

# Colorado Climate Center – *WATF Climate Update*

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**Russ Schumacher, state climatologist**

**Water Availability Task Force**

**August 24, 2021**



COLORADO  
**CLIMATE**  
CENTER



**ATMOSPHERIC SCIENCE**  
COLORADO STATE UNIVERSITY

# Water year 2021 to date:

temperature, precipitation,  
evaporative demand

I-70 flash flood and debris flow



Colorado Department of Transportation @ColoradoDOT

(8/1) I-70 through Glenwood Canyon will continue to be closed due to extreme damage from the latest round of flooding Saturday night (7/31). Motorists advised to take northern alternate route (see map), and trucks traveling through take I-80. Go to [COtrip.org](https://COtrip.org).

5:38 PM · Aug 1, 2021 · Twitter Web App

132 Retweets 56 Quote Tweets

225 Likes

Tweet your reply Reply

Colorado Department of Transportation · Aug 2

Replying to @ColoradoDOT

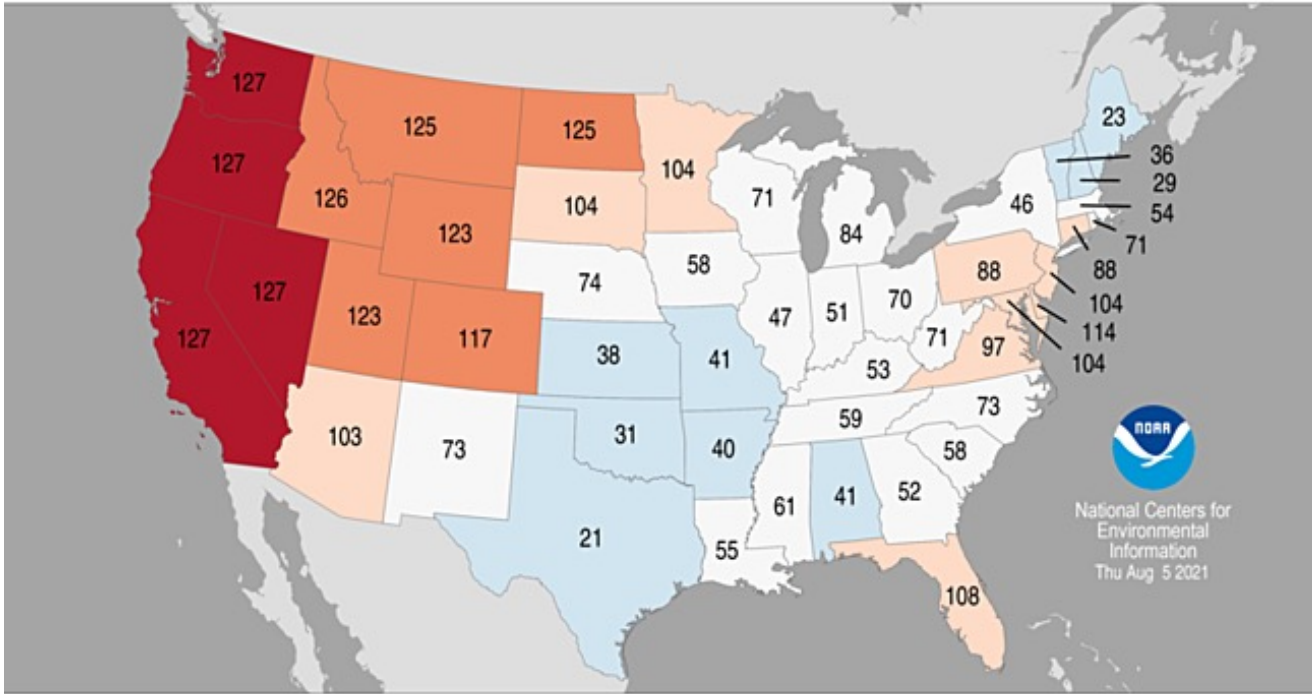
WATCH [fb.watch/78bWpbZ59l](https://fb.watch/78bWpbZ59l): @GovofCO joined #TeamCDOT, @COPublicSafety & @CSP\_News today to provide an update on the ongoing mudslides, safety closures and Flash Flood Warnings that have taken place during the past week on #I70 in the #GlenwoodCanyon.

facebook.com Governor Jared Polis on Facebook...



# Statewide Average Temperature Ranks

July 2021  
Period: 1895–2021



Statewide: 17<sup>th</sup> warmest October – July  
1.8°F above 20<sup>th</sup> century average  
0.2°F above 1991-2020 average

Month	T Rank (of 127 years)	Above, below, or near avg?
Oct	54 <sup>th</sup> warmest	near avg
Nov	7 <sup>th</sup> warmest	much above
Dec	46 <sup>th</sup> warmest	near avg
Jan	33 <sup>rd</sup> warmest	above
Feb	28 <sup>th</sup> coolest	below
Mar	46 <sup>th</sup> warmest	near avg
Apr	62 <sup>nd</sup> warmest	near avg
May	50 <sup>th</sup> warmest	near avg
Jun	6 <sup>th</sup> warmest	much above
Jul	11 <sup>th</sup> warmest	much above

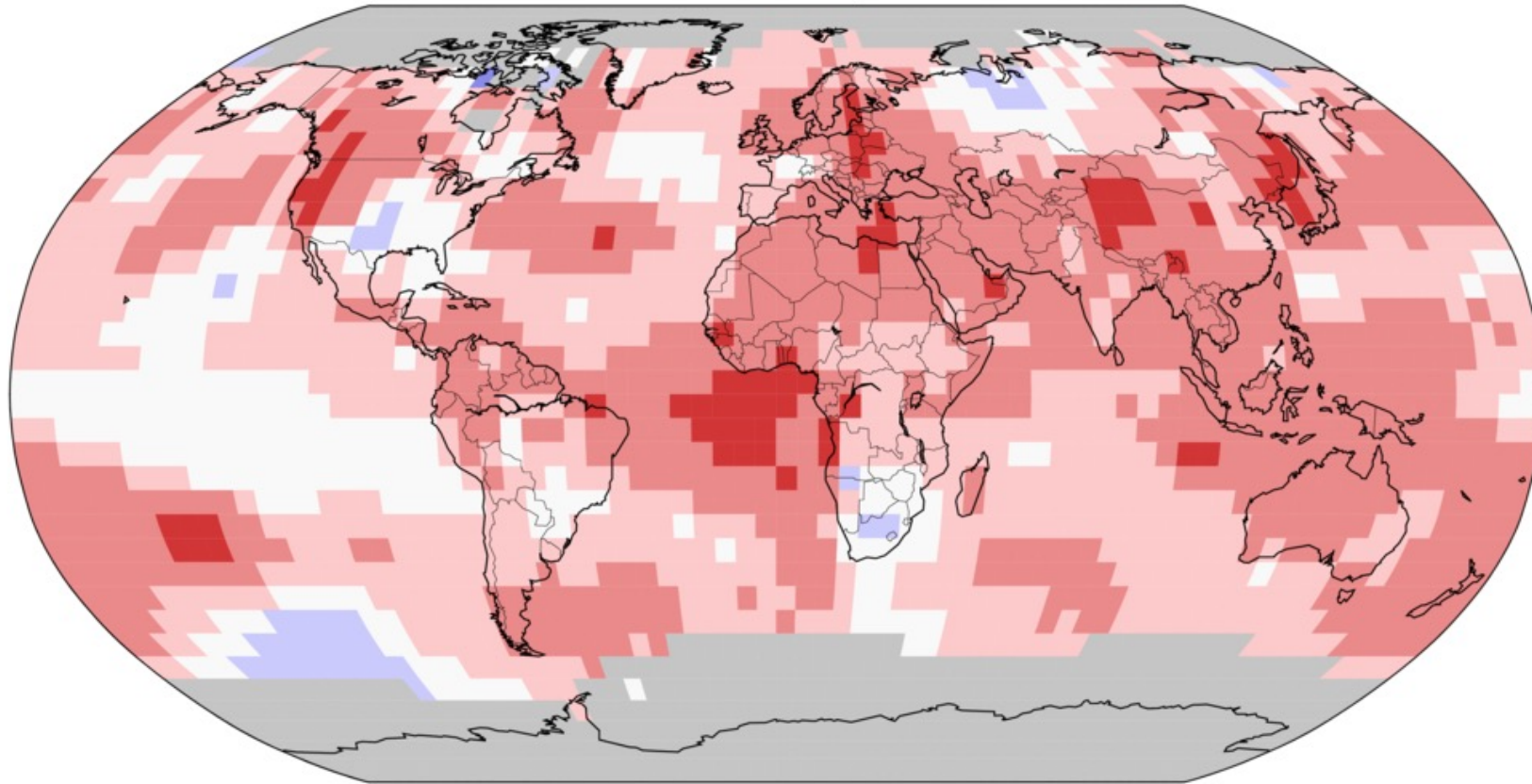




# Land & Ocean Temperature Percentiles Jul 2021

NOAA's National Centers for Environmental Information

Data Source: NOAA GlobalTemp v5.0.0-20210808





**Globally, July 2021 was the warmest month on record (data since 1880)**




  
Record Coldest

  
Much Cooler than Average

  
Cooler than Average

  
Near Average

  
Warmer than Average

  
Much Warmer than Average

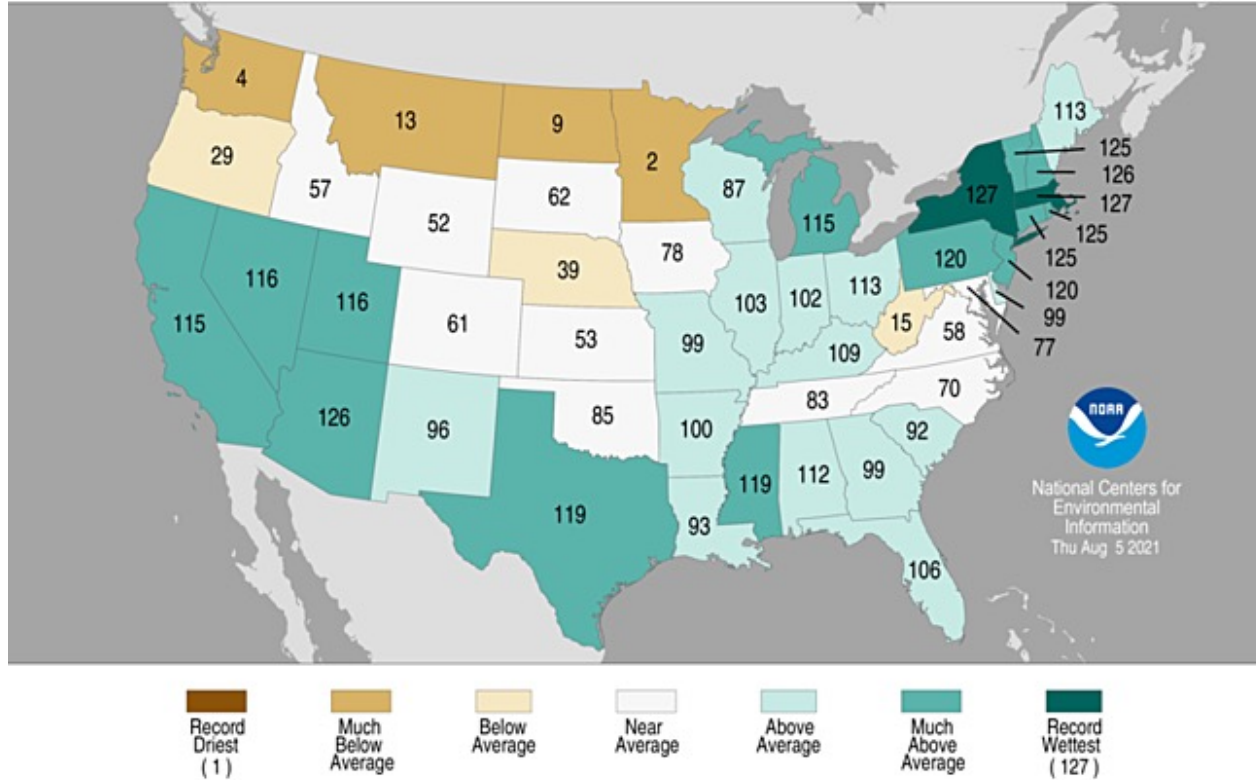
  
Record Warmest

GHCNM v4.0.1.20210807.qfe





## Statewide Precipitation Ranks July 2021 Period: 1895–2021



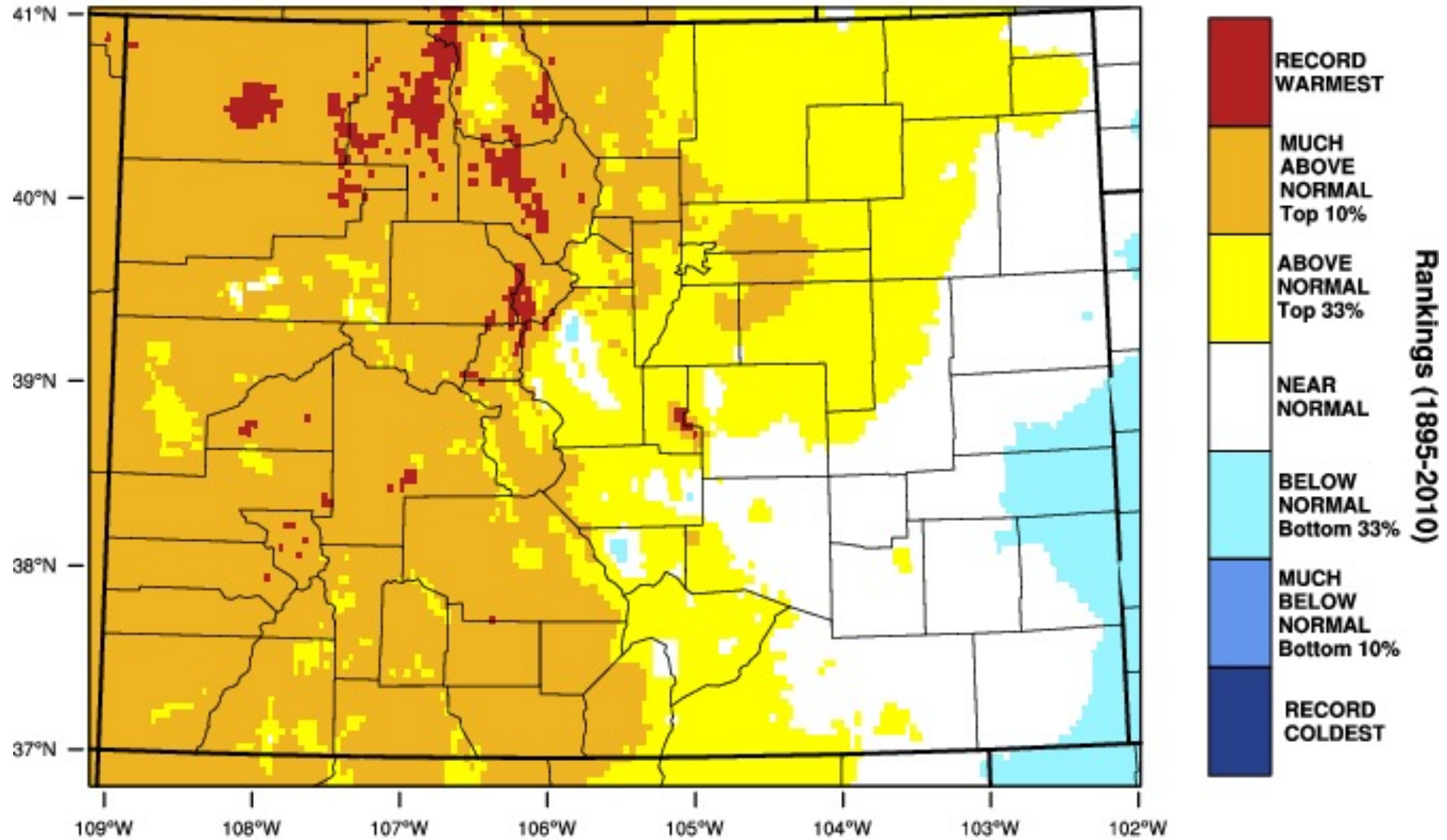
Statewide: 49<sup>th</sup> driest October-July  
0.94" below 20<sup>th</sup> century average

Month	P Rank (of 127 years)	Above, below, or near avg?
Oct	16 <sup>th</sup> driest	below
Nov	44 <sup>th</sup> driest	near avg
Dec	56 <sup>th</sup> driest	near avg
Jan	38 <sup>th</sup> driest	below
Feb	70 <sup>th</sup> driest	near avg
Mar	22 <sup>nd</sup> wettest	above
Apr	18 <sup>th</sup> driest	below
May	10 <sup>th</sup> wettest	much above
Jun	53 <sup>rd</sup> driest	near avg
Jul	61 <sup>st</sup> driest	near avg



# Colorado - Mean Temperature

## July 2021 Percentile

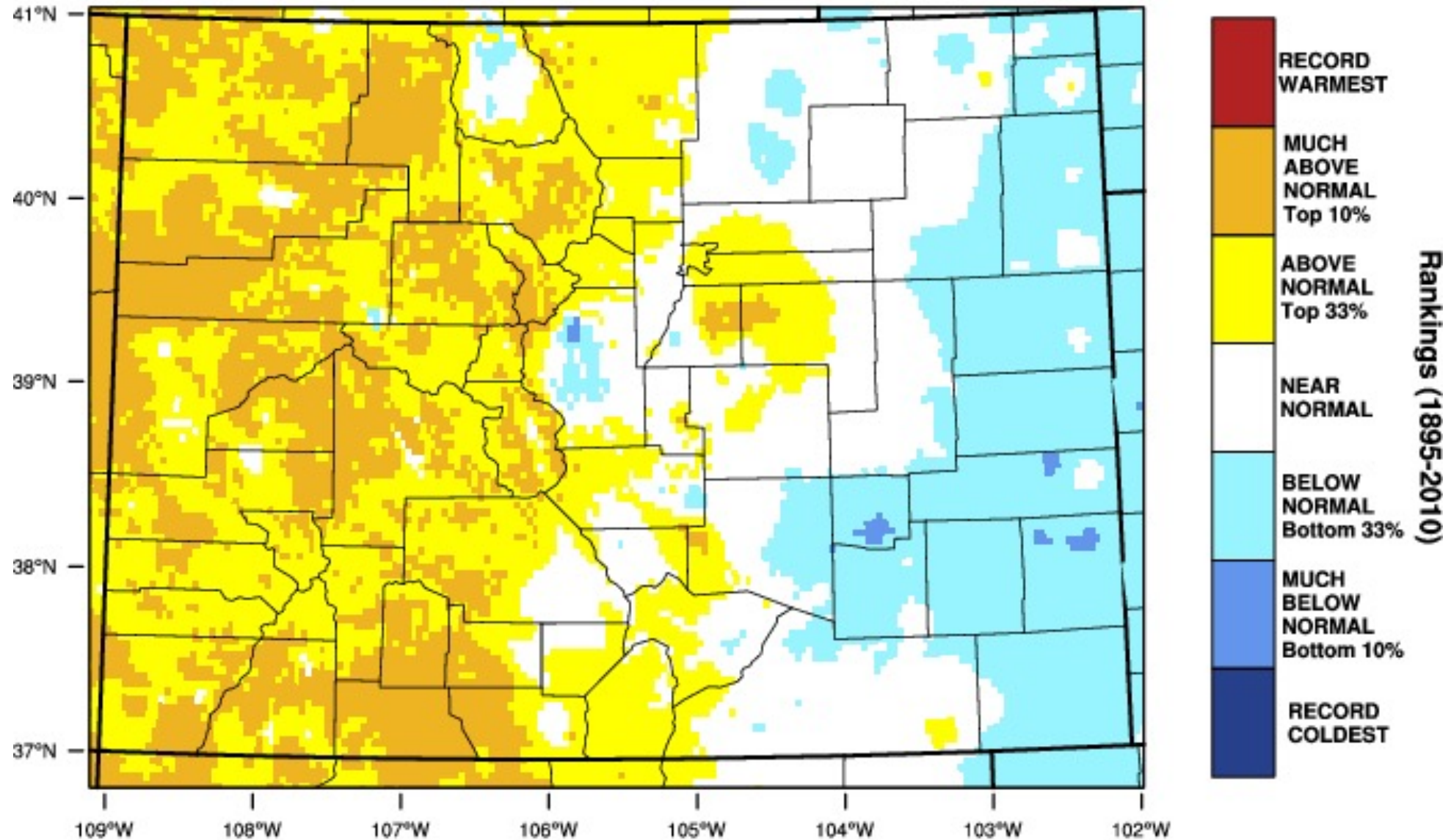


WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 16 AUG 2021



# Colorado - Mean Temperature

## October-July 2021 Percentile

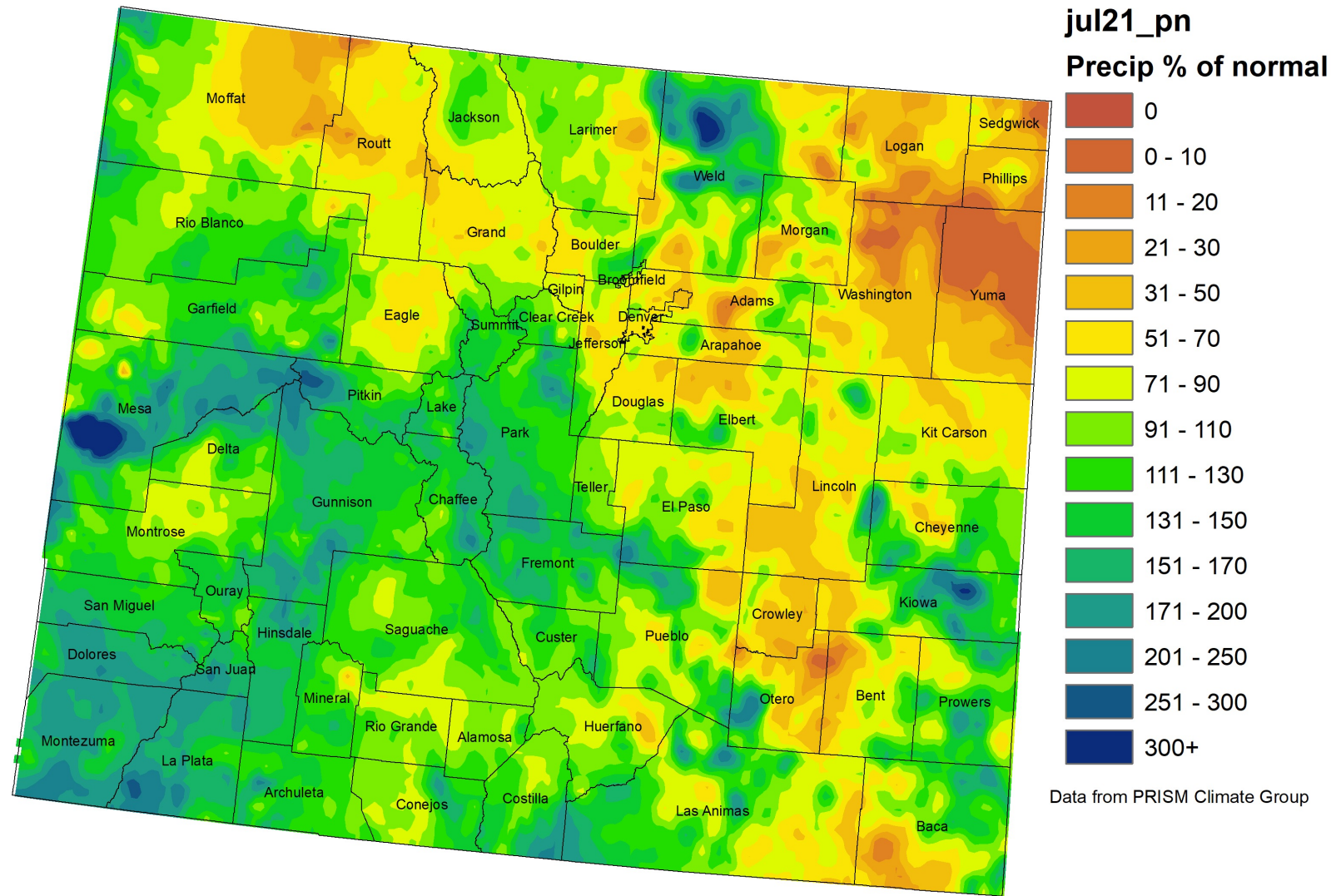


WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 16 AUG 2021



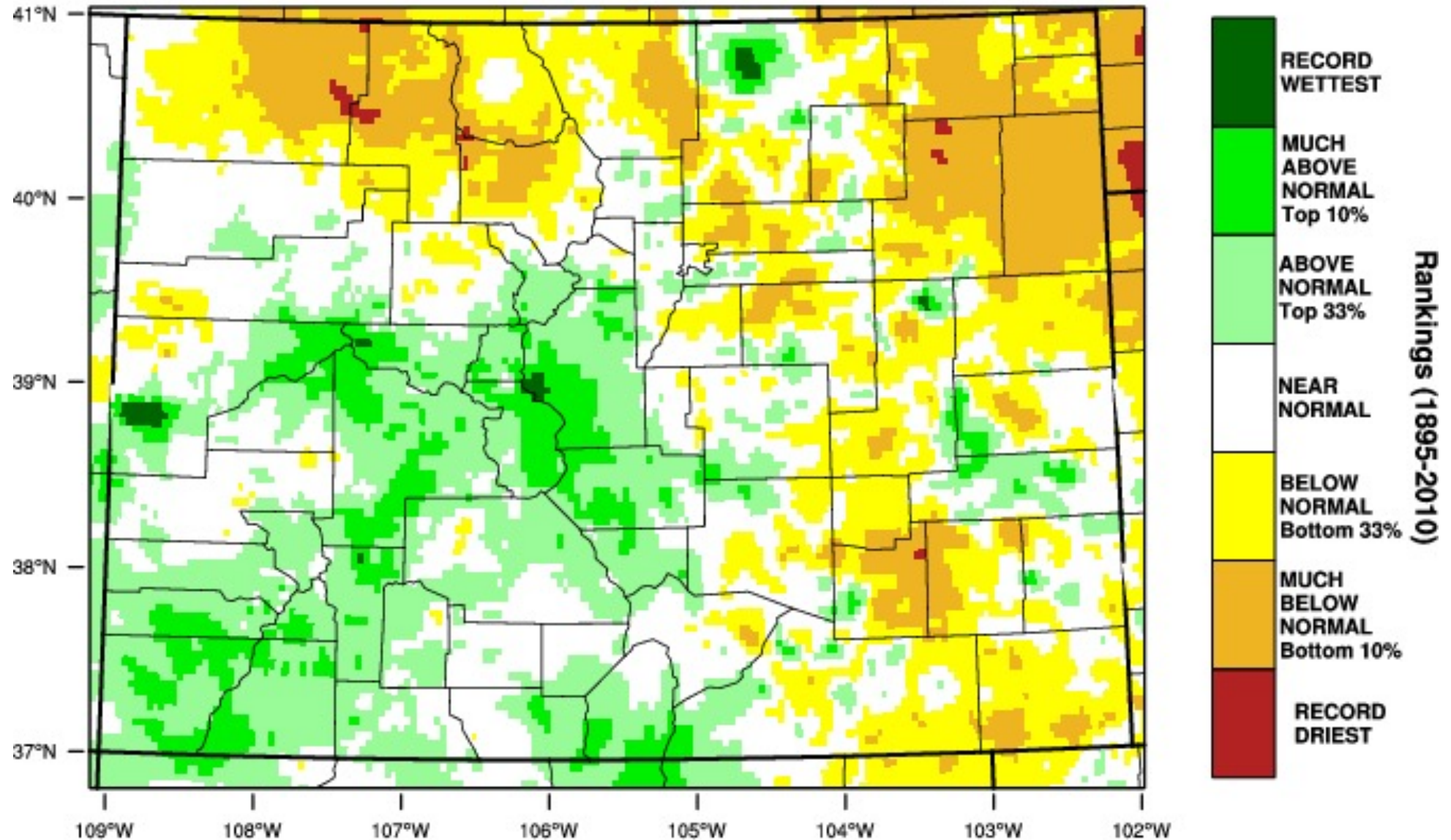


# Colorado July 2021 Precipitation as a Percentage of Normal



# Colorado - Precipitation

## June-July 2021 Percentile

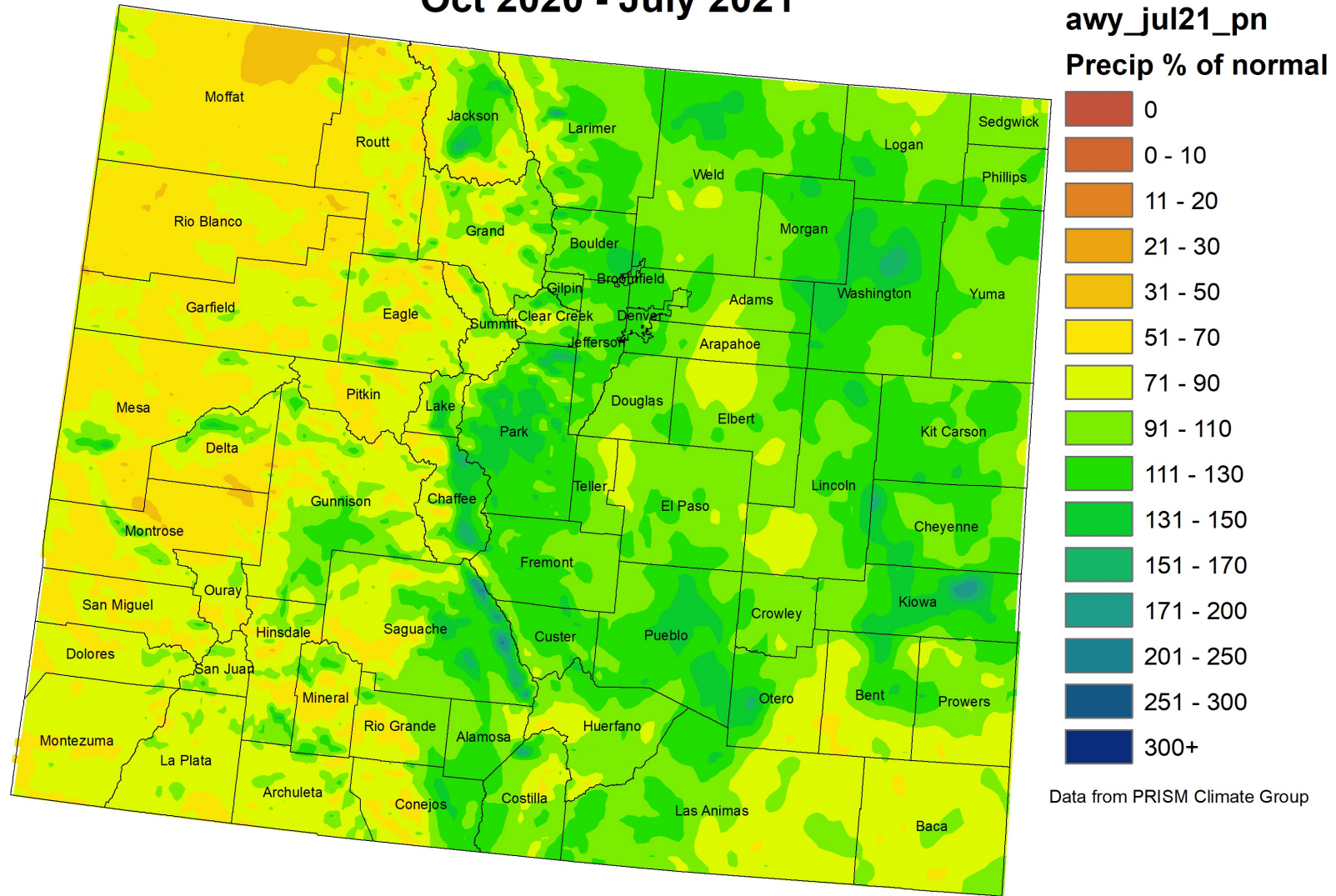


WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 16 AUG 2021





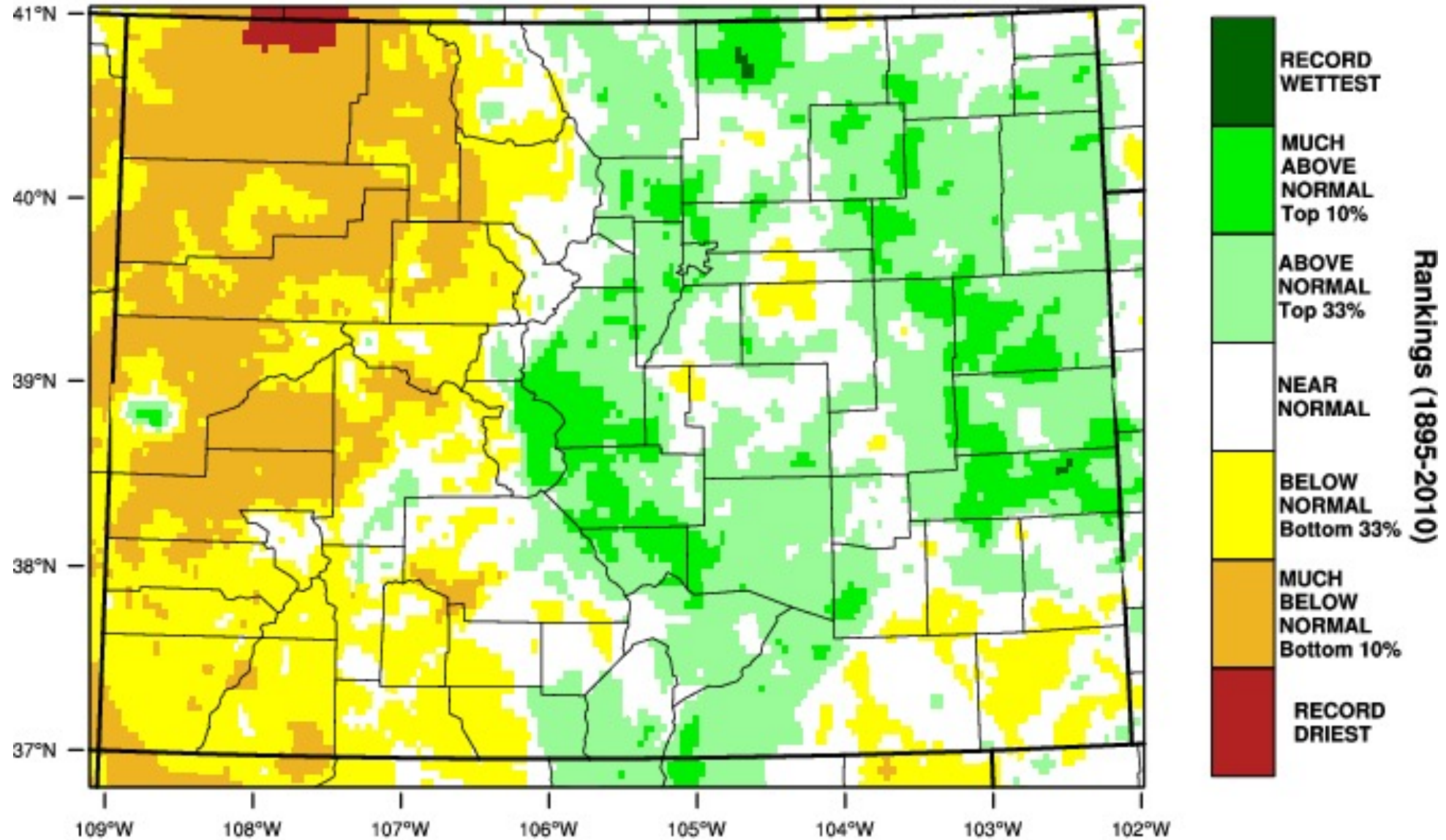
# Colorado Water Year 2021 Precipitation as a Percentage of Normal Oct 2020 - July 2021





