

Colorado Climate Update

Peter Goble
Climatologist

Water Availability Task Force

July 19, 2022



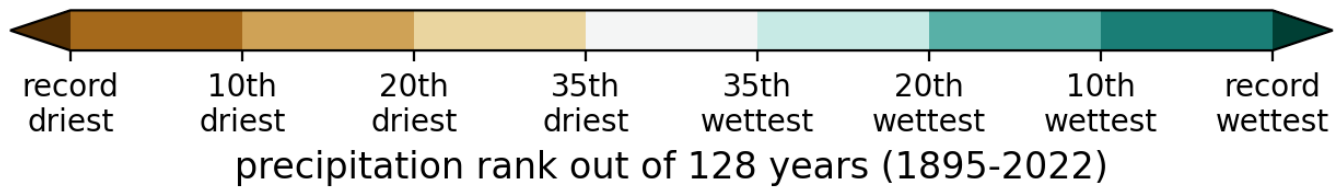
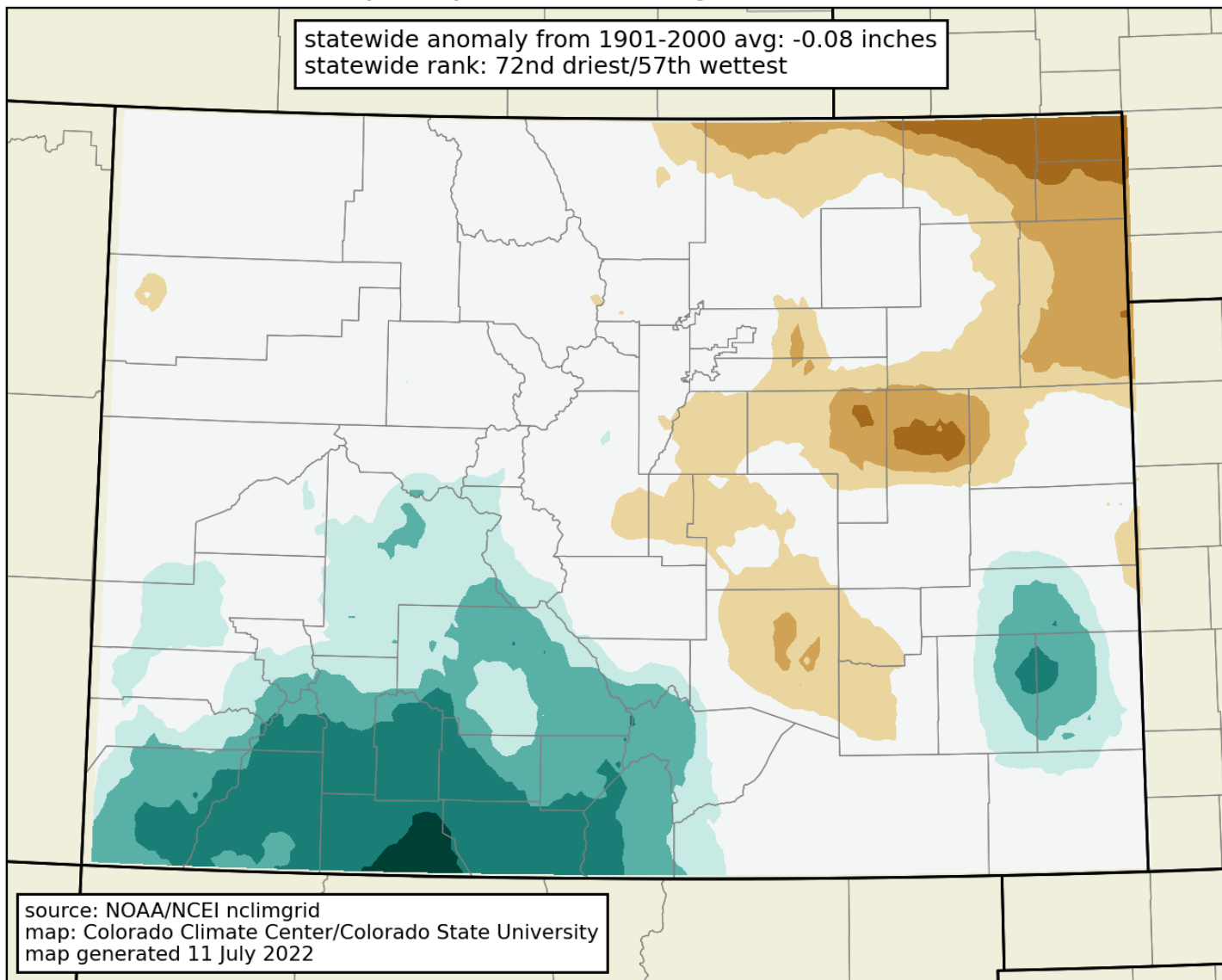
ATMOSPHERIC SCIENCE
COLORADO STATE UNIVERSITY

2022 Water Year to Date

A look at
WY 2022
June 2022
& MTD stats



precipitation rank: June 2022

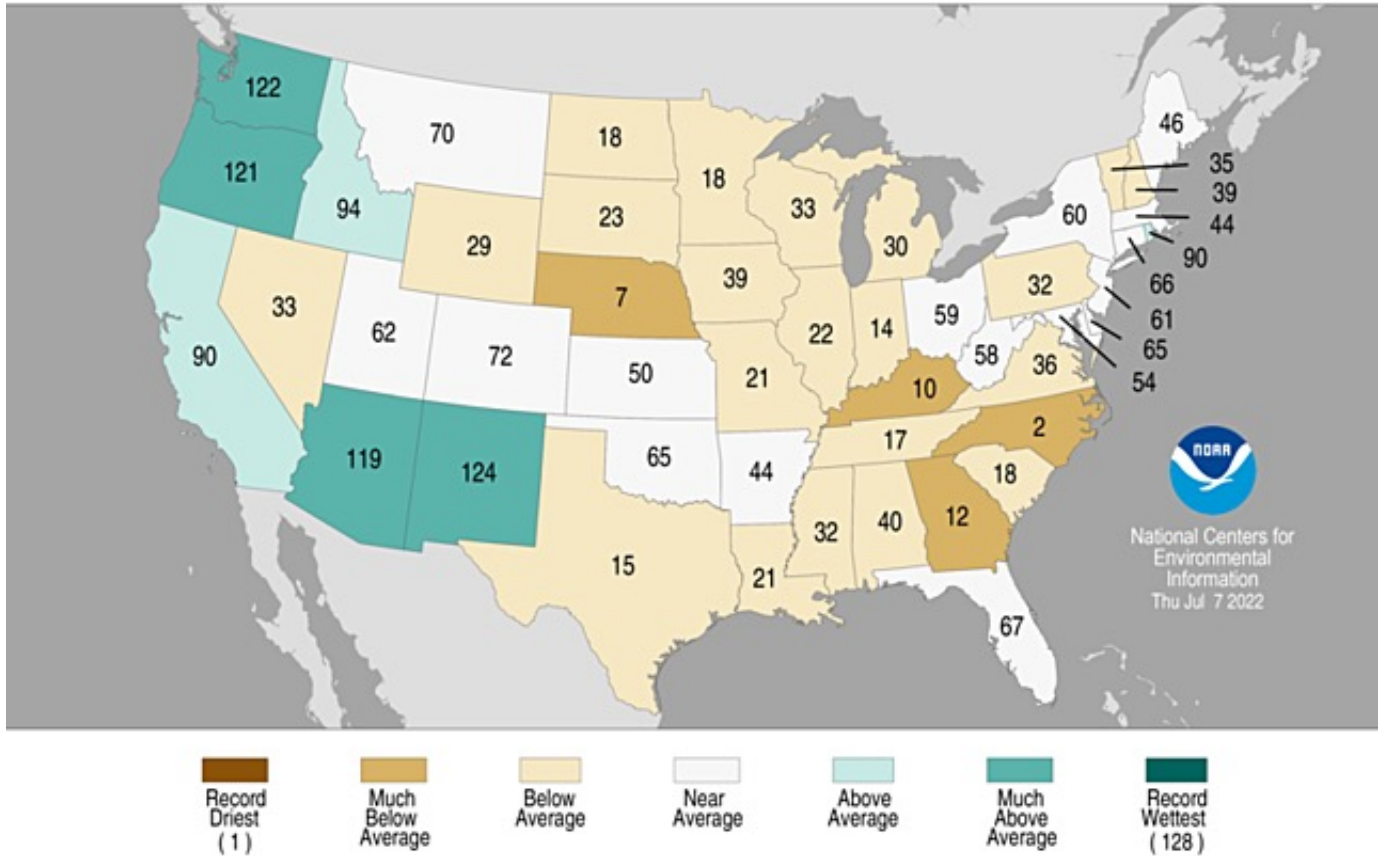


https://climate.colostate.edu/co_cag/rank_maps.html



Statewide Precipitation Ranks

June 2022
Period: 1895–2022



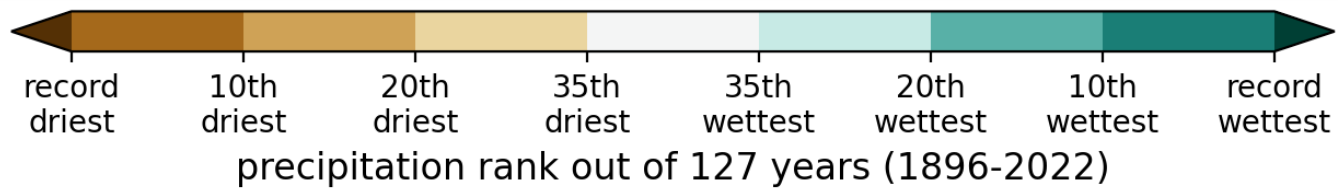
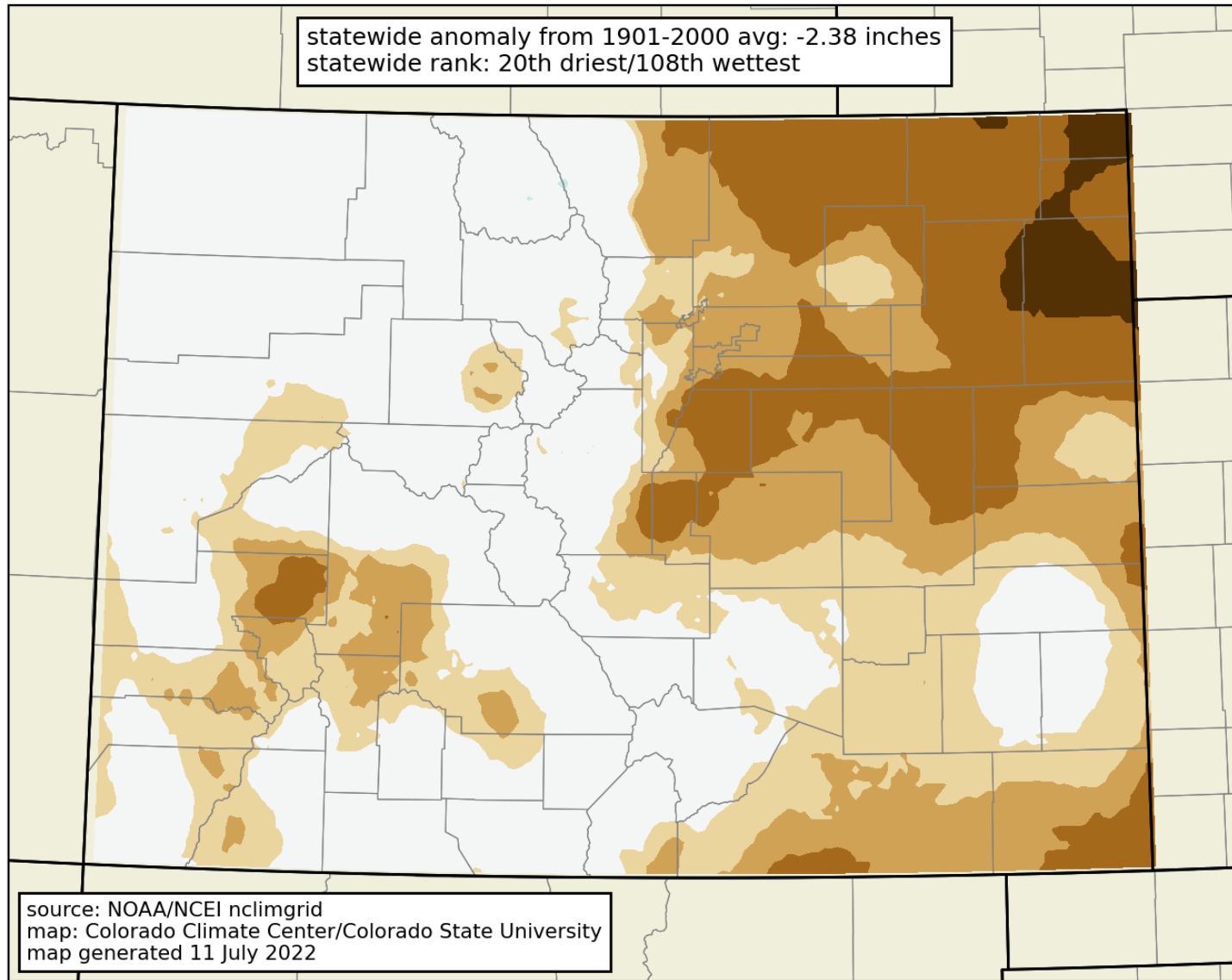
Month	P Rank (of 128 years)	Above, below, or near 20 th century avg?
Oct	62 nd driest	near avg
Nov	10 th driest	much below
Dec	13 th wettest	much above
Jan	40 th driest	below
Feb	49 th driest	near avg
Mar	67 th driest	near avg
Apr	5 th driest	much below
May	47 th driest	near avg
Jun	57 th wettest	near avg
Jul		
Aug		
Sep		

A welcome early start to the monsoon in SW CO, but dry on the eastern plains. Still a dry year for the water year to date.

