Colorado Climate Update

Russ Schumacher, state climatologist

Water Conditions Monitoring Committee

August 27, 2024

COLORADO CLIMATE CENTER

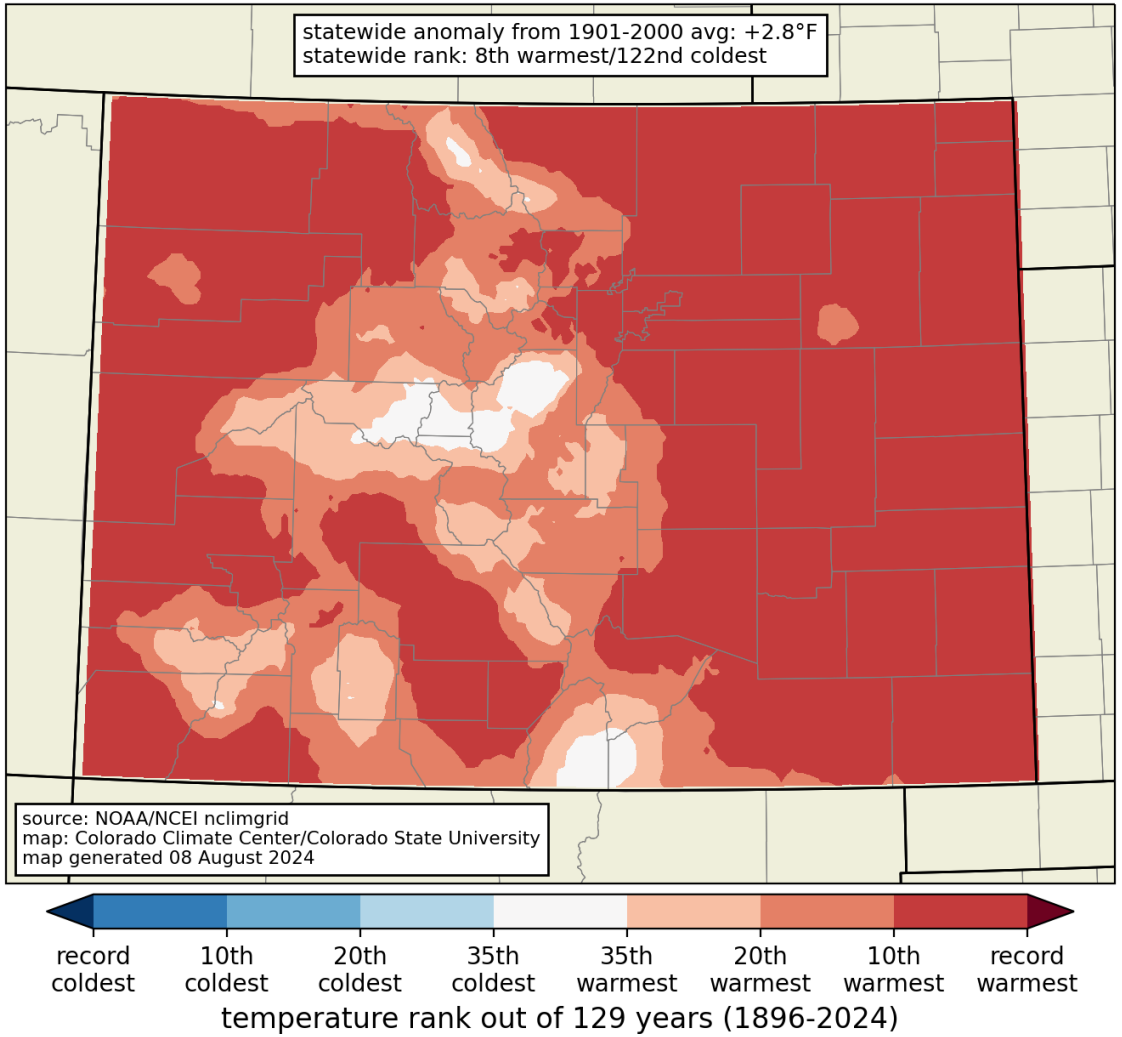
ATMOSPHERIC SCIENCE
COLORADO STATE UNIVERSITY

Water year 2024 to date:

temperature, precipitation, evaporative demand

From Cheyenne Mountain Resort at Water Congress last week

average temperature rank: 10 months ending July 2024 (Oct-Jul)

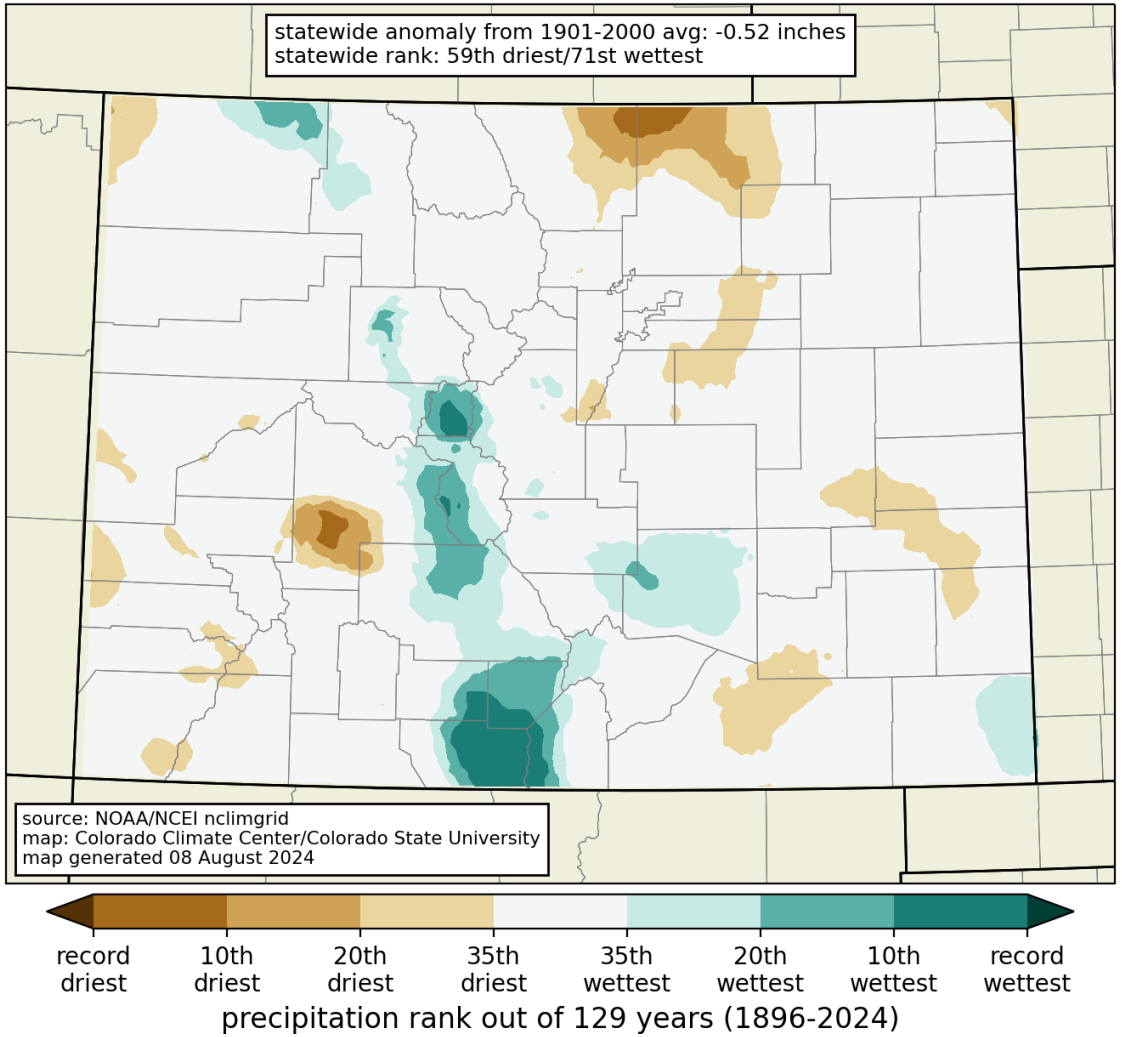


Statewide: 8th warmest October-July (out of 129), warmest first 10 months of a water year since 2018

Colorado rankings:

Month	T Rank (of 129 years)	Above, below, or near 20th century avg?
Oct	26th warmest	above
Nov	20th warmest	above
Dec	7th warmest	much above
Jan	51th warmest	near avg
Feb	11th warmest	much above
March	31st warmest	above
April	17th warmest	above
May	49th coolest	near avg
Jun	3rd warmest	much above
Jul	45th warmest	near avg

precipitation rank: 10 months ending July 2024 (Oct-Jul)

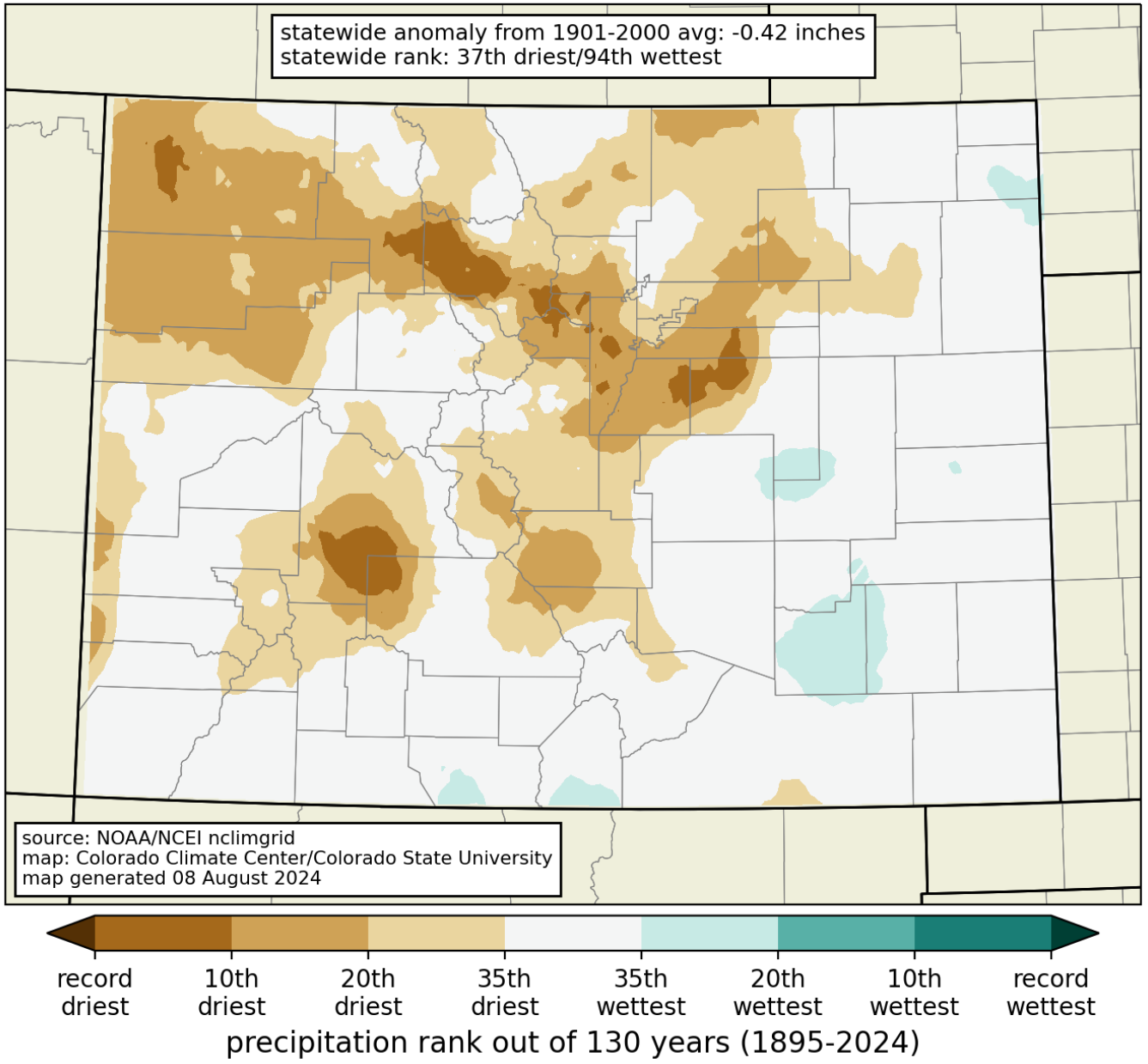


Statewide: 59th driest/71st wettest October-July (out of 129): slightly below average

Colorado rankings:

Month	T Rank (of 129 years)	Above, below, or near 20th century avg?
Oct	52nd driest	near avg
Nov	22nd driest	below
Dec	66th driest	near avg
Jan	47th wettest	near avg
Feb	19th wettest	above
Mar	16th wettest	above
Apr	46th driest	near avg
May	58th driest	near avg
Jun	38th wettest	above
Jul	37th driest	below

