

# Climate Center Update

Colorado Water  
Conditions Monitoring  
Committee 7/22/2025

Peter Goble  
Colorado Climate  
Center



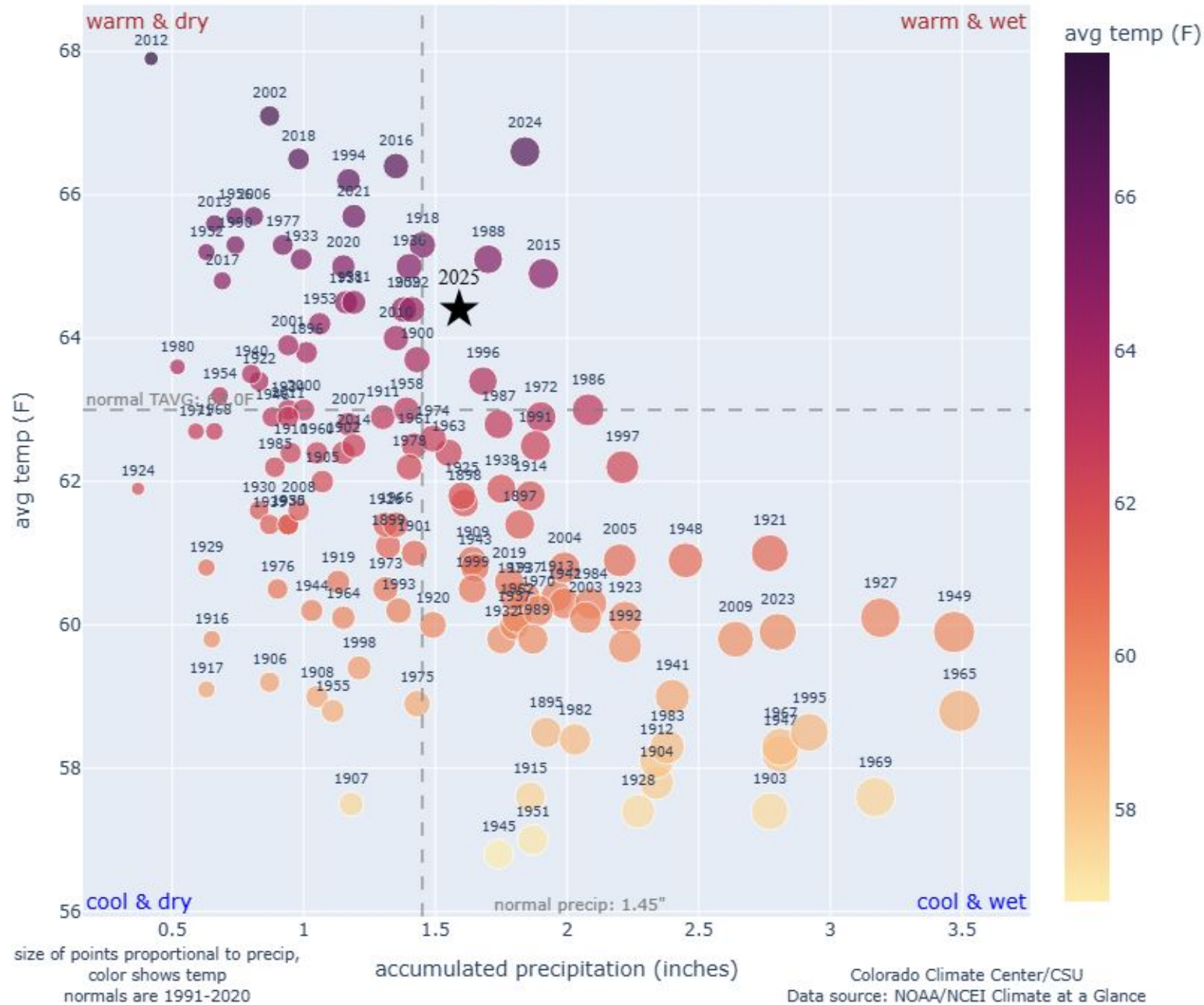
Photo Credit:  
Allie Mazurek

# Agenda

- Current seasonal climate conditions update
- Drought update – some new products
- Seasonal Forecast info (Remainder of summer and beyond)



# Colorado statewide average temperature and precipitation, June

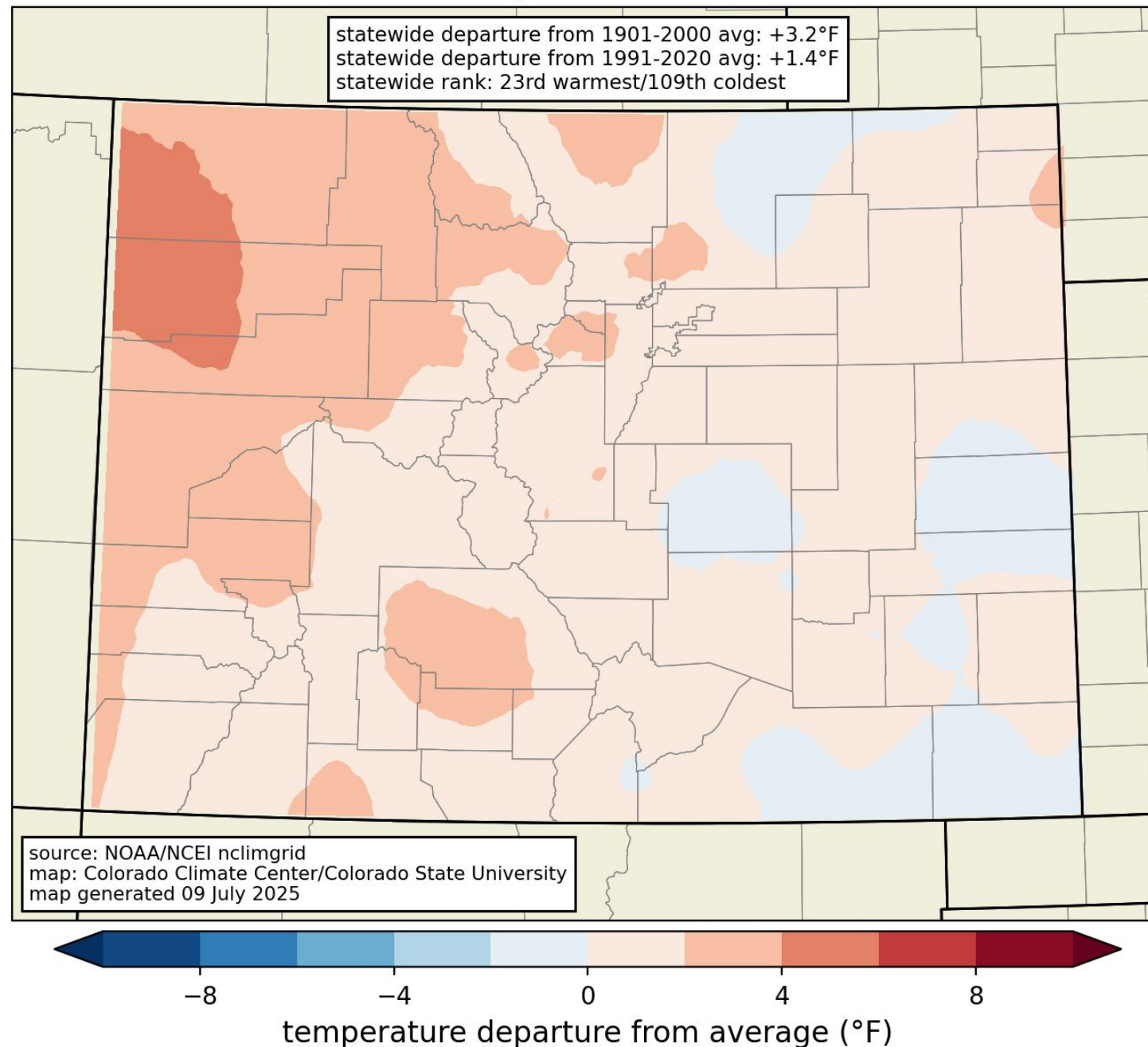


1.4 °F above  
1991-2020  
normal

0.14" above  
1991-2020  
normal



# temperature departure from 1991-2020 average June 2025

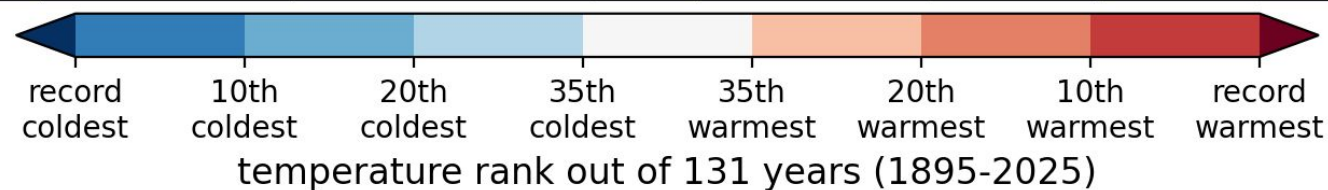
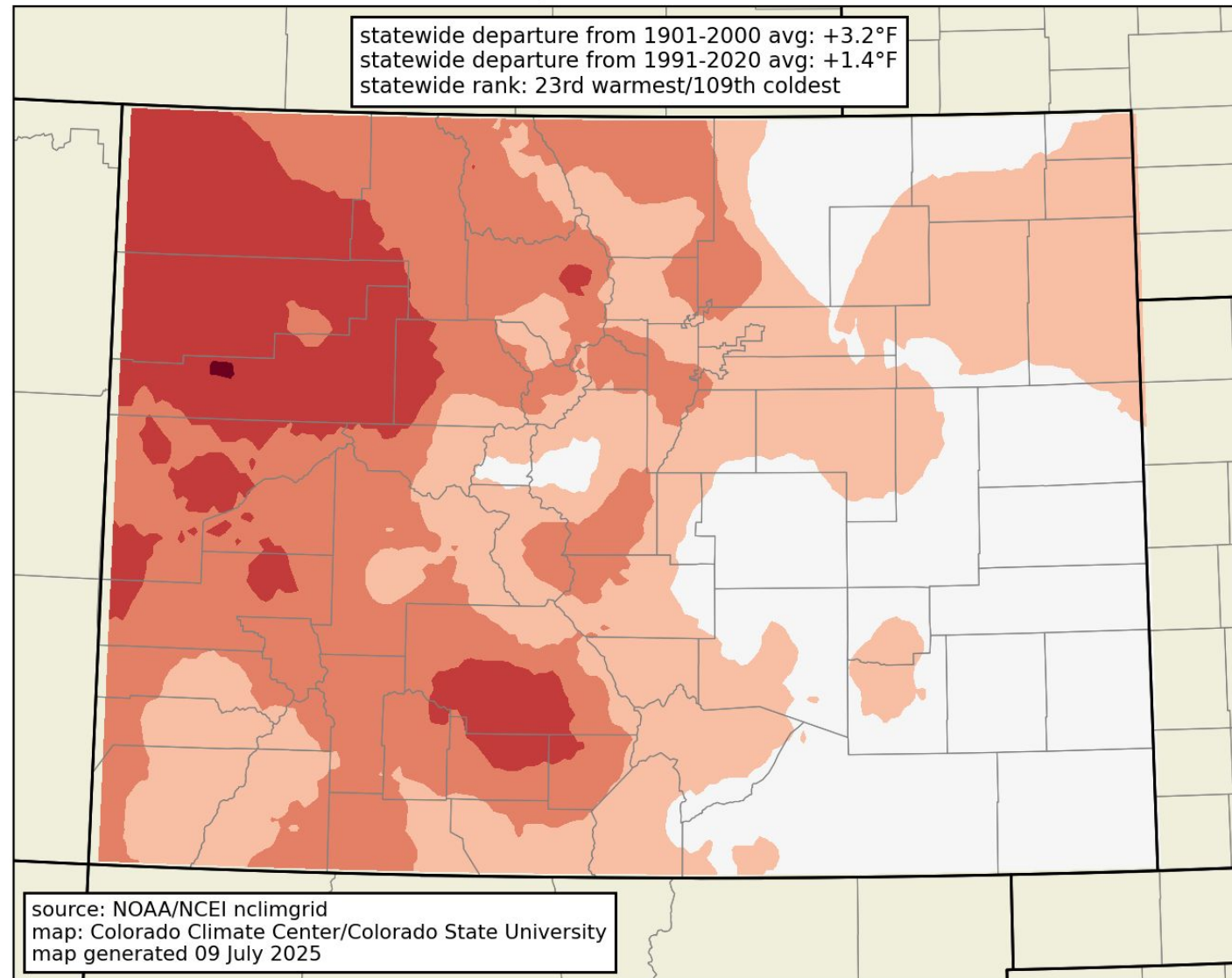


[https://climate.colostate.edu/co\\_cag/rank\\_maps.html](https://climate.colostate.edu/co_cag/rank_maps.html)





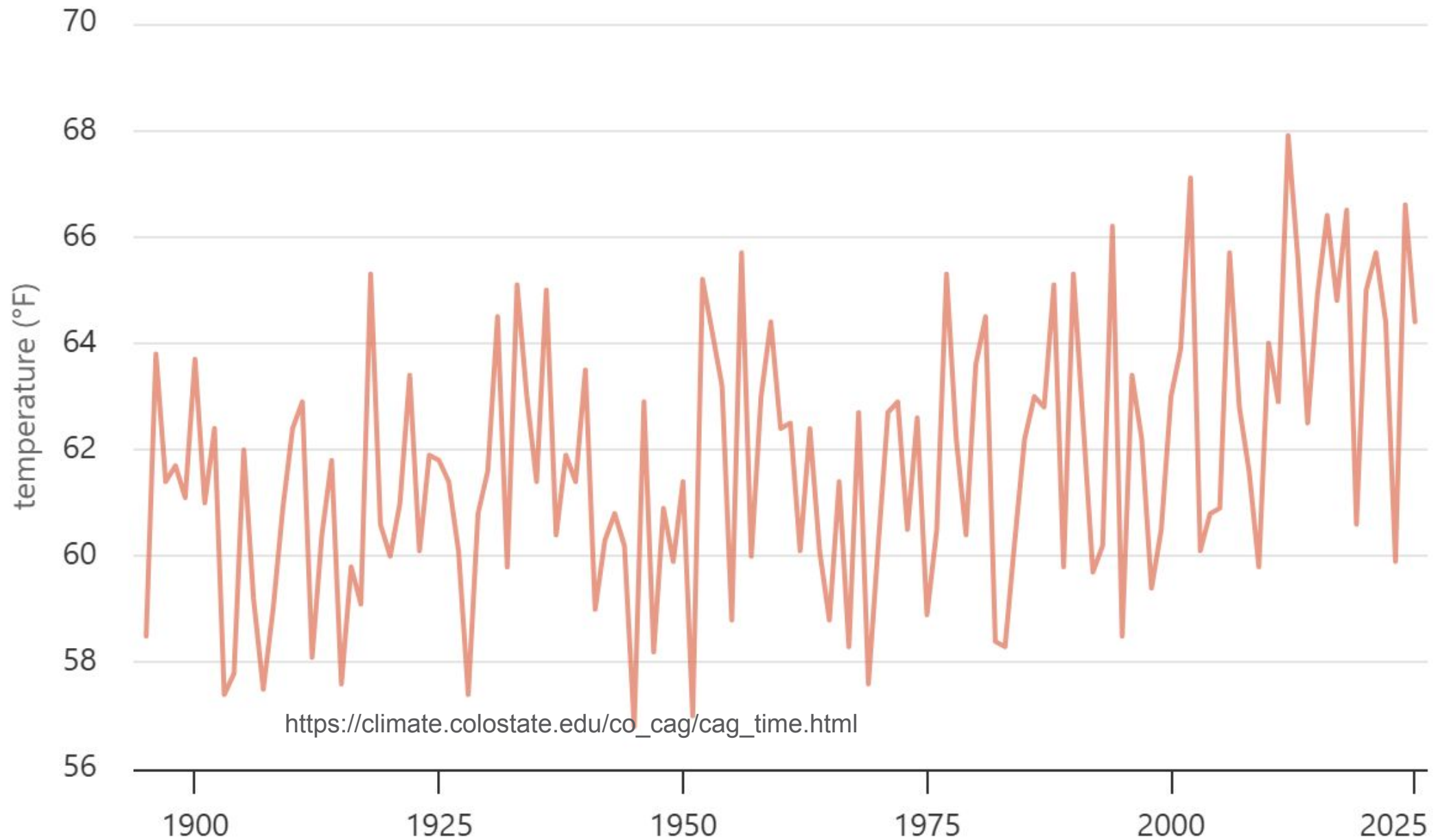
# average temperature rank June 2025



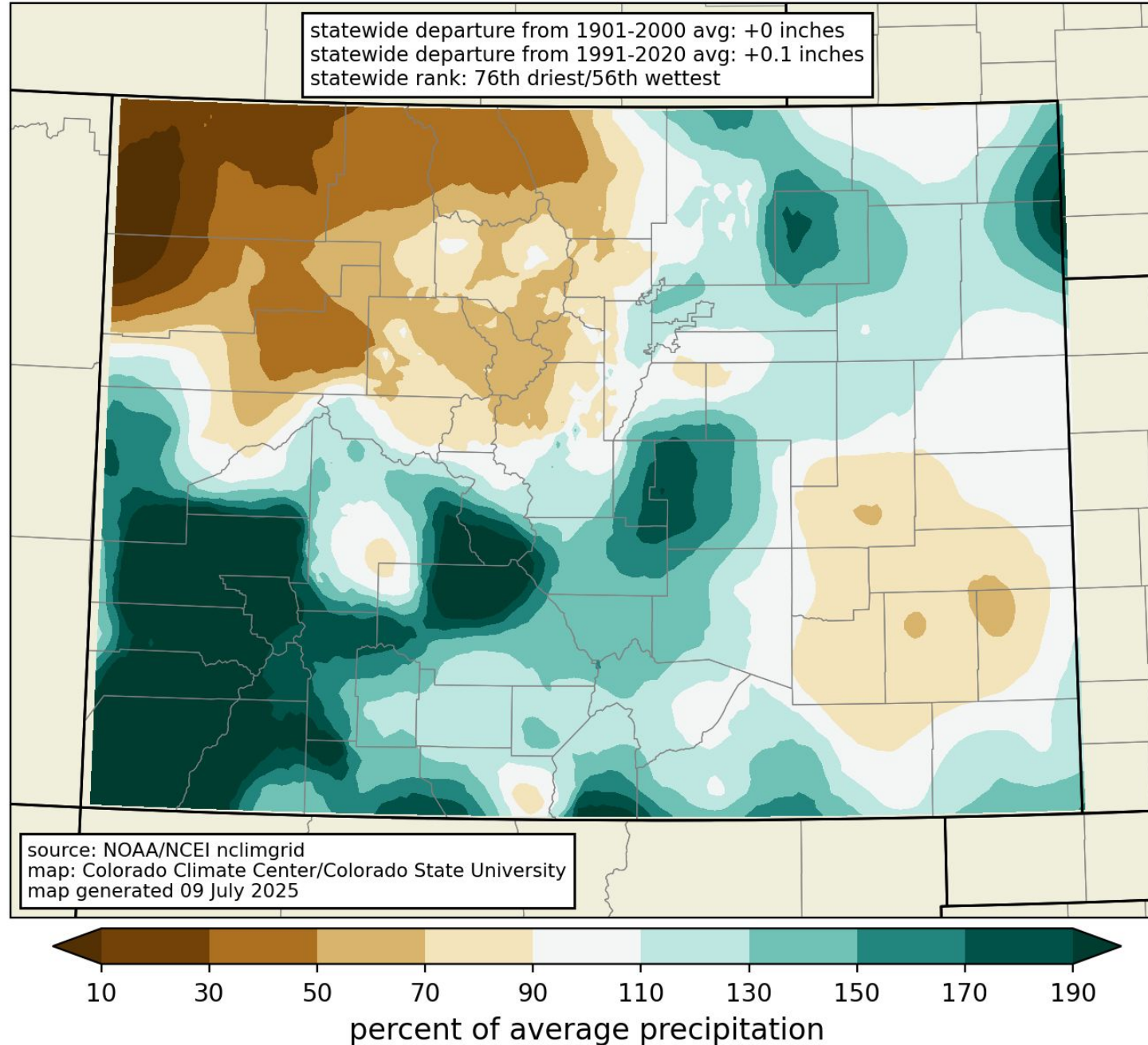
[https://climate.colostate.edu/co\\_cag/rank\\_maps.html](https://climate.colostate.edu/co_cag/rank_maps.html)