# Colorado - Precipitation

## October-July 2021 Percentile



WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 16 AUG 2021



# Colorado average temperature and precipitation, October - July

**Warm & dry**

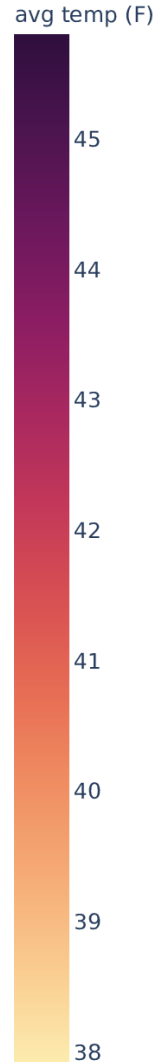
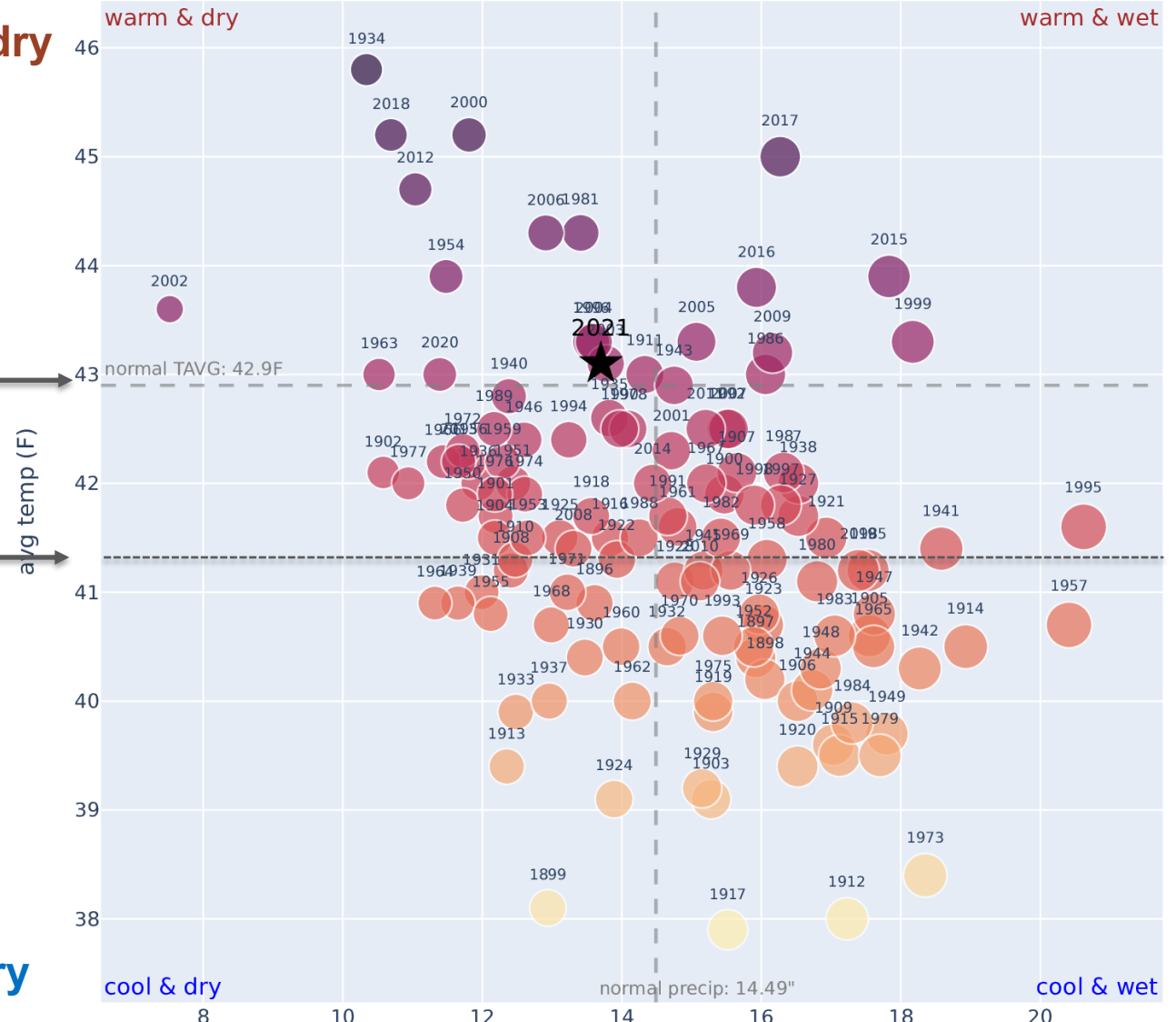
**Water year 2021 through July**

**warm & wet**

**Warm & wet**

1991-2020 avg temp →

1901-2000 avg temp →



**Cool & dry**

**cool & dry**

**cool & wet**

**Cool & wet**

size of points proportional to precip.  
color shows temp  
normals are 1991-2020

accumulated precipitation (inches)

Colorado Climate Center/CSU  
Data source: NOAA/NCEI Climate at a Glance



Colorado CD2 (Colorado drainage) average temperature and precipitation, October - July

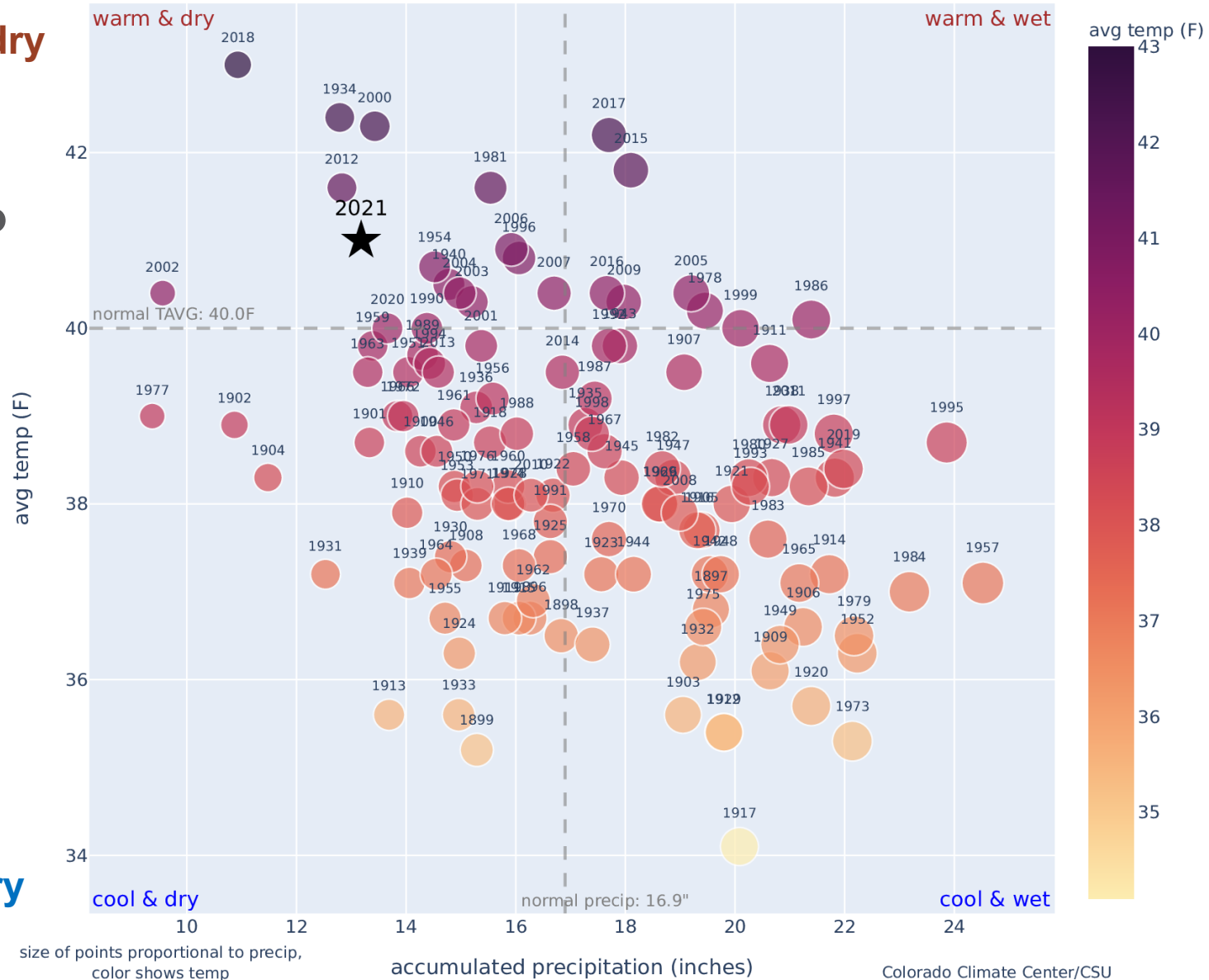
Water year 2021 through July, Western Colorado

Warm & dry

Warm & wet

Cool & dry

Cool & wet



Colorado Climate Center/CSU  
Data source: NOAA/NCEI Climate at a Glance





Colorado CD1 (Arkansas drainage) average temperature and precipitation, October - July

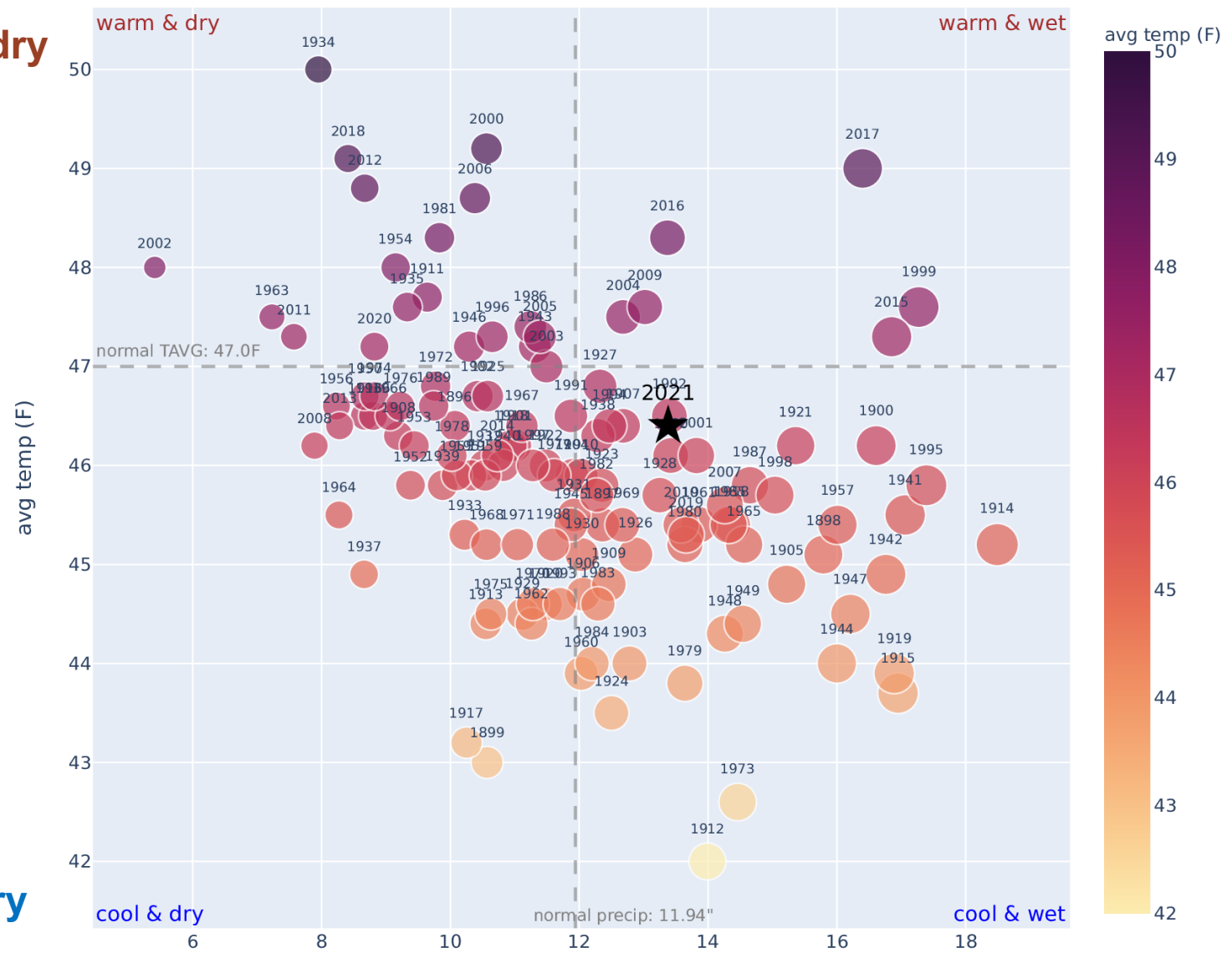
Water year 2021 through July, Arkansas River basin

Warm & dry

Warm & wet

Cool & dry

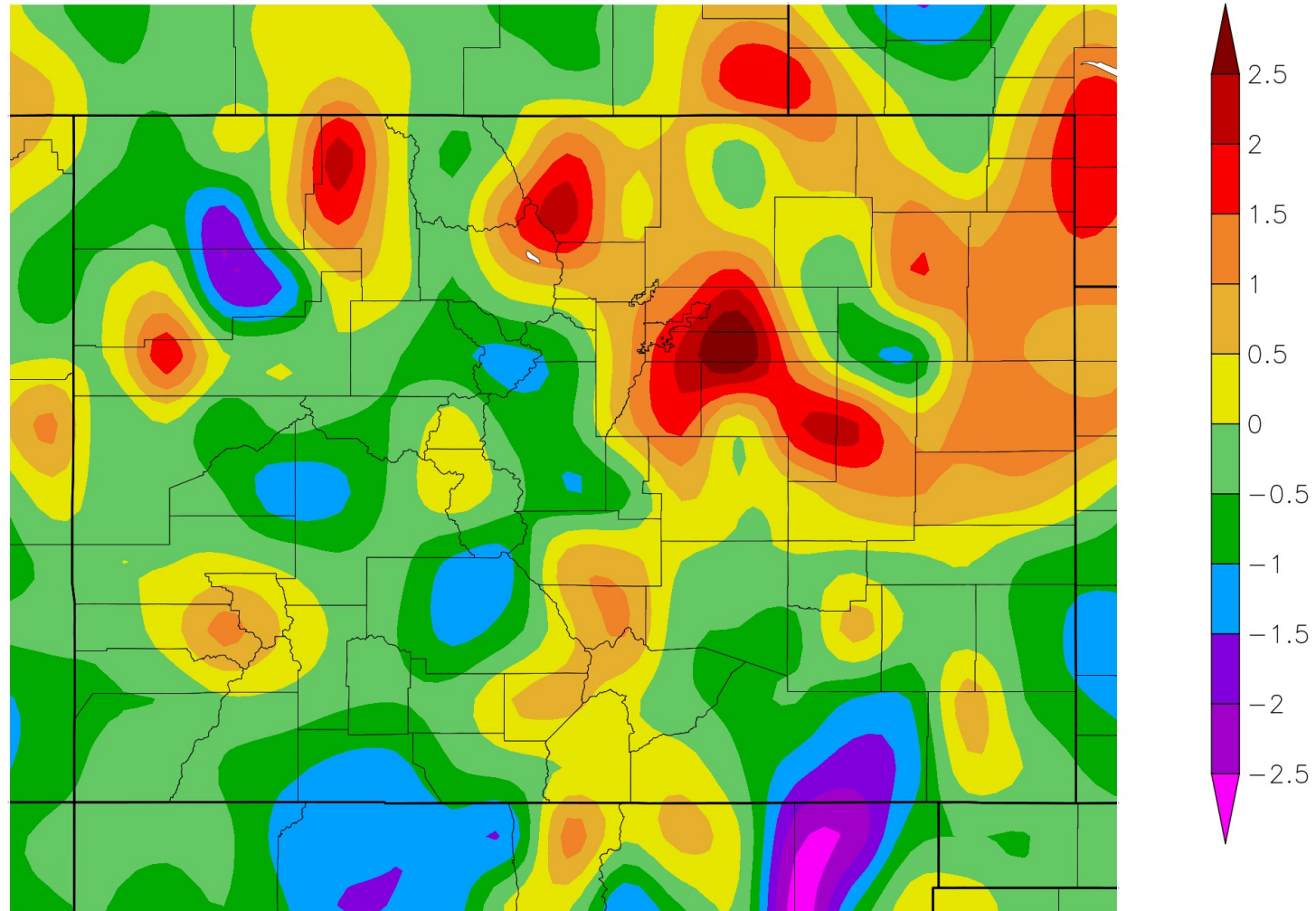
Cool & wet



Colorado Climate Center/CSU  
Data source: NOAA/NCEI Climate at a Glance



# Departure from Normal Temperature (F) 8/1/2021 - 8/22/2021

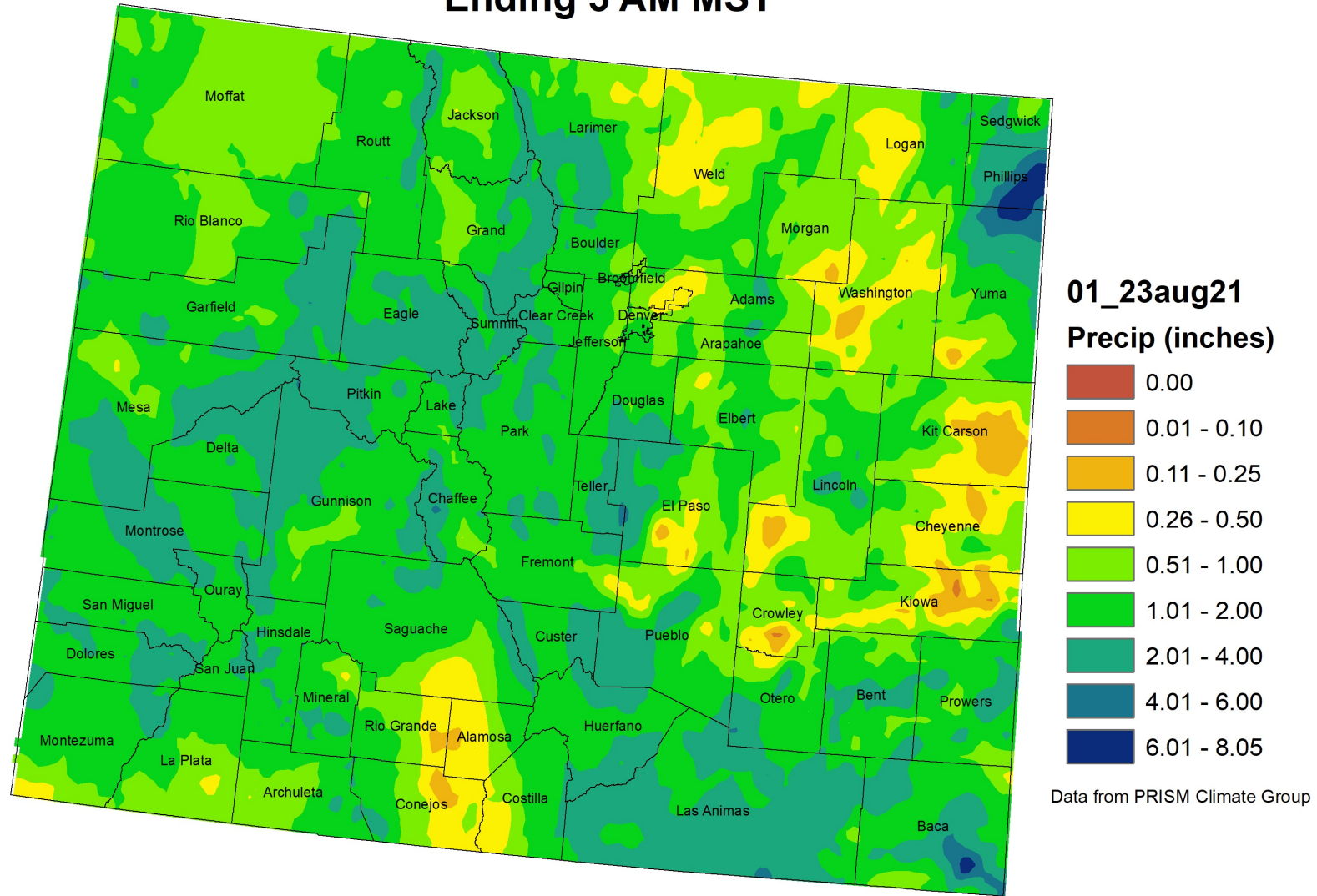


Generated 8/23/2021 at HPRCC using provisional data.

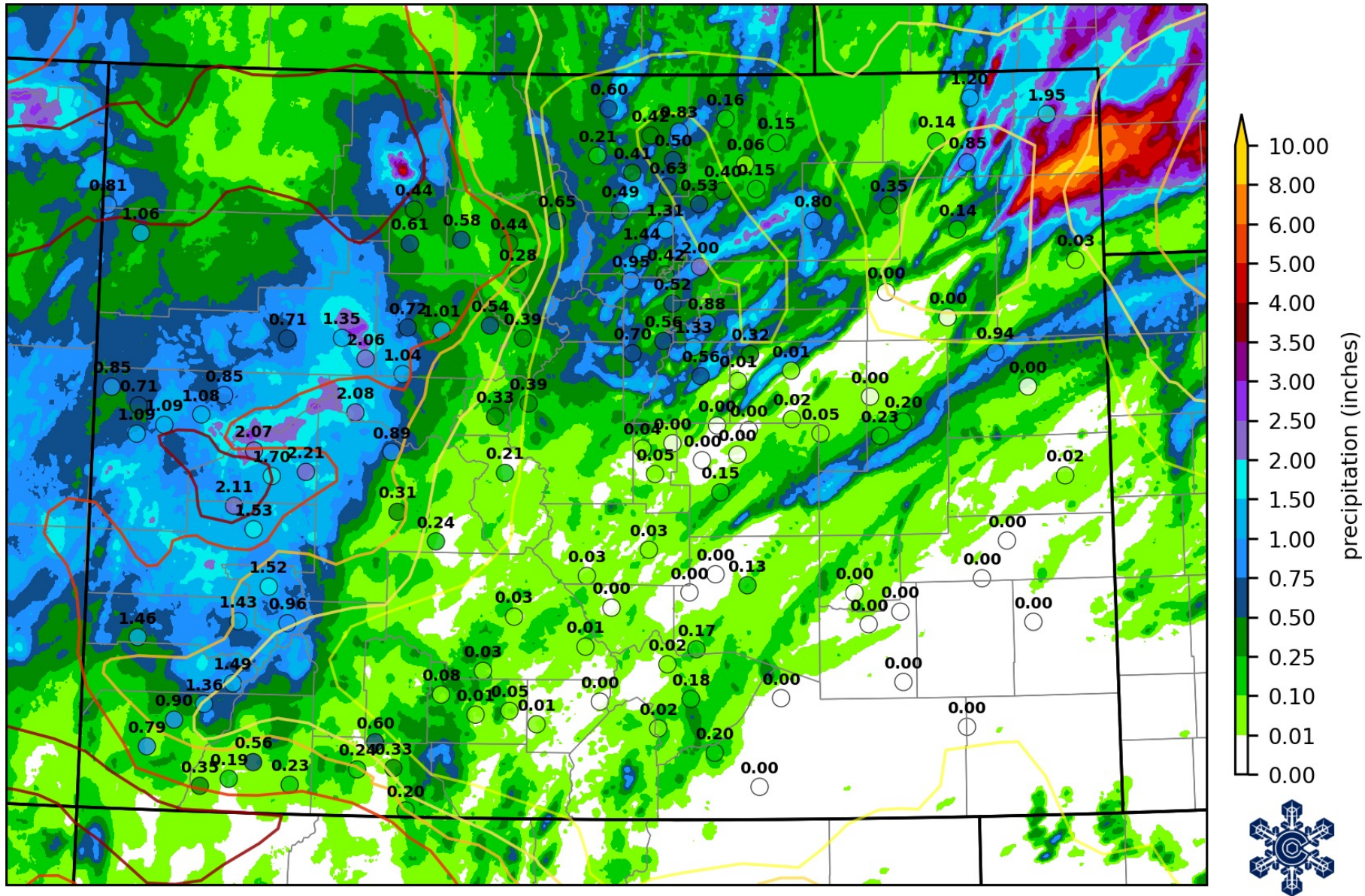
NOAA Regional Climate Centers



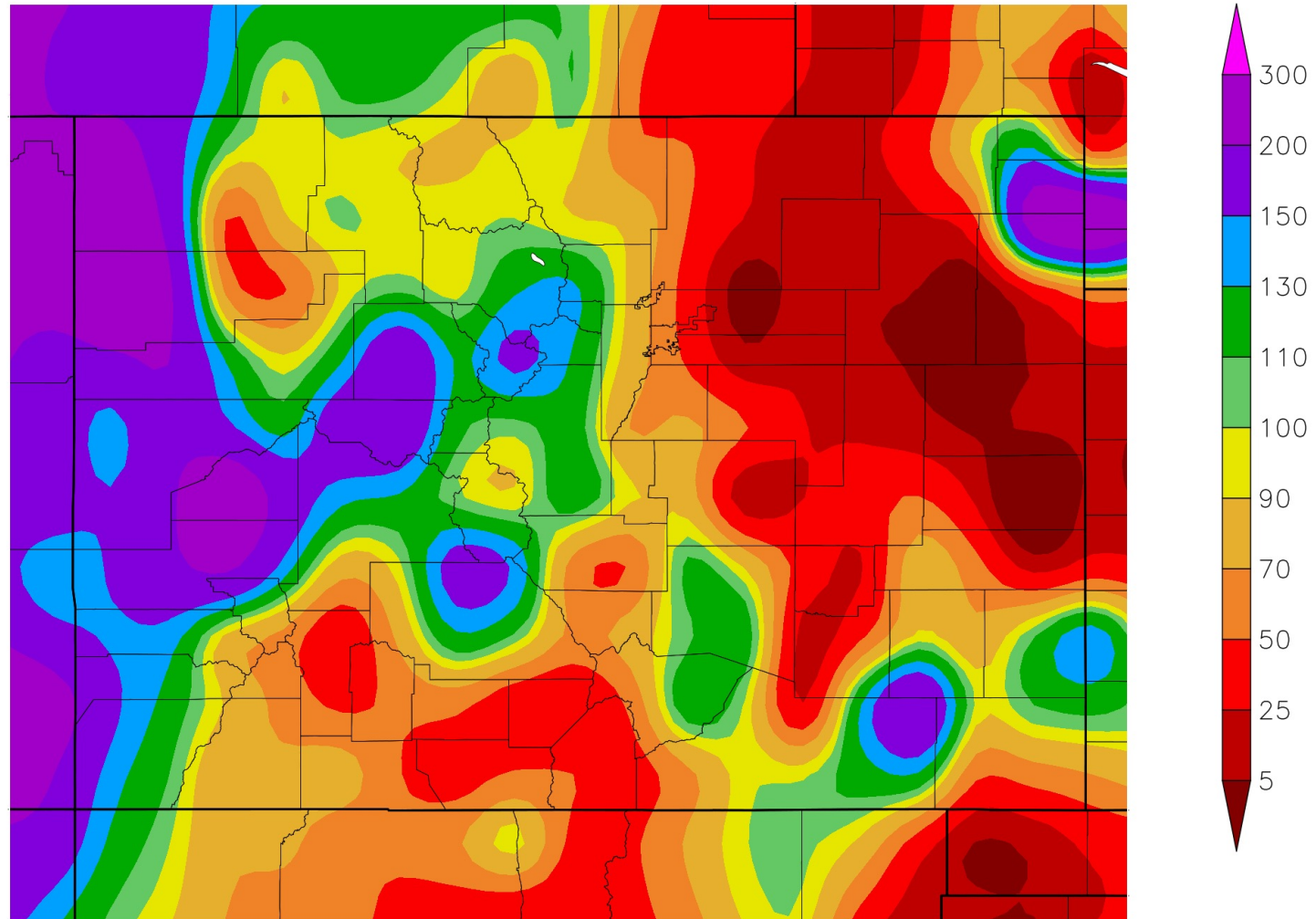
# Colorado Month to Date Precipitation 1 - 23 August 2021 Ending 5 AM MST







# Percent of Normal Precipitation (%) 8/1/2021 – 8/22/2021



Generated 8/23/2021 at HPRCC using provisional data.