precipitation rank: July 2024



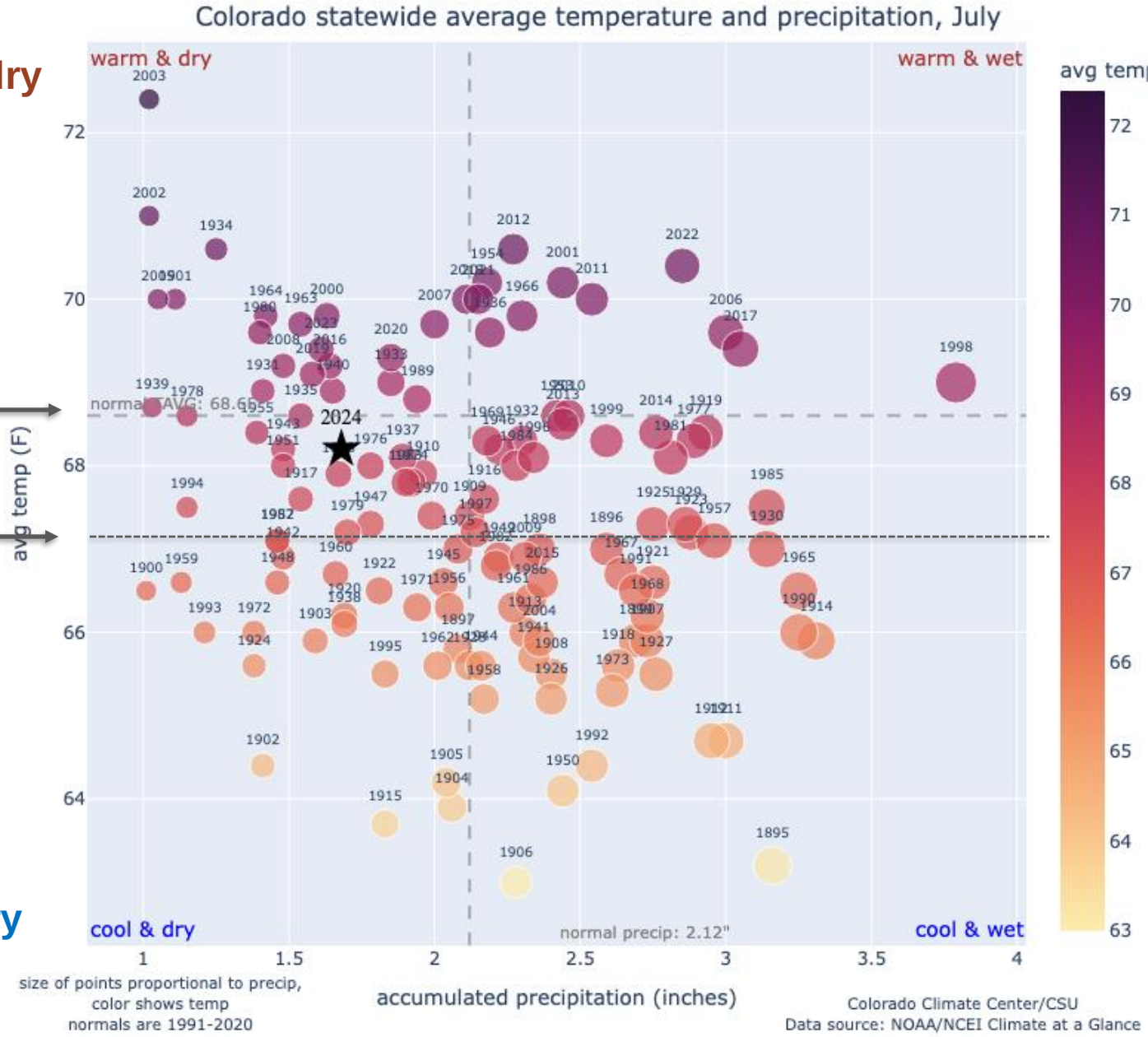
Warm & dry

Warm & wet

July 2024

1991-2020 avg temp

1901-2000 avg temp



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

Cool & dry

Cool & wet

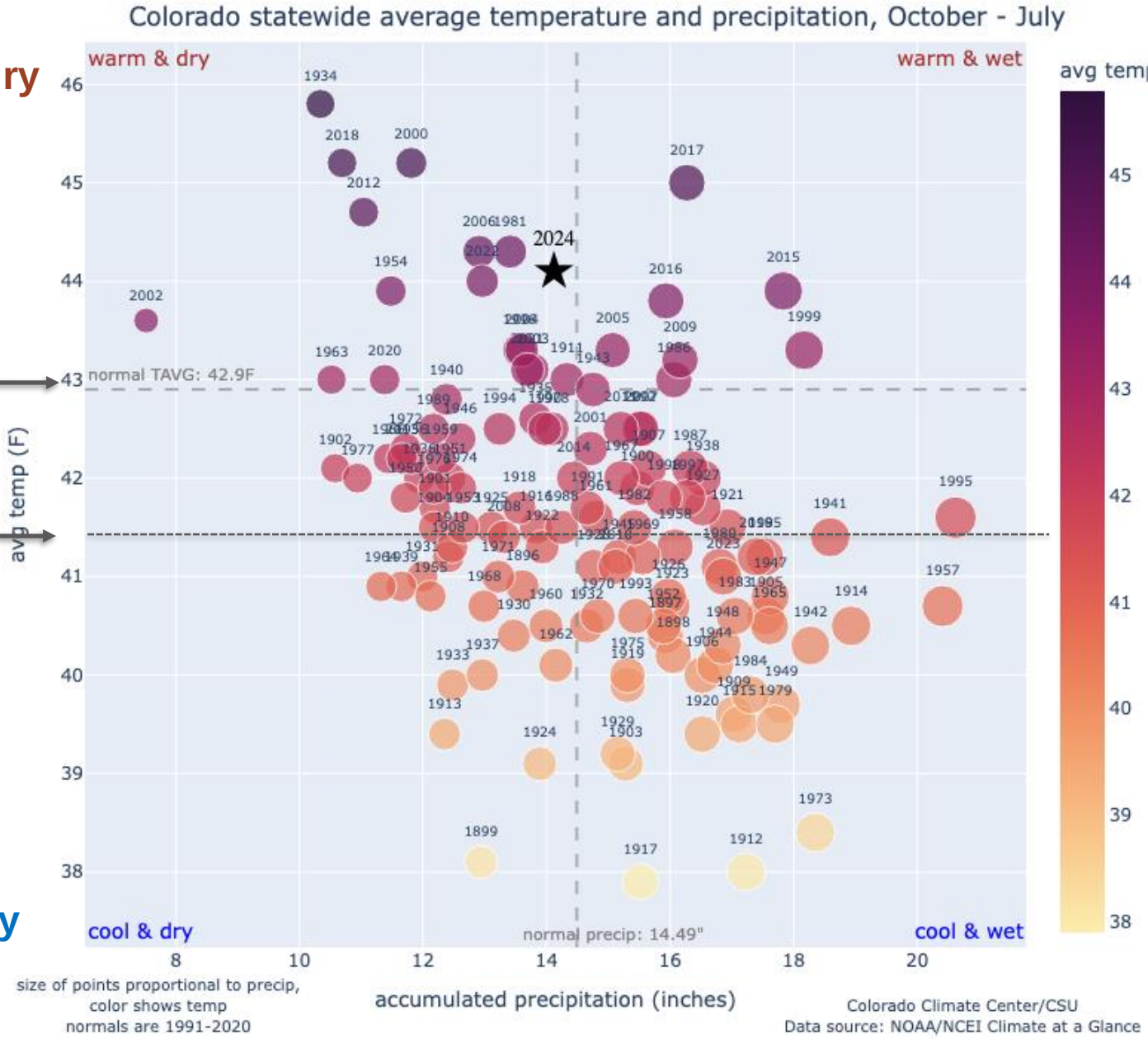
Warm & dry

Warm & wet

Water year 2024 through July

1991-2020 avg temp

1901-2000 avg temp

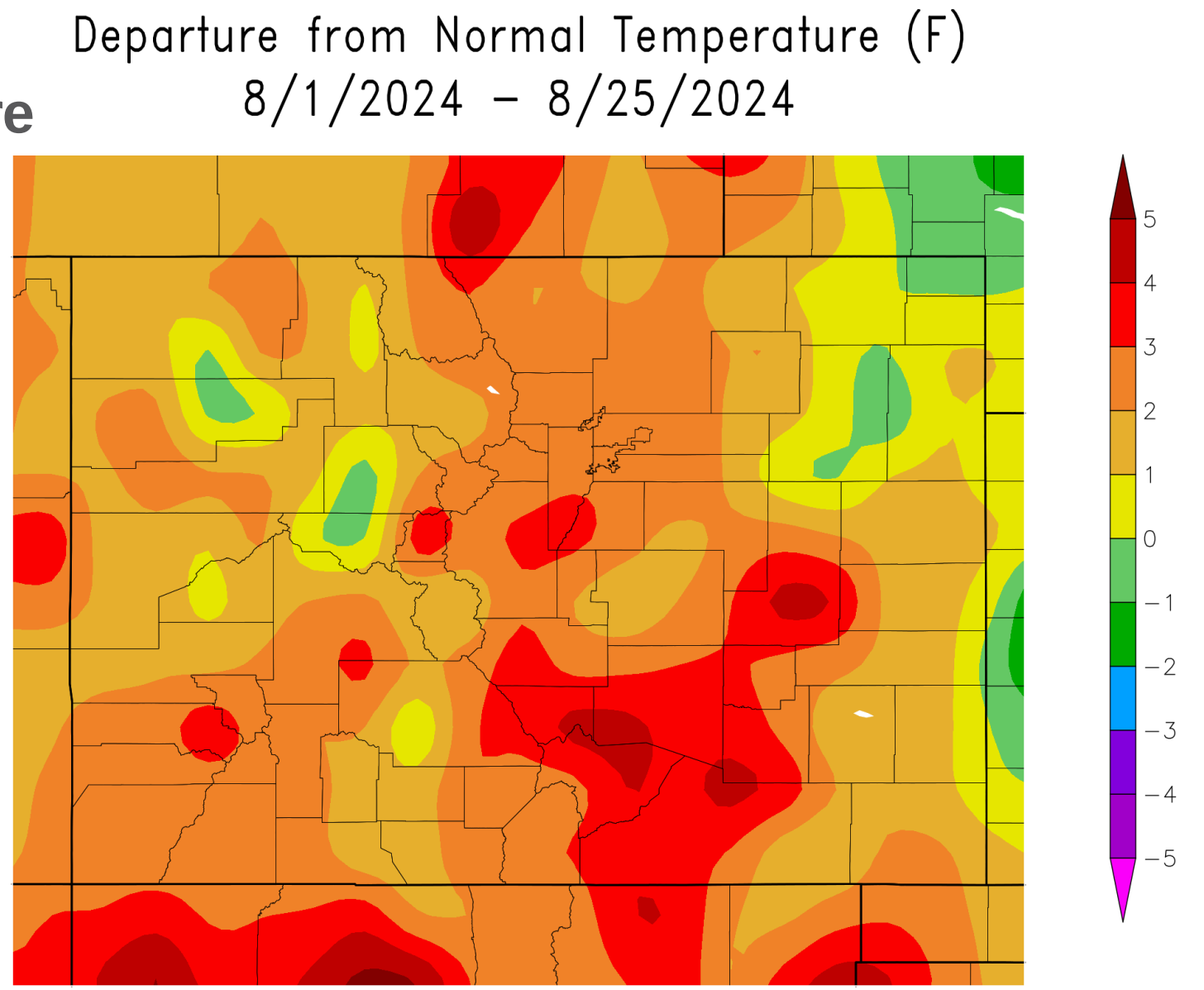


Cool & dry

Cool & wet

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

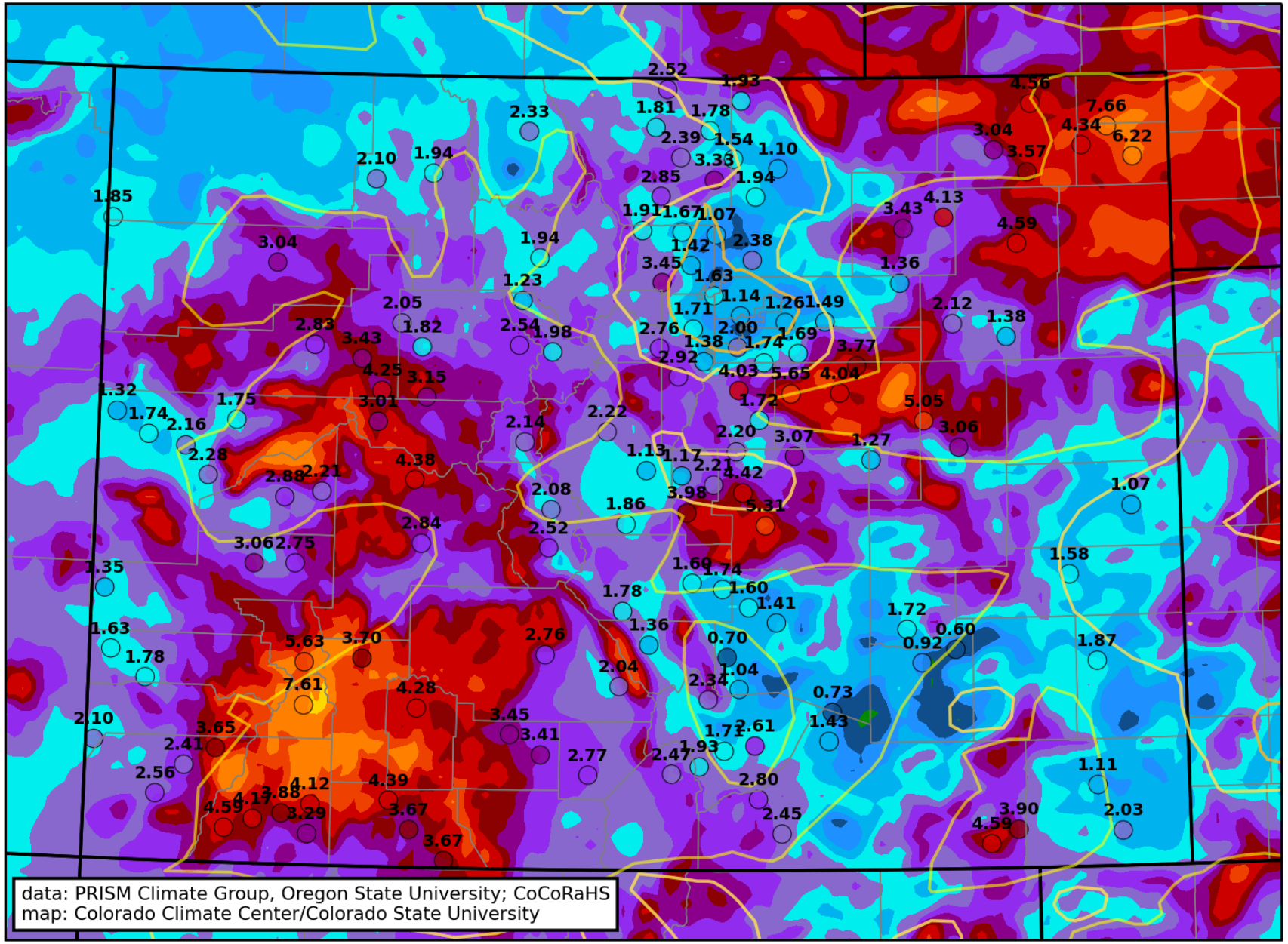
August temperature so far



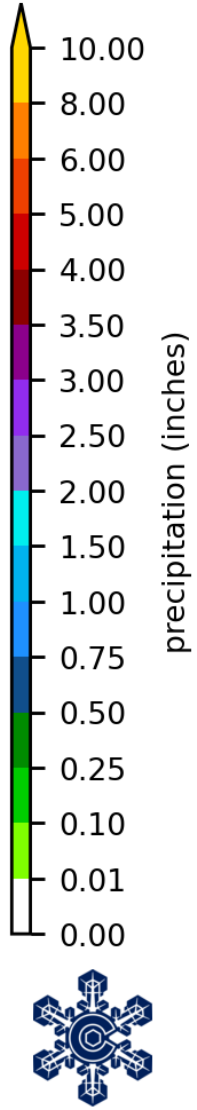
Generated 8/26/2024 at HPRCC using provisional data.

NOAA Regional Climate Centers

PRISM and CoCoRaHS month-to-date precipitation, US Drought Monitor through 5:00am MST Mon 26 August 2024

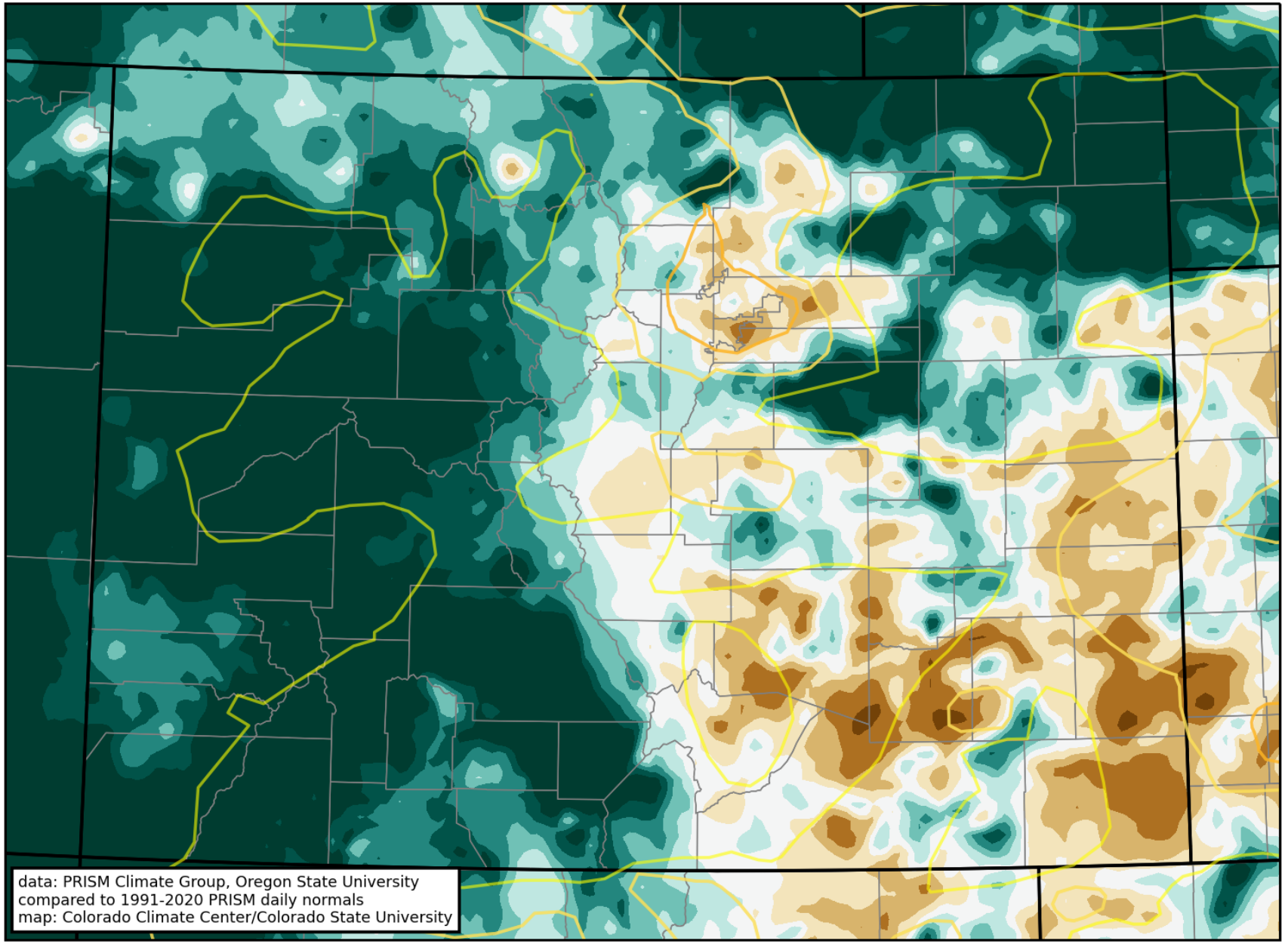


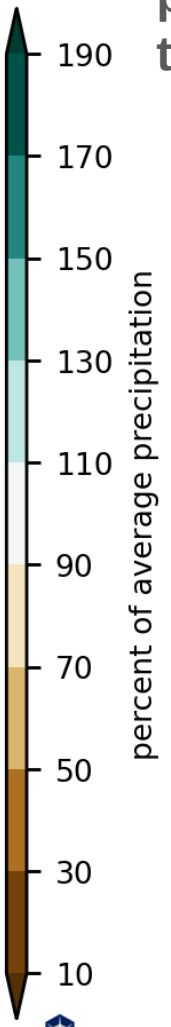
August precipitation through the 26th



PRISM month-to-date % of average precipitation, US Drought Monitor

through 5:00am MST Mon 26 August 2024





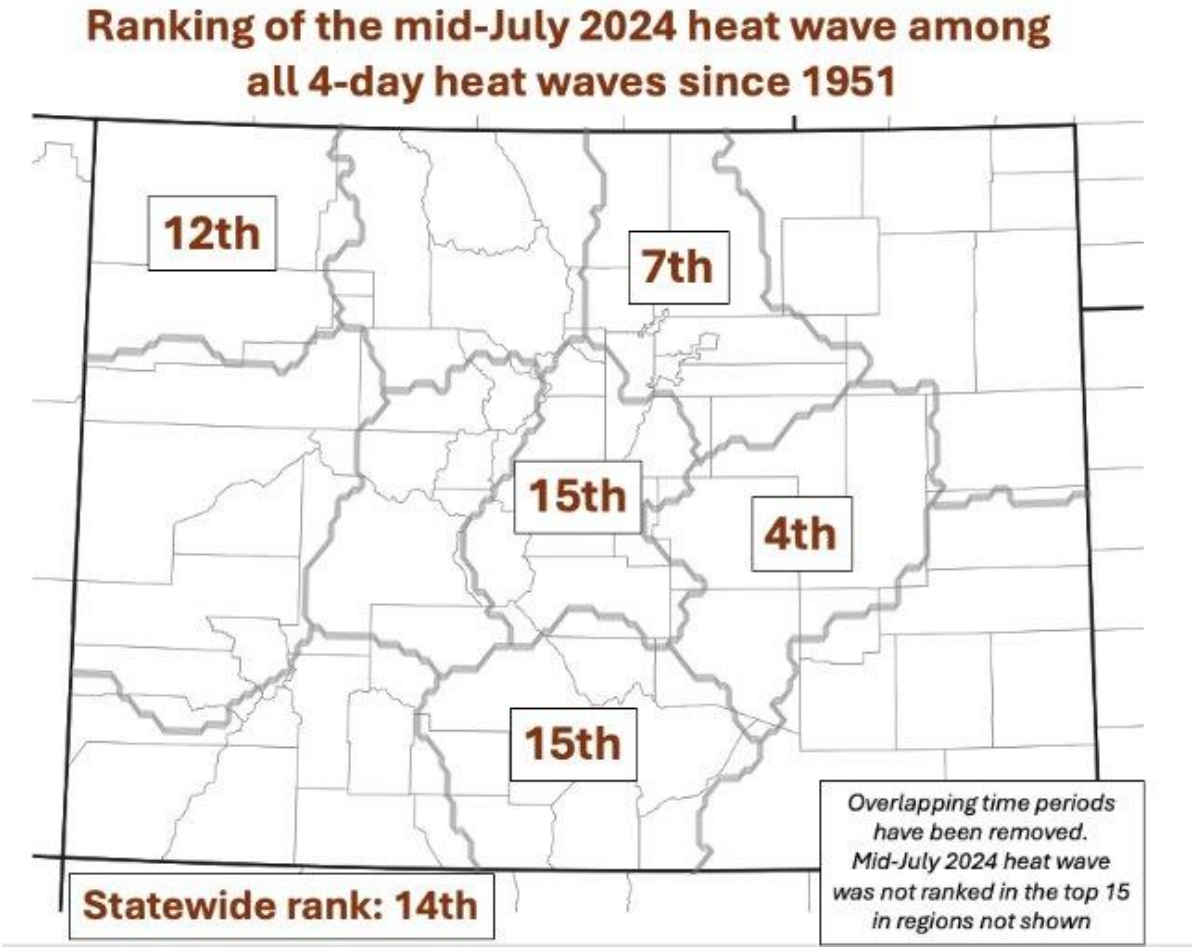
August percent of normal precipitation through the 26th

Summer heat waves

Notable heat waves occurred across Colorado in both the middle of July and again in late July into early August

The mid-July heat wave was especially intense along the Front Range, where it ranked in the top 10 since 1951. Two of our blog posts in July focused on heat waves – please subscribe to the blog if you haven't!

