

Colorado Climate Update

Dr. Becky Bolinger
Assistant State Climatologist

Water Availability Task Force

June 28, 2022



COLORADO
CLIMATE
CENTER



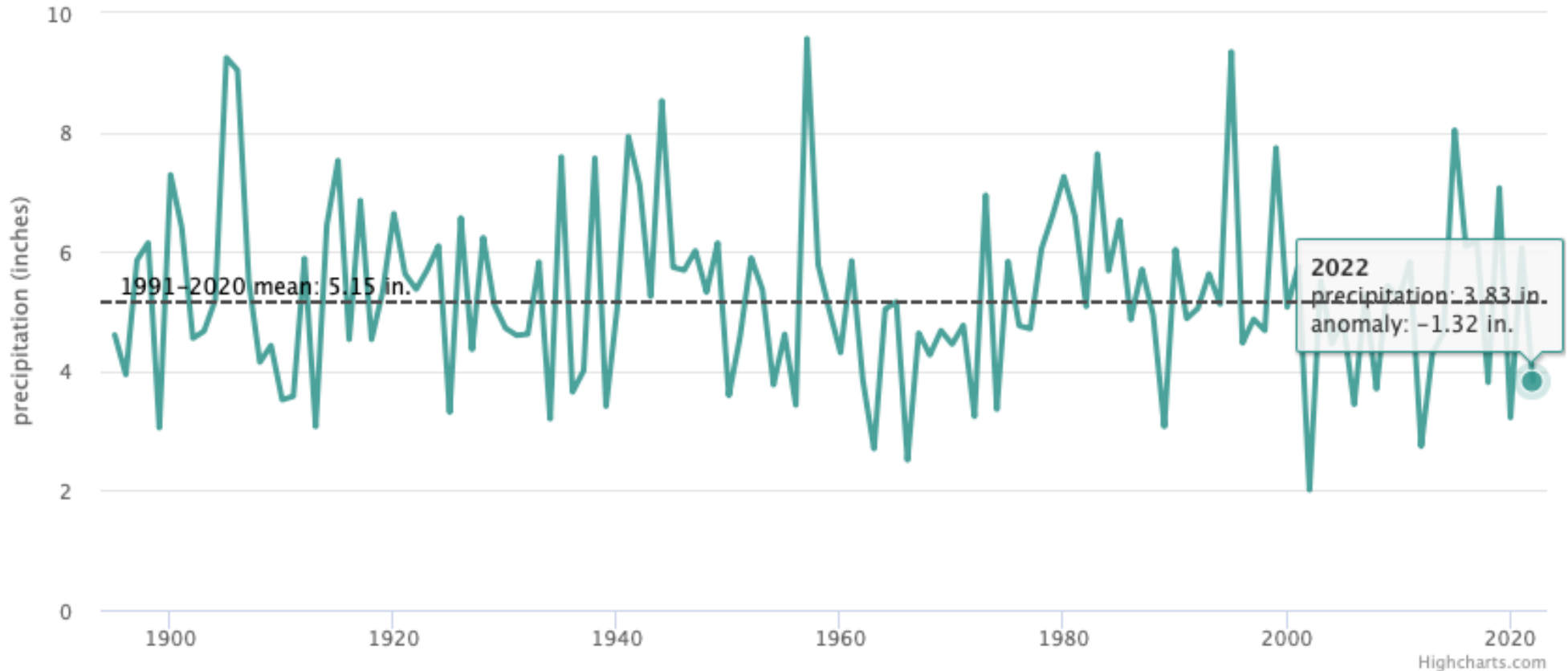
ATMOSPHERIC SCIENCE
COLORADO STATE UNIVERSITY

2022 Water Year to Date

A look at
Spring 2022 &
May 2022



Colorado, Precipitation, March–May



Spring 2022 was drier than average and ranked as the 23rd driest spring in the 128-year record.

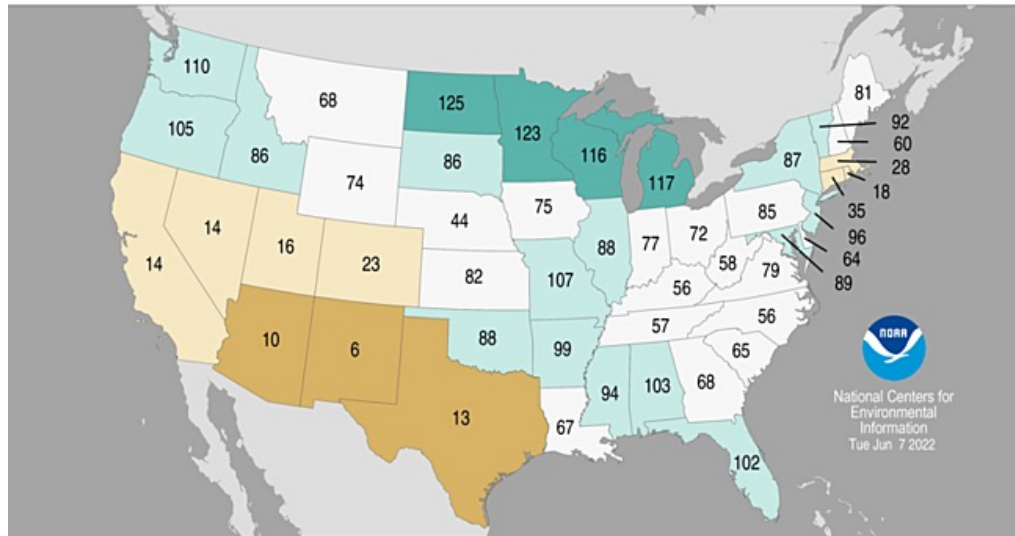
https://climate.colostate.edu/co_cag/cag_time.html



Statewide Precipitation Ranks

March – May 2022

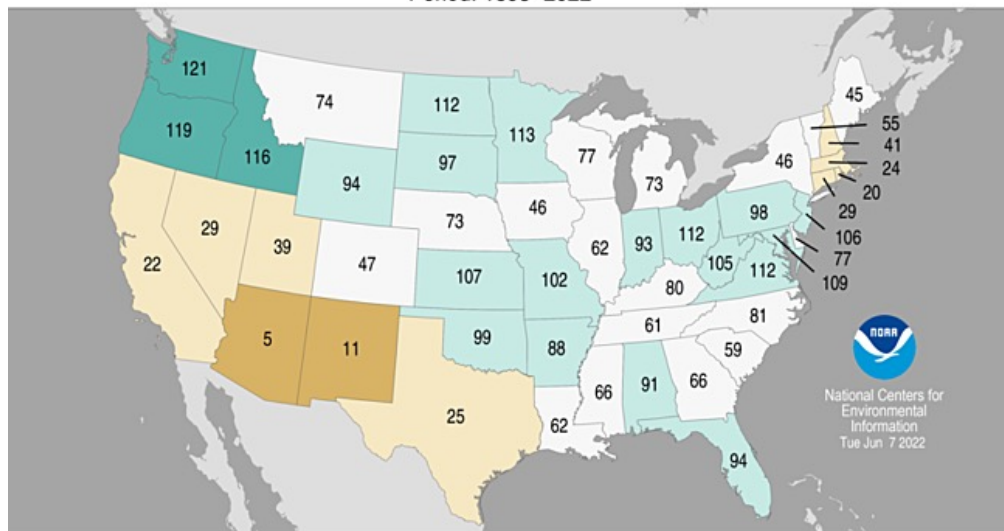
Period: 1895–2022



Statewide Precipitation Ranks

May 2022

Period: 1895–2022

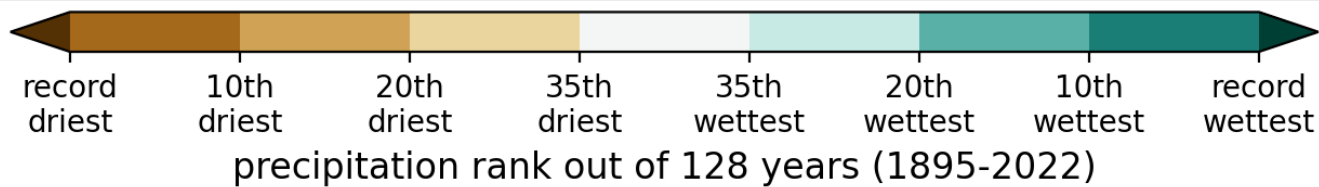
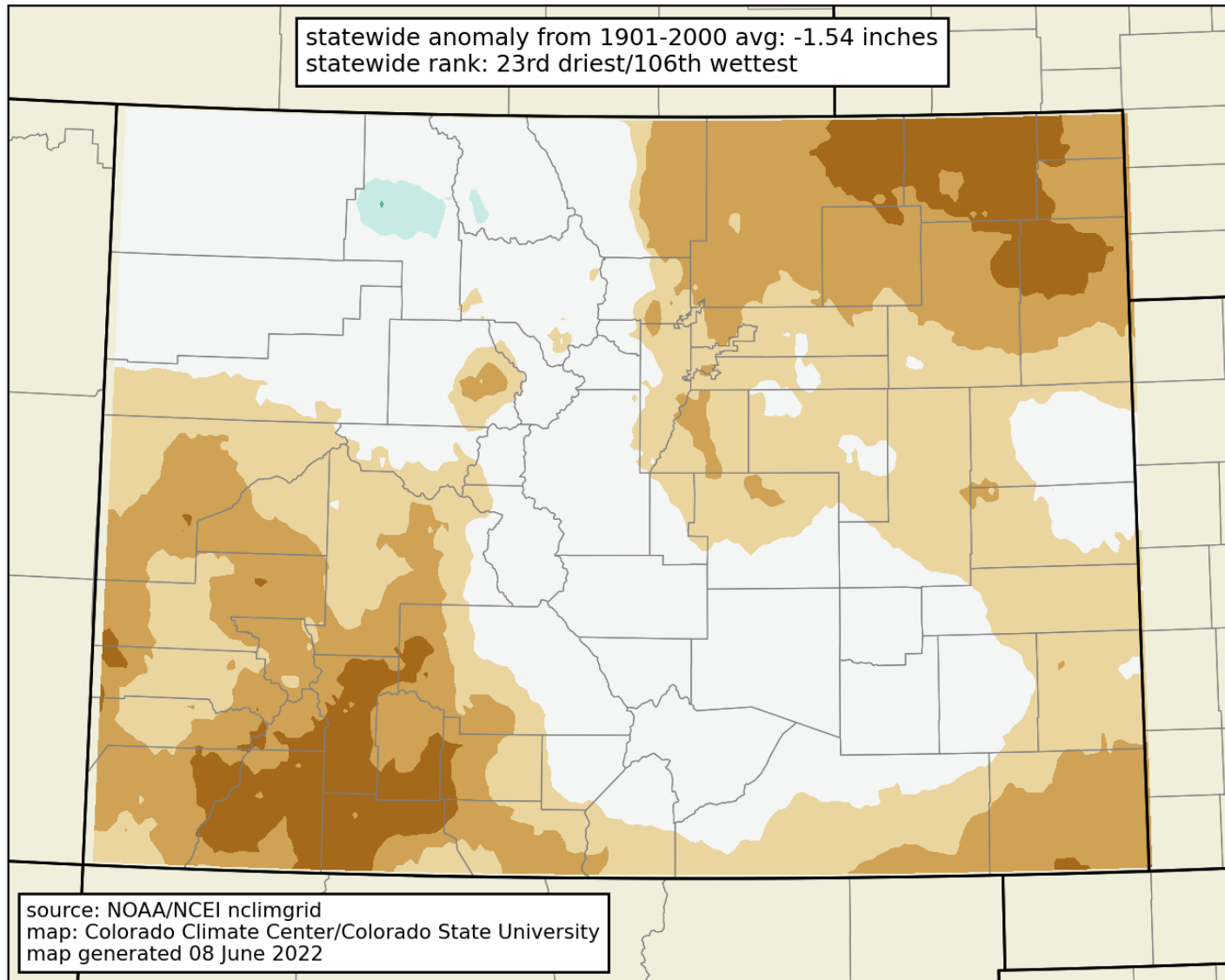


Month	P Rank (of 128 years)	Above, below, or near 20 th century avg?
Oct	62 nd driest	near avg
Nov	10 th driest	much below
Dec	13 th wettest	much above
Jan	40 th driest	below
Feb	49 th driest	near avg
Mar	67 th driest	near avg
Apr	5 th driest	much below
May	47 th driest	near avg
Jun		
Jul		
Aug		
Sep		