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



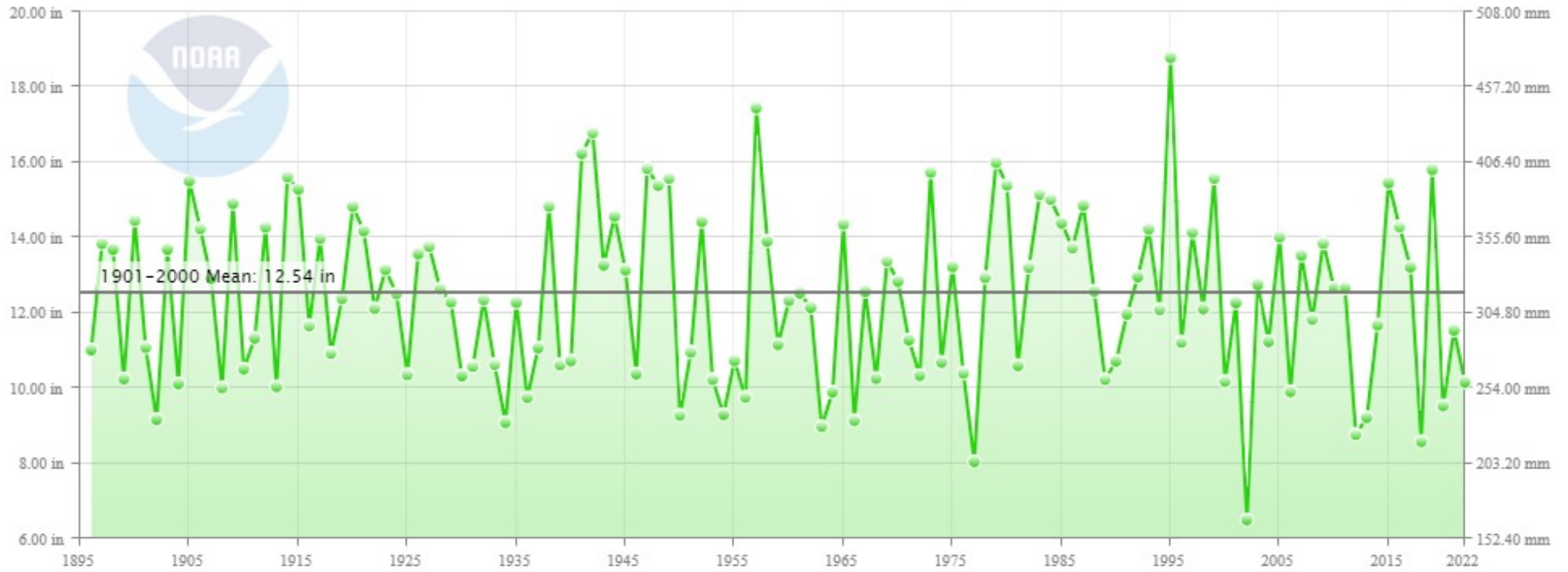
precipitation rank: 9 months ending June 2022 (Oct-Jun)



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



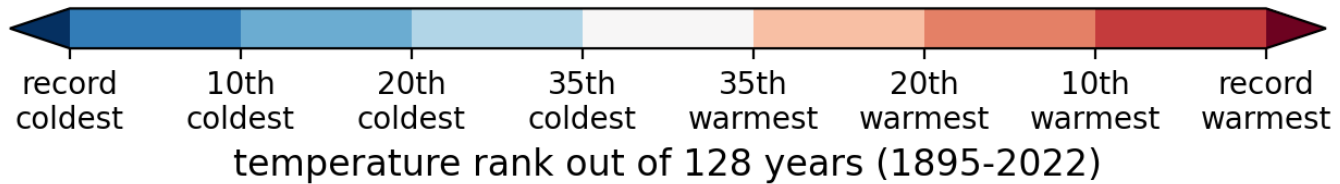
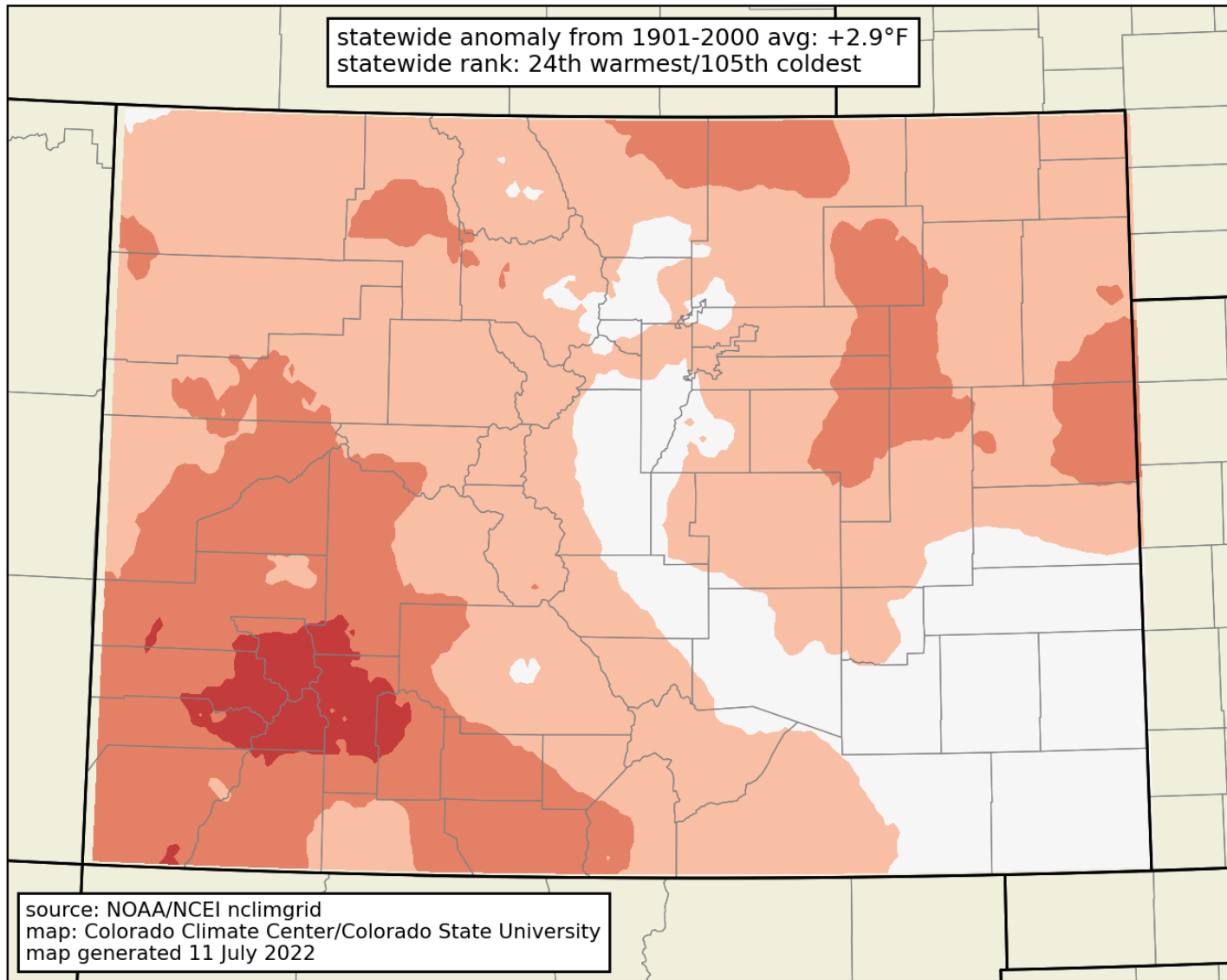
Colorado Precipitation October-June



<https://www.ncei.noaa.gov/access/monitoring/climate-at-a-glance/statewide/time-series>



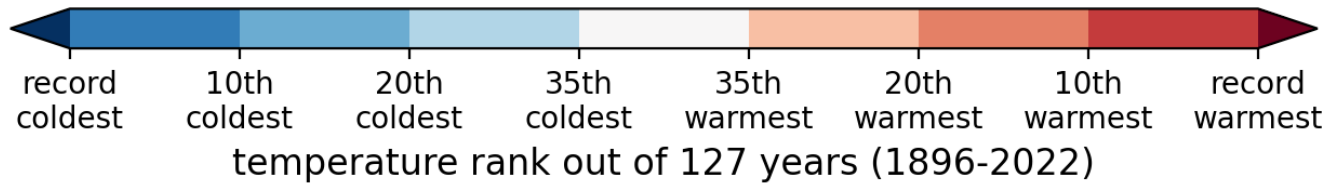
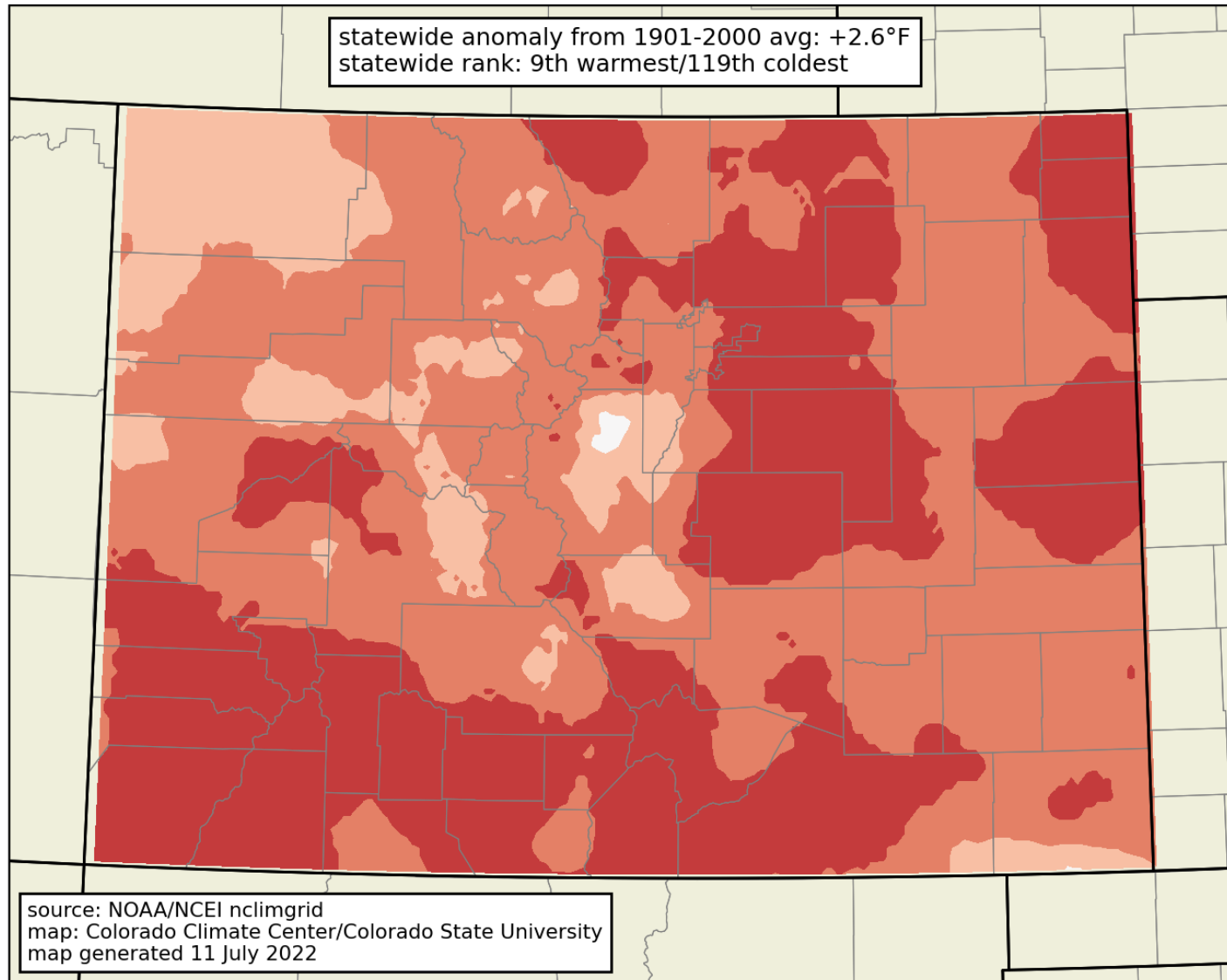
average temperature rank: June 2022



