

# Colorado Climate Update

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Assistant State Climatologist

Water Availability Task Force  
June 2023



COLORADO  
CLIMATE  
CENTER

ATMOSPHERIC SCIENCE  
COLORADO STATE UNIVERSITY

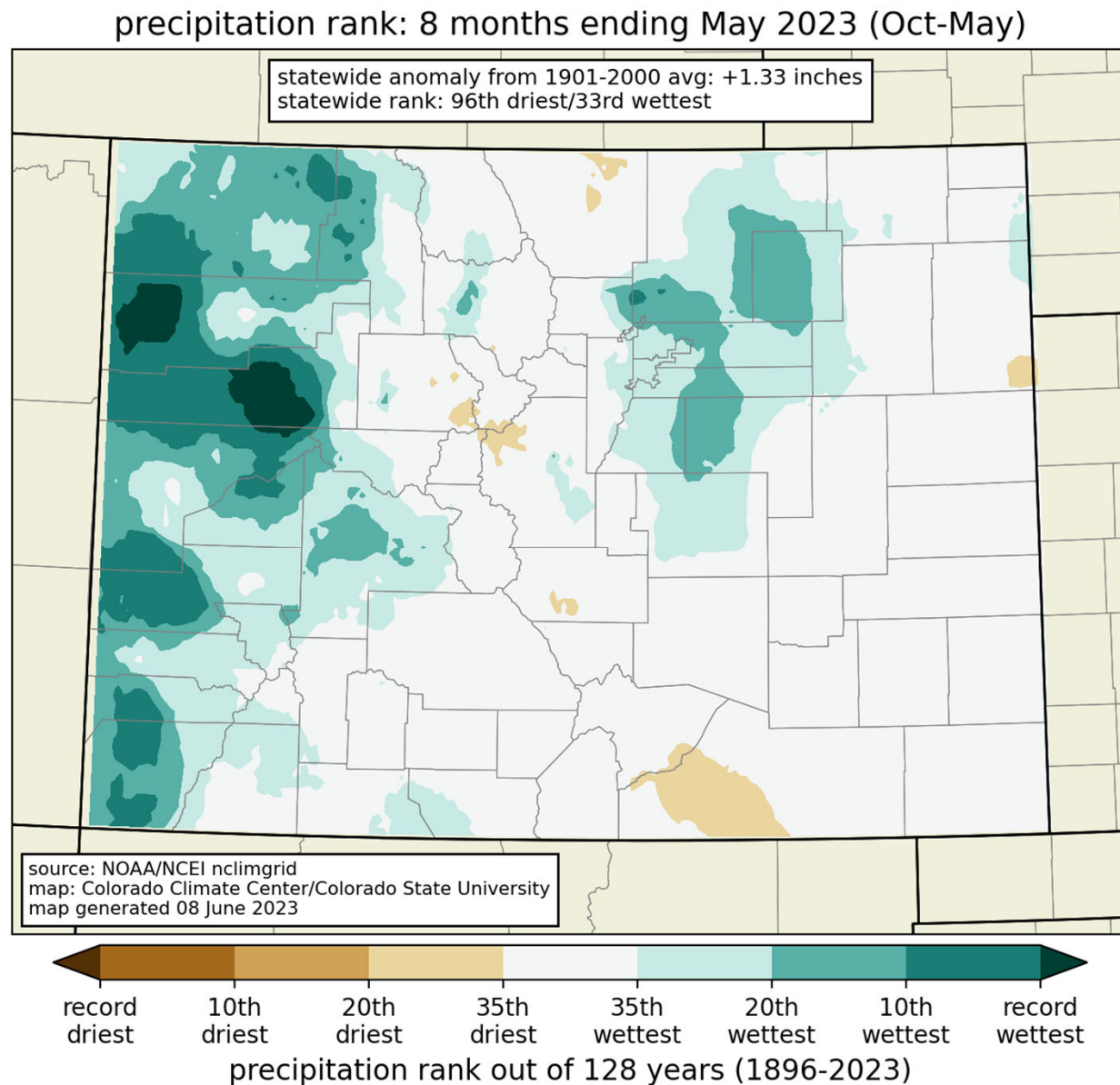


## 2023 Water Year to Date

A look at  
Spring 2023



Water Year 2023 so far has been wetter than average for many areas, and at least near average for most of the state.

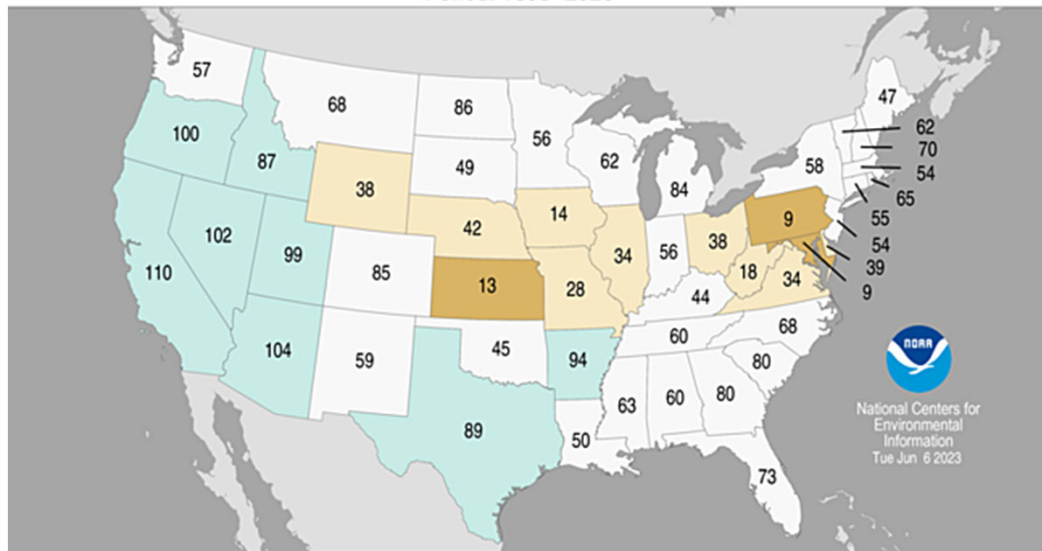


[https://climate.colostate.edu/co\\_cag/rank\\_maps.html](https://climate.colostate.edu/co_cag/rank_maps.html)

## Statewide Precipitation Ranks

March – May 2023

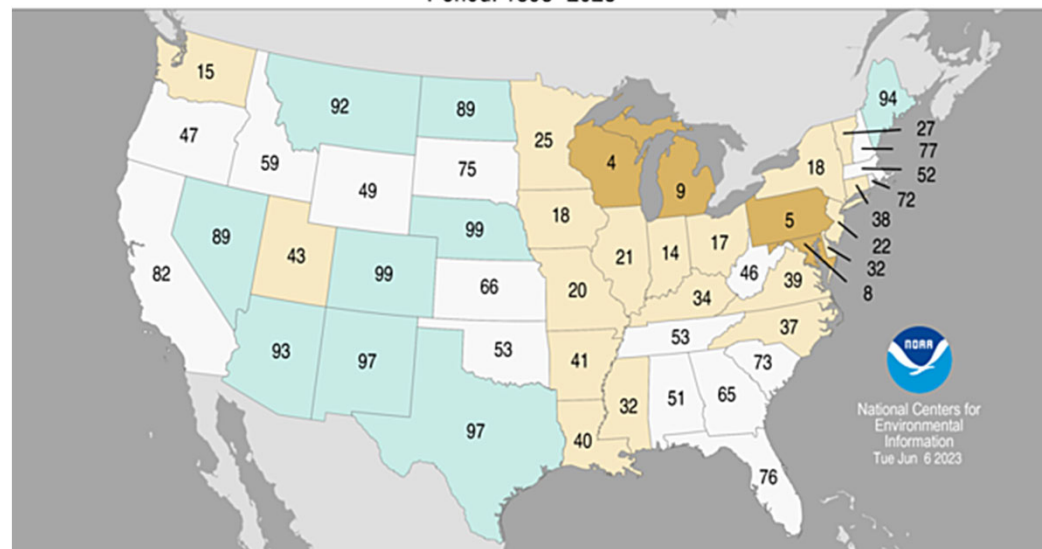
Period: 1895–2023



## Statewide Precipitation Ranks

May 2023

Period: 1895–2023



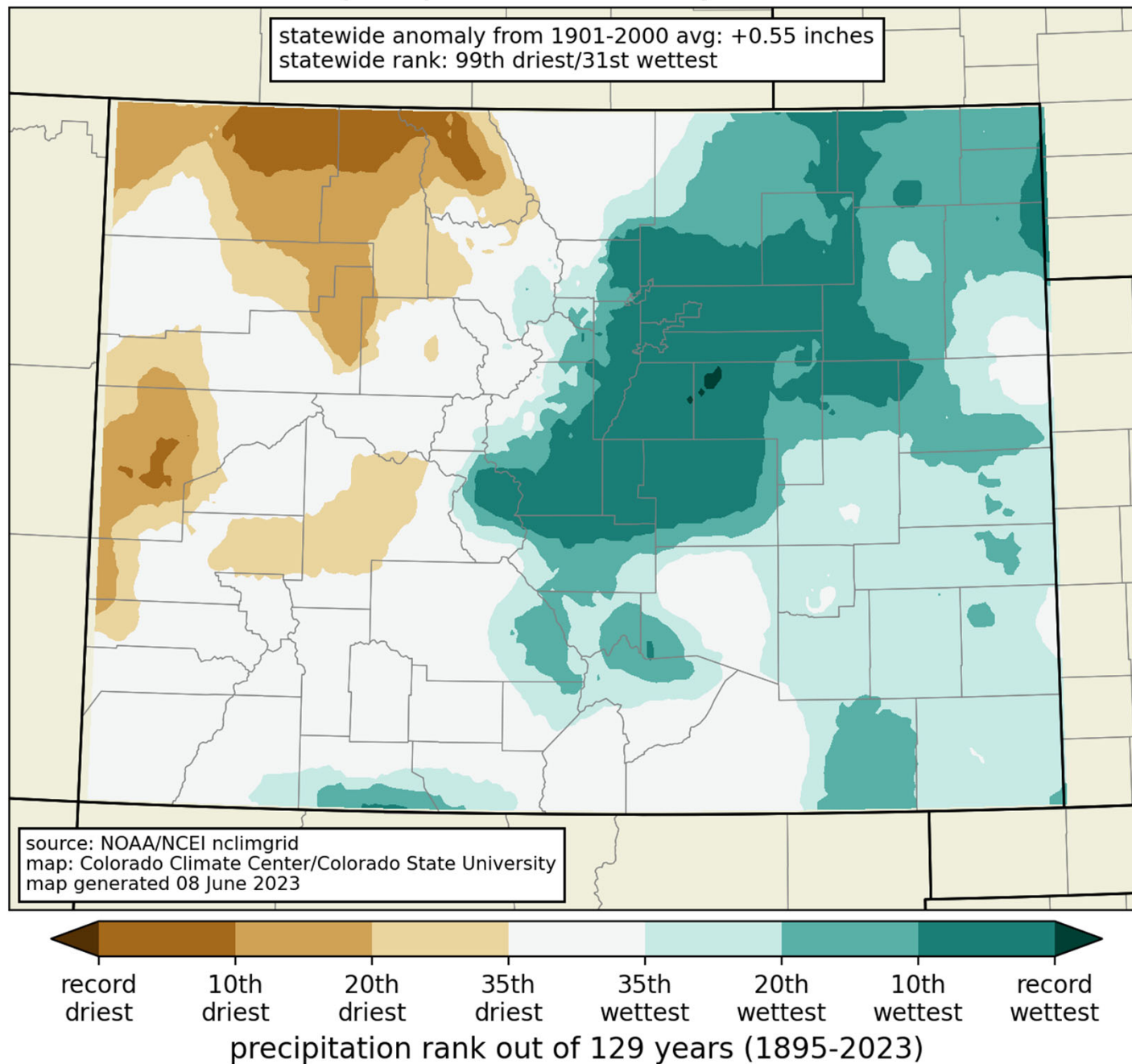
Month	P Rank (of 129 years)	Above, below, or near 20 <sup>th</sup> century avg?
Oct	62 <sup>nd</sup> driest	near avg
Nov	52 <sup>nd</sup> driest	near avg
Dec	20 <sup>th</sup> wettest	above
Jan	10 <sup>th</sup> wettest	much above
Feb	62 <sup>nd</sup> wettest	near avg
Mar	32 <sup>nd</sup> wettest	above
Apr	37 <sup>th</sup> driest	below
May	31 <sup>st</sup> wettest	above
Jun		
Jul		
Aug		
Sep		