NOAA Regional Climate Centers



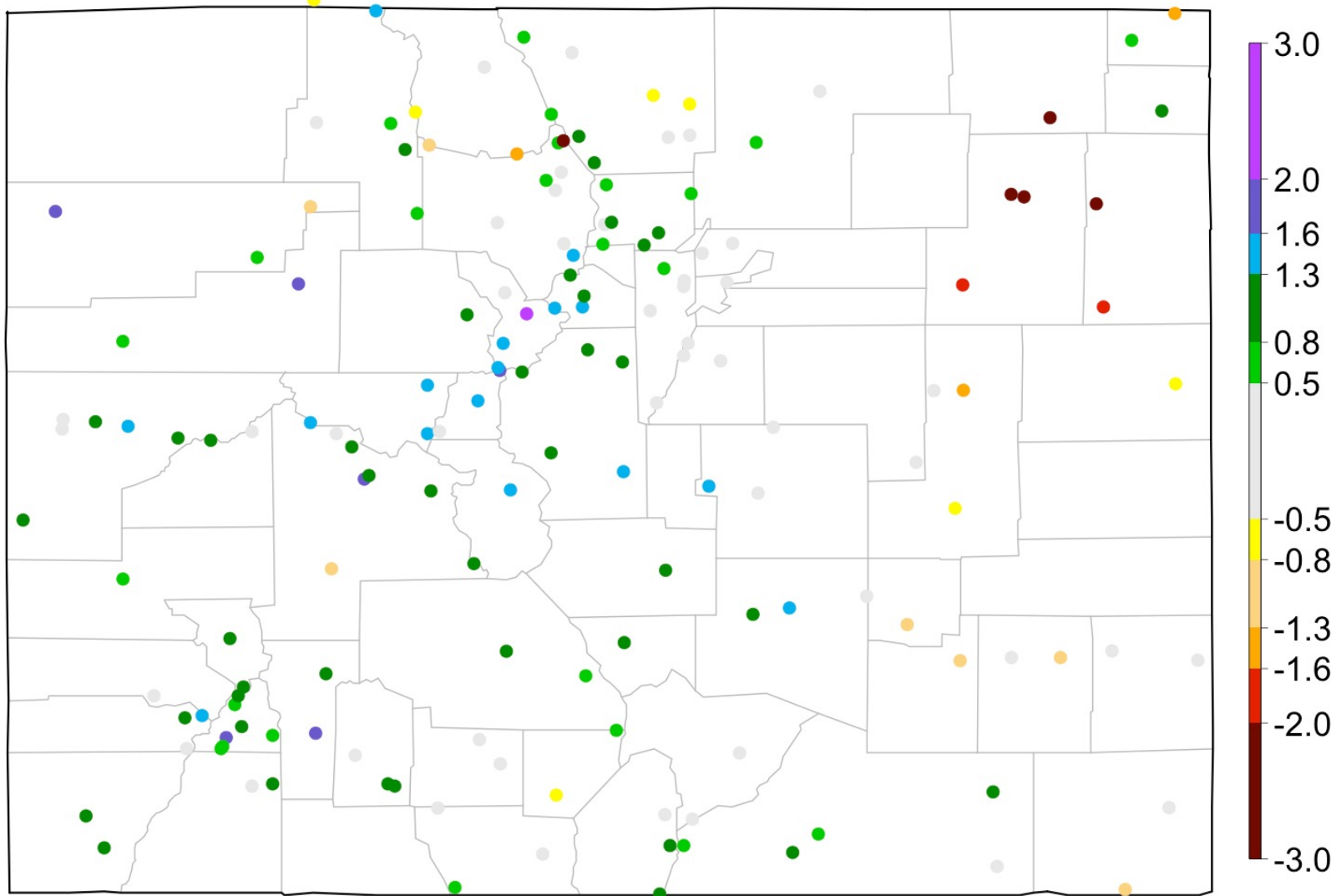






# Standardized Precipitation Index

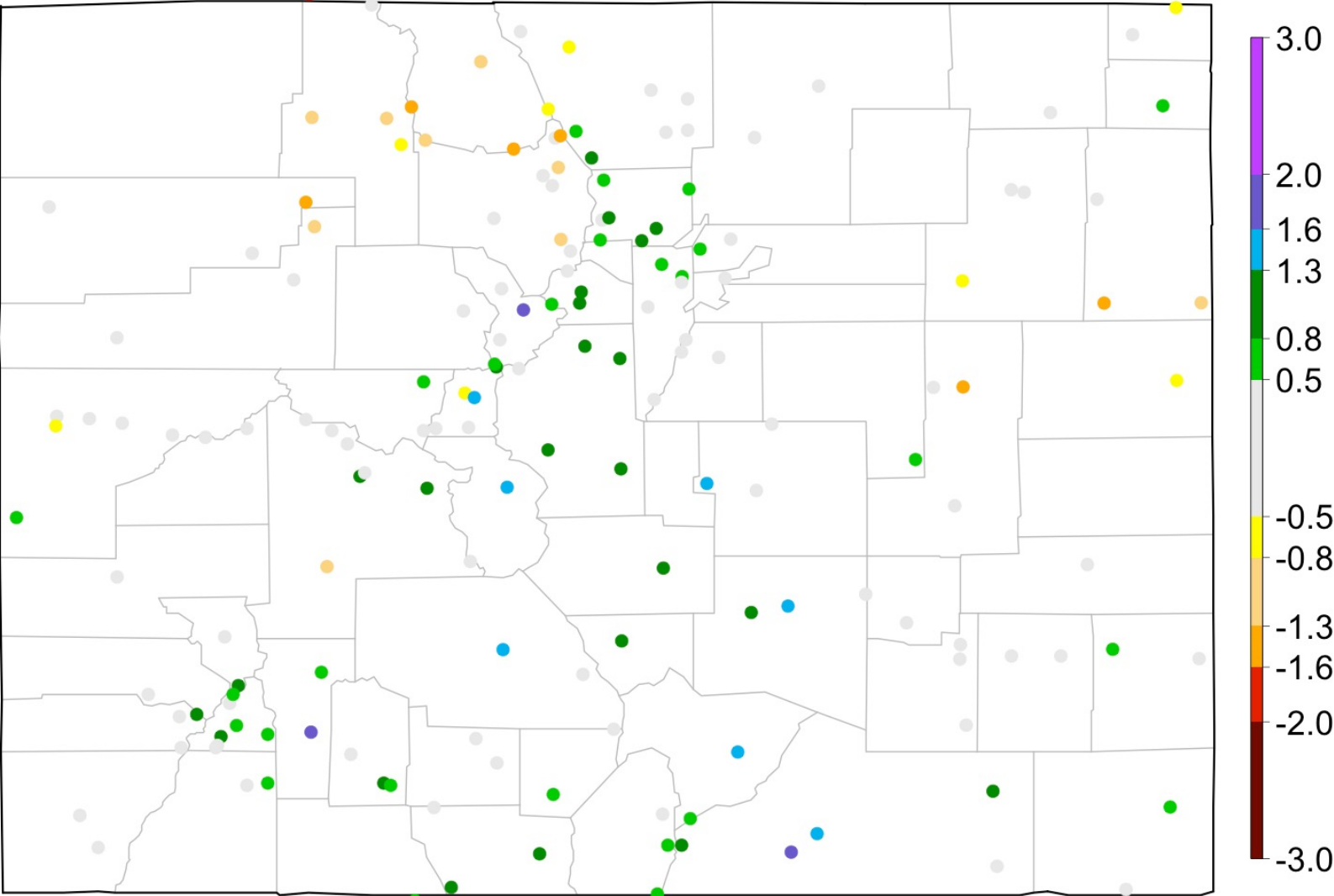
60-day SPI: 2021/06/23 - 2021/08/21



Data from High Plains Regional Climate Center and ACIS

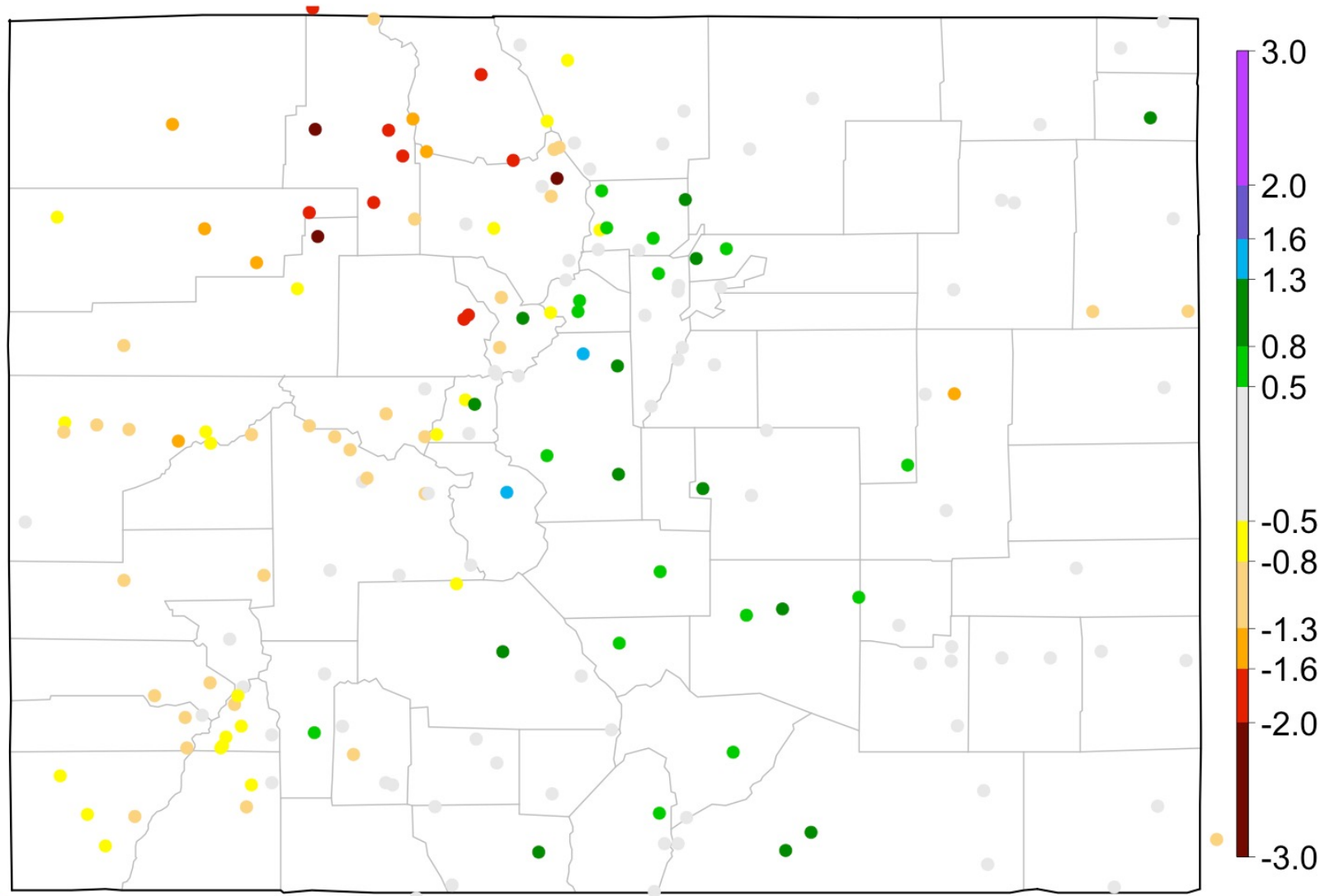


120-day SPI: 2021/04/24 - 2021/08/21



Data from High Plains Regional Climate Center and ACIS

# Water-year-to-date SPI: 2021/10/01 - 2021/08/21

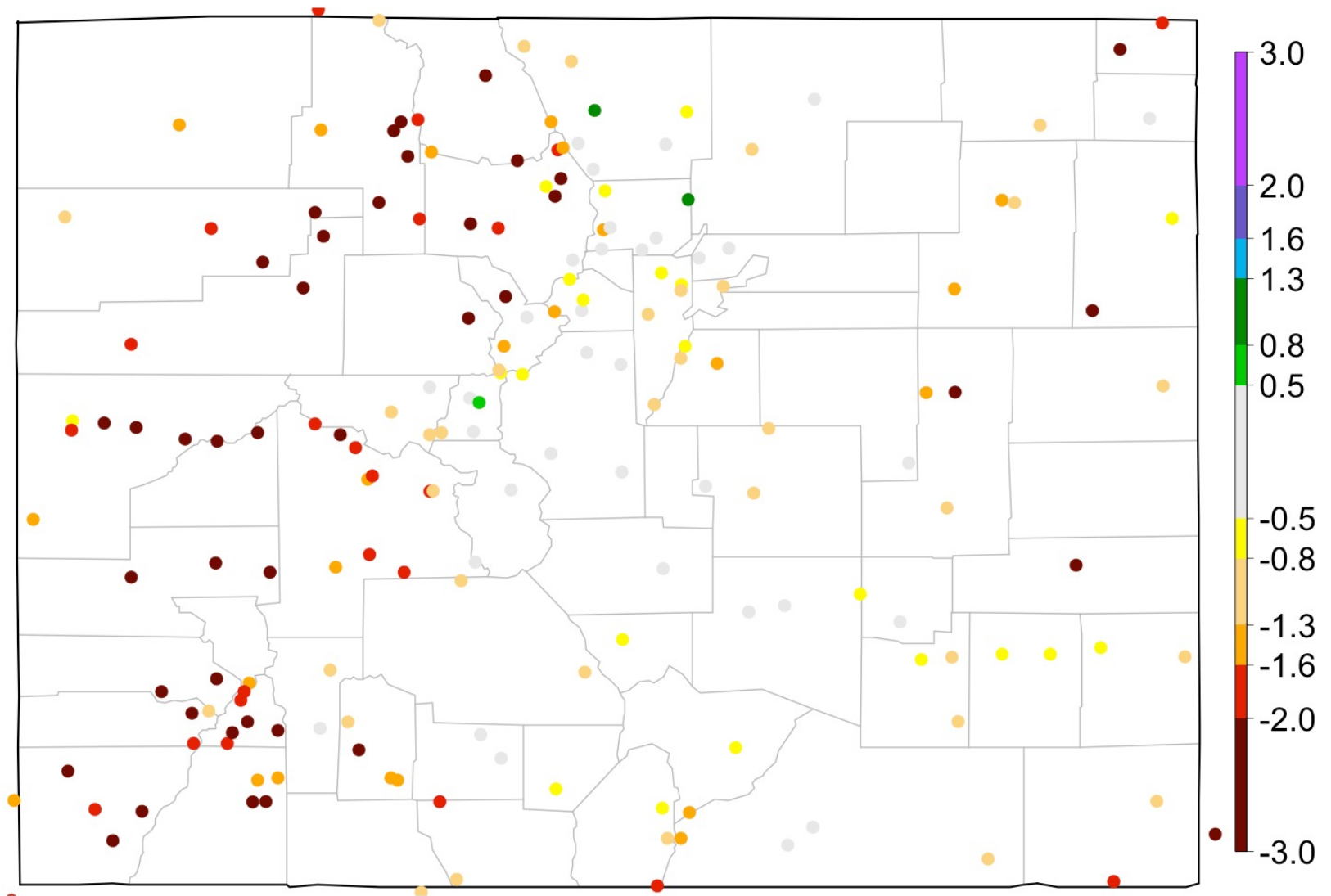


Data from High Plains Regional Climate Center and ACIS



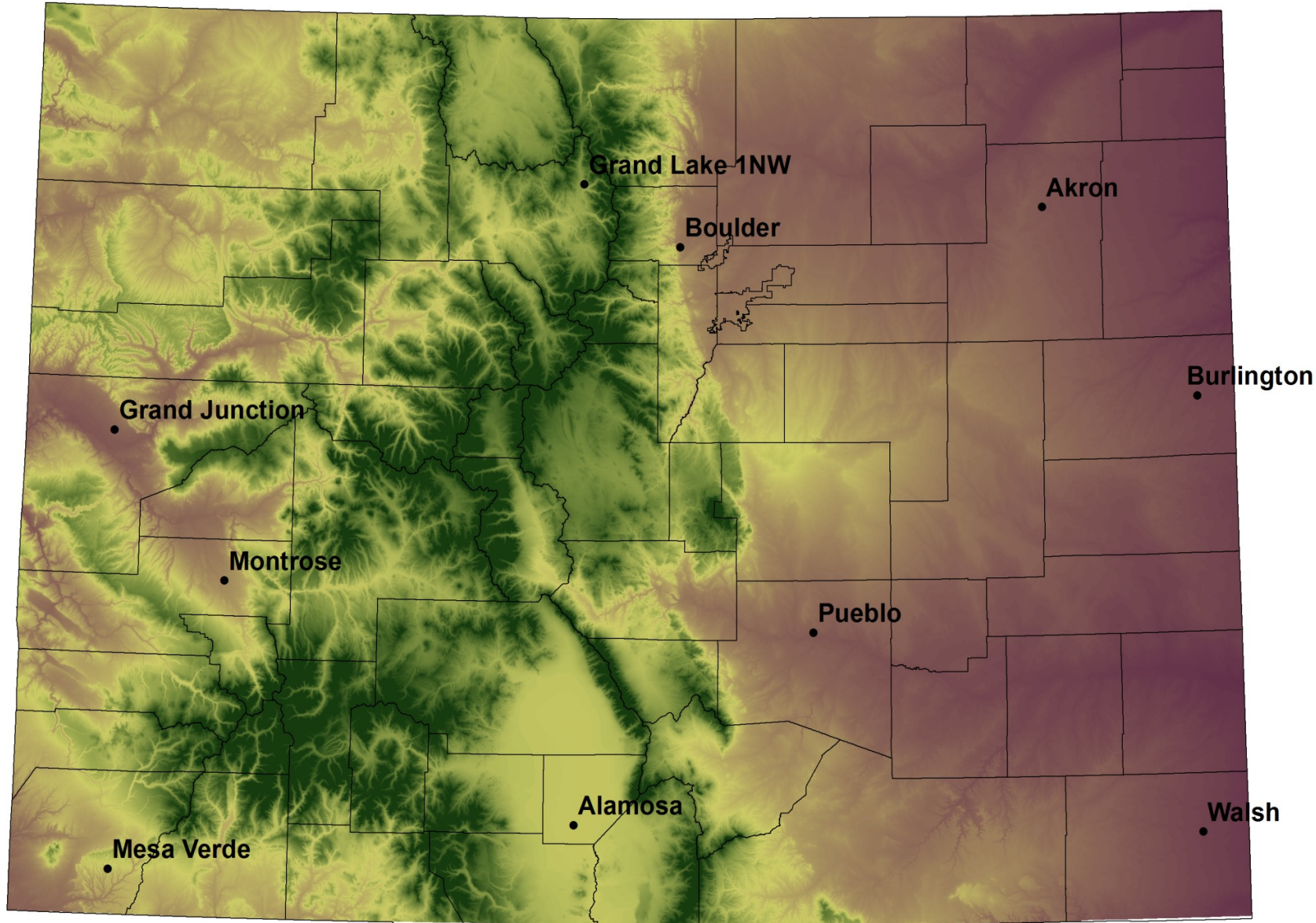


# 24-month SPI: 2019/08/22 - 2021/08/21



Data from High Plains Regional Climate Center and ACIS

# NWS Cooperative Stations for WATF



## Water Year 2021 – Station Updates



# Grand Lake

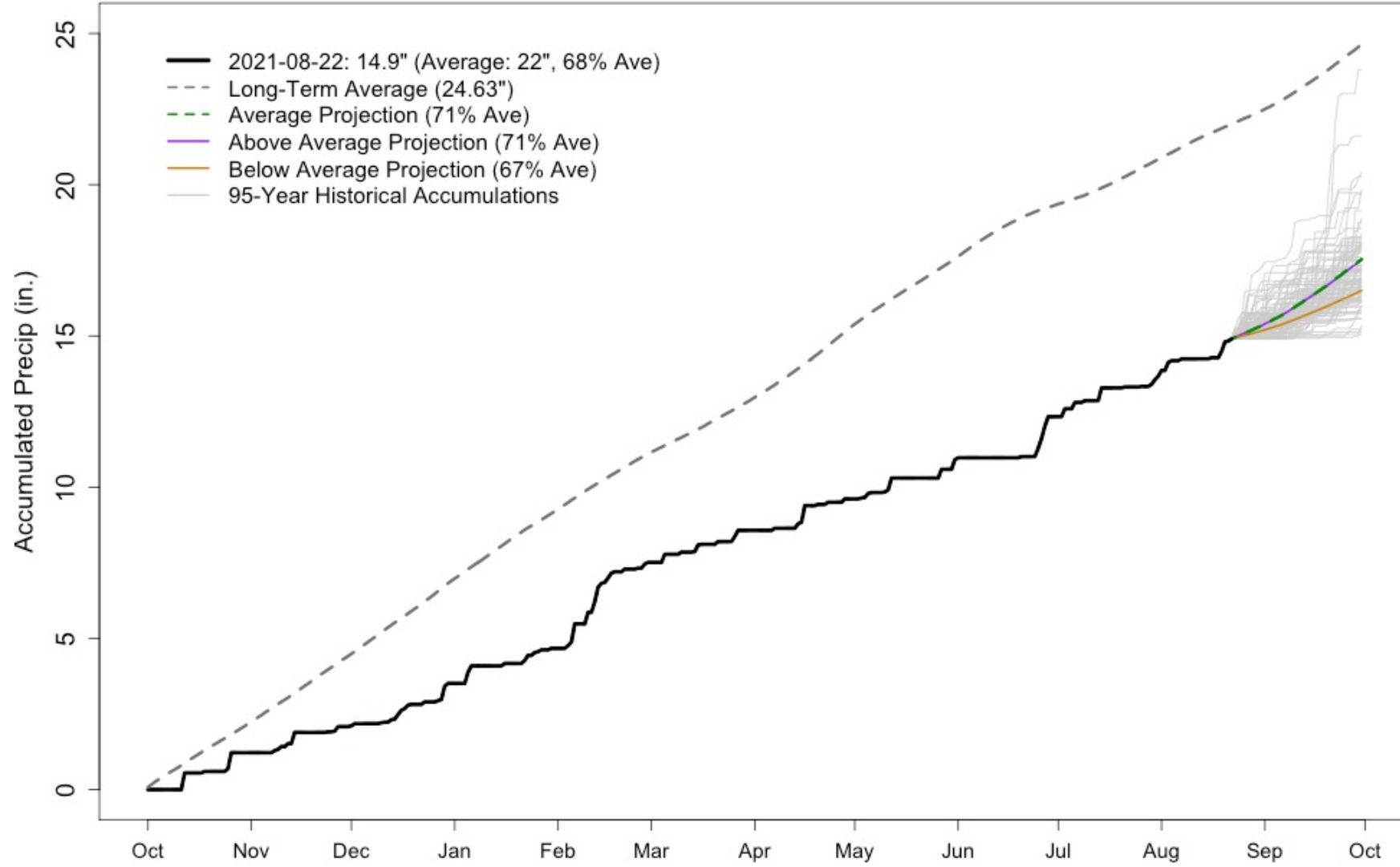
(A lot of missing data from last fall – won't show this month)





