



BUREAU OF RECLAMATION

# Aspinal Operations Meeting

April 26, 2022



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# Microsoft Teams Video Conferencing

Mute/Unmute Yourself      View Participant List



Turn on/off your camera

Share your screen: Should be disabled

Chat: Ask questions, make comments (everyone can see this)

Depending on your device/browser, these buttons may be in a different location



2

# Microsoft Teams Video Conferencing

The image shows a dark-themed Microsoft Teams video conferencing control bar. Above the bar, three labels with arrows point to icons: 'Participants List' points to the group of people icon, 'Raise Hand' points to the hand icon, and 'Video on/off' points to the video camera icon. Below the bar, two labels with arrows point to icons: 'Chat' points to the speech bubble icon, and 'Microphone on/off' points to the microphone icon. A small logo is visible in the bottom right corner of the slide.

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April 2022


**Weather Outlook**

**Aldis Strautins**  
National Weather Service  
Grand Junction, CO  
<http://www.weather.gov/gjt>


National Oceanic and Atmospheric Administration  
U.S. Department of Commerce

National Weather Service  
Grand Junction, Colorado

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 **Outline** April 2022

- Precipitation and Temperature
- Snow Water Equivalent
- Drought
- ENSO
- Weather outlook

 National Oceanic and Atmospheric Administration  
U.S. Department of Commerce

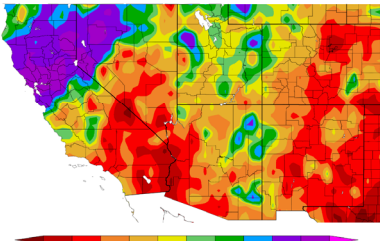
National Weather Service  
Grand Junction, Colorado

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 **Sep – Nov, 2021 - Precipitation** April 2022

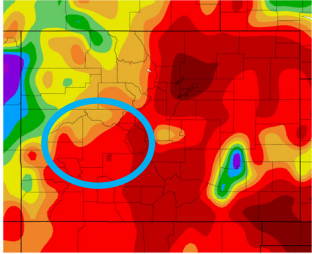
**(percent of normal)**  
**Dry fall for three quarters of the western slope going into the winter season**

Percent of Normal Precipitation (%)  
9/1/2021 – 11/30/2021




Generated 1/1/2022 at HPRCC using provisional data.

Percent of Normal Precipitation (%)  
9/1/2021 – 11/30/2021



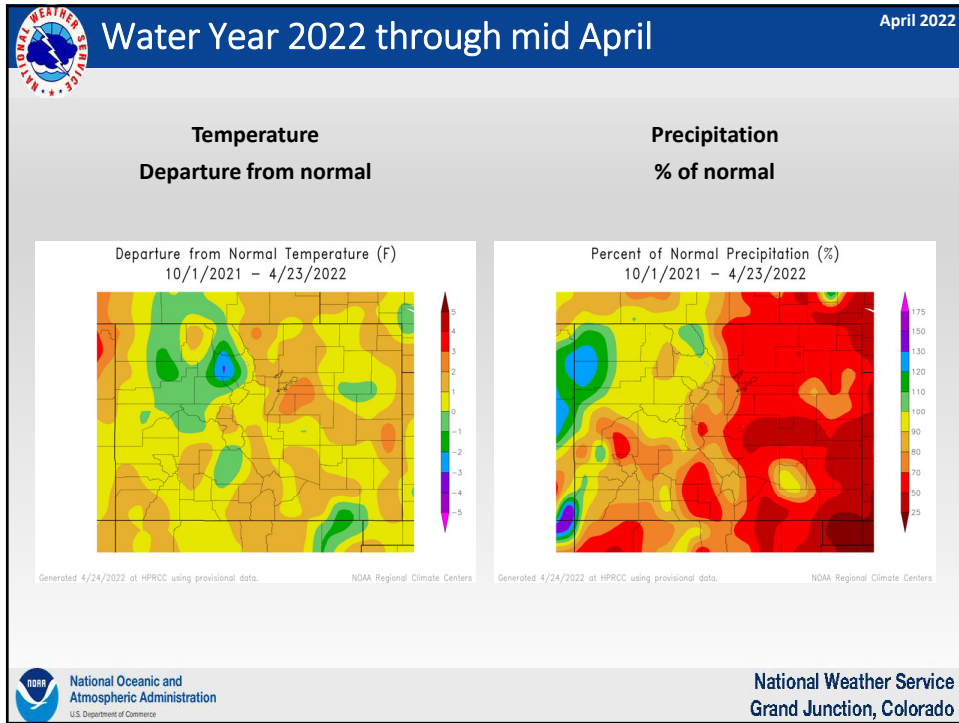
Generated 1/1/2022 at HPRCC using provisional data.

NOAA Regional Climate Centers

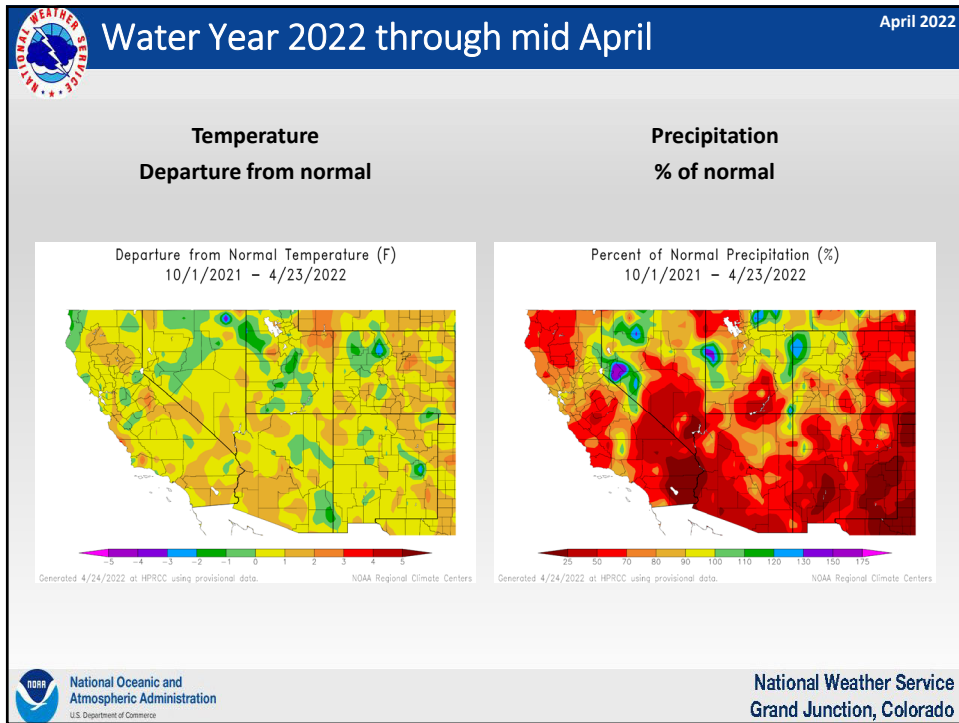
 National Oceanic and Atmospheric Administration  
U.S. Department of Commerce