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



average temperature rank: 9 months ending June 2022 (Oct-Jun)

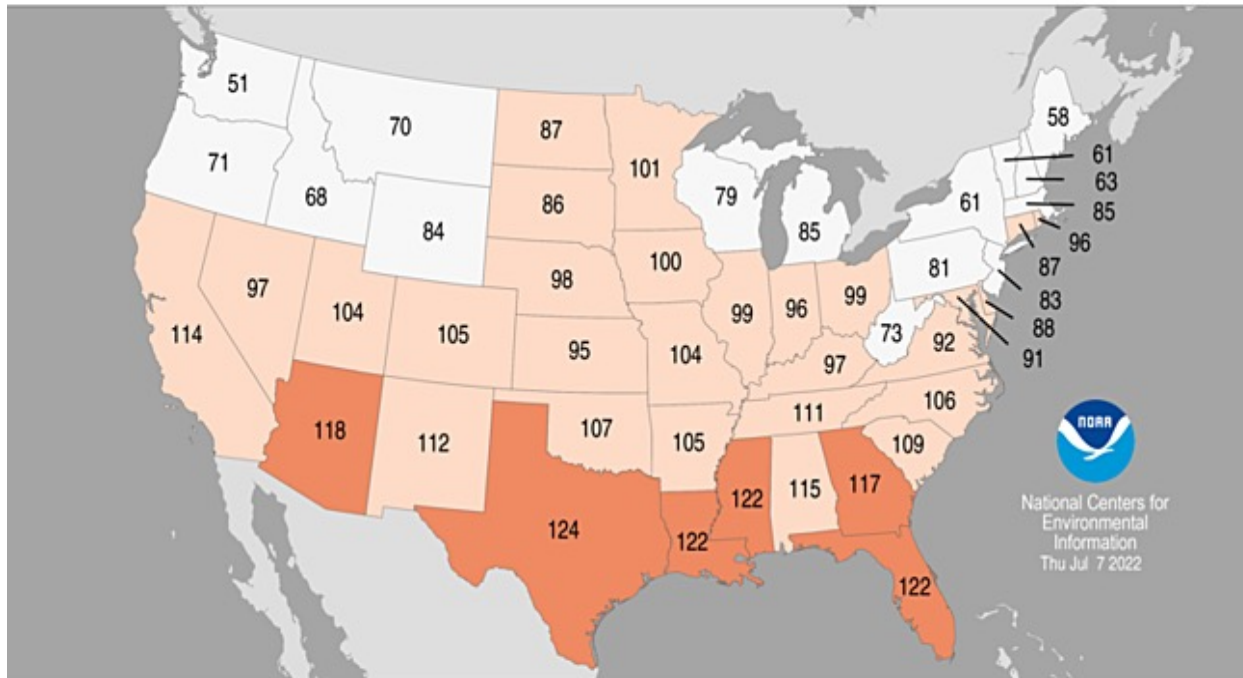


https://climate.colostate.edu/co_cag/rank_maps.html



Statewide Average Temperature Ranks

June 2022
Period: 1895–2022

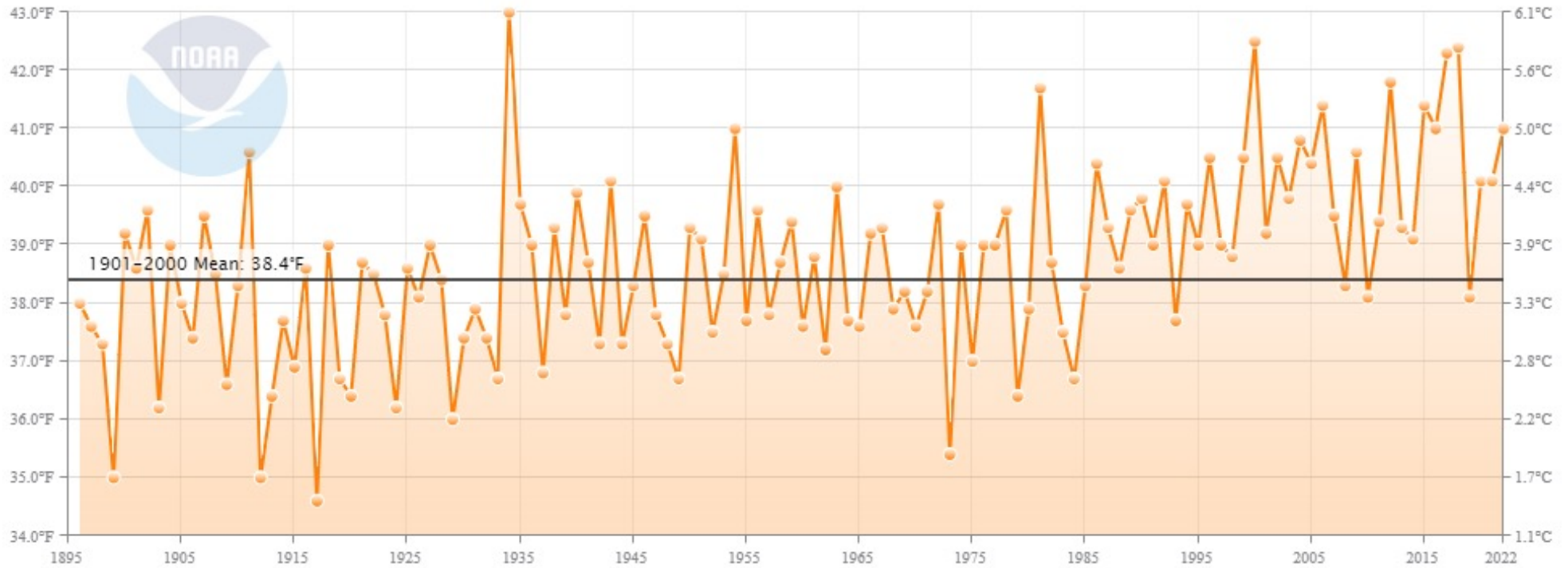


June was warm early with a little cooler weather near the end.
Overall, a warm start to summer

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	24 th warmest	above
Jul		
Aug		
Sep		

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

Colorado Average Temperature
October–June



2.6 F warmer than the 20th century average for the water year to date

Tied for 5th warmest Oct-Jun over last ten year span

<https://www.ncei.noaa.gov/access/monitoring/climate-at-a-glance/statewide/time-series>



