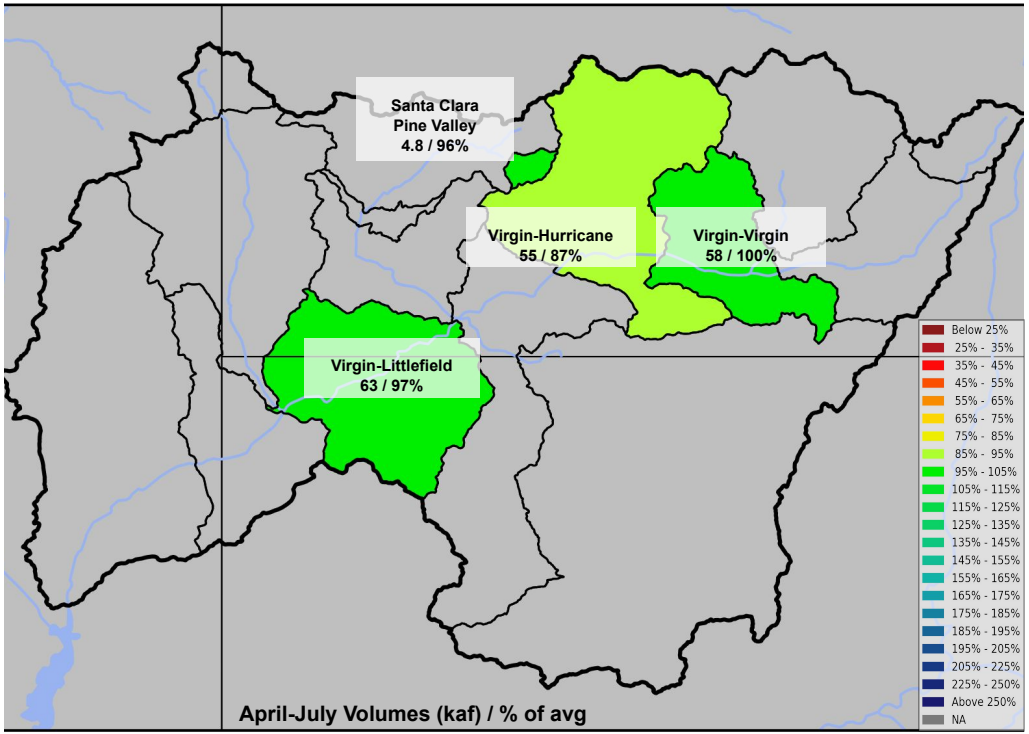


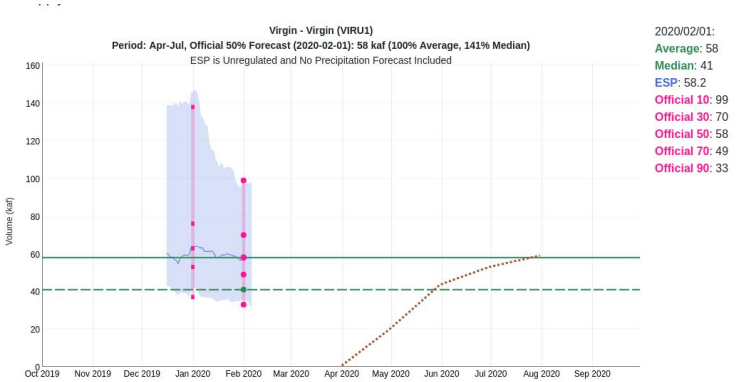


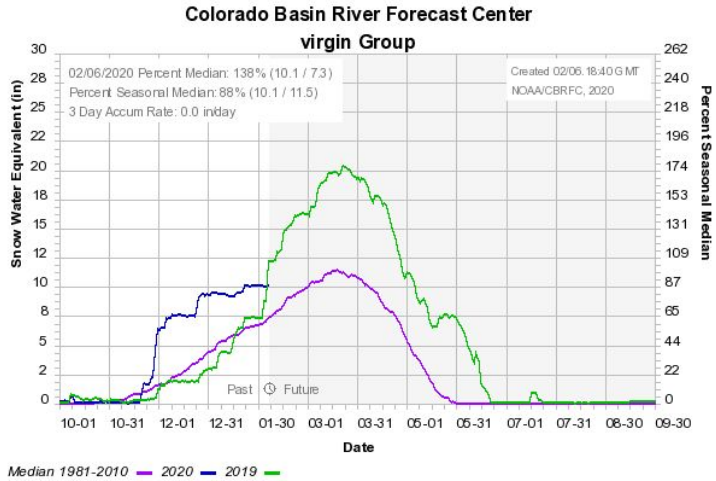
Lake Powell summarizes the hydrologic conditions throughout the Upper Colorado River Basin.