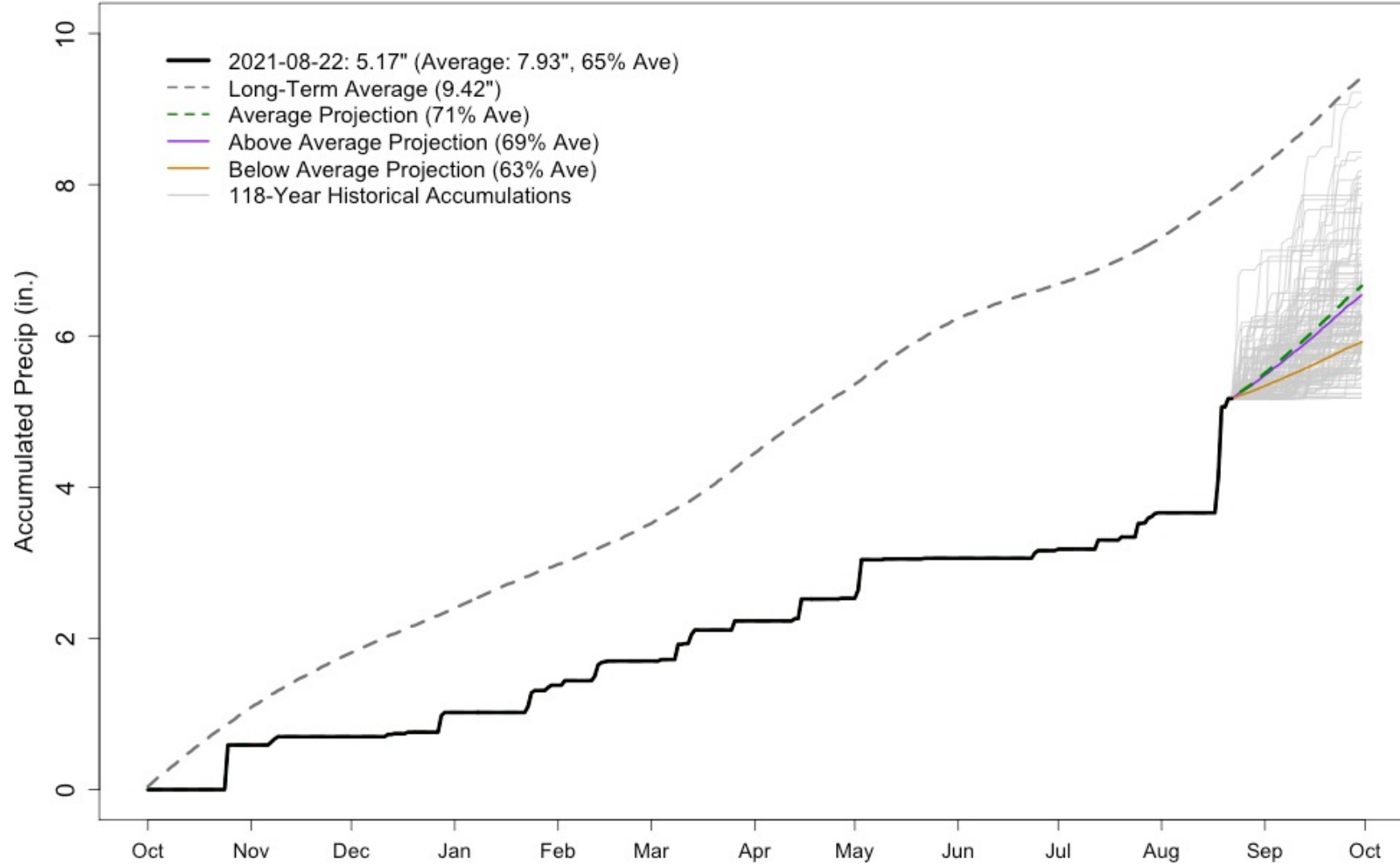
# Steamboat Springs

## STEAMBOAT SPRINGS WY2021 Precipitation Projections



# Grand Junction

## GRAND JUNCTION WALKER FIELD WY2021 Precipitation Projections

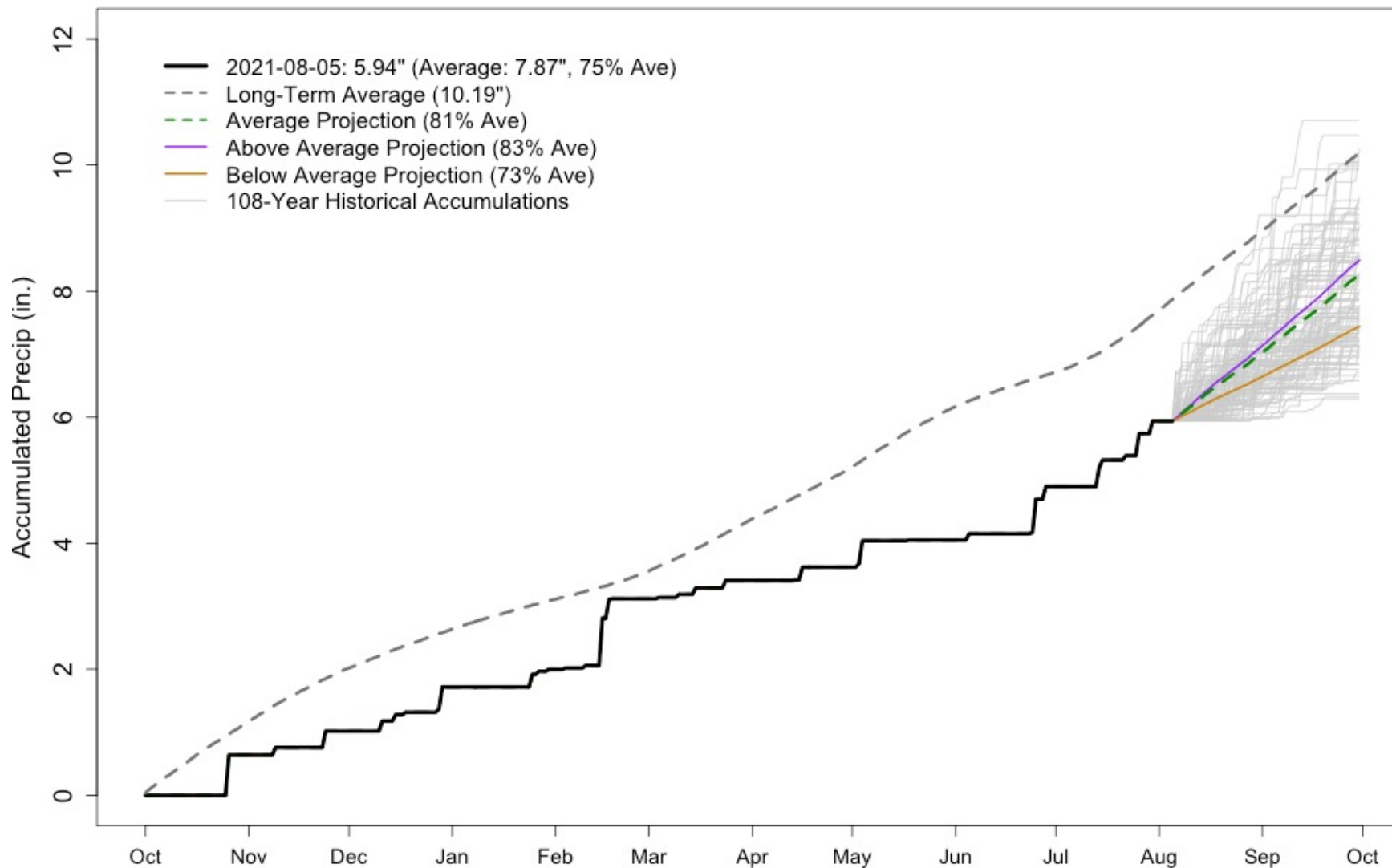


Even with 1.4" of rain last week, still only 65% of average for the water year



# Montrose

## MONTROSE NO 2 WY2021 Precipitation Projections



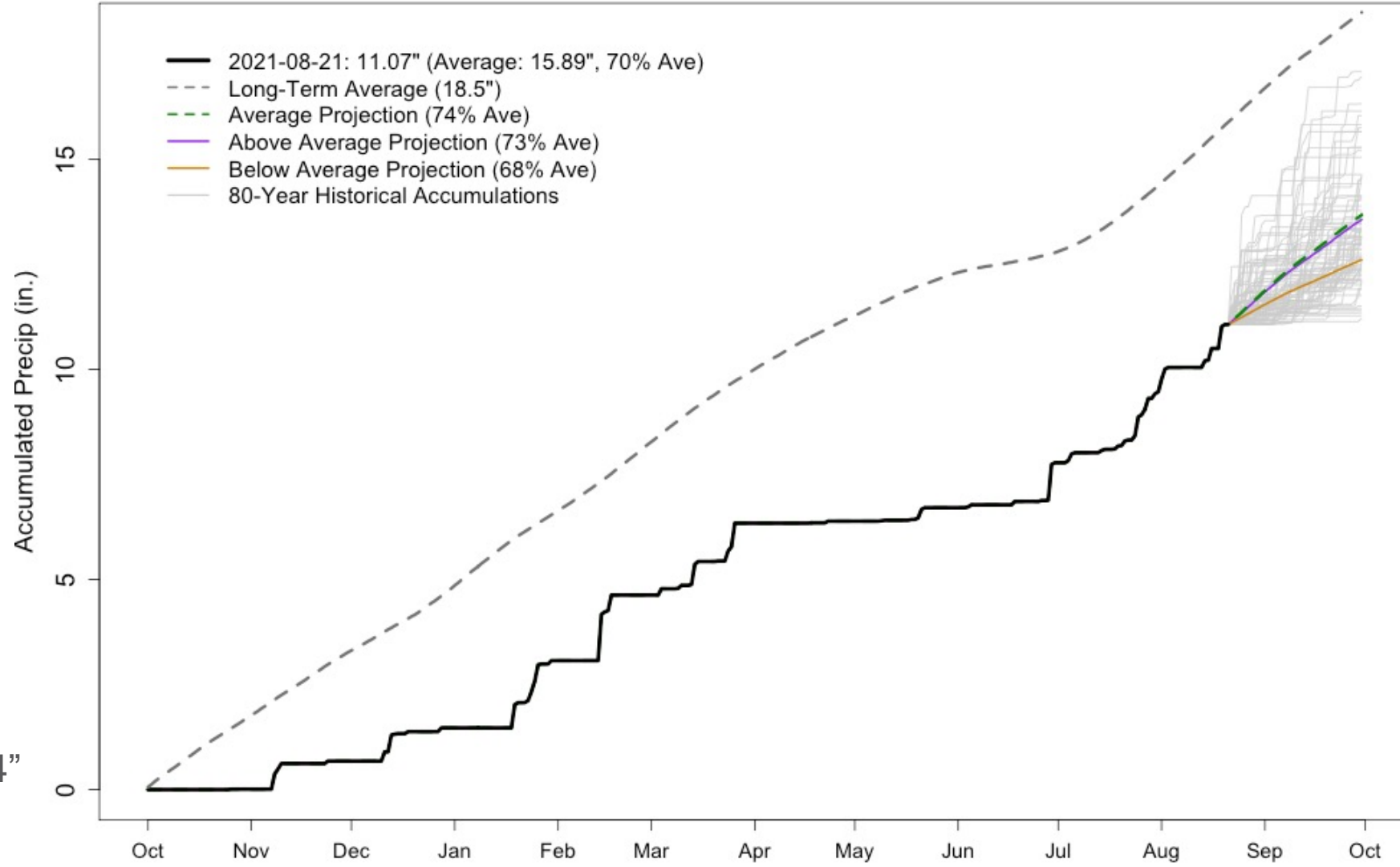
Note: data only through August 5, other stations around Montrose got ~1.5" of rain last week





# Mesa Verde NP

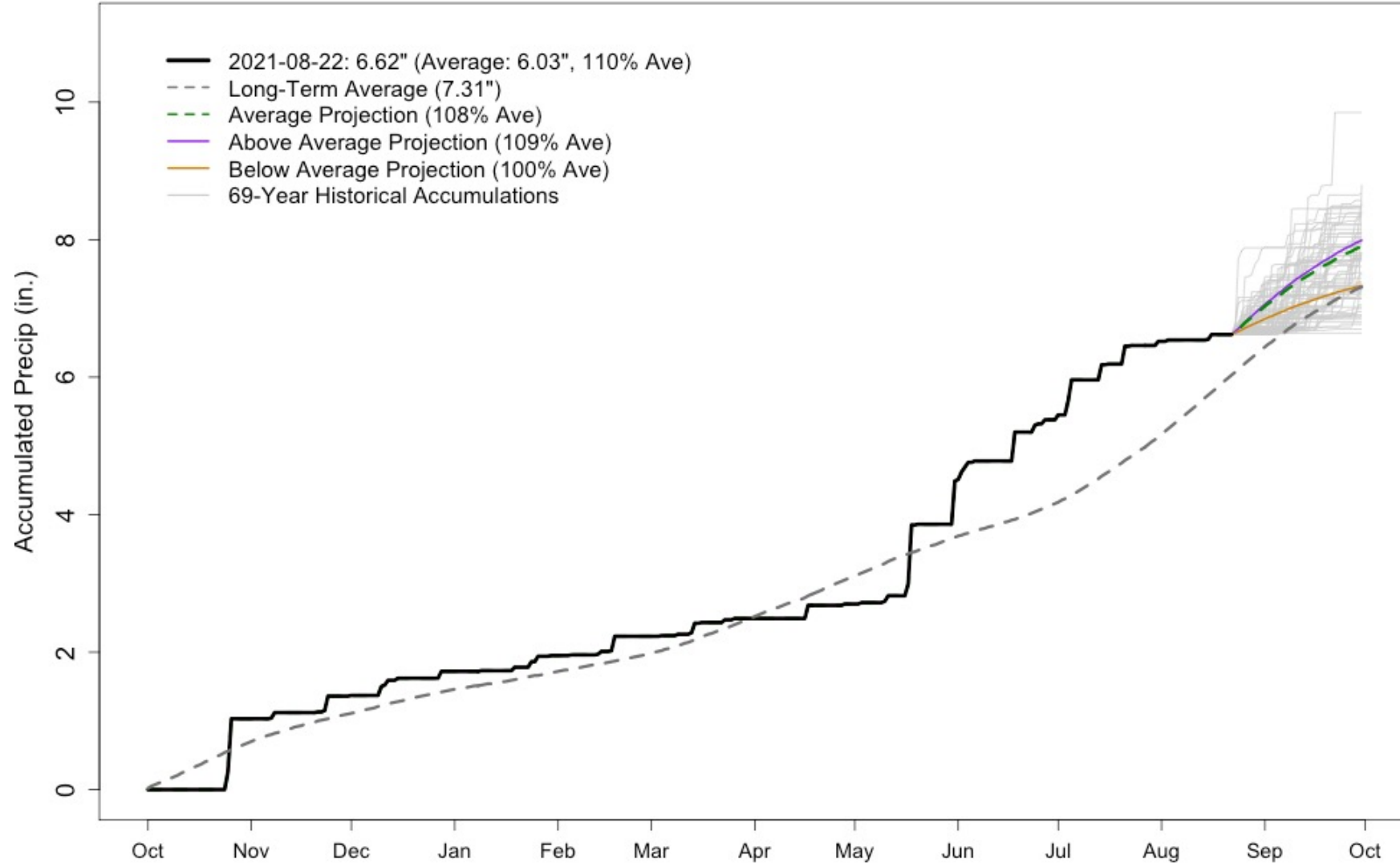
## MESA VERDE NP WY2021 Precipitation Projections



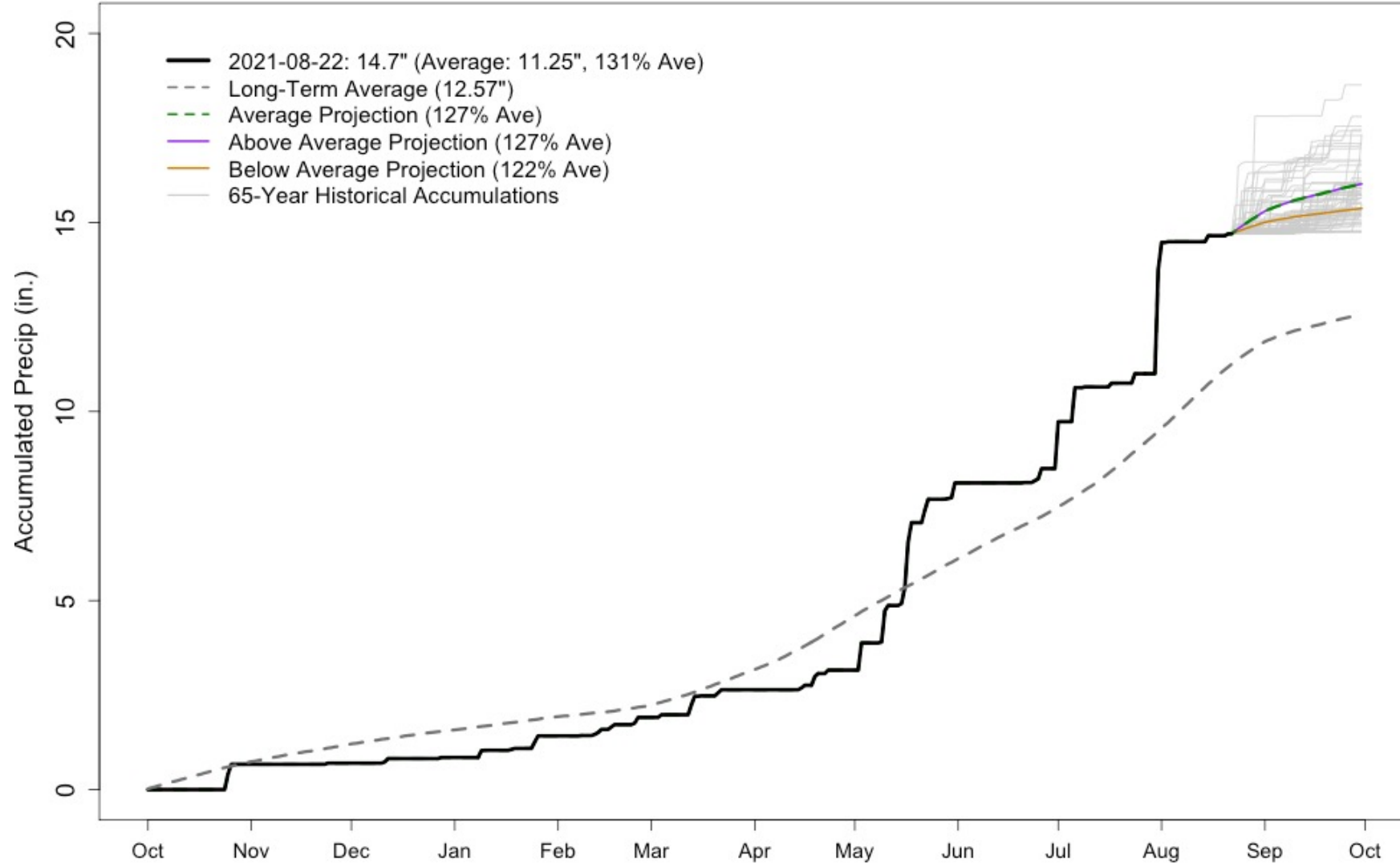
Since October 2019, 20.81" compared to average of 31.84" (an 11" deficit)



## ALAMOSA-BERGMAN FIELD WY2021 Precipitation Projections

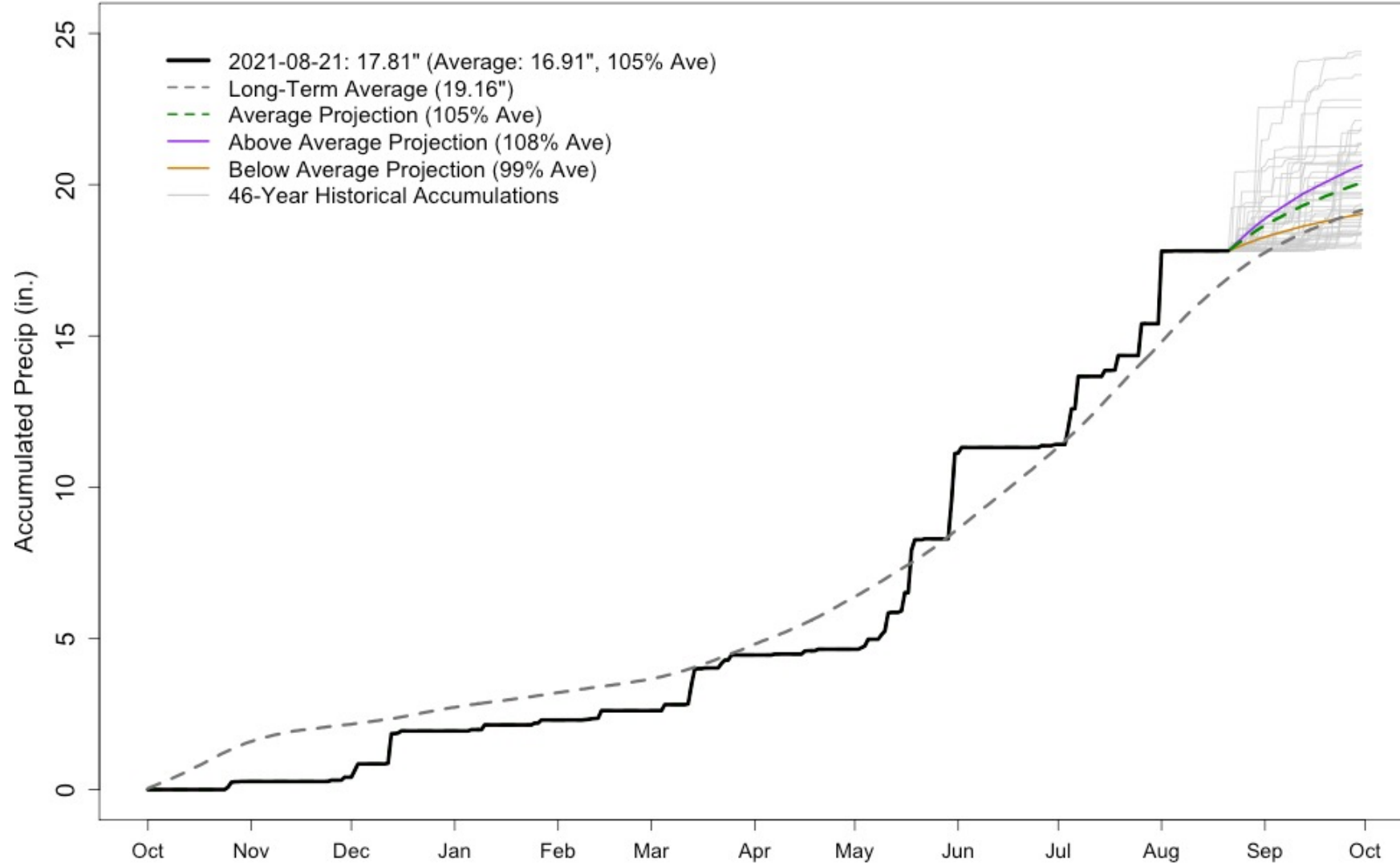


## PUEBLO MEMORIAL AIRPORT WY2021 Precipitation Projections

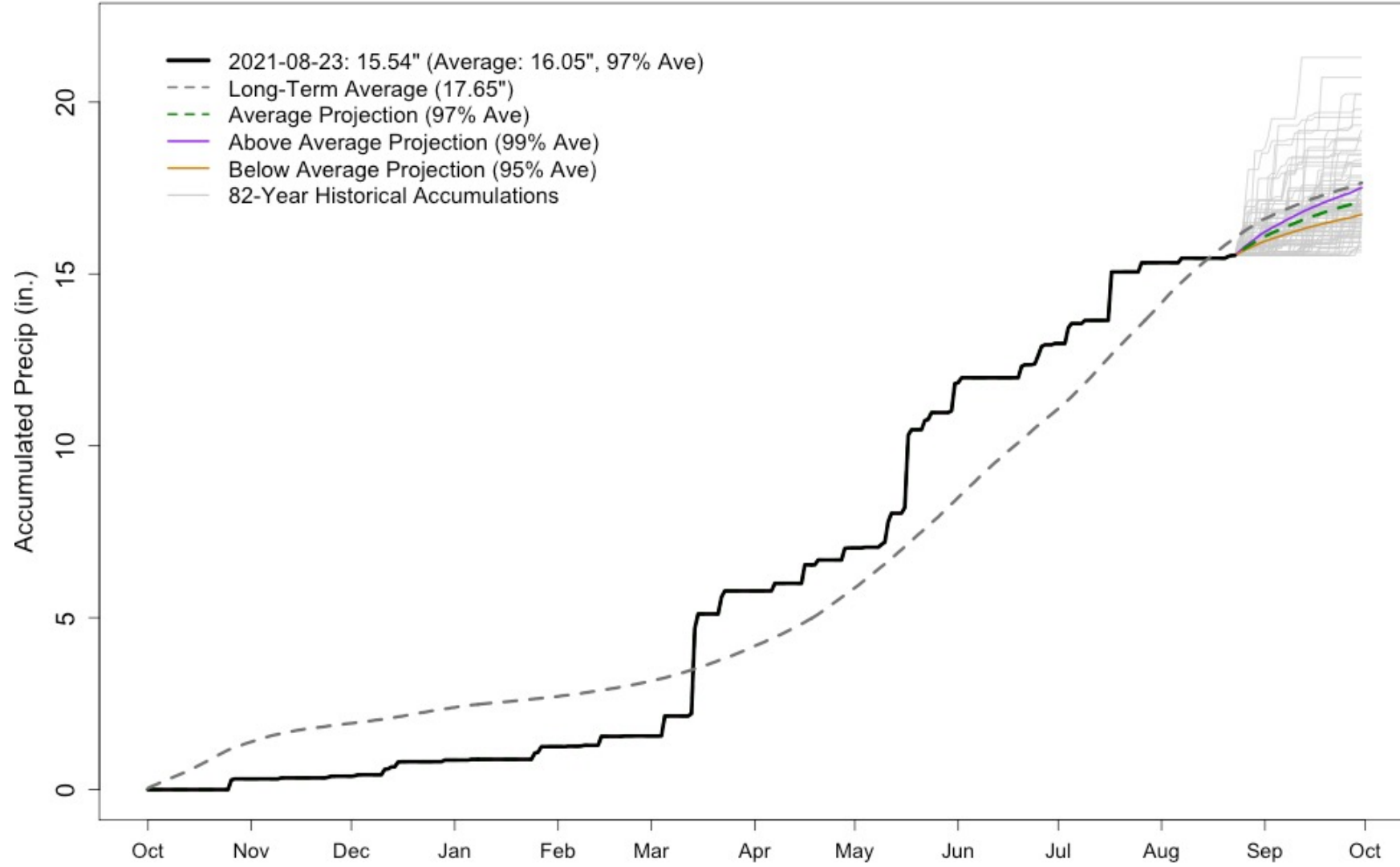




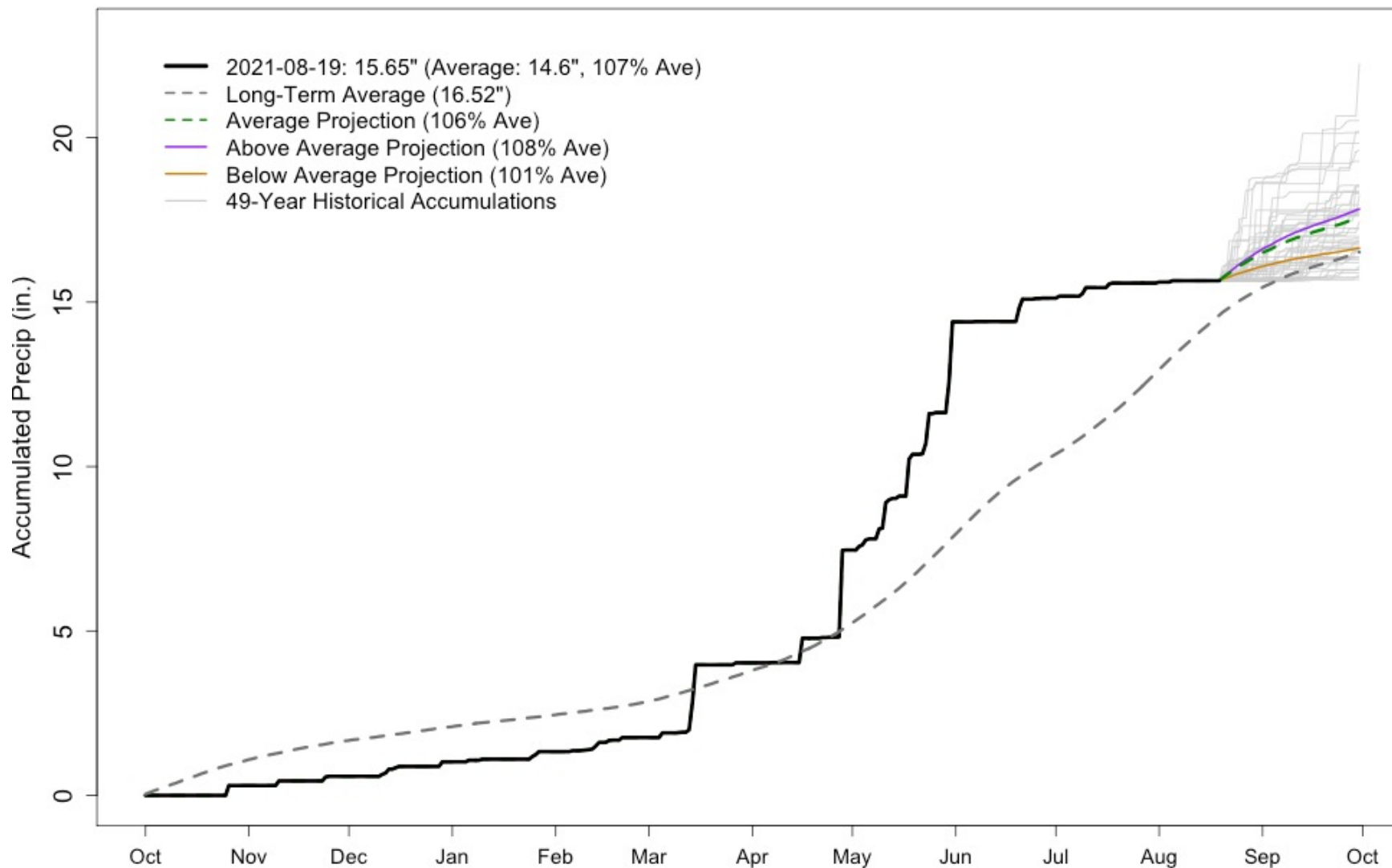
### WALSH 1 W WY2021 Precipitation Projections



## BURLINGTON WY2021 Precipitation Projections



## AKRON 4 E WY2021 Precipitation Projections



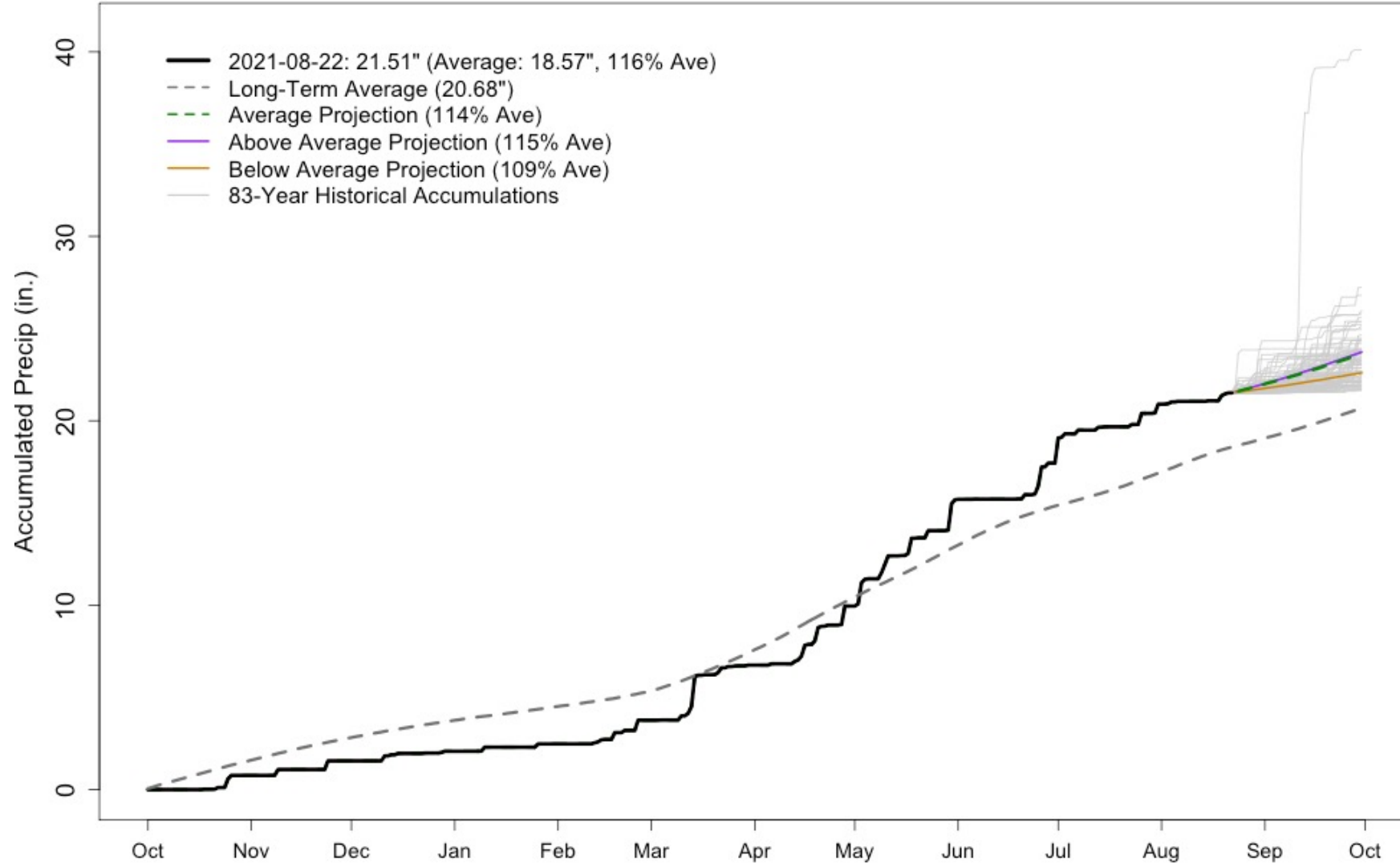
Since June 1,  
1.75" compared  
to average of  
6.59"

**Driest June 1 –  
August 22 on  
record**





## BOULDER WY2021 Precipitation Projections







Black Hollow flash flood, Poudre Canyon  
<https://www.larimer.org/spotlights/2021/07/21/black-hollow-poudre-canyon-flooding-information>



I-70 flash flood and debris flow

Colorado Department of Transportation  
@ColoradoDOT

(8/1) I-70 through Glenwood Canyon will continue to be closed due to extreme damage from the latest round of flooding Saturday night (7/31). Motorists advised to take northern alternate route (see map), and trucks traveling through take I-80. Go to [COtrip.org](http://COtrip.org).

5:38 PM · Aug 1, 2021 · Twitter Web App

132 Retweets 56 Quote Tweets

225 Likes

Tweet your reply Reply

Colorado Department of Transportation · Aug 2

Replying to @ColoradoDOT  
WATCH [fb.watch/78bWpbZ59/](https://www.facebook.com/watch/78bWpbZ59/): @GovofCO joined #TeamCDOT, @COPublicSafety & @CSP\_News today to provide an update on the ongoing mudslides, safety closures and Flash Flood Warnings that have taken place during the past week on #170 in the #GlenwoodCanyon.

facebook.com  
Governor Jared Polis on Facebook...

