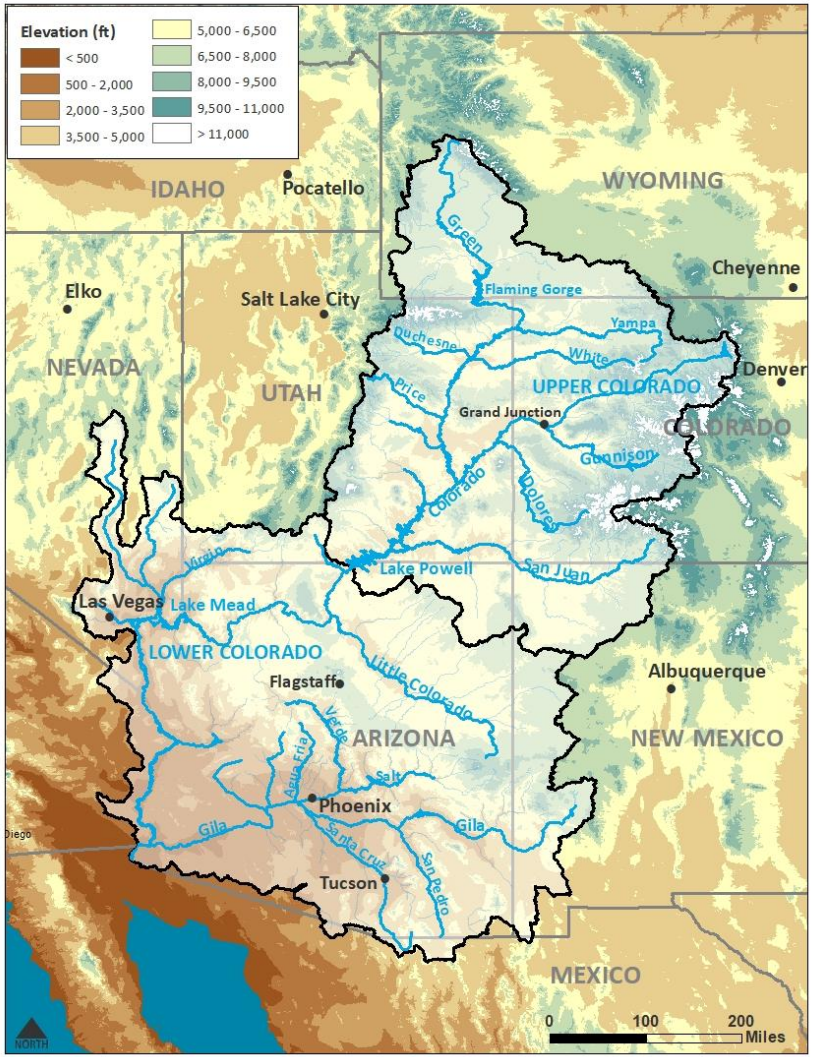
Colorado River Basin Water Supply Briefing

January 7, 2022

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

2022 Water Supply Forecasts

Early Season Forecast Error

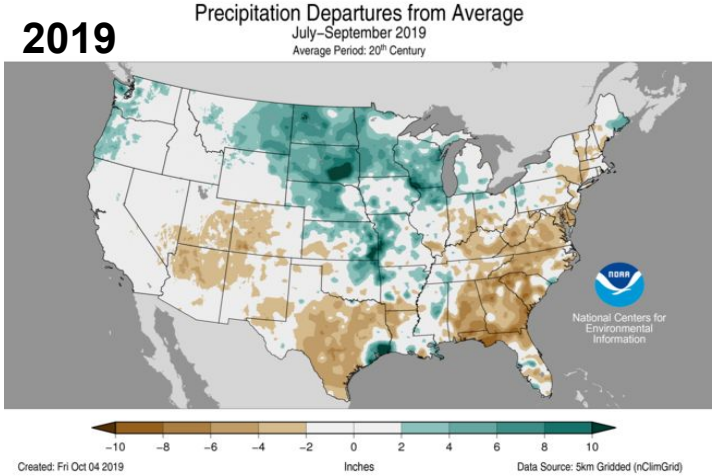
Recent/Upcoming Weather

Contacts & Questions

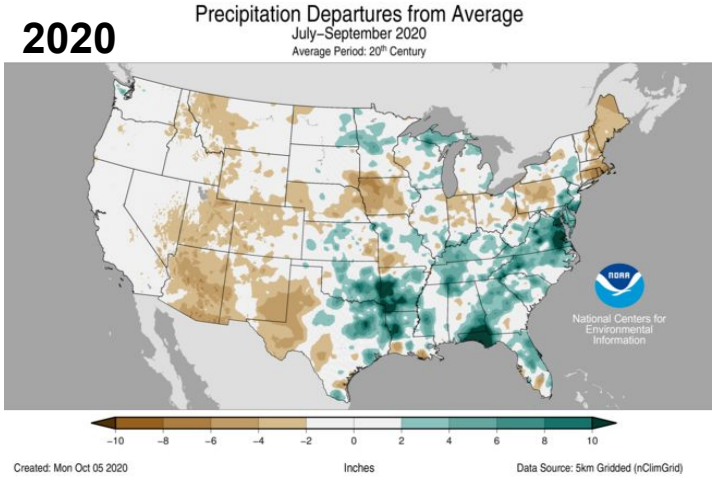
Webinar recording & slides will be made available on CBRFC webpage

Monsoon: July-September Precipitation

2019

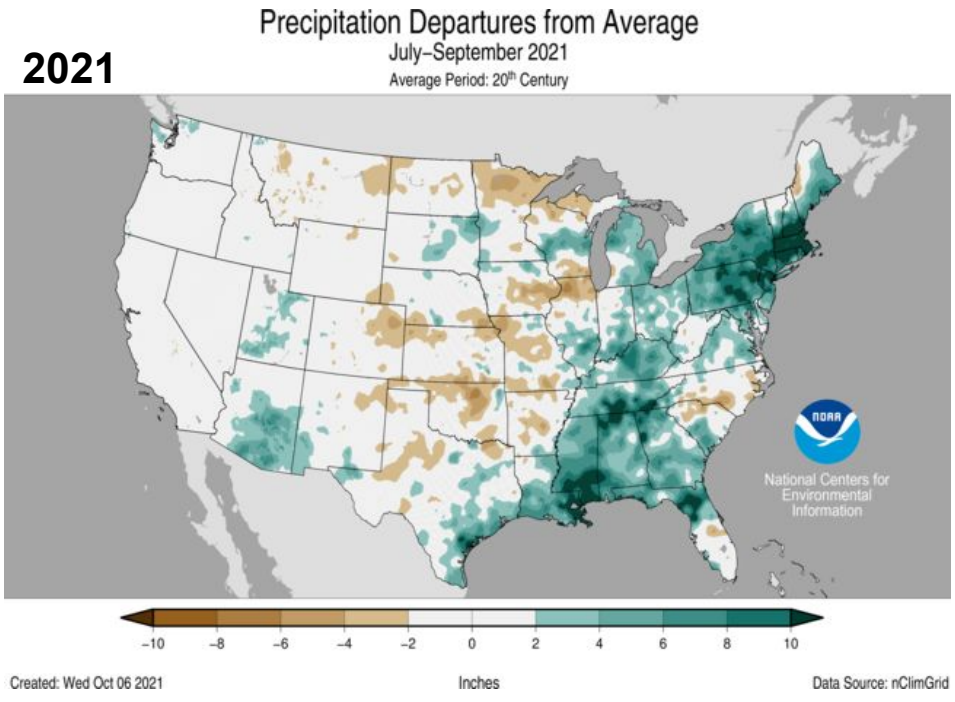


2020

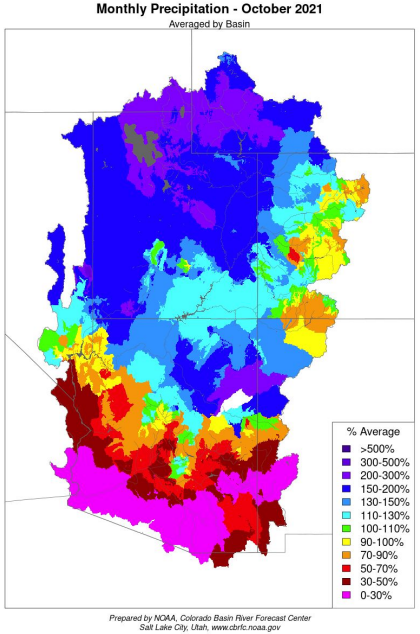


The 2021 monsoon season was much wetter than recent years, especially across southern Arizona and central Utah.

2021

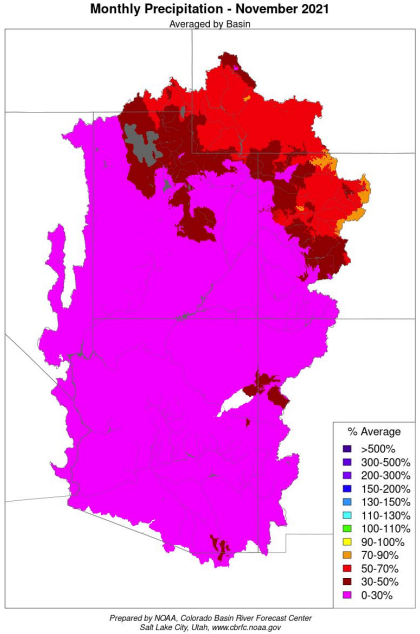


Water Year 2022 (October - December) Monthly Precipitation Summary



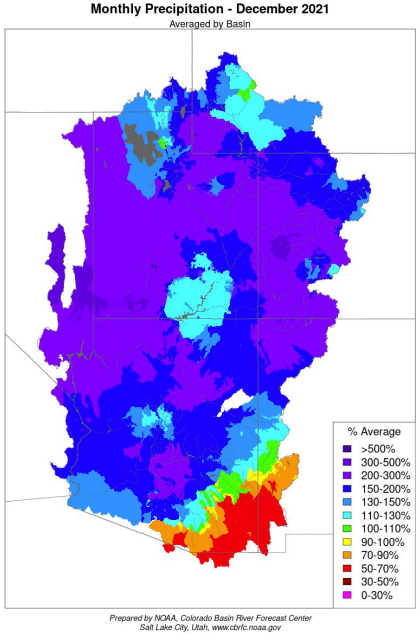
October precipitation was well above average across much of the region including southwest Wyoming, most of Utah, and northern Arizona.

Western Colorado had near average October precipitation while southern Arizona had below average precipitation during the month.



November's weather pattern was mostly very warm and dry with much below average monthly precipitation across most of the region.

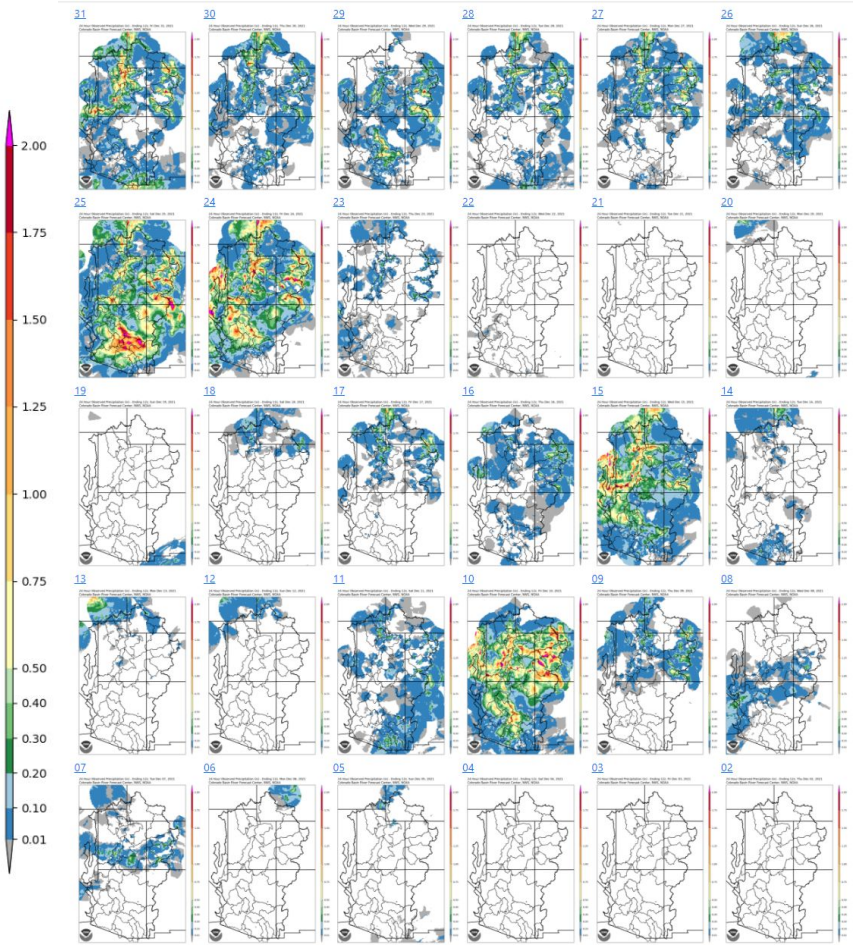
November precipitation fell in the bottom five at numerous SNOTEL stations across Utah, southwest Colorado, and central Arizona.



The weather pattern shifted during the second week of December towards colder and wetter conditions and featured multiple storm systems that brought widespread precipitation to most of the region during the last three weeks of the month.

The majority of SNOTEL sites across Utah and western Colorado and a few sites across central Arizona reported December precipitation values that ranked in the wettest five on record.

December 2021 Precipitation



Precipitation continued through the end of December and further improved regional SWE conditions.

December 23-24
Most SNOTEL stations reported 1-3” of observed SWE.
3-5” locally higher amounts reported at around a dozen sites around the region.

Mid-Month
Another 1-2” of SWE to Utah’s higher elevations and southwest Colorado.
Widespread 0.5-1.0” of SWE elsewhere across the region.

