Climate Center Update

Colorado Water Conditions Monitoring Committee 9/24

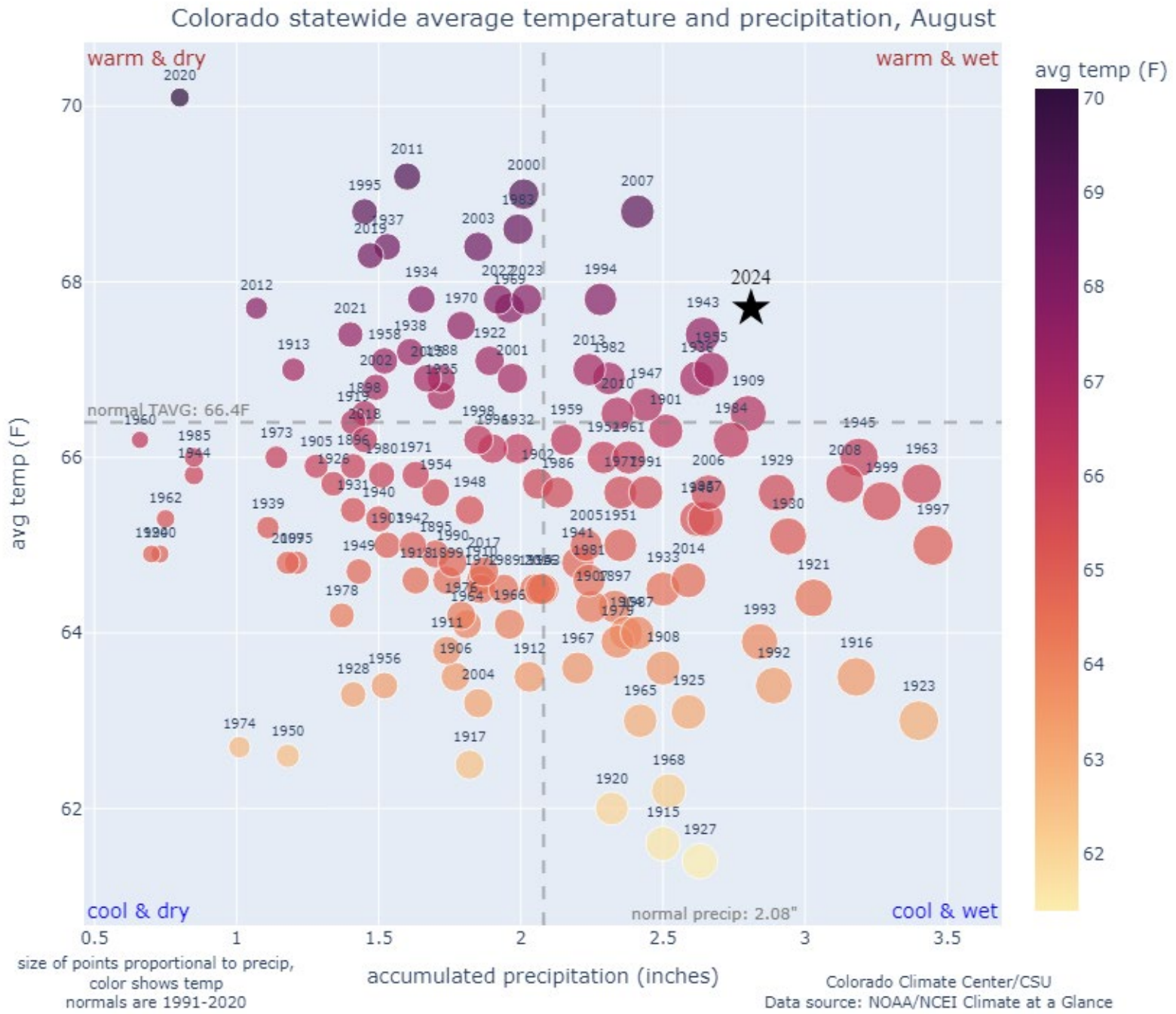
Peter Goble
Colorado Climate Center

COLORADO CLIMATE CENTER

ATMOSPHERIC SCIENCE
COLORADO STATE UNIVERSITY

Agenda

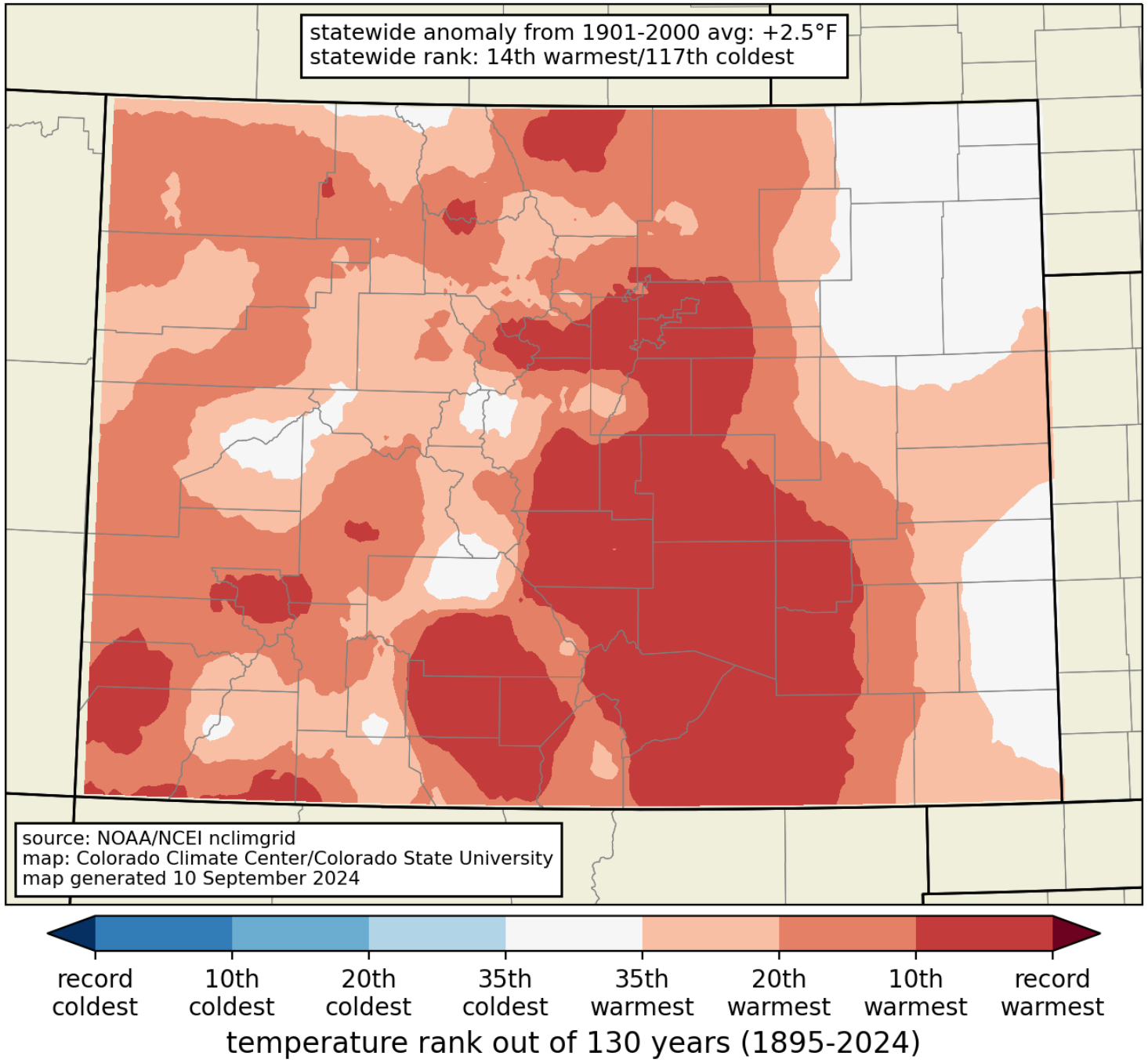
- Current seasonal climate conditions update
- Drought update
- Previewing new land surface products
- Seasonal Forecast info (What will our transition into winter look like?)



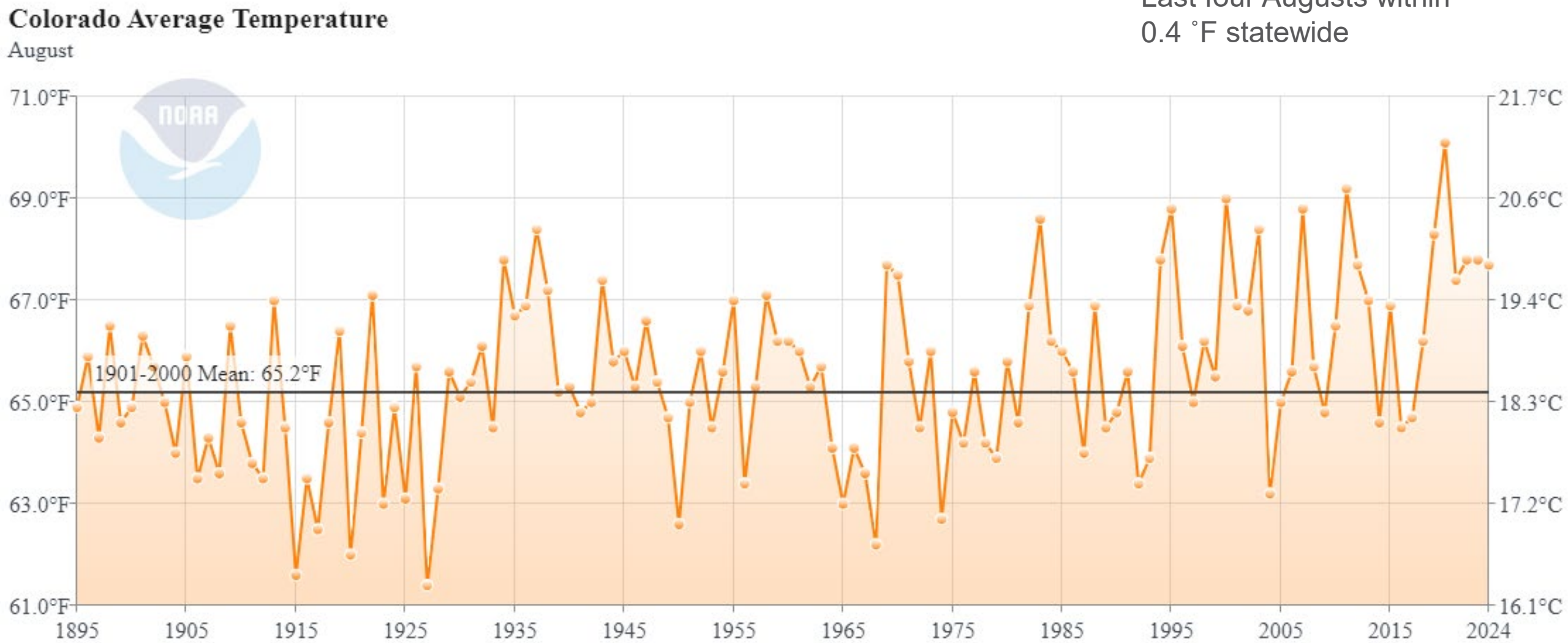
1.3 ˚F above 1991-2020 normal

0.73” above 1991-2020 normal

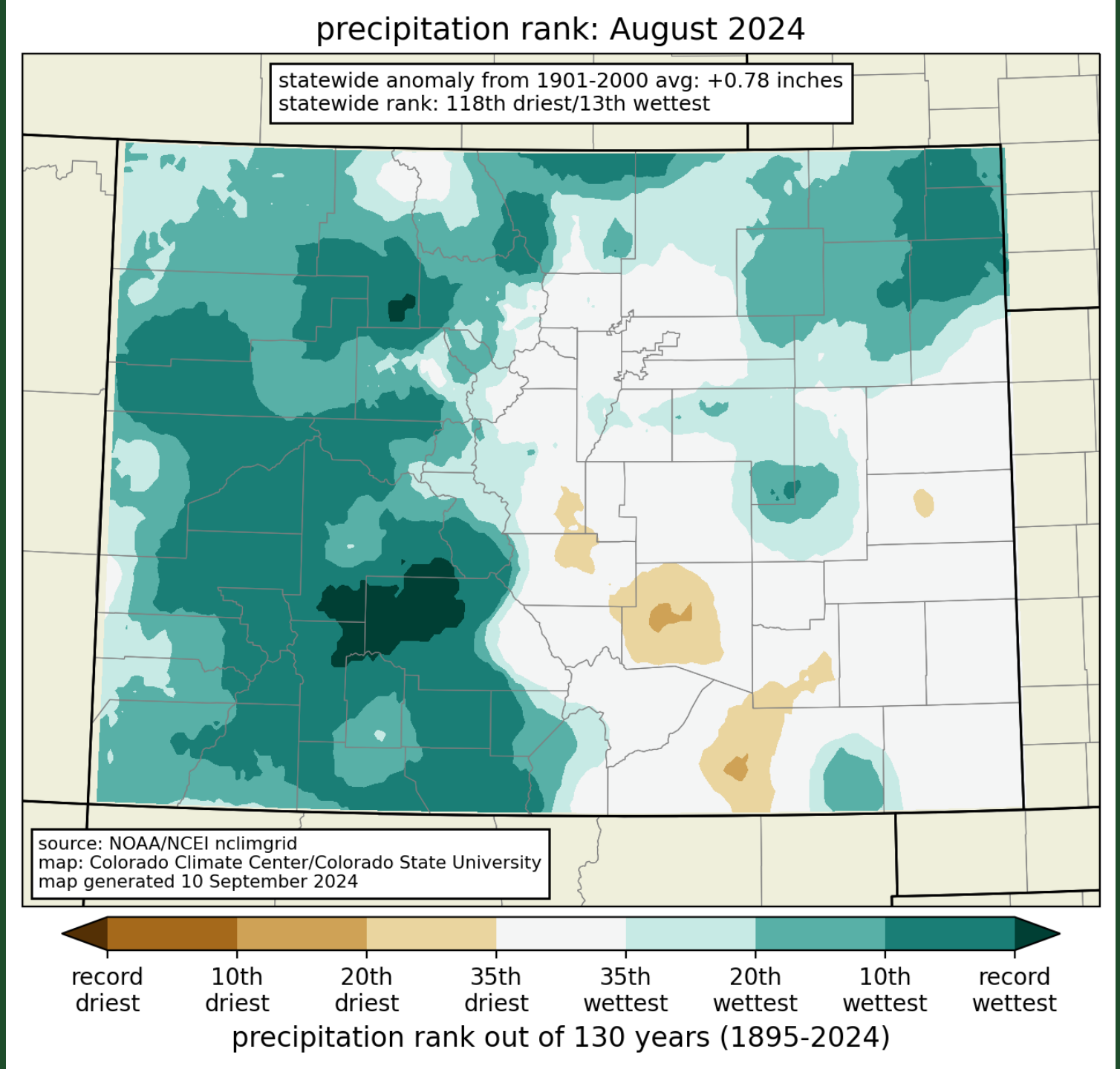
average temperature rank: August 2024



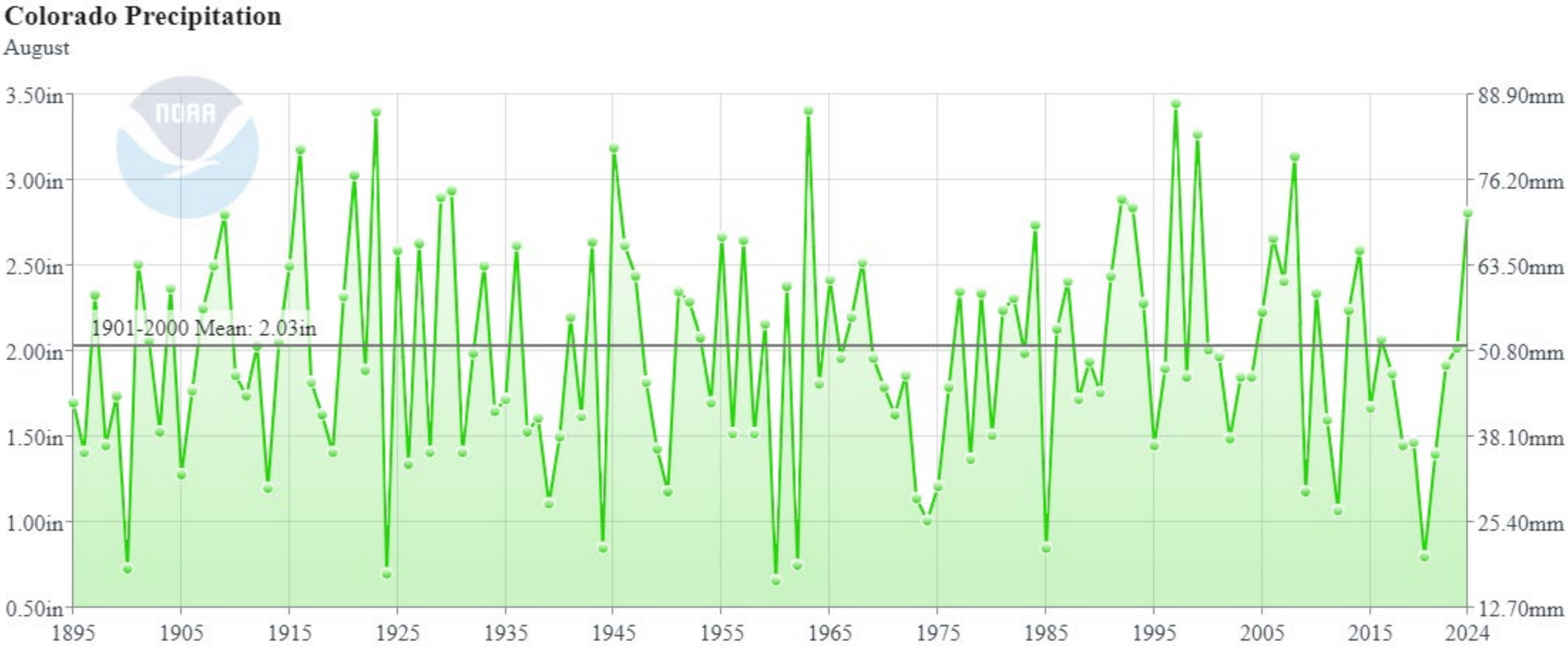
Last four Augusts within
0.4 ˚F statewide



