

Colorado River Basin Water Supply Briefing

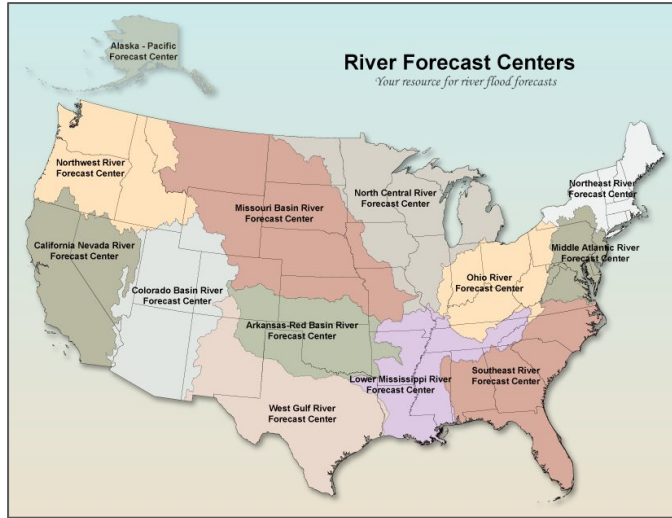
February 15, 2024



Colorado Basin
River Forecast Center
National Weather Service



CBRFC Overview



Presentation Overview

Soil Moisture Conditions
Precipitation Review
Snowpack Conditions
2024 Water Supply Forecasts
Upcoming Weather

The CBRFC modeling framework includes hydrologic models that simulate soil moisture, snow accumulation and melt, reservoir operations, channel routing, irrigation demand/return flows, unmeasured losses/gains, and more.

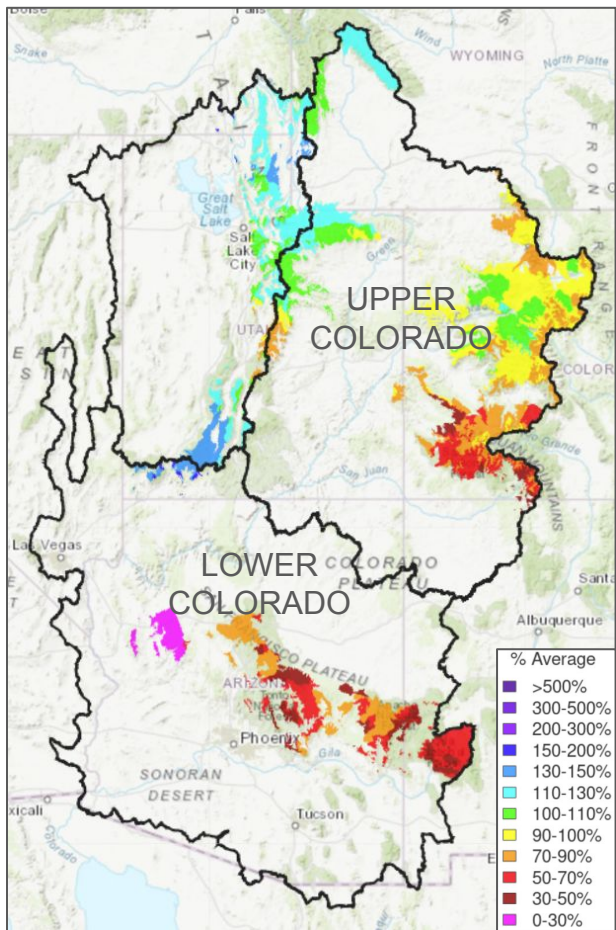
Data from ground stations, radar, satellites, and weather forecast models are used in CBRFC streamflow forecast operations.

The CBRFC hydrologic model is used to provide streamflow forecasts for emergency response and long-term water use planning and management, including:

- 10-day streamflow forecasts that include real-time reservoir operations
- Seasonal water supply forecasts
- Peak flow forecasts

The CBRFC hydrologic model is calibrated and relies on historical data from the USGS, NRCS, USBR, among many other local and state agencies.

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

Soil Moisture Impacts on Water Supply / Runoff

Above normal soil moisture conditions → positive impact (increased runoff efficiency)

Below normal soil moisture conditions → negative impact (decreased runoff efficiency)

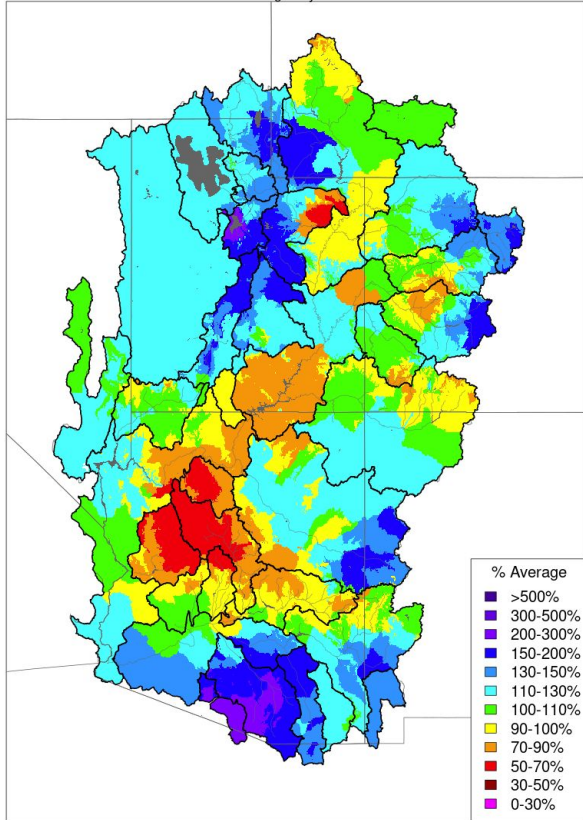
Colorado River Basin: near to below normal; improves from south to north