# Colorado June Average Temperature



percent of 1991-2020 average precipitation  
June 2025

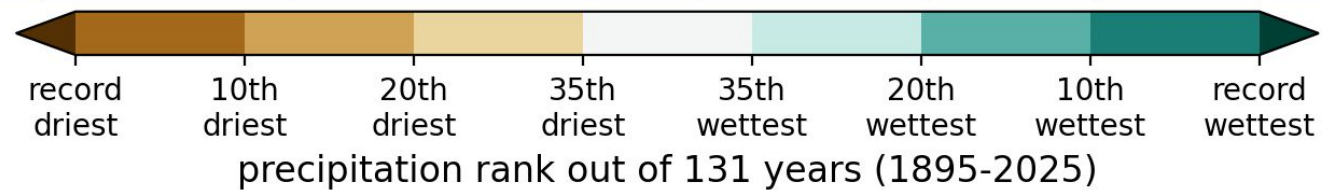
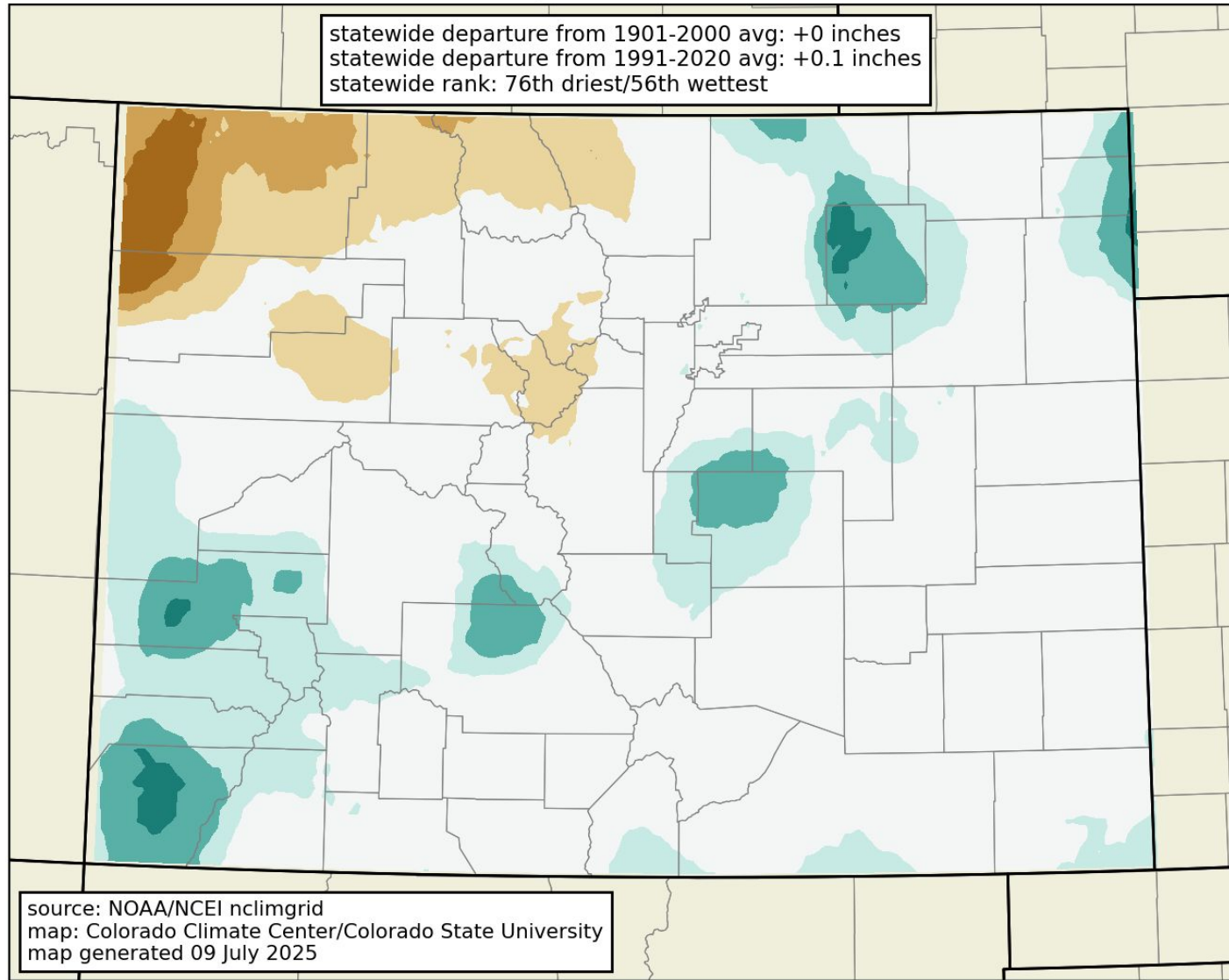


[https://climate.colostate.edu/co\\_cag/rank\\_maps.html](https://climate.colostate.edu/co_cag/rank_maps.html)



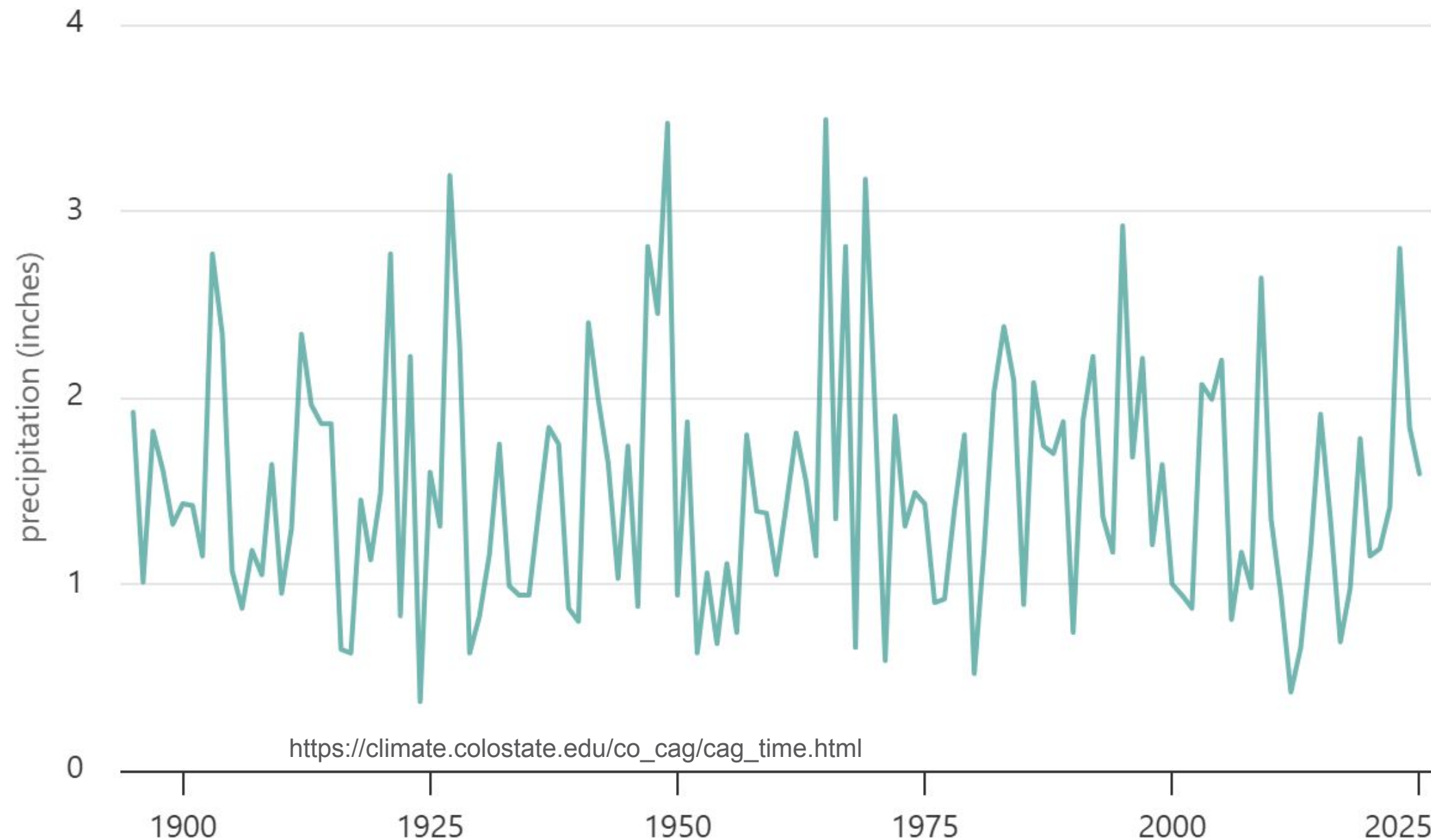
## precipitation rank June 2025

statewide departure from 1901-2000 avg: +0 inches  
statewide departure from 1991-2020 avg: +0.1 inches  
statewide rank: 76th driest/56th wettest



[https://climate.colostate.edu/co\\_cag/rank\\_maps.html](https://climate.colostate.edu/co_cag/rank_maps.html)

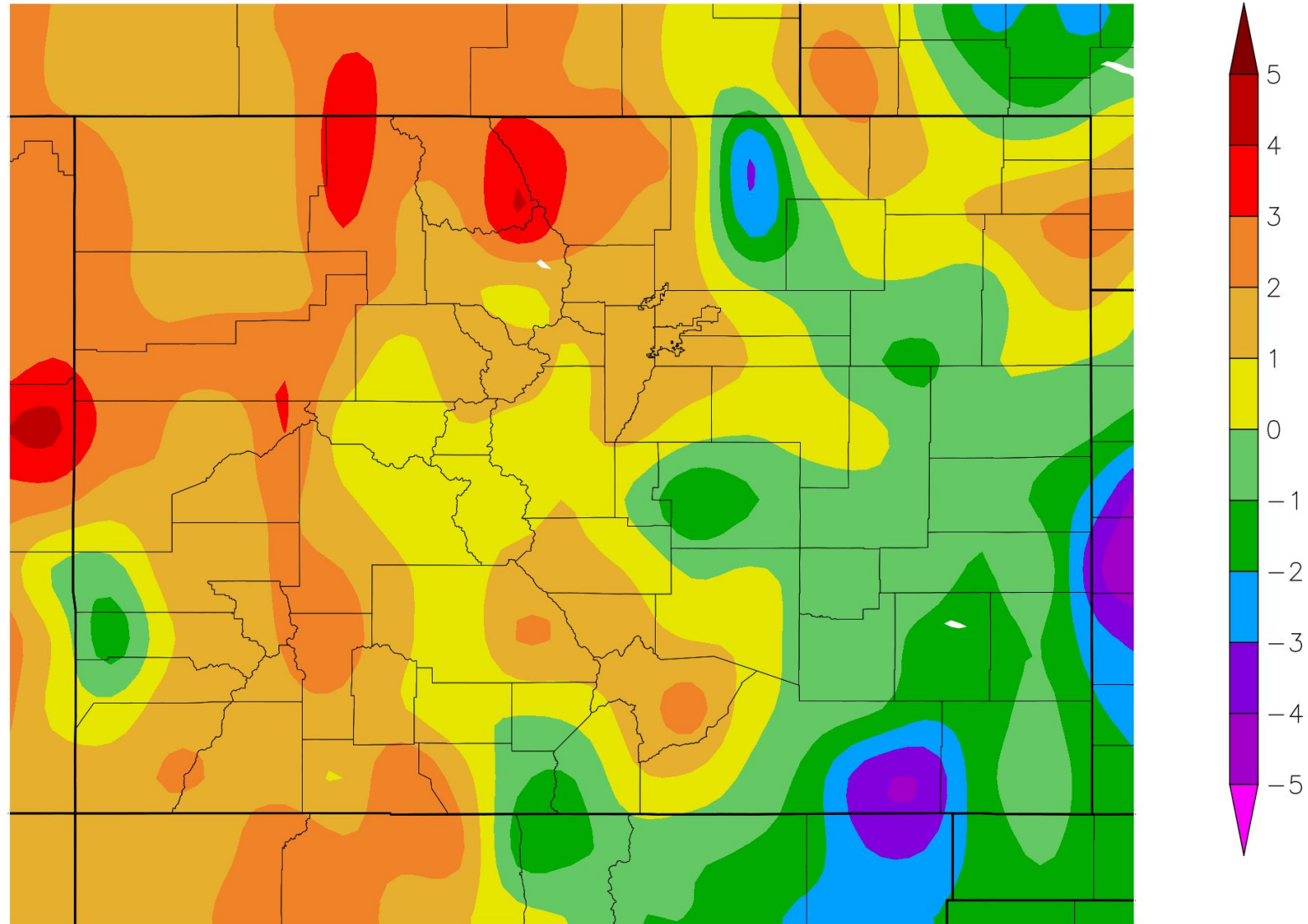
# Colorado June Precipitation



[https://climate.colostate.edu/co\\_cag/cag\\_time.html](https://climate.colostate.edu/co_cag/cag_time.html)

# Departure from Normal Temperature (F)

## 7/1/2025 – 7/20/2025

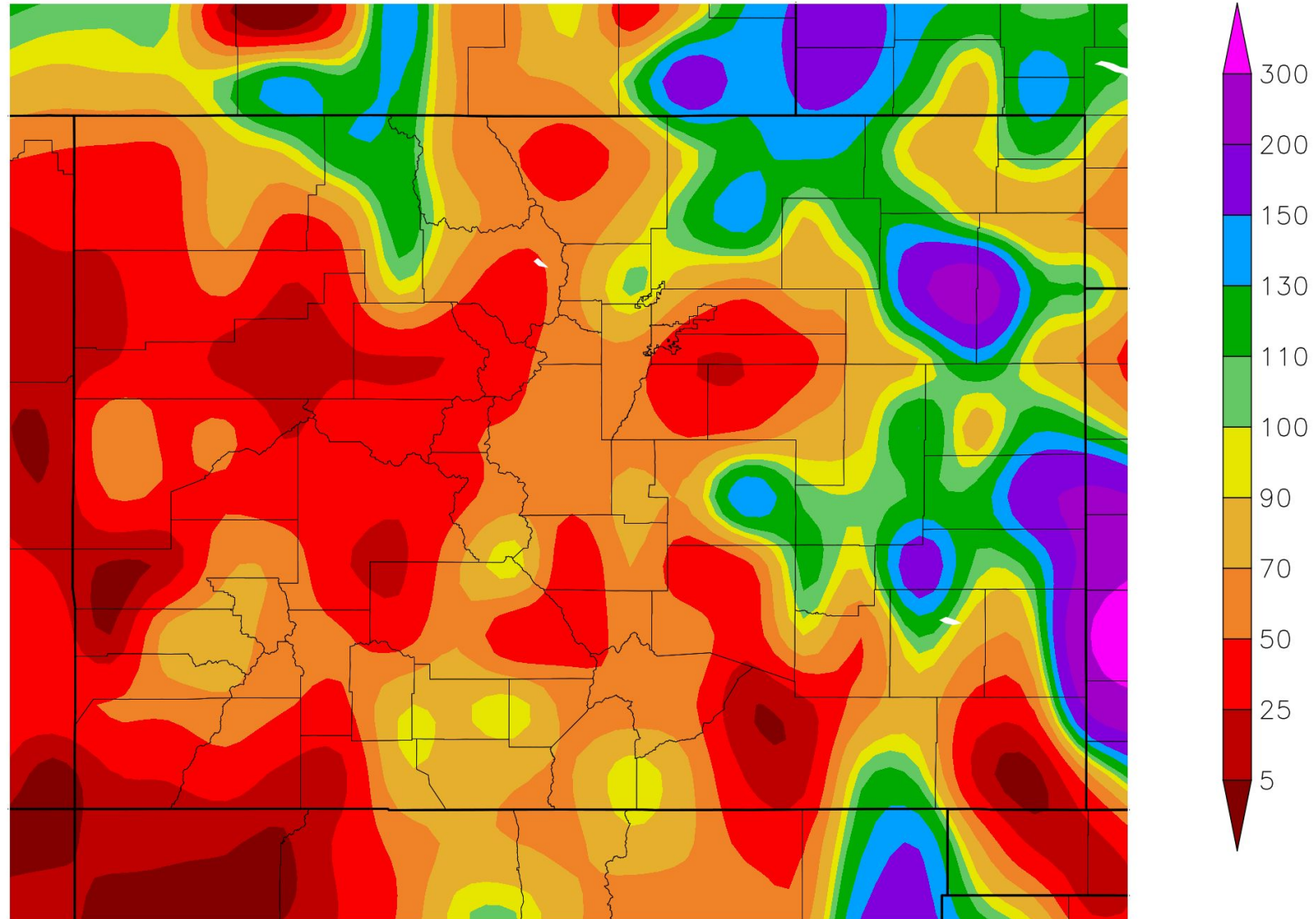


<https://hprcc.unl.edu/maps.php?map=ACISClimateMaps>



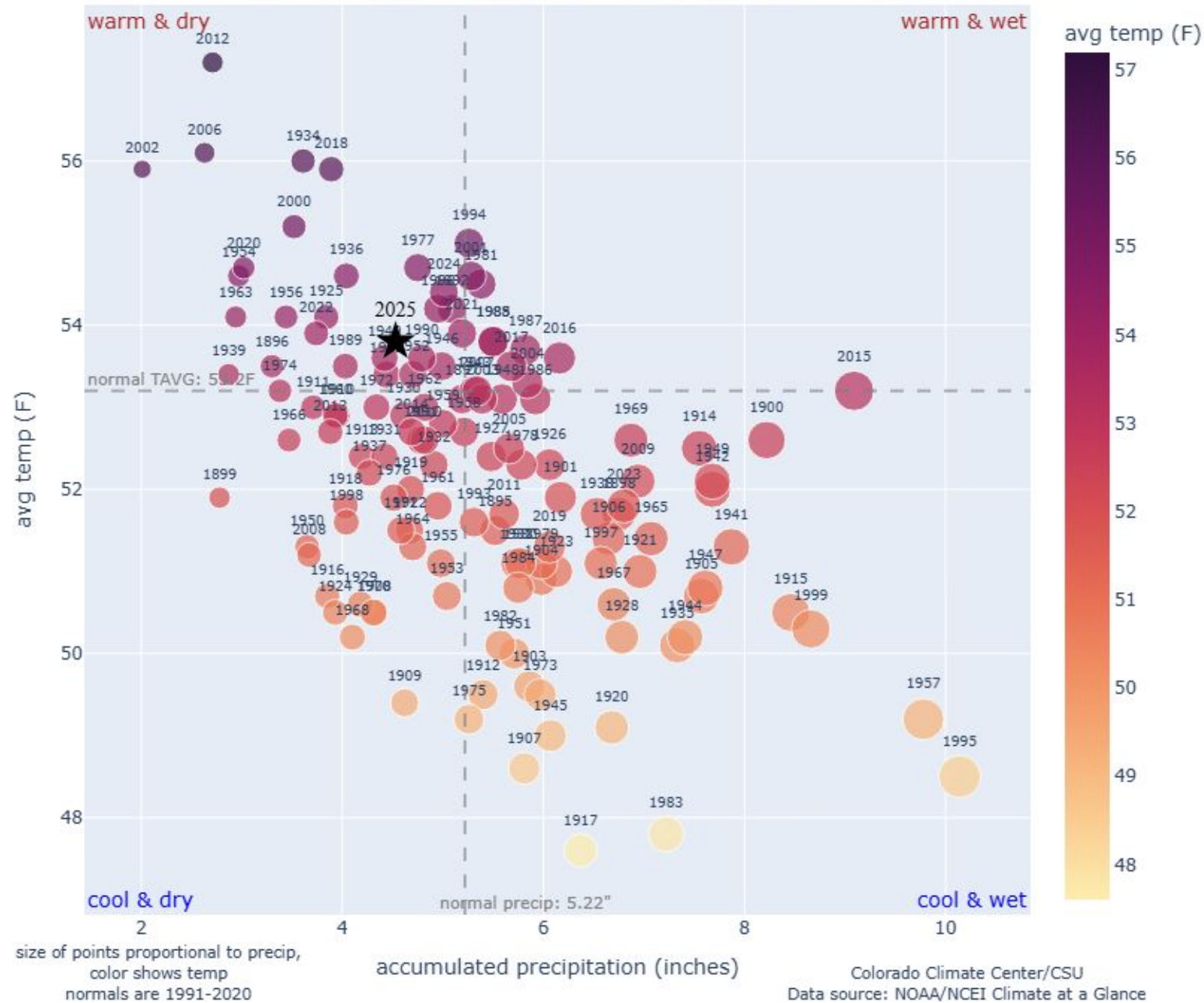
# Percent of Normal Precipitation (%)

## 7/1/2025 – 7/20/2025



<https://hprcc.unl.edu/maps.php?map=ACISClimateMaps>

# Colorado statewide average temperature and precipitation, April - June



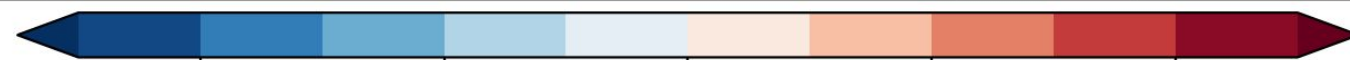
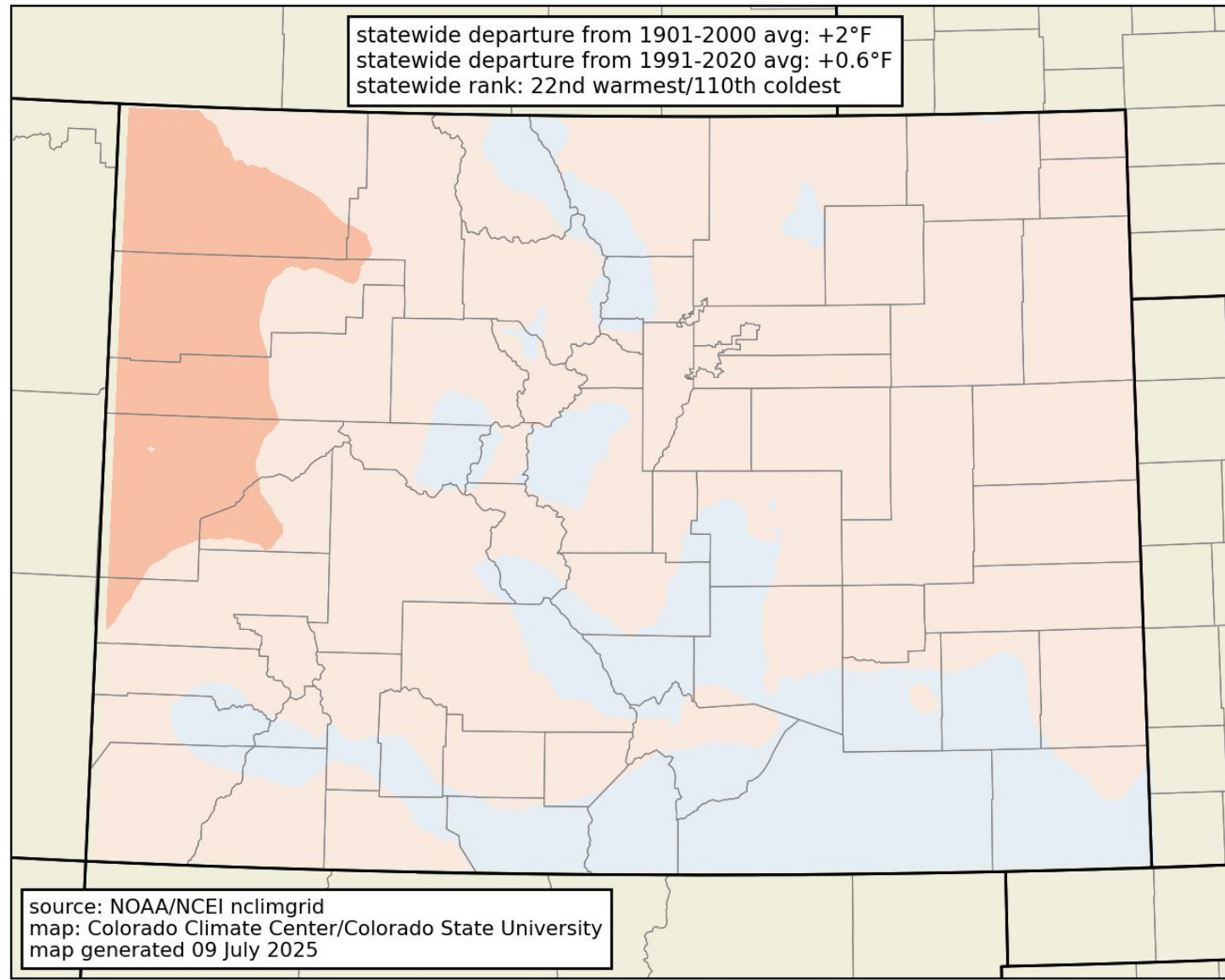
0.6 °F above  
1991-2020  
normal