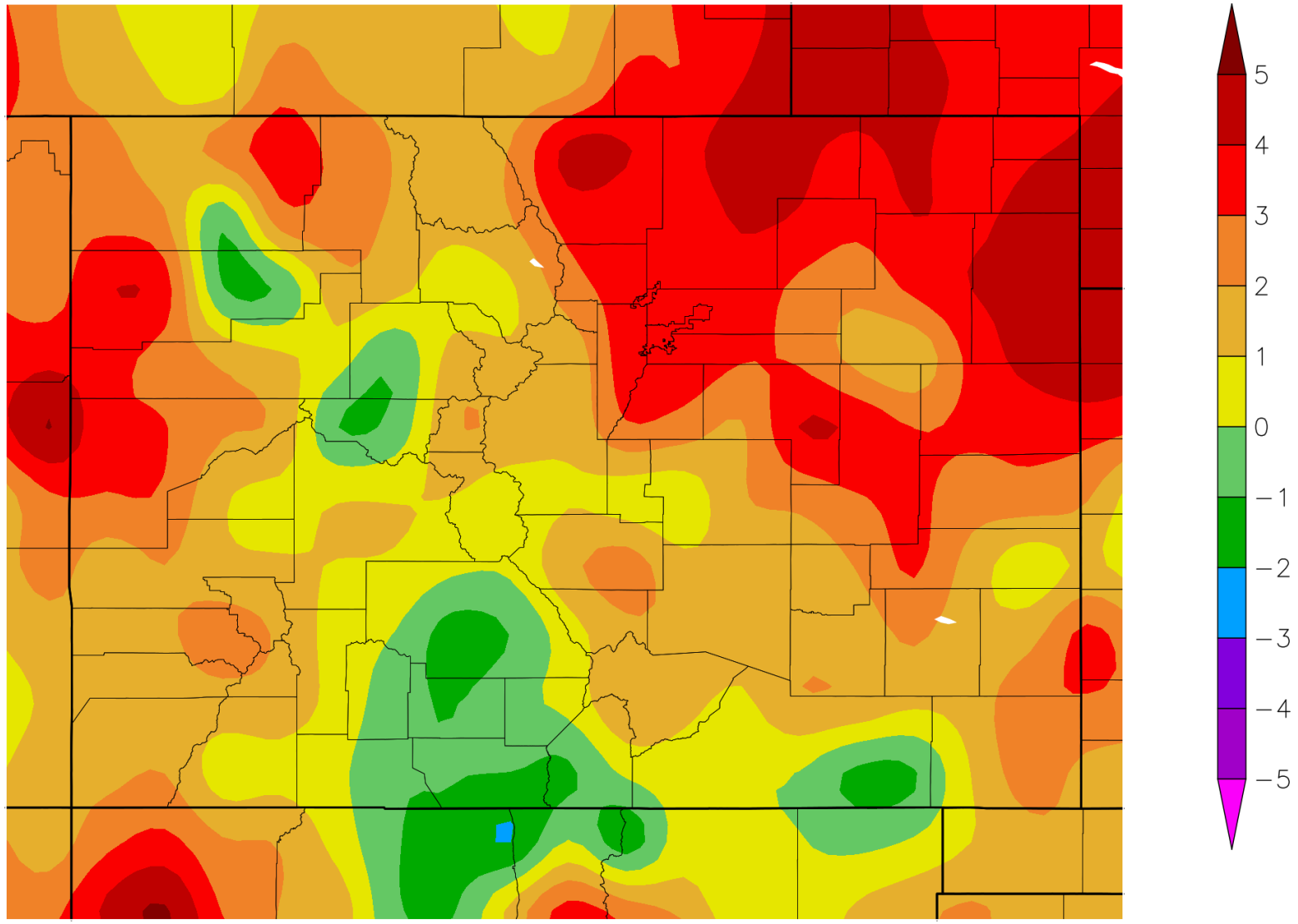
Ouray County declares emergency disaster with Ridgway flooding on August 14th, 2024



Wettest August statewide since 2008



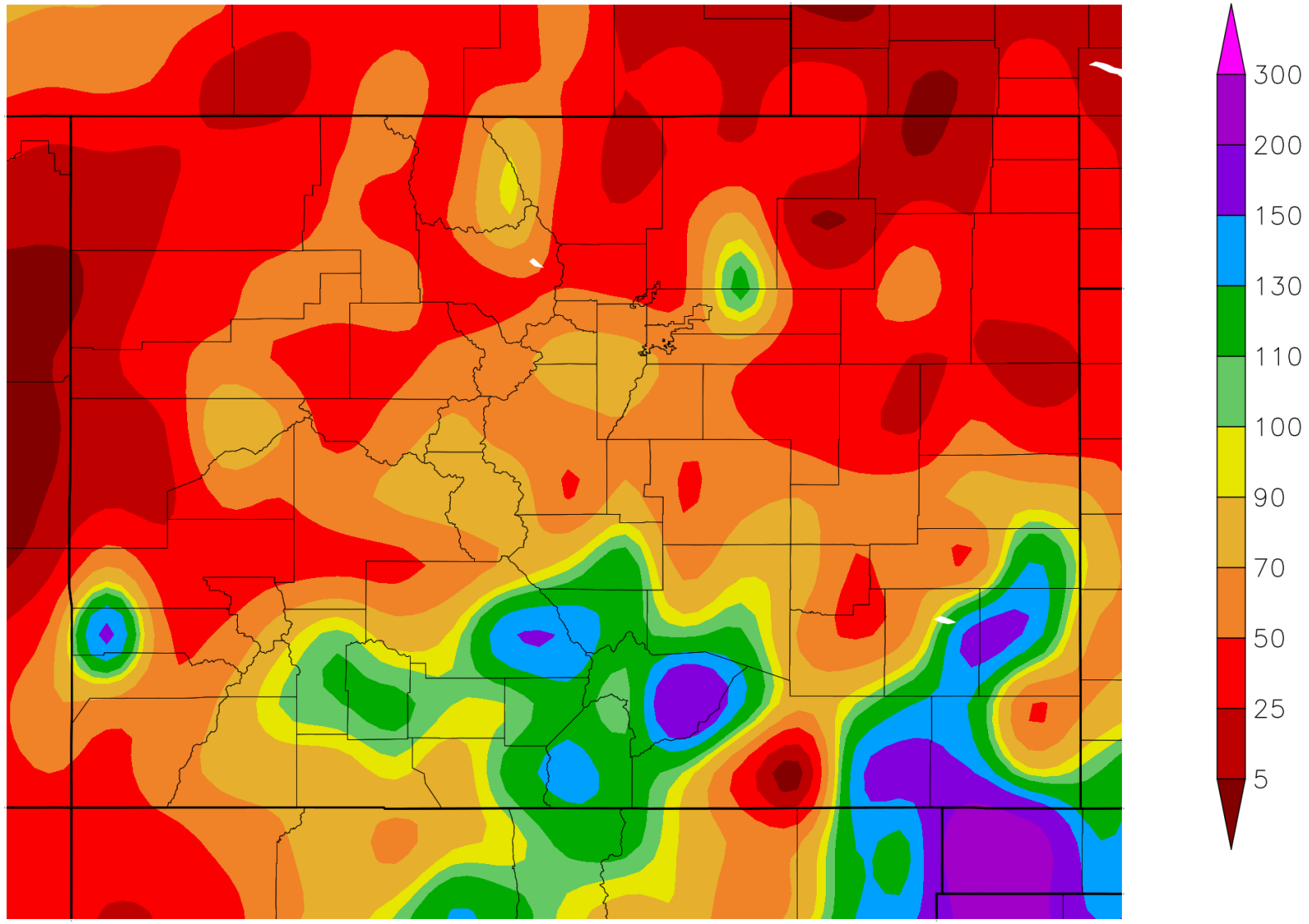
Departure from Normal Temperature (F)
9/1/2024 – 9/22/2024



Generated 9/23/2024 at HPRCC using provisional data.

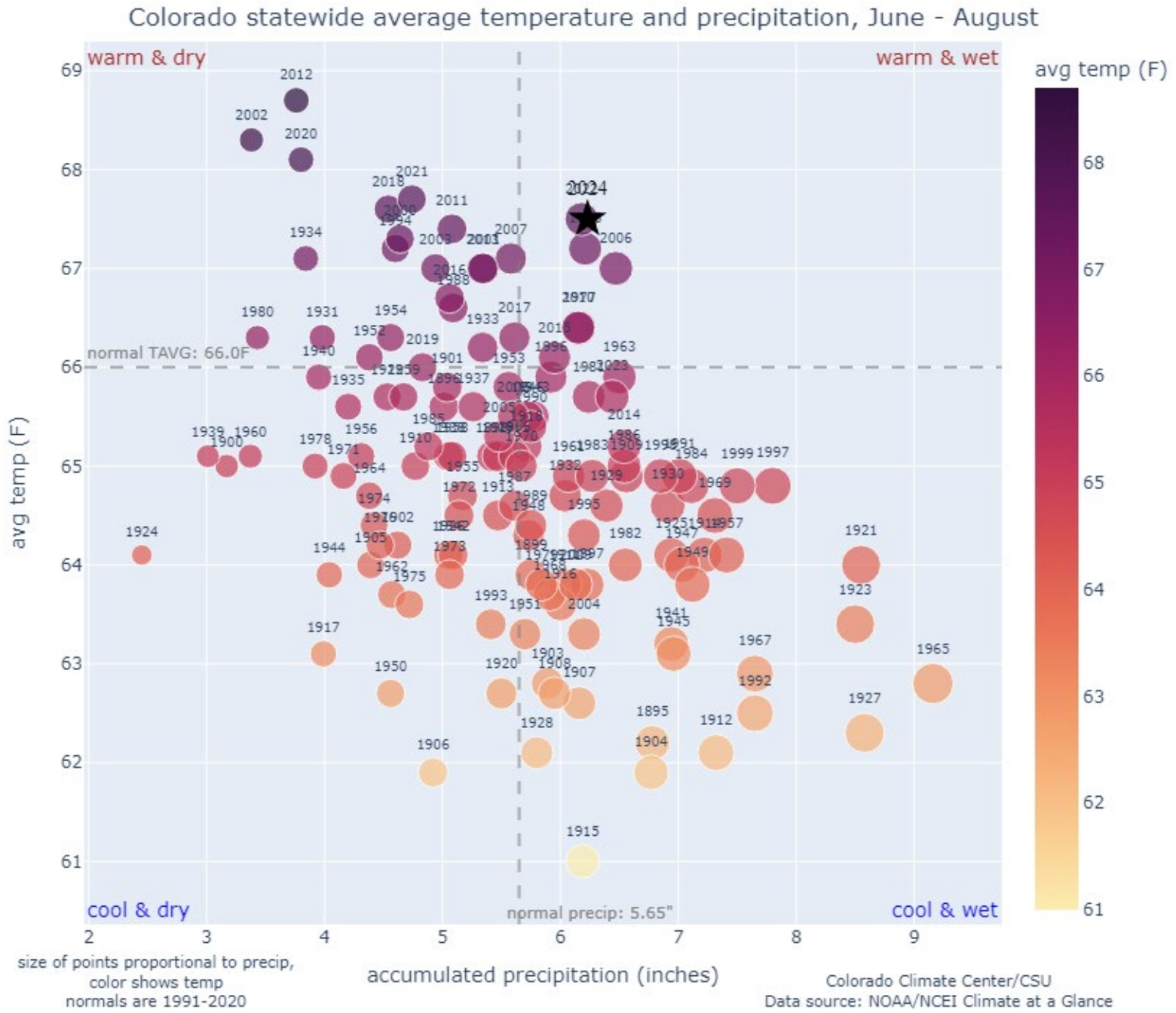
NOAA Regional Climate Centers

Percent of Normal Precipitation (%)
9/1/2024 – 9/22/2024



Generated 9/23/2024 at HPRCC using provisional data.