Feb 1st Water Supply Forecasts: Virgin River Basin

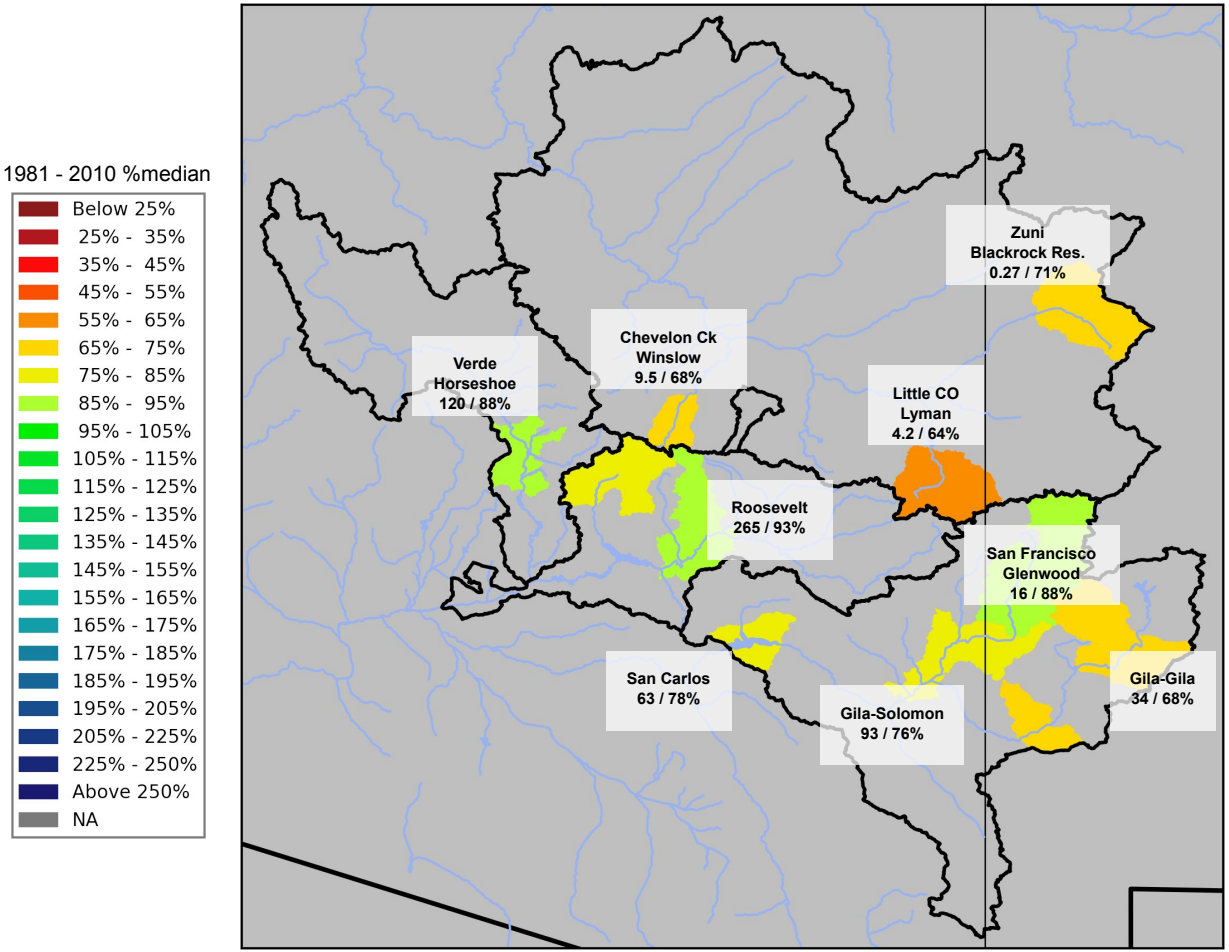
Forecast Range & (1-month Trend):
85 - 100% avg (3 - 10% decrease)