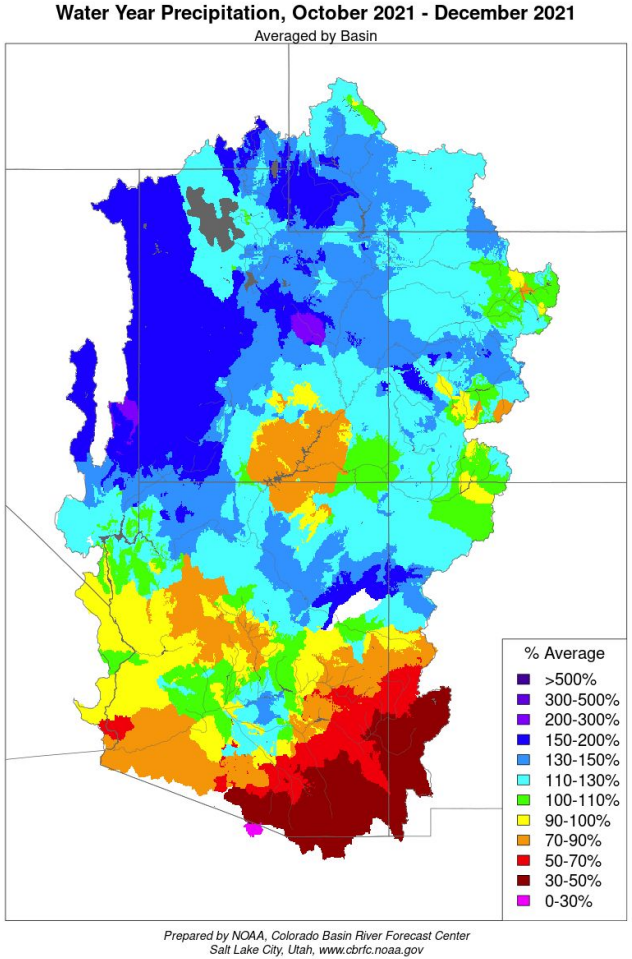
Dec 8-10
Widespread 1-2” of SWE to most of Utah and Colorado’s Western Slope.
Locally higher amounts across SW Colorado (Gunnison, Dolores, and San Juan Basins).
Northernmost/Upper Green area received much lower precipitation amounts.

← November’s warm and dry weather pattern continued through the first week of December.

[Link to CBRFC Observed Daily Precip Graphics]

Water Year 2022 (October - December) Precipitation

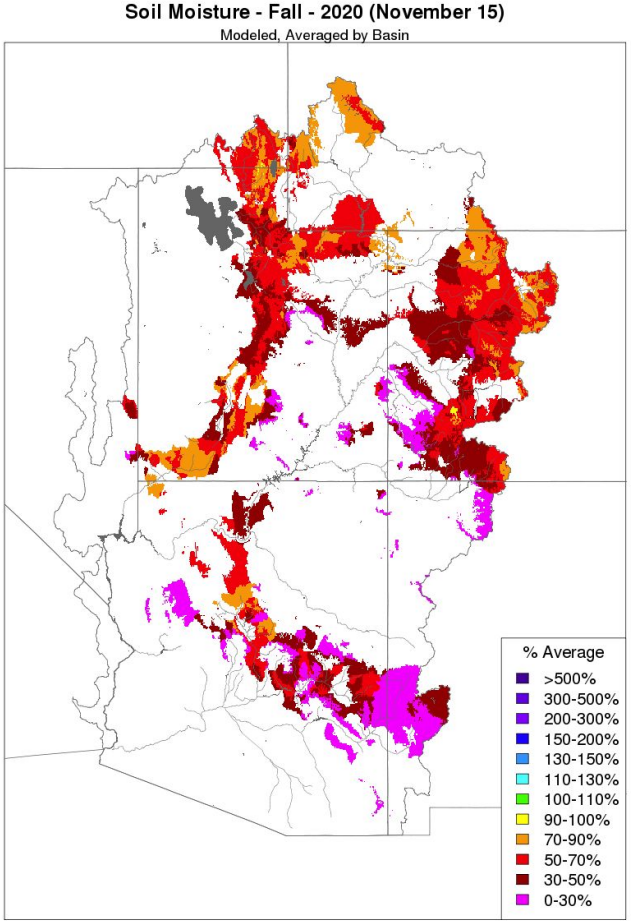
Water year precipitation can be used as a good indicator of early season water supply conditions.



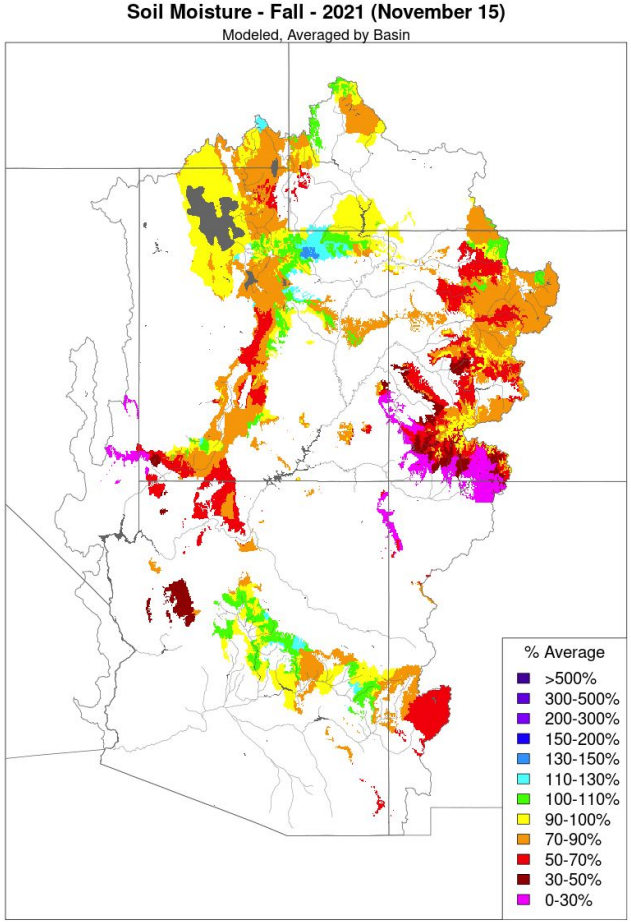
Water Year 2022
Oct-Dec Precip Summary

Basin	Precip (% Avg)
Upper Green	125%
Duchesne	145%
Price/San Rafael	155%
Yampa/White	125%
Upper CO Mainstem	120%
Gunnison	125%
Dolores	130%
San Juan	115%
Lake Powell	125%
Virgin	165%
Verde	105%
Salt	90%
Little Colorado	100%
Upper Gila	50%

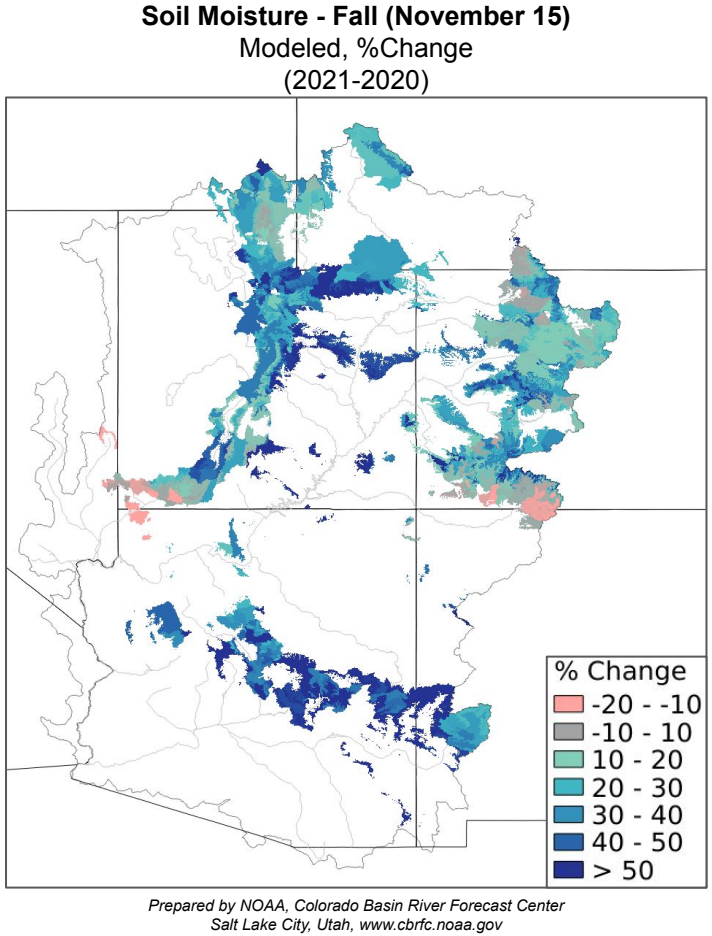
Fall Model Soil Moisture Conditions: 2020 vs. 2021



CBRFC model soil moisture conditions are improved from their record/near record dry levels a year ago but remain below to well below normal across many of the major runoff producing areas, notably western Colorado.



Fall Model Soil Moisture Conditions: 2020 vs. 2021

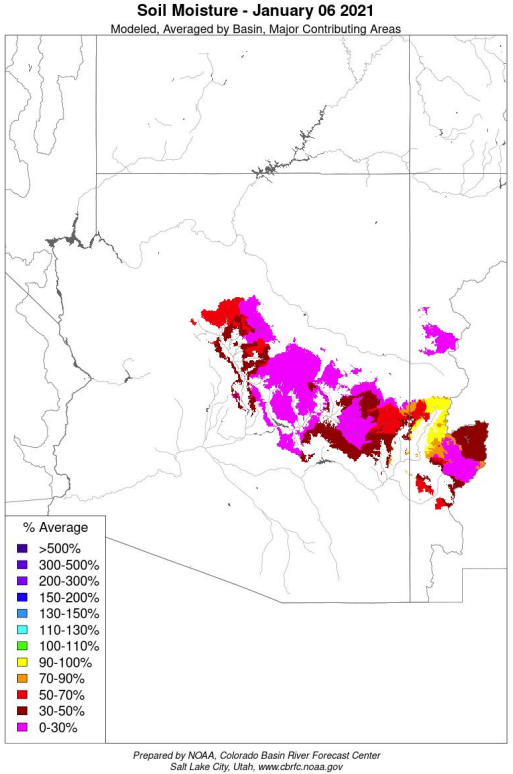


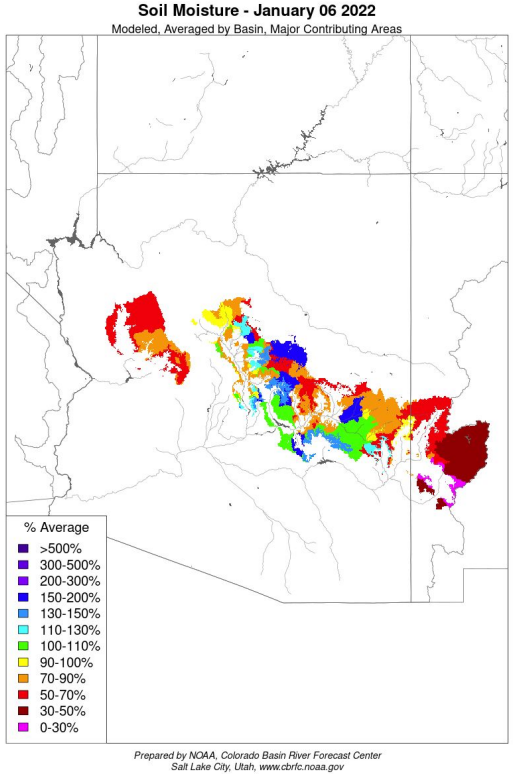
This is an experimental CBRFC soil moisture graphic.

Utah & Arizona model soil moisture conditions improved more compared to southwest Wyoming & western Colorado.

Soil Moisture Conditions - Lower Colorado

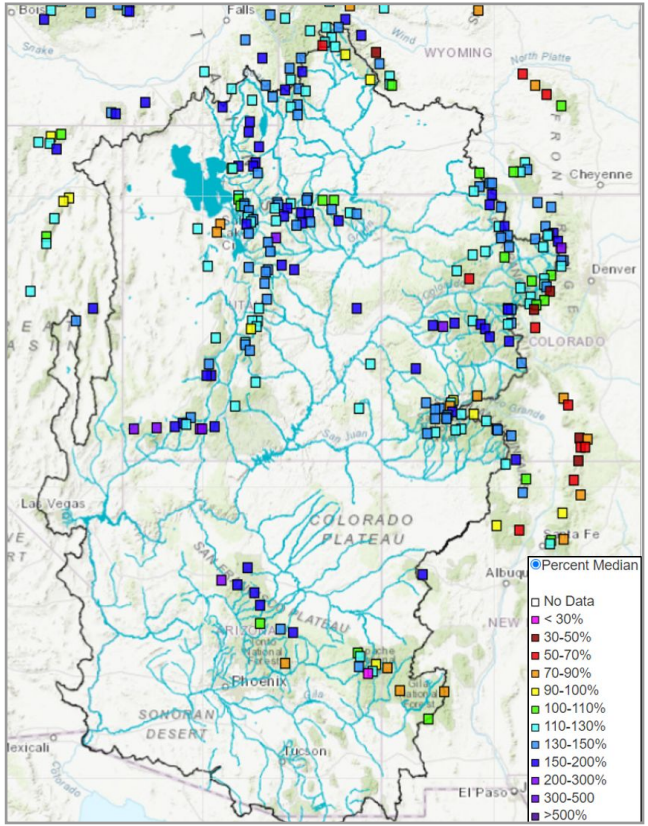
Model soil moisture conditions across the Lower Colorado River Basin have improved considerably from a year ago as a result of above average monsoon season precipitation and recent storm activity that has occurred during December.