0.69" below  
1991-2020  
normal

[https://climate.colostate.edu/co\\_cag/quadrant.html](https://climate.colostate.edu/co_cag/quadrant.html)



temperature departure from 1991-2020 average  
3 months ending June 2025 (Apr-Jun)



-8

-4

0

4

8

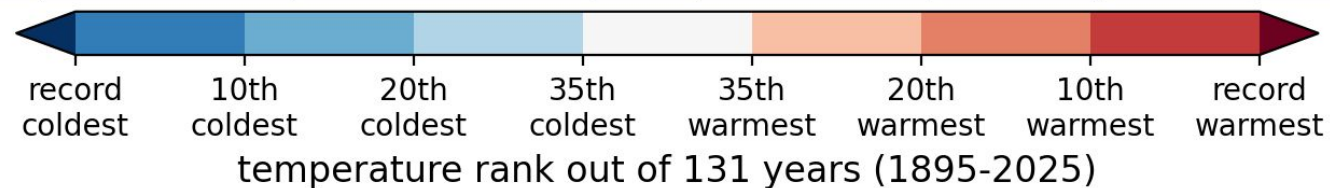
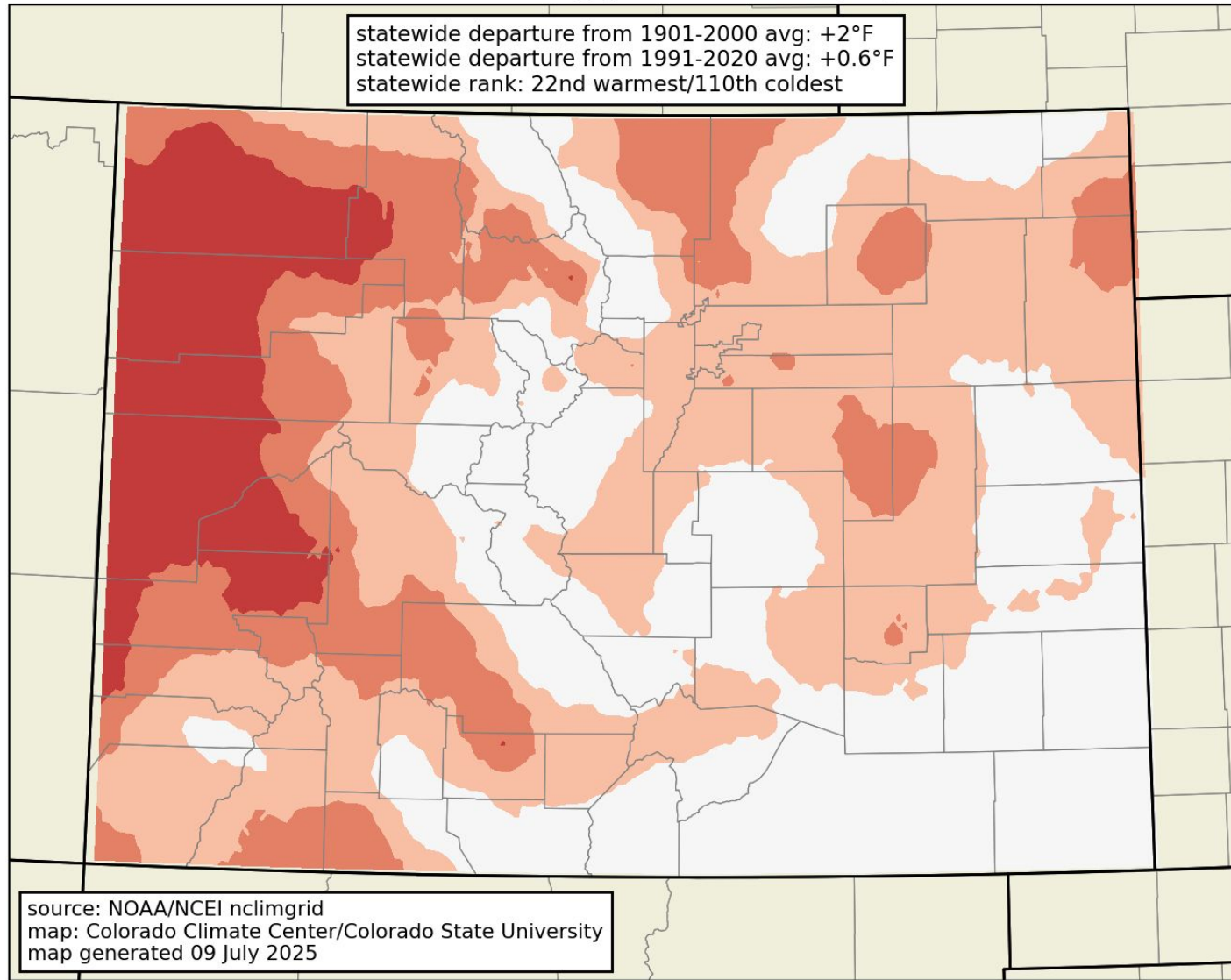
temperature departure from average (°F)

[https://climate.colostate.edu/co\\_cag/rank\\_maps.html](https://climate.colostate.edu/co_cag/rank_maps.html)



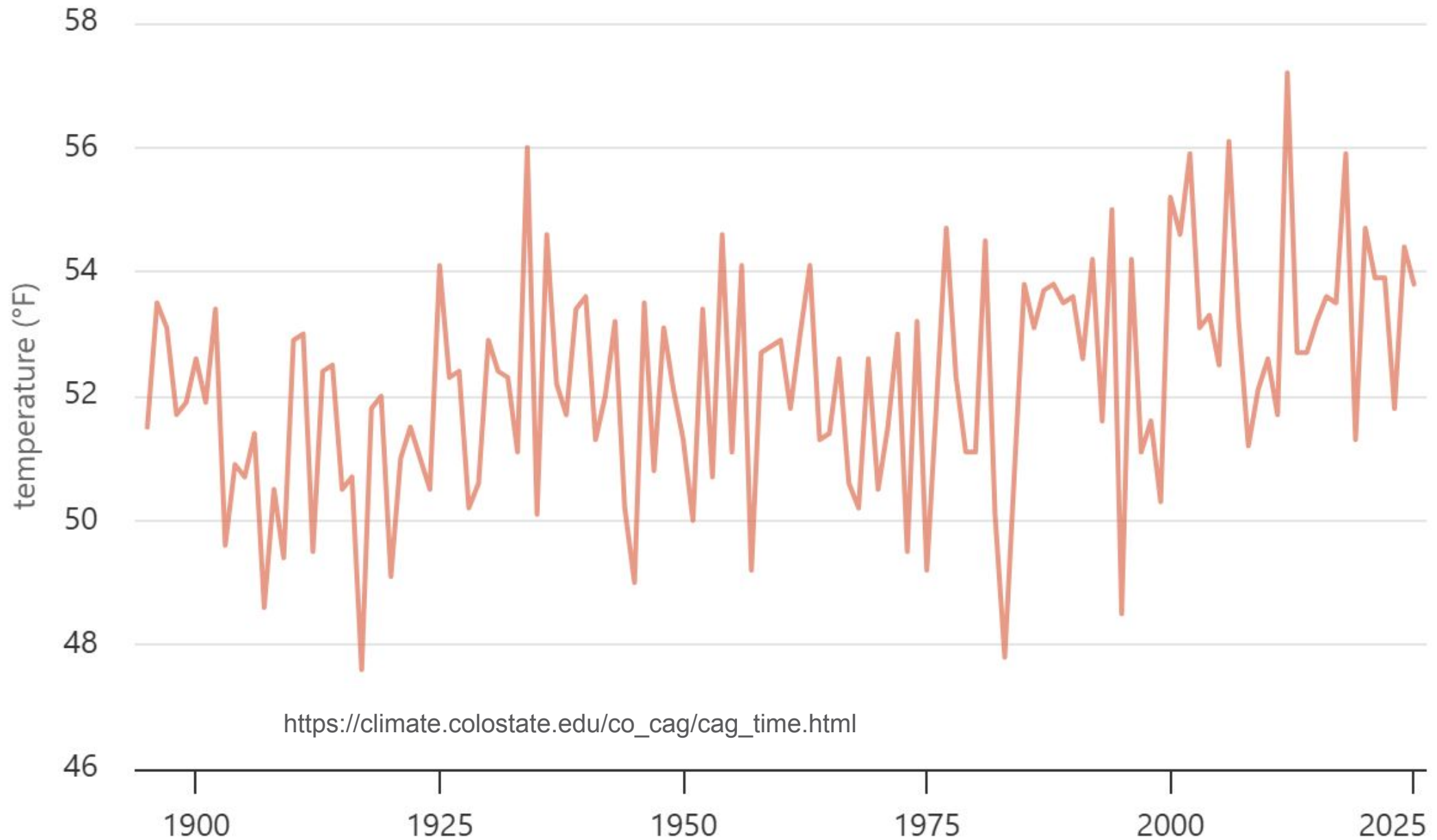
# average temperature rank 3 months ending June 2025 (Apr-Jun)

statewide departure from 1901-2000 avg: +2°F  
statewide departure from 1991-2020 avg: +0.6°F  
statewide rank: 22nd warmest/110th coldest



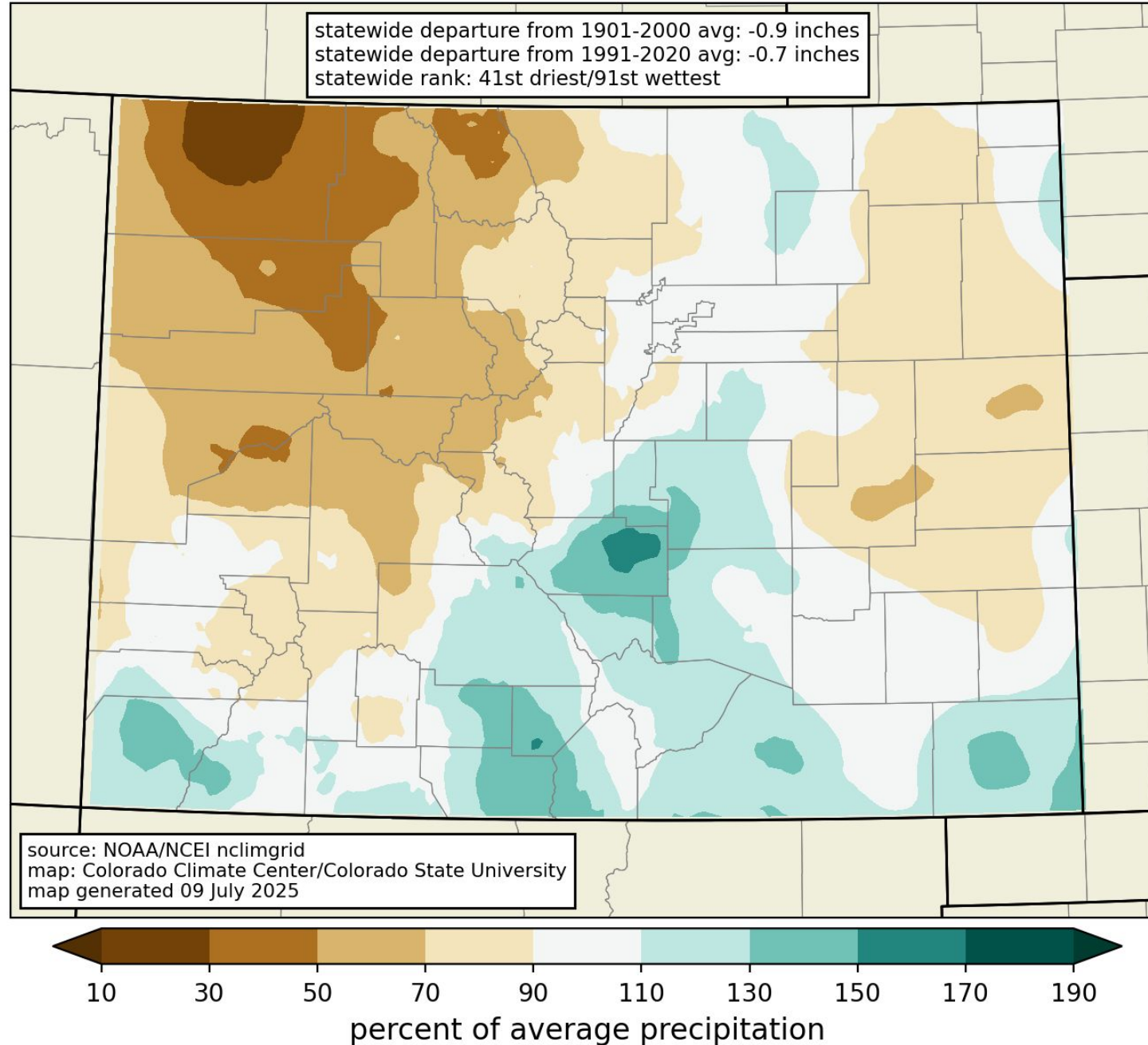
[https://climate.colostate.edu/co\\_cag/rank\\_maps.html](https://climate.colostate.edu/co_cag/rank_maps.html)

# Colorado April-June Average Temperature



[https://climate.colostate.edu/co\\_cag/cag\\_time.html](https://climate.colostate.edu/co_cag/cag_time.html)

percent of 1991-2020 average precipitation  
3 months ending June 2025 (Apr-Jun)

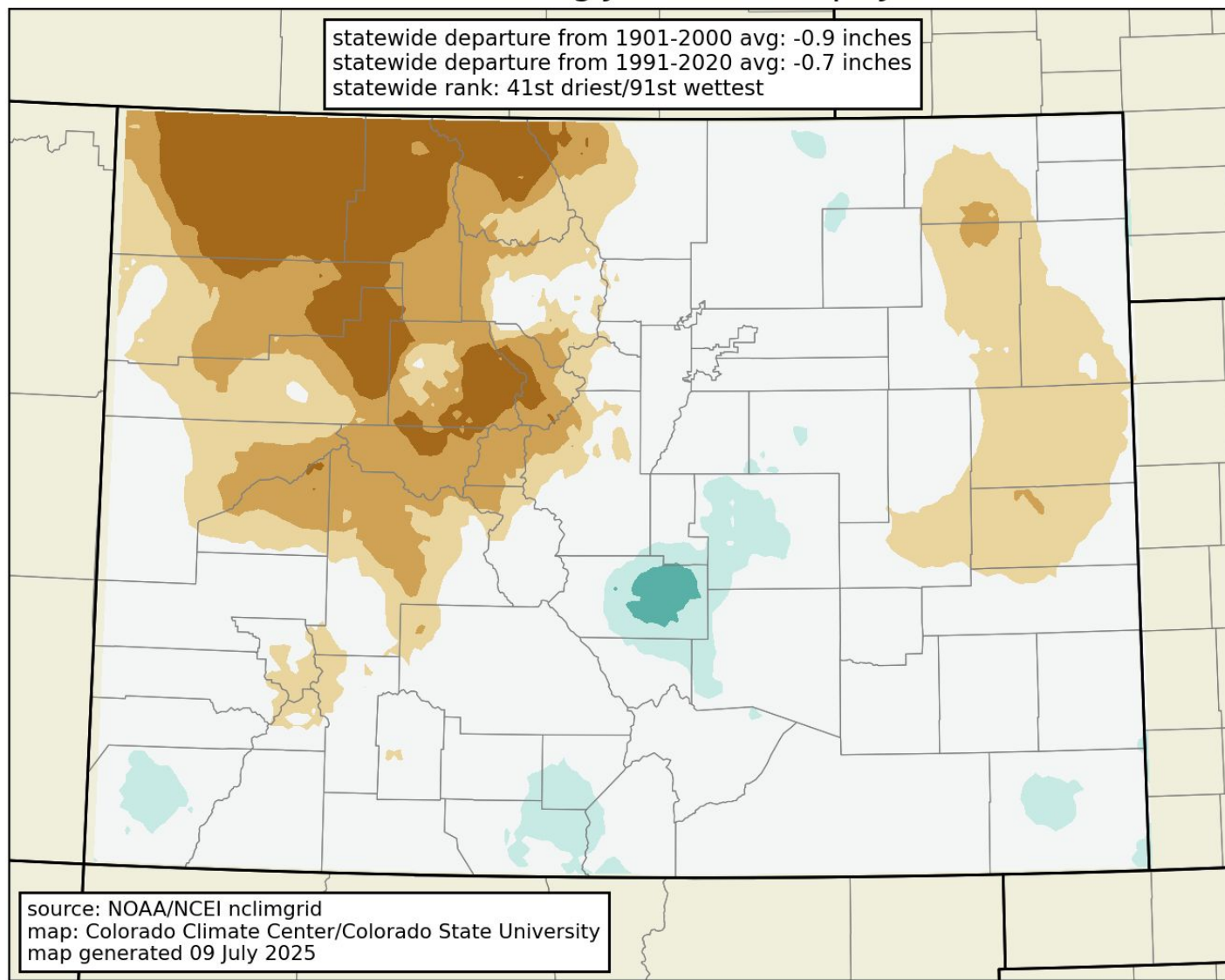


Top 10 warm and  
dry April-June for  
parts of NW CO

[https://climate.colostate.edu/co\\_cag/rank\\_maps.html](https://climate.colostate.edu/co_cag/rank_maps.html)

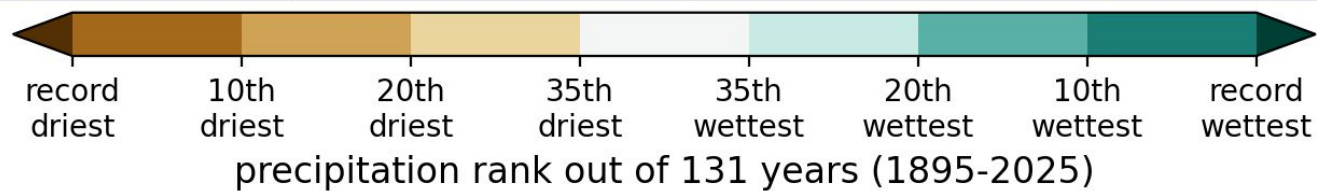


# precipitation rank 3 months ending June 2025 (Apr-Jun)

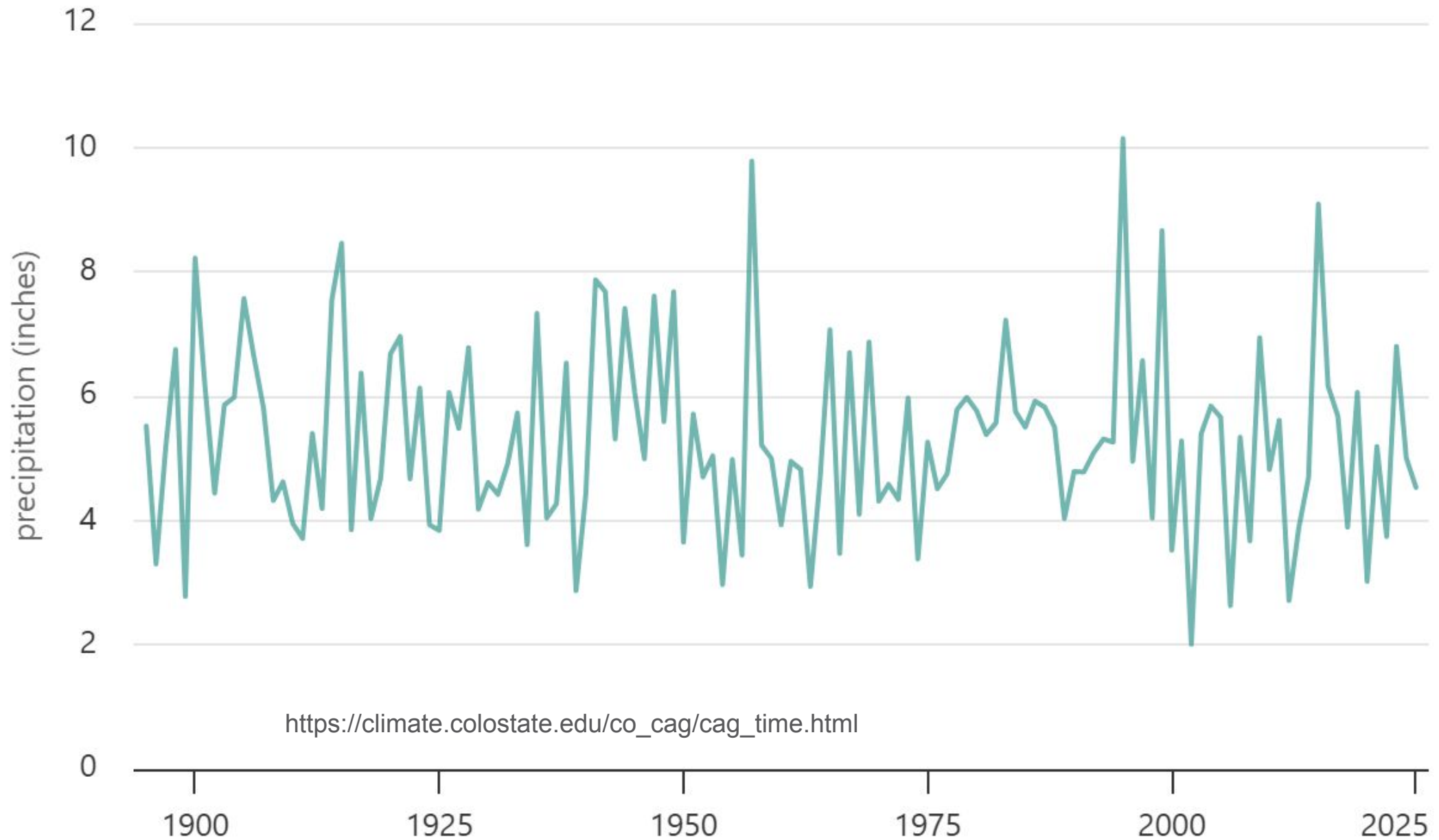


Top 10 warm and  
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[https://climate.colostate.edu/co\\_cag/rank\\_maps.html](https://climate.colostate.edu/co_cag/rank_maps.html)