<https://www.ncdc.noaa.gov/temp-and-precip/us-maps/>

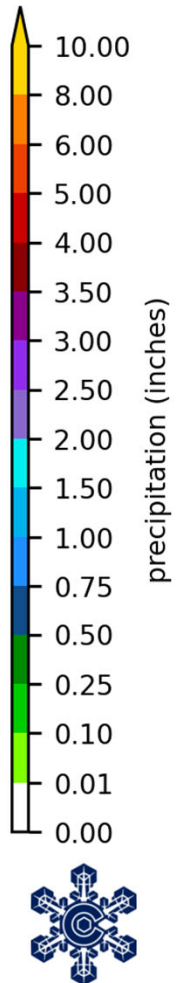




## precipitation rank: May 2023

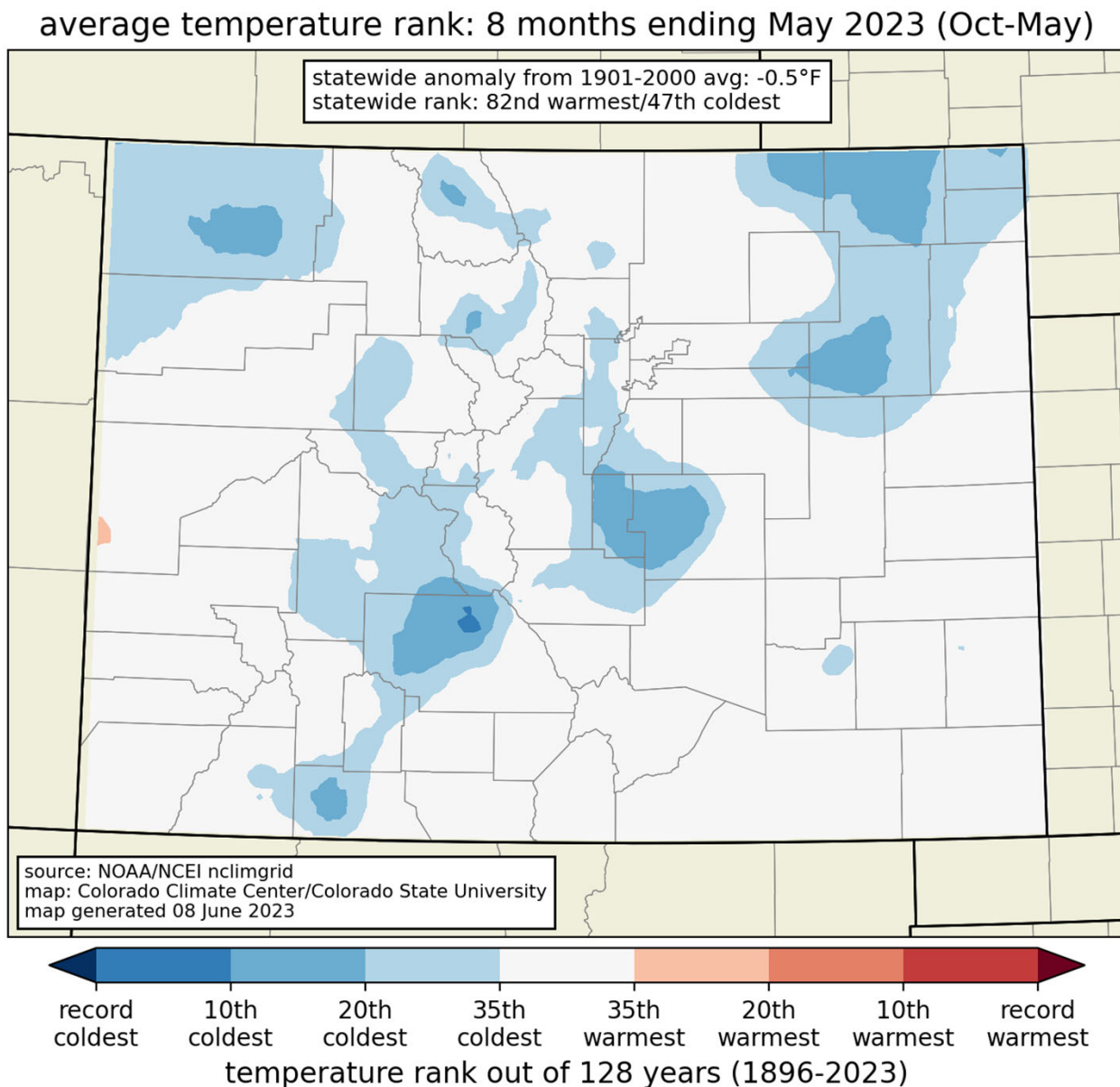


[https://climate.colostate.edu/co\\_cag/rank\\_maps.html](https://climate.colostate.edu/co_cag/rank_maps.html)



Castle Rock and Aurora were the May 2023 winners: 9-10 inches.

Cool anomalies have dominated the state for most of WY2023. May 2023 was the first month of the water year with above average temperatures. For the water year, the state shows mostly cool anomalies or near average temperatures.



[https://climate.colostate.edu/co\\_cag/rank\\_maps.html](https://climate.colostate.edu/co_cag/rank_maps.html)

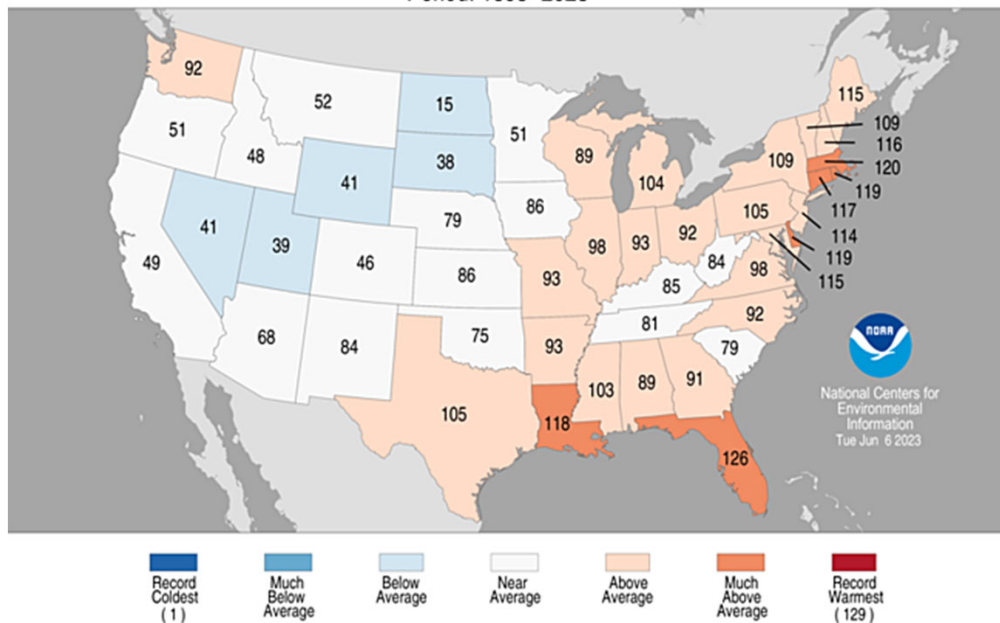




## Statewide Average Temperature Ranks

March – May 2023

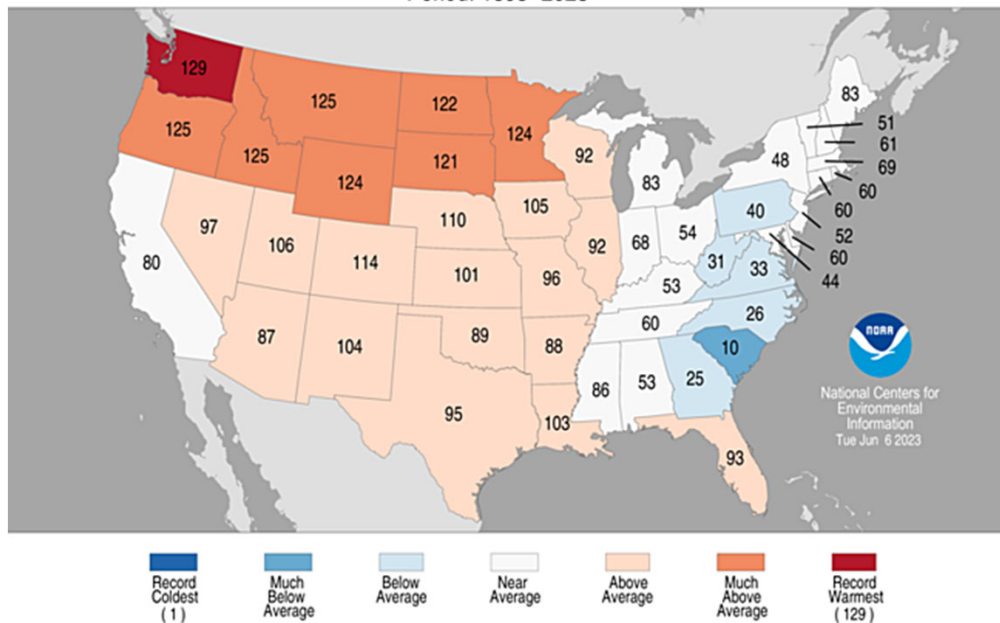
Period: 1895–2023



## Statewide Average Temperature Ranks

May 2023

Period: 1895–2023

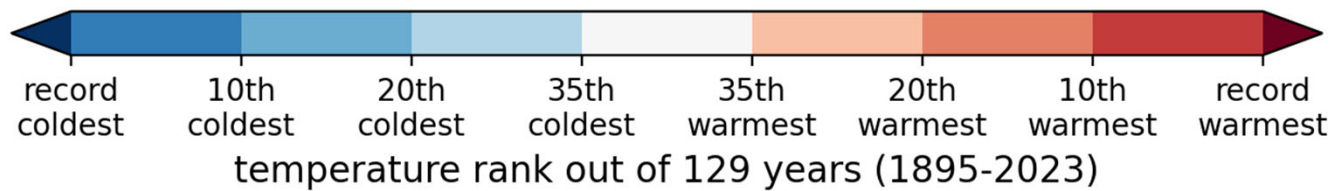
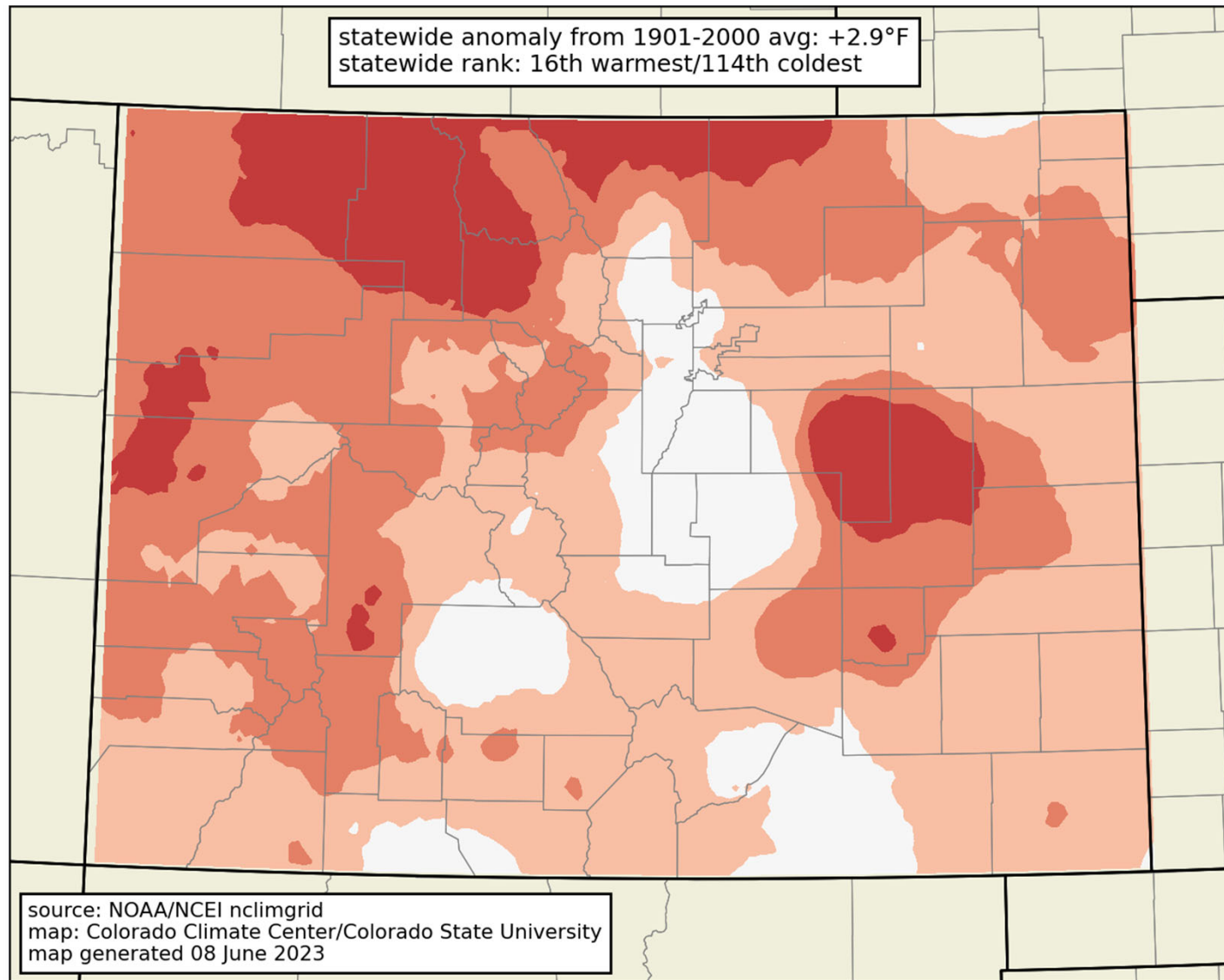


Month	T Rank (of 129 years)	Above, below, or near 20 <sup>th</sup> century avg?
Oct	45 <sup>th</sup> warmest	near avg
Nov	29 <sup>th</sup> coolest	below
Dec	57 <sup>th</sup> coolest	near avg
Jan	55 <sup>th</sup> coolest	near avg
Feb	37 <sup>th</sup> coolest	below
Mar	22 <sup>nd</sup> coolest	below
Apr	41 <sup>st</sup> coolest	below
May	16 <sup>th</sup> warmest	above
Jun		
Jul		
Aug		
Sep		

<https://www.ncdc.noaa.gov/temp-and-precip/us-maps/>



## average temperature rank: May 2023



[https://climate.colostate.edu/co\\_cag/rank\\_maps.html](https://climate.colostate.edu/co_cag/rank_maps.html)



