

Colorado Climate Update

Russ Schumacher, state climatologist

Water Conditions Monitoring Committee

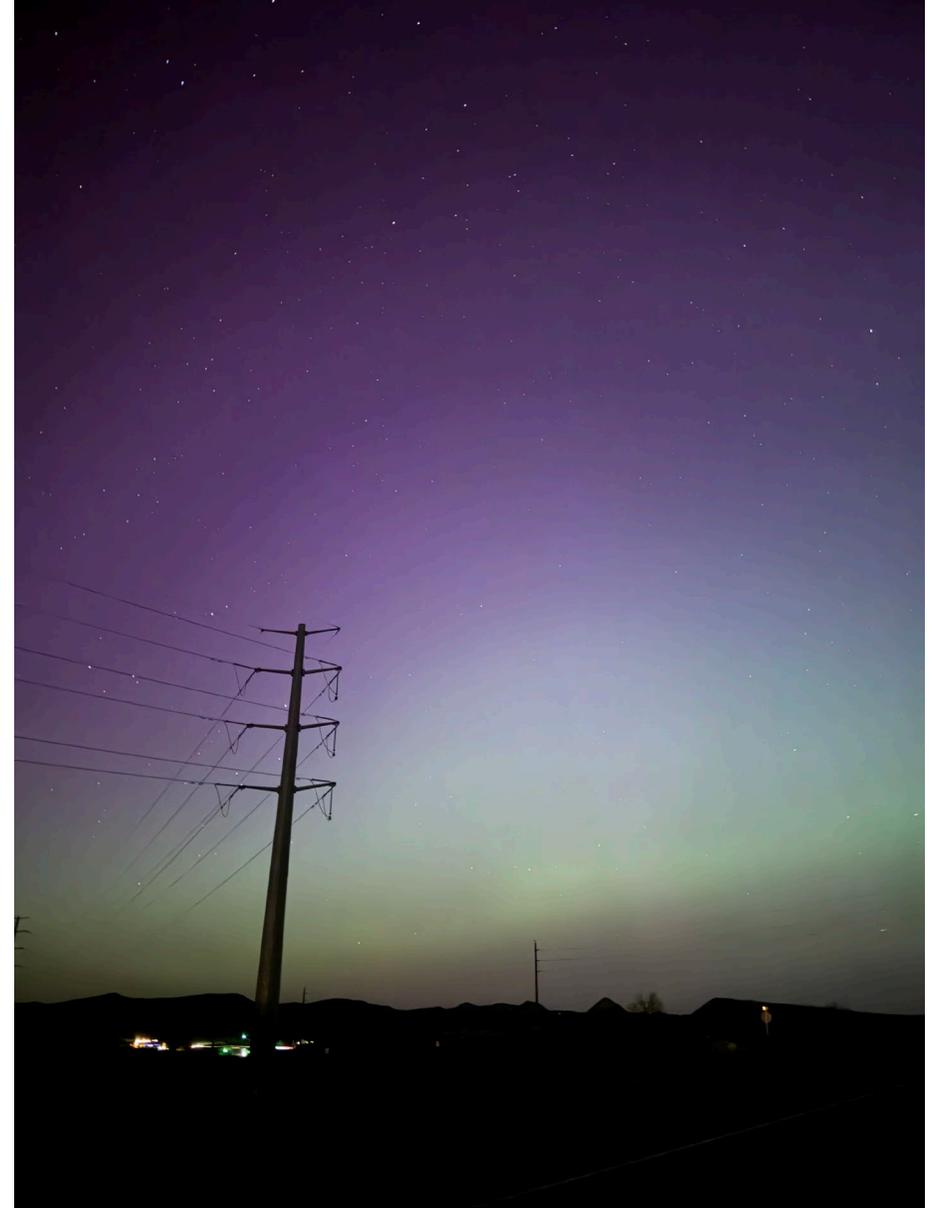
May 21, 2024



ATMOSPHERIC SCIENCE
COLORADO STATE UNIVERSITY

Water year 2024 to date:

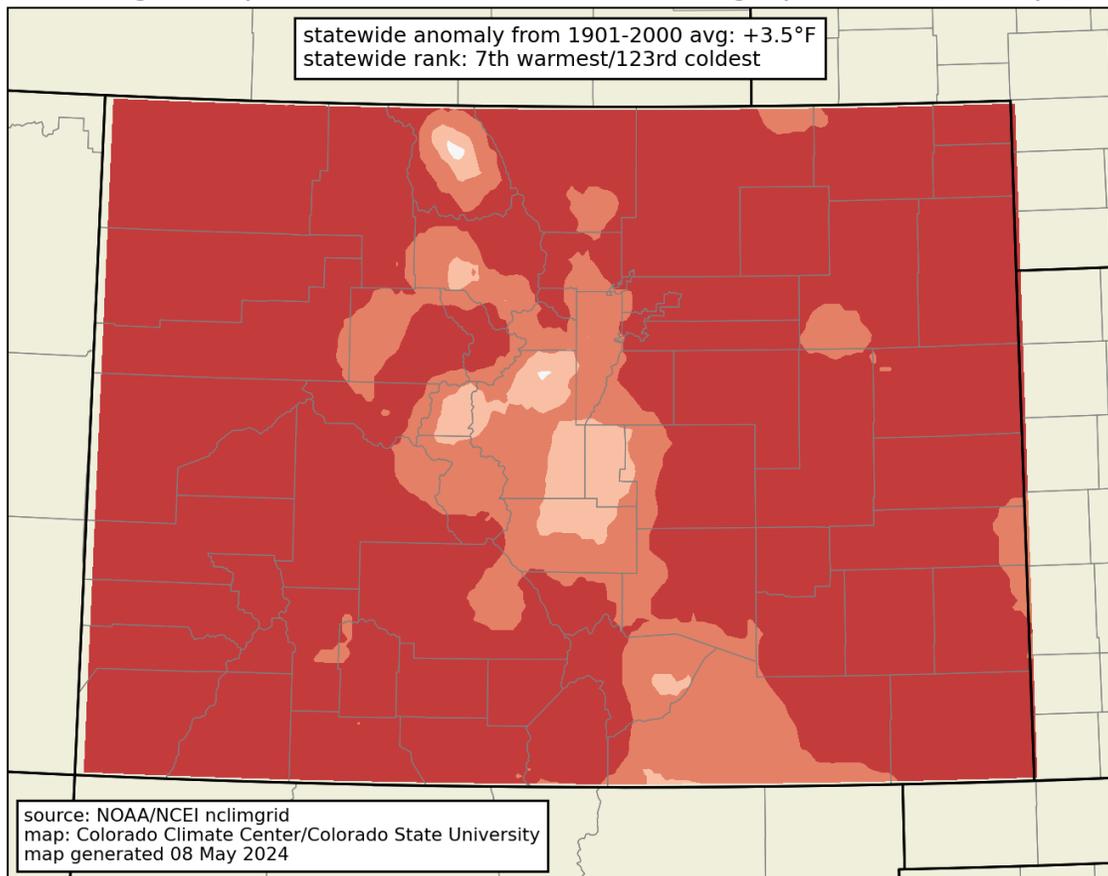
temperature, precipitation,
evaporative demand



Aurora north of Fort Collins, May 10



average temperature rank: 7 months ending April 2024 (Oct-Apr)



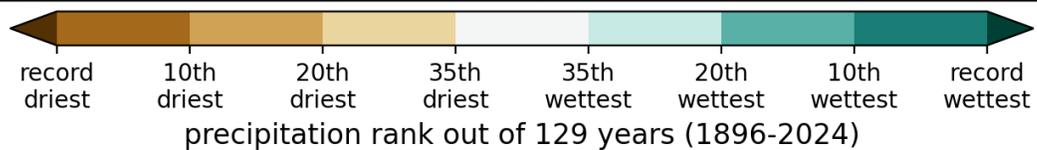
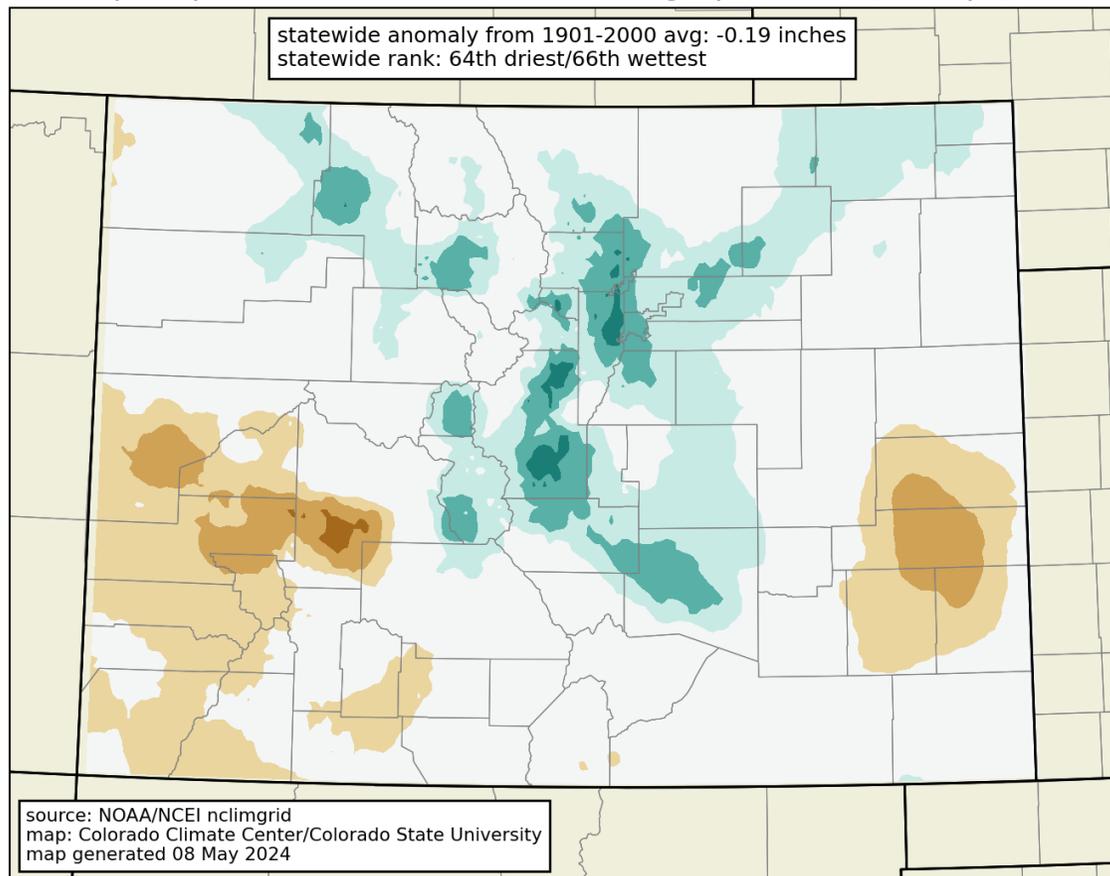
Colorado rankings:

Month	T Rank (of 129 years)	Above, below, or near 20 th century avg?
Oct	26 th warmest	above
Nov	20 th warmest	above
Dec	7 th warmest	much above
Jan	51 th warmest	near avg
Feb	11 th warmest	much above
March	31 st warmest	above
April	17 th warmest	above

Statewide: 7th warmest October-April (out of 129), warmest start to a water year since 2018



precipitation rank: 7 months ending April 2024 (Oct-Apr)



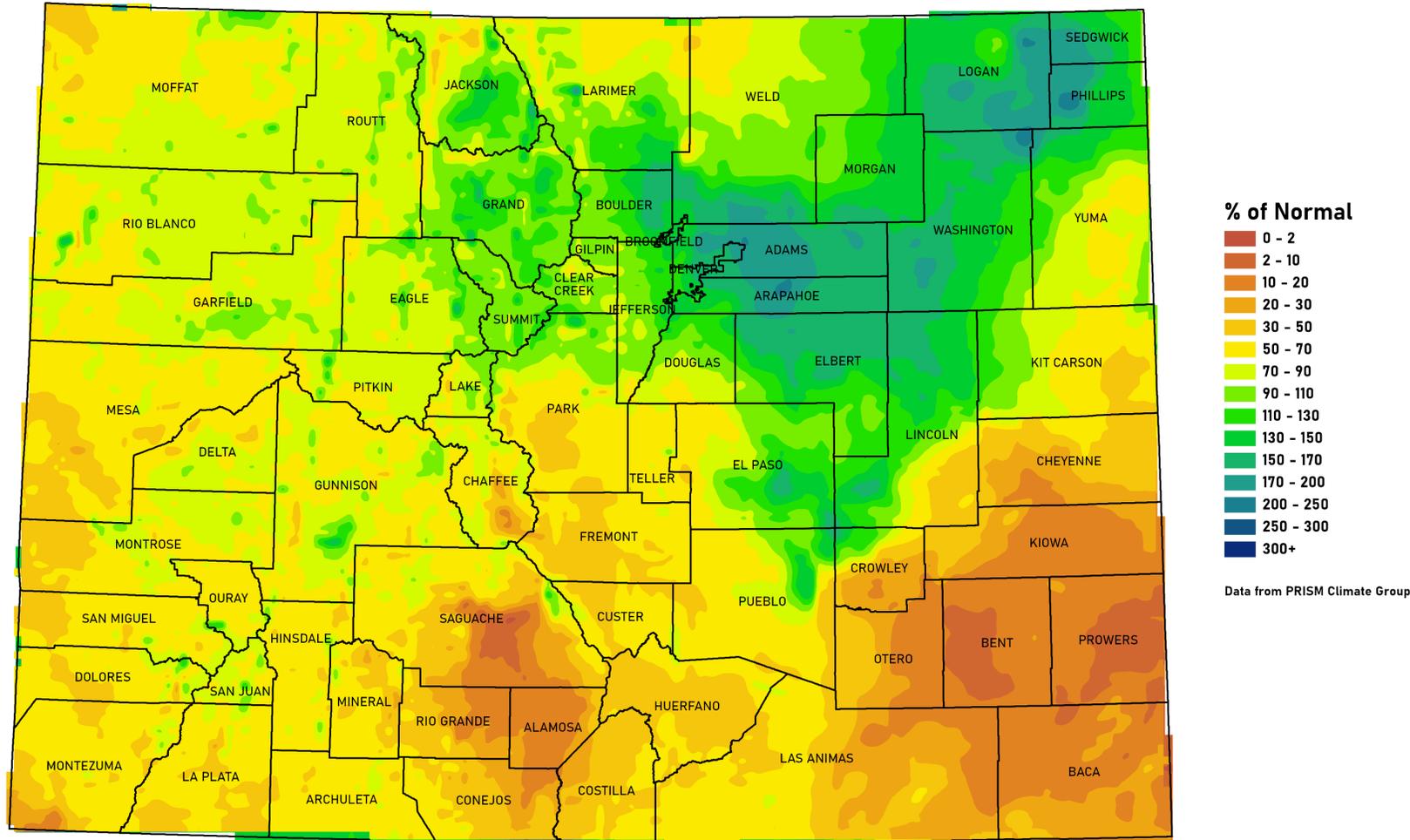
Statewide: 64th driest/66th wettest October-April (out of 129): almost exactly average

