

Colorado Climate Update

Russ Schumacher, state climatologist

Water Conditions Monitoring Committee

January 22, 2025



ATMOSPHERIC SCIENCE
COLORADO STATE UNIVERSITY

Water Year 2025 so far

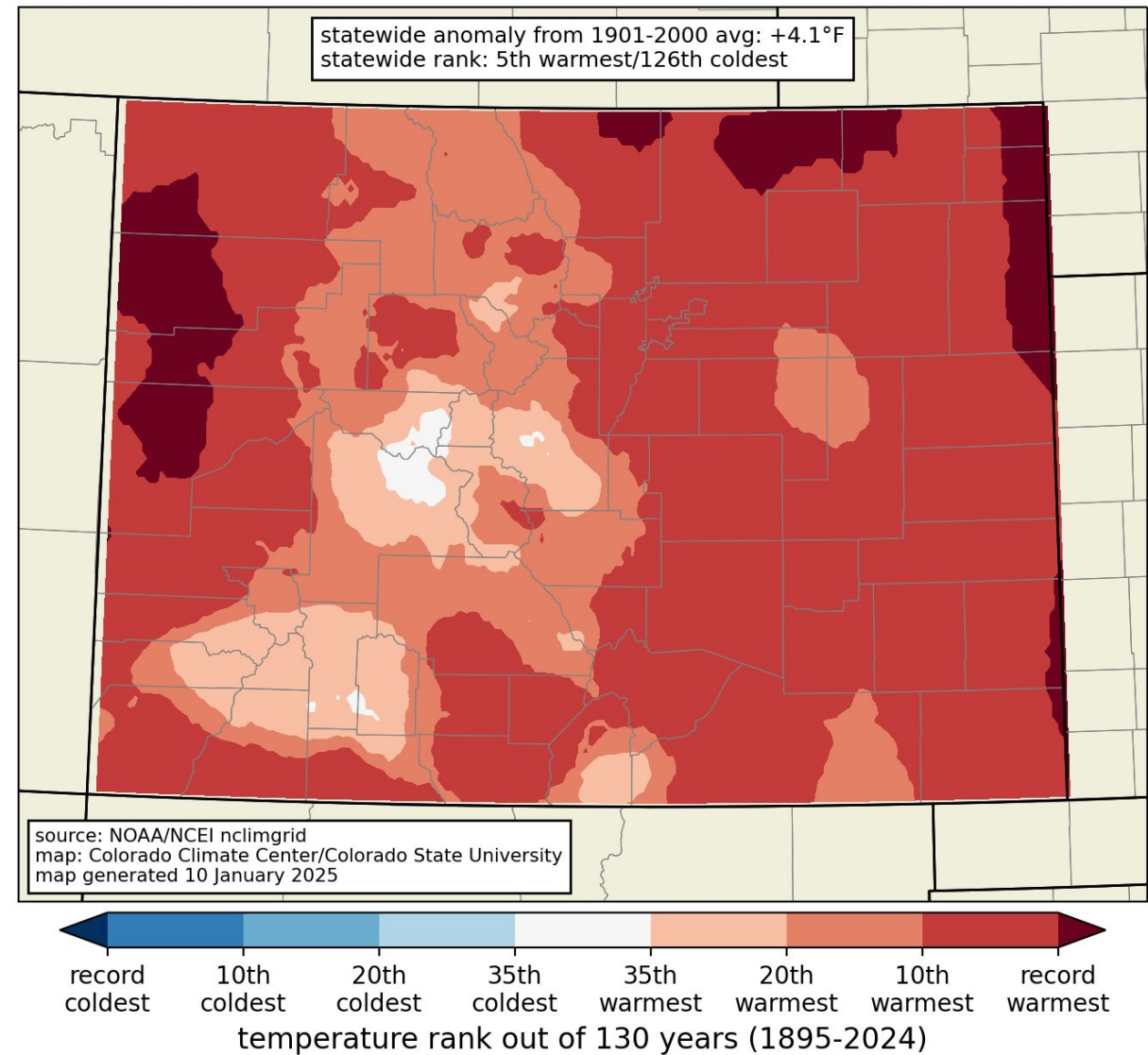
temperature, precipitation, etc.



(from Winter Park, January 3)



average temperature rank: 3 months ending December 2024 (Oct-Dec)

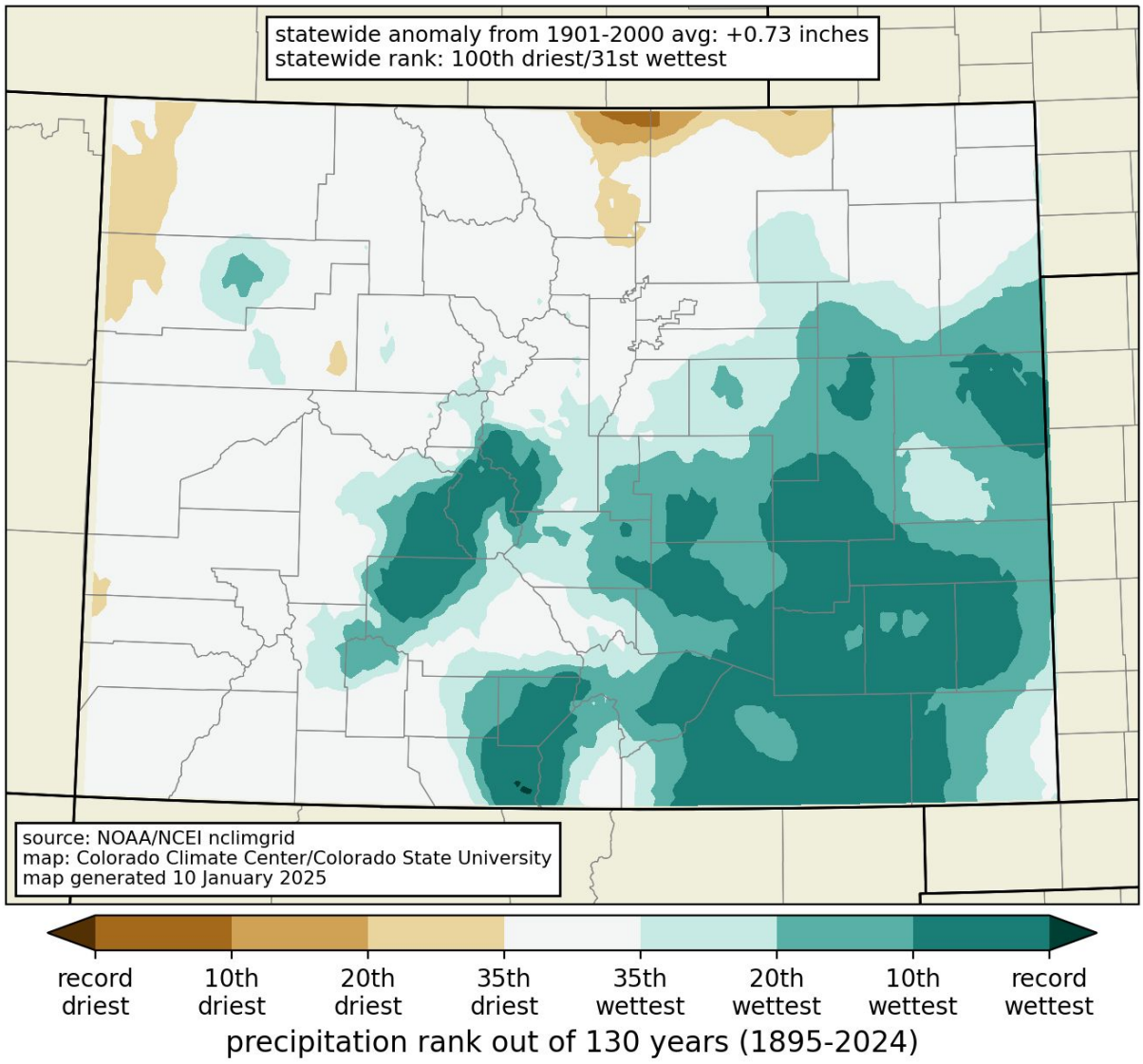


Month	T Rank (of 130 years)	Above, below, or near 20 th century avg?
Oct	2 nd warmest	much above
Nov	45 th coolest	near avg
Dec	3 rd warmest	much above

Statewide: 5th warmest first 3 months of the water year



precipitation rank: 3 months ending December 2024 (Oct-Dec)



Statewide: 31st wettest first three months of the water year

Month	P Rank (of 130 years)	Above, below, or near 20 th century avg?
Oct	47 th wettest	near average
Nov	5 th wettest	much above
Dec	12 th driest	below