## Current Conditions

Temperature

Precipitation

Evaporative Demand

Soil Moisture

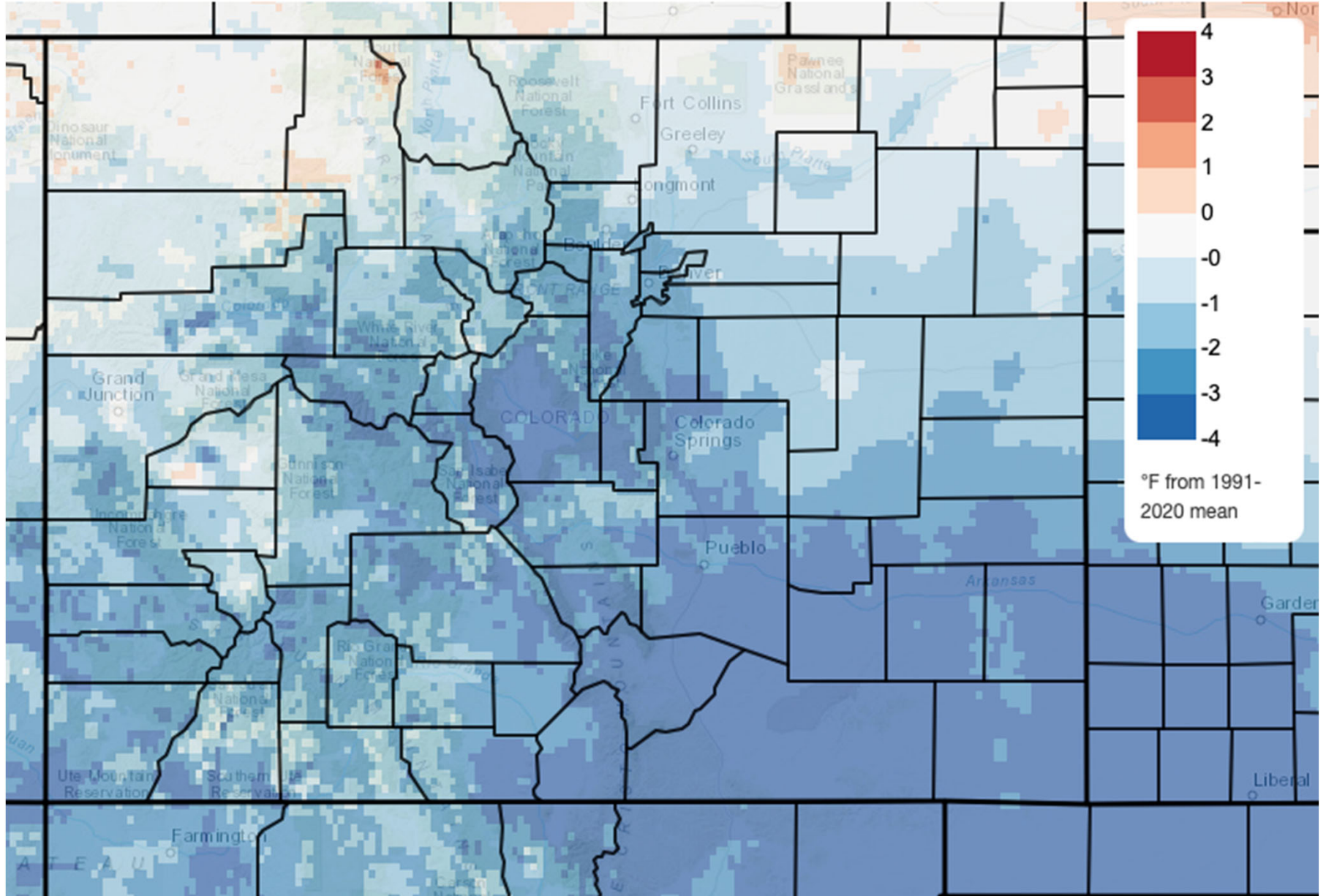
Vegetation





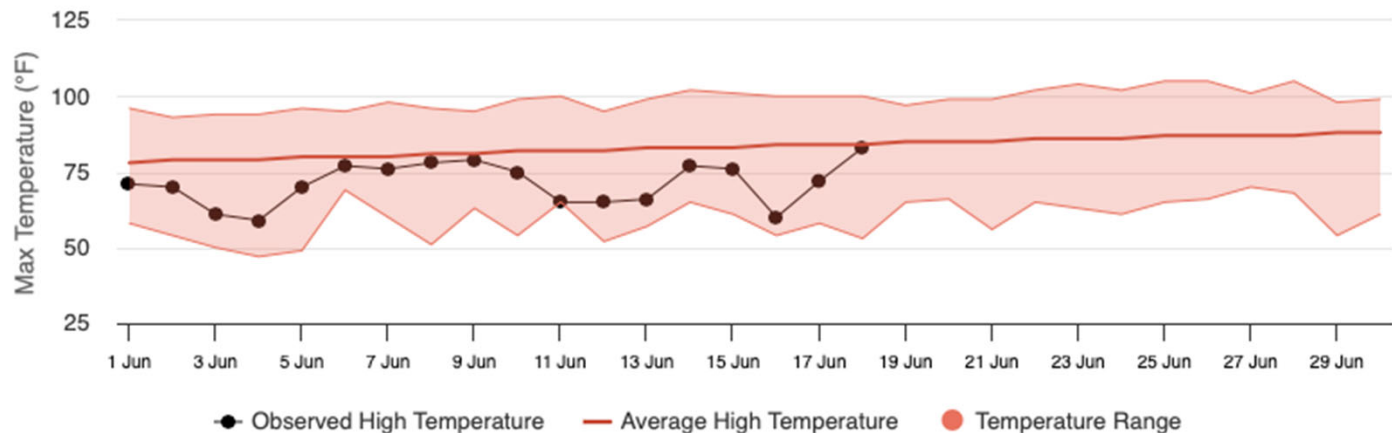
# Mean Daily Temperature Anomaly, Last 30 Days

2023/05/20 - 2023/06/18



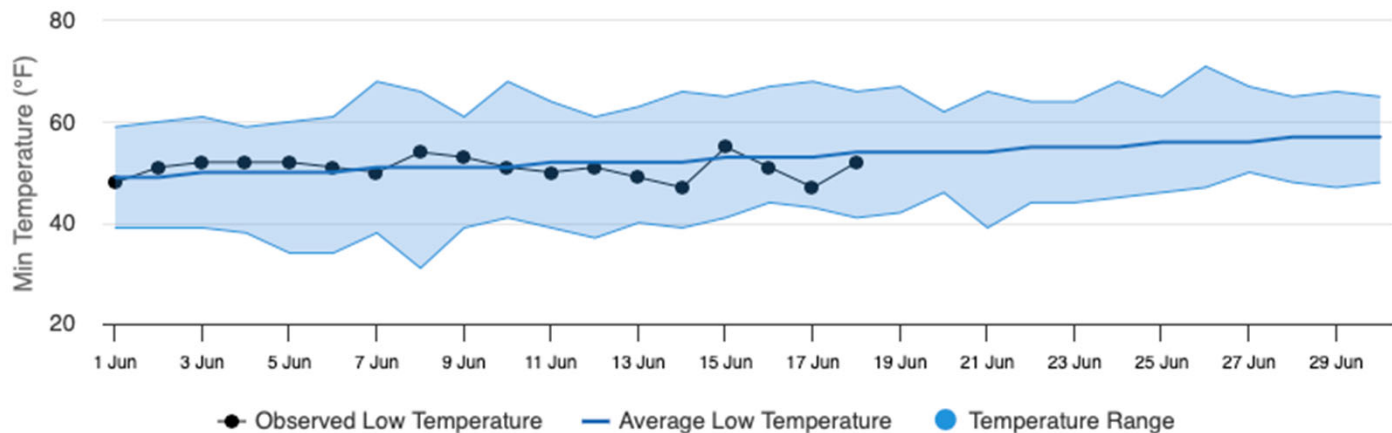
<https://climatetoolbox.org/tool/Climate-Mapper>

## Daily High Temperatures for DENVER INTL AP



Highcharts.com

## Daily Low Temperatures for DENVER INTL AP



Highcharts.com

### Daily Temperature Stats for DENVER INTL AP

\*\*Average temperatures based on 1991-2020 Normals\*\*

Number of high temperatures above average: 0  
 Number of high temperatures below average: 18  
 Number of record tied or broken highs: 0

Number of low temperatures above average: 8  
 Number of low temperatures below average: 9  
 Number of record tied or broken lows: 0

Our year of weird temperature patterns continues. Cooler highs and warmer lows indicate more clouds and higher humidity.

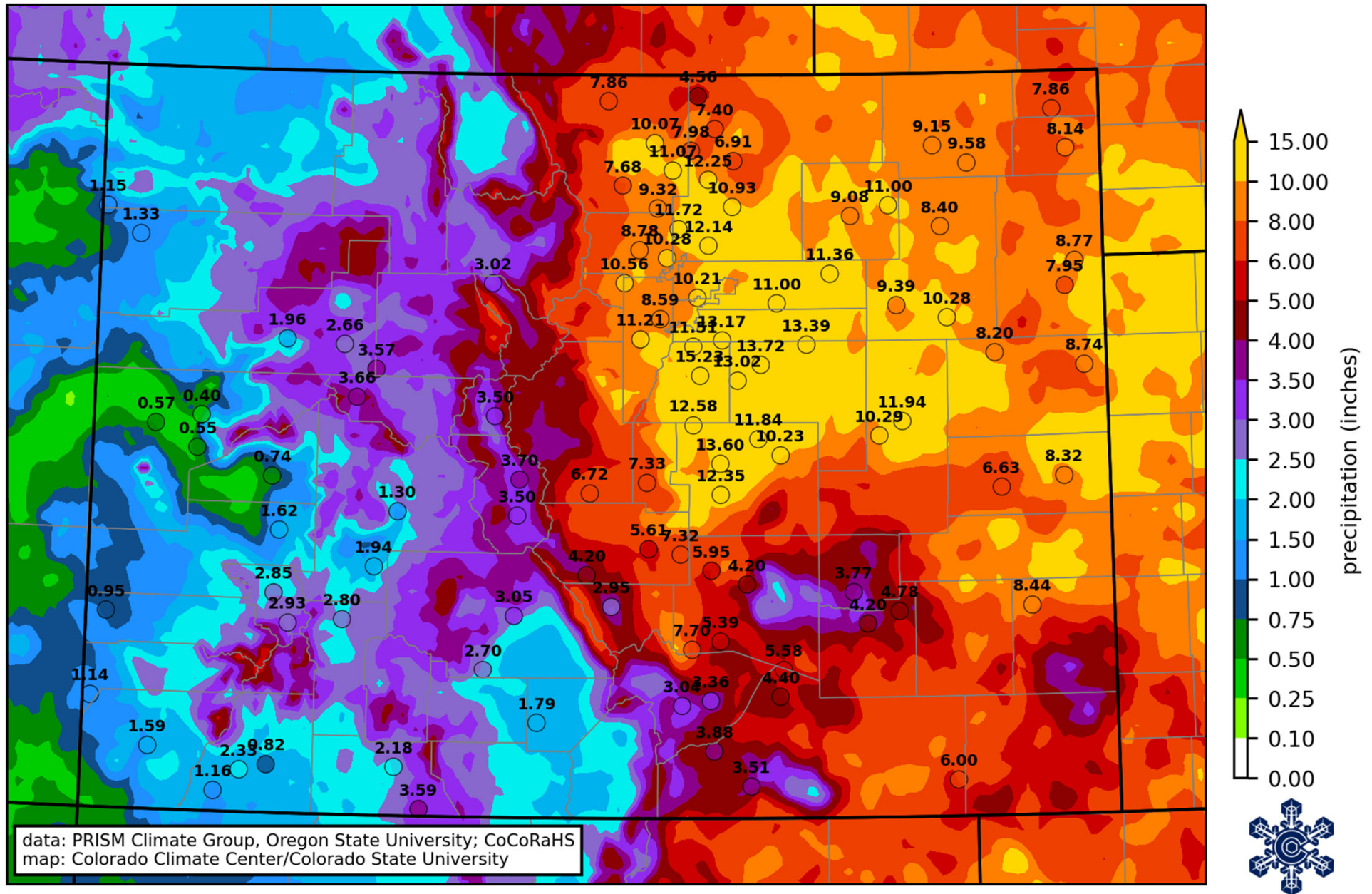
[https://climate.colostate.edu/temp\\_graph.html](https://climate.colostate.edu/temp_graph.html)