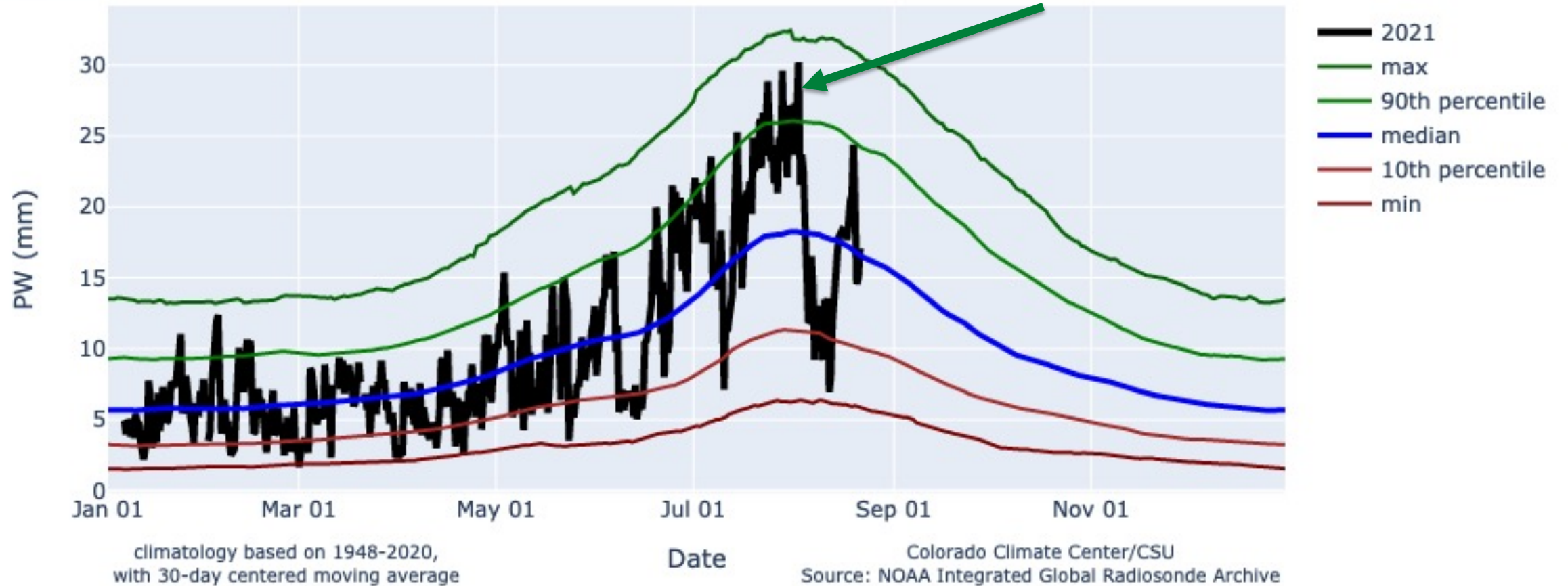


Precipitable water: total amount of water vapor in the atmosphere, measured by instruments on weather balloons

select year:

2021 ▼

## Grand Junction precipitable water climatology and selected year data



<https://climate.colostate.edu/pw.html>



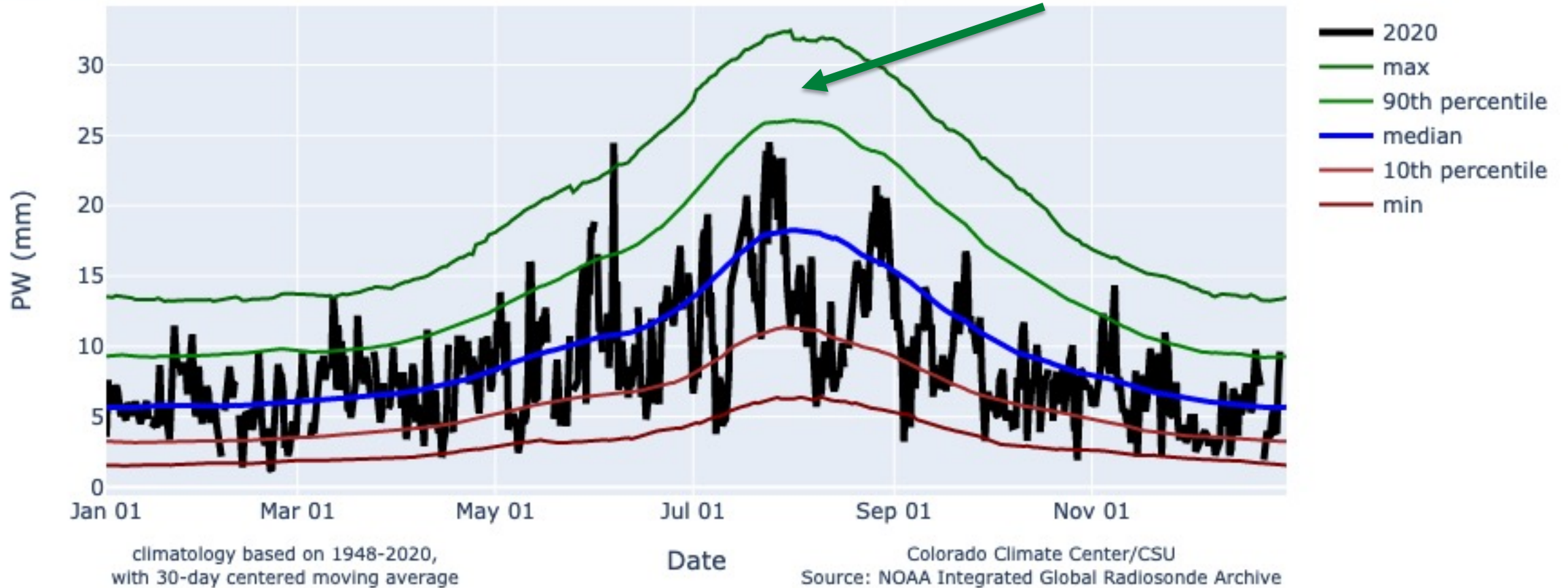
Precipitable water: total amount of water vapor in the atmosphere, measured by instruments on weather balloons

(last year: 2020)

select year:

2020 ▼

### Grand Junction precipitable water climatology and selected year data

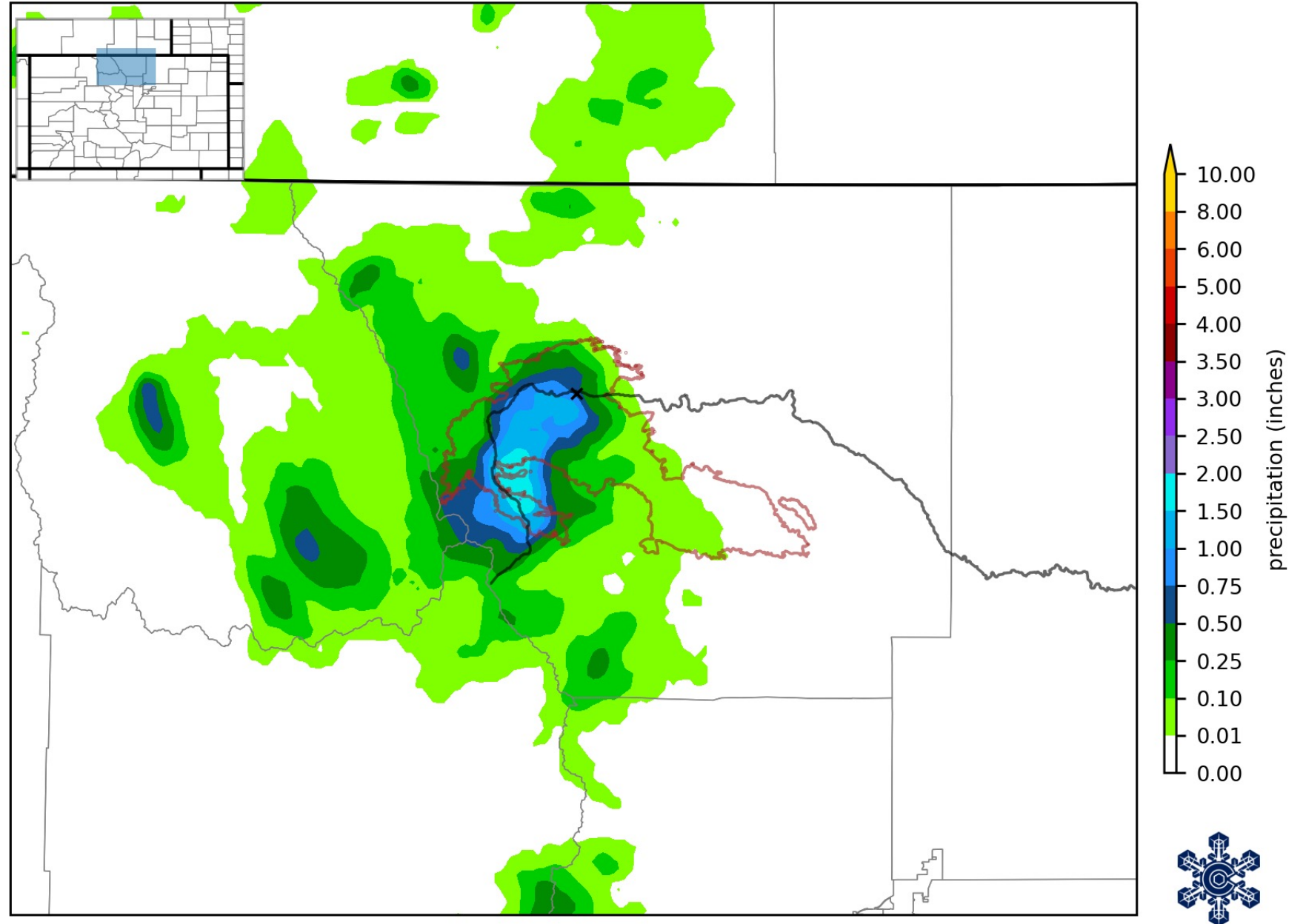


<https://climate.colostate.edu/pw.html>

2-hour rainfall estimates from evening of July 20 (Black Hollow flash flood)

Rain gauge near Joe Wright reservoir (courtesy Stephanie Kampf, CSU):

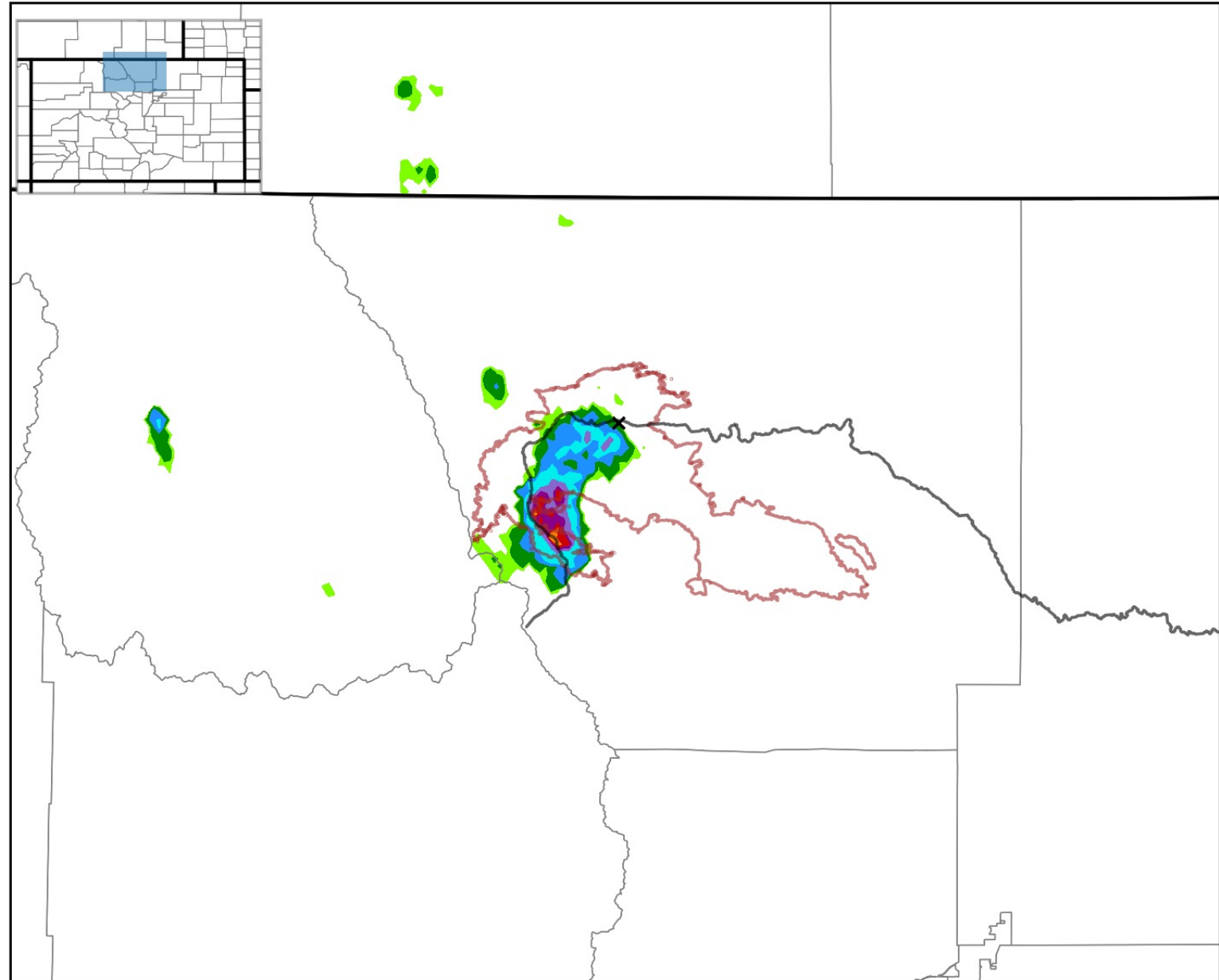
0.77" in 10 minutes  
0.99" in 20 minutes



Maximum average recurrence interval exceeded

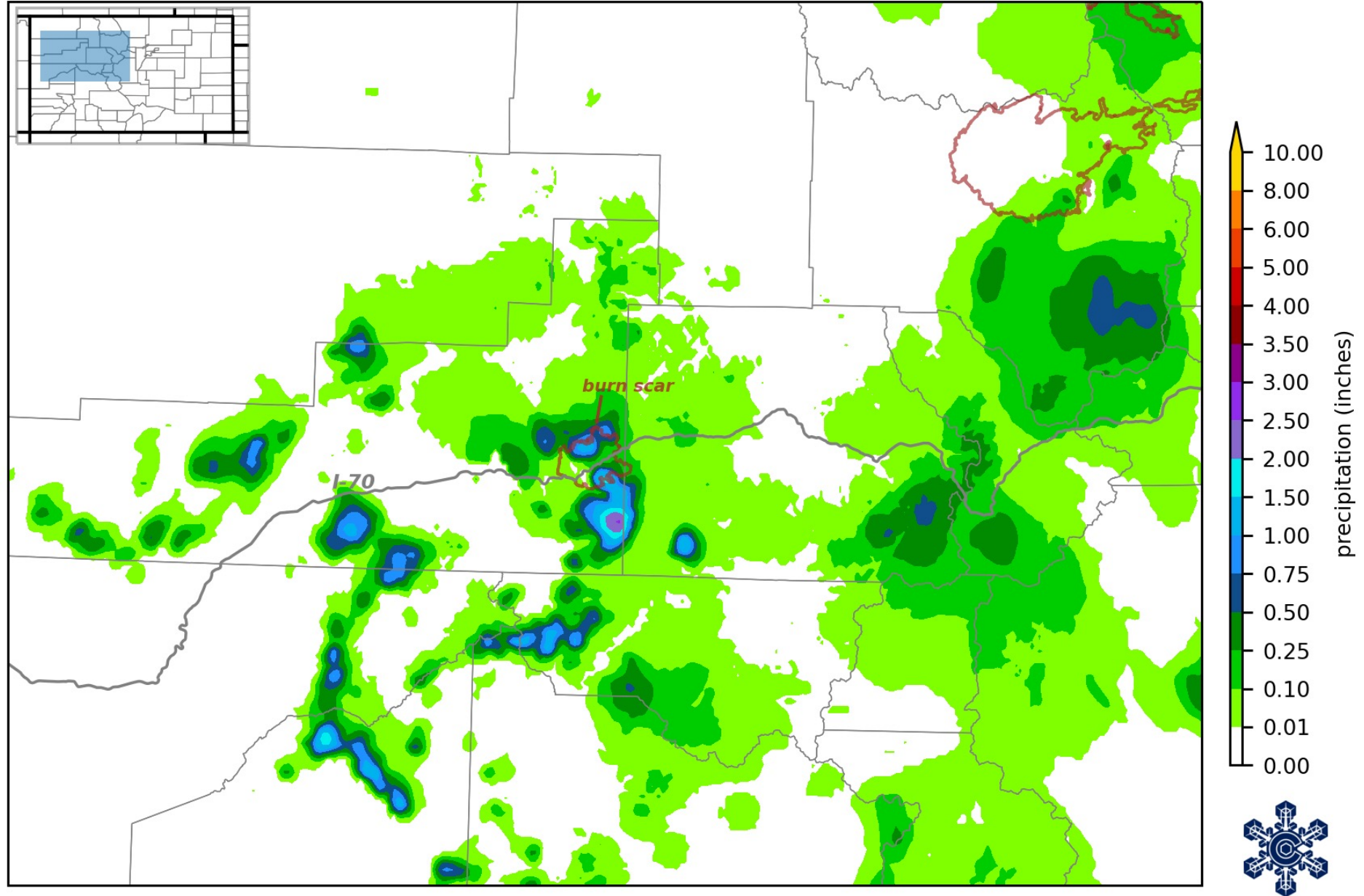
For this high elevation, roughly a 100-200-year rain event

Closer to Black Hollow, however, more like a 25-year rainstorm

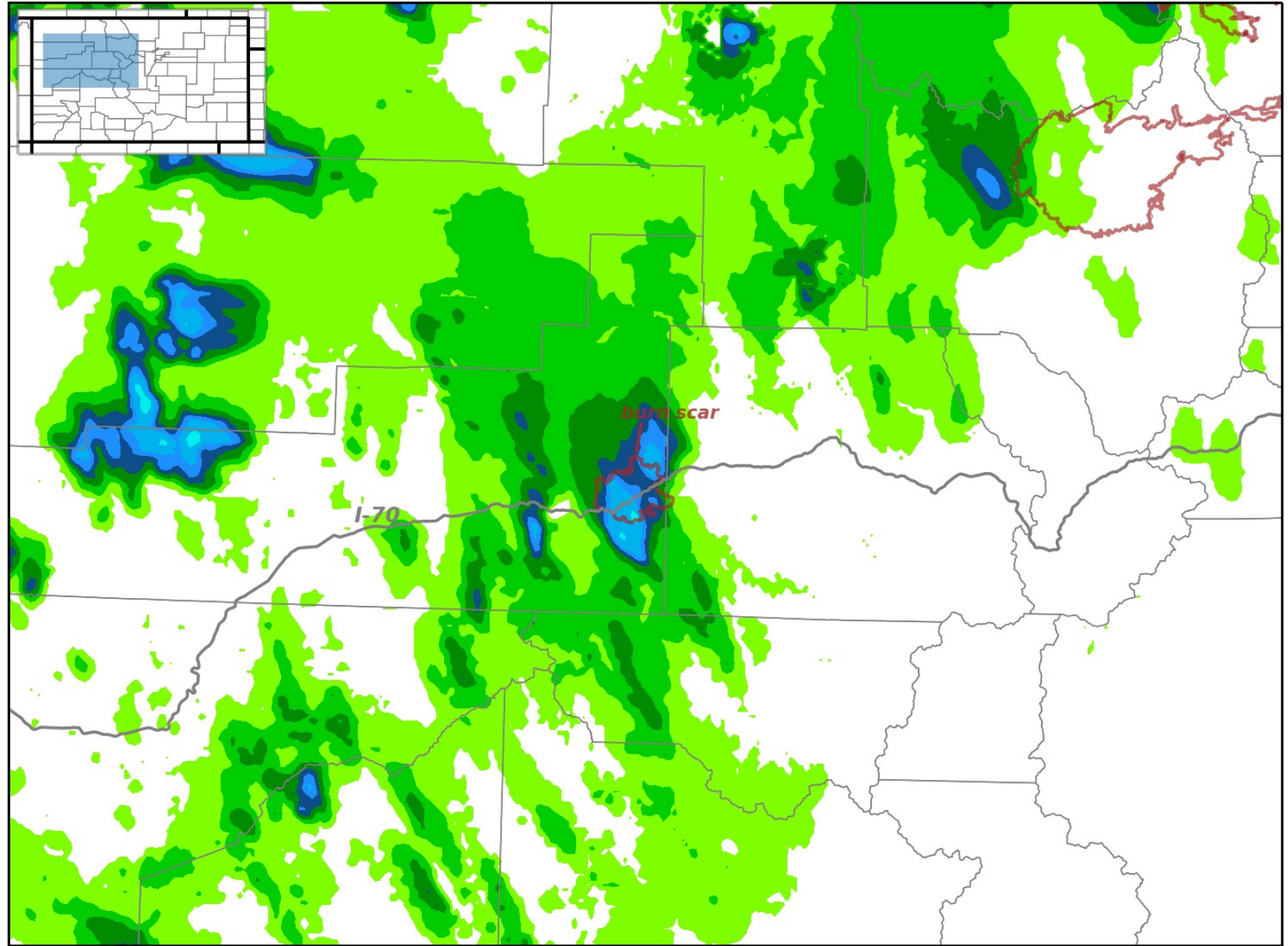




3-hour rainfall estimates from evening of July 22



3-hour rainfall estimates from evening of July 29

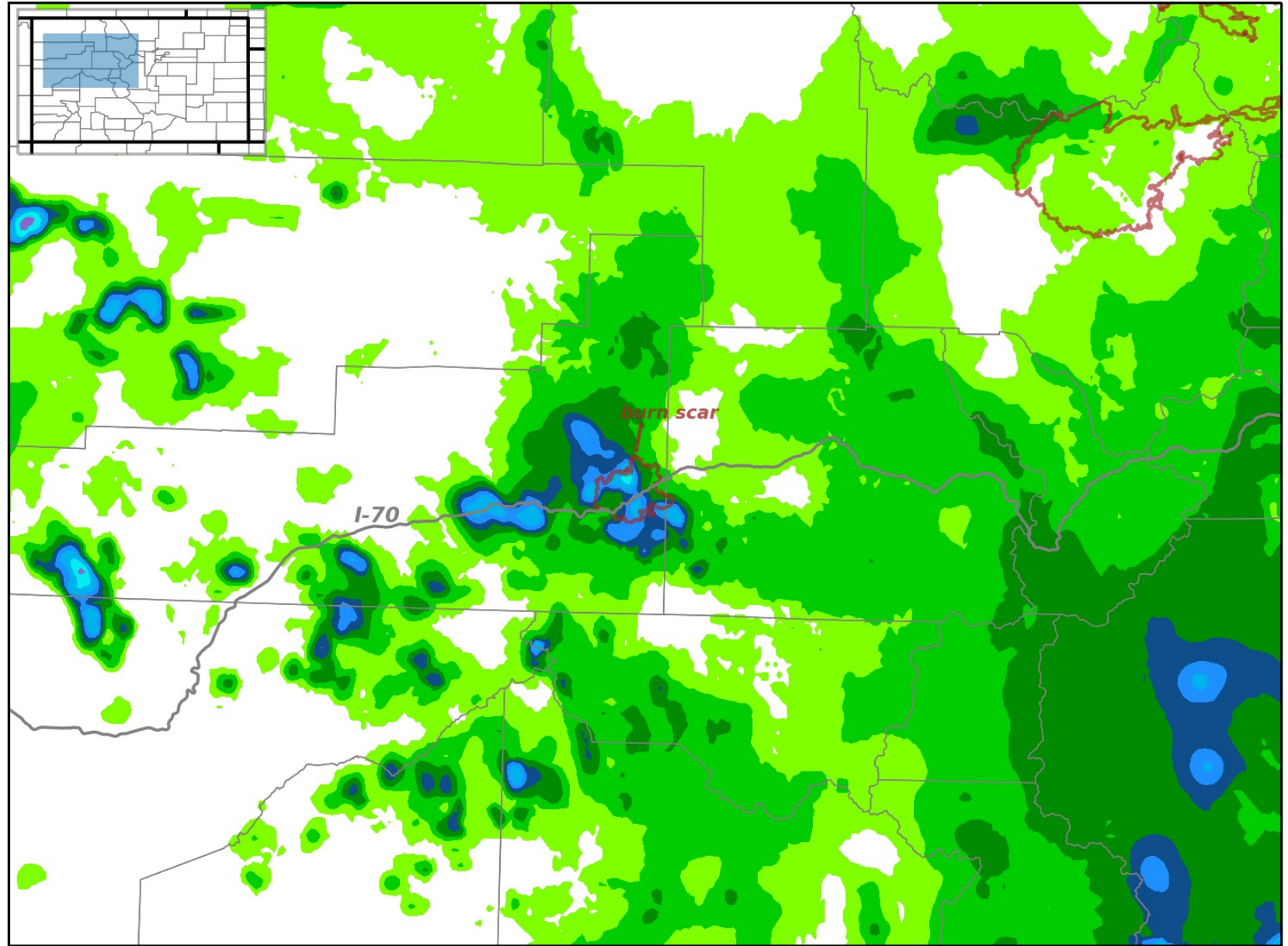


CDOT rain gauge 0.4 miles west of Bair Ranch (east of Glenwood Springs)

Date/Time ( MDT )	Type	Intens	Rate	Start Time	End Time	10 min. Accum	1 hr. Accum	3 hr. Accum	6 hr. Accum	12 hr. Accum	24 hr. Accum
07/29/2021 21:49	Other	Other	-	-	-	-	-	-	1.31 in	1.31 in	1.31 in
07/29/2021 21:44	Other	Other	-	-	-	-	-	-	1.30 in	1.30 in	1.30 in
07/29/2021 21:39	Other	Other	-	-	-	-	-	-	1.28 in	1.28 in	1.28 in
07/29/2021 21:34	Other	Other	-	-	-	-	-	-	1.28 in	1.28 in	1.28 in
07/29/2021 21:29	Other	Other	-	-	-	-	-	-	1.28 in	1.28 in	1.28 in
07/29/2021 21:24	Other	Other	-	-	-	-	-	-	1.28 in	1.28 in	1.28 in
07/29/2021 21:19	Other	Other	-	-	-	-	-	-	1.27 in	1.27 in	1.28 in
07/29/2021 21:14	Other	Other	-	-	-	-	-	-	1.26 in	1.26 in	1.28 in
07/29/2021 21:09	Other	Other	-	-	-	-	-	-	1.21 in	1.21 in	1.26 in
07/29/2021 21:04	Other	Other	-	-	-	-	-	-	1.14 in	1.14 in	1.27 in
07/29/2021 20:59	Other	Other	-	-	-	-	-	-	0.64 in	0.64 in	0.82 in
07/29/2021 20:54	Other	Other	-	-	-	-	-	-	0.33 in	0.33 in	0.53 in
07/29/2021 20:49	Other	Other	-	-	-	-	-	-	0.11 in	0.11 in	0.36 in
07/29/2021 20:44	Other	Other	-	-	-	-	-	-	0.06 in	0.06 in	0.31 in
07/29/2021 20:39	Other	Other	-	-	-	-	-	-	0.04 in	0.04 in	0.31 in



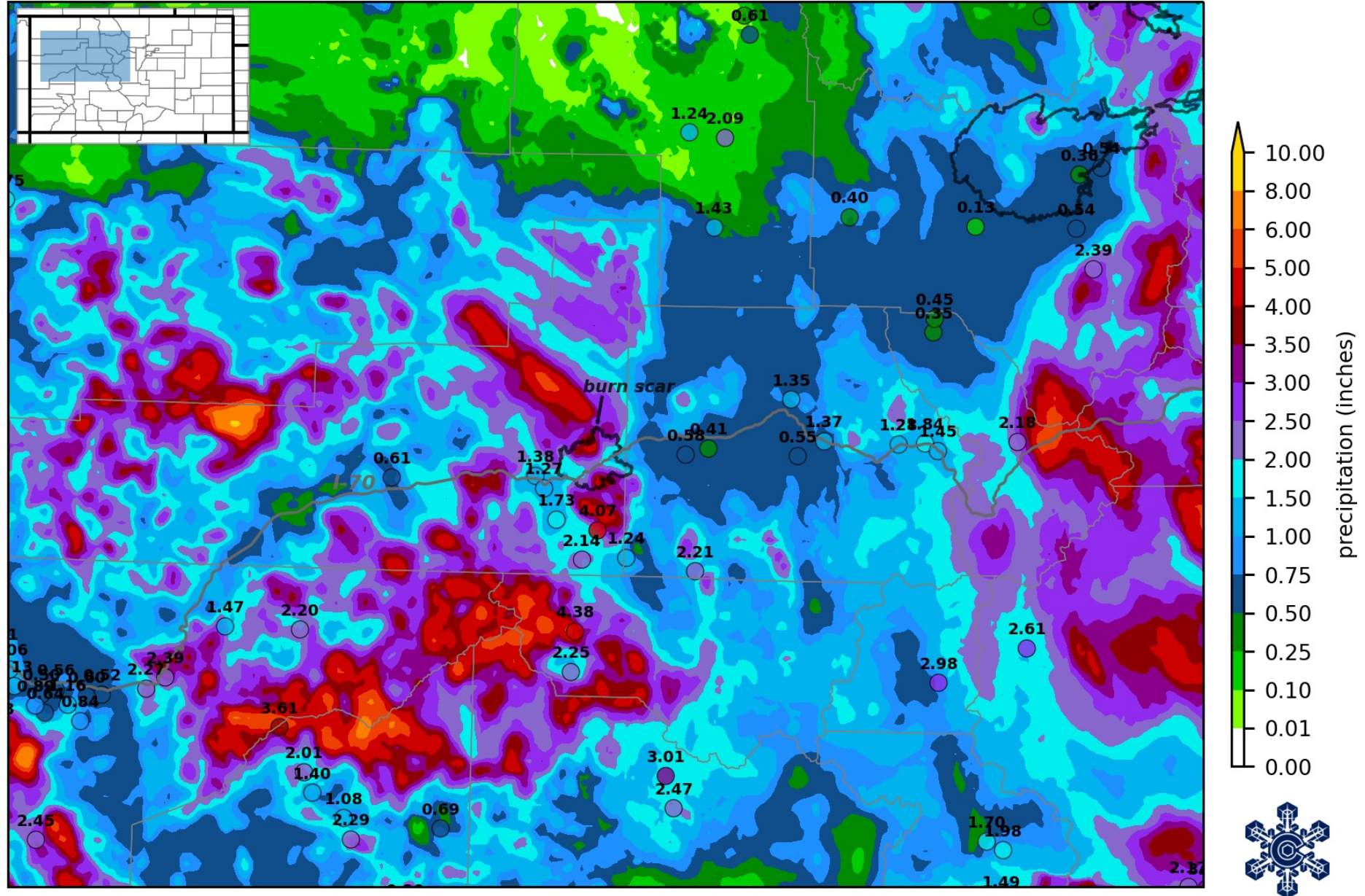
3-hour rainfall estimates from evening of July 31





12-day total precipitation  
(July 22 – August 3)

NOAA MRMS precipitation  
dataset + CoCoRaHS  
observations







## Drought Conditions

Webcam view of the Dillon Pinnacles and Blue Mesa Reservoir, August 23

<https://www.nps.gov/media/webcam/view.htm?id=81B46802-1DD8-B71B-0B3B619C8C1D1A09>





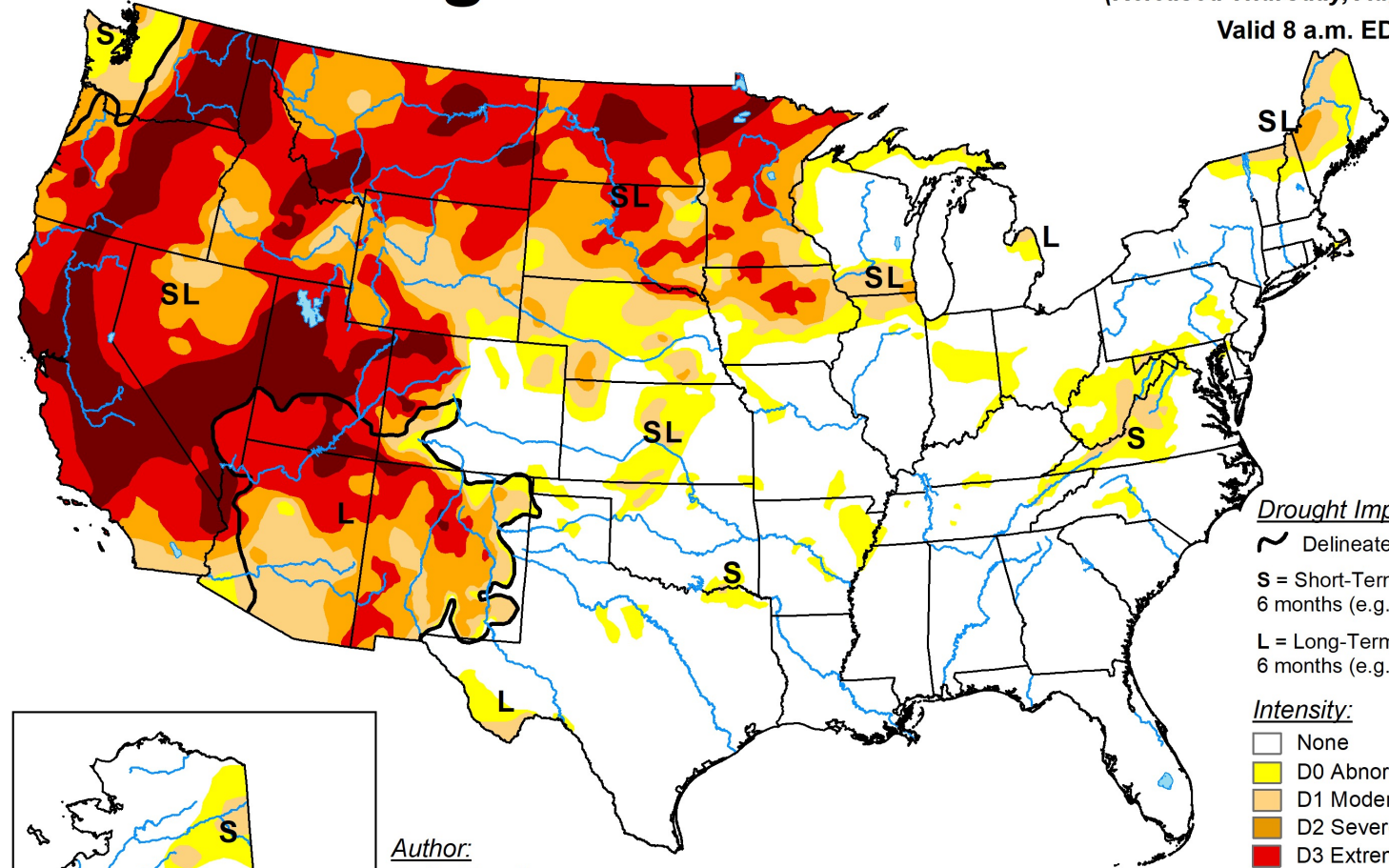
# U.S. Drought Monitor

August 17, 2021  
(Released Thursday, Aug. 19, 2021)  
Valid 8 a.m. EDT

Per drought.gov:

22.4% of the USA is in D3/D4 compared to 22.1% the previous week.