Colorado rankings:

Month	T Rank (of 129 years)	Above, below, or near 20 th century avg?
Oct	52 nd driest	near avg
Nov	22 nd driest	below
Dec	66 th driest	near avg
Jan	47 th wettest	near avg
Feb	19 th wettest	above
Mar	16 th wettest	above
Apr	46 th driest	near avg



Colorado April 2024 Precipitation as a Percentage of Normal



0 25 50 100 Miles



Colorado statewide average temperature and precipitation, April

Warm & dry

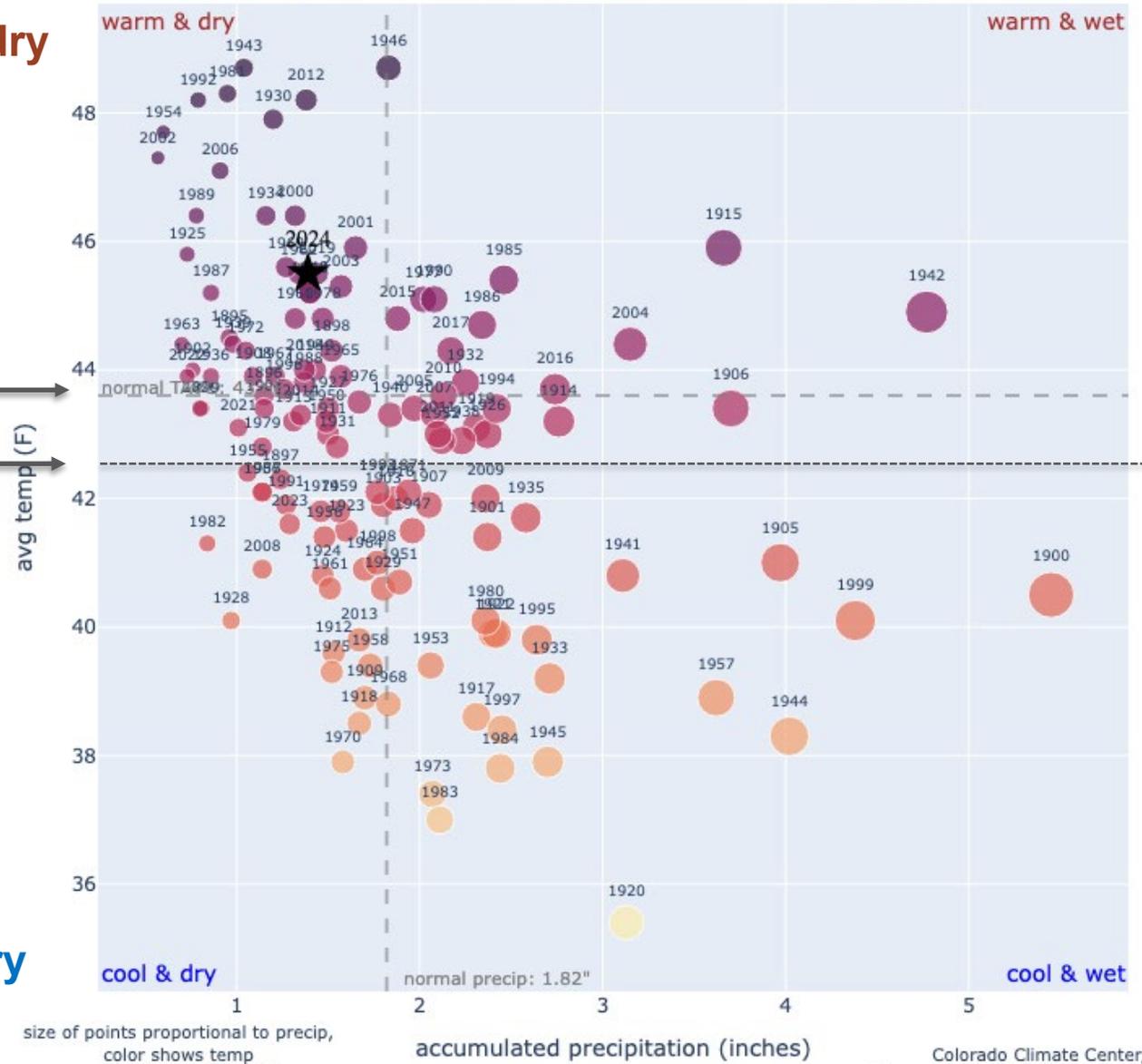
warm & wet

Warm & wet

April 2024

avg temp (F)

1991-2020 avg temp →
1901-2000 avg temp →



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

Cool & dry

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



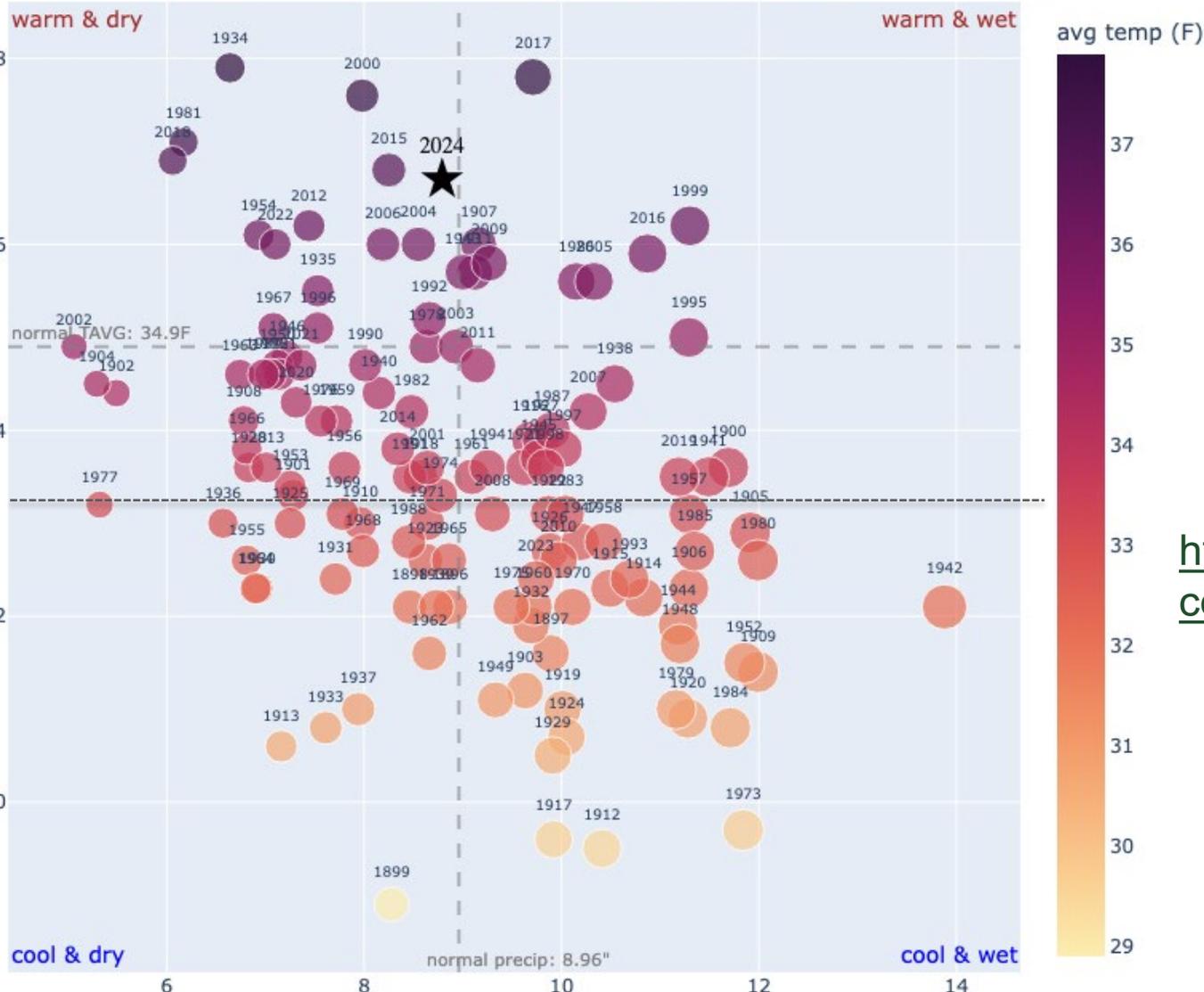
Colorado statewide average temperature and precipitation, October - April

Warm & dry

warm & wet

Warm & wet

Water year 2024 through April



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

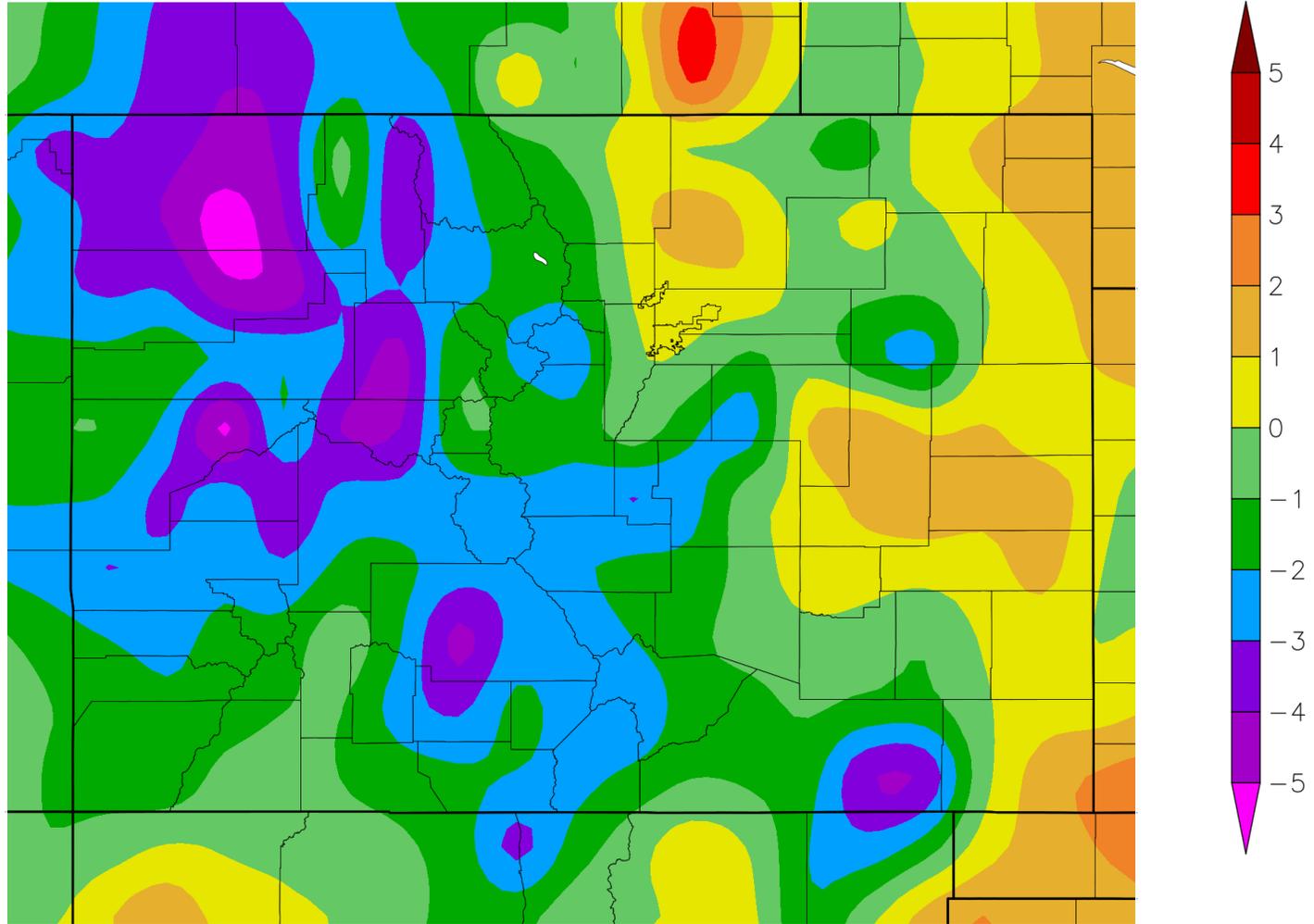
https://climate.colostate.edu/co_cag/quadrant.html



