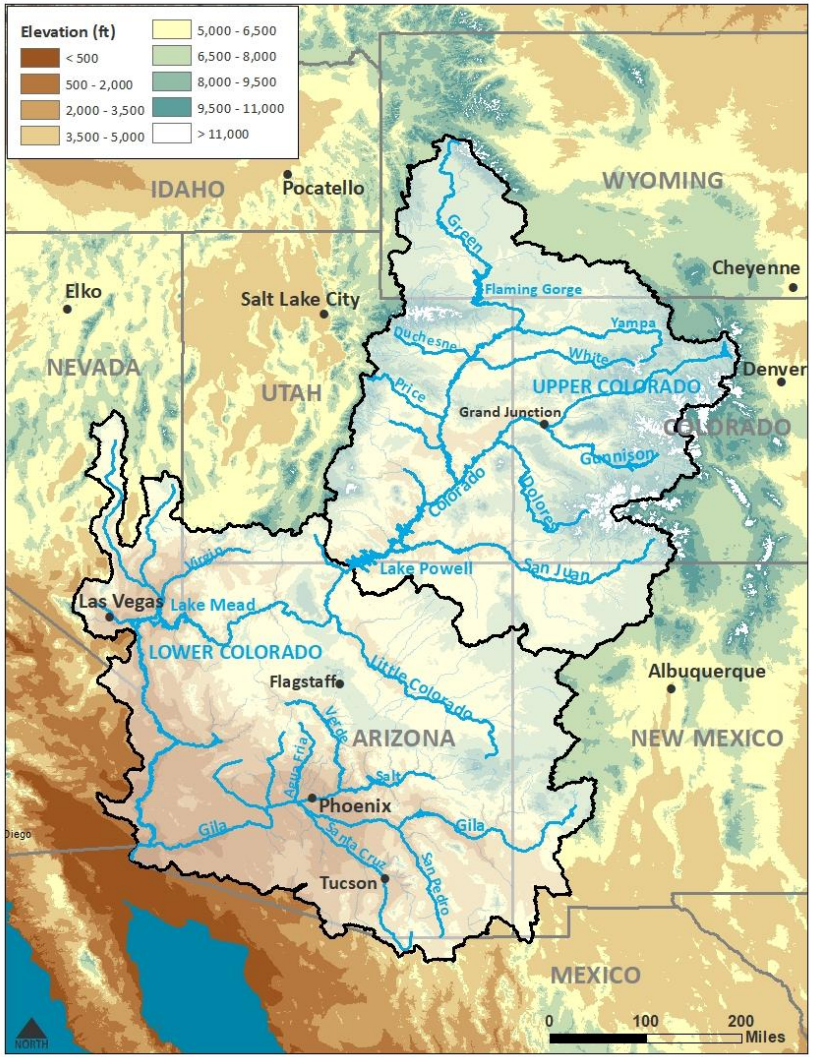
# Colorado River Basin Water Supply Briefing

February 7, 2024

Colorado Basin
River Forecast Center
National Weather Service



# Presentation Overview

Soil Moisture Conditions

Precipitation Review

Snowpack Conditions

2024 Water Supply Forecasts

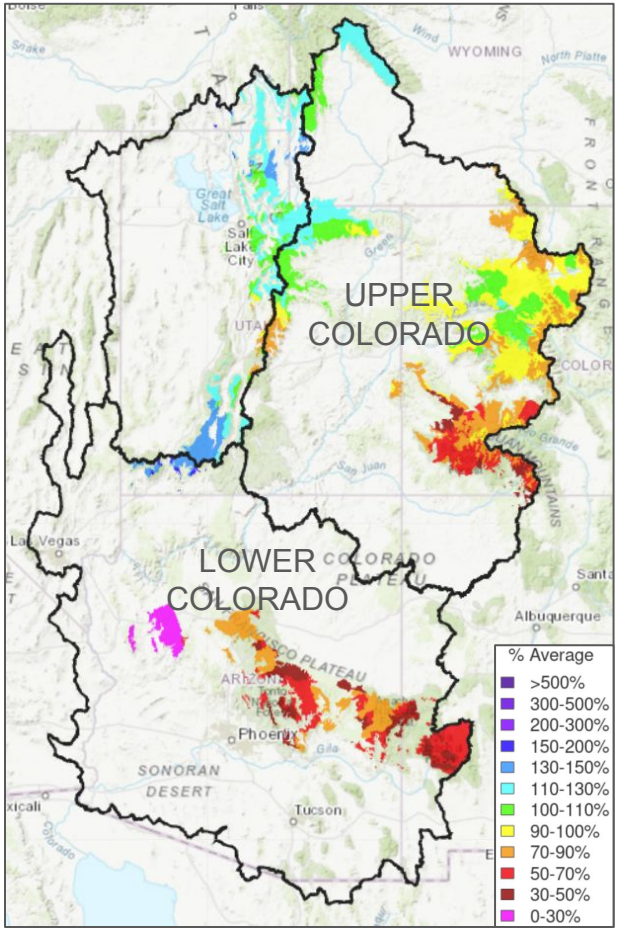
Early Season Forecast Error

Upcoming Weather

Contacts & Questions

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

# Fall 2023 Hydrologic Model Soil Moisture Conditions




CBRFC hydrologic model soil moisture is adjusted (if necessary) every fall after irrigation season has ended and before winter.
Data used to make adjustments:

- -Early November streamflow observations (baseflow)
- -Reservoir inflows
- -July-October precipitation
- -Past season(s) runoff conditions

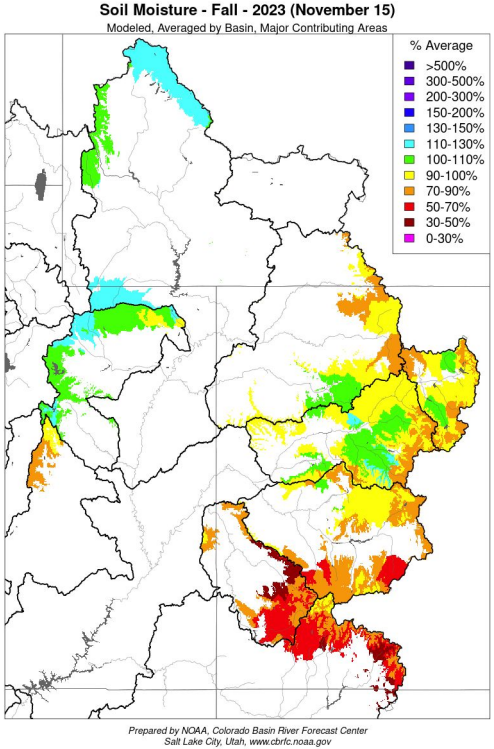
<u>Soil Moisture Impacts on Water Supply / Runoff</u>
Above normal soil moisture conditions → positive impact (increased runoff efficiency)
Below normal soil moisture conditions → negative impact (decreased runoff efficiency)

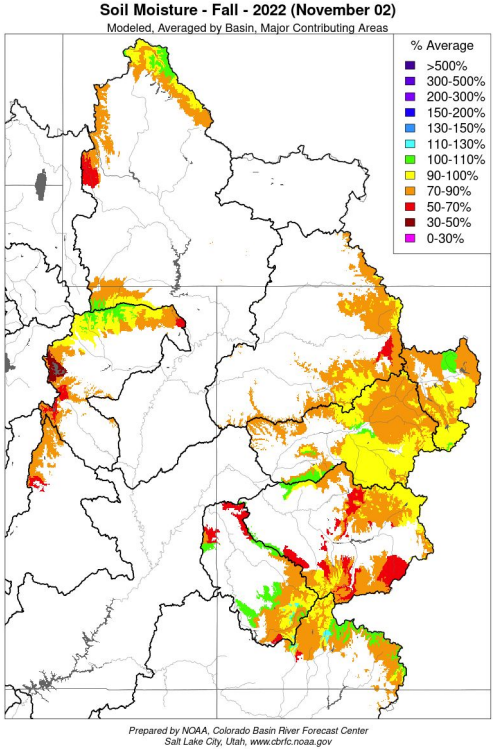
**Colorado River Basin: near to below normal; improves from south to north**

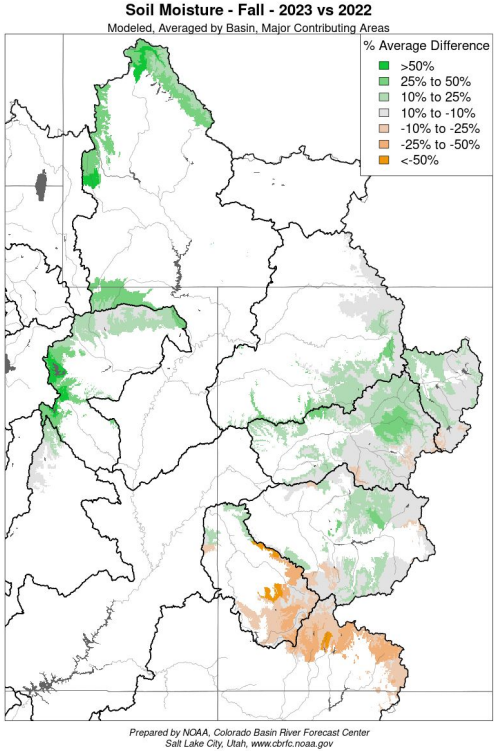
**The timing and magnitude of spring runoff is ultimately a result of snowpack conditions, spring weather, and soil moisture conditions.**

# UCRB Fall Model Soil Moisture Conditions: 2023 vs. 2022

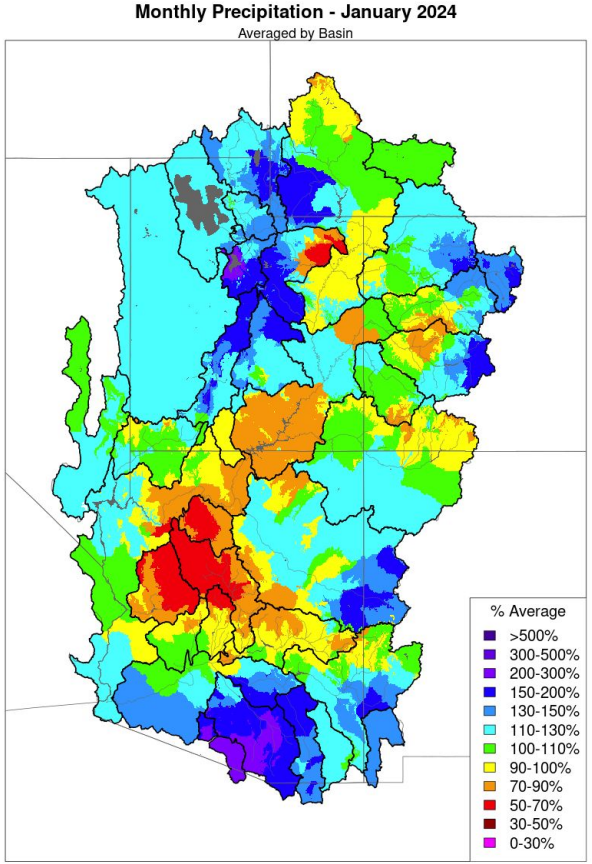
Northern basins: near/above average soil moisture, better/similar compared to last year
Southern basins: below average soil moisture, worse compared to last year
↘ Due to a much drier than normal Southwest monsoon season.