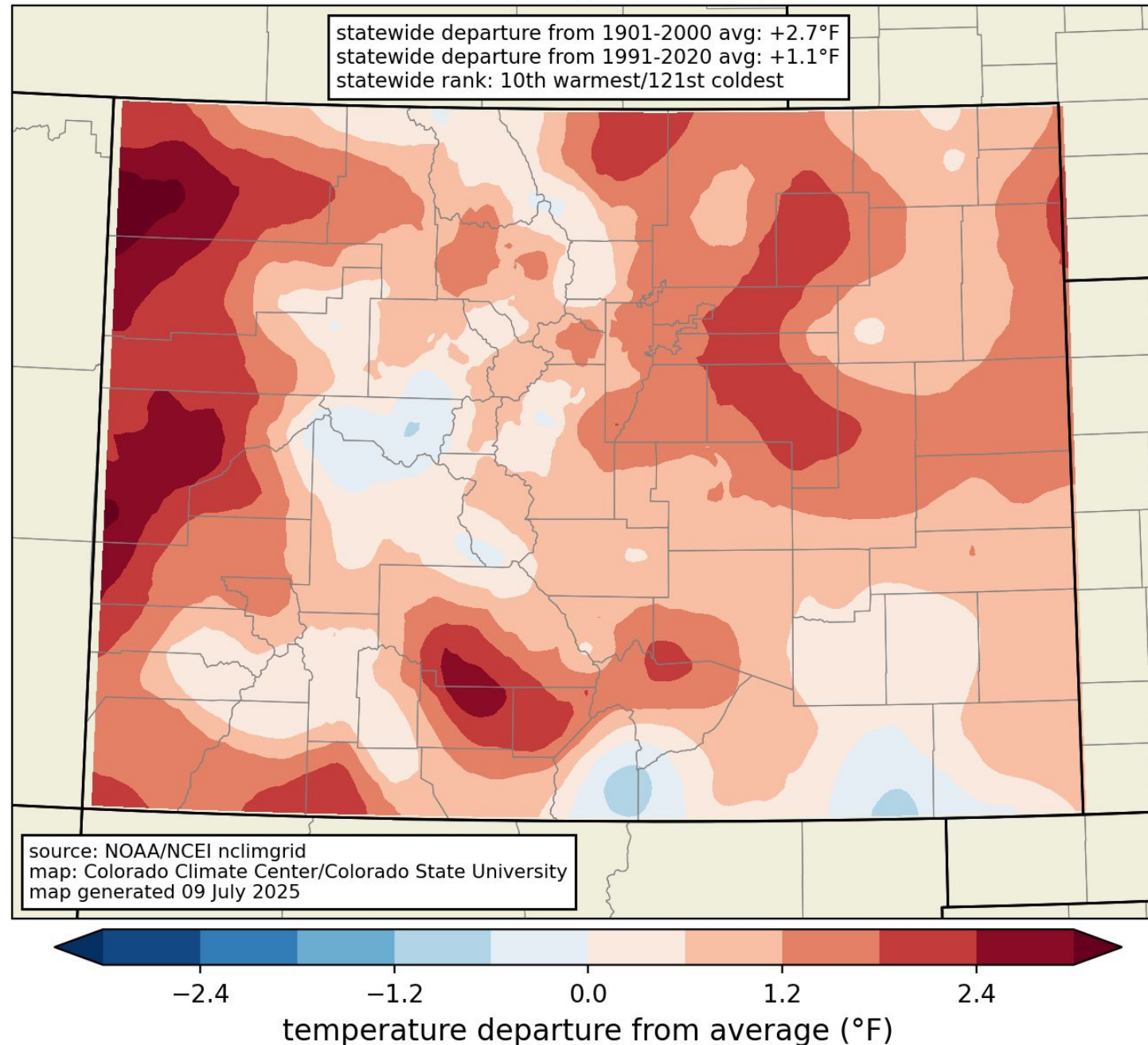


# Colorado April-June Precipitation



[https://climate.colostate.edu/co\\_cag/cag\\_time.html](https://climate.colostate.edu/co_cag/cag_time.html)

temperature departure from 1991-2020 average  
12 months ending June 2025 (Jul-Jun)



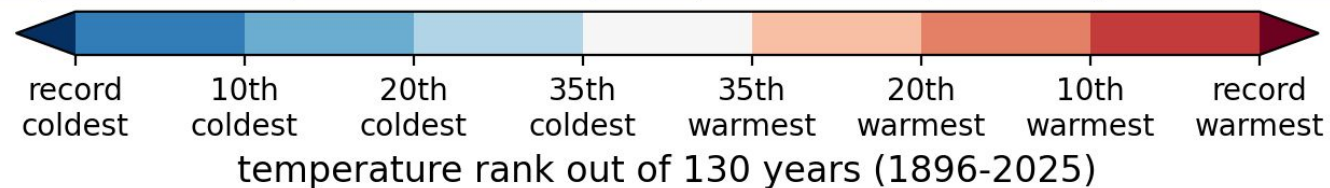
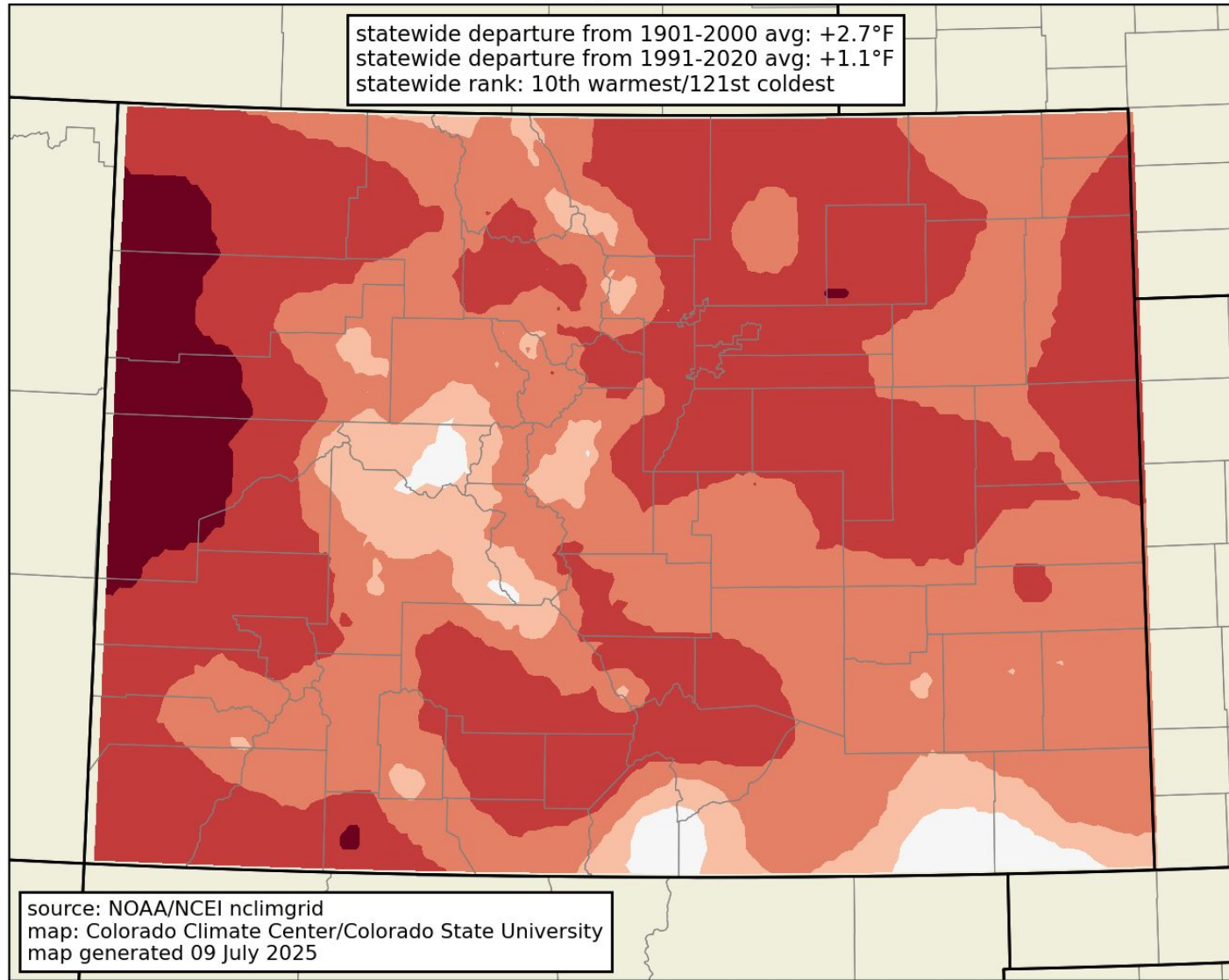
Warmest  
July-June on  
record for parts  
of NW CO

[https://climate.colostate.edu/co\\_cag/rank\\_maps.html](https://climate.colostate.edu/co_cag/rank_maps.html)



# average temperature rank 12 months ending June 2025 (Jul-Jun)

statewide departure from 1901-2000 avg: +2.7°F  
statewide departure from 1991-2020 avg: +1.1°F  
statewide rank: 10th warmest/121st coldest

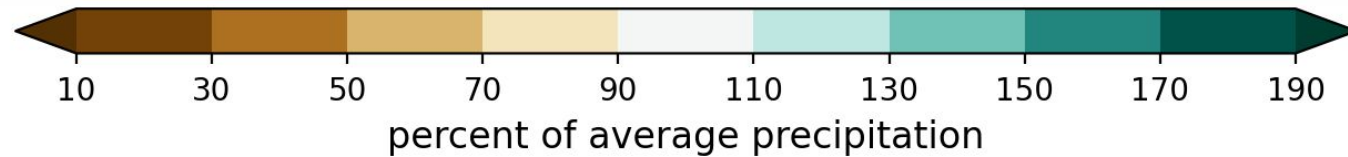
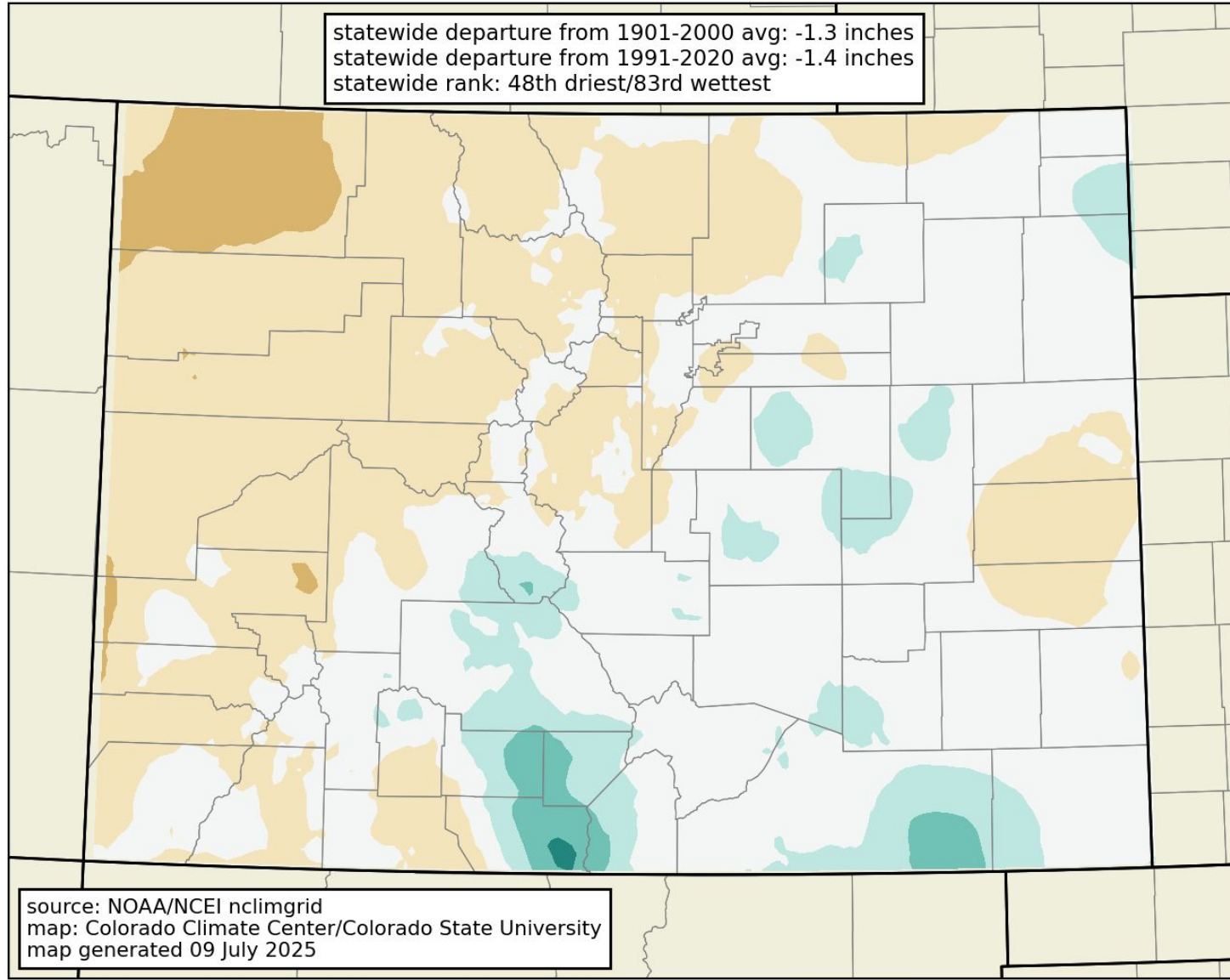


Warmest  
July-June on  
record for parts  
of NW CO

[https://climate.colostate.edu/co\\_cag/rank\\_maps.html](https://climate.colostate.edu/co_cag/rank_maps.html)

percent of 1991-2020 average precipitation  
12 months ending June 2025 (Jul-Jun)

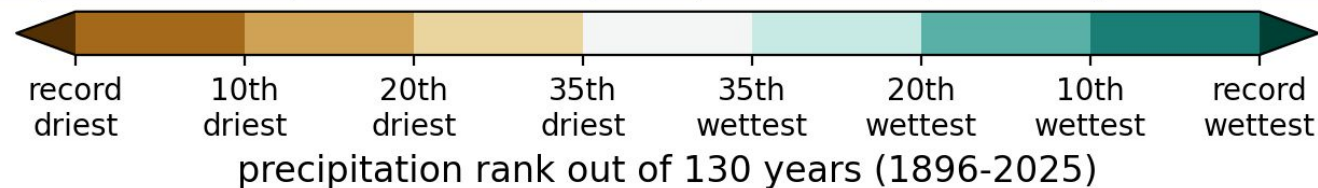
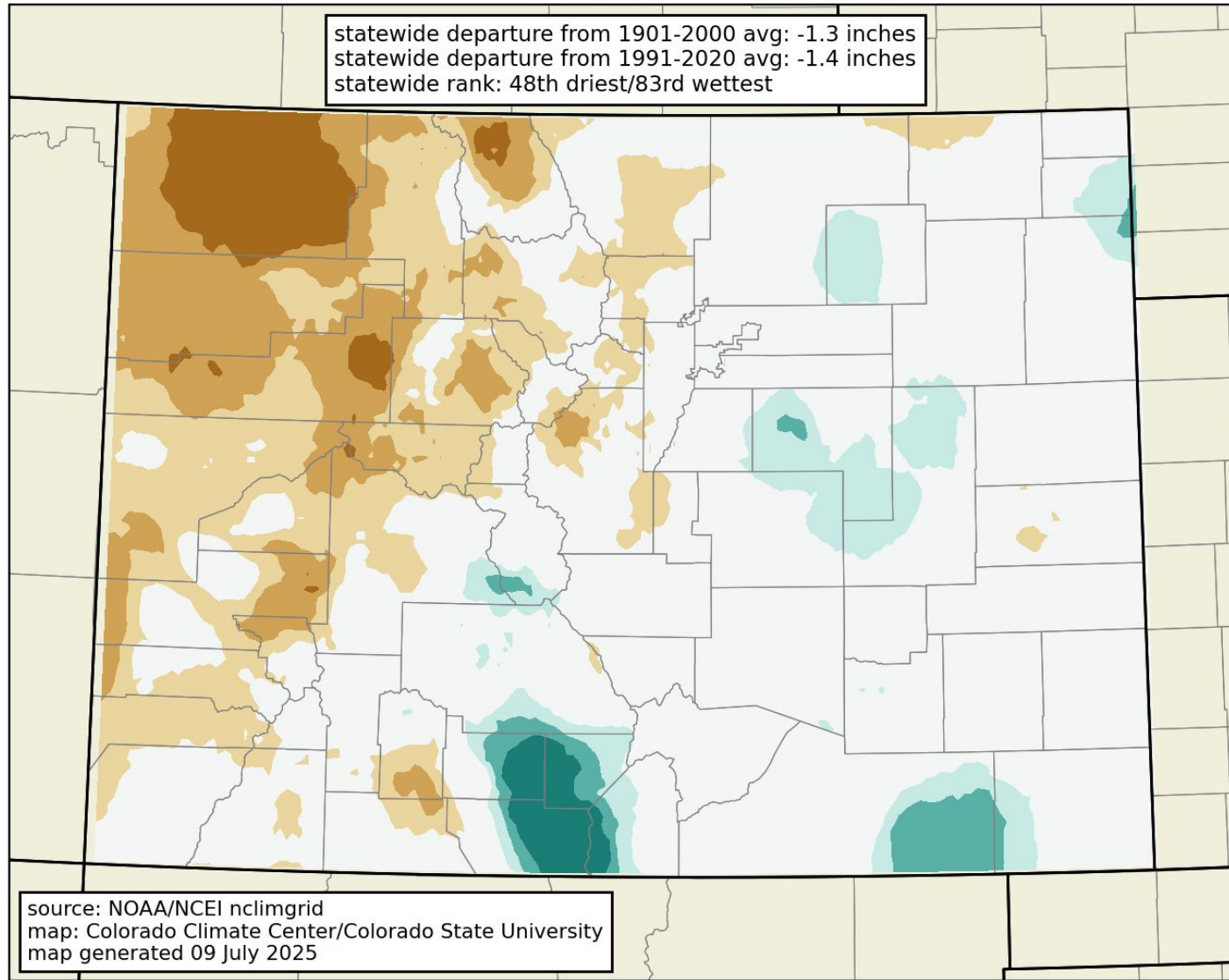
statewide departure from 1901-2000 avg: -1.3 inches  
statewide departure from 1991-2020 avg: -1.4 inches  
statewide rank: 48th driest/83rd wettest



[https://climate.colostate.edu/co\\_cag/rank\\_maps.html](https://climate.colostate.edu/co_cag/rank_maps.html)

# precipitation rank 12 months ending June 2025 (Jul-Jun)

statewide departure from 1901-2000 avg: -1.3 inches  
statewide departure from 1991-2020 avg: -1.4 inches  
statewide rank: 48th driest/83rd wettest



[https://climate.colostate.edu/co\\_cag/rank\\_maps.html](https://climate.colostate.edu/co_cag/rank_maps.html)

# Drought Update

- Rapid drought onset for west slopes
- Dry soils and vegetation west of the Continental Divide
- Improvements across eastern plains
- Largest wildfire in Colorado since 2020
- Should Drought Task Force be activated?