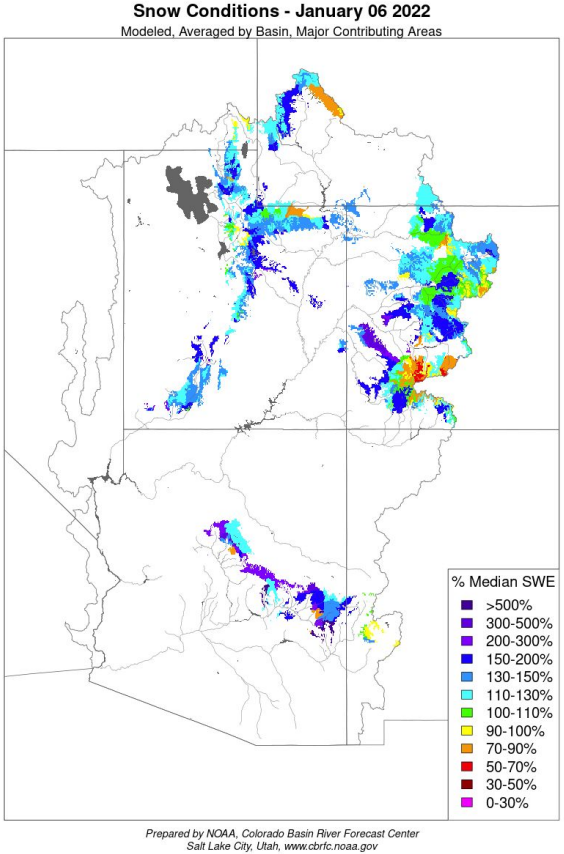


Early January Snow Conditions

SNOTEL (Observed)



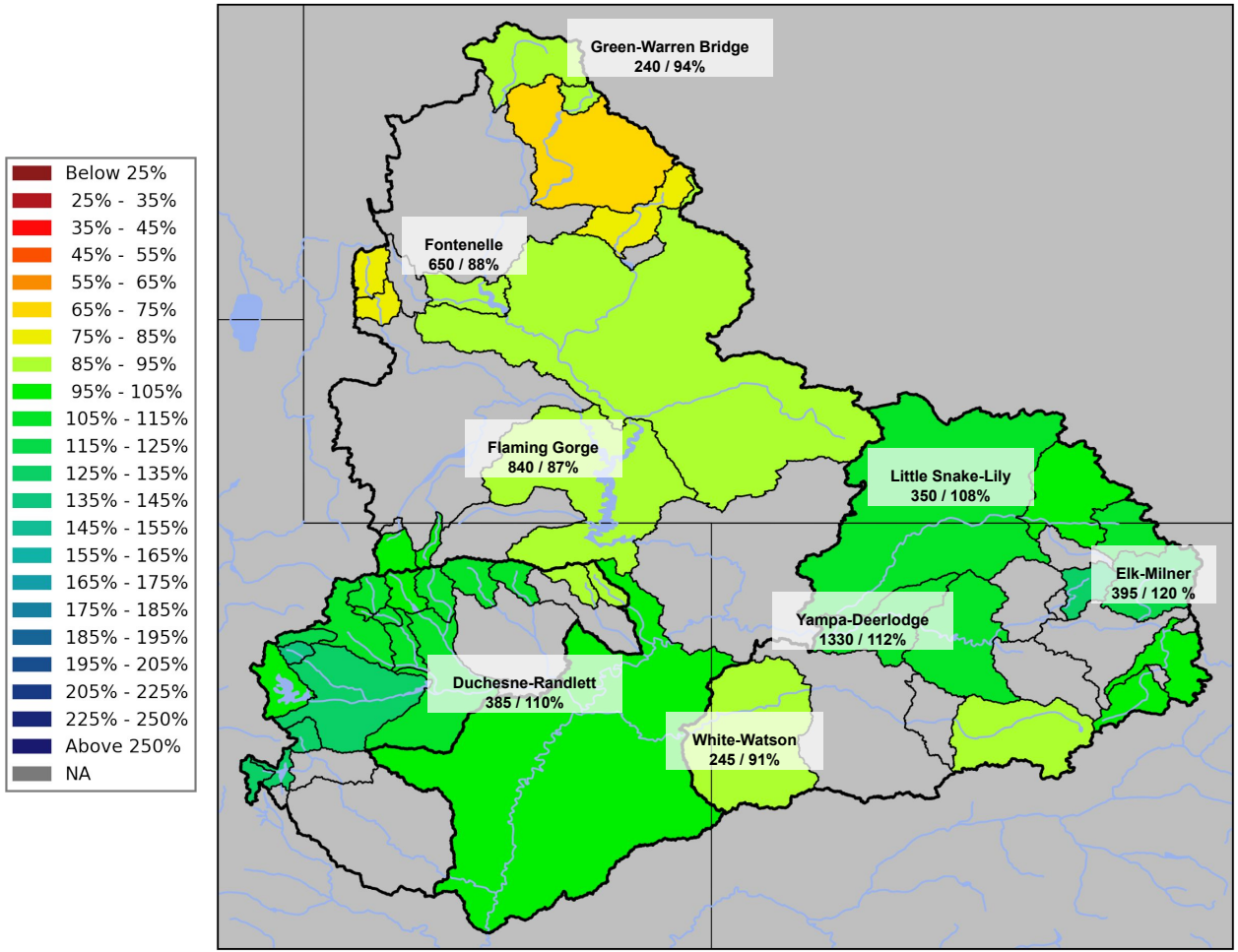
CBRFC (Model)



Jan 7 SWE Summary (SNOTEL)

Basin	SWE (% Median)
Upper Green	130%
Duchesne	160%
Price/San Rafael	140%
Yampa/White	135%
Upper CO Mainstem	130%
Gunnison	150%
Dolores	130%
San Juan	130%
Virgin	180%
Verde	140%
Salt	105%
Little Colorado	115%
Upper Gila	90%

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



January 1st 2022 Forecasts

Volume (kaf) / % of 1991-2020 avg

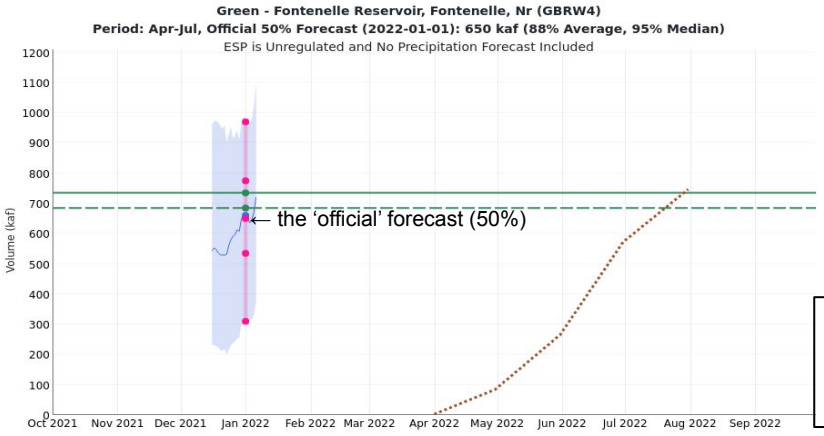
Forecast Ranges

Upper Green: 75 - 105%

Yampa/White: 90 - 125%

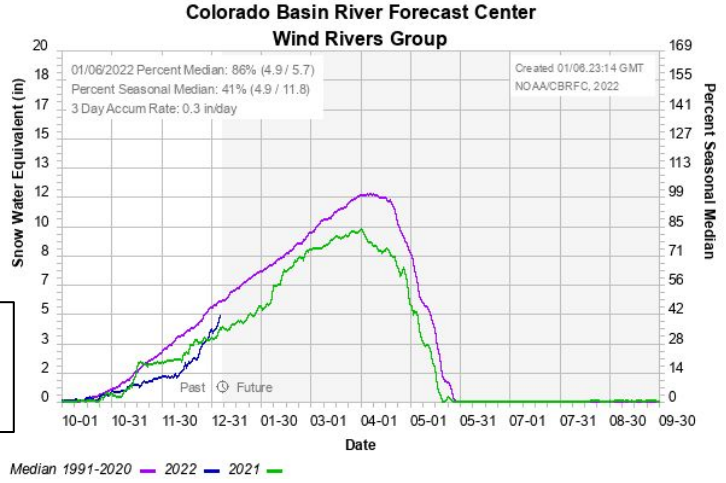
Duchesne: 85 - 140%

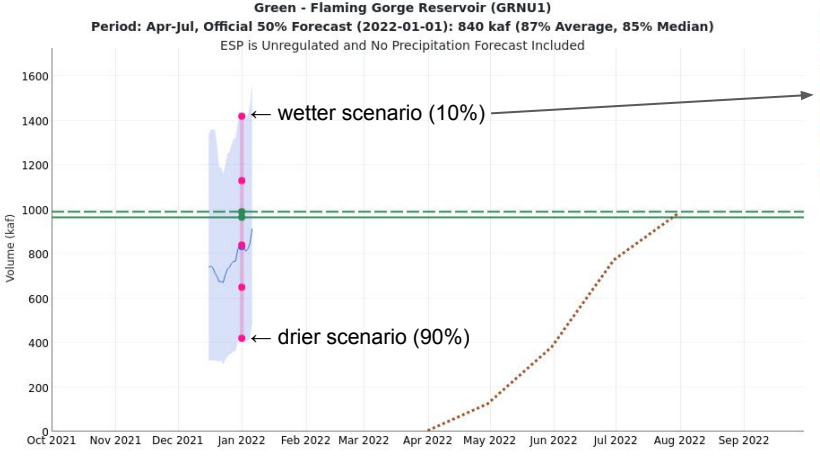
Upper Green Water Supply Forecasts & Snow Conditions



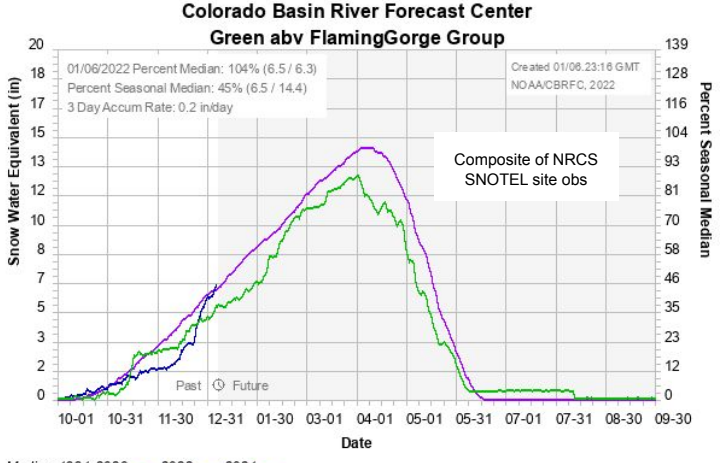
2022/01/01:
Average: 735
Median: 685
ESP: 660
Official 10: 970
Official 30: 775
Official 50: 650
Official 70: 535
Official 90: 310

Conditions over the Wind River mountains, a major contributor to streamflow, are not as favorable as in other parts of the basin.

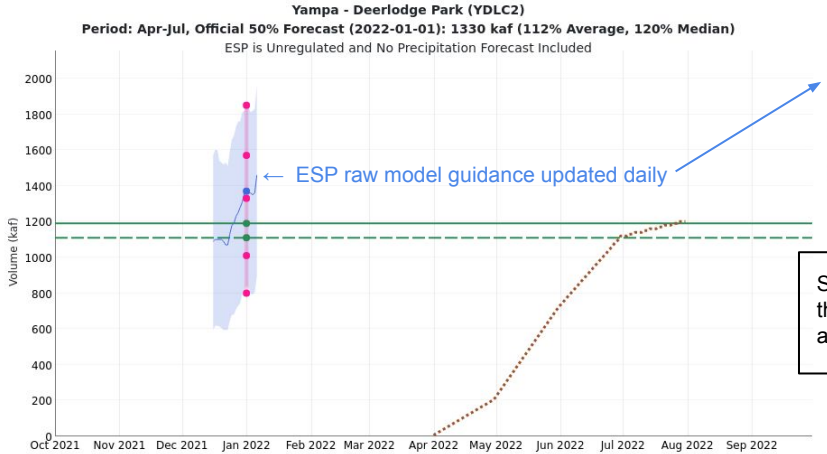




2022/01/01:
Average: 965
Median: 990
ESP: 833
Official 10: 1420
Official 30: 1130
Official 50: 840
Official 70: 650
Official 90: 420

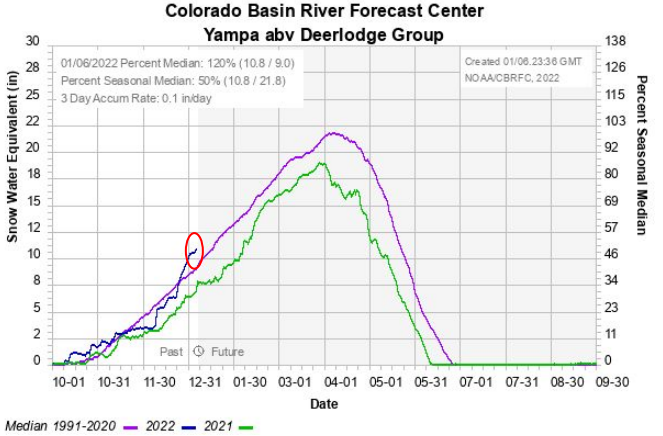


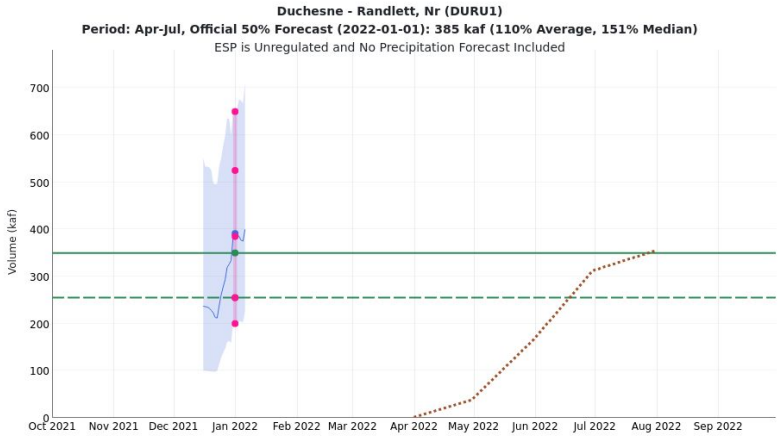
Yampa & Duchesne Water Supply Forecasts & Snow Conditions



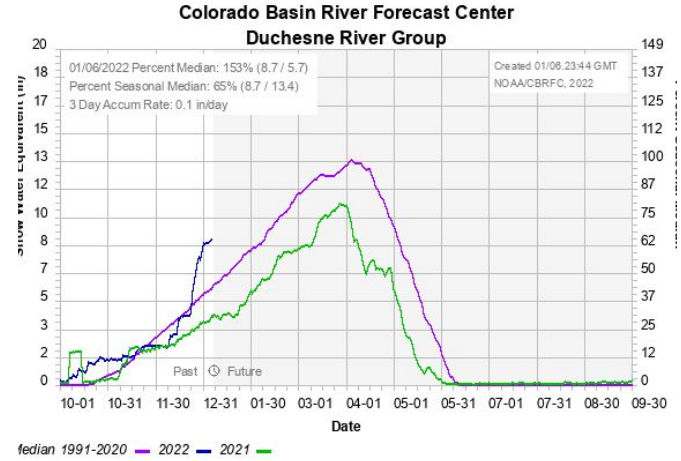
2022/01/01:
Average: 1190
Median: 1110
ESP: 1370
Official 10: 1850
Official 30: 1570
Official 50: 1330
Official 70: 1010
Official 90: 800

Snow conditions have improved in the Yampa River Basin since Jan 1 and ESP guidance has responded.