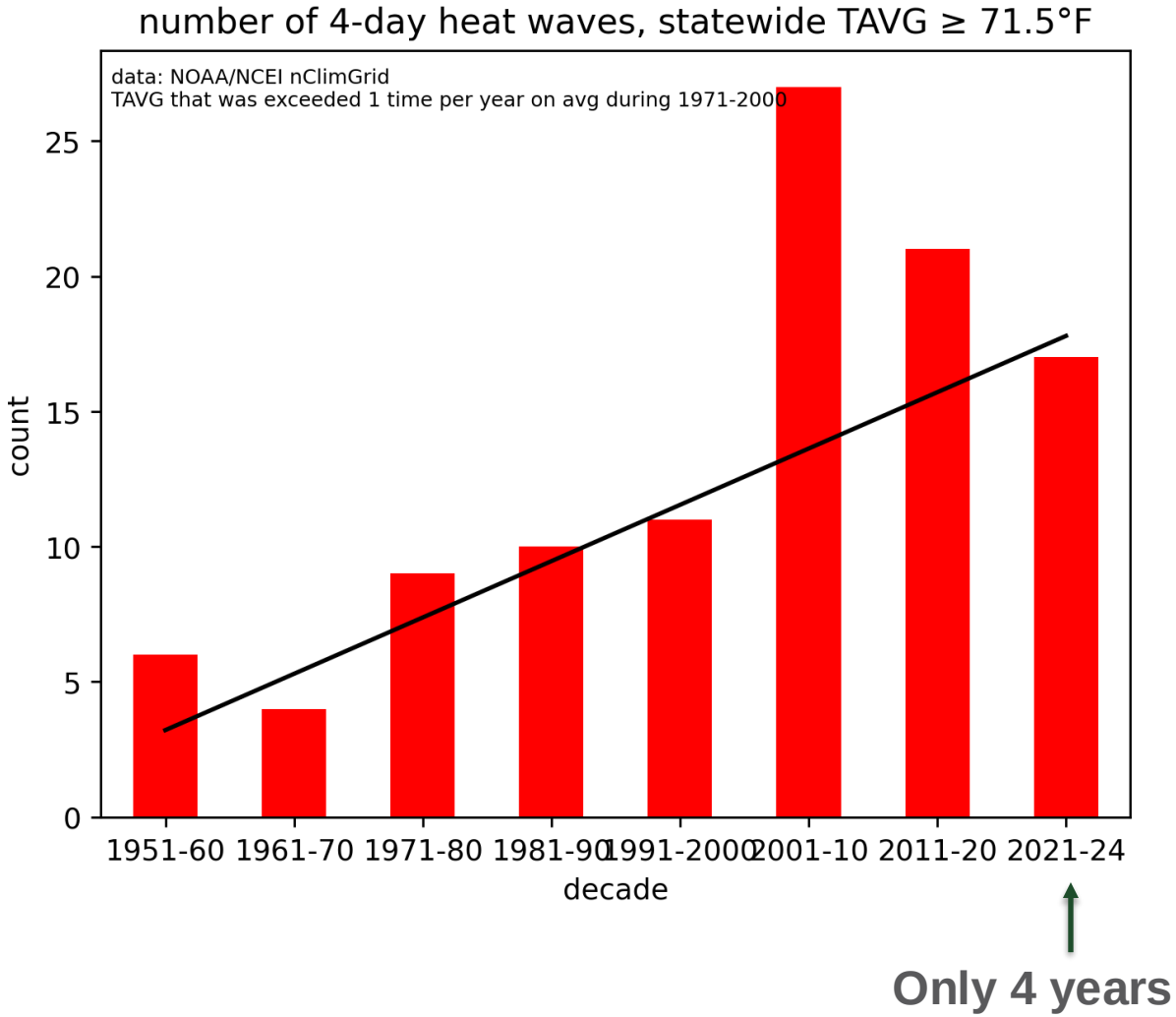
https://climate.colostate.edu/blog/



Summer heat waves

Using the definition from the Climate Change in Colorado report*, there have been four 4-day heat waves statewide in 2024: June 24-27, July 13-16, July 30-August 2, and August 3-6

The first four years of this decade have more heat waves than any full decade from 1950-2000



*heat wave or cold wave = 4 day period with an average temperature that would've been exceeded once a year on average during 1971-2000

Summer heat waves

The late July/early August heat was also prolonged (much longer than 4 days). Fort Collins set a new record with 16 consecutive 90-degree days

Number of Consecutive Days Max Temperature >= 90 for FORT COLLINS, CO

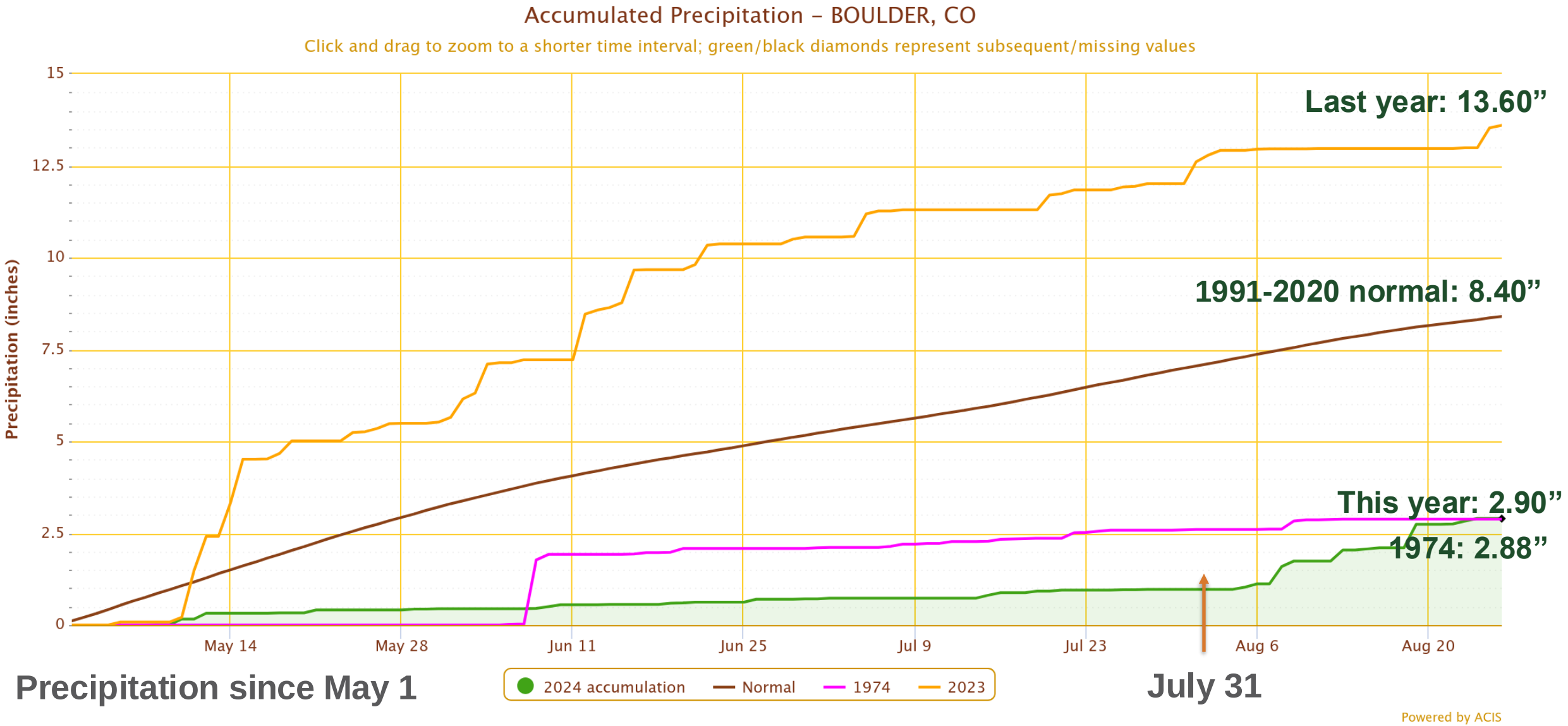
Click column heading to sort ascending, click again to sort descending.

Rank	Run Length	Ending Date
1	16	2024-08-07
2	14	2012-07-05
-	14	1987-08-02
4	12	2022-07-23
-	12	2020-08-27
-	12	2002-07-03
7	11	2005-07-16
-	11	1954-07-13
9	10	1989-07-09
-	10	1919-06-30
Period of record: 1893-01-01 to 2024-08-25		

Late July wildfires

The combination of heat and lack of precipitation led to the rapid growth of multiple destructive wildfires near the end of July. This included the Alexander Mountain Fire west of Loveland (pictured at left), the Stone Canyon Fire near Lyons, and the Quarry Fire southwest of the Denver Metro area. These fires tragically caused one fatality, injuries to firefighters, and the loss of numerous homes. The fires continued burning into August.

Driest May-June-July on record at Boulder (by far!)



Precipitation since May 1

July 31

Northern Front Range, May-June-July 2024

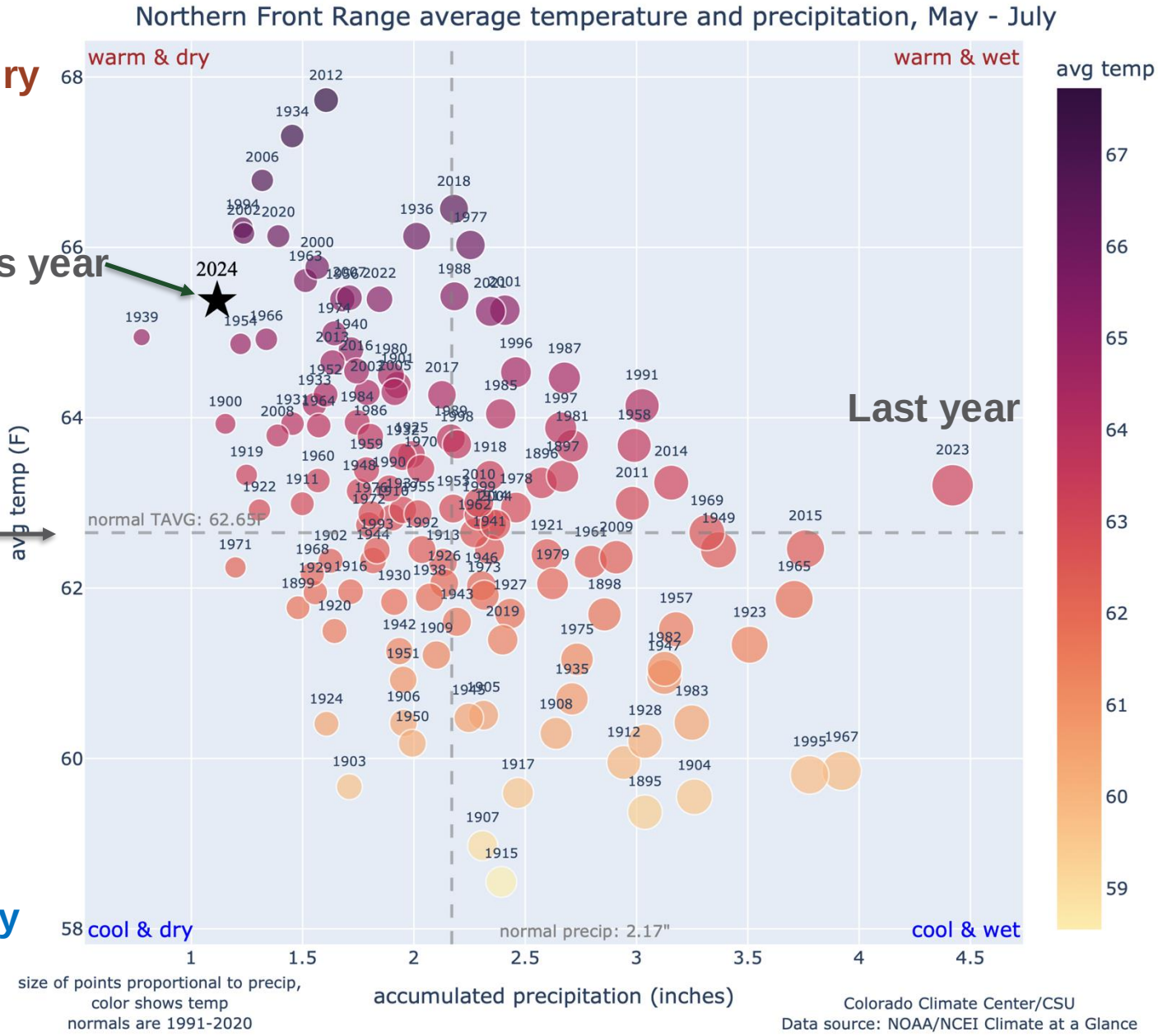
Warm & dry

Warm & wet

This year

Last year

1901-2000 avg temp



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

Cool & dry

Cool & wet

Drought conditions

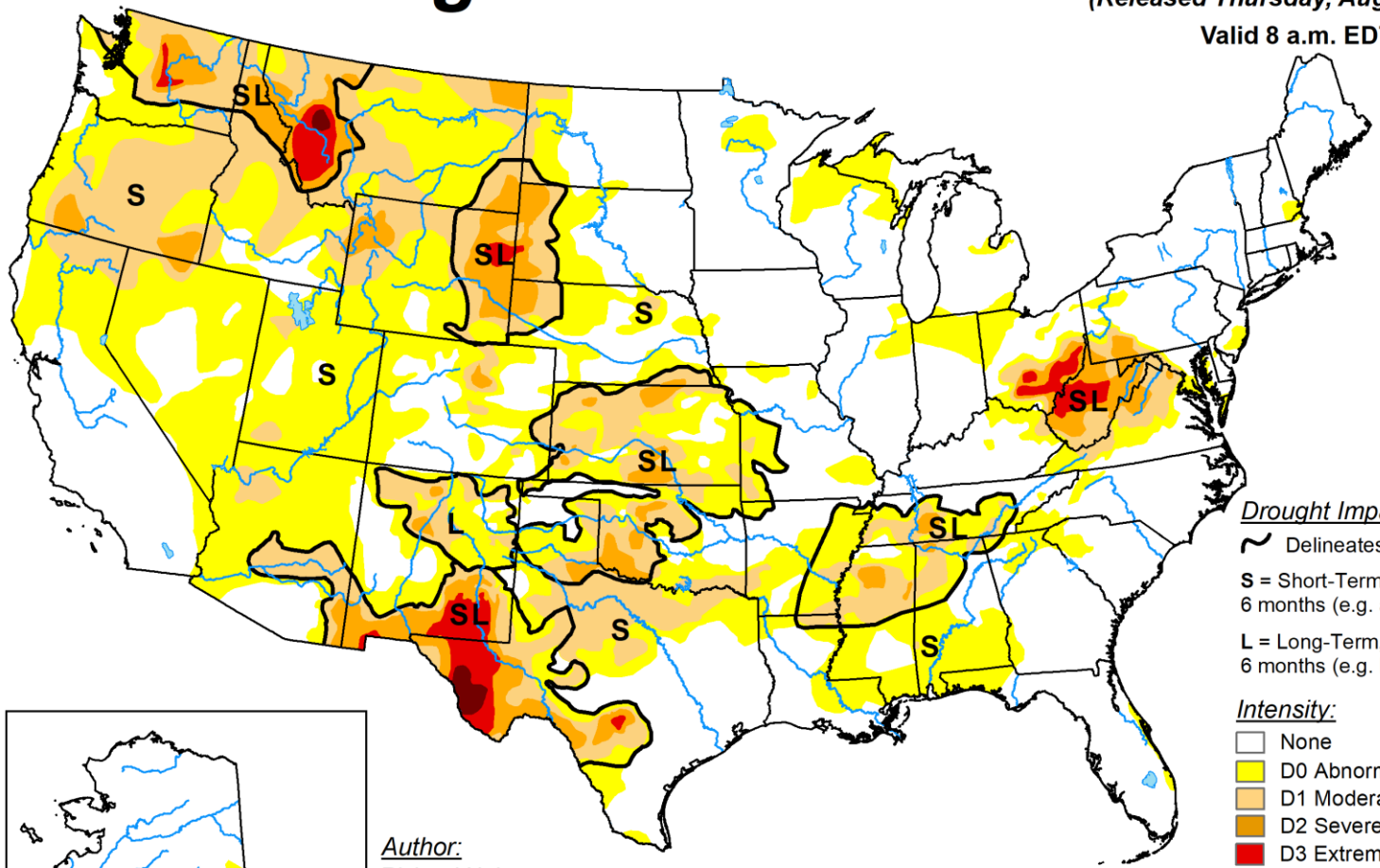
Alexander Mountain Fire, July 29
Photo credit: Becky Bolinger

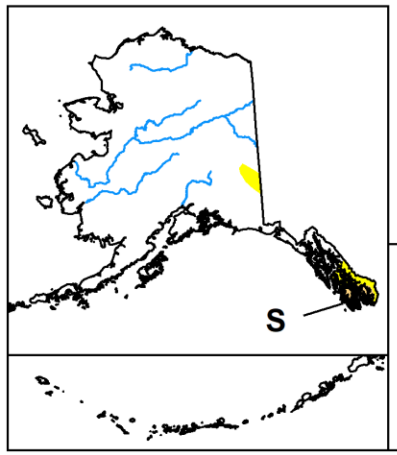
U.S. Drought Monitor

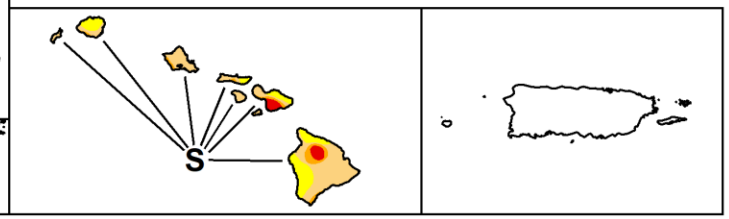
August 20, 2024

(Released Thursday, Aug. 22, 2024)