## PRISM &amp; CoCoRaHS total precipitation since May 1 through 5:00am MST 19 June 2023

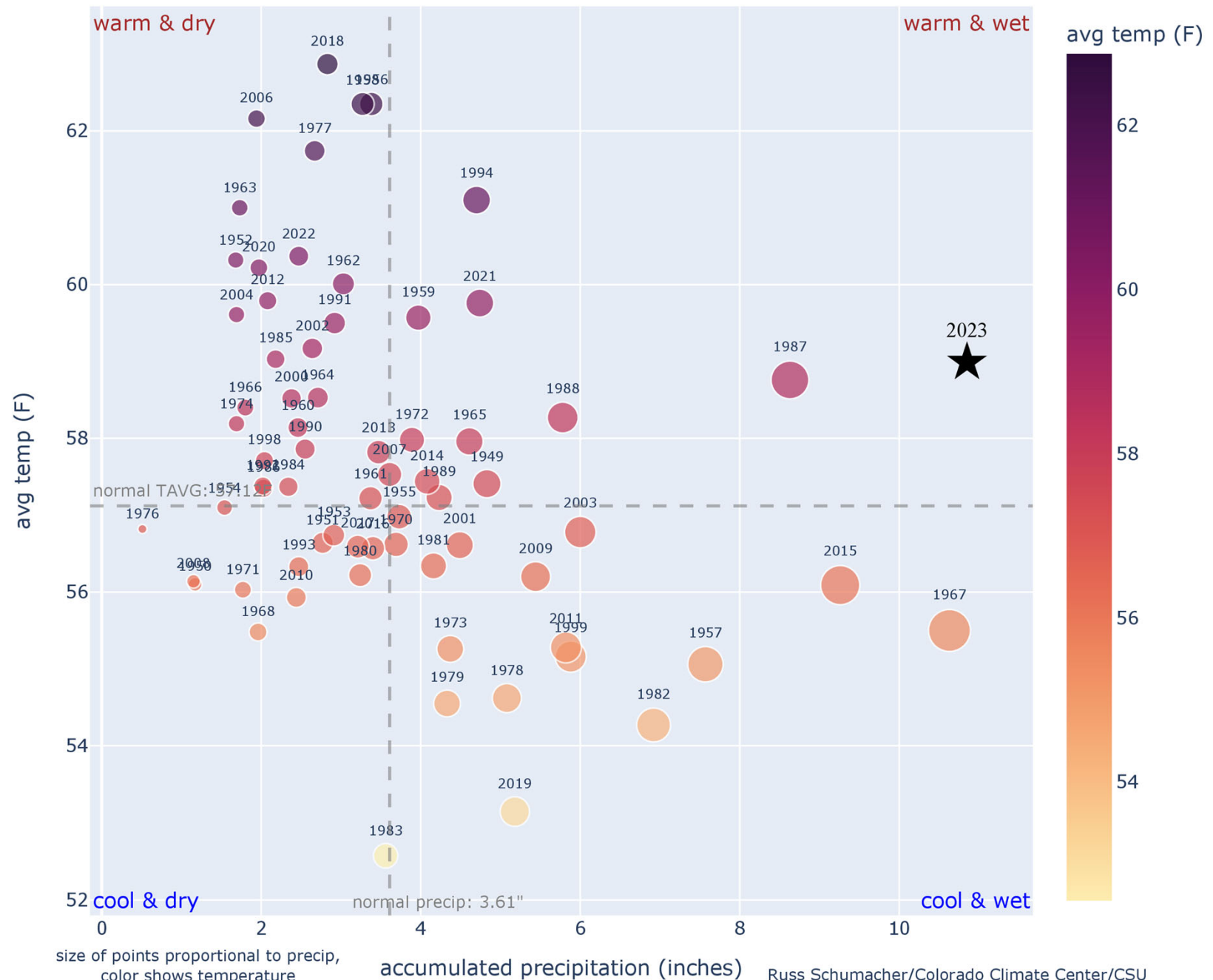
through 5:00am MST 19 June 2023



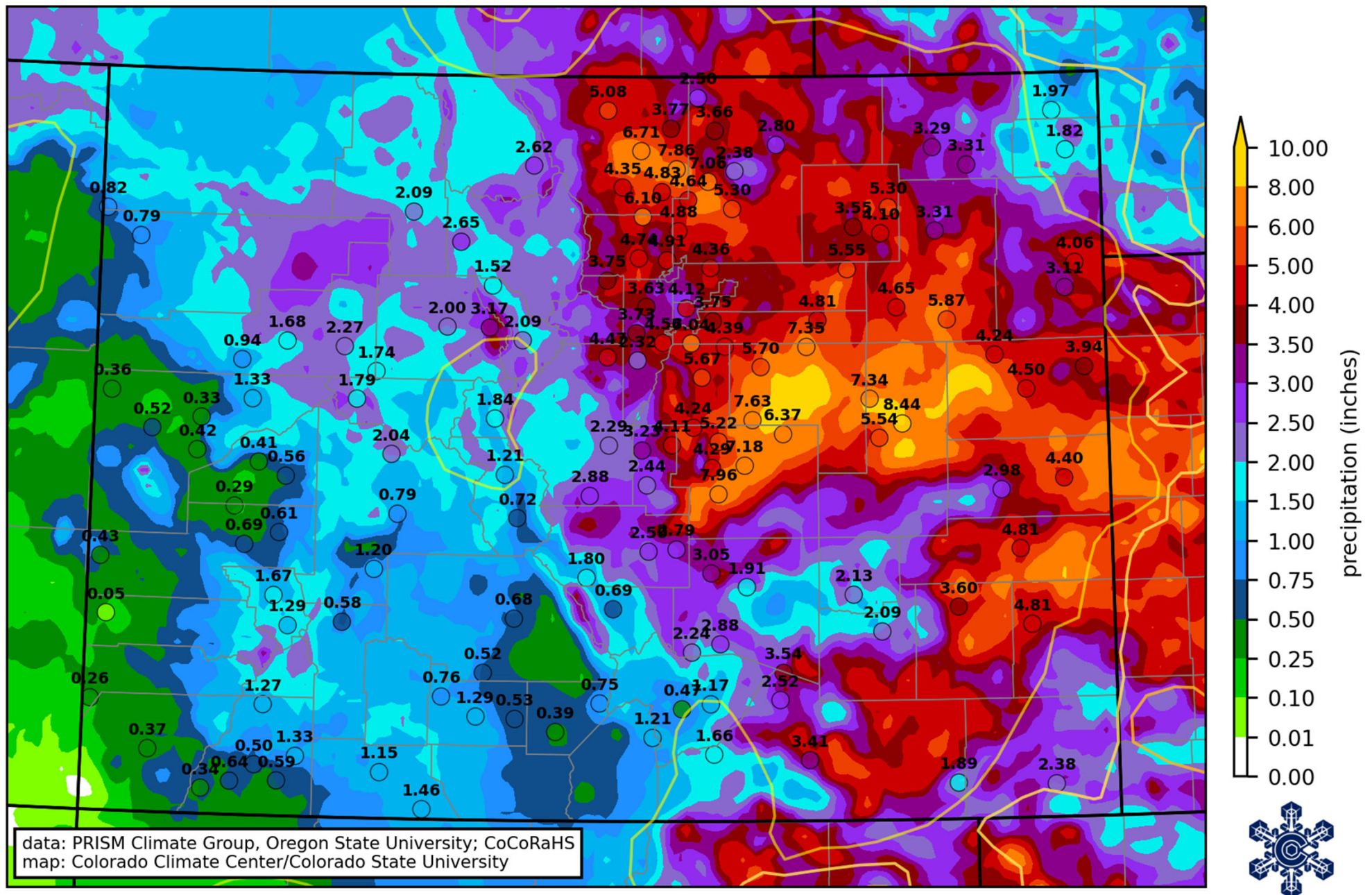
<https://climate.colostate.edu/drought/>



# LIMON temperature and precipitation, May 1 - June 18

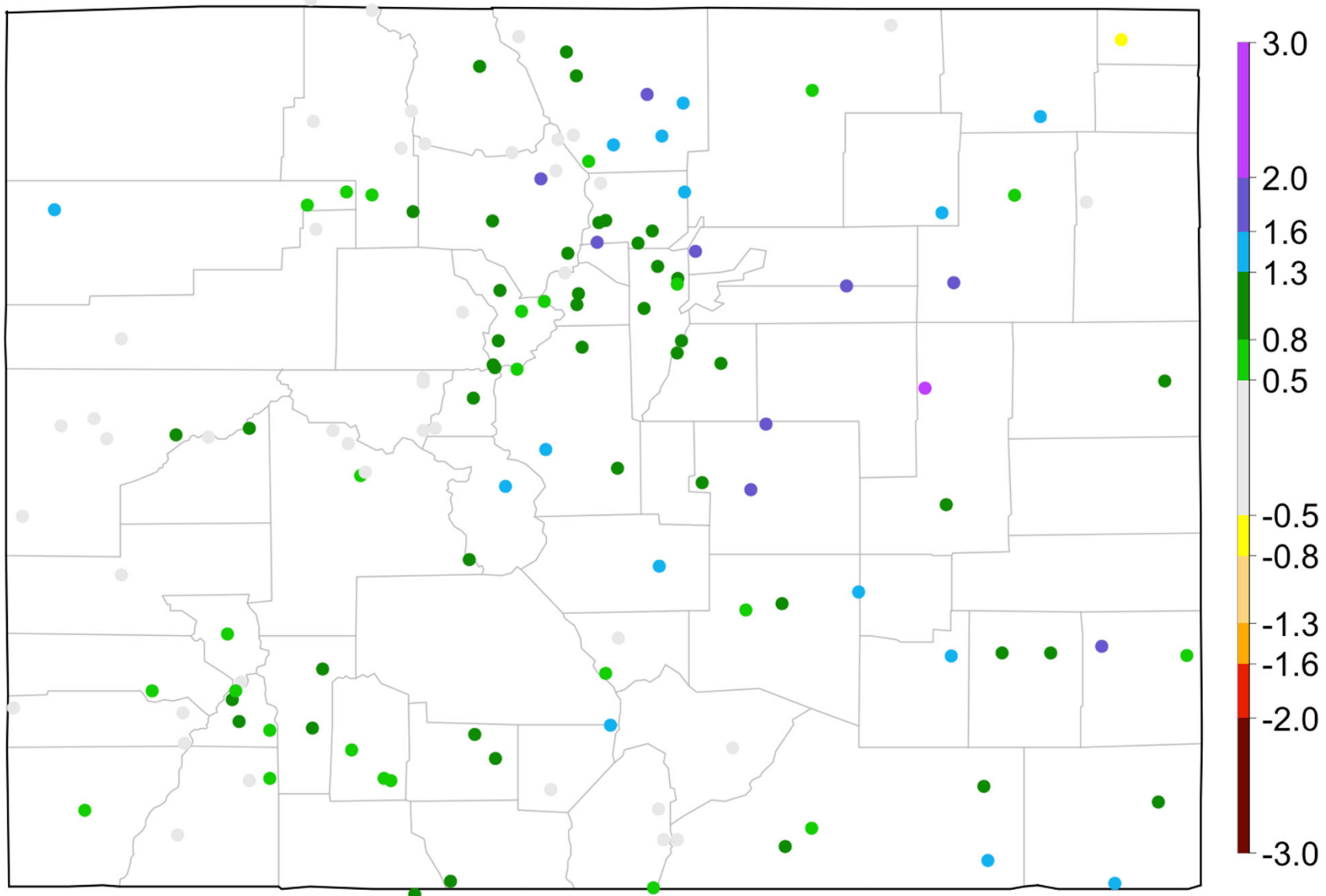






<https://climate.colostate.edu/drought/>

## 30-day SPI: 2023/05/20 - 2023/06/18



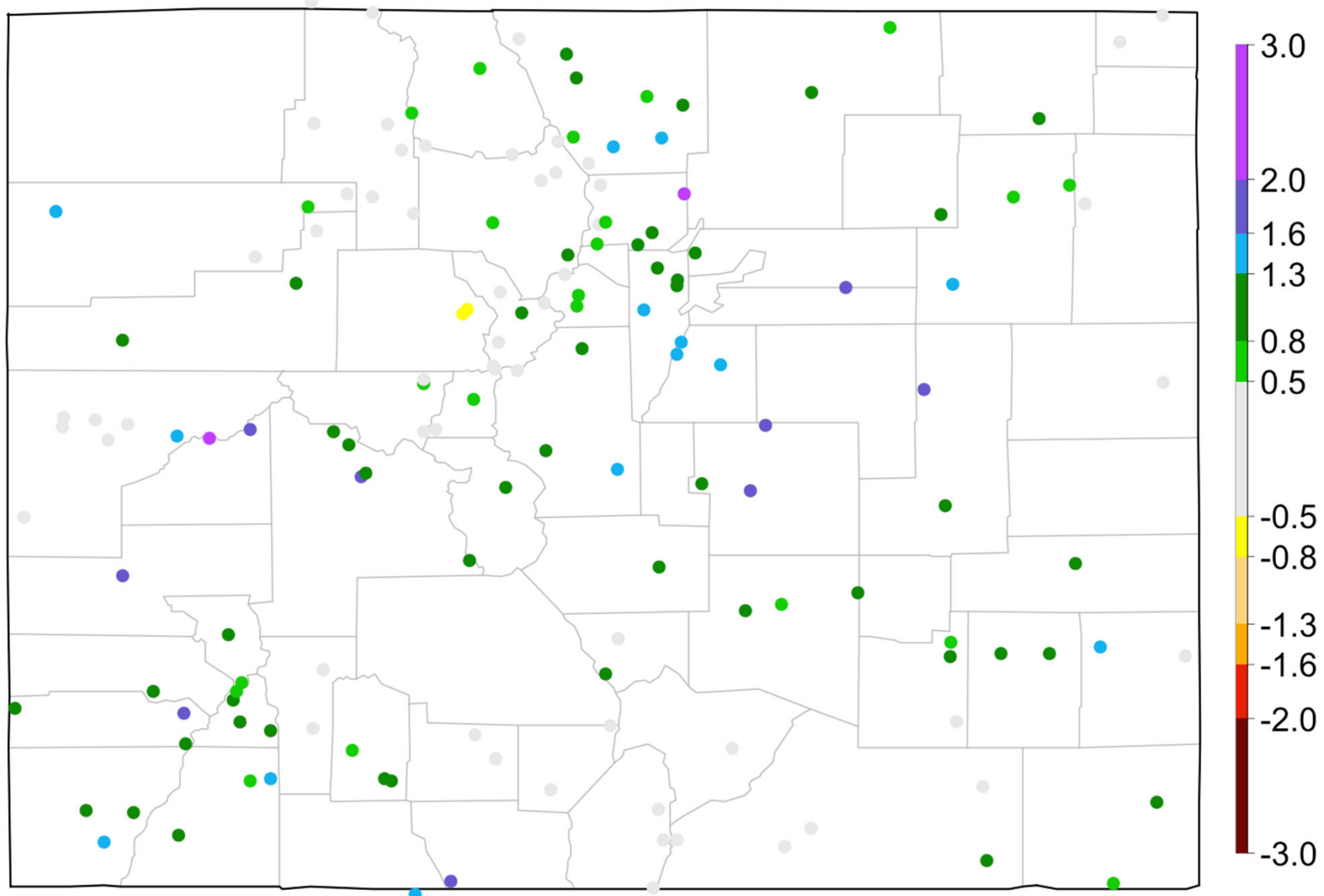
Data from High Plains Regional Climate Center and ACIS