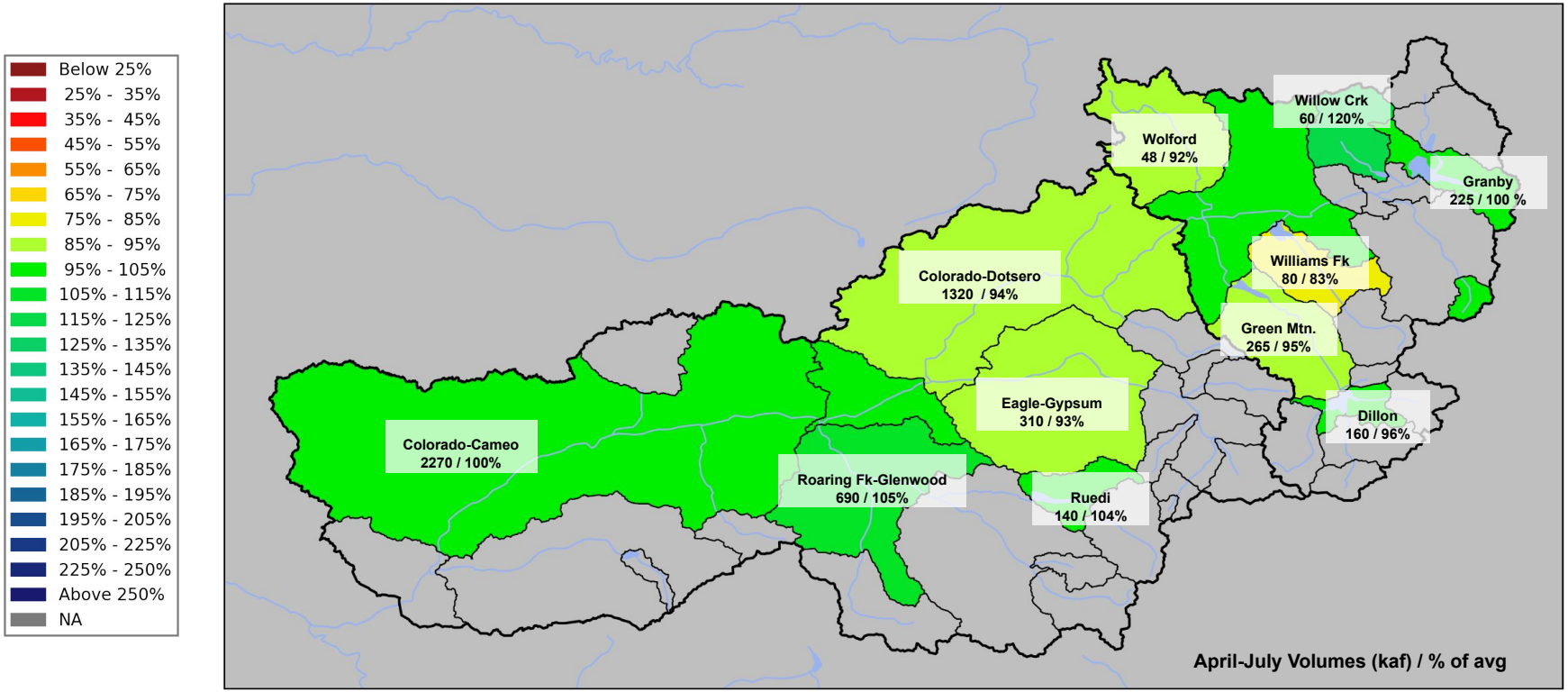
2022/01/01:
Average: 350
Median: 255
ESP: 391
Official 10: 650
Official 30: 525
Official 50: 385
Official 70: 255
Official 90: 200



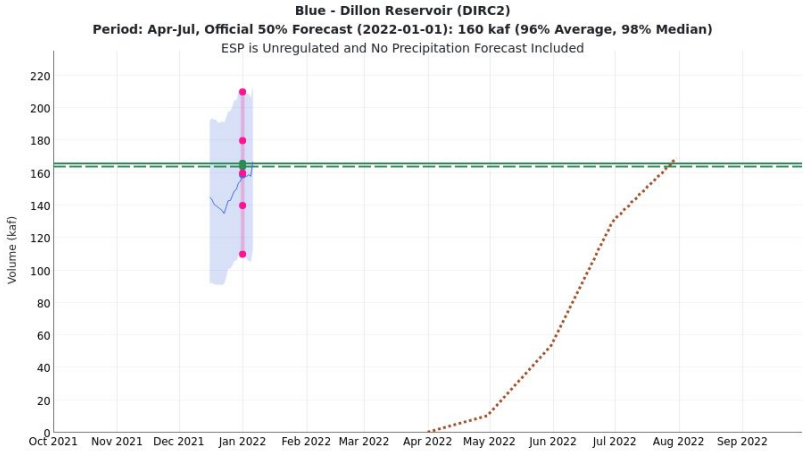
Jan 1st Water Supply Forecasts: Upper Colorado River Mainstem

Forecast Ranges:

Granby to Kremmling: 85 - 120% of average
Kremmling to Cameo: 95 - 105% of average



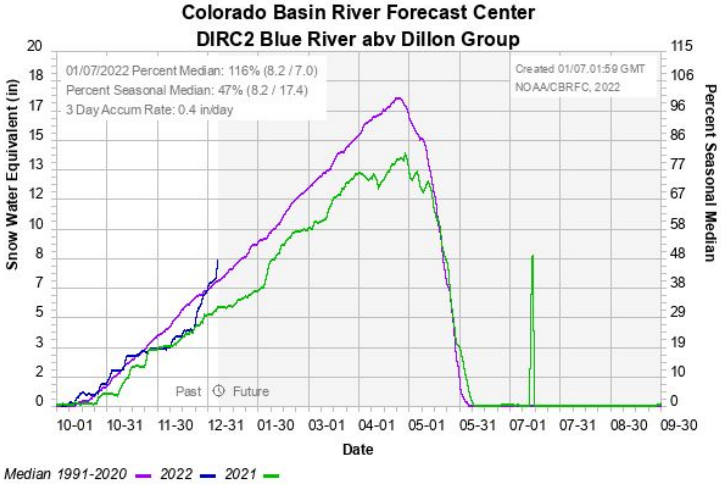
Upper Colorado Mainstem Water Supply Forecasts & Snow Conditions



2022/01/01:
Average: 166
Median: 164
ESP: 159
Official 10: 210
Official 30: 180
Official 50: 160
Official 70: 140
Official 90: 110

WY22 SWE (%med)

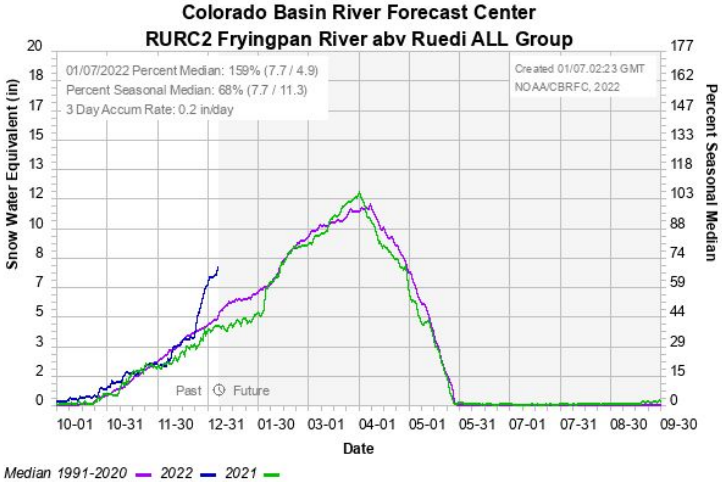
Nov1:	117%
Dec1:	80%
Jan1:	105%
Jan7:	116%



2022/01/01:
Average: 135
Median: 129
ESP: 143
Official 10: 190
Official 30: 155
Official 50: 140
Official 70: 130
Official 90: 100

Snow vs. Flow Obs Relationship

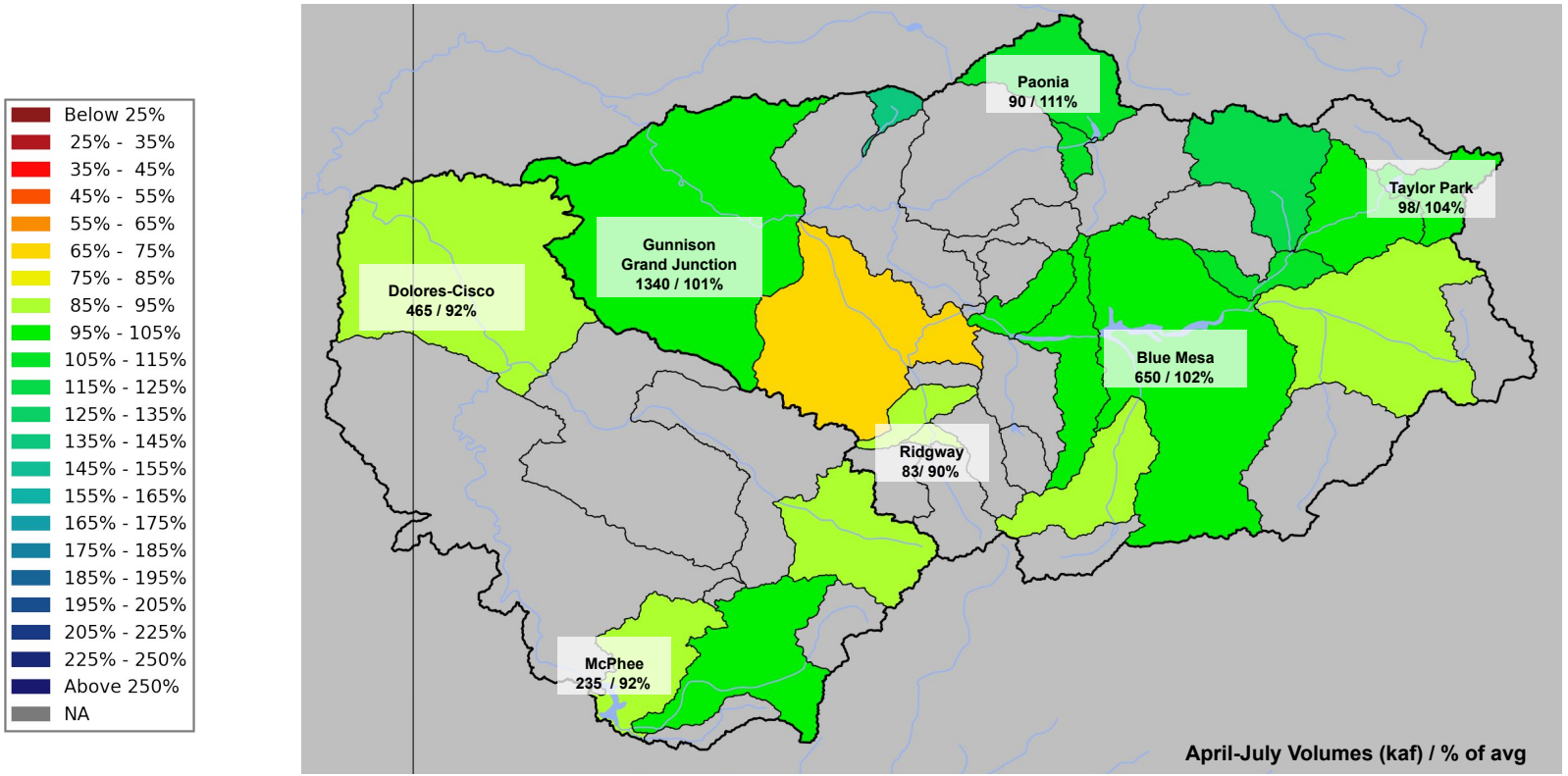
WY	PEAK SWE	AMJJ
2019	163%	140%
2020	138%	76%
2021	108%	55%
2022	159%	