National Weather Service  
Grand Junction, Colorado

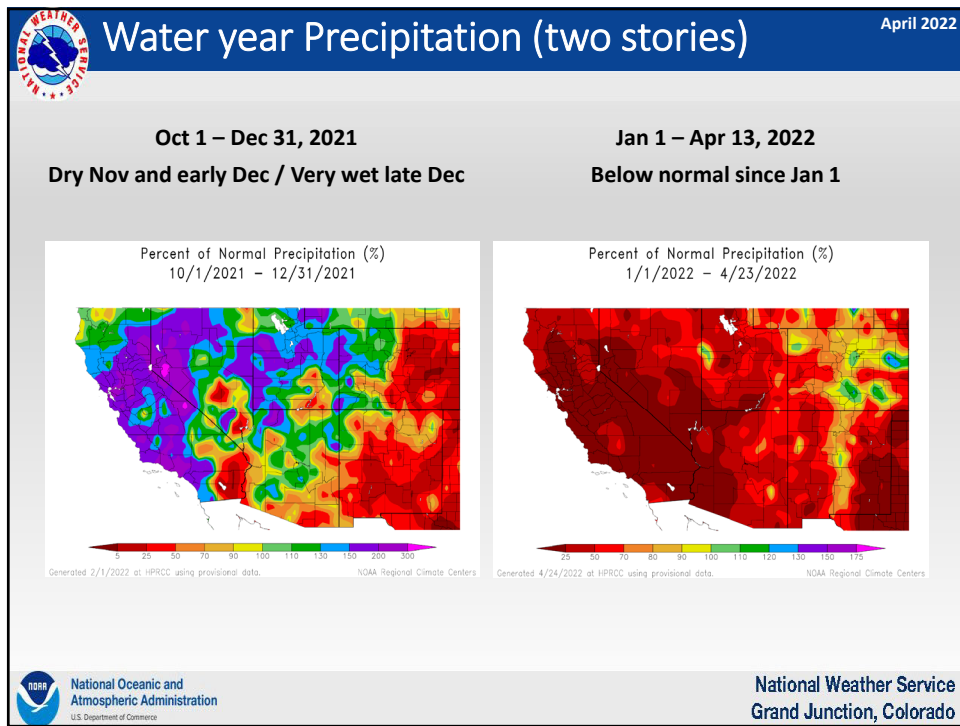
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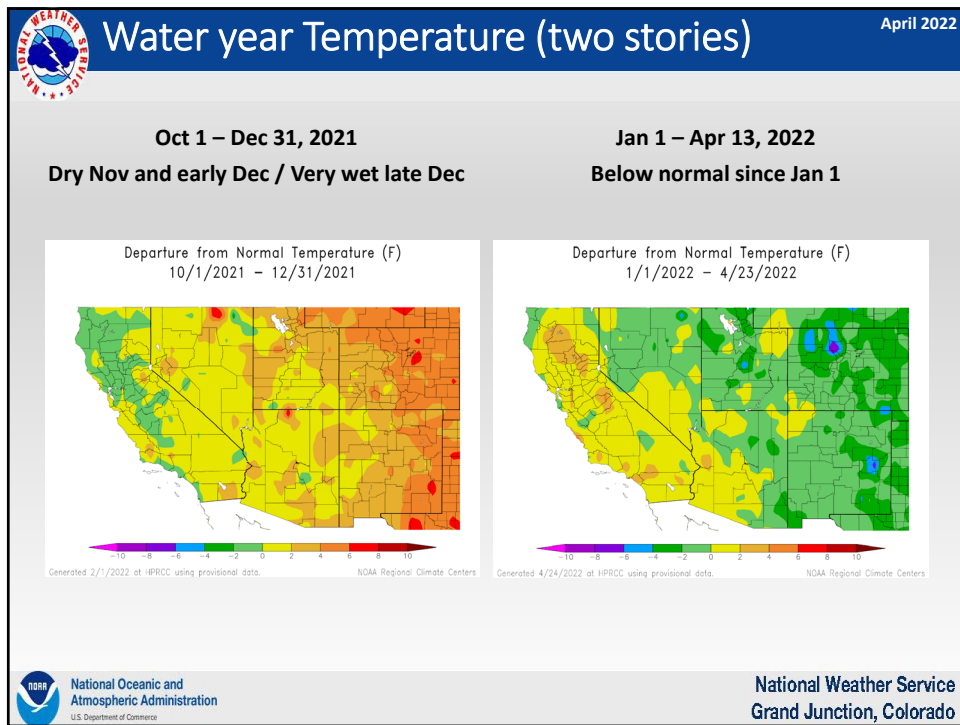
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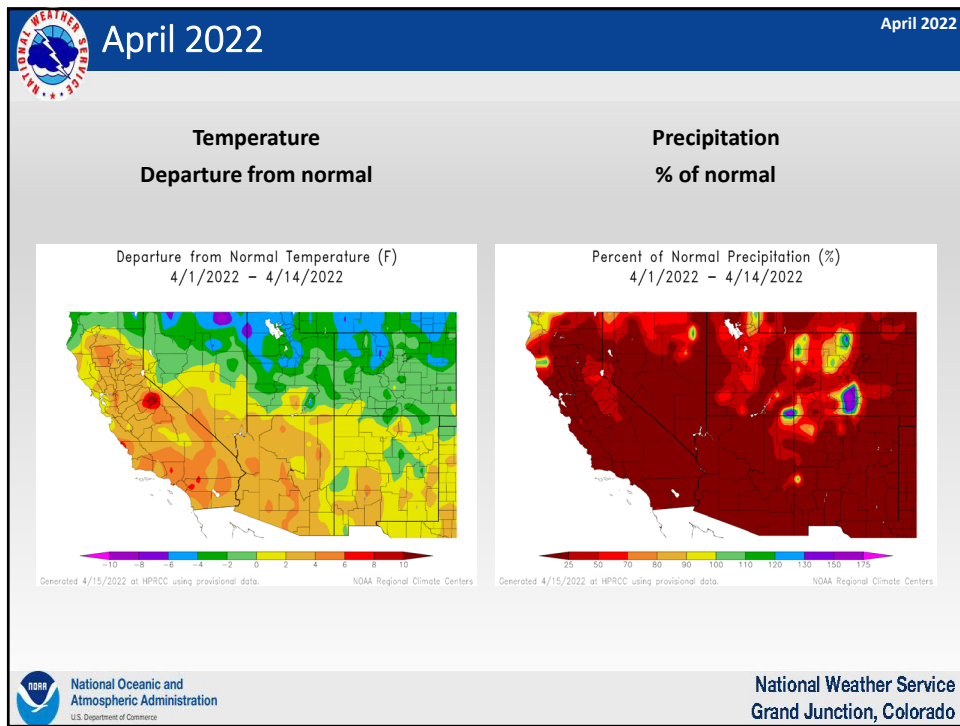
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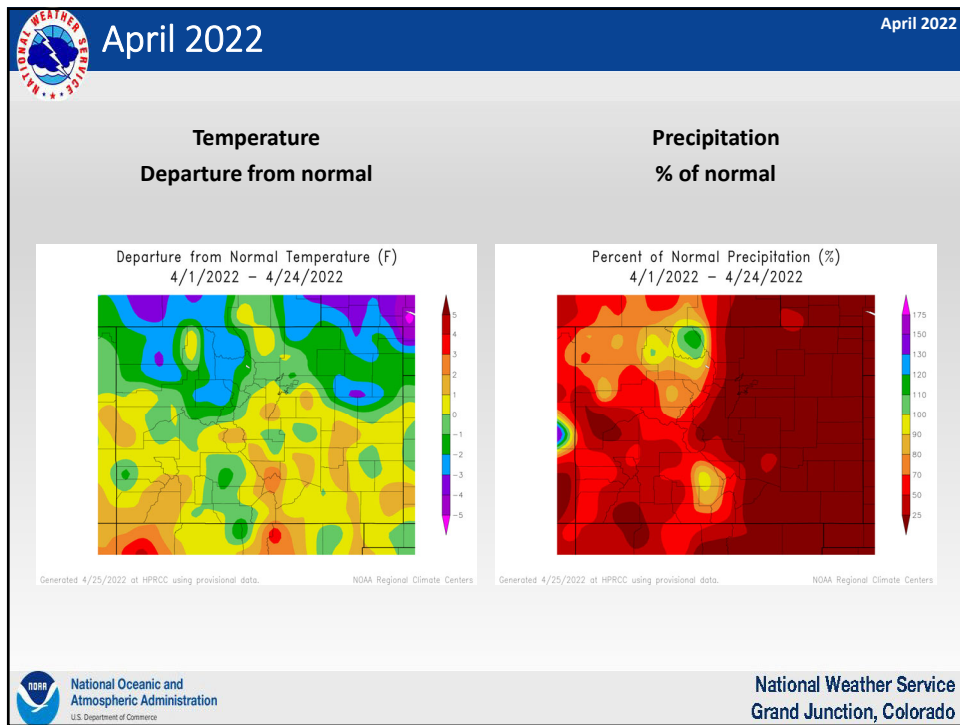
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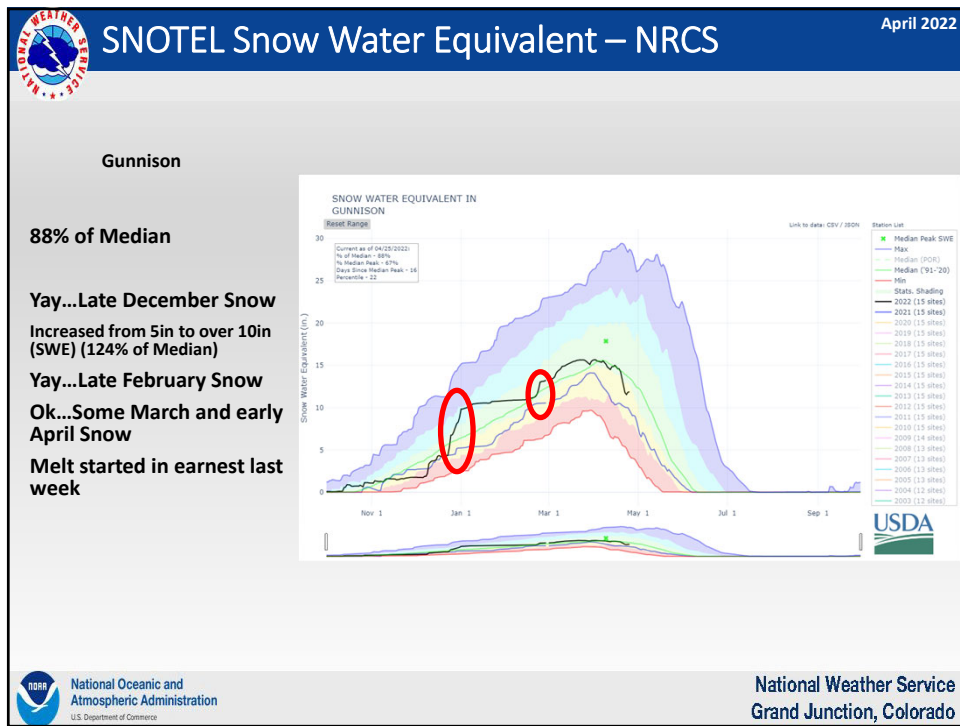
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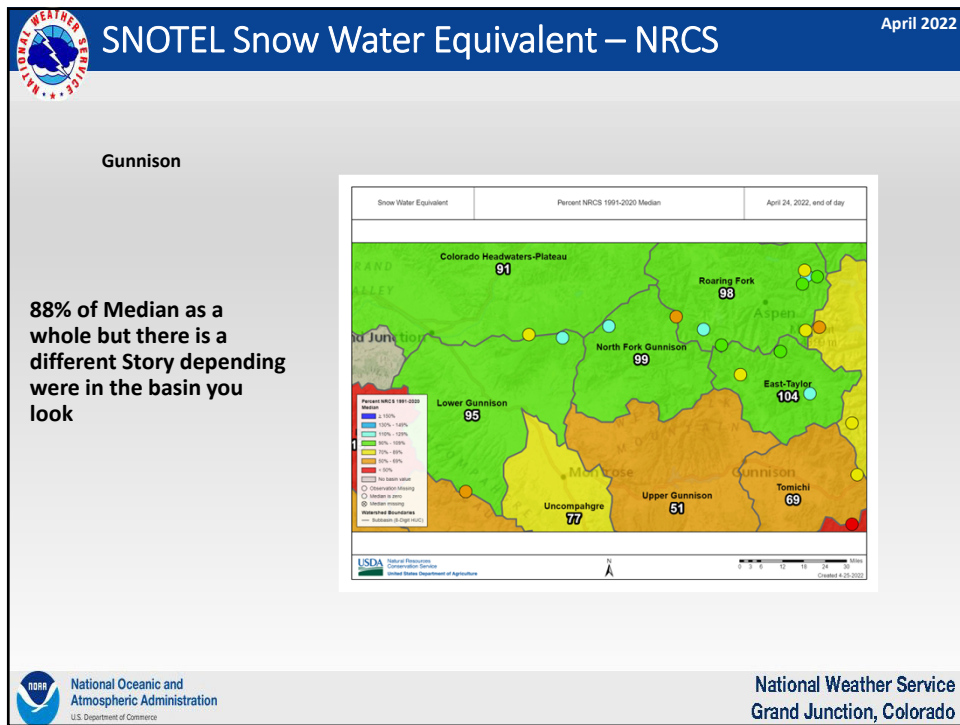
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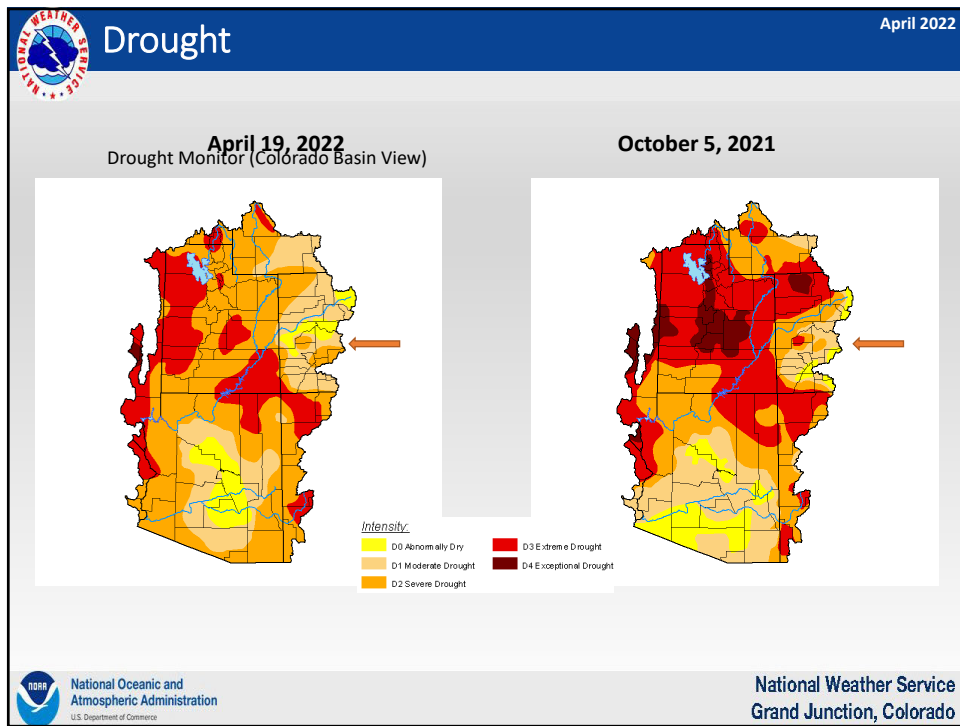
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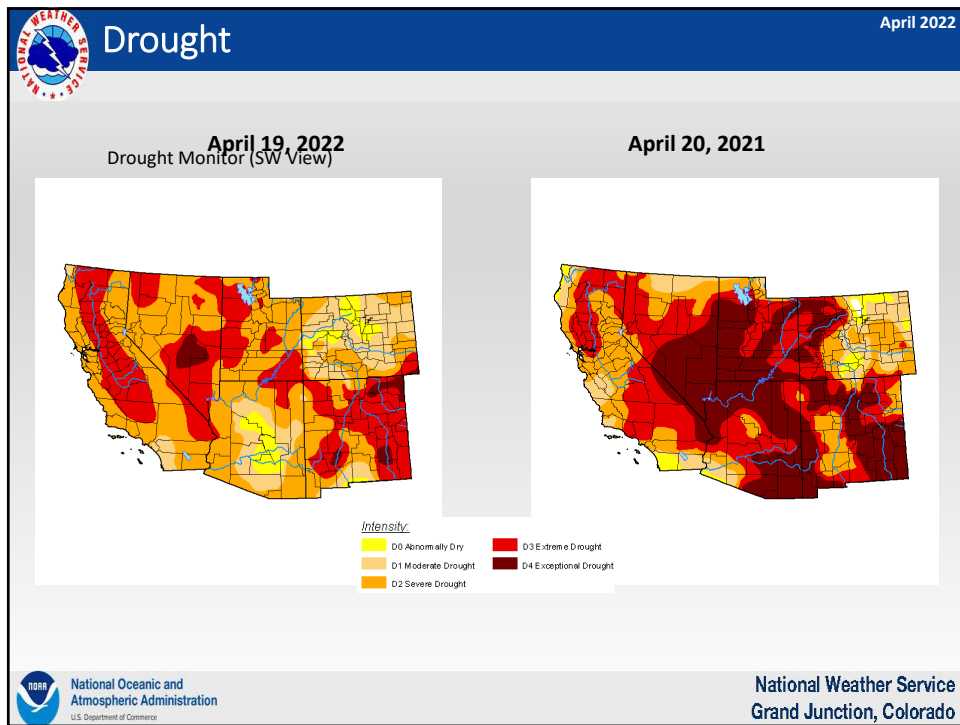
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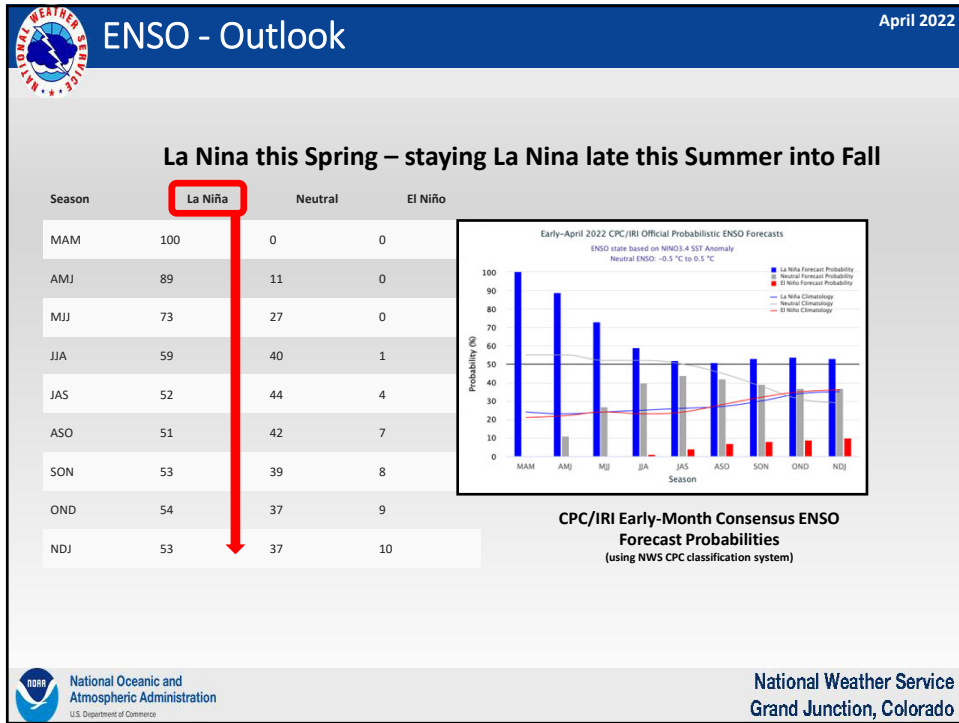