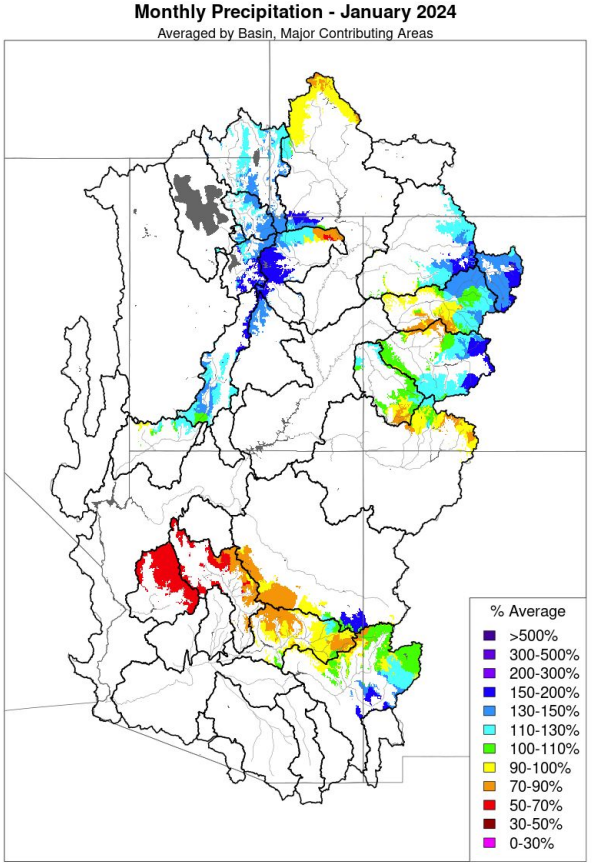


# January 2024 Precipitation Summary

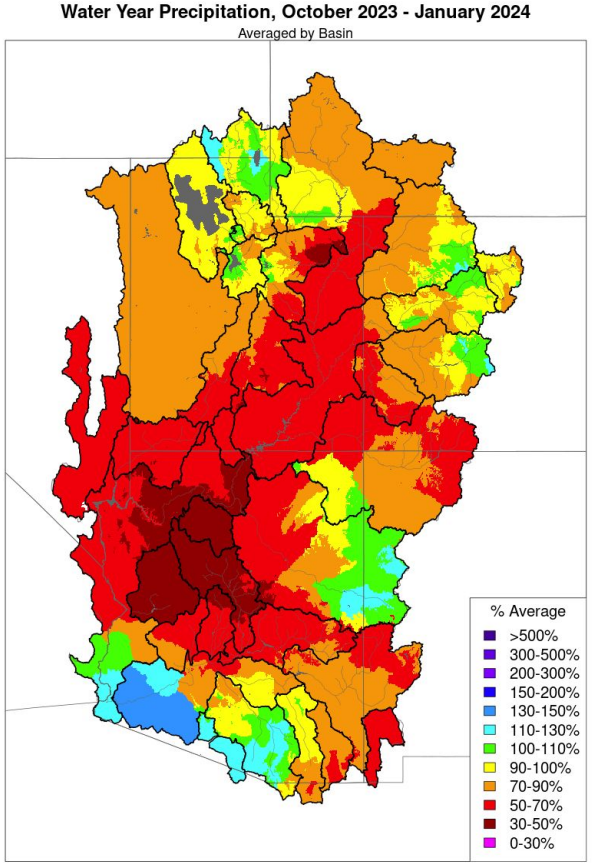


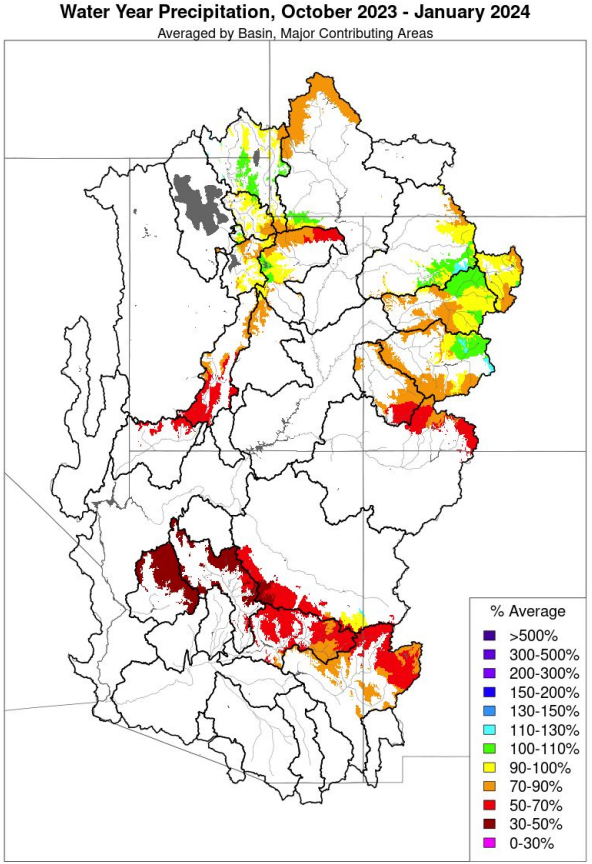




An active weather pattern during January resulted in near to above average monthly precipitation across most CRB high elevation areas.

| Water Year 2024<br>CBRFC Precipitation (Major Contributing Areas)<br>Percent of 1991-2020 Average | | |
|---|---|---|
| **UPPER COLORADO RIVER BASIN** | | |
| | Jan | Oct-Jan |
| Above Lake Powell | 120 | 86 |
| **Green River Basin** | | |
| Above Fontenelle | 97 | 81 |
| Above Flaming Gorge | 111 | 85 |
| Yampa/White | 133 | 96 |
| Duchesne | 124 | 76 |
| Price/San Rafael/Dirty Devil | 152 | 91 |
| **Colorado River Headwaters** | | |
| Above Kremmling | 145 | 91 |
| Eagle | 125 | 96 |
| Roaring Fork | 110 | 94 |
| Above Cameo | 126 | 93 |
| **Southwest Colorado** | | |
| Gunnison | 118 | 90 |
| Dolores | 101 | 72 |
| San Juan | 94 | 67 |
| **LOWER COLORADO RIVER BASIN** | | |
| Virgin | 112 | 59 |
| Little Colorado | 94 | 63 |
| Verde | 79 | 48 |
| Salt | 92 | 67 |
| Upper Gila | 107 | 72 |

# Water Year 2024 Precipitation Summary




Water year 2024 precipitation (October-January) is near to below normal.

| Water Year 2024<br>CBRFC Precipitation (Major Contributing Areas)<br>Percent of 1991-2020 Average | | |
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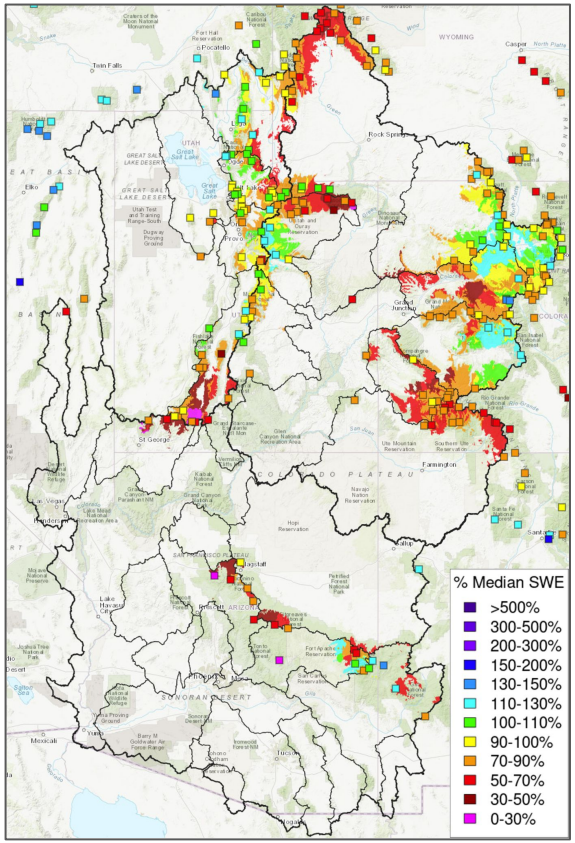
# Snowpack Conditions

## February 1 SWE Conditions

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




**SWE** = Snow Water Equivalent
The amount of water in snow.

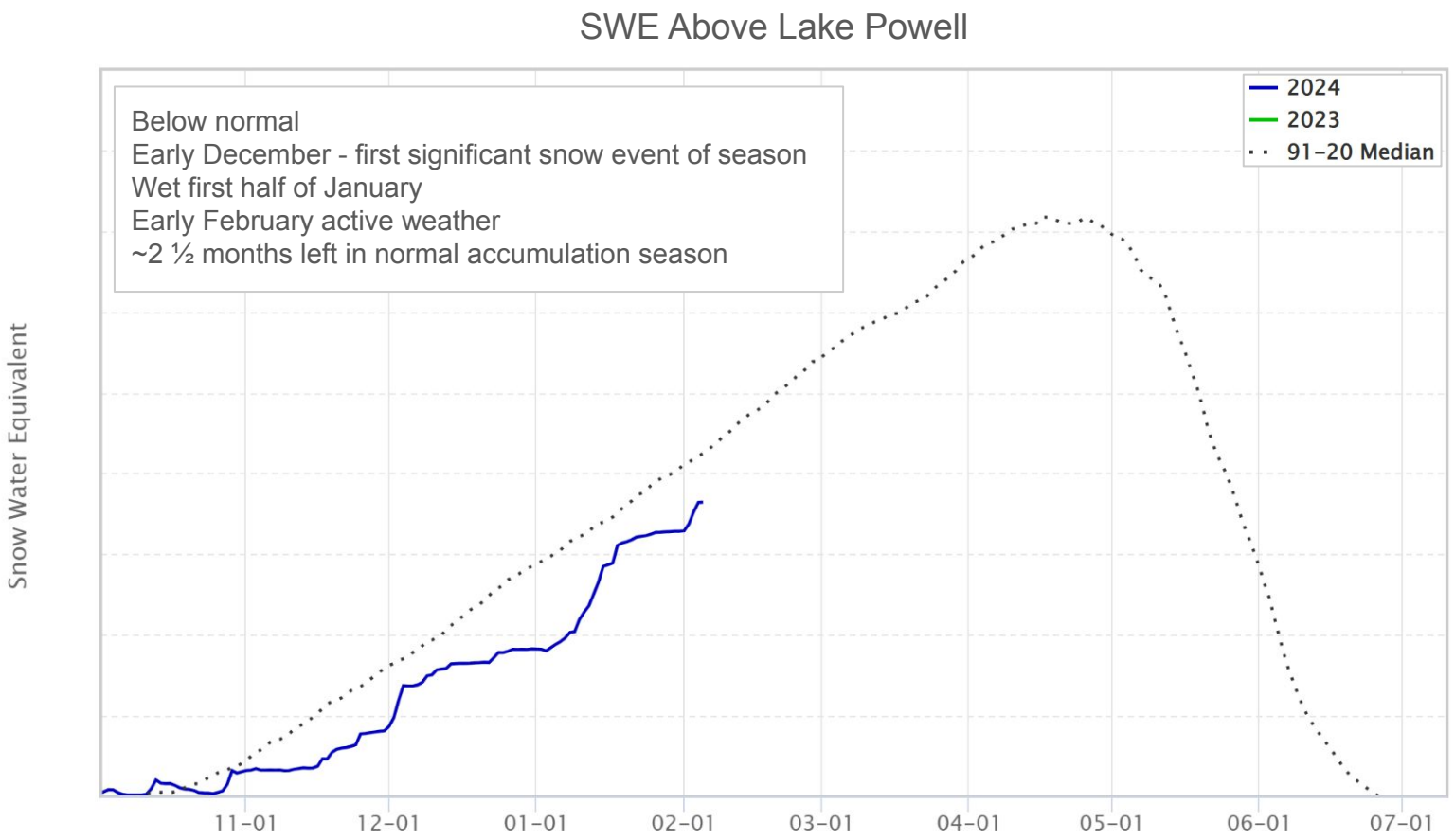
| Water Year 2024<br>CBRFC Model SWE (Major Contributing Areas)<br>Percent of 1991-2020 Median | | | |
|---|---|---|---|
| **UPPER COLORADO RIVER BASIN** | | | |
| | Jan1 | Feb1 | Change |
| Above Lake Powell | 60 | 84 | 24 |
| **Green River Basin** | | | |
| Above Fontenelle | 49 | 67 | 18 |
| Above Flaming Gorge | 53 | 75 | 22 |
| Yampa/White | 71 | 94 | 23 |
| Duchesne | 42 | 70 | 28 |
| Price/San Rafael/Dirty Devil | 54 | 95 | 41 |
| **Colorado River Headwaters** | | | |
| Above Kremmling | 66 | 97 | 31 |
| Eagle | 68 | 91 | 23 |
| Roaring Fork | 69 | 87 | 18 |
| Above Cameo | 68 | 91 | 23 |
| **Southwest Colorado** | | | |
| Gunnison | 66 | 88 | 22 |
| Dolores | 52 | 75 | 23 |
| San Juan | 53 | 68 | 15 |
| **LOWER COLORADO RIVER BASIN** | | | |
| Virgin | 11 | 43 | 32 |
| Little Colorado | 6 | 38 | 32 |
| Verde | 0 | 45 | 45 |
| Salt | 33 | 73 | 40 |
| Upper Gila | 32 | 57 | 25 |

Colorado River Basin
SWE conditions improved during January but February 1 conditions generally remain below normal.