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



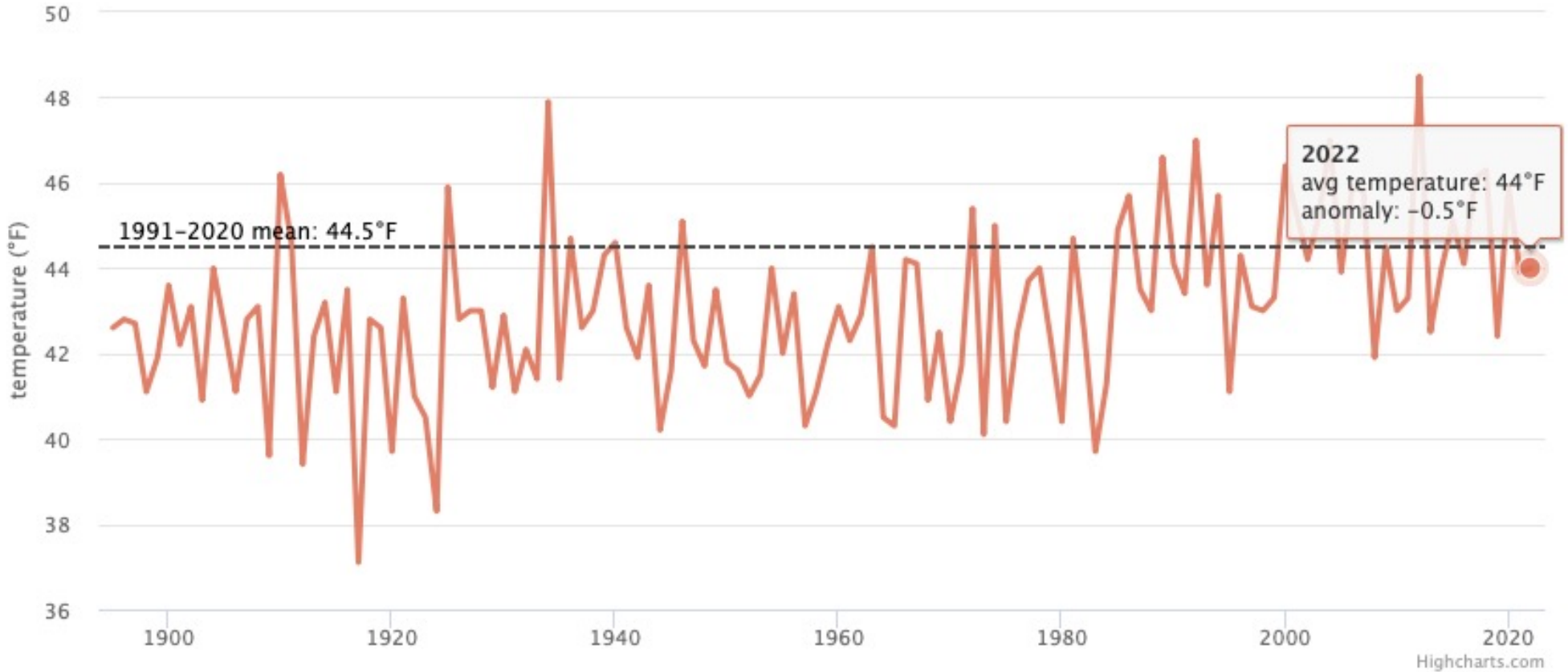
precipitation rank: 3 months ending May 2022 (Mar-May)



https://climate.colostate.edu/co_cag/rank_maps.html



Colorado, Average Temperature, March–May



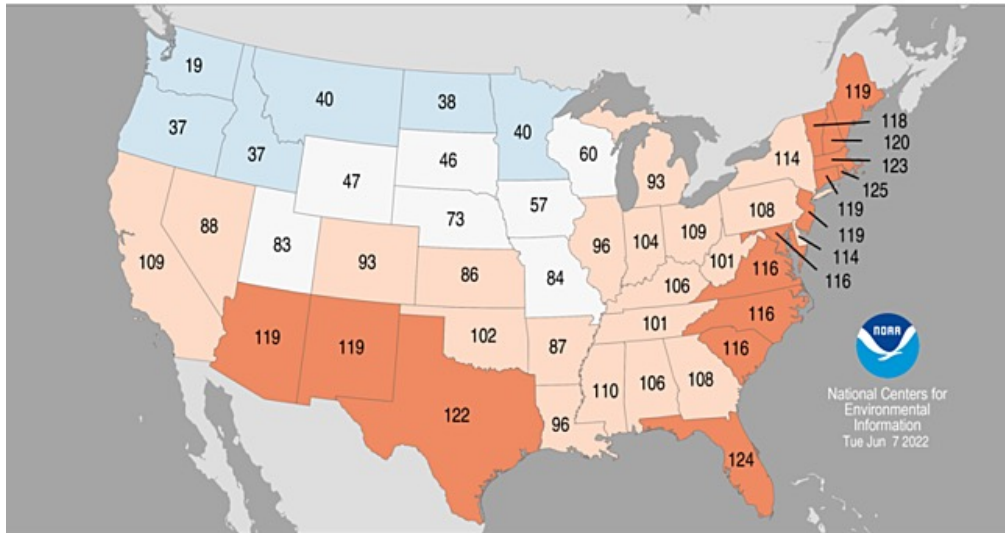
Spring 2022 was slightly cooler than average, marking the second consecutive cooler spring. Despite being cooler than the 1991-2020 average, it still ranks as the 36th warmest spring in the 128-year record.

https://climate.colostate.edu/co_cag/cag_time.html



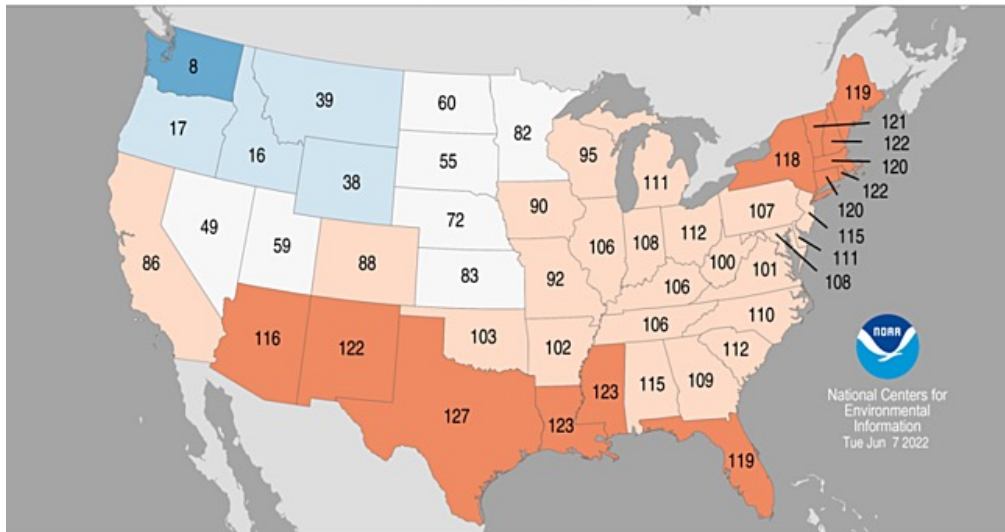
Statewide Average Temperature Ranks

March – May 2022
Period: 1895–2022



Statewide Average Temperature Ranks

May 2022
Period: 1895–2022

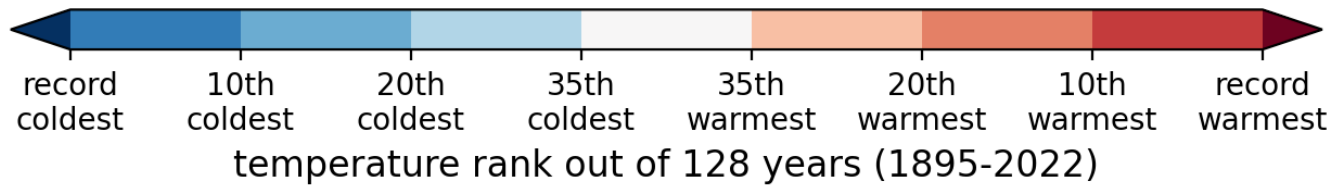
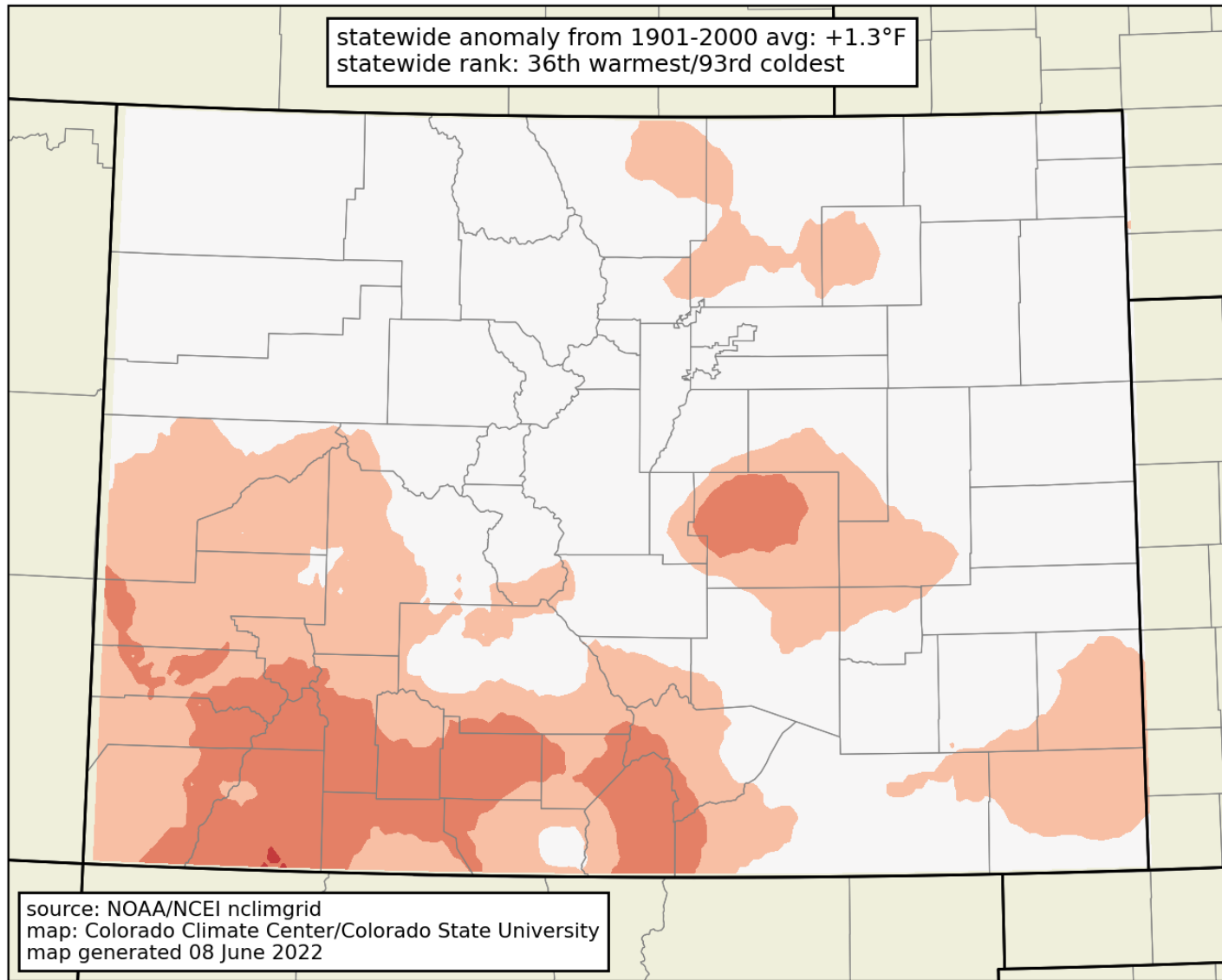


Month	T Rank (of 127 years)	Above, below, or near 20 th century avg?
Oct	41 st warmest	above
Nov	3 rd warmest	much above
Dec	2 nd warmest	much above
Jan	33 rd warmest	above
Feb	31 st coldest	below
Mar	54 th warmest	near avg
Apr	49 th warmest	near avg
May	41 st warmest	above
Jun		
Jul		
Aug		
Sep		

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



average temperature rank: 3 months ending May 2022 (Mar-May)