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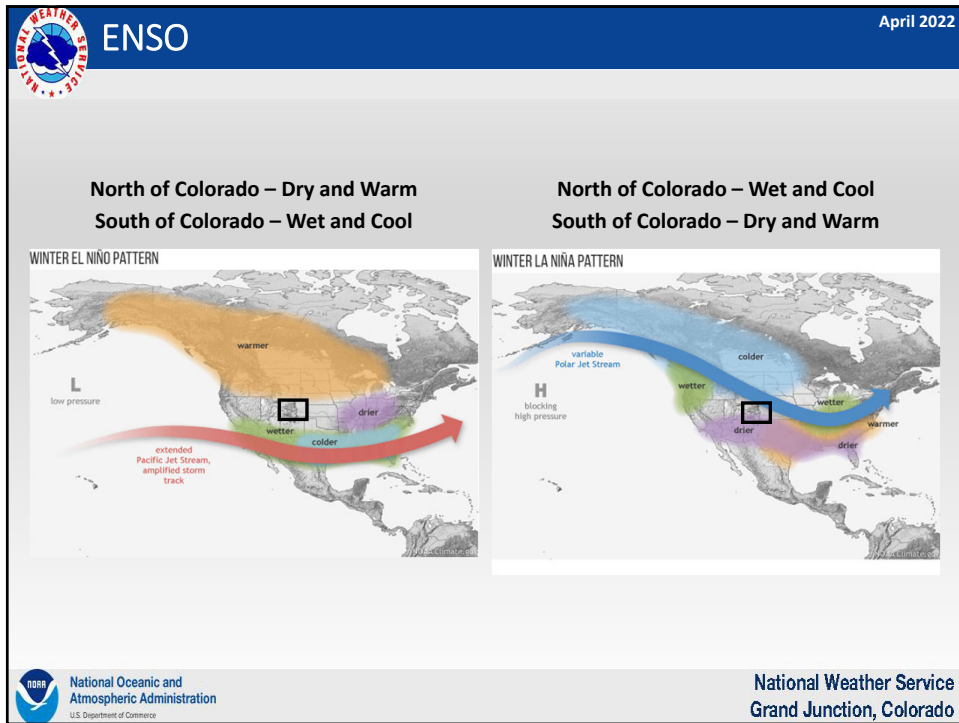


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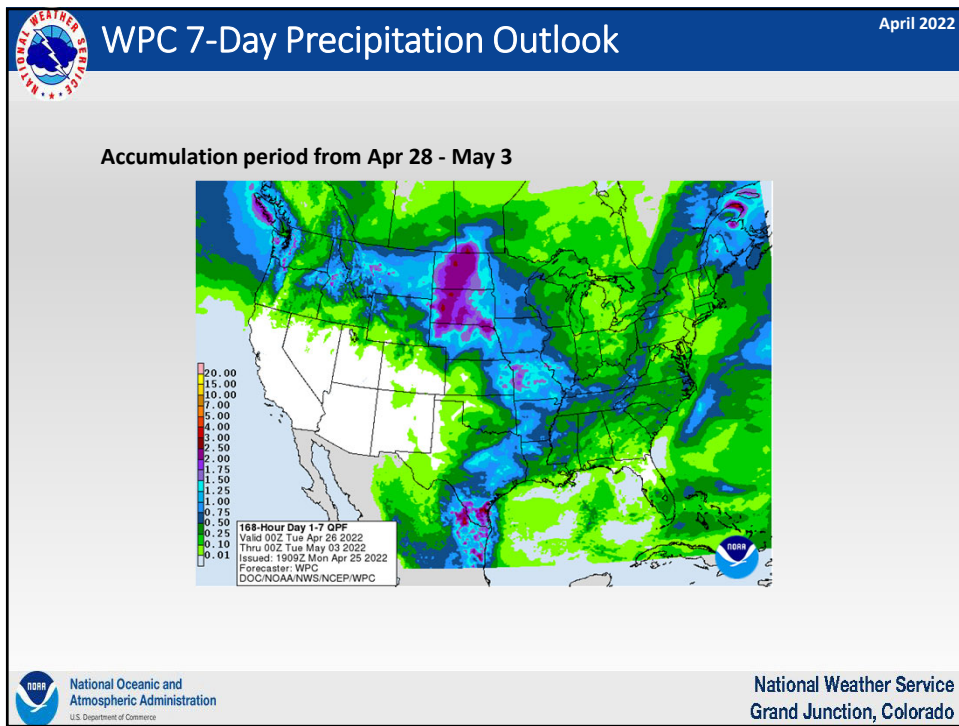




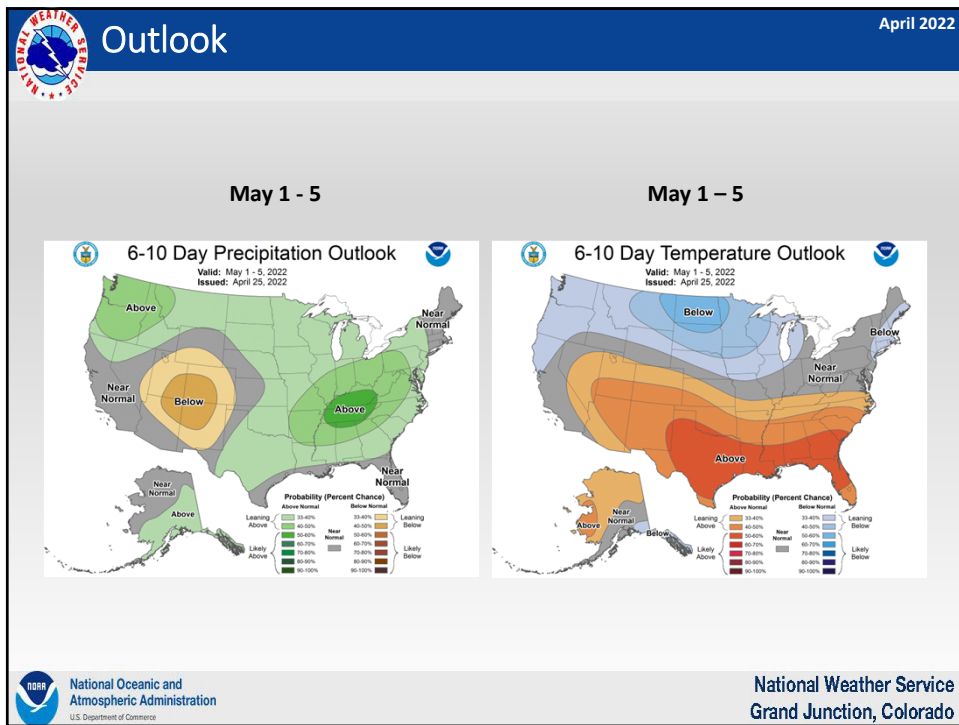
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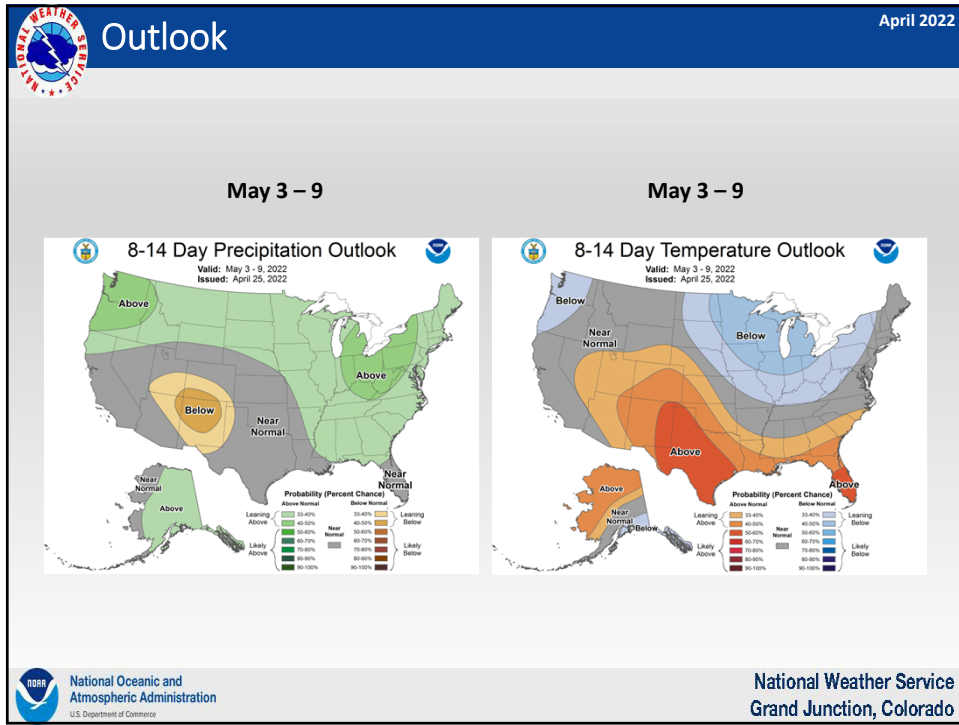
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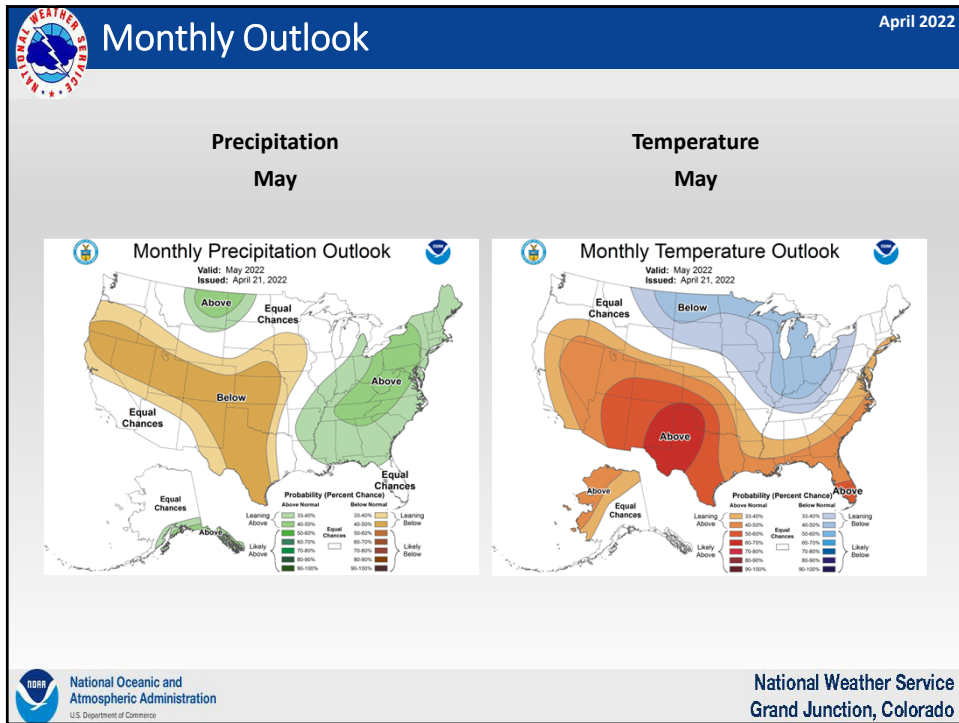
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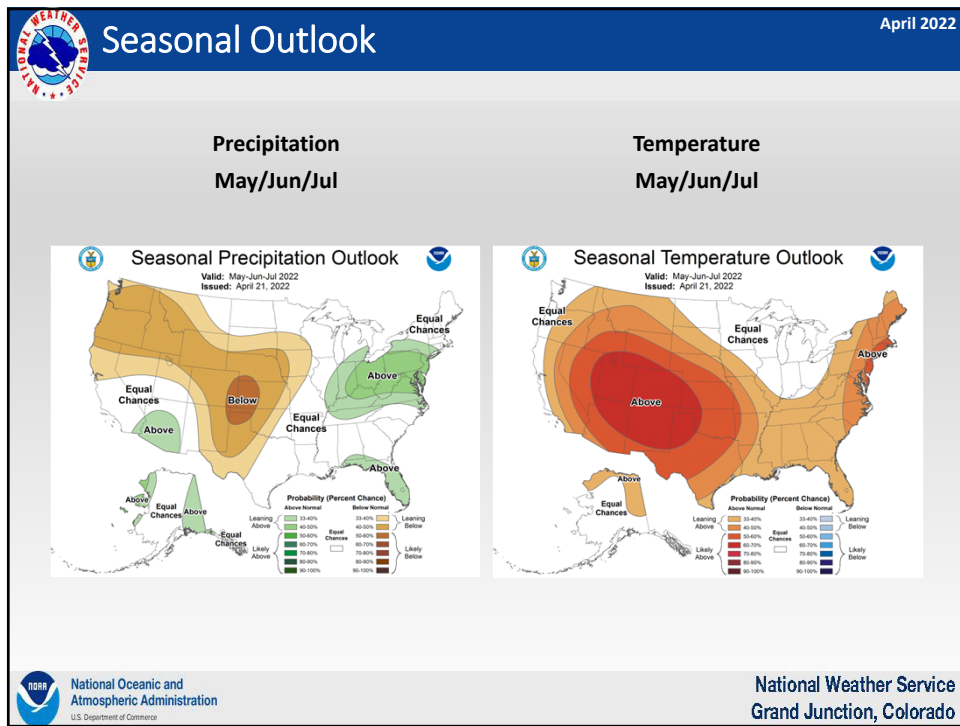
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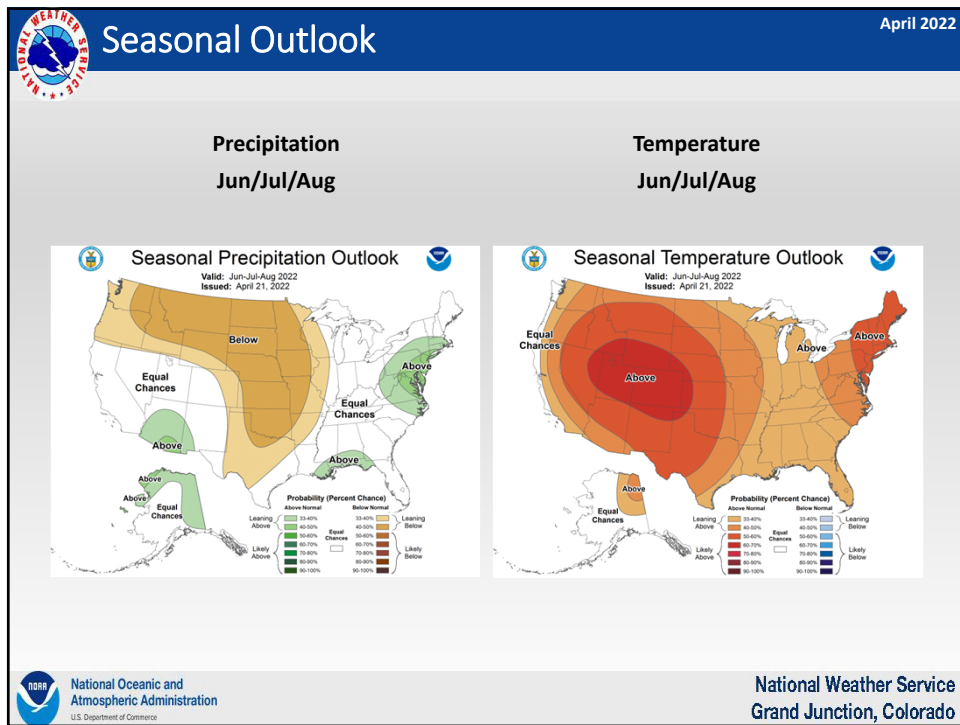
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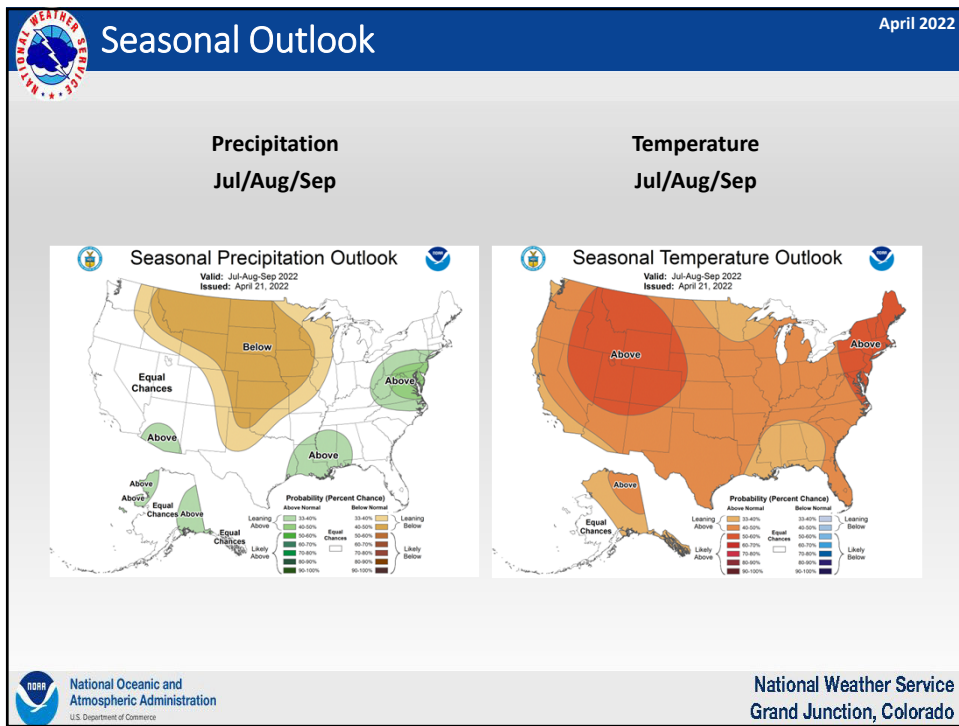
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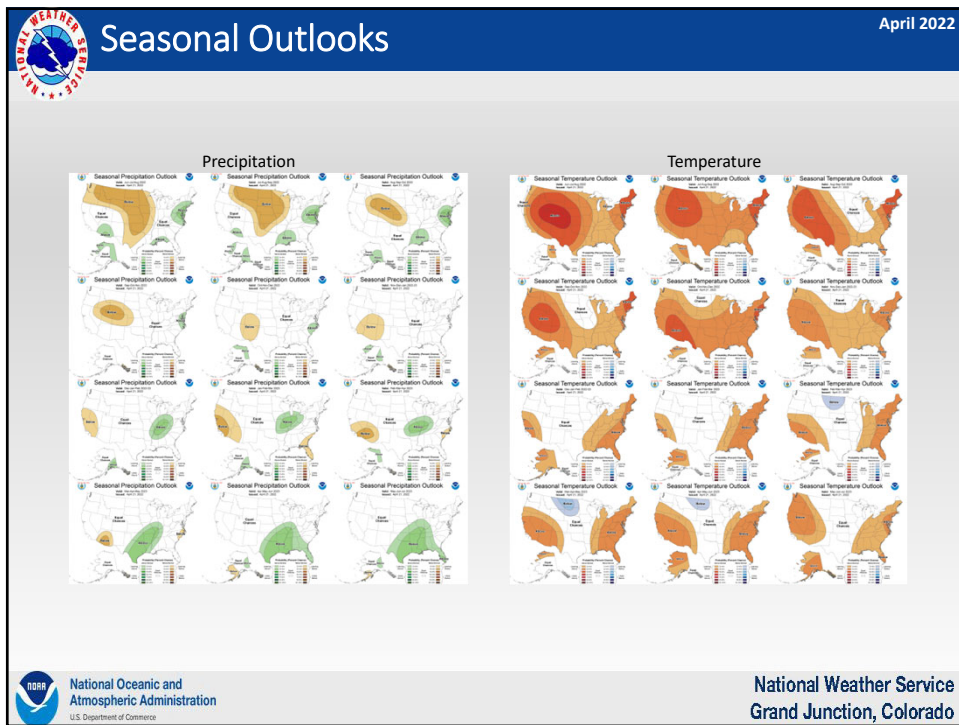
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Aspinall Operations Meeting  
 Water Supply Outlook  
 April 2022