Colorado statewide average temperature and precipitation, December

Warm & dry

December 2024

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

Cool & dry



Warm & wet

**December was very
warm and dry
statewide**

Cool & wet



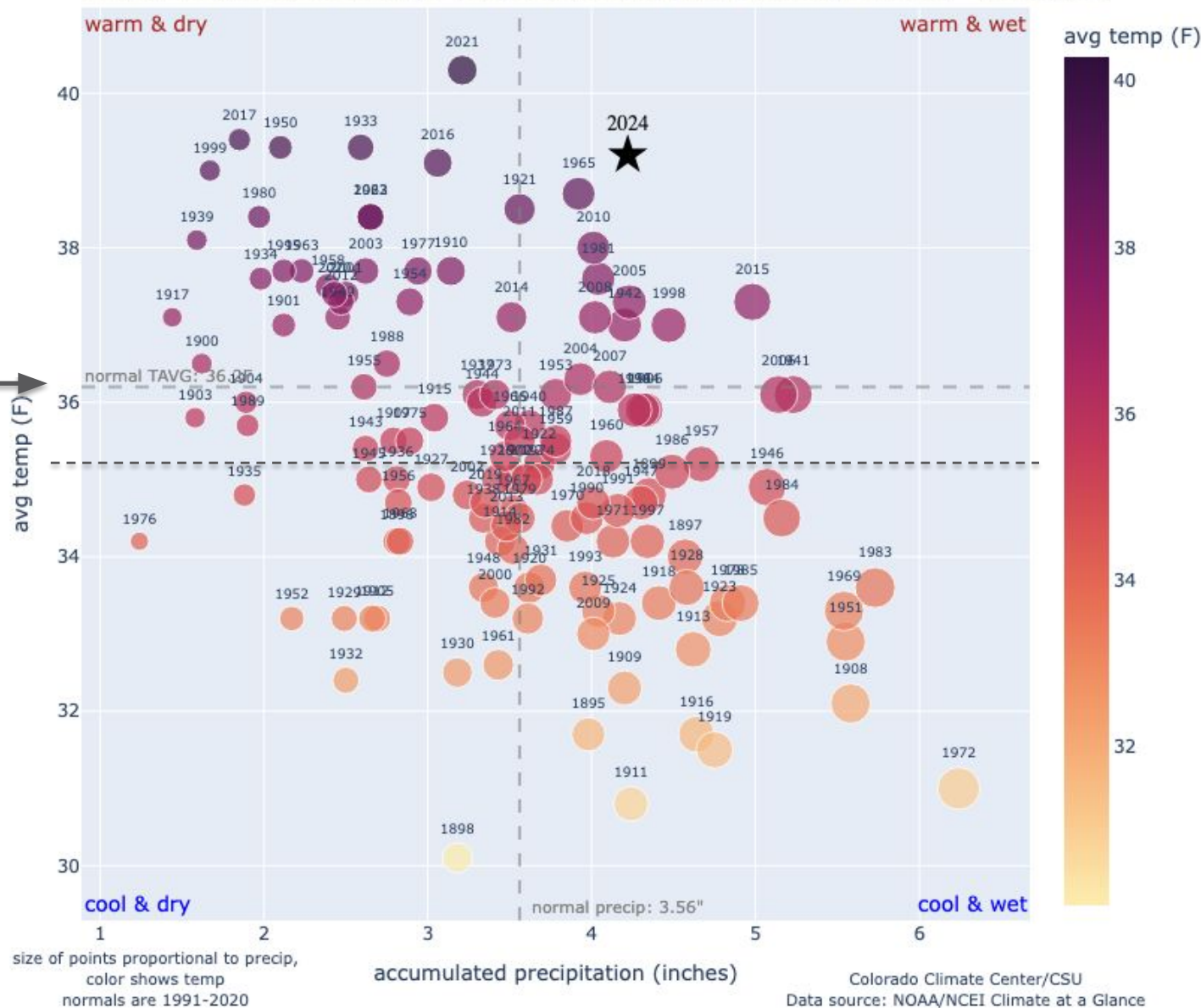
Warm & dry

October-December 2024

1991-2020 avg temp

1901-2000 avg temp

Cool & dry

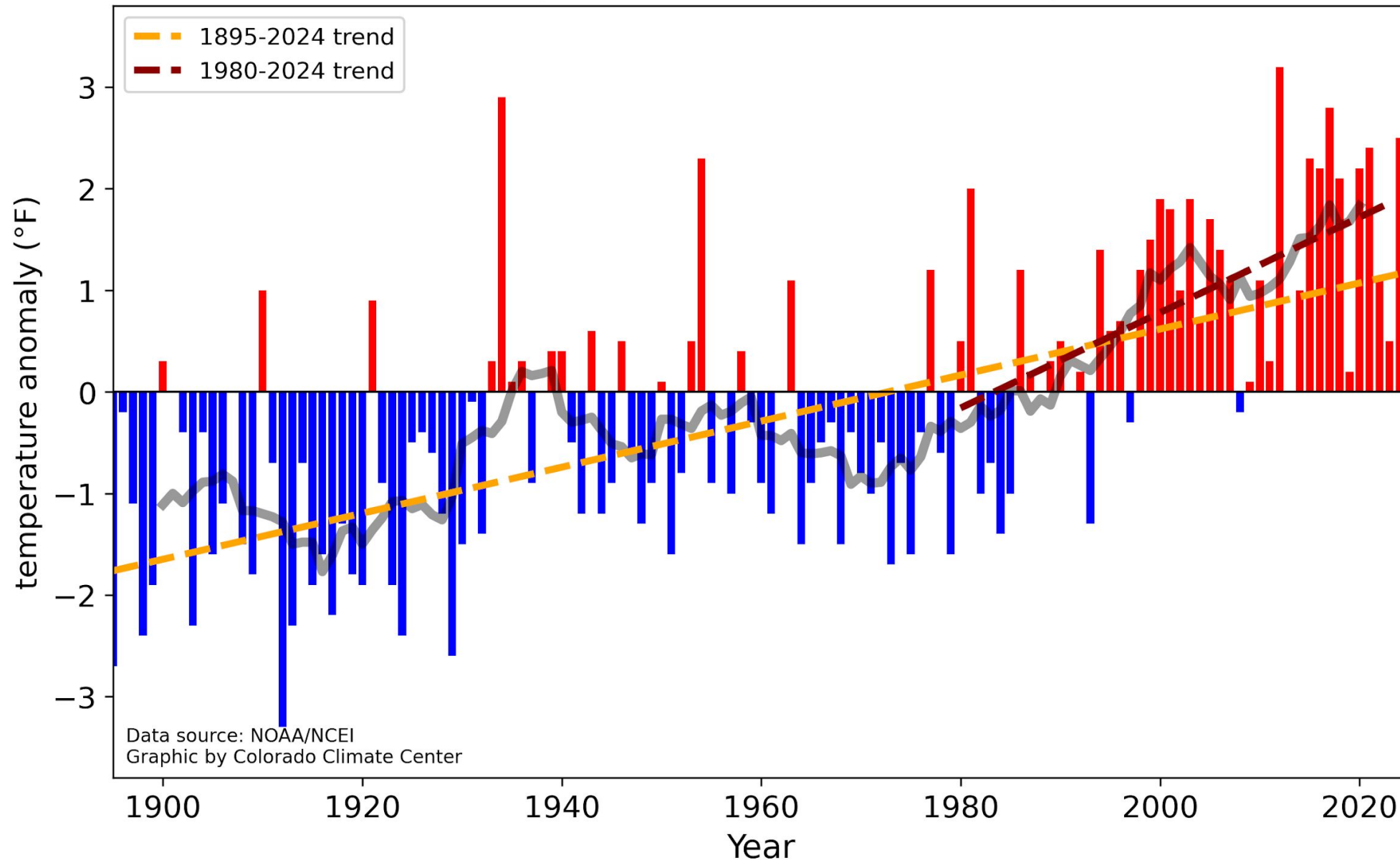


F) Warm & wet

**October through
December: very
warm, somewhat
wetter than average**

Cool & wet

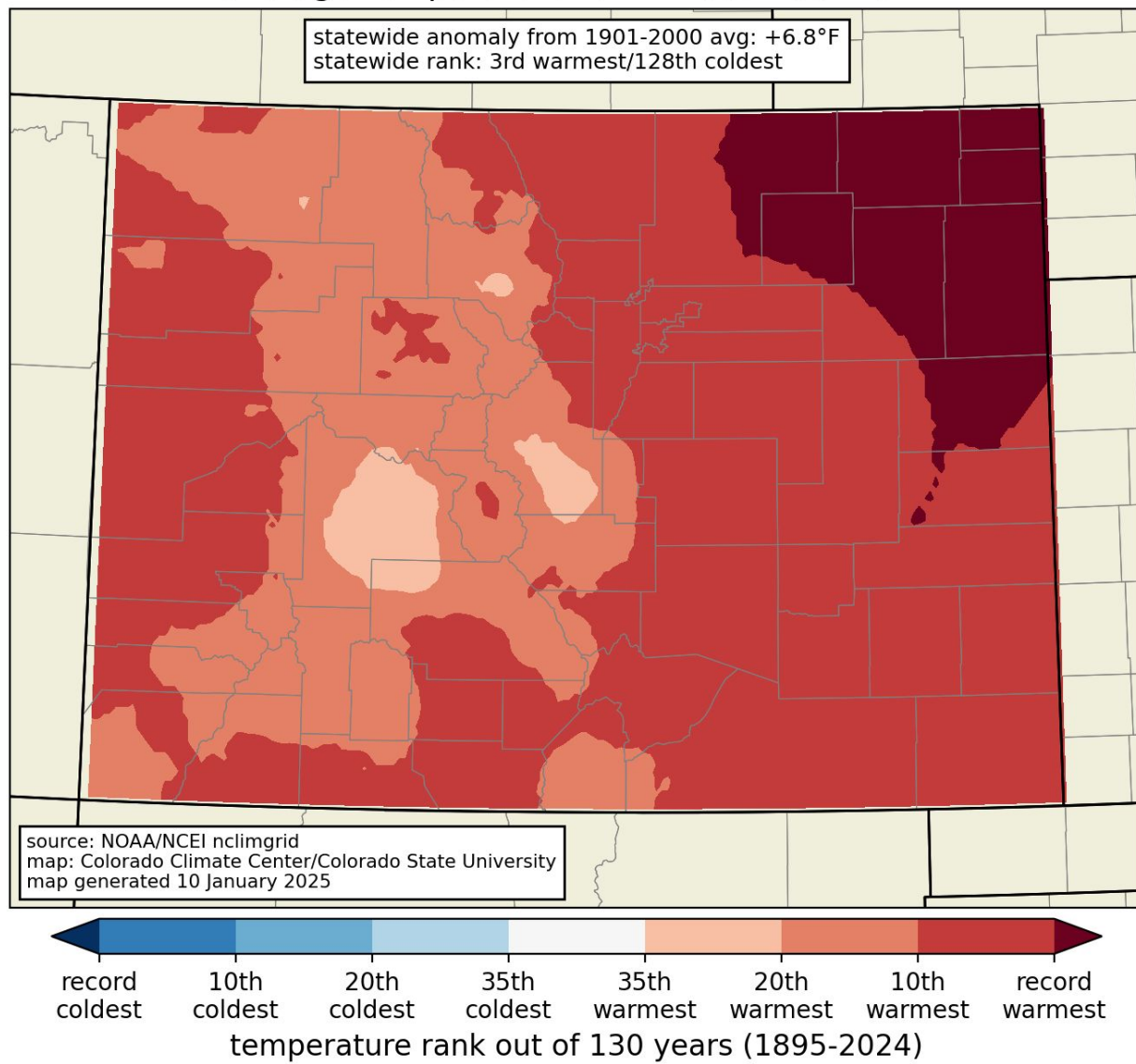
Colorado statewide annual temperature anomaly (°F), with respect to 1971-2000 average



**2024 was 4th
warmest year for
Colorado**

**8 of the 10
warmest years on
record have been
since 2012**

average temperature rank: December 2024

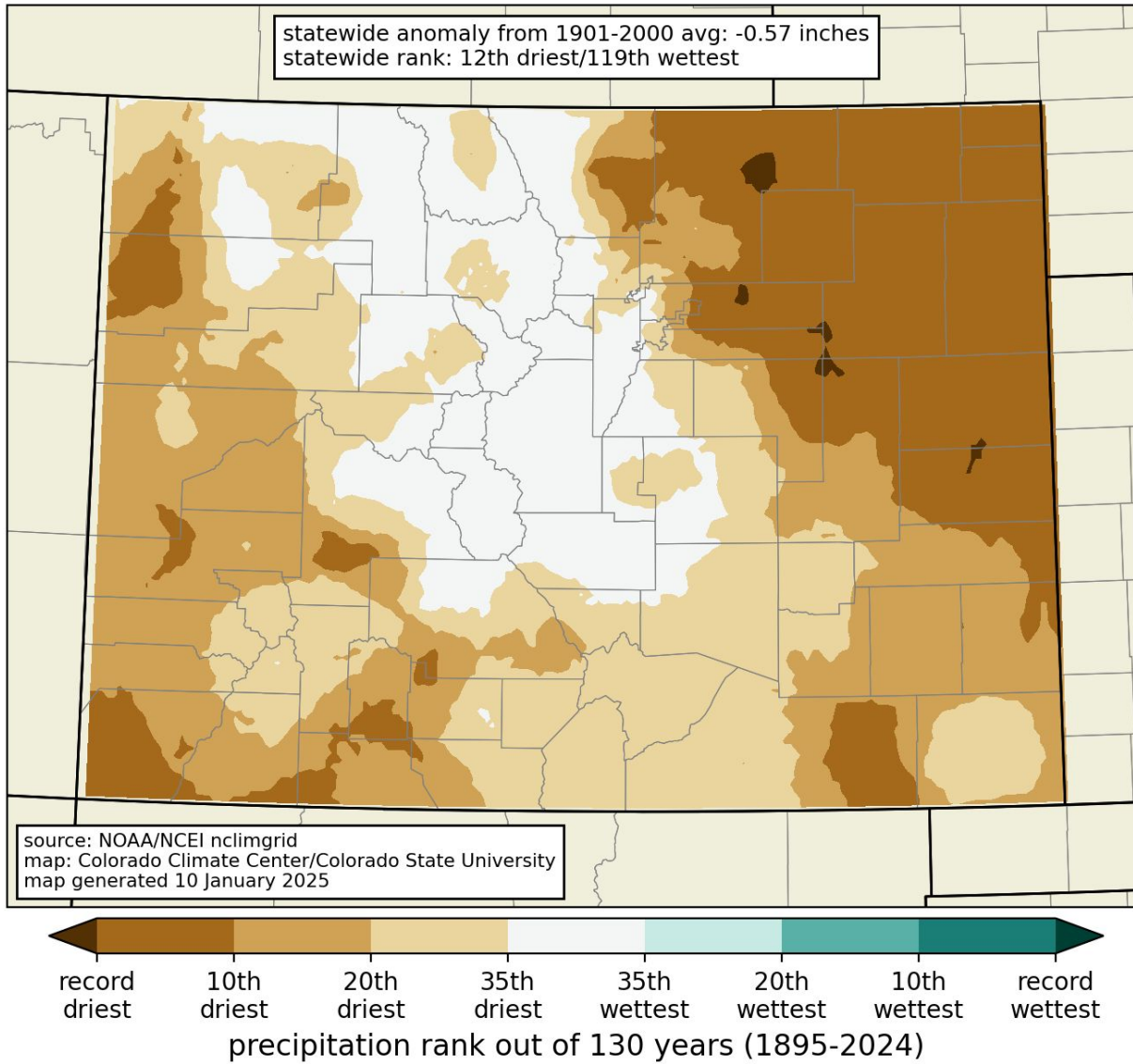


3rd-warmest December on record, behind only December 1980 and 2021

Many locations had their “warmest coldest” temperature prior to the end of December on record

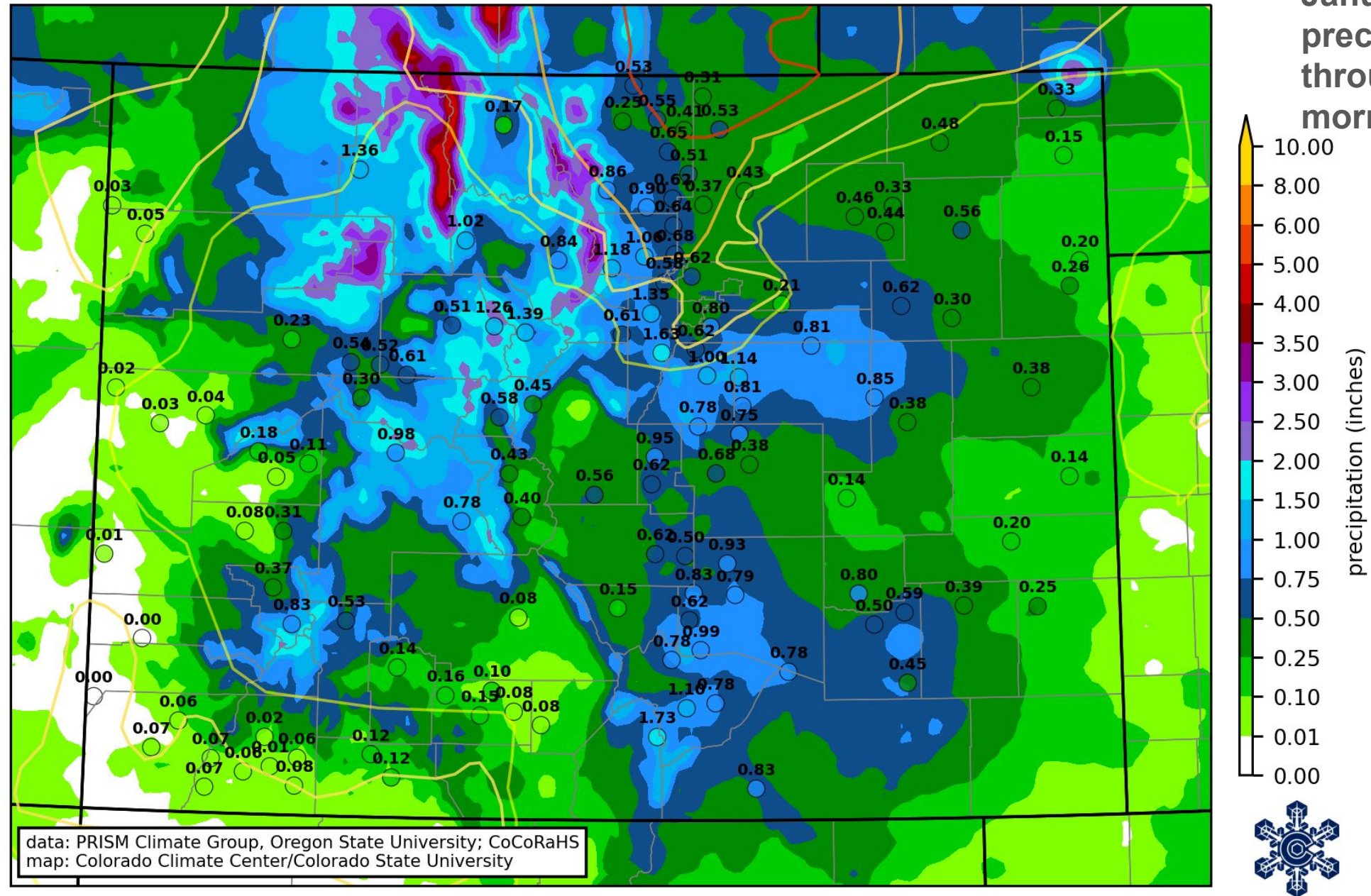
e.g., at Fort Collins, the lowest temp through Dec 31 was 15°F; previous record was 12°F.

precipitation rank: December 2024

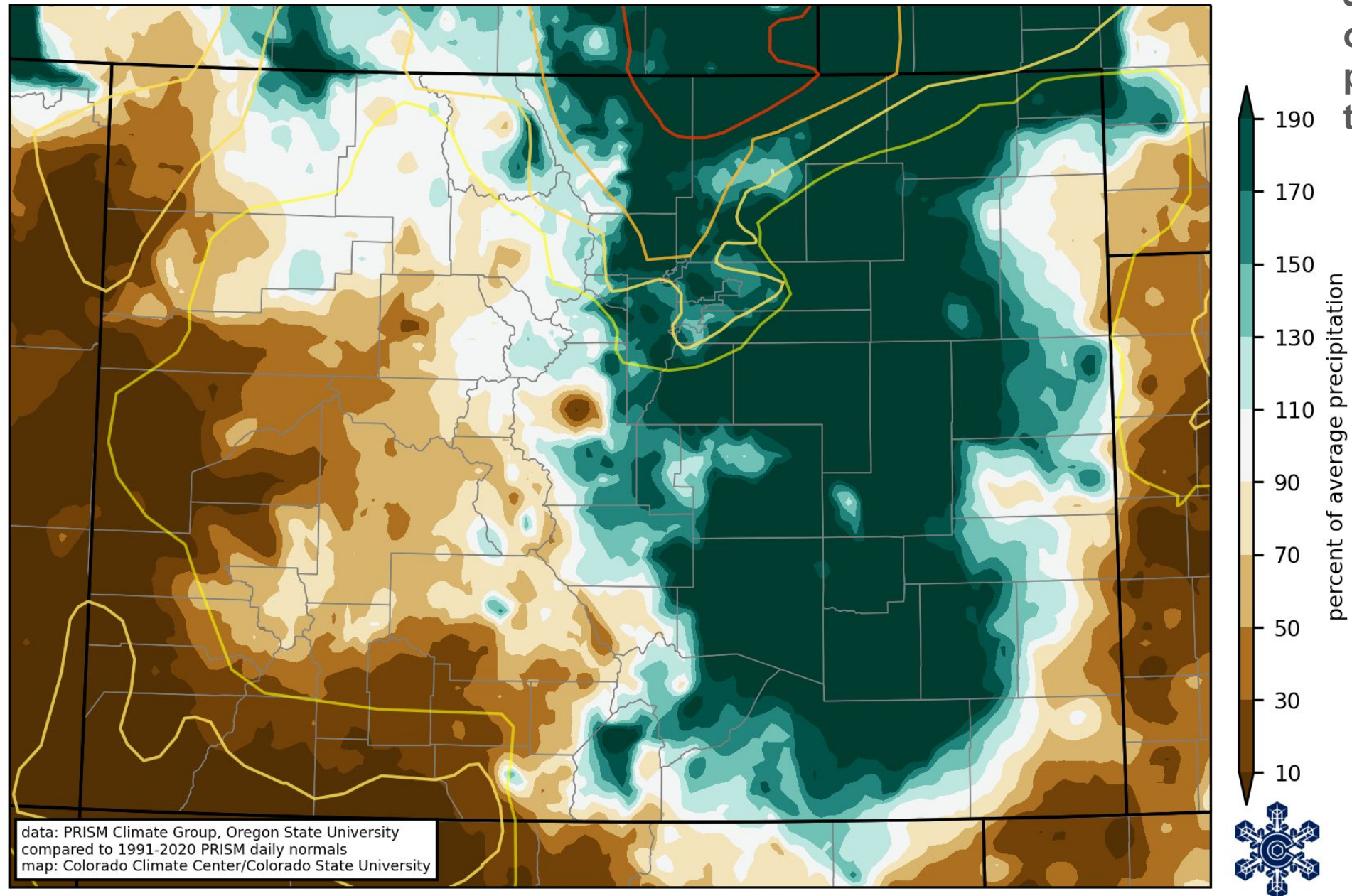


December precipitation was much below average at lower elevations, closer to average in the mountains

