

Colorado River Basin Water Supply Briefing

May 5, 2023

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Colorado Basin
River Forecast Center
National Weather Service



Presentation Overview

April Weather Review

April Flows

Snow Conditions

Water Supply Forecasts

May Forecast Error

Upcoming Weather

Contacts & Questions

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

April Weather Summary

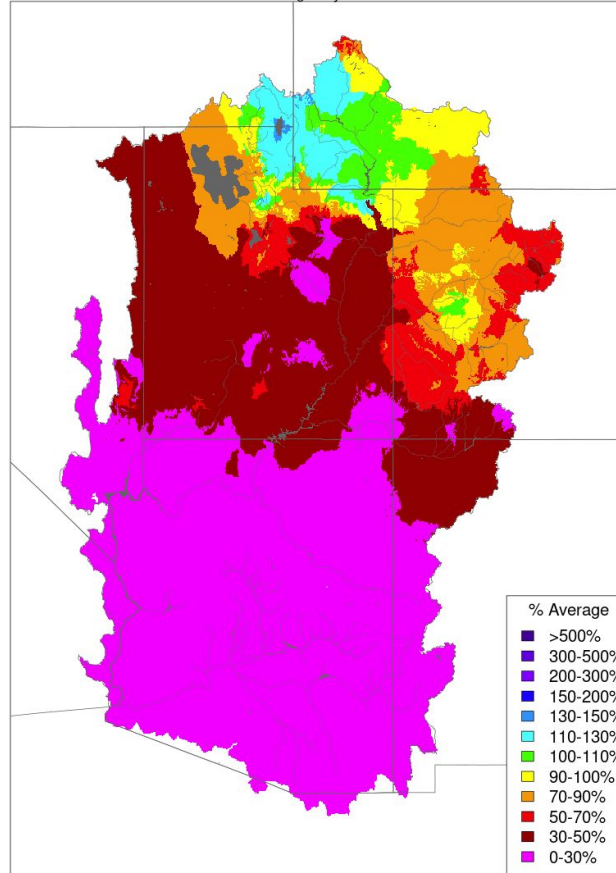
Northern Basins

Warm/dry periods - snowmelt
Cool/wet periods - rain & snow
Below normal temperatures

Southern Basins

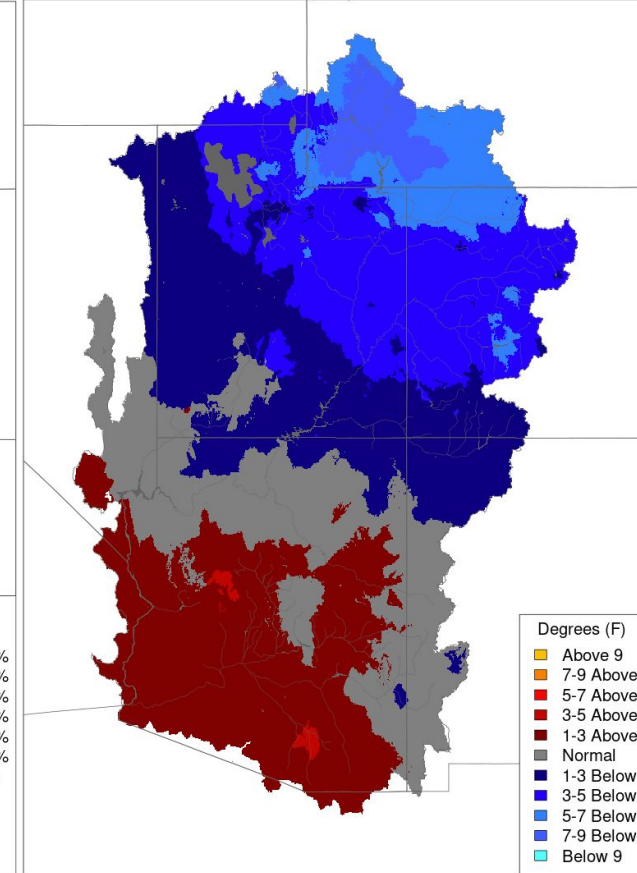
Warmer and drier
More continuous snowmelt
Near/above normal temperatures
Record dry April across much of AZ

Monthly Precipitation - April 2023
Averaged by Basin



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

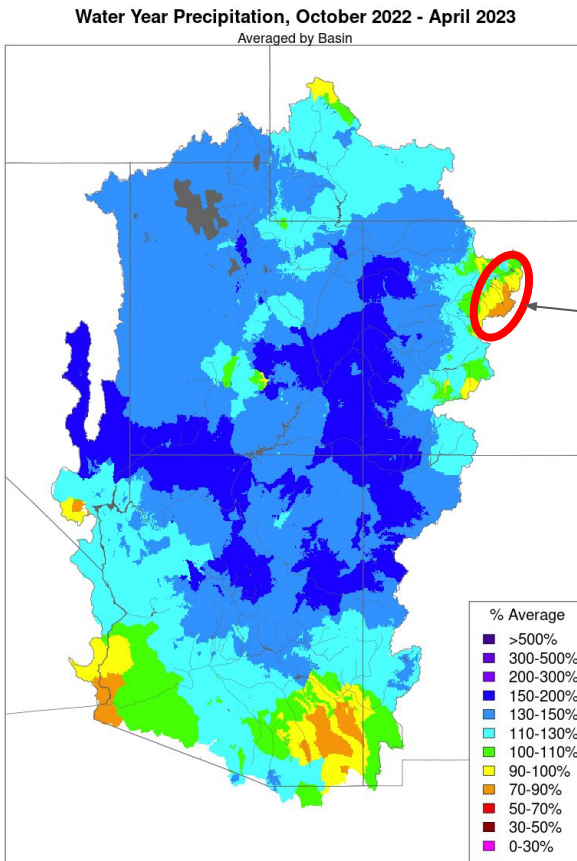
Max Temp - Monthly Deviation - April 2023
Averaged by Basin



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

Water Year 2023 Precipitation (October-April)

Water Year 2023 CBRFC Precipitation (Significant Runoff Areas) Percent of 1991-2020 Average		
UPPER COLORADO RIVER BASIN		
	Apr	Oct-Apr
Above Lake Powell	68	121
Green River Basin		
Above Fontenelle	95	103
Above Flaming Gorge	99	112
Yampa/White	76	126
Duchesne	72	130
Price/San Rafael/Dirty Devil	41	134
Colorado River Headwaters		
Above Kremmling	61	93
Eagle	58	97
Roaring Fork	73	115
Above Cameo	66	105
Southwest Colorado		
Gunnison	76	123
Dolores	66	139
San Juan	38	127
LOWER COLORADO RIVER BASIN		
Virgin	33	158
Little Colorado	0	143
Verde	0	154
Salt	0	127
Upper Gila	0	116



Water year precipitation can be used as a good indicator of water supply conditions, and is above average across most of the region.

Less precipitation compared to surrounding basins along Colorado's Western Slope extending from the Fraser River Basin to the headwaters of the Roaring Fork.

April 2023 Observed Unregulated Streamflow Volumes (% of Average)

UCRB areas with observed April flows >200% of average are labeled on the map.

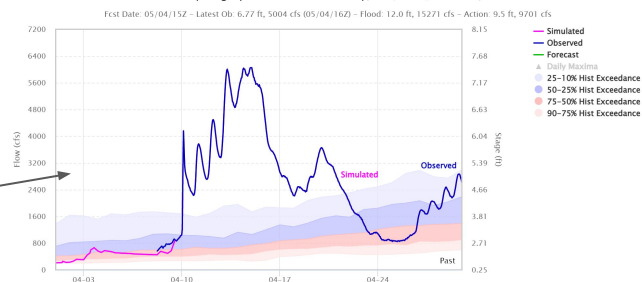
Little Snake

Dolores

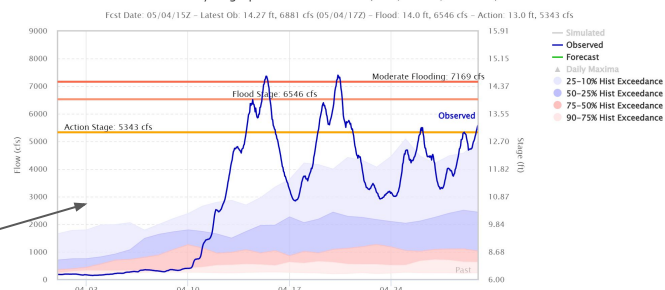
Virgin

*Data Provisional

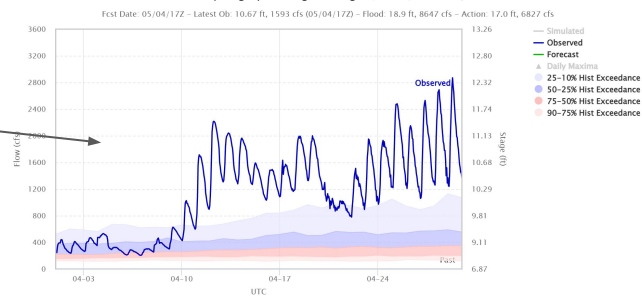
Forecast Hydrograph - Little Snake - Lily, Nr (LILC2) - NOAA/CBRCF