Departure from Normal Temperature (F)

May temperature so far

5/1/2024 – 5/19/2024

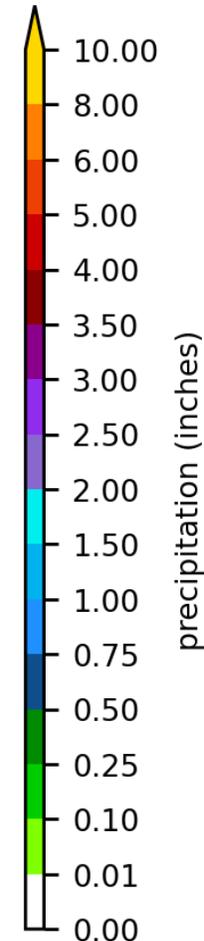
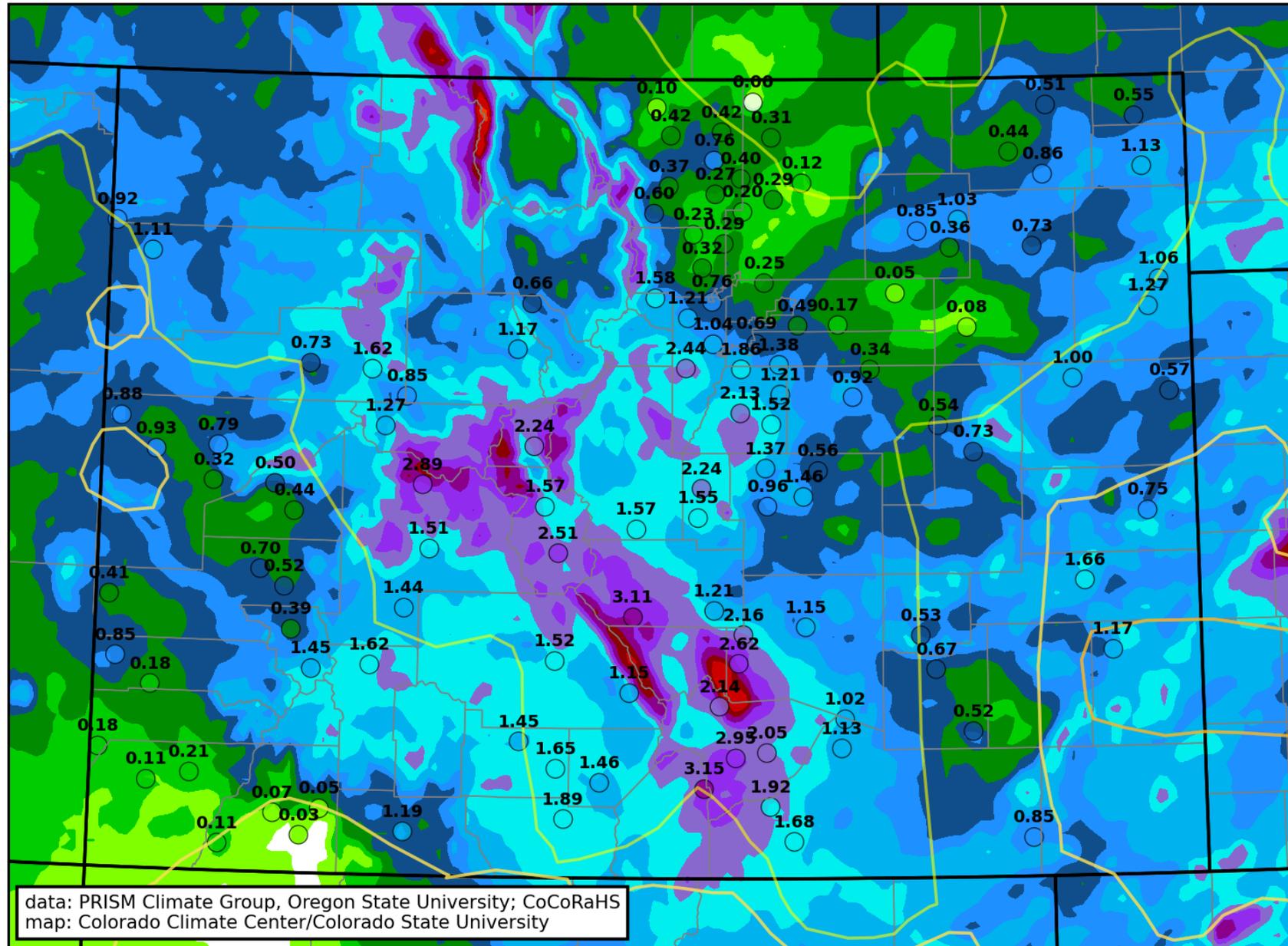


Generated 5/20/2024 at HPRCC using provisional data.

NOAA Regional Climate Centers



May precipitation through Monday morning

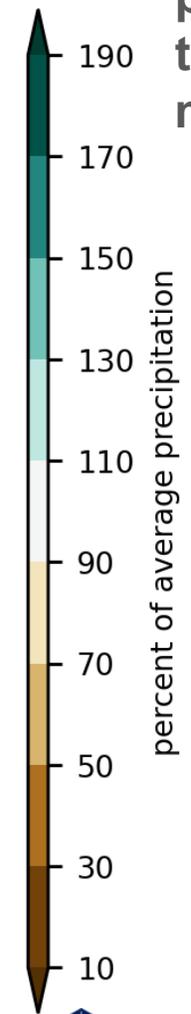
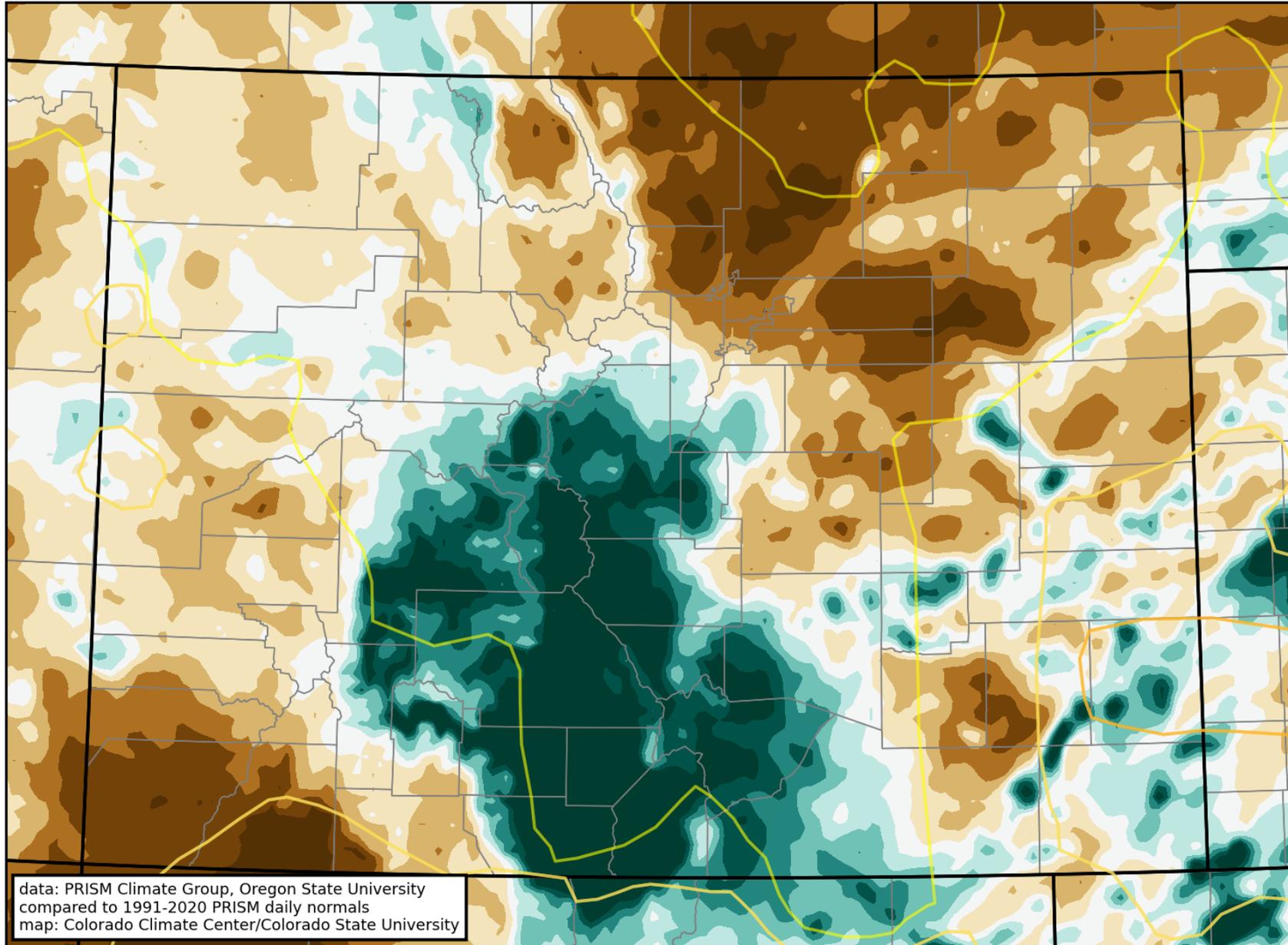


Alamosa has 1.70" in May so far, 2nd wettest month-to-date

data: PRISM Climate Group, Oregon State University; CoCoRaHS map: Colorado Climate Center/Colorado State University



May percent of normal precipitation through Monday morning



data: PRISM Climate Group, Oregon State University compared to 1991-2020 PRISM daily normals
map: Colorado Climate Center/Colorado State University



Very fast snowmelt in southern basins in late April

Largest 14-day declines in SWE prior to April 30

San Miguel-Dolores-Animas-San Juan basin

Year	14-day loss of snow water equivalent (inches)
2024	-8.18
2017	-7.79
2022	-6.96
2009	-6.96
2008	-6.94

Upper Rio Grande basin

Year	14-day loss of snow water equivalent (inches)
2024	-5.96
2022	-5.86
1989	-5.73
2017	-4.88
2008	-4.69

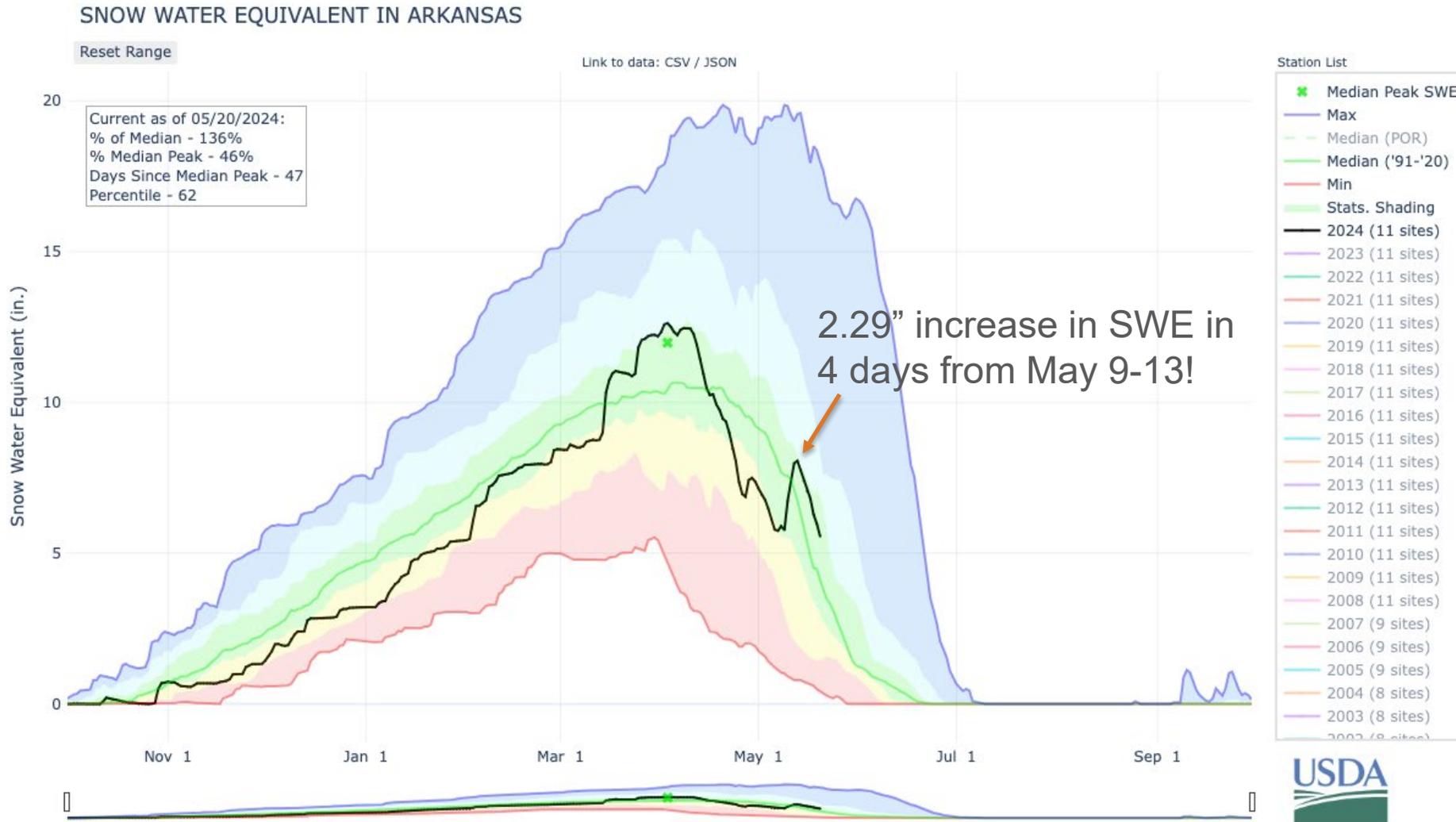
Arkansas basin

Year	14-day loss of snow water equivalent (inches)
2024	-4.95
2022	-4.40
2017	-3.92
2008	-3.65
2021	-3.59

<https://climate.colostate.edu/blog/index.php/2024/05/08/another-fast-early-melt-in-the-southern-mountains/>



But then the Arkansas basin recovered...