January precipitation through Monday morning (20th)

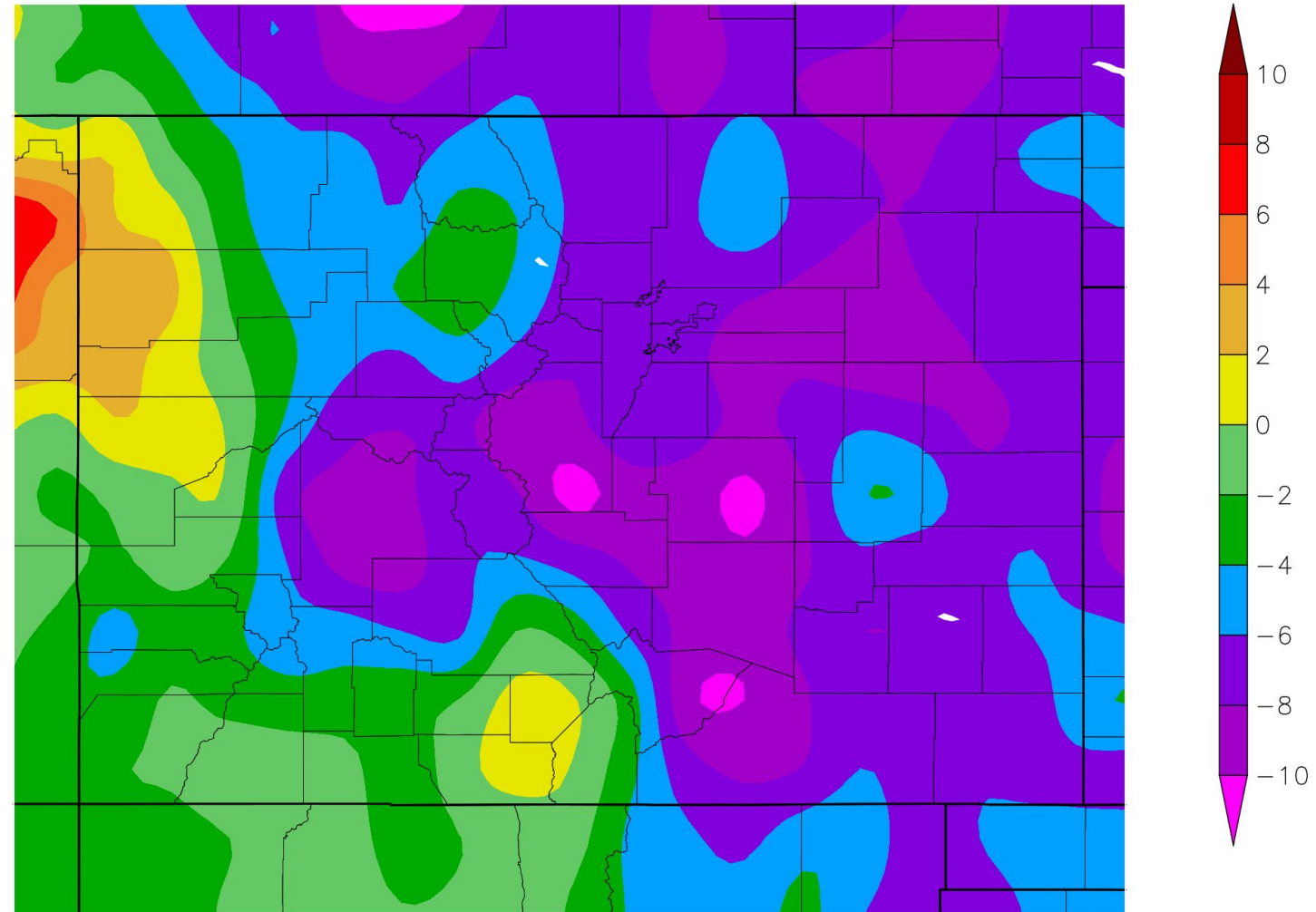


January percent of normal precipitation through the 20th



Departure from Normal Temperature (F)
1/1/2025 – 1/21/2025

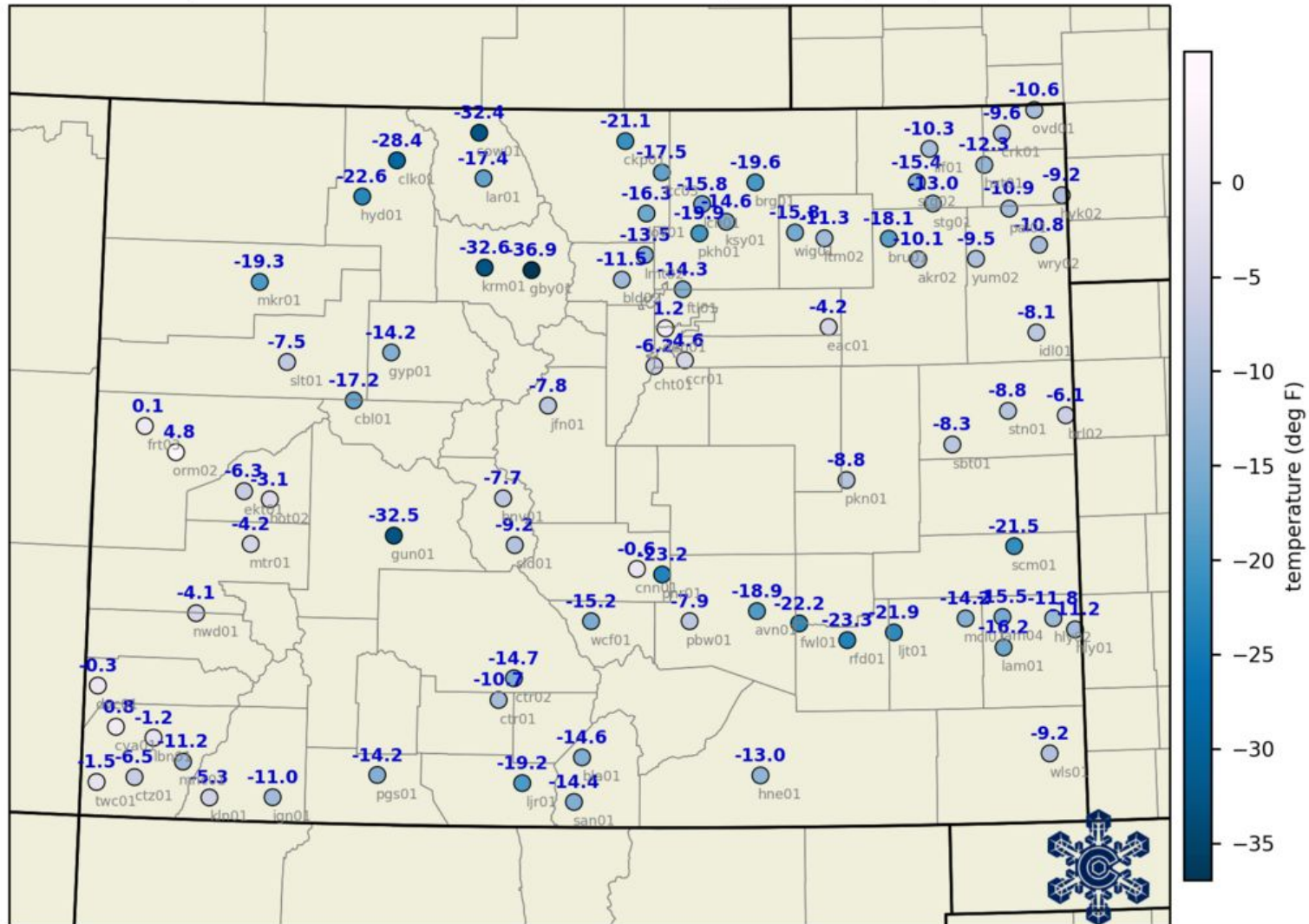
**January departure
from normal
temperature
through the 21st**



Generated 1/22/2025 at HPRCC using provisional data.

NOAA Regional Climate Centers



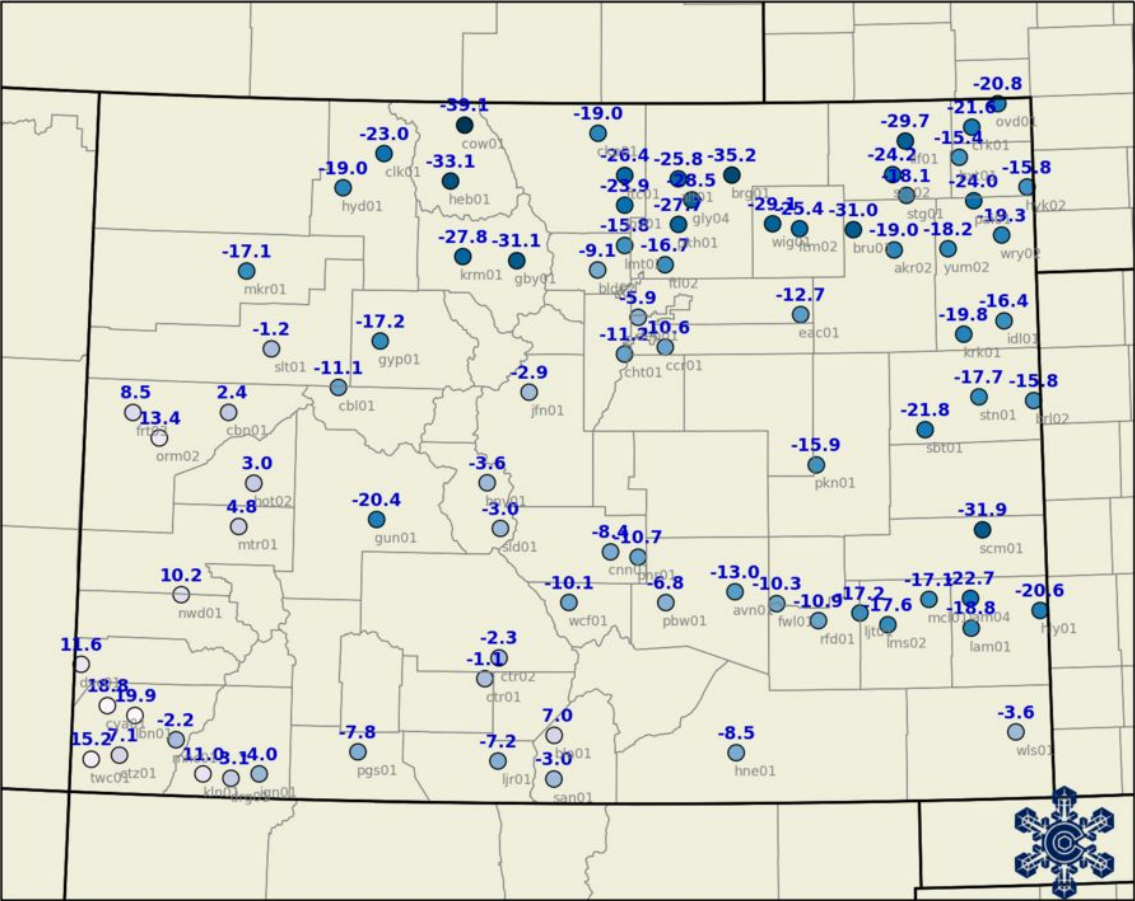


Mid-January cold blasts

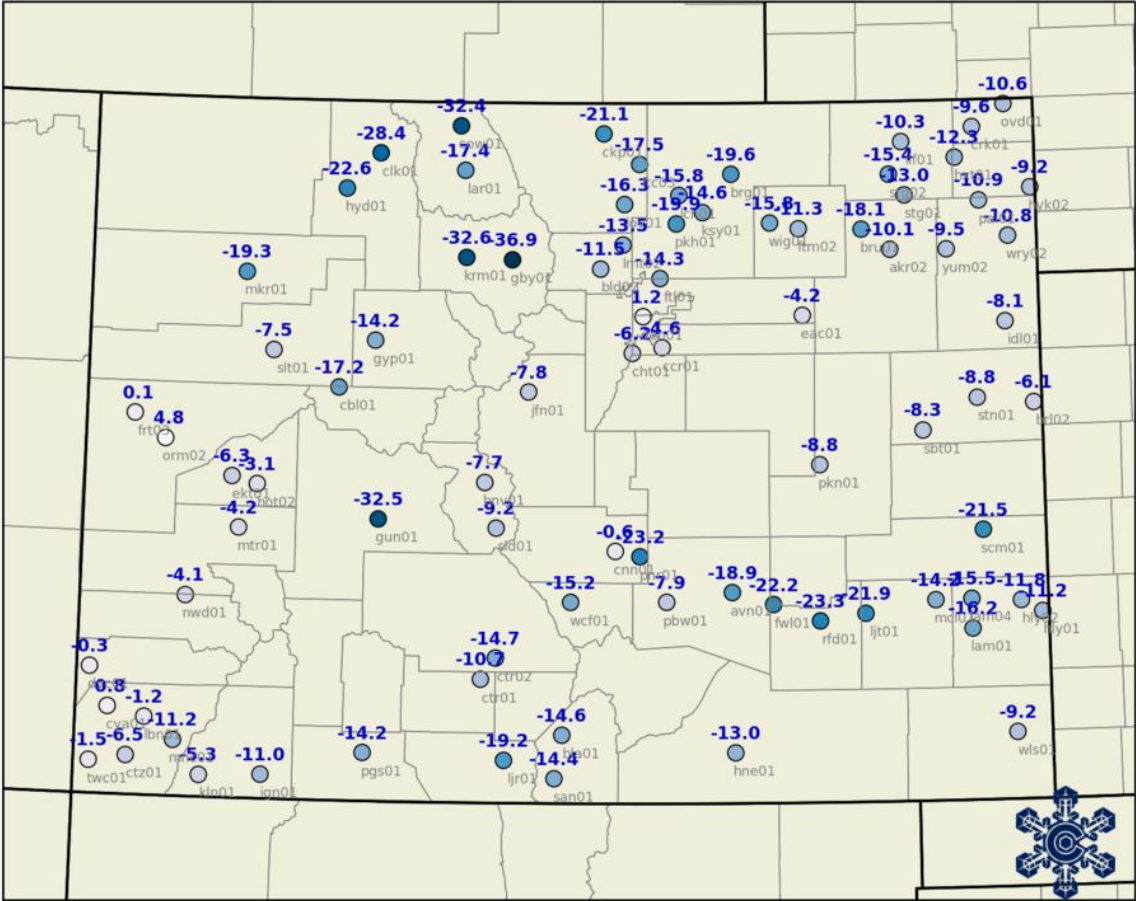
Last year (January 16)