Current Conditions

Temperature

Precipitation

Evaporative Demand

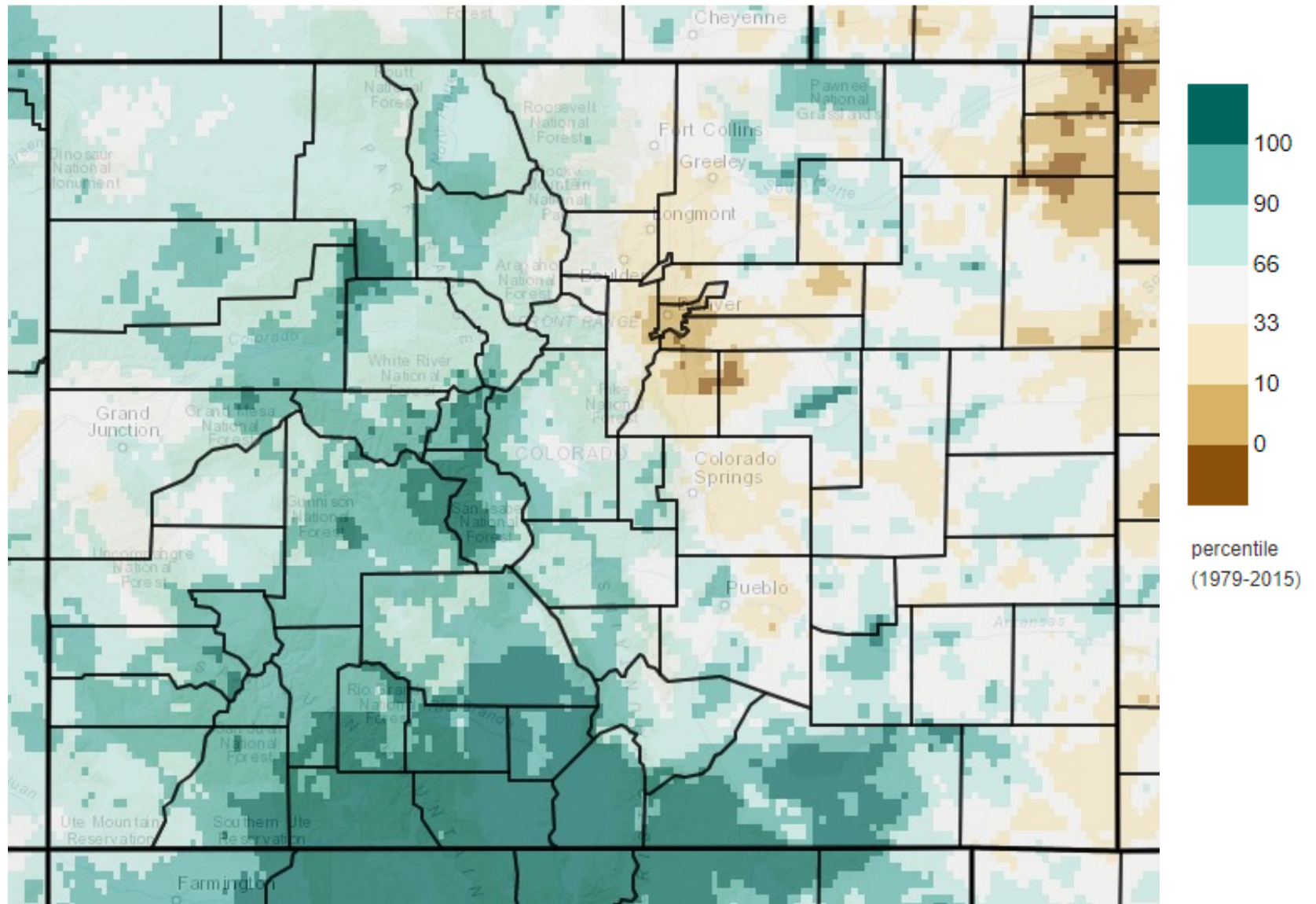
Soil Moisture

Vegetation



Total Precipitation Percentile, Last 30 Days

2022/06/17 - 2022/07/16

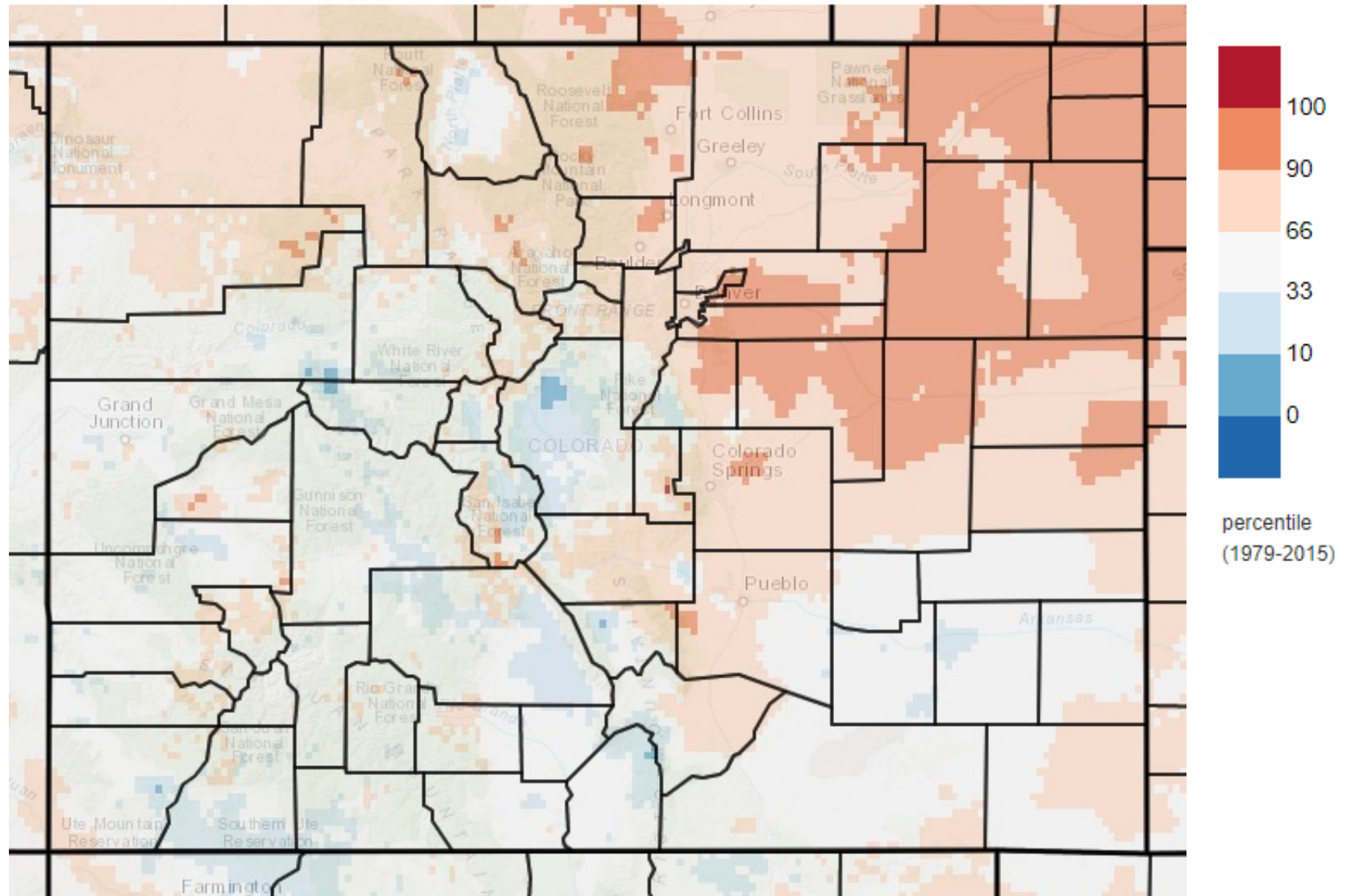


<https://climate.colostate.edu/drought/>



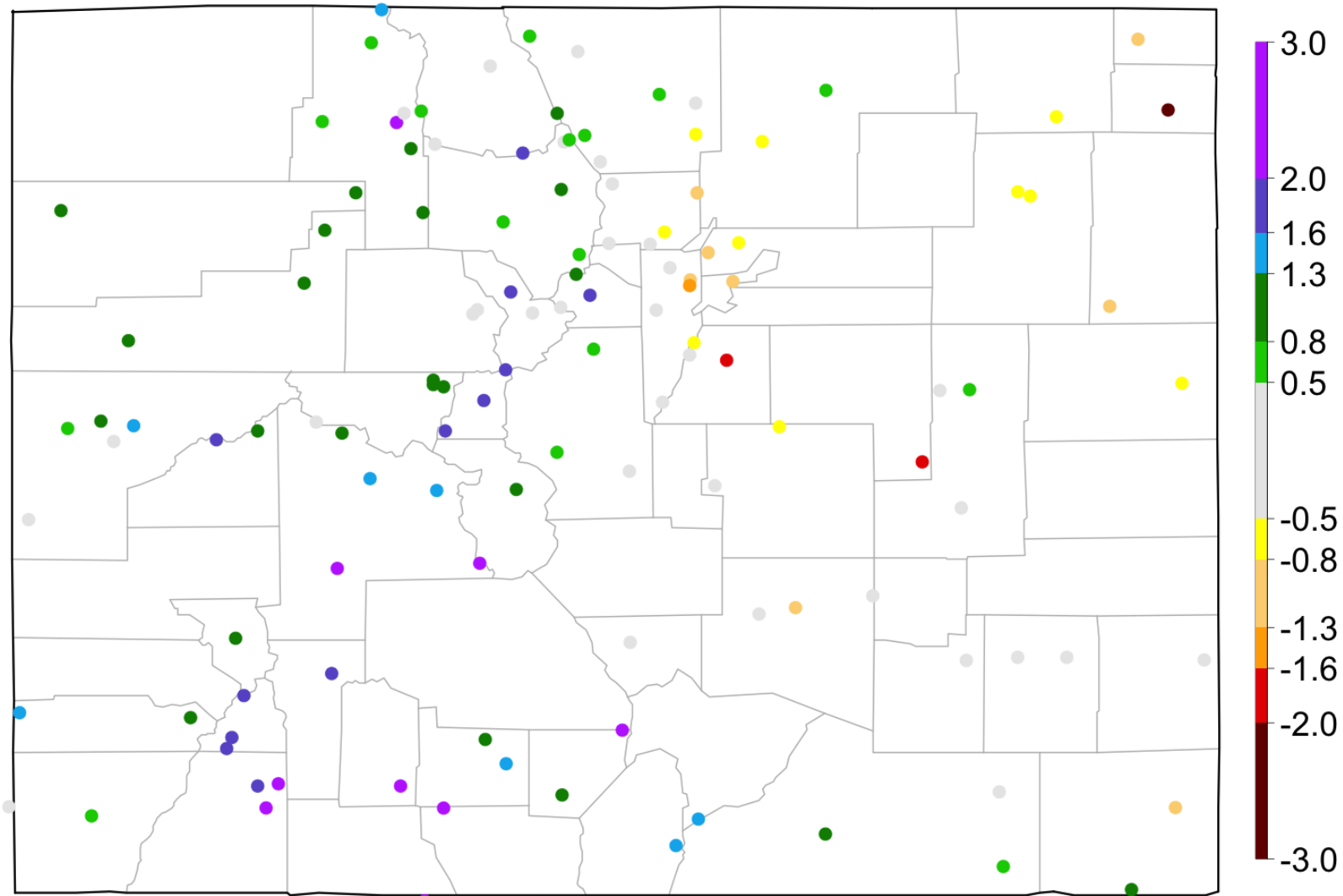
Mean Daily Temperature Percentile, Last 30 Days