Jan 1st Water Supply Forecasts: Gunnison, Dolores

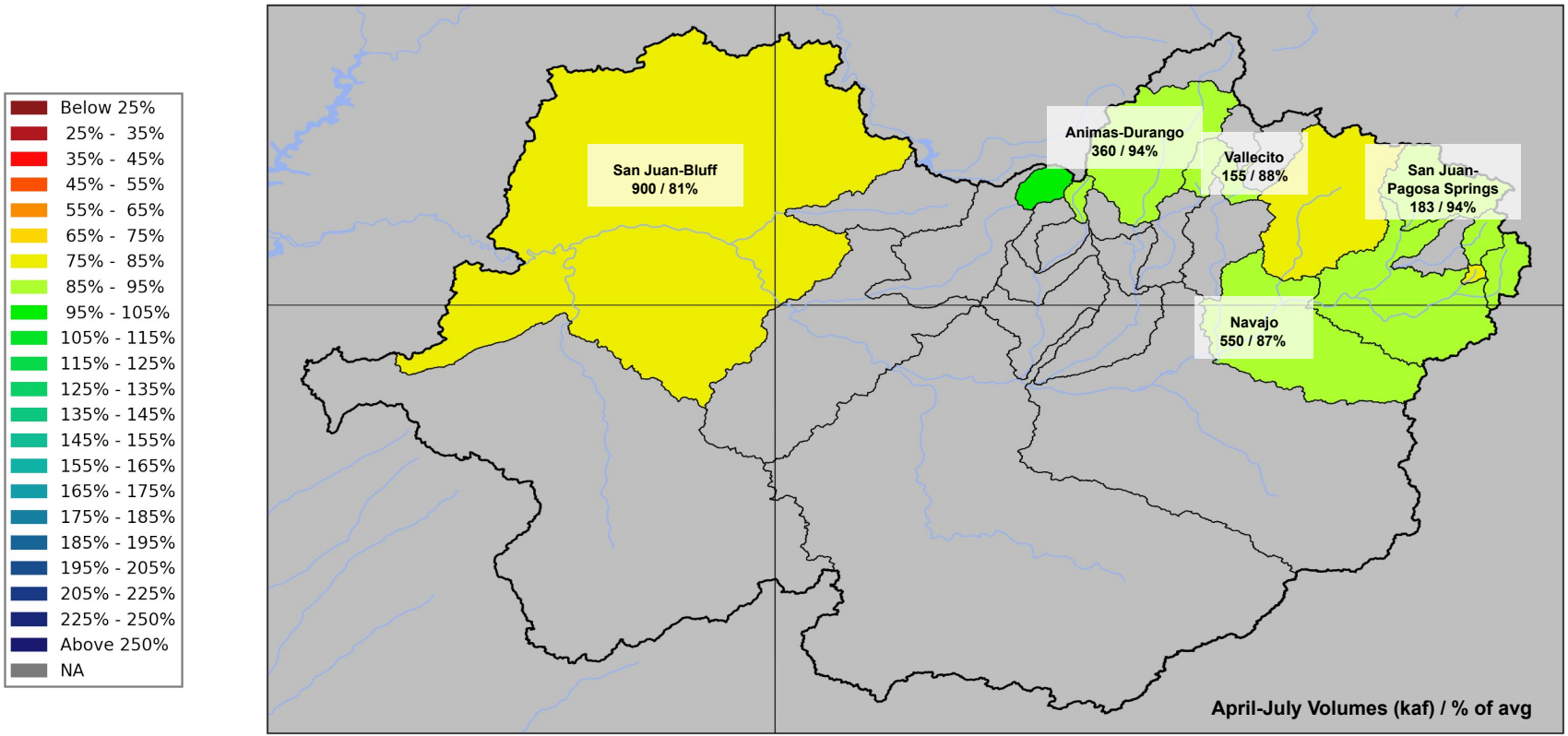
Forecast Ranges:

Gunnison: 90 - 135% of average
Dolores: 90 - 95% of average

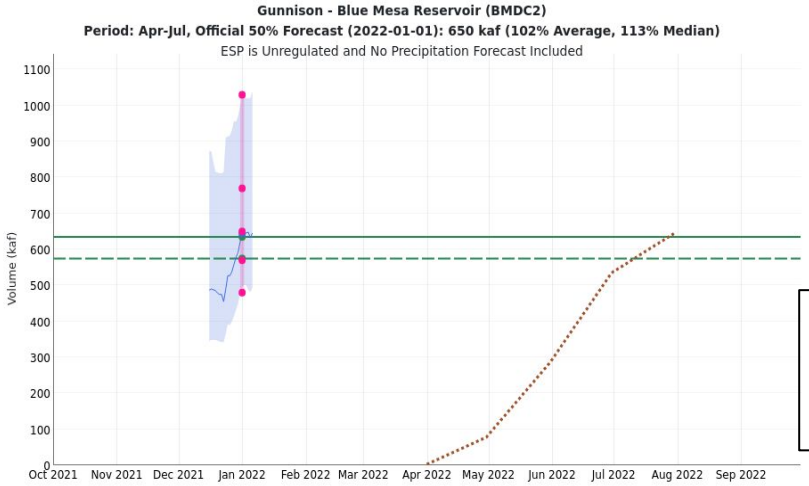


Jan 1st Water Supply Forecasts: San Juan

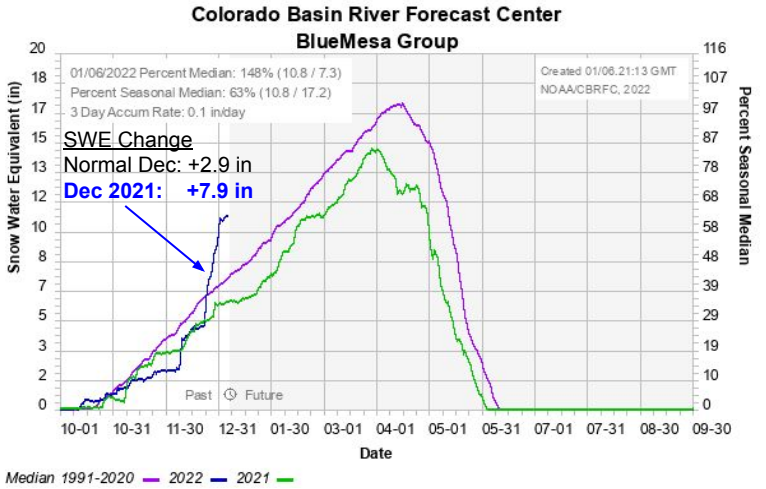
Forecast Range: 80 - 95% of average



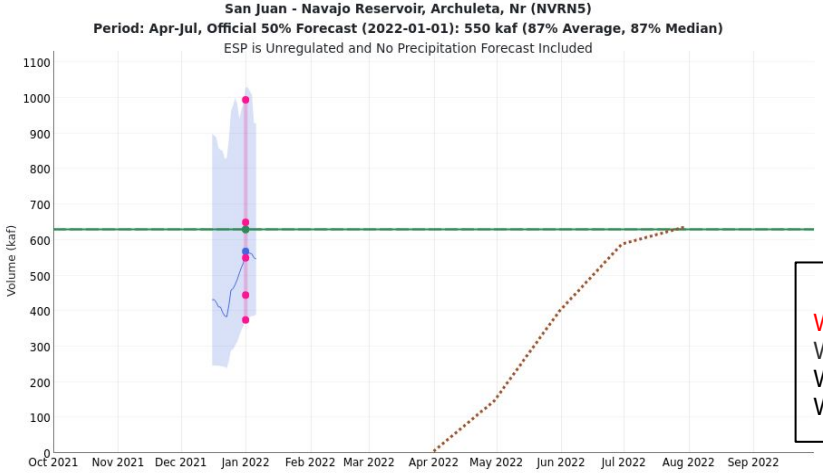
Southwest Colorado Water Supply Forecasts & Snow Conditions



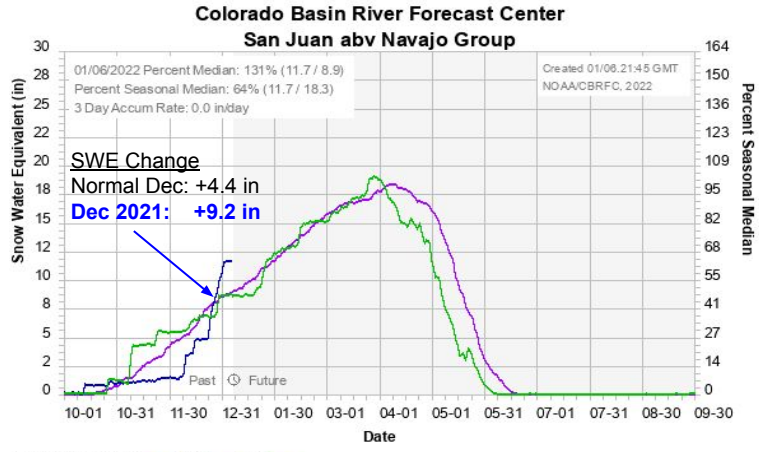
2022/01/01:
Average: 635
Median: 575
ESP: 645
Official 10: 1030
Official 30: 770
Official 50: 650
Official 70: 570
Official 90: 480



Blue Mesa Res Inflow
WY22 fcst: 650 kaf /102%
WY21 obs: 316 kaf / 55%
WY20 obs: 387 kaf / 67%
WY19 obs: 1089 kaf /189%

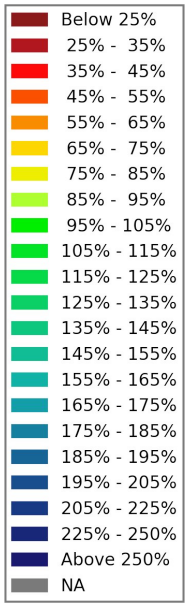


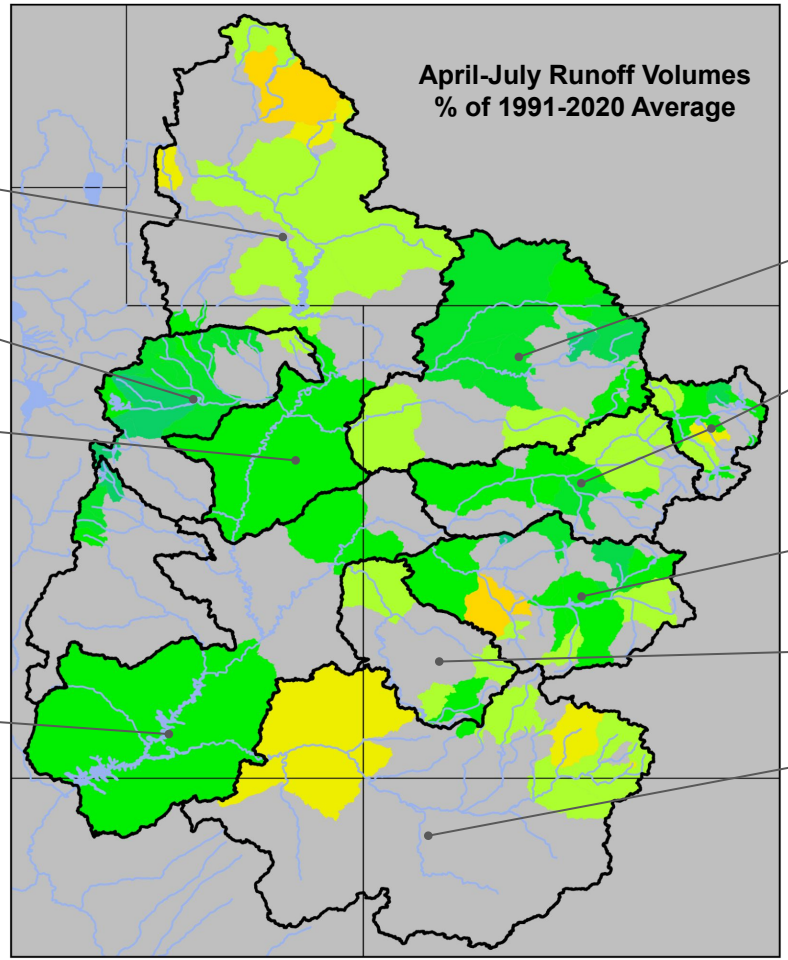
2022/01/01:
Average: 630
Median: 630
ESP: 568
Official 10: 995
Official 30: 650
Official 50: 550
Official 70: 445
Official 90: 375



Navajo Res Inflow
WY22 fcst: 550 kaf /87%
WY21 obs: 378 kaf / 60%
WY20 obs: 348 kaf / 55%
WY19 obs: 1162 kaf /185%