UCRB
65-95% of normal

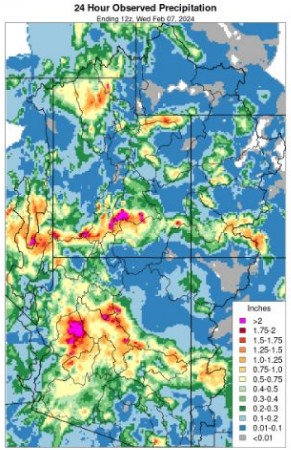
LCRB
40-75% of normal

# UCRB Snowpack Evolution



# February Observed Precipitation/Snow

07

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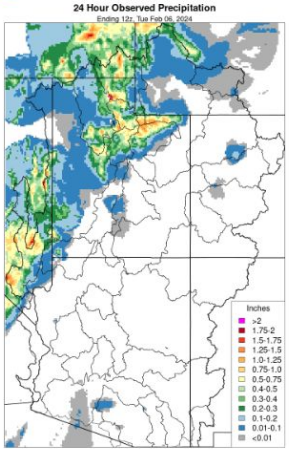


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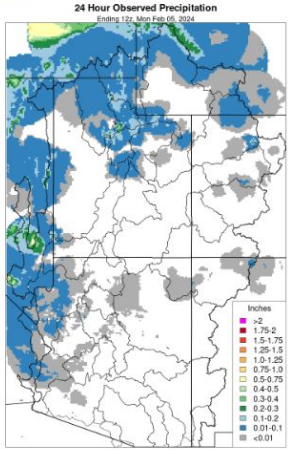


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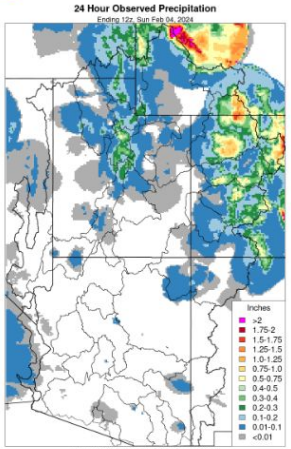


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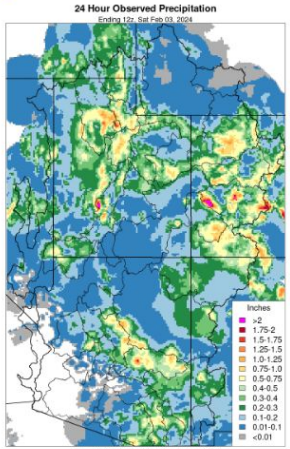


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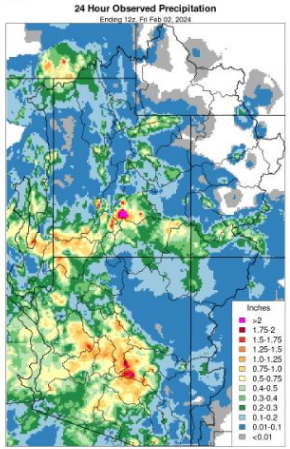


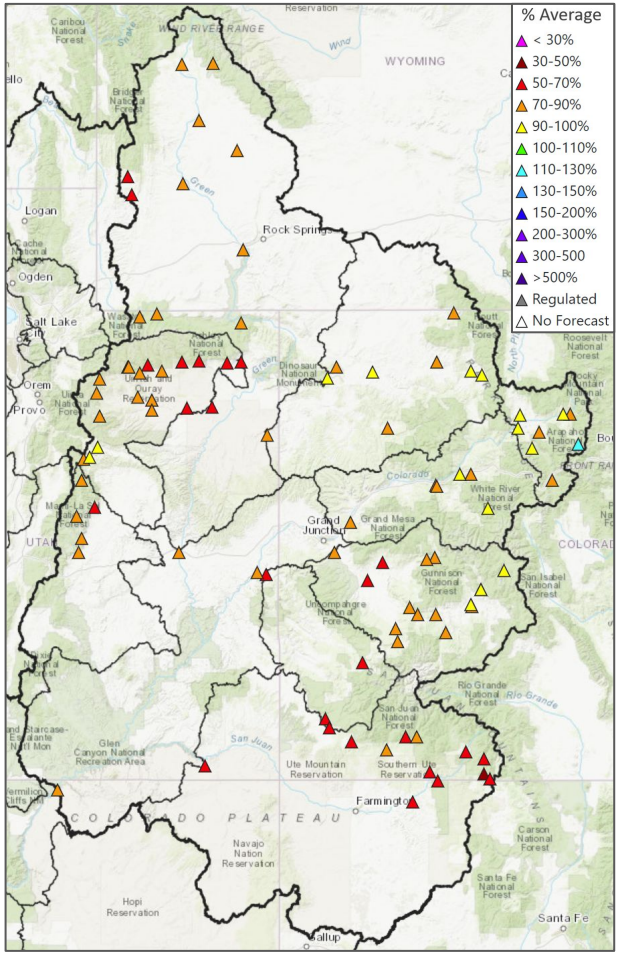

Inches
- >2
- 1.75-2
- 1.5-1.75
- 1.25-1.5
- 1.0-1.25
- 0.75-1.0
- 0.5-0.75
- 0.4-0.5
- 0.3-0.4
- 0.2-0.3
- 0.1-0.2
- 0.01-0.1
- <0.01

Continued active weather
Additional snow accumulation

**Water Year 2024**
**CBRFC Model SWE (Major Contributing Areas)**
**Percent of 1991-2020 Median**

| UPPER COLORADO RIVER BASIN | Feb1 | Feb6 | Change |
|---|---|---|---|
| Above Lake Powell | 84 | 93 | 9 |
| **Green River Basin** | | | |
| Above Fontenelle | 67 | 76 | 9 |
| Above Flaming Gorge | 75 | 84 | 9 |
| Yampa/White | 94 | 99 | 5 |
| Duchesne | 70 | 92 | 22 |
| Price/San Rafael/Dirty Devil | 95 | 104 | 9 |
| **Colorado River Headwaters** | | | |
| Above Kremmling | 97 | 104 | 7 |
| Eagle | 91 | 101 | 10 |
| Roaring Fork | 87 | 94 | 7 |
| Above Cameo | 91 | 98 | 7 |
| **Southwest Colorado** | | | |
| Gunnison | 88 | 95 | 7 |
| Dolores | 75 | 84 | 9 |
| San Juan | 68 | 76 | 8 |
| **LOWER COLORADO RIVER BASIN** | | | |
| Virgin | 43 | 68 | 25 |
| Little Colorado | 38 | 72 | 34 |
| Verde | 45 | 131 | 86 |
| Salt | 73 | 93 | 20 |
| Upper Gila | 57 | 62 | 5 |

# UCRB Water Supply Forecasts: Overview




The water supply outlook has improved due to above average January precipitation. However, seasonal (April-July) water supply volumes remain below normal across the UCRB.

Forecasts are more favorable in areas that have:

-better soil moisture conditions

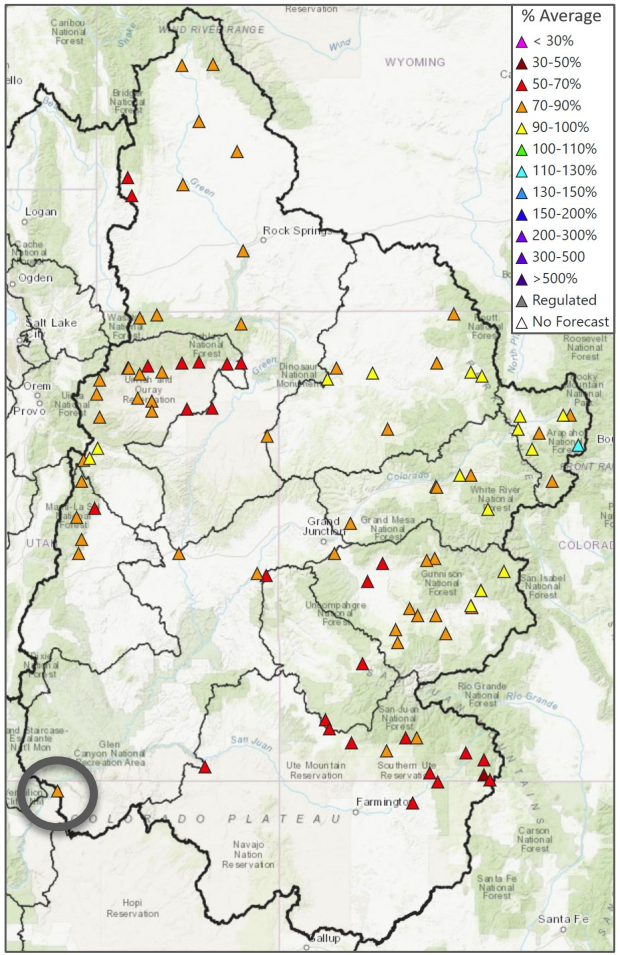
-better snowpack conditions

**Colorado Basin River Forecast Center Water Supply Forecasts**
**February 1, 2024**

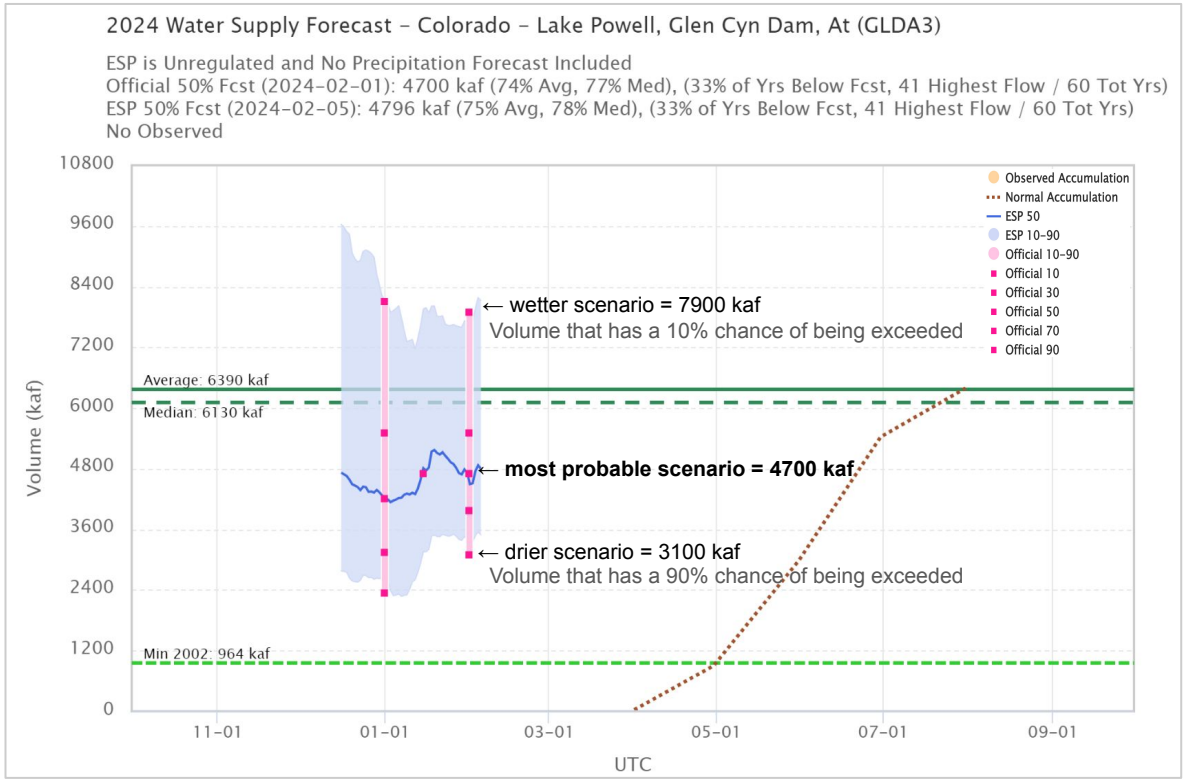
| UPPER COLORADO RIVER BASIN | | | |
|---|---|---|---|
| **Basin** | **Volume (KAF)** | **%Normal (1991-2020)** | **Period** |
| Lake Powell | 4700 | 74 | Apr-Jul |
| **Green River Basin** | | | |
| Green-Flaming Gorge Reservoir | 680 | 70 | Apr-Jul |
| Yampa-Deerlodge | 1100 | 92 | Apr-Jul |
| Duchesne-Tabiona | 80 | 78 | Apr-Jul |
| **Colorado River Headwaters** | | | |
| Colorado-Kremmling | 800 | 92 | Apr-Jul |
| Eagle-Gypsum | 285 | 85 | Apr-Jul |
| Roaring Fork-Glenwood Springs | 550 | 84 | Apr-Jul |
| Colorado-Cameo | 2000 | 88 | Apr-Jul |
| **Southwest Colorado** | | | |
| Gunnison-Blue Mesa Reservoir | 560 | 88 | Apr-Jul |
| Dolores-McPhee Reservoir | 167 | 65 | Apr-Jul |
| San Juan-Navajo Reservoir | 390 | 62 | Apr-Jul |
| Animas-Durango | 275 | 71 | Apr-Jul |