The high prior to the 2020/2021 drought was Aug 7, 2012, at 20.2%.

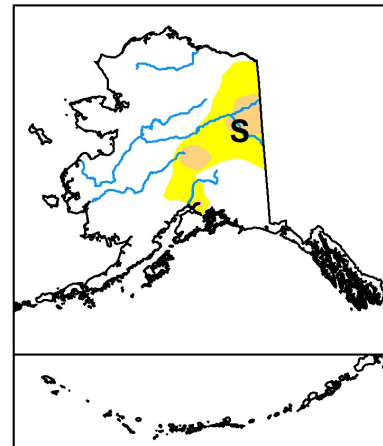


### Drought Impact Types:

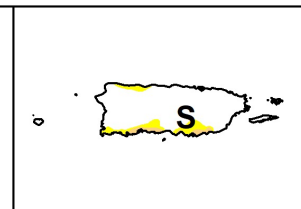
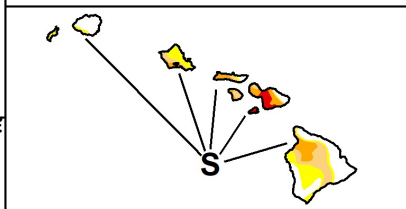
- ~ Delineates dominant impacts
- S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)
- L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

### Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought



Author:  
Curtis Riganti  
National Drought Mitigation Center



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

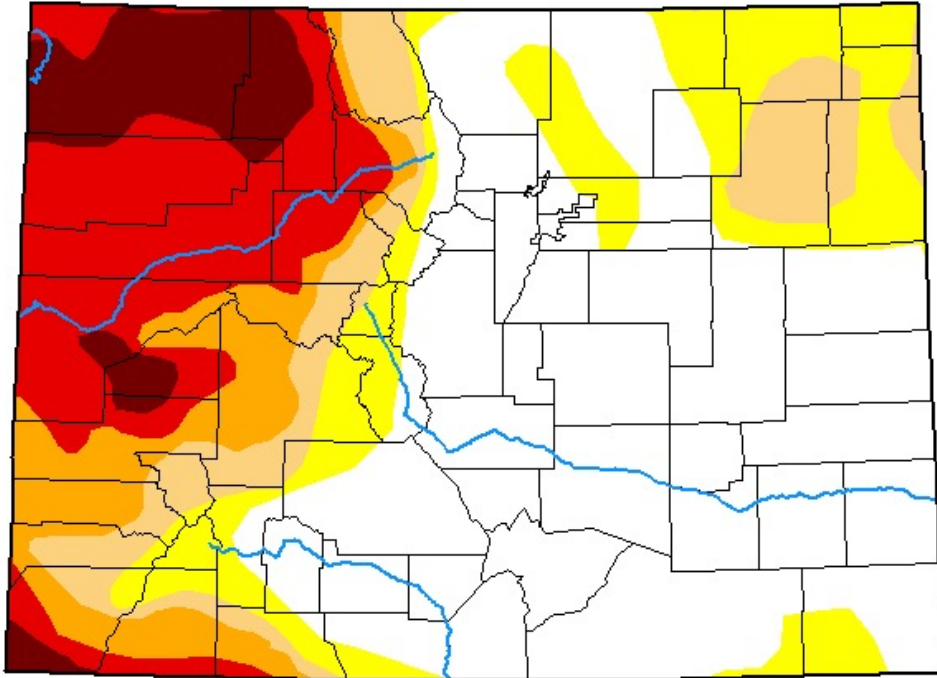


[droughtmonitor.unl.edu](https://droughtmonitor.unl.edu)



# U.S. Drought Monitor Colorado

**August 17, 2021**  
(Released Thursday, Aug. 19, 2021)  
Valid 8 a.m. EDT



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	48.62	51.38	37.23	28.04	20.37	6.38
<b>Last Week</b> 08-10-2021	53.18	46.82	34.43	28.04	20.37	6.38
<b>3 Months Ago</b> 05-18-2021	23.30	76.70	51.80	39.29	28.96	16.39
<b>Start of Calendar Year</b> 12-29-2020	0.00	100.00	100.00	93.73	76.17	27.60
<b>Start of Water Year</b> 09-29-2020	0.00	100.00	99.29	89.35	52.88	2.64
<b>One Year Ago</b> 08-18-2020	0.00	100.00	98.76	72.69	27.31	0.00

Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

Author:

Curtis Riganti  
National Drought Mitigation Center



[droughtmonitor.unl.edu](https://droughtmonitor.unl.edu)



# U.S. Drought Monitor Colorado

August 18, 2020

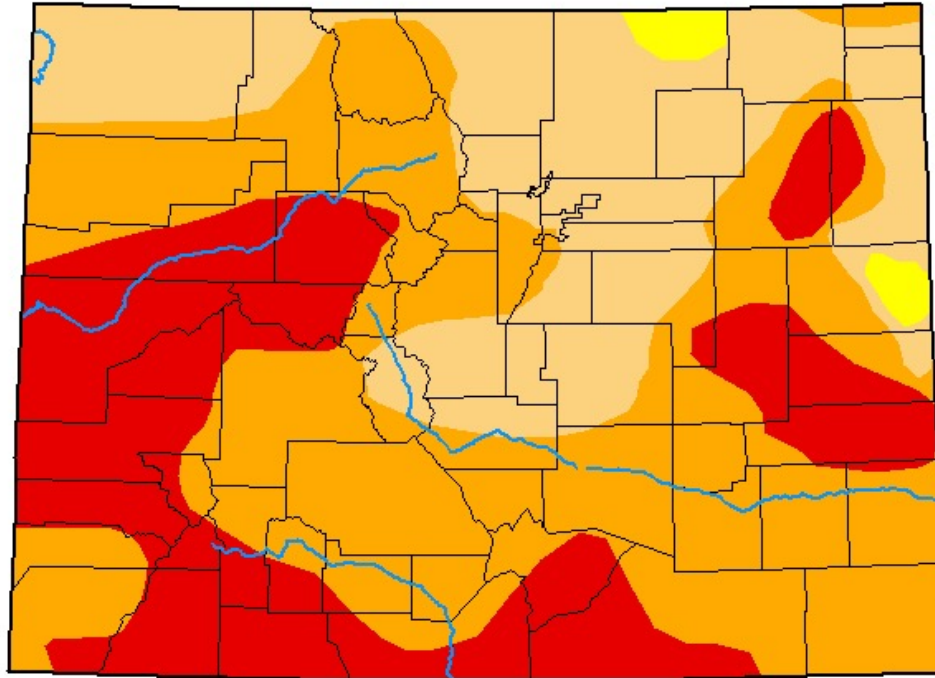
One year ago

(Released Thursday, Aug. 20, 2020)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	0.00	100.00	98.76	72.69	27.31	0.00
<b>Last Week</b> 08-13-2020	0.00	100.00	93.87	61.43	23.66	0.00
<b>3 Months Ago</b> 05-21-2020	23.22	76.78	65.20	46.31	17.52	0.00
<b>Start of Calendar Year</b> 01-02-2020	31.72	68.28	51.19	20.11	0.00	0.00
<b>Start of Water Year</b> 10-03-2019	30.14	69.86	27.53	0.00	0.00	0.00
<b>One Year Ago</b> 08-22-2019	93.35	6.65	0.00	0.00	0.00	0.00



**Intensity:**

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

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**Author:**

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[droughtmonitor.unl.edu](https://droughtmonitor.unl.edu)

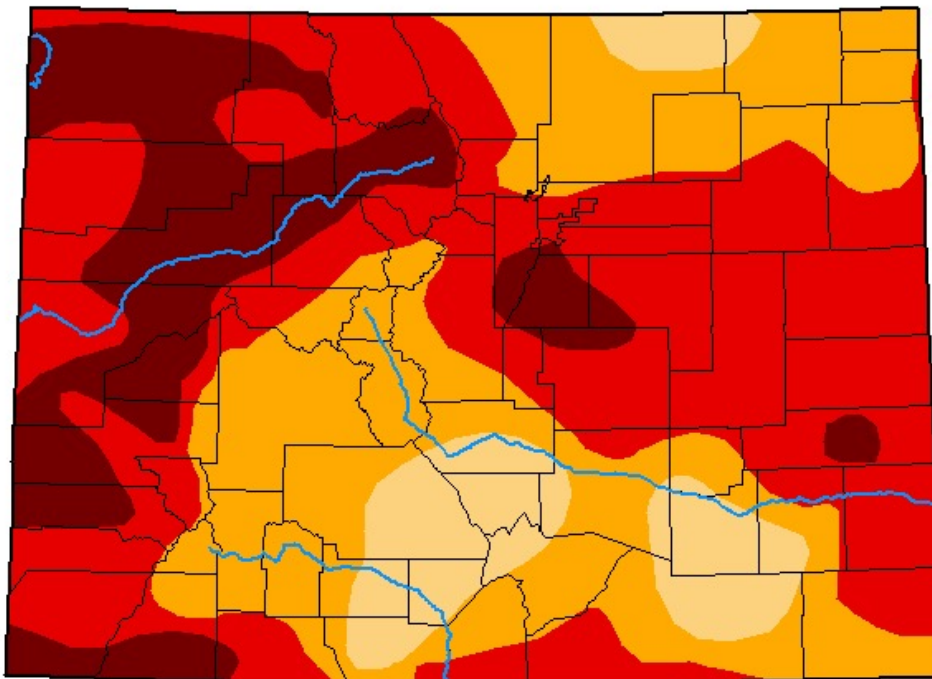




# U.S. Drought Monitor Colorado

**February 16, 2021**  
(Released Thursday, Feb. 18, 2021)  
Valid 7 a.m. EST

Six months ago



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	0.00	100.00	100.00	90.24	58.91	17.78
<b>Last Week</b> <i>02-11-2021</i>	0.00	100.00	100.00	90.24	70.11	24.79
<b>3 Months Ago</b> <i>11-19-2020</i>	0.00	100.00	100.00	93.71	74.08	27.22
<b>Start of Calendar Year</b> <i>12-31-2020</i>	0.00	100.00	100.00	93.73	76.17	27.60
<b>Start of Water Year</b> <i>10-01-2020</i>	0.00	100.00	99.29	89.35	52.88	2.64
<b>One Year Ago</b> <i>02-20-2020</i>	28.75	71.25	43.82	3.30	0.00	0.00

Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

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Author:

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NOAA/NWS/NCEP/CPC



[droughtmonitor.unl.edu](https://droughtmonitor.unl.edu)



# U.S. Drought Monitor Colorado

May 18, 2021

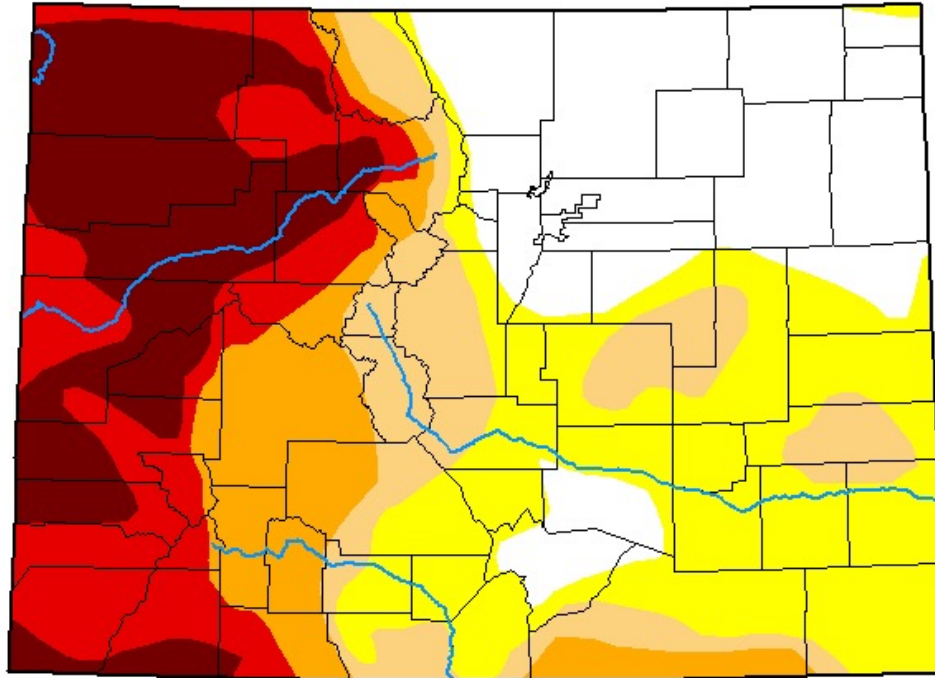
Three months ago

(Released Thursday, May. 20, 2021)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	23.30	76.70	51.80	39.29	28.96	16.39
<b>Last Week</b> <i>05-11-2021</i>	13.05	86.95	75.19	43.27	29.45	16.39
<b>3 Months Ago</b> <i>02-16-2021</i>	0.00	100.00	100.00	90.24	58.91	17.78
<b>Start of Calendar Year</b> <i>12-29-2020</i>	0.00	100.00	100.00	93.73	76.17	27.60
<b>Start of Water Year</b> <i>09-29-2020</i>	0.00	100.00	99.29	89.35	52.88	2.64
<b>One Year Ago</b> <i>05-19-2020</i>	23.22	76.78	65.20	46.31	17.52	0.00



Intensity:



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Author:

Adam Hartman  
NOAA/NWS/NCEP/CPC

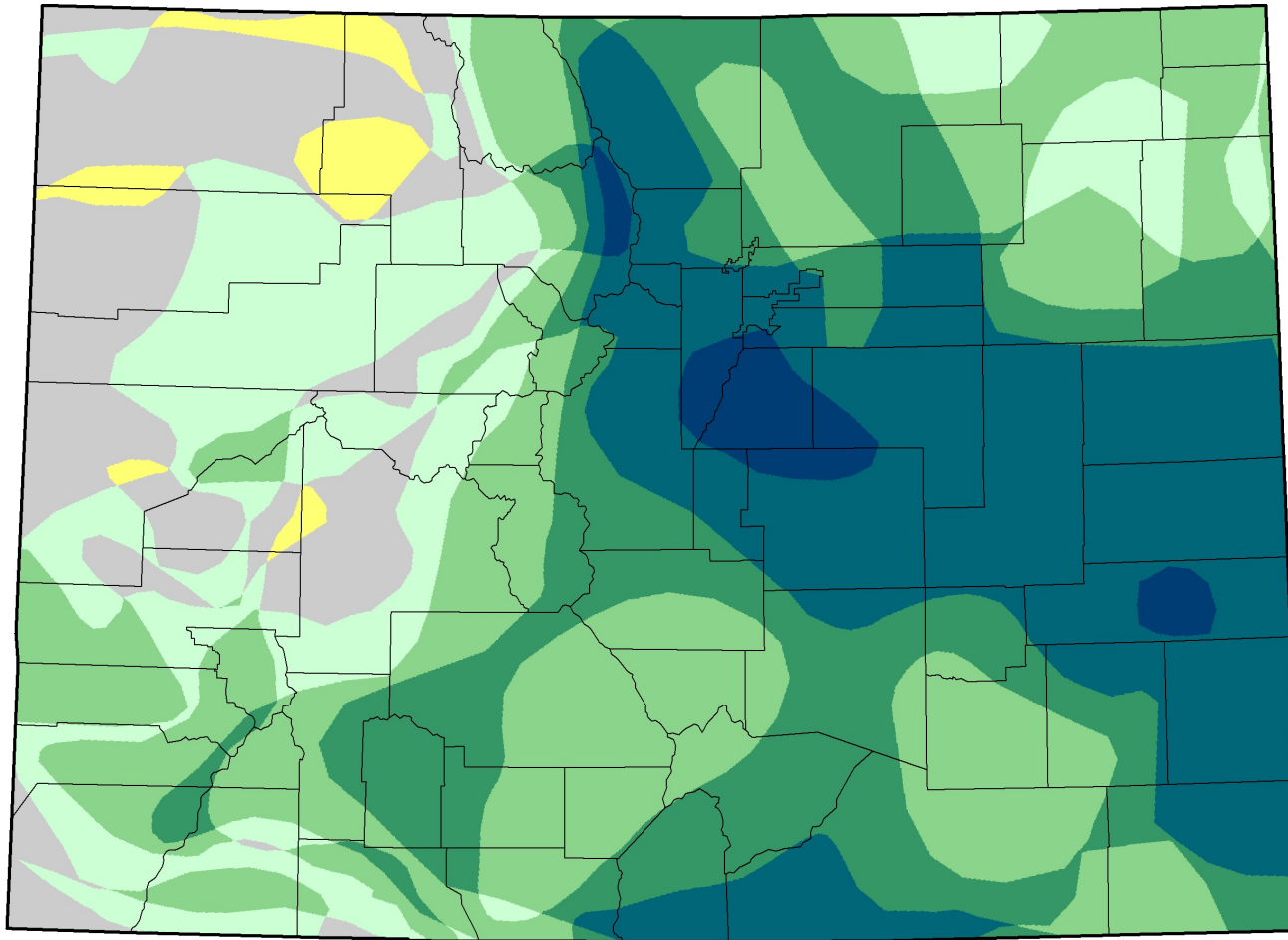


[droughtmonitor.unl.edu](https://droughtmonitor.unl.edu)



# U.S. Drought Monitor Class Change - Colorado 26 Week

## Change over six months



August 17, 2021  
compared to  
February 16, 2021

[droughtmonitor.unl.edu](http://droughtmonitor.unl.edu)



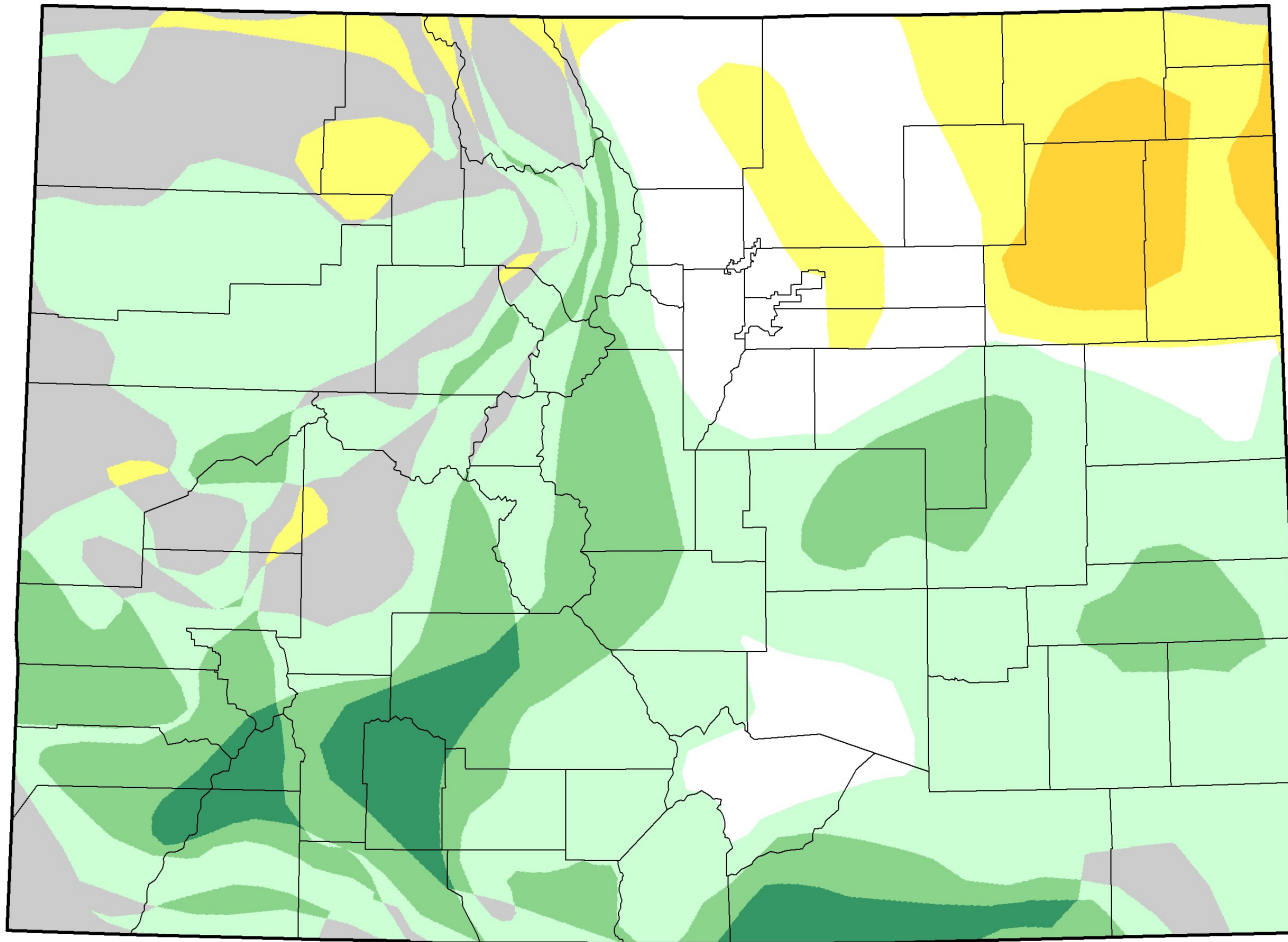
- 5 Class Degradation
- 4 Class Degradation
- 3 Class Degradation
- 2 Class Degradation
- 1 Class Degradation
- No Change
- 1 Class Improvement
- 2 Class Improvement
- 3 Class Improvement
- 4 Class Improvement
- 5 Class Improvement





# Change over three months

## U.S. Drought Monitor Class Change - Colorado 13 Week



- 5 Class Degradation
- 4 Class Degradation
- 3 Class Degradation
- 2 Class Degradation
- 1 Class Degradation
- No Change
- 1 Class Improvement
- 2 Class Improvement
- 3 Class Improvement
- 4 Class Improvement
- 5 Class Improvement

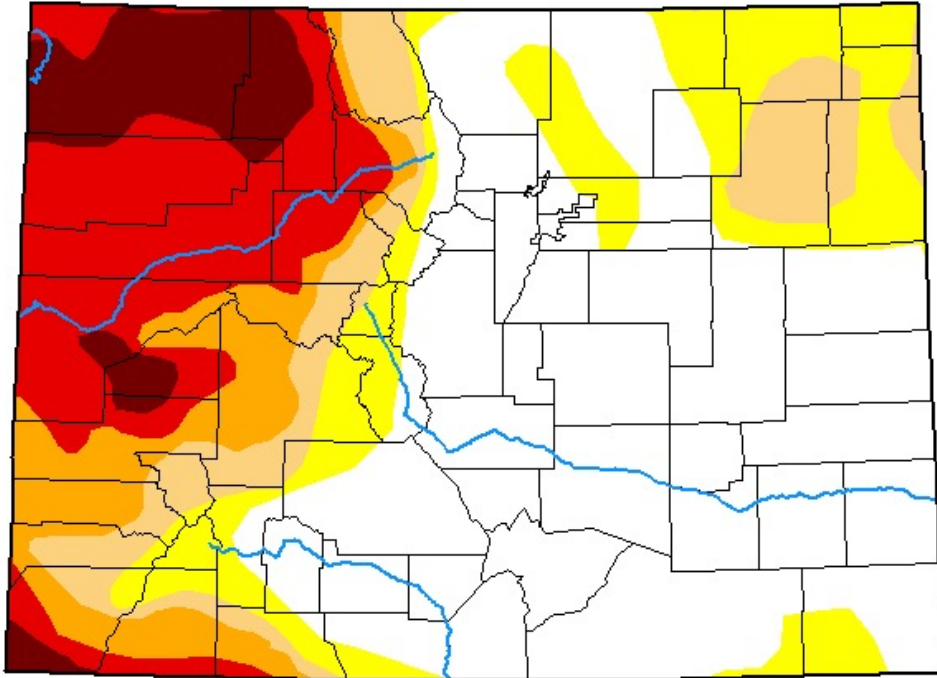
August 17, 2021  
compared to  
May 18, 2021

[droughtmonitor.unl.edu](http://droughtmonitor.unl.edu)



# U.S. Drought Monitor Colorado

**August 17, 2021**  
(Released Thursday, Aug. 19, 2021)  
Valid 8 a.m. EDT



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	48.62	51.38	37.23	28.04	20.37	6.38
<b>Last Week</b> 08-10-2021	53.18	46.82	34.43	28.04	20.37	6.38
<b>3 Months Ago</b> 05-18-2021	23.30	76.70	51.80	39.29	28.96	16.39
<b>Start of Calendar Year</b> 12-29-2020	0.00	100.00	100.00	93.73	76.17	27.60
<b>Start of Water Year</b> 09-29-2020	0.00	100.00	99.29	89.35	52.88	2.64
<b>One Year Ago</b> 08-18-2020	0.00	100.00	98.76	72.69	27.31	0.00

Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

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Author:

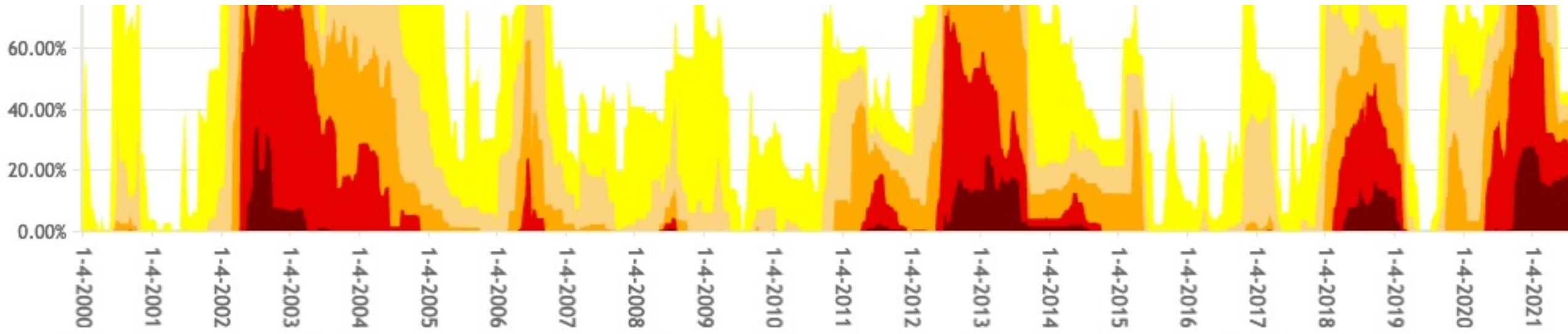
Curtis Riganti  
National Drought Mitigation Center



[droughtmonitor.unl.edu](https://droughtmonitor.unl.edu)



# Percent of Colorado in drought (since 2000)



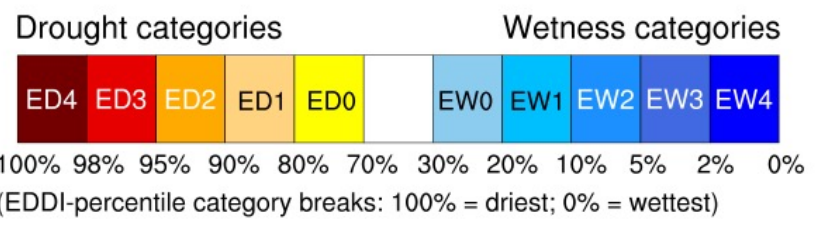
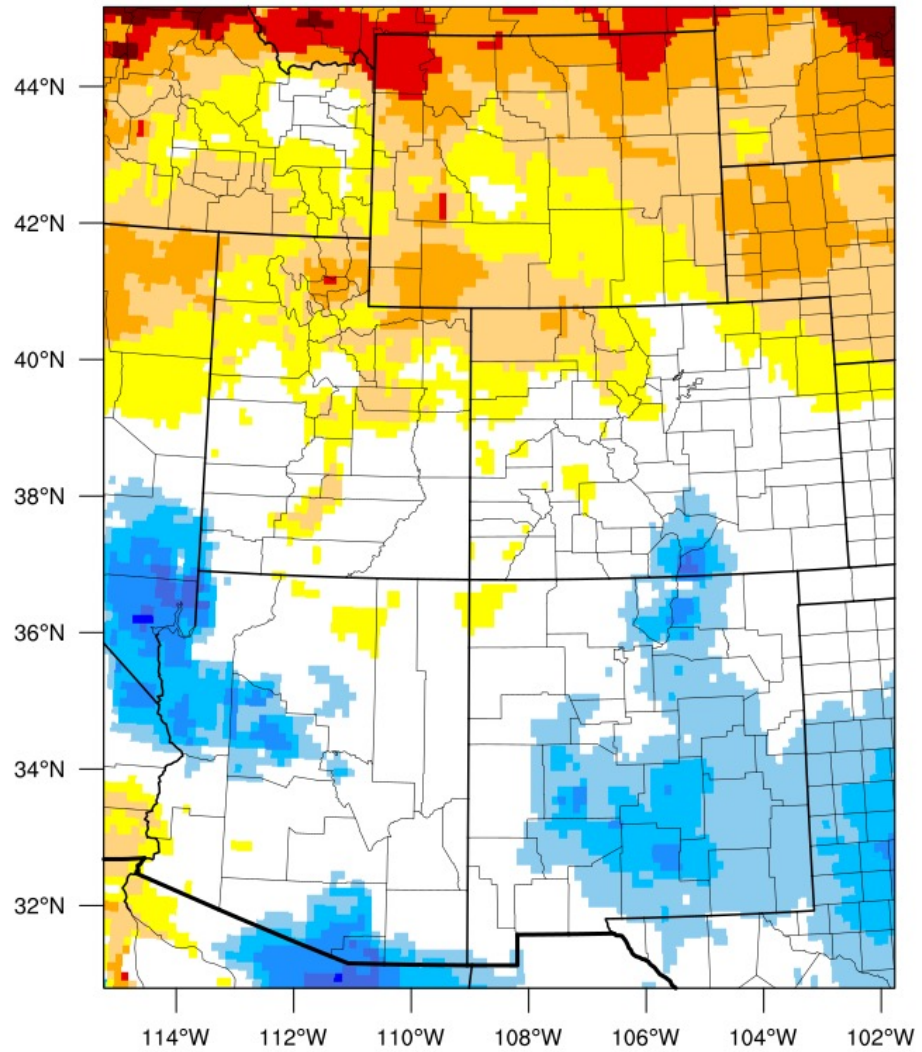
## Intensity:

-  D0 Abnormally Dry
-  D1 Moderate Drought
-  D2 Severe Drought
-  D3 Extreme Drought
-  D4 Exceptional Drought





3-month EDDI categories for August 17, 2021



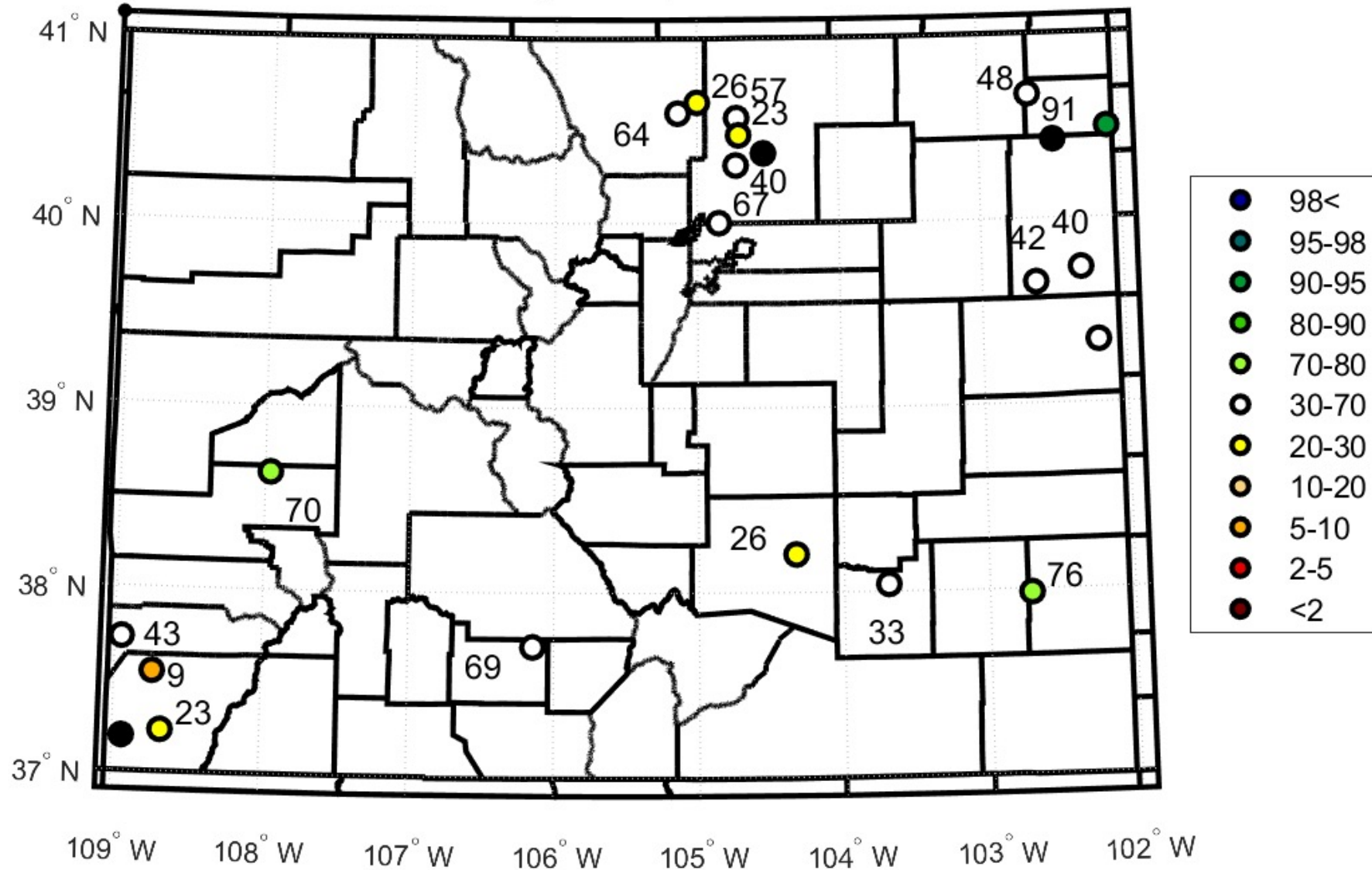
# Evaporative Demand Drought Index

Over last 3 months, high evaporative demand in northwest and northeast Colorado (warm, low humidity); near-normal across southwest Colorado and the Arkansas Valley; below normal in San Luis Valley

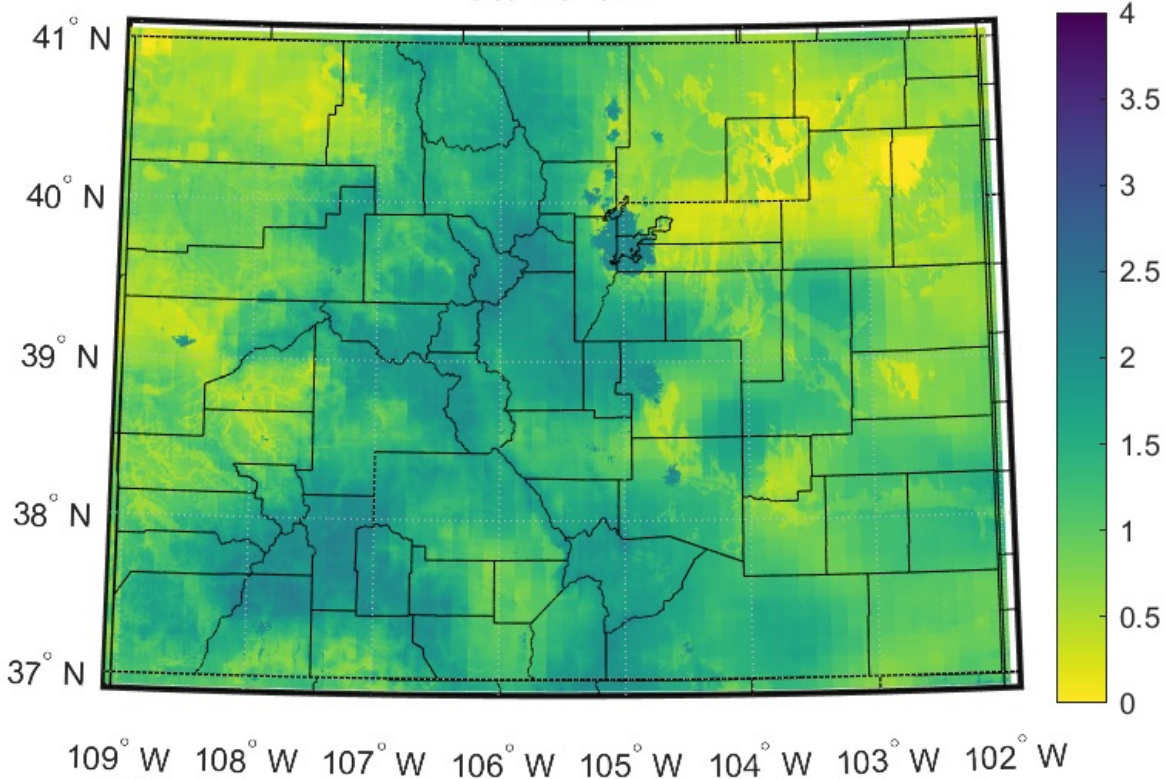


# Growing Season Water Balance (P/PET) Percentiles

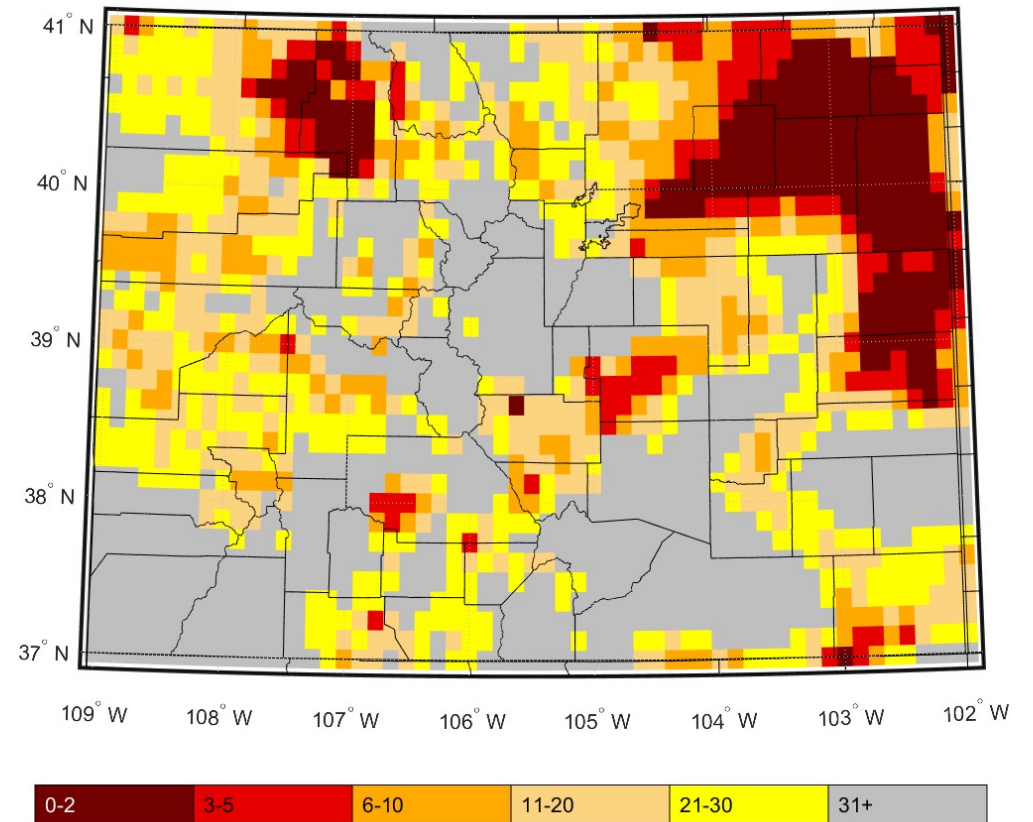
August 20, 2021



**Top 10cm Plant Available Water (cm)**  
**08/17/2021**



**Top 10cm Soil Moisture Percentile**  
**08/17/2021**



Shallow soil moisture has deteriorated in northeast Colorado in the warm, dry summer  
(Note: any effects of last week's rainstorms are not yet included here)



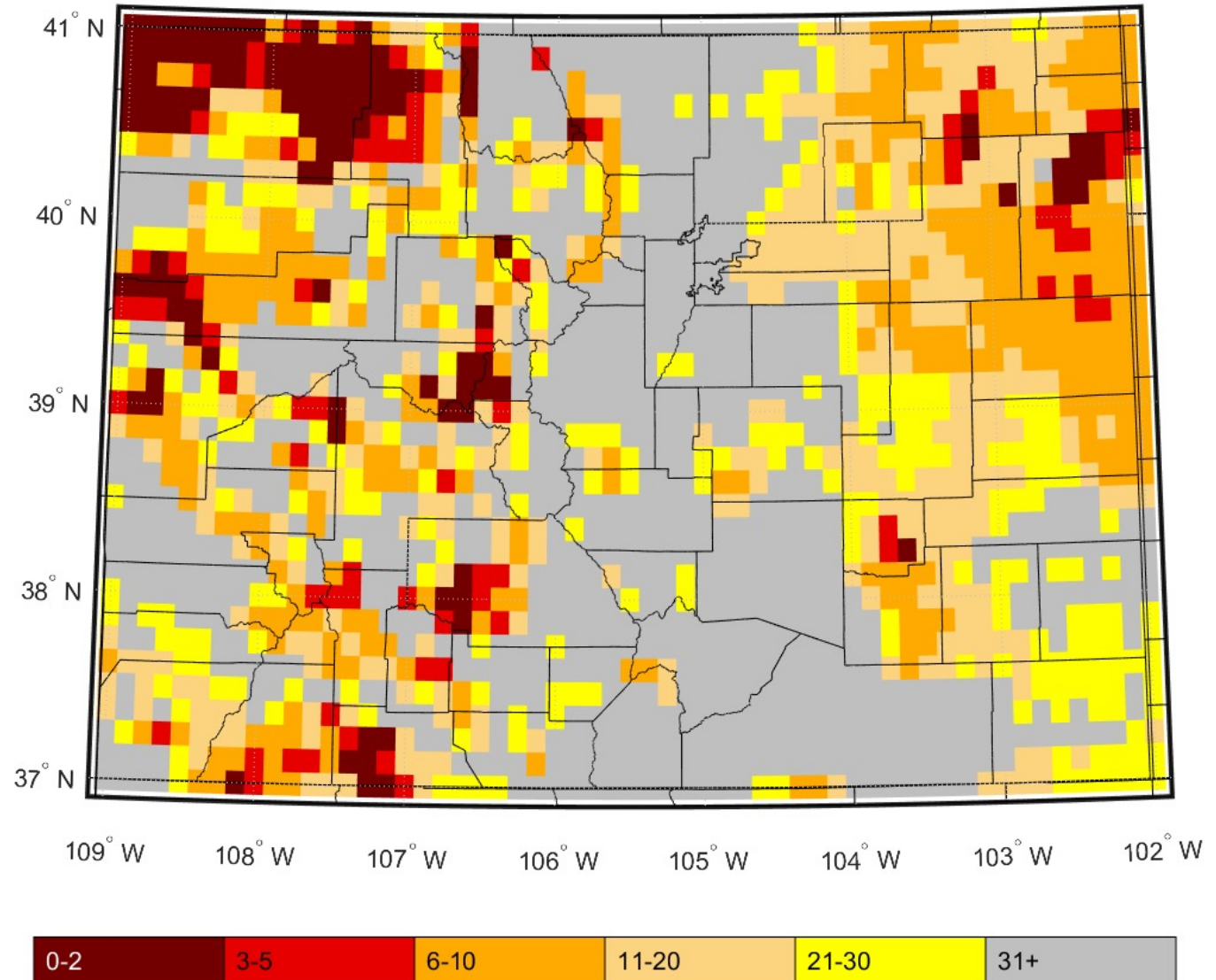


**Top Meter Soil Moisture Percentile**  
**08/17/2021**

Deep soil moisture is looking much better in parts of western Colorado, though significant deficits persist in some areas

Soil moisture deficits have returned in eastern Colorado with the warm, dry summer

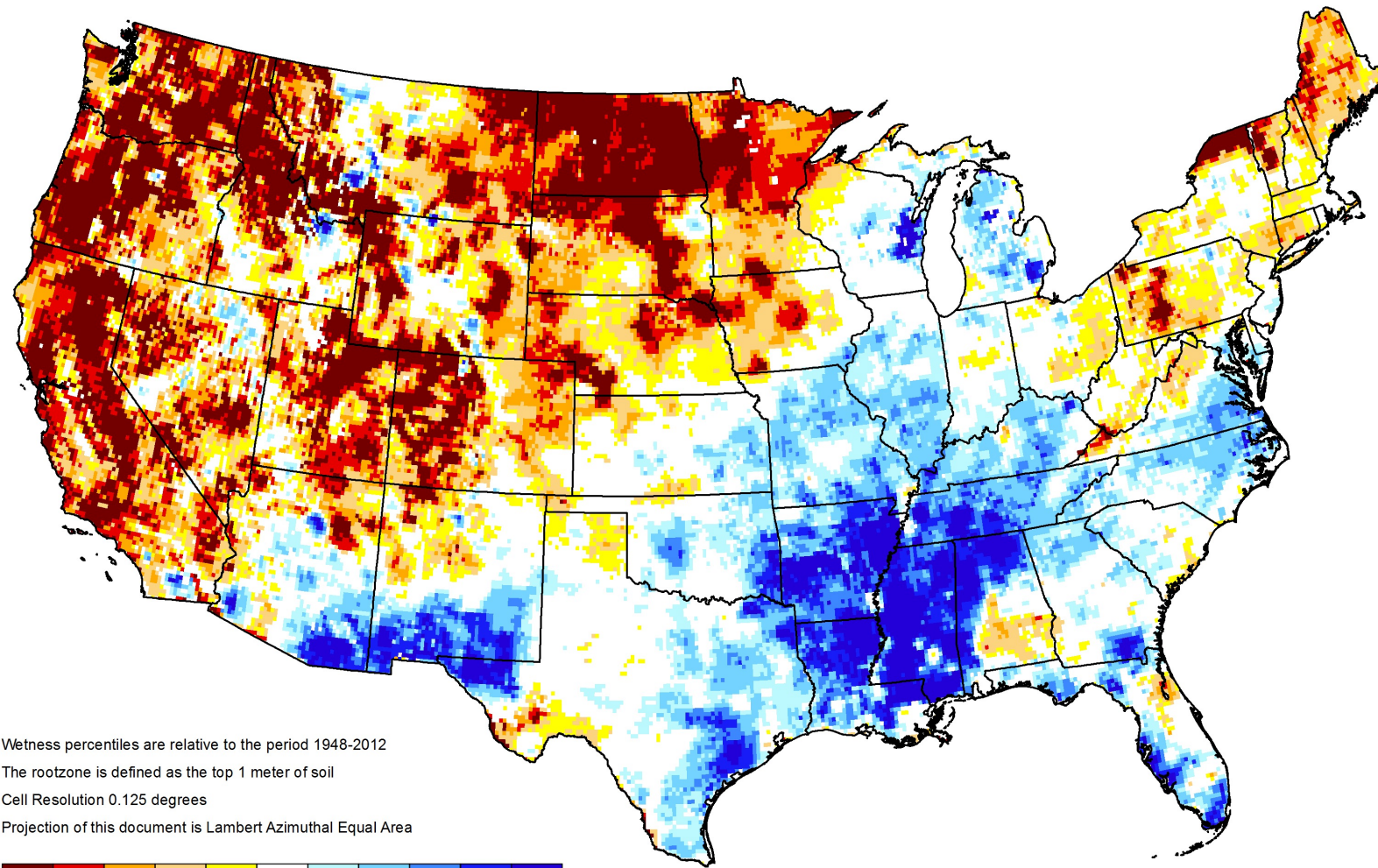
(Note: any effects of last week's rainstorms are not yet included here)





# GRACE-Based Root Zone Soil Moisture Drought Indicator

August 16, 2021



Wetness percentiles are relative to the period 1948-2012  
The rootzone is defined as the top 1 meter of soil  
Cell Resolution 0.125 degrees  
Projection of this document is Lambert Azimuthal Equal Area



<https://nasagrace.unl.edu>





# VegDRI: longer-term vegetation condition

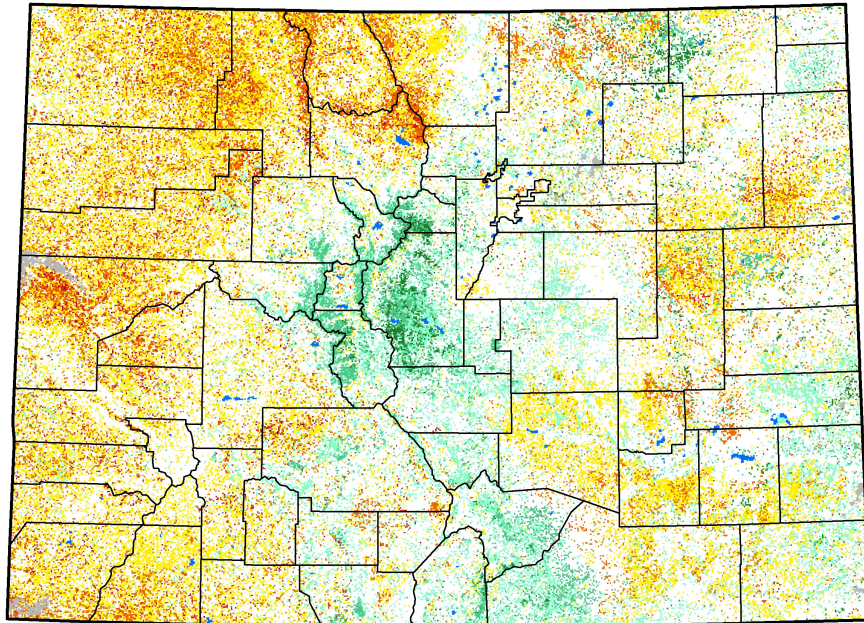
## Vegetation Drought Response Index

Complete: Colorado

August 22, 2021

### Vegetation Condition

- Extreme Drought
- Severe Drought
- Moderate Drought
- Pre-drought stress
- Near Normal
- Unusually Moist
- Very Moist
- Extreme Moist
- Out of Season
- Water



# QuickDRI: shorter-term vegetation response

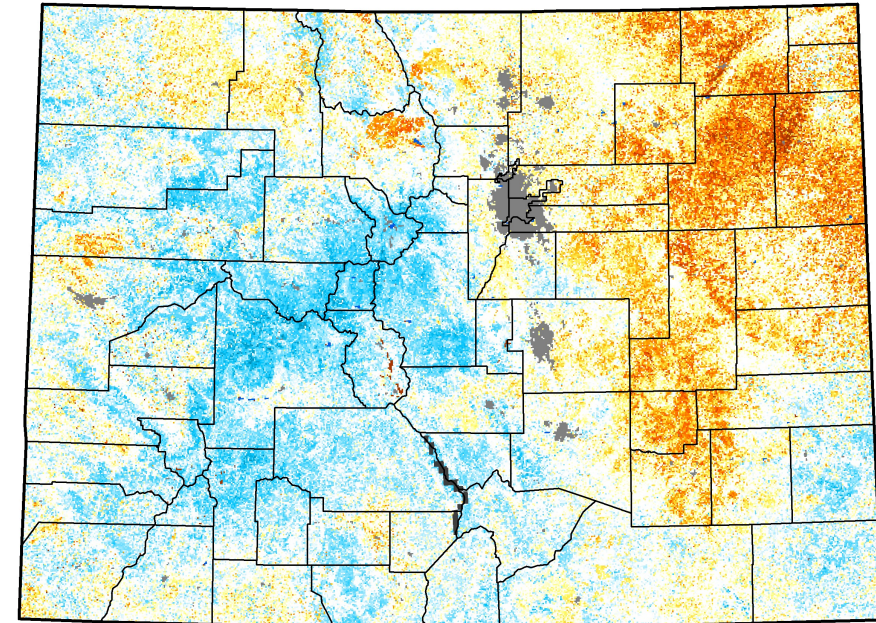
## Quick Drought Response Index

Colorado

August 15, 2021  
(Week 33)

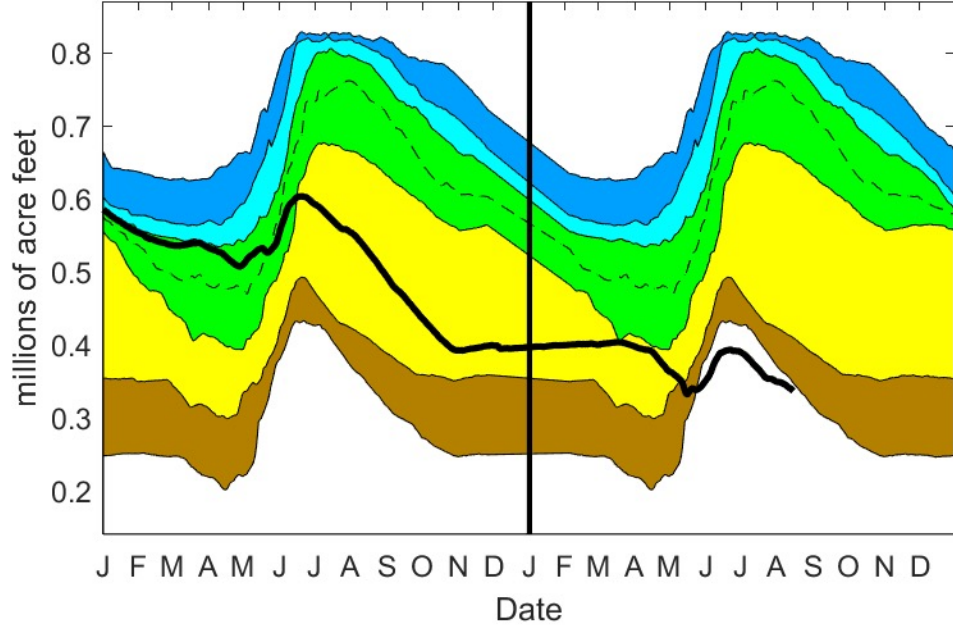
### Conditions Relative to 4-Week Historical Average

- Wetter
- Near Average
- Drier
- Out of Season
- Urban
- No Data
- Water

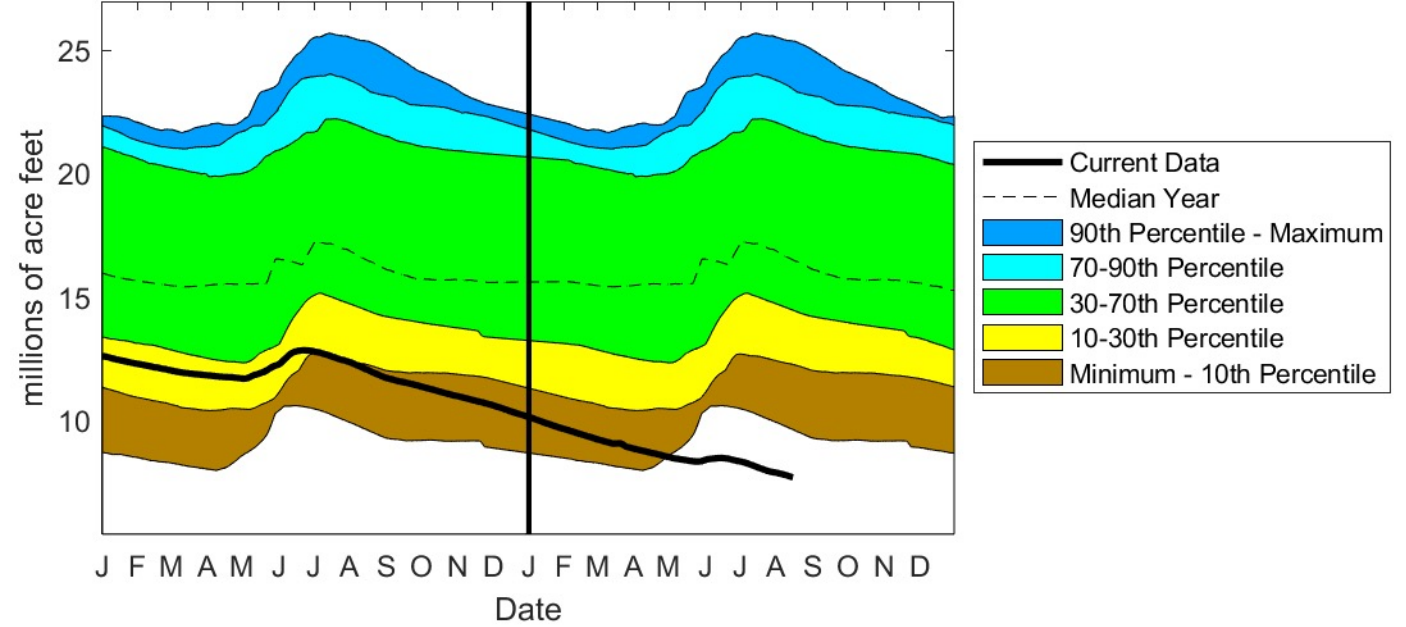




**Blue Mesa Reservoir Level 08/15/2021**  
**50 Percent of 1981-2019 Average**



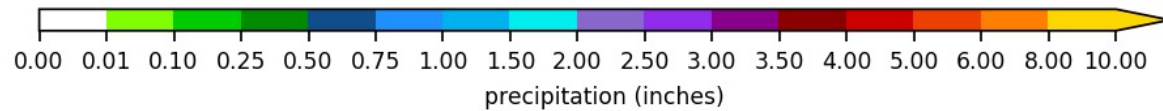
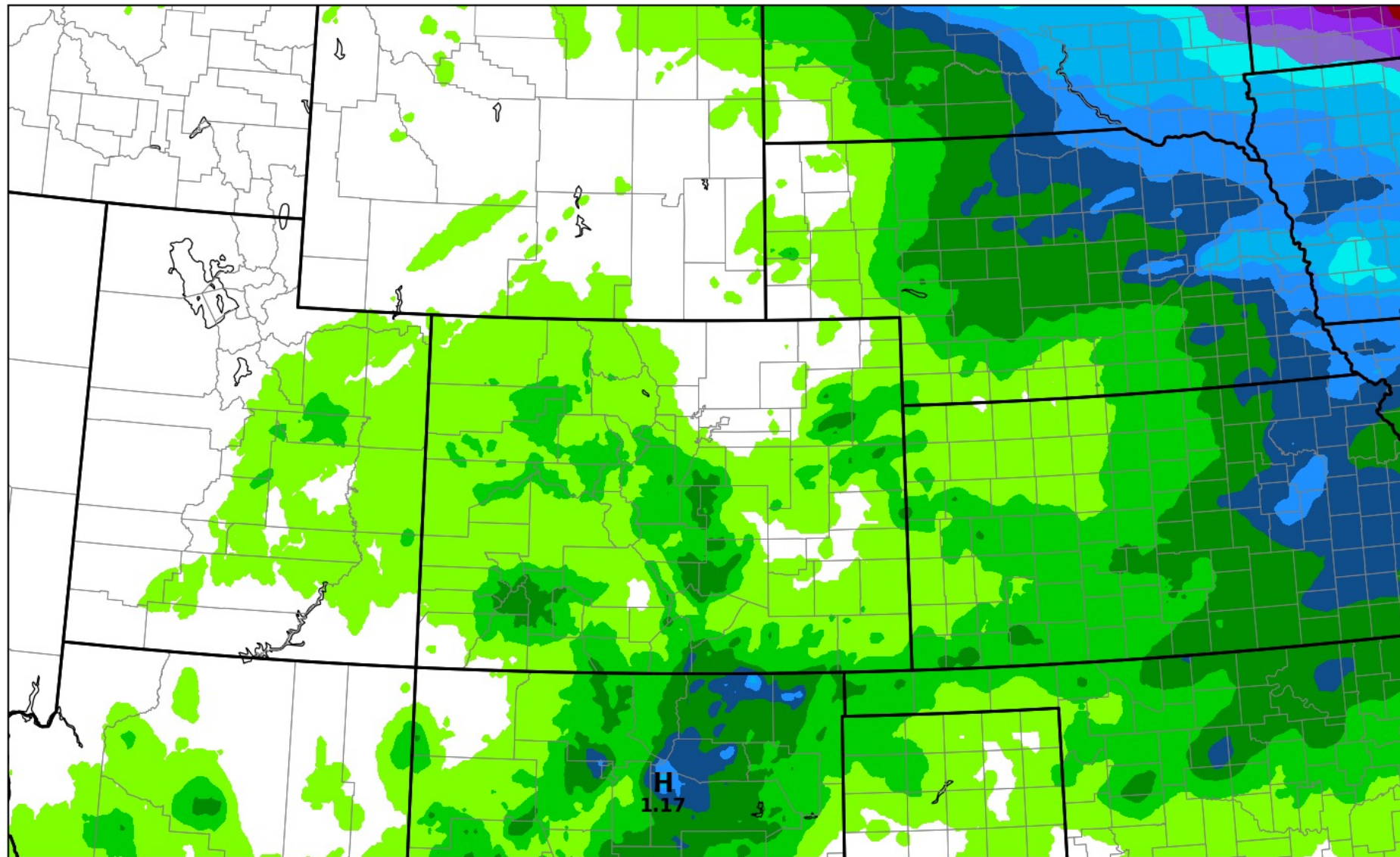
**Lake Powell Level 08/15/2021**  
**43 Percent of 1981-2019 Average**