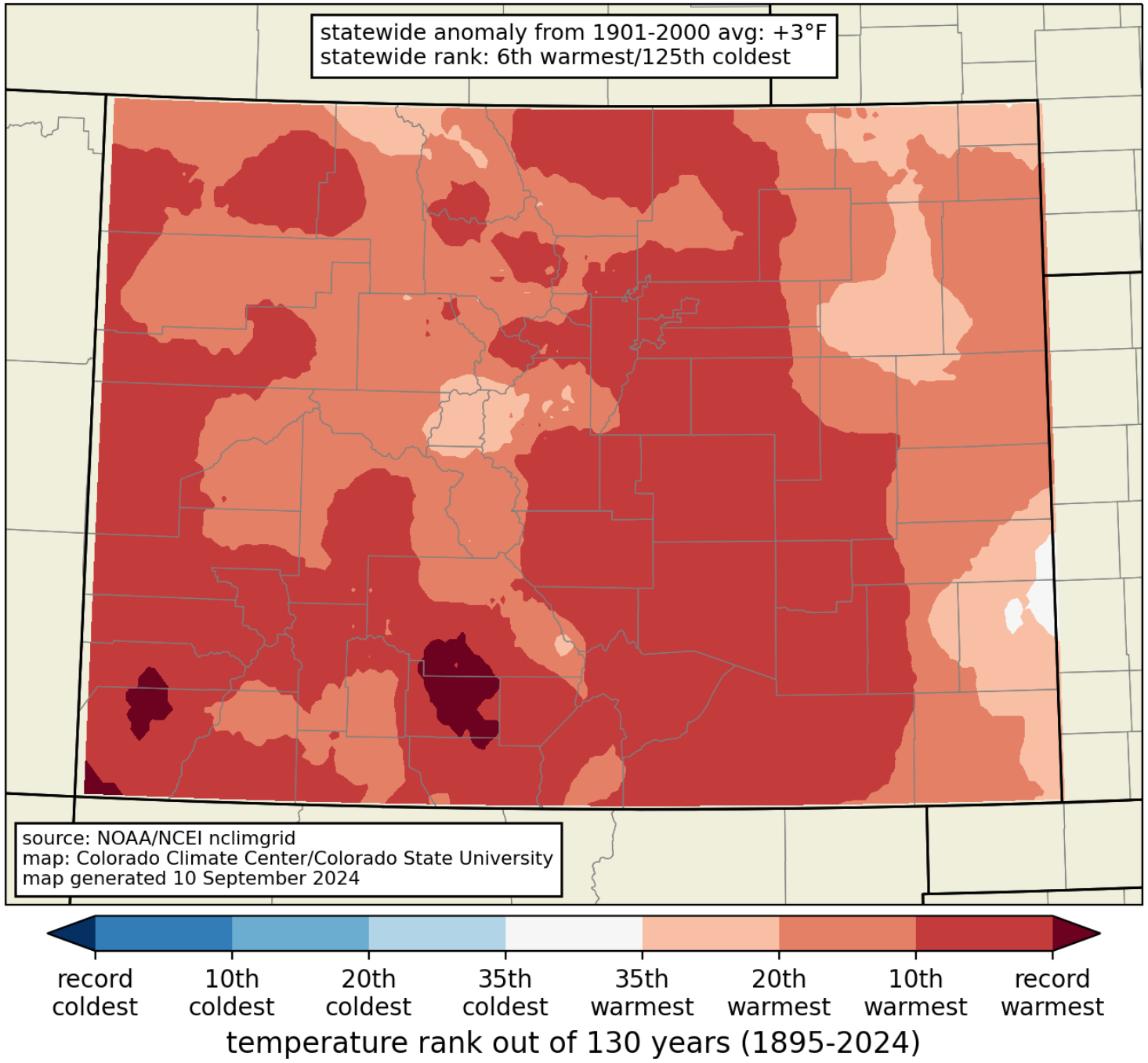
NOAA Regional Climate Centers



1.5 ˚F above 1991-2020 normal

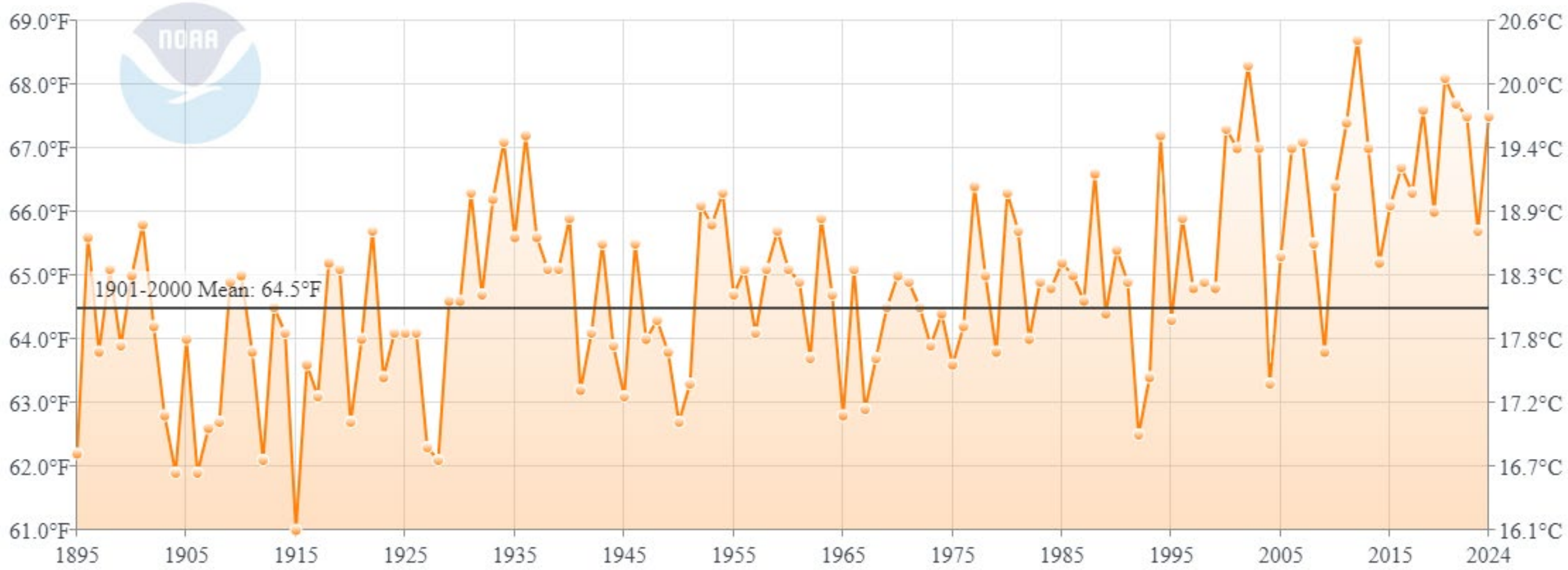
0.58” above 1991-2020 normal

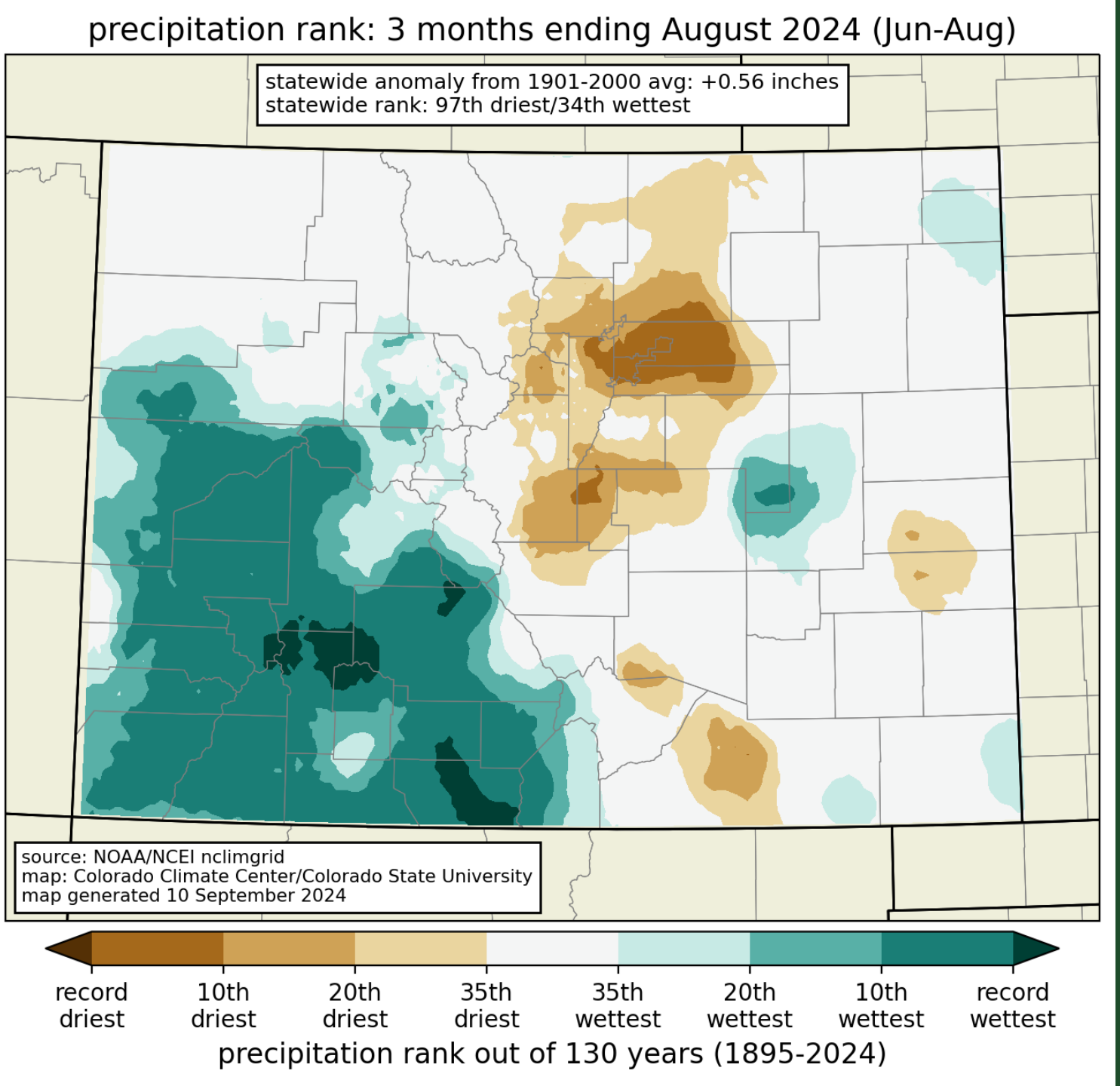
average temperature rank: 3 months ending August 2024 (Jun-Aug)

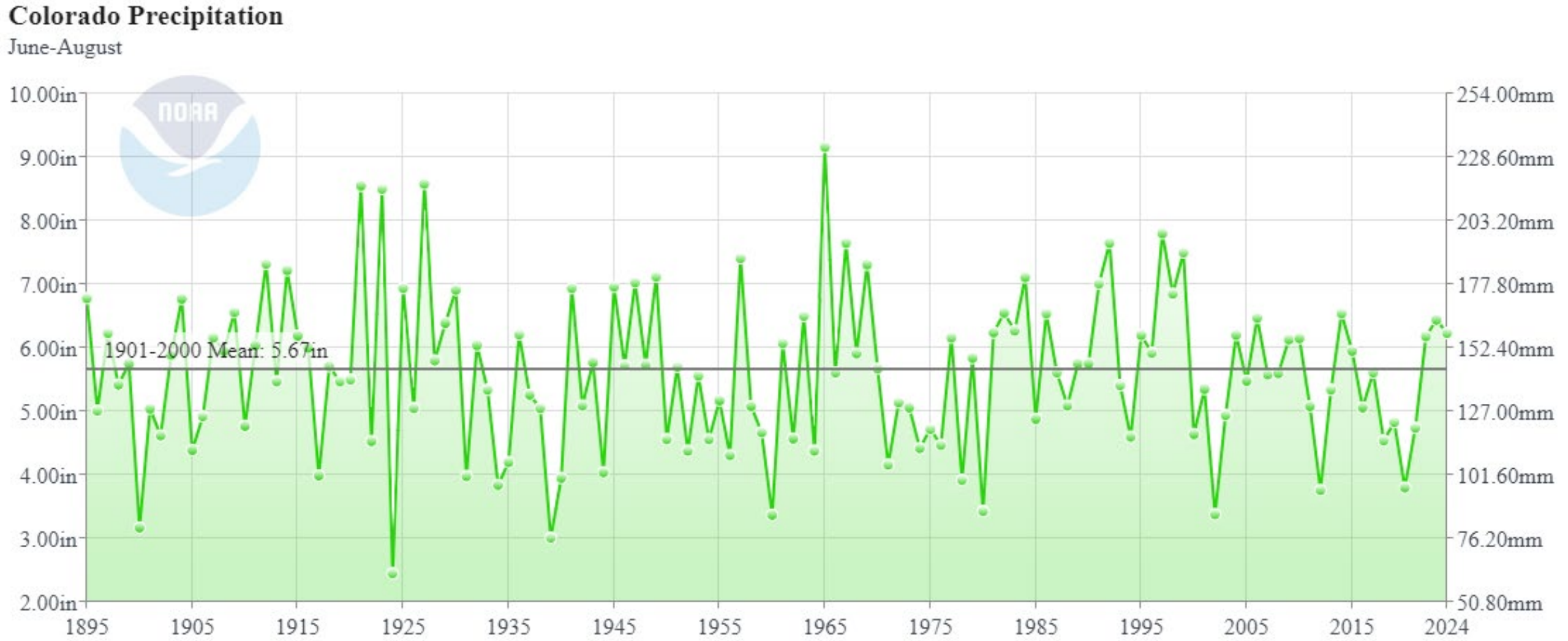


Colorado Average Temperature

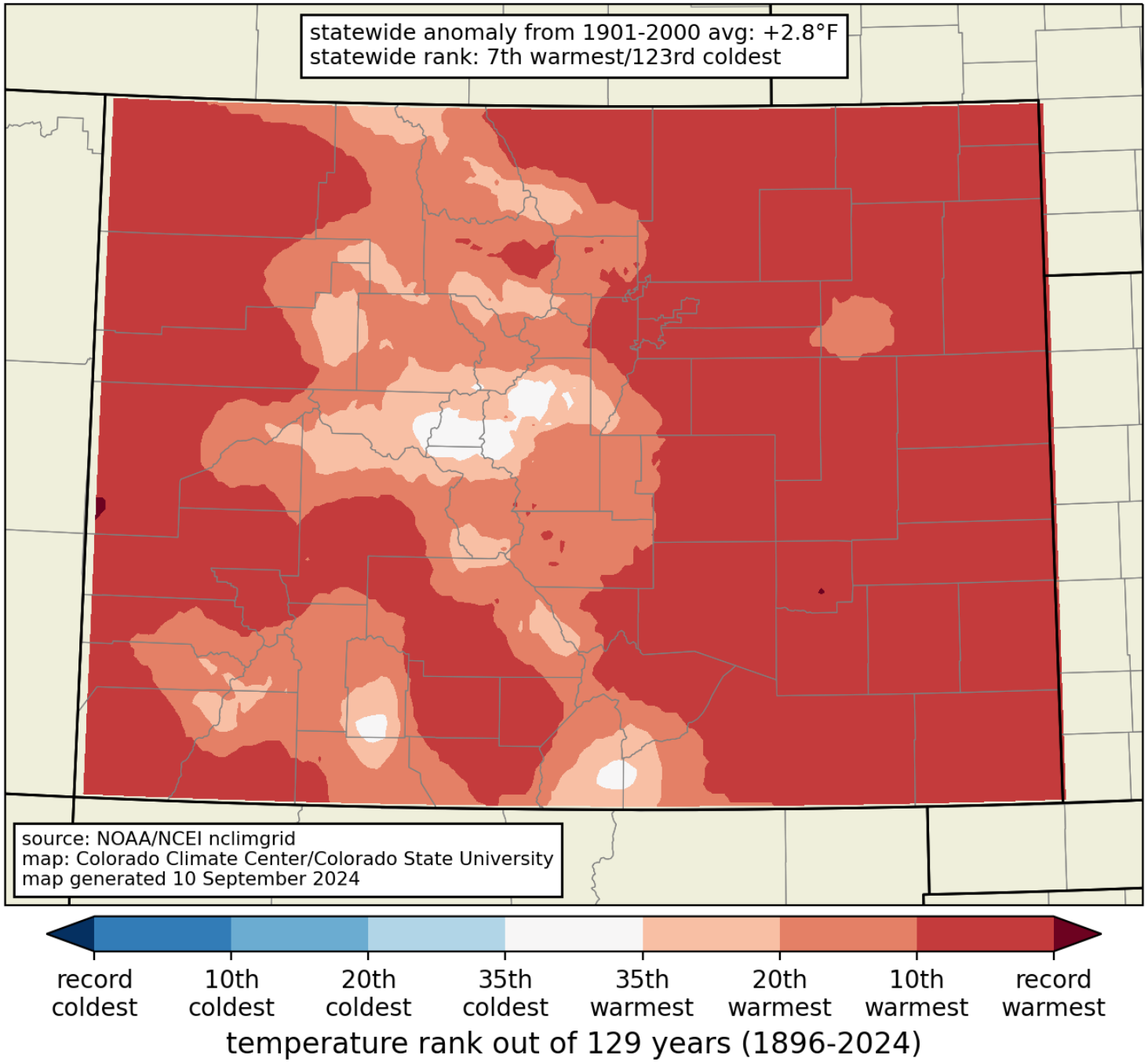
June-August

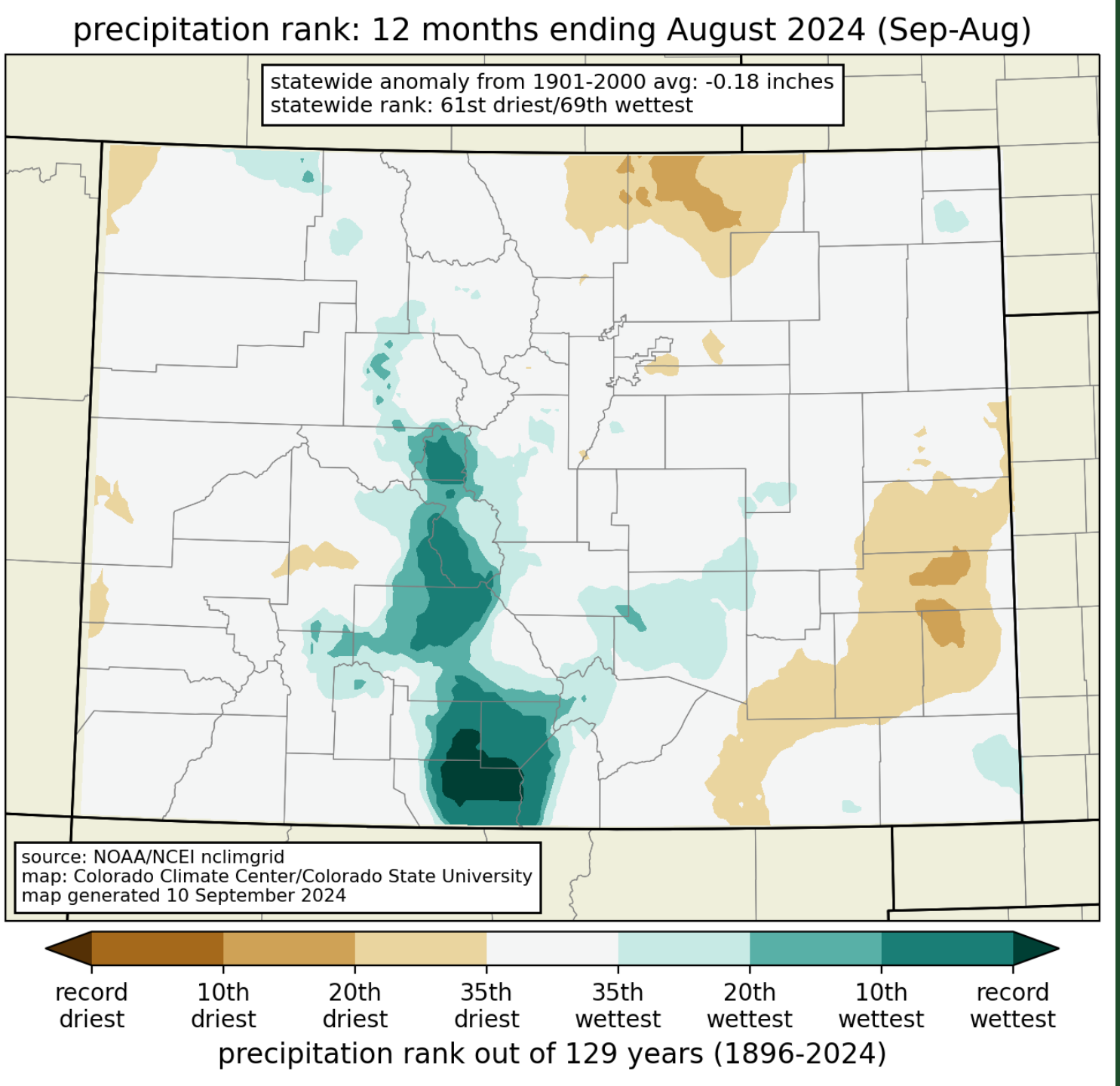



precipitation rank: 3 months ending August 2024 (Jun-Aug)
statewide anomaly from 1901-2000 avg: +0.56 inches
statewide rank: 97th driest/34th wettest
source: NOAA/NCEI nclimgrid
map: Colorado Climate Center/Colorado State University
map generated 10 September 2024
record driest
10th driest
20th driest
35th driest
35th wettest
20th wettest
10th wettest
record wettest
precipitation rank out of 130 years (1895-2024)


Colorado Precipitation
June-August
10.00in
9.00in
8.00in
7.00in
6.00in
5.00in
4.00in
3.00in
2.00in
254.00mm
228.60mm
203.20mm
177.80mm
152.40mm
127.00mm
101.60mm
76.20mm
50.80mm
1901-2000 Mean: 5.67in
1895
1905
1915
1925
1935
1945
1955
1965
1975
1985
1995
2005
2015
2024

average temperature rank: 12 months ending August 2024 (Sep-Aug)




precipitation rank: 12 months ending August 2024 (Sep-Aug)
statewide anomaly from 1901-2000 avg: -0.18 inches
statewide rank: 61st driest/69th wettest
source: NOAA/NCEI nclimgrid
map: Colorado Climate Center/Colorado State University
map generated 10 September 2024
record driest
10th driest
20th driest
35th driest
35th wettest
20th wettest
10th wettest
record wettest
precipitation rank out of 129 years (1896-2024)

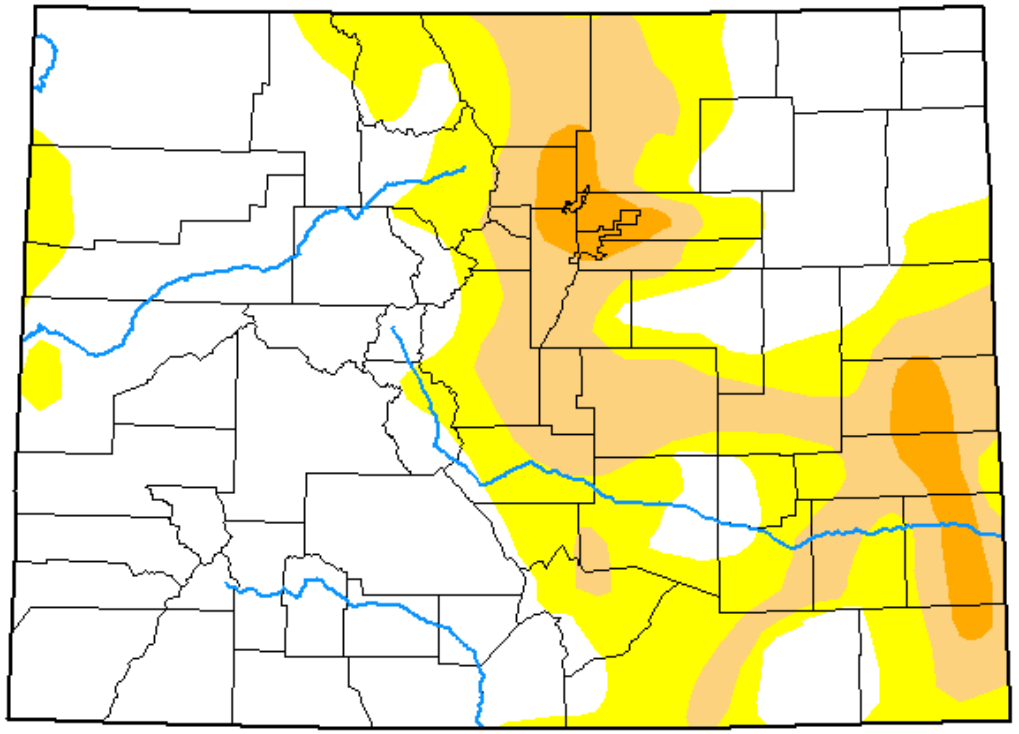
Hottest summer on record for Grand Junction, whiles still being much wetter than normal