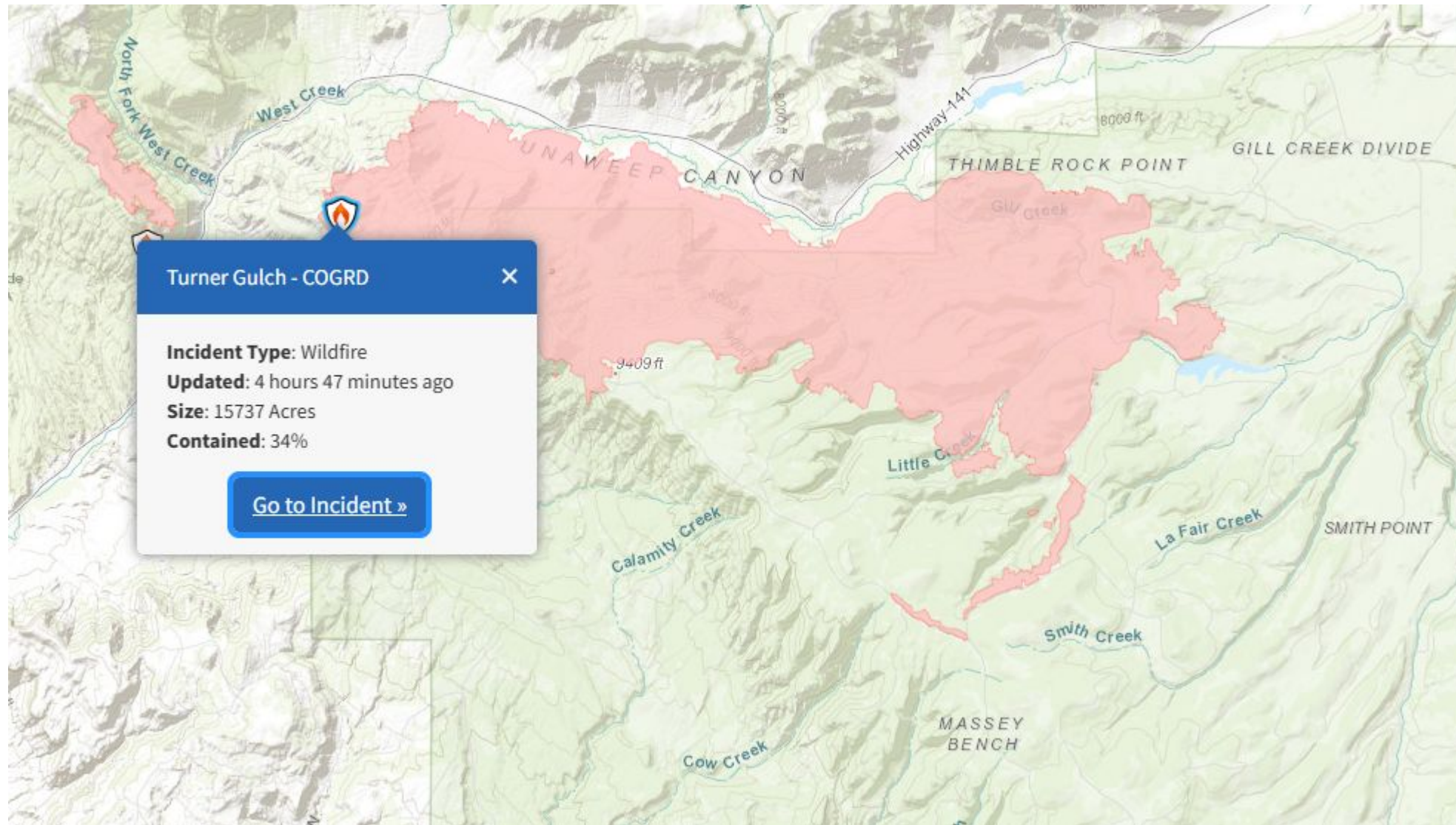


## Turner Gulch Fire

Over 15k acres  
burned

Mesa County

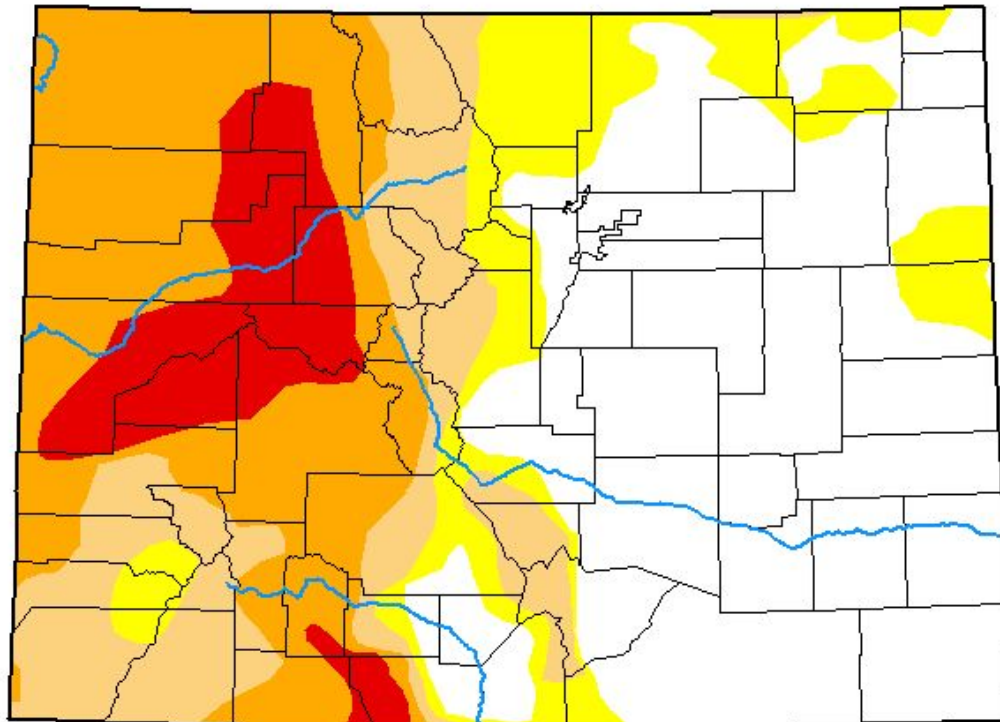
Largest wildfire in  
Colorado since the  
East Troublesome  
Fire



<https://inciweb.wildfire.gov/>



# U.S. Drought Monitor Colorado



<https://droughtmonitor.unl.edu/>

**July 15, 2025**

*(Released Thursday, Jul. 17, 2025)*

Valid 8 a.m. EDT

*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	42.78	57.22	44.90	30.40	8.79	0.00
<b>Last Week</b> <i>07-08-2025</i>	44.69	55.31	42.45	22.23	6.74	0.00
<b>3 Months Ago</b> <i>04-15-2025</i>	44.14	55.86	37.18	15.89	0.77	0.00
<b>Start of Calendar Year</b> <i>01-07-2025</i>	71.40	28.60	10.78	4.08	0.98	0.00
<b>Start of Water Year</b> <i>10-01-2024</i>	48.27	51.73	24.40	4.62	0.00	0.00
<b>One Year Ago</b> <i>07-16-2024</i>	59.68	40.32	9.75	1.32	0.00	0.00

## Intensity:

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

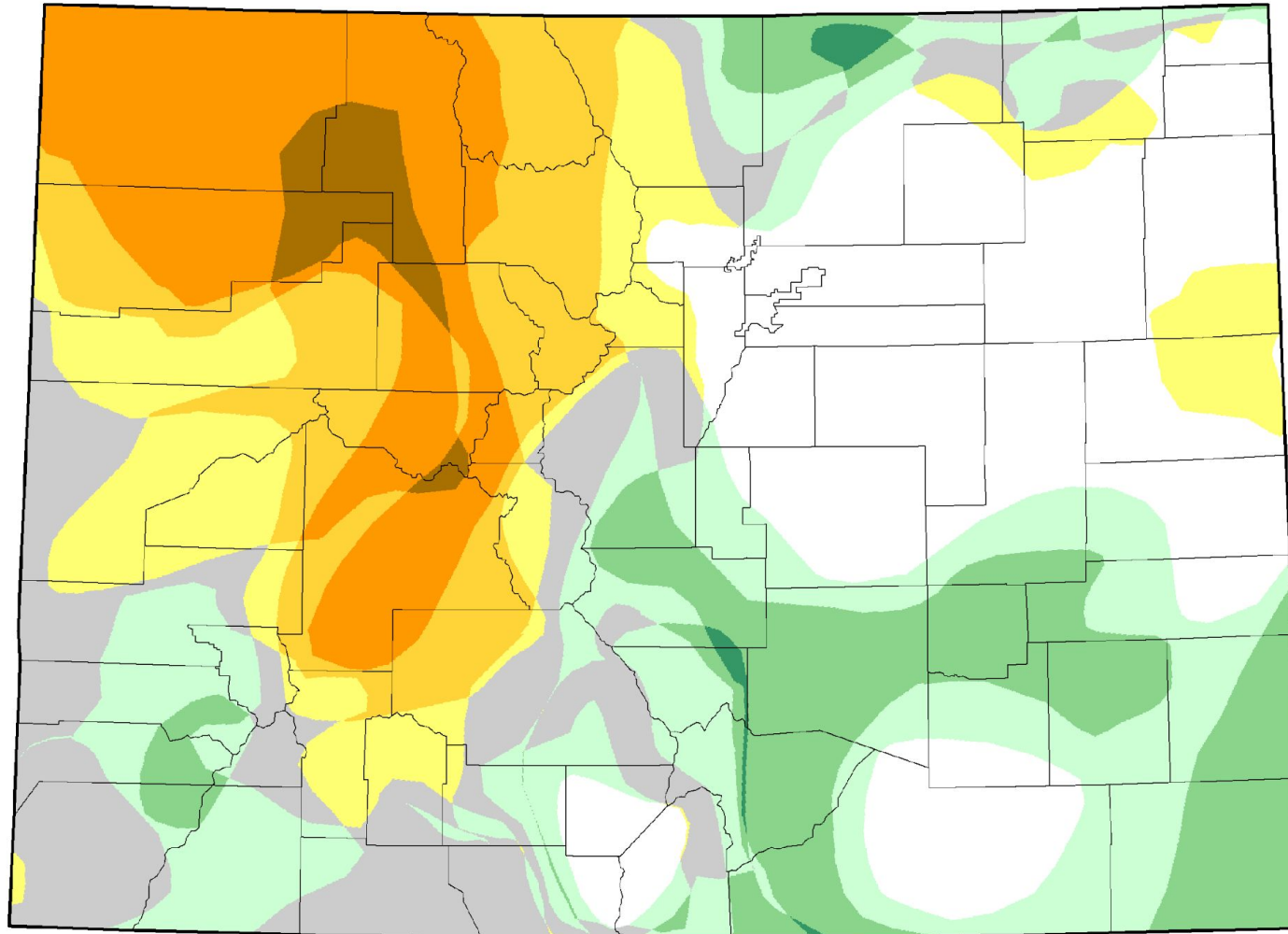
Brian Fuchs  
National Drought Mitigation Center



**droughtmonitor.unl.edu**



## U.S. Drought Monitor Class Change - Colorado 12 Week



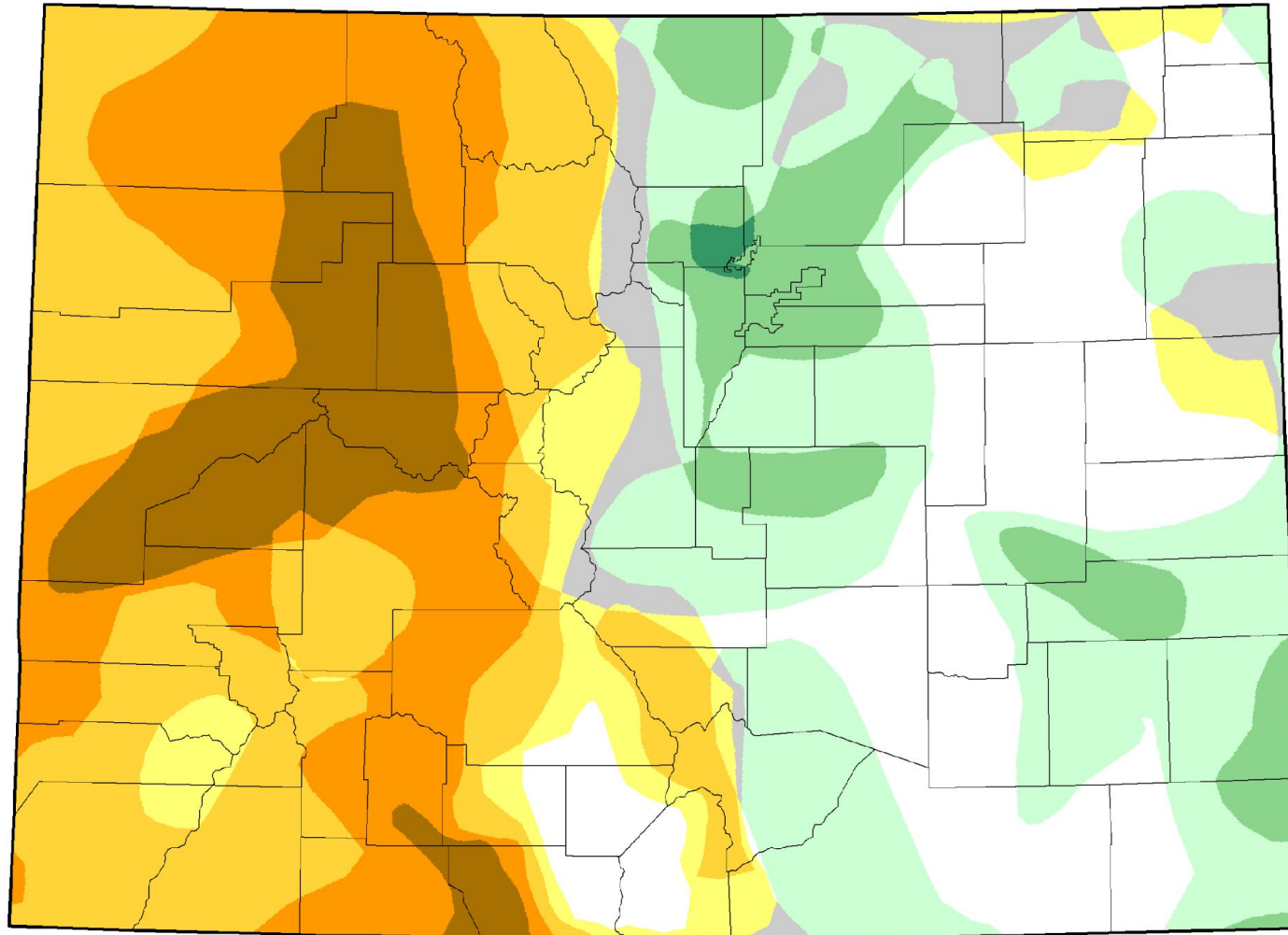
- 5 Class Degradation
- 4 Class Degradation
- 3 Class Degradation
- 2 Class Degradation
- 1 Class Degradation
- No Change
- 1 Class Improvement
- 2 Class Improvement
- 3 Class Improvement
- 4 Class Improvement
- 5 Class Improvement

July 15, 2025  
compared to  
April 22, 2025

<https://droughtmonitor.unl.edu/>

[droughtmonitor.unl.edu](https://droughtmonitor.unl.edu)

## U.S. Drought Monitor Class Change - Colorado 52 Week



- 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

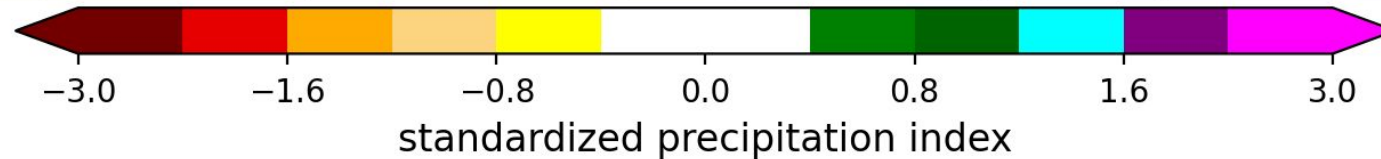
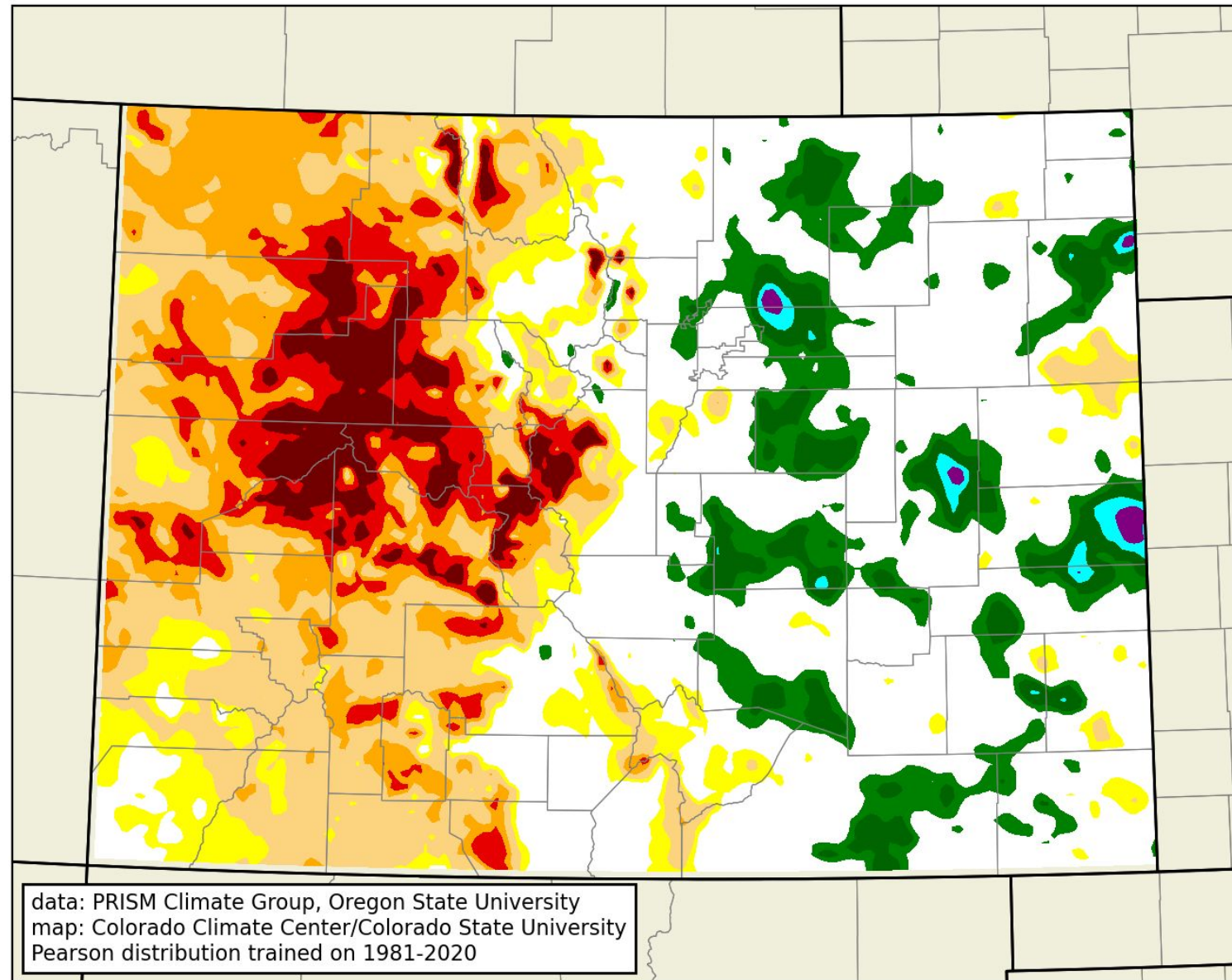
July 15, 2025  
compared to  
July 16, 2024

<https://droughtmonitor.unl.edu/>

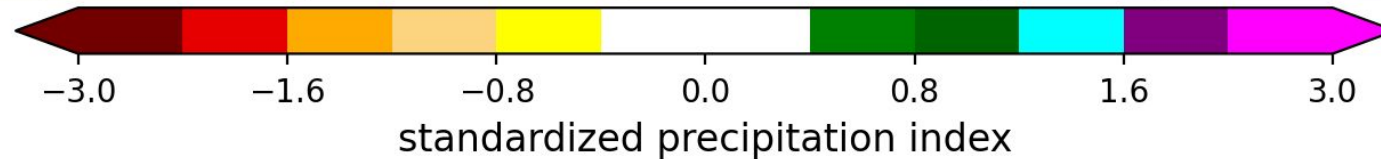
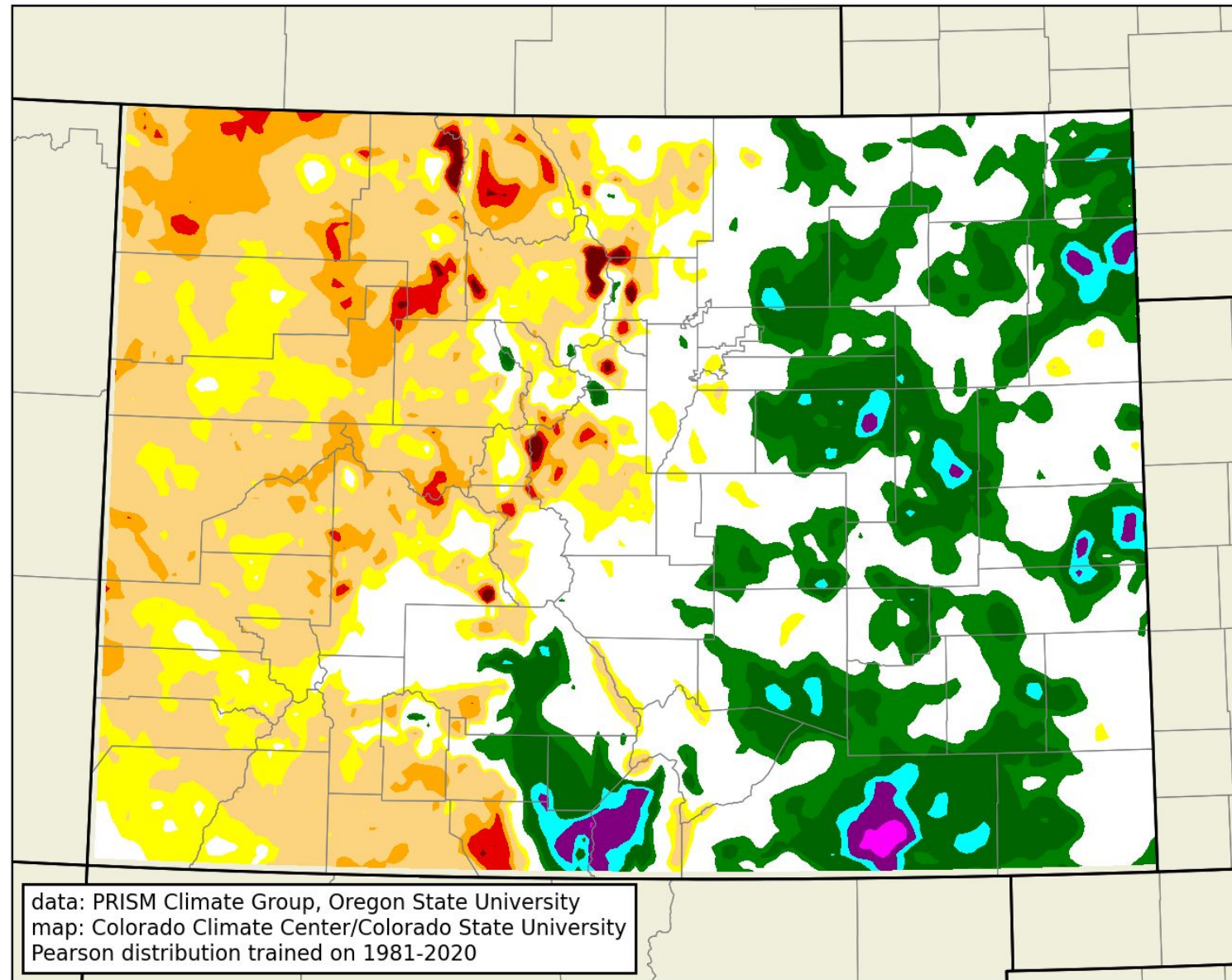
[droughtmonitor.unl.edu](https://droughtmonitor.unl.edu)



