

Colorado Climate Center – *WATF Climate Update*

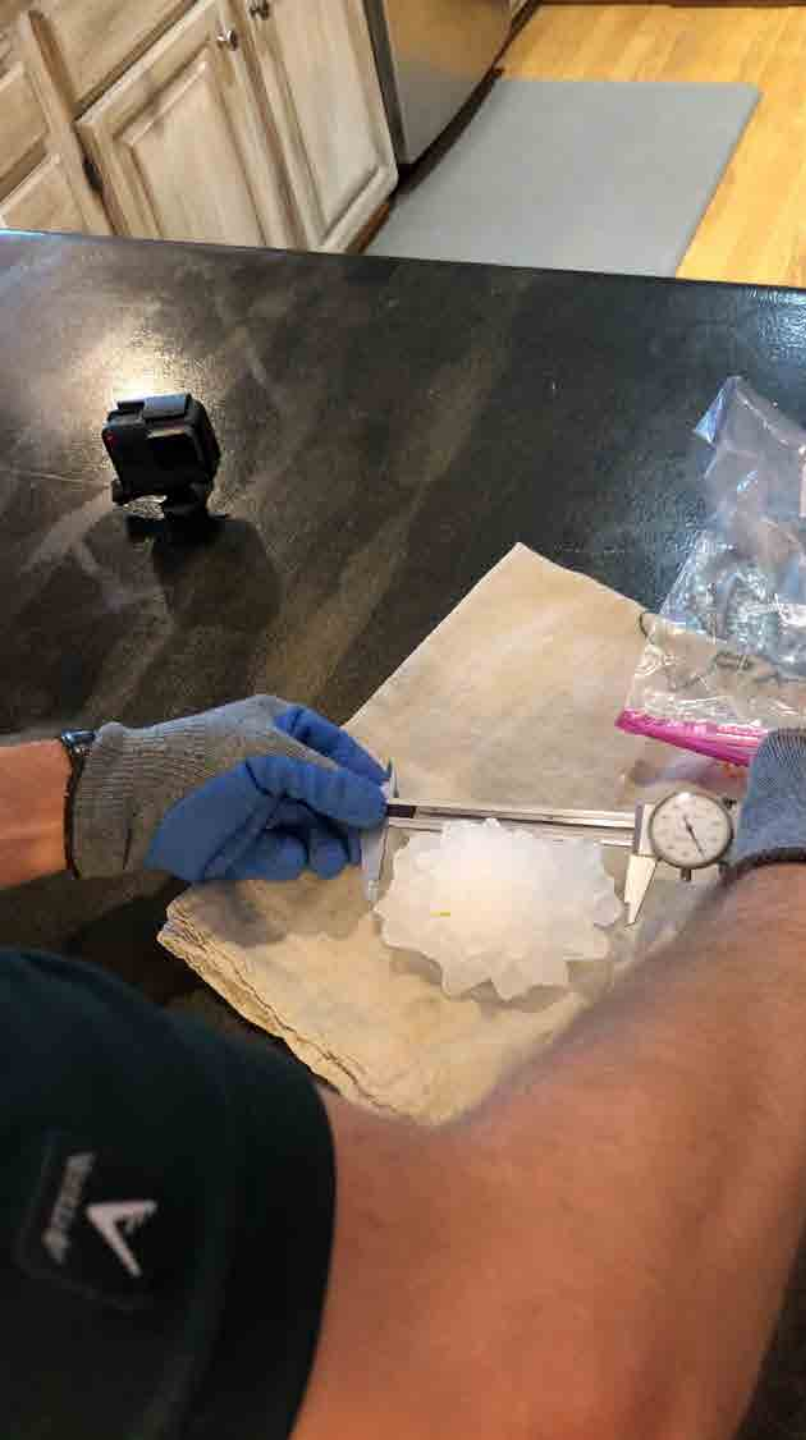
Russ Schumacher, state climatologist

Water Availability Task Force

August 27, 2019



ATMOSPHERIC SCIENCE
COLORADO STATE UNIVERSITY



2019 Water Year To Date

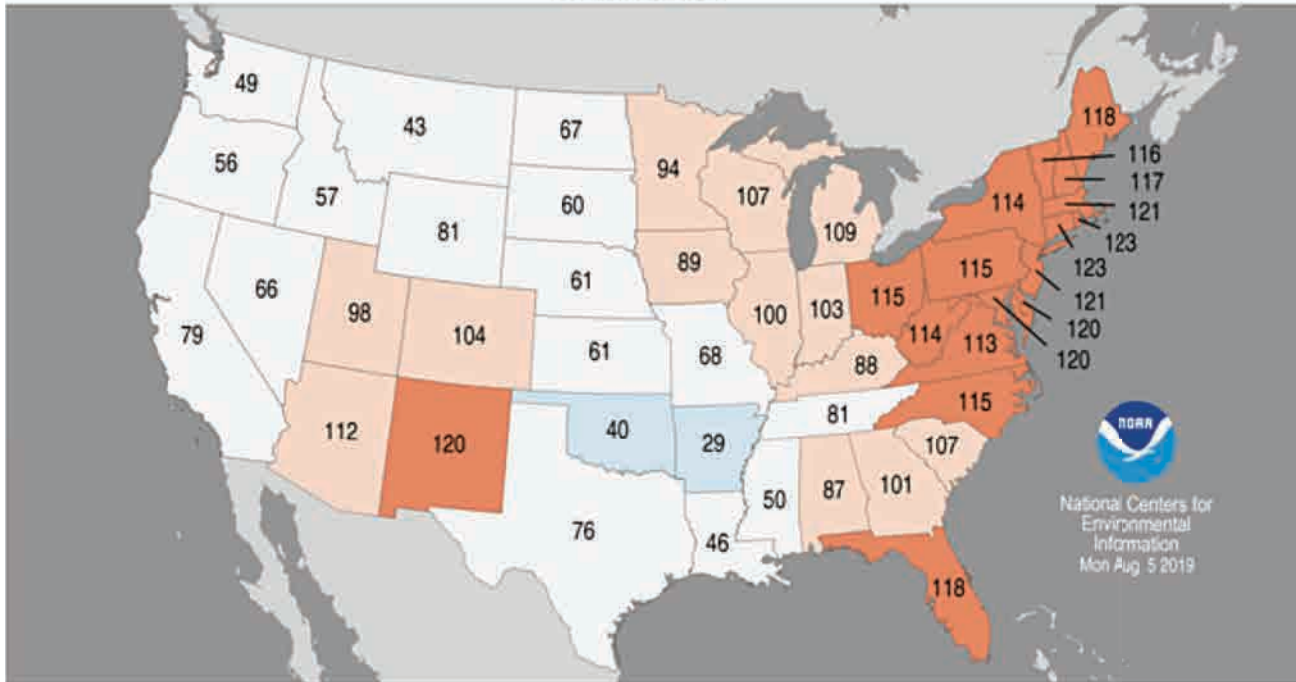
temperature, precipitation,
evaporative demand



Statewide Average Temperature Ranks