This year (January 21)

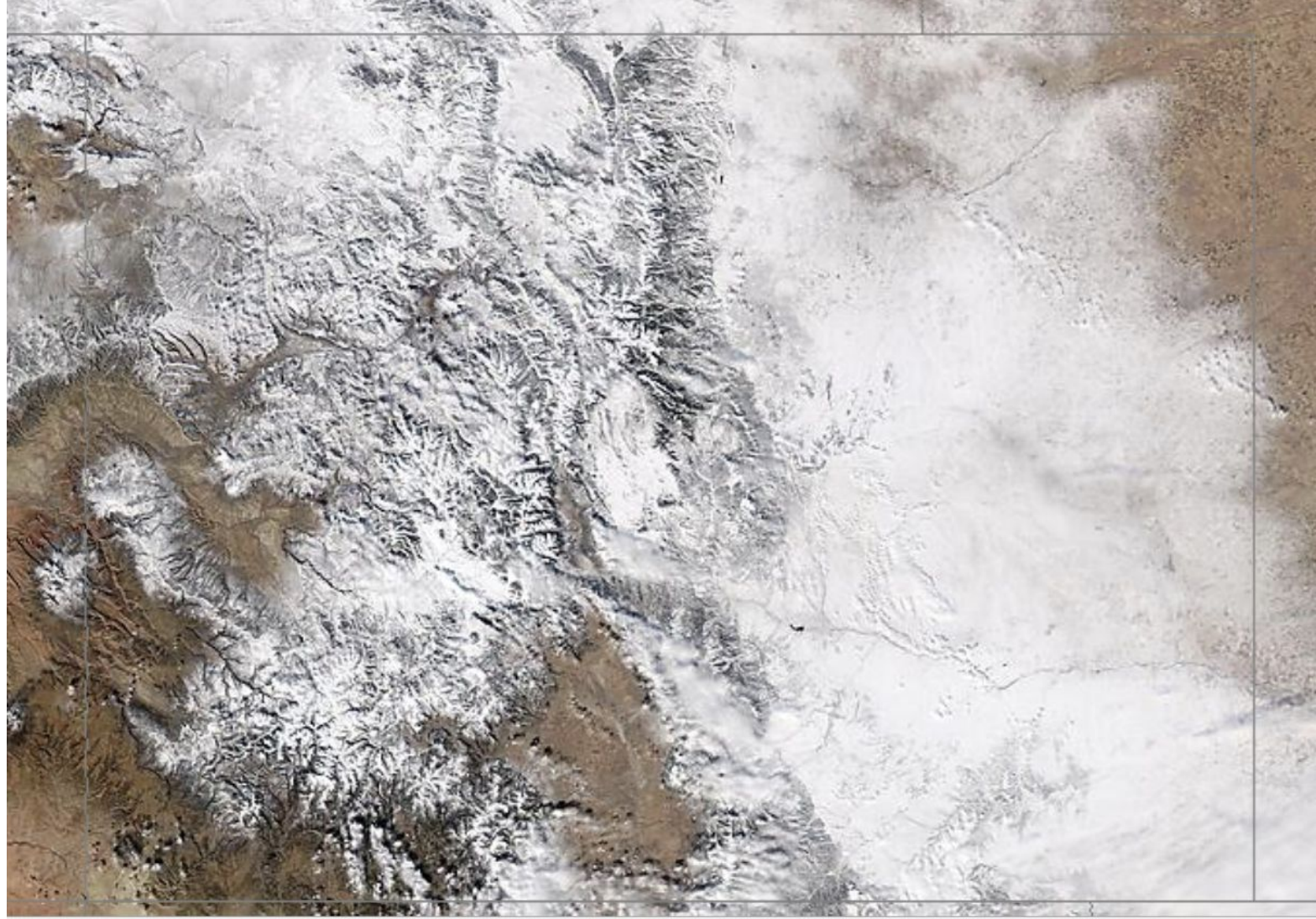
CoAgMET/Northern Water daily minimum temperature (F): 16 Jan 2024



CoAgMET/Northern Water daily minimum temperature (F): 21 Jan 2025



Drought conditions



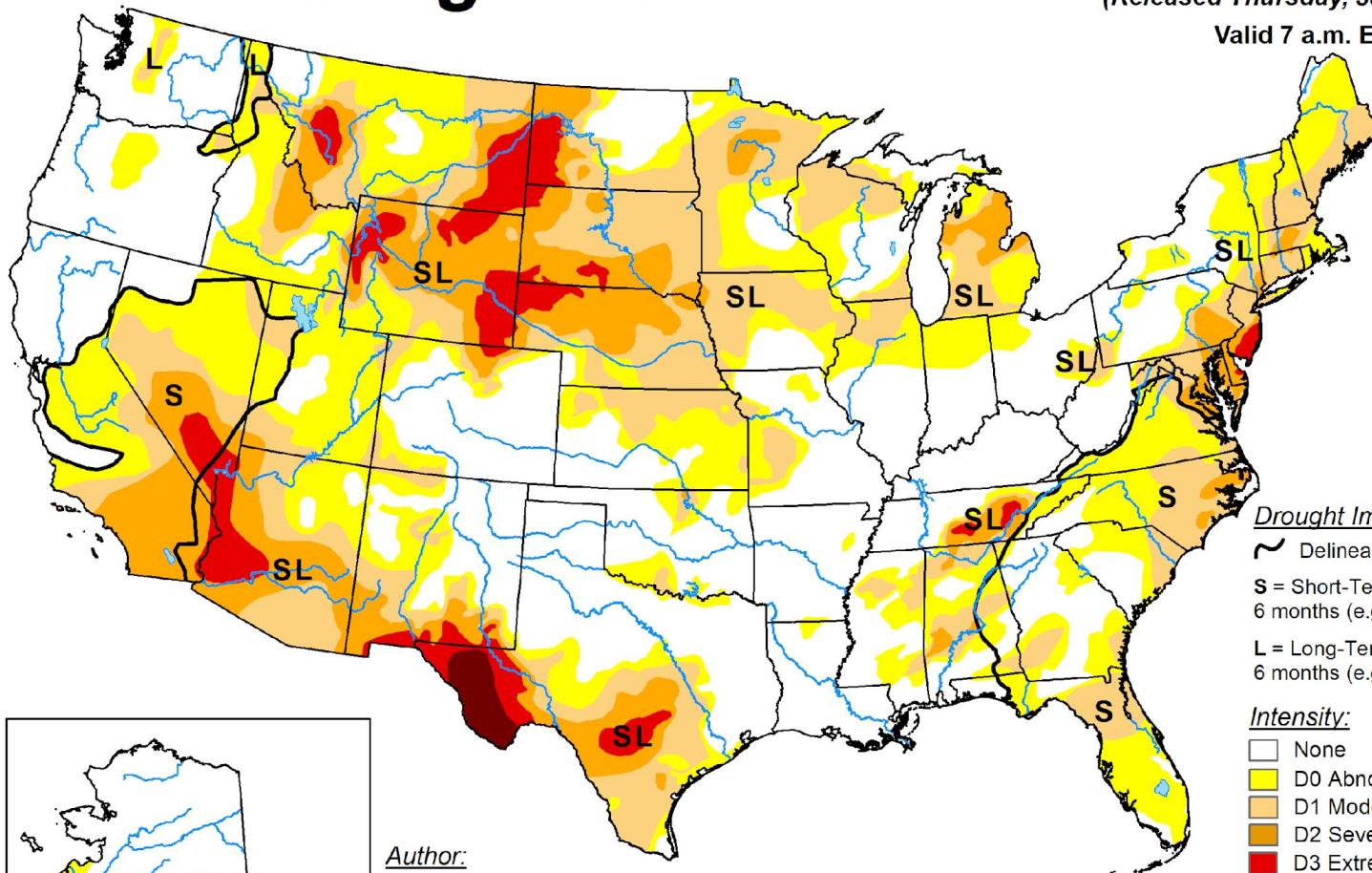
From MODIS Today, January 20
<https://ge.ssec.wisc.edu/modis-today/index.php>



U.S. Drought Monitor

January 14, 2025
(Released Thursday, Jan. 16, 2025)

Valid 7 a.m. EST



Drought Impact Types:

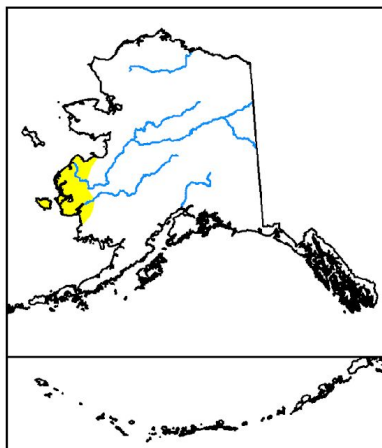
~ Delineates dominant impacts

S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)

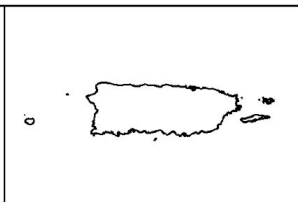
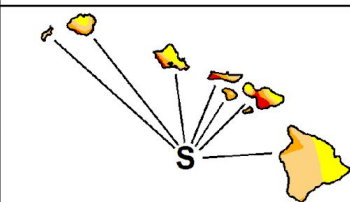
L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

Intensity:

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



Author:
Brad Pugh
CPC/NOAA



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

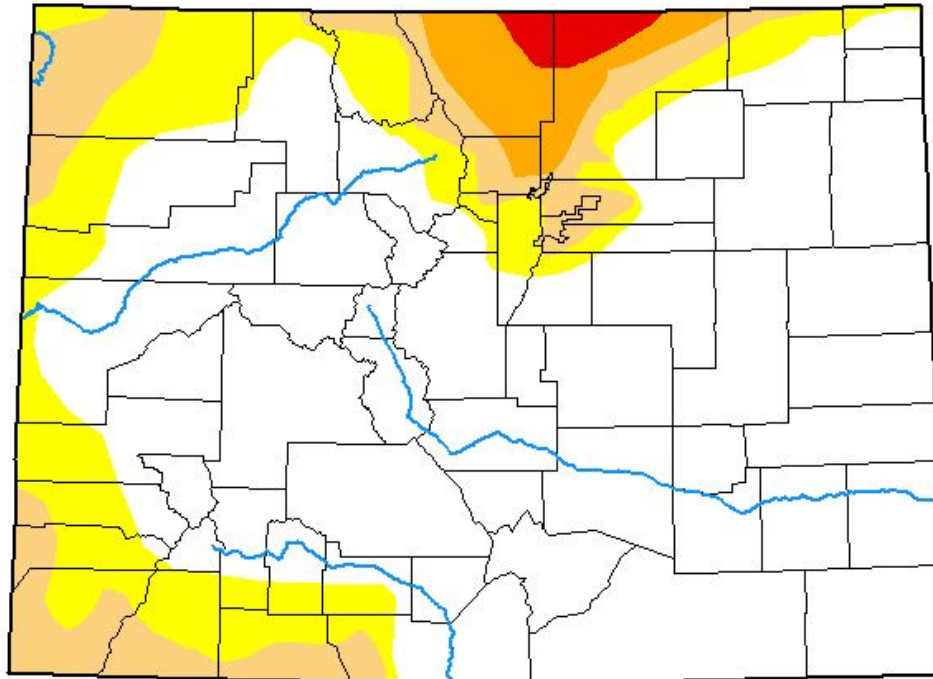
January 14, 2025

(Released Thursday, Jan. 16, 2025)

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	71.40	28.60	13.46	4.08	0.98	0.00
Last Week 01-07-2025	71.40	28.60	10.78	4.08	0.98	0.00
3 Months Ago 10-15-2024	29.78	70.22	40.67	12.14	1.59	0.00
Start of Calendar Year 01-07-2025	71.40	28.60	10.78	4.08	0.98	0.00
Start of Water Year 10-01-2024	48.27	51.73	24.40	4.62	0.00	0.00
One Year Ago 01-16-2024	38.12	61.88	27.83	6.72	2.05	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:

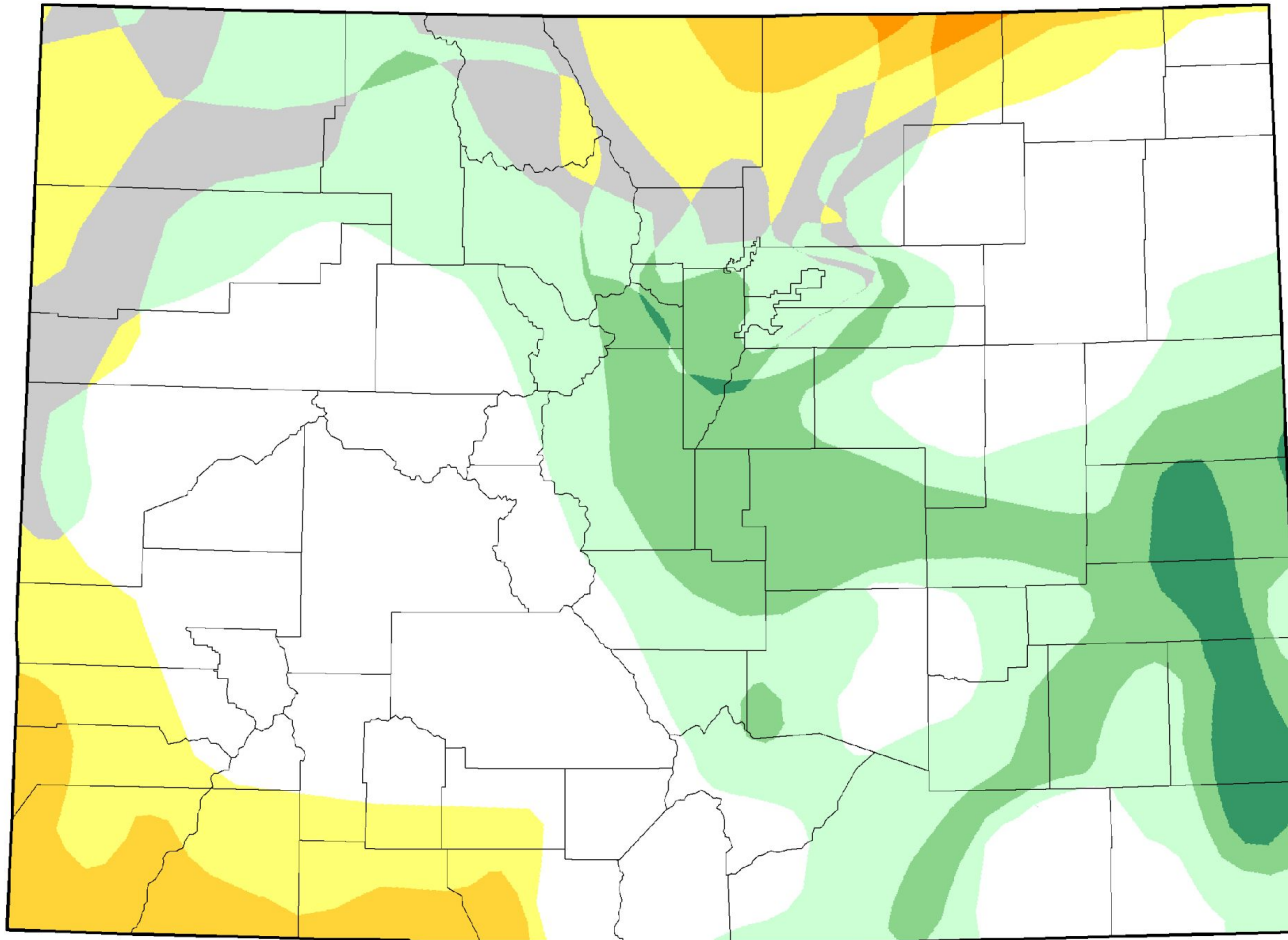
Brad Pugh
CPC/NOAA



droughtmonitor.unl.edu



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



January 14, 2025
compared to
October 1, 2024

droughtmonitor.unl.edu

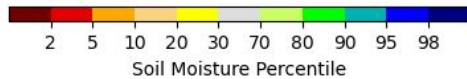
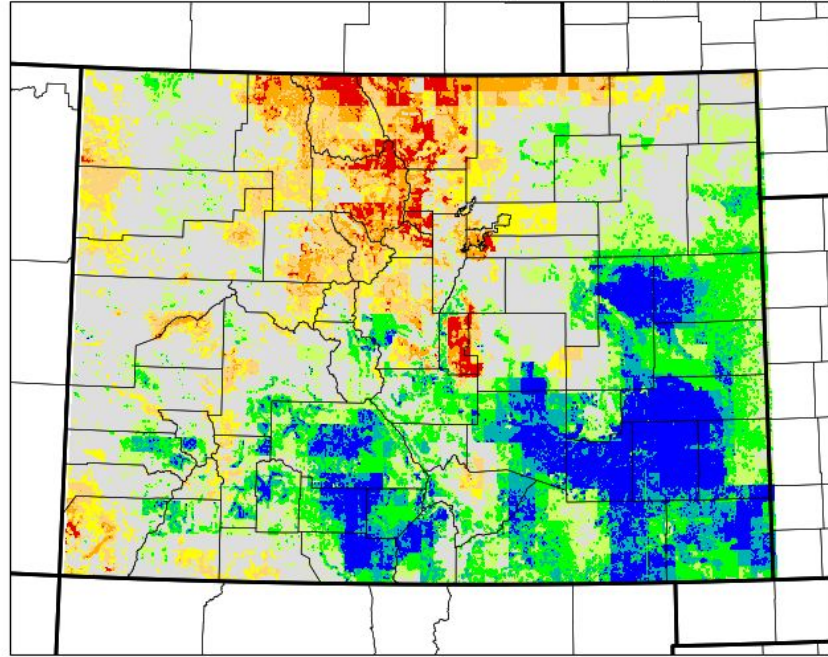


- 5 Class Degradation
- 4 Class Degradation
- 3 Class Degradation
- 2 Class Degradation
- 1 Class Degradation
- No Change
- 1 Class Improvement
- 2 Class Improvement
- 3 Class Improvement
- 4 Class Improvement
- 5 Class Improvement

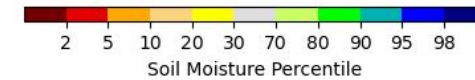
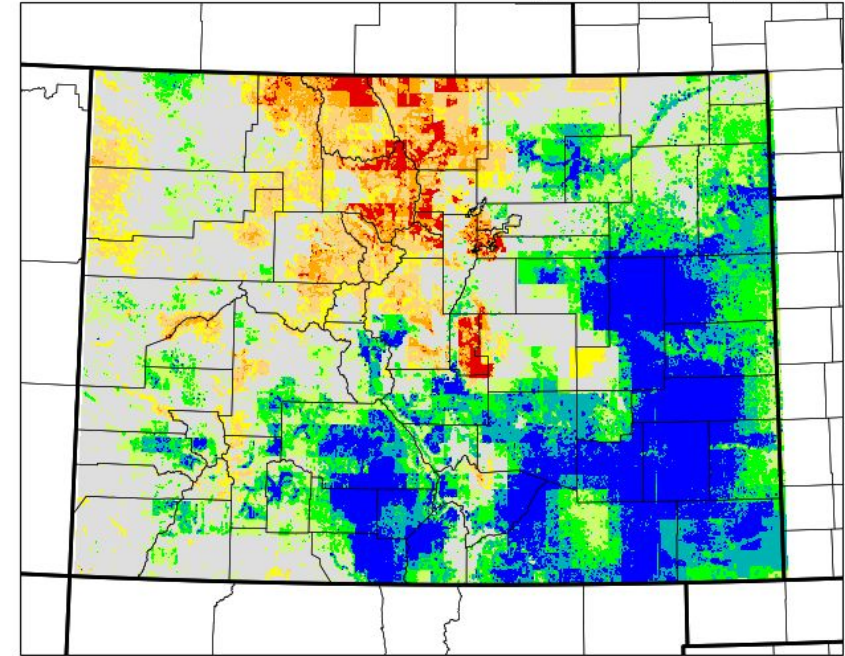
Change since beginning of the Water Year



Soil Moisture Percentiles (0-10cm) 01/16/2025



Soil Moisture Percentiles (0-1m) 01/16/2025

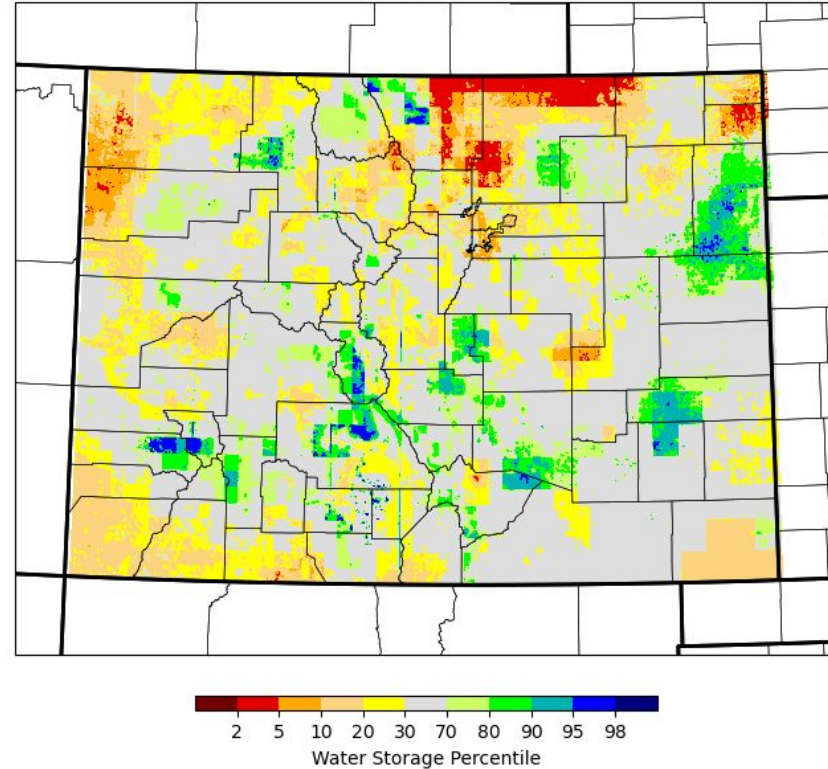


Soil moisture remains good in southeastern Colorado from the huge November storm, and in the SLV after the wet summer and fall.

Soil moisture remains low in northern Colorado.



Terrestrial Water Storage Percentiles 01/16/2025



Terrestrial water storage: ground water + soil moisture + snowpack

Is this helpful? We are still evaluating it for a NASA project, any feedback welcome!



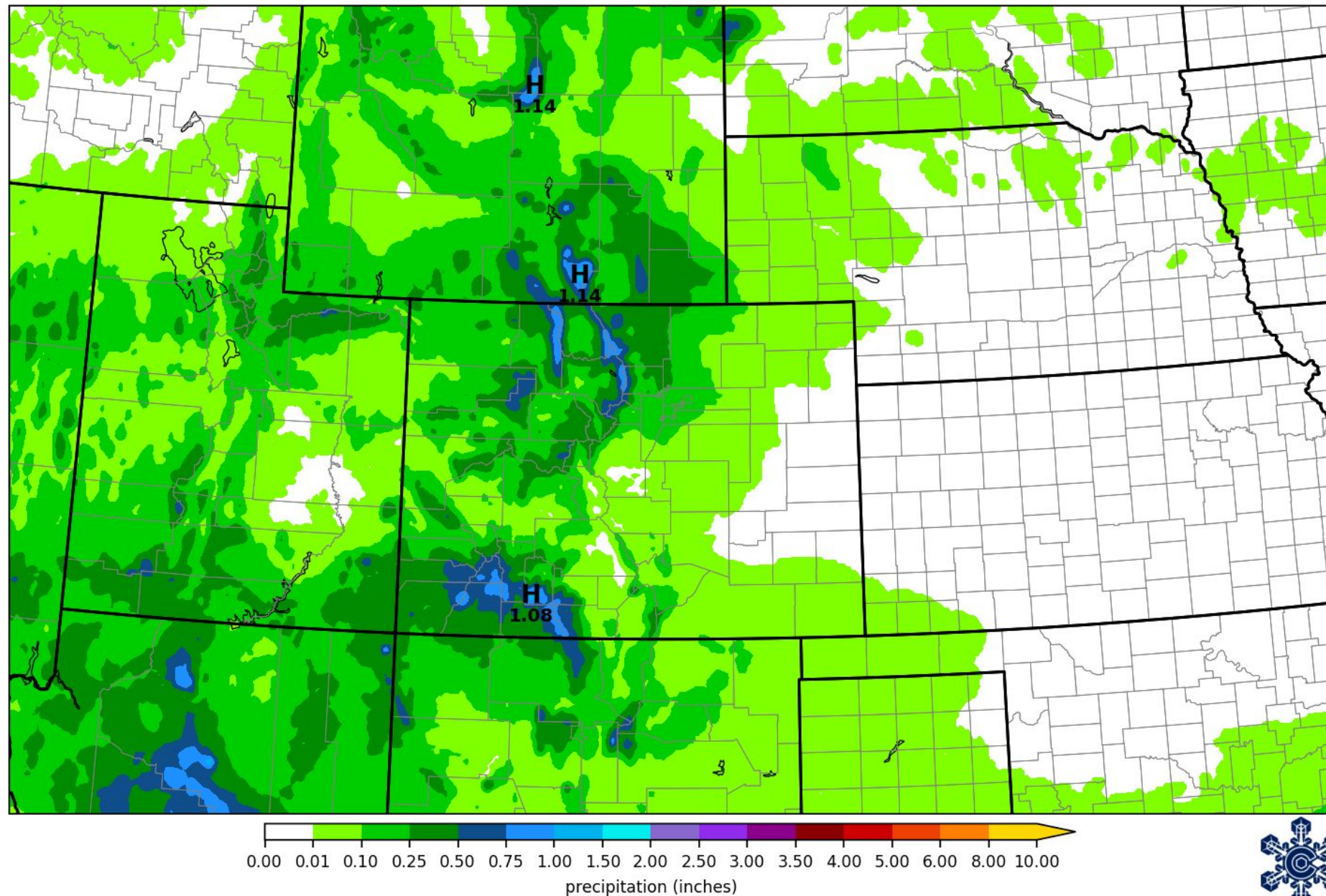


Outlook

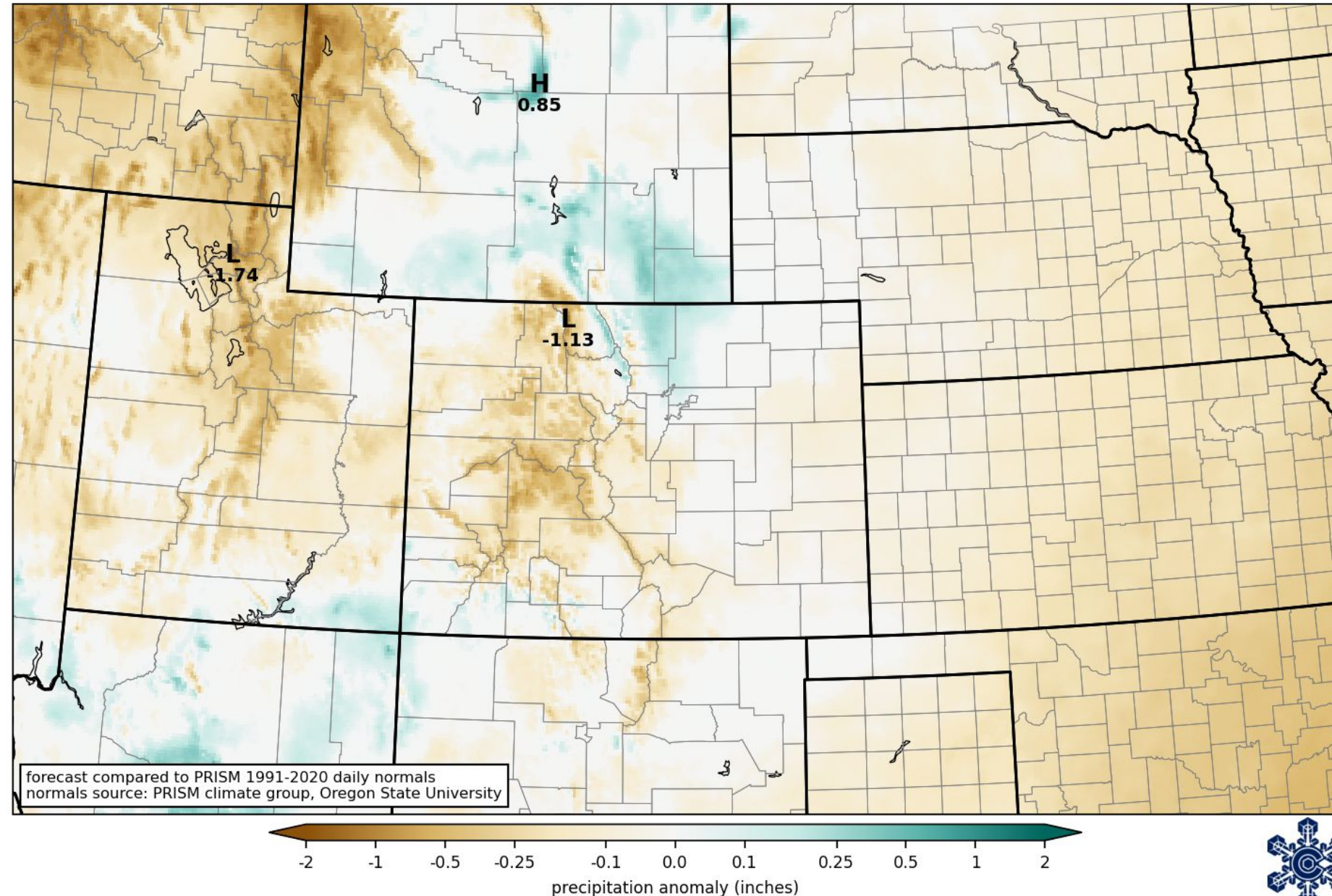


NOAA 7-day precipitation forecast

Mostly dry until the
weekend, then
another snowstorm
for both the
mountains and Front
Range