Valid 8 a.m. EDT







Author:
Richard Heim
NCEI/NOAA

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)

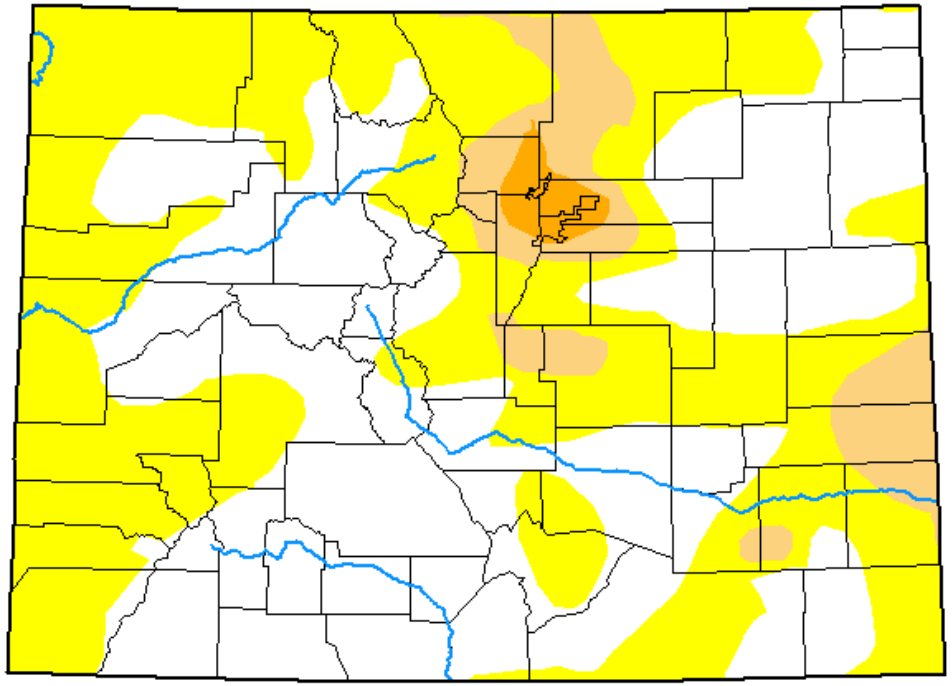
Intensity:

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

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



August 20, 2024

(Released Thursday, Aug. 22, 2024)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	47.21	52.79	8.27	1.16	0.00	0.00
Last Week *08-13-2024*	37.27	62.73	10.11	0.72	0.14	0.00
3 Months Ago *05-21-2024*	62.83	37.17	12.23	0.22	0.00	0.00
Start of Calendar Year *01-02-2024*	34.65	65.35	29.59	8.85	2.05	0.00
Start of Water Year *09-26-2023*	65.71	34.29	17.43	2.77	0.00	0.00
One Year Ago *08-22-2023*	69.61	30.39	15.67	1.52	0.00	0.00

Intensity:

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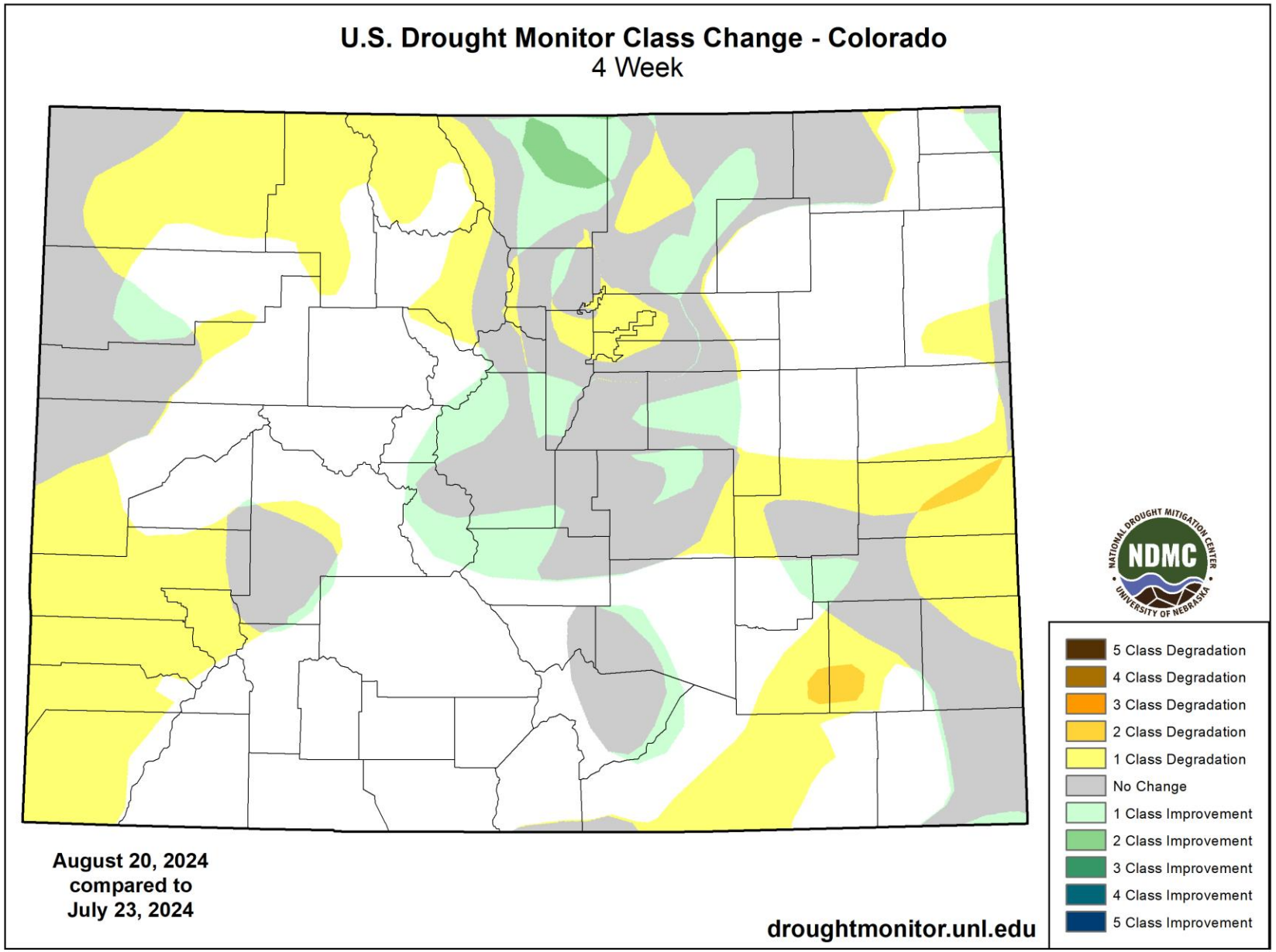
Author:

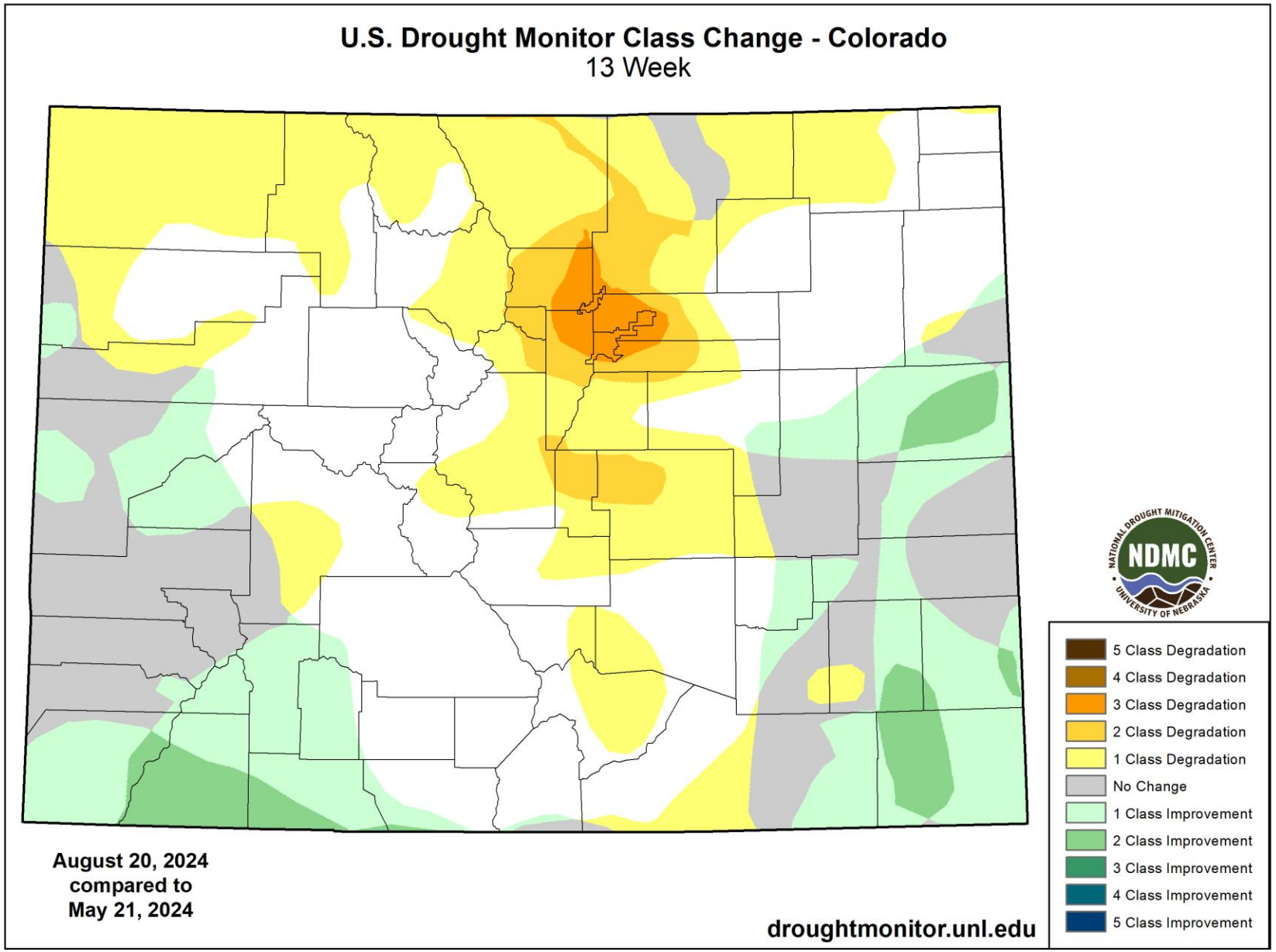
Richard Heim
NCEI/NOAA

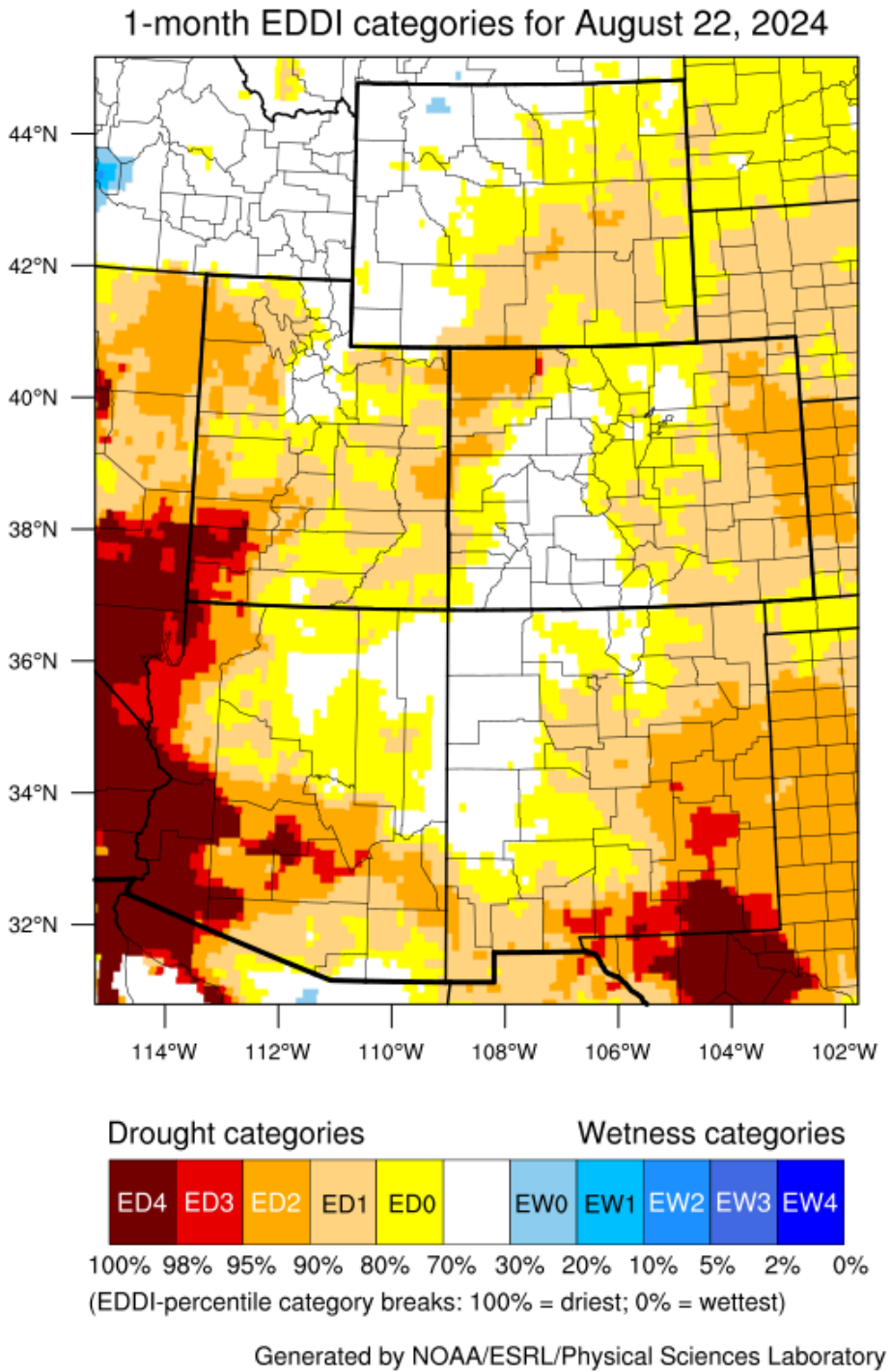
droughtmonitor.unl.edu

Change in the last 4 weeks



Change in the last 3 months





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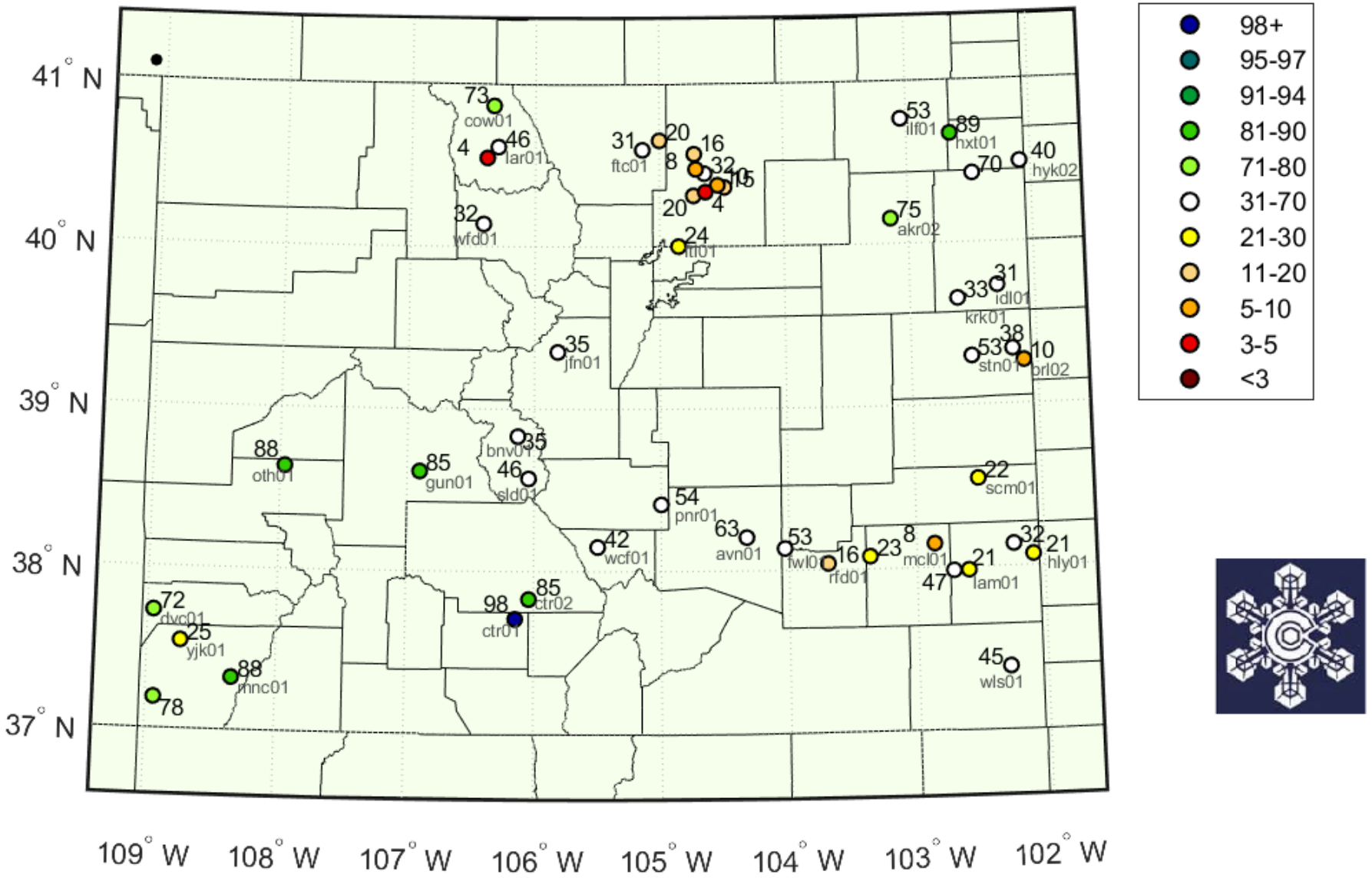
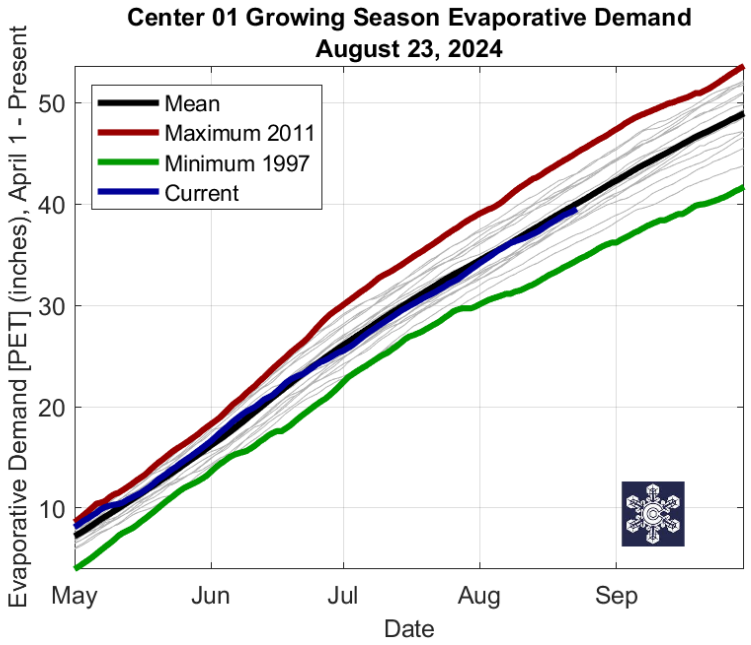
Evaporative Demand Drought Index