Drought Update

- Drought development on eastern plains and amelioration in western Colorado
- Growing season and wildfire season winding down
- US Drought Monitor will begin to move more slowly as we wait to see what next snowpack season looks like

U.S. Drought Monitor

Colorado



September 17, 2024

(Released Thursday, Sep. 19, 2024)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	58.19	41.81	19.69	3.37	0.00	0.00
Last Week *09-10-2024*	59.70	40.30	15.42	1.22	0.00	0.00
3 Months Ago *06-18-2024*	56.65	43.35	16.11	0.38	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 *09-19-2023*	70.81	29.19	15.77	2.77	0.00	0.00

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:

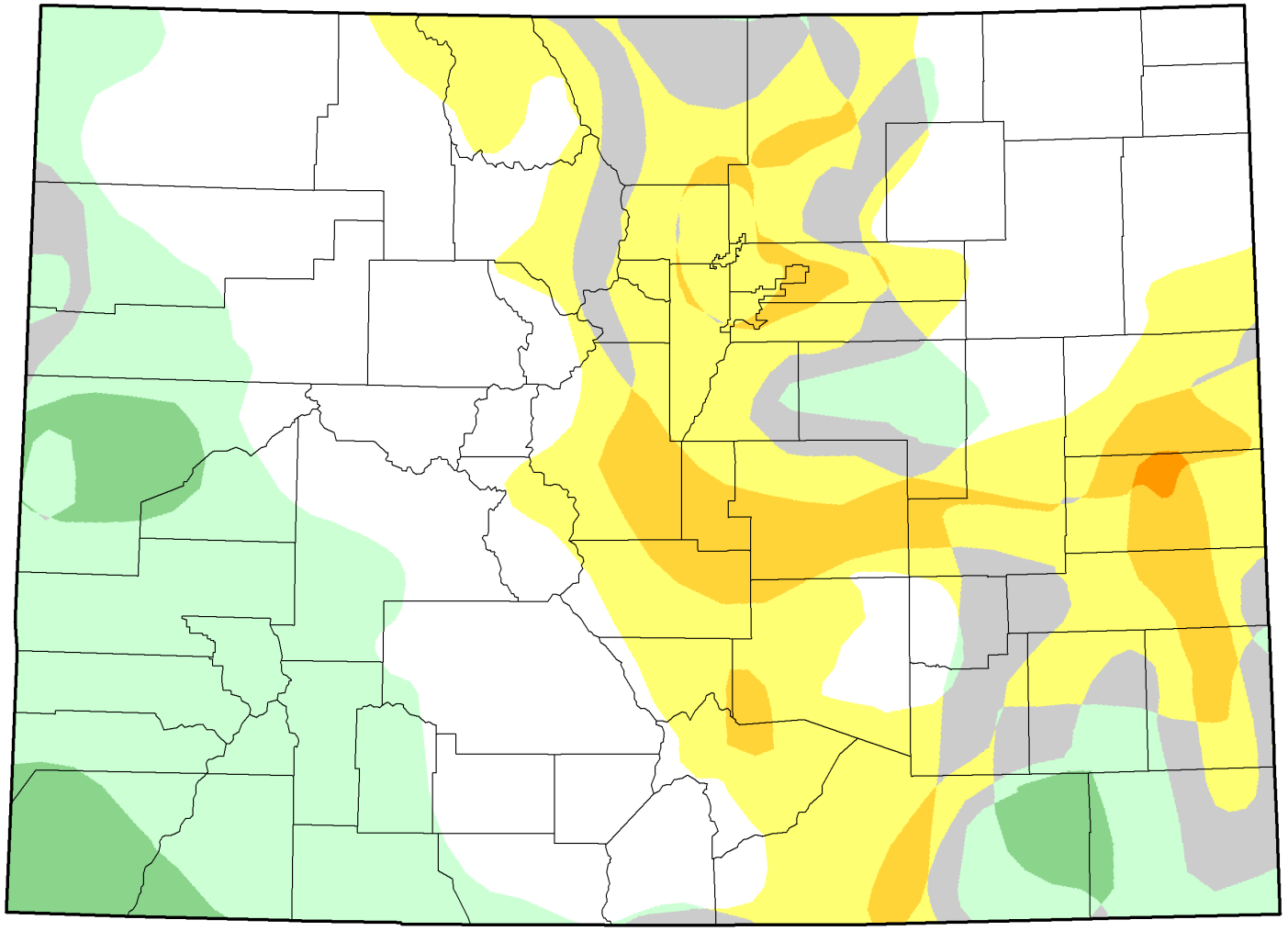
Brad Rippey

U.S. Department of Agriculture

droughtmonitor.unl.edu

U.S. Drought Monitor Class Change - Colorado

12 Week



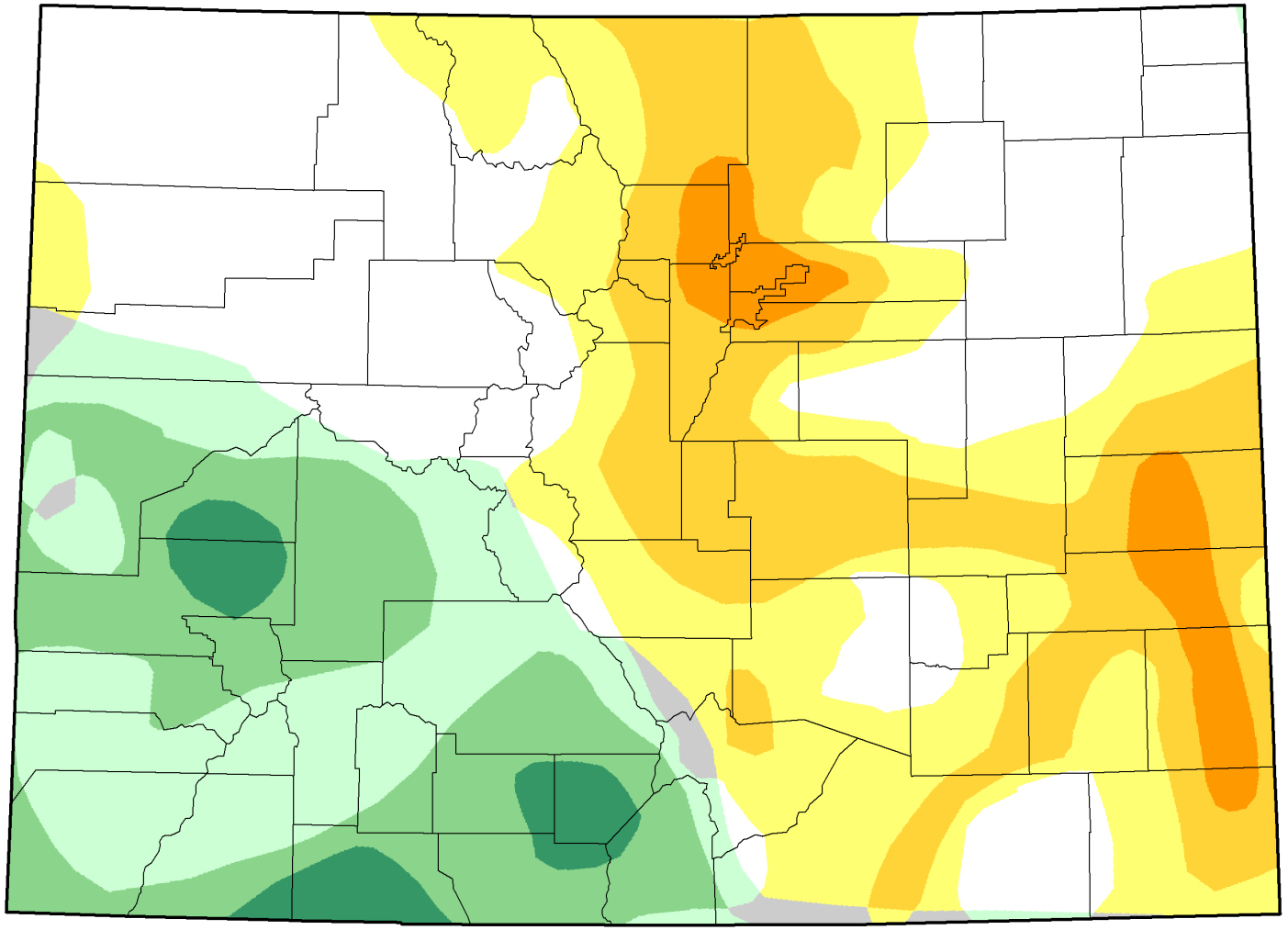
September 17, 2024
compared to
June 25, 2024

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

U.S. Drought Monitor Class Change - Colorado

52 Week

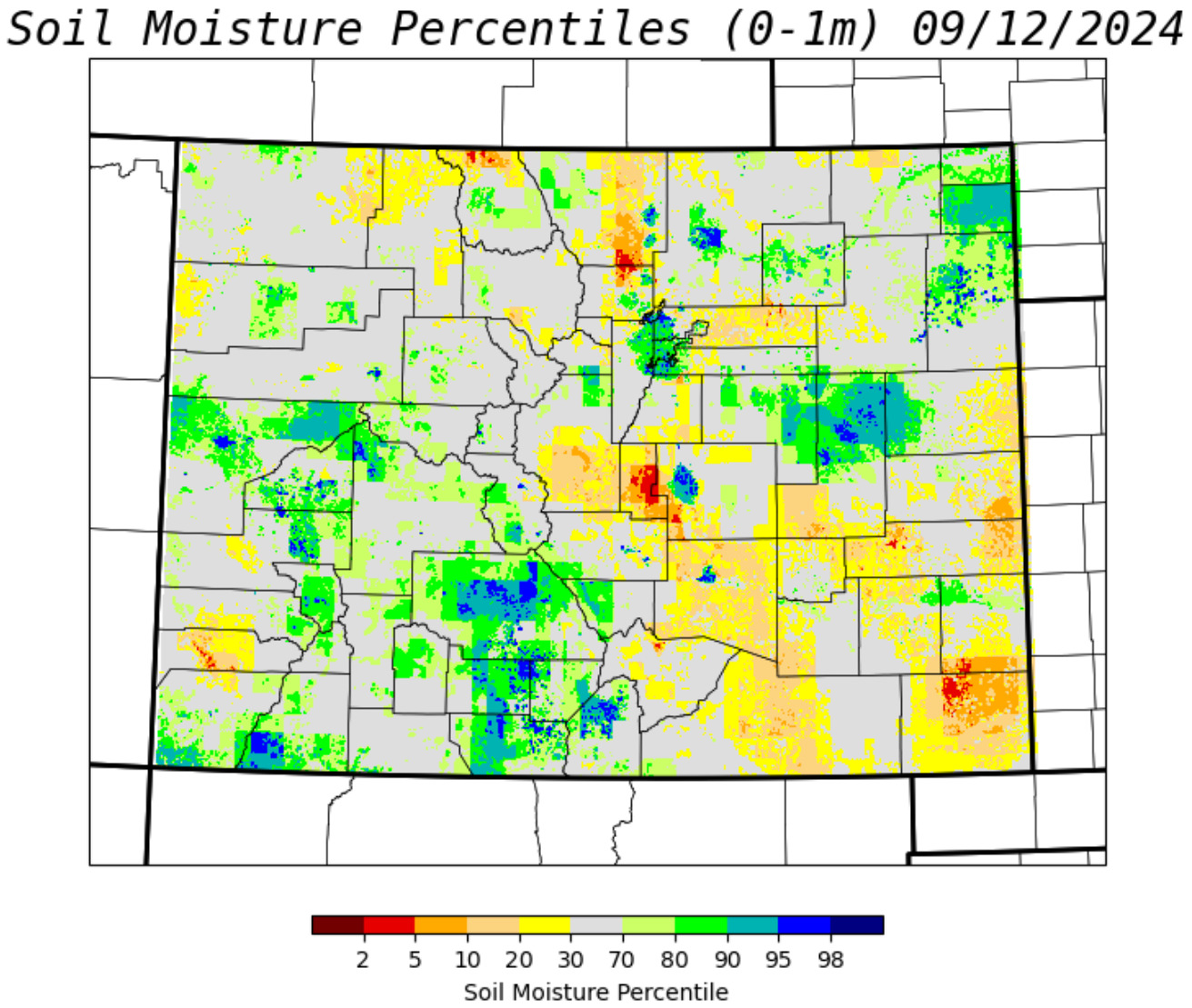


September 17, 2024
compared to
September 19, 2023

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

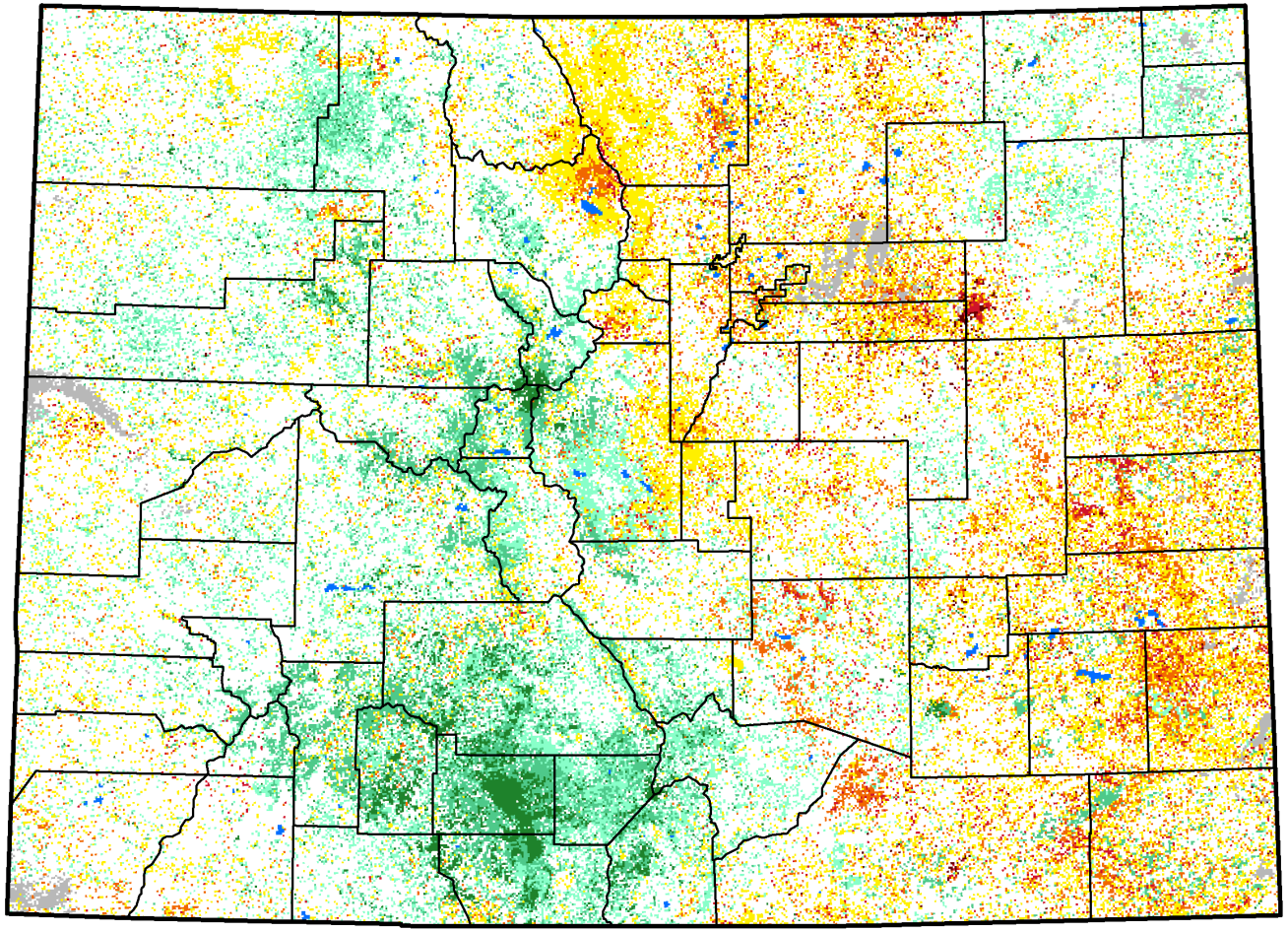
Major improvements in SW CO and the San Luis valley. Mixed conditions across the eastern plains