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

January 2024 Precipitation Summary

Monthly Precipitation - January 2024

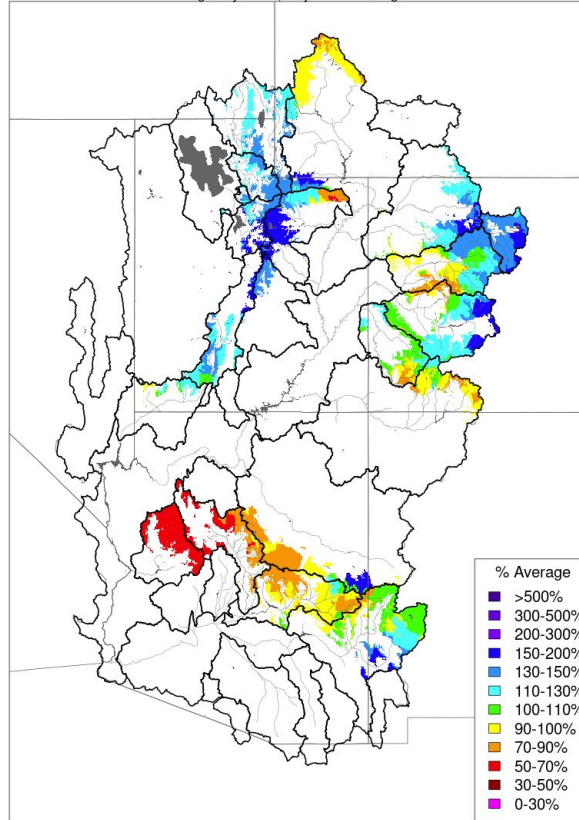
Averaged by Basin



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

Monthly Precipitation - January 2024

Averaged by Basin, Major Contributing Areas



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

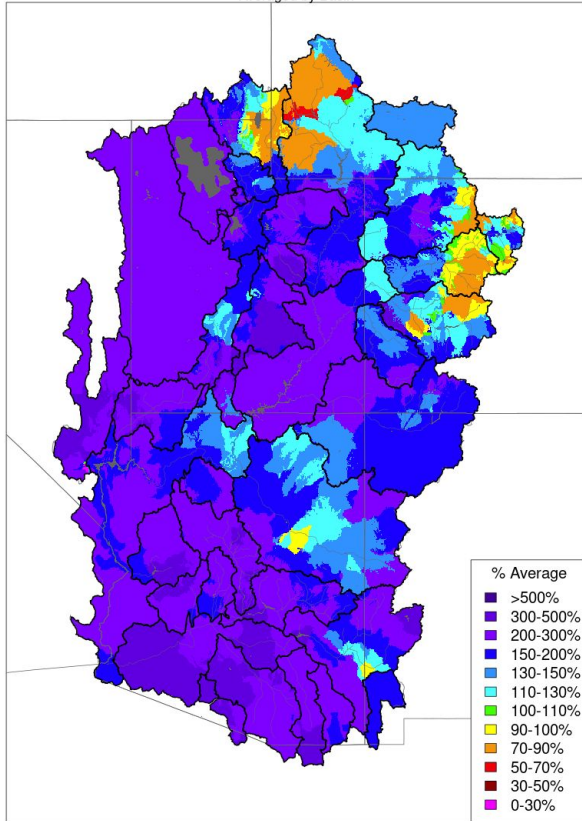
An active weather pattern during January resulted in near to above average monthly precipitation across most CRB high elevation areas.

Water Year 2024 CBRFC Precipitation (Major Contributing Areas) 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