July 2019

Period: 1895–2019



Water year thus far: 0.1°F below the 20th century average

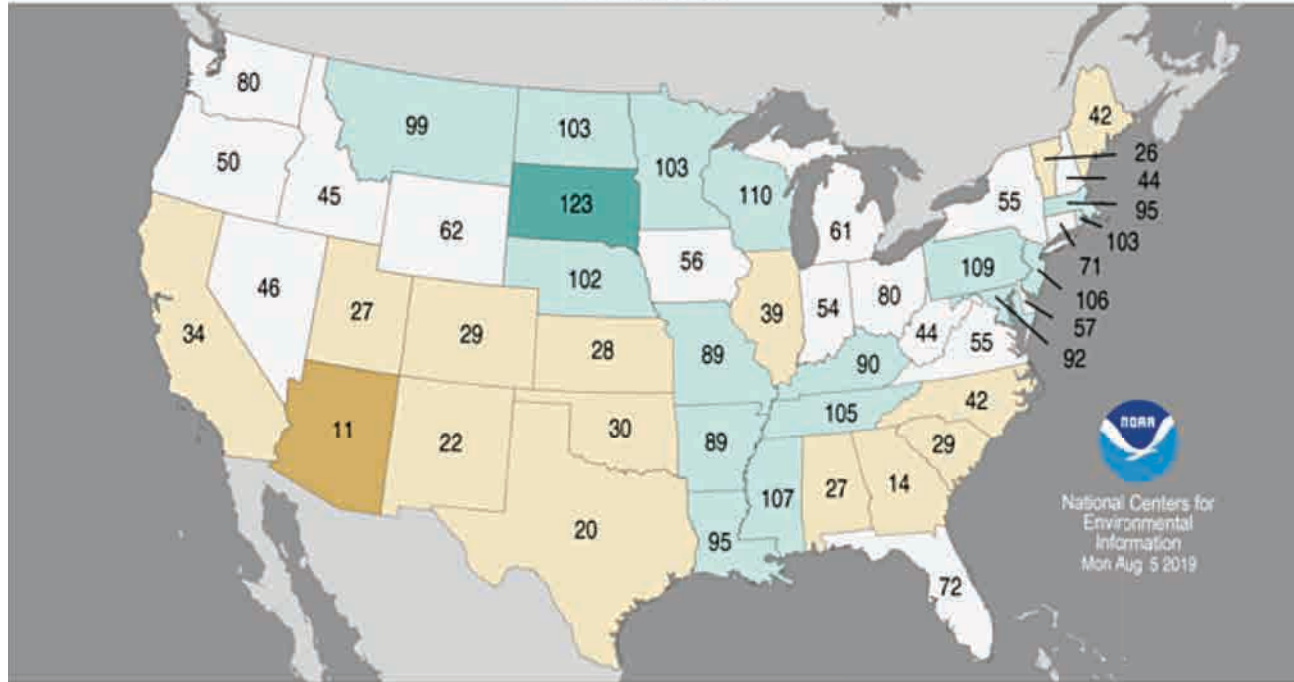
Month	T Rank (of 125 years)	Above, below, or near avg?
Oct	35 th	below
Nov	39 th	below
Dec	80 th	near
Jan	90 th	above
Feb	28 th	below
Mar	66 th	near
Apr	108 th	above
May	5 th	much below
June	42 nd	below
July	104 th	above