Largest 4-day increase on record for so late in the season in this basin (after May 8)

In 1999, gained 3.78" in 4 days at beginning of May



Notable precipitation total

- Alamosa had 1.46” of precipitation from May 9-11, the 2nd-most for a 3-day period in May

Maximum 3-Day Total Precipitation for Alamosa Area, CO (ThreadEx)

Click column heading to sort ascending, click again to sort descending.

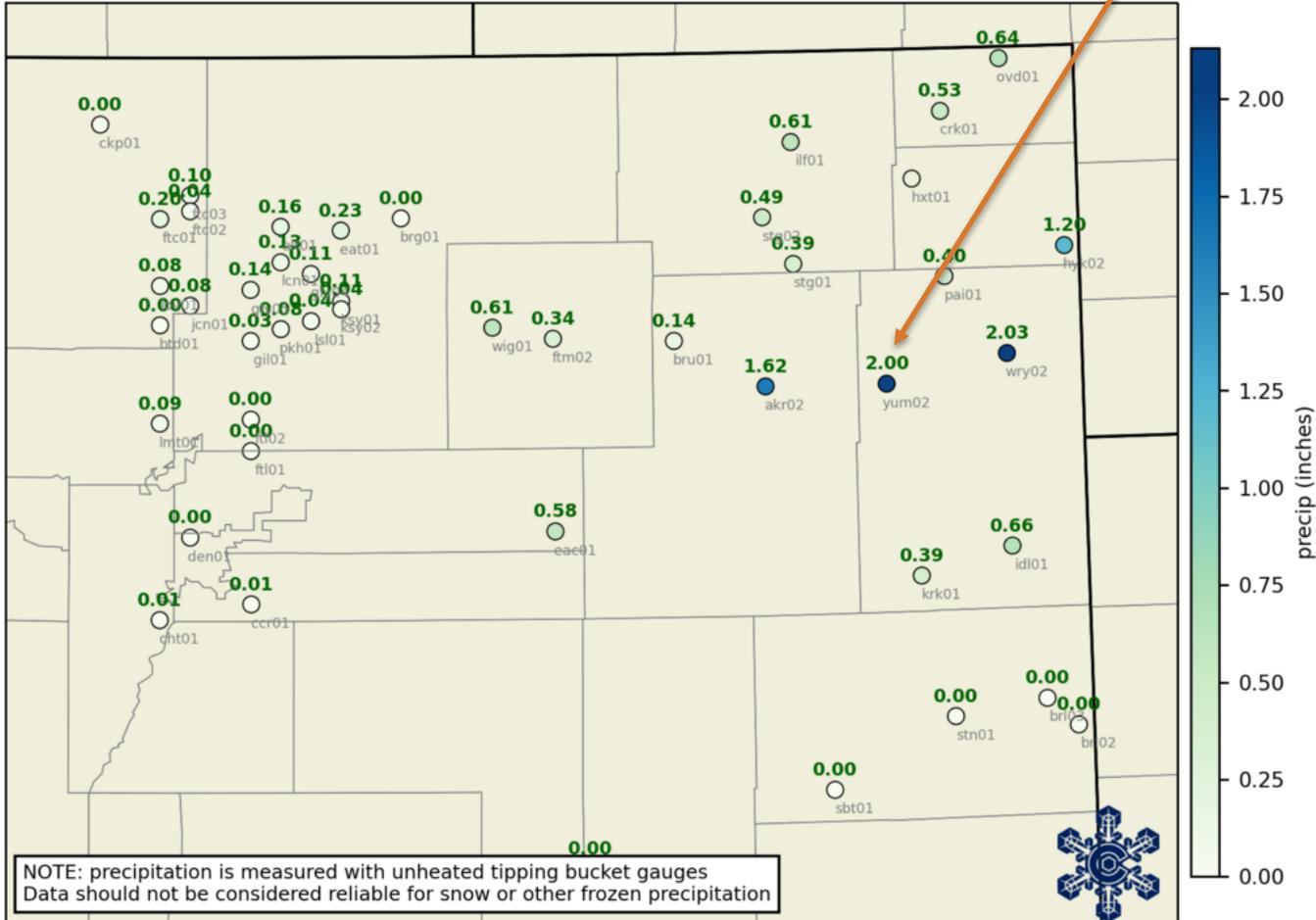
Rank	Value	Ending Date	Missing Days
1	1.61	1935-05-20	0
2	1.46	2024-05-11	0
3	1.41	1935-05-19	0
4	1.36	1935-05-18	0
5	1.29	2024-05-10	0
6	1.22	2017-05-10	0
7	1.16	2017-05-11	0
8	1.12	1967-05-28	0
9	1.03	2021-05-19	0
-	1.03	2021-05-18	0
Period of record: 1906-05-01 to 2024-05-19			



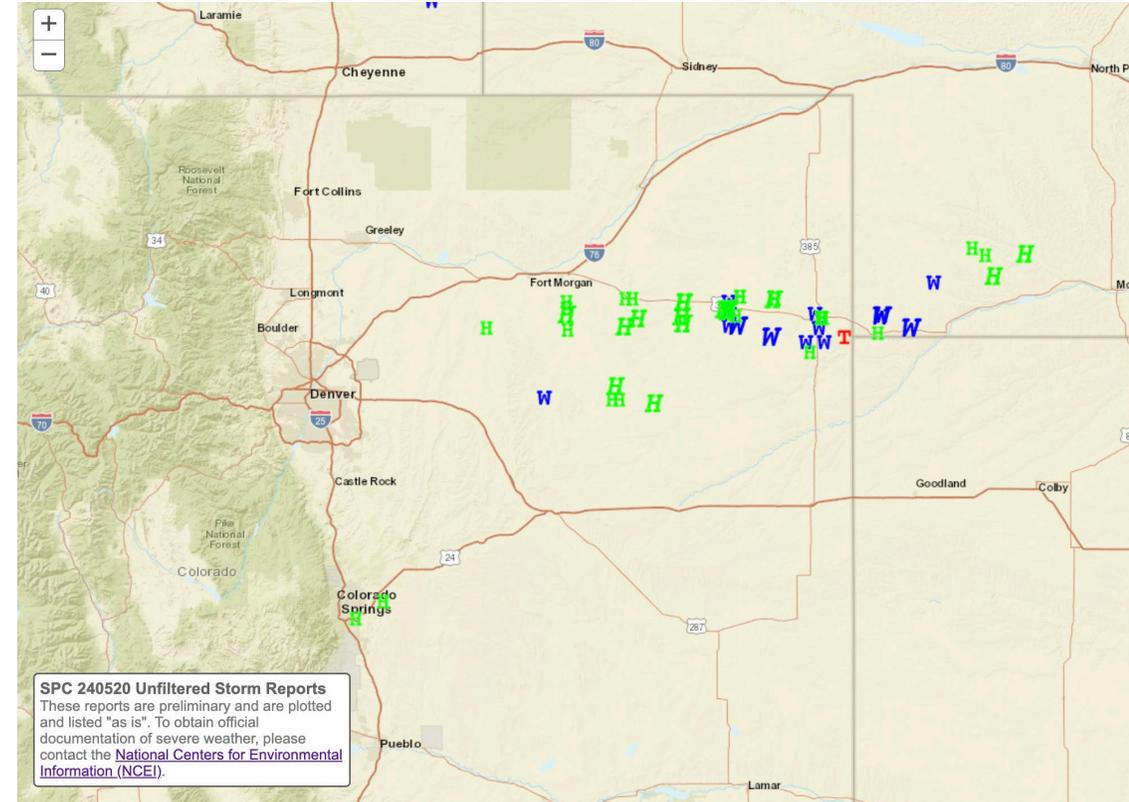
Last night

1.42" in 20 minutes at Yuma, station likely damaged by storm

CoAgMET/Northern Water daily precipitation (24 h ending midnight MST): 20 May 2024



Severe storm reports



Drought conditions



Family of ducks along the irrigation ditch in Fort Collins, May 19

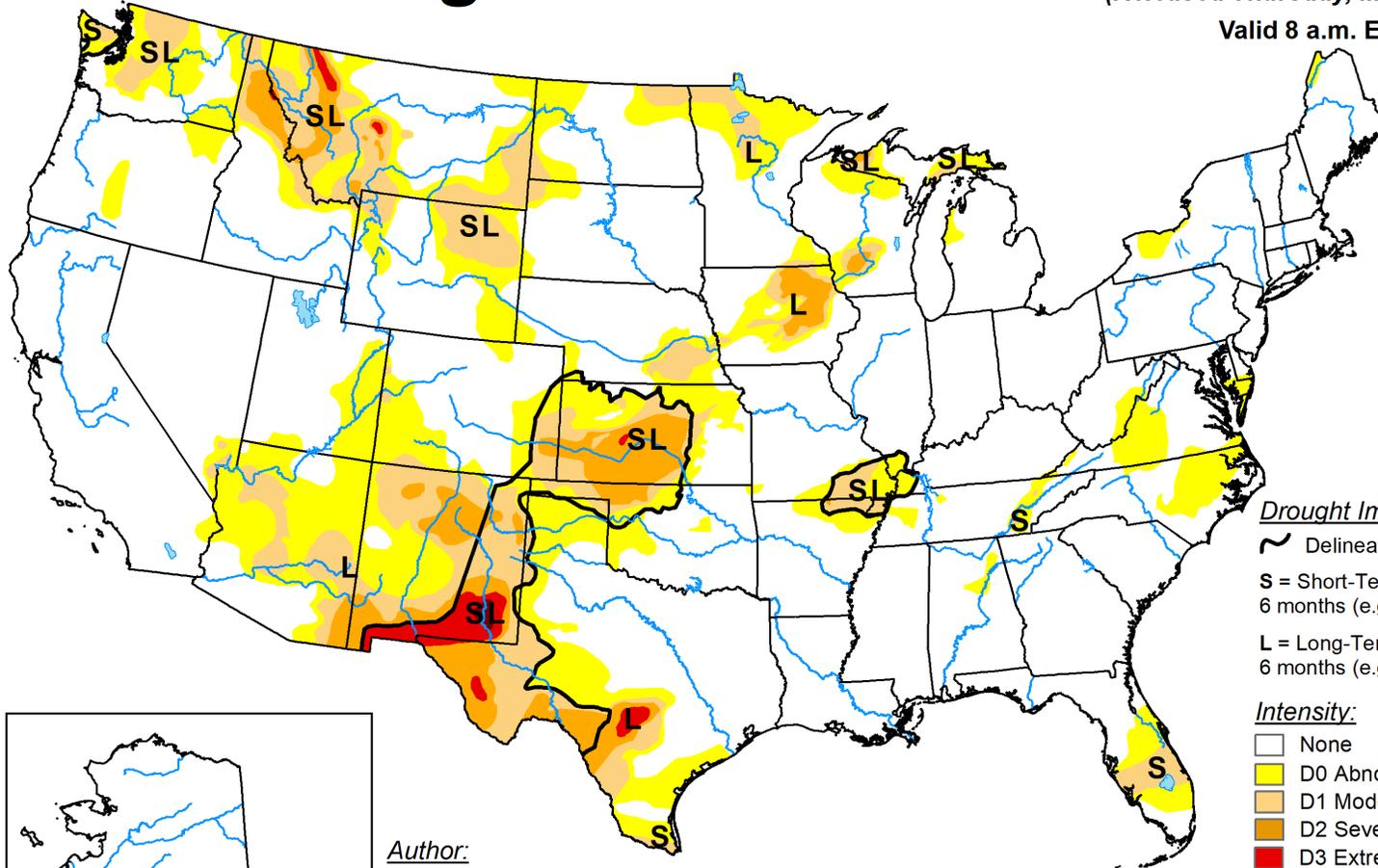


U.S. Drought Monitor

May 14, 2024

(Released Thursday, May. 16, 2024)