**KAF** = thousand acre-feet

# Lake Powell Water Supply Forecast

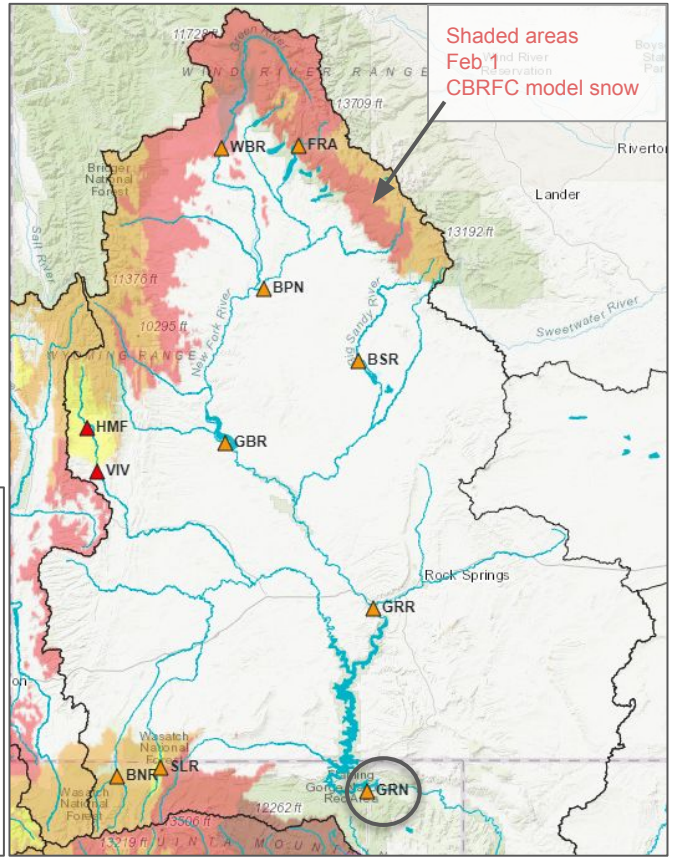


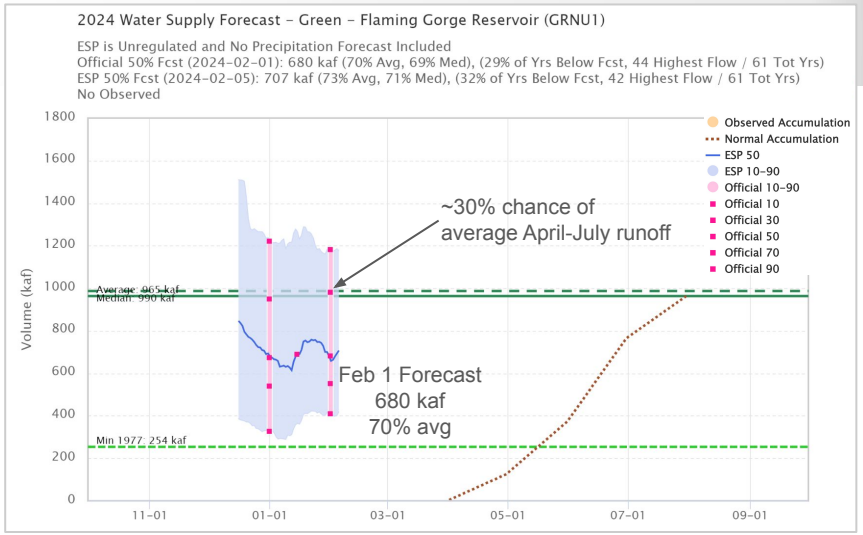

Lake Powell summarizes the hydrologic conditions throughout the Upper Colorado River Basin.