2022/06/17 - 2022/07/16



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

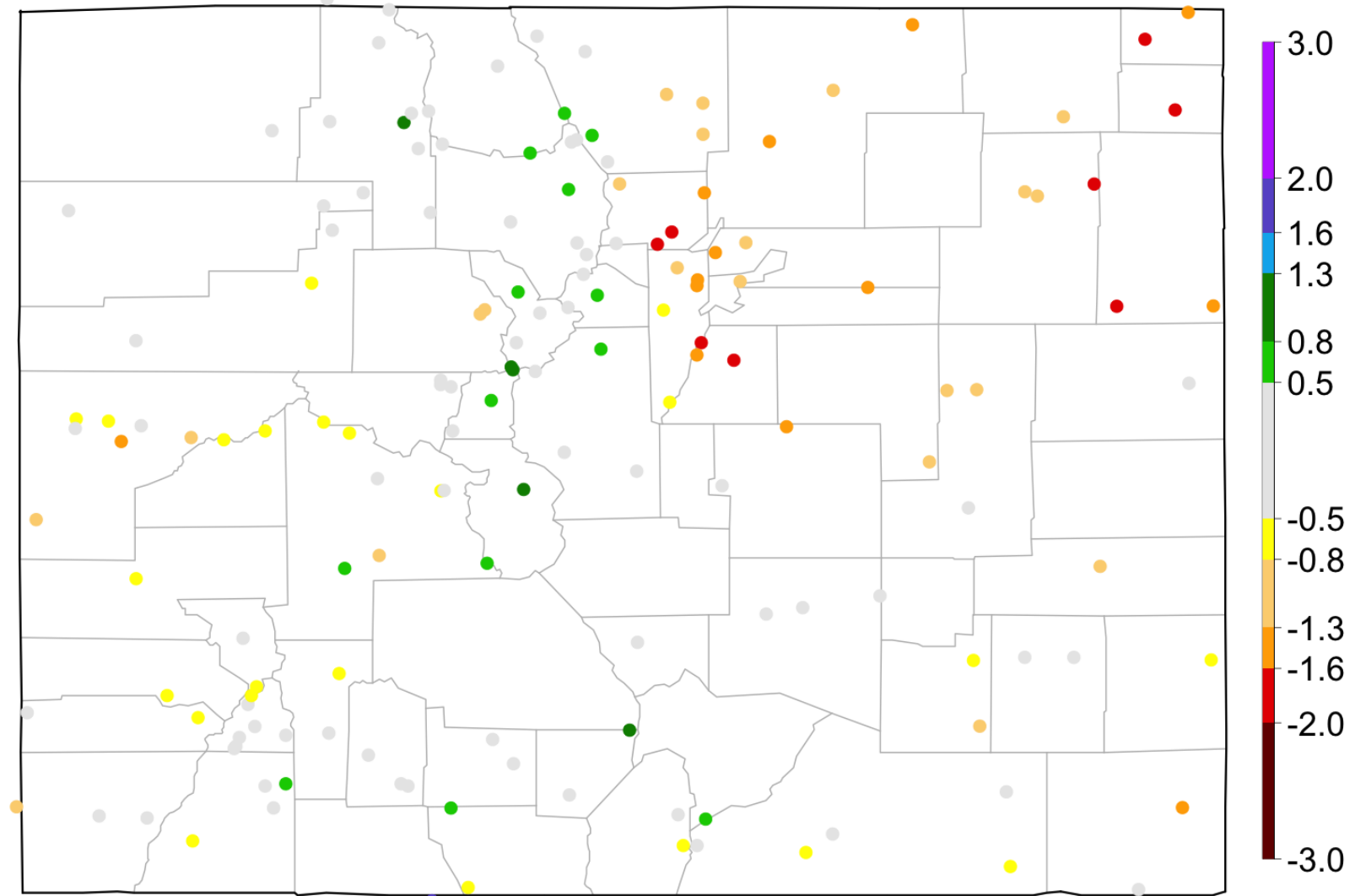
30-day SPI: 2022/06/18 - 2022/07/17



Data from High Plains Regional Climate Center and ACIS

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

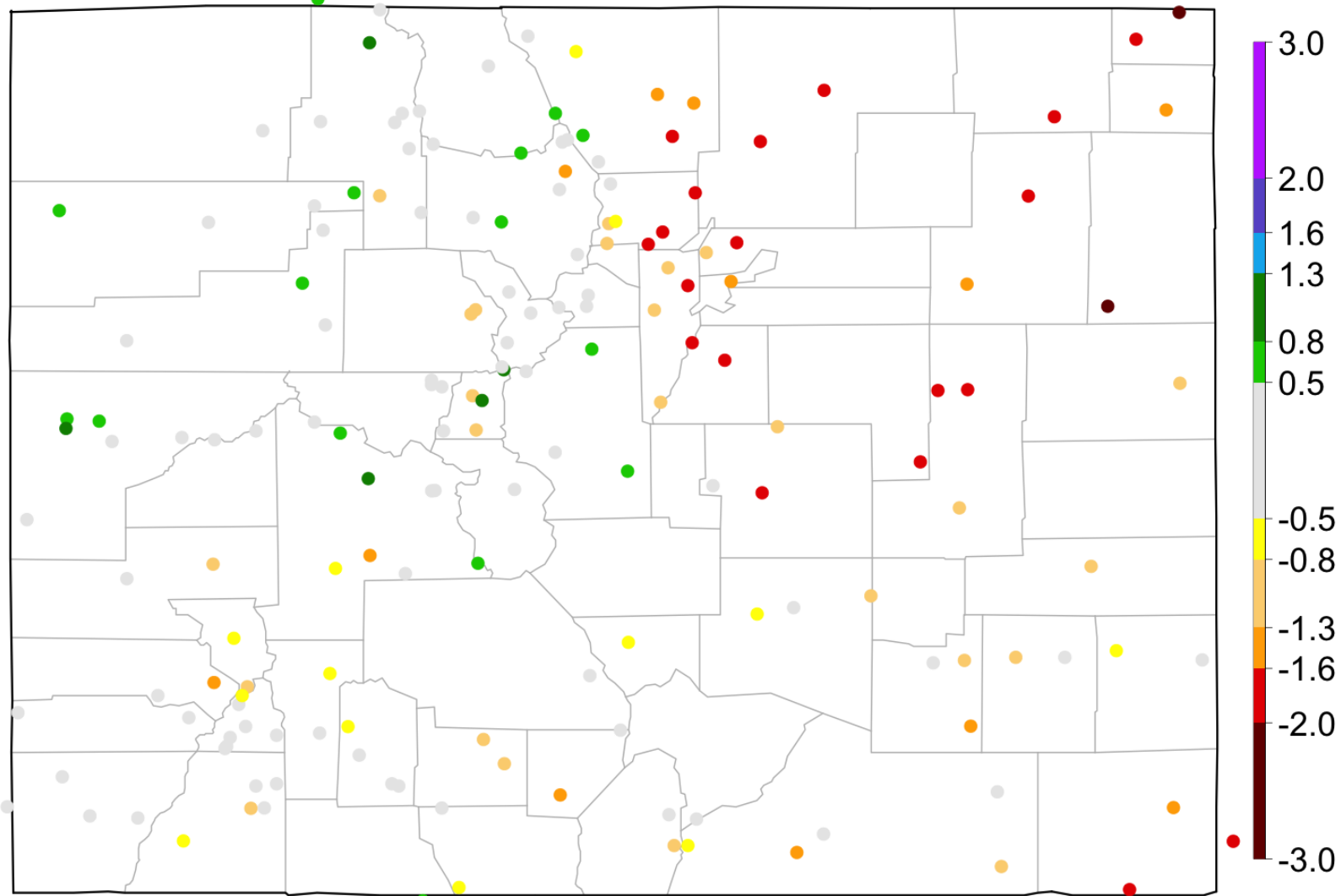
120-day SPI: 2022/03/20 - 2022/07/17



Data from High Plains Regional Climate Center and ACIS

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

12-month SPI: 2021/07/18 - 2022/07/17

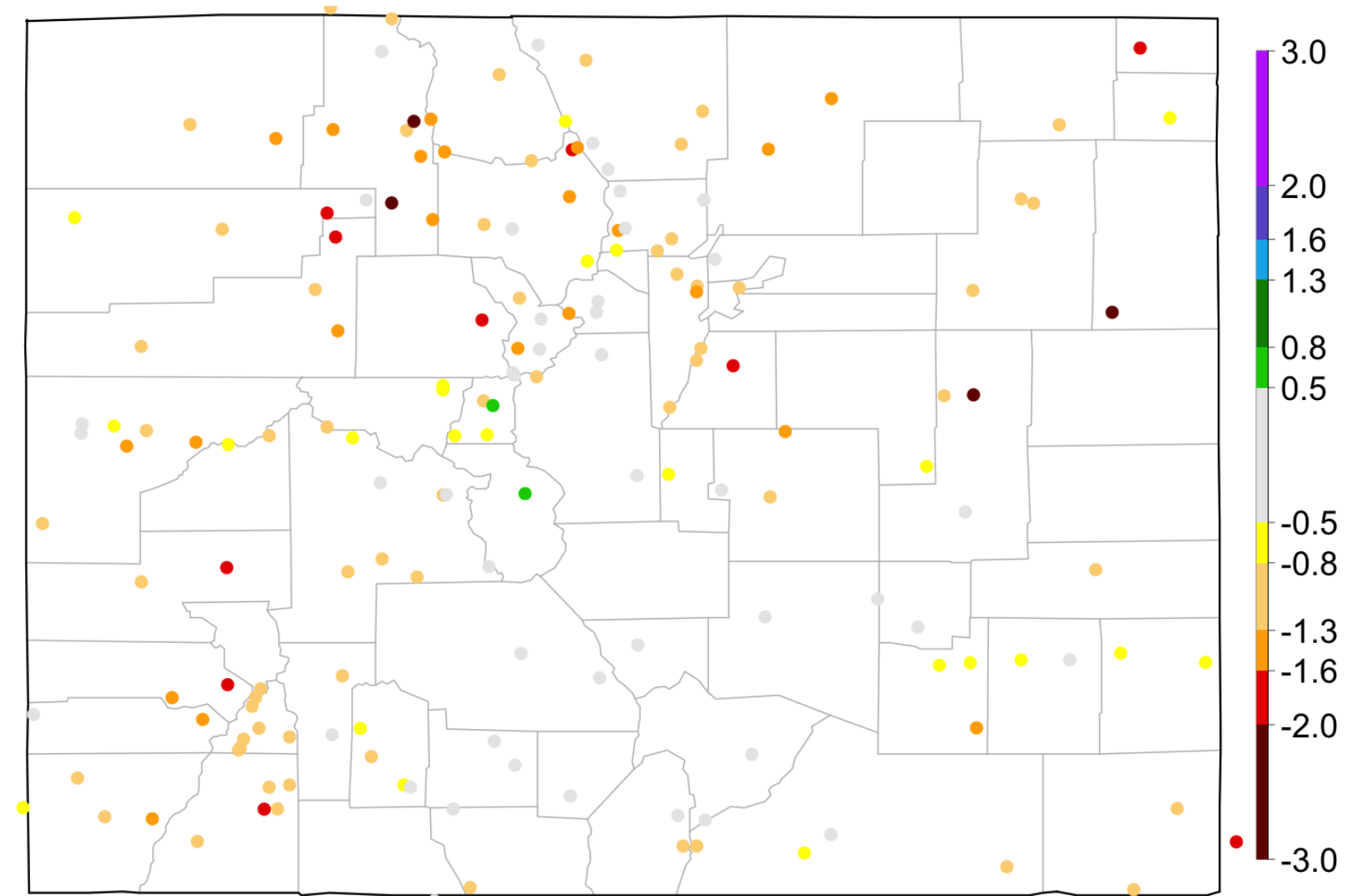


Data from High Plains Regional Climate Center and ACIS

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

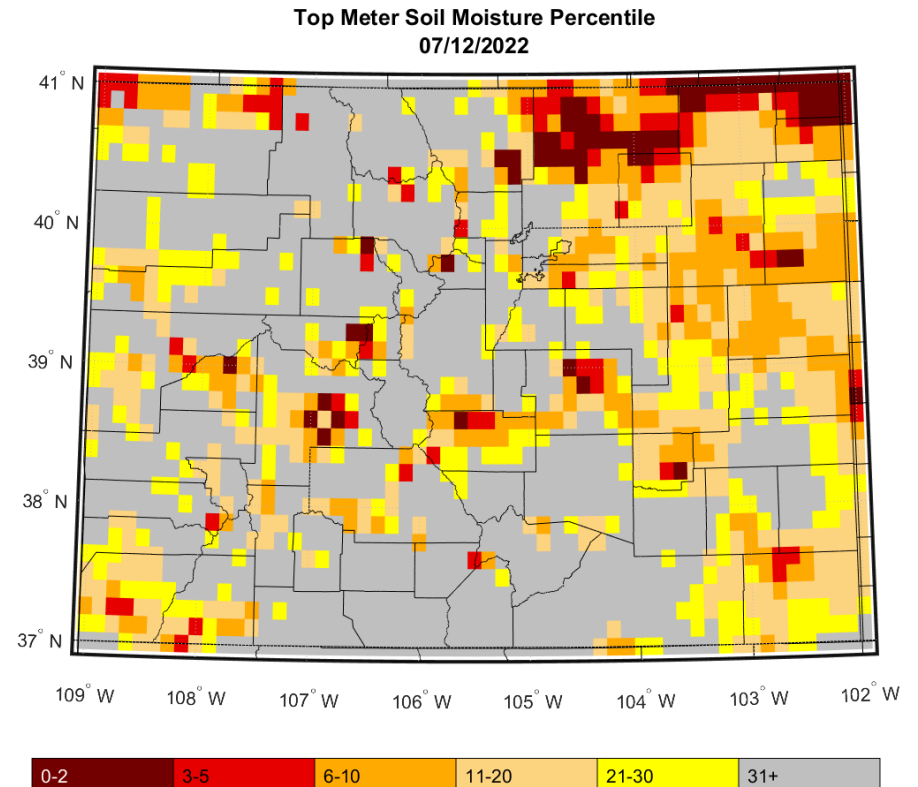
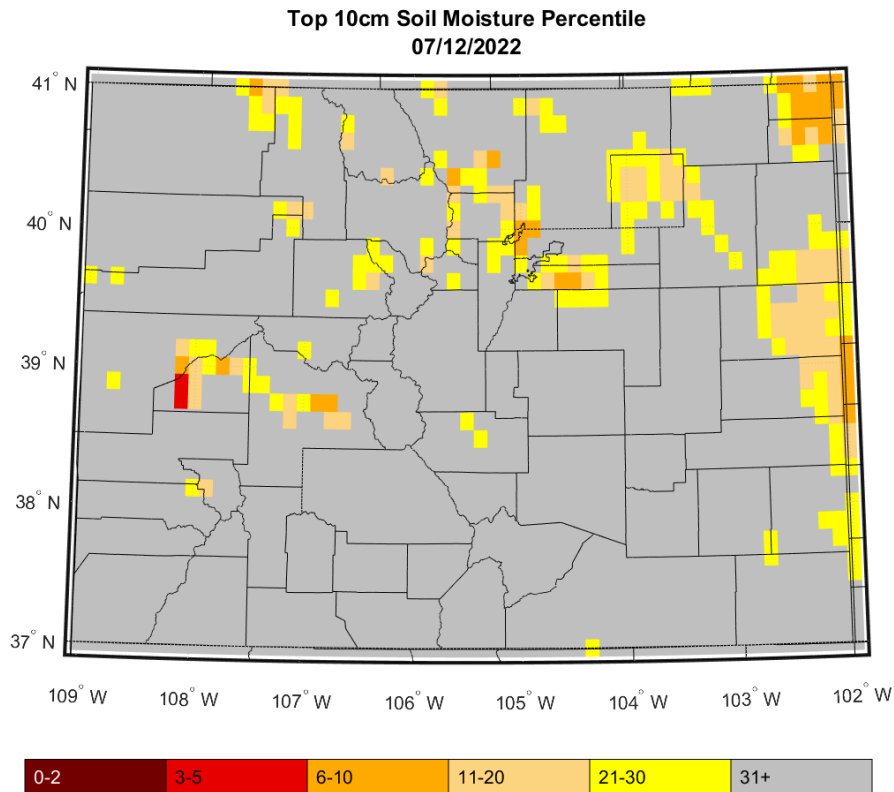


24-month SPI: 2020/07/18 - 2022/07/17



Data from High Plains Regional Climate Center and ACIS

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.

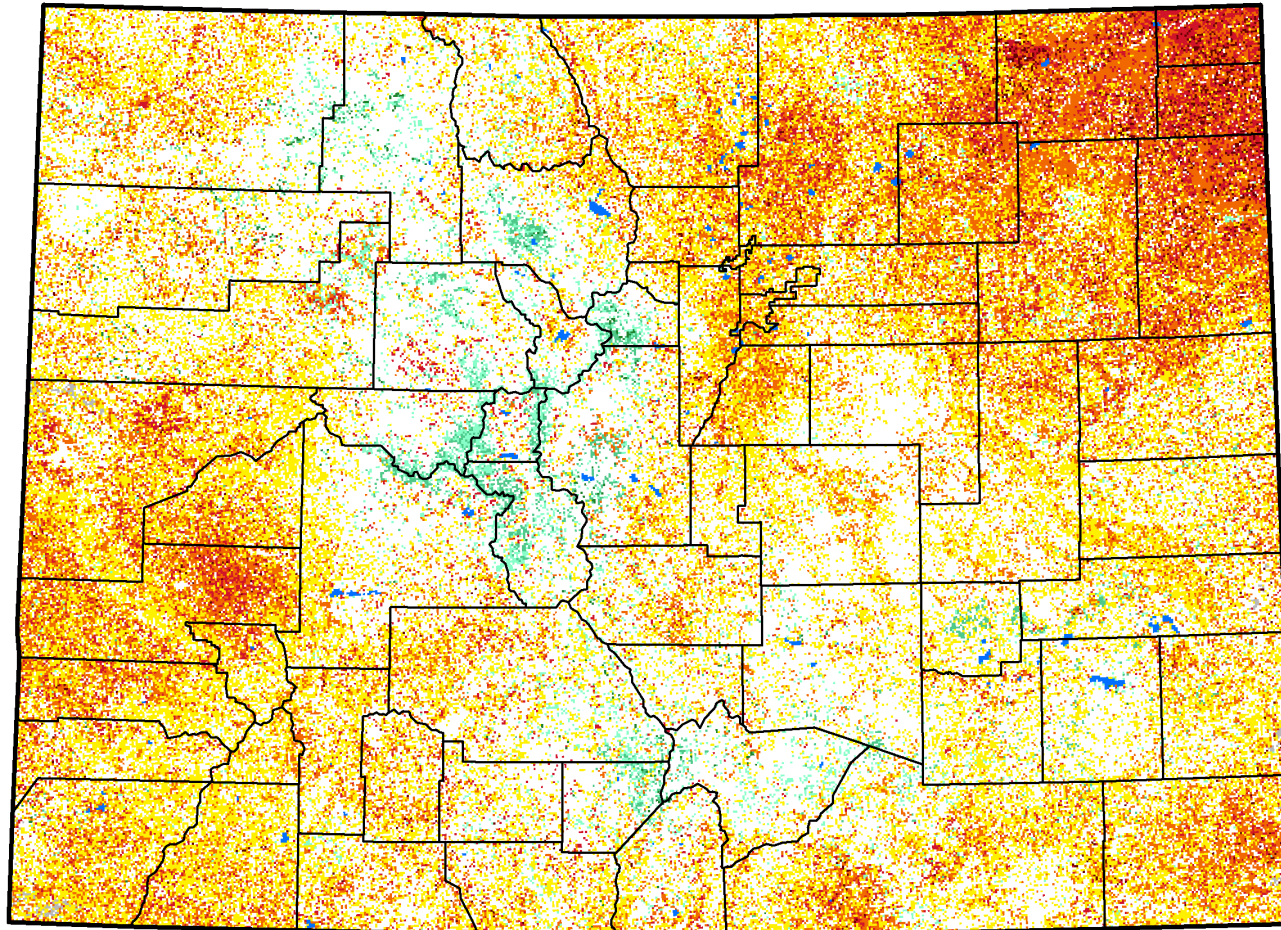
<https://climate.colostate.edu/drought>



Vegetation Drought Response Index

Complete: Colorado

July 17, 2022

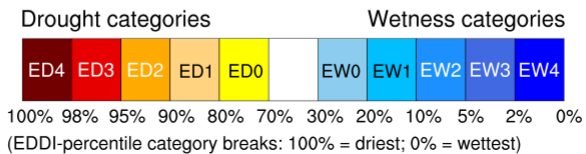
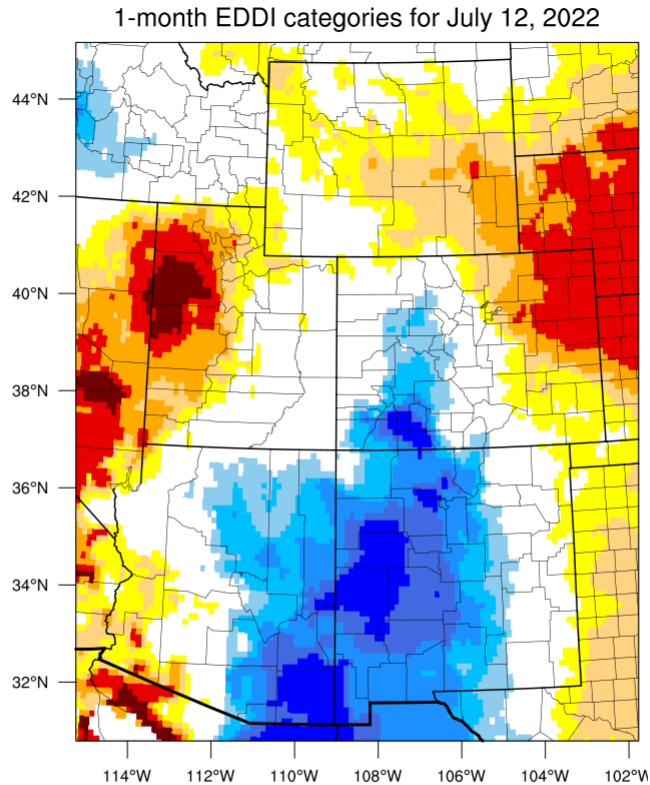