Feb 1st Water Supply Forecasts: Lower Colorado River Basin



February - May Forecast Period
Volume (kaf) / % of 1981-2010 Median

Forecast Ranges

Little Colorado: 65 - 70%

Upper Gila: 65 - 90%

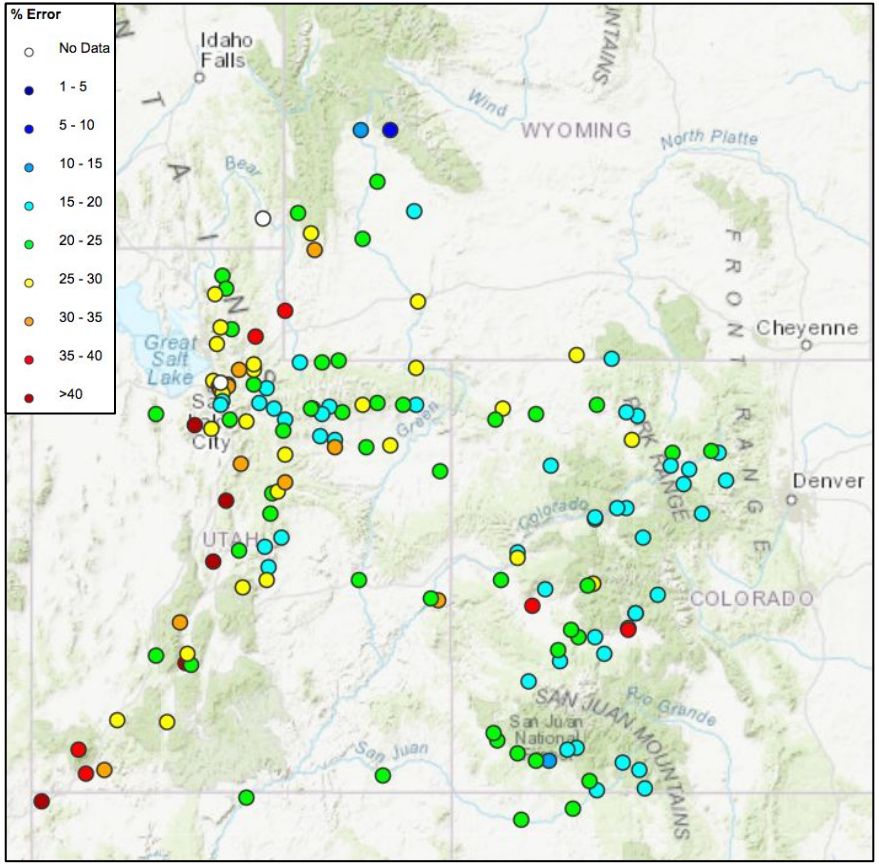
Salt: 75 - 95%

Verde: 88%

Jan-May forecasts have decreased or not changed since January.