Over the last month, evaporative demand has been near-average in most of western Colorado, with good humidity and cloud cover. The northwest corner of the state and the eastern plains have seen above-average evaporative demand

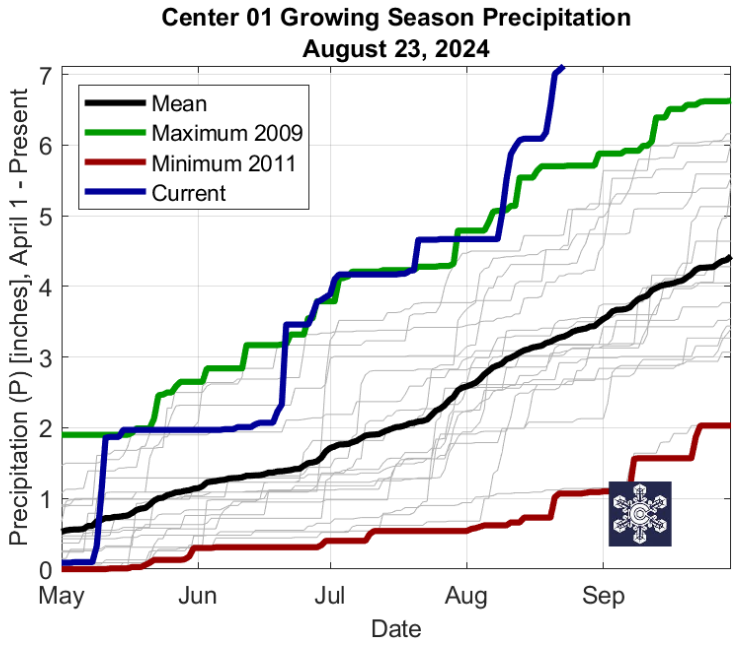
Growing Season Water Balance (P/PET) Percentiles
August 23, 2024



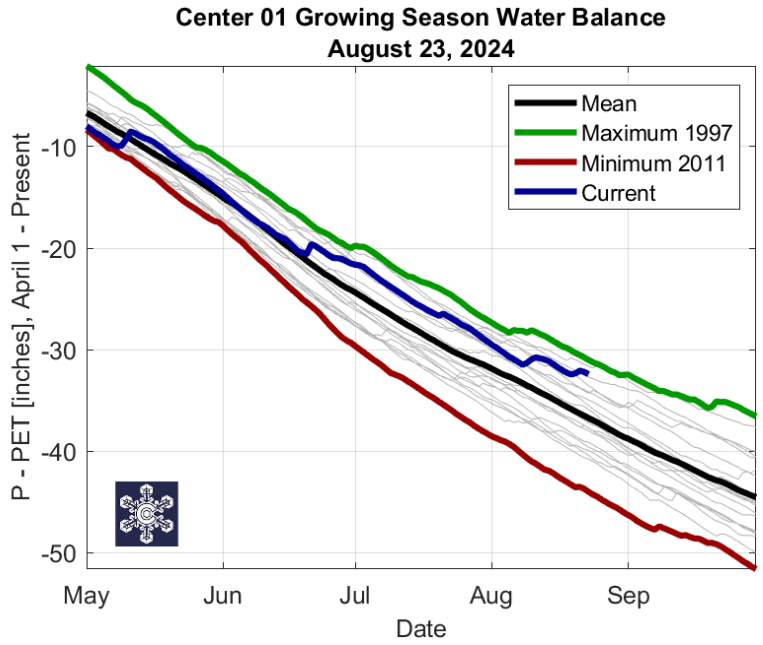
Center CoAgMET station, since April 1



Near-average evaporative demand



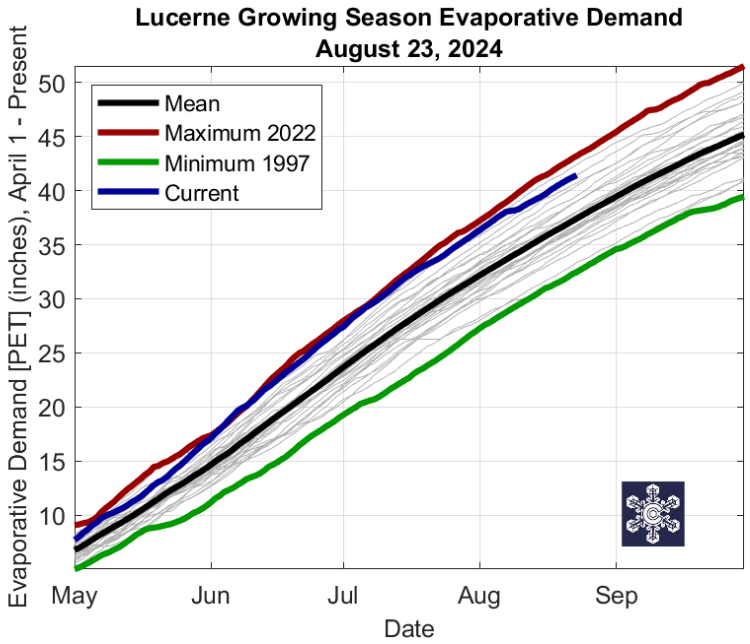
Record-high precipitation



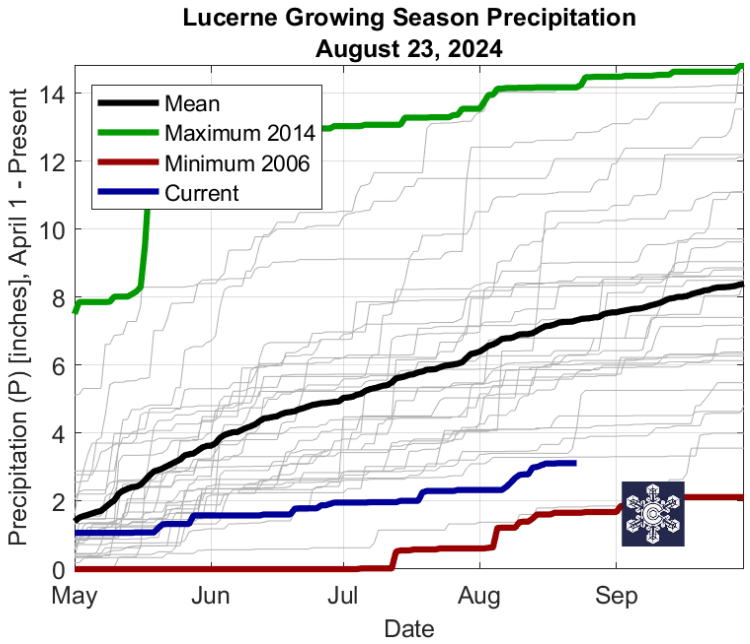
Above-average water balance

Data since 1992 at this station

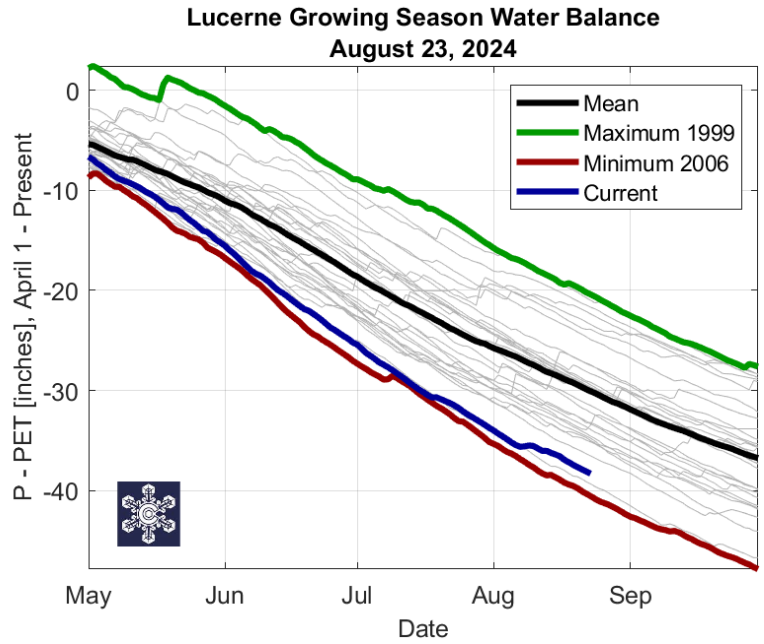
Lucerne CoAgMET station, since April 1



High evaporative demand



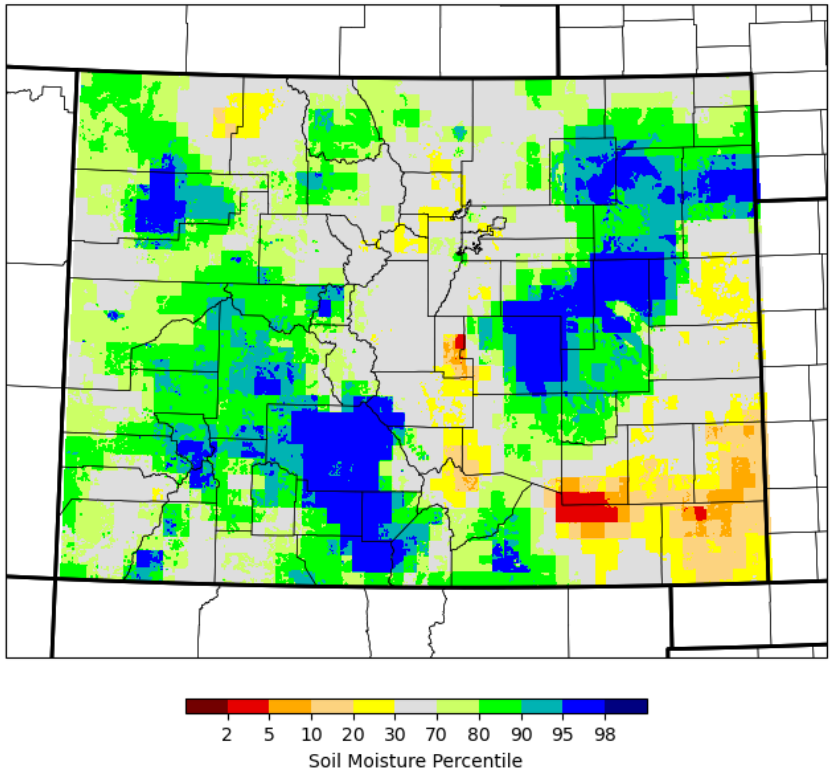
Below-average precipitation



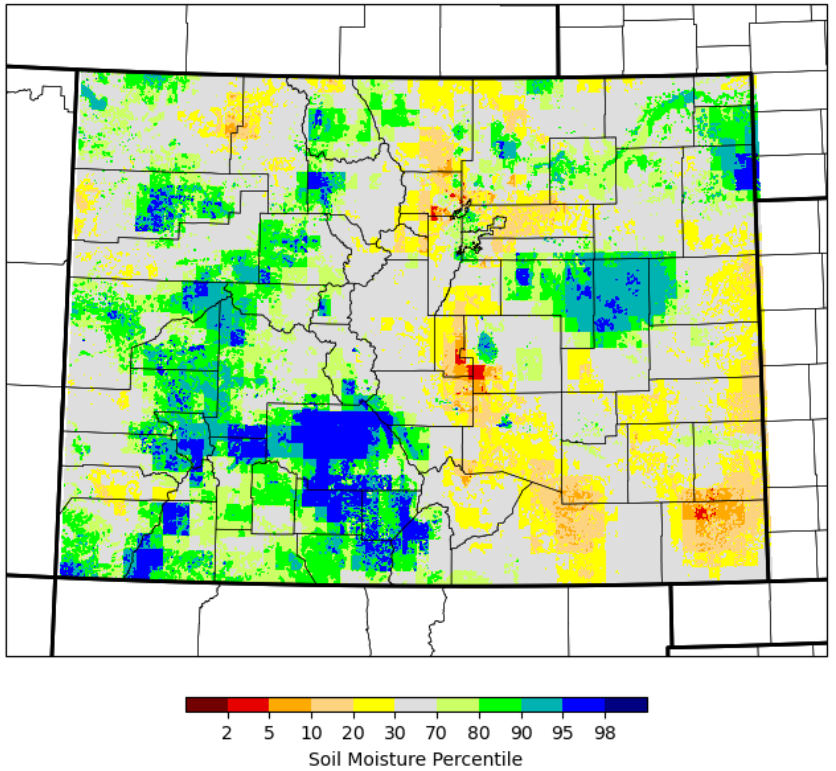
Below-average water balance

Data since 1992 at this station

Soil Moisture Percentiles (0-10cm) 08/22/2024



Soil Moisture Percentiles (0-1m) 08/22/2024



Recent rains have increased soil moisture in the southern mountains and San Luis Valley, and portions of the eastern plains. Deep soil moisture remains low along the Front Range and parts of southeast Colorado.

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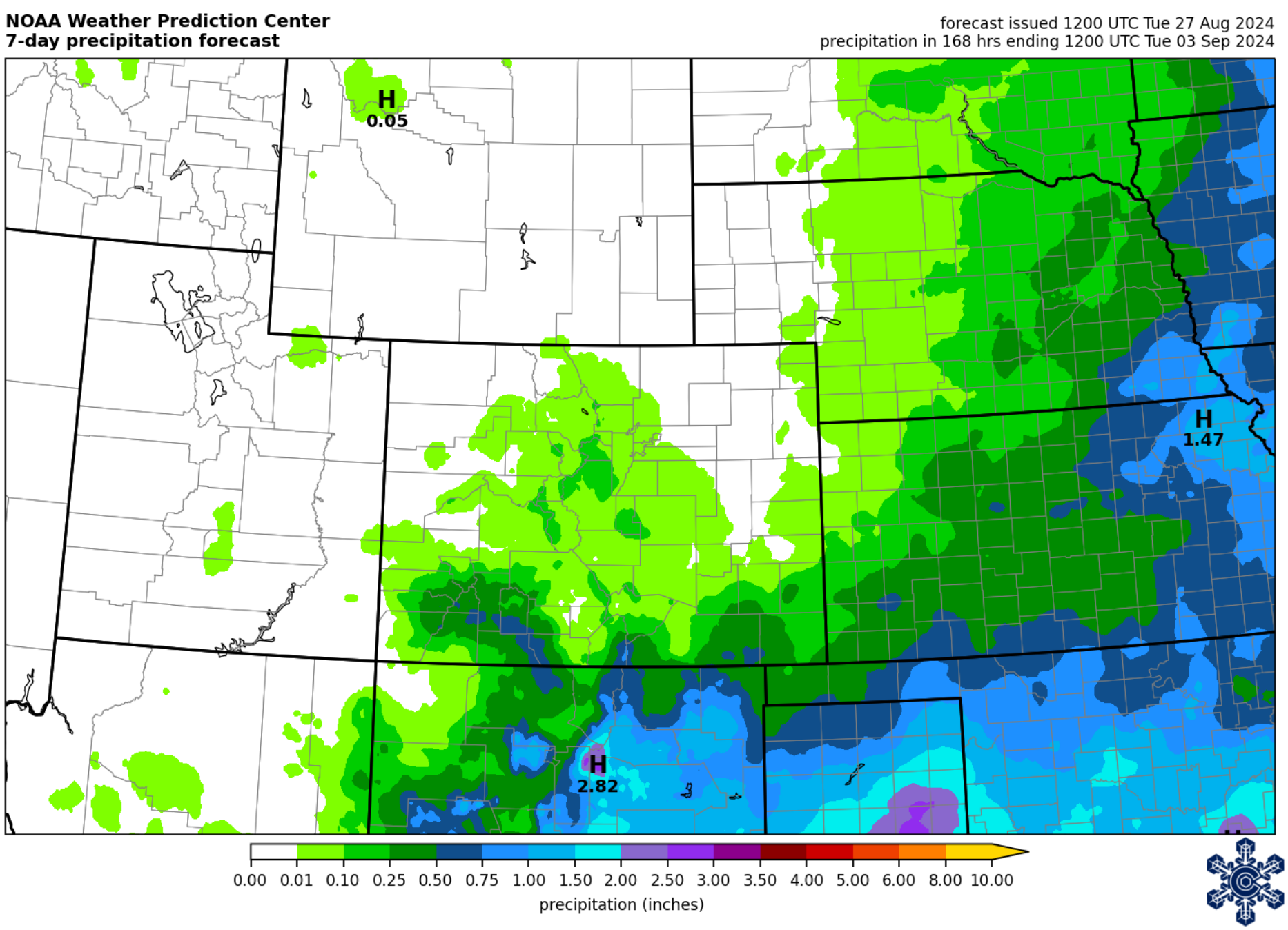
Outlook