https://climate.colostate.edu/co_cag/rank_maps.html



Current Conditions

Temperature

Precipitation

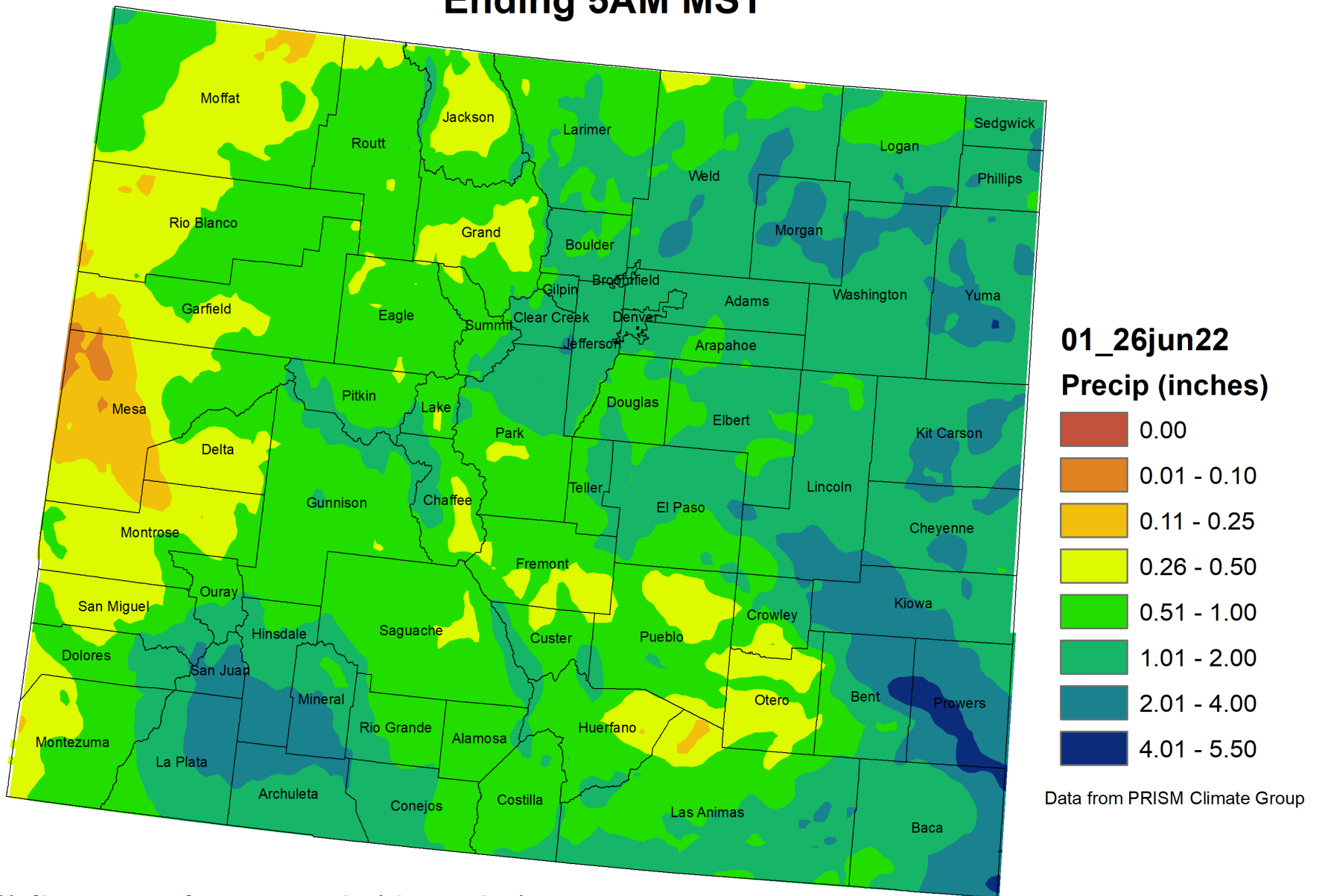
Evaporative Demand

Soil Moisture

Vegetation



Colorado Month to Date Precipitation 1 - 26 June 2022 Ending 5AM MST

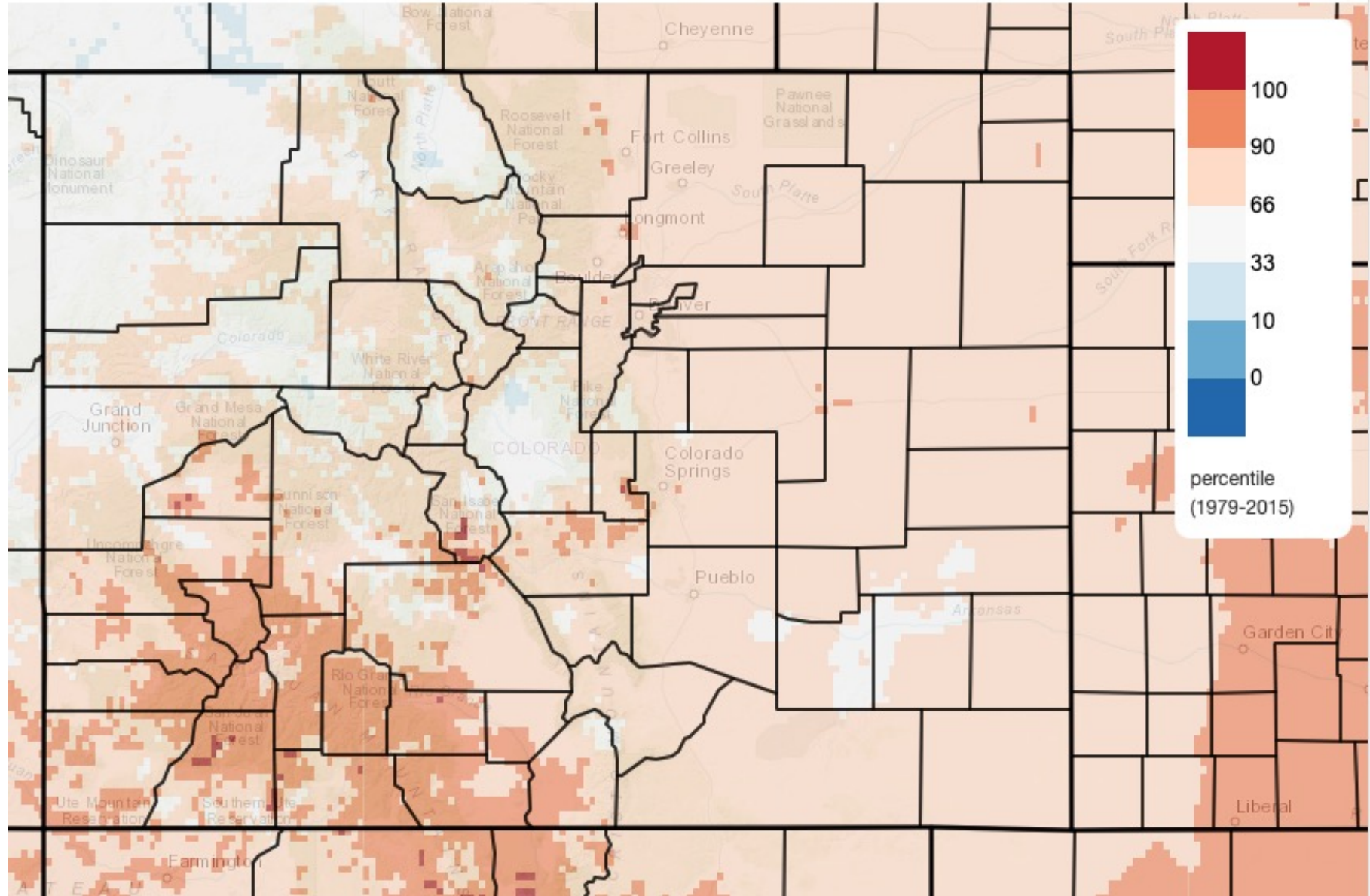


<https://climate.colostate.edu/drought/>



Mean Daily Temperature Percentile, Last 30 Days

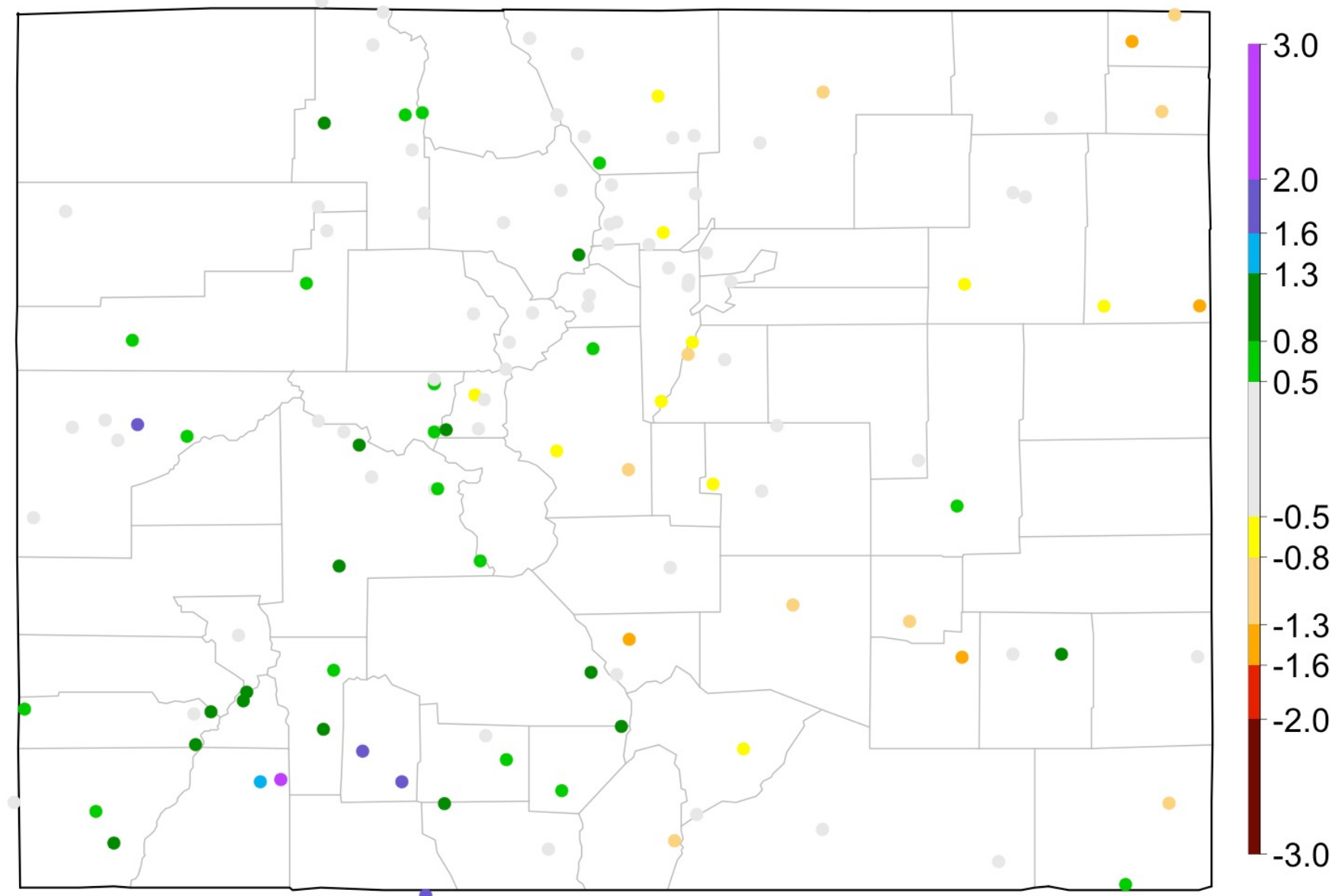
2022/05/27 - 2022/06/25



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



30-day SPI: 2022/05/28 - 2022/06/26

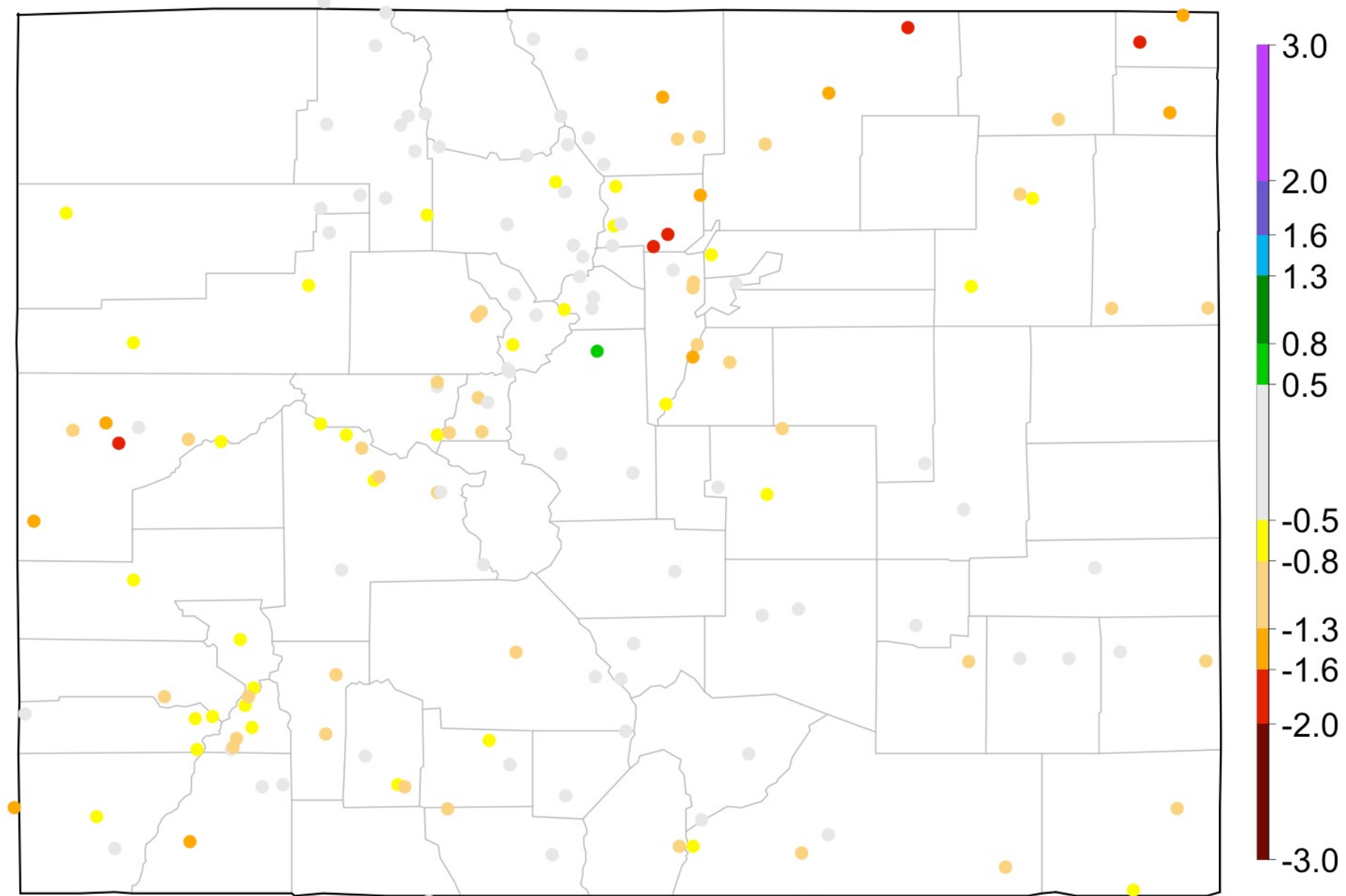


Data from High Plains Regional Climate Center and ACIS

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



120-day SPI: 2022/02/27 - 2022/06/26

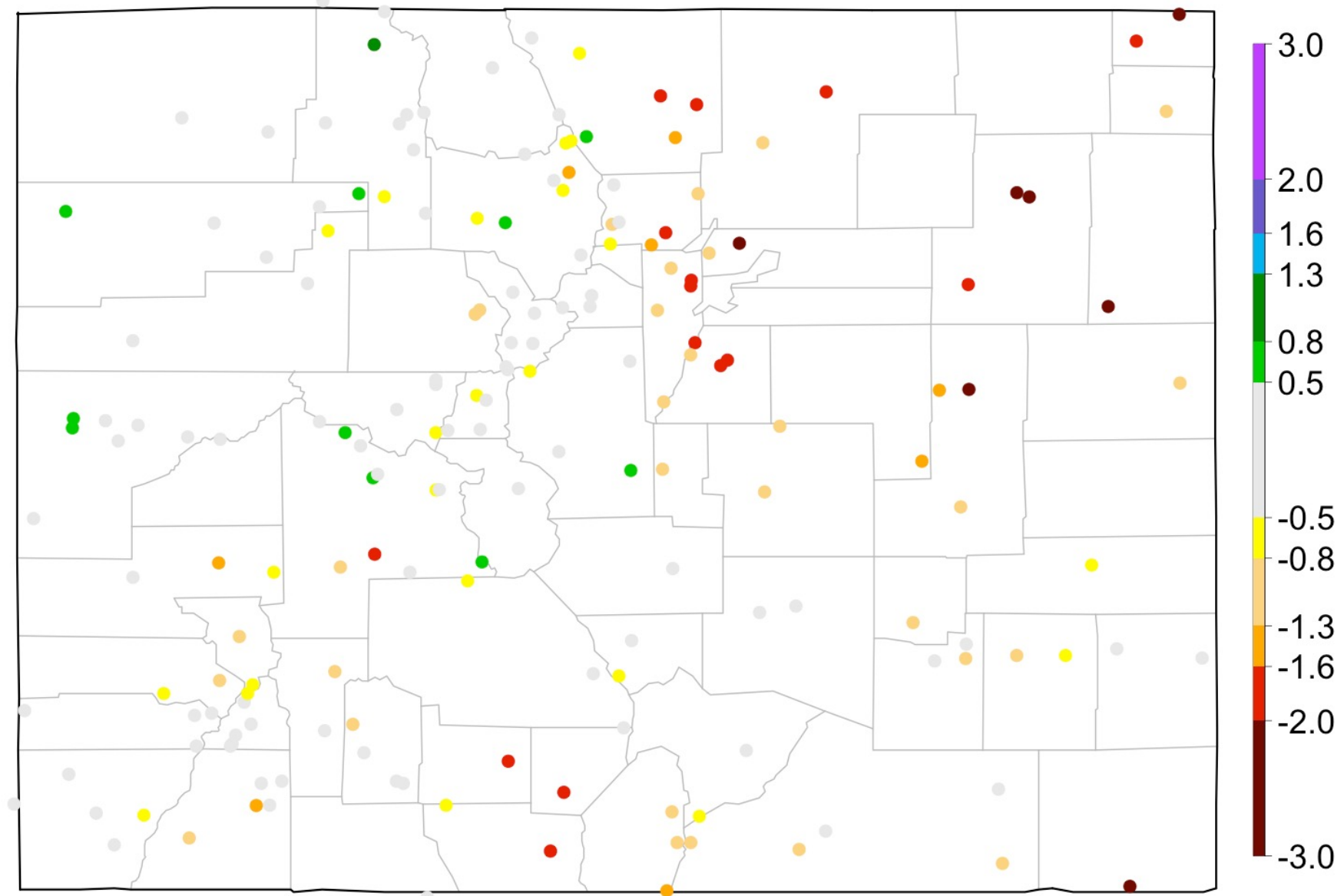


Data from High Plains Regional Climate Center and ACIS

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



12-month SPI: 2021/06/27 - 2022/06/26

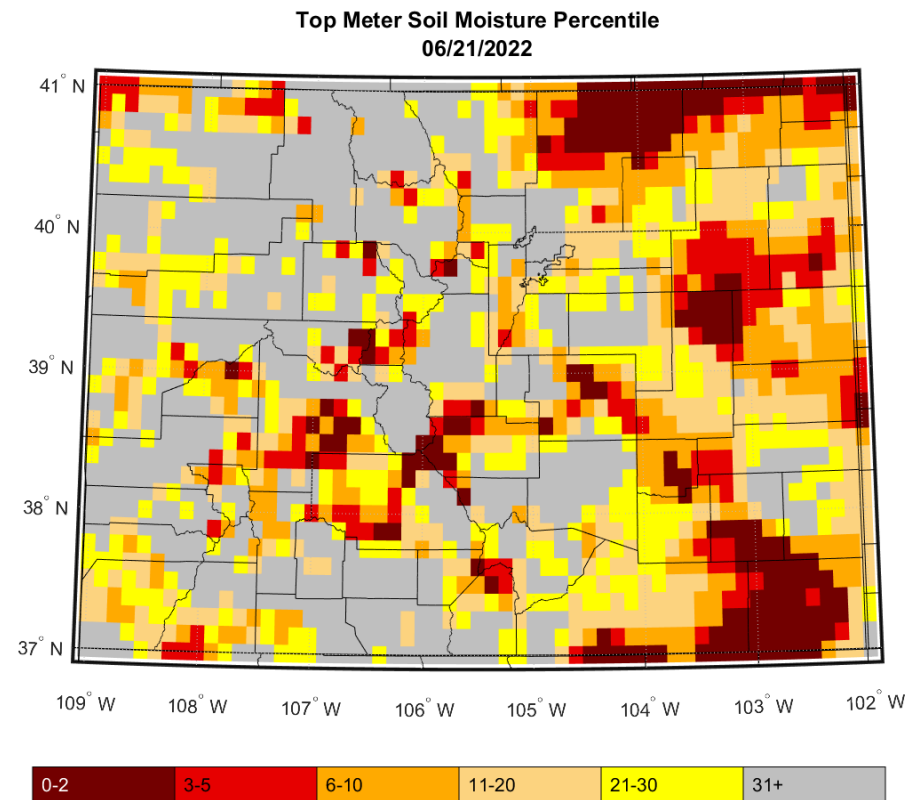
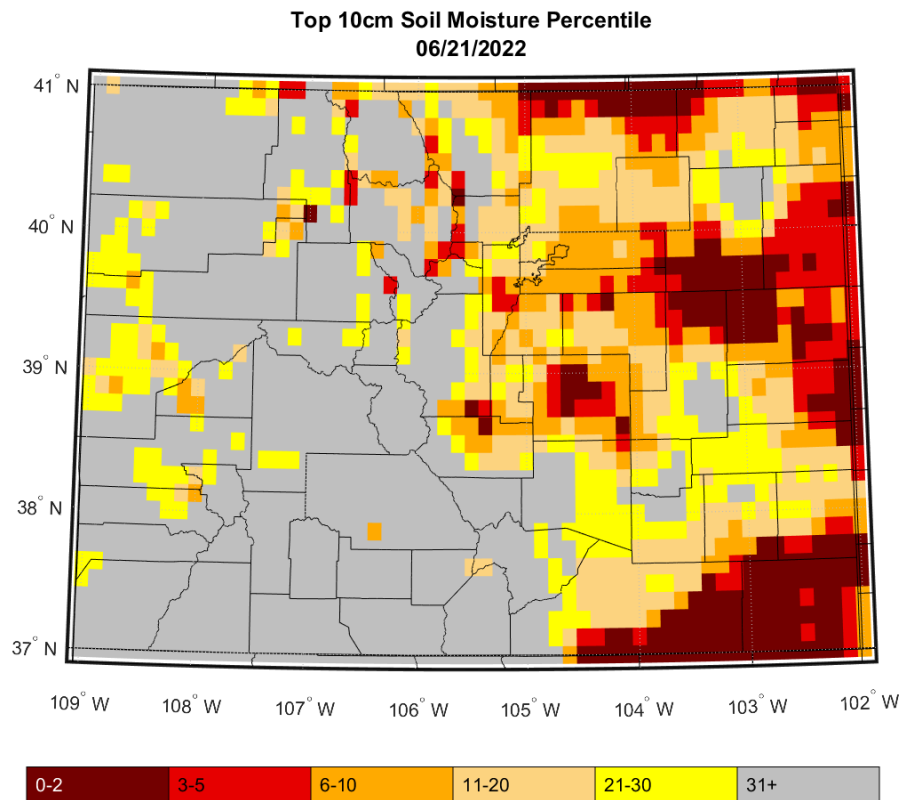