February-To-Date Precipitation Summary

Month to Date Precipitation - February 14 2024

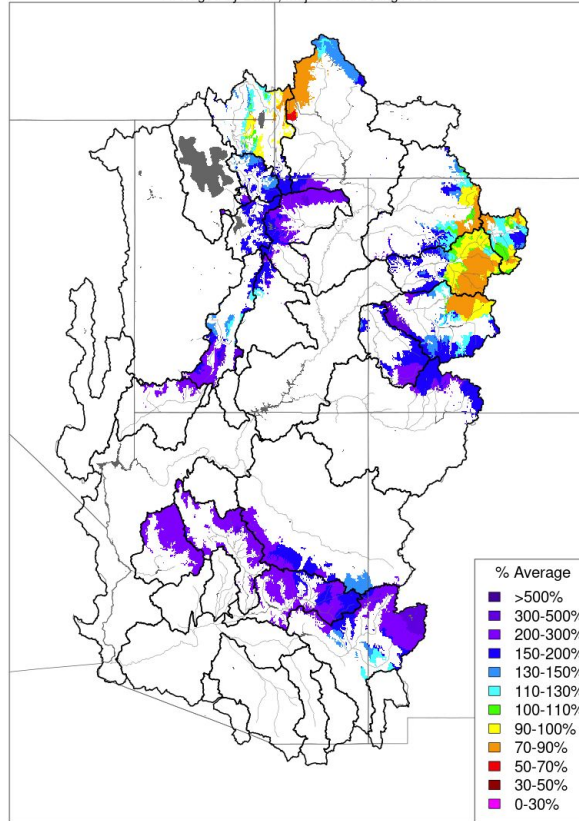
Averaged by Basin



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

Month to Date Precipitation - February 14 2024

Averaged by Basin, Major Contributing Areas



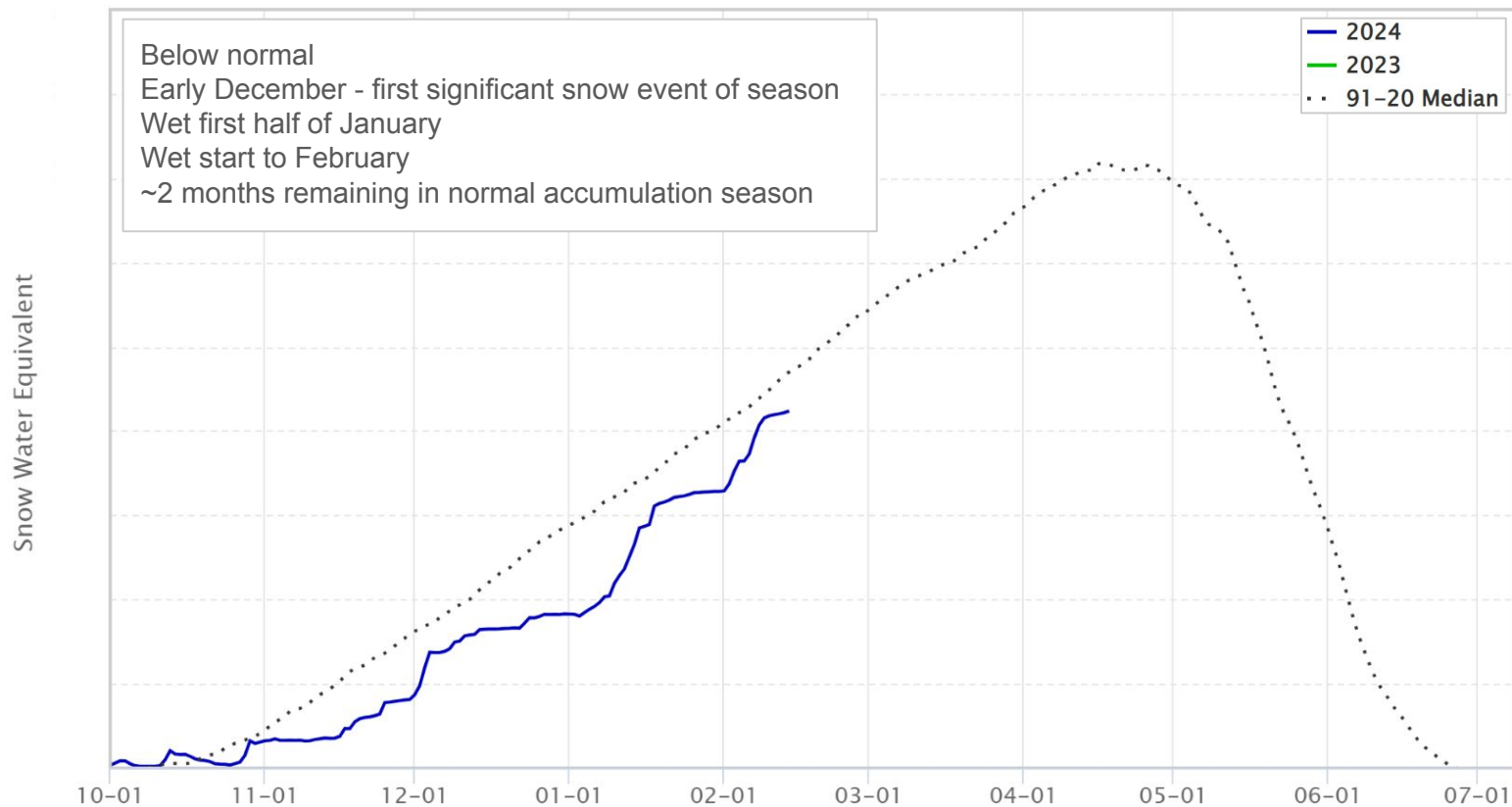
Prepared by NOAA, Colorado Basin River Forecast Center
Salt Lake City, Utah, www.cbrfc.noaa.gov

Active weather continued during the first half of February.