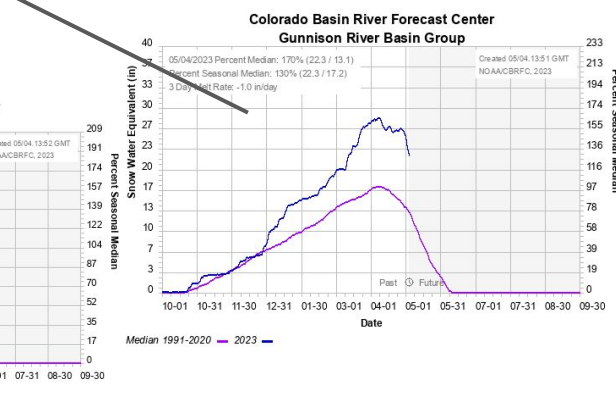
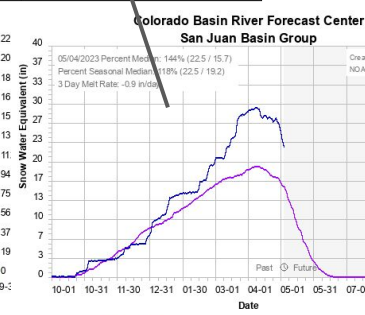
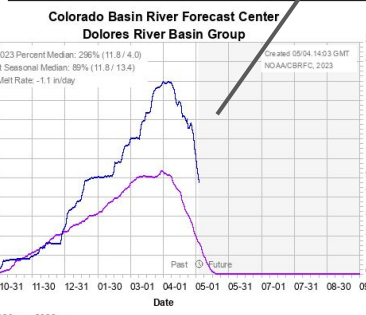
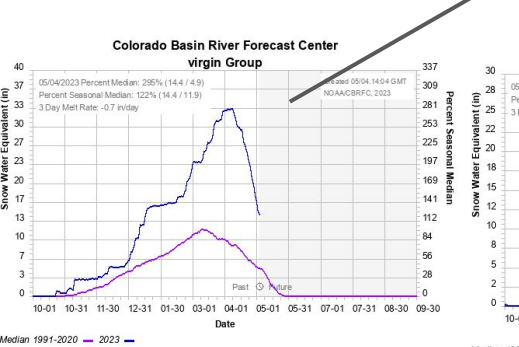
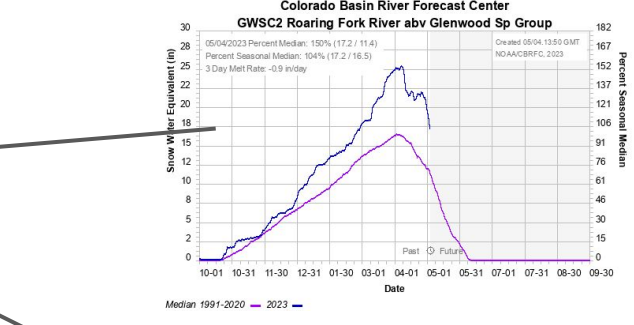
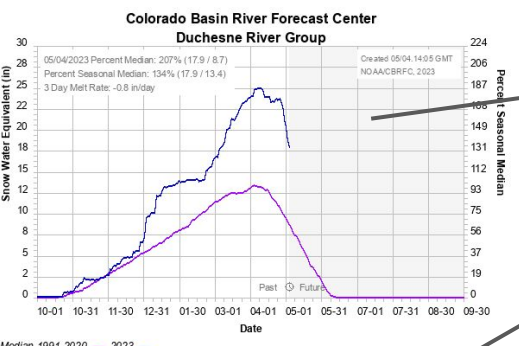
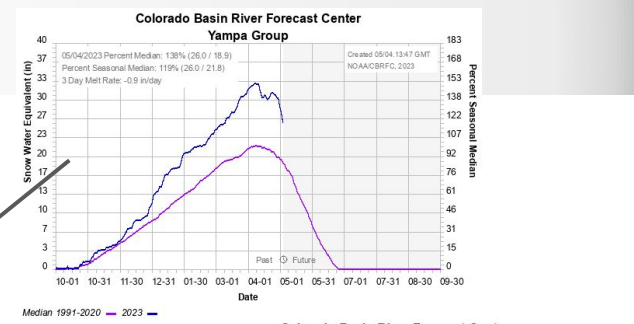
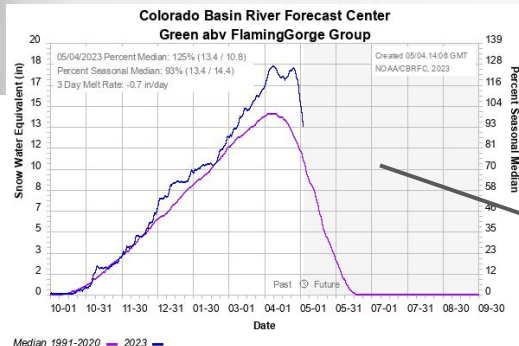
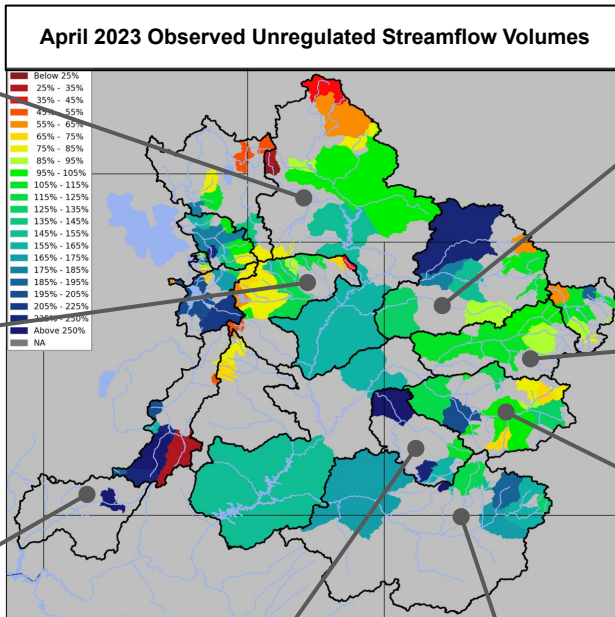
Forecast Hydrograph - Dolores - Cisco, Nr (DOLU1) - NOAA/CBRCF



Forecast Hydrograph - Virgin - Virgin (VIRU1) - NOAA/CBRCF



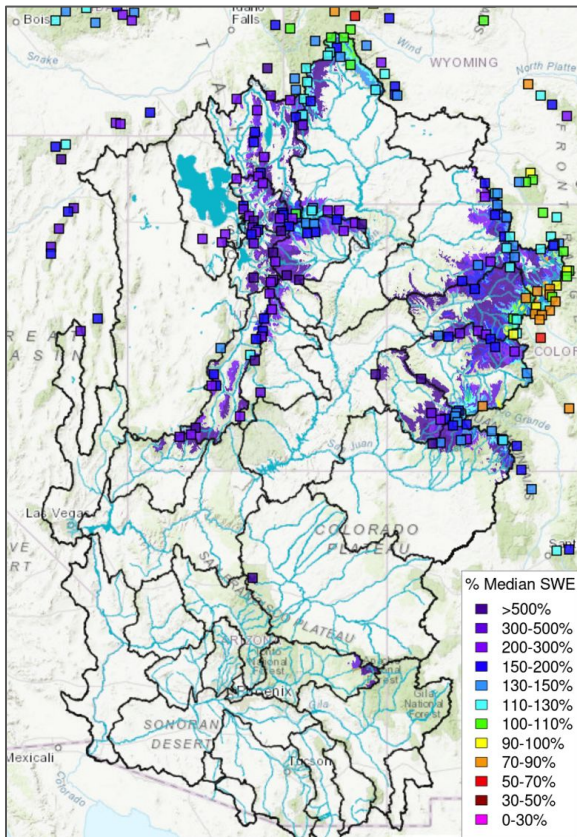
April Flows/Snowmelt



Snowpack Conditions

May 1 SWE Conditions

NRCS SNOTEL Observed (Squares)
CBRFC Model (Significant Areas)



SWE = Snow Water Equivalent
The amount water in snow.

Water Year 2023
CBRFC Model SWE (Significant Runoff Areas)
Percent of 1991-2020 Median

UPPER COLORADO RIVER BASIN

	Apr1	May1	Change
Above Lake Powell	169	163	-6

Green River Basin

Above Fontenelle	114	129	15
Above Flaming Gorge	131	146	15
Yampa/White	175	180	5
Duchesne	199	205	6
Price/San Rafael/Dirty Devil	247	255	8

Colorado River Headwaters

Above Kremmling	124	113	-11
Eagle	119	110	-9
Roaring Fork	142	137	-5
Above Cameo	136	129	-7

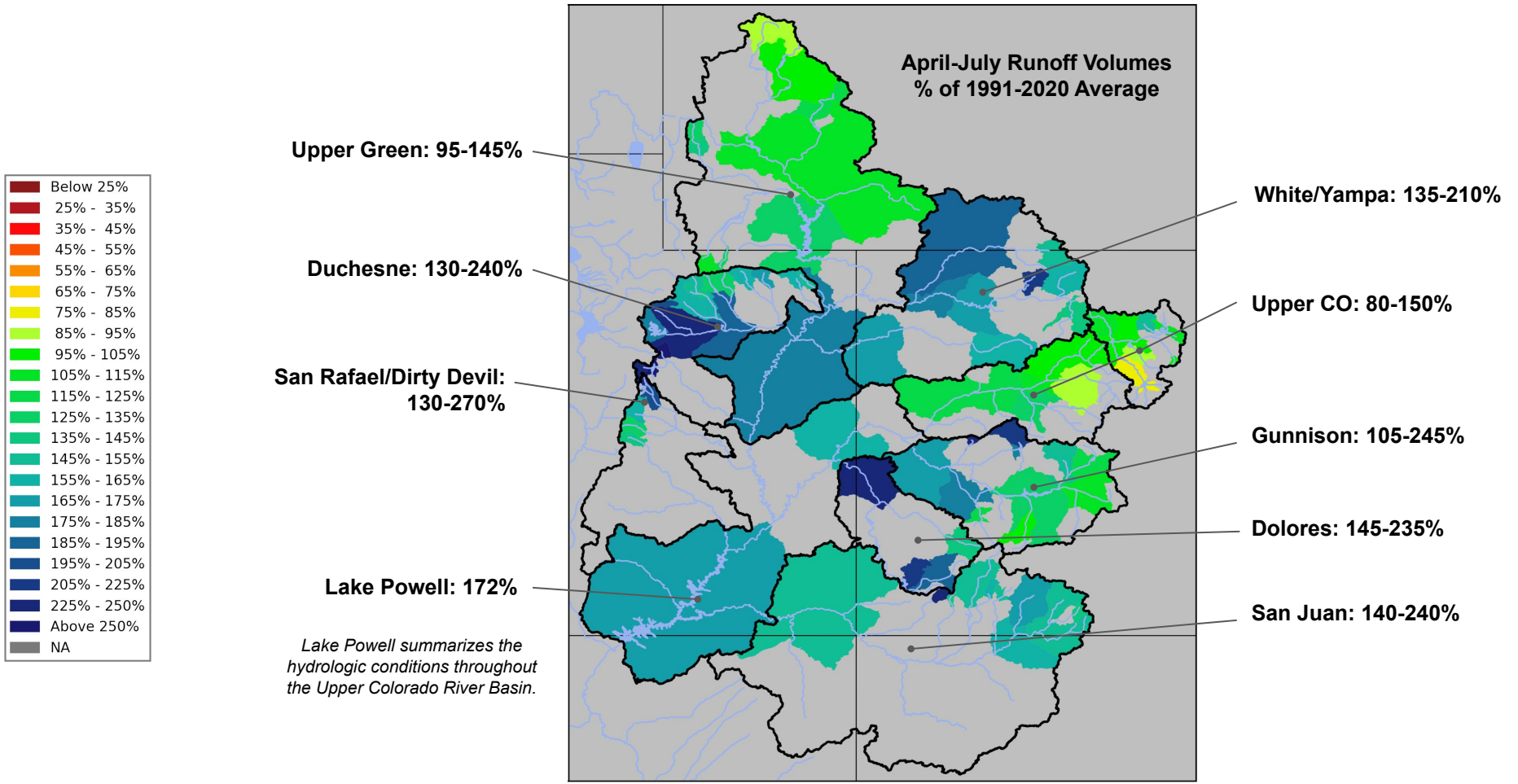
Southwest Colorado

Gunnison	167	162	-5
Dolores	238	240	2
San Juan	186	155	-31

Minimal high elevation snowmelt
occurred during April.