Valid 8 a.m. EDT

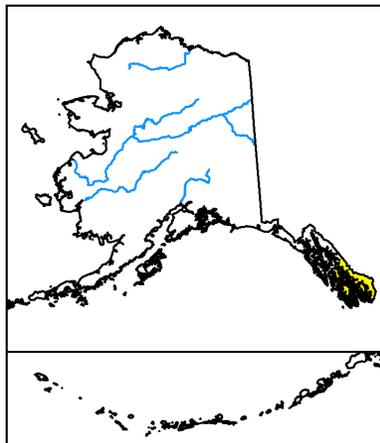


Drought Impact Types:

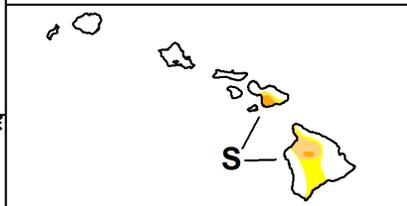
- ~ Delineates dominant impacts
- S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)
- L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

Intensity:

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



Author:
Lindsay Johnson
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



U.S. Drought Monitor Colorado

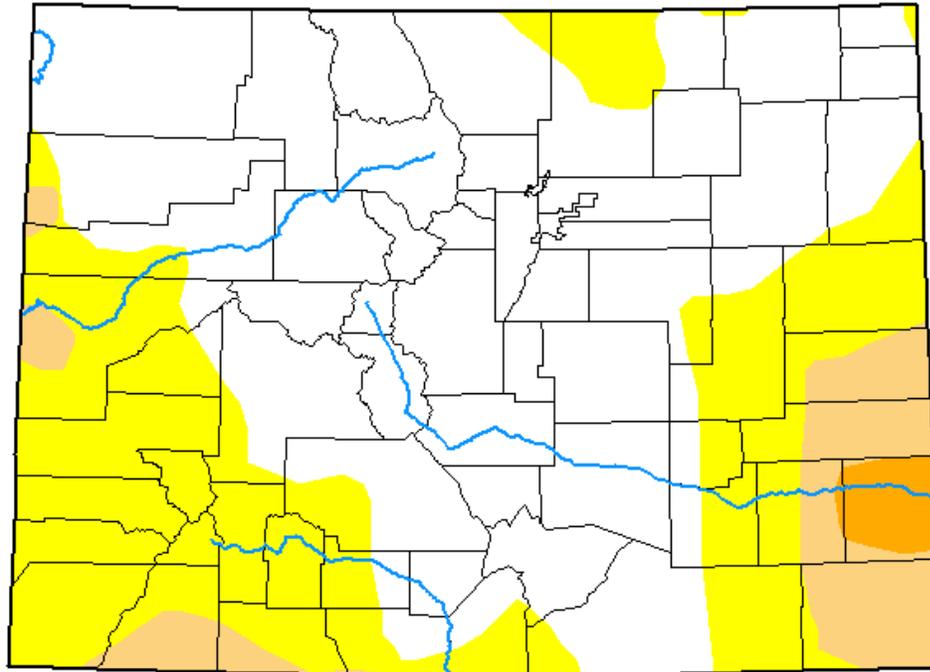
May 14, 2024

(Released Thursday, May. 16, 2024)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	60.34	39.66	9.02	1.41	0.00	0.00
Last Week <i>05-07-2024</i>	55.96	44.04	10.62	1.41	0.00	0.00
3 Months Ago <i>02-13-2024</i>	63.20	36.80	11.65	3.52	0.00	0.00
Start of Calendar Year <i>01-02-2024</i>	34.65	65.35	29.59	8.85	2.05	0.00
Start of Water Year <i>09-26-2023</i>	65.71	34.29	17.43	2.77	0.00	0.00
One Year Ago <i>05-16-2023</i>	54.68	45.32	10.76	2.91	1.15	0.31



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:

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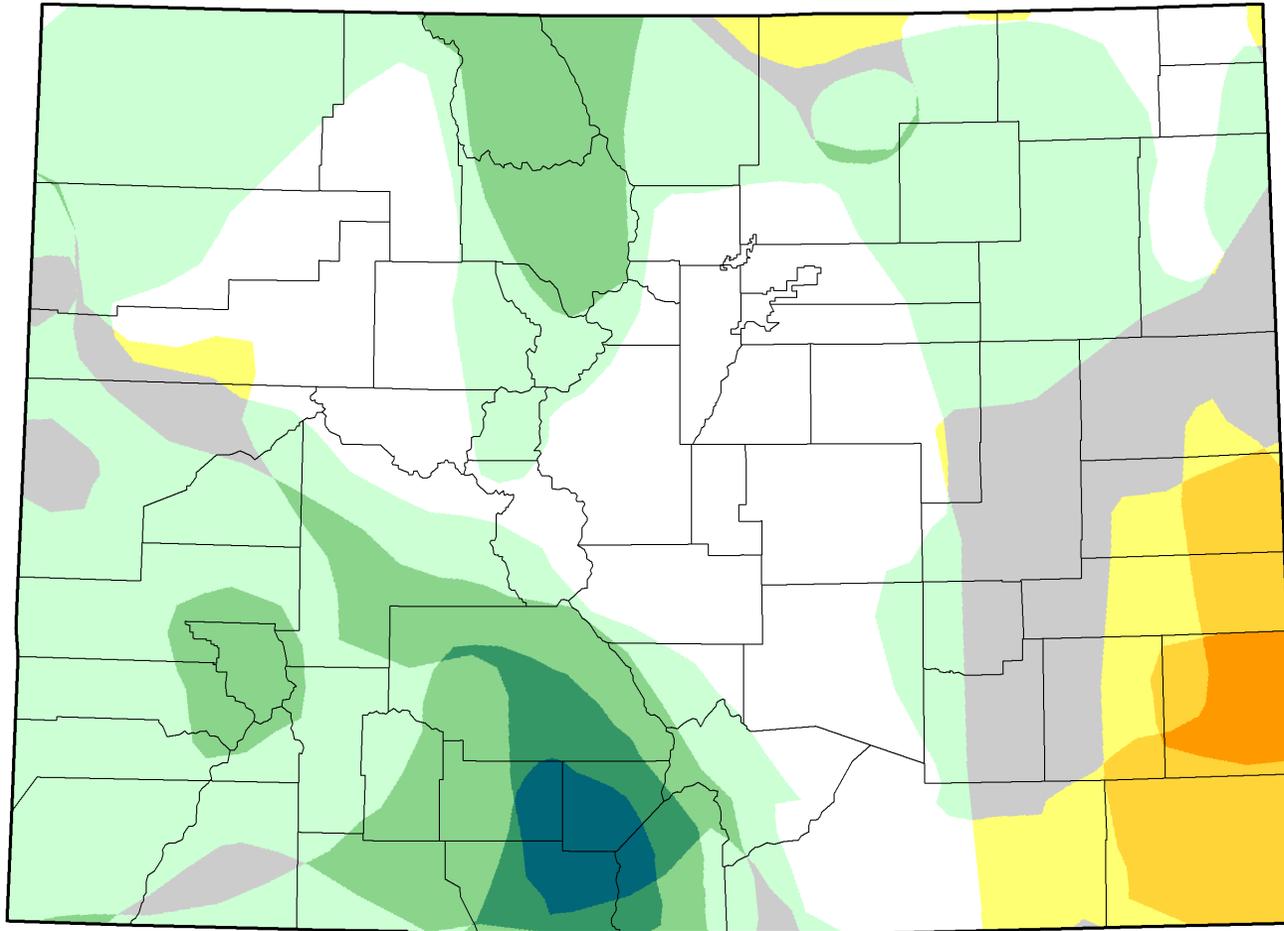