<https://climate.colostate.edu/drought/>





## 120-day SPI: 2023/02/19 - 2023/06/18

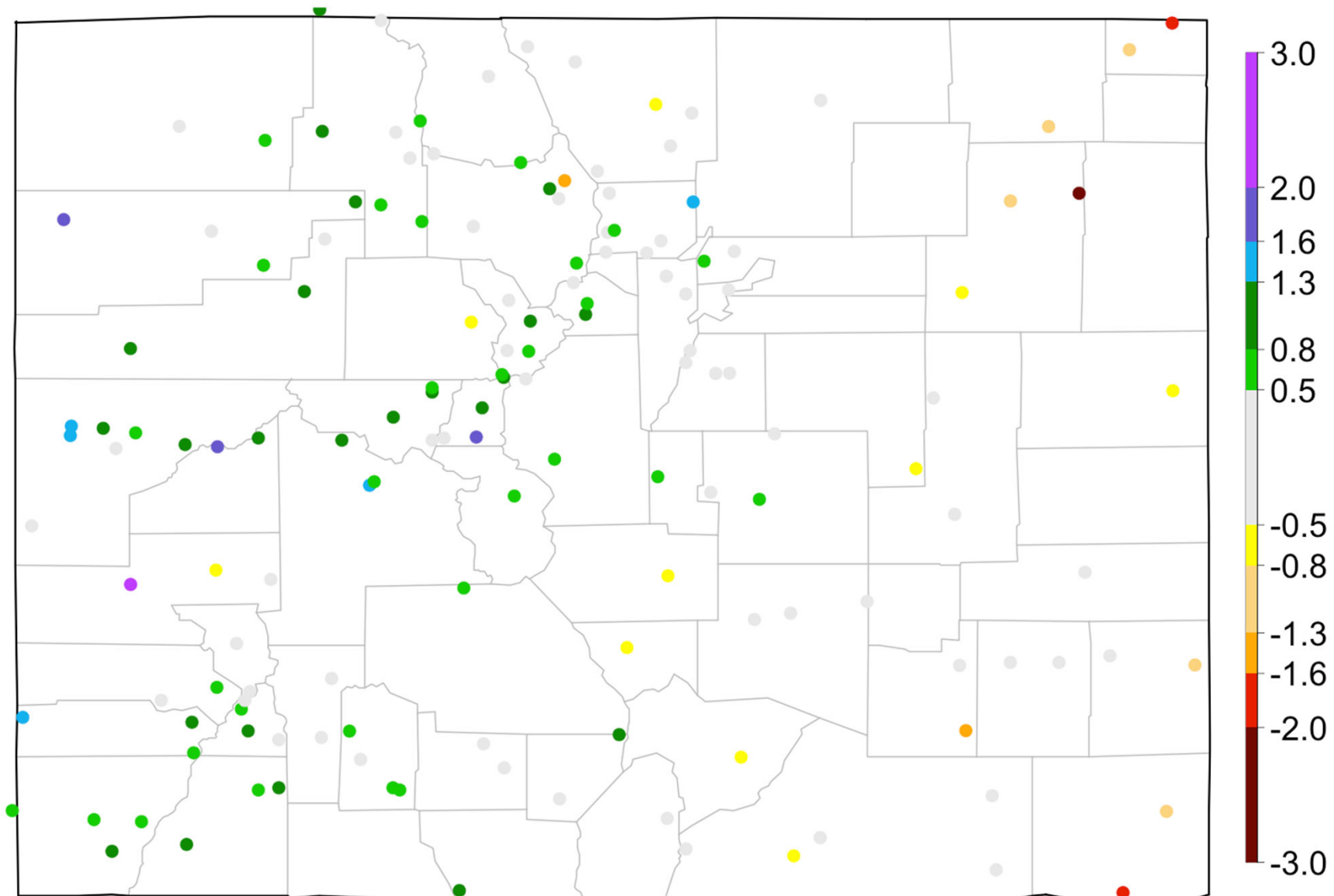


Data from High Plains Regional Climate Center and ACIS

<https://climate.colostate.edu/drought/>



## 24-month SPI: 2021/06/19 - 2023/06/18

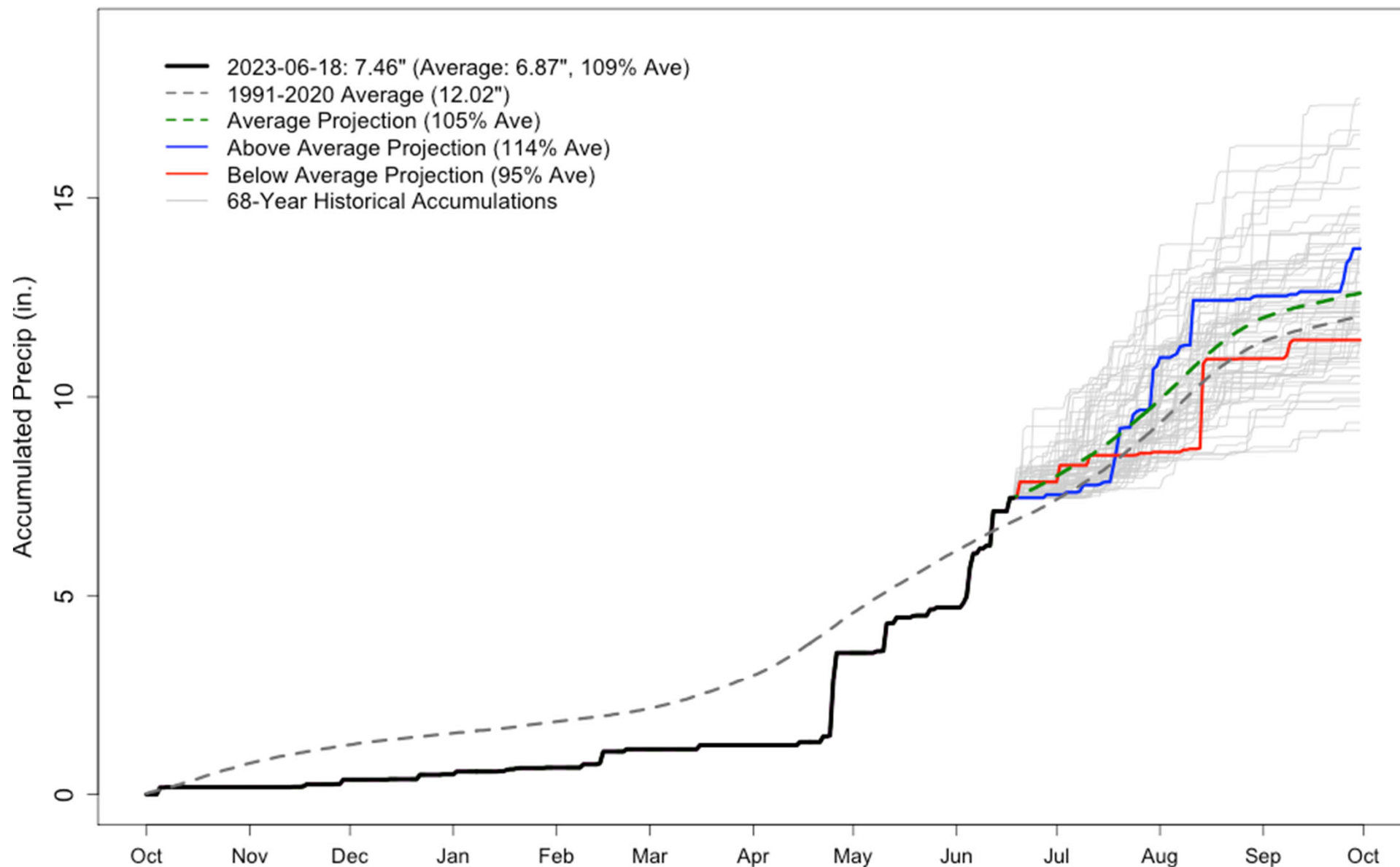


Data from High Plains Regional Climate Center and ACIS

<https://climate.colostate.edu/drought/>

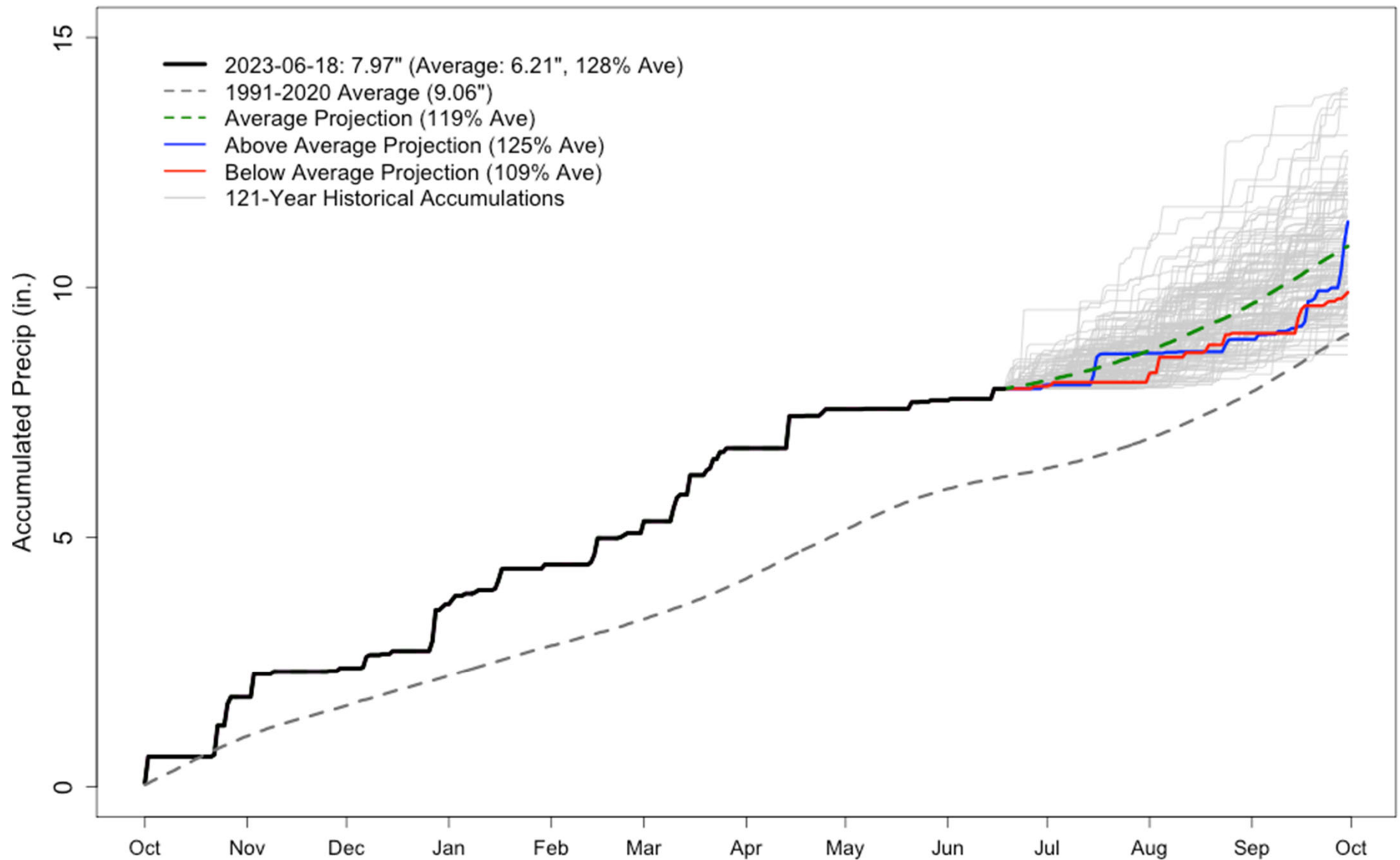


## PUEBLO MEMORIAL AIRPORT WY2023 Precipitation Projections



[https://climate.colostate.edu/precip\\_proj.html](https://climate.colostate.edu/precip_proj.html)

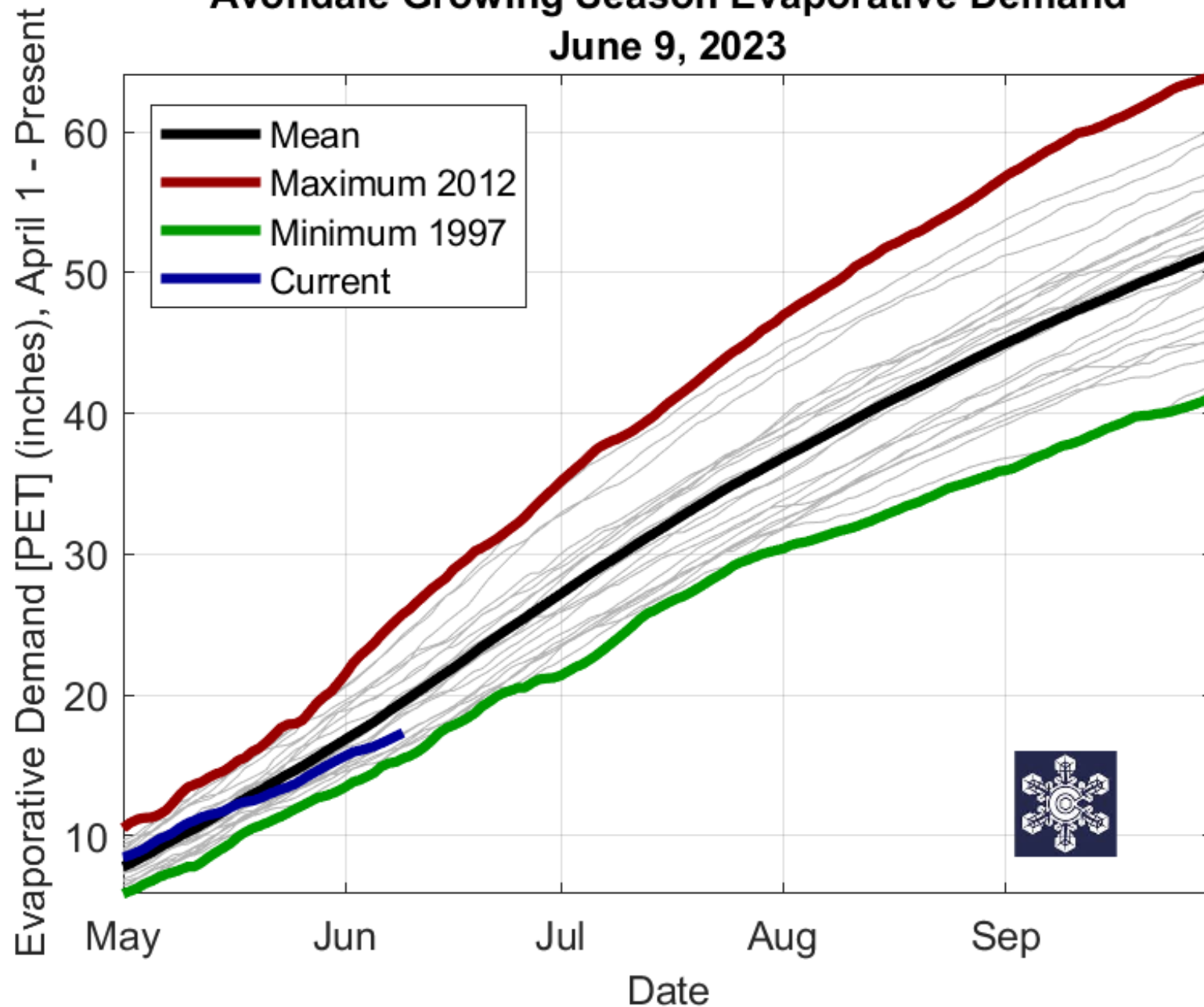
## GRAND JUNCTION WALKER FIELD WY2023 Precipitation Projections



[https://climate.colostate.edu/precip\\_proj.html](https://climate.colostate.edu/precip_proj.html)



## Avondale Growing Season Evaporative Demand June 9, 2023



Evaporative demand is low so far for the growing season.





## Drought

National Drought

Colorado Drought

Some Drought Facts





# U.S. Drought Monitor Contiguous U.S. (CONUS)

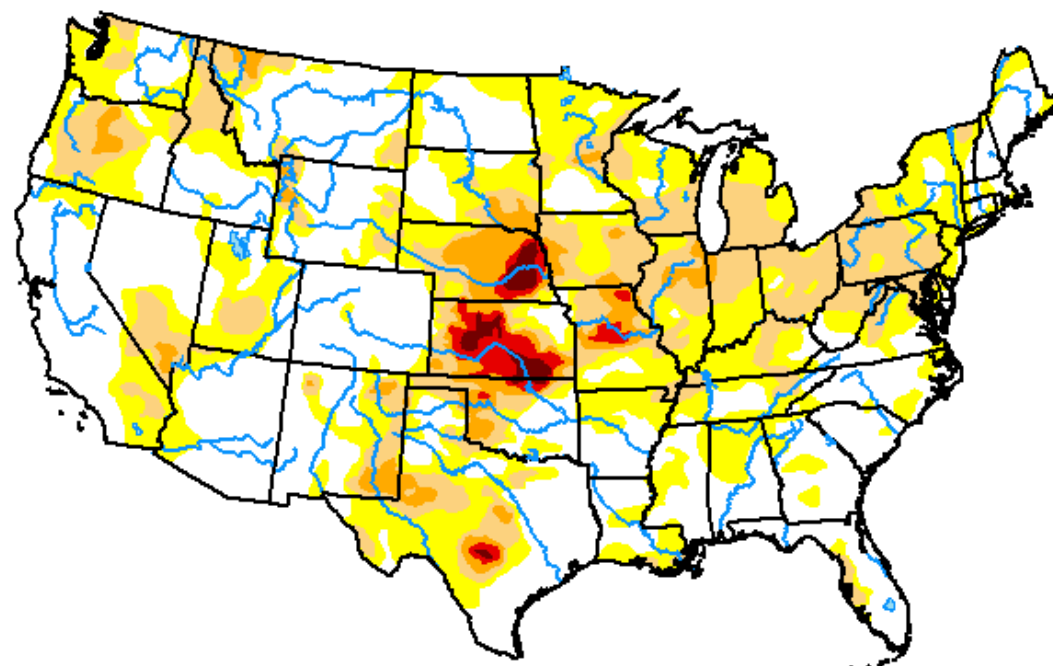
**June 13, 2023**

(Released Thursday, Jun. 15, 2023)

Valid 8 a.m. EDT

*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	45.53	54.47	24.98	6.90	2.17	0.72
<b>Last Week</b> 06-06-2023	45.47	54.53	21.94	7.17	2.35	0.79
<b>3 Months Ago</b> 03-14-2023	47.51	52.49	35.79	15.73	5.32	1.56
<b>Start of Calendar Year</b> 01-03-2023	30.50	69.50	46.26	26.24	9.86	1.85
<b>Start of Water Year</b> 09-27-2022	24.85	75.15	50.88	30.25	12.50	2.56
<b>One Year Ago</b> 06-14-2022	42.78	57.22	44.54	32.76	19.63	5.59



## Intensity:

None	D2 Severe Drought
D0 Abnormally Dry	D3 Extreme Drought
D1 Moderate 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:

Adam Hartman  
NOAA/NWS/NCEP/CPC



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





# U.S. Drought Monitor

## Colorado

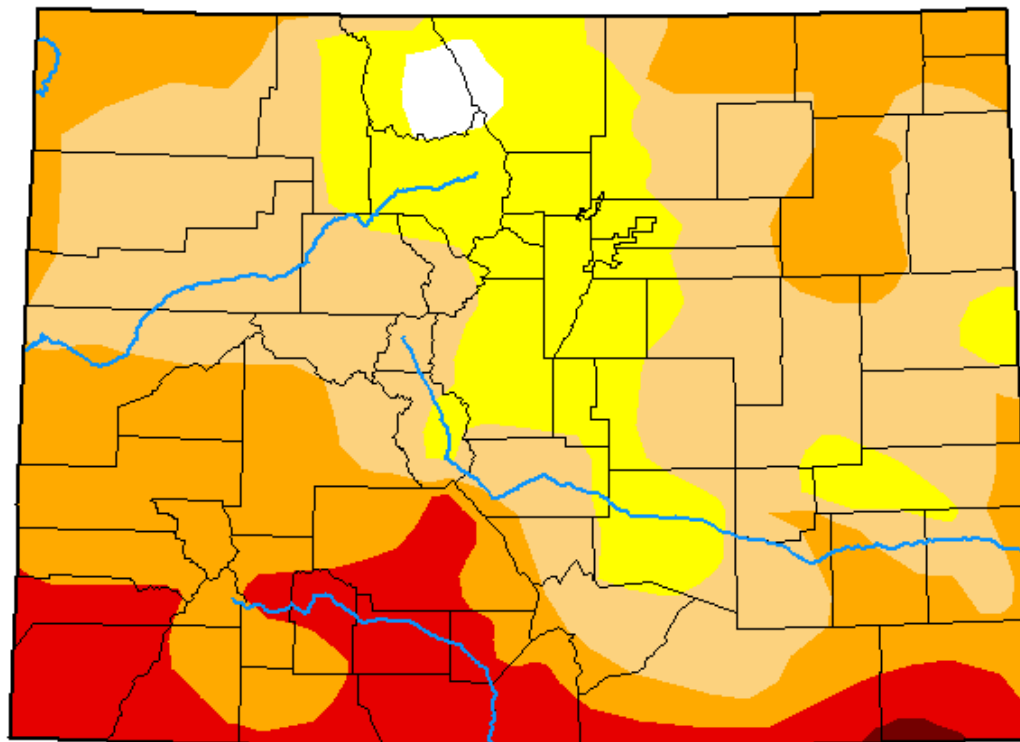
**June 21, 2022**

(Released Thursday, Jun. 23, 2022)

Valid 8 a.m. EDT

*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	1.09	98.91	81.55	43.08	12.76	0.23
<b>Last Week</b> 06-14-2022	1.09	98.91	81.75	42.97	15.89	0.23
<b>3 Months Ago</b> 03-22-2022	0.00	100.00	82.83	33.50	7.11	0.13
<b>Start of Calendar Year</b> 01-04-2022	0.00	100.00	95.49	67.08	22.25	0.00
<b>Start of Water Year</b> 09-28-2021	12.72	87.28	46.42	26.30	15.05	3.91
<b>One Year Ago</b> 06-22-2021	54.41	45.59	41.62	36.37	30.35	17.73



### Intensity:

None	D2 Severe Drought
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# U.S. Drought Monitor Colorado

**June 13, 2023**




(Released Thursday, Jun. 15, 2023)

Valid 8 a.m. EDT

*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	92.94	7.06	0.42	0.00	0.00	0.00
<b>Last Week</b> <i>06-06-2023</i>	83.43	16.57	1.07	0.24	0.00	0.00
<b>3 Months Ago</b> <i>03-14-2023</i>	46.03	53.97	36.48	9.05	2.00	0.16
<b>Start of Calendar Year</b> <i>01-03-2023</i>	39.97	60.03	33.83	12.28	1.91	0.01
<b>Start of Water Year</b> <i>09-27-2022</i>	15.46	84.54	45.65	15.47	3.73	0.57
<b>One Year Ago</b> <i>06-14-2022</i>	1.09	98.91	81.75	42.97	15.89	0.23

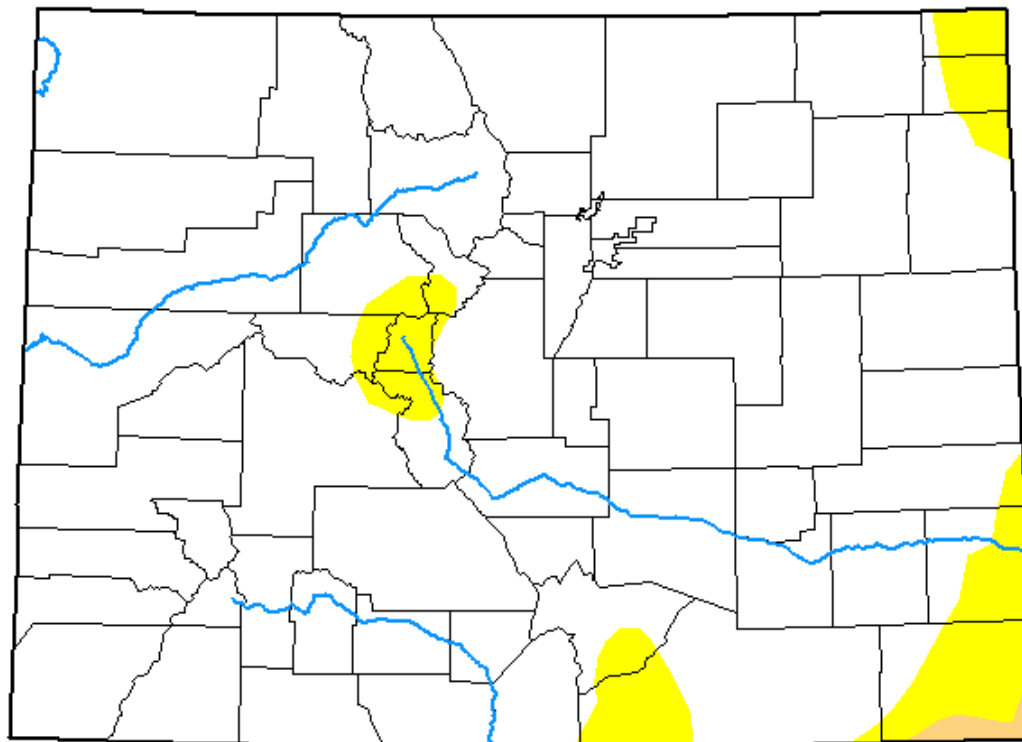
## Intensity:

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

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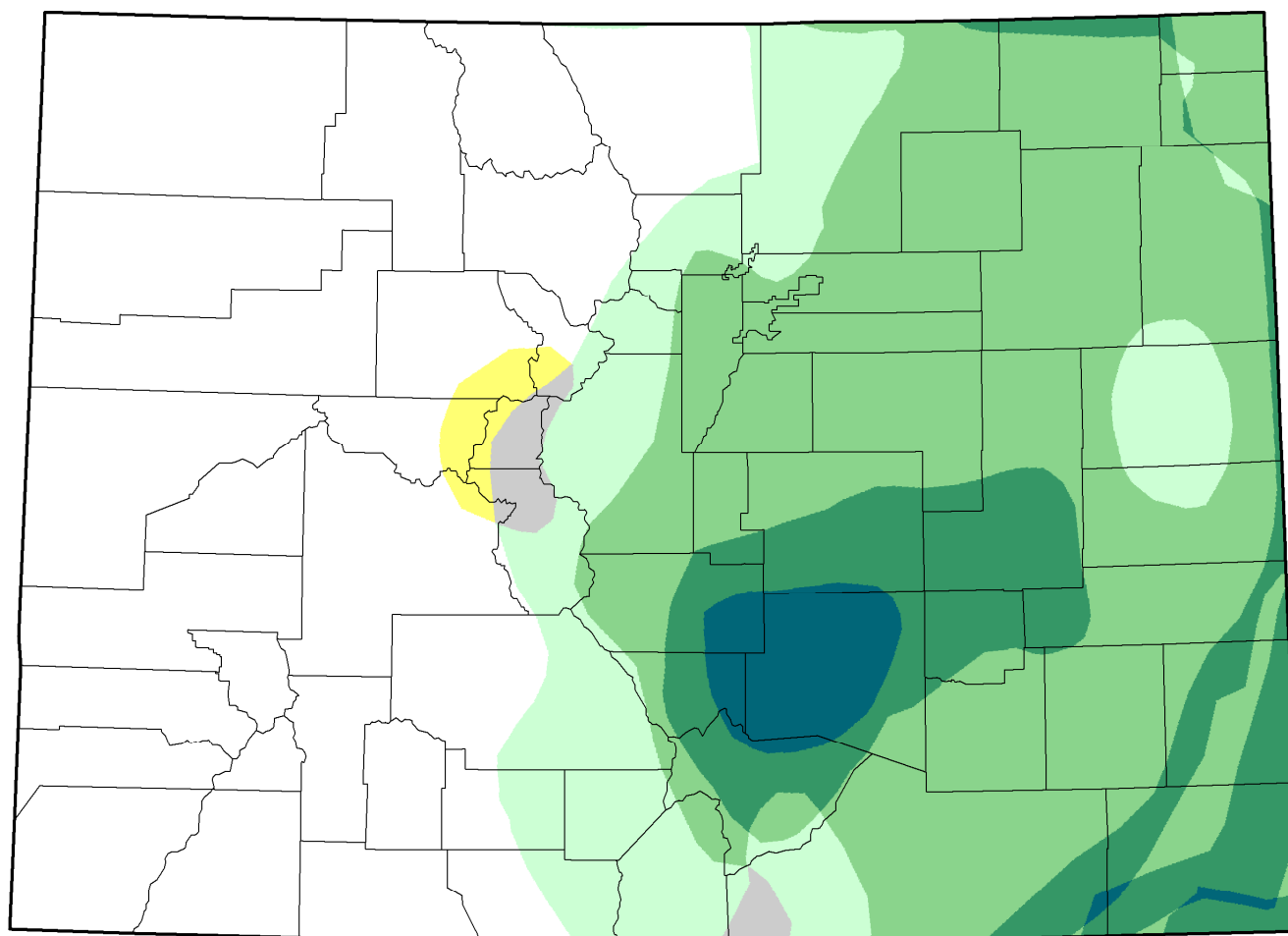
Lowest drought coverage since 2019!



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



## U.S. Drought Monitor Class Change - Colorado 8 Week



June 13, 2023  
compared to  
April 18, 2023

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



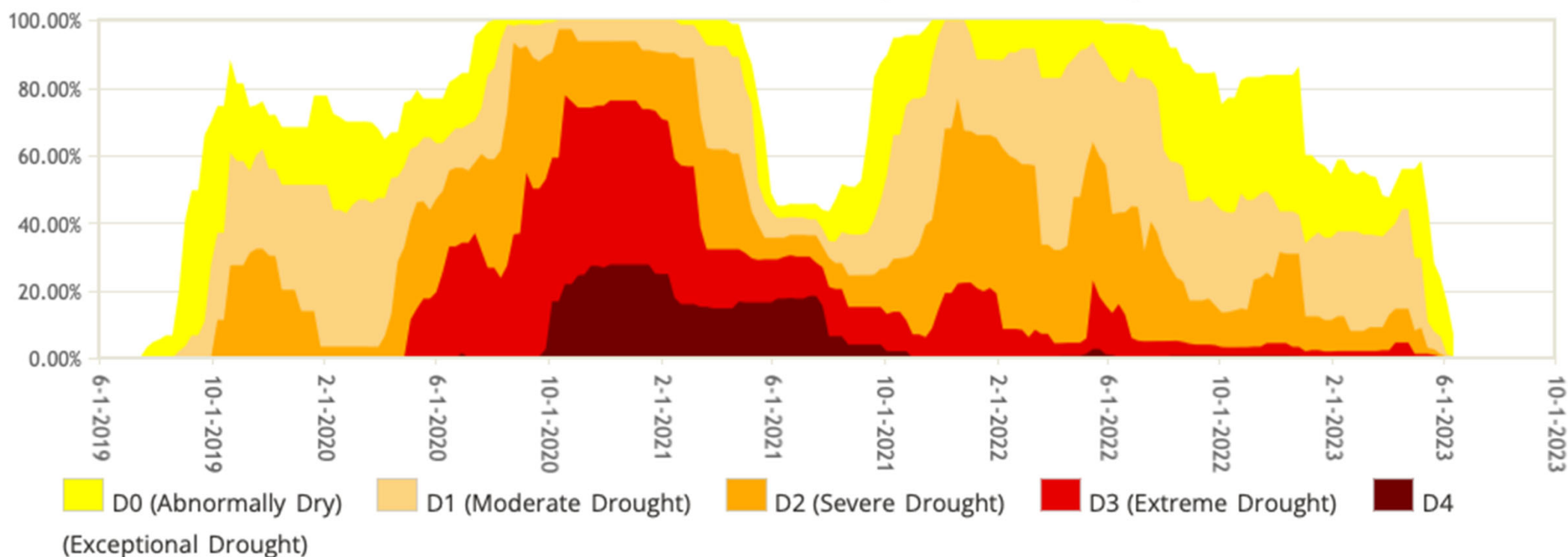
- 5 Class Degradation
- 4 Class Degradation
- 3 Class Degradation
- 2 Class Degradation
- 1 Class Degradation
- No Change
- 1 Class Improvement
- 2 Class Improvement
- 3 Class Improvement
- 4 Class Improvement
- 5 Class Improvement

Large scale improvements in drought coverage for eastern Colorado over the past eight weeks.