Statewide Precipitation Ranks

July 2019

Period: 1895–2019



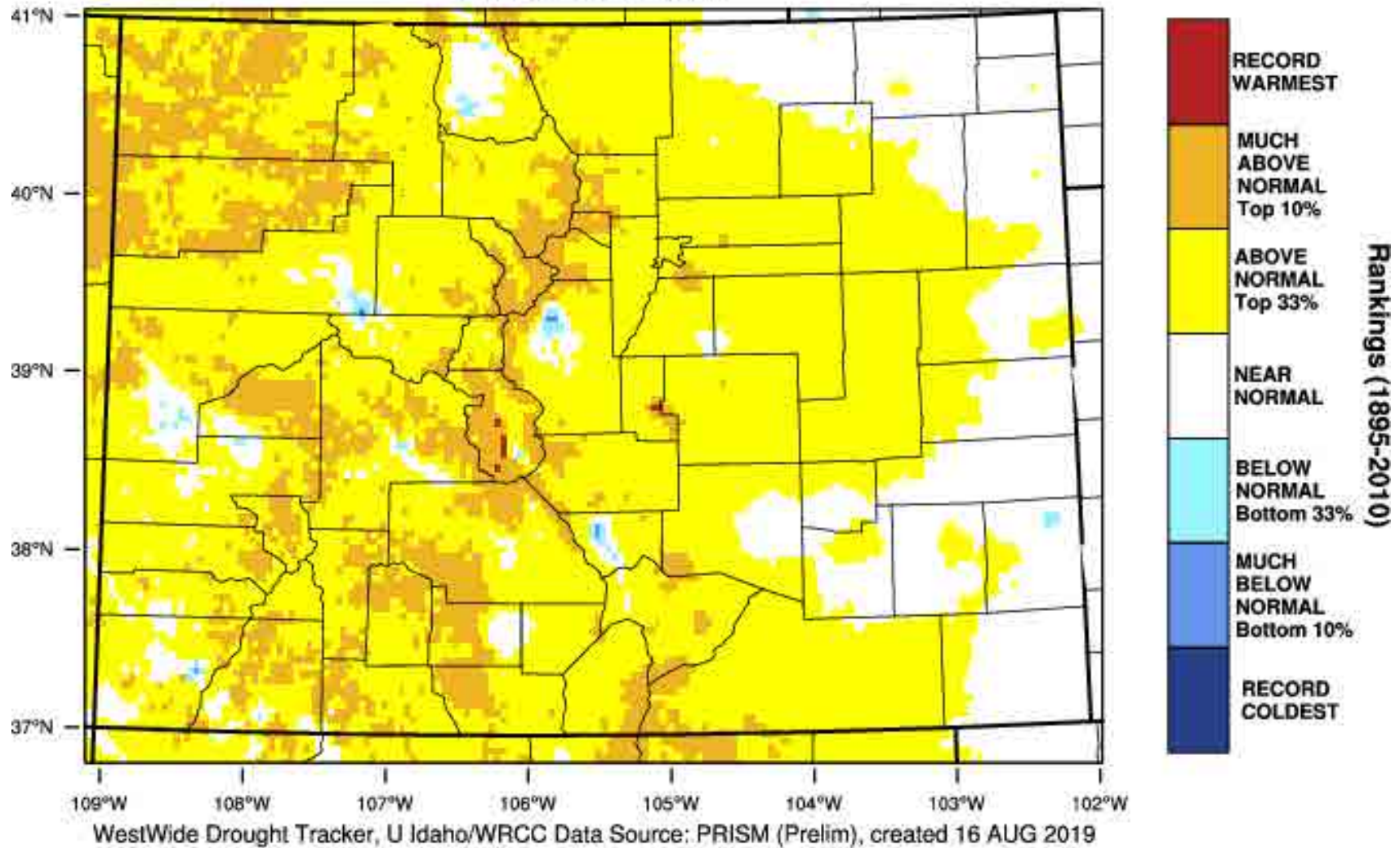
16th wettest October – July

Month	P Rank (of 125 years)	Above, below, or near avg?
Oct	112 th	above
Nov	45 th	near