Water Year 2024 CBRFC Precipitation (Major Contributing Areas) Percent of 1991-2020 Average		
UPPER COLORADO RIVER BASIN		
	Jan	Feb1-Feb13
Above Lake Powell		
	120	152
Green River Basin		
Above Fontenelle	97	123
Above Flaming Gorge	111	142
Yampa/White	133	114
Duchesne	124	249
Price/San Rafael/Dirty Devil	152	189
Colorado River Headwaters		
Above Kremmling	145	107
Eagle	125	92
Roaring Fork	110	88
Above Cameo	126	104
Southwest Colorado		
Gunnison	118	133
Dolores	101	193
San Juan	94	200
LOWER COLORADO RIVER BASIN		
Virgin	112	276
Little Colorado	94	216
Verde	79	274
Salt	92	215
Upper Gila	107	221

Water Year 2024 UCRB Snowpack Evolution

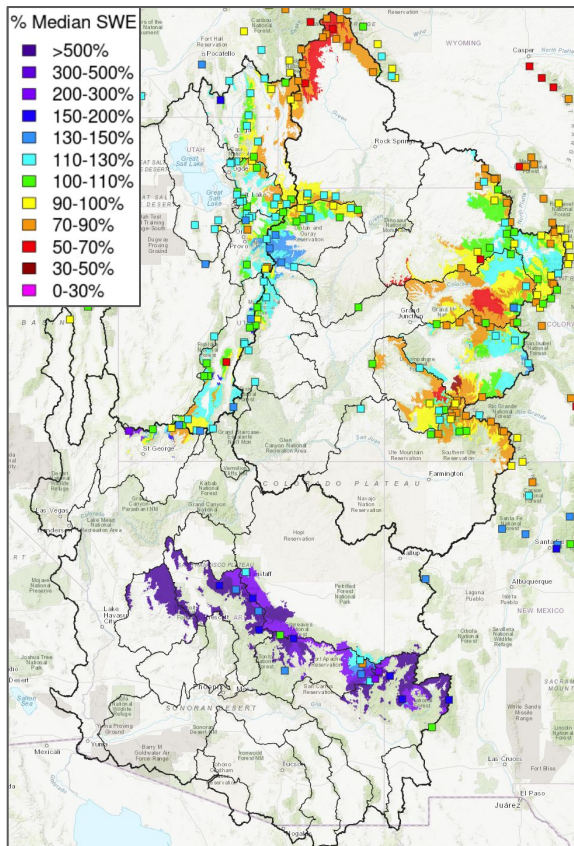
SWE Above Lake Powell



Snowpack Conditions

February 14 SWE Conditions

NRCS SNOTEL Observed (Squares)
CBRFC Model (Major Contributing Areas)



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

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

UPPER COLORADO RIVER BASIN			
	Jan1	Feb1	Feb14
Above Lake Powell	60	84	95
Green River Basin			
Above Fontenelle	49	67	74
Above Flaming Gorge	53	75	84
Yampa/White	71	94	96
Duchesne	42	70	102
Price/San Rafael/Dirty Devil	54	95	112
Colorado River Headwaters			
Above Kremmling	66	97	98
Eagle	68	91	93
Roaring Fork	69	87	89
Above Cameo	68	91	94
Southwest Colorado			
Gunnison	66	88	96
Dolores	52	75	94
San Juan	53	68	89
LOWER COLORADO RIVER BASIN			
Virgin	11	43	104
Little Colorado	6	38	221
Verde	0	45	534
Salt	33	73	187
Upper Gila	32	57	251

UCRB

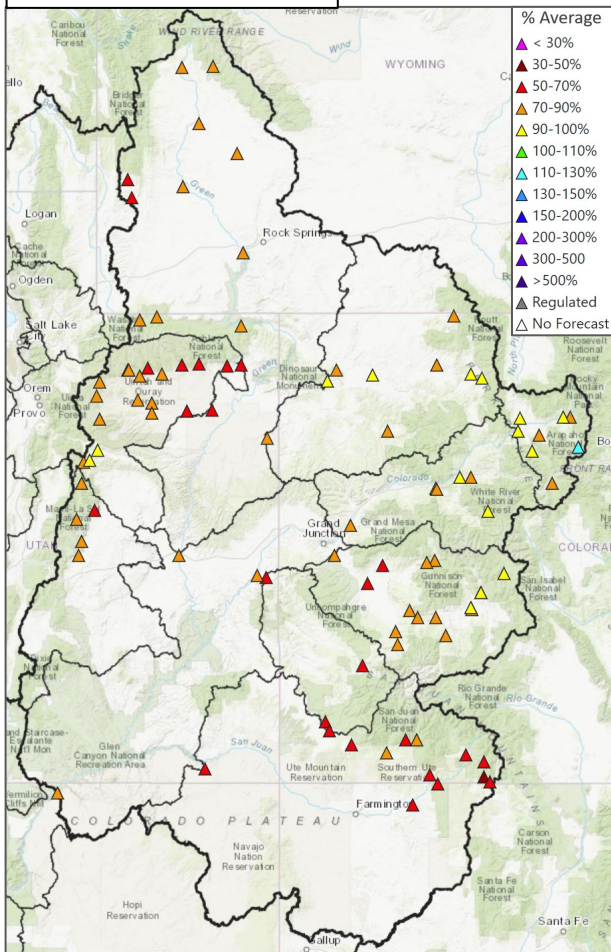
Jan1: 50-70%
Feb1: 65-95%
Feb14: 75-110%