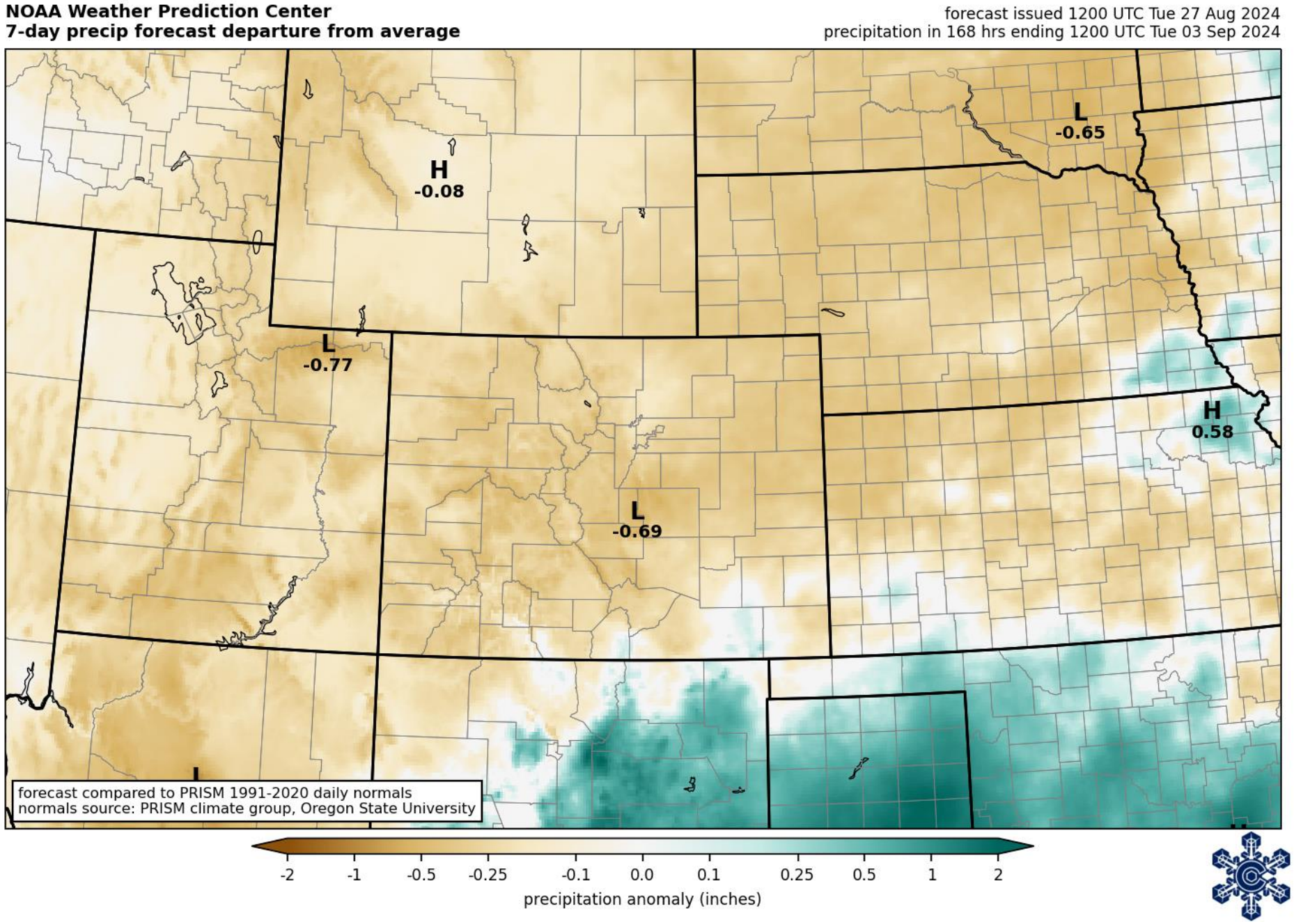
NOAA 7-day precipitation forecast

Drying out over the next week, except for the southern mountains

This is common for late August/early September



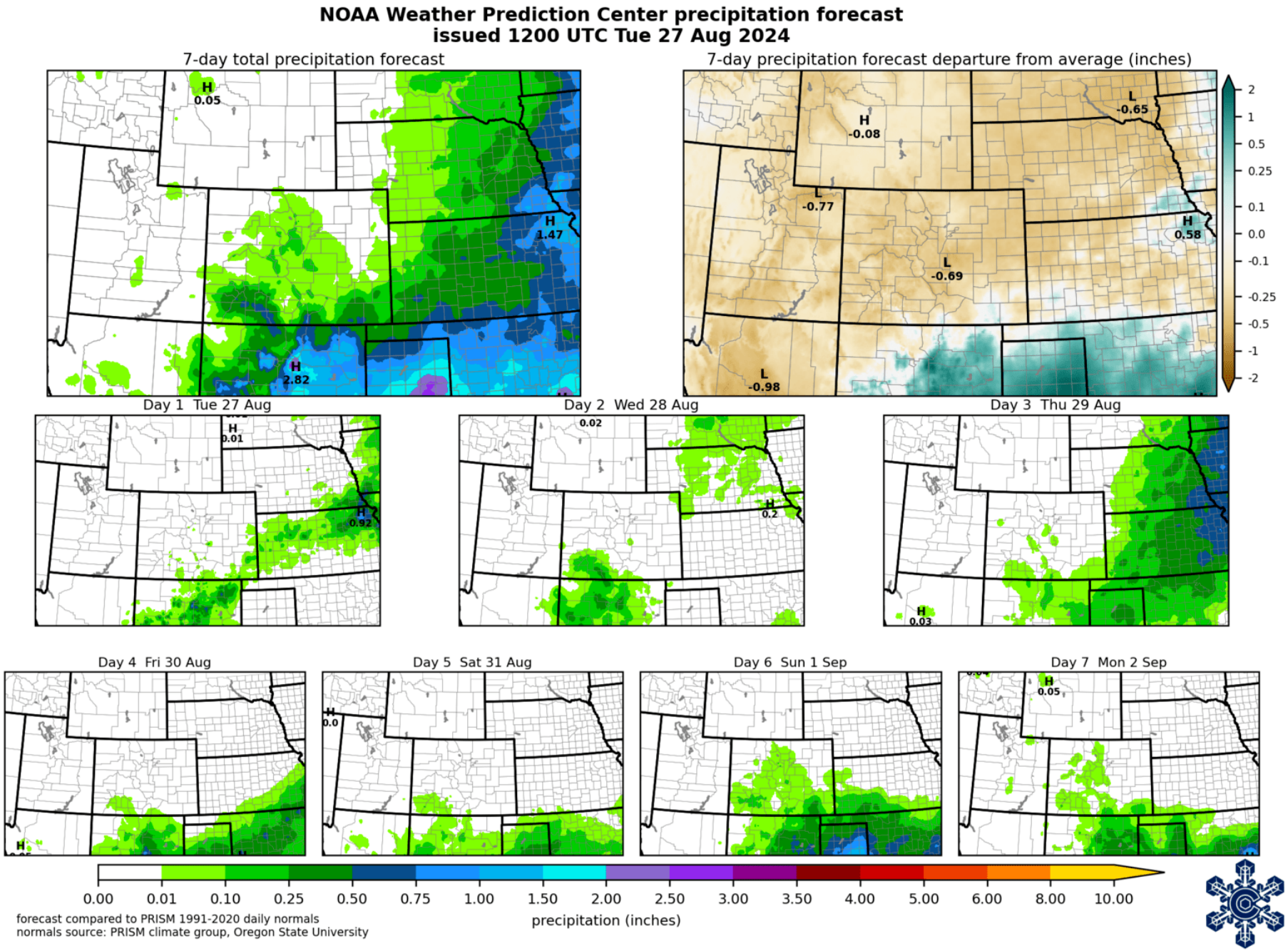
NOAA 7-day precipitation forecast (difference from average)



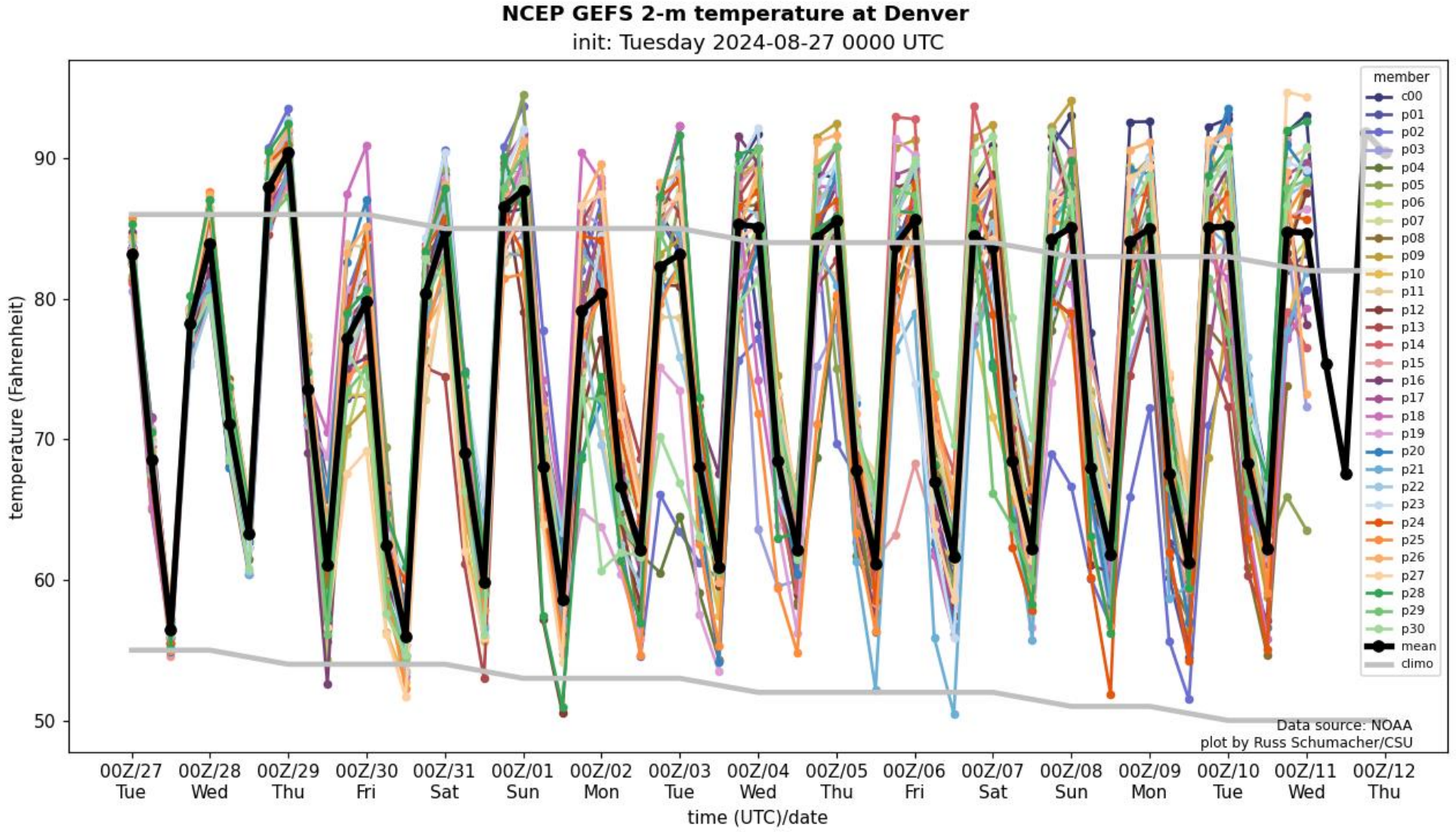
NOAA 7-day precipitation forecast

Quick-look maps on our drought page:

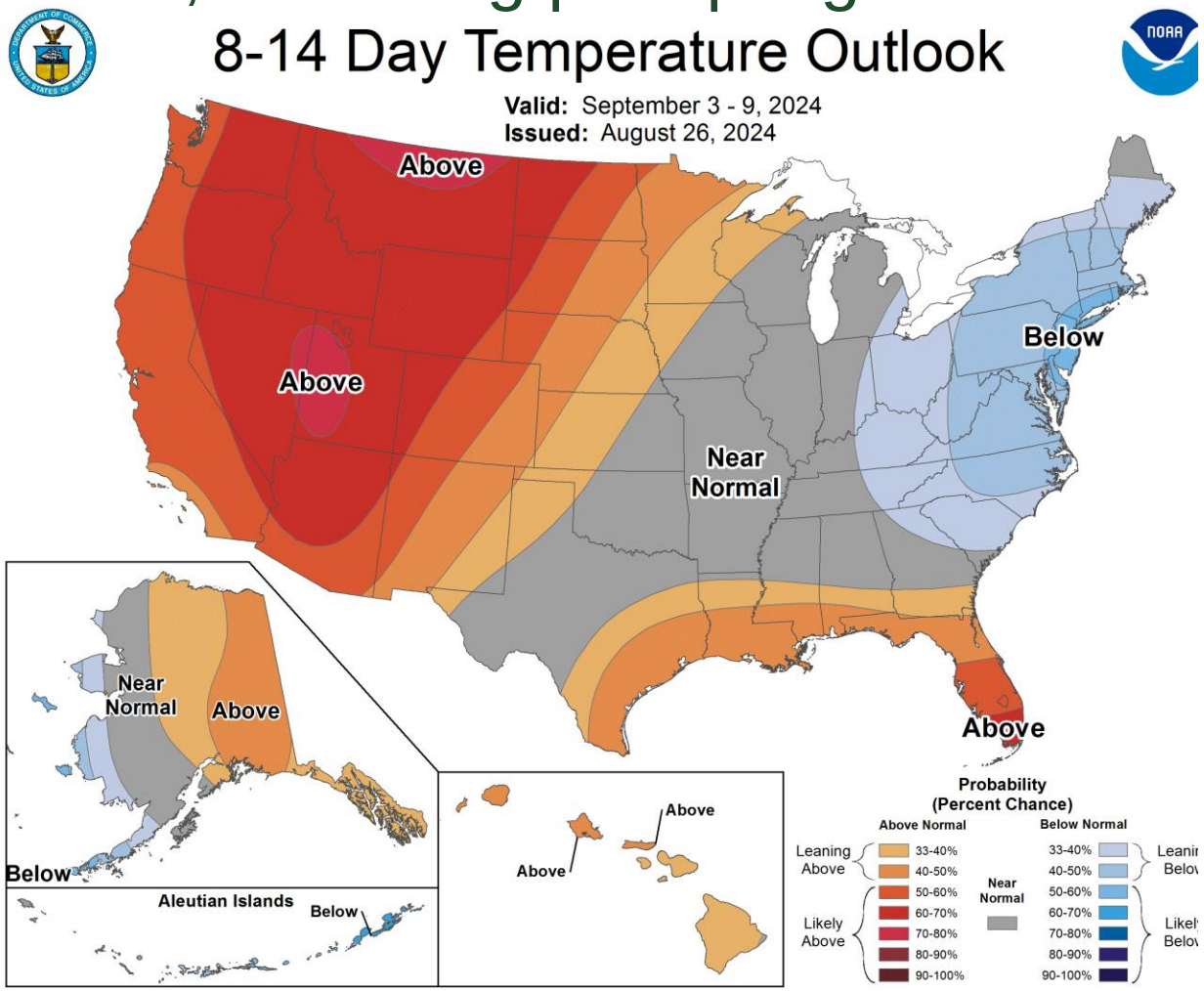
https://climate.colostate.edu/drought/#outlook

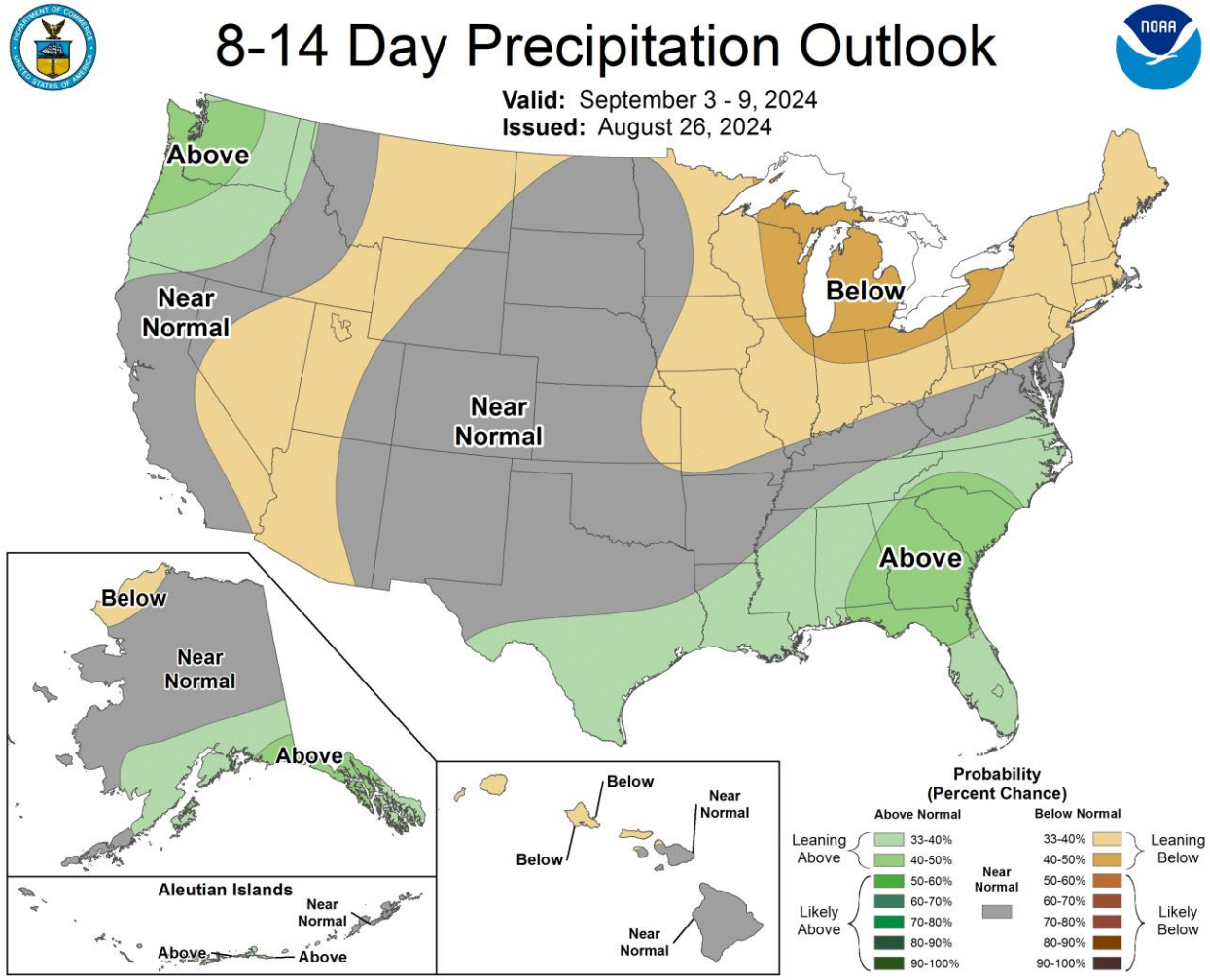


Temperatures expected to stay generally above-average for the coming 2 weeks, though the average starts sloping downward as we get into September