Ashley Nielson  
 Senior Hydrologist  
 Colorado Basin River Forecast Center  
 National Weather Service/NOAA



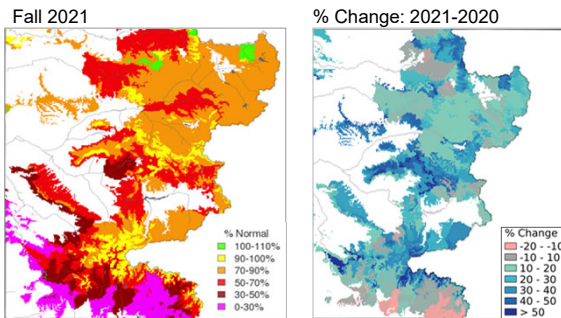
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Fall Modeled Soil Moisture Conditions: 2020 vs. 2021

- Soil moisture conditions have improved from near record dry levels last year but still remain below normal across the majority of the Gunnison River Basin.

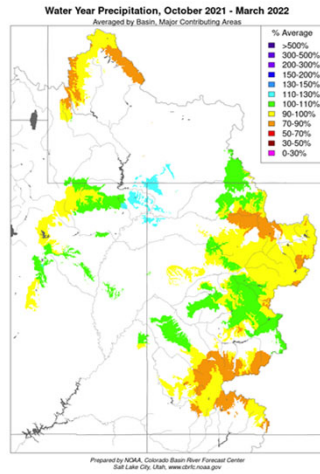
CBRFC Modeled Soil Moisture:

- Represents the deep soil layer
- Source of longer-term (weeks to years) streamflow
- Impacts water supply forecasts
  - Below average conditions = lower forecasts
  - Above average conditions = higher forecasts



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### Water Year (Oct-Mar) Precipitation

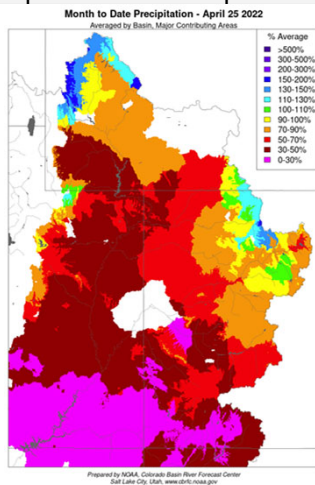


Basin Mean Precipitation as a % of Average	
Water Year	95
October	105
November	40
December	225
January	40
February	80
March	90

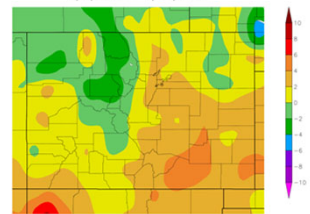
Water year precipitation is near normal in the Gunnison River Basin. There is a strong north-south divide with the northern half of the basin having better conditions than the southern half of the basin.

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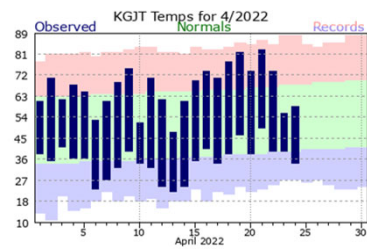
### April Precipitation and Temperature to Date



Departure from Normal Average Maximum Temperature (F)  
4/1/2022 - 4/24/2022



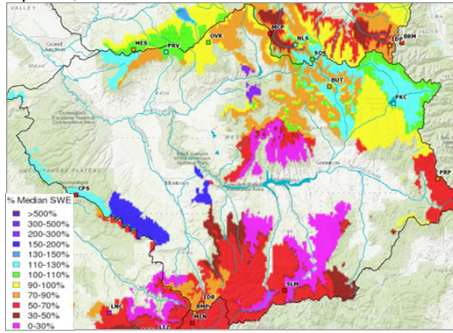
Generated 4/25/2022 at MPRCC using provisional data. NOAA Regional Climate Centers



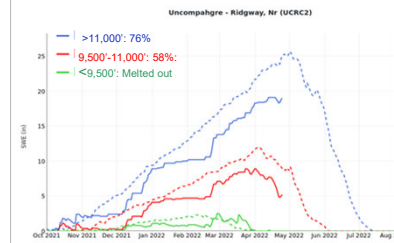
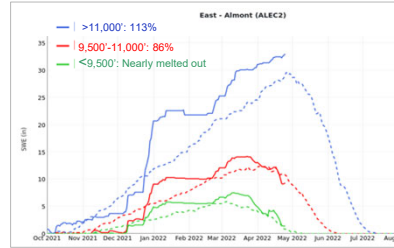
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### Snow Conditions: CBRFC Model Snow Water Equivalent

April 24, 2022

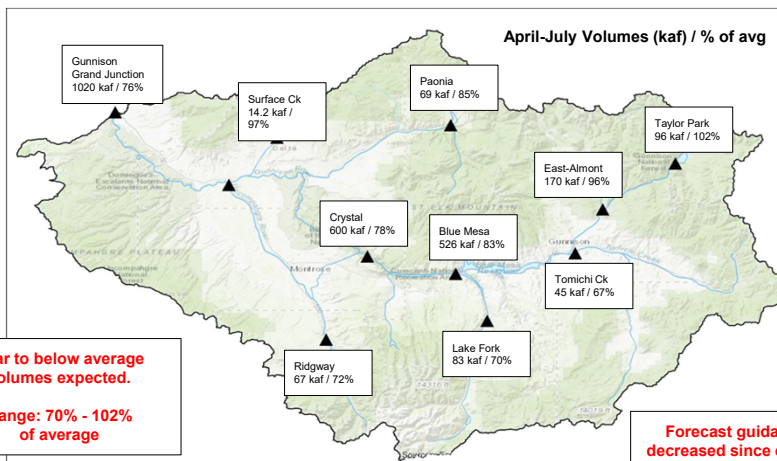


- Impressive storms and significant SWE accumulation in late December
- Dry January; storms returned in Feb-April.
- Peak snow conditions:
  - Near to Above normal: Northern half of basin
  - Below normal: Southern half of basin
- Melt has begun below 11,000'; earlier than normal.



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### CBRFC April 25th Gunnison River Basin Water Supply Guidance

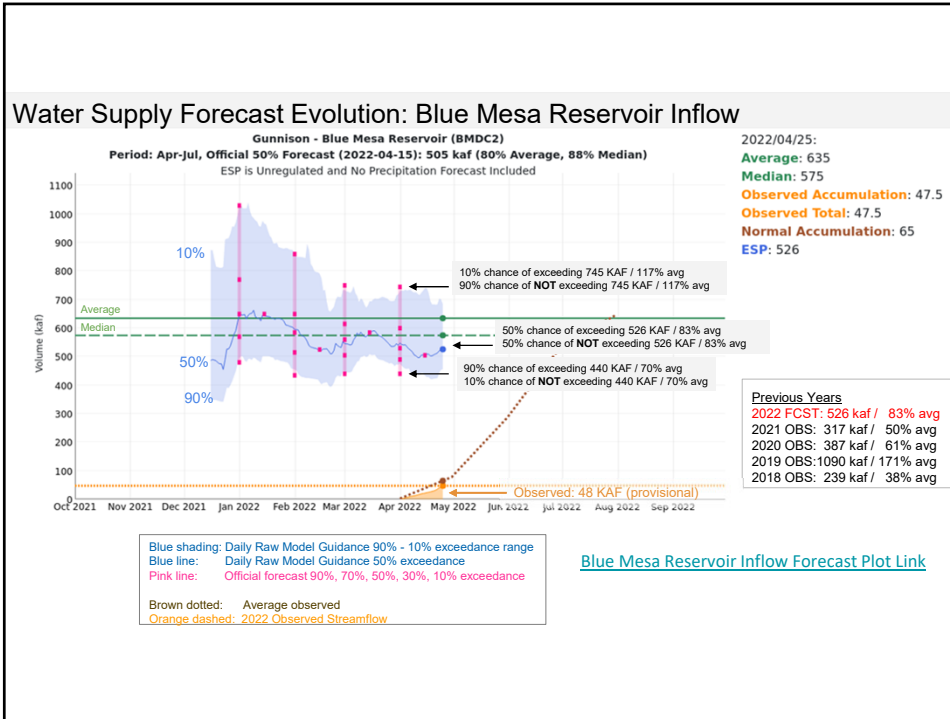


**Near to below average volumes expected.**  
**Range: 70% - 102% of average**

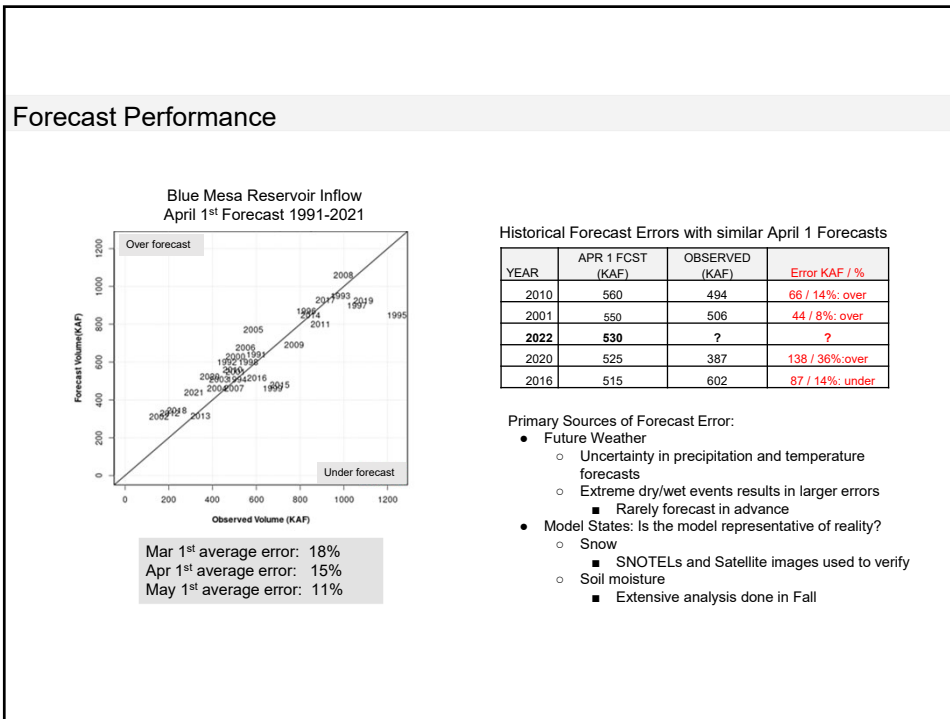
**Forecast guidance has decreased since early April.**