LCRB

Jan1: 0-35%
Feb1: 40-75%
Feb14: 105-250+

UCRB Water Supply Outlook

Feb 1 Forecast Map



The water supply outlook has improved due to above average Jan/Feb 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 Outlook 2024: February 1 / February 14

UPPER COLORADO RIVER BASIN

Basin	Volume (KAF)	%Normal (1991-2020)	Period
Lake Powell	4700 / 5043	74 / 79	Apr-Jul
Green River Basin			
Green-Flaming Gorge Reservoir	680 / 739	70 / 77	Apr-Jul
Yampa-Deerlodge	1100 / 1104	92 / 93	Apr-Jul
Duchesne-Tabiona	80 / 89	78 / 87	Apr-Jul
Colorado River Headwaters			
Colorado-Kremmling	800 / 825	92 / 95	Apr-Jul
Eagle-Gypsum	285 / 288	85 / 86	Apr-Jul
Roaring Fork-Glenwood Springs	550 / 572	84 / 87	Apr-Jul
Colorado-Cameo	2000 / 2019	88 / 89	Apr-Jul
Southwest Colorado			
Gunnison-Blue Mesa Reservoir	560 / 555	88 / 87	Apr-Jul
Dolores-McPhee Reservoir	167 / 186	65 / 73	Apr-Jul
San Juan-Navajo Reservoir	390 / 443	62 / 70	Apr-Jul
Animas-Durango	275 / 317	71 / 82	Apr-Jul

KAF = thousand acre-feet

El Niño Southern Oscillation (ENSO) Status

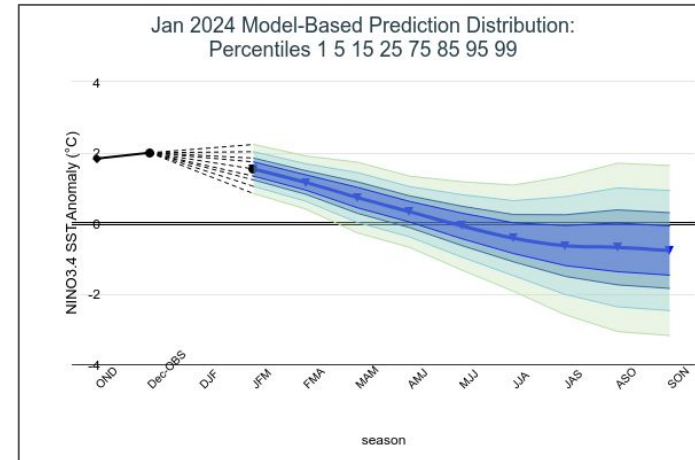
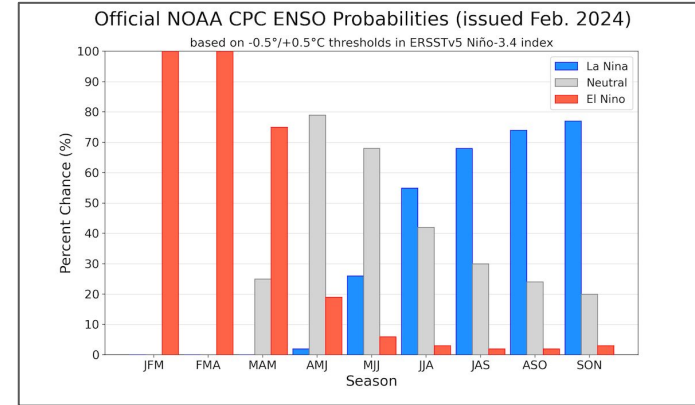
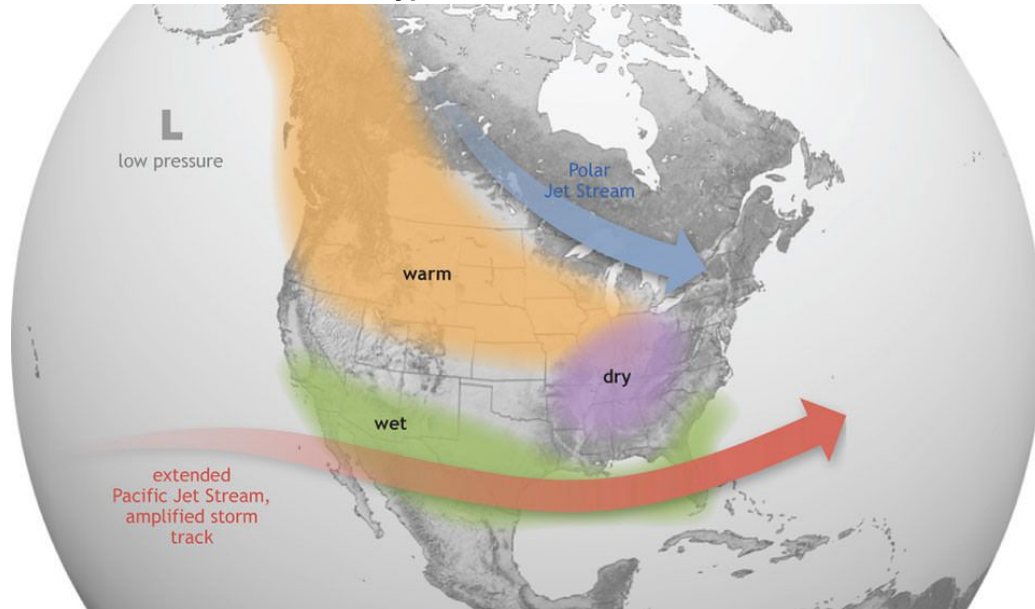
EL NIÑO/SOUTHERN OSCILLATION (ENSO) DIAGNOSTIC DISCUSSION