## Colorado Percent Area in U.S. Drought Monitor Categories



Onset, intensification, evolution, and amelioration of Colorado's 2020 drought:

August 28, 2019 – 20% in D0-D1, 2% in D1

June 13, 2023 – 7% in D0-D1, 0.42% in D1

Three continuous years with D3-D4 drought



# Outlook

Next 7 days

8-14 day Outlook

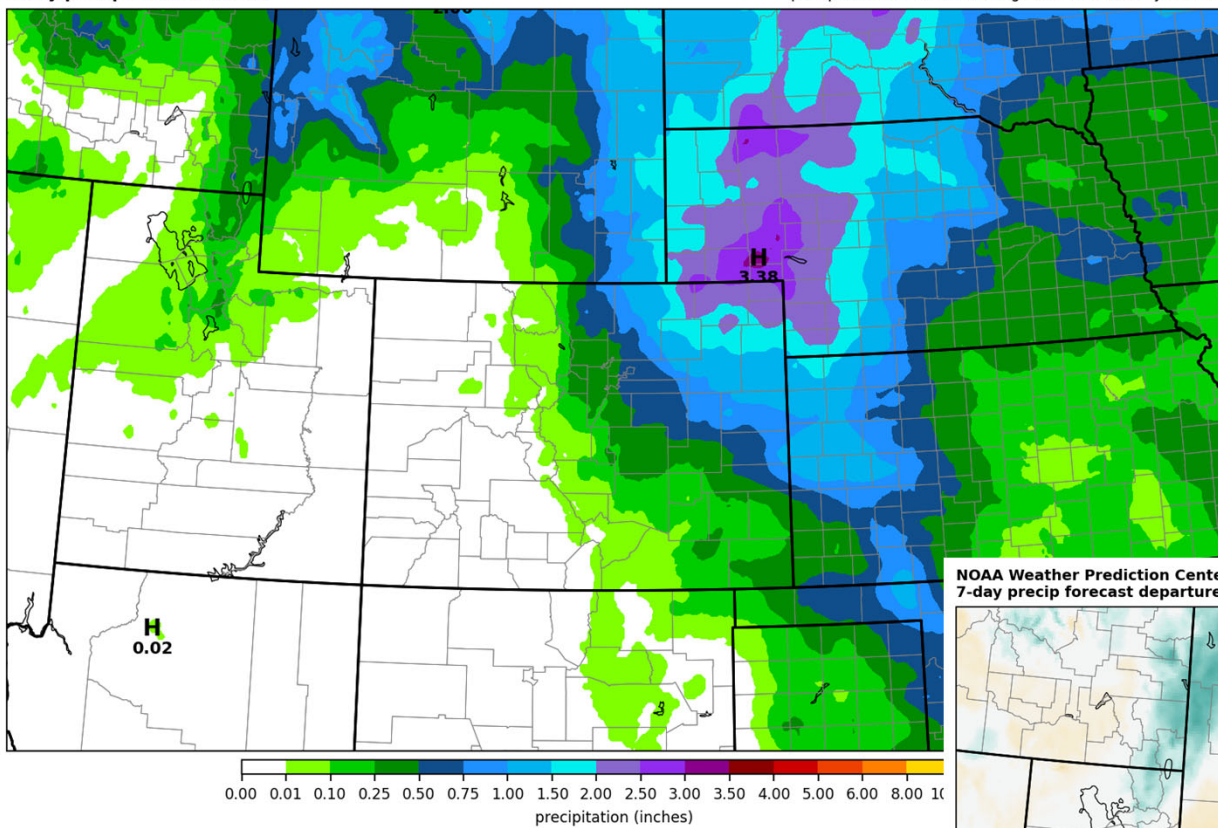
CPC Outlooks

El Niño

# NOAA 7-day precip forecast

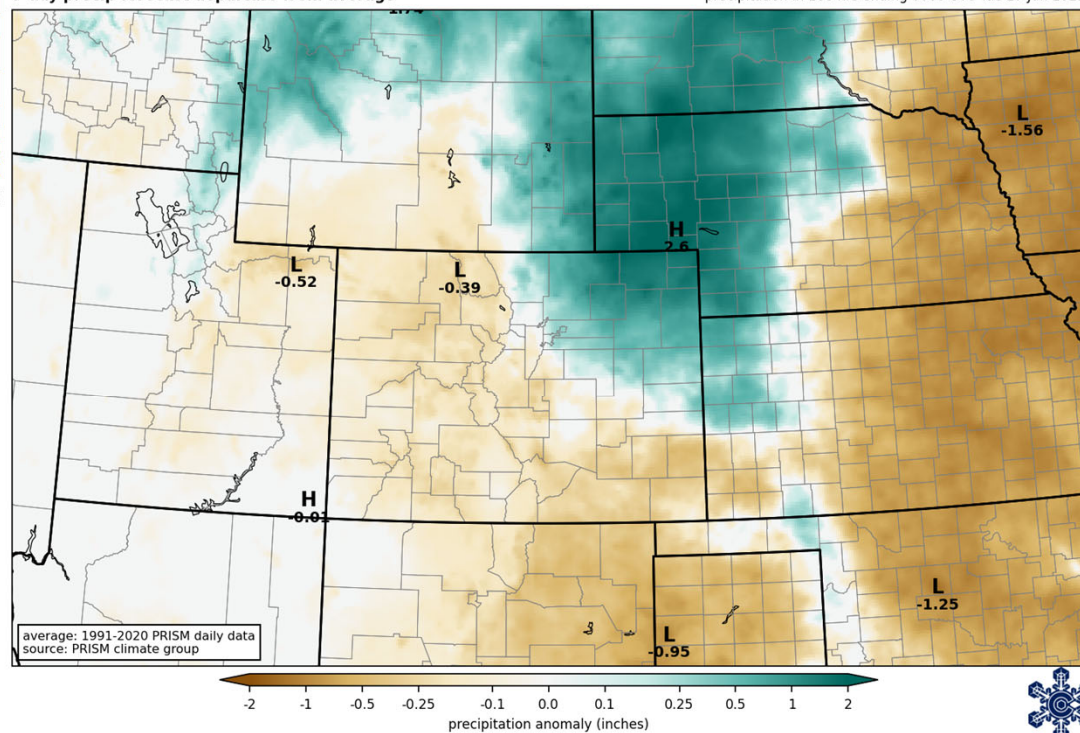
NOAA Weather Prediction Center  
7-day precipitation forecast

forecast issued 0000 UTC Tue 20 Jun 2023  
precipitation in 168 hrs ending 0000 UTC Tue 27 Jun 2023



NOAA Weather Prediction Center  
7-day precip forecast departure from average

forecast issued 0000 UTC Tue 20 Jun 2023  
precipitation in 168 hrs ending 0000 UTC Tue 27 Jun 2023



<http://schumacher.atmos.colostate.edu/weather/>

COLORADO CLIMATE CENTER



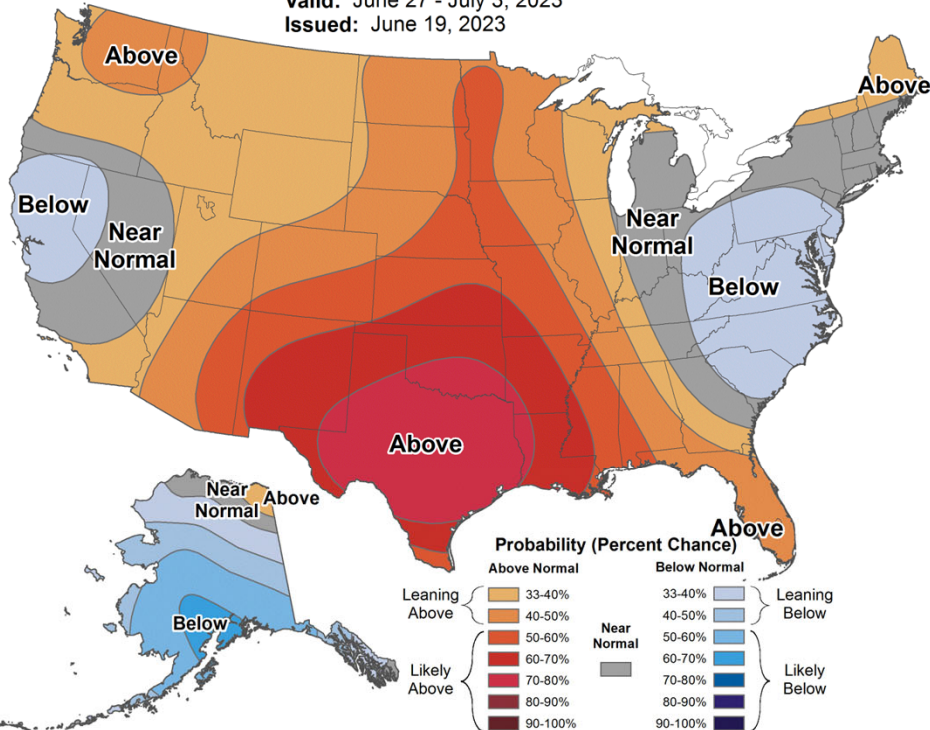


# 8-14 day outlook



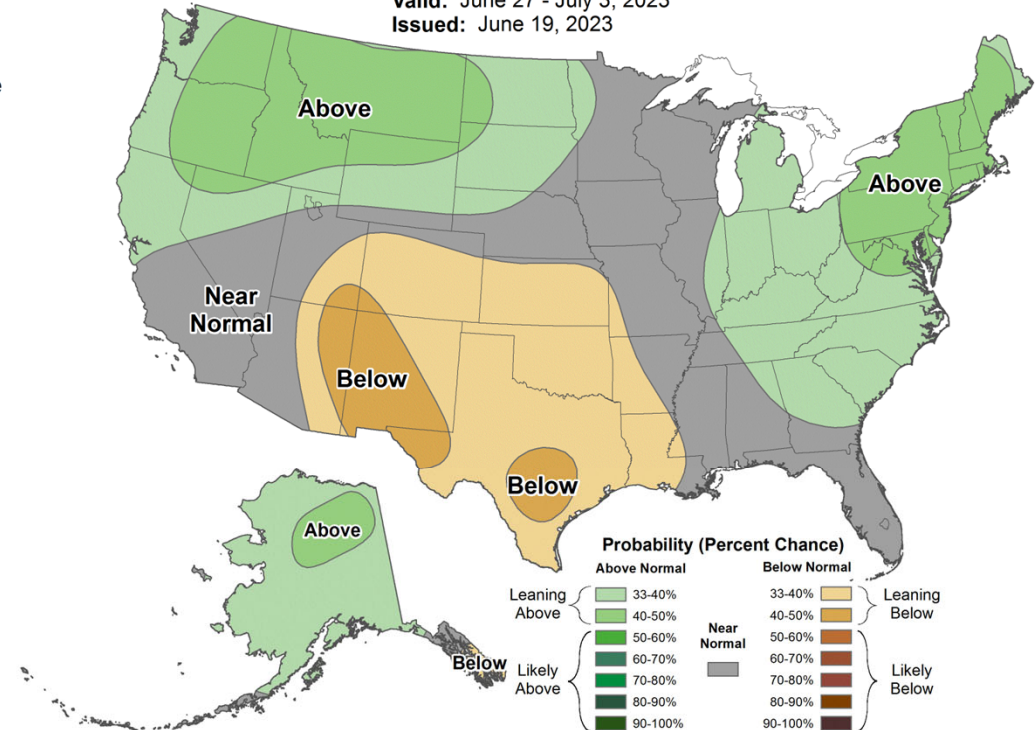
## 8-14 Day Temperature Outlook

Valid: June 27 - July 3, 2023  
Issued: June 19, 2023



## 8-14 Day Precipitation Outlook

Valid: June 27 - July 3, 2023  
Issued: June 19, 2023



Looking to end the month and start July with a warm up. Models favor greater likelihood of below normal precipitation for the Four Corners.

Slight risk of excessive heat over much of the state. Risk increases to the south – particularly Texas.

<https://www.cpc.ncep.noaa.gov>



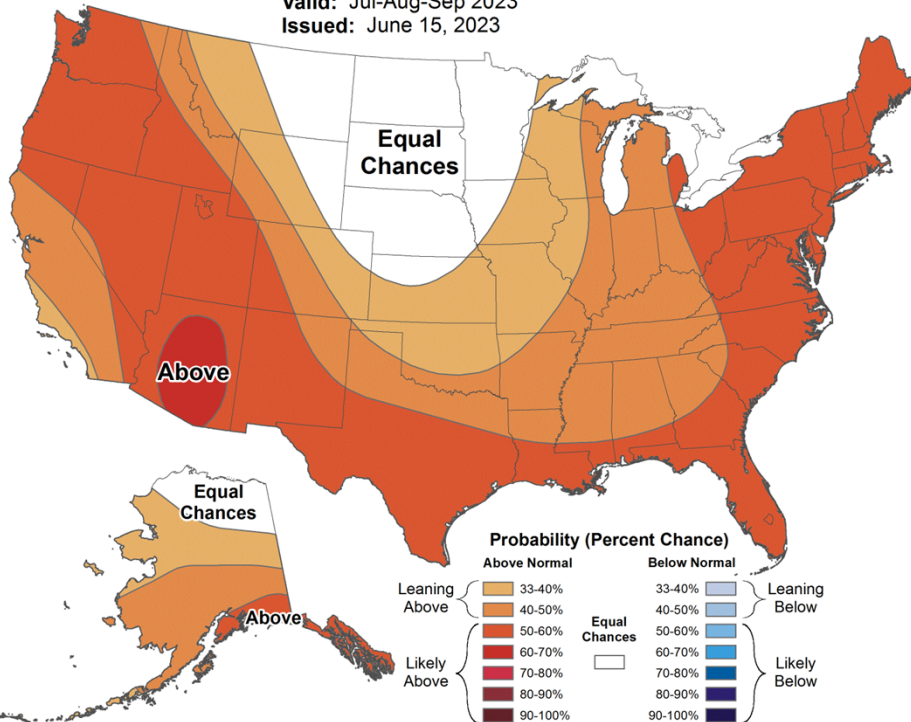
# Seasonal outlook



## Seasonal Temperature Outlook



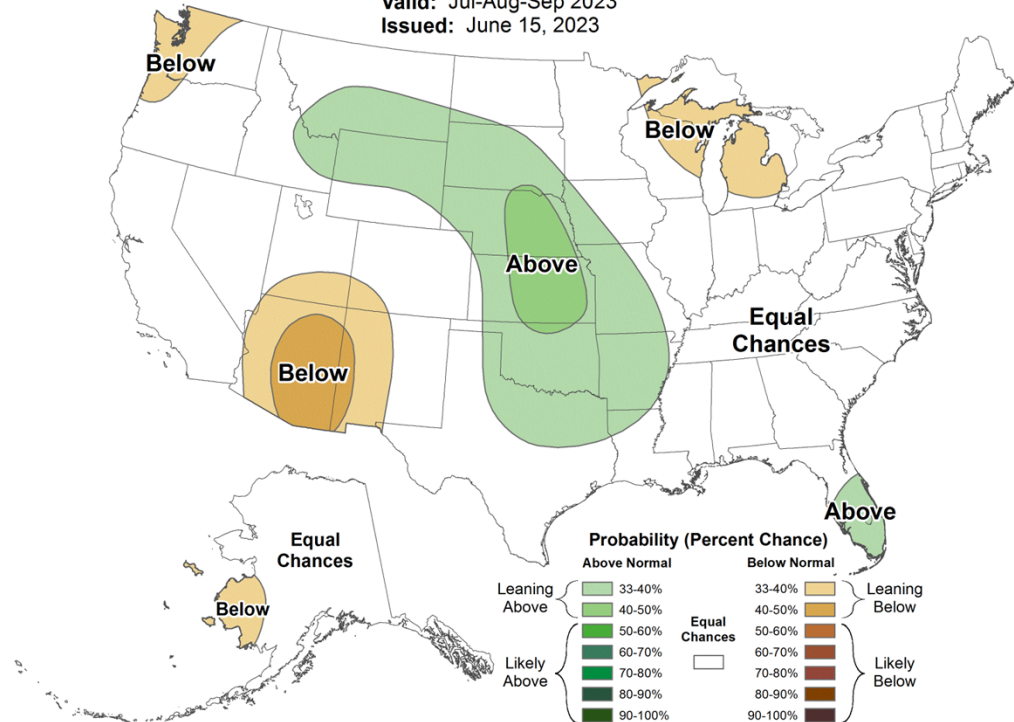
Valid: Jul-Aug-Sep 2023  
Issued: June 15, 2023



## Seasonal Precipitation Outlook



Valid: Jul-Aug-Sep 2023  
Issued: June 15, 2023



Seasonal outlook shows increased chances of above average temperatures for most of the state, with greater confidence toward the southwest. Models favoring a weaker monsoon and above average precipitation over the Great Plains, which could continue to favor eastern CO.