Early May SWE conditions range
from slightly above normal to
near/record across the Colorado
River Basin.

May 1st Water Supply Forecasts: Upper Colorado River Basin

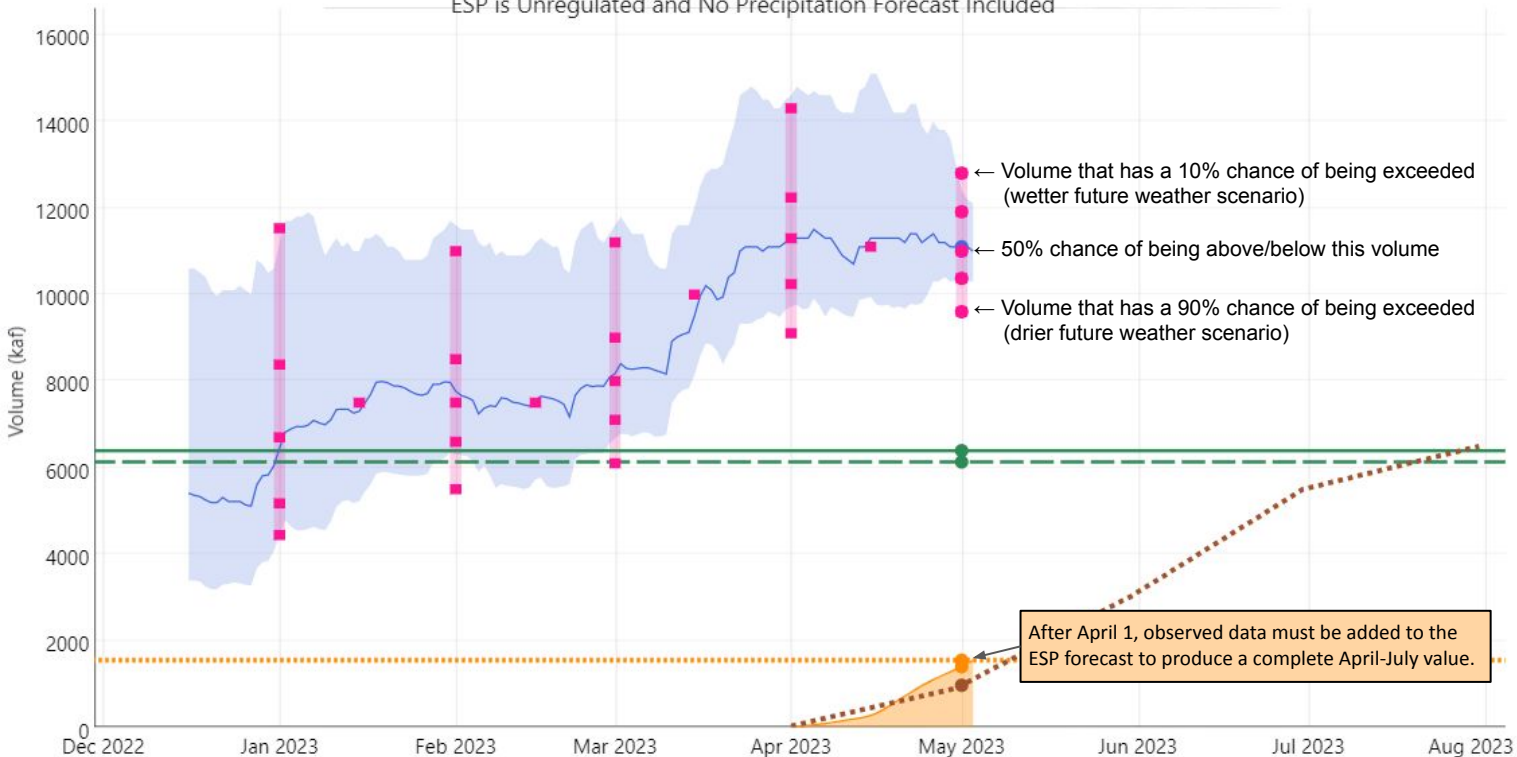


May 1st Water Supply Forecast - Lake Powell

Colorado - Lake Powell, Glen Cyn Dam, At (GLDA3)

Period: Apr-Jul, Official 50% Forecast (2023-05-01): 11000 kaf (172% Average, 179% Median)

ESP is Unregulated and No Precipitation Forecast Included



2023/05/01:

Average: 6390

Median: 6130

Observed Accumulation: 1400

Observed Total: 1550

Normal Accumulation: 971

ESP: 11100

Official 10: 12800

Official 30: 11910

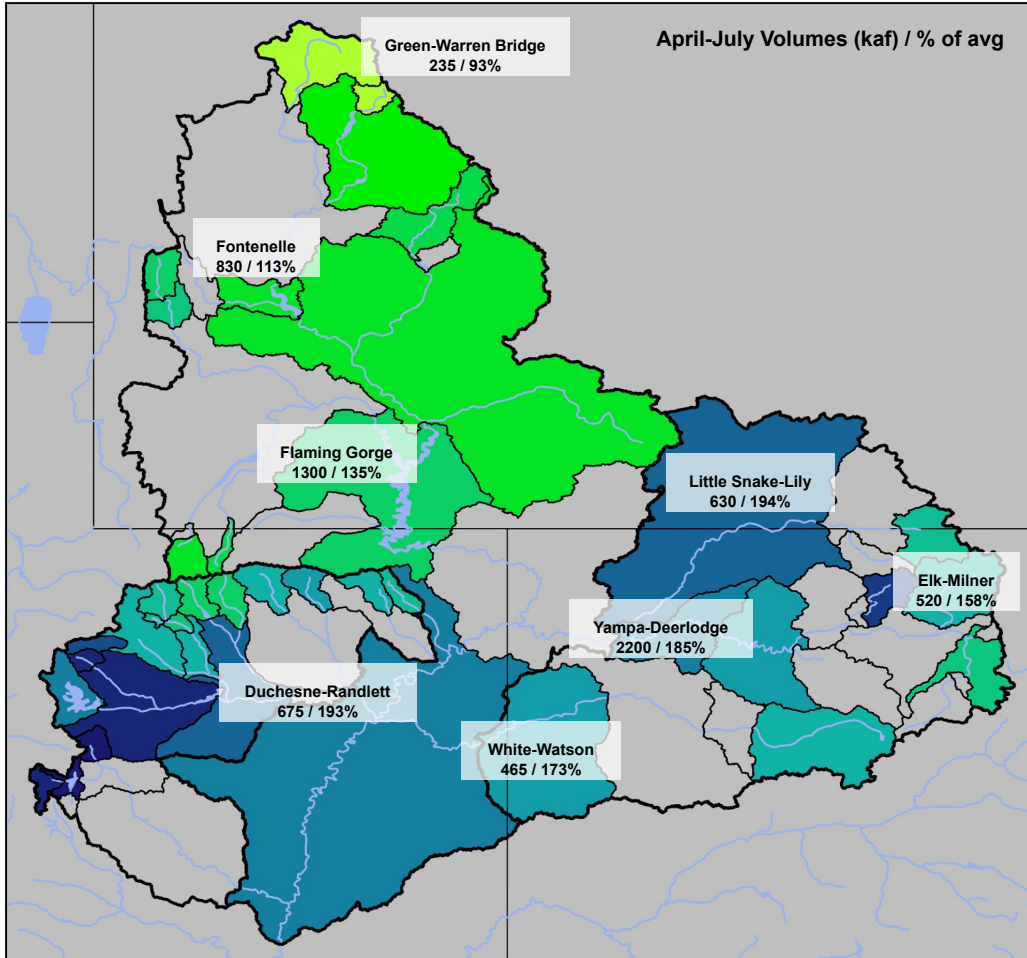
Official 50: 11000

Official 70: 10370

Official 90: 9600

20% chance observed runoff volume could be outside of the 10/90 forecast range.