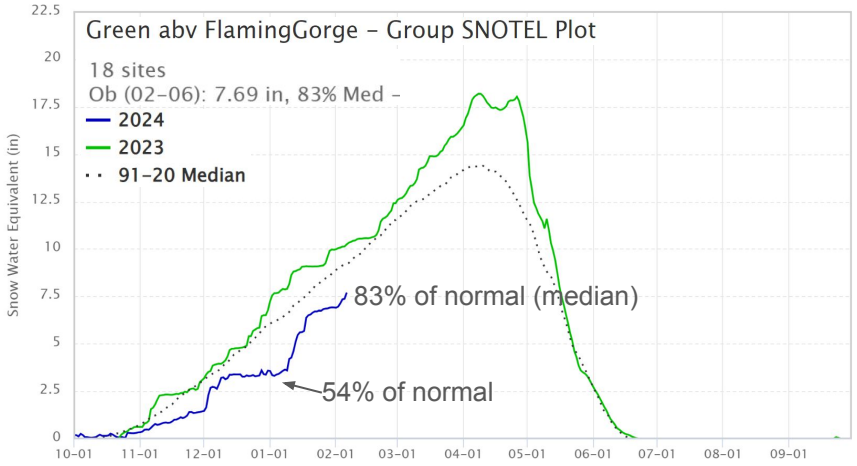


# Upper Green River Basin

## Forecast Range: 70-80%

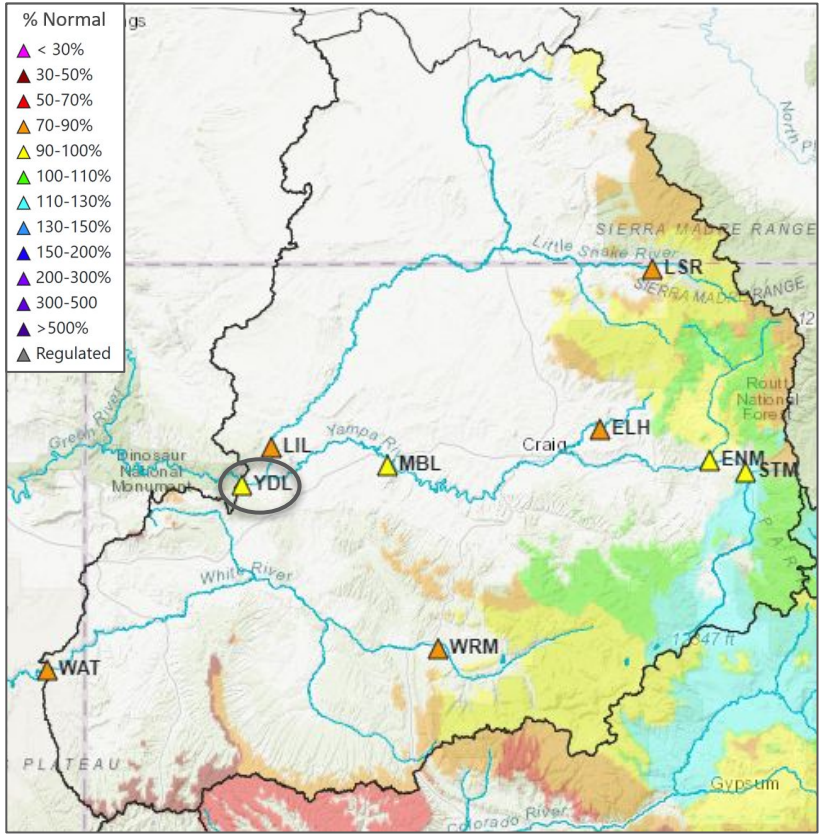


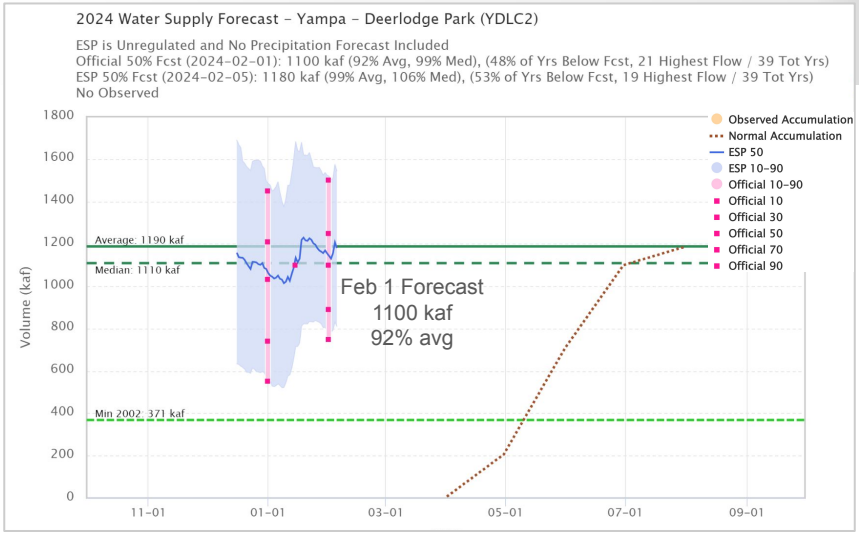



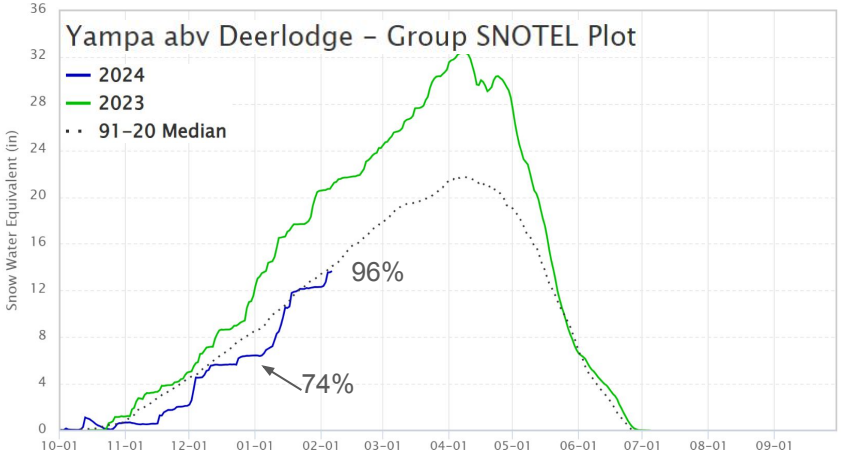



# White/Yampa River Basin

Forecast Range: 75-100%

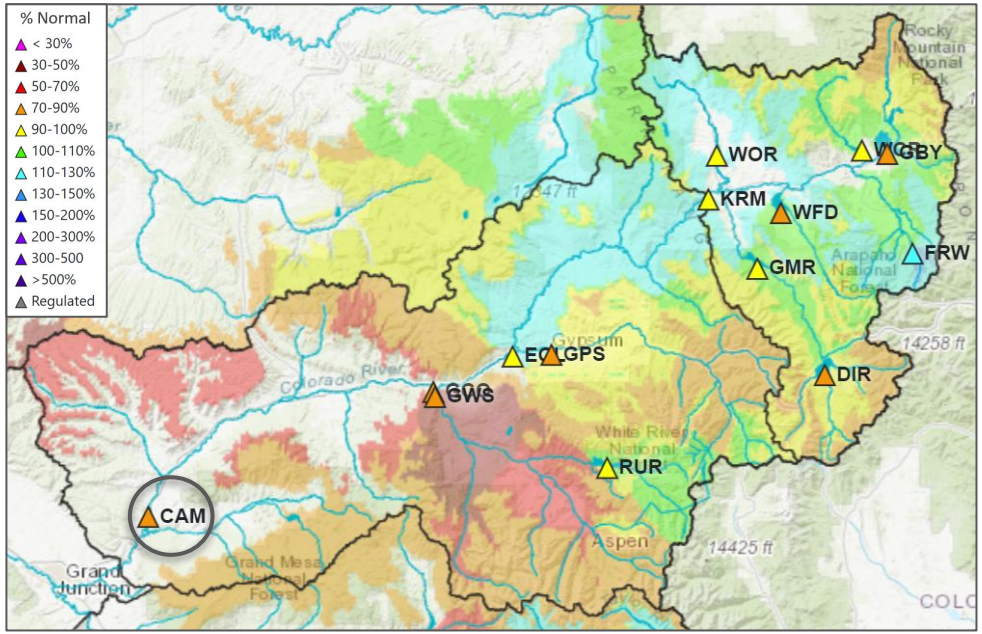


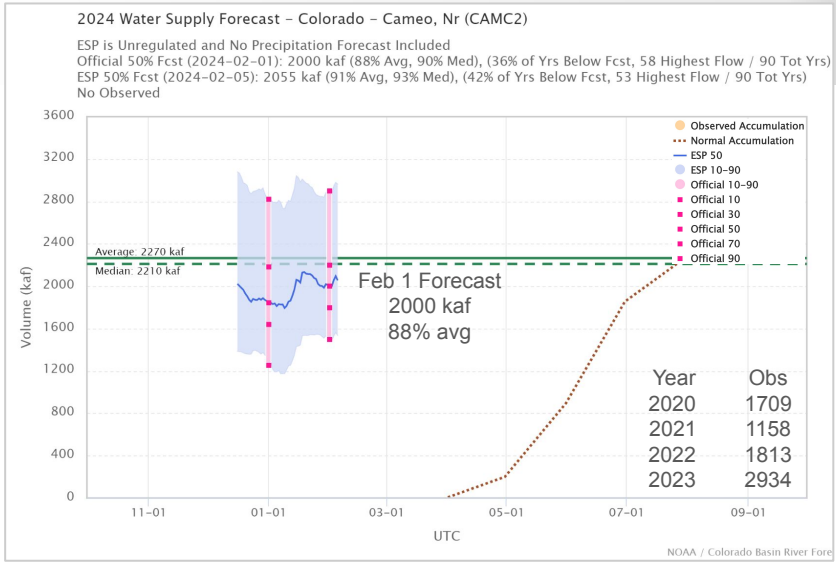



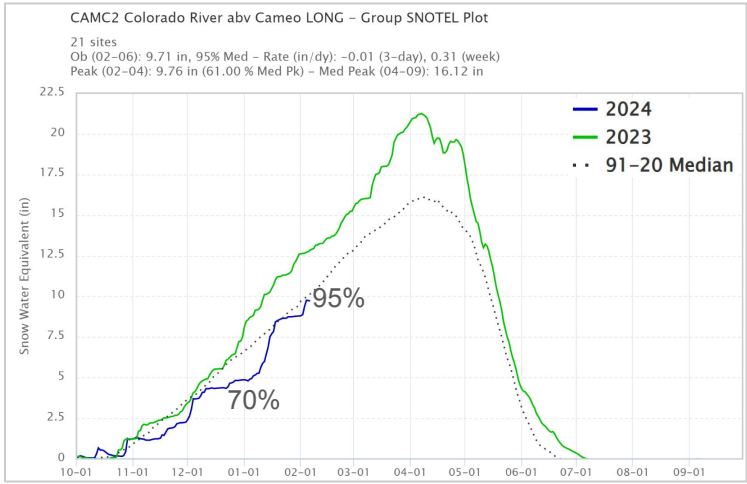



# Colorado River Headwaters

Forecast Range: 85-115%

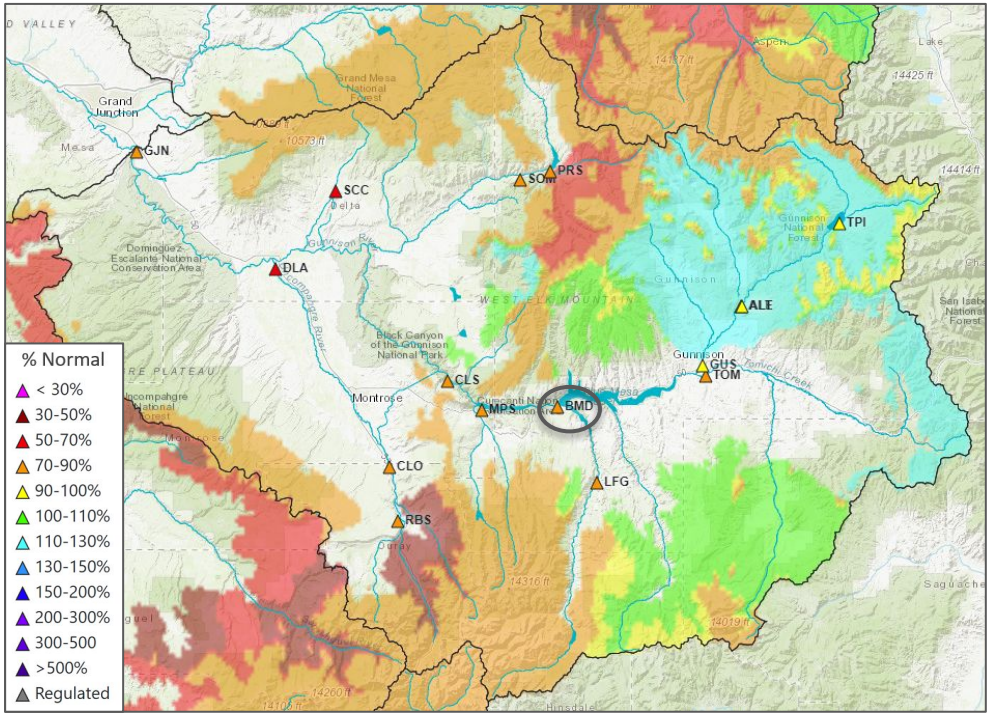


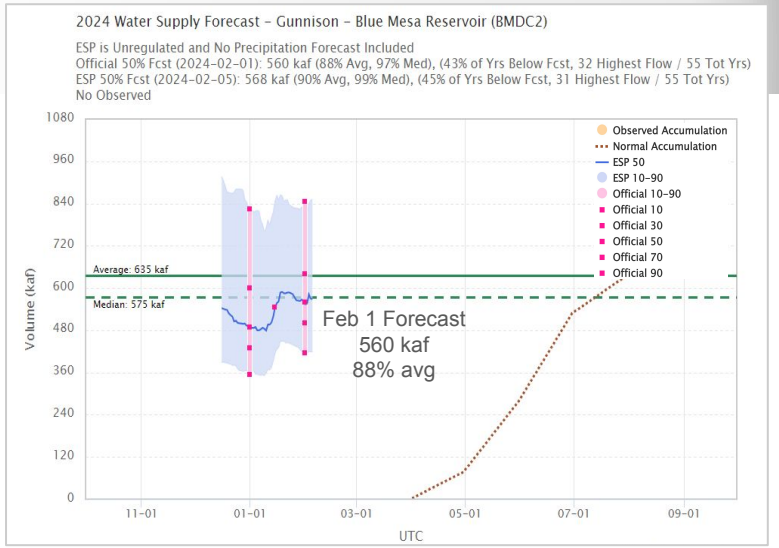



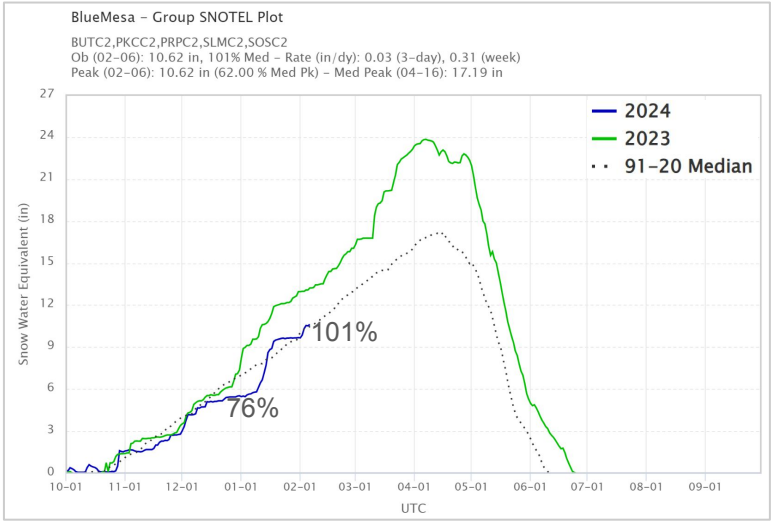



# Gunnison River Basin

Forecast Range: 55-90%

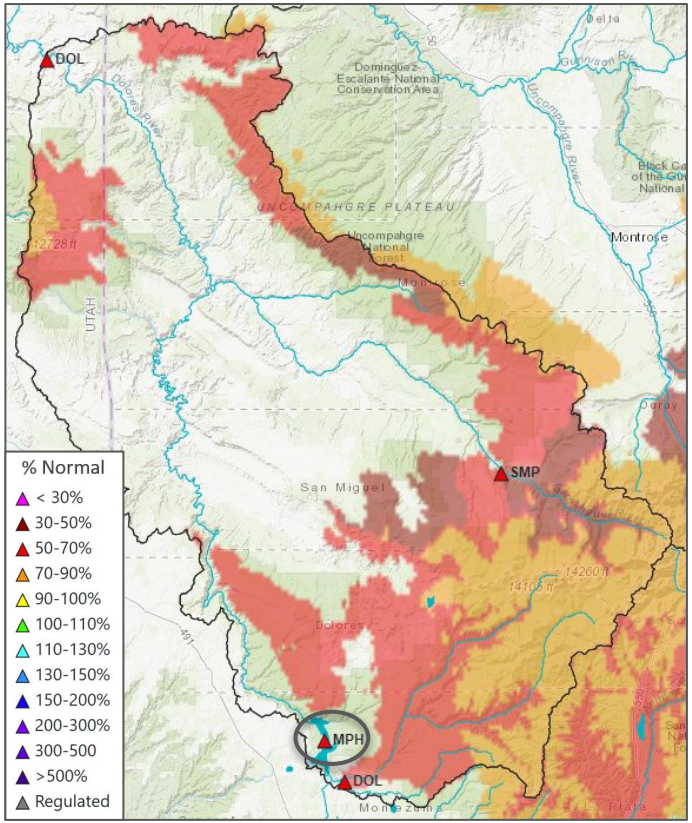


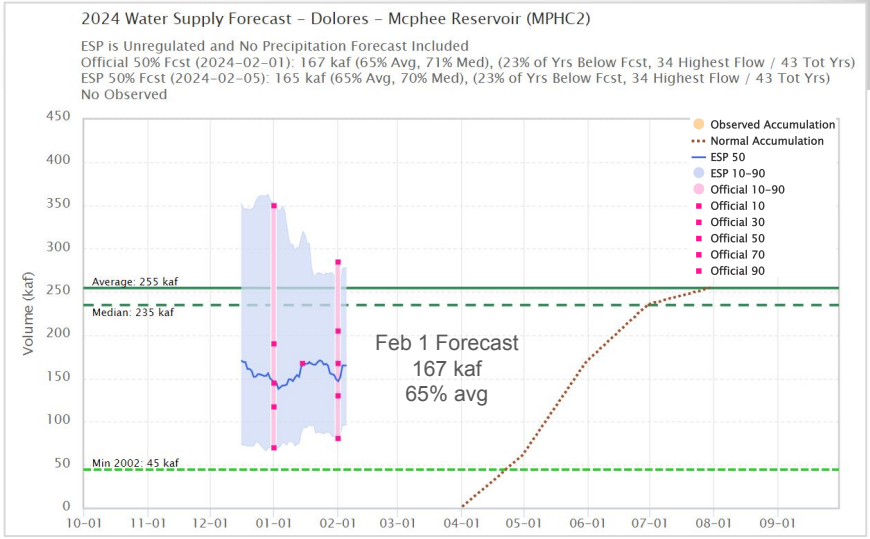



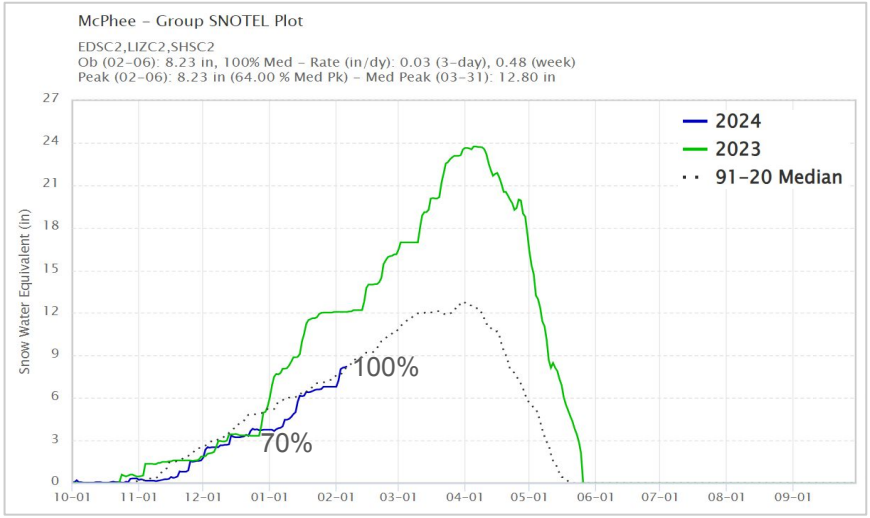



# Dolores River Basin

Forecast Range: 55-70%

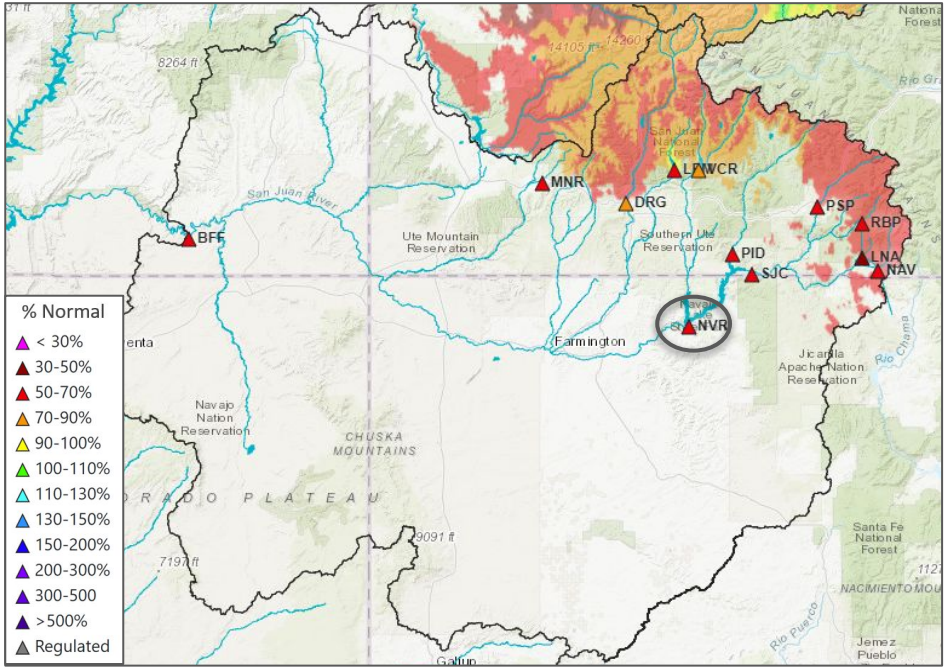


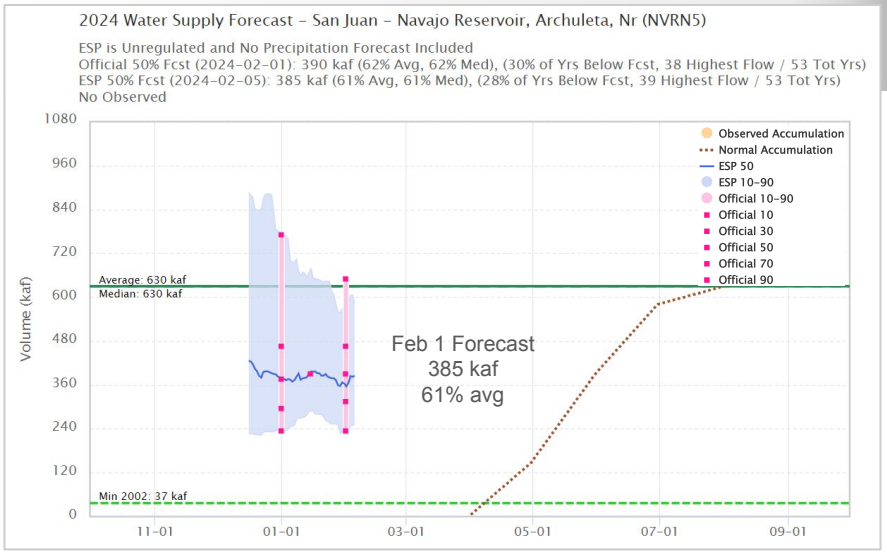



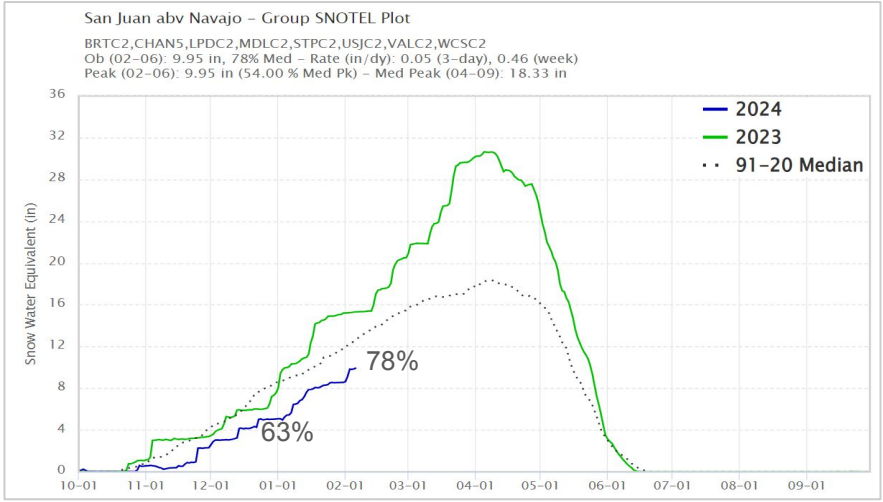



# San Juan River Basin

Forecast Range: 50-70%

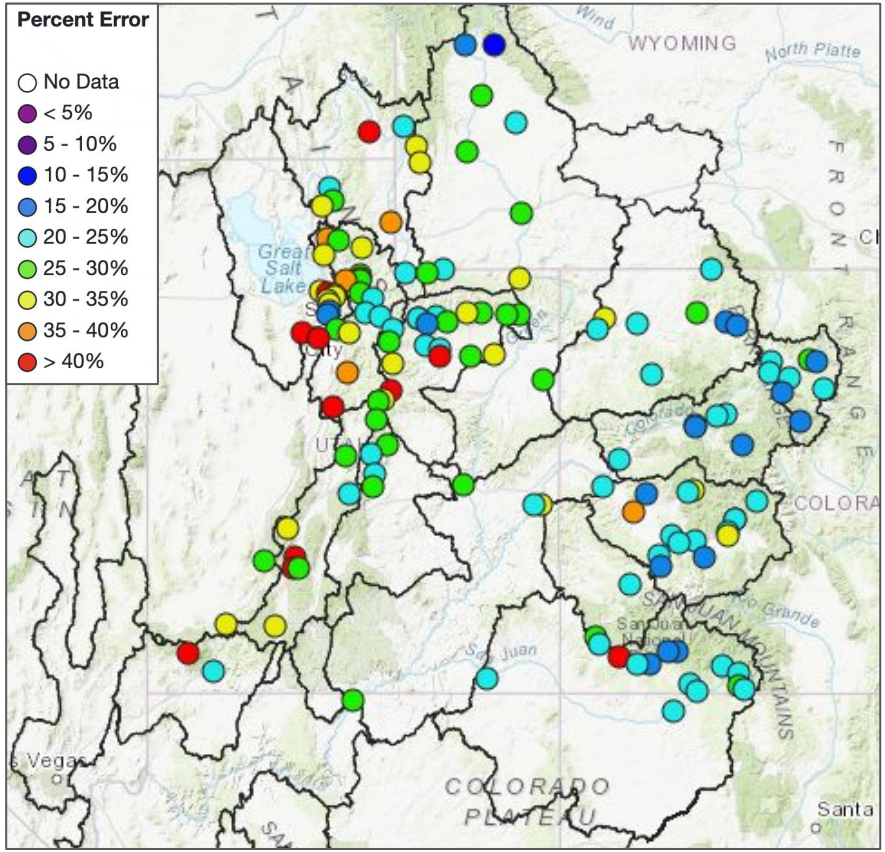


# Historical Forecast Verification

February Forecast Error: April-July Volume