Jan 1st Water Supply Forecasts: Upper Colorado





Upper Green: 75-105%

Duchesne: 85-140%

Lower Green: 105%

Lake Powell: 99%

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

White/Yampa: 90-125%

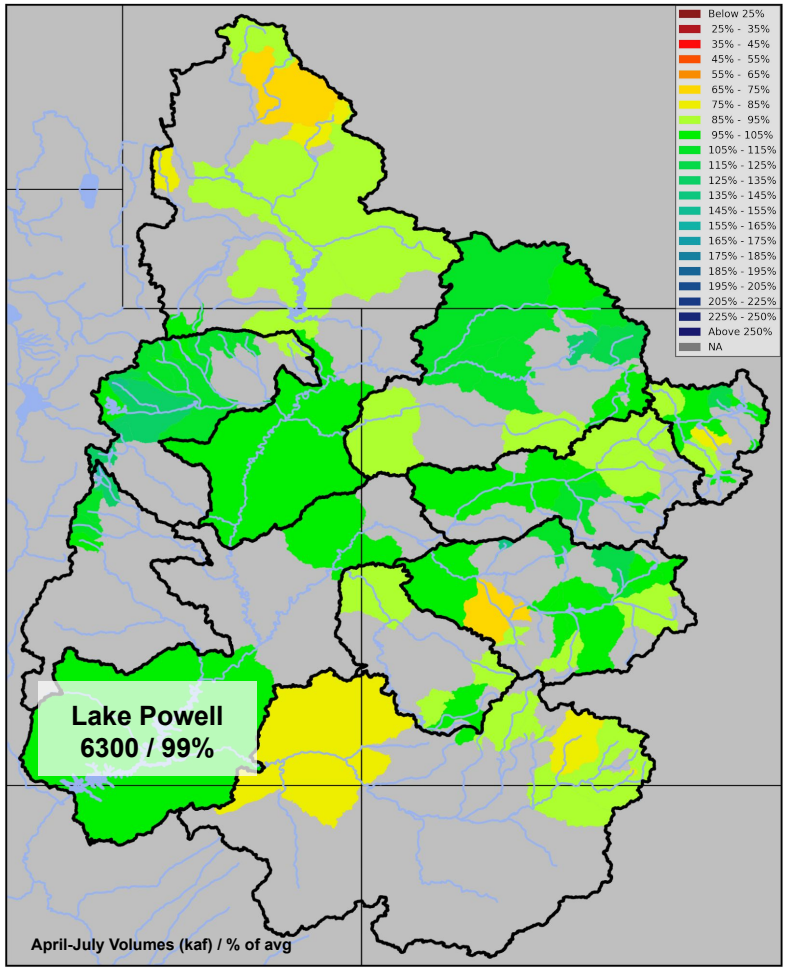
Upper CO: 85-120%

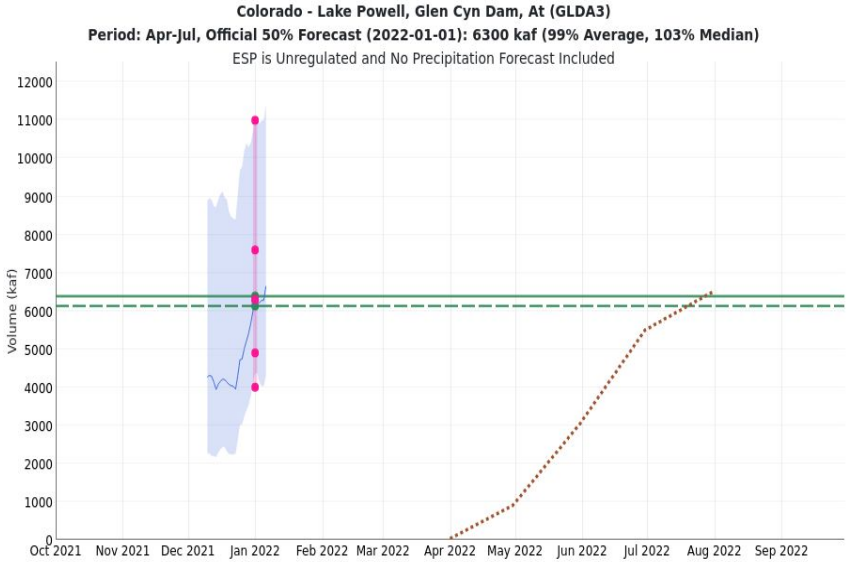
Gunnison: 90-135%

Dolores: 90-95%

San Juan: 80-95%

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





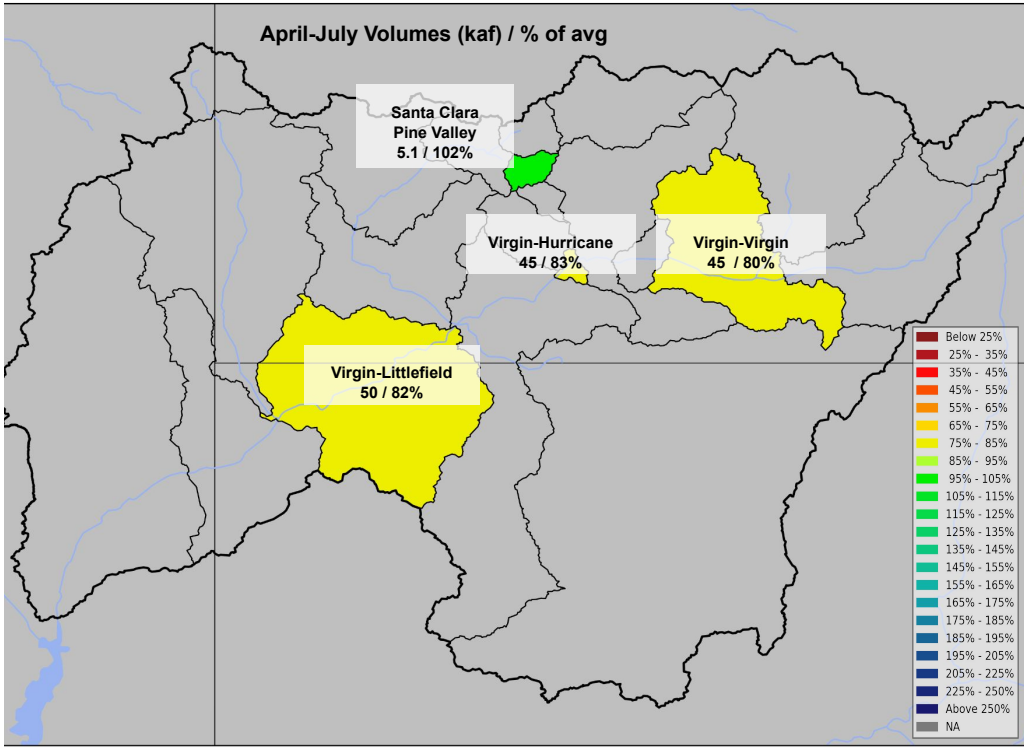
2022/01/01:
Average: 6390
Median: 6130
ESP: 6280
Official 10: 11000
Official 30: 7600
Official 50: 6300
Official 70: 4900
Official 90: 4000

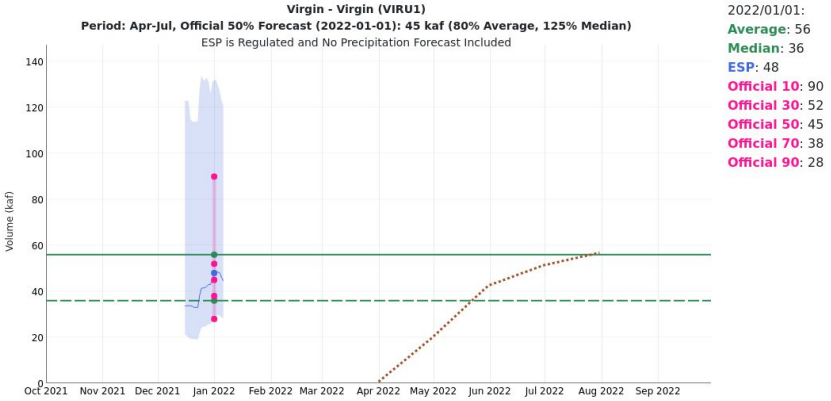
Current Forecast - Comparison of Period Normal %Avg

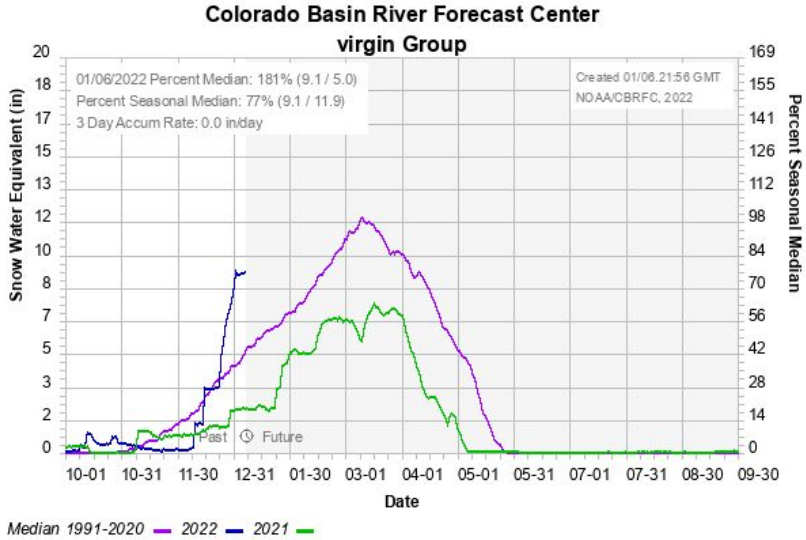
	Apr-Jul Fcst (KAF)	1981-2010 (7160 KAF)	1991-2020 (6390 KAF)
10%	11000	154%	172%
50%	6300	88%	99%
90%	4000	56%	63%

Jan 1st Water Supply Forecasts: Virgin River Basin

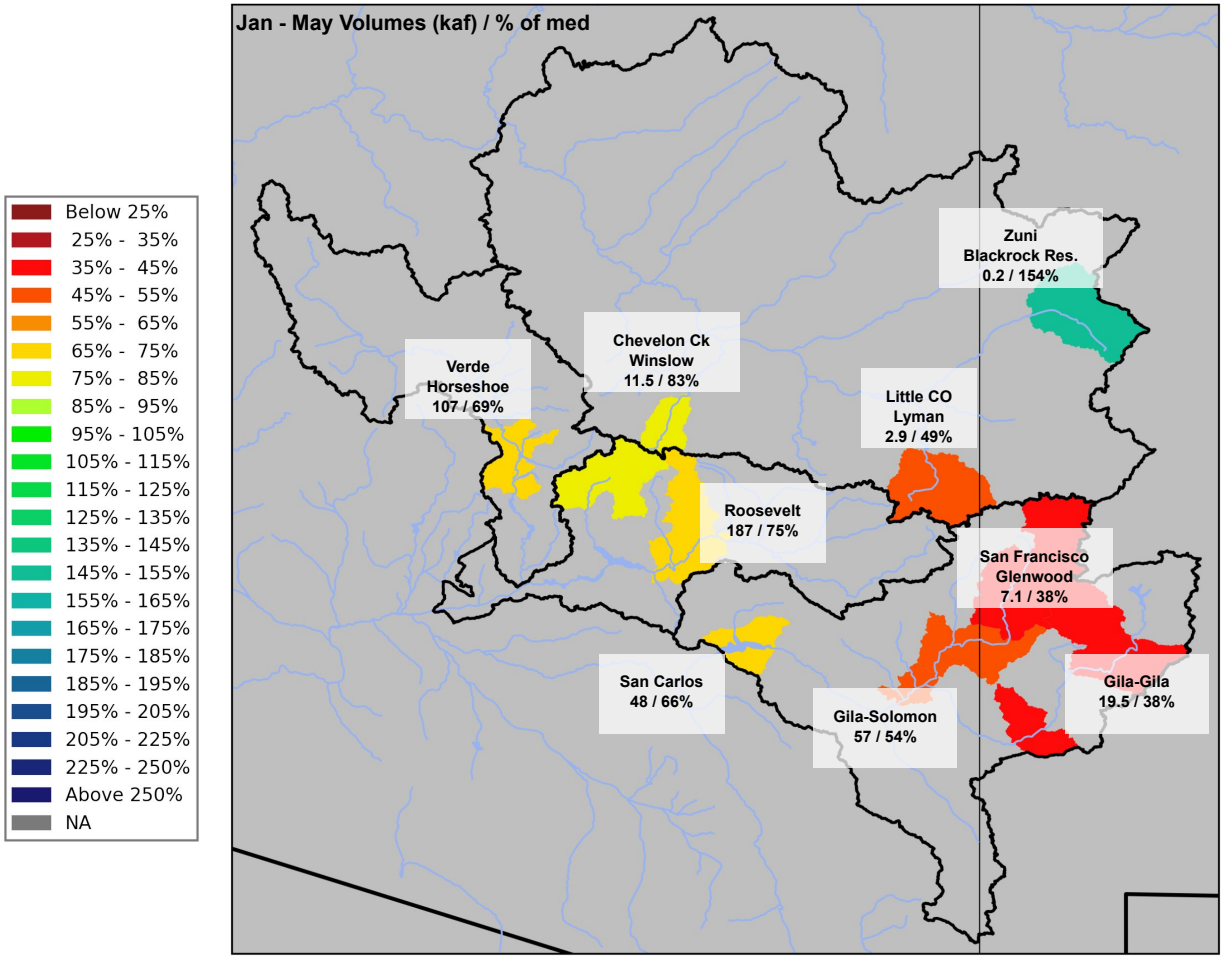
Forecast Range: 80 - 100% of average







Jan 1st Water Supply Forecasts: Lower Colorado River Basin



January - May Forecast Period
% of 1991-2020 Median

Forecast Ranges

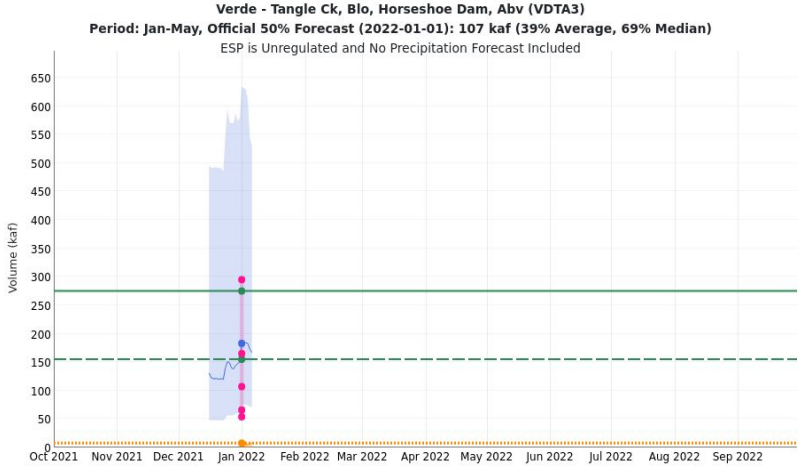
Little Colorado: 50 - 155%

Upper Gila: 40 - 65%

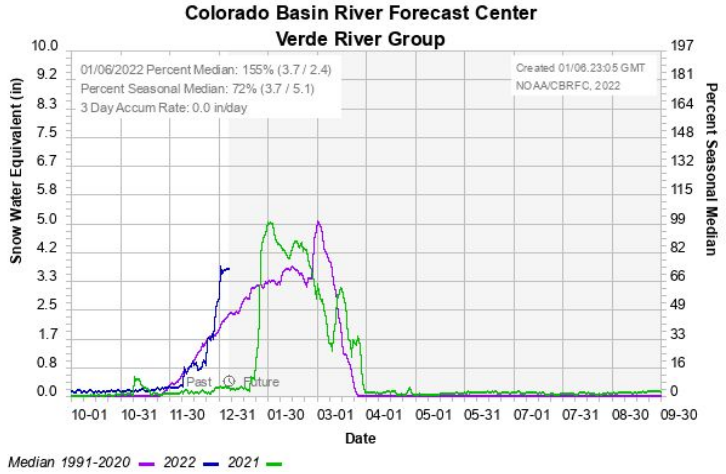
Salt: 75 - 80%

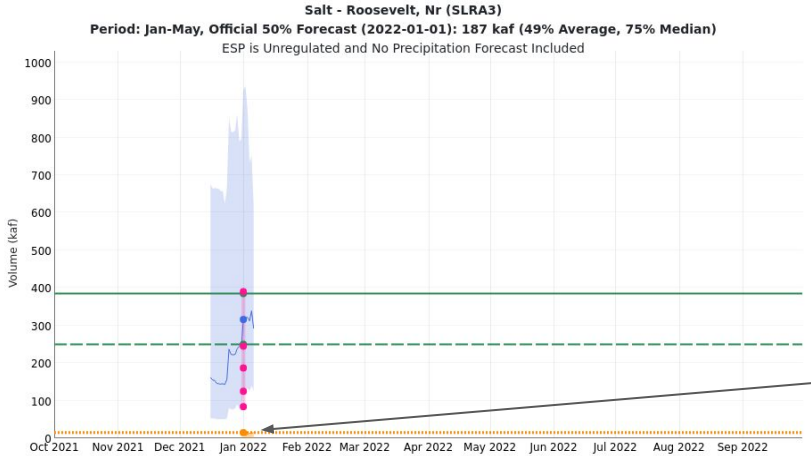
Verde: 70%

Lower Colorado Water Supply Forecasts & Snow Conditions



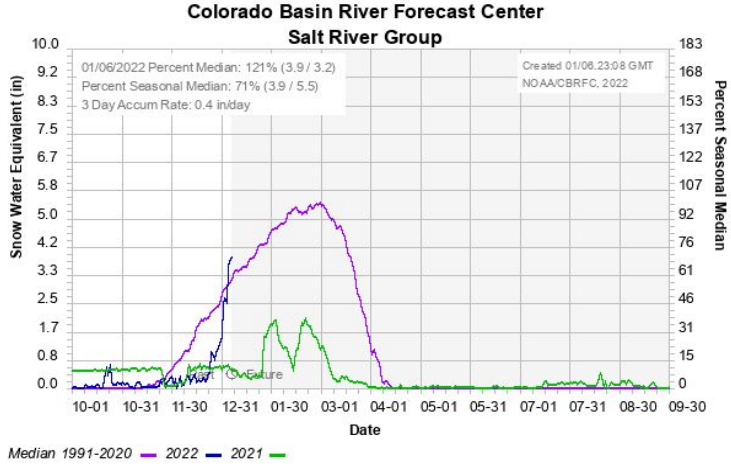
2022/01/01:
Average: 275
Median: 155
Observed Total: 7.6
ESP: 183
Official 10: 295
Official 30: 165
Official 50: 107
Official 70: 66
Official 90: 54