Vegetation Drought Response Index

Complete: Colorado

September 15, 2024



Vegetation Condition

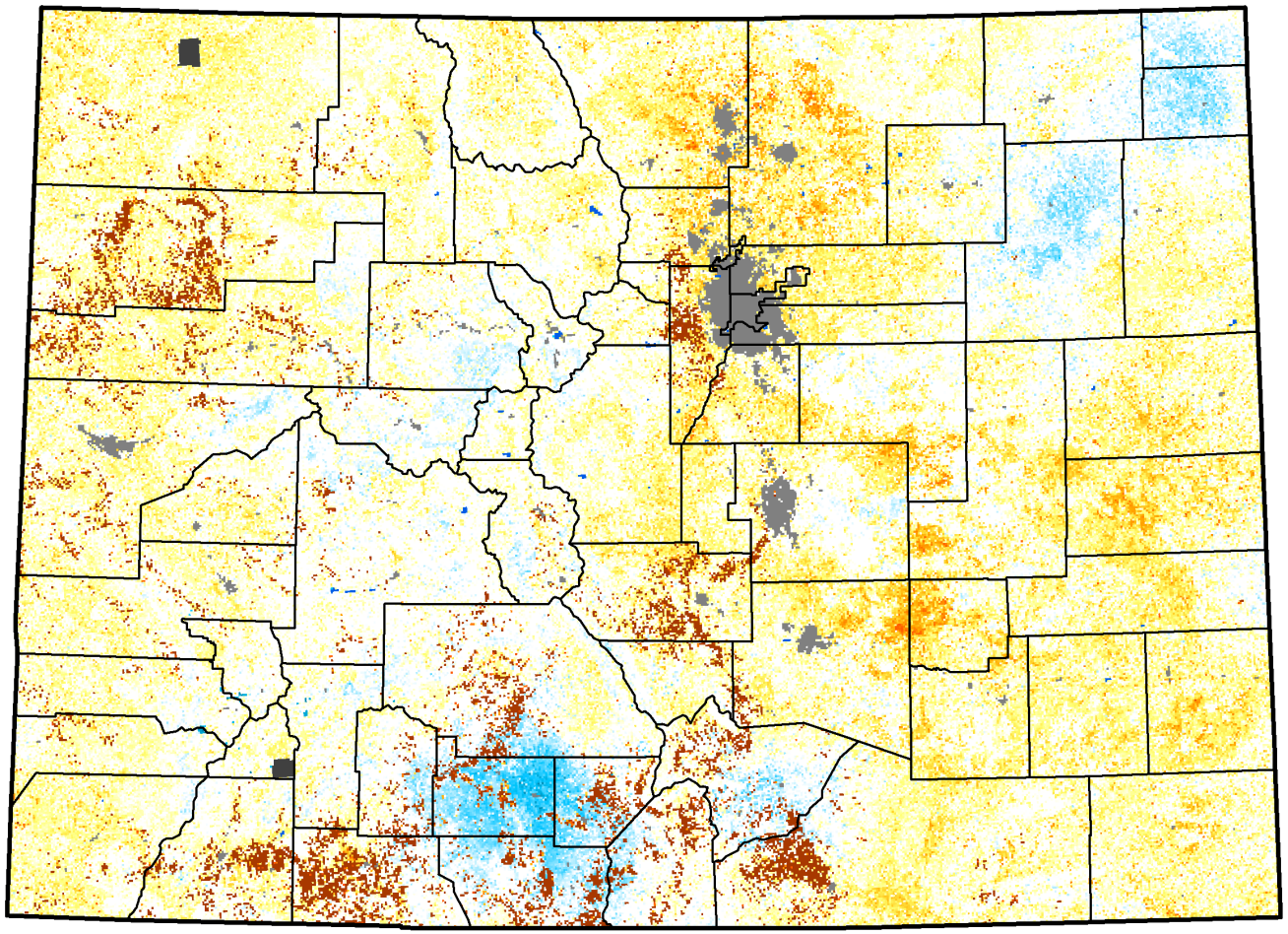
- Extreme Drought
- Severe Drought
- Moderate Drought
- Pre-drought stress
- Near Normal
- Unusually Moist
- Very Moist
- Extreme Moist
- Out of Season
- Water

Vegetative health from satellite retrievals: Excellent in western CO right now, but waning in southeastern Colorado

Quick Drought Response Index

Colorado

September 15, 2024
(Week 37)



Conditions Relative to 4-Week Historical Average

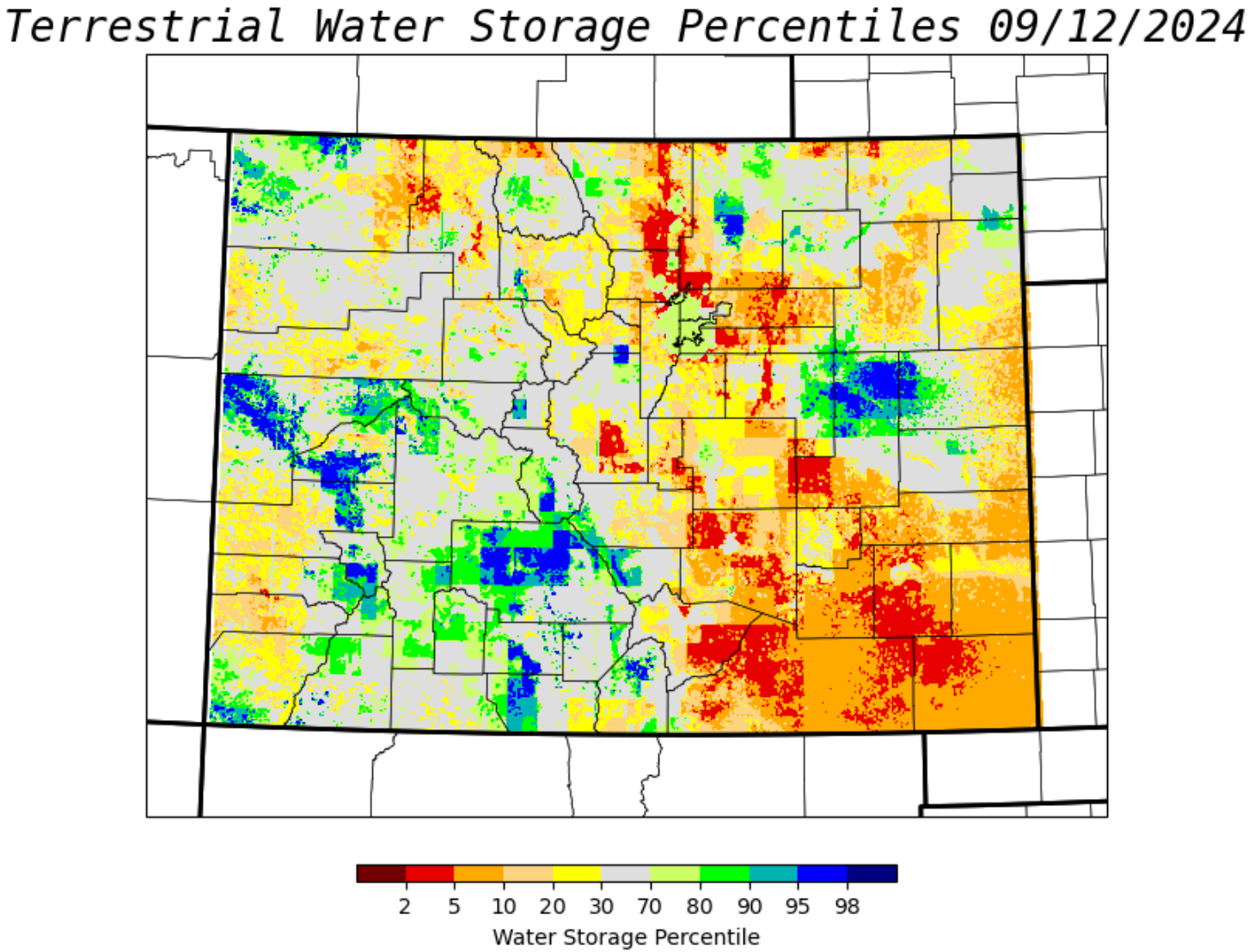
- Wetter
- Near Average
- Drier
- Out of Season
- Urban
- No Data
- Water

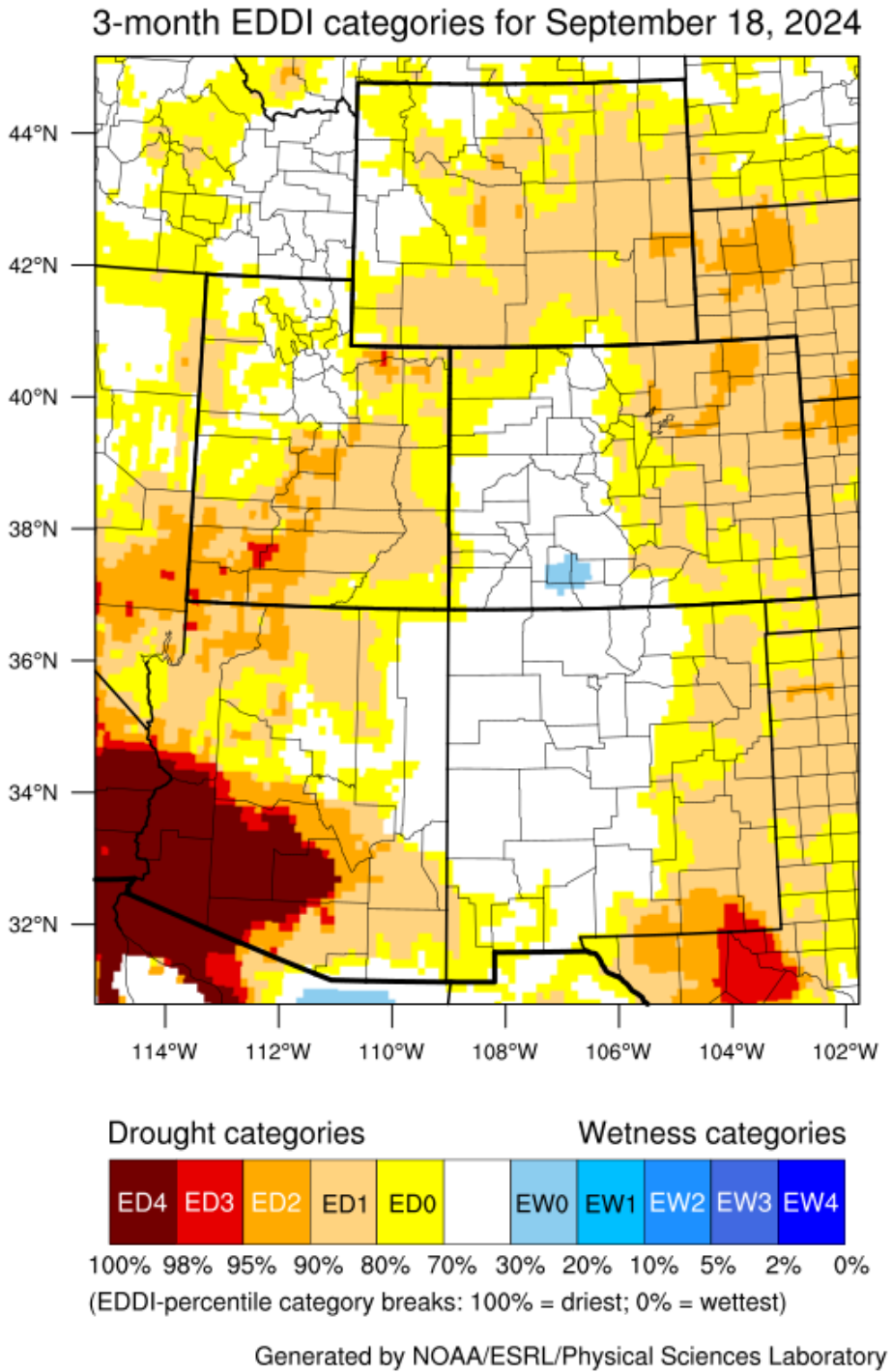
Shorter-term dryness across most of the state

This product begins to go out of season around this time of year

Groundwater products indicating very dry conditions in southeastern Colorado

This product integrates satellite groundwater retrievals and modeled soil moisture. It also includes snowpack and canopy moisture (negligible this time of year)



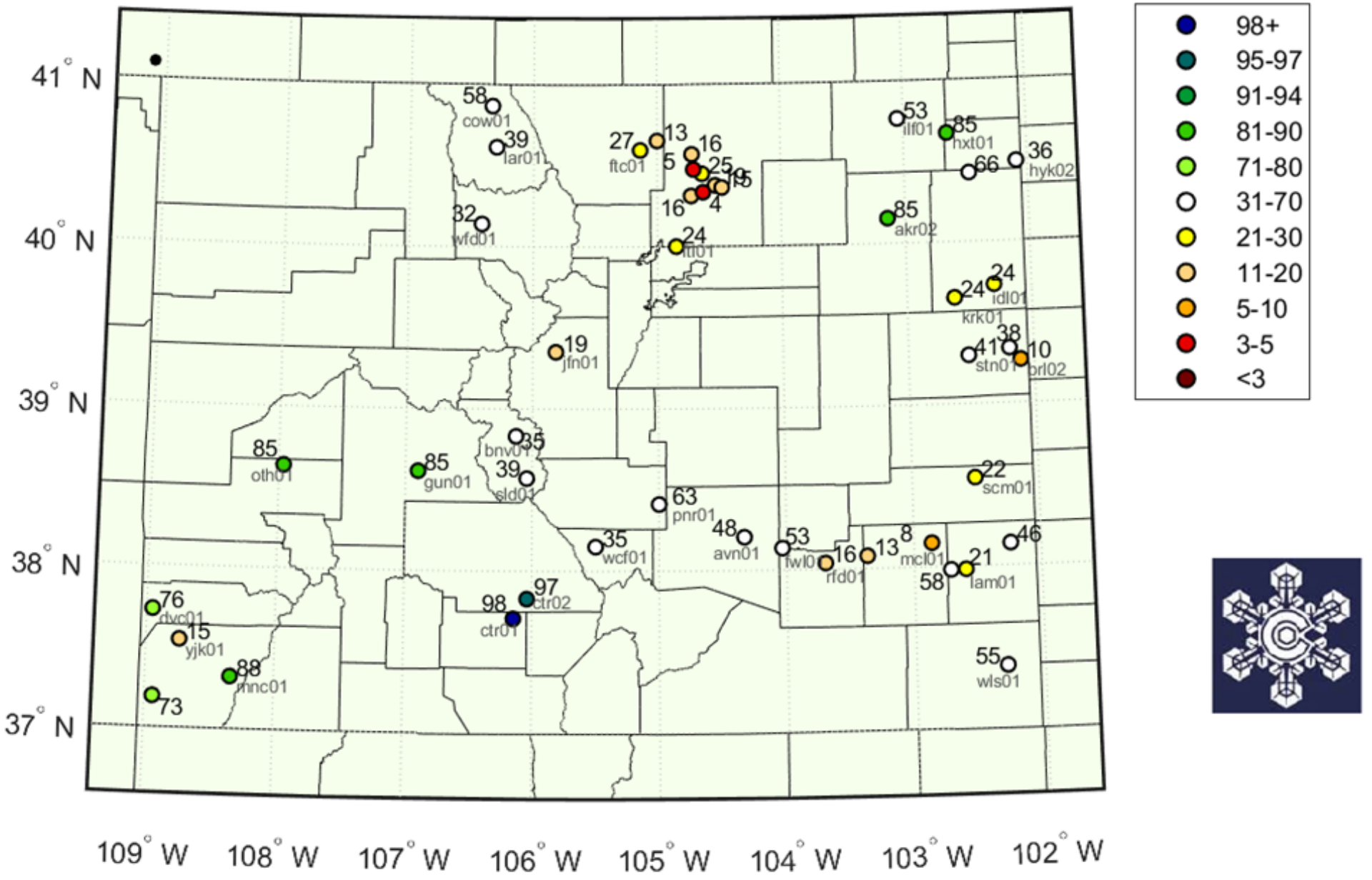


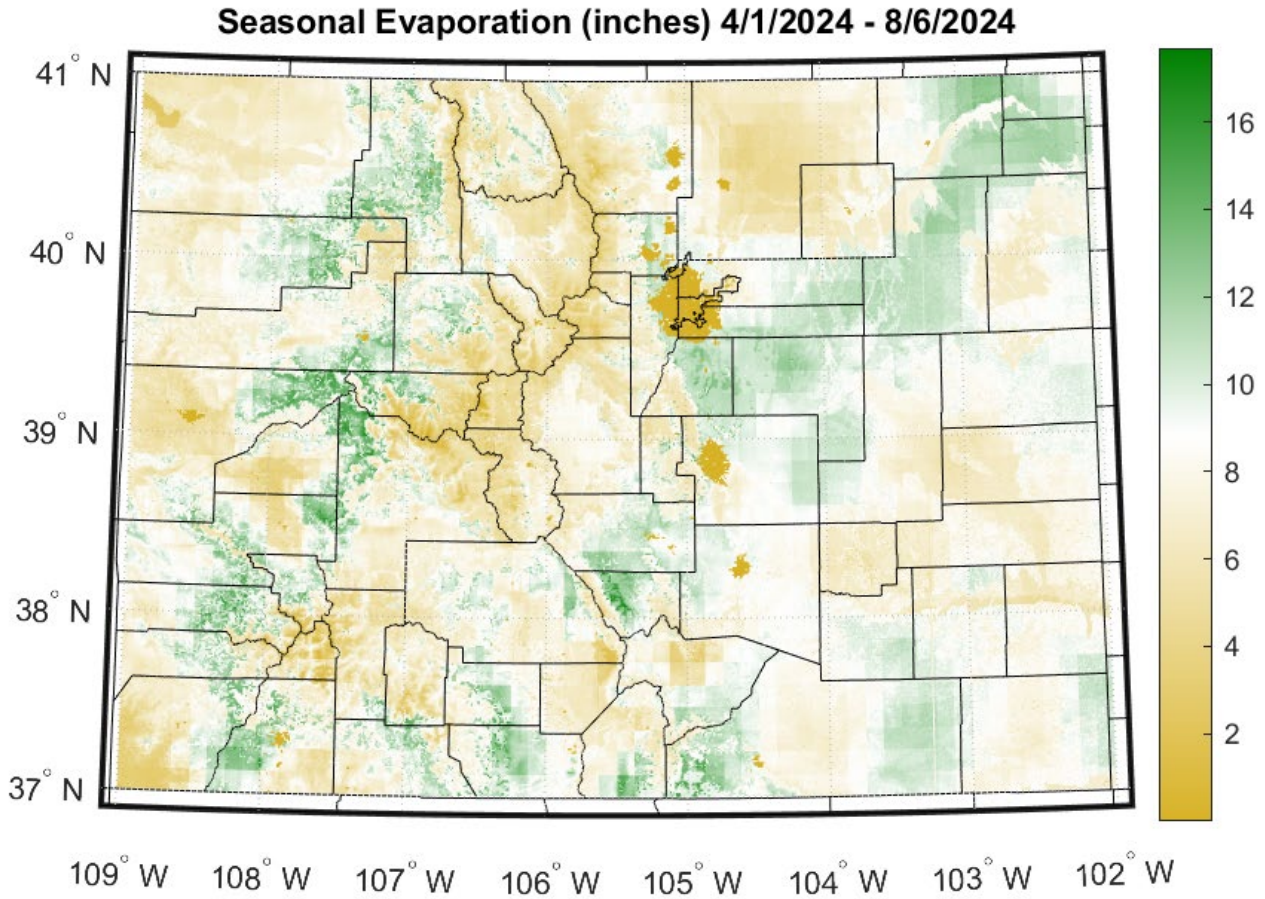
Warmer than normal does not always mean above average evaporative demand