180-day SPI based on PRISM data, Thu 17 Jul 2025



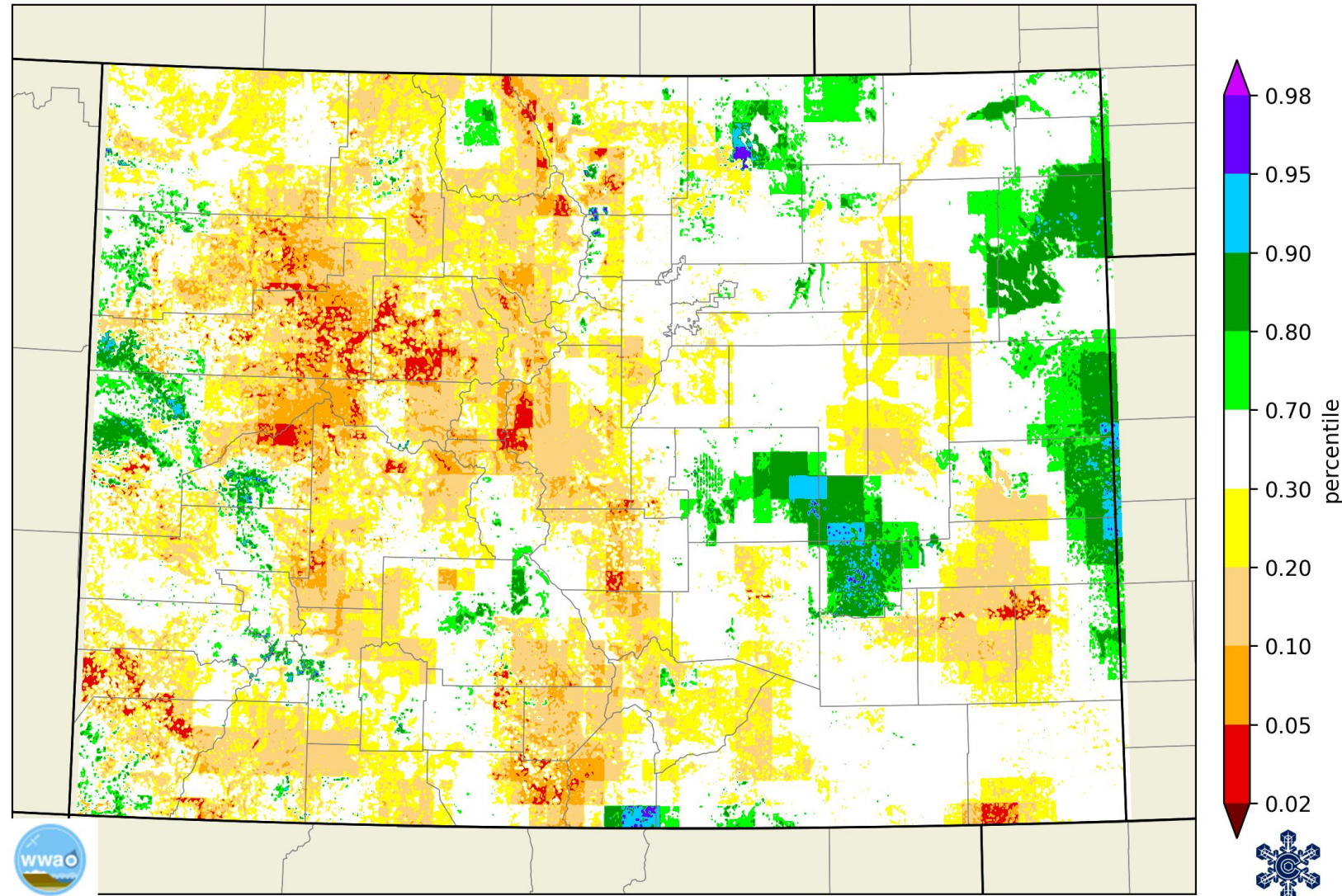
# 360-day SPI based on PRISM data, Thu 17 Jul 2025





High soil moisture on eastern plains: Good. Always better to start the growing season with more plant water

High soil moisture over mid-elevations of western Colorado: Bad. This signifies early snowmelt





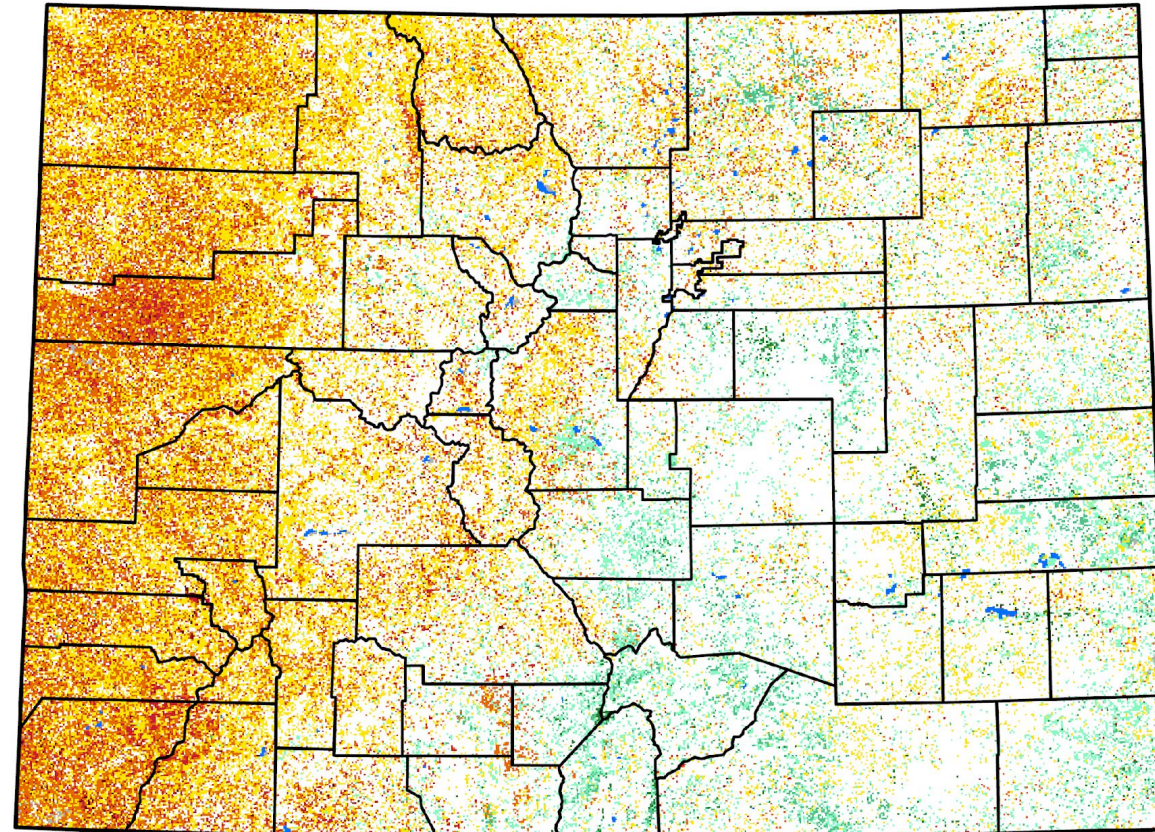
# Vegetation Drought Response Index

Complete: Colorado

July 13, 2025

Groundwater products indicating very dry conditions in parts of northern and western Colorado

This product integrates satellite groundwater retrievals and modeled soil moisture. It also includes snowpack and canopy moisture



## Vegetation Condition

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

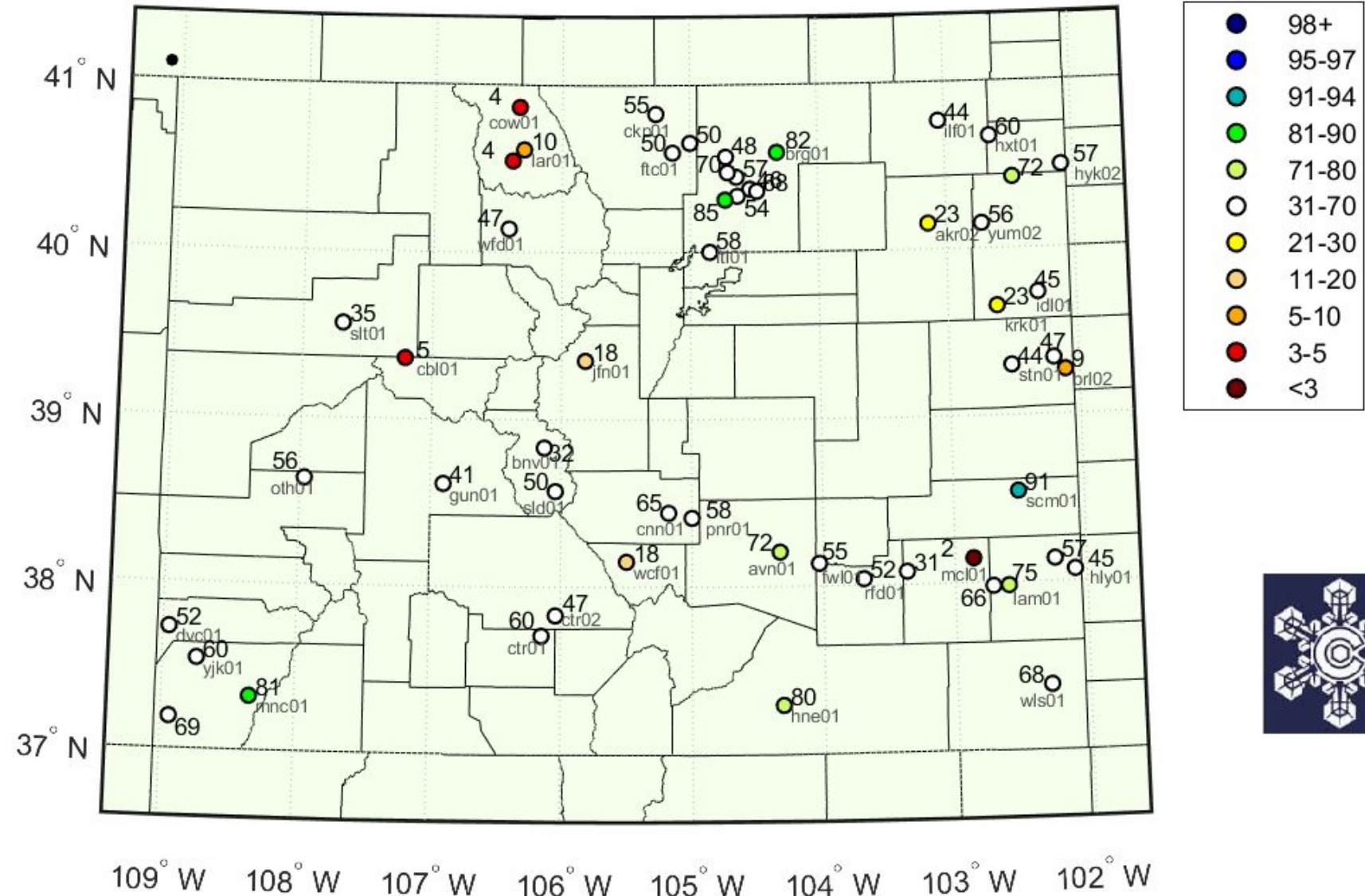


<https://climate.colostate.edu/drought/index.html#soil>





# Growing Season Water Balance (P/PET) Percentiles July 18, 2025



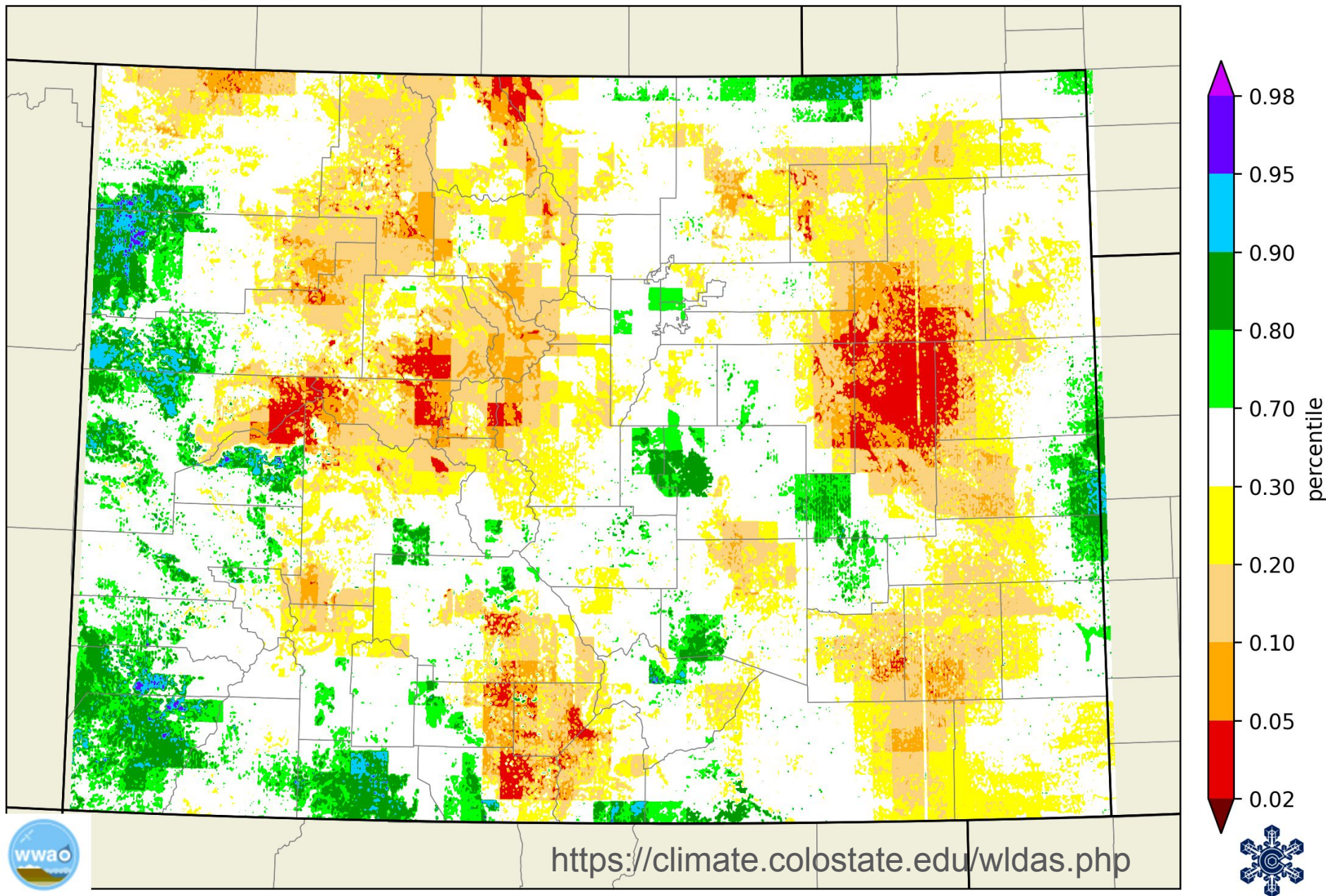


percentile (2002-present) of accumulated P minus ET from 1 Apr to 17 Jul 2025

Low water balance  
values over high  
elevation areas (e.g.  
Pitkin/Eagle Counties)

Areas of high ET in  
Lincoln/Washington  
Counties

Are the low elevation  
west slopes numbers  
so low due to low ET?



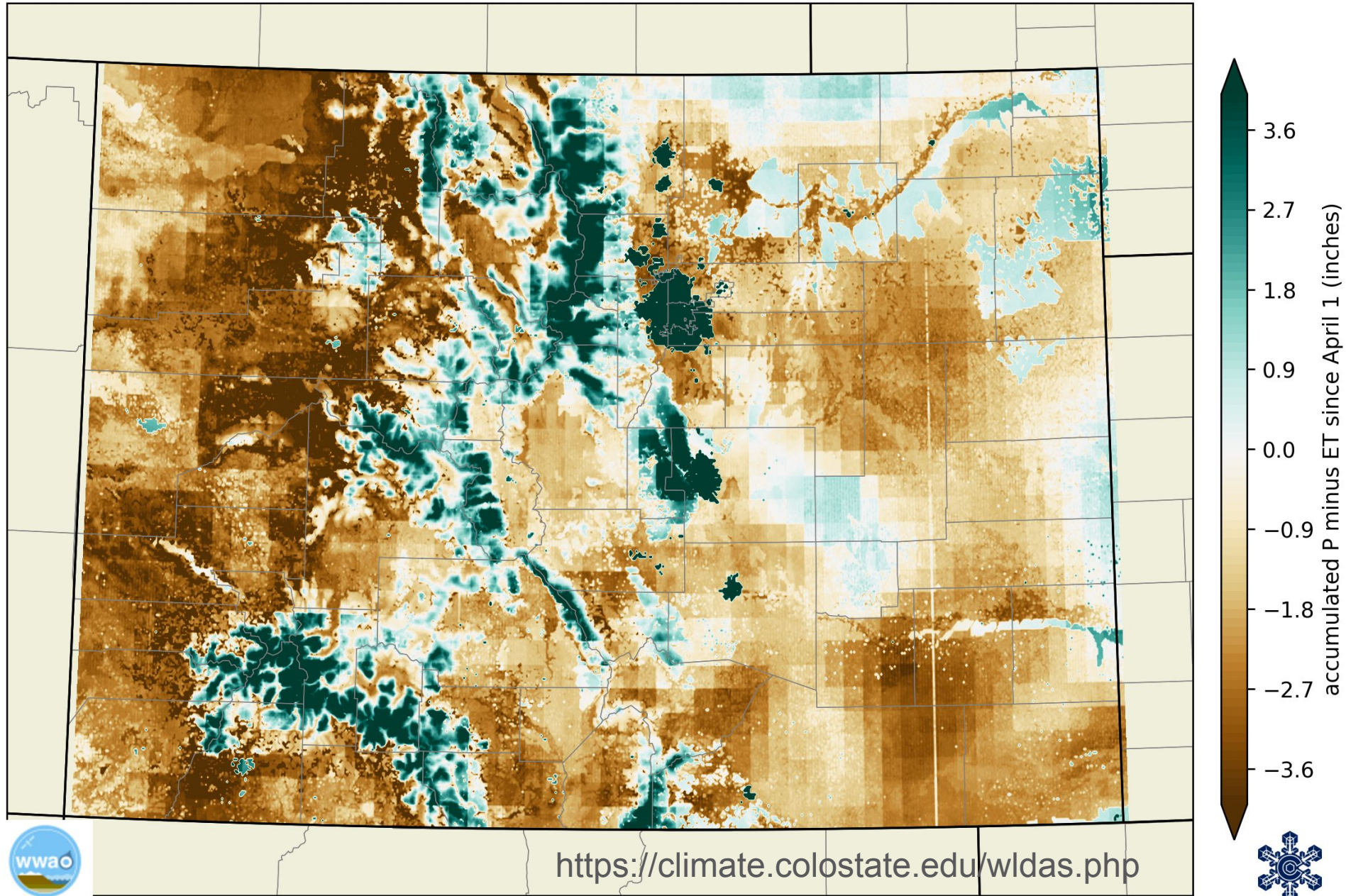


# WLDAS accumulated P minus ET from 1 Apr to 17 Jul 2025

Strong net negative  
water balance on the  
west slopes since April  
1<sup>st</sup>

Positive water balance  
over portions of eastern  
plains

Cityscapes?