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



May 1st 2023 Forecasts

Volume (kaf) / % of 1991-2020 avg

Forecast Ranges:

Upper Green: 90 - 145%

Yampa/White: 135 - 210%

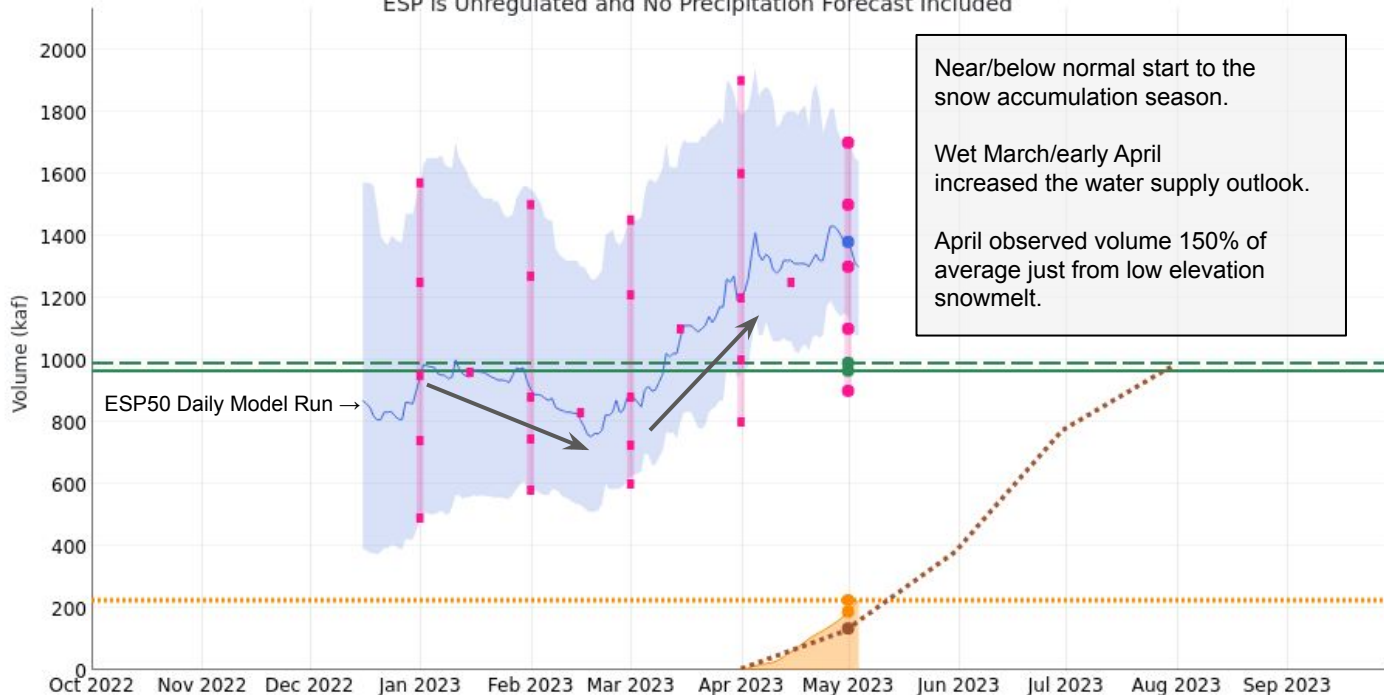
Duchesne: 130 - 240%

May 1st Water Supply Forecast - Flaming Gorge Reservoir

Green - Flaming Gorge Reservoir (GRNU1)

Period: Apr-Jul, Official 50% Forecast (2023-05-01): 1300 kaf (135% Average, 131% Median)

ESP is Unregulated and No Precipitation Forecast Included



2023/05/01:

Average: 965

Median: 990

Observed Accumulation: 188

Observed Total: 225

Normal Accumulation: 134

ESP: 1380

Official 10: 1700

Official 30: 1500

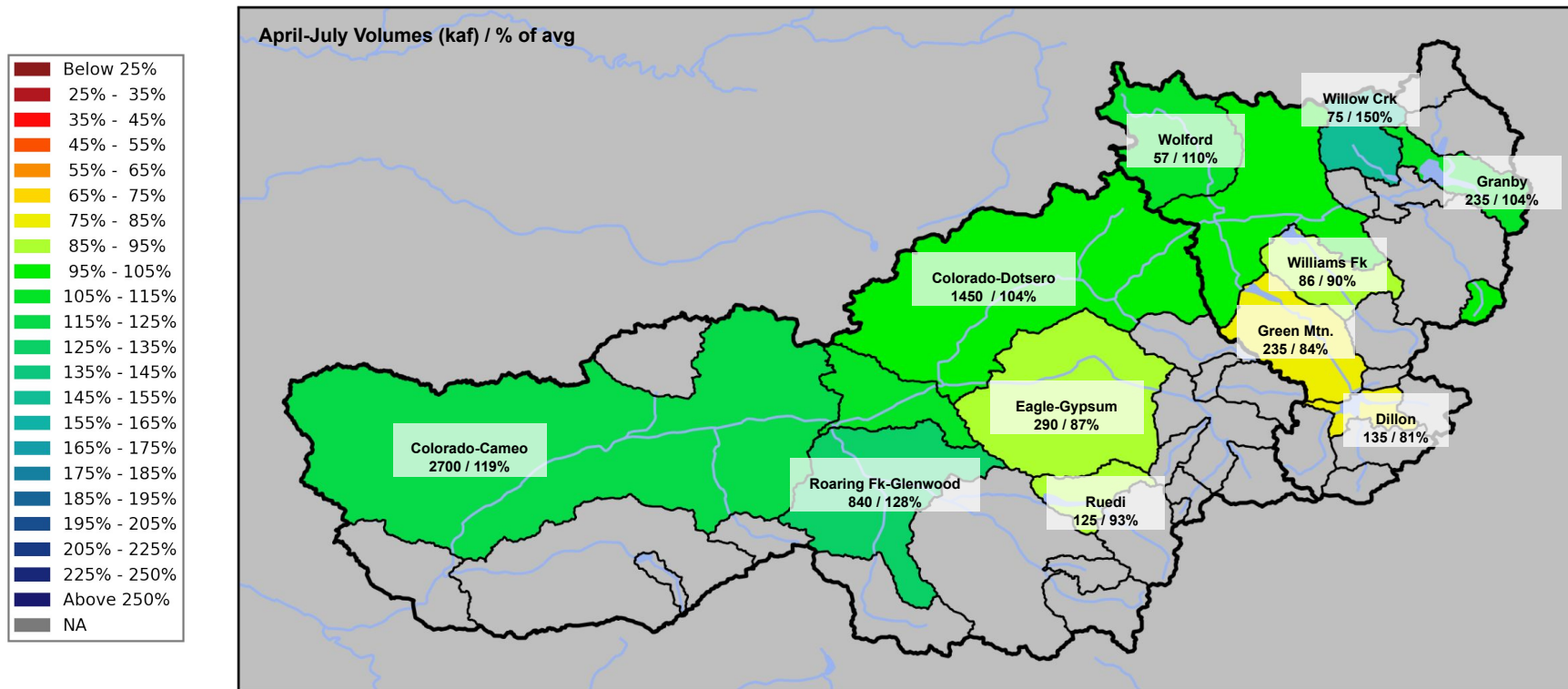
Official 50: 1300

Official 70: 1100

Official 90: 900

May 1st Water Supply Forecasts: Upper Colorado River Mainstem

Forecast Ranges: Granby to Kremmling: 80 - 150% of average
Kremmling to Cameo: 85 - 130% of average



Upper Colorado Mainstem Water Supply Forecast - Green Mountain Reservoir

Blue - Green Mtn Reservoir (GMRC2)

Period: Apr-Jul, Official 50% Forecast (2023-05-01): 235 kaf (84% Average, 87% Median)

ESP is Unregulated and No Precipitation Forecast Included

2023/05/01:

Average: 280

Median: 270

Observed Accumulation: 17.4

Observed Total: 19.8

Normal Accumulation: 22.4

ESP: 239

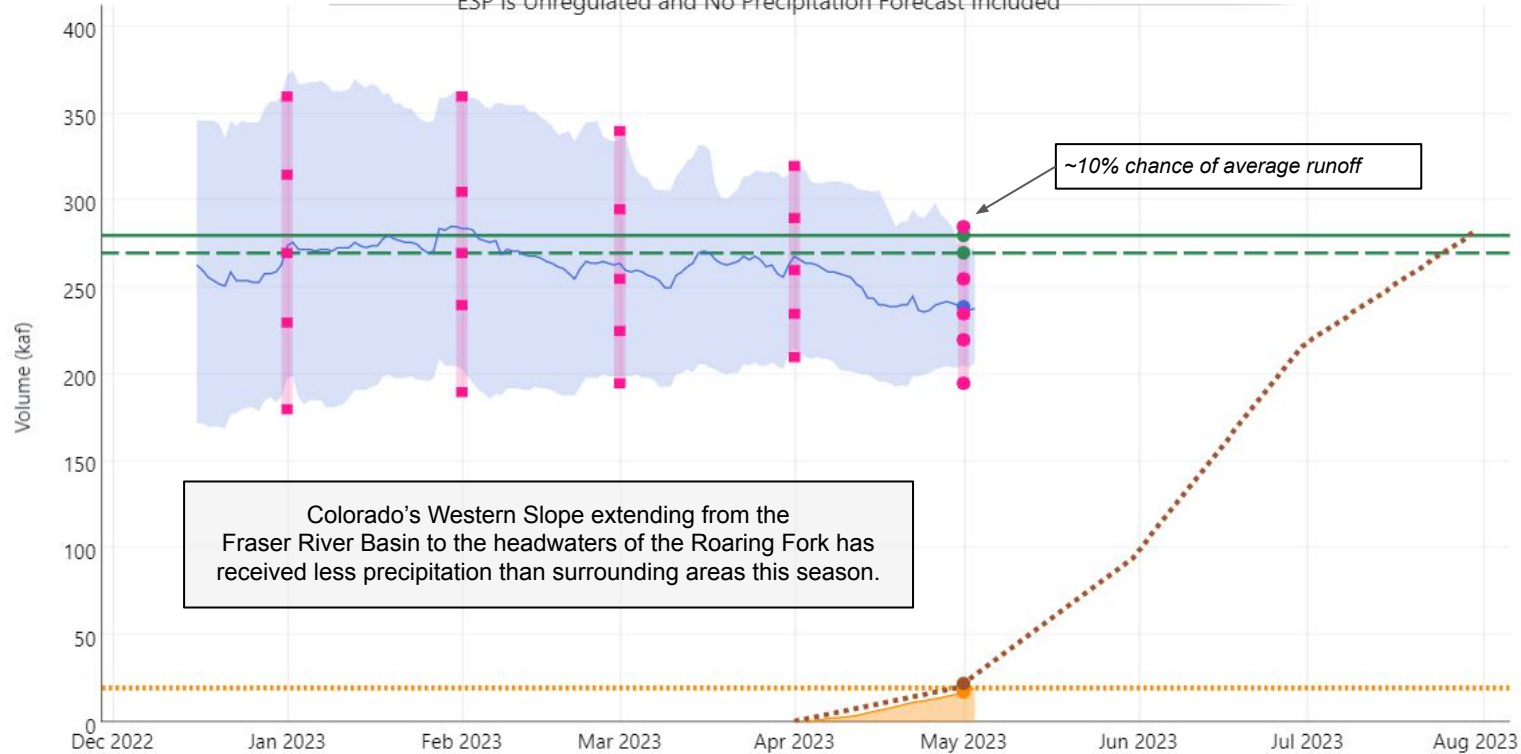
Official 10: 285

Official 30: 255

Official 50: 235

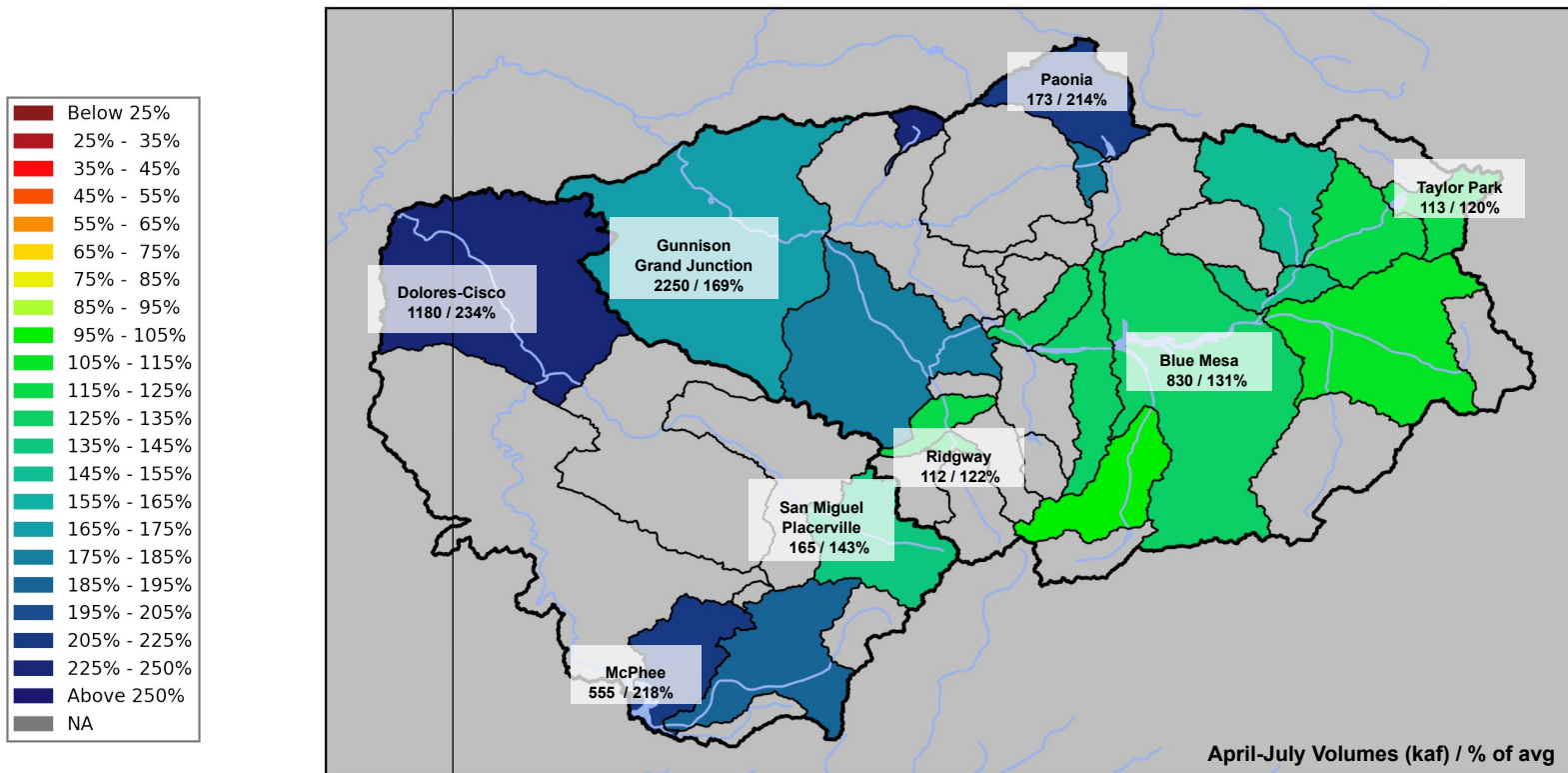
Official 70: 220

Official 90: 195



May 1st Water Supply Forecasts: Gunnison, Dolores

Forecast Ranges: Gunnison: 105 - 245% of average
Dolores: 145 - 235% of average



Dolores River Basin Water Supply Forecast - McPhee Reservoir

Dolores - Mcphee Reservoir (MPHC2)

Period: Apr-Jul, Official 50% Forecast (2023-05-01): 555 kaf (218% Average, 236% Median)

ESP is Unregulated and No Precipitation Forecast Included

2023/05/01:

Max 1993: 519.12

Min 2002: 45.16

Average: 255

Median: 235

Observed Accumulation: 147

Observed Total: 168

Normal Accumulation: 64.4

ESP: 564

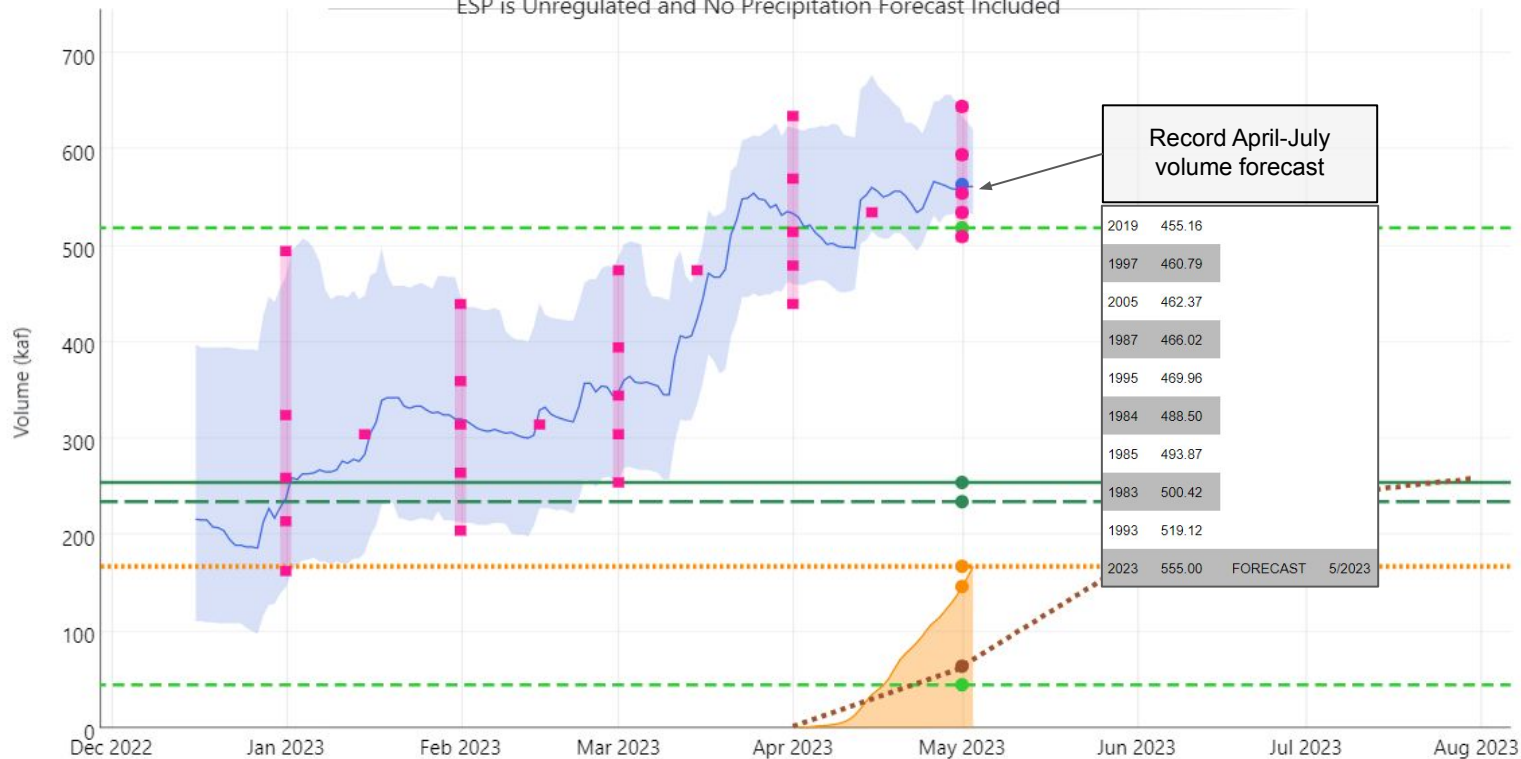
Official 10: 645

Official 30: 595

Official 50: 555

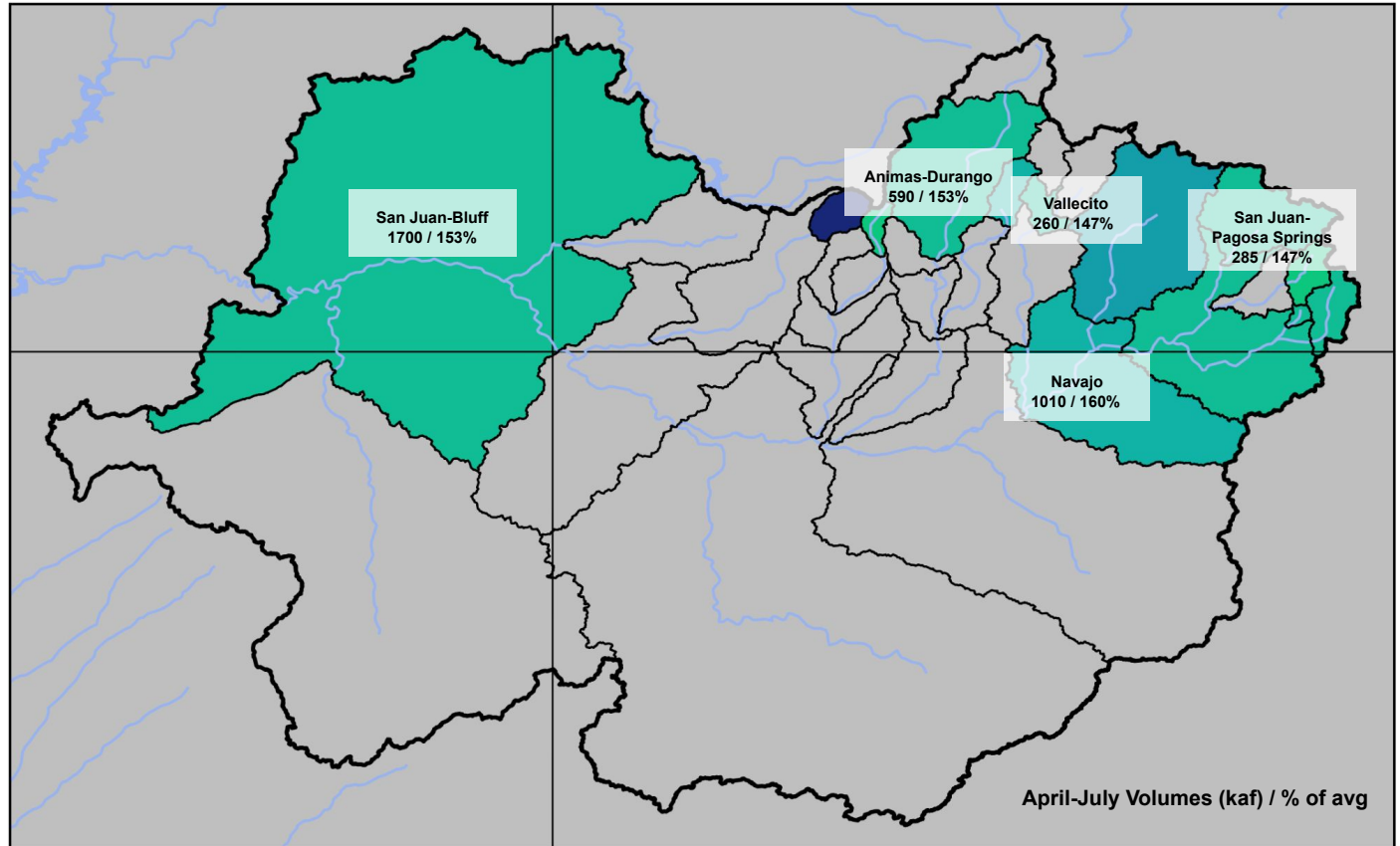
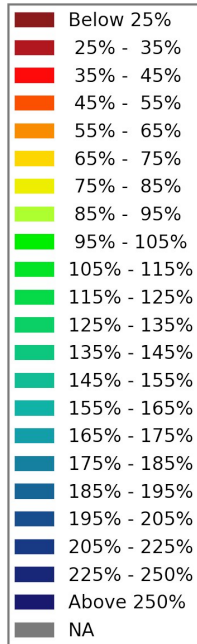
Official 70: 535

Official 90: 510



May 1st Water Supply Forecasts: San Juan

Forecast Range: 140 - 240% of average



San Juan River Basin Water Supply Forecast - Navajo Reservoir

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

Period: Apr-Jul, Official 50% Forecast (2023-05-01): 1010 kaf (160% Average, 160% Median)

ESP is Unregulated and No Precipitation Forecast Included

2023/05/01:

Average: 630

Median: 630

Observed Accumulation: 245

Observed Total: 297

Normal Accumulation: 155

ESP: 1010

Official 10: 1160

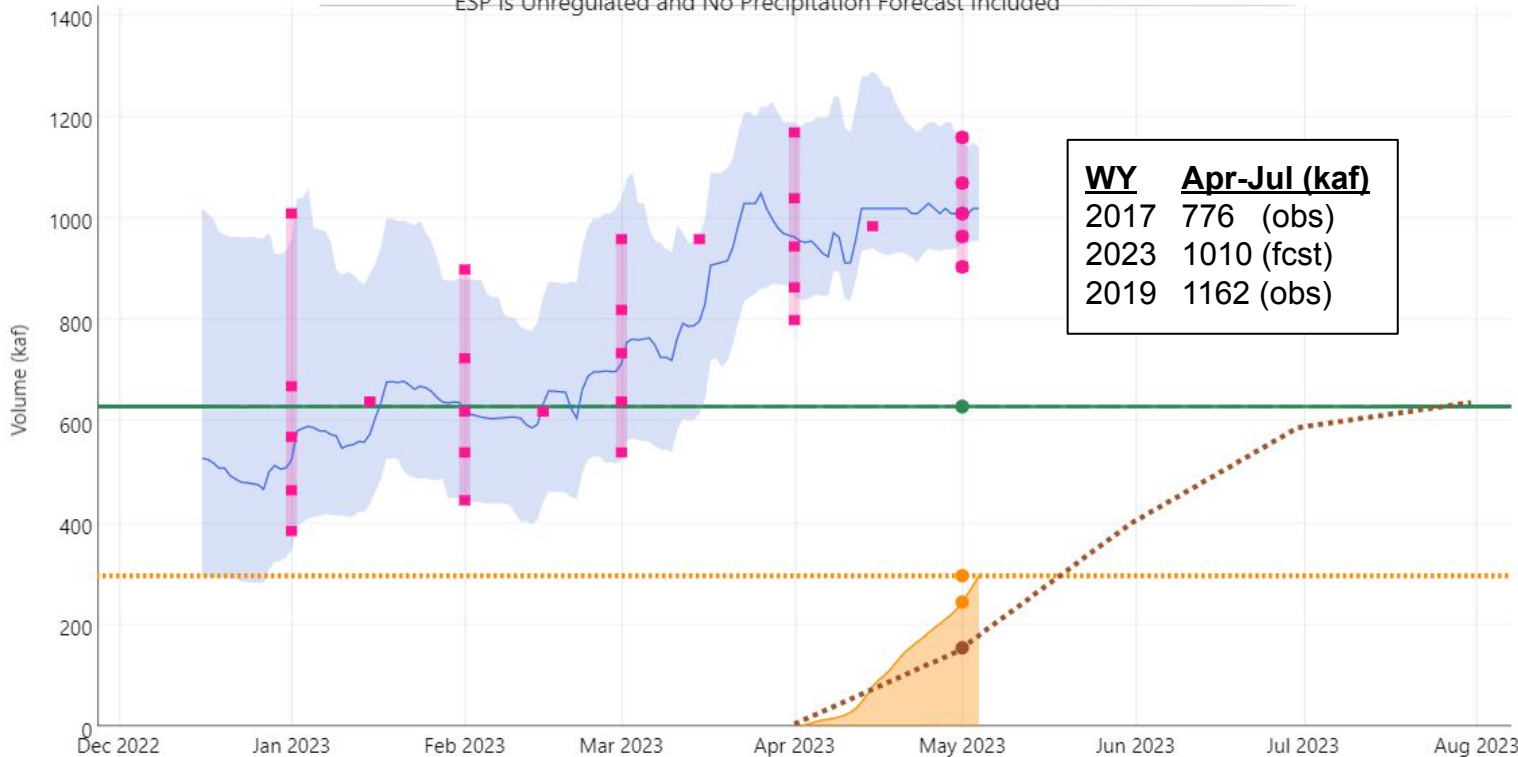
Official 30: 1070

Official 50: 1010

Official 70: 965

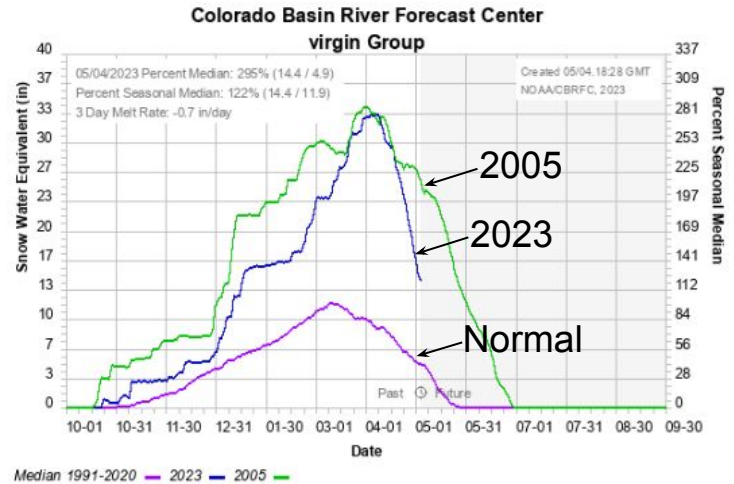
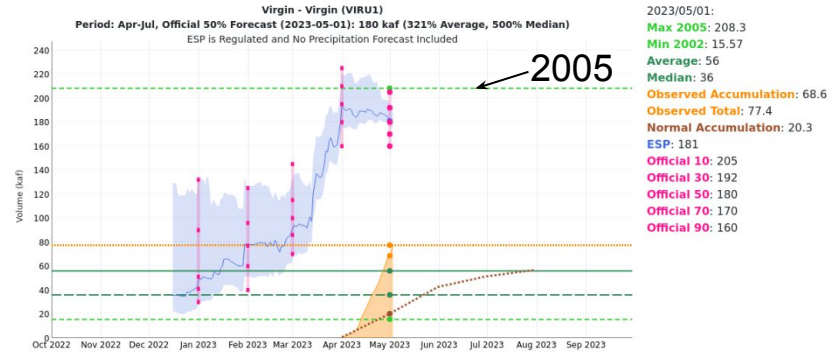
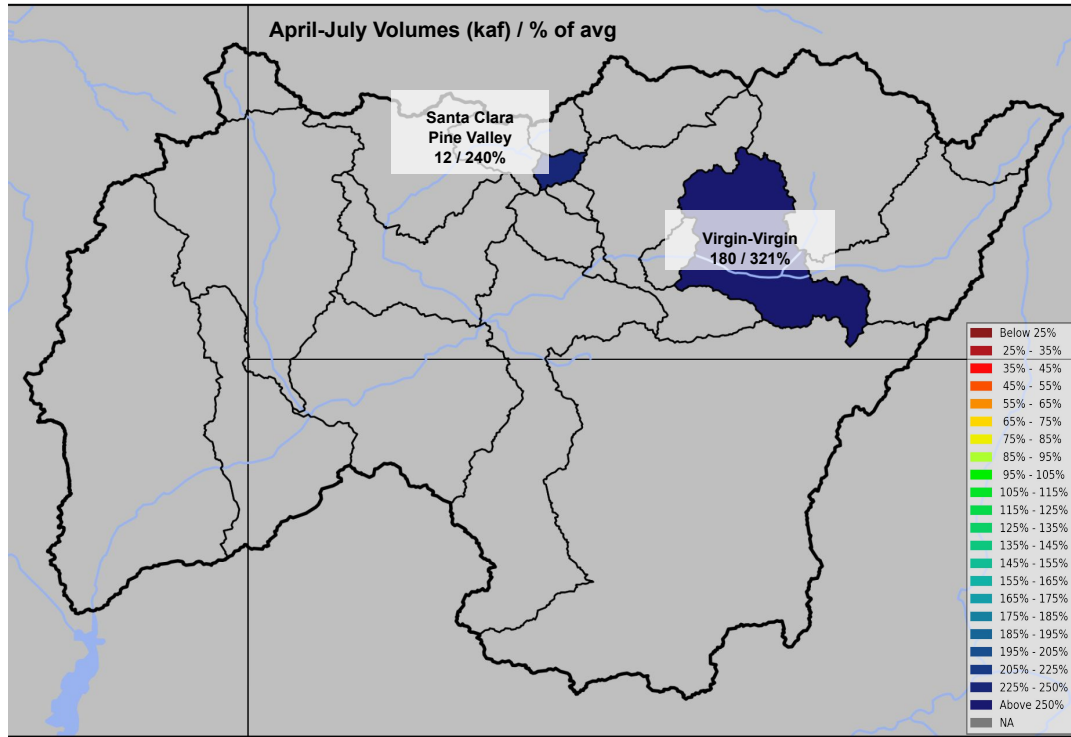
Official 90: 905