droughtmonitor.unl.edu



U.S. Drought Monitor Class Change - Colorado Start of Calendar Year

Change since start of calendar year



- 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

May 14, 2024
compared to
January 2, 2024

droughtmonitor.unl.edu



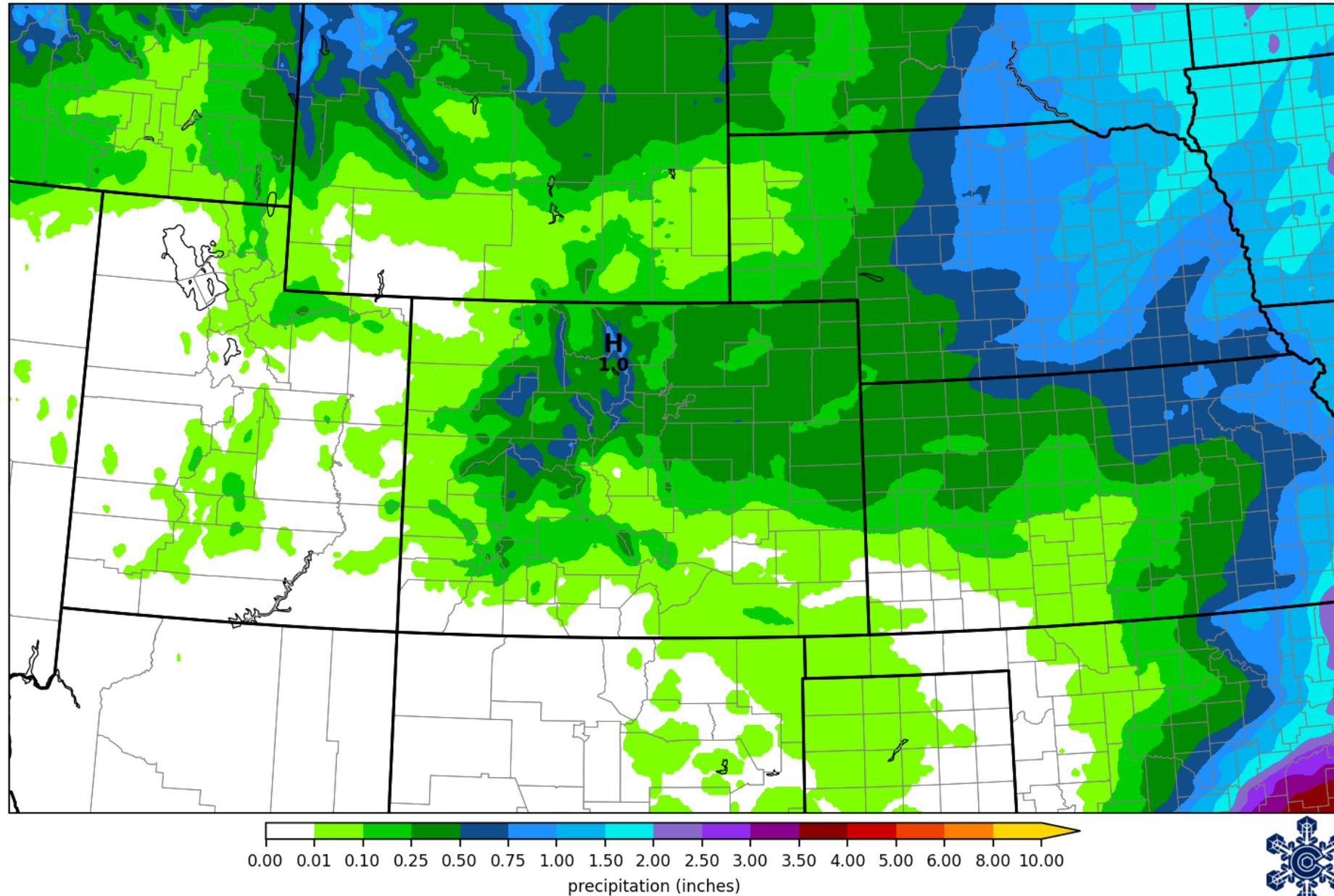


Outlook

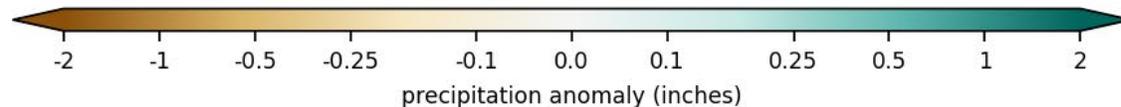
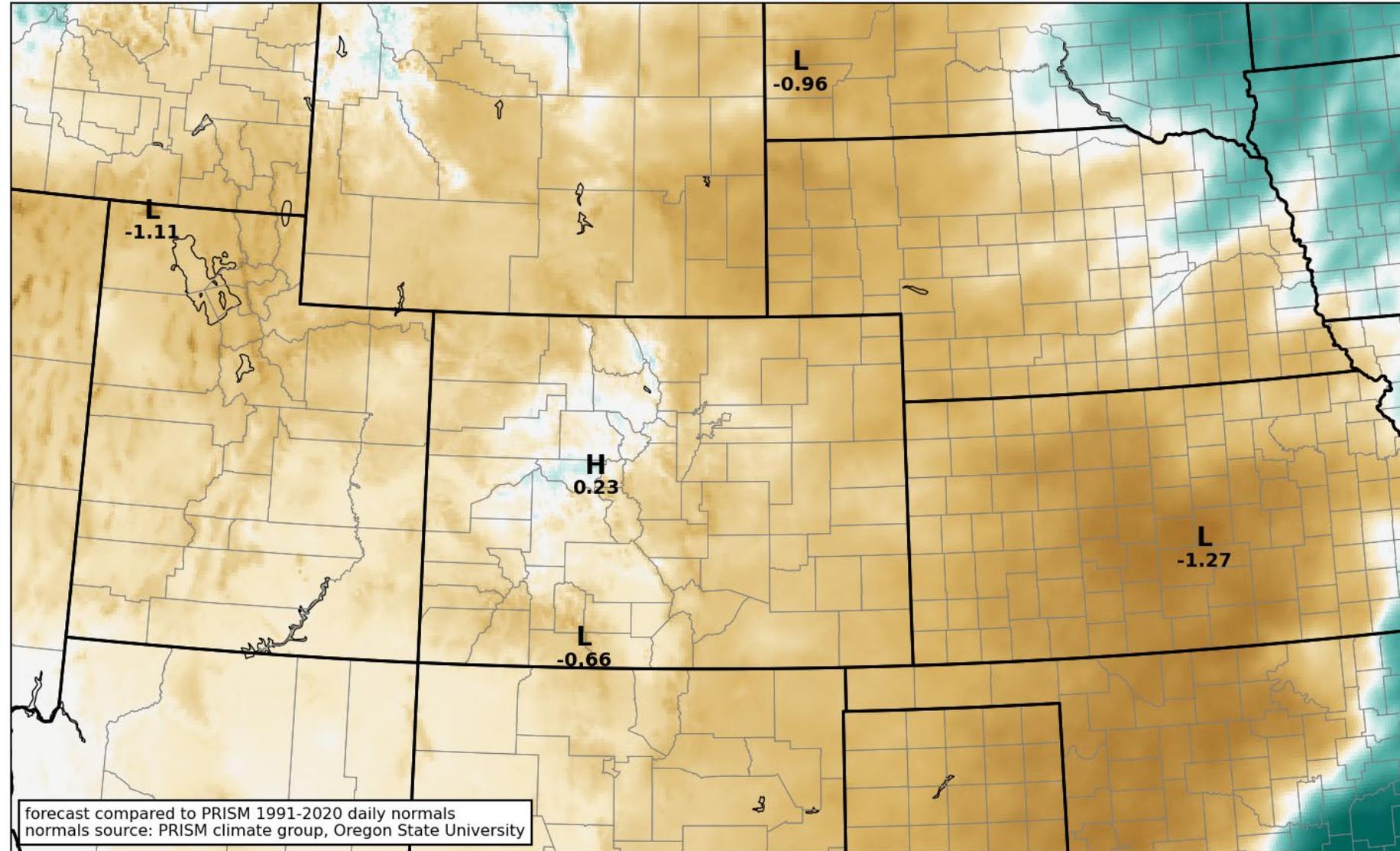


NOAA 7-day precipitation forecast

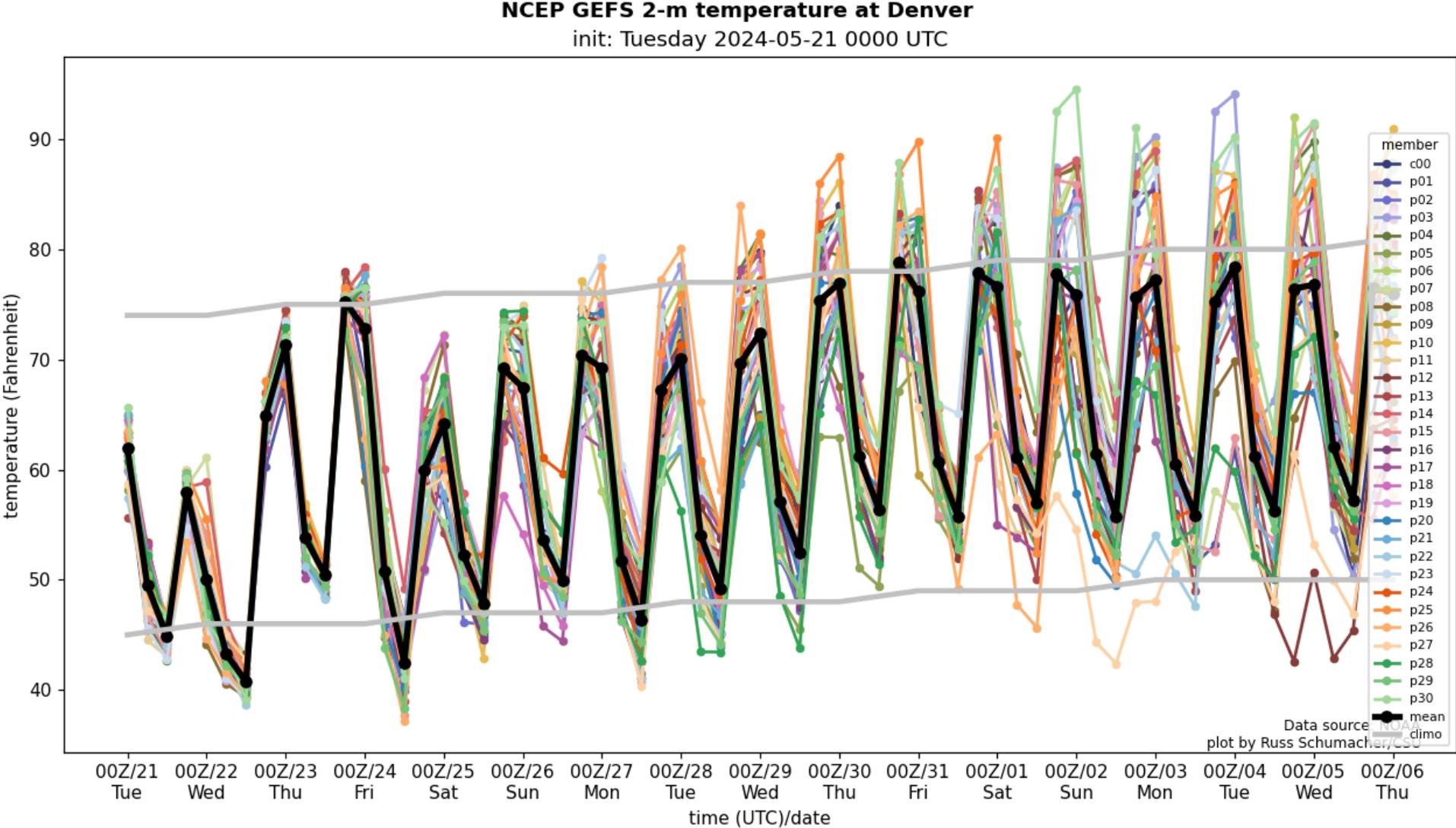
This forecast
precipitation is
almost all today; then
dry for the next
several days



NOAA 7-day precipitation forecast (difference from average)



Temperatures generally in the average range for the next couple weeks, no signal for major heat or cold waves (but the average slopes up as we head into June!)



The May 28-June 3 period leans warmer than normal, no strong precip signal



8-14 Day Temperature Outlook

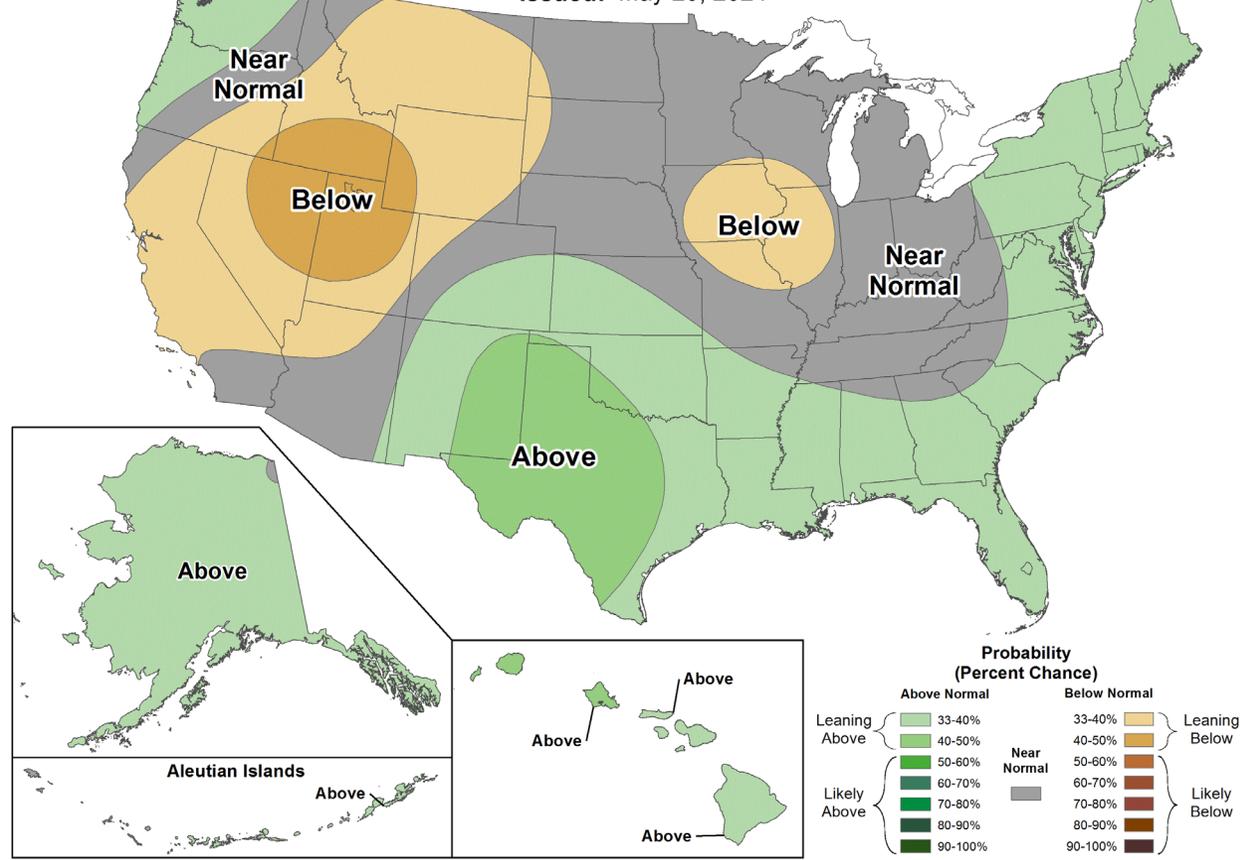
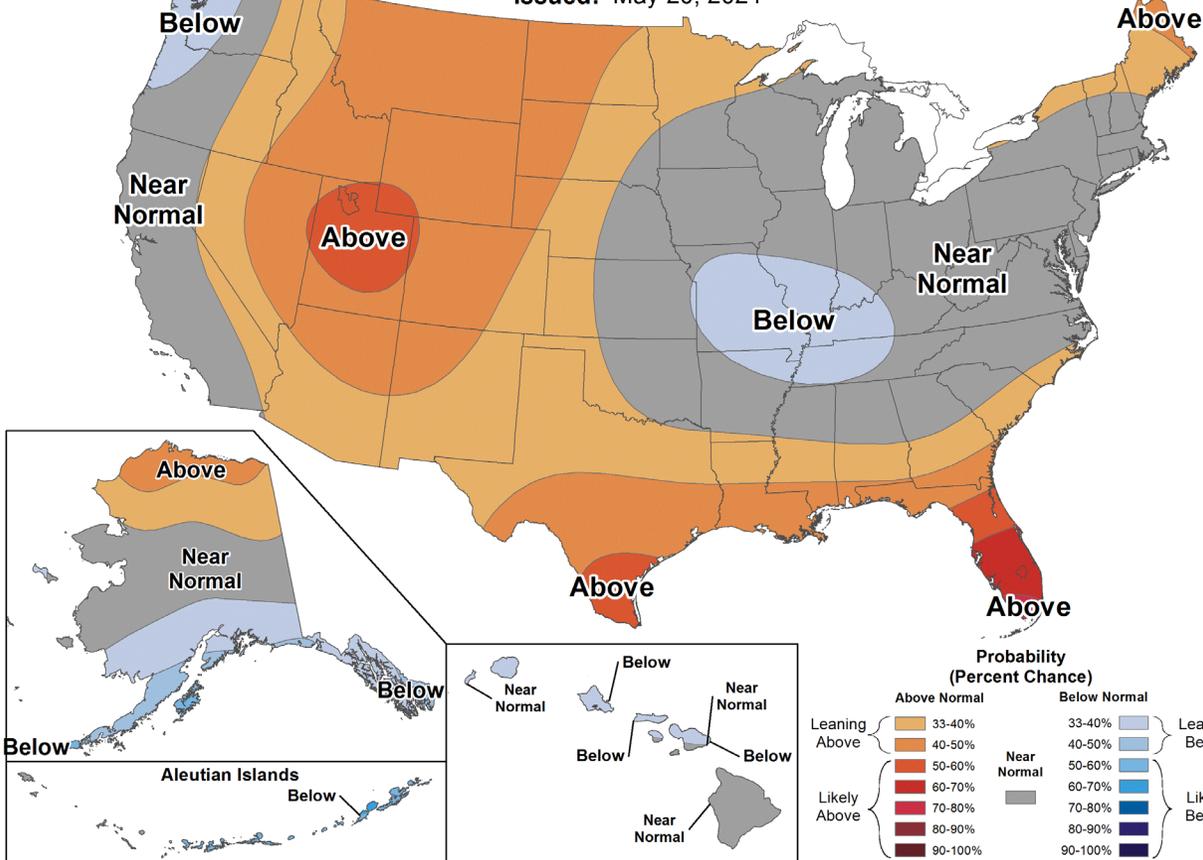