Data from High Plains Regional Climate Center and ACIS

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



Soil Moisture



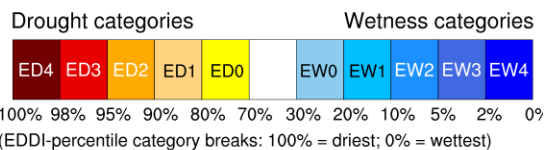
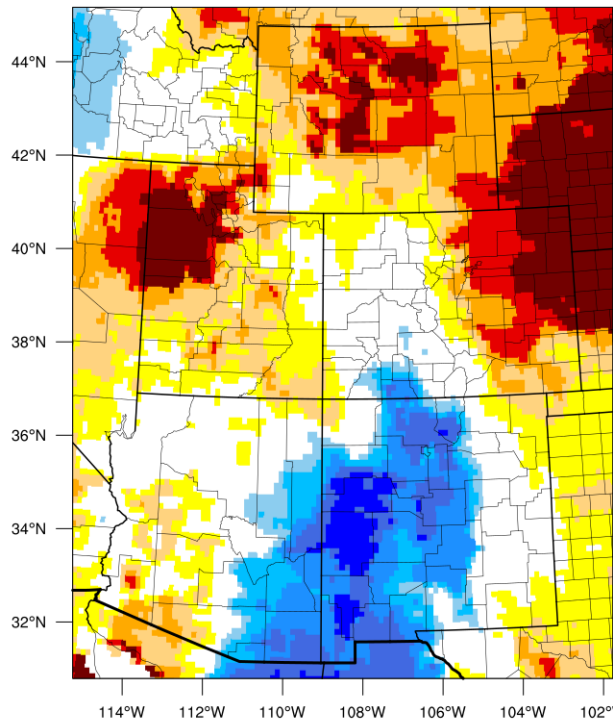
Shallow soil moisture has shown notable improvement in western CO where monsoon moisture has been consistent over the past couple of weeks. Eastern Plains soil moisture indicate longer-term hydrologic drought is dominant.

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



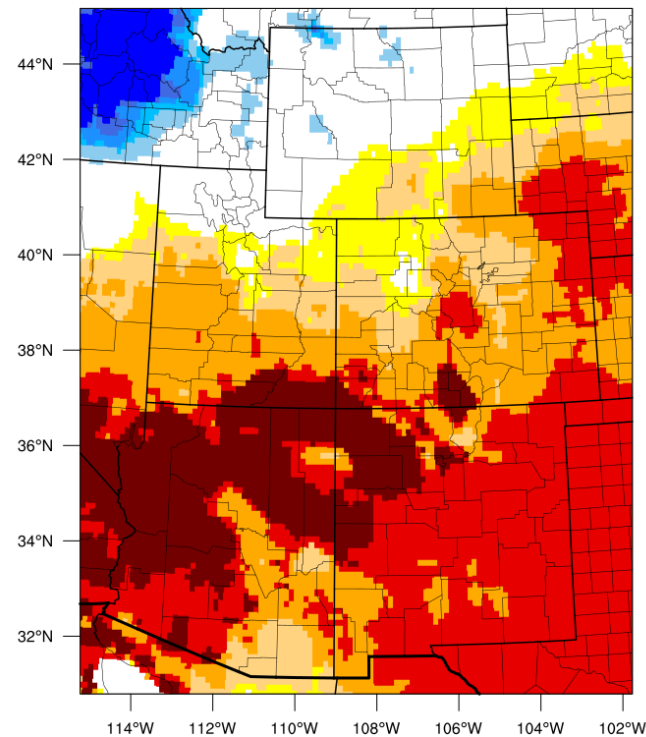
Evaporative Demand

1-week EDDI categories for June 22, 2022



Generated by NOAA/ESRL/Physical Sciences Laboratory

3-month EDDI categories for June 22, 2022



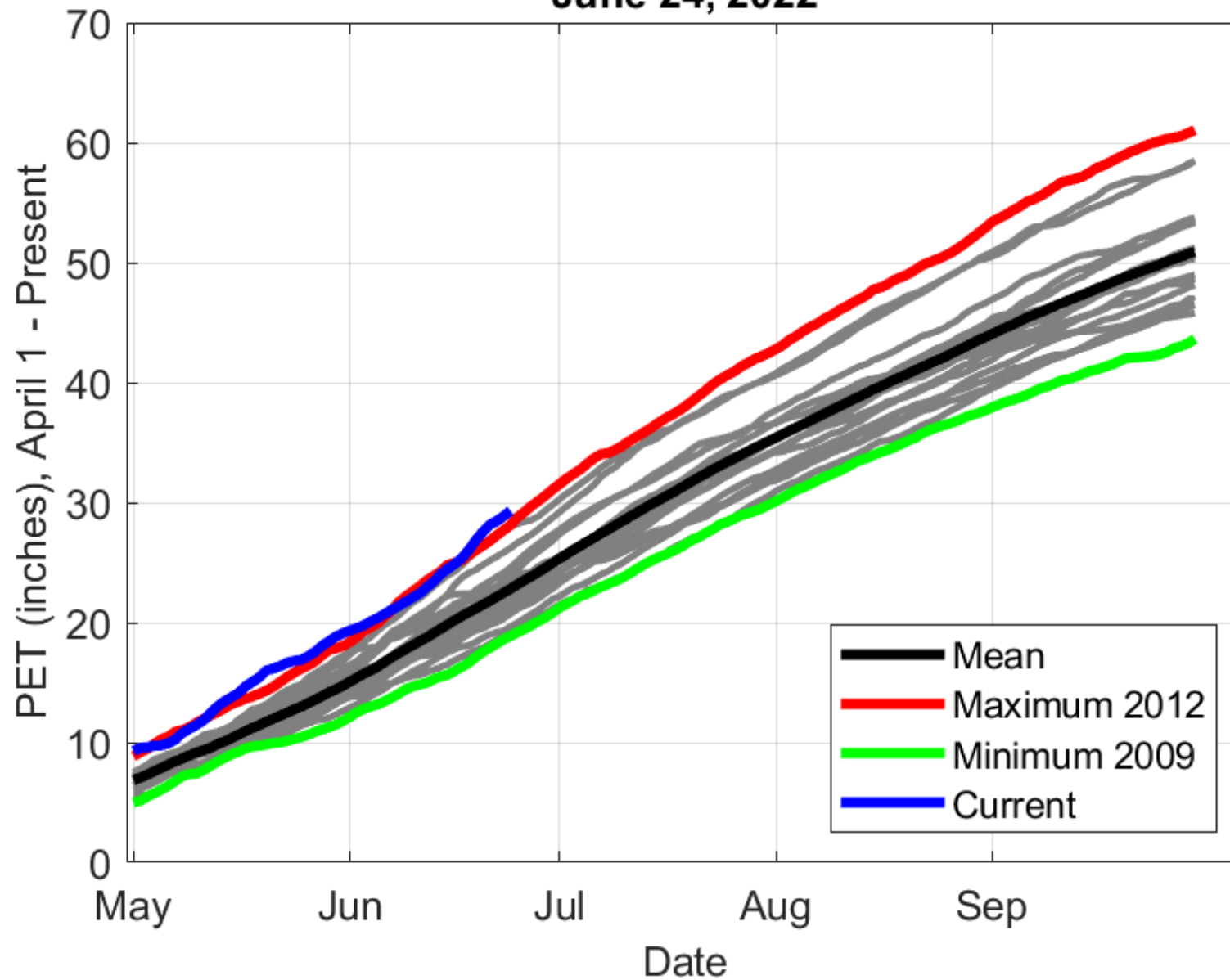
Generated by NOAA/ESRL/Physical Sciences Laboratory

EDDI combines temperature, solar radiation, wind, and humidity – compares to historical record for that time period shown. Short term higher demand showing up over Eastern Plains, longer term demands have been high for most of the state.