Evaporative demand also depends on windspeeds, cloud cover, and surface humidity

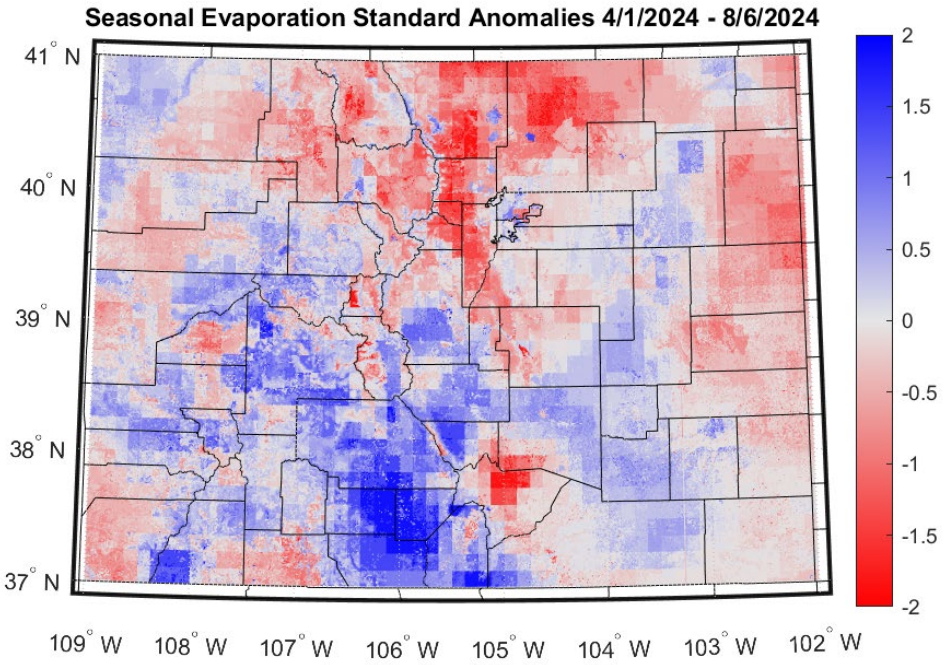
D1-D2-level evaporative demand over the last three months across the eastern plains

Growing Season Water Balance (P/PET) Percentiles
September 20, 2024





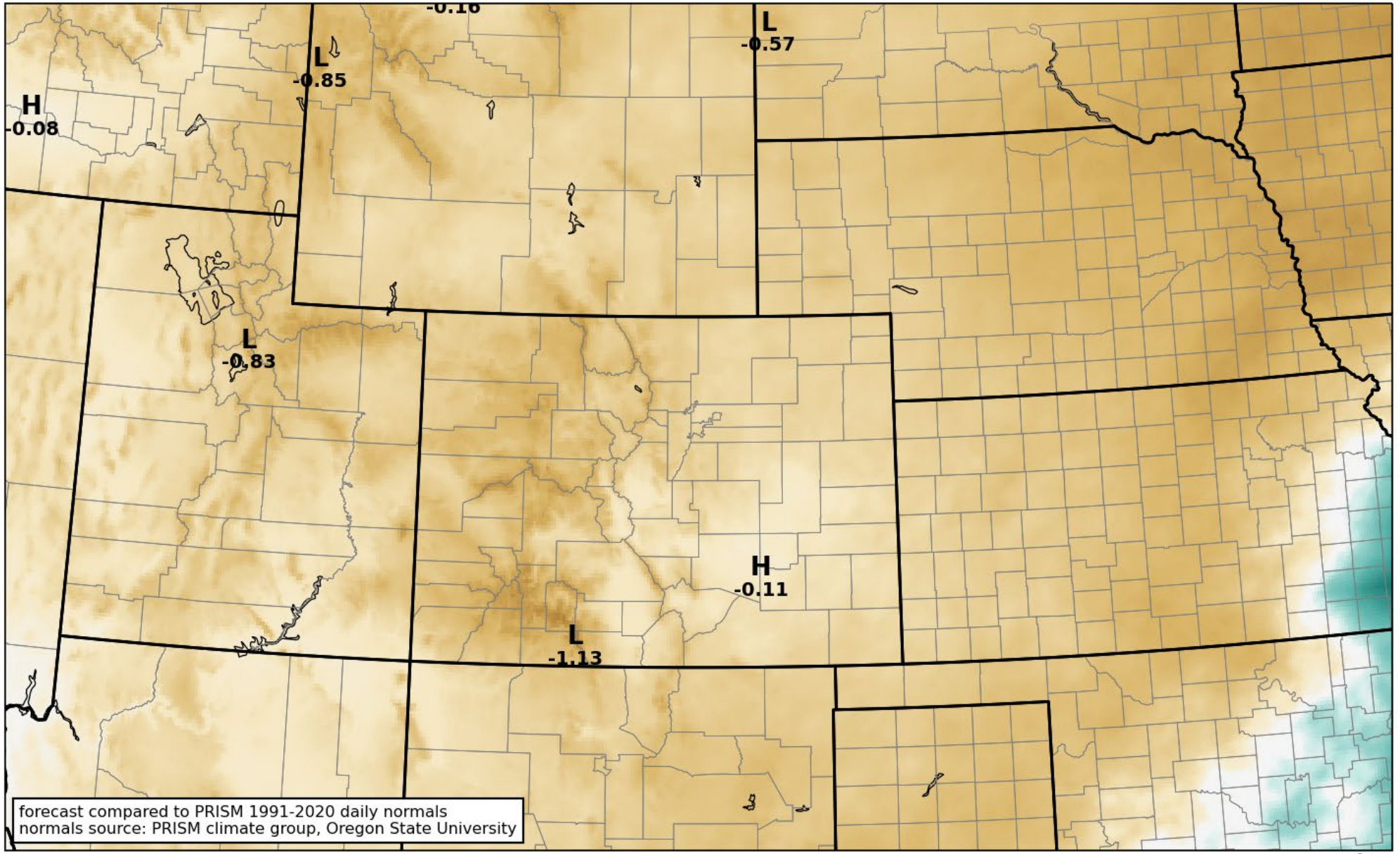
Seasonal ET (out of date) – to be featured more heavily in future meetings

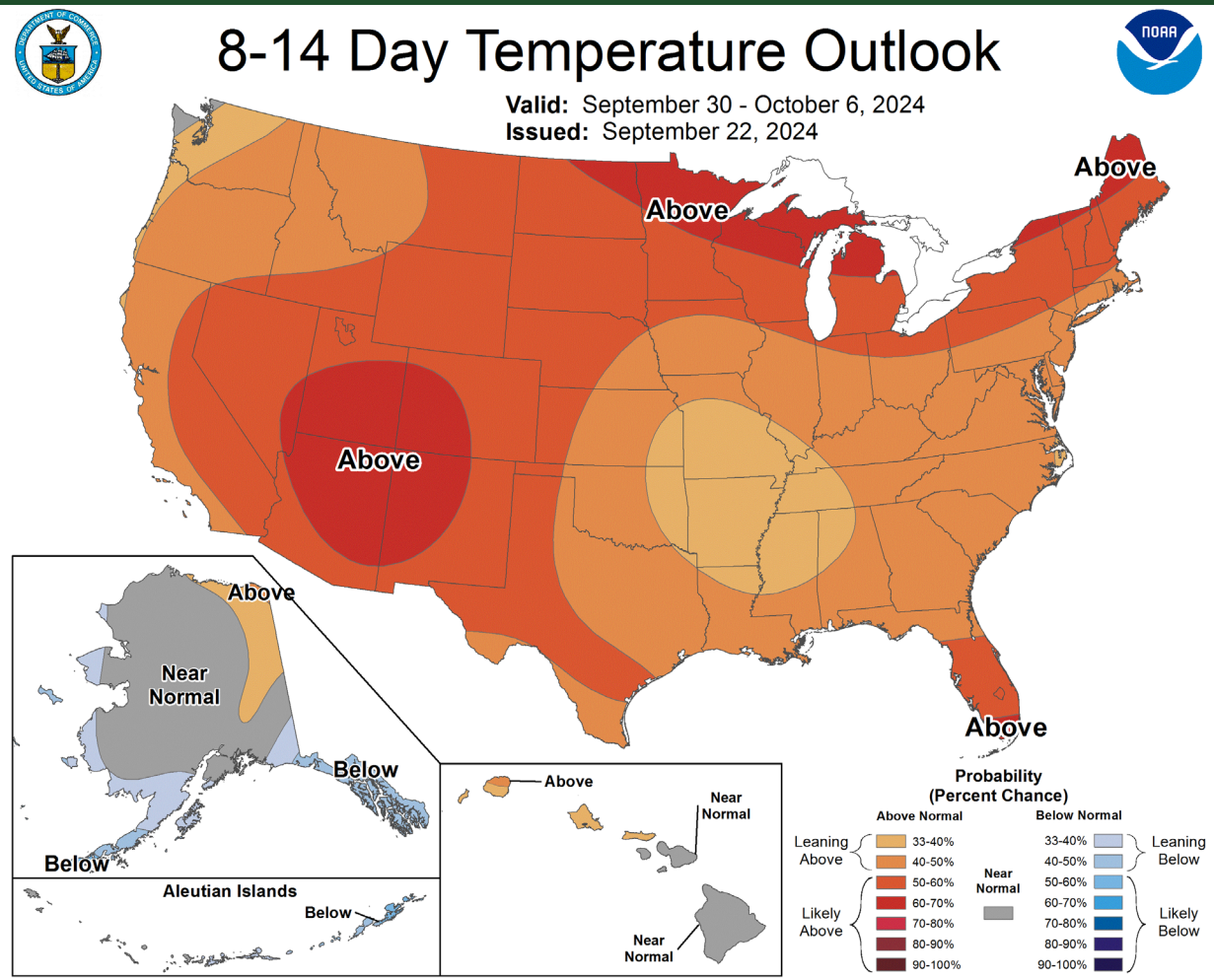


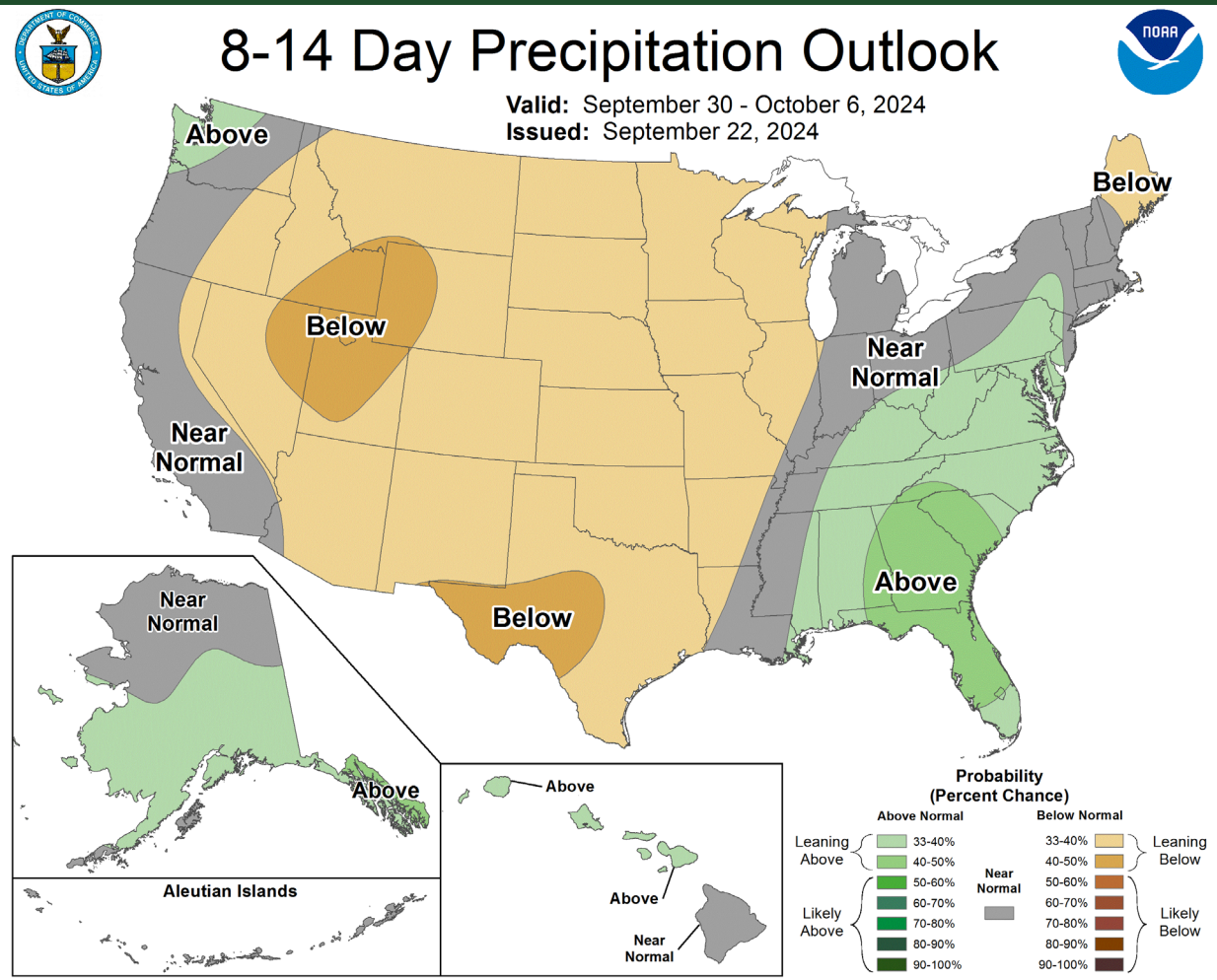
Spring/Summer Outlook

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

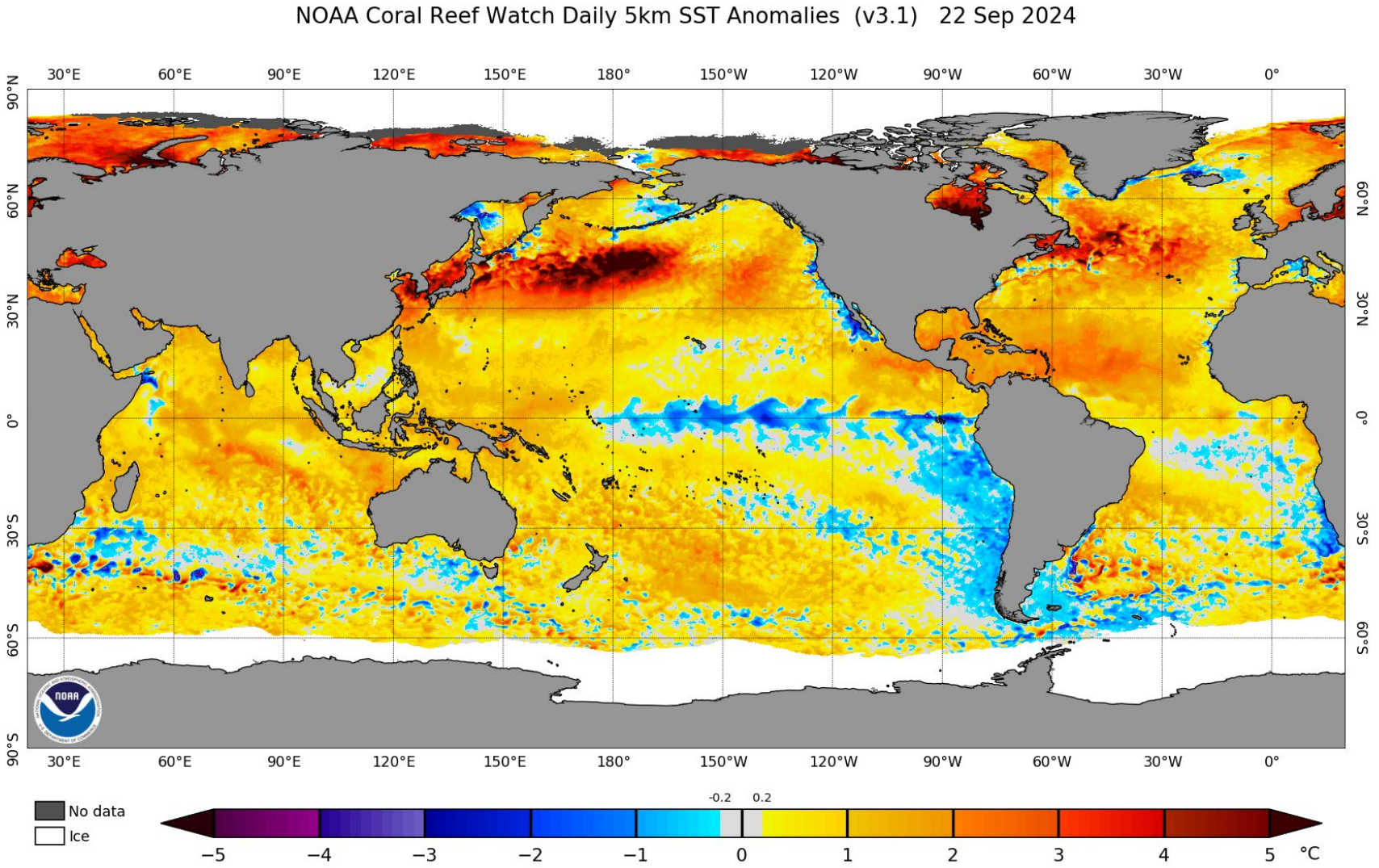
forecast issued 1200 UTC Mon 23 Sep 2024
precipitation in 168 hrs ending 1200 UTC Mon 30 Sep 2024