8-14 Day Precipitation Outlook



Valid: May 28 - June 3, 2024
Issued: May 20, 2024

Valid: May 28 - June 3, 2024
Issued: May 20, 2024



El Niño technically still in place, but not for long

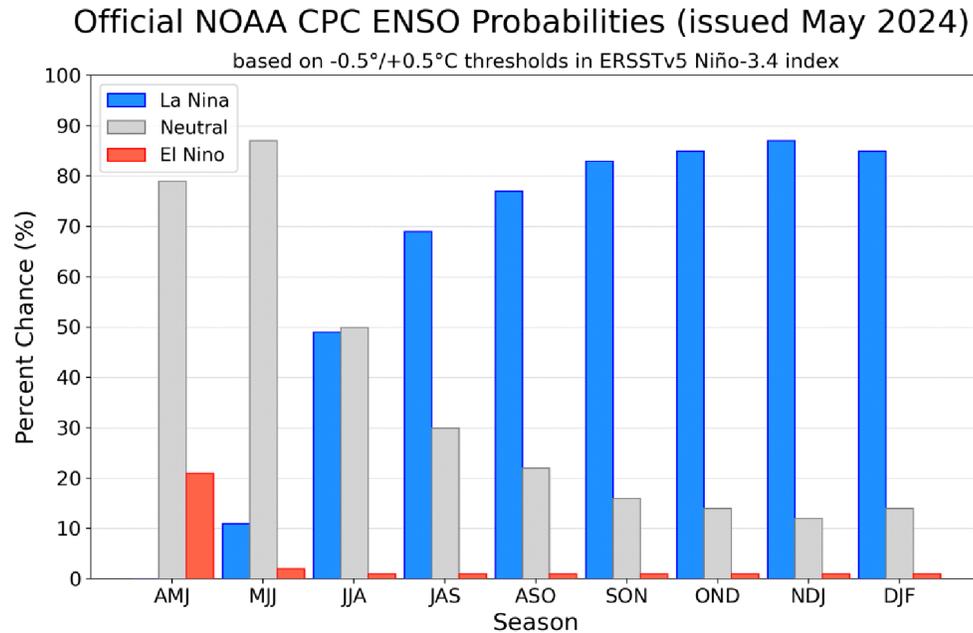


Figure 7. Official ENSO probabilities for the Niño 3.4 sea surface temperature index (5°N - 5°S , 120°W - 170°W). Figure updated 9 May 2024.

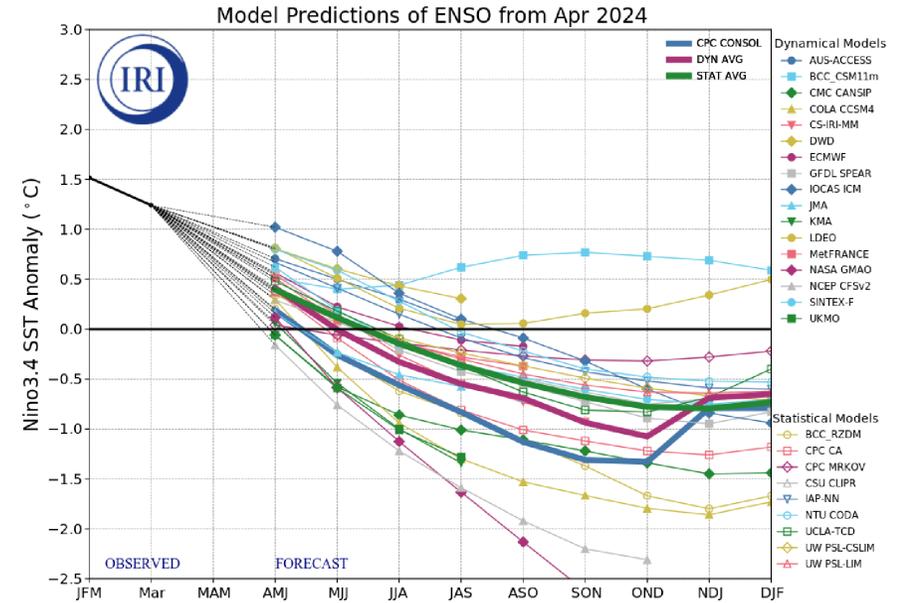
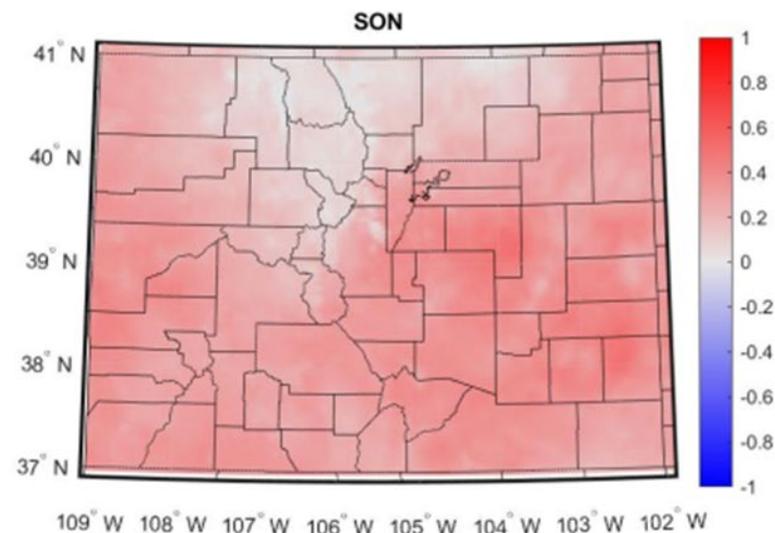
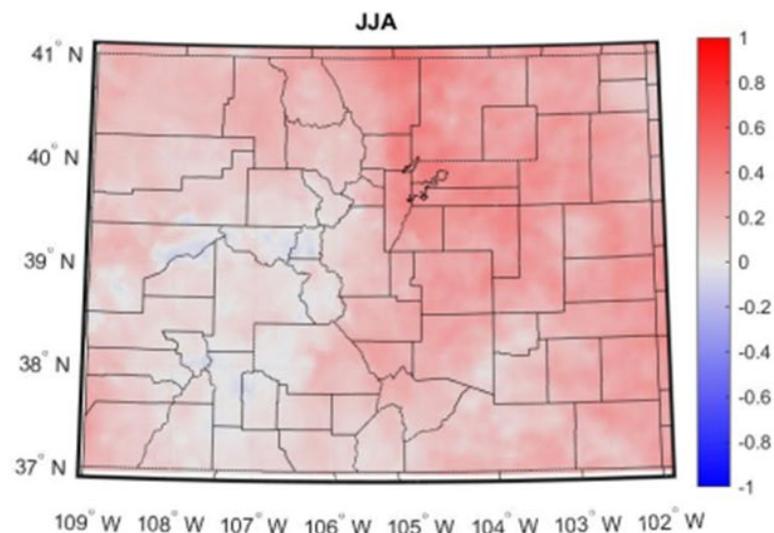
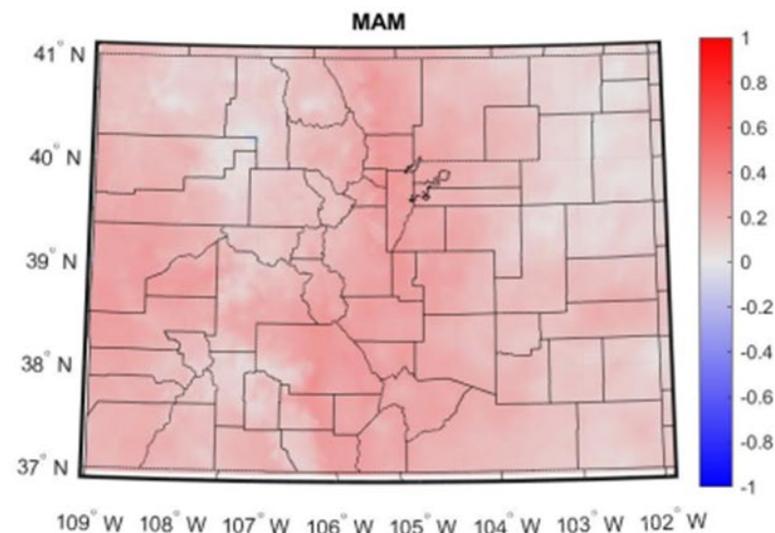
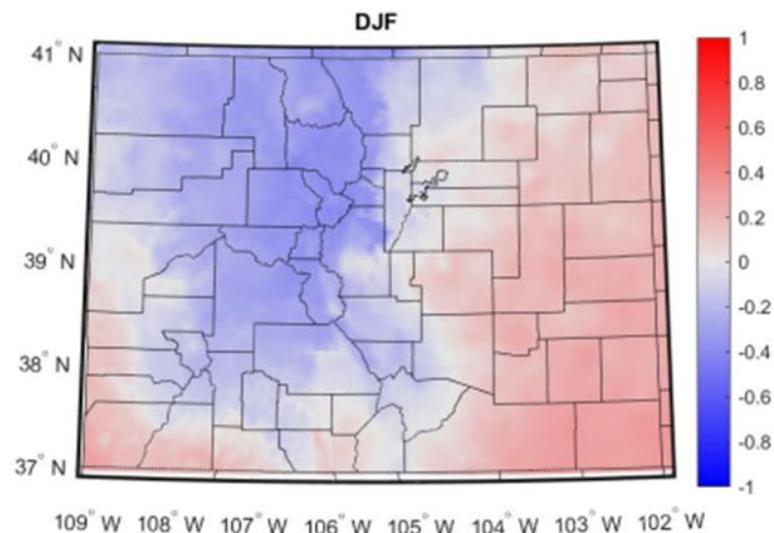


Figure 6. Forecasts of sea surface temperature (SST) anomalies for the Niño 3.4 region (5°N - 5°S , 120°W - 170°W). Figure updated 19 April 2024 by the International Research Institute (IRI) for Climate and Society.

“A transition from El Niño to ENSO-neutral is likely in the next month. La Niña may develop in June-August (49% chance) or July-September (69% chance).” https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/ensodisc.shtml



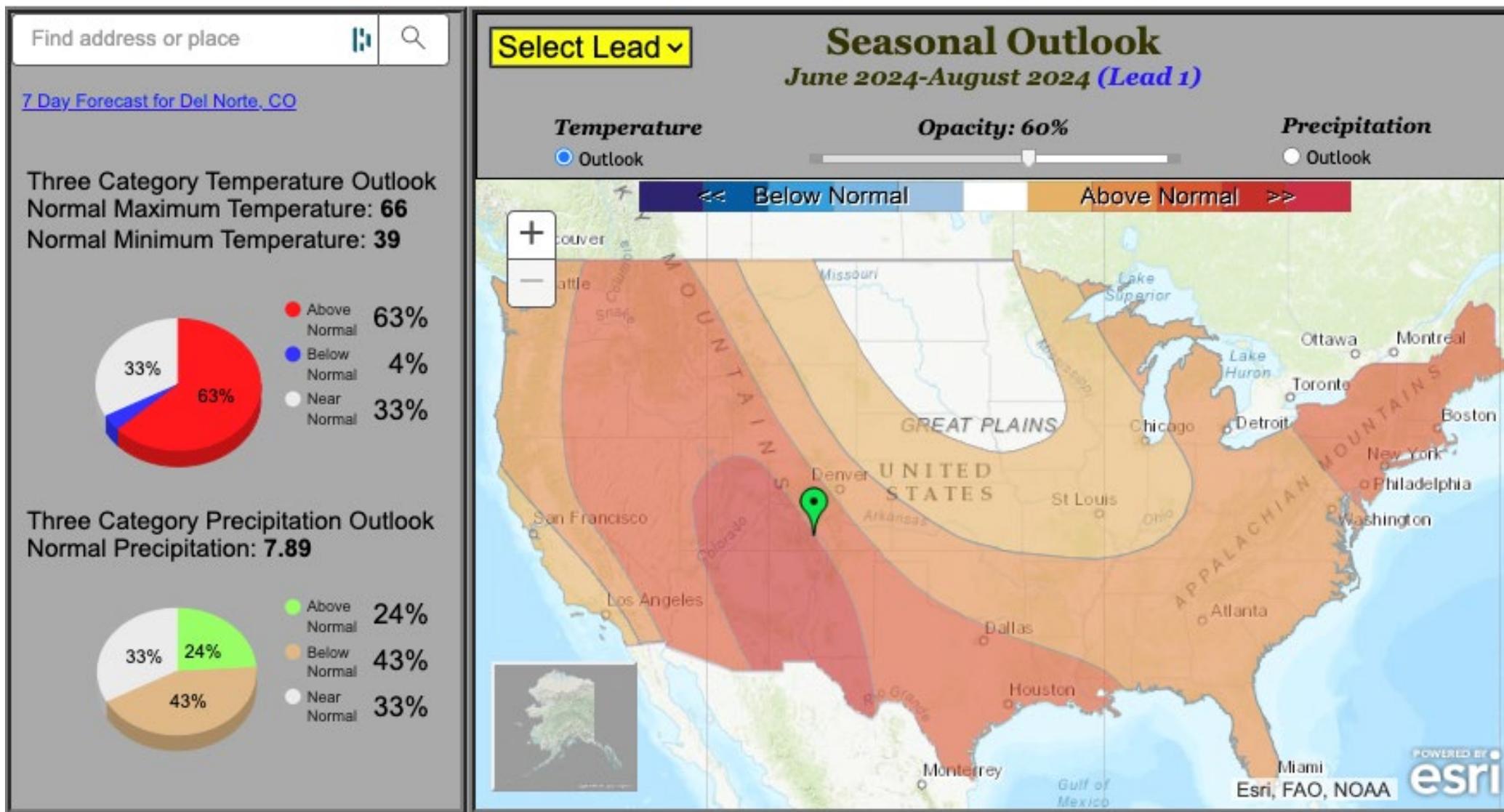
Correlation Between ENSO ONI and Seasonal Precipitation in Colorado (1951-2020)