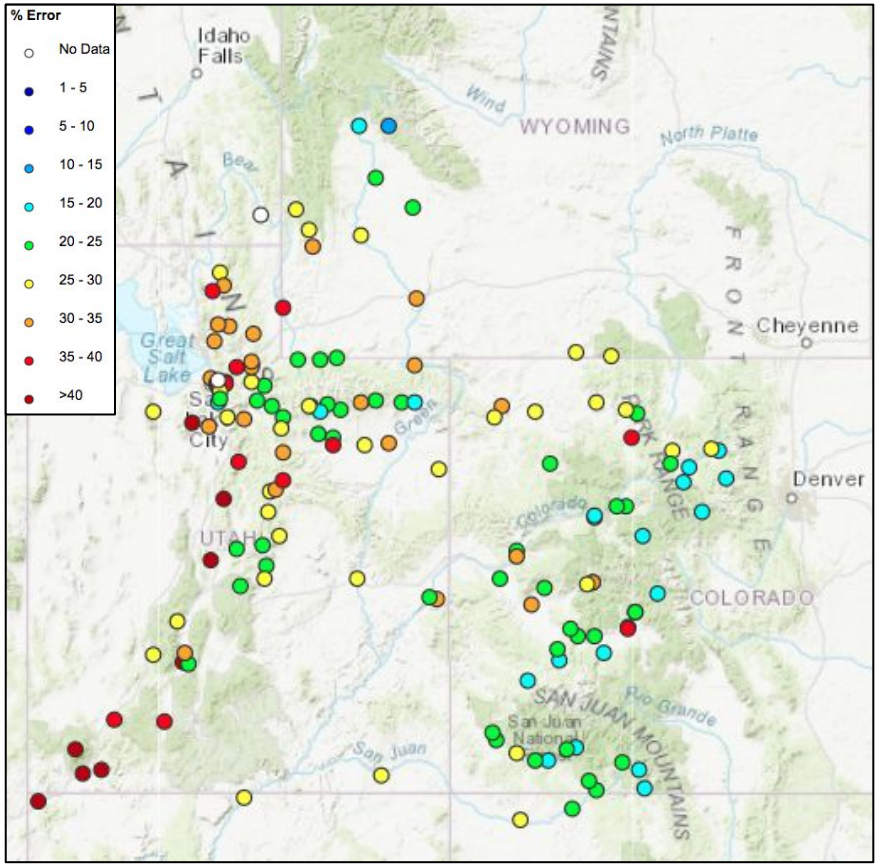
2022/01/01:
Average: 385
Median: 250
Observed Total: 14.8
ESP: 316
Official 10: 390
Official 30: 245
Official 50: 187
Official 70: 125
Official 90: 84

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



Historical (1981-2010) Forecast Verification

January Forecast Error: April-July Volume



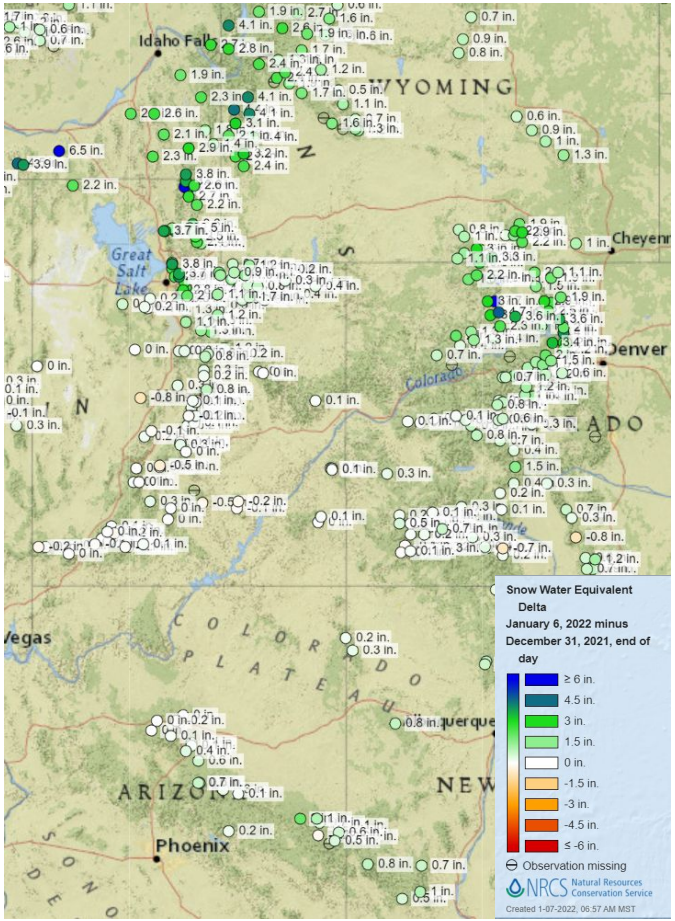
Location	Avg January Forecast Error
Green River - Warren Bridge	19%
Fontenelle Reservoir	28%
Yampa River - Deerlodge	27%
Blue River - Dillon Reservoir	16%
Colorado River - Cameo	21%
Blue Mesa Reservoir (Gunnison)	23%
McPhee Reservoir (Dolores)	25%
Navajo Reservoir (San Juan)	25%
Lake Powell	27%
Virgin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

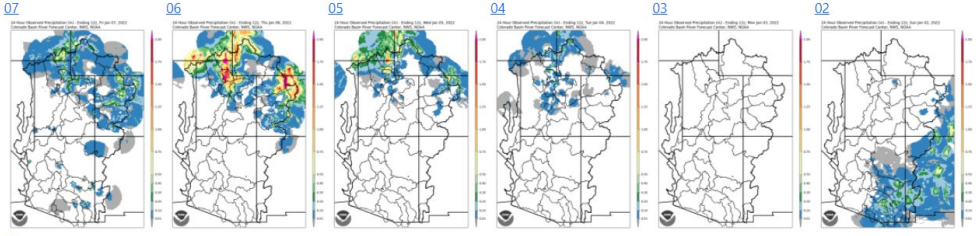
Error tends to decrease each month into the spring

Where Forecasts are Better:
- -Headwaters
- -Primarily snow melt basins
- -Known diversions / demands

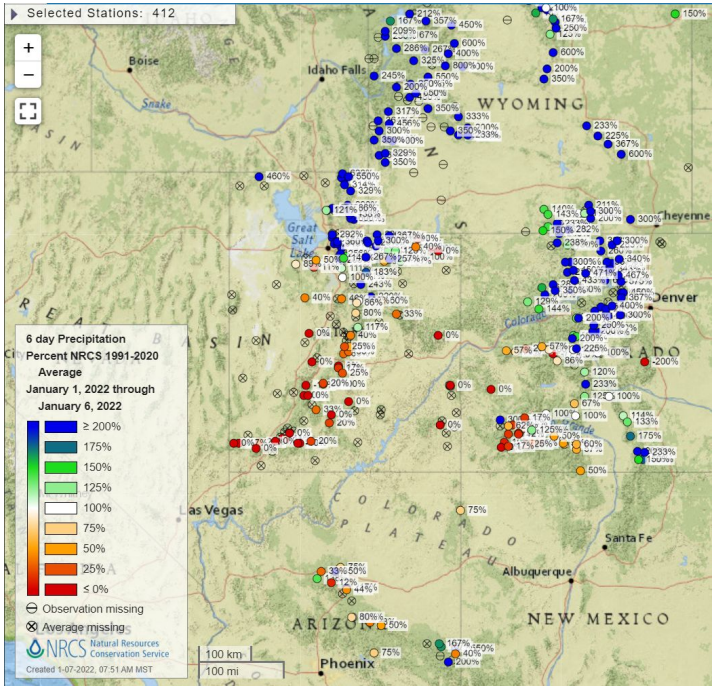
Where Forecasts are Worse:
- -Lower elevations (rain or early melt)
- -Downstream of diversions / irrigation
- -Little is known about diversions / demands

January 2022 Month-To-Date Precipitation

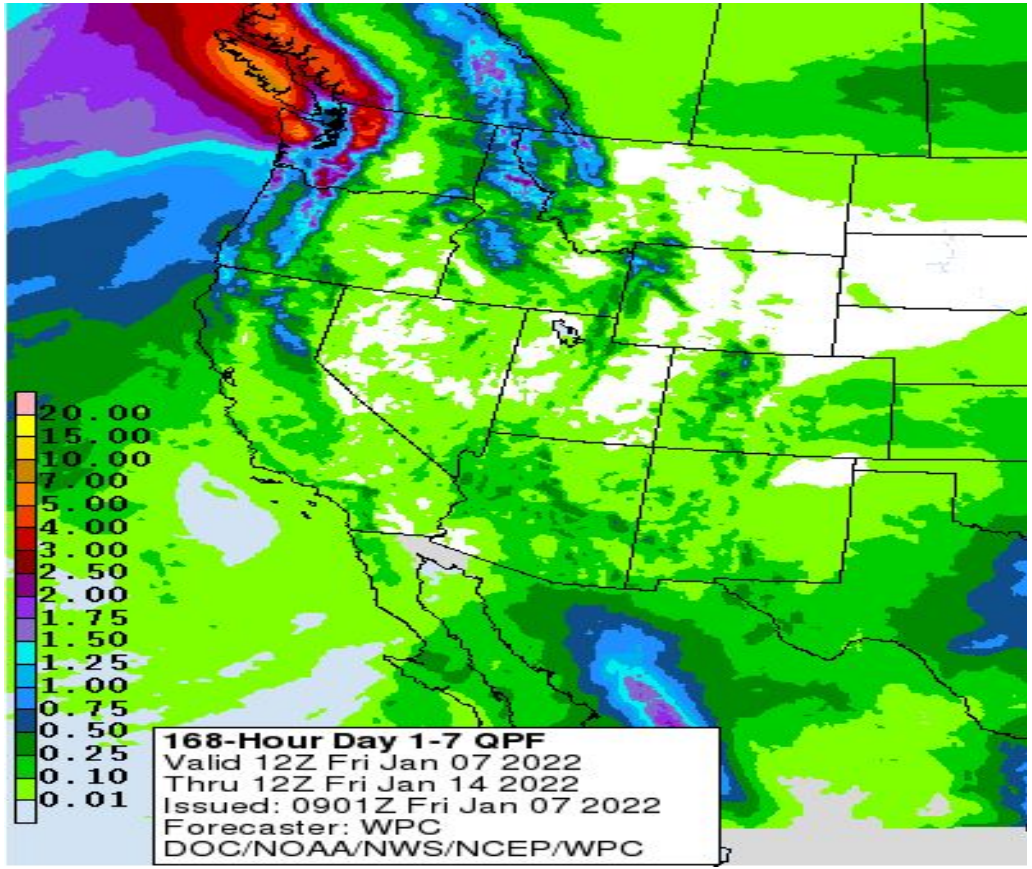




Precipitation during January has targeted southern Arizona earlier in the month and northern high elevation areas including the the Upper Green, Duchesne, White/Yampa, and western Colorado basins along the Continental Divide during the last few days.

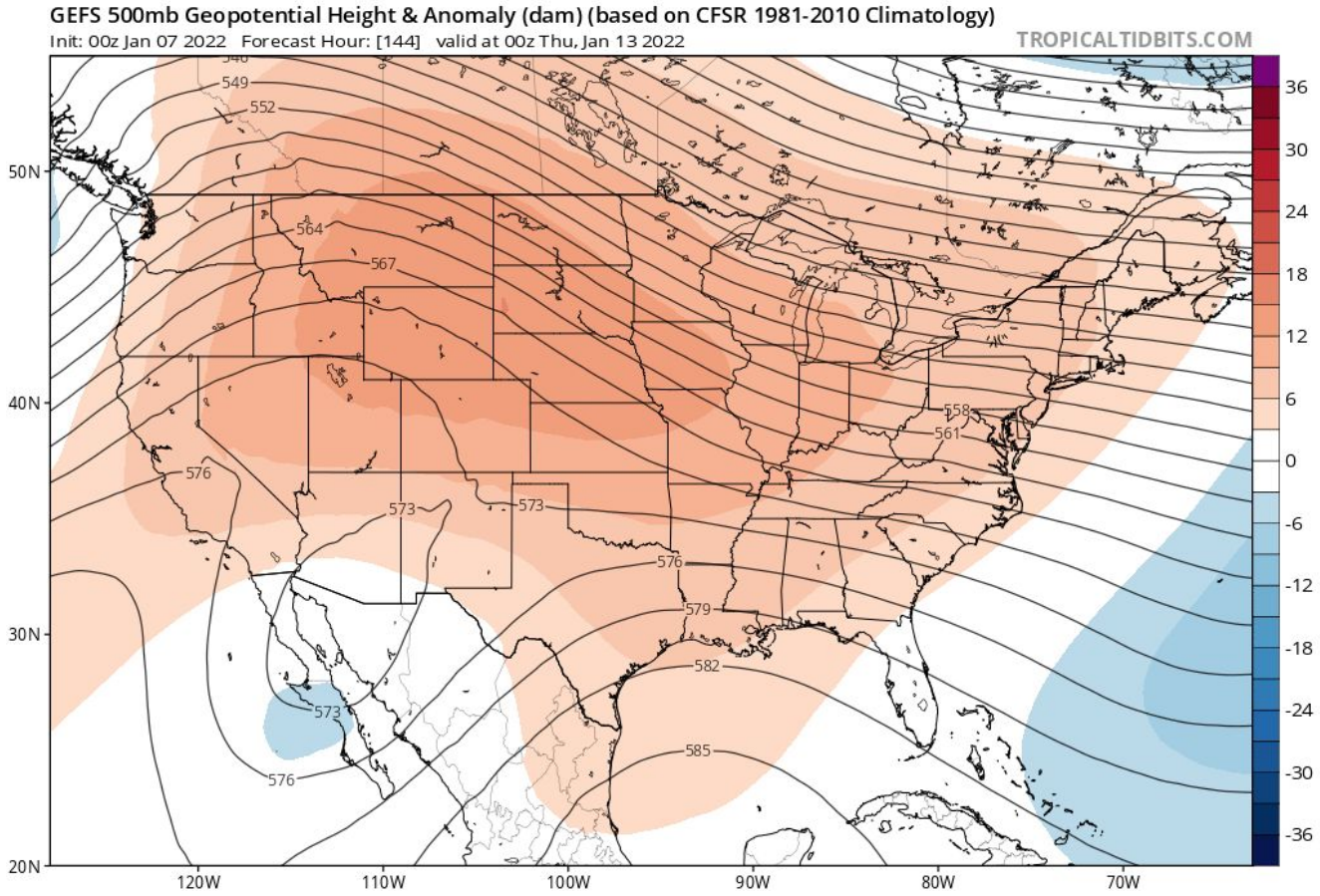


Upcoming Weather: WPC January 7-14 Precipitation Outlook



- A trough moves through Utah and Colorado today, exiting the region tomorrow (Saturday)
- Generally less than one inch of precipitation is forecast for the higher elevations of UT, WY, and CO
- A ridge quickly builds over the Western US, bringing quieter weather