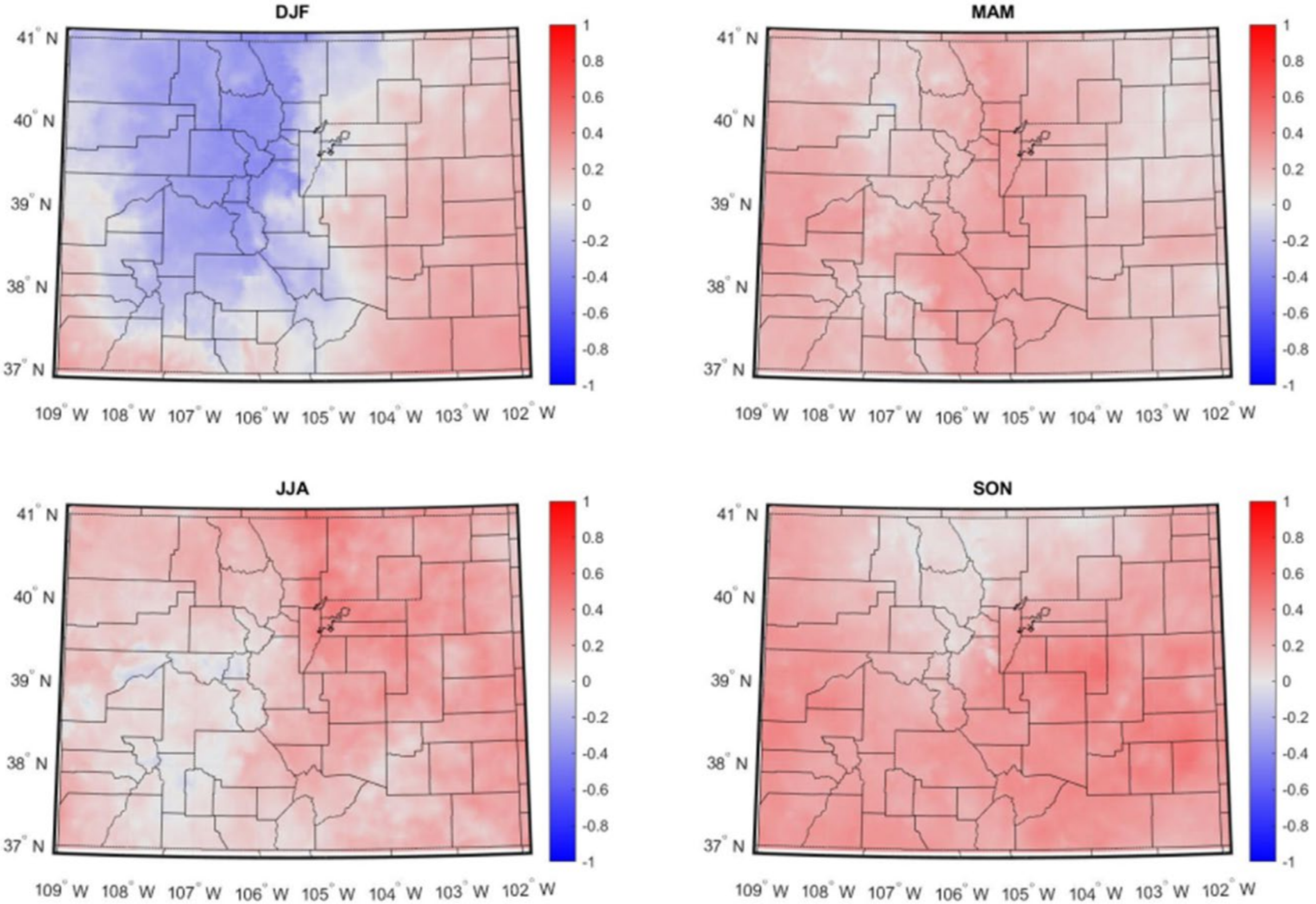

8-14 Day Temperature Outlook
Valid: September 30 - October 6, 2024
Issued: September 22, 2024
Above
Above
Above
Above
Above
Near Normal
Below
Below
Aleutian Islands
Below
Above
Near Normal
Near Normal
Probability (Percent Chance)
Above Normal
Below Normal
Leaning Above
Likely Above
Near Normal
Leaning Below
Likely Below
33-40%
40-50%
50-60%
60-70%
70-80%
80-90%
90-100%


8-14 Day Precipitation Outlook
Valid: September 30 - October 6, 2024
Issued: September 22, 2024
Above
Below
Near Normal
Near Normal
Below
Above
Below
Near Normal
Above
Aleutian Islands
Above
Above
Near Normal
Probability (Percent Chance)
Above Normal
Below Normal
Leaning Above
Likely Above
Near Normal
Leaning Below
Likely Below
33-40%
40-50%
50-60%
60-70%
70-80%
80-90%
90-100%

Beyond the Forecast (El Niño/La Niña)

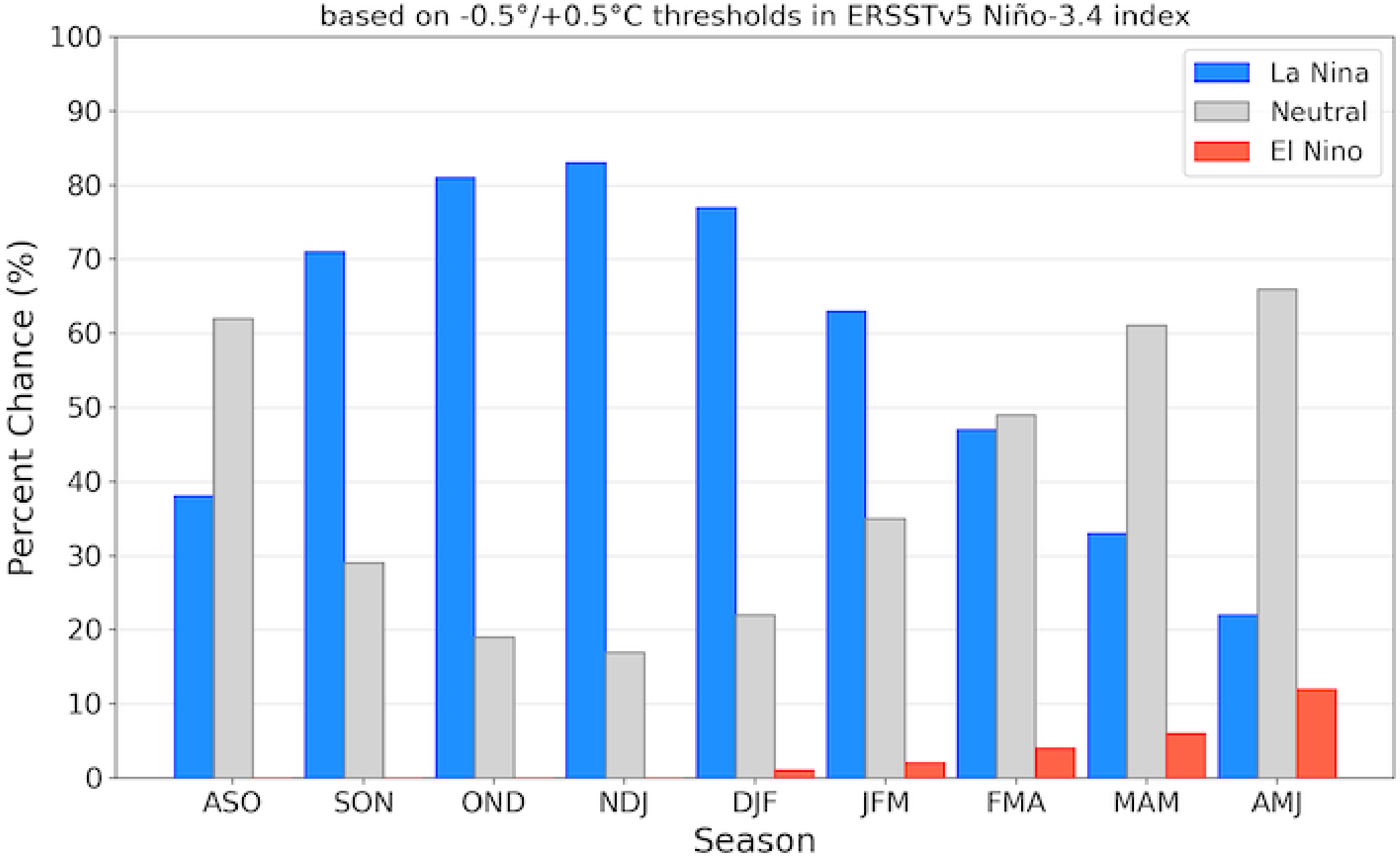


Correlation Between ENSO ONI and Seasonal Precipitation in Colorado (1951-2020)



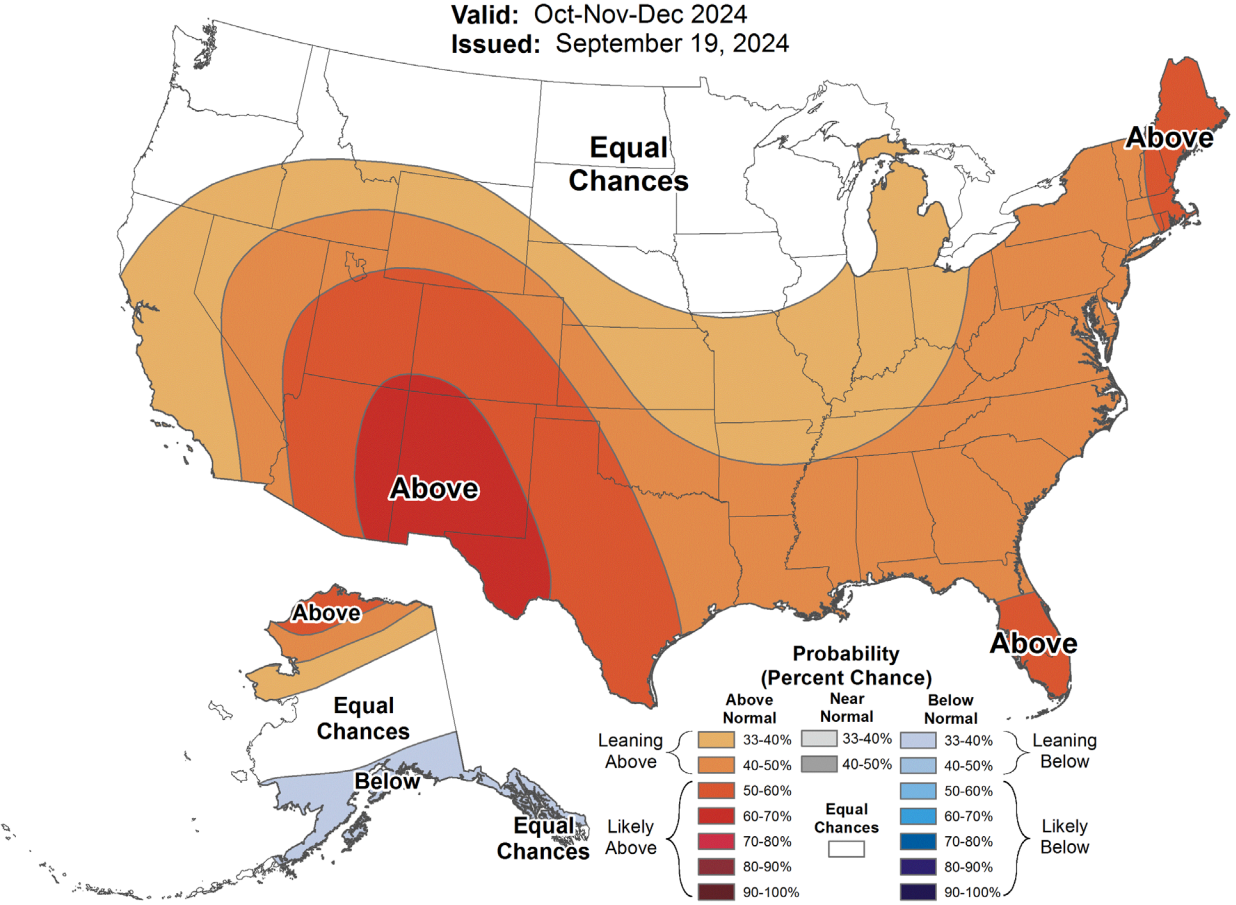
Blue = La Niña wetter Red = El Niño wetter

Official NOAA CPC ENSO Probabilities (issued September 2024)