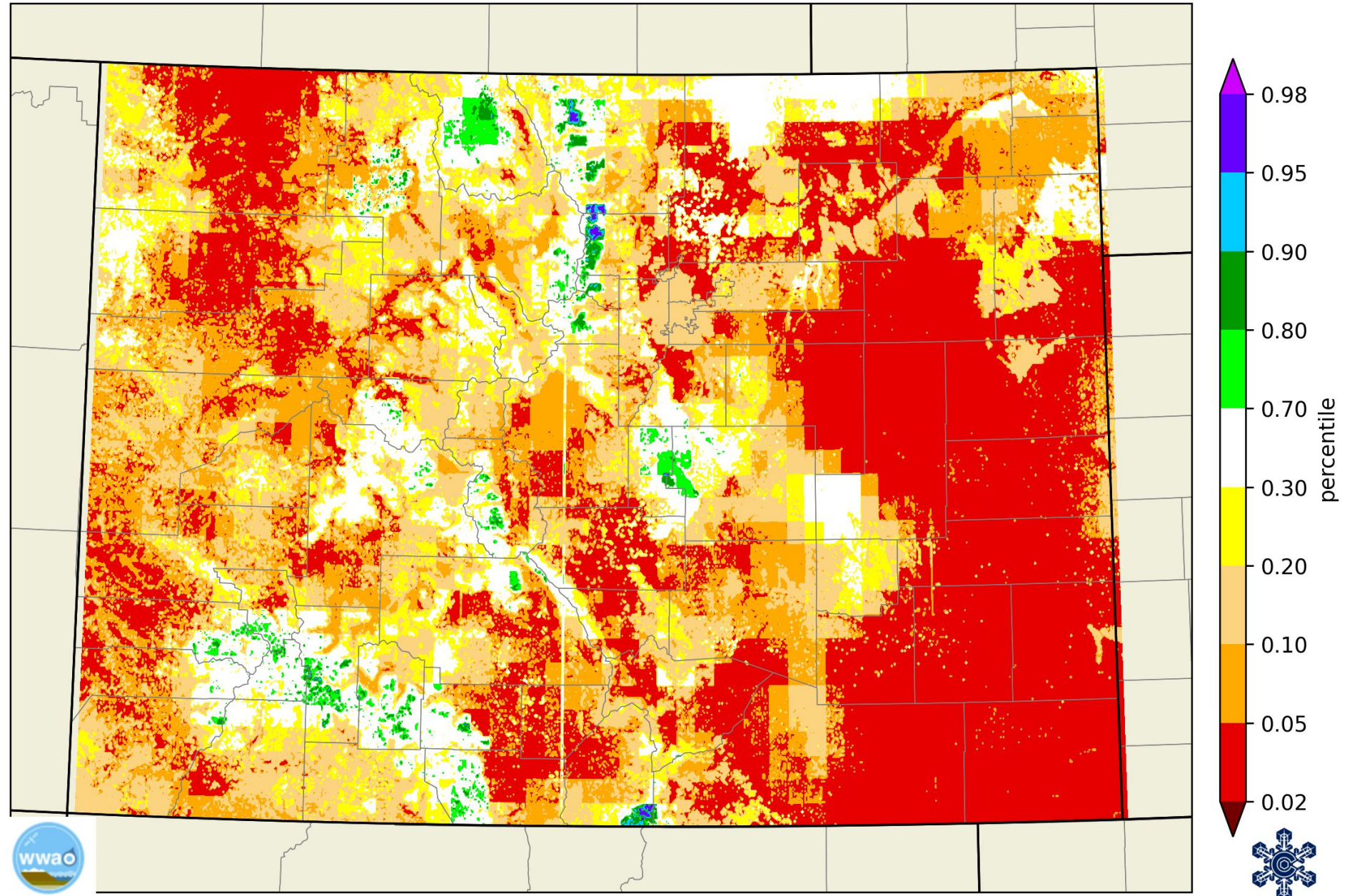
## WLDAS Terrestrial Water Storage percentile, 17 Jul 2025

Lowest groundwater values for much of the state since 2002.

Source: GRACE satellite data

How much of the groundwater does this satellite measure? In theory, all of it, but not without uncertainties

How is it calibrated? USGS groundwater well data





# Drought Task Force

E-SHMP guidelines suggest drought task force should be activated at D2, and drought disaster emergency declared at D3

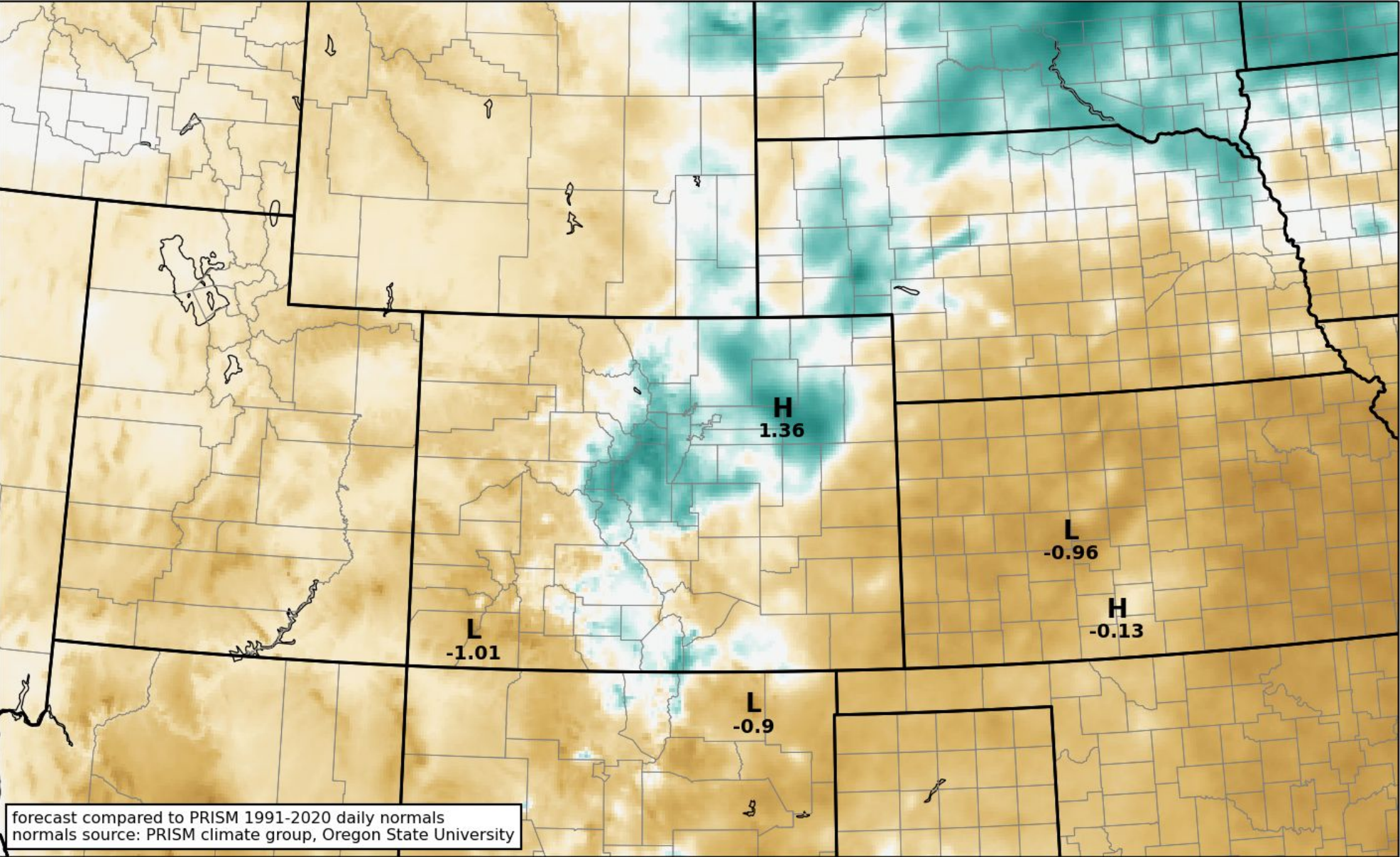
Is there a reason the Drought Task Force has not been activated? If so, is the US Drought Monitor showing too much drought in western Colorado

Phase 2	<p><u>Severity Indicators</u> Drought Monitor - D2 Severe Drought</p> <ul style="list-style-type: none"> <li>• SWSI -3.0 to -3.9</li> <li>• PDSI -3.0 to -3.9</li> <li>• SPI2 -1.3 to -1.5 Indicator blend Percentile: 6-10</li> </ul> <p><u>Other Considerations</u> PDSI is less than -2.0 in any river basin or modified Palmer climate division.</p> <p><u>Impacts</u> Crop or pasture losses likely; water shortages common; water restrictions likely to be imposed.</p>	Drought Task Force activated; potential Drought Emergency declared	<ul style="list-style-type: none"> <li>• DTF and CWCB staff prepare a memorandum of potential drought emergency based on WCMC analysis for the governor.</li> <li>• The DTF and CWCB staff meet to evaluate need for ad hoc workgroup(s).</li> <li>• Any activated workgroups may make an initial damage or impact assessment (physical and economic) or provide input on local conditions and sector-level impacts.</li> </ul>
Phase 3	<p><u>Severity Indicators</u> Drought Monitor D3 to D4 Extreme/Exceptional Drought</p> <ul style="list-style-type: none"> <li>• SWSI -4.0 to -5.0</li> <li>• PDSI -4.0 to -5.0 or less</li> <li>• SPI -1.6 to -2.0 or less</li> </ul> <p><u>Other Considerations</u> PDSI Lowest reading at -2.0 to -3.9 in any river basin or modified Palmer climate division; SPI Less than -1.0 to -1.99 for six months.</p> <p><u>Impacts</u> Major crop/pasture losses; widespread water shortages or restrictions very likely to be imposed. Phase 3 impacts under Exceptional Drought also include widespread crop/pasture losses; shortages of water in reservoirs, streams, and wells creating water emergencies.</p>	Drought Emergency is declared by proclamation of the governor.	<ul style="list-style-type: none"> <li>• Governor's Memorandum updated to activate additional Impact Task Forces as necessary.</li> <li>• DTF continues to assess, report, and recommend response measures and incident mitigation.</li> <li>• Unmet needs are reported to the DTF Chairs.</li> <li>• DTF Chairs determine the unmet needs that can be met by reallocation of existing resources. Those which cannot are forwarded to the Governor with recommendations to support a request for a Presidential Drought Declaration.</li> <li>• Governor may request a presidential declaration.</li> <li>• If approved, Federal-State Agreement establishes Colorado DHSEM Director as the State Coordinating Officer (SCO).</li> <li>• Work with the governor's office on long-term recovery operations.</li> </ul>

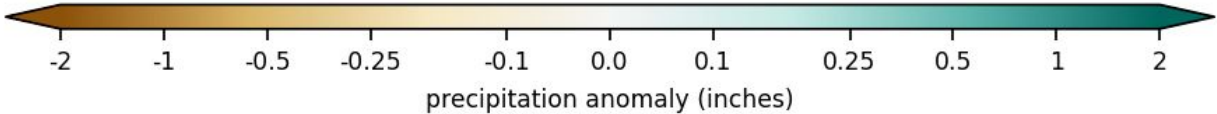
# Spring/Summer Outlook







forecast compared to PRISM 1991-2020 daily normals  
normals source: PRISM climate group, Oregon State University



Thunderstorms forming over high terrain and propagating over northeastern plains Tuesday night through Thursday night

Beyond that, flash flooding and storm concerns low for this time of year

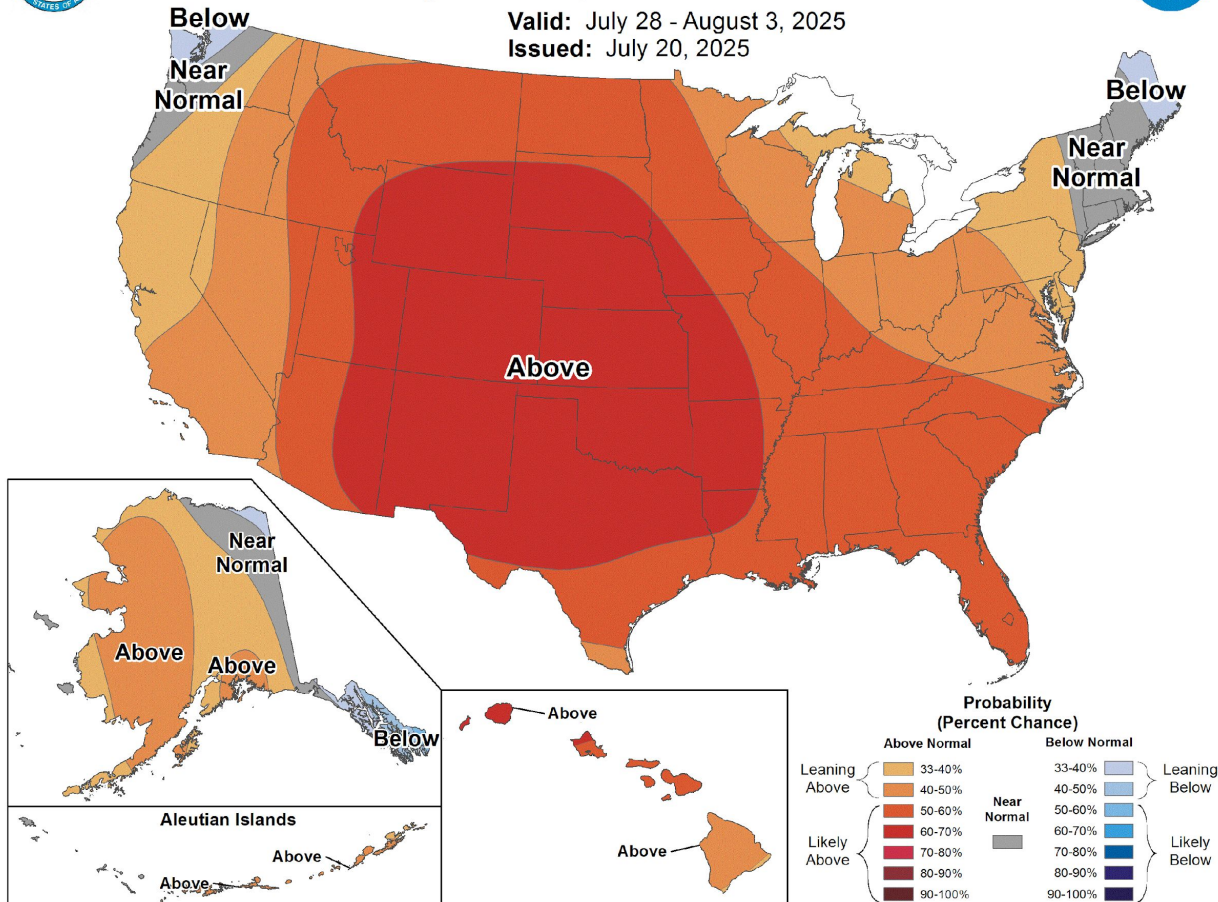




## 8-14 Day Temperature Outlook



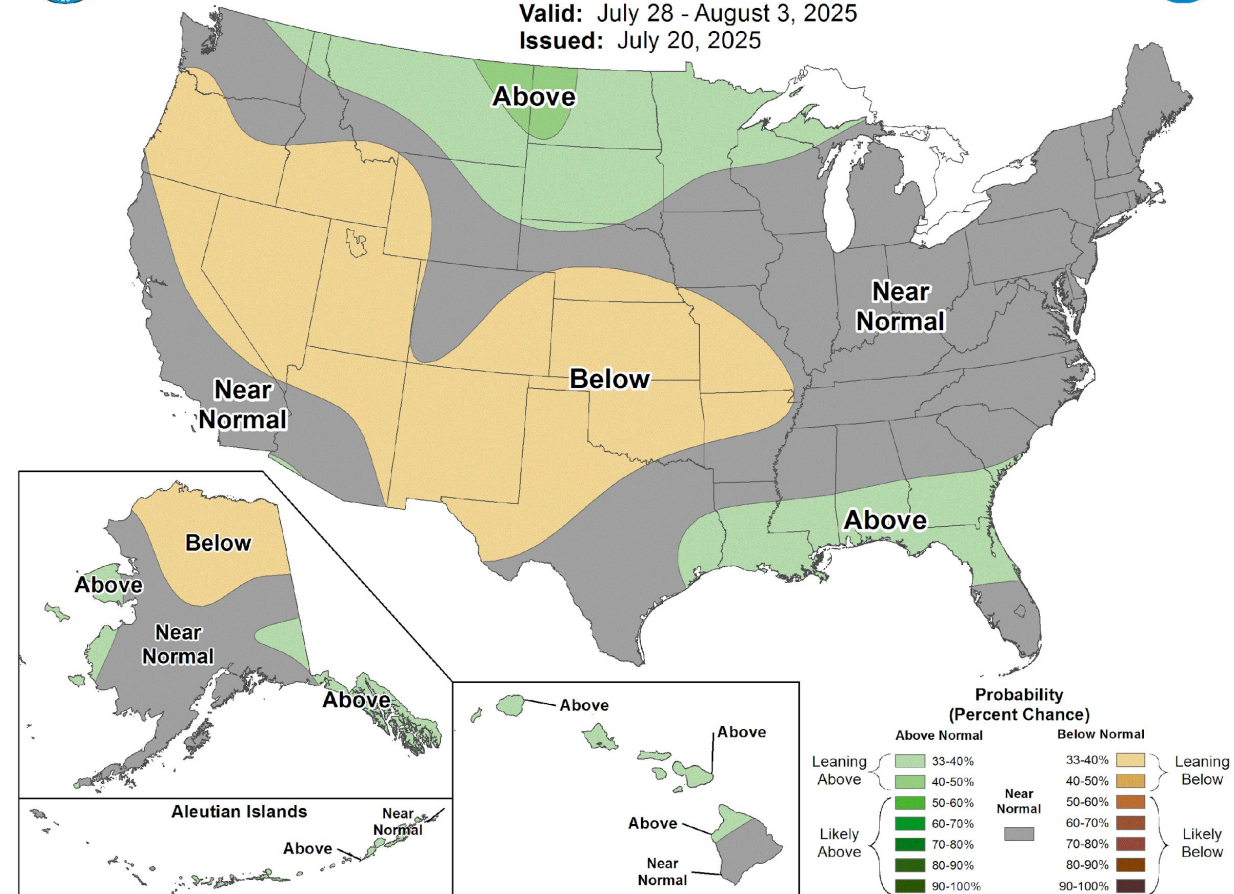
Valid: July 28 - August 3, 2025  
Issued: July 20, 2025



## 8-14 Day Precipitation Outlook



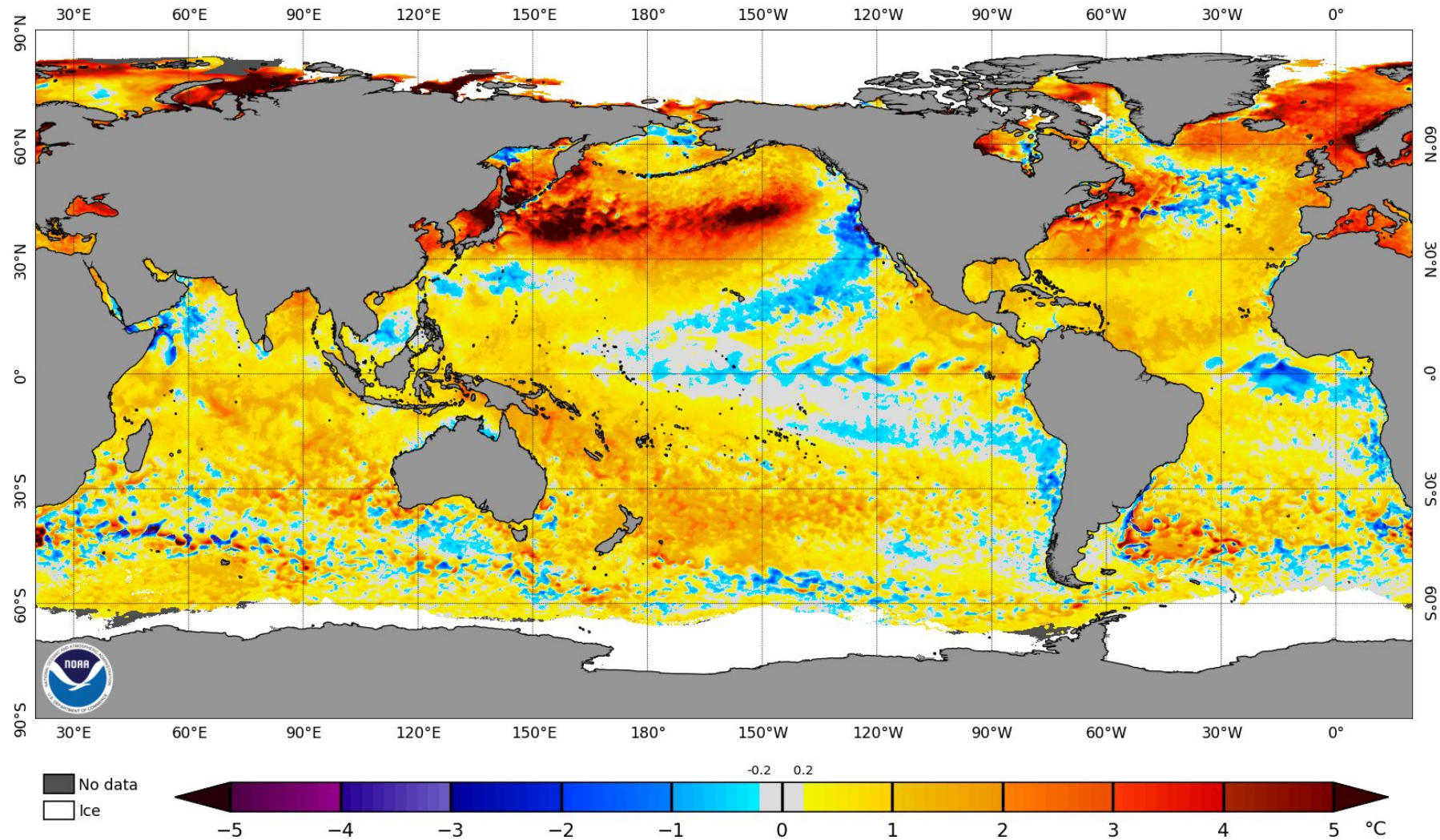
Valid: July 28 - August 3, 2025  
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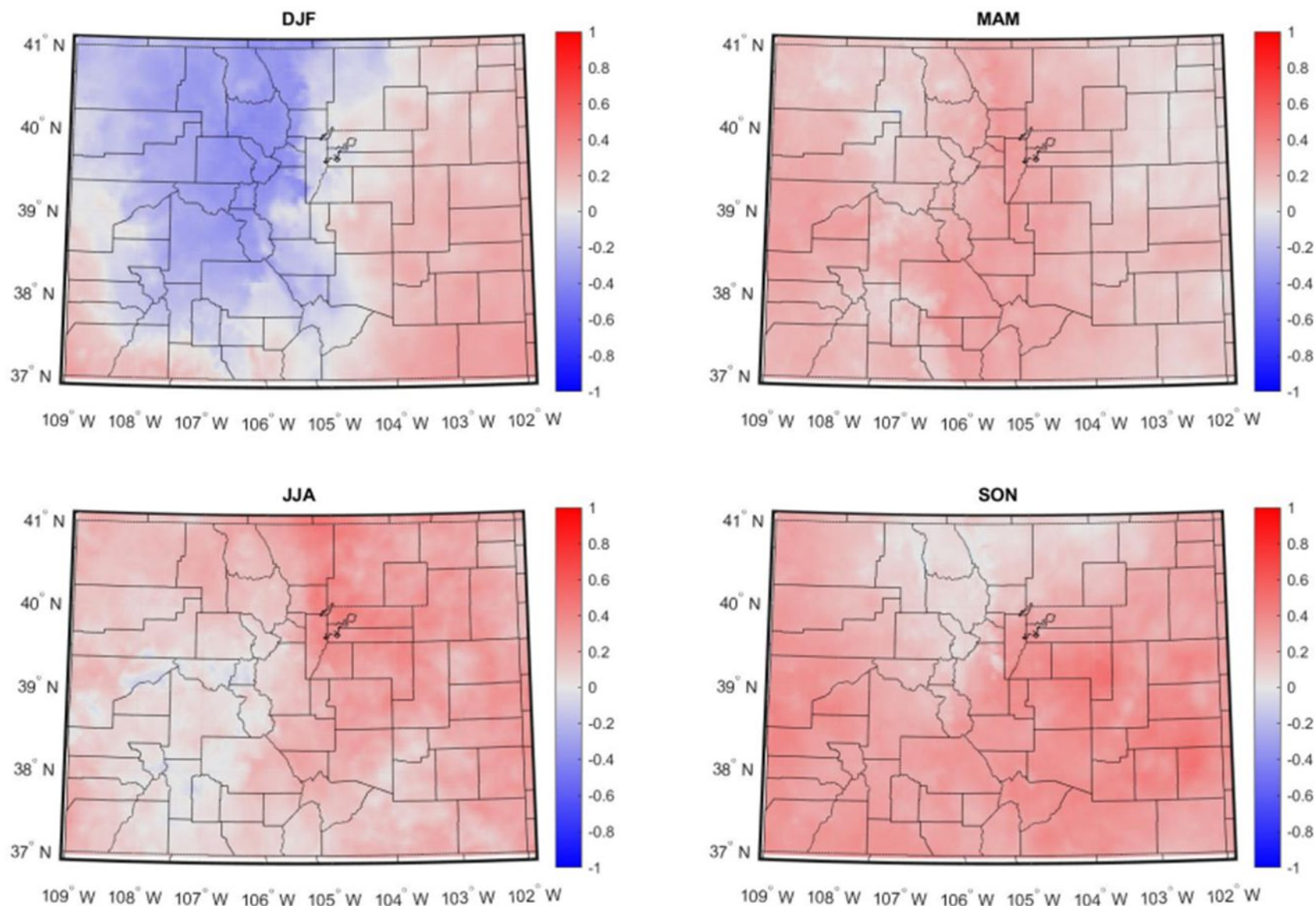