Upcoming Weather: January 13-18: Western Ridge and a Closed Low

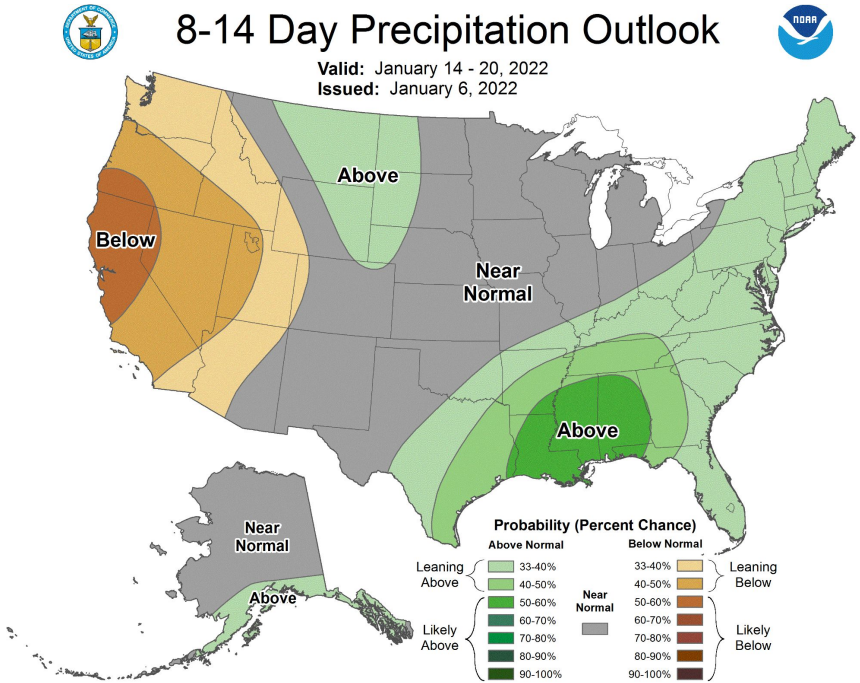


- Western ridge to persist through next week
- A closed low will move to the south of the ridge over the Lower Basin, bringing slight chances of precipitation before dissipating

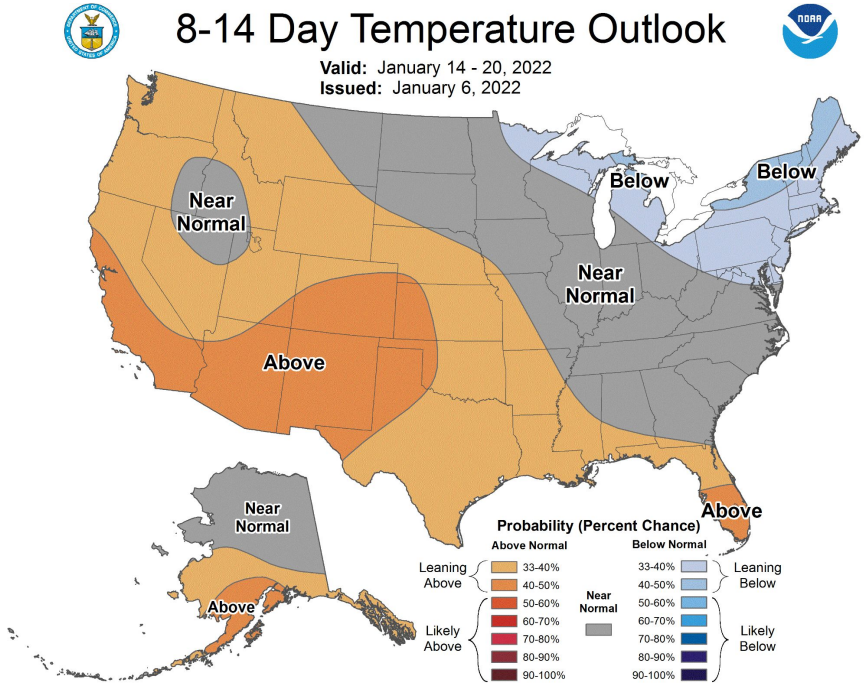
Upcoming Weather: 8-14 Day Outlook (January 14-20)

Slightly elevated odds of near to below average precipitation (below primarily across Utah and northwest Arizona) & above average temperatures.

Precipitation Outlook

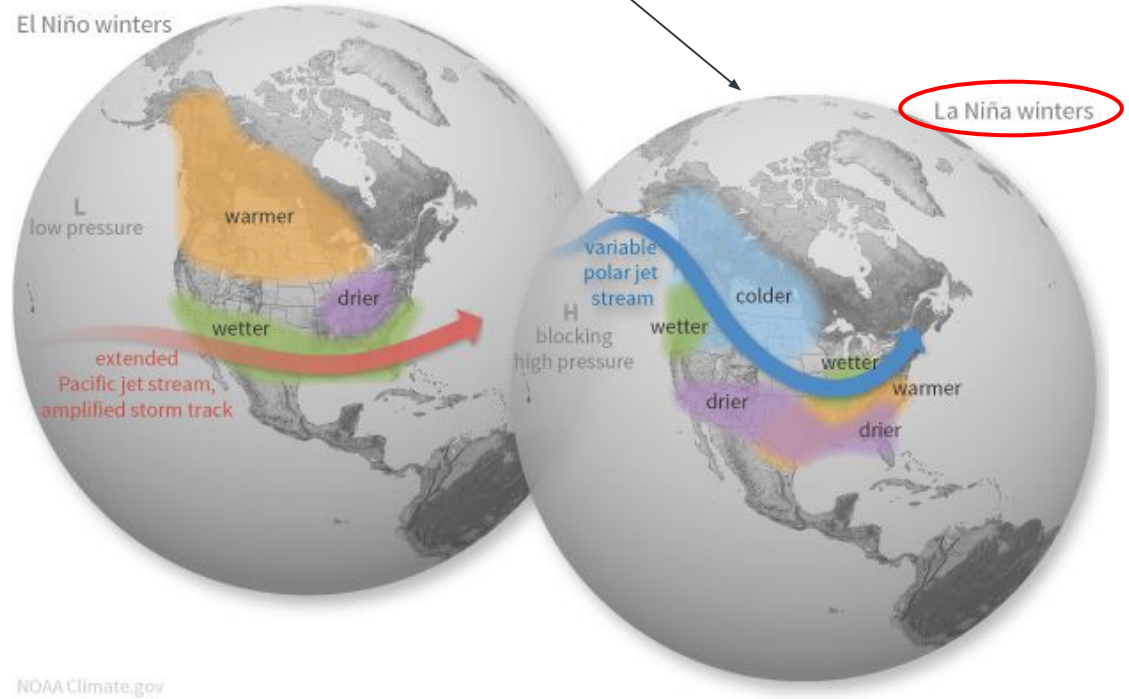


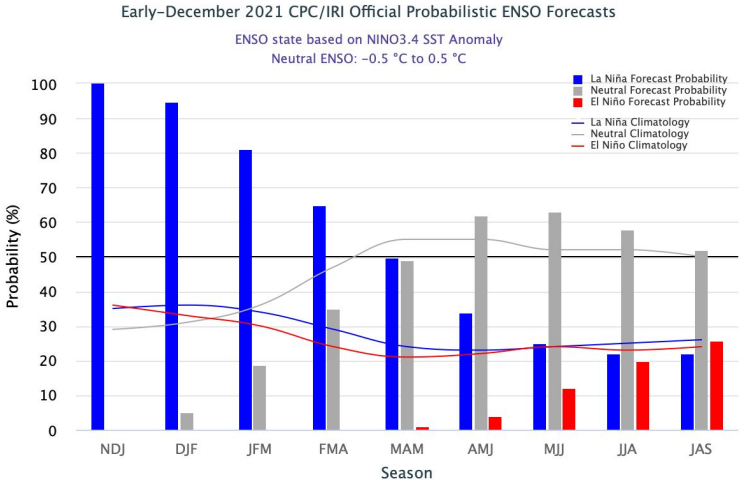
Temperature Outlook

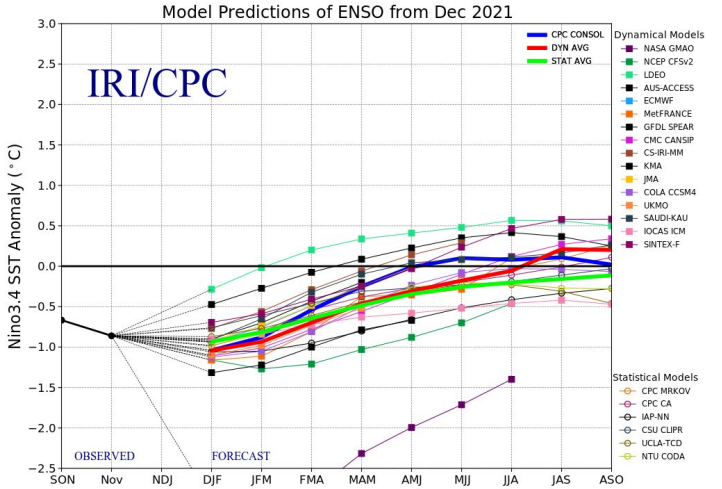


El Niño Southern Oscillation (ENSO) Status

- **La Niña** is favored to continue through the Northern Hemisphere winter 2021-22 (~95% chance) and transition to ENSO-neutral during the spring 2022 (~60% chance during April-June).
  - Very similar conditions to last year
  - Increased chances of drier winter weather in Arizona/LCRB
  - Much weaker correlation/winter weather signal elsewhere in basin







Summary

How we got here

- A wet monsoon season helped soil moisture conditions, which are improved from a year ago but soil moisture deficits are still out there, notably across much of western Colorado

- November/early December were warm and dry
- October and the last three weeks of December were wet/above normal

- Current (Jan7) SWE Conditions are mostly above normal across the Colorado River Basin
  - Upper Colorado: 130-160%
  - Lower Colorado: 50-165%

- January water supply forecasts (% of normal):
  - Upper Colorado: 75-140%
  - Lower Colorado: 40-155%

- Weather outlook
  - Light/moderate precipitation today/tomorrow across northern basins (Upper Green, NW Colorado)
  - Additional precipitation is possible across southern basins ~mid-next week (LCRB, SW Colorado)

2022 Water Supply Webinar Schedule

**All Times Mountain Time (MT)*

Colorado River Basin

Friday	Jan 7th	10 am
Monday	Feb 7th	10 am
Monday	Mar 7th	10 am
Thursday	Apr 7th	10 am
Friday	May 6th	10 am

Great Basin

Friday	Jan 7th	11:30 am
Monday	Feb 7th	11:30 am
Monday	Mar 7th	11:30 am
Thursday	Apr 7th	11:30 am
Friday	May 6th	11:30 am

Peak flow forecast webinar Thursday, March 17th, 10 am MT

Additional briefings scheduled as needed

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

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

CBRFC Webinar Registration & Email List

Colorado Basin River Forecast Center
National Weather Service

Home | Rivers | Snow | Water Supply | Reservoirs | Weather | Climate | Help | About | News

Webinars
Email Updates

Friday, January 7, 2022: CBRFC Water Supply Webinars. Registration: More Info
The first Official Forecast for water year 2022 is now available: Forecast Map

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.

CBRFC Water Supply Forecast Webinar Schedule & Registration - Water Year 2022

The Colorado Basin River Forecast Center (CBRFC) produces water supply forecasts for the Colorado River Basin and the eastern Great Basin.
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
Wednesday December 15 @ 10 am MT

Colorado River Basin Water Supply Webinars
Friday January 7 @ 10 am MT
Monday February 7 @ 10 am MT
Monday March 7 @ 10 am MT
Thursday April 7 @ 10 am MT
Friday May 6 @ 10 am MT

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

Peak Flow Webinar
Thursday March 17 @ 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 on the CBRFC presentations page soon after each briefing.

2022 Presentations

Overview of the 1991-2020 Normal Period and Model Impacts Presentation during Reclamation's October 24-Month Study Rollout
Slides (.pdf)

2022 Early Season Water Supply Outlook
Slides (.pdf)
Recording (.mp4)

CBRFC Contacts & WY22 Basin Focal Points

Basin Focal Points (Forecasters)

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

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

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

Patrick Kormos – Great Basin/Sevier
patrick.kormos@noaa.gov

Trevor Grout - Virgin, Lower Colorado
trevor.grout@noaa.gov

Brent Bernard – Hydrologist
brent.bernard@noaa.gov

Tracy Cox - Hydrometeorologist
tracy.cox@noaa.gov

Nanette Hosenfeld - Senior Hydrometeorologist
nanette.hosenfeld@noaa.gov

Wolfgang Hanft - Hydrometeorologist
wolfgang.hanft@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

CBRFC Webpage
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