Historical (1981-2010) Forecast Verification

February Forecast Error: April-July Volume



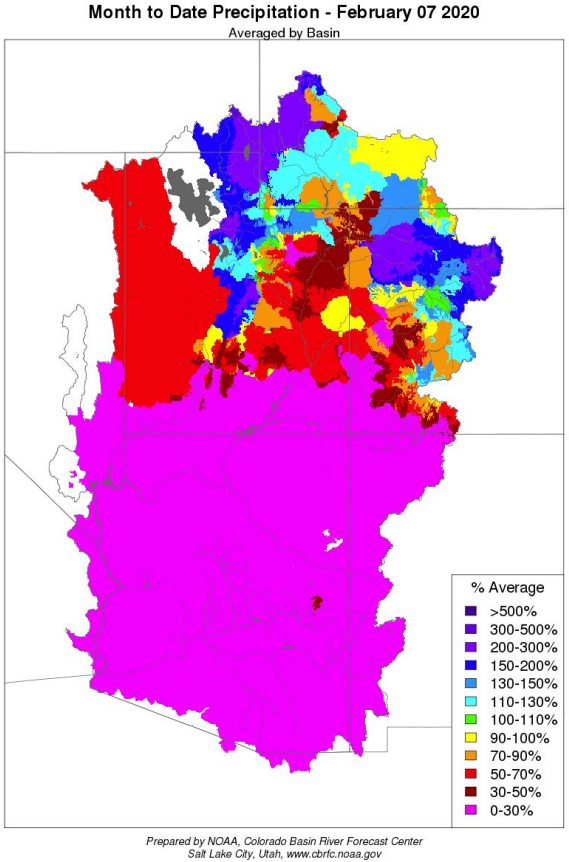
Location	Avg Feb Forecast Error
Green River - Warren Bridge	15%
Fontenelle Reservoir	25%
Yampa River - Deerlodge	25%
Blue River - Dillon Reservoir	17%
Colorado River - Cameo	19%
Blue Mesa Reservoir (Gunnison)	20%
McPhee Reservoir (Dolores)	25%
Navajo Reservoir (San Juan)	22%
Lake Powell	24%
Virgin River at Virgin	34%

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

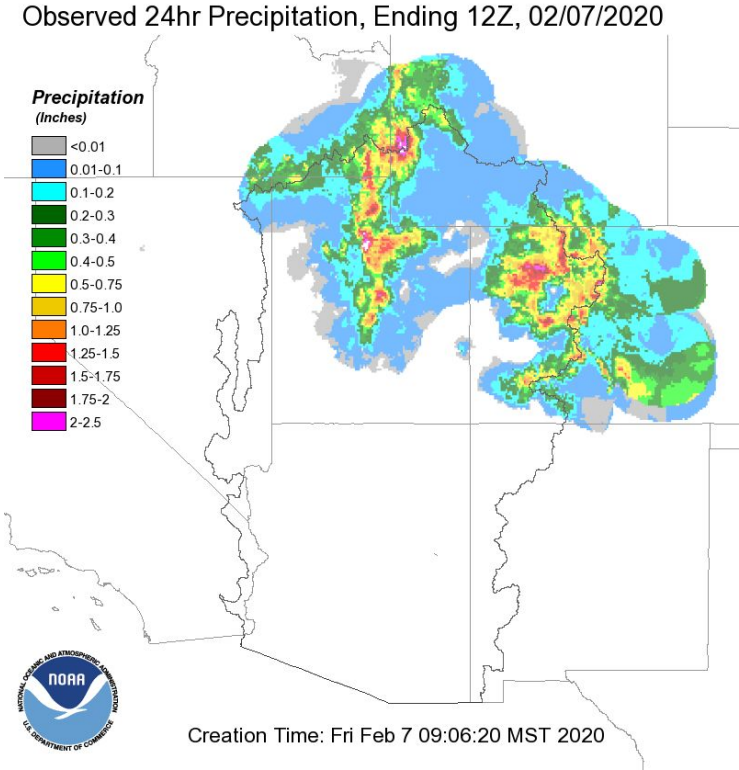
February 2020 Month-To-Date Precipitation



Precipitation during the first week of February has had a positive impact to water supply guidance across northern basins.

Basins to the south have been dry during the first week of February.