| Location | Avg February Forecast Error |
|---|---|
| Green River - Warren Bridge | 17% |
| Fontenelle Reservoir | 28% |
| Yampa River - Deerlodge | 24% |
| Blue River - Dillon Reservoir | 19% |
| Colorado River - Cameo | 20% |
| Blue Mesa Reservoir (Gunnison) | 22% |
| McPhee Reservoir (Dolores) | 29% |
| Navajo Reservoir (San Juan) | 24% |
| Lake Powell | 25% |
| Virgin River at Virgin | 22% |

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 early season water supply forecast error/uncertainty.

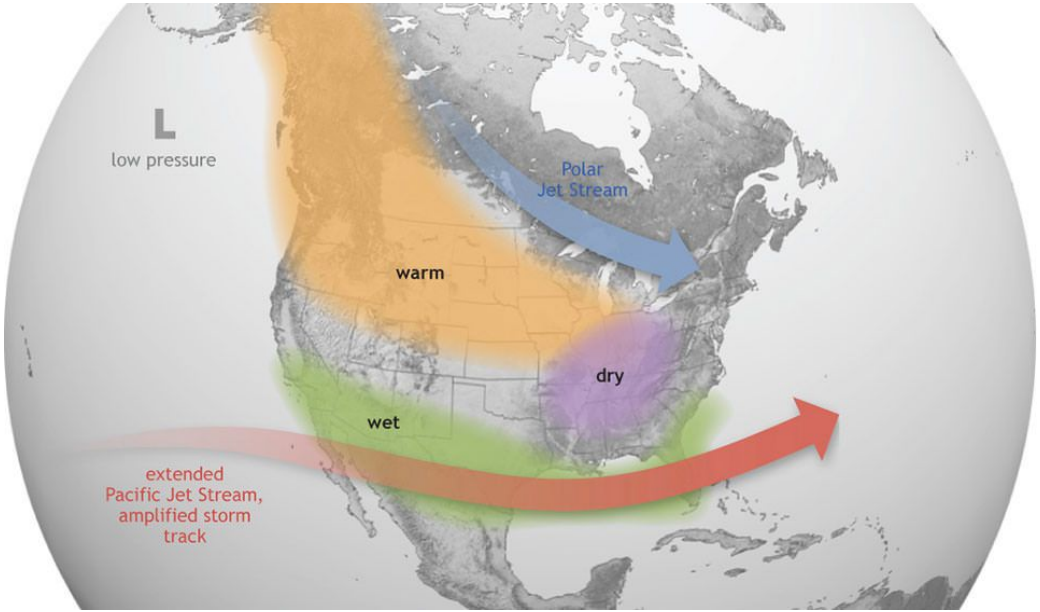
# El Niño Southern Oscillation (ENSO) Status

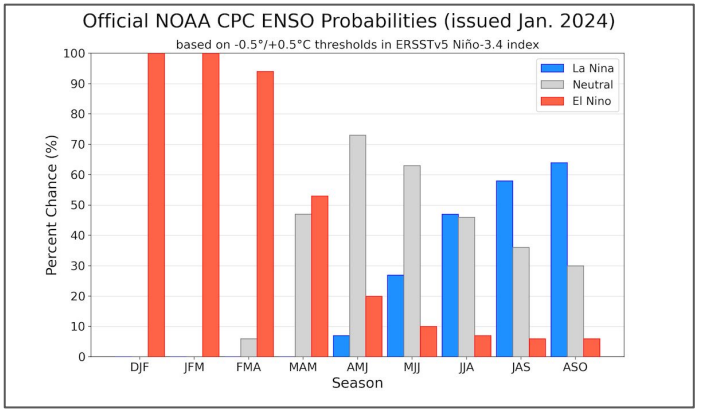
**EL NIÑO/SOUTHERN OSCILLATION (ENSO) DIAGNOSTIC DISCUSSION**
issued by
CLIMATE PREDICTION CENTER/NCEP/NWS
11 January 2024

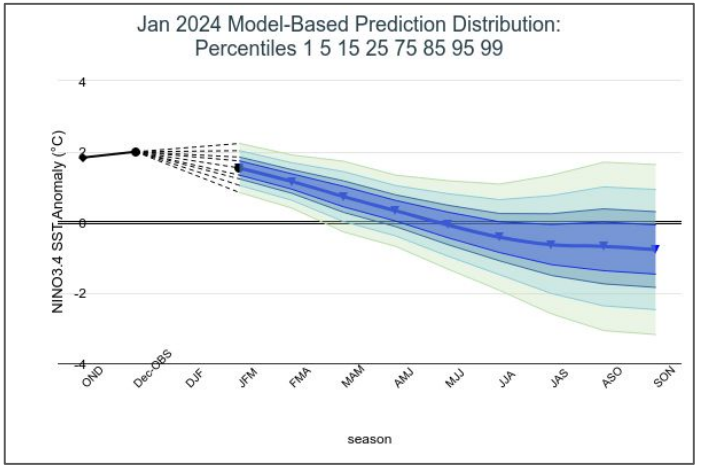
**ENSO Alert System Status:** El Niño Advisory

- **El Niño** is expected to continue through the winter
  - Increased chances of wetter winter weather in Arizona/LCRB
  - Much weaker correlation/winter weather signal elsewhere in basin
  - Transition to ENSO-neutral favored during April-June 2024 (73% chance)