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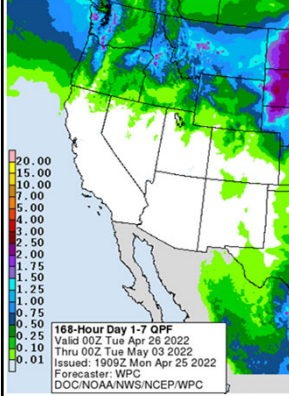
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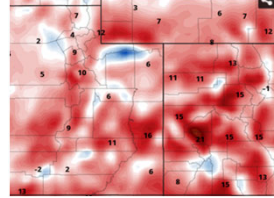
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## Upcoming Weather

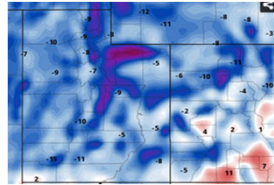
Precipitation Forecast: 4/26-5/3



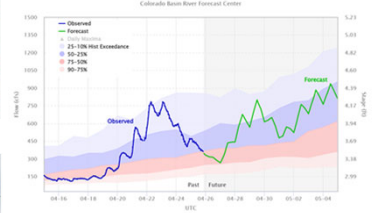
Temperature Anomaly: Wednesday 4/27



Temperature Anomaly: Friday 4/29



Forecast Hydrograph - East - Almont (ALEC2)



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## Summary

- **Soil moisture**
  - Conditions have improved from last year but are still below normal.
  - Soil moisture deficits still exist and must be overcome before runoff can occur.
- **Snow**
  - Peak Snow:
    - Near to above normal: Northern half of basin
    - Below normal: Southern half of basin
  - Melt at elevations below 11,000'
  - Melt earlier than normal
- **April Water Supply Forecasts**
  - Near to below average
    - Impacted by below normal modeled soil moisture conditions
  - Forecast guidance has decreased since early April for the majority of the basin.
- **Upcoming Weather**
  - Minimal precipitation expected in the Gunnison River basin over the next week.
    - April precipitation will most likely end below normal.
  - Periods of above average and below average temperatures

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## CBRFC Contacts

**Basin Forecasters**

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Michelle Stokes - Hydrologist In Charge  
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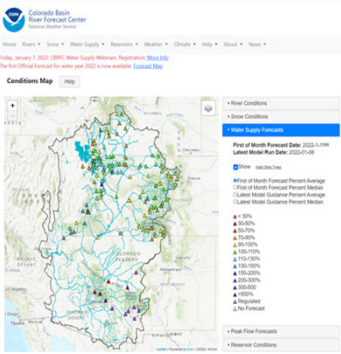
Paul Miller - Service Coordination Hydrologist  
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John Lhotak - Development and Operations Hydrologist  
[john.lhotak@noaa.gov](mailto:john.lhotak@noaa.gov)

**CBRFC Webpage**  
<https://www.cbrfc.noaa.gov/>


**CBRFC Operations**  
[cbrfc.operations@noaa.gov](mailto:cbrfc.operations@noaa.gov)  
 801-524-4004

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

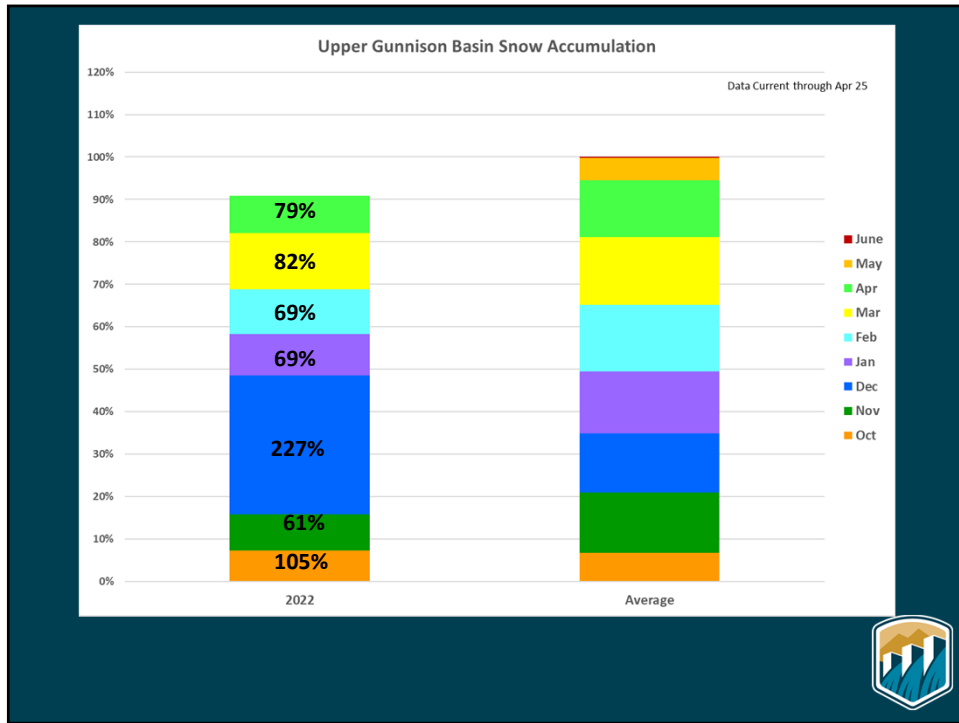


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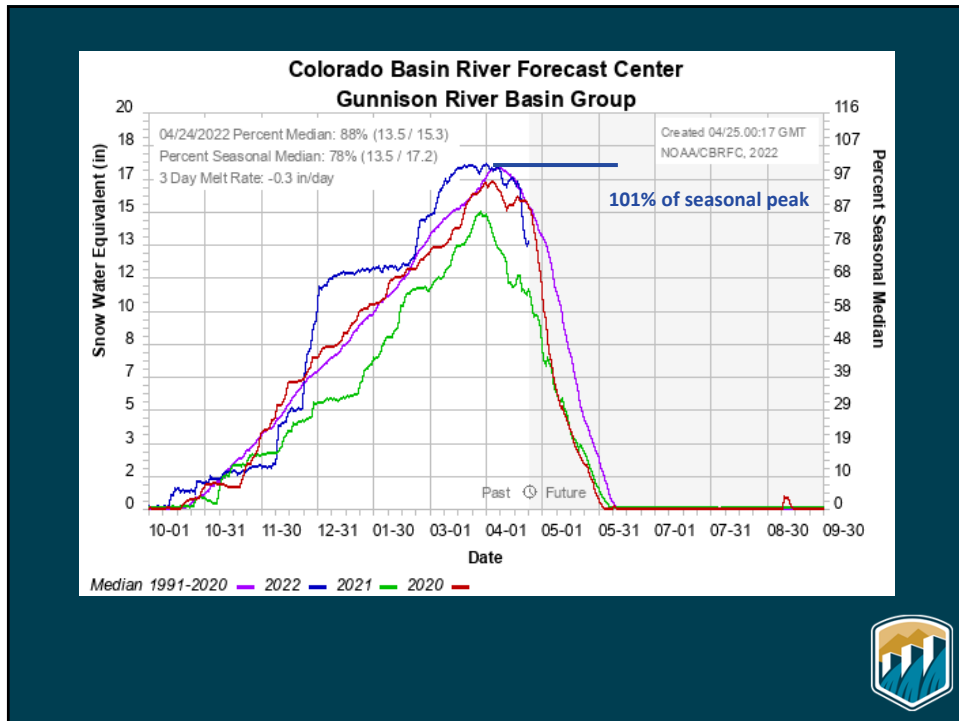
# SNOWPACK SUMMARY



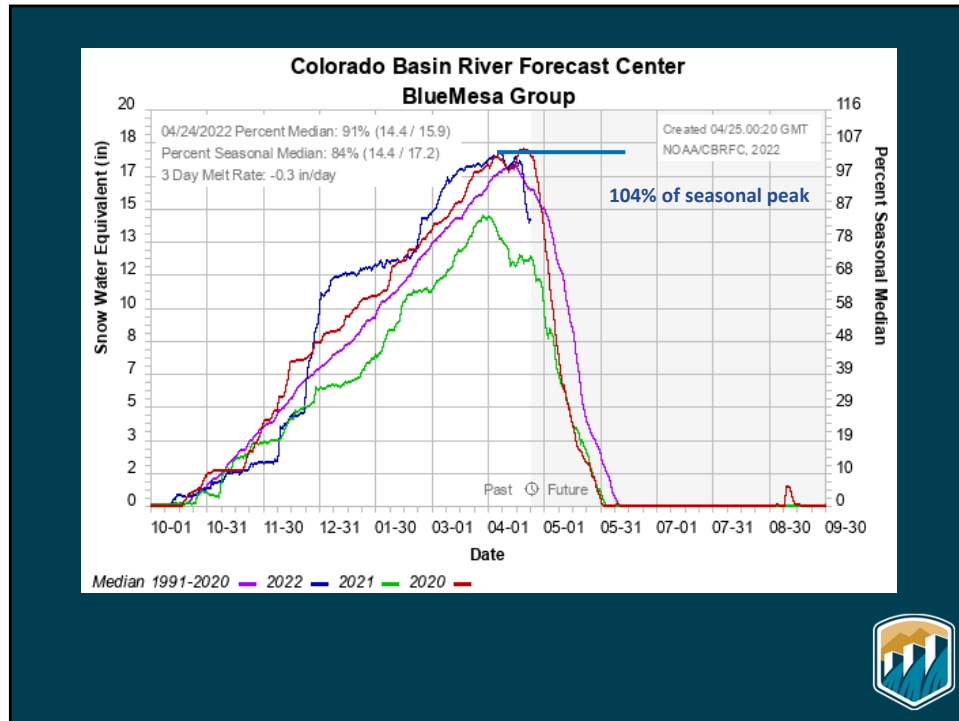
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## RESERVOIR AND RIVER STATUS

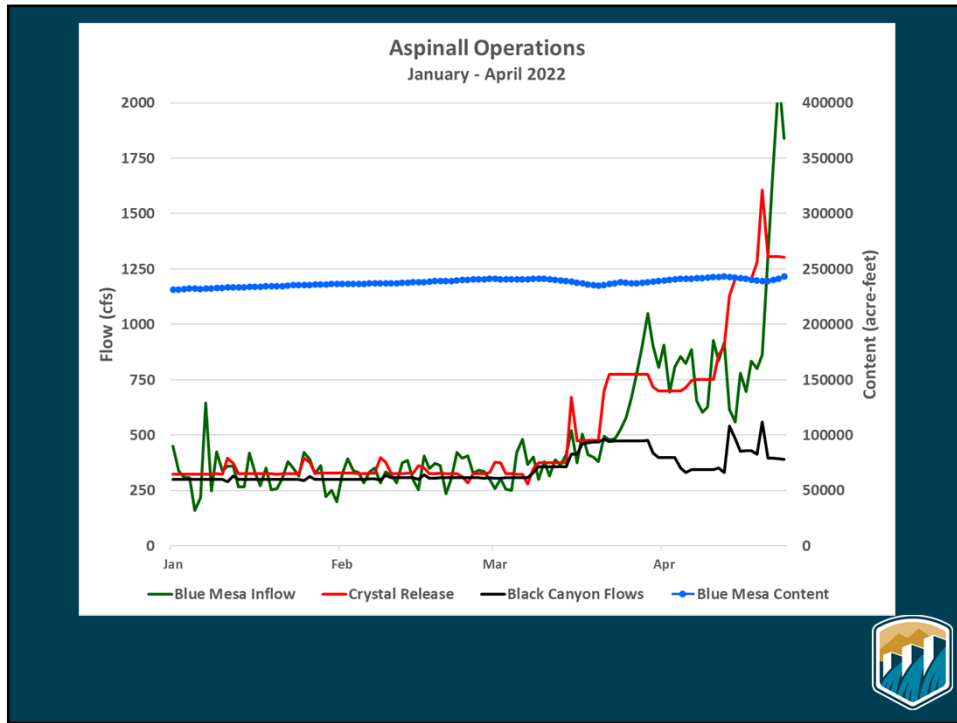
Blue Mesa Reservoir content is currently at 243,000 acre-feet at an elevation of 7437 feet.