0.5 - 2.0” new SWE last 24 hours in some areas



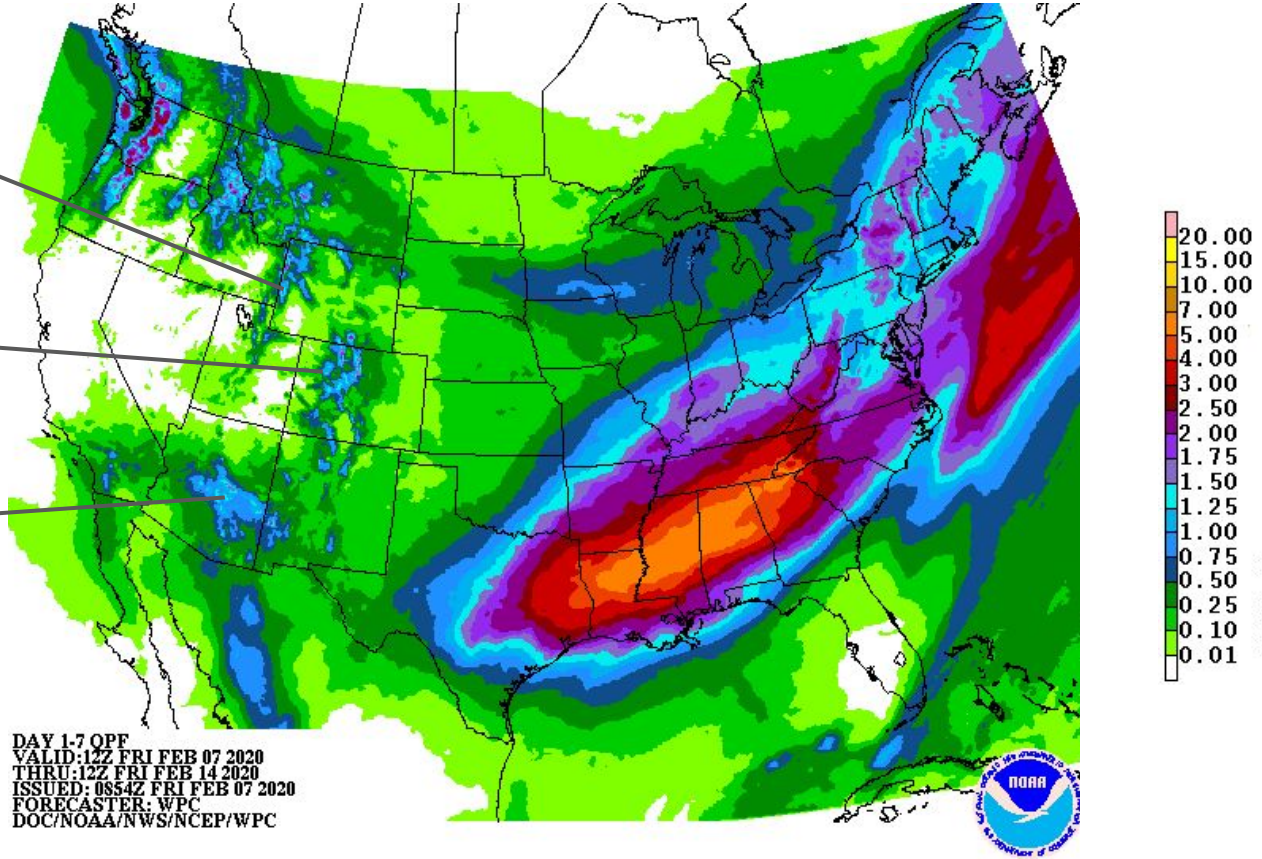
Upcoming Weather: WPC February 7th - 14th Precipitation Outlook

Weather models are in fairly good agreement with precipitation amounts and placement in the coming week.