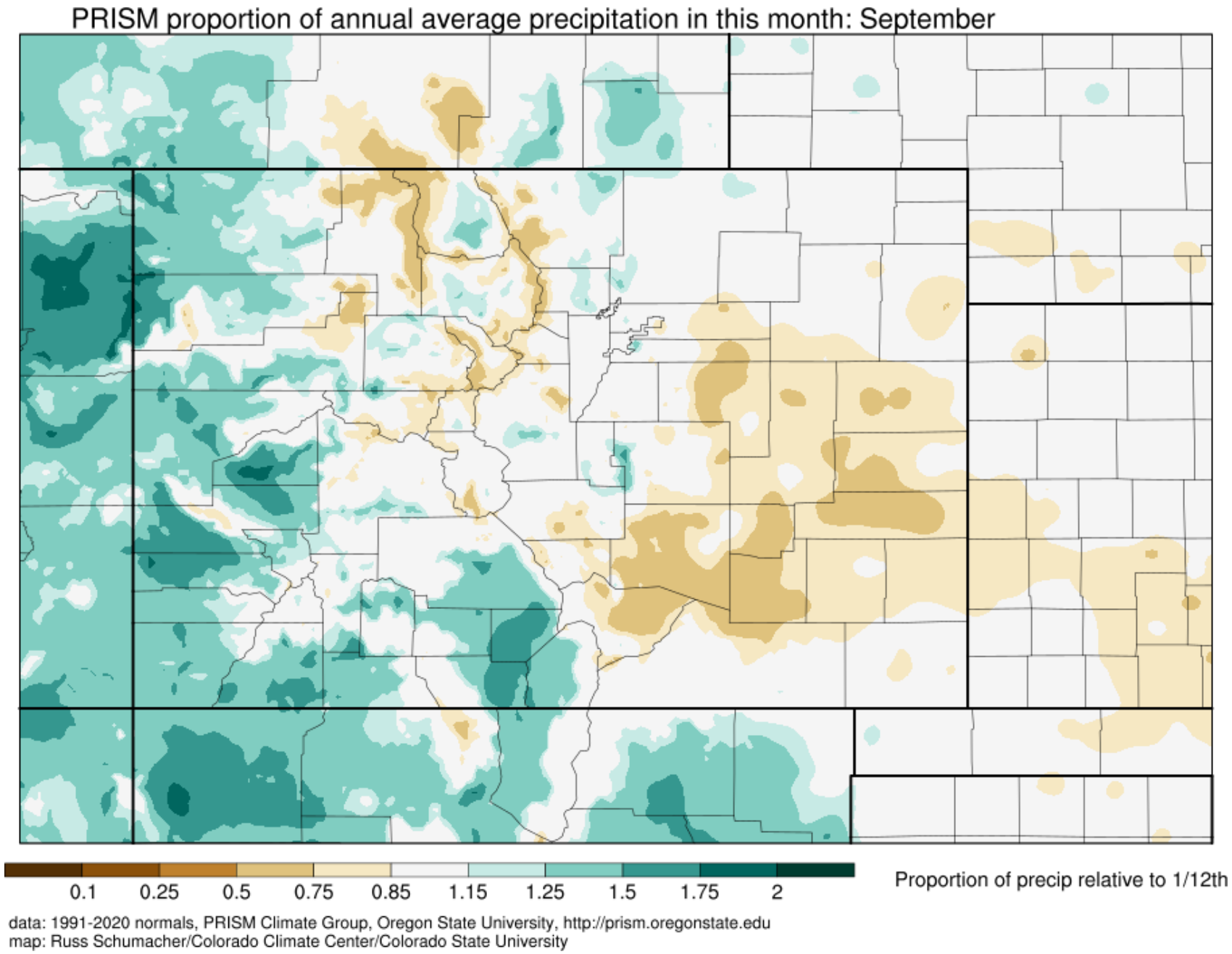


The Sept 3-9 period leans warmer than normal across the western US, no strong precip signal





Is September typically a wet or dry month?



La Niña is on its way back

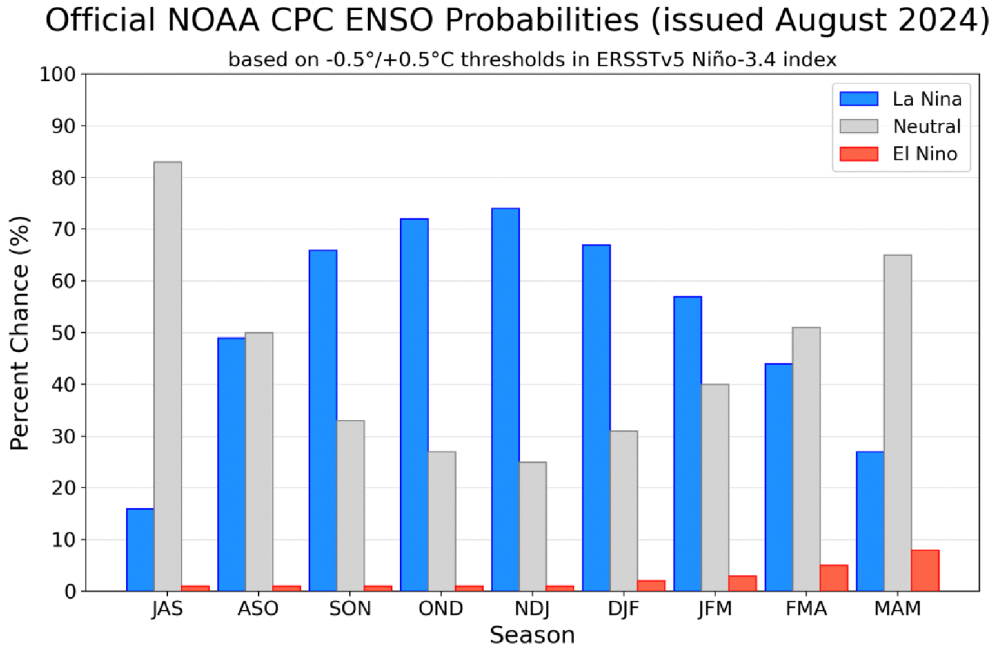
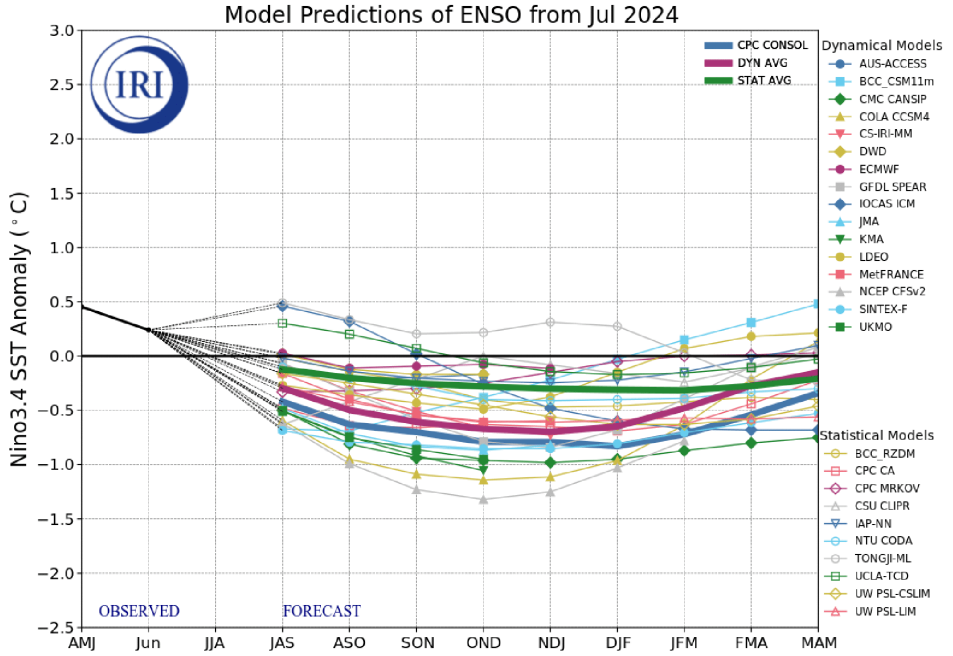


Figure 7. Official ENSO probabilities for the Niño 3.4 sea surface temperature index (5°N-5°S, 120°W-170°W). Figure updated 8 August 2024.



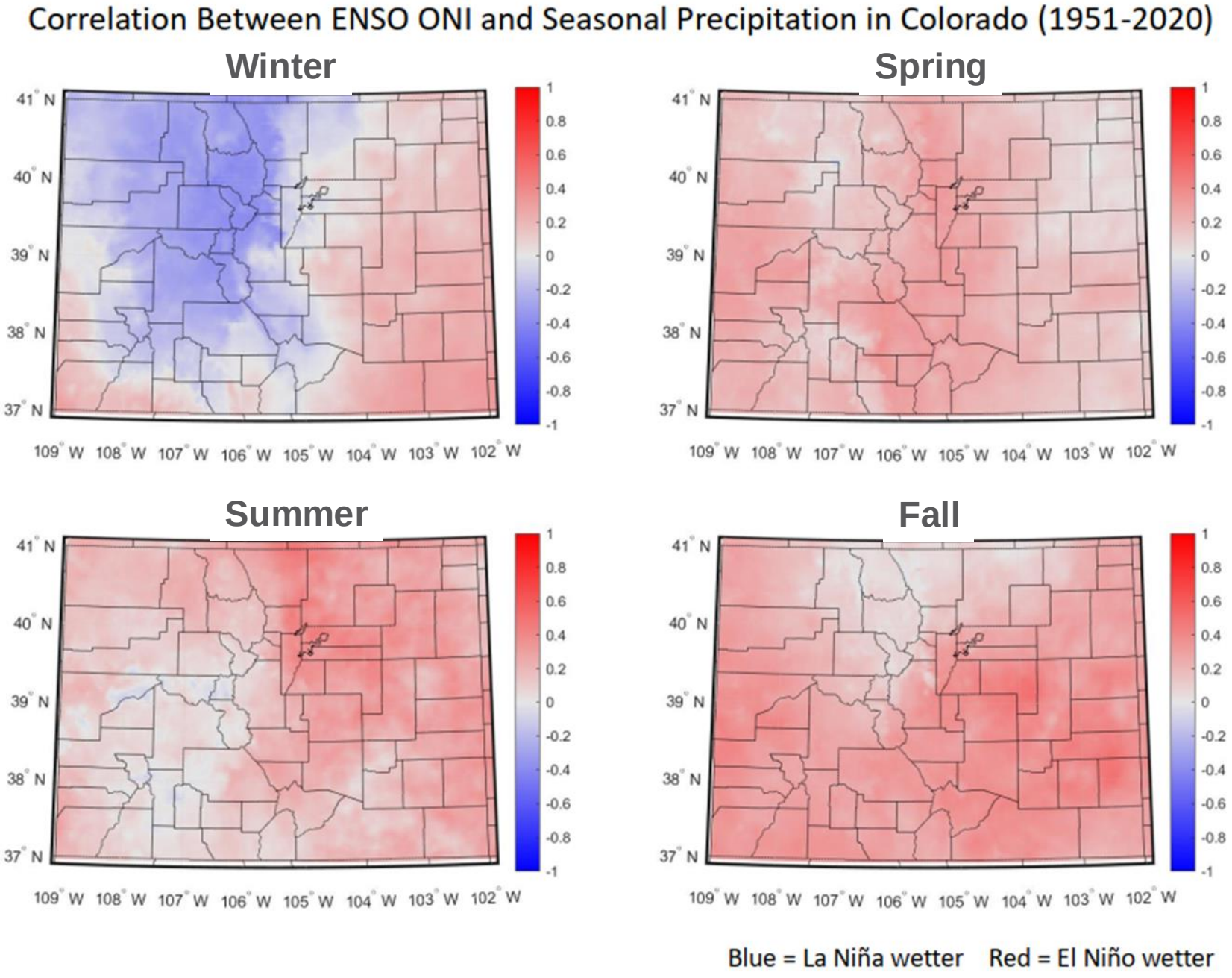
ure 6. Forecasts of sea surface temperature (SST) anomalies for the Niño 3.4 region (5°N-5°S, 120°W-170°W). Figure updated 19 July 2024 by the International Research Institute (IRI) for Climate and Society.

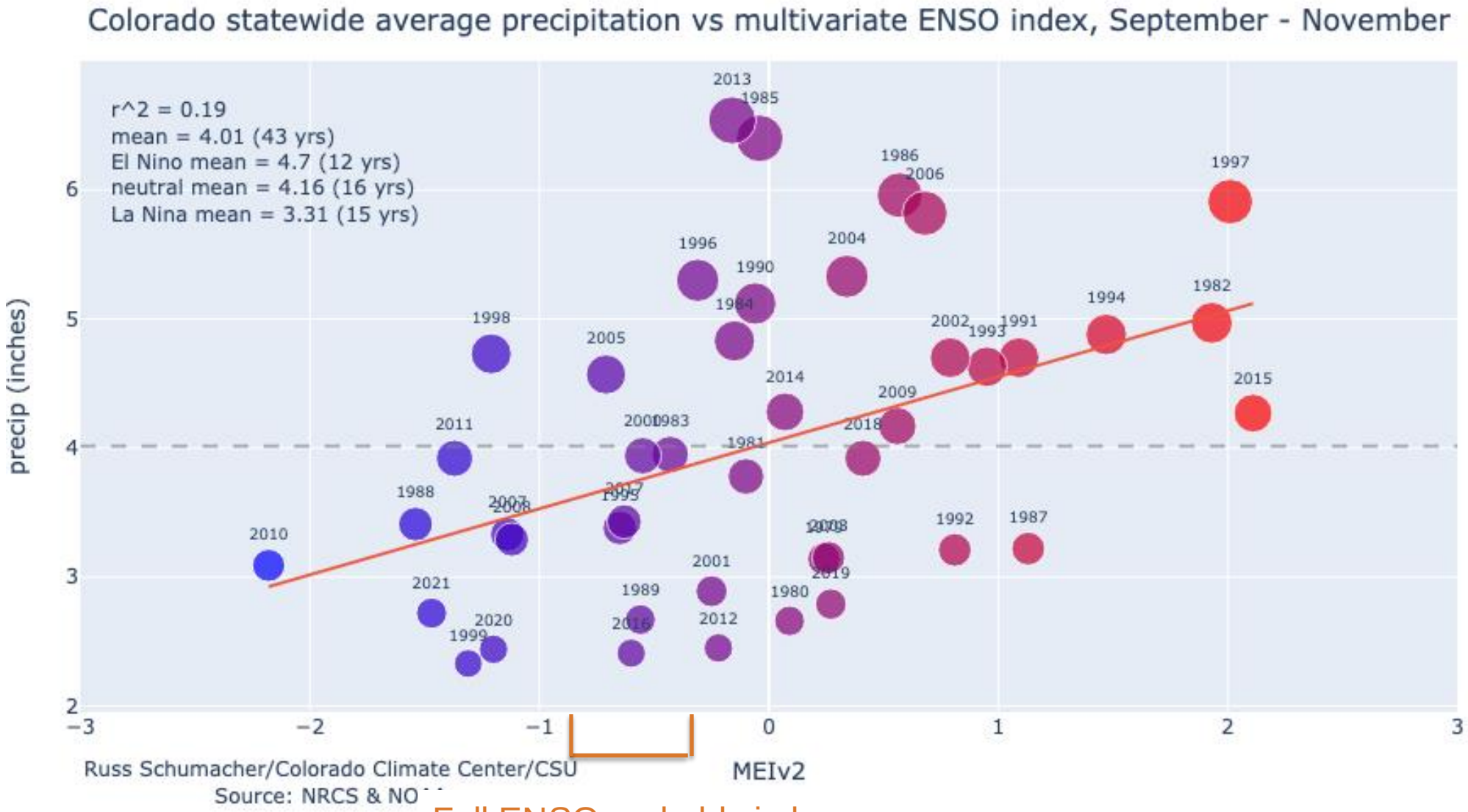
"ENSO-neutral is expected to continue for the next several months, with La Niña favored to emerge during September-November (66% chance) and persist through the Northern Hemisphere winter 2024-25 (74% chance during November-January)"

https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/ensodisc.shtml

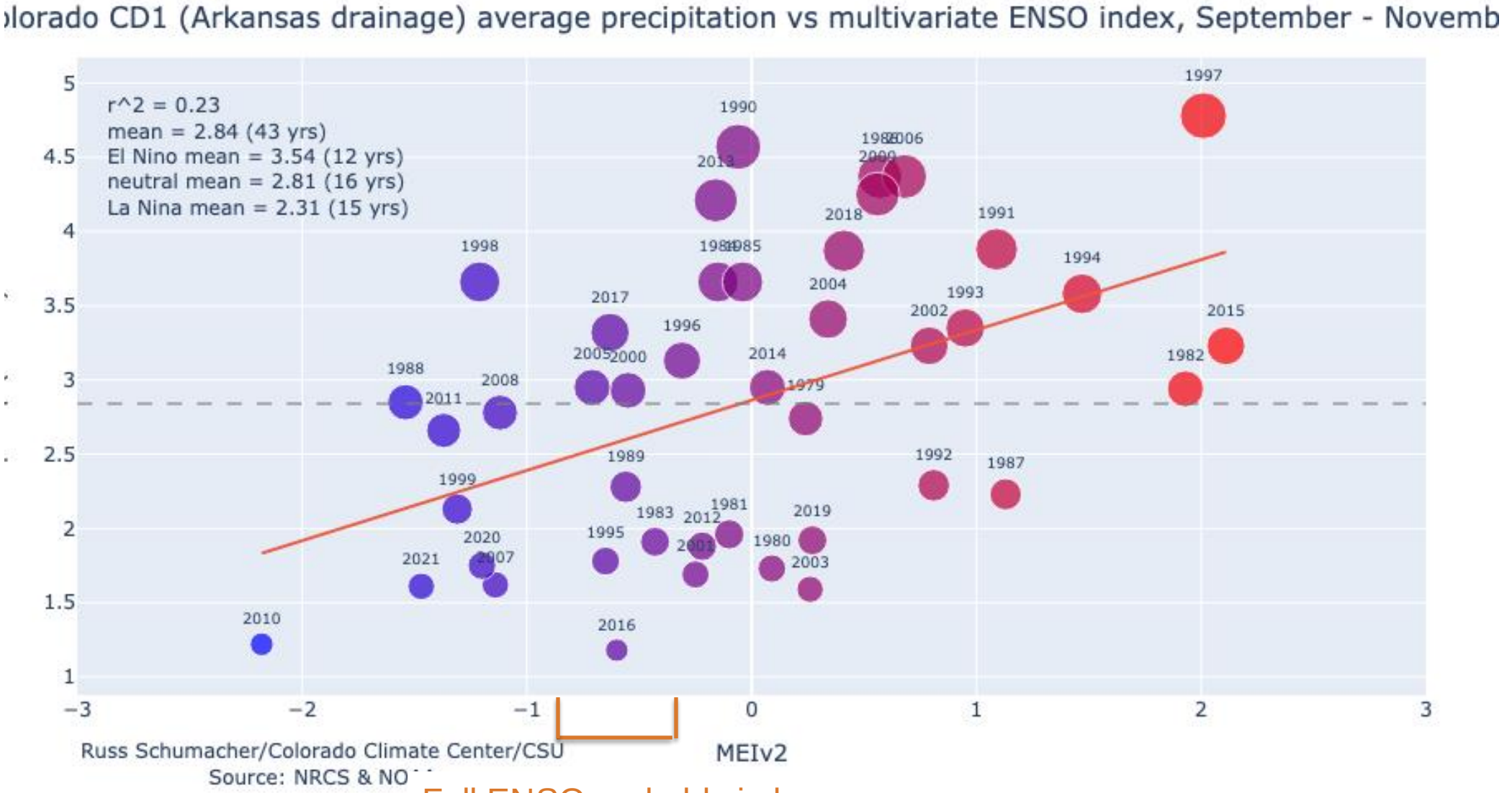
Which seasons tend to be wet or dry depending on the status of El Niño and La Niña?