Crystal Dam is releasing 500 cfs and flows in the Gunnison River through the Black Canyon are 350 cfs

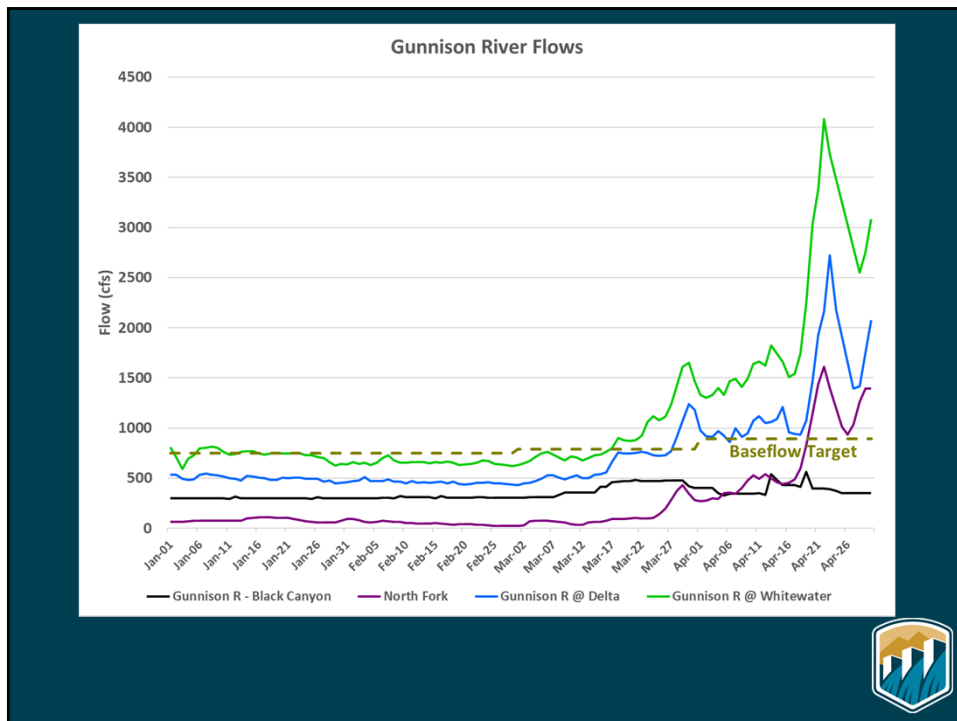
Flows in the lower Gunnison River at the Whitewater gage are 2100 cfs, above the baseflow target of 890 cfs

*The Gunnison Tunnel has been shutdown due to an erosion issue near the South Canal. Crystal releases have been reduced accordingly and river flows downstream are around 350 cfs.*

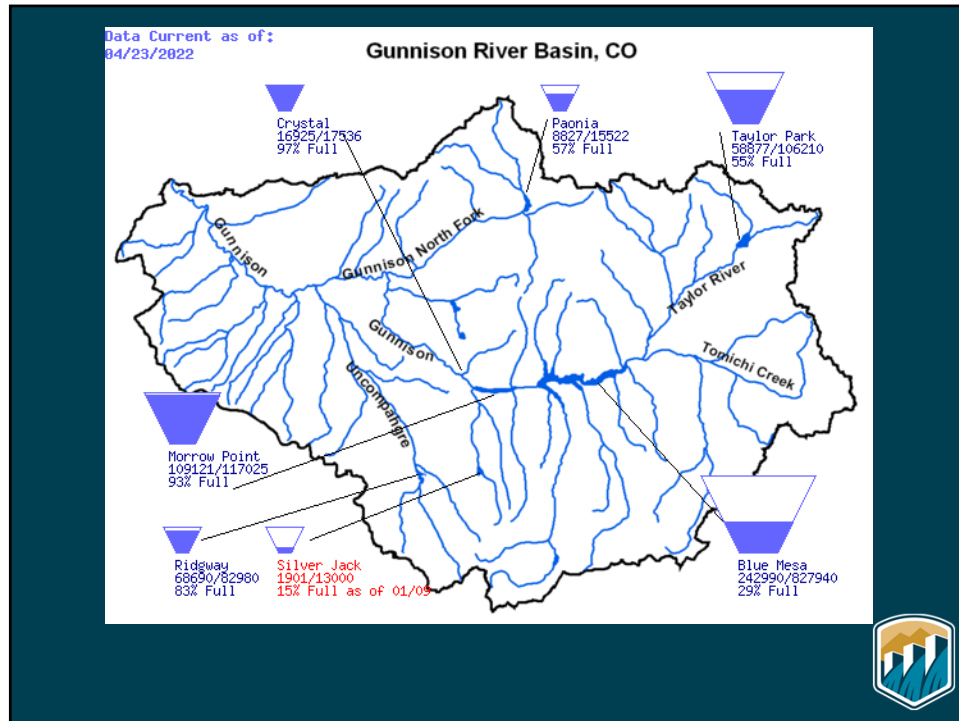
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## SPRING RUNOFF FORECASTS AND TARGETS

Early season runoff forecasts for major rivers in the Gunnison Basin are in the 70-100% of average range

The April 15<sup>th</sup> runoff forecast for Blue Mesa Reservoir puts 2022 into the Moderately Dry hydrologic category

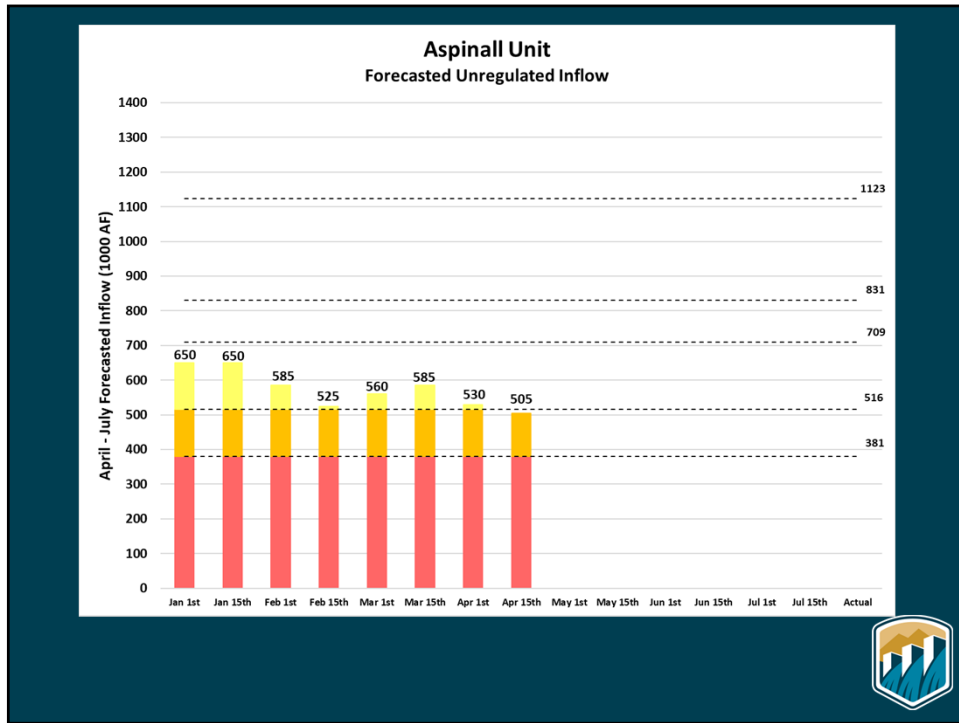
The ROD targets in the Moderately Dry category call for a 1 day peak flow of 7,624 cfs at Whitewater. However, there is a drought rule that allows the peak flow at Whitewater to be reduced to 5,000 cfs when Blue Mesa content is less than 400,000 acre-feet.

There are no half bankfull or peak flow duration targets.

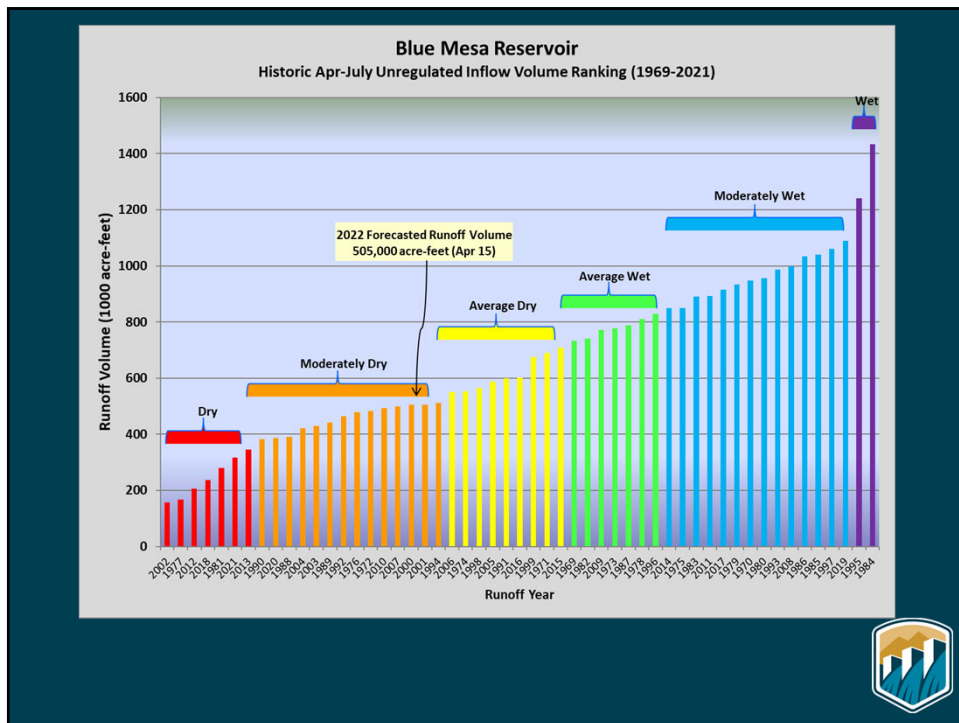
Drought rules that lower the baseflow targets will be in effect in a Moderately Dry year

The Black Canyon water right peak flow target is 2,790 cfs

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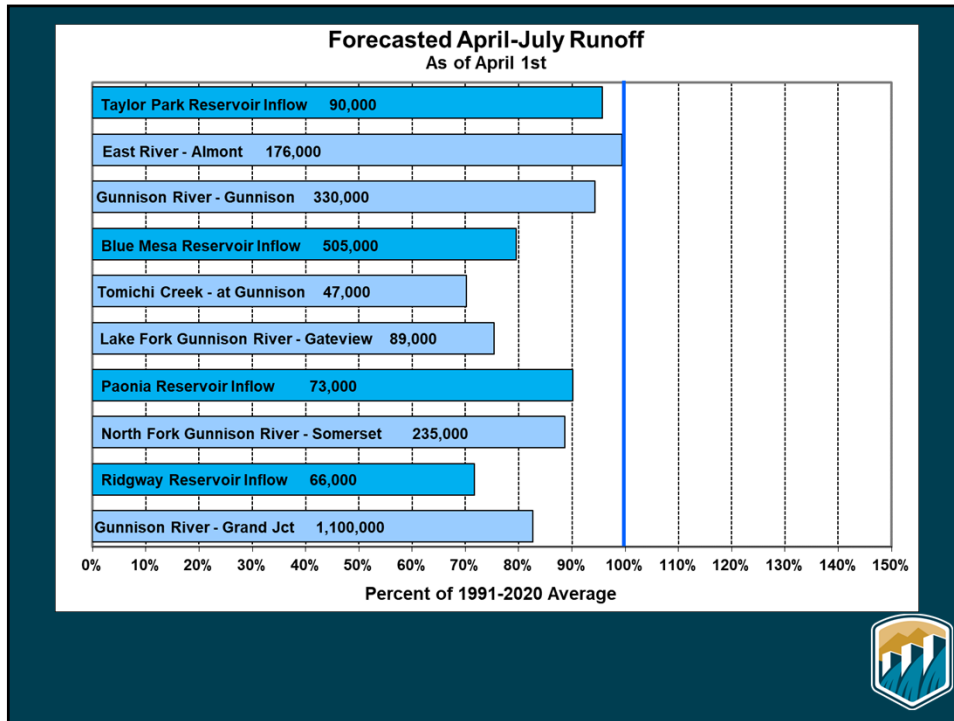


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### Spring Peak & Duration Targets Based on Hydrologic Year Type

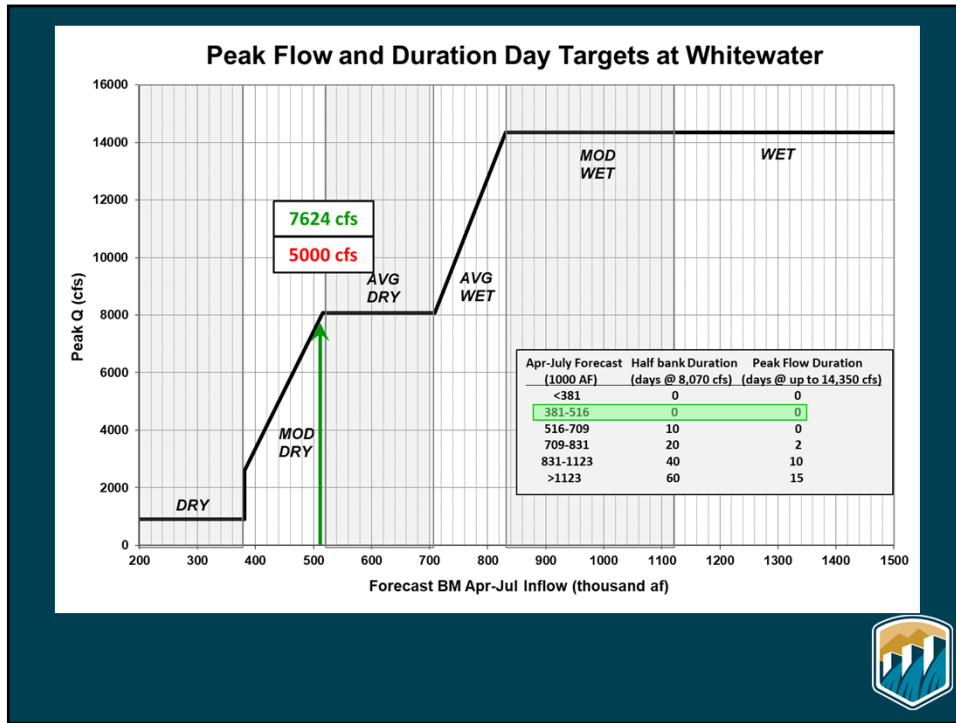
Year Type	Blue Mesa Forecasted	Desired Peak at Whitewater	Duration of Half Bank (8,070 cfs)	Duration of Peak Flow (up to 14,350 cfs)
	April-July Inflow Af	cfs	Days	Days
DRY	< 381,000	900	0	0
MOD DRY	381,000 to 516,000	2,600 to 8,070	0	0
AVG DRY	516,001 to 709,000	8,070	10	0
AVG WET	709,001 to 831,000	8,070 to 14,350	20	2
MOD WET	831,001 to 1,123,000	14,350	40	10
WET	>1,123,000	14,350	60	15