Upper Green
Duchesne
0.50 - 1 inch

White / Yampa
Upper CO Headwaters
Southwest CO
1-1.5 inches

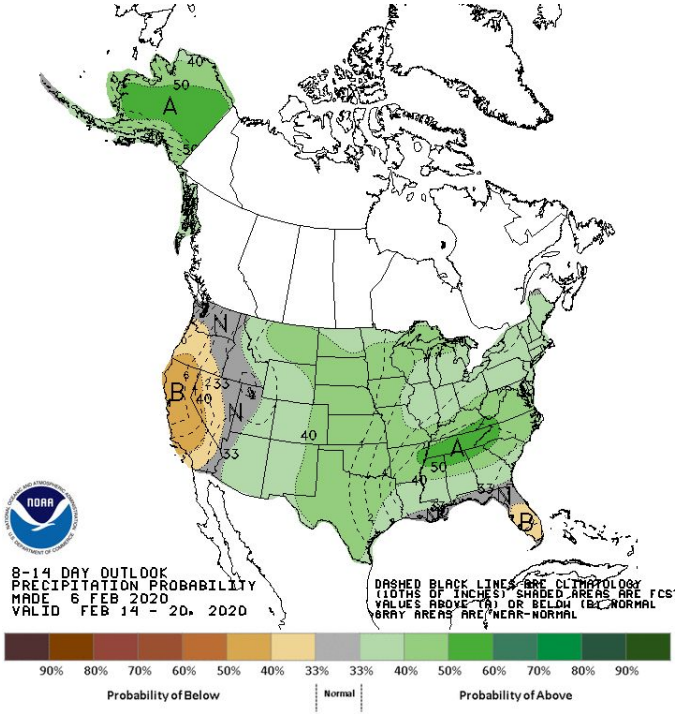
Upper Gila / Salt / Verde
1-1.5 inches



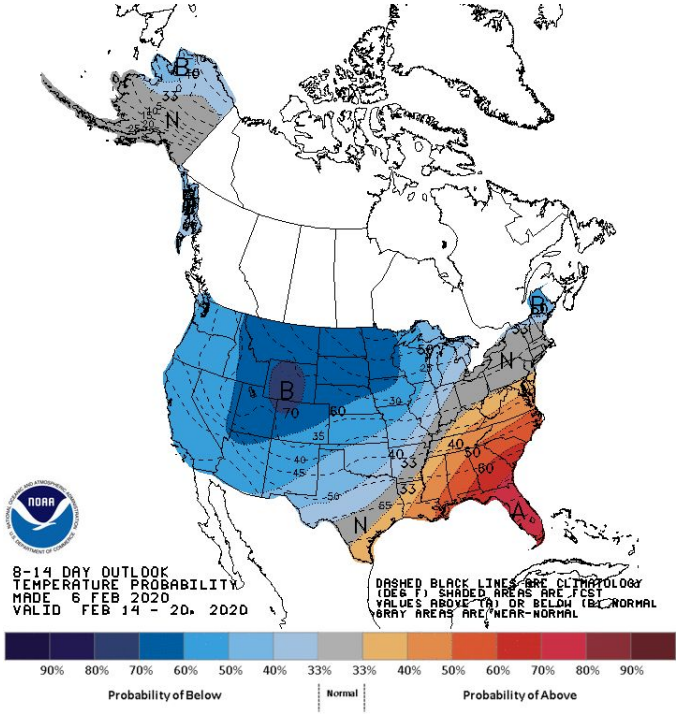
Upcoming Weather: 8-14 Day Outlook (Feb 14th-20th)

Increased probability of above average precipitation & below average temperature into mid-February.

Precipitation Outlook



Temperature Outlook



Summary

- Northern mountainous basins have benefited the most from January / early February weather pattern
  - Water supply guidance during the past month generally fared better from north to south
    - Increases in Upper Green & White/Yampa
    - Decreases in SW CO (Gunnison/Dolores/San Juan) and Lower Colorado Basin

- Early February snow conditions:
  - Upper Colorado River Basin: near to slightly above median
  - Virgin River Basin: above median
  - Rest of Lower Colorado Basin: near to below median

- Active weather period in the coming weeks expected to have a positive impact to water supply in the Colorado River Basin

2020 Water Supply Briefing Schedule

**All Times Mountain Time (MT)*

Colorado River Basin

~~Wednesday~~	~~Jan 8th~~	~~10 am~~
Friday	Feb 7th	10 am
Friday	Mar 6th	10 am
Tuesday	Apr 7th	10 am
Thursday	May 7th	10 am