Blue: La Niña wetter
Red: El Niño wetter



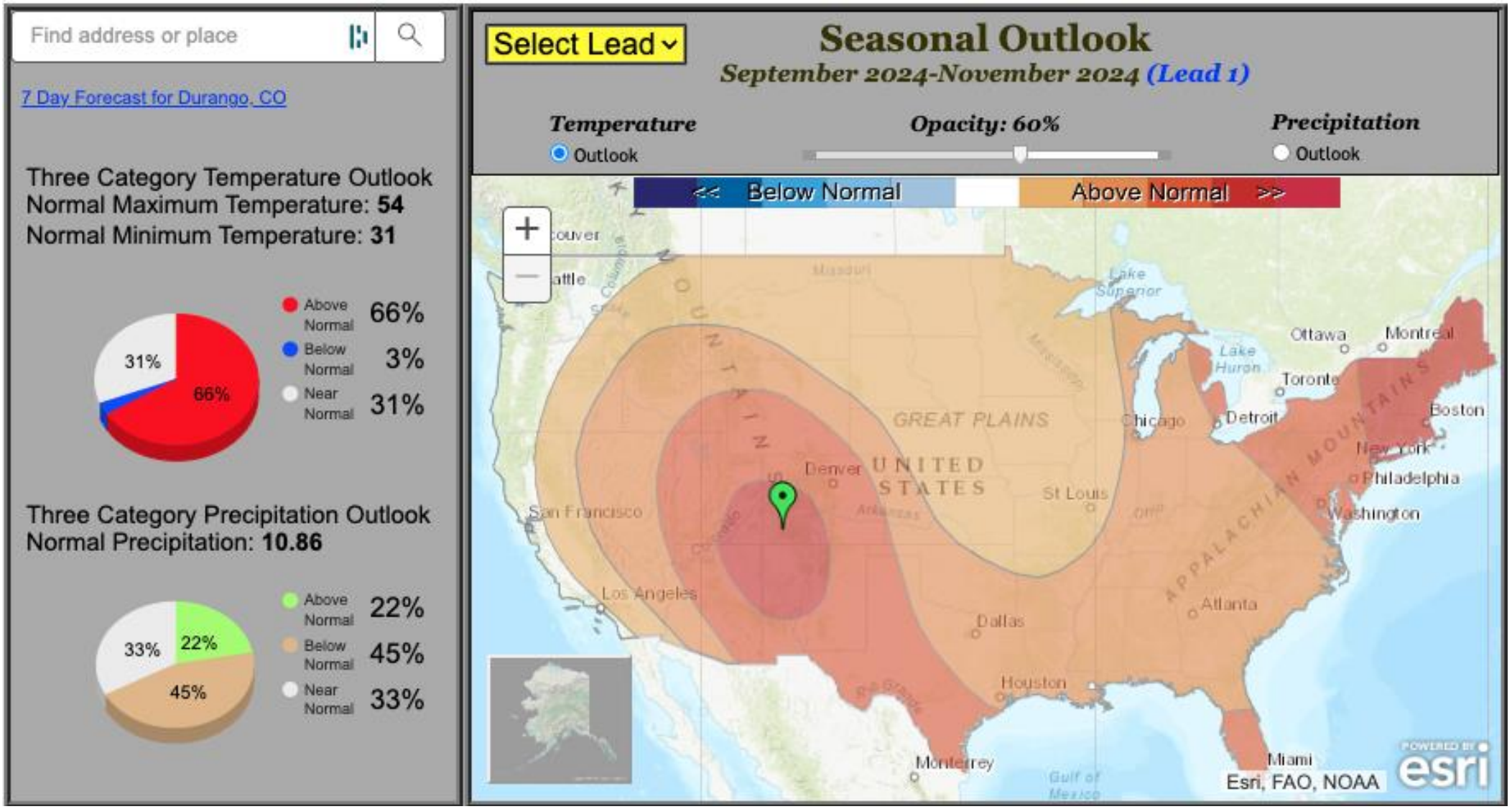


Fall ENSO probably in here

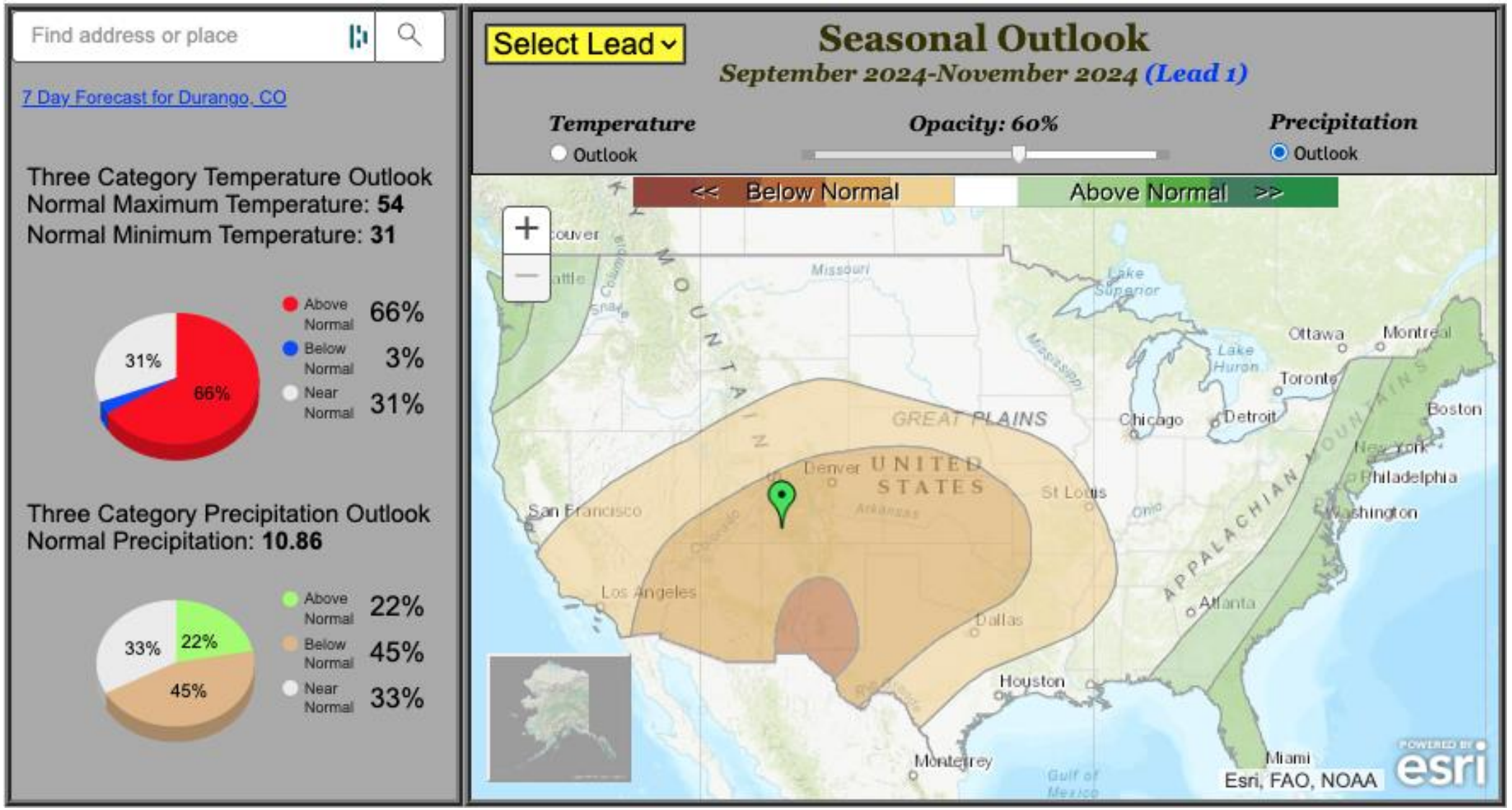


Fall ENSO probably in here

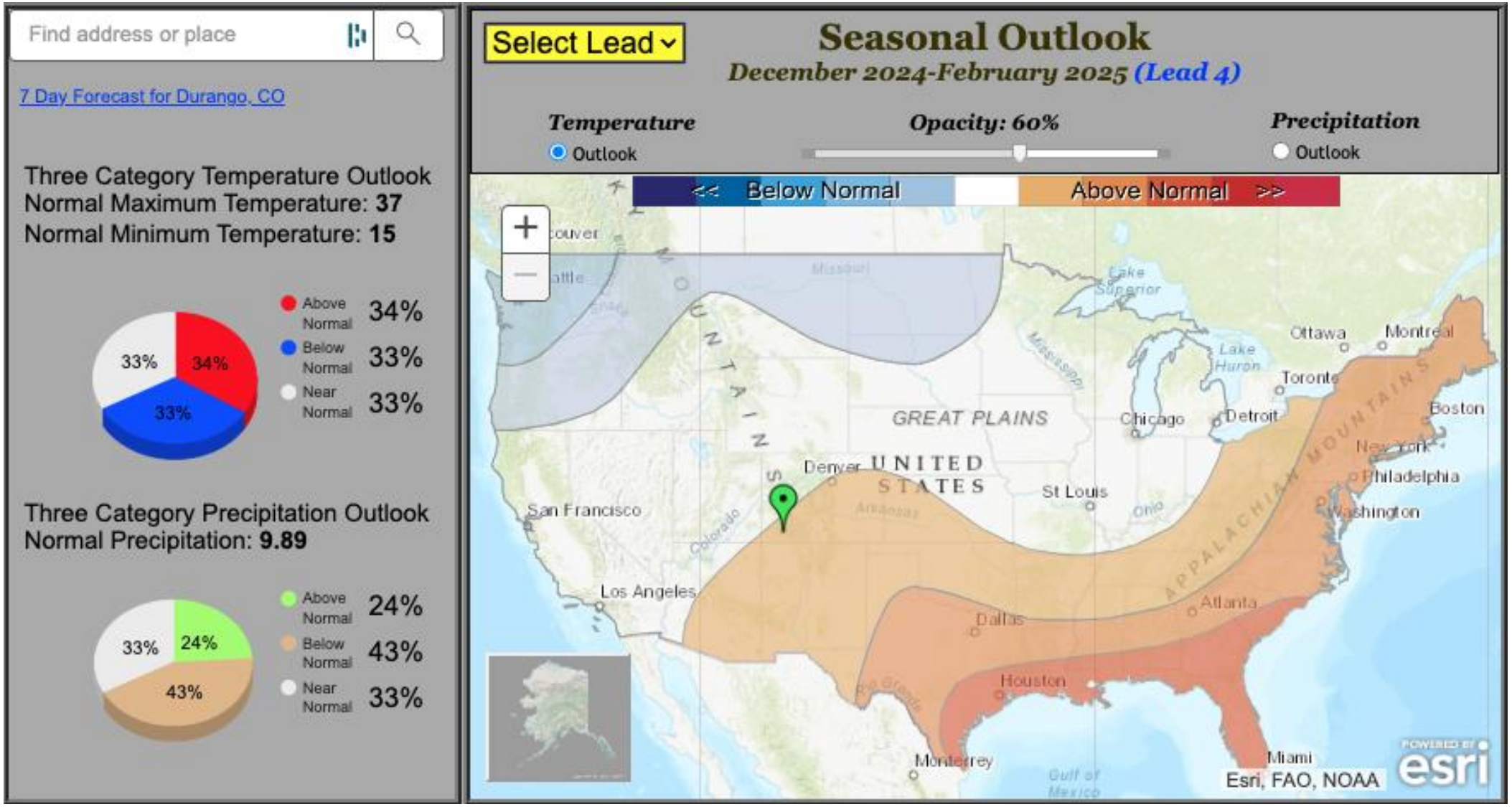
NOAA's Fall (Sept-Oct-Nov) temperature outlook



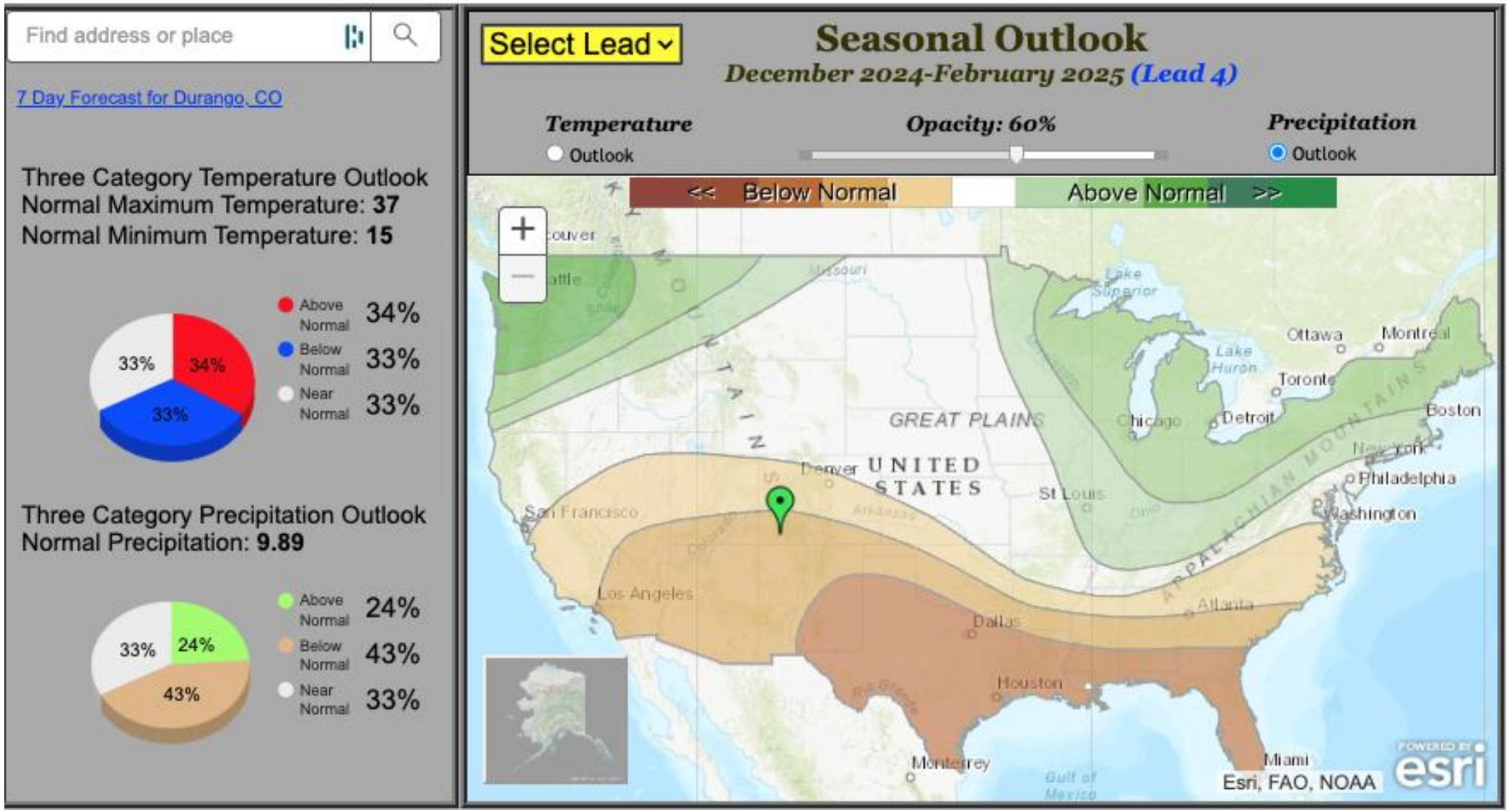
NOAA's Fall (Sept-Oct-Nov) precipitation outlook



NOAA's Winter (Dec-Jan-Feb) temperature outlook



NOAA's Winter (Dec-Jan-Feb) precipitation outlook



Takeaways

- Water Year 2024 has been a warm one. Through July, the 8th warmest on record, and August will finish warmer than average in most of the state.
- Averaged statewide, precipitation has remained near average for the water year. The western slope and parts of the northeastern plains have been wet recently, while it's been dry in the southeast.
- Drought persists along the northern Front Range, where May-July were very dry and several fires broke out, but there's been some relief lately
- La Niña will arrive this fall
- Climate Prediction Center outlooks show high probabilities of a warm, dry fall. The winter outlook reflects the expected La Niña, with a weak signal for Colorado (only a slight tilt toward drier than average in the south)

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