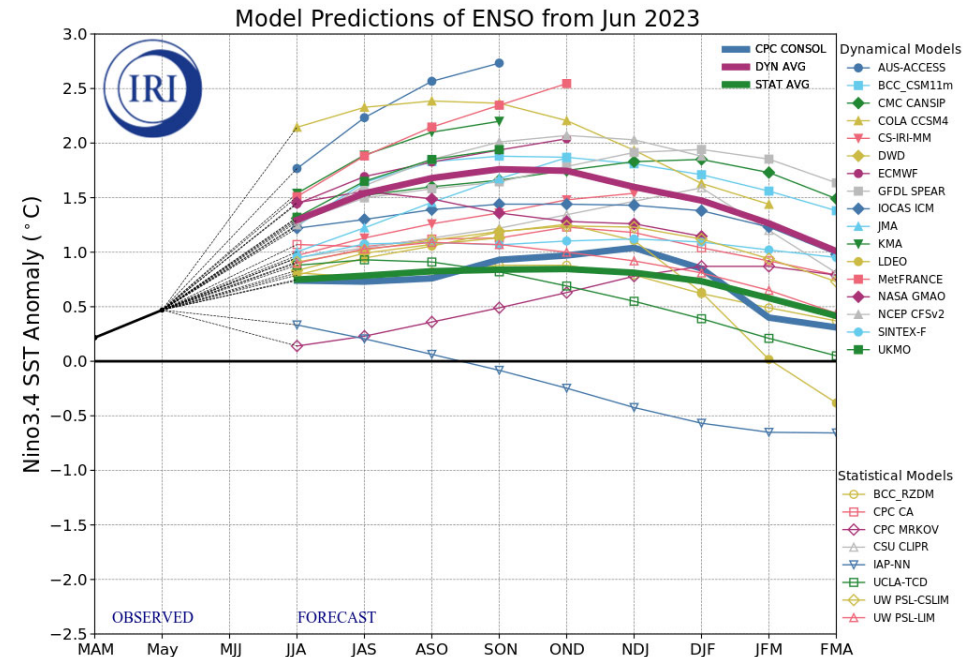
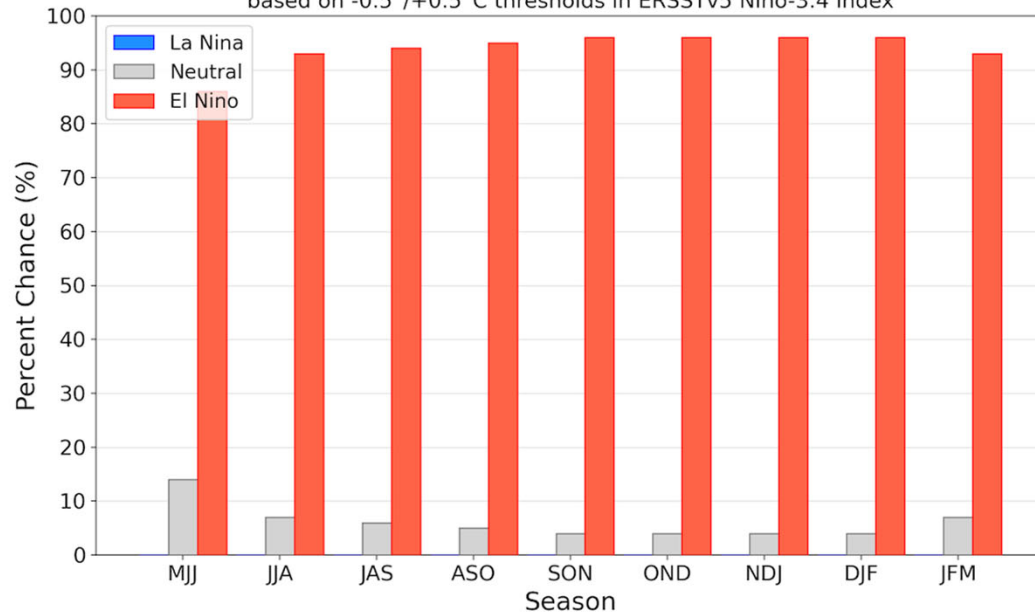
<https://www.cpc.ncep.noaa.gov>



# What's the ENSO forecast?

## Official NOAA CPC ENSO Probabilities (issued June 2023)

based on  $-0.5^{\circ}/+0.5^{\circ}\text{C}$  thresholds in ERSSTv5 Niño-3.4 index



CPC/IRI June 16, 2023: As of mid-June 2023, the previously ENSO-neutral conditions in the central-eastern equatorial Pacific have transitioned to warm El Niño-like conditions. Key oceanic and atmospheric variables are consistent with the onset of El Niño. CPC issued an El Niño advisory in Jun 2023, signaling the onset of the warm phase of the ENSO. Almost all of the models in the IRI ENSO prediction plume forecast an El Niño event during boreal summer, continuing into boreal autumn and winter.

<https://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/>

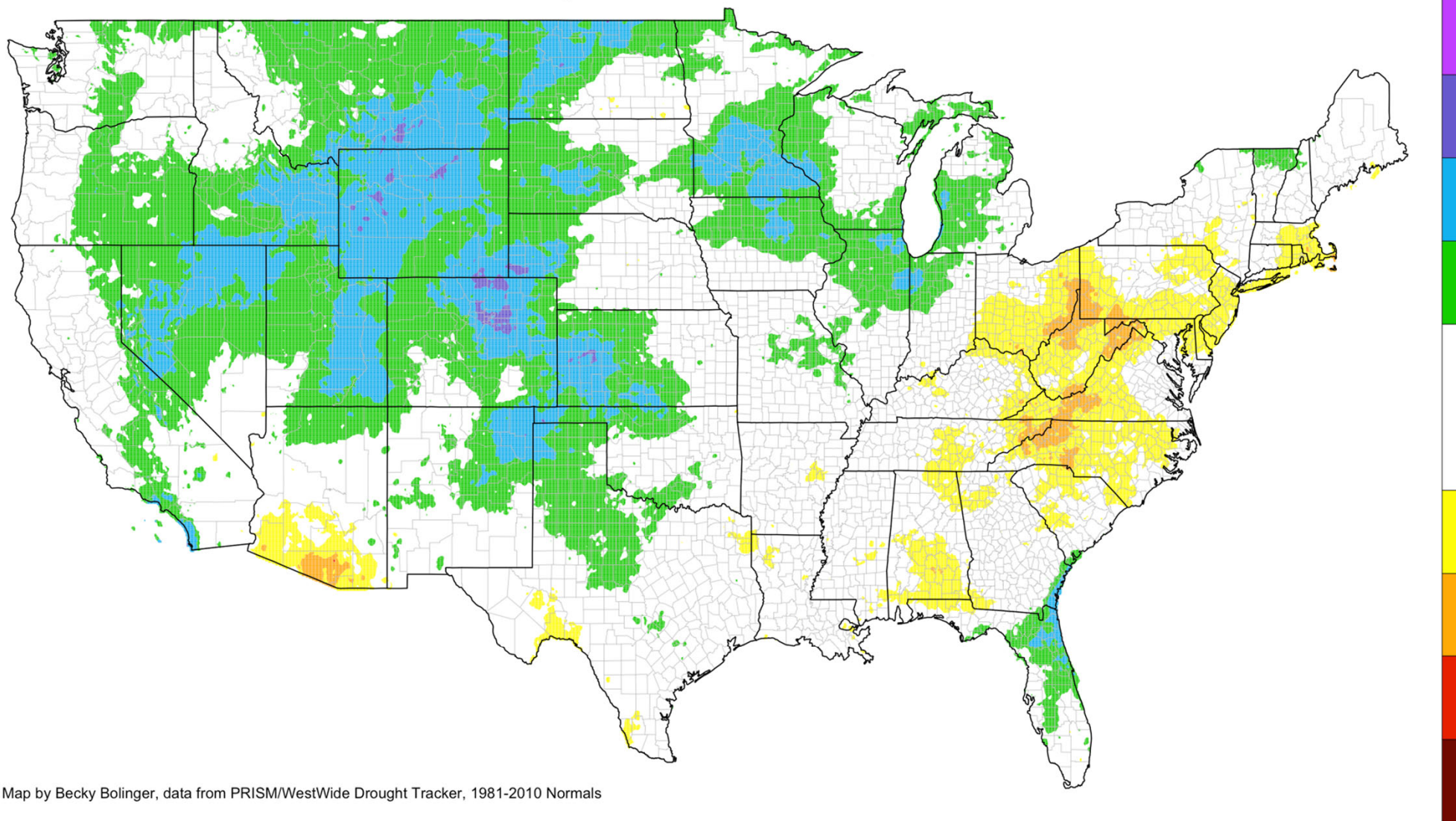




A decorative background consisting of a grid of small, light green dots on a dark green background. The dots are arranged in a regular pattern, with some dots missing in the top right corner, creating a sense of depth and texture.

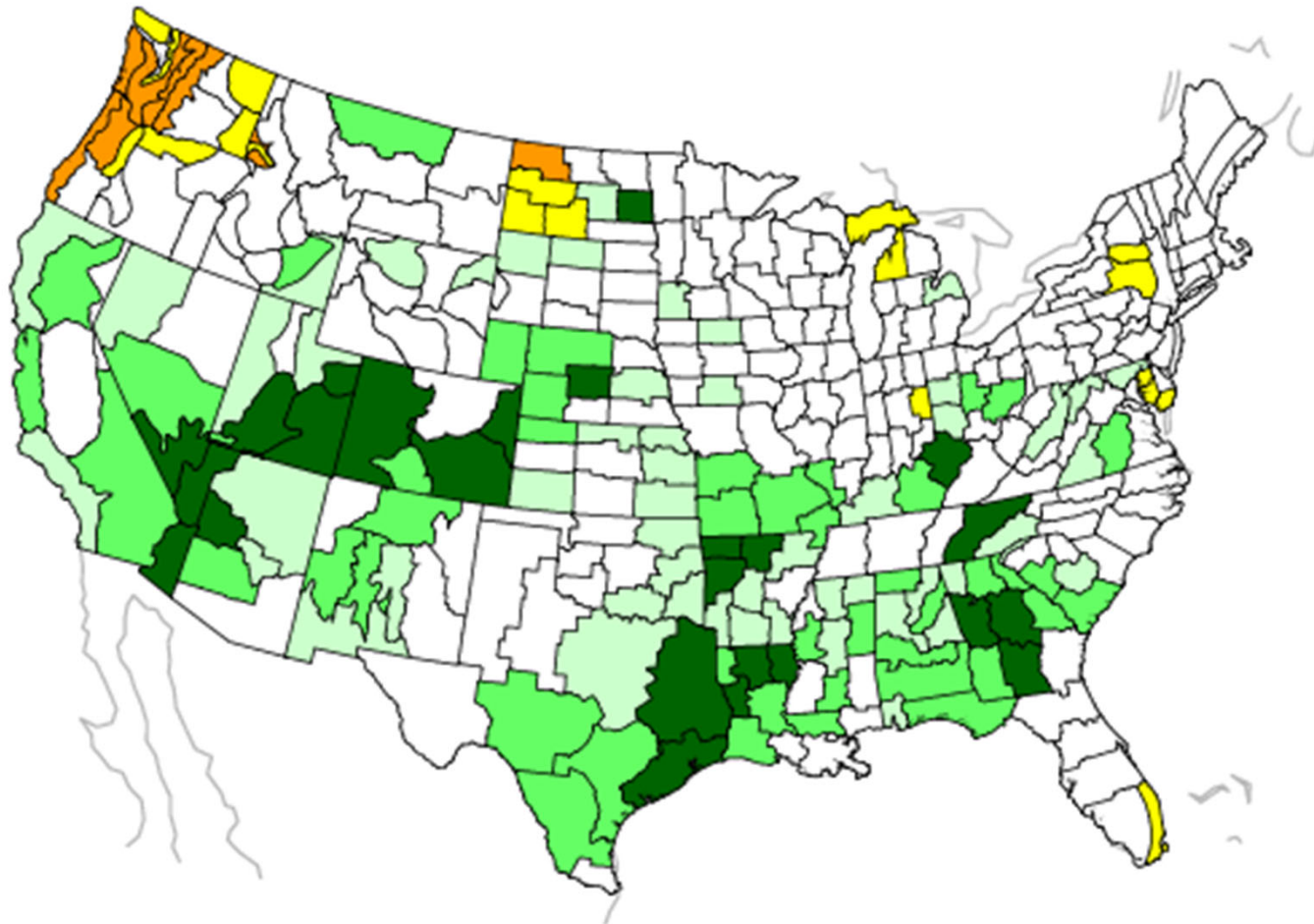
What does El Niño mean  
for the summer and fall?

## JJA Precipitation Anomalies - All El Niños



Map by Becky Bolinger, data from PRISM/WestWide Drought Tracker, 1981-2010 Normals

## SON Precipitation During El Nino Increased Risk of Wet or Dry Extremes



Historically, there is an increased risk of wet extremes and decreased risk of dry extremes during a fall El Niño.



Percent (%) Increase in Risk

NOAA/ESRL/PSD

<https://psl.noaa.gov/enso/climaterisks/>

# Key Takeaways

- ❑ Consistent moisture, cooler temperatures, and low evaporative demand have all contributed to drought recovery.
- ❑ Pattern shift to warmer and drier could be on the way.
- ❑ It is almost certain that we will be in an El Niño at least until next spring.
- ❑ El Niño is not so good news for the monsoon.
- ❑ Overall, El Niño conditions generally mean more precipitation for most areas of our state, so I don't expect a repeat of 2019 (great start, quickly deteriorating).
- ❑ Regardless of recent temperature patterns, or El Niño, expect warmer than average conditions to return.
- ❑ Flooding will remain a concern this summer – particularly over burn scars.
- ❑ For the distant future, be aware! This vegetation growth will at some point become an issue, when things start to dry out again.
- ❑ We live in Colorado – in other words, it WILL dry out again!





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 @ClimateBecky

climate.colostate.edu

To view this and other presentations:  
[https://climate.colostate.edu/ccc\\_archive.html](https://climate.colostate.edu/ccc_archive.html)

Thank you

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