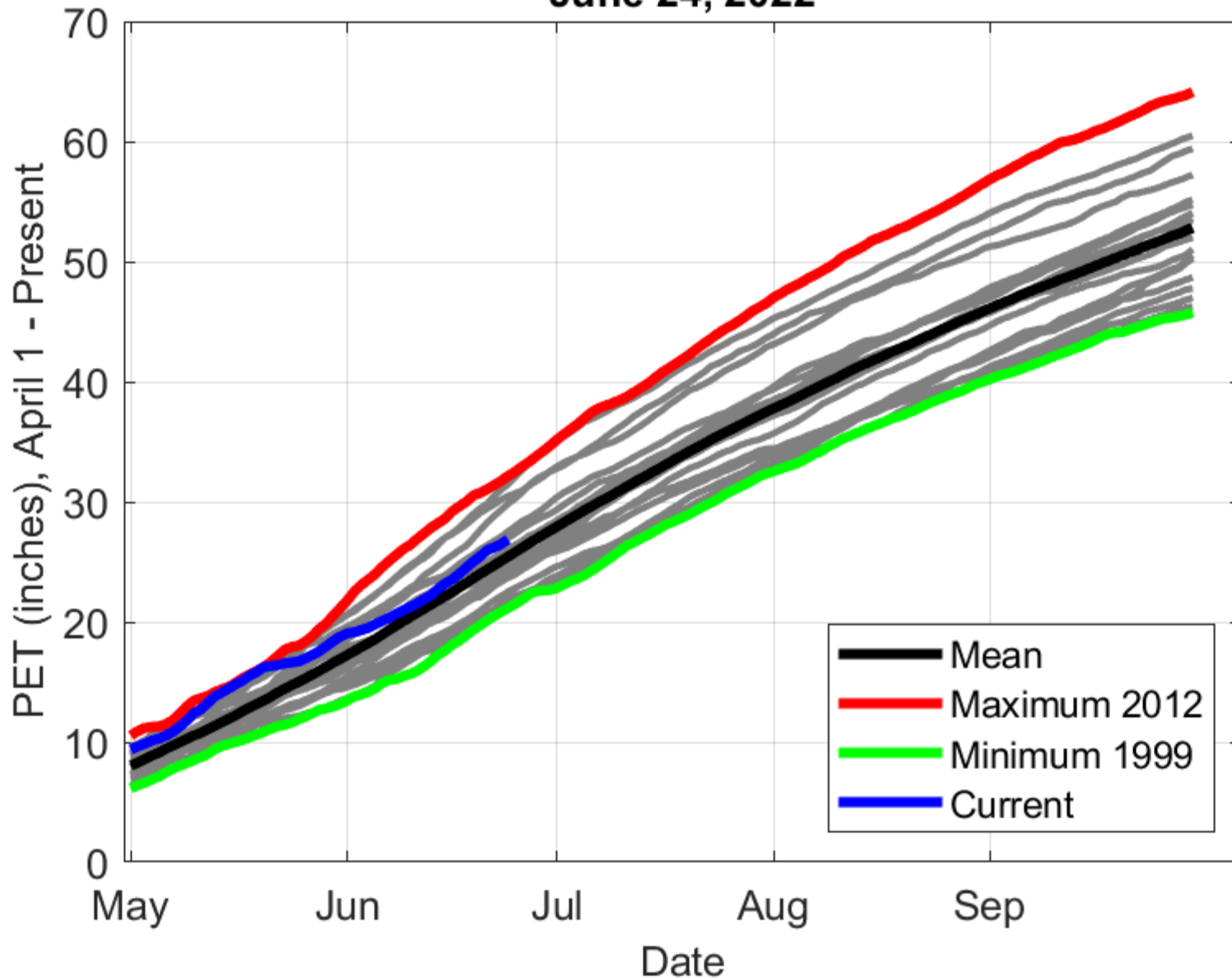
<https://psl.noaa.gov/eddi/>



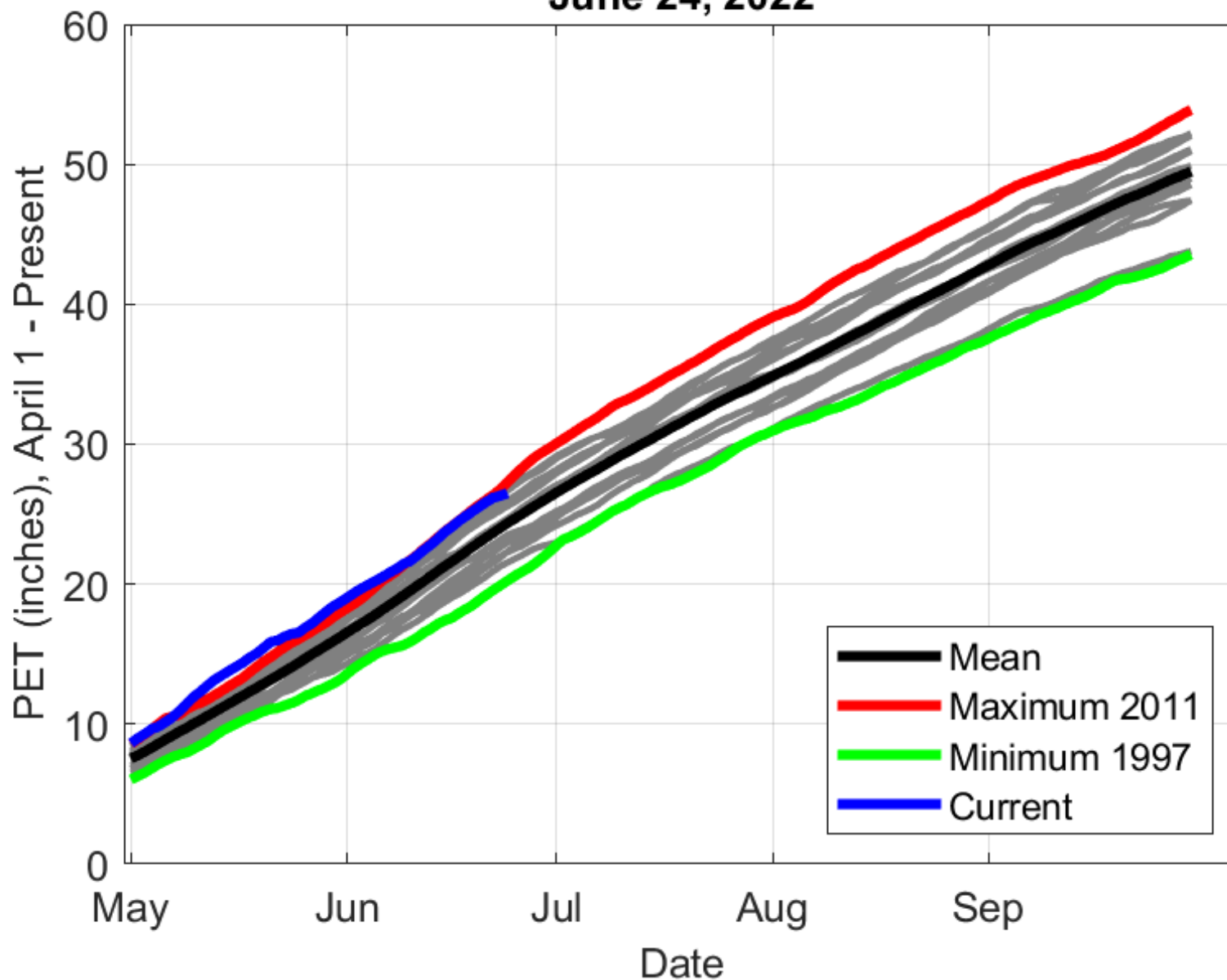
Haxtun Growing Season Evaporative Demand June 24, 2022



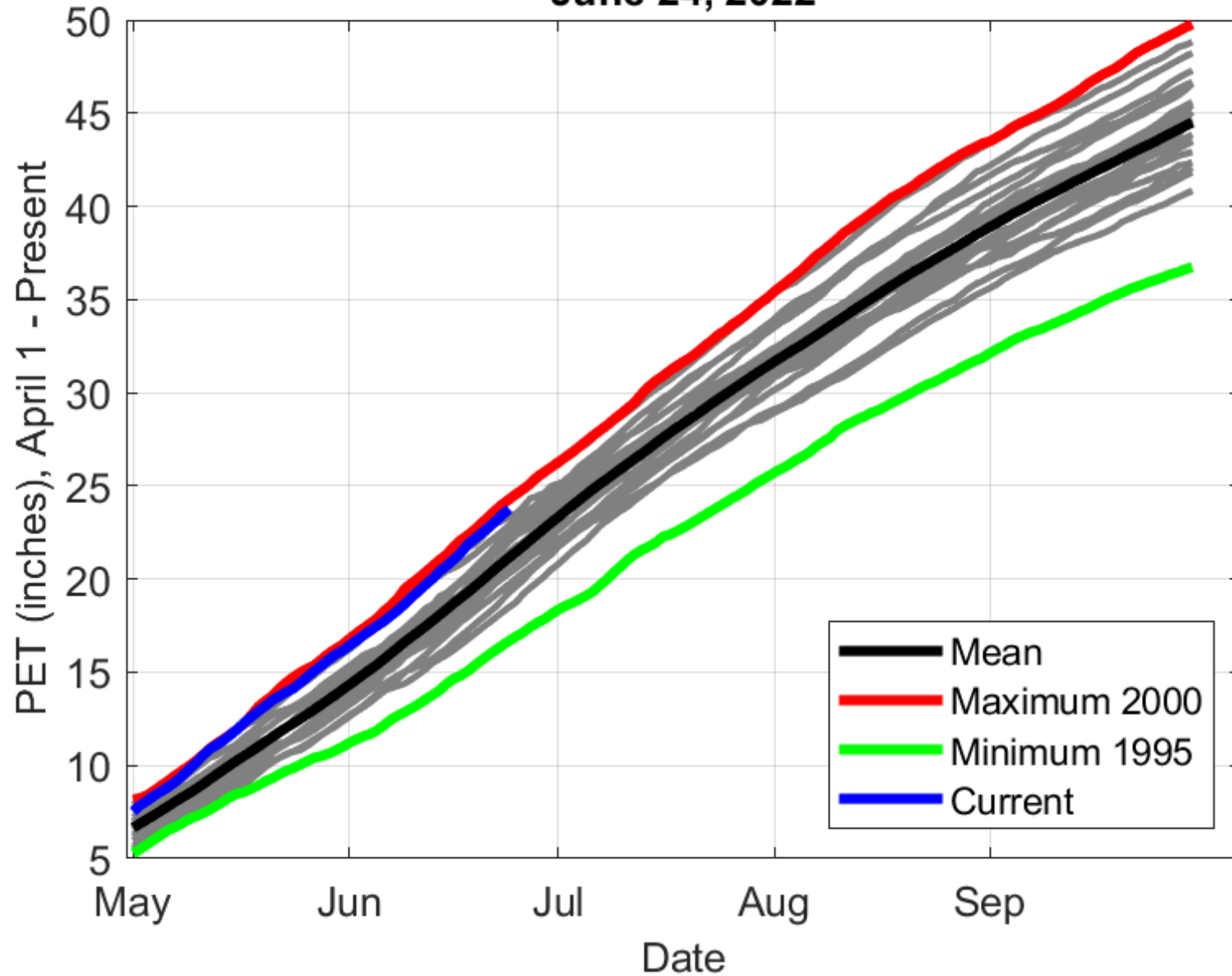
Avondale Growing Season Evaporative Demand June 24, 2022