**April 15**  
**505,000**  
→

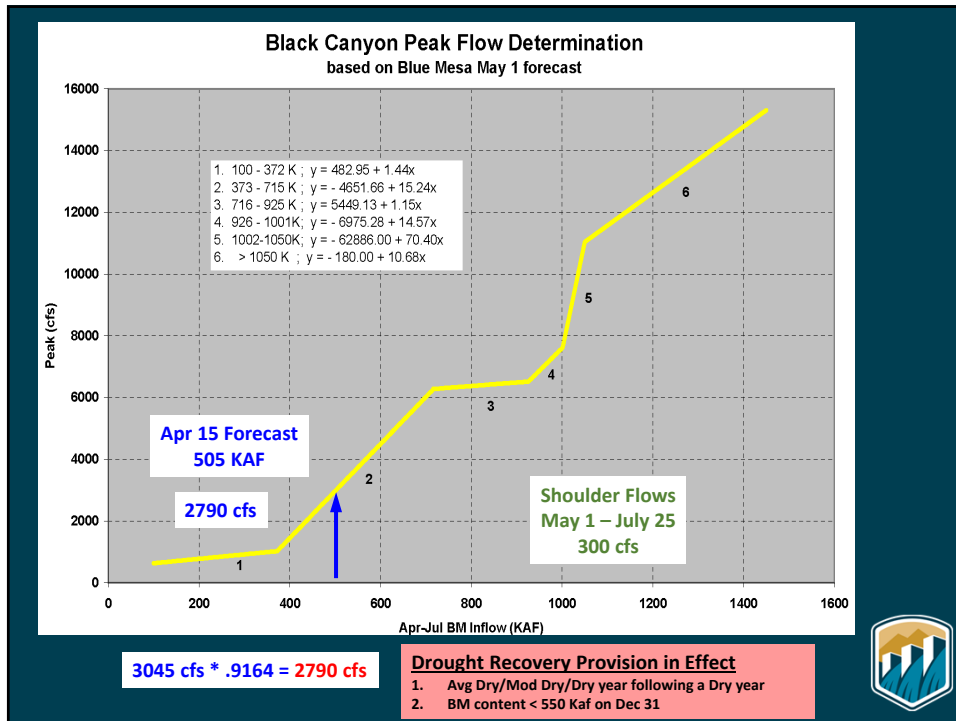
Drought Rules

- When a Moderately Dry year follows a Dry or Moderately Dry year and Blue Mesa content < 400,000 af on Mar 31 or Apr 30, the peak target at Whitewater is reduced to 5000 cfs

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# PROJECTED OPERATIONS

In order to achieve the ROD targets in the lower Gunnison River it is expected that flows in the Gunnison River through the Black Canyon will peak near 2,800 cfs

The entire spring operation is projected to take 11 days

Blue Mesa Reservoir is expected to reach a maximum content of ~450,000 acre-feet, about 47 feet below the full reservoir level

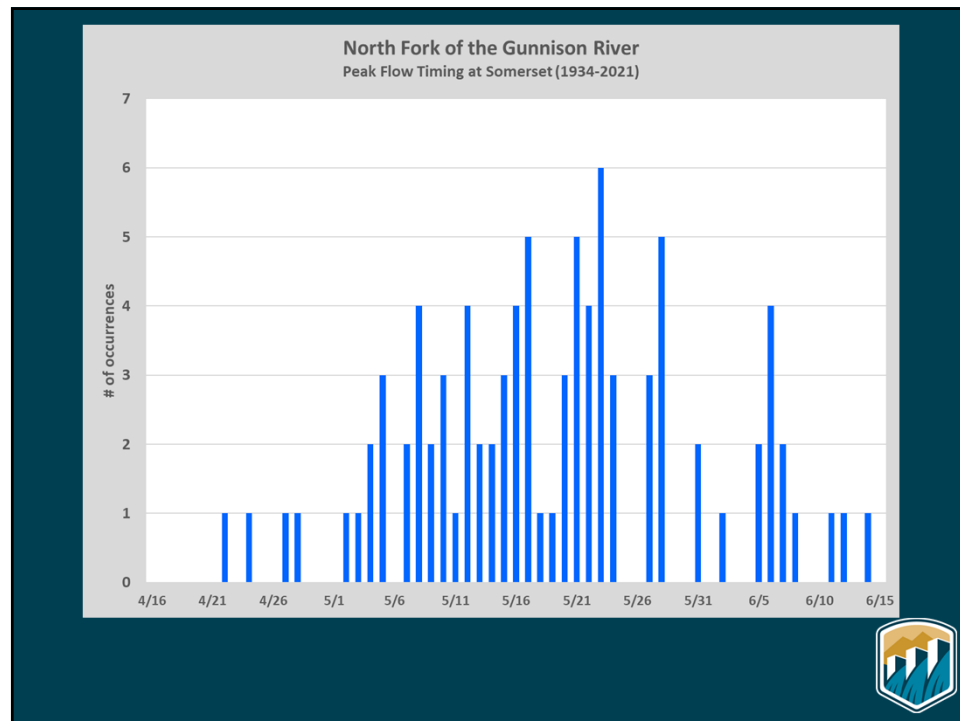
A change back to the Average Dry category would result in lower reservoir levels at Blue Mesa than the current Mod Dry category projections

After the spring operation has concluded, Aspinall releases will continue to meet the baseflow targets

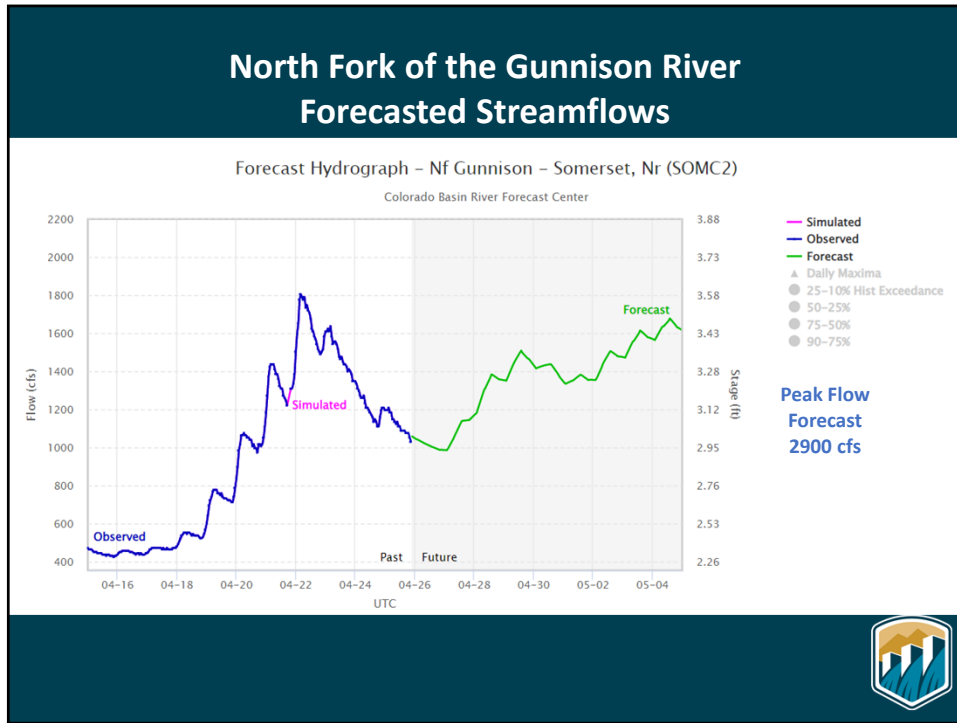
Flows in the Gunnison River through the Black Canyon are projected to range between 300 cfs and 400 cfs during the summer and fall months



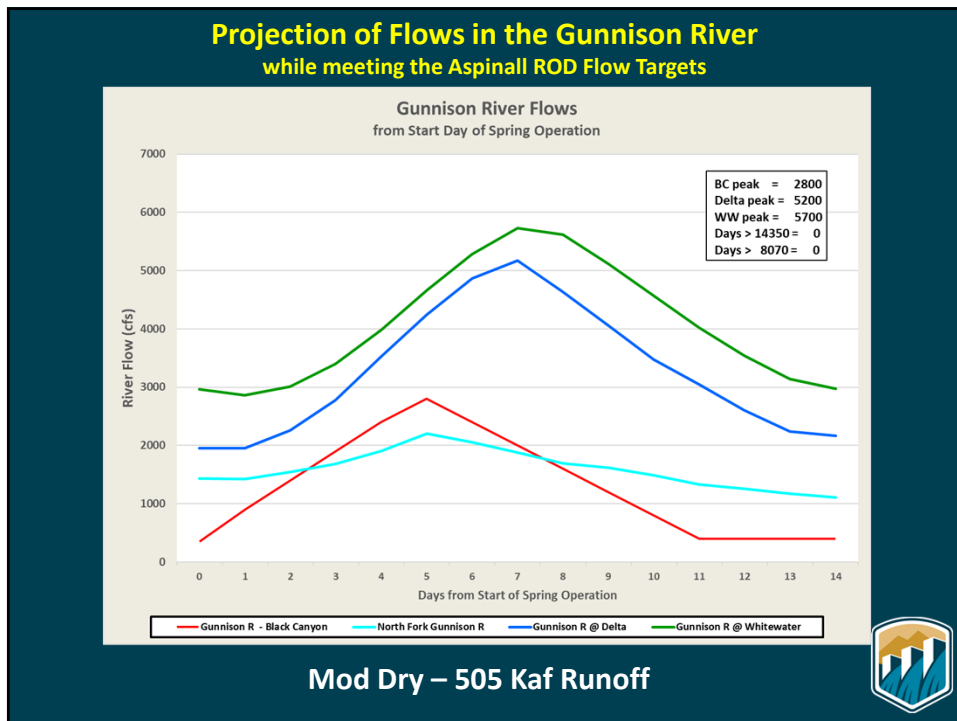
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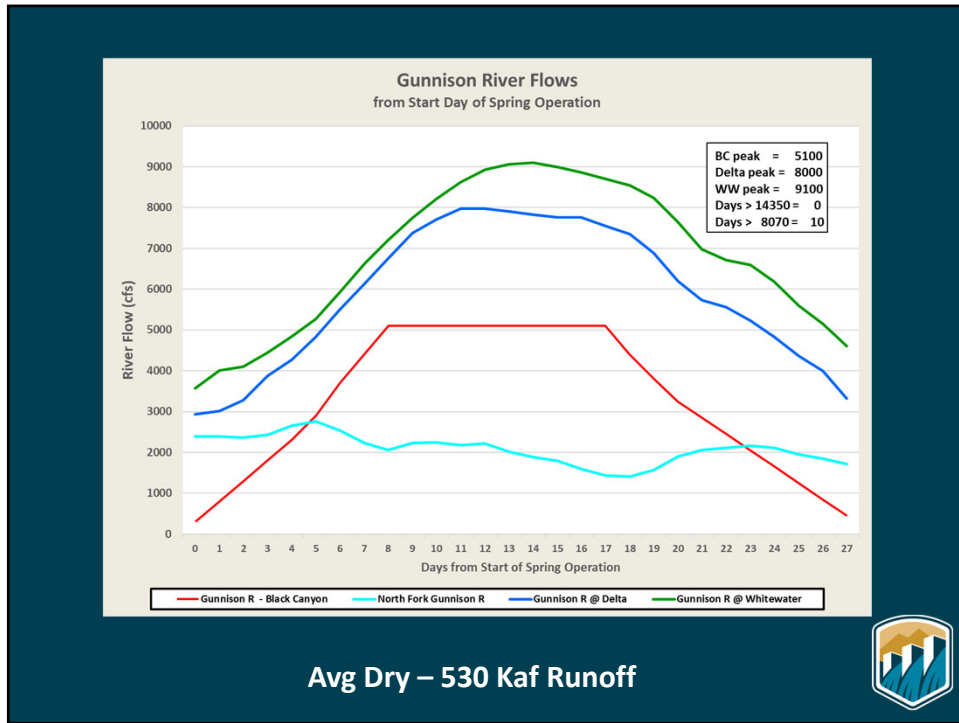
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# OPERATIONS – REMAINDER OF YEAR

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## Baseflow Targets

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Wet</b>	1050	1050	1050	1050	1050	1500	1500	1500	1050	1050	1050	1050
<b>Mod Wet</b>	1050	1050	1050	1050	1050	1500	1500	1500	1050	1050	1050	1050
<b>Avg Wet</b>	1050	1050	1050	1050	1050	1500	1500	1050	1050	1050	1050	1050
<b>Avg Dry</b>	1050	1050	1050	1050	1050	1500	1500	1050	1050	1050	1050	1050
<b>Mod Dry*</b>	750	750	750/790	750/890	750/890	1050	1050	1050	750/890	750/790	750/790	750
<b>Dry*</b>	750	750	750/790	750/890	750/890	1050	1050	750/890	750/890	750/790	750/790	750

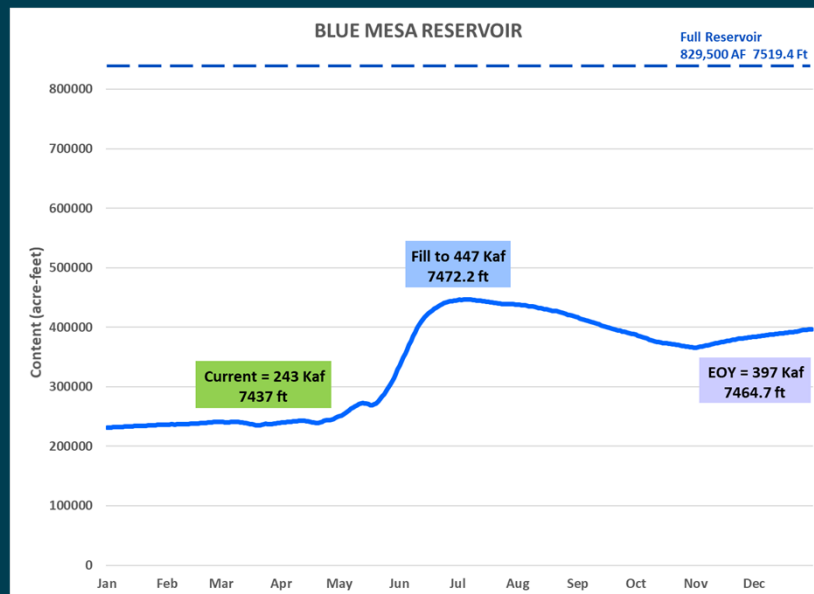
\*During March through November in Moderately Dry and Dry type years, additional releases will be made as necessary to provide flows above the 750 cfs anticipated to be diverted by the Redlands Water and Power Company, for the fish ladder and fish screen as shown.