Vegetation Condition

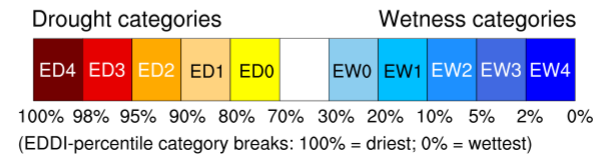
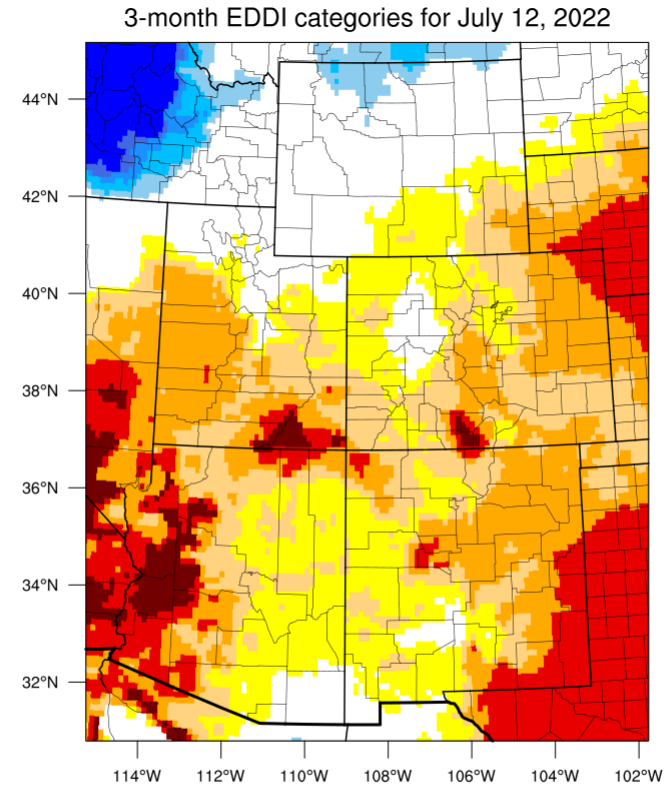
- Extreme Drought
- Severe Drought
- Moderate Drought
- Pre-drought stress
- Near Normal
- Unusually Moist
- Very Moist
- Extreme Moist
- Out of Season
- Water



Evaporative Demand



Generated by NOAA/ESRL/Physical Sciences Laboratory



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/>





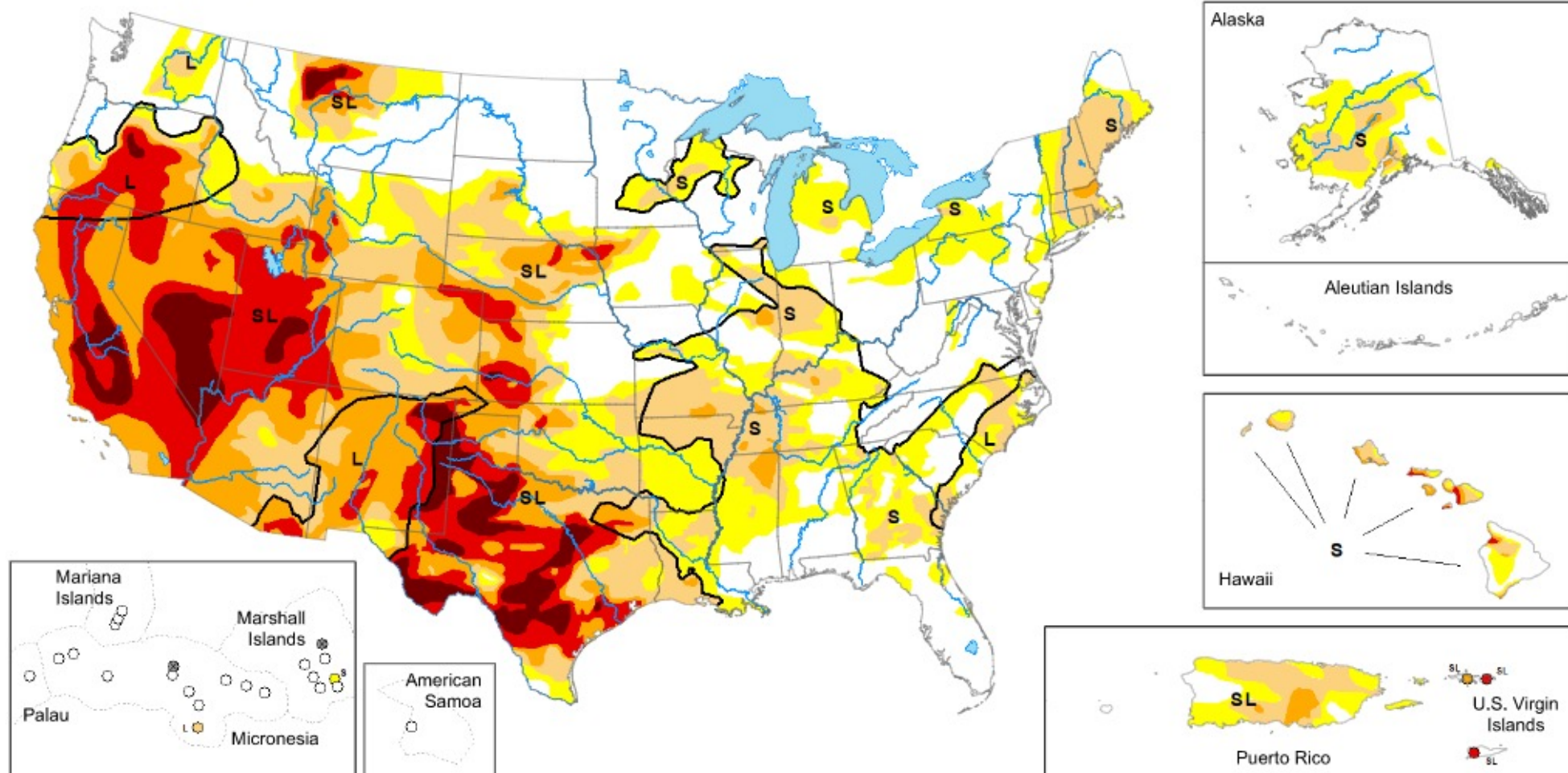
Drought

- National Drought
- Colorado Drought
- Some Drought Facts



Map released: July 14, 2022

Data valid: July 12, 2022

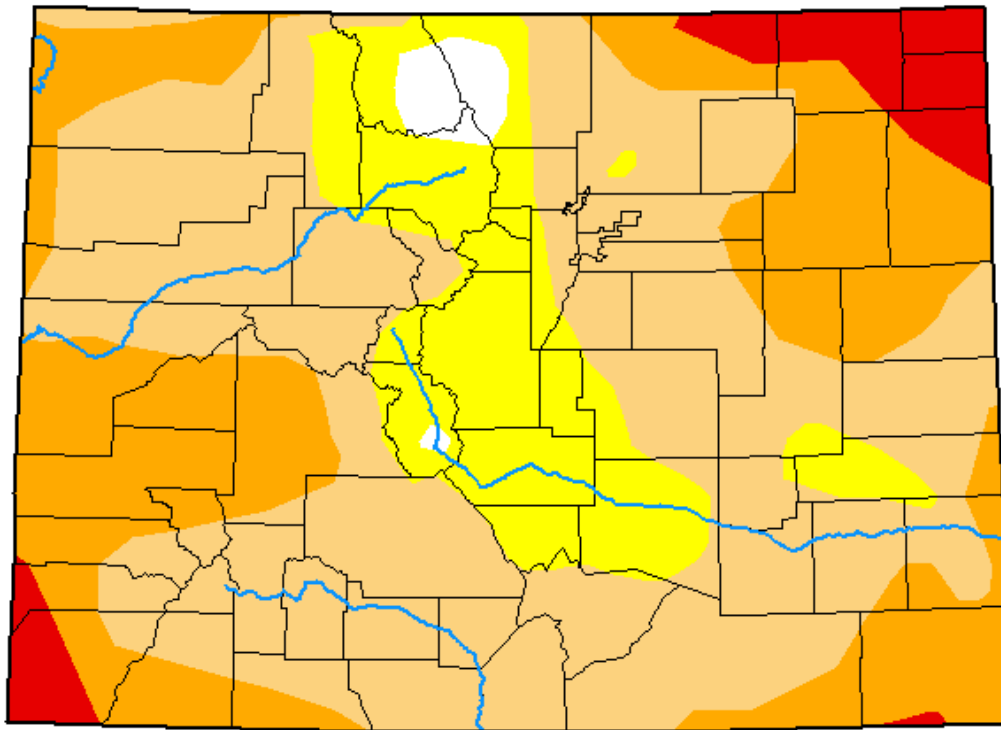


U.S. Drought Monitor Colorado

July 12, 2022
(Released Thursday, Jul. 14, 2022)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	1.52	98.48	82.84	31.59	4.88	0.00
Last Week <i>07-05-2022</i>	1.52	98.48	82.84	44.60	5.06	0.07
3 Months Ago <i>04-12-2022</i>	0.00	100.00	82.90	31.94	4.32	0.53
Start of Calendar Year <i>01-04-2022</i>	0.00	100.00	95.49	67.08	22.25	0.00
Start of Water Year <i>09-28-2021</i>	12.72	87.28	46.42	26.30	15.05	3.91
One Year Ago <i>07-13-2021</i>	54.44	45.56	40.99	36.23	29.94	18.32



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>

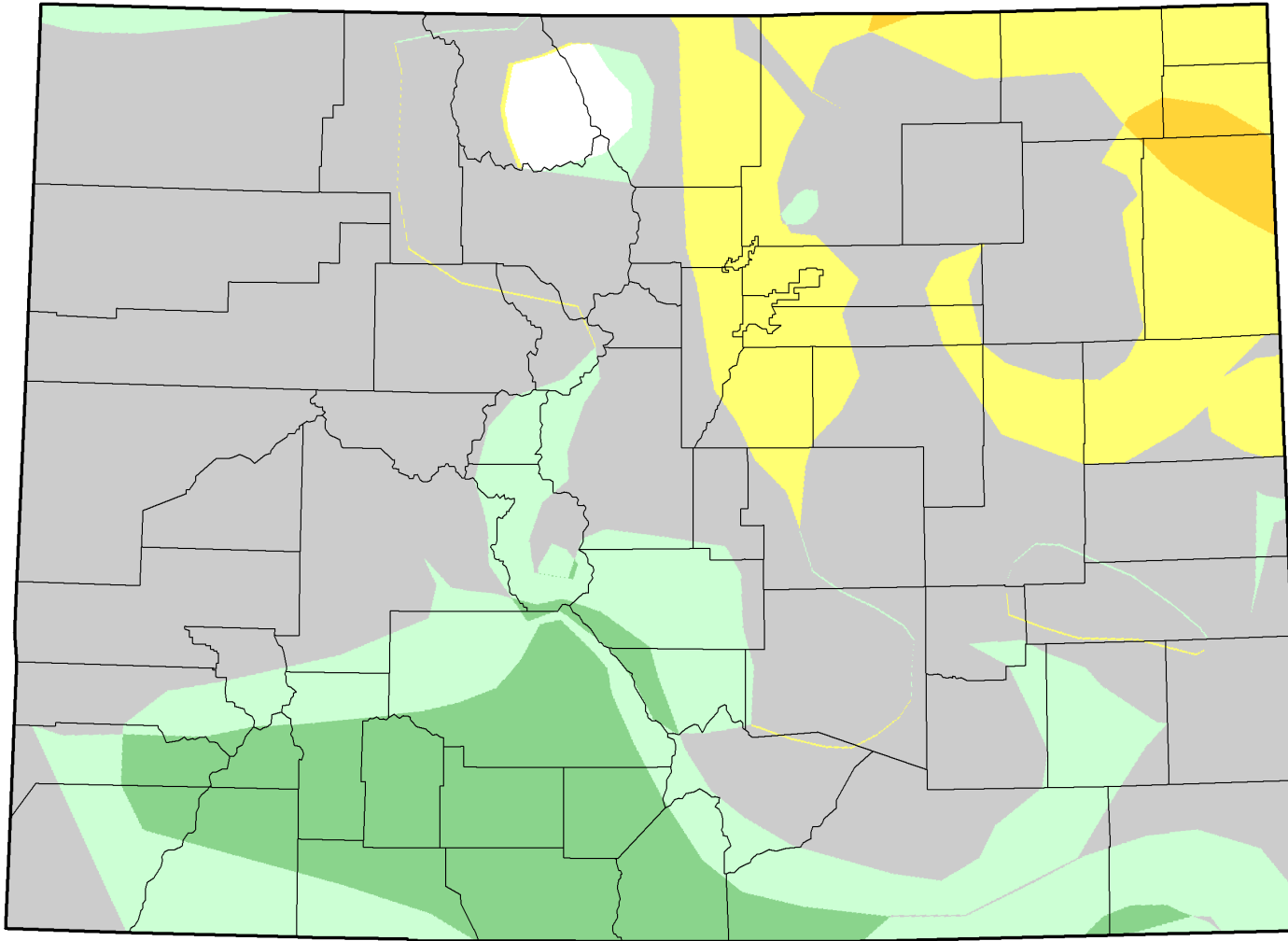
Author:

Brian Fuchs
National Drought Mitigation Center














droughtmonitor.unl.edu

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



July 12, 2022
compared to
June 14, 2022



-  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

droughtmonitor.unl.edu



Outlook

Next 7 days

8-14 day Outlook

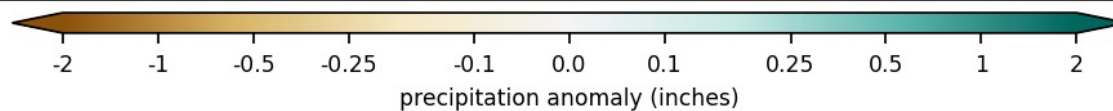
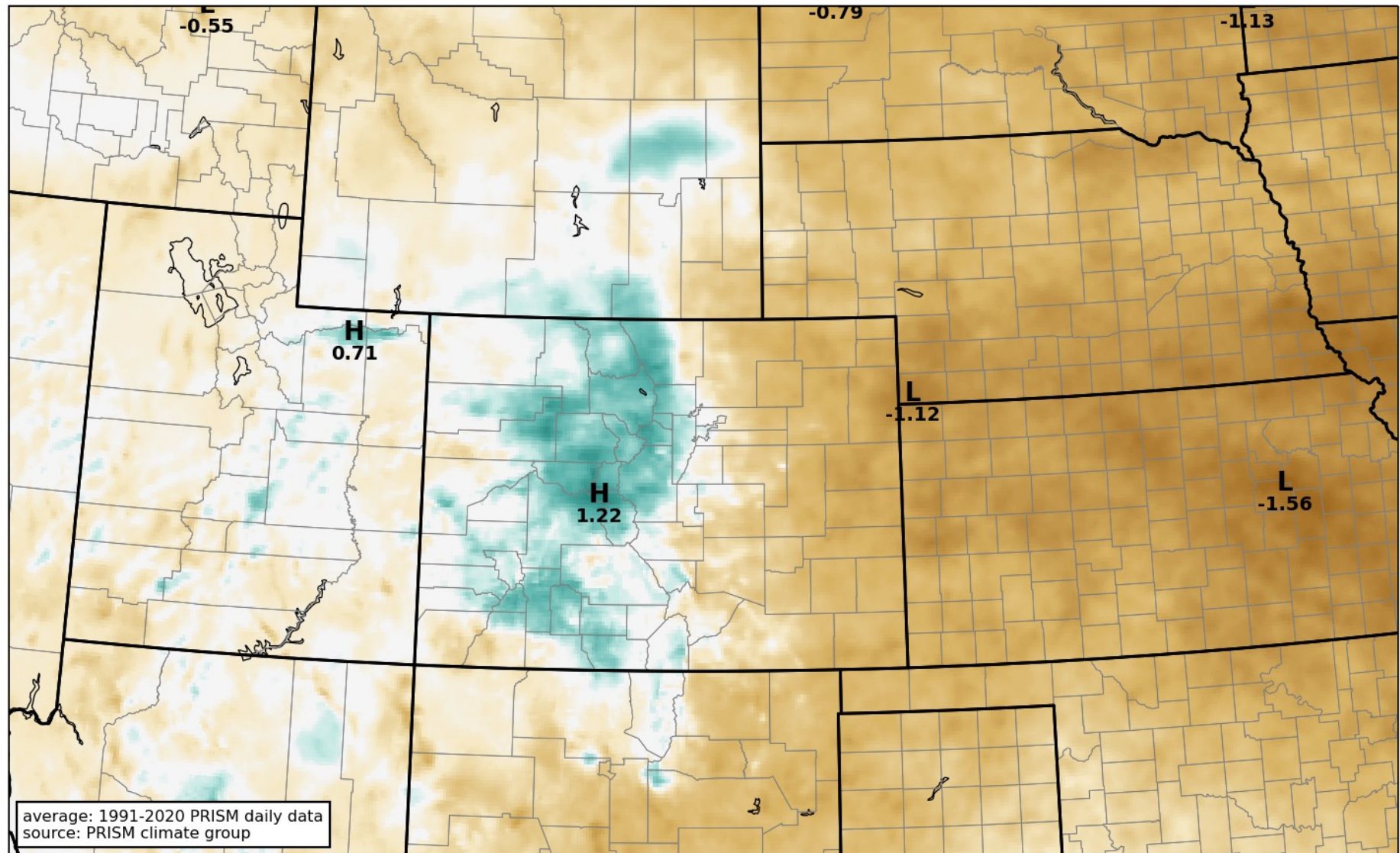
CPC Outlooks

La Niña

NOAA 7-day precip forecast

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

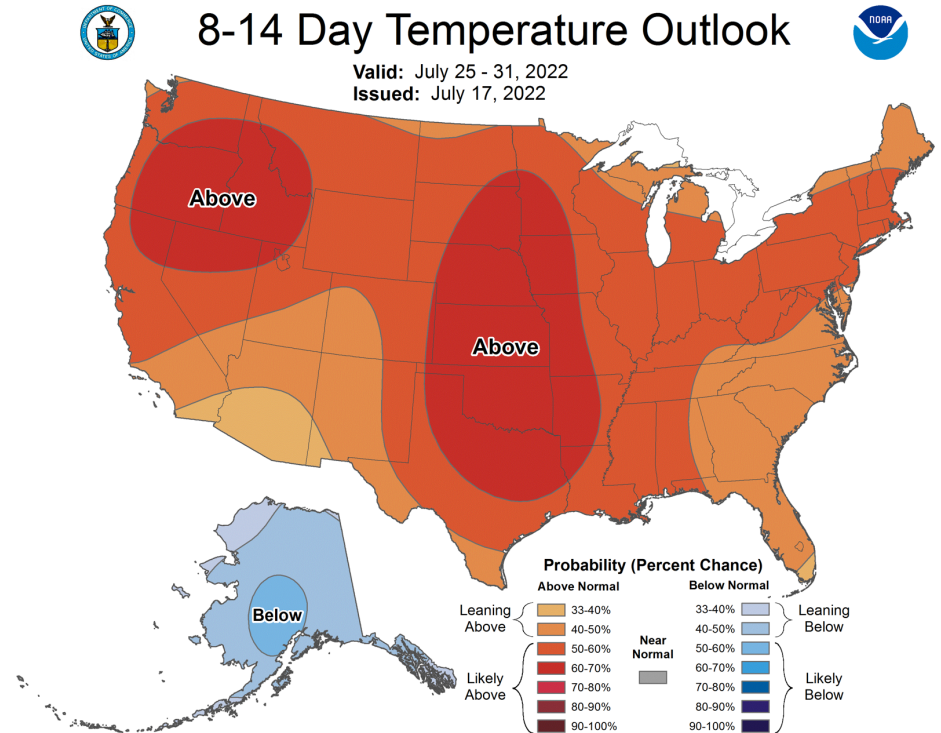
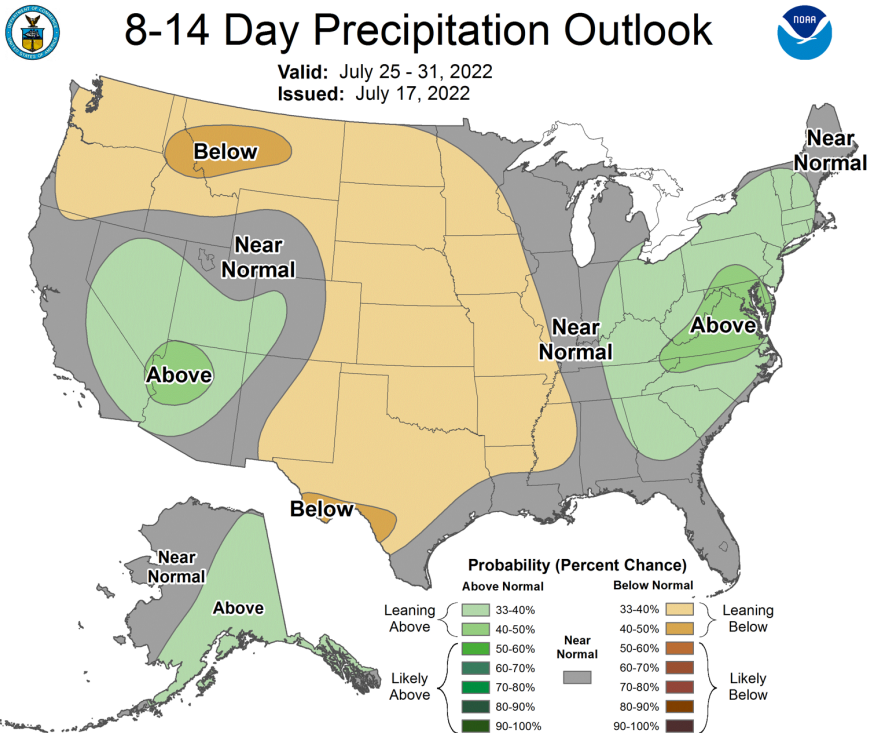
forecast issued 1200 UTC Mon 18 Jul 2022
precipitation in 168 hrs ending 1200 UTC Mon 25 Jul 2022