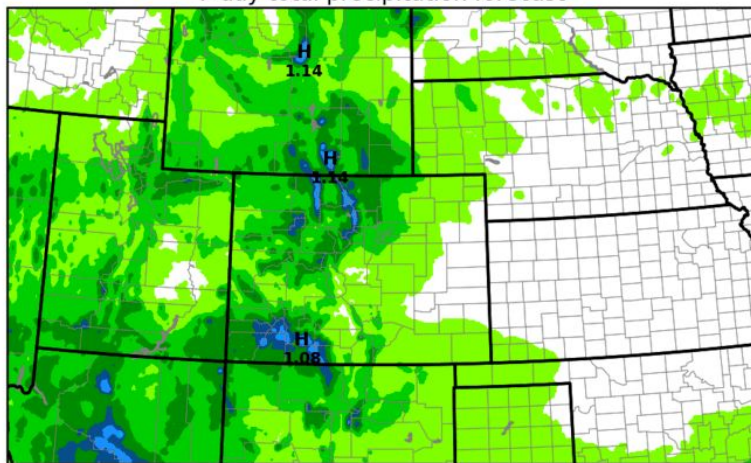
NOAA 7-day precipitation forecast (difference from average)



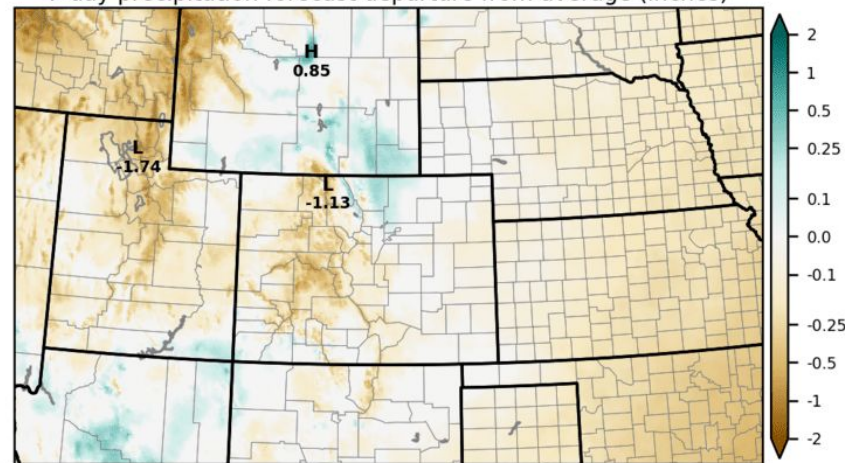
NOAA 7-day precipitation forecast

NOAA Weather Prediction Center precipitation forecast
issued 1200 UTC Wed 22 Jan 2025

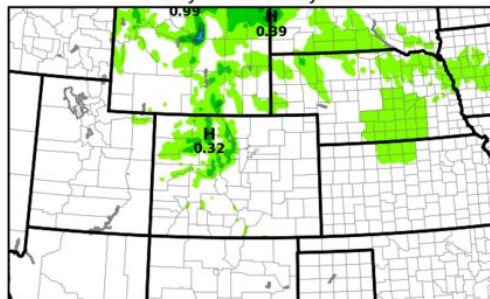
7-day total precipitation forecast



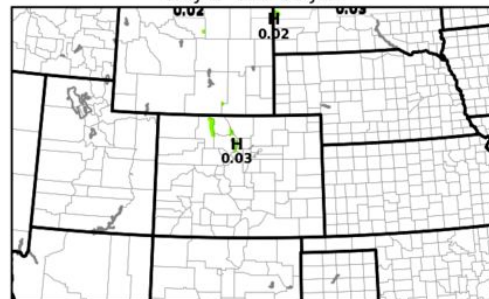
7-day precipitation forecast departure from average (inches)



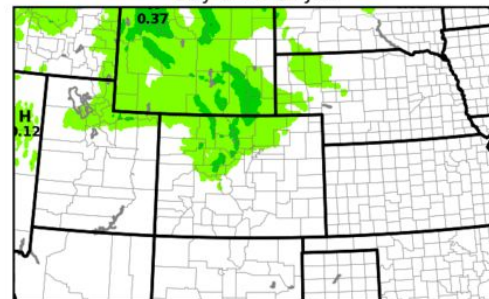
Day 1 Wed 22 Jan



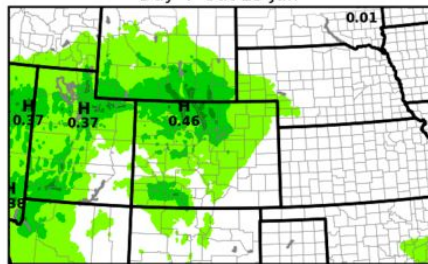
Day 2 Thu 23 Jan



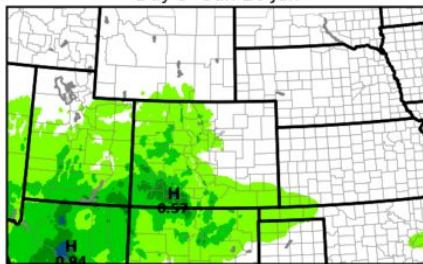
Day 3 Fri 24 Jan



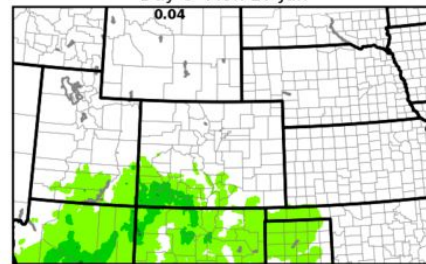
Day 4 Sat 25 Jan



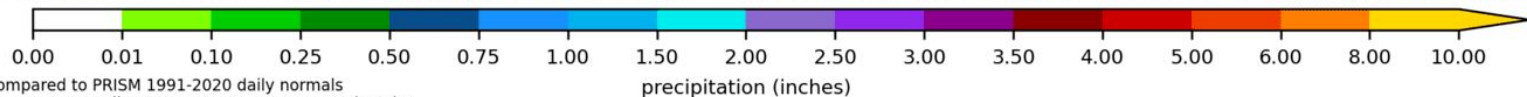
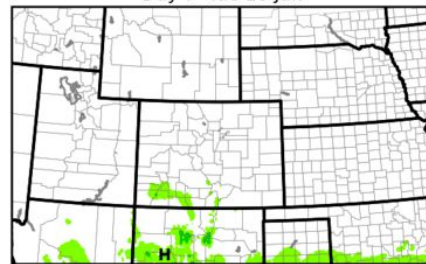
Day 5 Sun 26 Jan



Day 6 Mon 27 Jan



Day 7 Tue 28 Jan

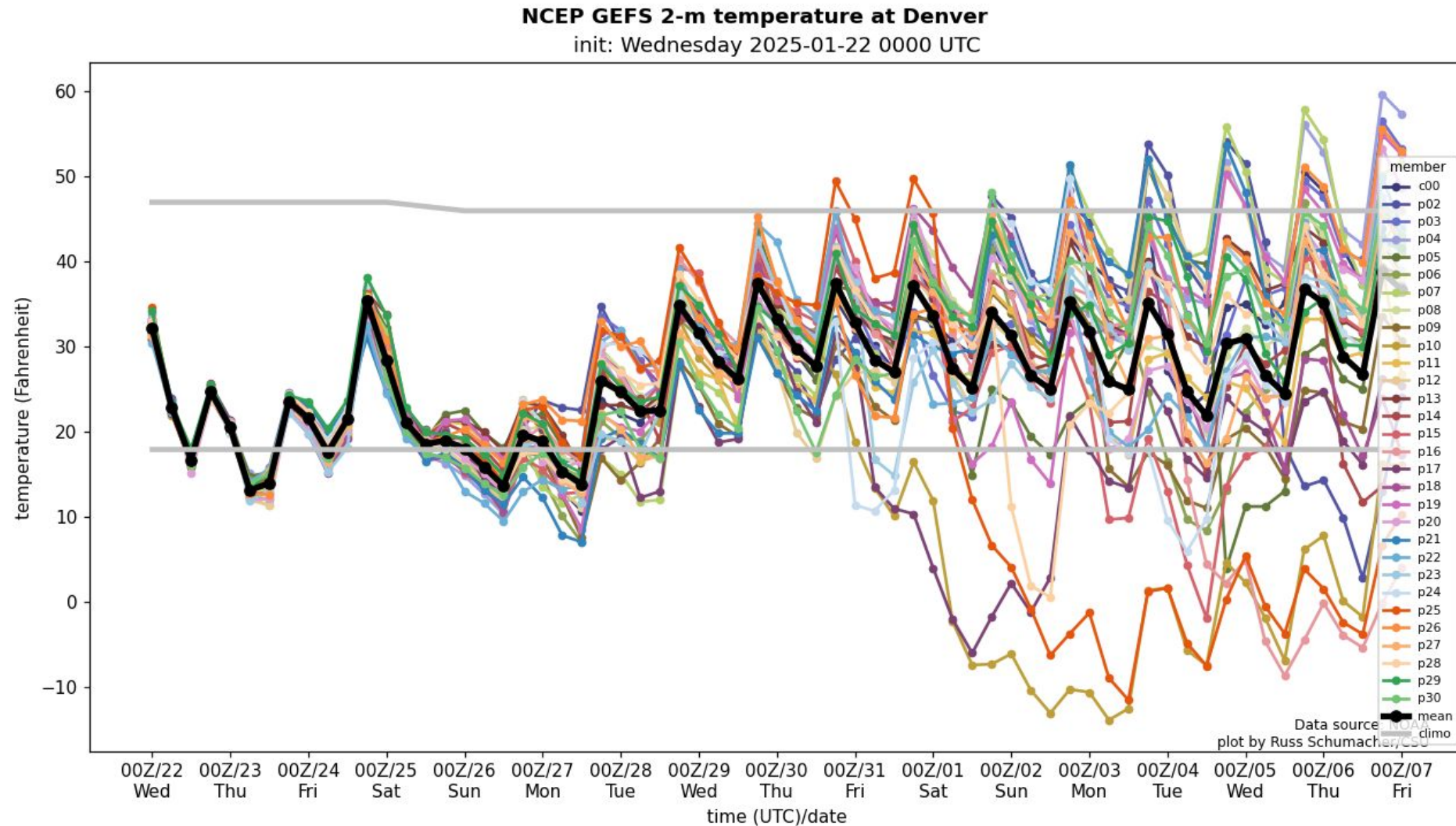


Quick-look maps on our
drought page:

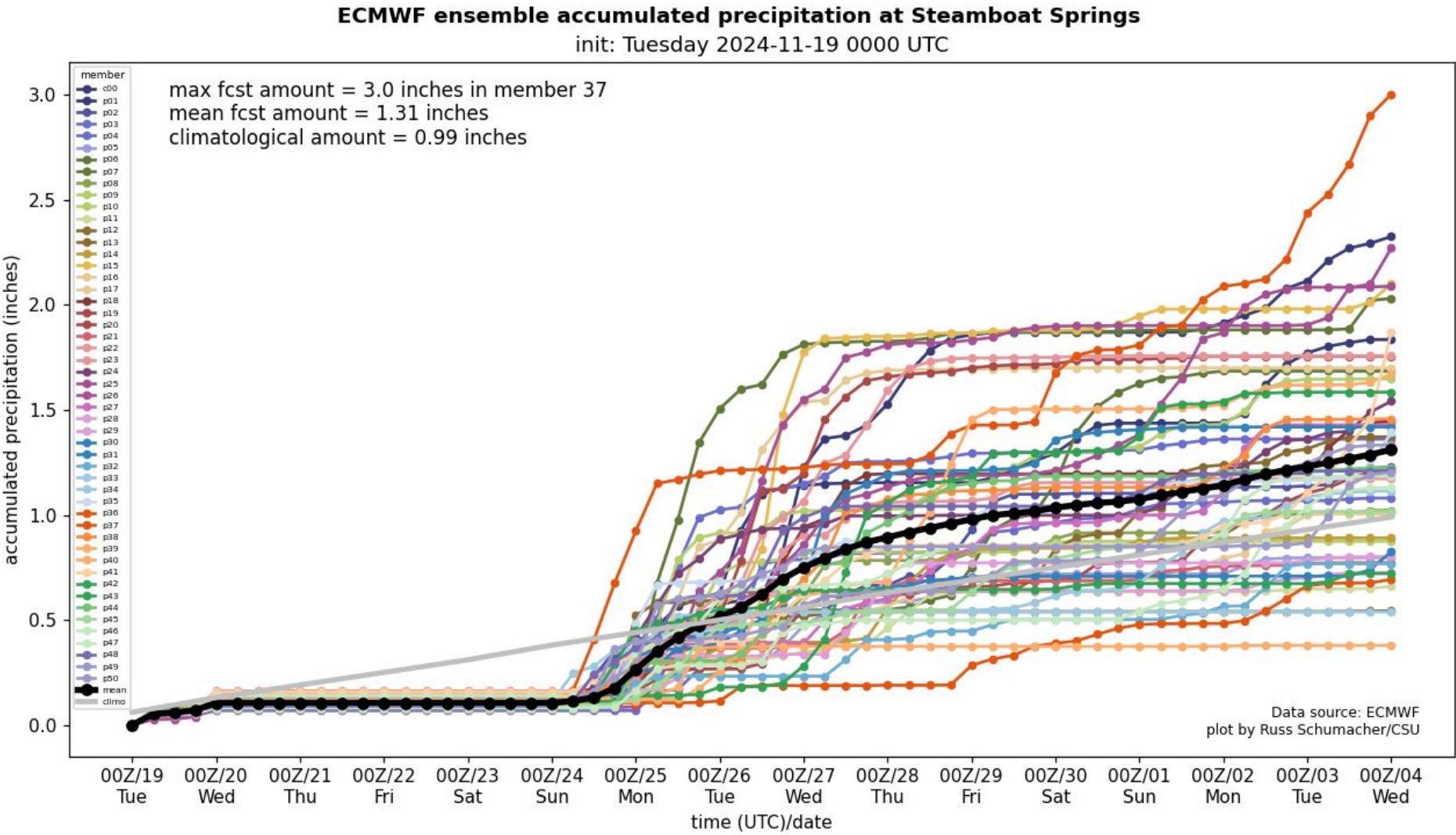
[https://climate.colostate.edu/
drought/#outlook](https://climate.colostate.edu/drought/#outlook)



Remaining colder than average this week (though with a couple warmer days), then warmer for the start of February



Mountain snow returns early next week, maybe also some lower-elevation snow?