<u>WY</u>	<u>Apr-Jul (kaf)</u>
2017	776 (obs)
2023	1010 (fcst)
2019	1162 (obs)



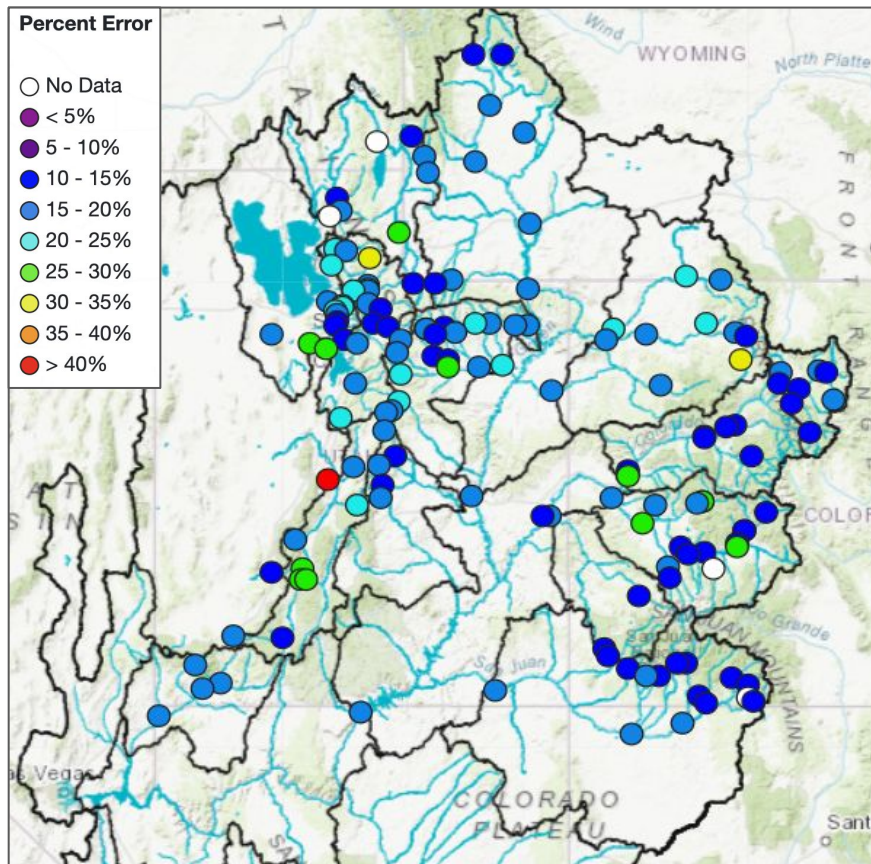
May 1st Water Supply Forecasts: Virgin River Basin

Forecast Range: 240 - 320% of average



Historical (1981-2010) Forecast Verification

May Forecast Error: April-July Volume



Location

Avg May Forecast Error

Green River - Warren Bridge	12%
Fontenelle Reservoir	17%
Yampa River - Deerlodge	15%
Blue River - Dillon Reservoir	11%
Colorado River - Cameo	11%
Blue Mesa Reservoir (Gunnison)	11%
McPhee Reservoir (Dolores)	12%
Navajo Reservoir (San Juan)	15%
Lake Powell	15%

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:

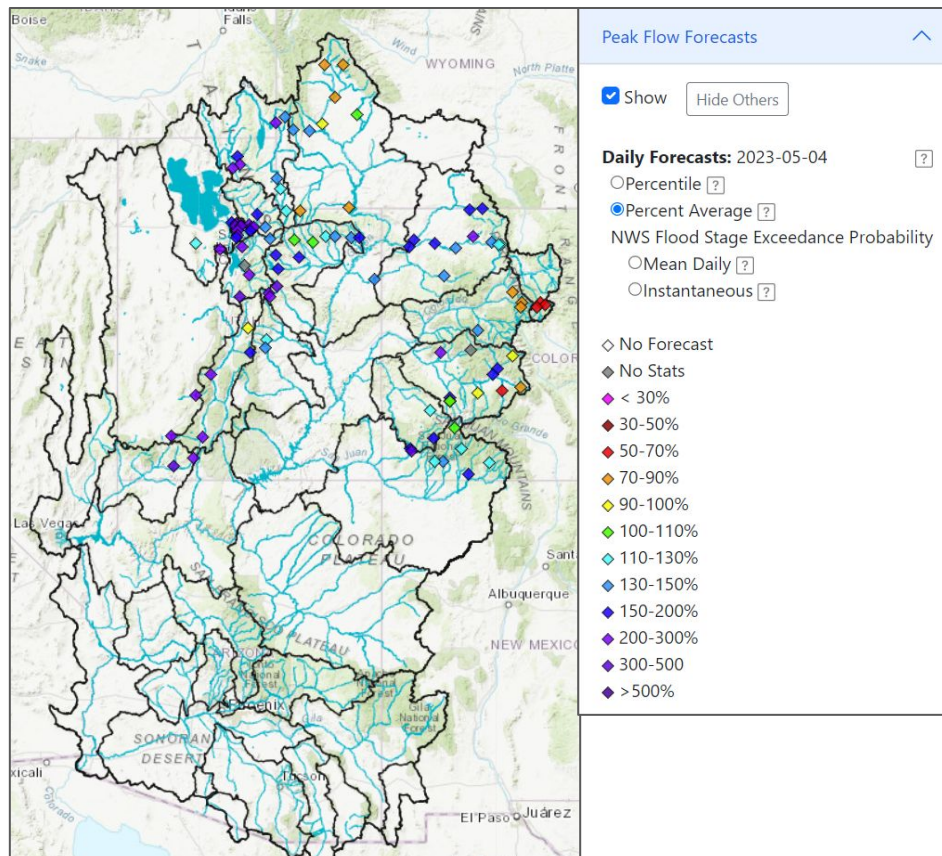
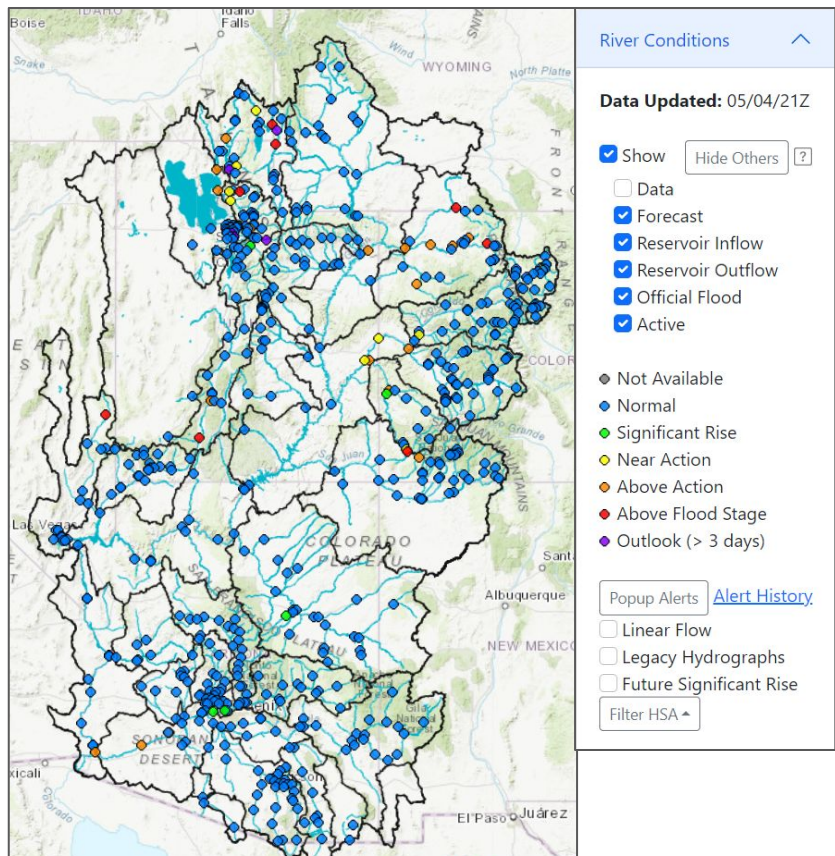
- Lower elevations (rain or early melt)
- Downstream of diversions / irrigation
- Little is known about diversions / demands

Future weather is the primary source of water supply forecast error/uncertainty.