Center Growing Season Evaporative Demand June 24, 2022



Cortez Growing Season Evaporative Demand June 24, 2022





Drought

National Drought

Colorado Drought

Some Drought Facts

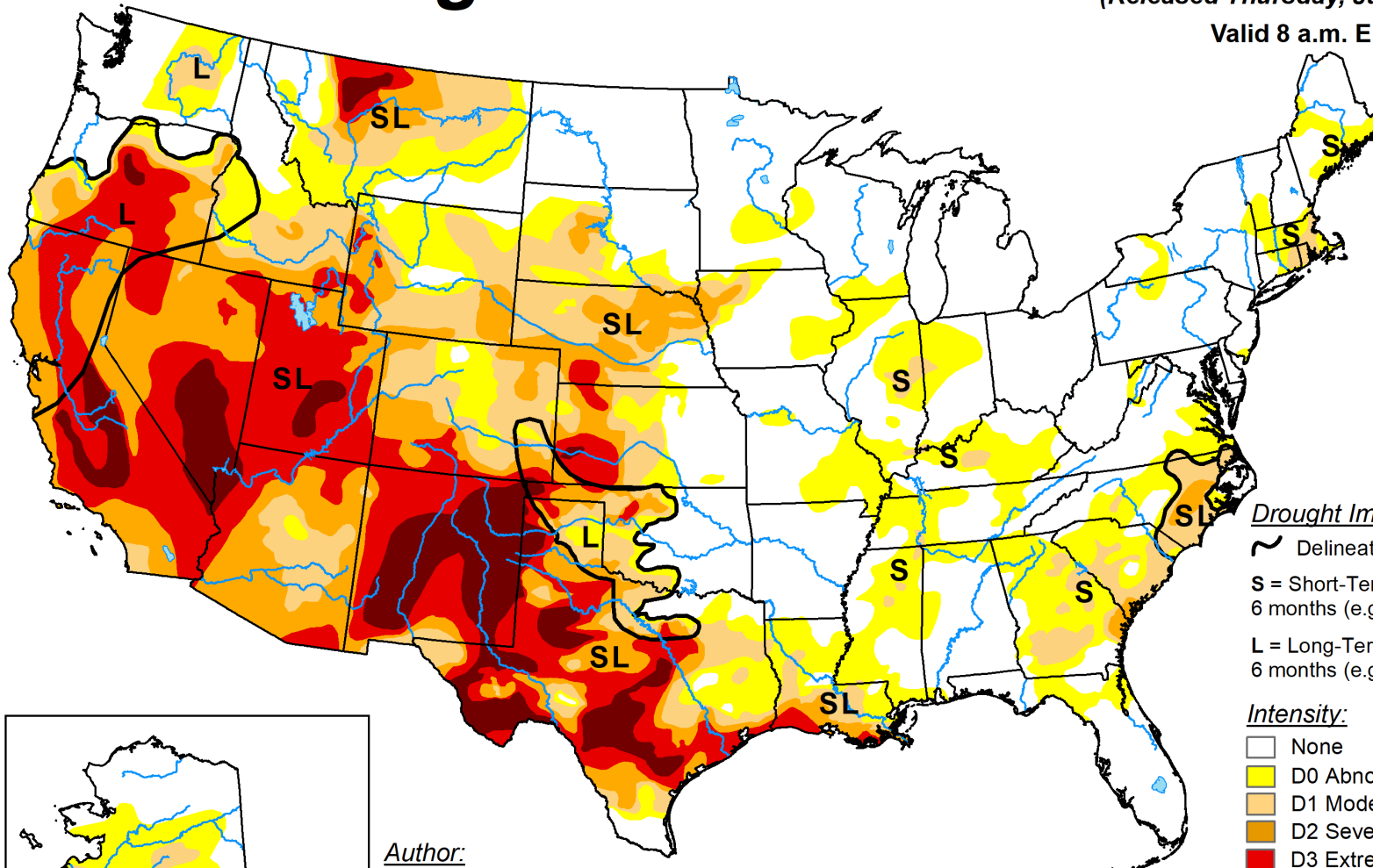


U.S. Drought Monitor

June 21, 2022

(Released Thursday, Jun. 23, 2022)

Valid 8 a.m. EDT

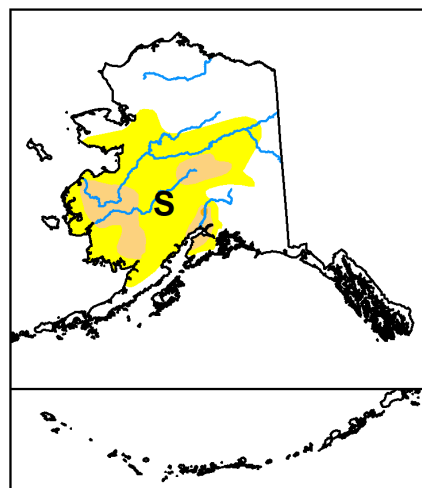


Drought Impact Types:

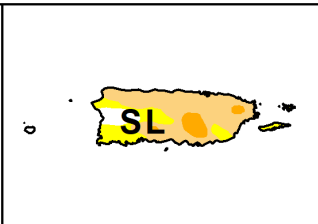
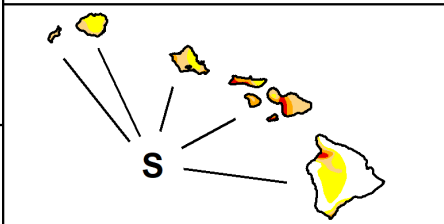
- ~ Delineates dominant impacts
- S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)
- L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

Intensity:

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



Author:
Adam Hartman
NOAA/NWS/NCEP/CPC



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>

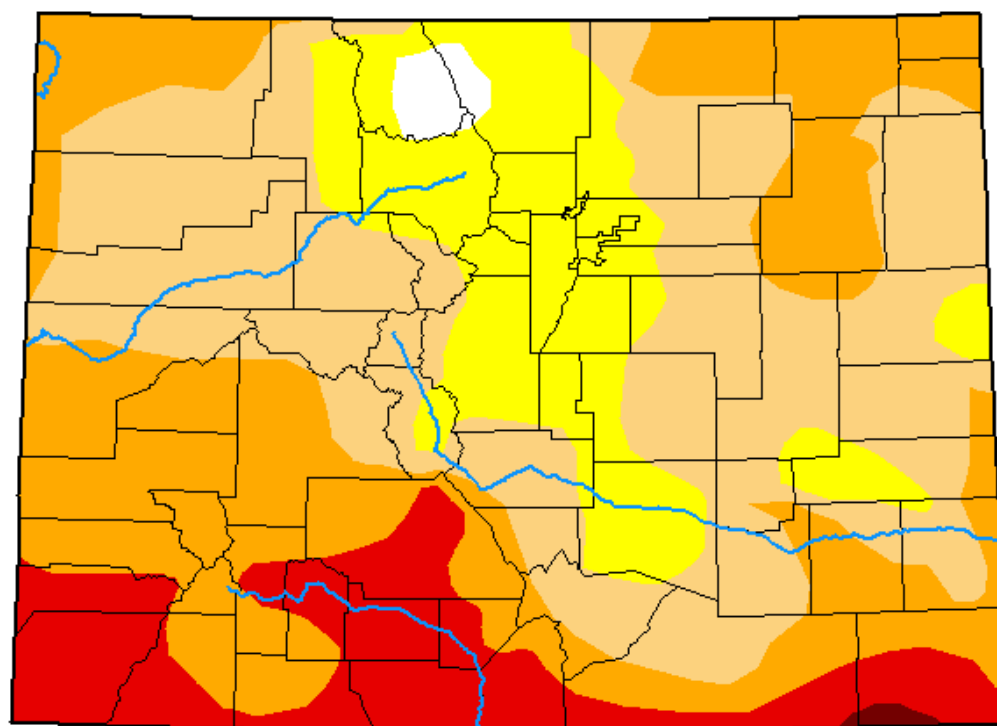


droughtmonitor.unl.edu



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
Current	1.09	98.91	81.55	43.08	12.76	0.23
Last Week 06-14-2022	1.09	98.91	81.75	42.97	15.89	0.23
3 Months Ago 03-22-2022	0.00	100.00	82.83	33.50	7.11	0.13
Start of Calendar Year 01-04-2022	0.00	100.00	95.49	67.08	22.25	0.00
Start of Water Year 09-28-2021	12.72	87.28	46.42	26.30	15.05	3.91
One Year Ago 06-22-2021	54.41	45.59	41.62	36.37	30.35	17.73

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:

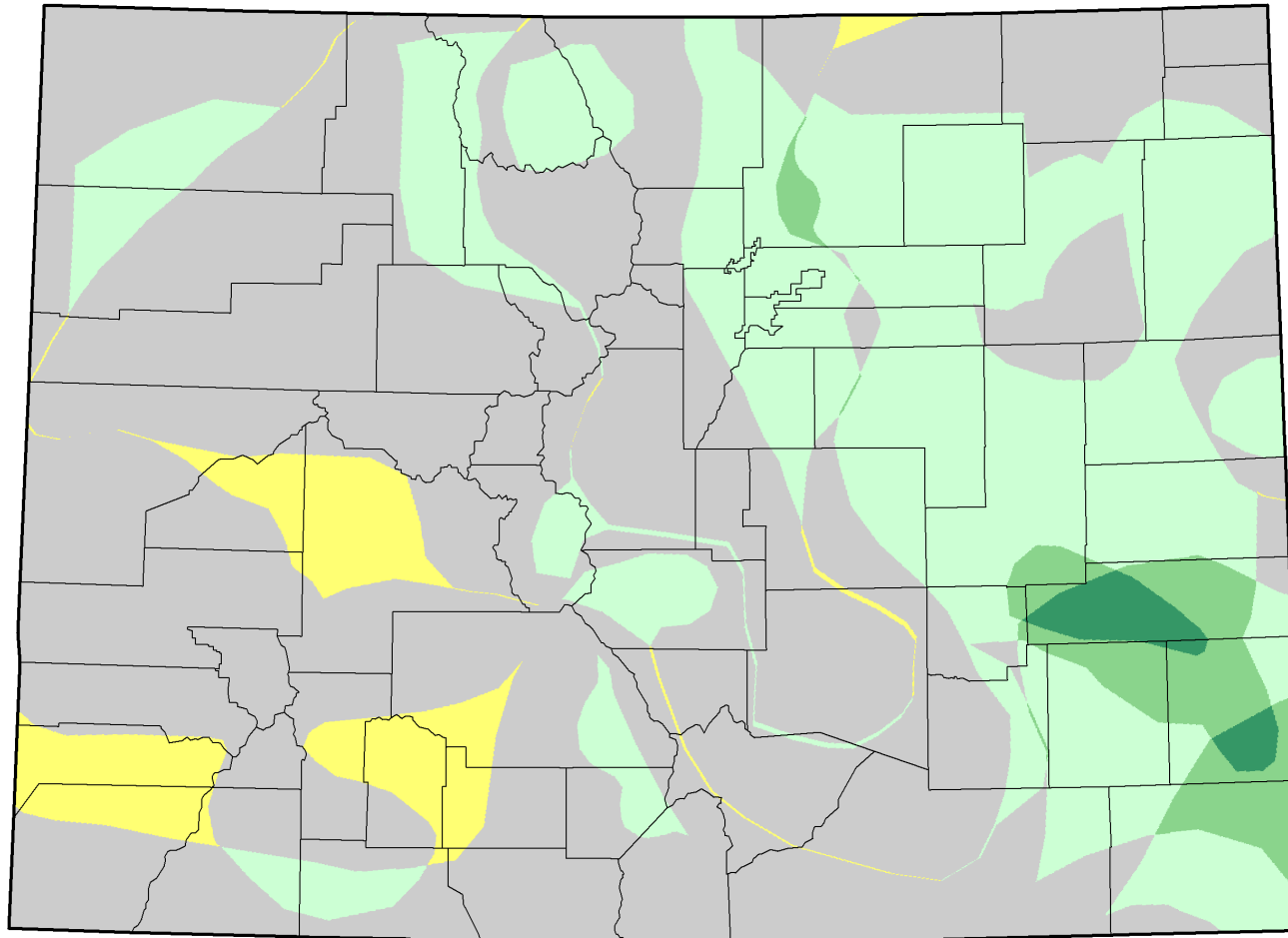
Adam Hartman
NOAA/NWS/NCEP/CPC



droughtmonitor.unl.edu

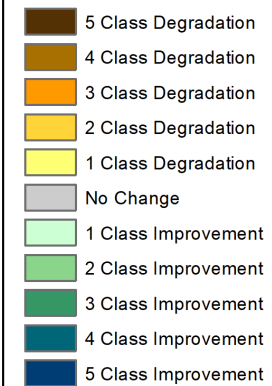


U.S. Drought Monitor Class Change - Colorado 4 Week



June 21, 2022
compared to
May 24, 2022

droughtmonitor.unl.edu



Changes over the past month show improvement over Eastern Plains from frequent thunderstorm activity. Deterioration has been minimal.