### Drought Rules

- During Dry and Moderately Dry years, if Blue Mesa Reservoir content drops below 600,000 af, the Whitewater baseflow target is reduced from 1050 cfs to 900 cfs until Blue Mesa Reservoir content exceeds 600,000 af



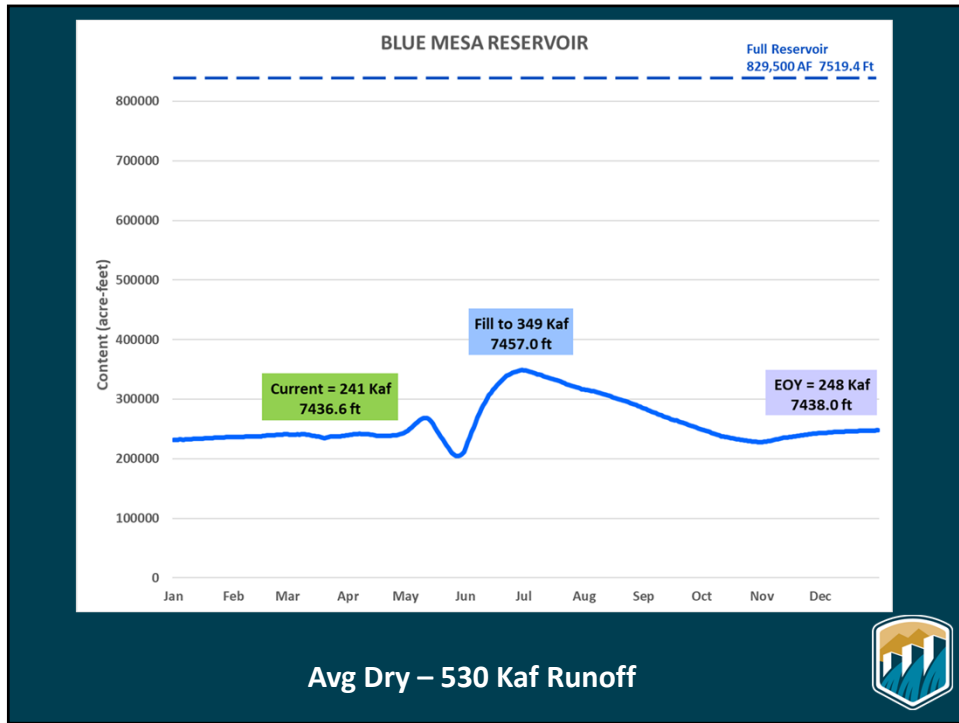
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Mod Dry – 505 Kaf Runoff



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# Drought Response Operation Agreement (DROA)

- DROA is an element of the Drought Contingency Plan to address water elevations in key Colorado River reservoirs. (Signed May 2019)
- **Purpose:** minimize risk of Lake Powell falling below the target elevation (3525') and thereby:
  - Fulfill Compact obligations
  - Maintain hydropower production
  - Minimize adverse effects to resources and infrastructure
- Directed Upper Basin States (WY, UT, CO, NM) and Reclamation to develop a Drought Response Operation Plan

<https://www.usbr.gov/dcp/finaldocs.html>

Attachment A1 to the Agreement Concerning Colorado River Drought Contingency Management and Operations ("Companion Agreement")

**AGREEMENT FOR DROUGHT RESPONSE OPERATIONS AT THE INITIAL UNITS OF THE COLORADO RIVER STORAGE PROJECT ACT**

This Agreement for Drought Response Operations ("Drought Response Operations Agreement") at the Glen Canyon Dam, Flaming Gorge Dam, Carcandit (the "Applugh Unit"), and Navajo Dam authorized by the Colorado River Storage Project Act (collectively referred to as the "CRSPA Initial Units" and individually as "CRSPA Initial Unit"), an element of the Upper Colorado River Basin's Drought Contingency Plan, is hereby made and entered into this 20th day of May, 2019 by and among the Upper Colorado River Division (States of Colorado, New Mexico, Utah, and Wyoming ("Upper Division States"), through the Upper Colorado River Commission ("Commission"), and the Secretary of the Interior ("Secretary") hereinafter collectively referred to as the "Parties." The Secretary may delegate his or her duties under this Drought Response Operations Agreement to the Bureau of Reclamation ("Reclamation").

**I. INTRODUCTION**

**A. BACKGROUND/OBJECTIVE**

Since 2000, drought conditions in the Colorado River Basin have led to marked fluctuations and decreases in water elevations at key Colorado River reservoirs. The Upper Division States, through the Commission, have developed a Drought Contingency Plan to address the possibility of reservoir storage at Lake Powell declining below a target elevation. This Drought Response Operations Agreement is one element of that Plan. Its primary goals are to minimize the risk of Lake Powell falling below a target elevation and thereby:

1. Help ensure the Upper Division States will continue fulfilling their interstate water compact obligations while exercising their rights to develop and utilize the Upper Colorado River Basin's ("Upper Basin") Colorado River System compact apportionment.
2. Maintain the ability to generate hydropower at Glen Canyon Dam so as to protect:
  - a. Continued operation and maintenance of the initial units and participating projects authorized under the 1956 Colorado River Storage Project Act, as amended ("CRSPA");
  - b. Continued funding and implementation of environmental and other programs.



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# Drought Response Operation Agreement (DROA)

- II.A.3.c - Participation from all CRSPA Initial Units
  - "DROA shall ensure that ALL CRSPA Initial Units will be considered for drought response operations:
    1. Operational Adjustments at Lake Powell
    2. All Initial Units Considered uniformly based on factors including:
      - Water availability
      - Hydrology
      - Resource conditions
      - Operational limitations
- II.A.3.d – Effectiveness
  - Releases "may not be recommended if they are ultimately determined to be futile to achieve the goals or intent of this Drought Response Operations Agreement"

<https://www.usbr.gov/dcp/finaldocs.html>

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## Drought Response Operations Plan

- **Plan Framework** – Static Guidance
  1. Introduction/Background
  2. Authorities governing DROA
  3. Hydrology and Projections summary
  4. Drought Response Operations summary
  5. Application of DROA
    - 1) DROA Planning Timeline
    - 2) Scope of DROA at initial units
    - 3) Effectiveness/futility
    - 4) Natural Resource Considerations
    - 5) Impacts to Basin Fund
    - 6) Transit Losses and Optimization
  6. Accounting/Recovery
  7. Consultation/Coordination/Outreach
  8. Monitoring/Amendments
- **Plan Attachments** – Specific to current year
  - A. Summary of current year (2022) DRO Plan
  - B. Glen Canyon Operational Adjustments
  - C. Flaming Gorge Operations
  - D. Aspinall Unit (Blue Mesa) Operations
  - E. Navajo Operations
  - F. Natural Resource Considerations
  - G. Basin Fund Considerations
  - H. Outreach Summary

<https://www.usbr.gov/dcp/droa.html>



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## Upper Basin DROA Initial Unit Emergency Releases in 2021

DROA Releases for the July 24MS Model Run

	Jul (kaf)	Aug (kaf)	Sep (kaf)	Oct (kaf)	Nov (kaf)	Dec (kaf)	Sum
Flaming Gorge	13	42	43	27	0	0	125
Blue Mesa	0	18	18	0	0	0	36
Navajo	0	0	0	0	0	0	0
Sum:	13	60	61	27	0	0	161



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## 2022 DROA Scenarios considered

CRSP Unit	DROA Scenario					
	No DROA	0.5 A	Scenario A	Scenario B	Scenario C	
Flaming Gorge	-	250,000	500,000	600,000	724,000	acft release
Aspinall	-	-	-	100,000	100,000	acft release
Navajo	-	-	-	-	-	acft release
Scenario total	-	250,000	500,000	700,000	824,000	acft



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## Timeline

- Documents published to <https://www.usbr.gov/dcp/droa.html>
- Upper Colorado River Commission considered during special session April 21 and recommends sending to Secretary of the Interior for approval

Currently there is no planned DROA Release at Aspinall in WY 2022.



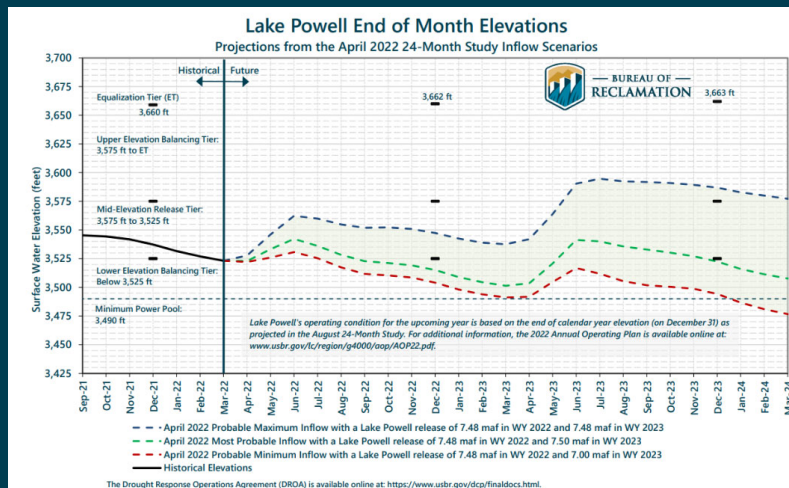
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## Methods to address drop in Lake Powell Storage

- Drought Response Operations Plan
  - Proposed release of 500 kaf from Flaming Gorge in 2022
- Lake Powell Annual Release Reduction under Interim Guidelines – Cooperative Action
  - This option is independent and outside the scope of DROA/DRO authority
  - 2022 Annual release volume is 7.48 maf
  - DOI is proposing reducing annual release volume to 7.0 maf
  - Future release of 480 kaf to the Lower Division States is to be determined
  - Likely to be approved at the same time as the DRO Plan



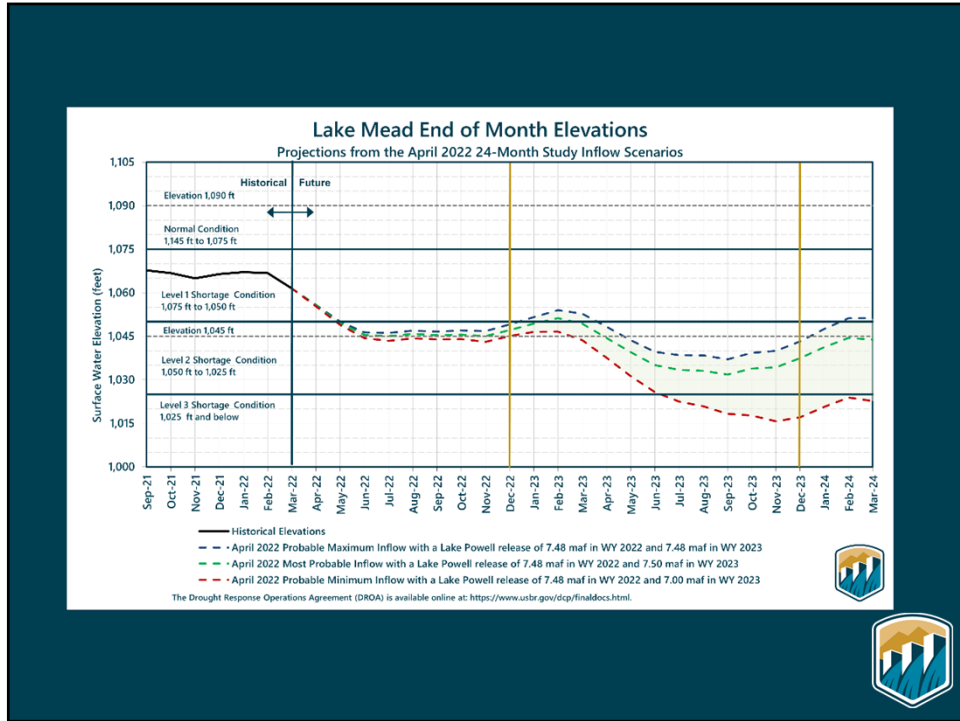
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See more about Glen Canyon Operations here: <https://www.usbr.gov/uc/water/crsp/cs/gcd.html>



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