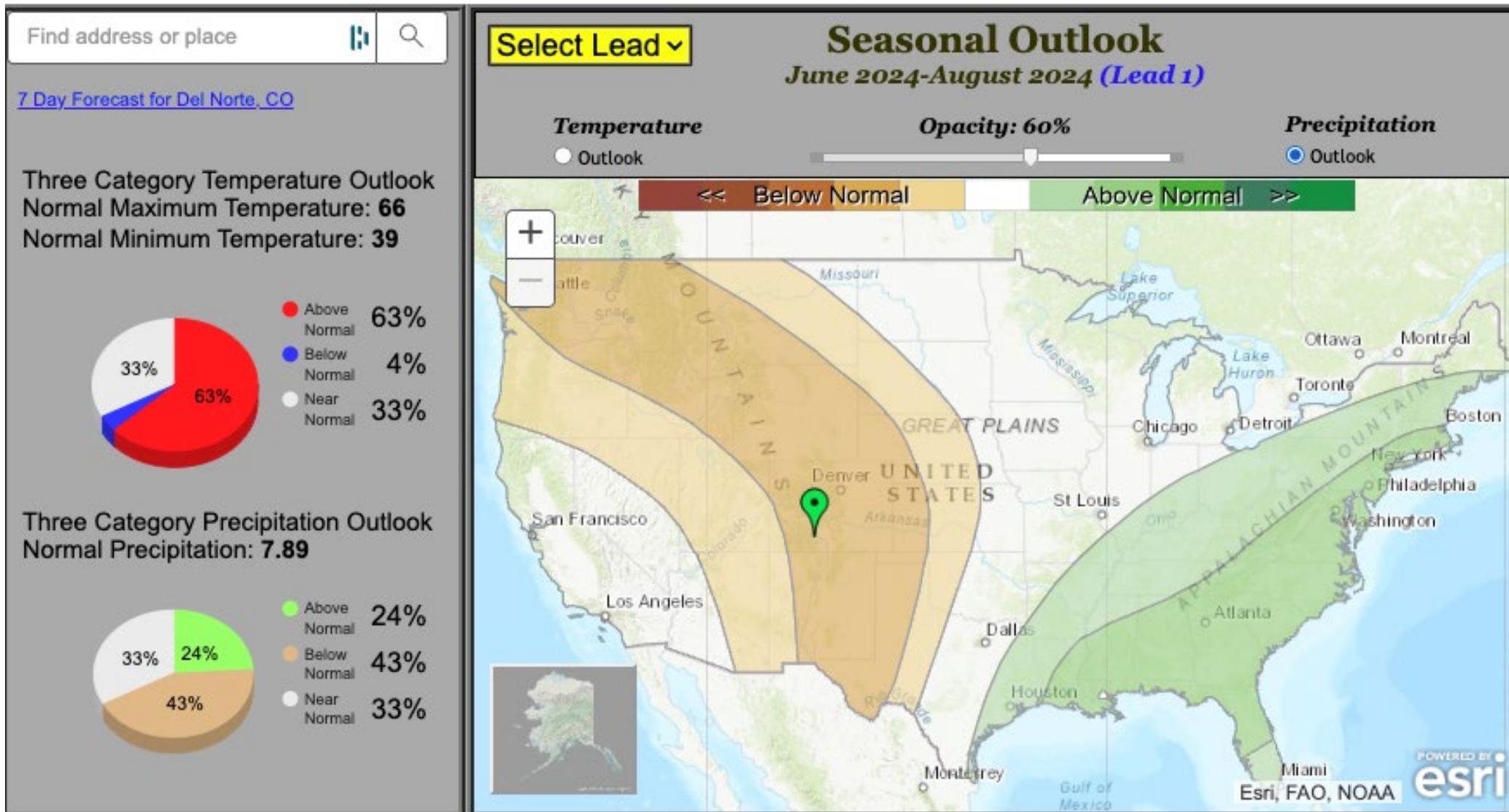
Blue = La Niña wetter Red = El Niño wetter



Summer (June-July-August) outlook



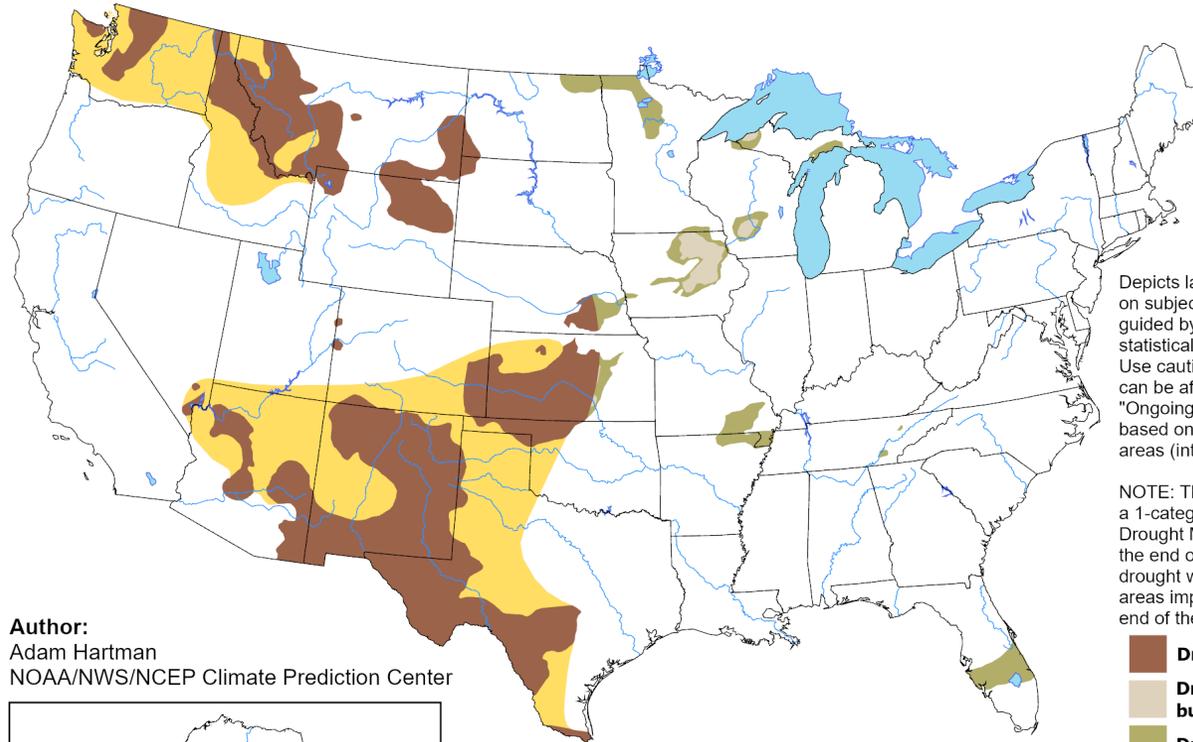
Summer (June-July-August) outlook



Summer (June-July-August) outlook

U.S. Seasonal Drought Outlook Drought Tendency During the Valid Period

Valid for May 16 - August 31, 2024
Released May 16, 2024

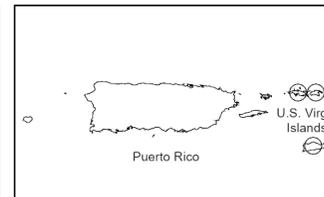
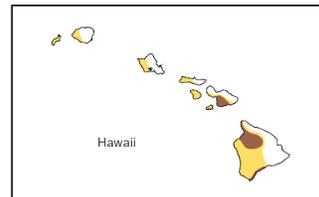


Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to D4).

NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).

-  **Drought persists**
-  **Drought remains, but improves**
-  **Drought removal likely**
-  **Drought development likely**
-  **No drought**

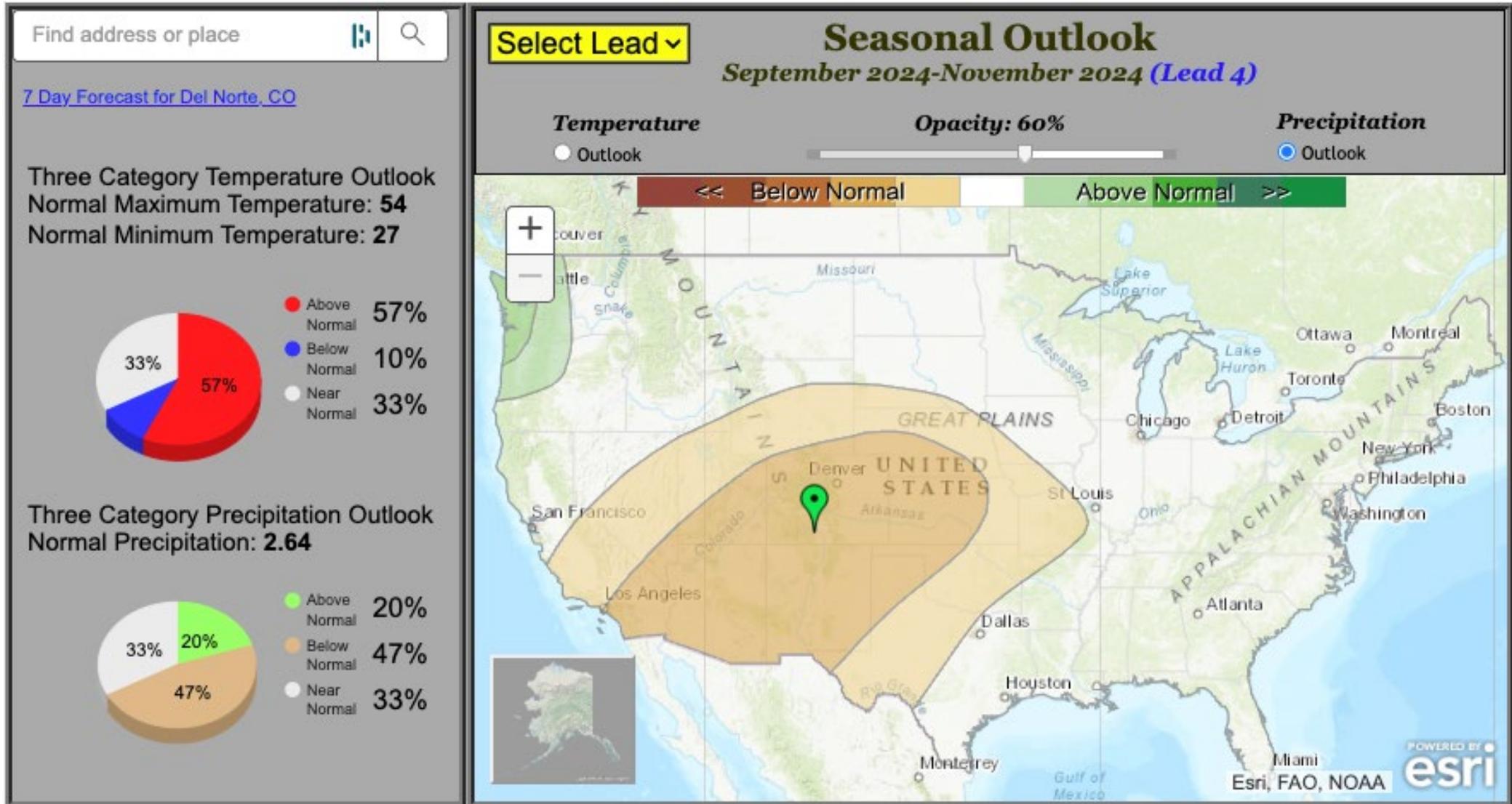
Author:
Adam Hartman
NOAA/NWS/NCEP Climate Prediction Center



<https://go.usa.gov/3eZ73>



Fall (Sept-Oct-Nov) outlook



Takeaways

- Water Year 2024 has continued to be warm across Colorado: 7th warmest October through April period, though May has been relatively cool thus far
- Statewide, precipitation has remained near average. Central and southern Colorado have been wet recently, while parts of the eastern plains have had a dry May
- Snowmelt has been rapid in the southern basins, while snowpack remains strong to the north
- El Niño will be gone soon, with a quick shift to La Niña
- Climate Prediction Center outlooks show high probabilities of a hot, dry summer, with warmer and drier than average conditions continuing into next winter
 - Always take seasonal projections with a grain of salt, but these show much higher confidence than they usually have this far in advance





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