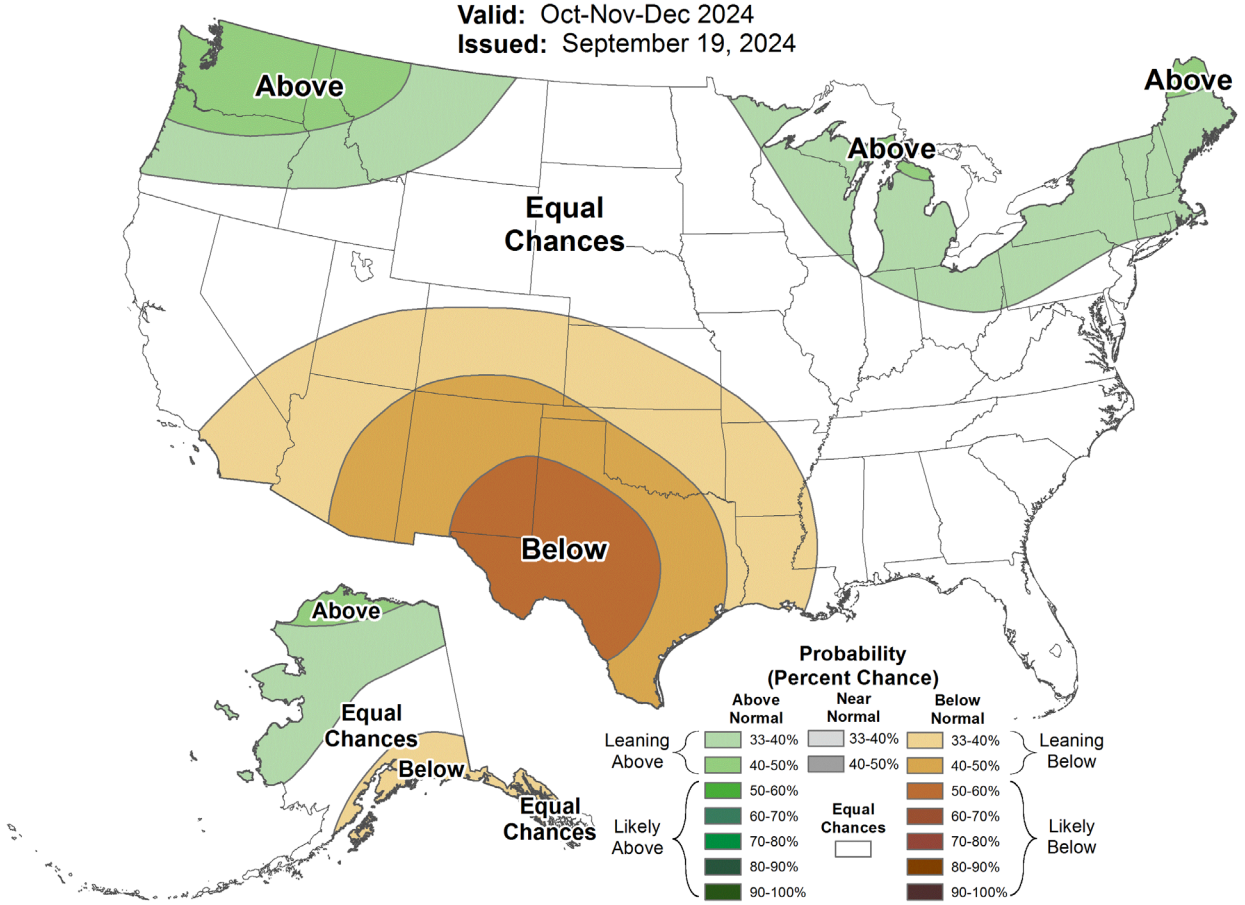
Seasonal Temperature Outlook

Valid: Oct-Nov-Dec 2024
Issued: September 19, 2024



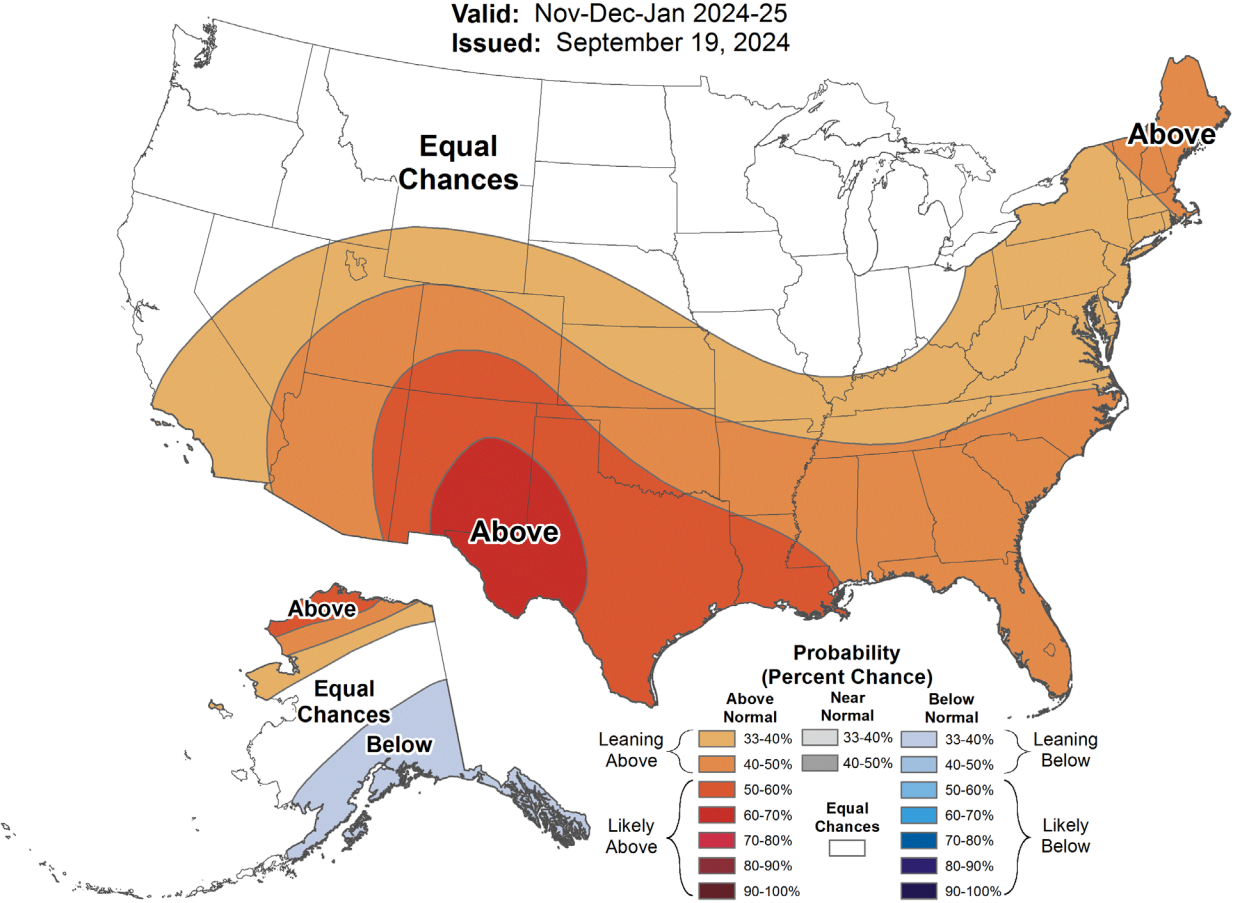
Seasonal Precipitation Outlook

Valid: Oct-Nov-Dec 2024
Issued: September 19, 2024



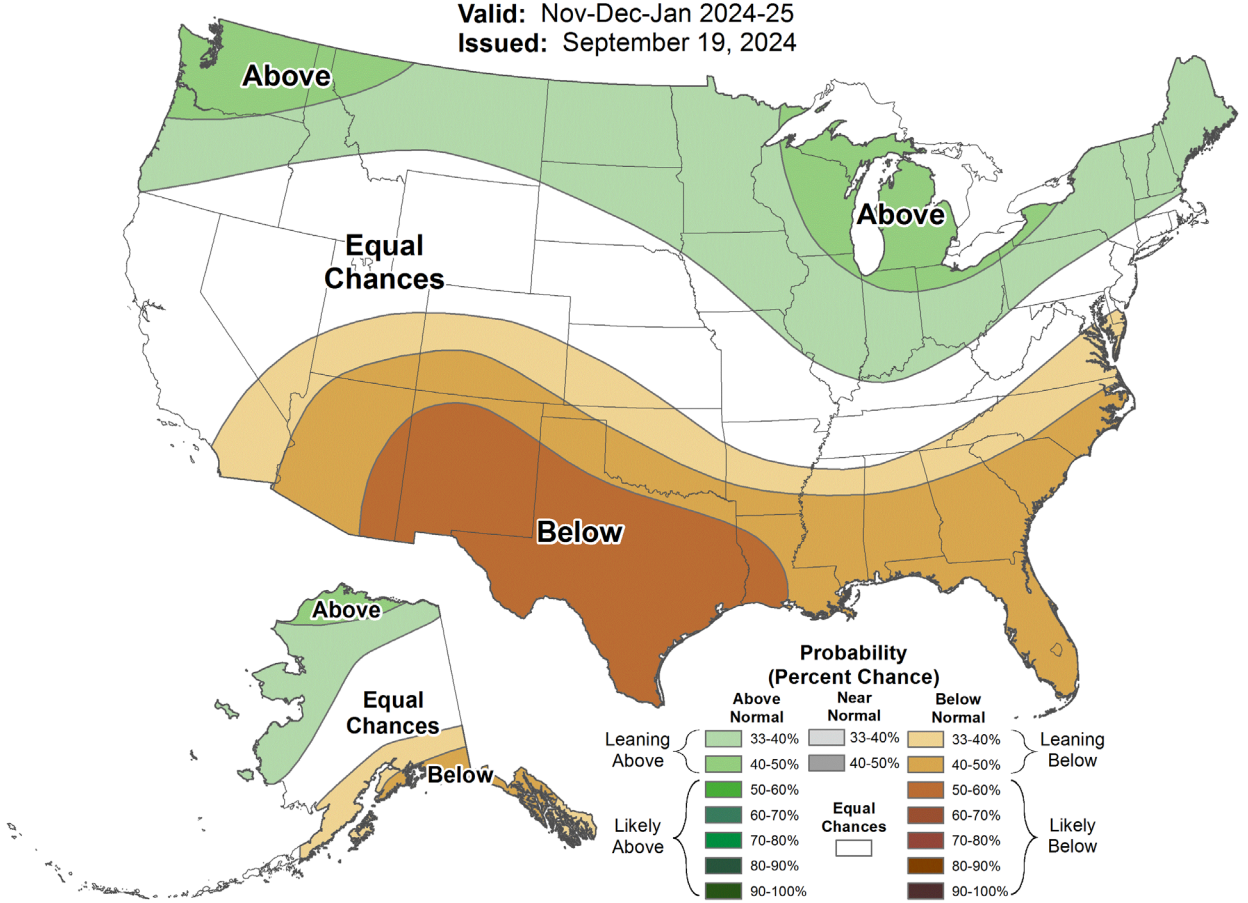
Seasonal Temperature Outlook

Valid: Nov-Dec-Jan 2024-25
Issued: September 19, 2024



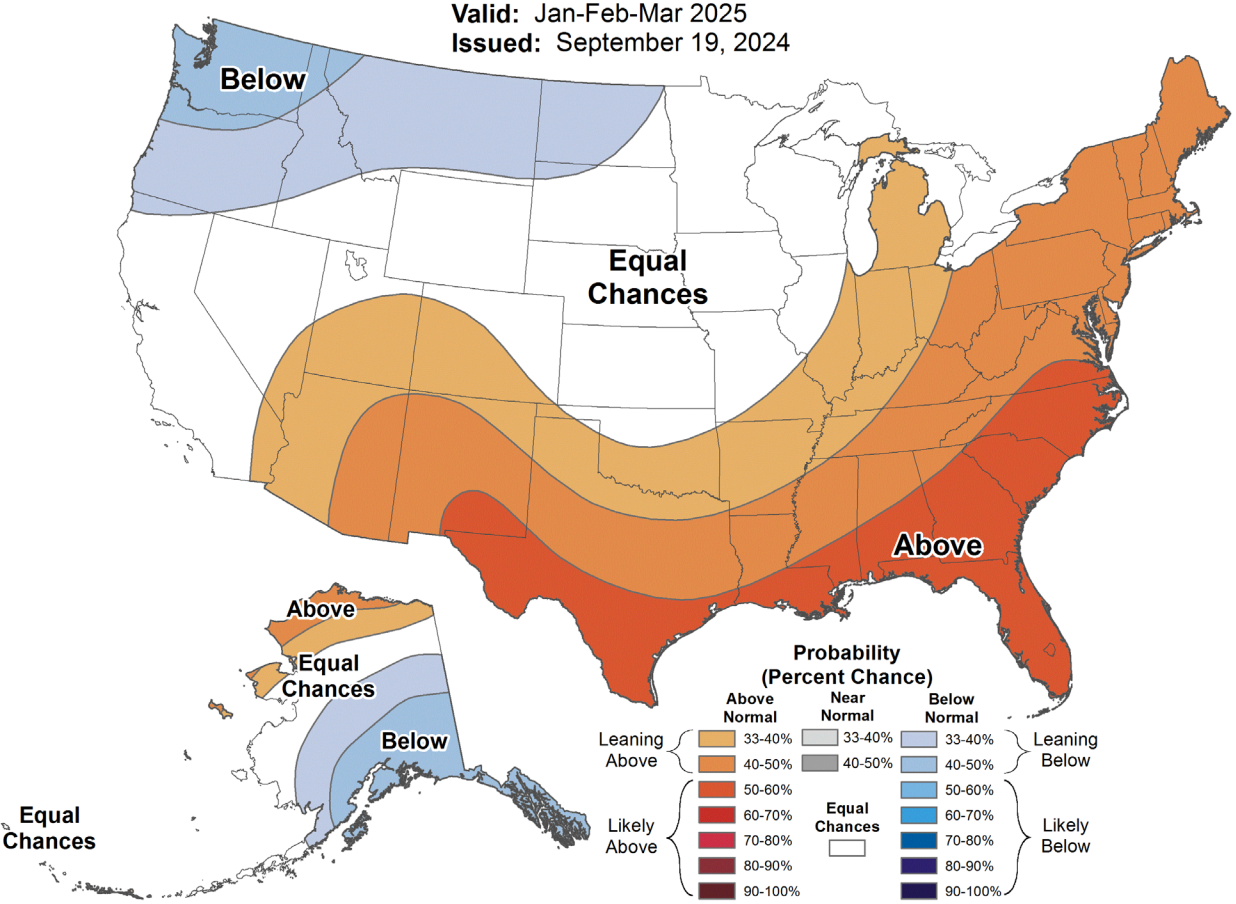
Seasonal Precipitation Outlook

Valid: Nov-Dec-Jan 2024-25
Issued: September 19, 2024



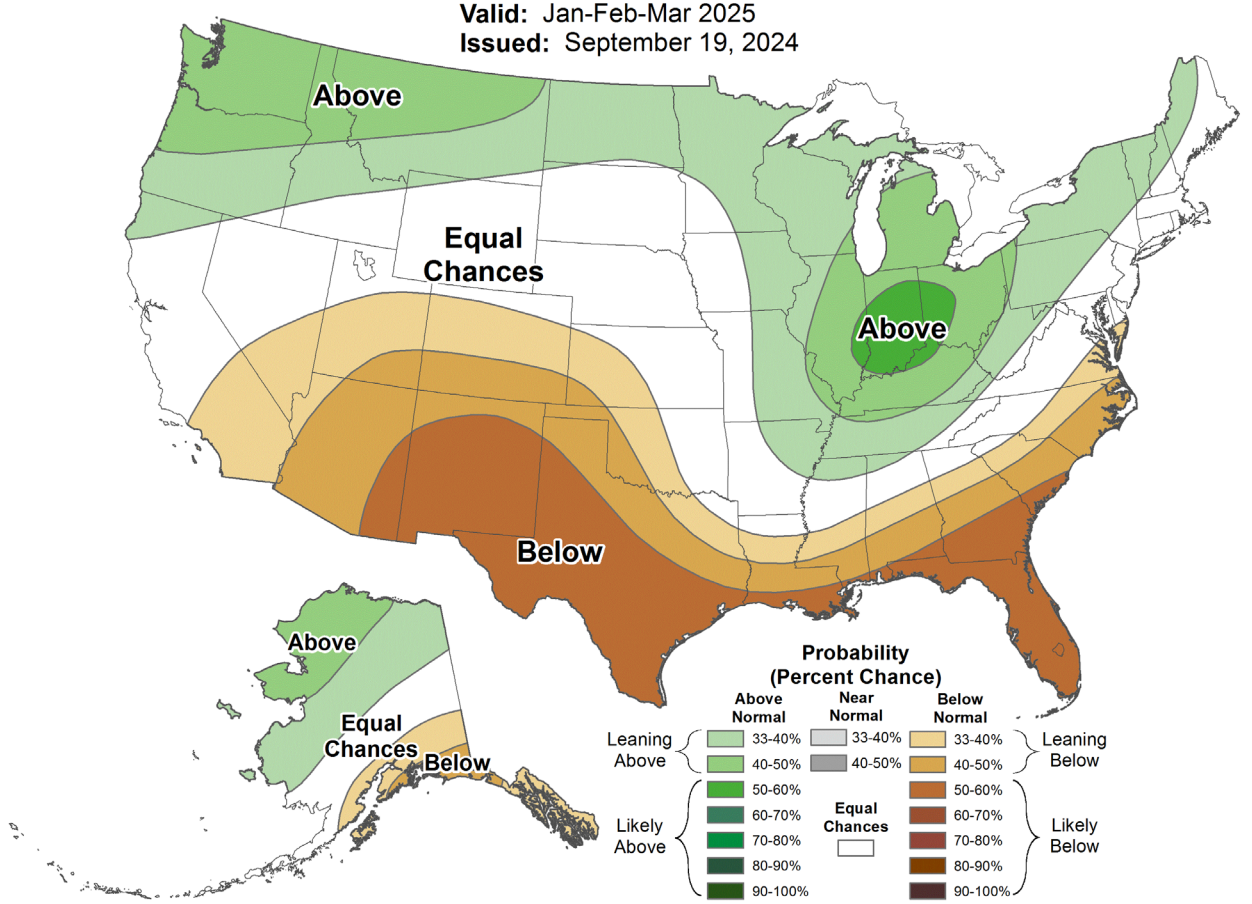
Seasonal Temperature Outlook

Valid: Jan-Feb-Mar 2025
Issued: September 19, 2024

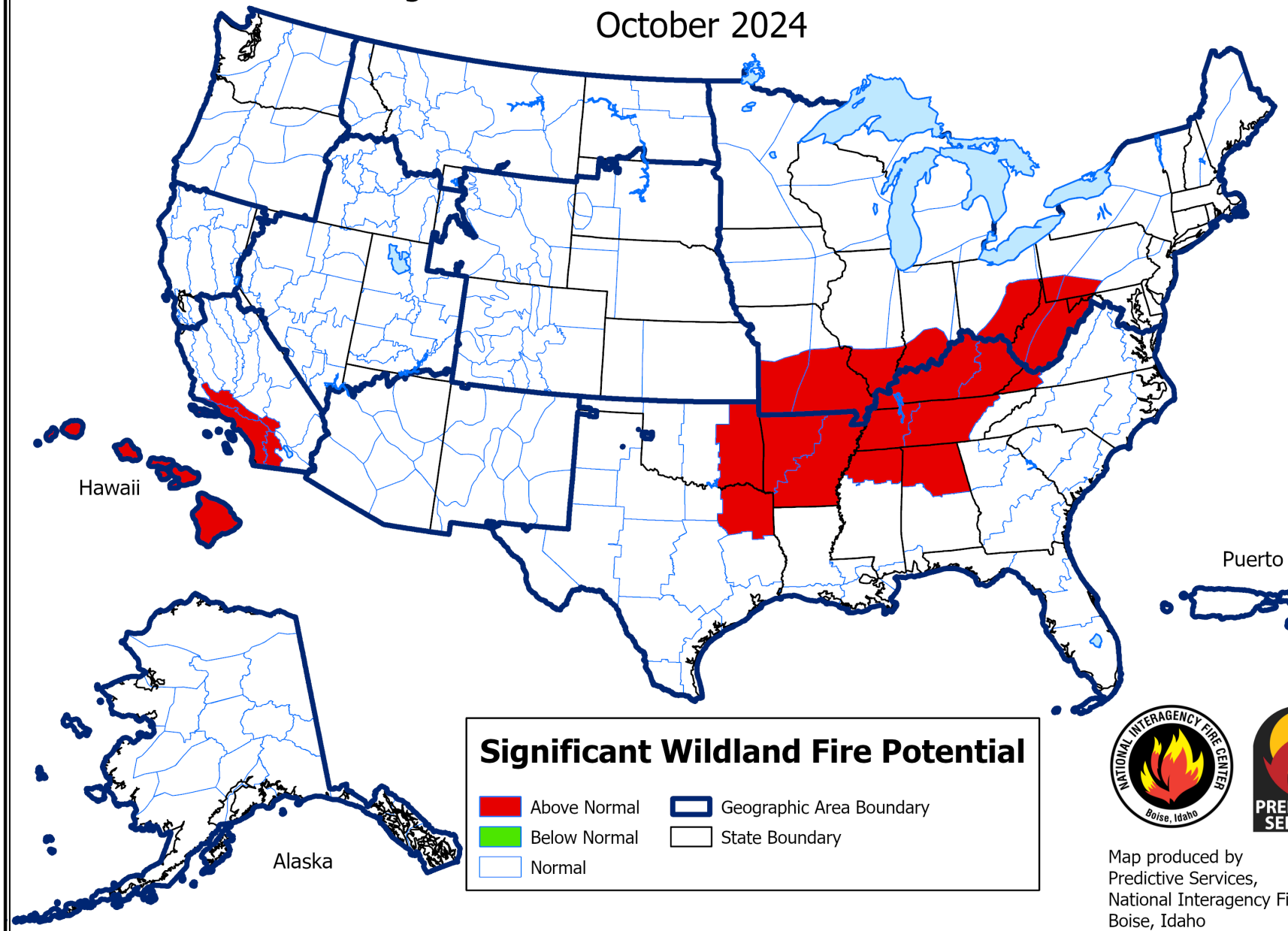


Seasonal Precipitation Outlook

Valid: Jan-Feb-Mar 2025
Issued: September 19, 2024



Significant Wildland Fire Potential Outlook
October 2024



Significant Wildland Fire Potential

- Above Normal
- Below Normal
- Normal
- Geographic Area Boundary
- State Boundary

Above normal significant wildland fire potential indicates a greater than usual likelihood that significant wildland fires will occur.
Significant wildland fires should be expected at typical times and intervals during normal significant wildland fire potential conditions.
Significant wildland fires are still possible but less likely than usual during forecasted below normal periods.

Map produced by
Predictive Services,
National Interagency Fire Center
Boise, Idaho
Issued September 1, 2024
Next issuance October 1, 2024

Takeaways

- Summer 2024 was warmer than normal, but also wetter than normal. Summer temperatures do continue to trend upwards Temperatures this year well in line with last five year.
- Moisture in recent months has been mixed. Unlike 2023, conditions have been much drier than normal on the northern Front Range and in eastern Colorado. Western Colorado experience a much wetter than normal August and significant drought amelioration
- Land surface models suggest that warm and dry conditions are having a cumulative impact on groundwater, which is trending downward across the region (some caveats here as we are still understanding this model)
- Seasonal forecast models suggest equal temperatures of above and below normal temperature and precipitation for northern Colorado with a tilt towards warm/dry this winter. Our in-house analysis suggests a bit more optimism for the high country, particularly the northern Rockies for DJF.
- These models lean heavily on La Nina and Climate change-based signals as well as dynamical factors
- Think snow and cold! It'll be here before we know it!

Colorado Climate Center (Contact Us)

Thanks, and let's keep in touch!

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Peter Goble (Assistant State Climatologist) – peter.goble@colostate.edu

Viewing this, and previous WATF Briefings:

http://climate.colostate.edu/ccc_archive.html

Thank you

ATMOSPHERIC SCIENCE
COLORADO STATE UNIVERSITY