<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>

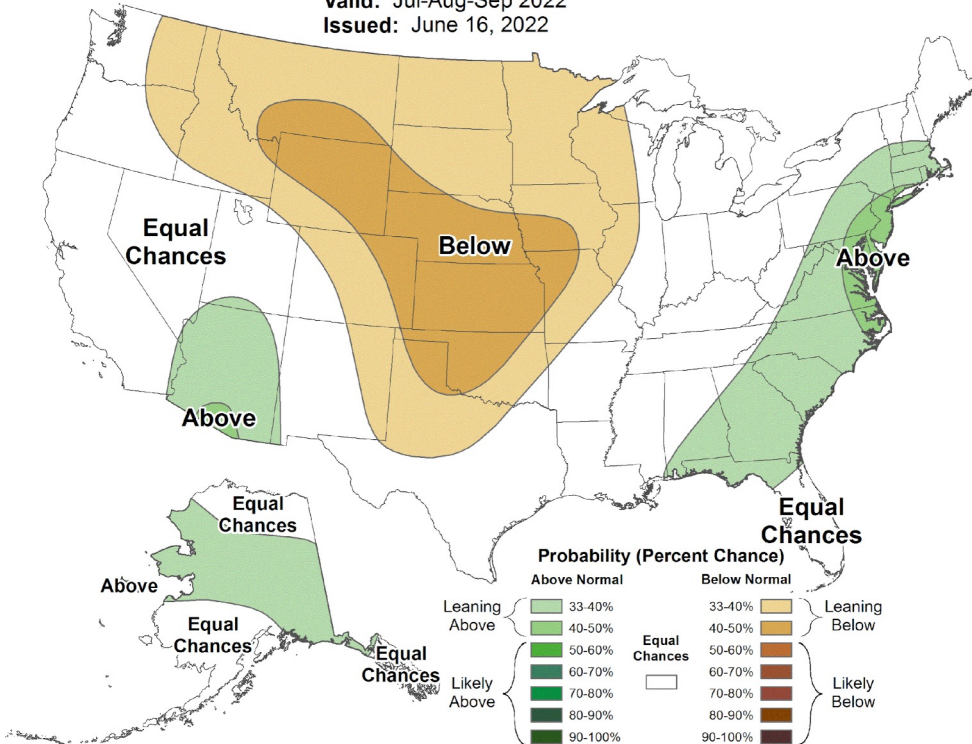


Seasonal outlook



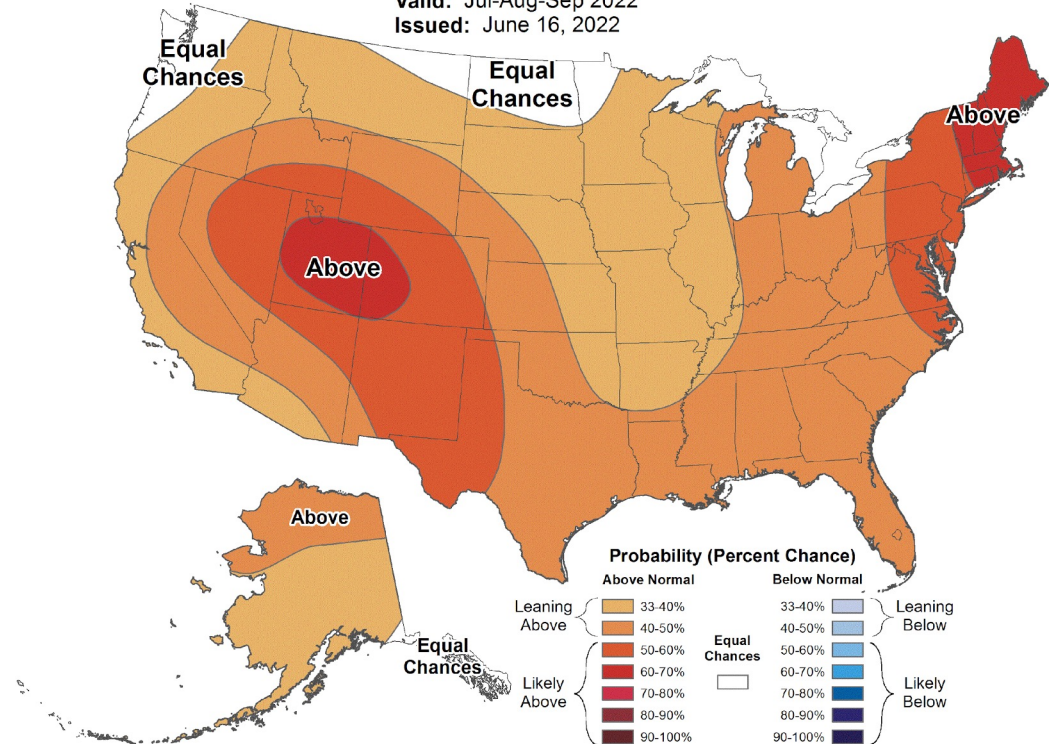
Seasonal Precipitation Outlook

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.

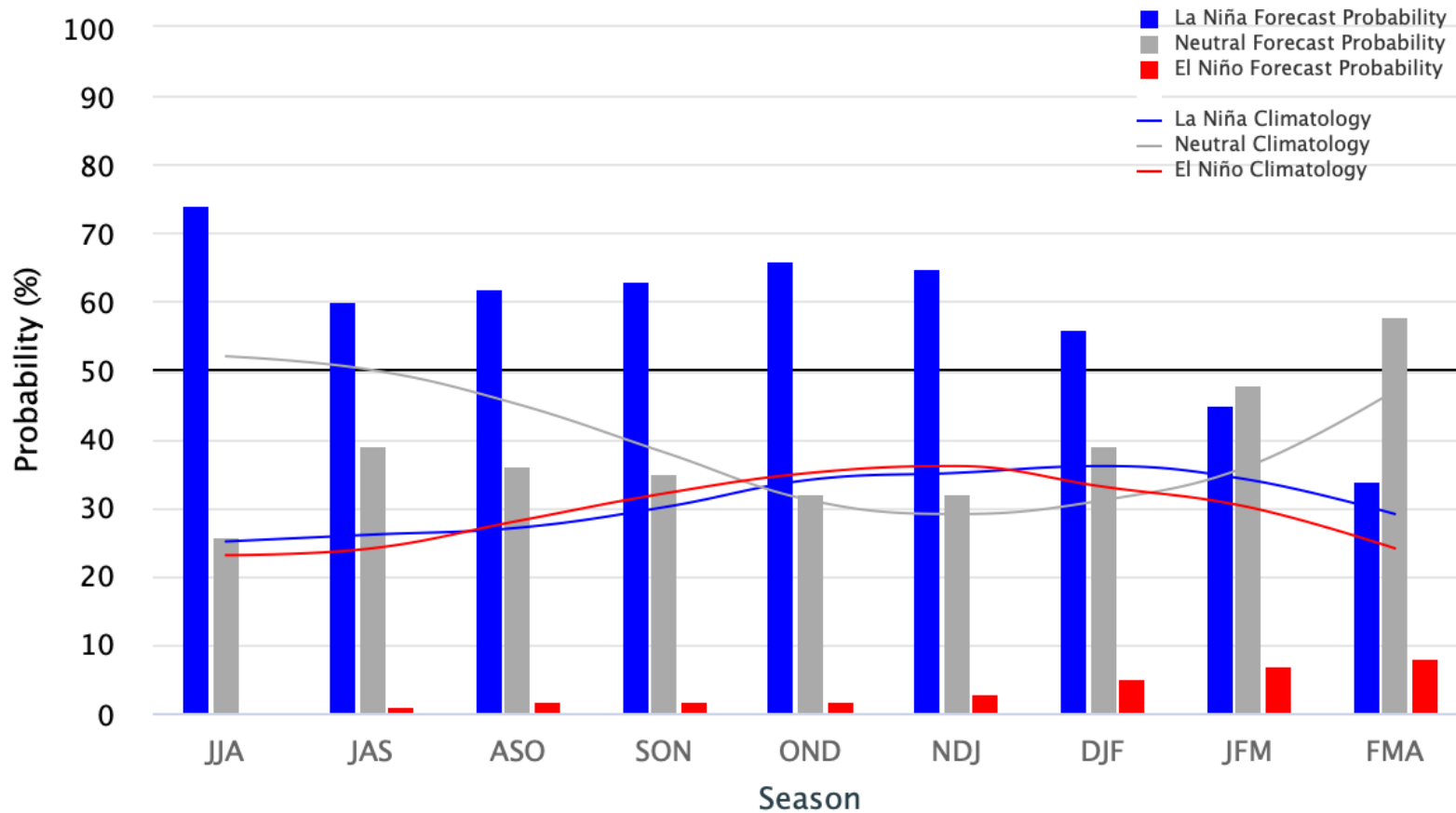
<https://www.cpc.ncep.noaa.gov>



What's the ENSO forecast?

Early-July 2022 CPC/IRI Official Probabilistic ENSO Forecasts

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



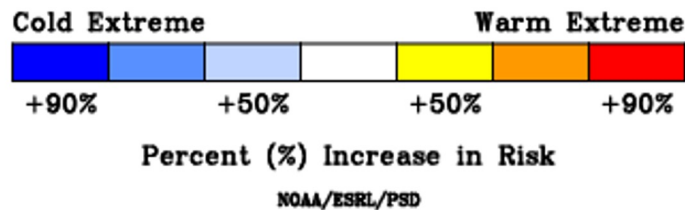
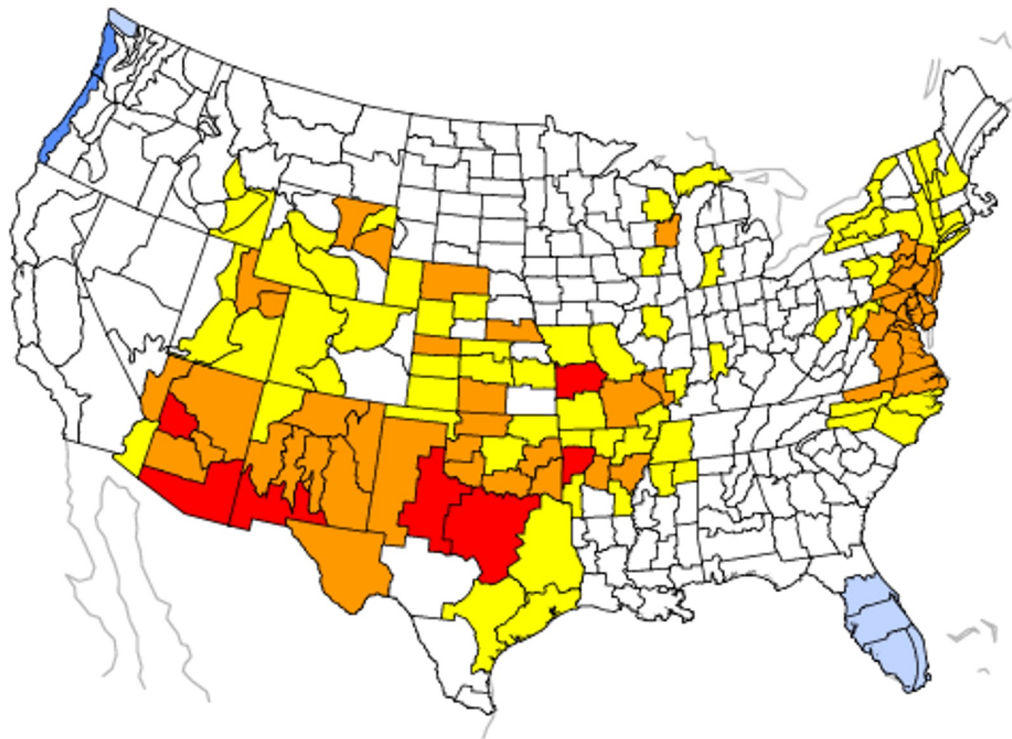
<https://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/>



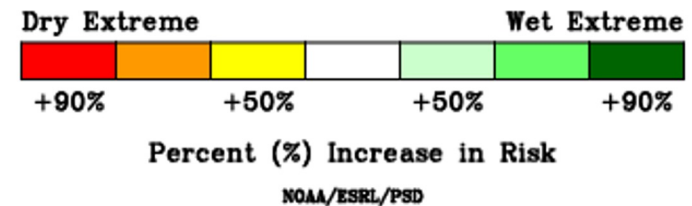
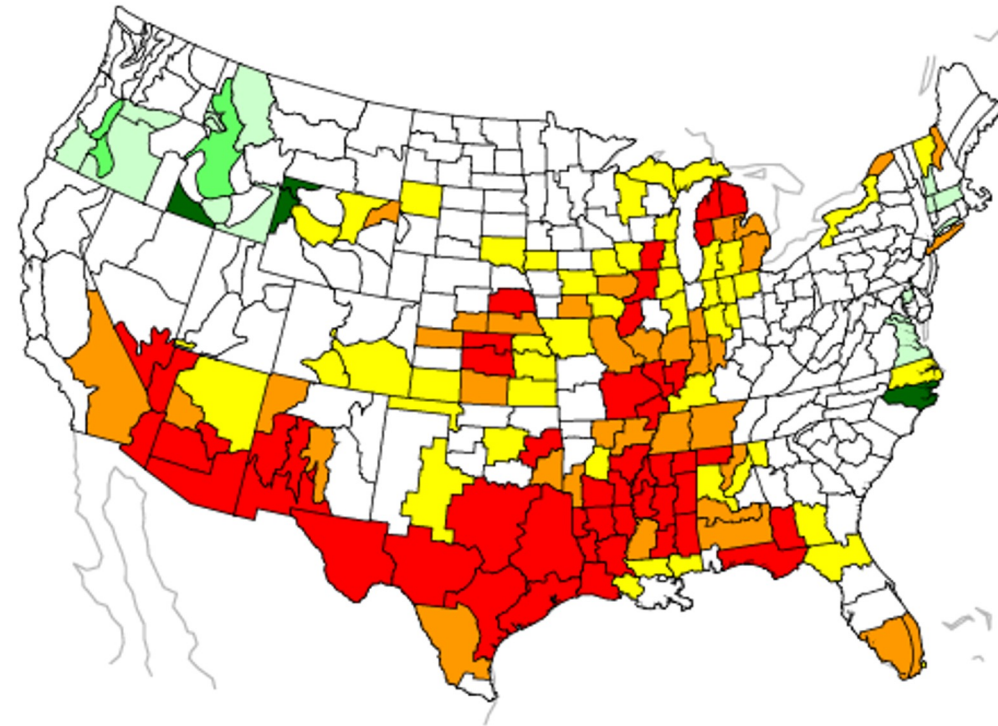


What does La Niña
mean for the fall?

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

- ❑ June was warmer than 20th century averages, but not out of line with recent years. An early monsoonal surge led to above normal moisture for western CO, but lack of polar jet influence and cold air led to a dry eastern plains.
- ❑ Long-term drought impacts remain evident in streams vegetation.
- ❑ Active monsoon is expected to continue, but the remainder of summer is expected to stay hot and linger late
- ❑ It is likely that either La Niña conditions will persist or neutral conditions will develop in fall. El Niño development is unlikely. This, in combination with other patterns observed in a warming climate (e.g. late redevelopment of cold arctic air) mean warm/dry conditions are likely to persist into fall



Thanks!

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