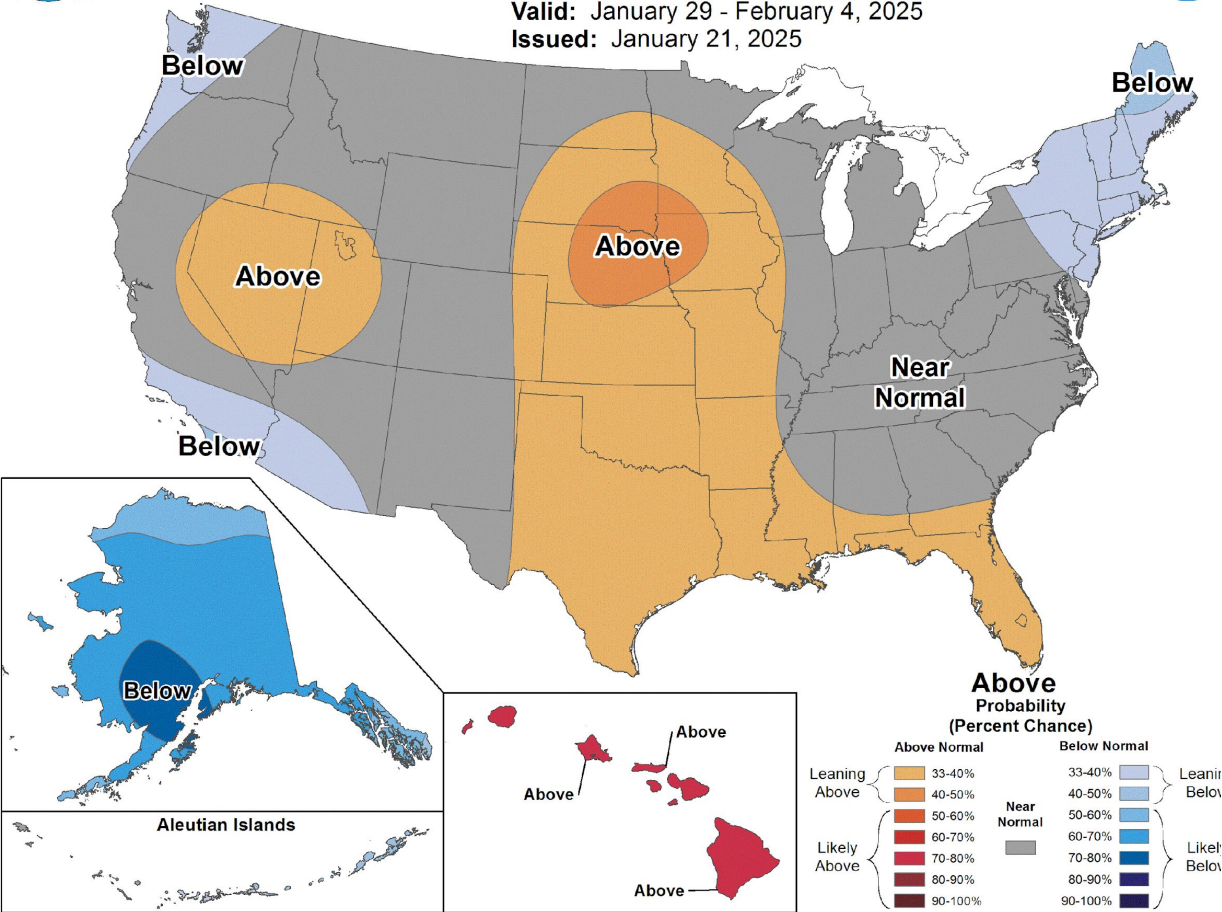


First week of February looking drier than average, especially in western CO



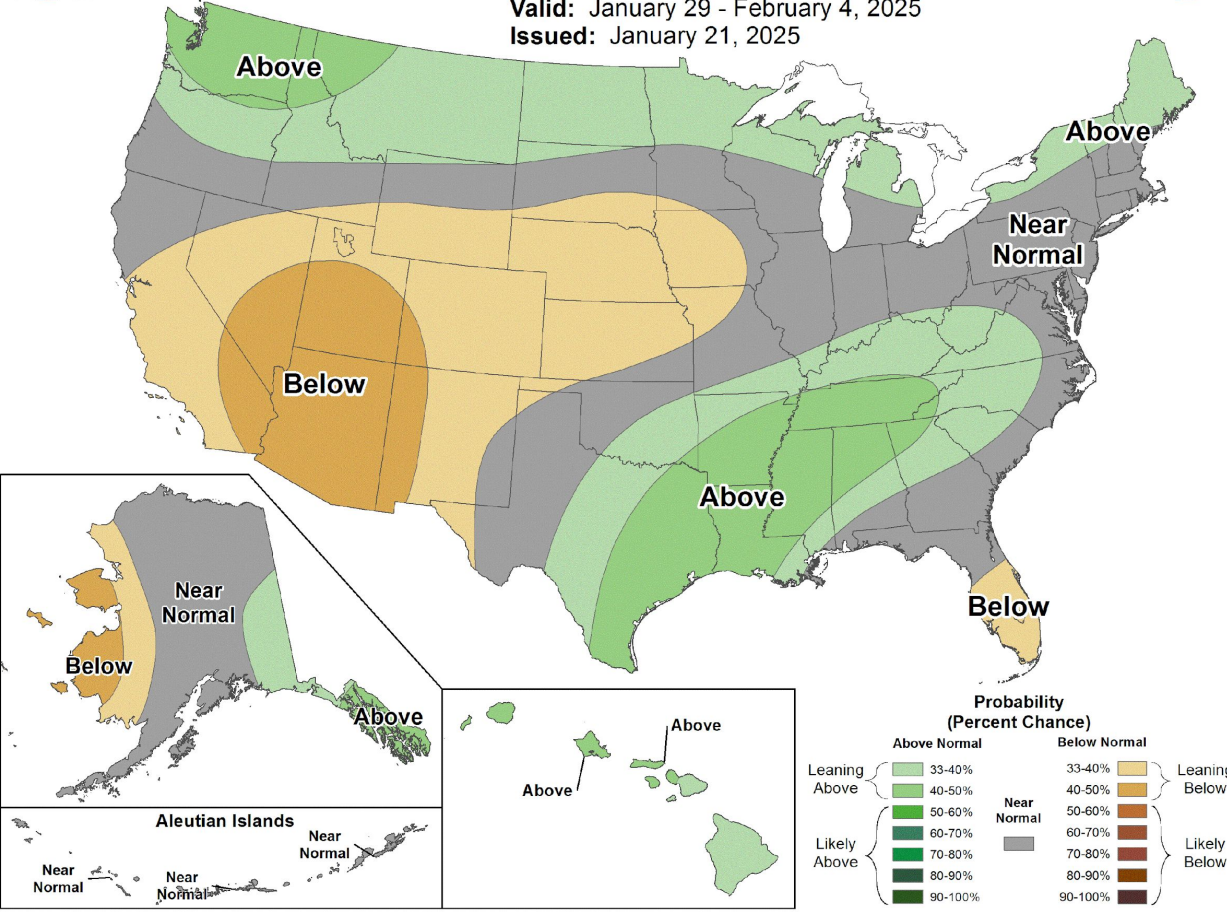
8-14 Day Temperature Outlook

Valid: January 29 - February 4, 2025
Issued: January 21, 2025



8-14 Day Precipitation Outlook

Valid: January 29 - February 4, 2025
Issued: January 21, 2025



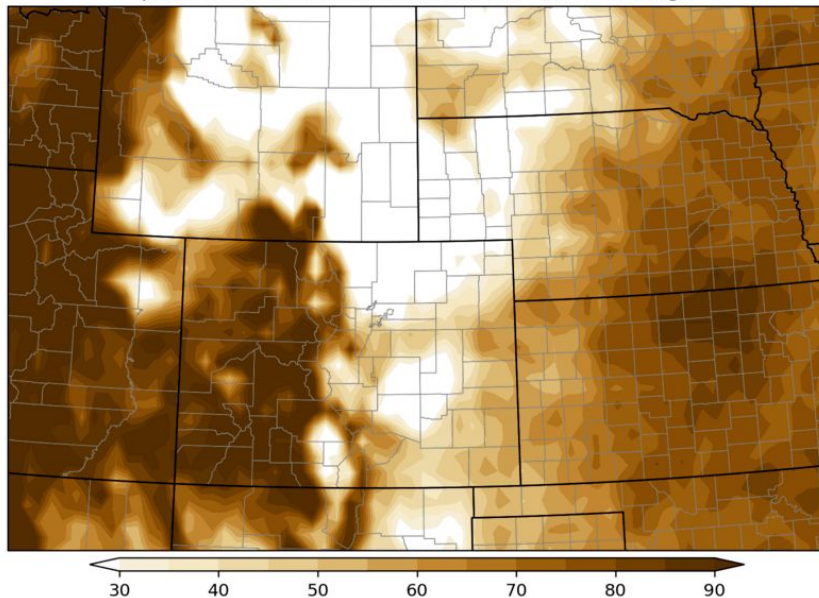
Will the next 15 days be above, below, or near average precipitation?

Out of 50 different model forecasts, how many are at least 0.1" above/below average, or within 0.1" of average

ECMWF Ensemble Prediction System
accumulated precipitation departure from average through 15 days (baseline: PRISM 1991-2020 daily normals)

initialized 0000 UTC Wed 22 Jan 2025
360-h forecast valid 0000 UTC Thu 06 Feb 2025

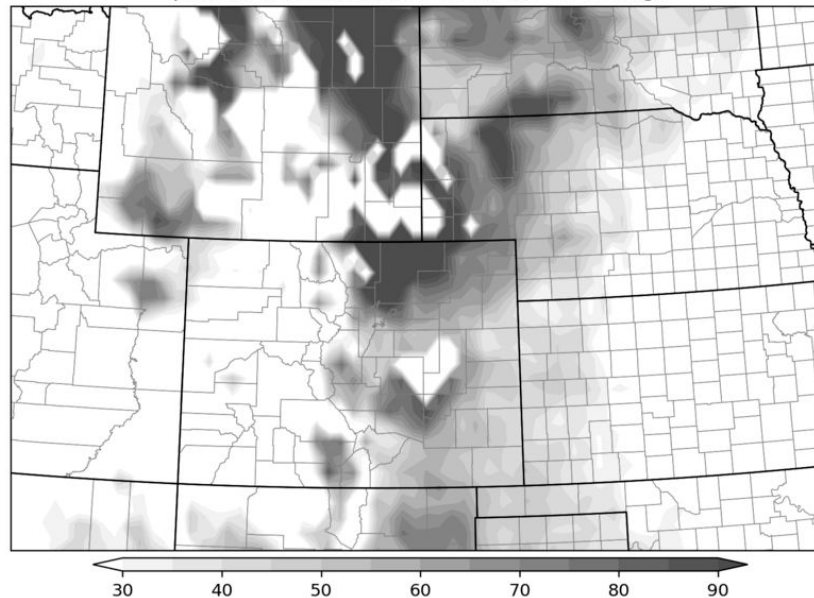
percent of EPS members at least 0.1" below average



data: ECMWF; plot: Russ Schumacher, Colorado State Univ

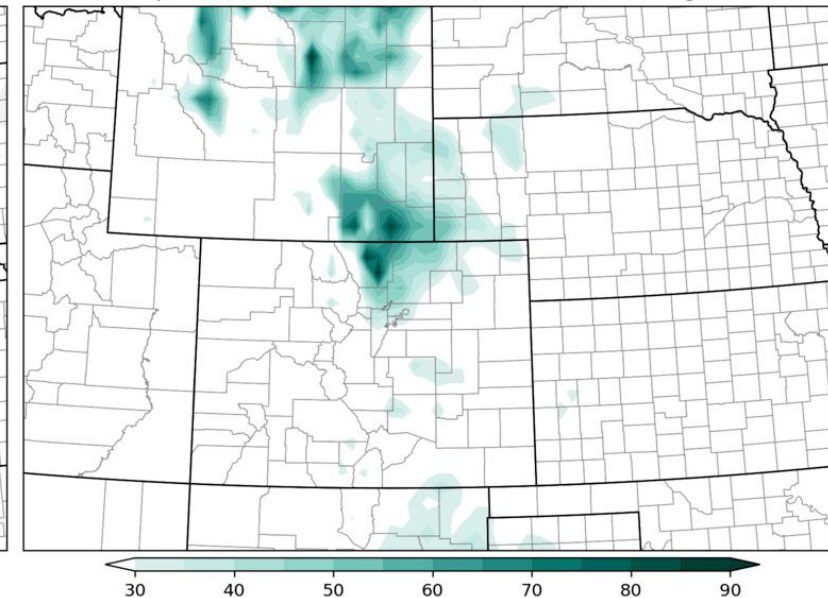
Percent of members below average

percent of EPS members within 0.1" of average



Percent of members within 0.1"

percent of EPS members at least 0.1" above average



Percent of members above avg

<https://schumacher.atmos.colostate.edu/weather/ecmwf.php>



COLORADO CLIMATE CENTER



La Niña in place, not very strong, expected to wane by spring

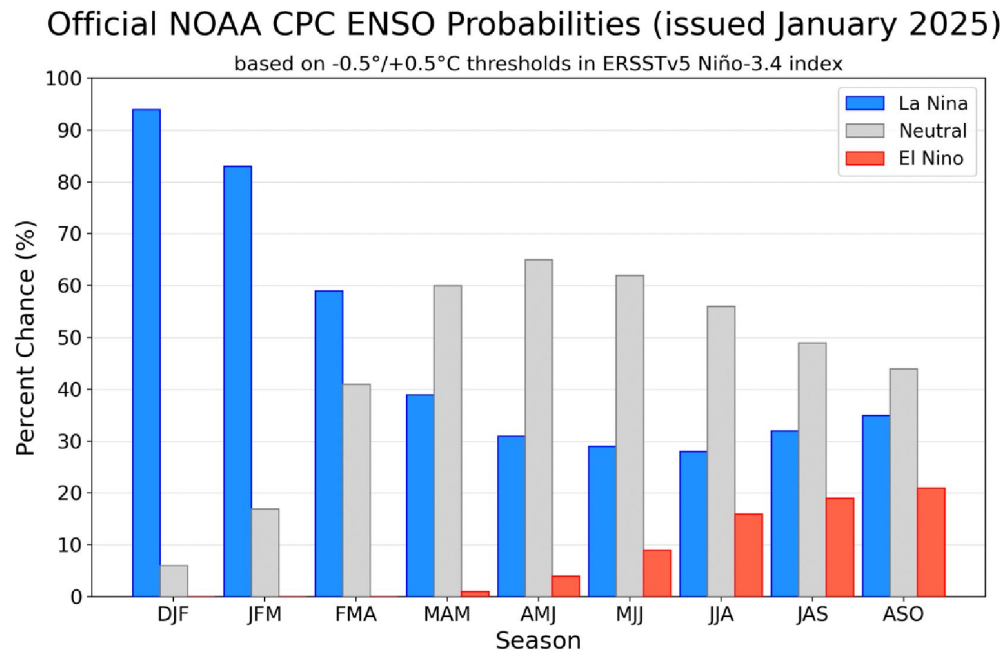


Figure 7. Official ENSO probabilities for the Niño 3.4 sea surface temperature index (5°N - 5°S , 120°W - 170°W). Figure updated 9 January 2025.