issued by
CLIMATE PREDICTION CENTER/NCEP/NWS
8 February 2024

ENSO Alert System Status: **El Niño Advisory** / La Niña Watch

- **El Niño Advisory**
 - Increased chances of wetter winter weather in Arizona/LCRB
 - Much weaker correlation/winter weather signal elsewhere in basin
 - Transition to ENSO-neutral likely by April-June 2024 (79% chance)

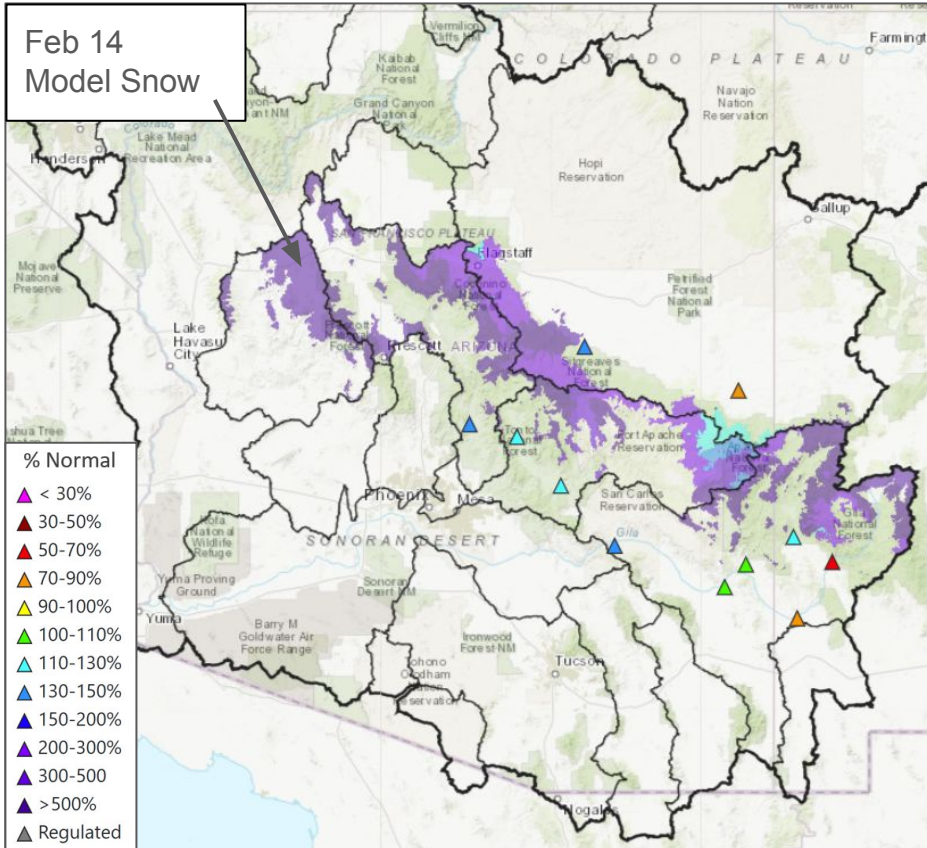
Typical El Niño Winters



Sources: NOAA, IRI

LCRB: Jan-May Water Supply Forecasts

February 1 Forecast Range: 70-140%



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

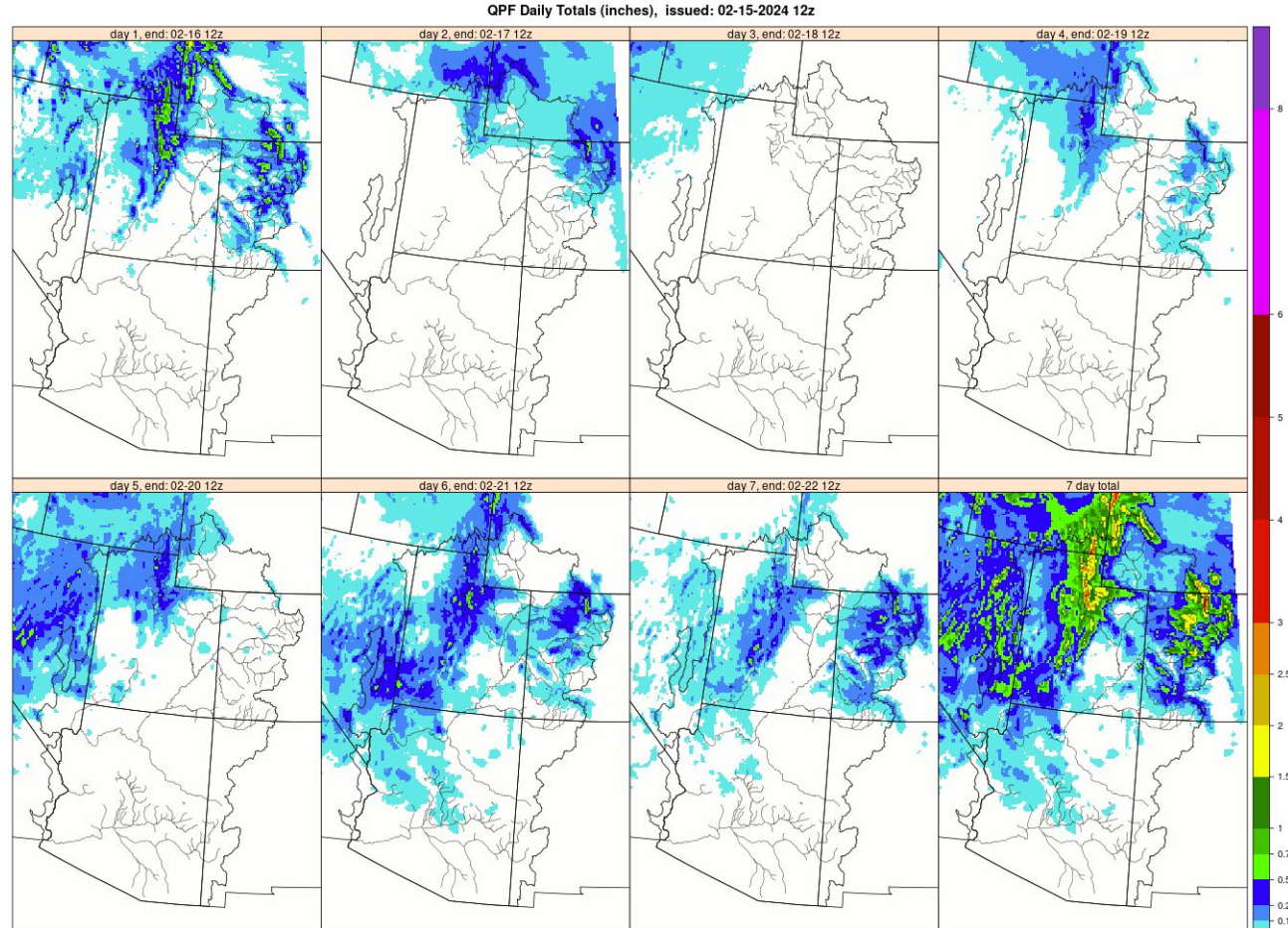
ID	Vol	%Med	%Avg	%ile	Description
▲ CHWA3	19.4	140	103	54	Chevelon Ck - Winslow Nr Wildcat Cyn Blo
▲ CLDA3	96	132	48	58	Gila - San Carlos Reservoir Coolidge Dam At
▲ GILN5	36	69	51	42	Gila - Gila Nr
▲ GLHA3	108	102	49	51	Gila - Solomon Nr Head Of Safford Vly
▲ GSFN5	21	114	55	56	San Francisco - Glenwood Nr
▲ GVRN5	48	75	46	46	Gila - Virden Nr Blue Ck Blo
▲ LCLA3	4.3	73	53	39	Little Colorado - Lyman Lk Abv St. Johns Nr
▲ SFCA3	48	109	52	52	San Francisco - Clifton
▲ SLRA3	280	112	73	50	Salt - Roosevelt Nr
▲ TNRA3	46	118	57	54	Tonto Ck - Roosevelt Nr Gun Ck Abv
▲ VDTA3	205	132	75	59	Verde - Tangle Ck Blo Horseshoe Dam Abv

Upcoming Weather: 7-Day Precipitation Forecast

Active weather will continue across northern basins

Highest 7-day totals of 1-2" across UCRB high elevations

LCRB 7-day totals < 0.25"



Upcoming Weather: 6-10 Day Outlook (February 20-24)

Increased chances of above average precipitation across most CRB areas
 Increased chances of above average temperatures basin wide