# Beyond the Forecast (El Niño/La Niña)

NOAA Coral Reef Watch Daily 5km SST Anomalies (v3.1) 20 Jul 2025



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



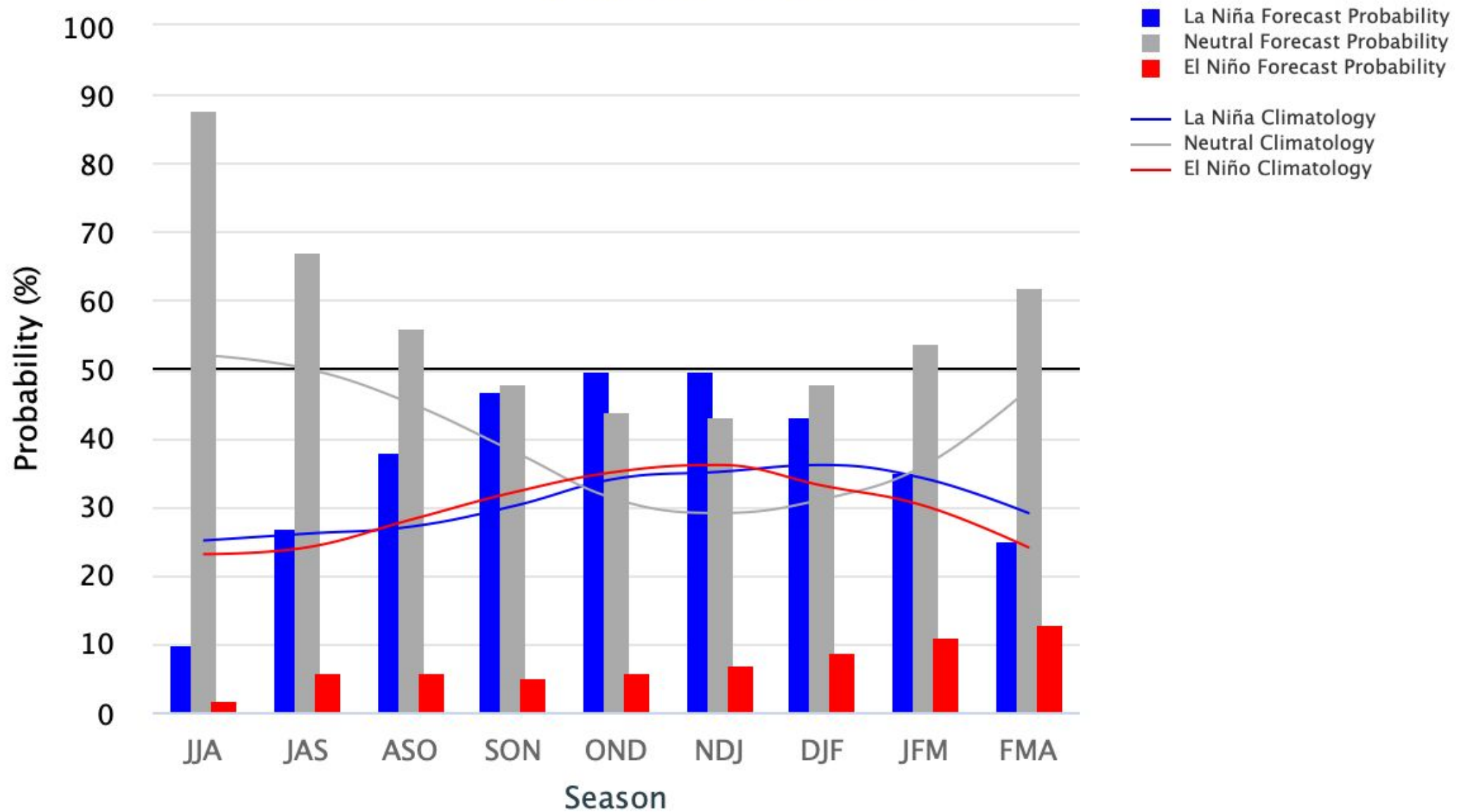
Blue = La Niña wetter    Red = El Niño wetter



# Early-July 2025 CPC Official Probabilistic ENSO Forecasts

ENSO state based on NINO3.4 SST Anomaly

Neutral ENSO:  $-0.5^{\circ}\text{C}$  to  $0.5^{\circ}\text{C}$



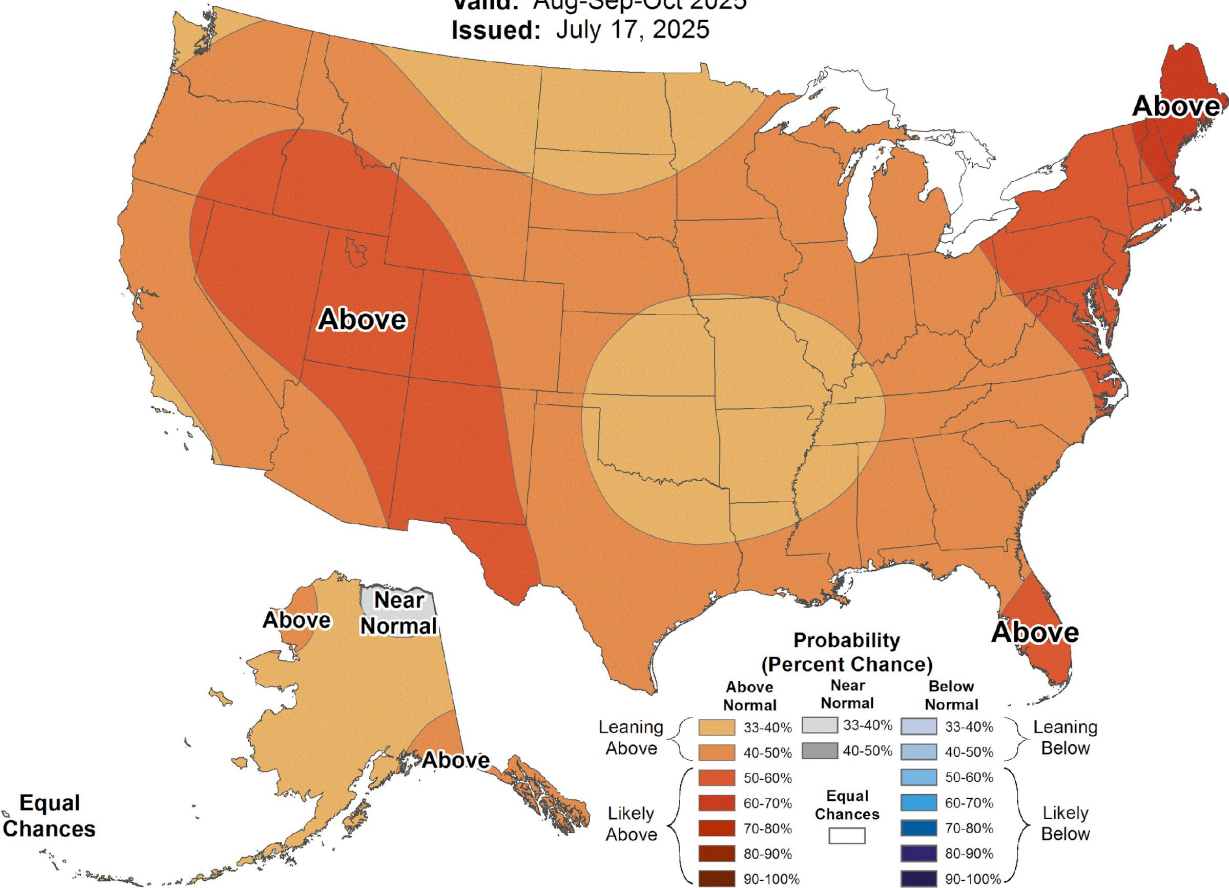




# Seasonal Temperature Outlook



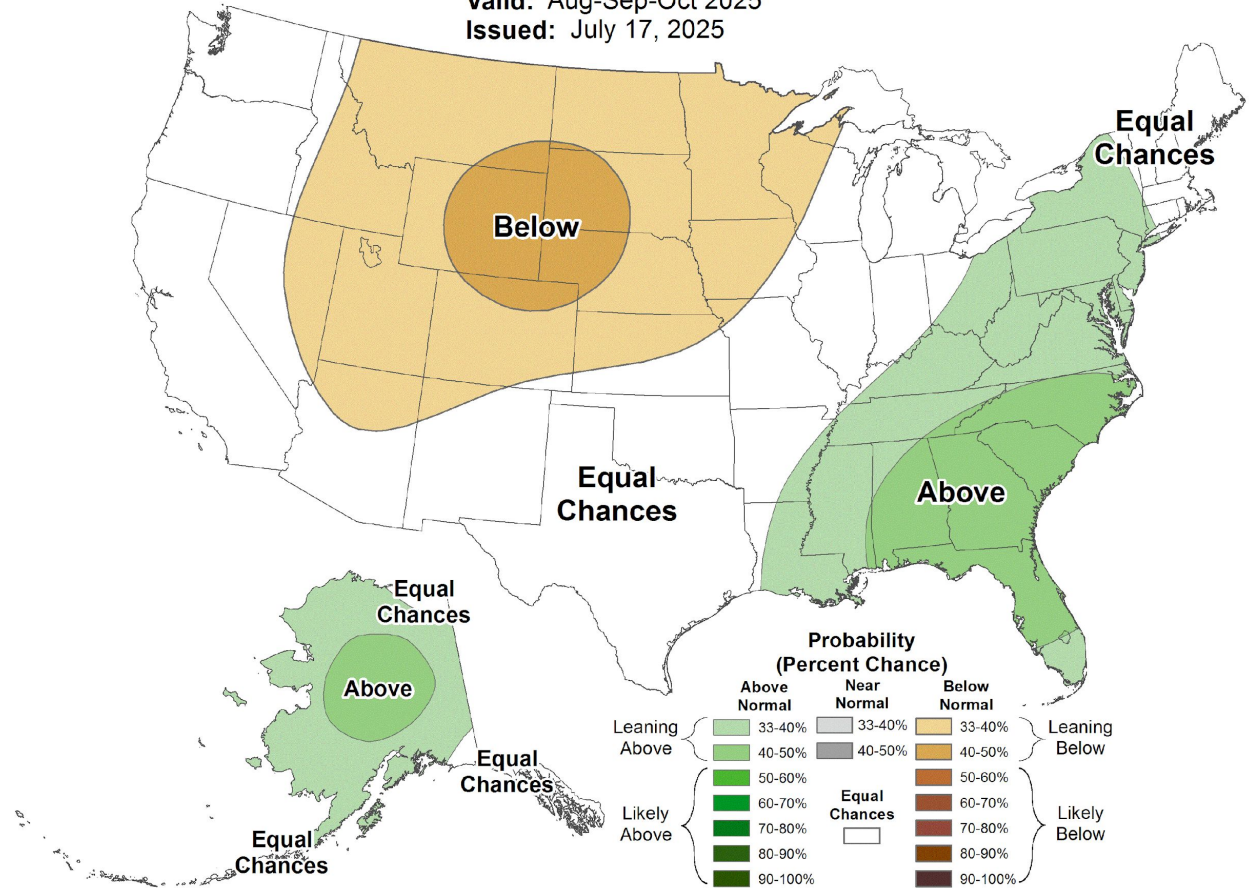
Valid: Aug-Sep-Oct 2025  
Issued: July 17, 2025



# Seasonal Precipitation Outlook



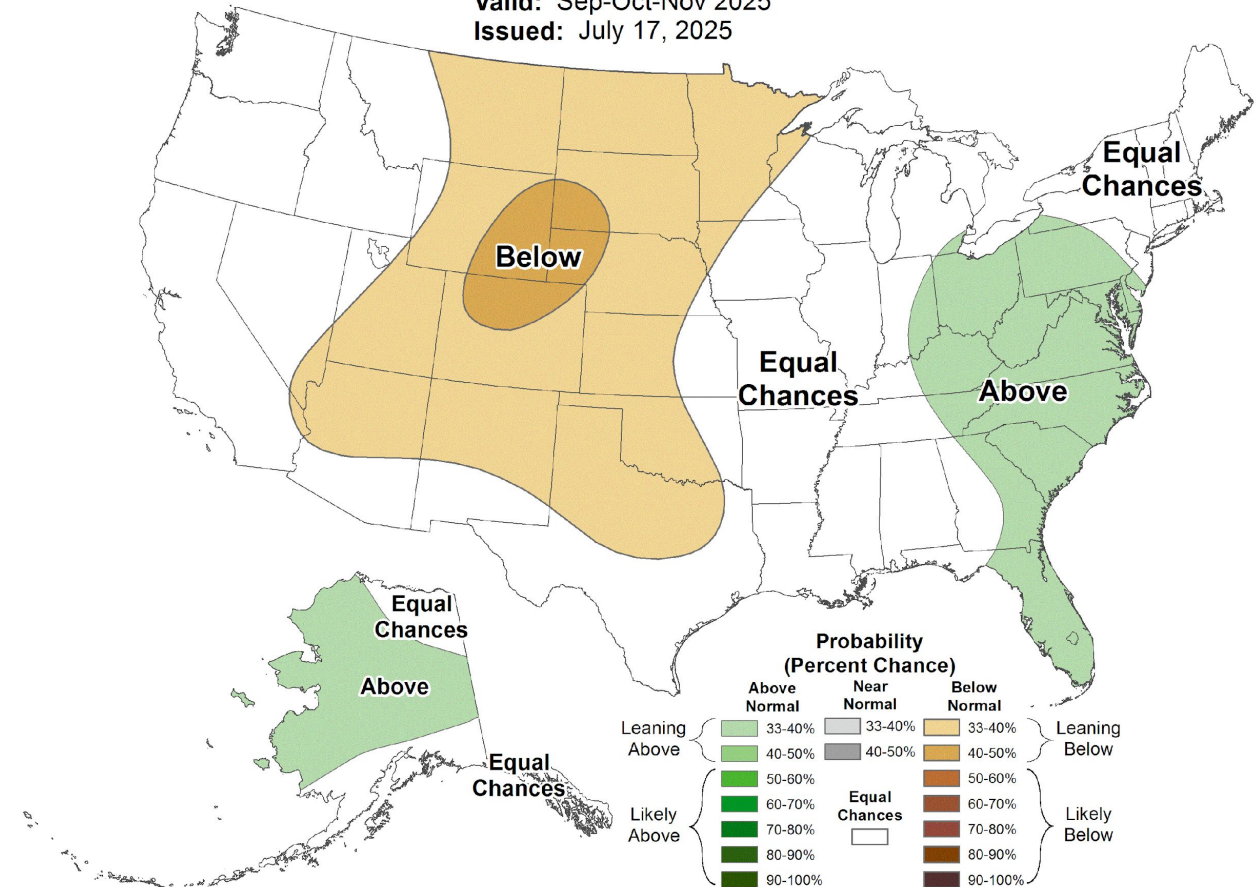
Valid: Aug-Sep-Oct 2025  
Issued: July 17, 2025

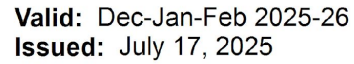






## Seasonal Precipitation Outlook

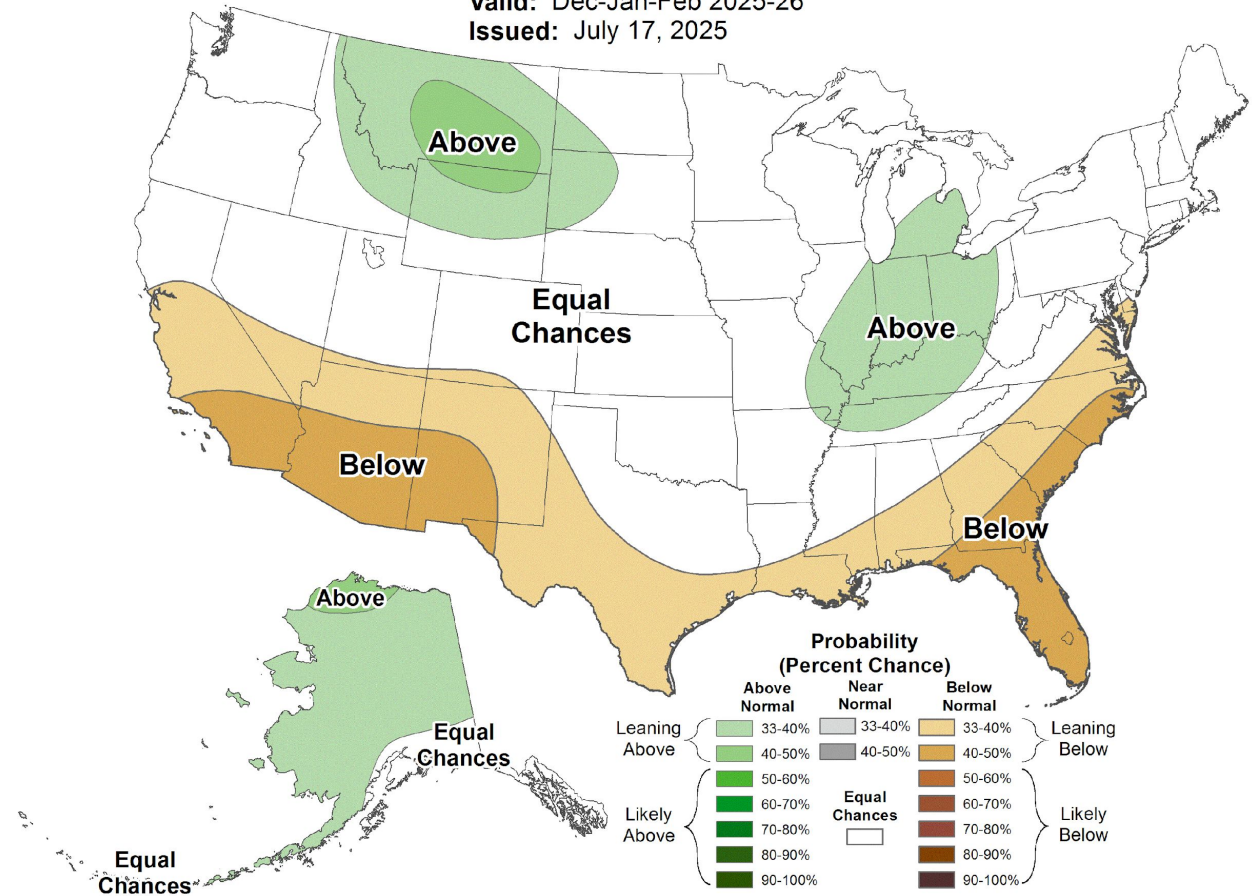




## Seasonal Precipitation Outlook



**Valid:** Dec-Jan-Feb 2025-26  
**Issued:** July 17, 2025





# Takeaways

- June was 1.4 °F warmer than the 1991-2020 normal with near normal precipitation. Statewide, the last three months have leaned warm and dry
- Drought conditions have improved for eastern Colorado with a relatively active thunderstorm season but have worsened considerably in western Colorado. Short term water balances are much lower than normal, and this is impacting soil moisture, vegetative health, and wildfire conditions. Turner Gulch Fire is the largest wildfire in the state since 2020
- Should the Drought Task Force be activated?
- Late July is shaping up for below normal peak season flood risks (save for some high-country terrain). The start of August is likely to be hotter and drier than normal, alleviating some flash flooding concern, but adding to drought concerns out west, and potential drought development elsewhere
- La Niña is gone, giving way to neutral conditions. Forecasts suggest neutral conditions are likely for fall and possible even winter, so extended outlooks rely on bias corrected dynamical model output, climate trends, and the El Niño being unlikely.



# Colorado Climate Center (Contact Us)

Thanks, and let's keep in touch!

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Viewing this, and previous WCMC Briefings:

[http://climate.colostate.edu/ccc\\_archive.html](http://climate.colostate.edu/ccc_archive.html)

# Thank you

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