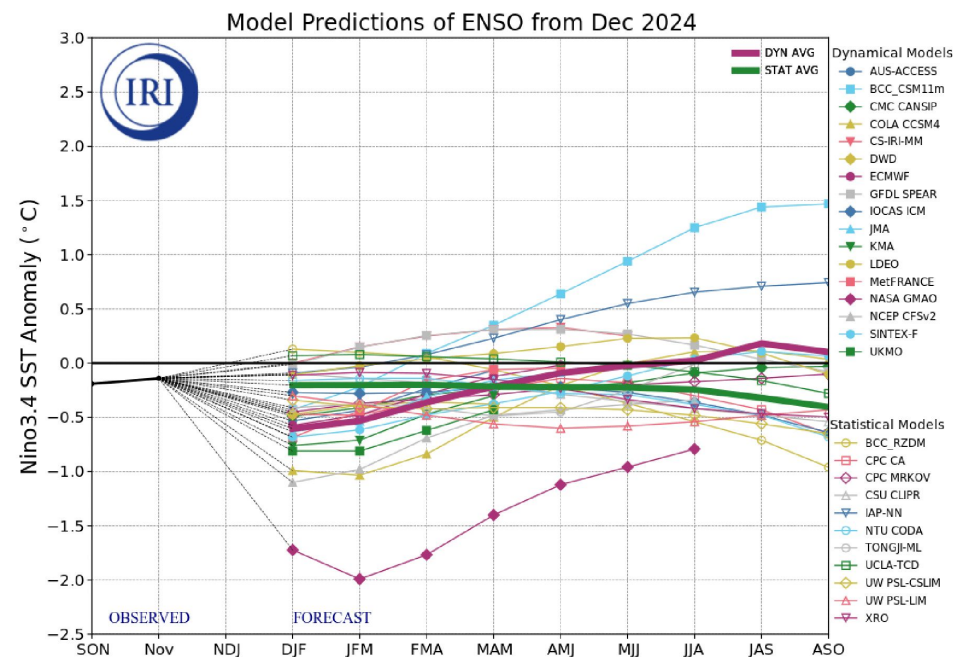
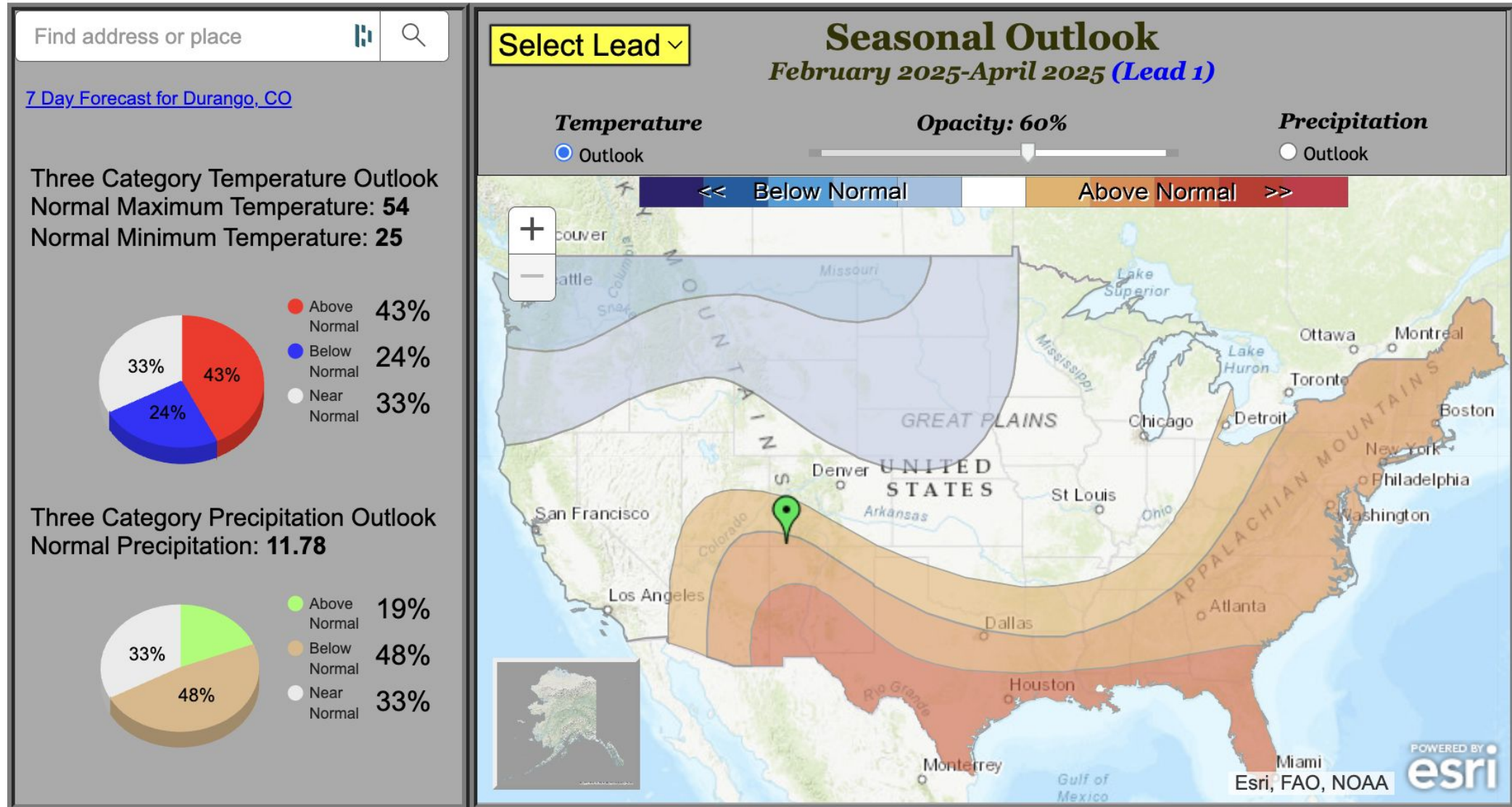


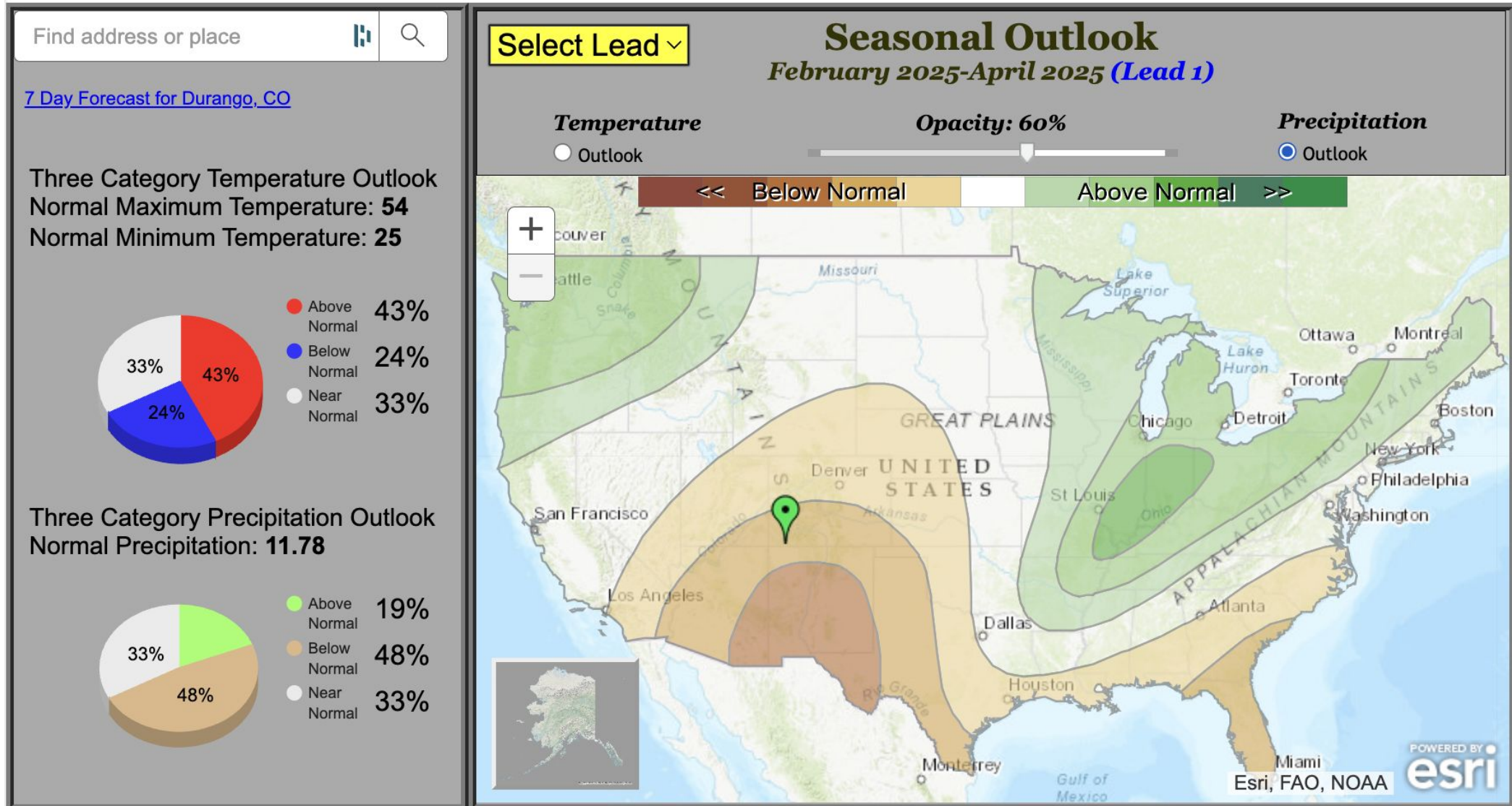
Figure 6. Forecasts of sea surface temperature (SST) anomalies for the Niño 3.4 region (5°N - 5°S , 120°W - 170°W). Figure updated 19 December 2024 by the International Research Institute (IRI) for Climate and Society.

“La Niña conditions are present and are expected to persist through February-April 2025 (59% chance), with a transition to ENSO-neutral likely during March-May 2025 (60% chance)” https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/ensodisc.shtml

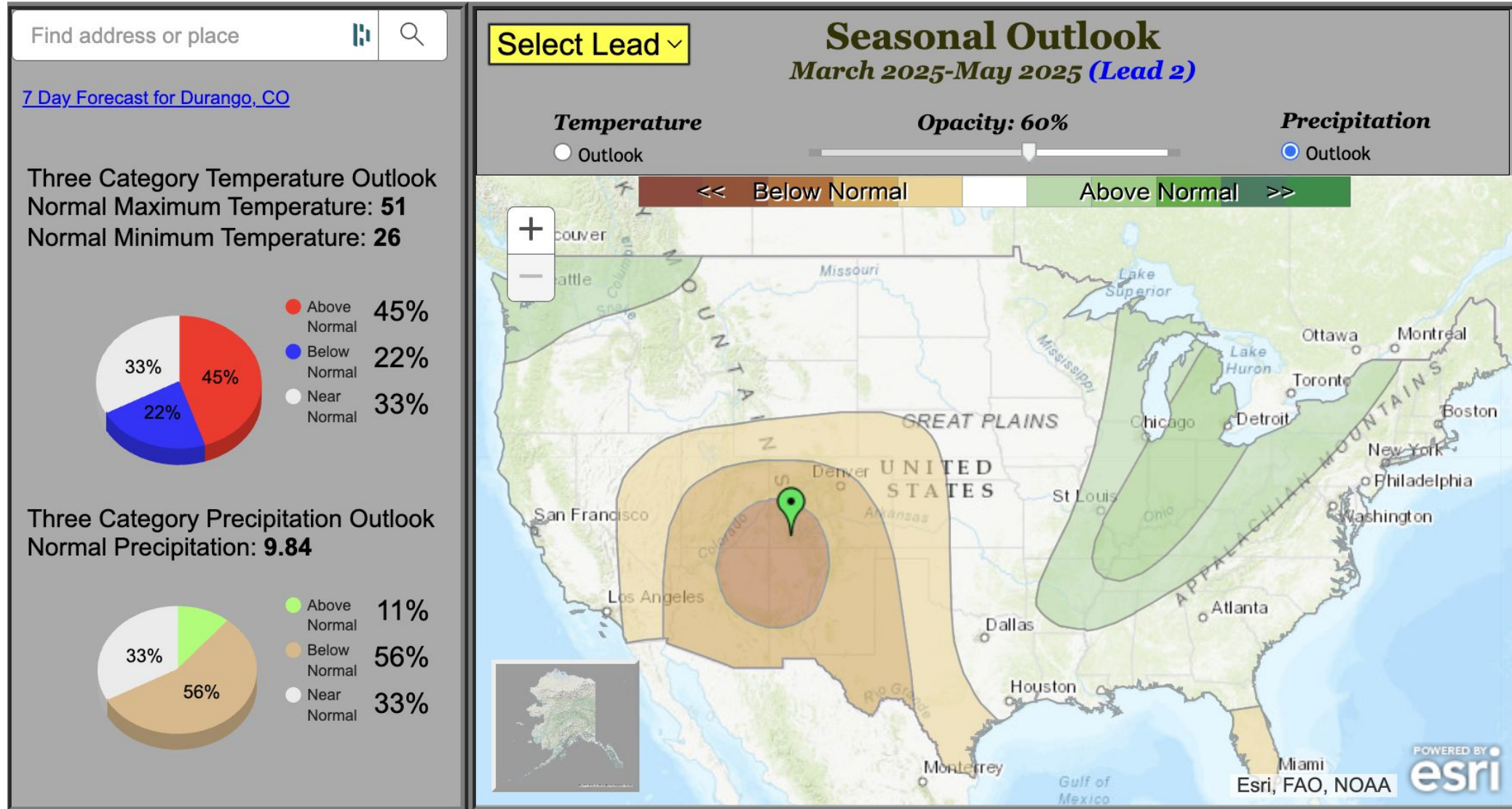
NOAA's Feb-Mar-Apr temperature outlook



NOAA's Feb-Mar-Apr precipitation outlook



NOAA's spring (Mar-Apr-May) precipitation outlook



Takeaways

- December 2024 was very warm across Colorado, and concluded a very warm calendar year: 4th warmest on record.
- Water Year 2025 was off to a very warm start through December, with wetter than average conditions in southeast Colorado (from the huge November storm) and close to average elsewhere.
- January has been cold, with above average snowfall in eastern Colorado, but little precipitation in the southwest
- La Niña is in place but expected to wane by spring
- Spring seasonal outlook is concerning for the southwestern US, with increased odds of warmer and drier than normal conditions
 - But as always, take seasonal outlooks with a grain of salt!





Thank you!



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