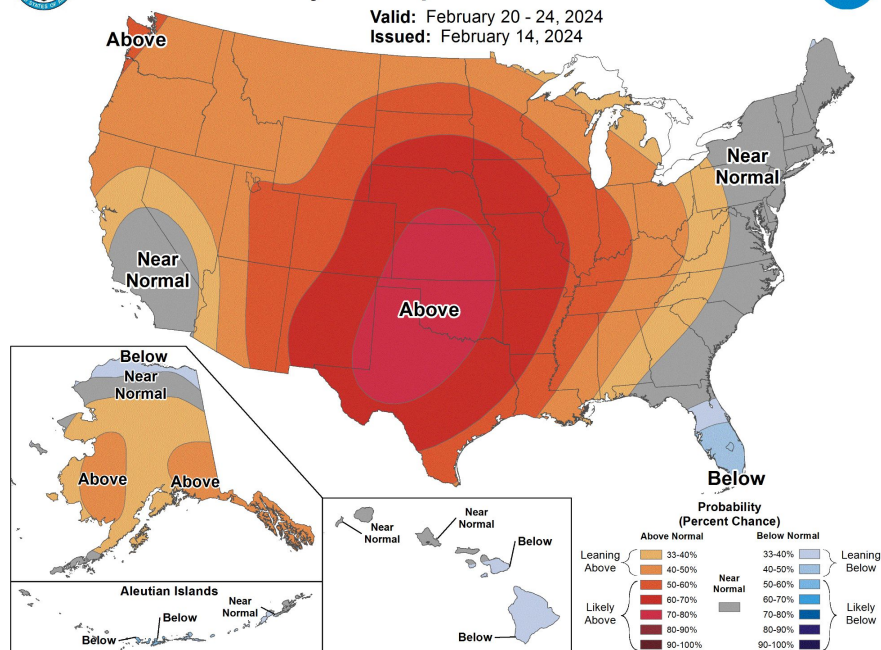
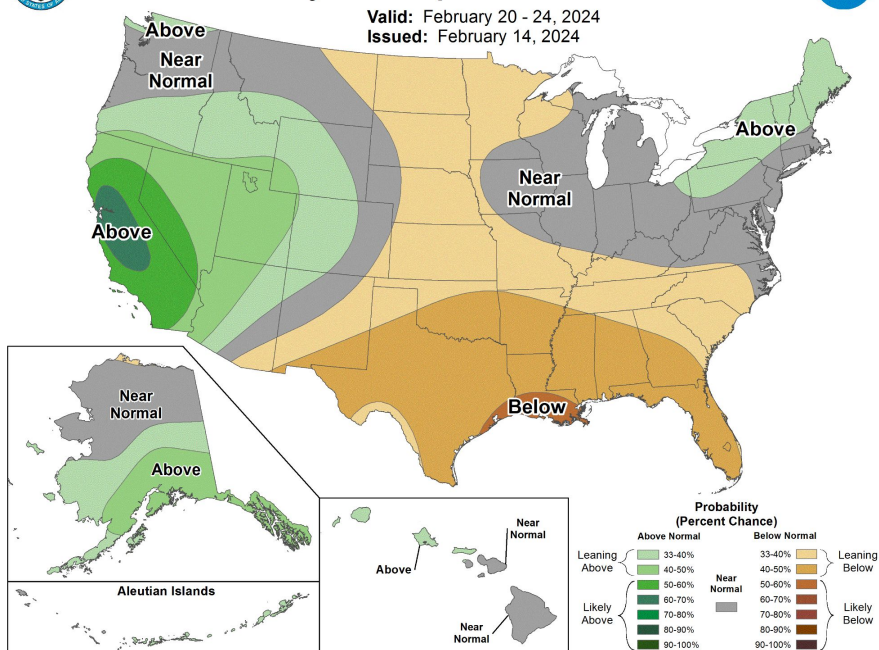
6-10 Day Precipitation Outlook

Valid: February 20 - 24, 2024
 Issued: February 14, 2024



6-10 Day Temperature Outlook

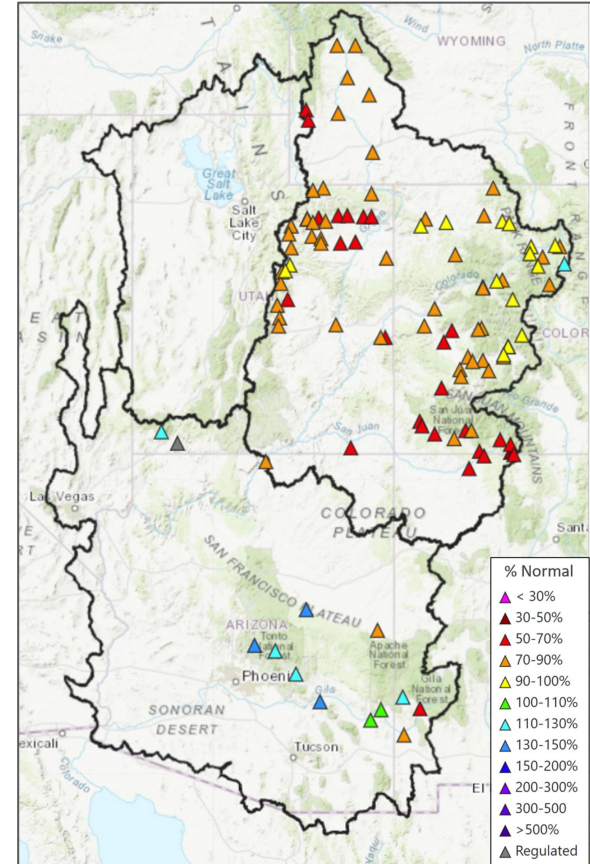
Valid: February 20 - 24, 2024
 Issued: February 14, 2024



Summary

- **Considerable improvements in the CRB water supply outlook during the past 1-2 months due to an active/wet weather pattern**
- **Upper Colorado**
 - Soil moisture:
 - Northern basins - near/above avg/better
 - Southern basins - below avg/worse
 - Feb 14 SWE: 75-110%
 - Feb 1 April-July volume forecasts: 50-115%
- **Lower Colorado**
 - Soil moisture: below normal/worse
 - Feb 14 SWE: 105-250+%
 - Feb 1 January-May volume forecasts: 70-140%
- **Weather forecast**
 - Continued active weather next ~10 days; northern basins favored
- **El Niño conditions**
 - LCRB - increased chances of wetter than average winter weather

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



CBRFC Operations

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CBRFC Webpage

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