See others on our drought page:  
<https://climate.colostate.edu/drought/>

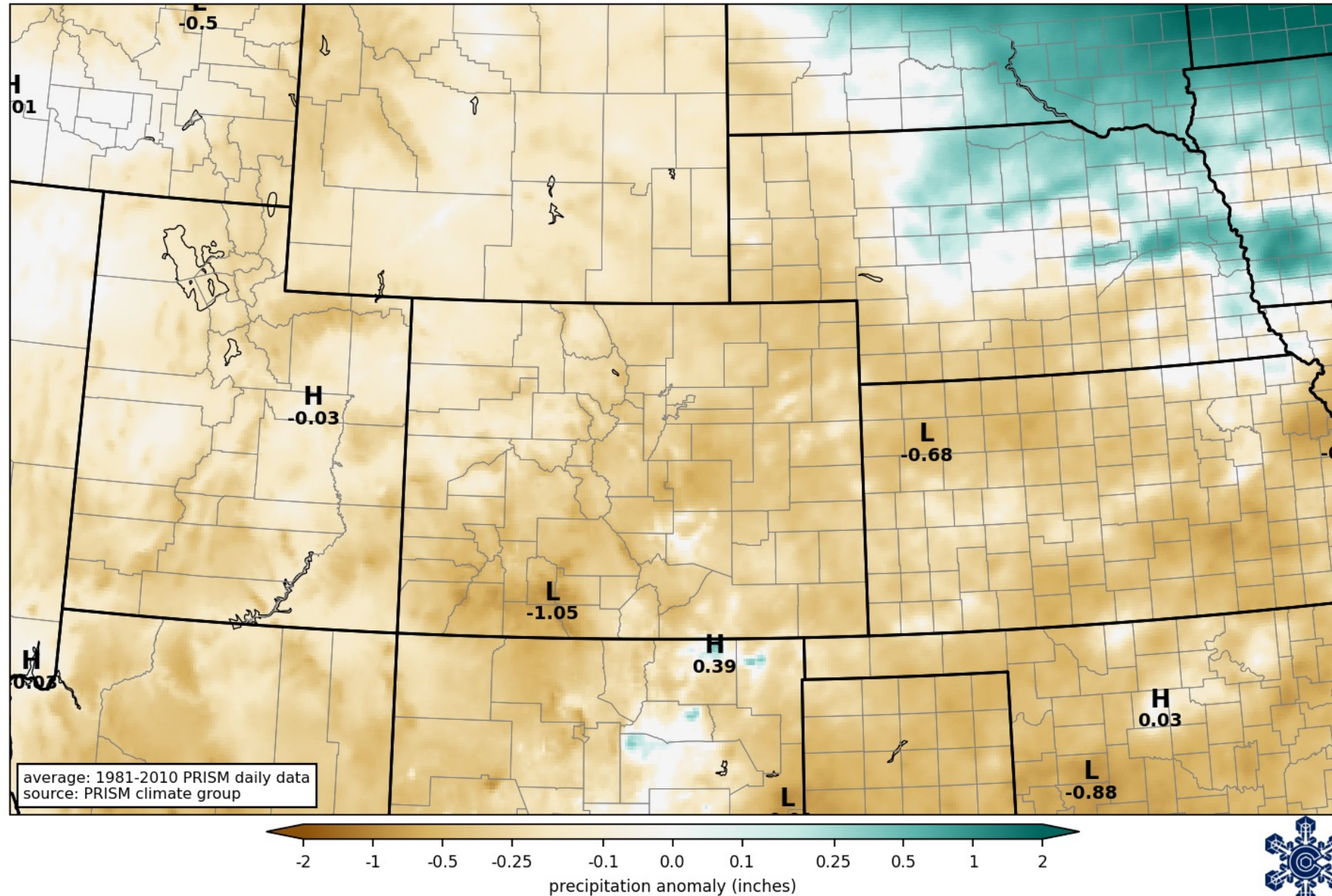


# NOAA 7-day precipitation forecast

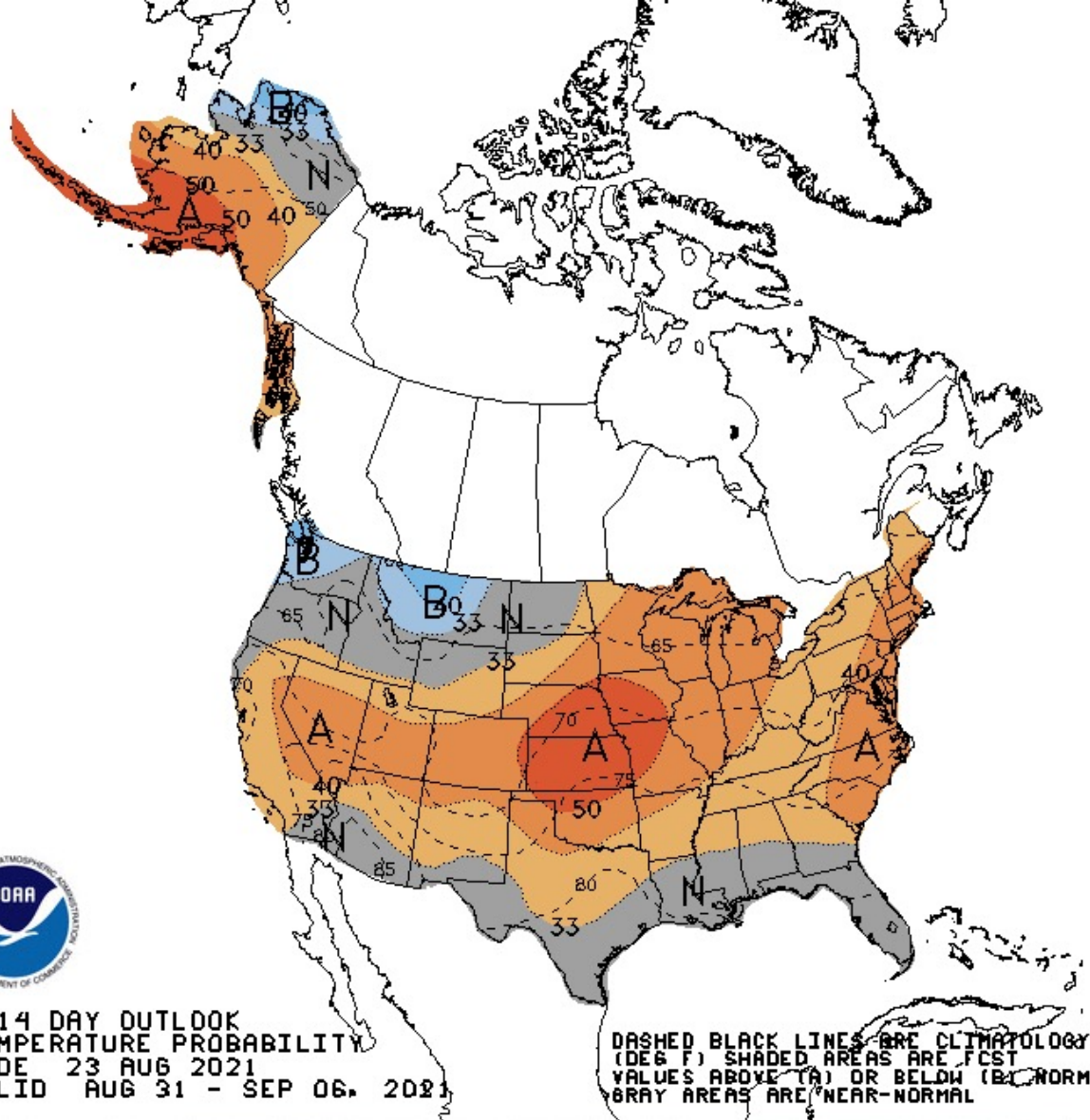




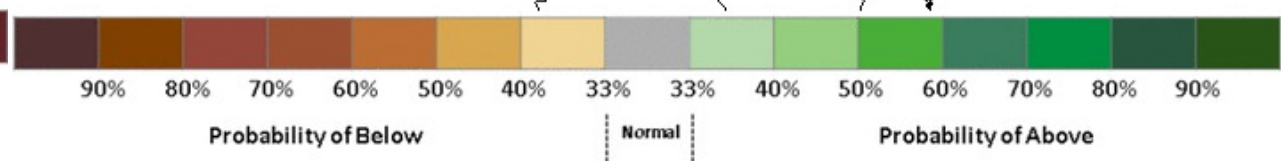
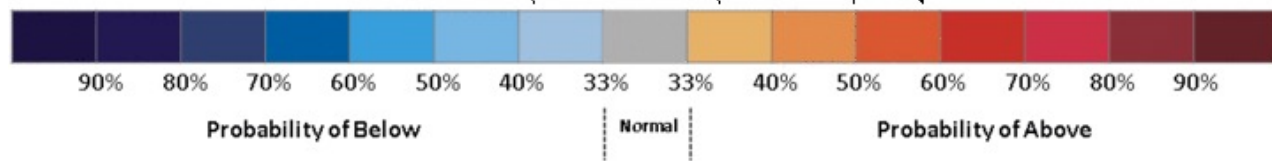
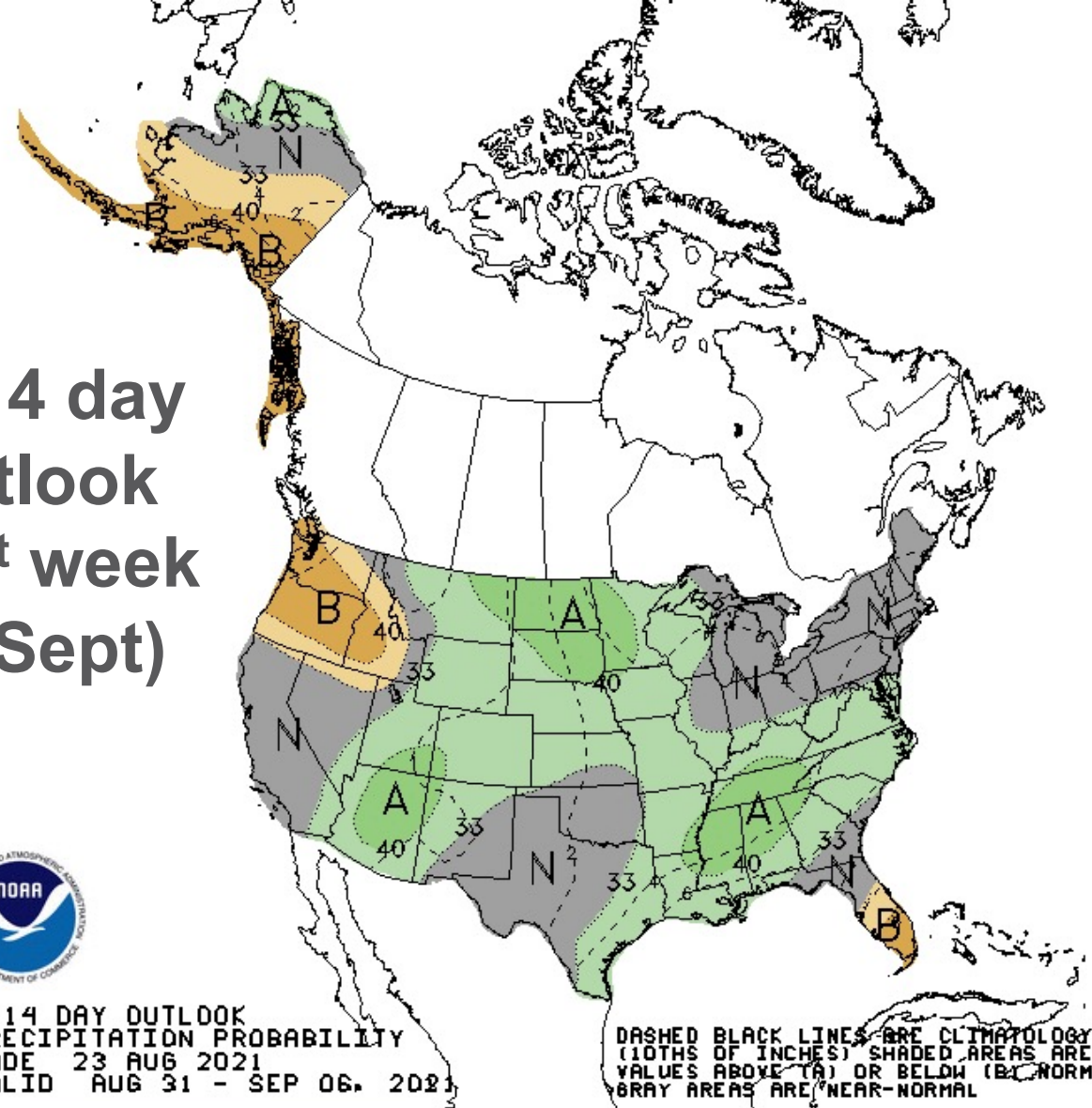
# NOAA 7-day precipitation forecast (difference from average)







## 8-14 day outlook (1<sup>st</sup> week of Sept)



# Currently ENSO-neutral conditions, La Niña may return by fall/winter

Early–August 2021 CPC/IRI Official Probabilistic ENSO Forecasts

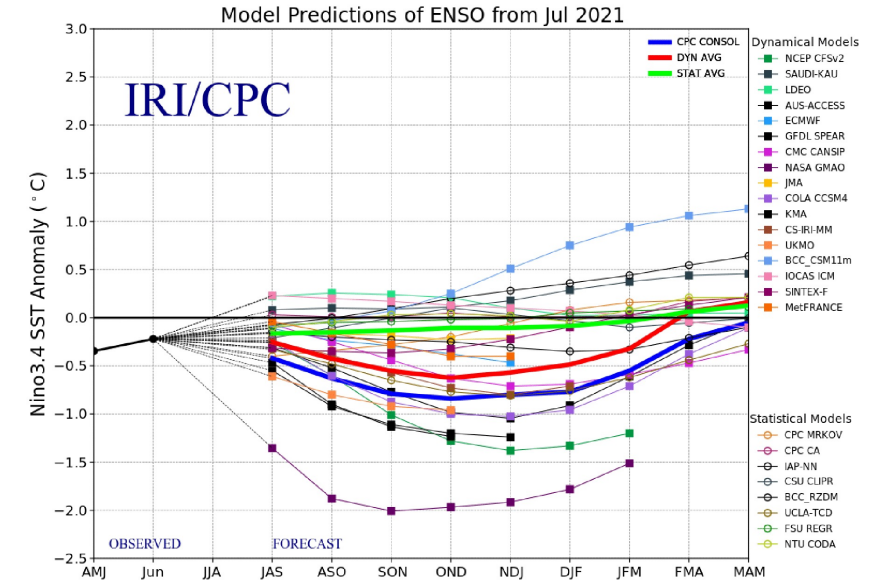
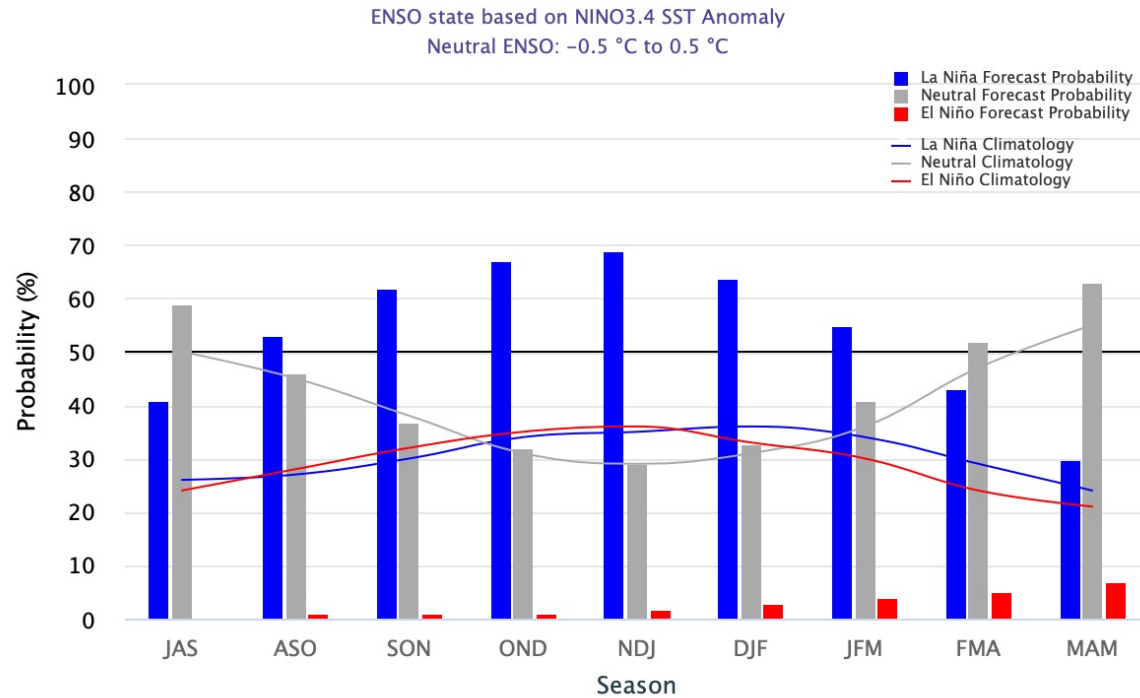


Figure 6. Forecasts of sea surface temperature (SST) anomalies for the Niño 3.4 region (5°N-5°S, 120°W-170°W). Figure updated 19 July 2021.

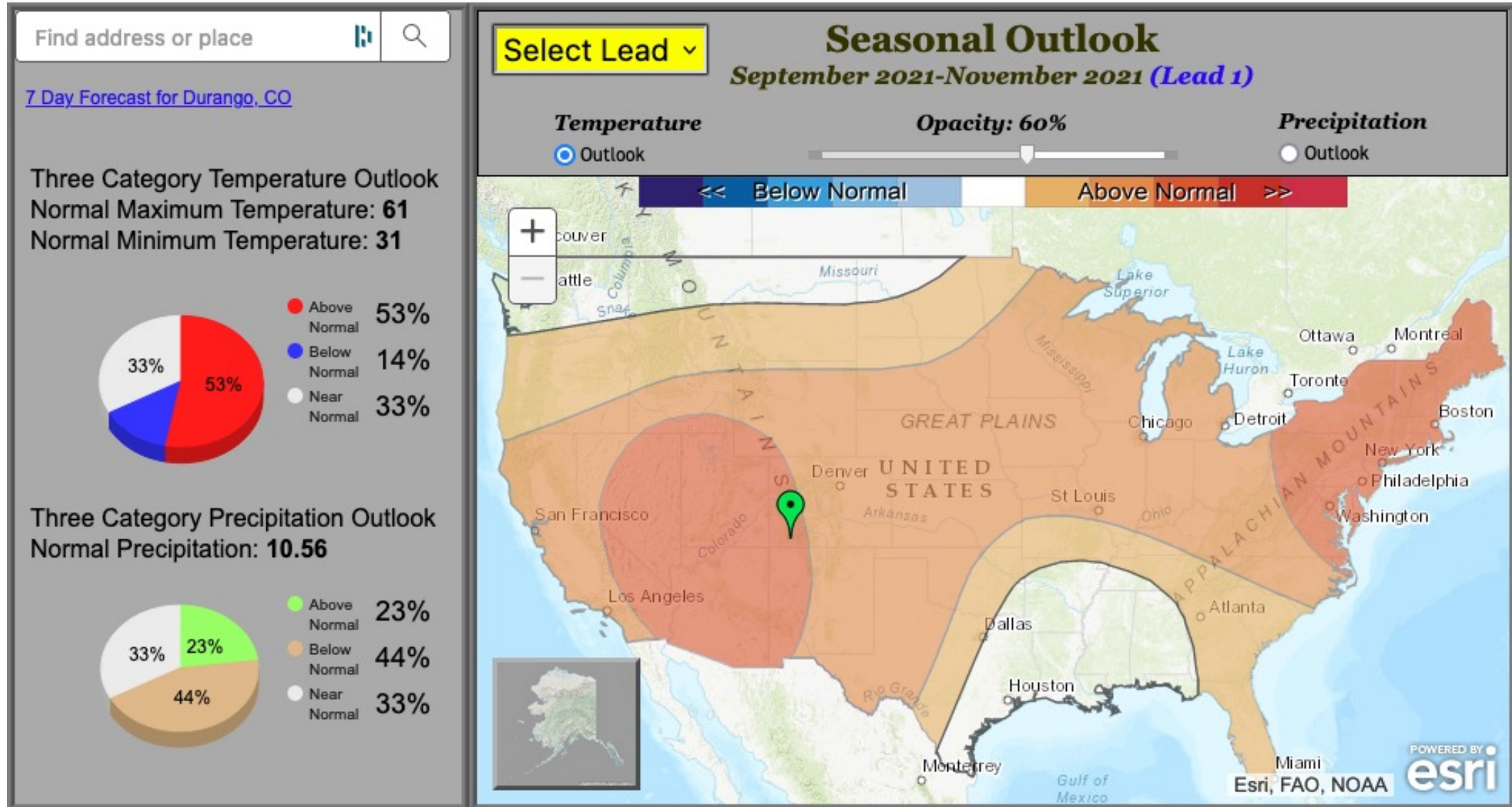
We're in a La Niña watch. ~70% chance that La Niña is back in place in Nov-Dec-Jan.

“Double-dip” La Niña winters have often been dry (1976, 2000, 2012, 2018), though not always (1985, 2009)



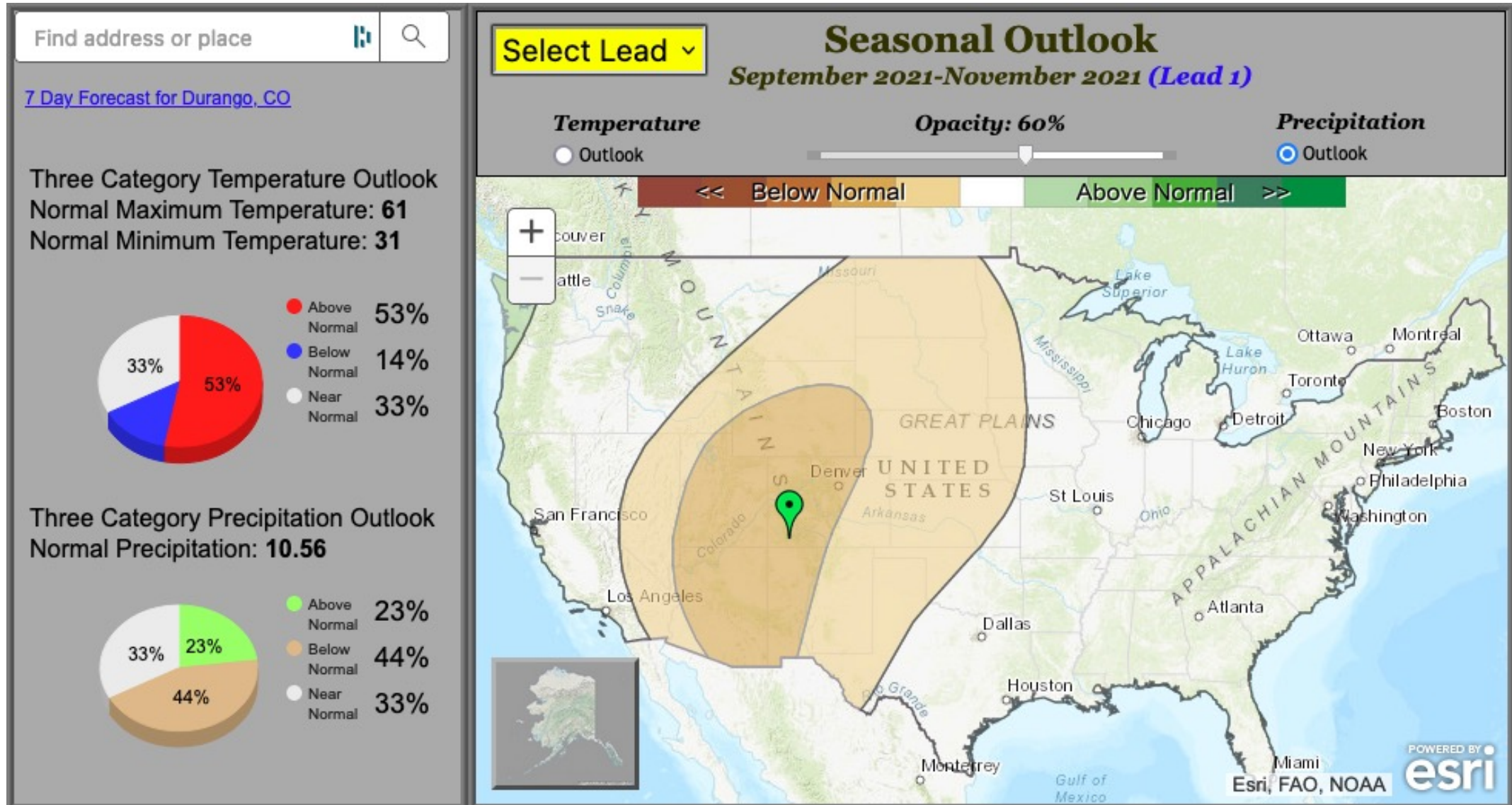


# September-October-November outlook

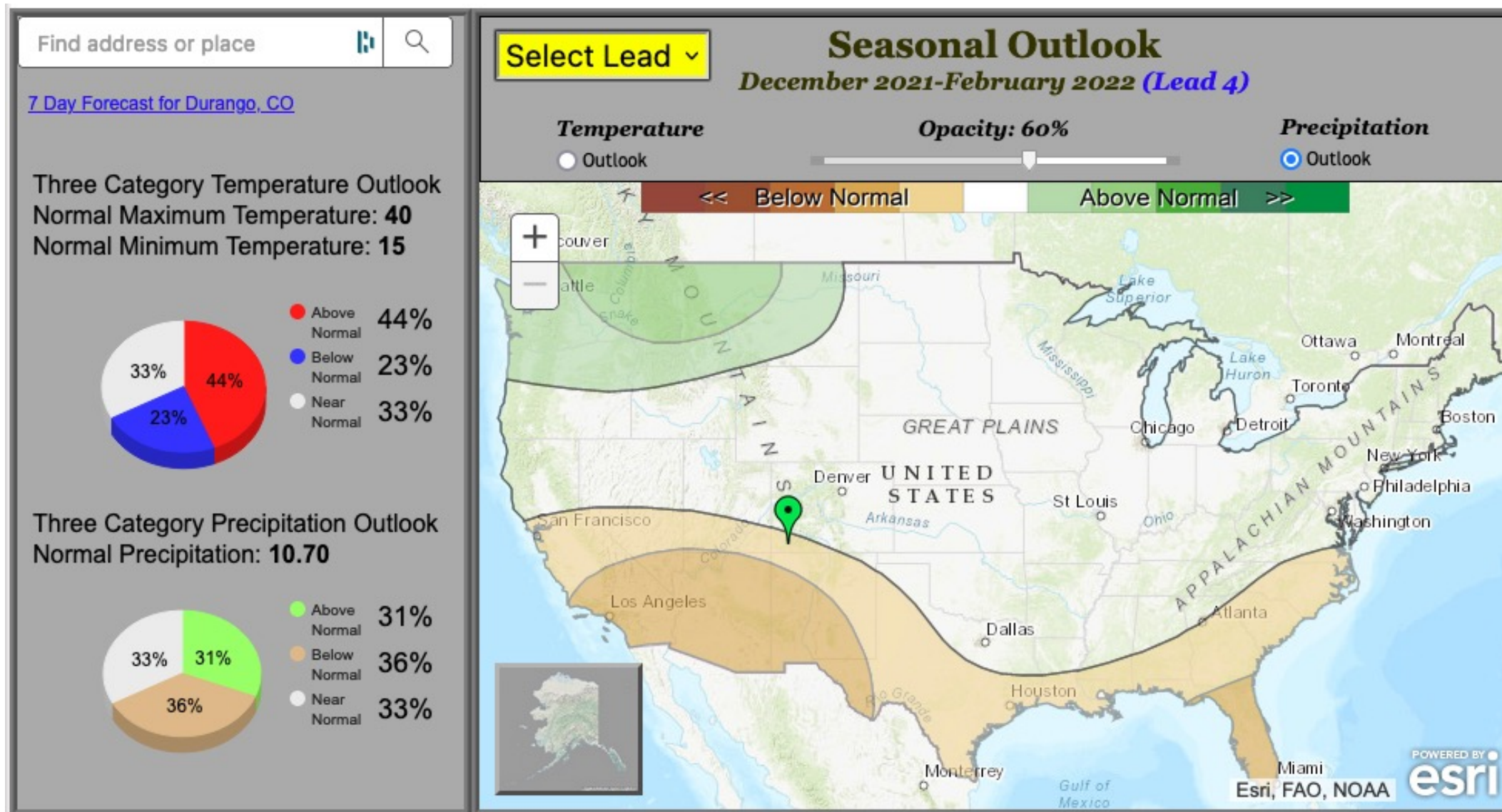




# September-October-November outlook



# Winter outlook



# Takeaways

- For the water year as a whole, western Colorado has been warm and dry, eastern Colorado wet. But this has been reversed for the summer.
- An active summer monsoon has improved the short-term drought situation in much of western Colorado, though it has also brought damaging flash floods
- Longer-term hydrologic drought impacts are still significant, with reservoirs at or near record lows
- With La Niña likely to return (plus the ongoing influences of climate warming), seasonal outlooks are not encouraging, though it's still very early





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