**Typical El Niño Winters**



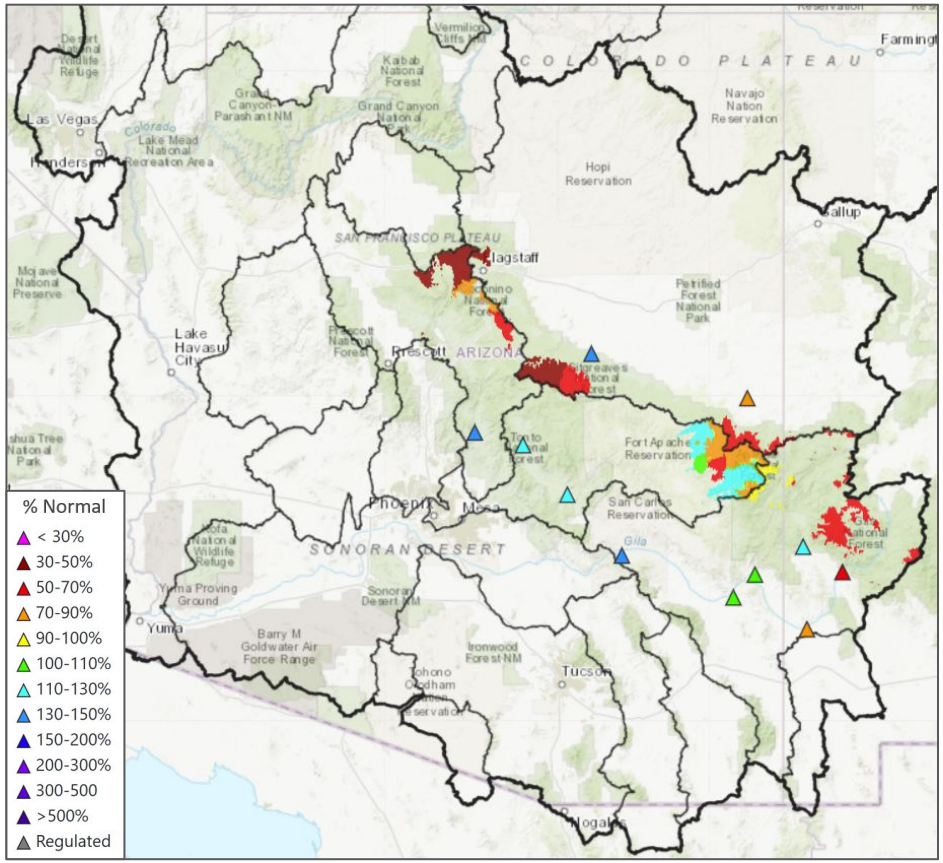




*Sources: NOAA, IRI*

# LCRB: Jan-May Water Supply Forecasts

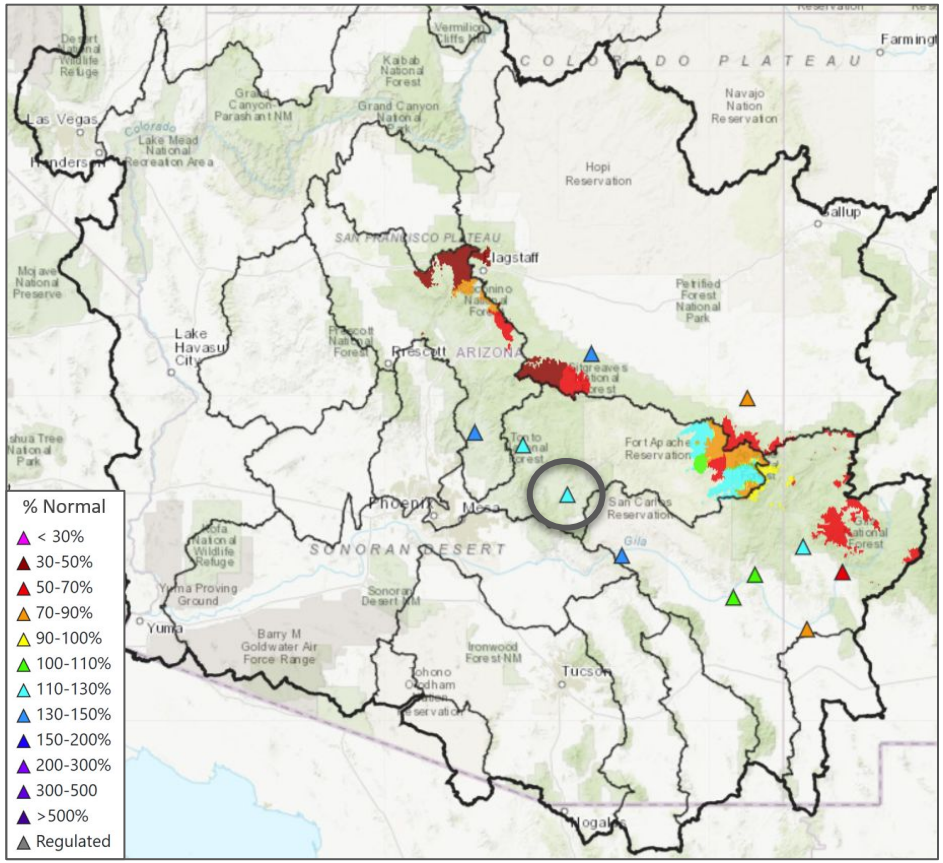
Forecast Range: 70-140%

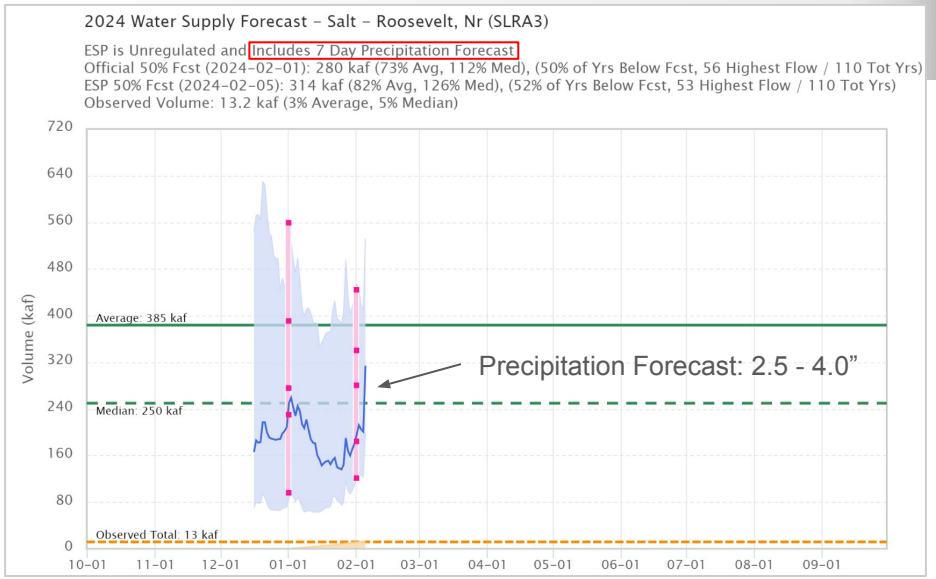


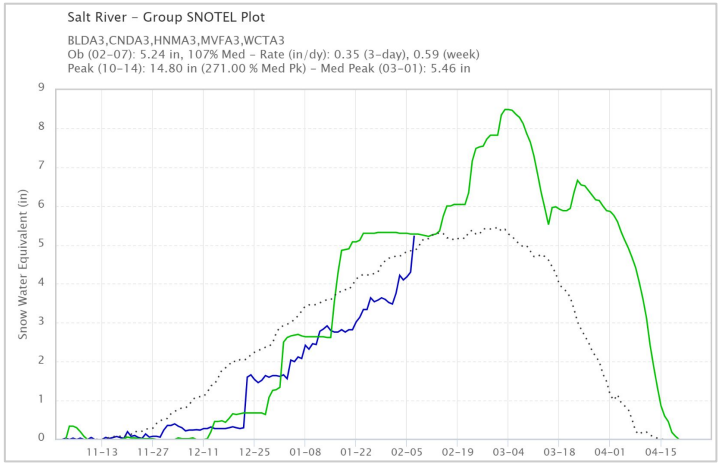

LCRB January-May volume forecasts are generally closer to normal and take into account the current El Niño, which is expected to continue through the winter and typically results in increased chances of wetter winter weather across the LCRB.

| | ID | %Med | %Avg | %ile | Description |
|---|---|---|---|---|---|
| ▲ | CHWA3 | 140 | 103 | 54 | Chevelon Ck - Winslow Nr Wildcat Cyn Blo |
| ▲ | CLDA3 | 132 | 48 | 58 | Gila - San Carlos Reservoir Coolidge Dam At |
| ▲ | GILN5 | 69 | 51 | 42 | Gila - Gila Nr |
| ▲ | GLHA3 | 102 | 49 | 51 | Gila - Solomon Nr Head Of Safford Vly |
| ▲ | GSFN5 | 114 | 55 | 56 | San Francisco - Glenwood Nr |
| ▲ | GVRN5 | 75 | 46 | 46 | Gila - Virden Nr Blue Ck Blo |
| ▲ | LCLA3 | 73 | 53 | 39 | Little Colorado - Lyman Lk Abv St. Johns Nr |
| ▲ | SFCA3 | 109 | 52 | 52 | San Francisco - Clifton |
| ▲ | SLRA3 | 112 | 73 | 50 | Salt - Roosevelt Nr |
| ▲ | TNRA3 | 118 | 57 | 54 | Tonto Ck - Roosevelt Nr Gun Ck Abv |
| ▲ | VDTA3 | 132 | 75 | 59 | Verde - Tangle Ck Blo Horseshoe Dam Abv |

# Salt River Basin



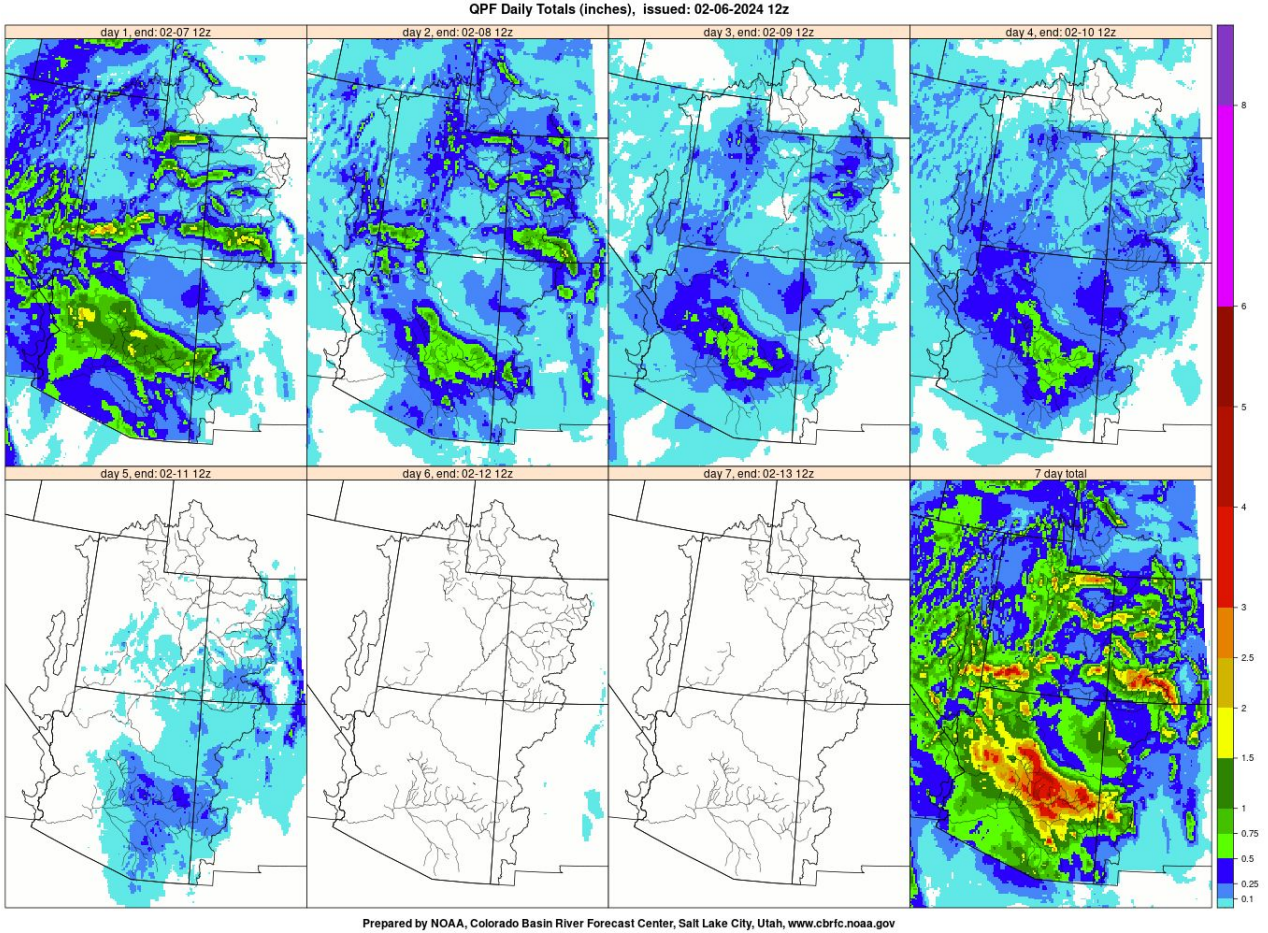



# Upcoming Weather: 7-Day Precipitation Forecast (from yesterday)

Active weather will continue this week with daily chances of precipitation through Saturday

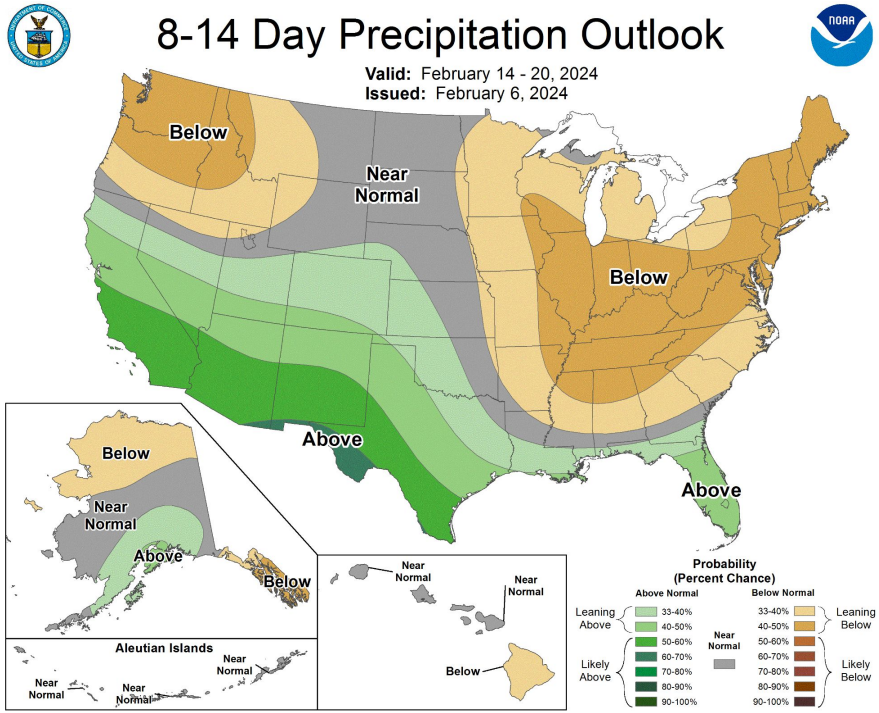
Highest amounts of 2-4” across the LCRB, with locally higher amounts possible