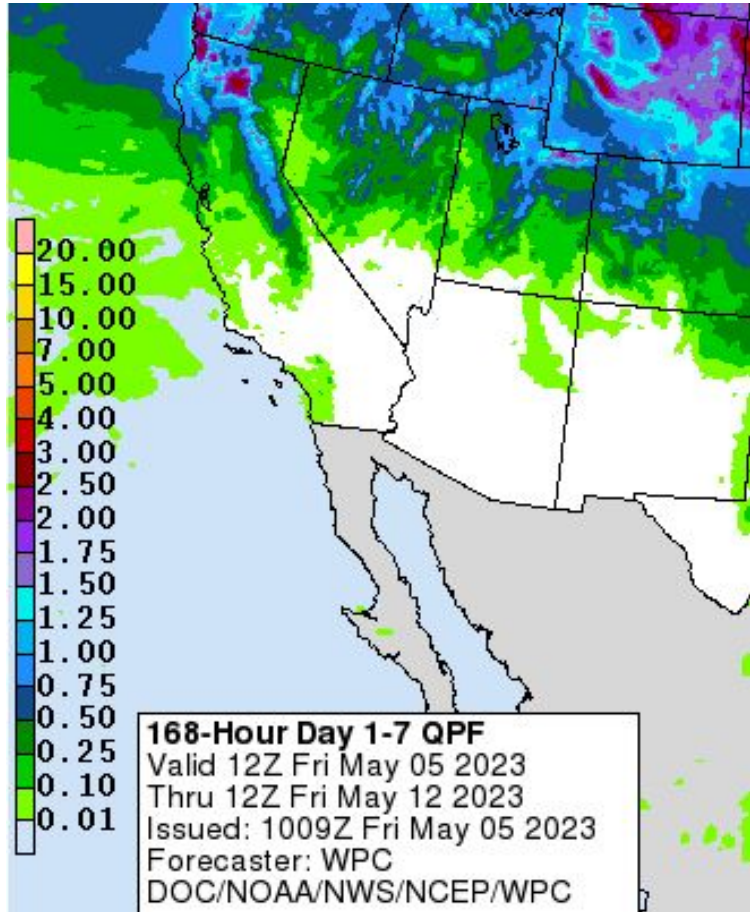
Current River Conditions

Elevated flows across much of the region.

Above average peak flows expected in many basins.



WPC May 5-12 Precipitation Outlook & Upcoming Weather



- A low pressure system will cross the area from southwest to northeast over the next few days bringing a sharp transition from above normal temperatures to below normal temperatures and will result in periods of precipitation across the northern half of the area.
- A cool, wet pattern will remain in place through early next week.
- Expected 7-day precipitation totals:
 - 0.75" to 1.25" in the higher elevations of UT and CO
 - 0.25-0.75" range across mid and lower elevations
- Weather models diverge next week in regard to the overall weather pattern.
 - The most likely scenario is that cool, unsettled weather will continue into next week.
 - However, there is about a 30% chance that high pressure will develop next week which would lead to above normal temperatures and below normal precipitation.

Upcoming Weather: 8-14 Day Outlook (May 12-18)

Elevated odds of above average precipitation across Colorado, Arizona, and southern Utah.

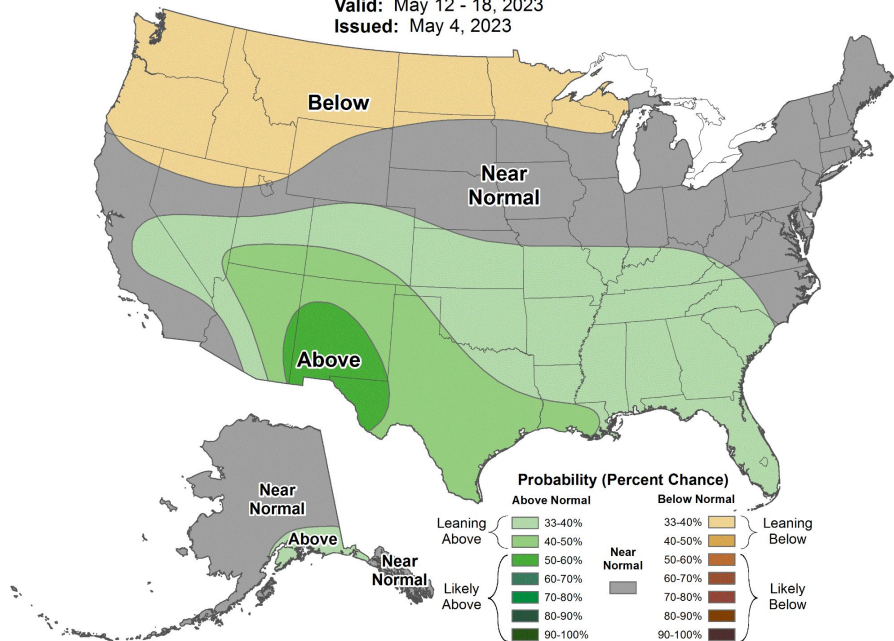
Above average temperatures favored across the Western US.



8-14 Day Precipitation Outlook



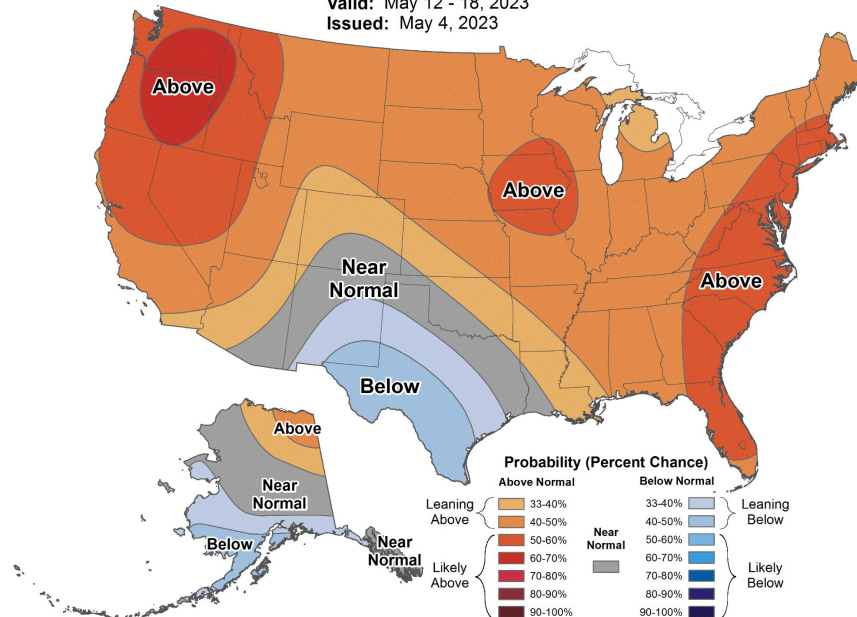
Valid: May 12 - 18, 2023
Issued: May 4, 2023



8-14 Day Temperature Outlook



Valid: May 12 - 18, 2023
Issued: May 4, 2023



Summary

- CBRFC Model Soil Moisture Conditions
 - UCRB (Fall 2022) - near to below normal across many of the major runoff producing areas
 - LCRB (Current) - above average
- April Weather
 - Northern basins - periods of warm/dry/snowmelt and periods of cool/wet/precipitation, below normal temps
 - Southern basins - warmer/drier, more continuous snowmelt, above average temps, little to no precip
 - Below average monthly precipitation across the majority of the Colorado River Basin
- May 1 CBRFC Model SWE Conditions (%Normal)
 - Upper Colorado: 110-255%
- May 1 Water Supply Forecasts (%Normal)
 - Upper Colorado: (Apr-Jul): 80-270%
 - Lake Powell = 172%; 11.0 MAF
- Peak Flow Forecasts
 - Well above average peak flows expected across the majority of the UCRB
 - Elevated flood potential
- Weather Outlook
 - A cool, wet pattern will remain in place through early next week.
 - High uncertainty in the weather forecast beyond early next week.

2023 Water Supply Webinar Schedule

**All Times Mountain Time (MT)*

Colorado River Basin

Monday	Jan 9th	10 am
Tuesday	Feb 7th	10 am
Tuesday	Mar 7th	10 am
Friday	Apr 7th	10 am
Friday	May 5 th	10 am

Utah/Great Basin

Monday	Jan 9th	11:30 am
Tuesday	Feb 7th	11:30 am
Tuesday	Mar 7th	11:30 am
Friday	Apr 7th	11:30 am
Friday	May 5 th	11:30 am



Colorado Basin
River Forecast Center
National Weather Service

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- National Oceanic and Atmospheric Administration
- Department of Commerce

2023 Presentations

2023 Early Season Water Supply Outlook

- [Slides \(.pdf\)](#) | [Recording \(.mp4\)](#) | [YouTube](#)

January 2023

- Colorado River Basin [Slides \(.pdf\)](#) | [Recording \(.mp4\)](#) | [YouTube](#)
- Utah / Great Basin [Slides \(.pdf\)](#) | [Recording \(.mp4\)](#) | [YouTube](#)

February 2023

- Colorado River Basin [Slides \(.pdf\)](#) | [Recording \(.mp4\)](#) | [YouTube](#)
- Utah / Great Basin [Slides \(.pdf\)](#) | [Recording \(.mp4\)](#) | [YouTube](#)

March 2023

- Colorado River Basin [Slides \(.pdf\)](#) | [Recording \(.mp4\)](#) | [YouTube](#)
- Utah / Great Basin [Slides \(.pdf\)](#) | [Recording \(.mp4\)](#) | [YouTube](#)

April/Peak Flow 2023

- Colorado River Basin [Slides \(.pdf\)](#) | [Recording \(.mp4\)](#) | [YouTube](#)
- Utah / Great Basin [Slides \(.pdf\)](#) | [Recording \(.mp4\)](#) | [YouTube](#)



CBRFC Contacts & WY23 Basin Focal Points

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CBRFC Water Supply Presentations
<https://www.cbrfc.noaa.gov/present/present.php>