Outlook

Next 7 days

8-14 day Outlook

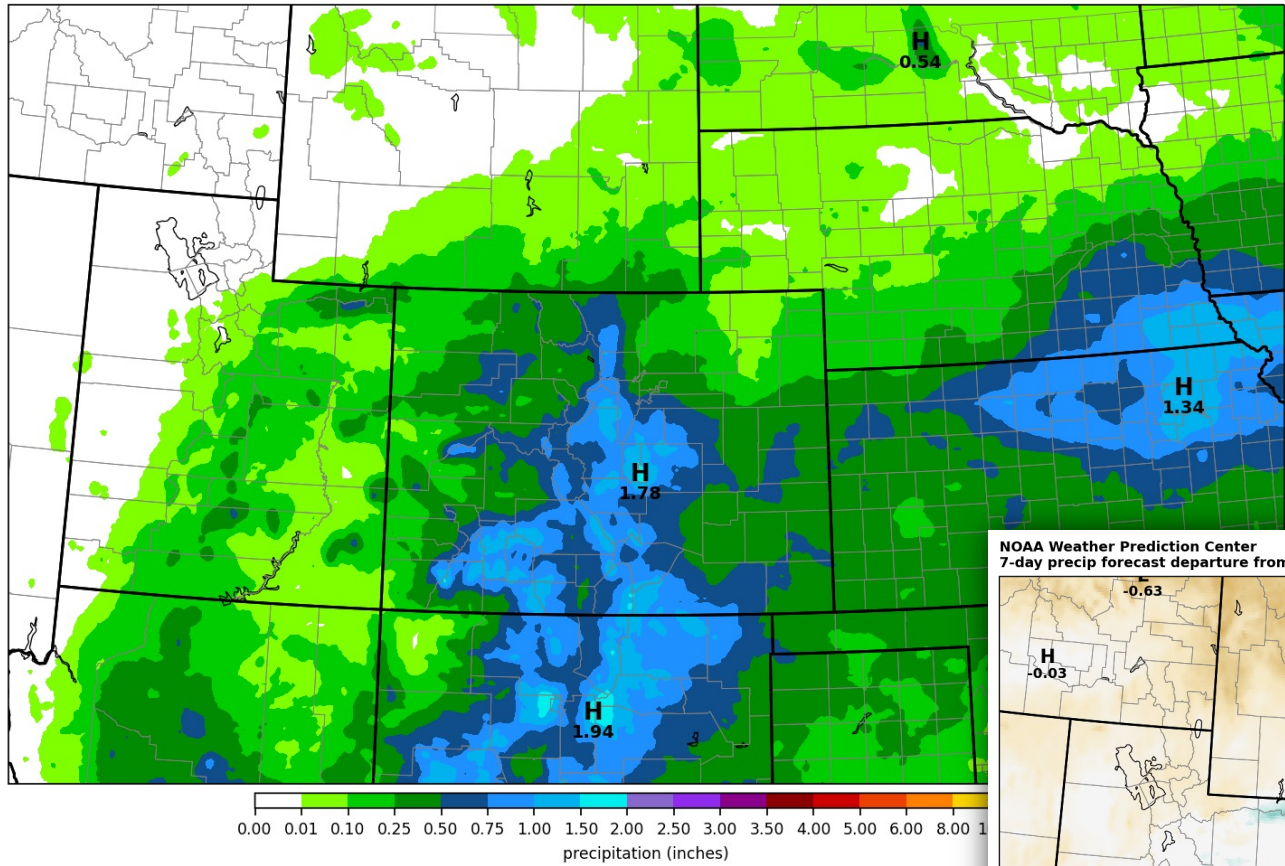
CPC Outlooks

La Niña

NOAA 7-day precip forecast

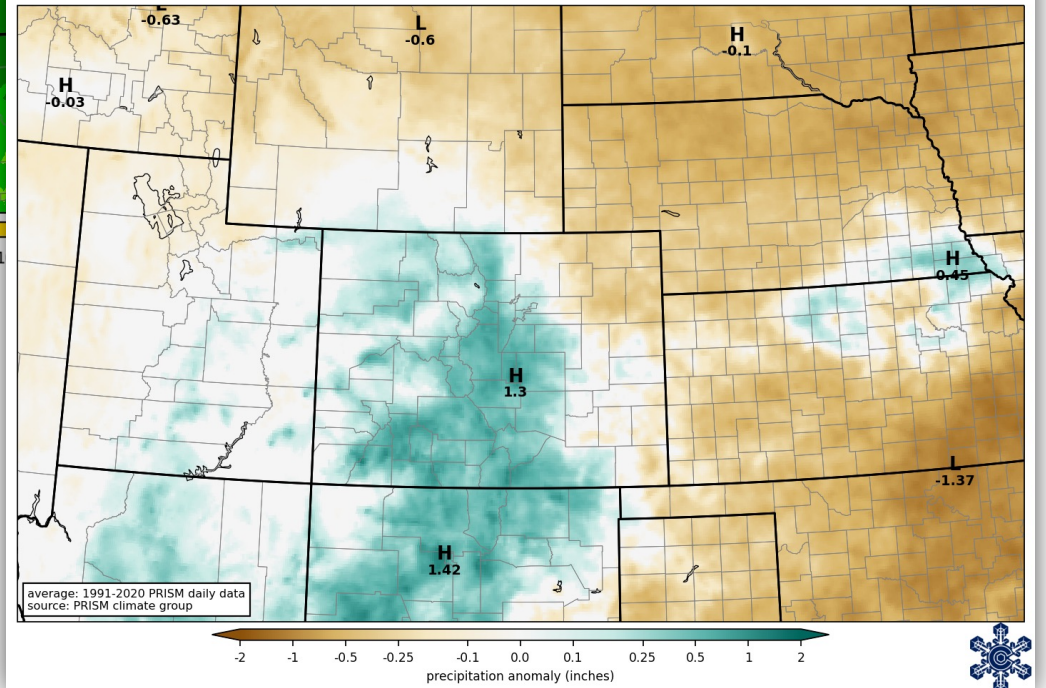
NOAA Weather Prediction Center
7-day precipitation forecast

forecast issued 1200 UTC Mon 27 Jun 2022
precipitation in 168 hrs ending 1200 UTC Mon 04 Jul 2022



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

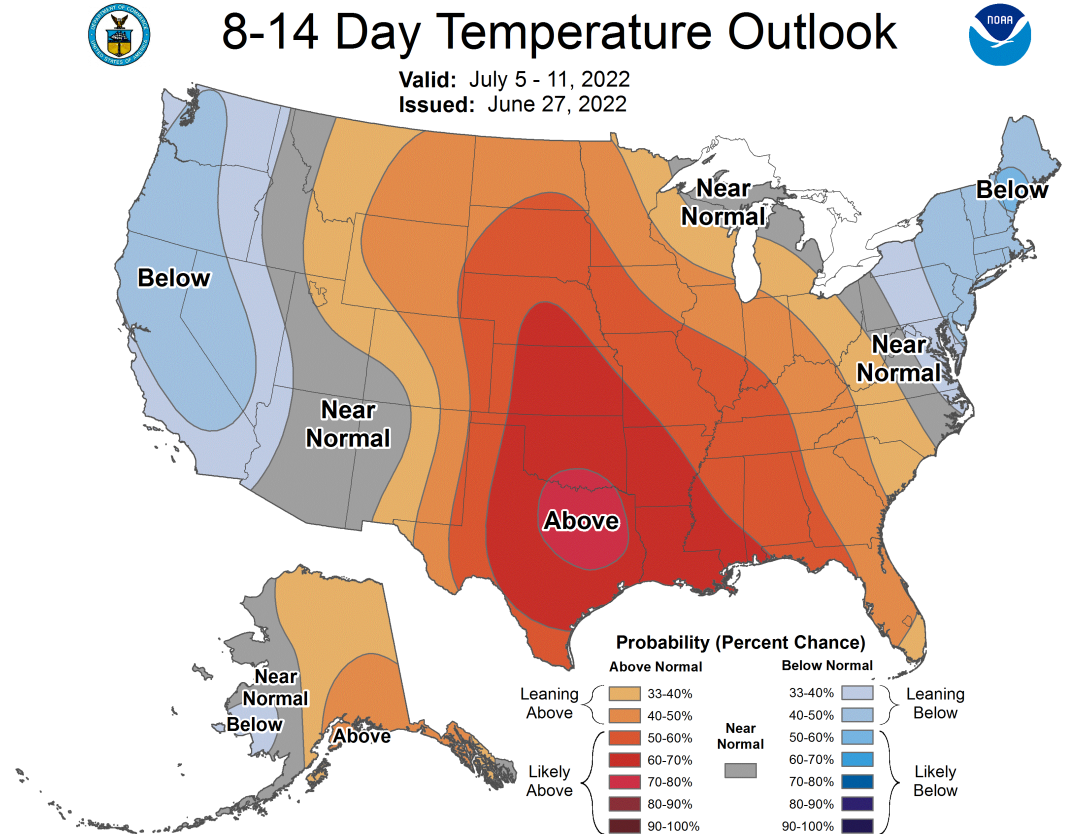
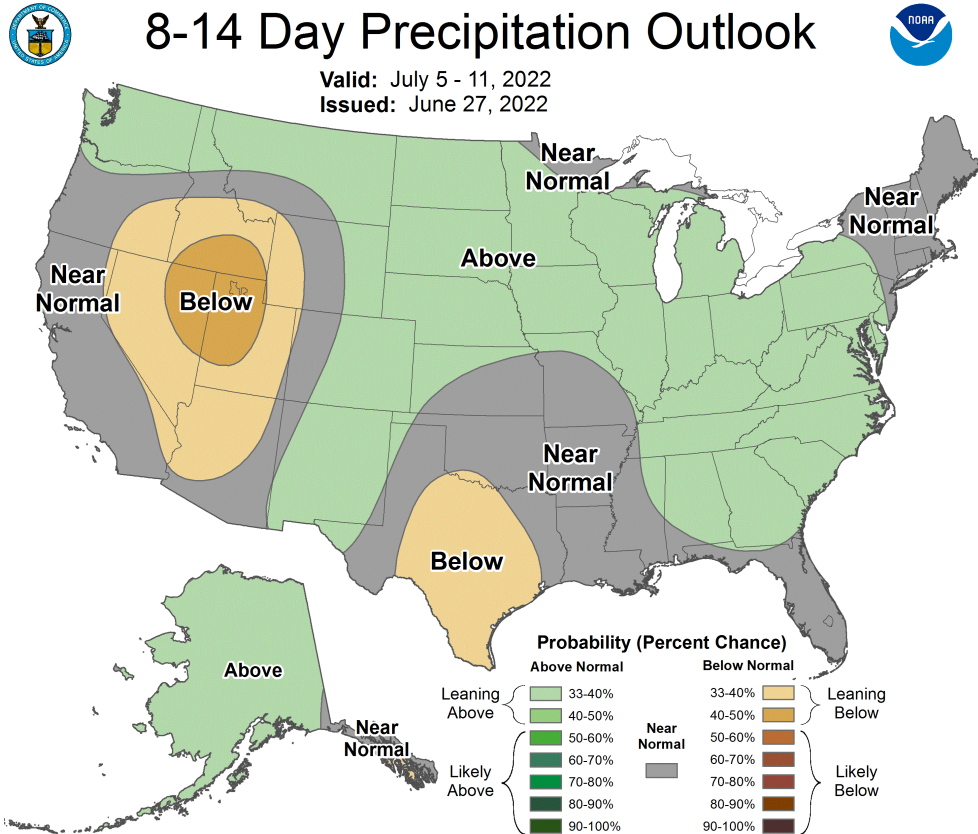
forecast issued 1200 UTC Mon 27 Jun 2022
precipitation in 168 hrs ending 1200 UTC Mon 04 Jul 2022



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



8-14 day outlook



Continue to expect monsoonal moisture, which should help regulate temperatures, at least for the Four Corners area.

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



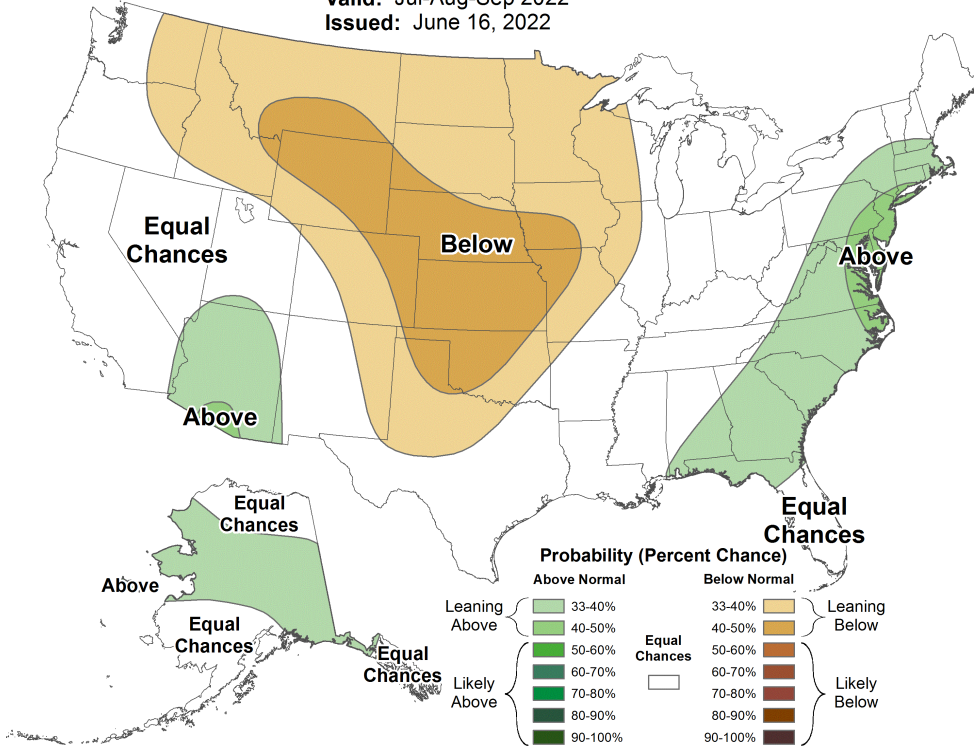
Seasonal outlook



Seasonal Precipitation Outlook



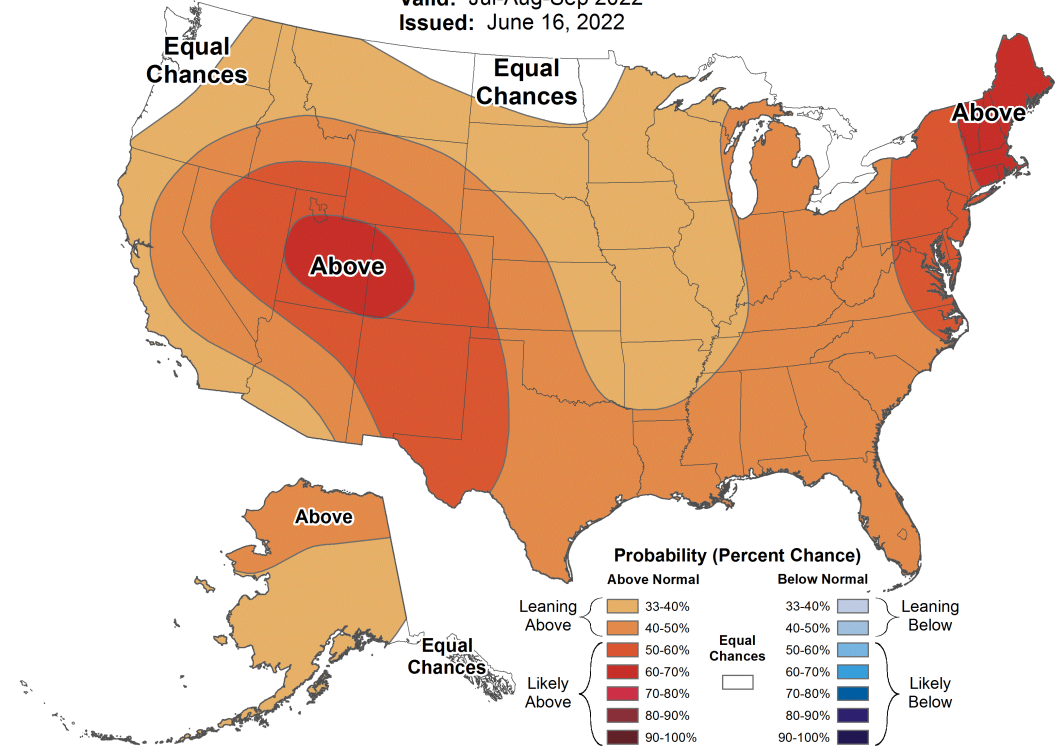
Valid: Jul-Aug-Sep 2022
 Issued: June 16, 2022



Seasonal Temperature Outlook



Valid: Jul-Aug-Sep 2022
 Issued: June 16, 2022



Seasonal outlook continues to show dominant warm signal over Colorado, with the most confidence over western CO. Continued monsoon moisture evident, but trending drier over the Eastern Plains.