Utah / Great Basin

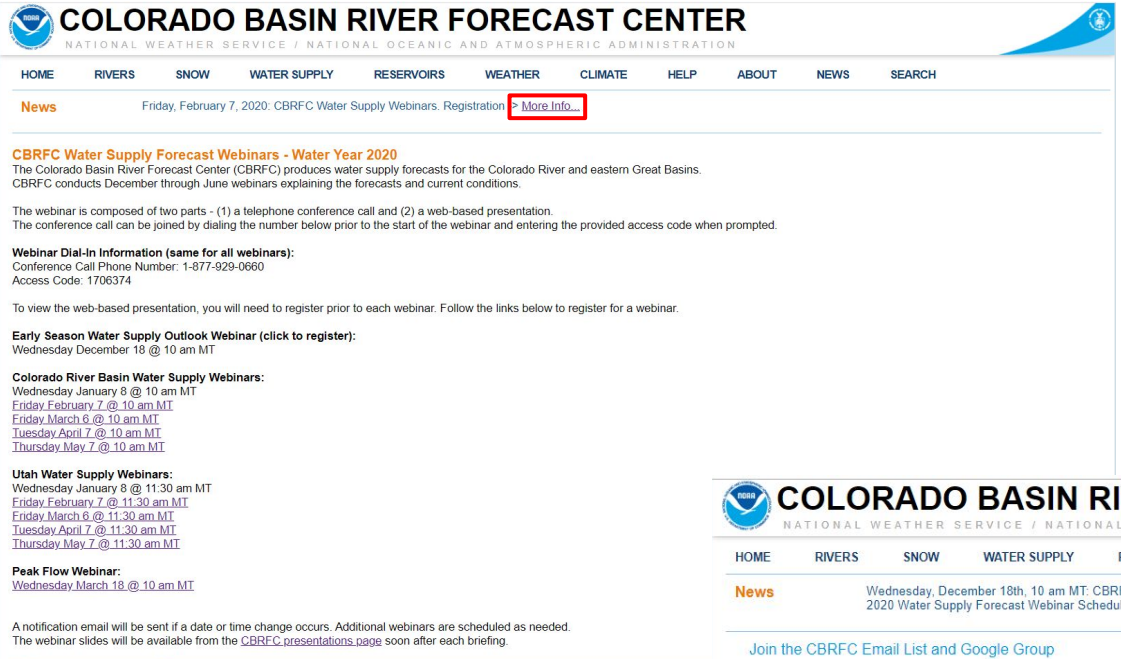
~~Wednesday~~	~~Jan 8th~~	~~11:30 am~~
Friday	Feb 7th	11:30 am
Friday	Mar 6th	11:30 am
Tuesday	Apr 7th	11:30 am
Thursday	May 7th	11:30 am

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



COLORADO BASIN RIVER FORECAST CENTER

NATIONAL WEATHER SERVICE / NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

HOME RIVERS SNOW WATER SUPPLY RESERVOIRS WEATHER CLIMATE HELP ABOUT NEWS SEARCH

News Friday, February 7, 2020: CBRFC Water Supply Webinars. Registration > More Info...

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 Basins.
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: 1-877-929-0660
Access Code: 1706374

To view the web-based presentation, you will need to register prior to each webinar. Follow the links below to register for a webinar.

Early Season Water Supply Outlook Webinar (click to register):
Wednesday December 18 @ 10 am MT

Colorado River Basin Water Supply Webinars:
Wednesday January 8 @ 10 am MT
Friday February 7 @ 10 am MT
Friday March 6 @ 10 am MT
Tuesday April 7 @ 10 am MT
Thursday May 7 @ 10 am MT

Utah Water Supply Webinars:
Wednesday January 8 @ 11:30 am MT
Friday February 7 @ 11:30 am MT
Friday March 6 @ 11:30 am MT
Tuesday April 7 @ 11:30 am MT
Thursday May 7 @ 11:30 am MT

Peak Flow Webinar:
Wednesday March 18 @ 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.

https://www.cbrfc.noaa.gov/

COLORADO BASIN RIVER FORECAST CENTER

NATIONAL WEATHER SERVICE / NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

HOME RIVERS SNOW WATER SUPPLY RESERVOIRS WEATHER CLIMATE HELP ABOUT NEWS SEARCH

News Wednesday, December 18th, 10 am MT: CBRFC Early Season Water Supply Outlook Webinar. Registration -> More Info...
2020 Water Supply Forecast Webinar Schedule and Registration -> More Info...

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RSS

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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

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CBRFC Water Supply Presentations
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Questions?