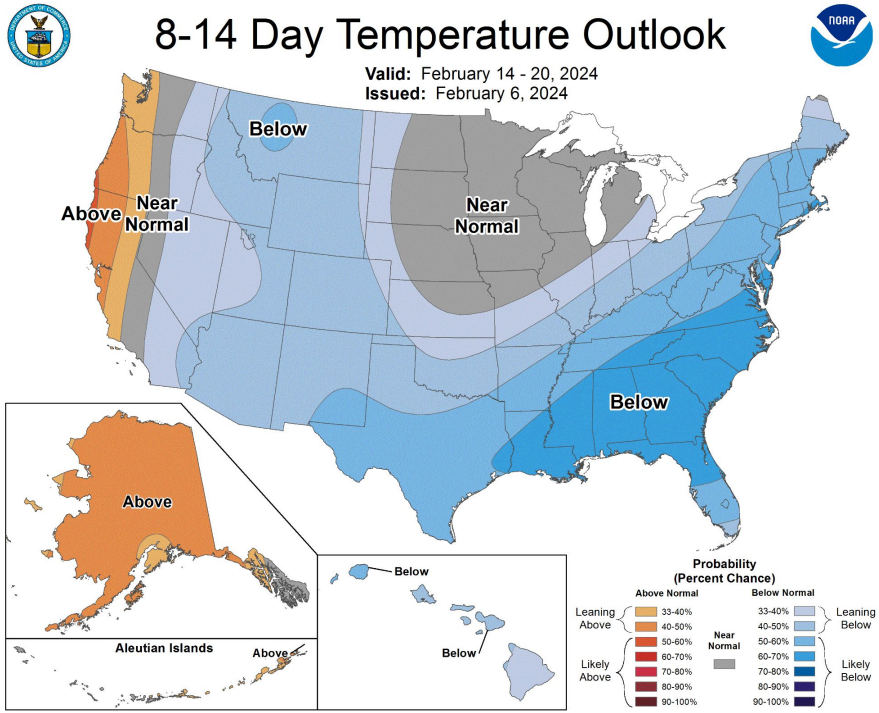
1-2” across the UCRB, with 2-3” possible for higher terrain



# Upcoming Weather: 8-14 Day Outlook (February 14-20)

Increased chances of above average precipitation except for far northern basins
Increased chances of below average temperatures basin wide



# Summary

- **Improved water supply conditions compared to a month ago**

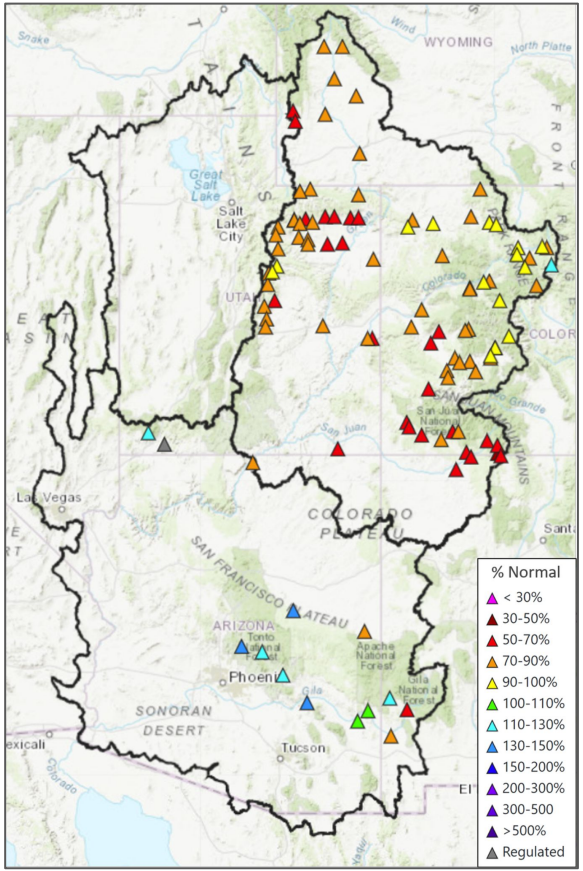
- **Upper Colorado**
  - Soil moisture:
    - Northern basins - near/above avg/better
    - Southern basins - below avg/worse
  - Feb 6 SWE: 75-105%
  - April-July volume forecasts: 50-115%

- **Lower Colorado**
  - Soil moisture: below normal/worse
  - Feb 6 SWE: 60-130%
  - January-May volume forecasts: 70-140%

- **Weather forecast**
  - Active weather will continue this week

- **El Niño conditions**
  - Increased chances of wetter winter weather across LCRB

February 1 Water Supply Forecasts
Percent of 1991-2020 Normal Seasonal Volume



# 2024 Water Supply Webinar Schedule

**All Times Mountain Time (MT)*

## Colorado River Basin

| | | |
|---|---|---|
| ~~Monday~~ | ~~Jan 8th~~ | ~~10 am~~ |
| Wednesday | Feb 7th | 10 am |
| Thursday | Mar 7th | 10 am |
| Friday | Apr 5th | 10 am |
| Tuesday | May 7th | 10 am |

## Utah/Great Basin

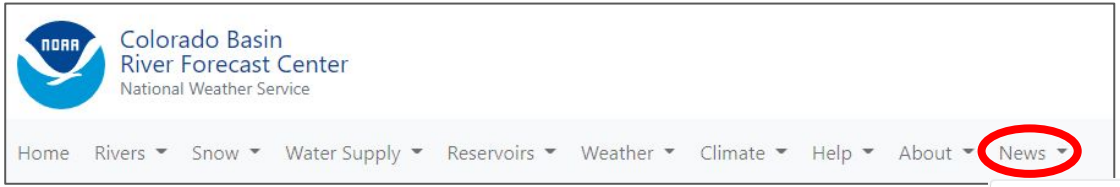
| | | |
|---|---|---|
| ~~Monday~~ | ~~Jan 8th~~ | ~~11:30 am~~ |
| Wednesday | Feb 7th | 11:30 am |
| Thursday | Mar 7th | 11:30 am |
| Friday | Apr 5th | 11:30 am |
| Tuesday | May 7th | 11:30 am |

Peak flow forecast webinar Wednesday, March 20th, 10 am MT

Additional briefings scheduled as needed

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

# CBRFC Webinar Registration & Email List




cbrfc.noaa.gov

## CBRFC Water Supply Forecast Webinar Schedule & Registration - Water Year 2024

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 13 @ 10:00 am MT

**Colorado River Basin Water Supply Webinars**
- Monday January 8 @ 10:00 am MT
- Wednesday February 7 @ 10:00 am MT
- Thursday March 7 @ 10:00 am MT
- Friday April 5 @ 10:00 am MT
- Tuesday May 7 @ 10:00 am MT

**Utah Water Supply Webinars**
- Monday January 8 @ 11:30 am MT
- Wednesday February 7 @ 11:30 am MT
- Thursday March 7 @ 11:30 am MT
- Friday April 5 @ 11:30 am MT
- Tuesday May 7 @ 11:30 am MT

**Peak Flow Webinar**
- Wednesday March 20 @ 10:00 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.

## Email Updates

**Available Email Lists**
- General Stakeholders
- Water Supply: Green River Basin Forecasts
- Water Supply: Upper Colorado Mainstem Forecasts
- Water Supply: San Juan, Gunnison and Dolores River Basins Forecasts
- Water Supply: Eastern Great Basin Forecasts
- Special forecasts for the Dolores River Basin
- Special forecasts for the San Juan River Basin
- Special forecasts for CUWCD
- Upper Basin Reclamation Reservoirs
- Utah Reservoir Forecasts

**Addition Requests**
- Request to be on one of our lists by emailing cbrfc.webmasters@noaa.gov

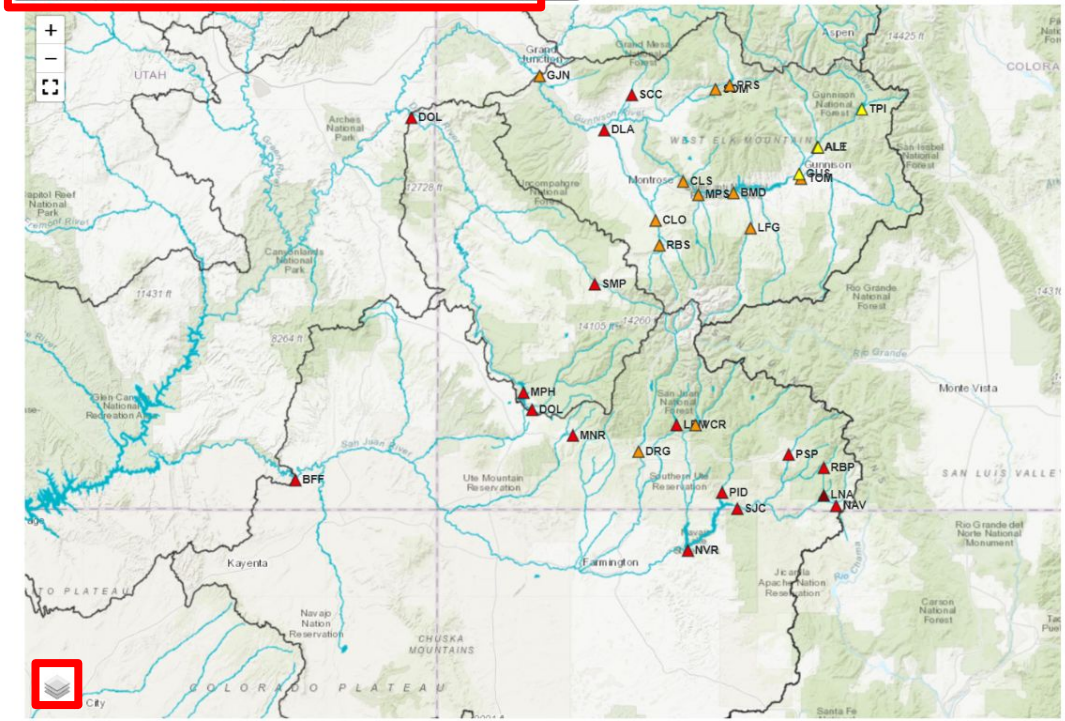
# CBRFC Webpage Updates

Colorado Basin
River Forecast Center
National Weather Service

Rivers | Snow | Water Supply | Peak Flow | Reservoirs | Weather | Climate | Help | About | News | Search this site... | Search

Interdisciplinary Position (Meteorologist or Hydrologist) Opening More Info
Wednesday, February 7, 2024: CBRFC Water Supply Webinars Registration

Select Data | Select Overlays | Filter Points | Show River Alerts | Get Map Image/URL | Help




## Filter Points

River, ID, Description | Filter

**Upper Region**
- [ ] Col abv Kremmling
- [ ] Eagle-Roaring Fork
- [x] Gunnison
- [x] Dolores
- [ ] Lake Powell
- [ ] Upper Green
- [ ] White-Yampa
- [ ] Duchesne-Price
- [ ] San Rafael-Dirty Devil
- [x] San Juan

**Great Region**
- [ ] Bear
- [ ] Weber
- [ ] Six Creeks-Jordan
- [ ] Provo-Utah Lake
- [ ] Salt Lake
- [ ] Sevier

**Lower Region**
- [ ] Virgin
- [ ] Little Colorado
- [ ] Lake Mead
- [ ] Muddy-Las Vegas
- [ ] Salt
- [ ] Verde
- [ ] Agua Fria
- [ ] Hassayampa-Centennial
- [ ] Upper Gila
- [ ] San Pedro
- [ ] Santa Cruz
- [ ] Whitewater-Vamori
- [ ] Lower Gila
- [ ] Bill Williams
- [ ] Lower Colorado Mainstem

32 Water Supply Points Found

| | ID | %Med | %Avg | %ile | Description |
|---|---|---|---|---|---|
| △ | ALEC2 | 99 | 90 | 36 | East - Almont |
| △ | ALTC2 | 110 | 92 | 37 | Taylor - Almont |
| ▲ | BFFU1 | 60 | 59 | 16 | San Juan - Bluff Nr |
| △ | BMDC2 | 97 | 88 | 43 | Gunnison - Blue Mesa Reservoir |
| △ | CLOC2 | 67 | 71 | 19 | Uncompahgre - Colona |
| △ | CLSC2 | 96 | 86 | 42 | Gunnison - Crystal Reservoir |
| ▲ | DLAC2 | 65 | 63 | 28 | Uncompahgre - Delta |

# CBRFC Contacts & Water Year 2024 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, Sevier
cody.moser@noaa.gov

Trevor Grout - Great Basin
trevor.grout@noaa.gov

Nanette Hosenfeld - Virgin, Lower Colorado
nanette.hosenfeld@noaa.gov

Wolfgang Hanft - Virgin, Lower Colorado
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

Cass Goodman - Computer Systems Analyst
cass.goodman@noaa.gov

**CBRFC Operations**
cbrfc.operations@noaa.gov
801-524-4004

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

**CBRFC Water Supply Presentations**
https://www.cbrfc.noaa.gov/present/present.html

CBRFC Hydrologist/Meteorologist Job Opening