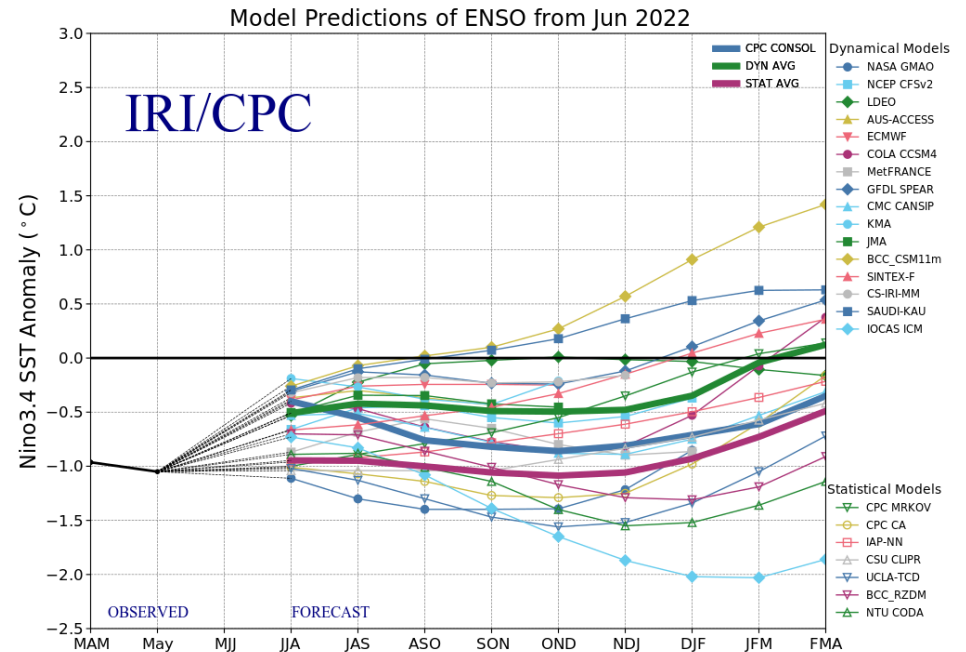
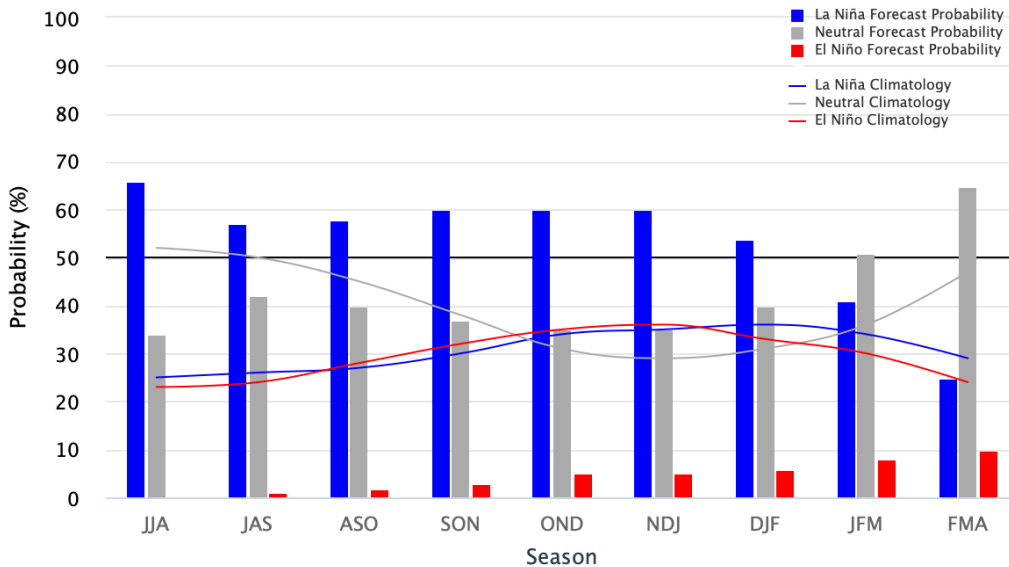
<https://www.cpc.ncep.noaa.gov>



What's the ENSO forecast?

Mid-June 2022 IRI/CPC Model-Based Probabilistic ENSO Forecasts

ENSO state based on NINO3.4 SST Anomaly
Neutral ENSO: $-0.5\text{ }^{\circ}\text{C}$ to $0.5\text{ }^{\circ}\text{C}$



CPC/IRI June 20, 2022: In mid-June, sea surface temperatures in the central-eastern equatorial Pacific remain below-average (warming slightly). Key oceanic and atmospheric variables have remained consistent with La Niña conditions, although weakened slightly. A La Niña Advisory still remains in place for June 2022. A large majority of the models in the plume predict SSTs to remain below-normal at the level of a weak La Niña until Jul-Sep 2022. Similar to the most-recent official CPC/IRI ENSO Outlook issued on June 9, 2022, the objective model-based ENSO outlook forecasts a continuation of the La Niña event with moderate probability (52% chance) during Jul-Sep 2022, continuing into boreal fall and winter with 51-59% likelihood.

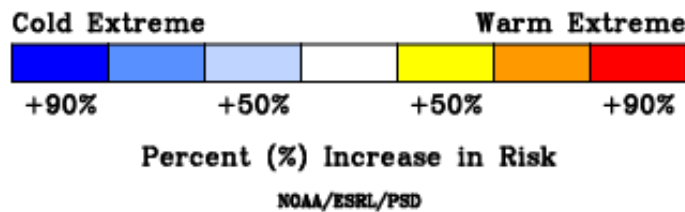
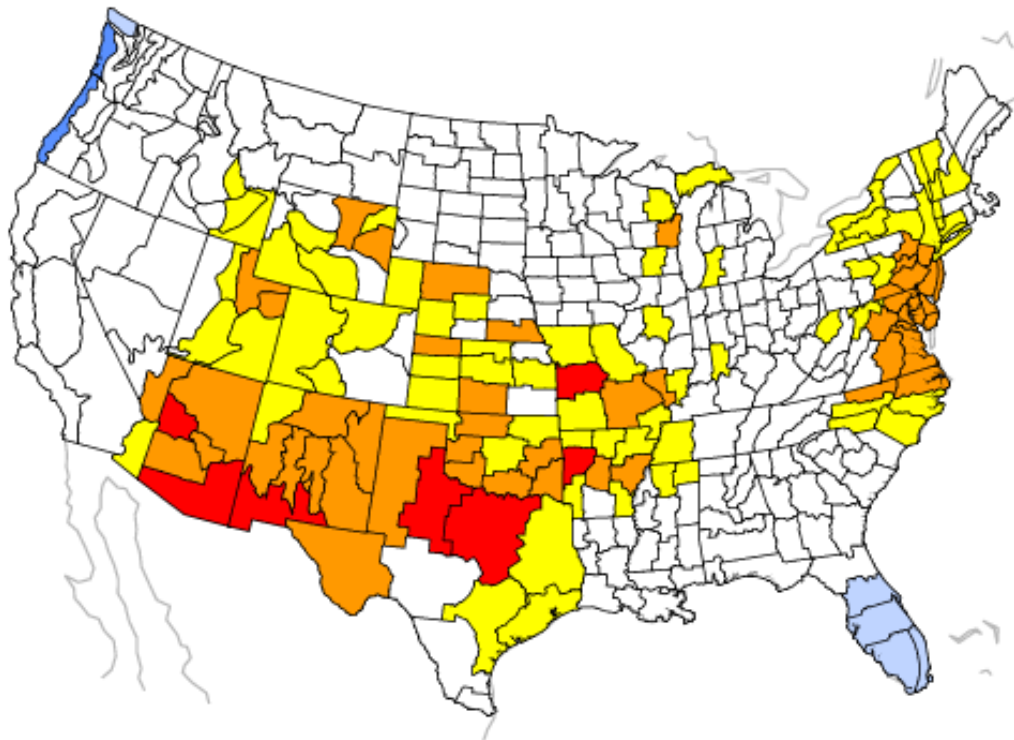
<https://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/>



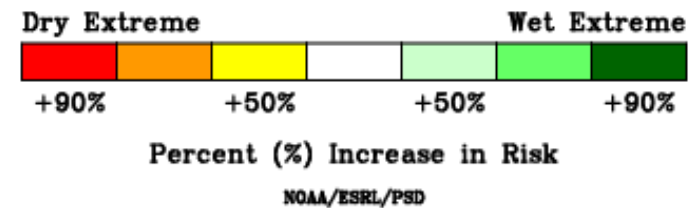
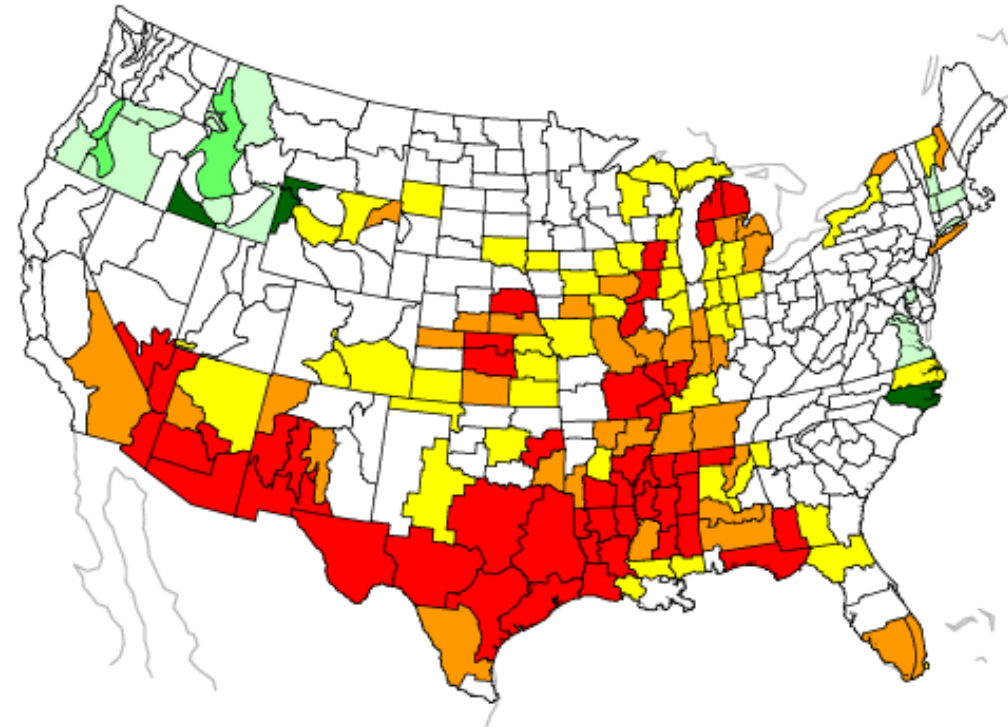


What does La Niña
mean for the fall?

SON Temperature During La Nina
Increased Risk of Warm or Cold Extremes



SON Precipitation During La Nina
Increased Risk of Wet or Dry Extremes



Risk of extremes during a La Niña, from <https://psl.noaa.gov/enso/climaterisks/>

The region is generally more likely to see warm and dry extremes in the fall during a La Niña. What would three La Niña winters in a row mean? Good question!



Key Takeaways

- ❑ Overall, spring was drier than average and slightly cooler than average.
- ❑ Summer has started out warm with an active precipitation pattern.
- ❑ Strong start to the monsoon in southern Colorado, particularly over southwest CO.
- ❑ Impacts from long-term drought still remain, evident in streams, soils, and vegetation.
- ❑ Evaporative demand has been variable, but overall higher than average.
- ❑ Active monsoon is expected to continue.
- ❑ It is likely that La Niña conditions will continue into the fall and beginning of winter.
- ❑ A continued active thunderstorm pattern could help recharge soils and improve drought conditions.
- ❑ If the fall is warm and dry, that could worsen drought conditions and we would start with another snowpack season at a deficit.



Becky.Bolinger@colostate.edu

 @ClimateBecky

climate.colostate.edu

To view this and other presentations:
https://climate.colostate.edu/ccc_archive.html

Thank you



ATMOSPHERIC SCIENCE
COLORADO STATE UNIVERSITY