Dec	31 st	below
Jan	94 th	above
Feb	109 th	above
Mar	120 th	much above
Apr	42 nd	below
May	111 th	above
June	82 nd	near
July	29 th	below



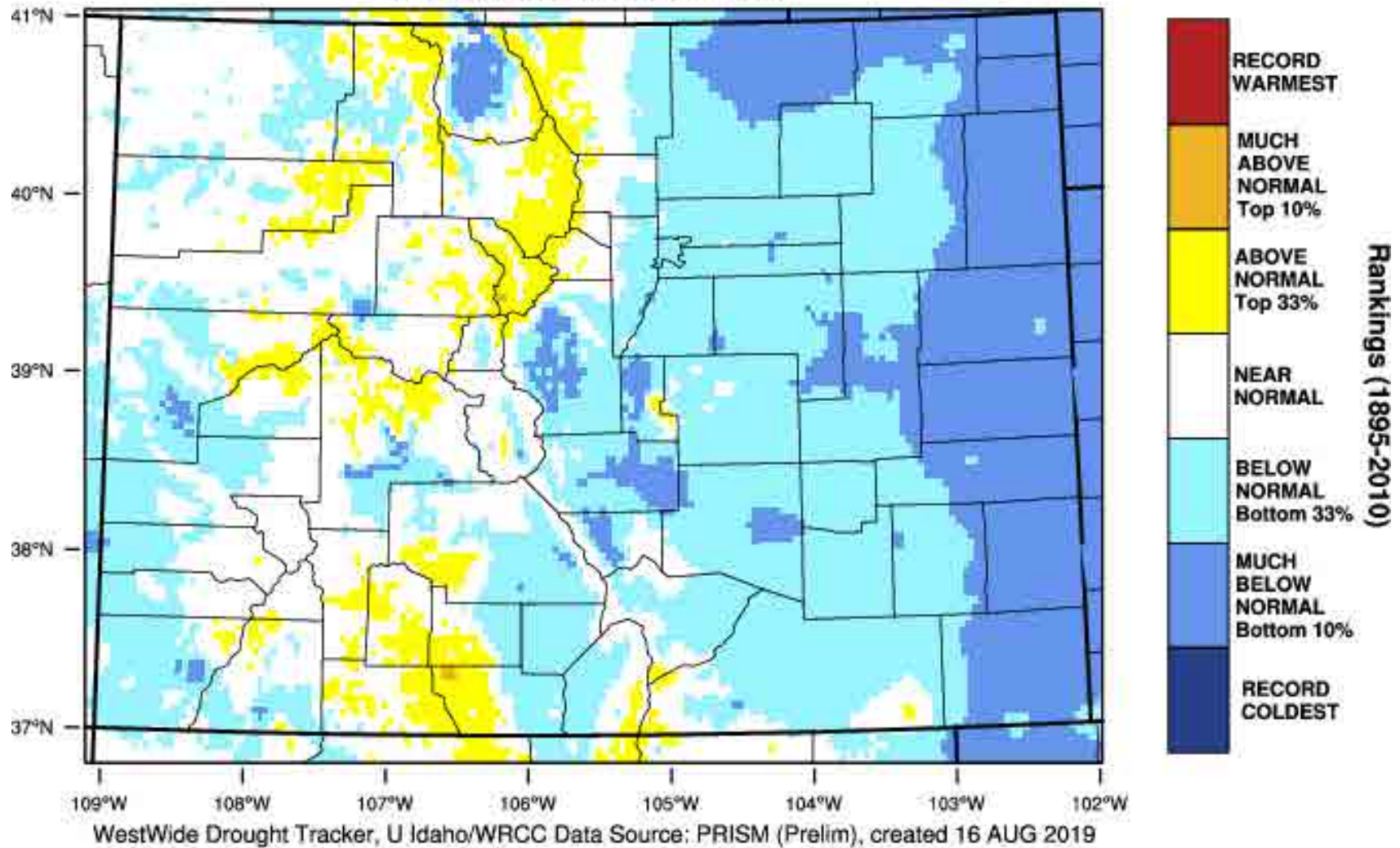
Colorado - Mean Temperature

July 2019 Percentile

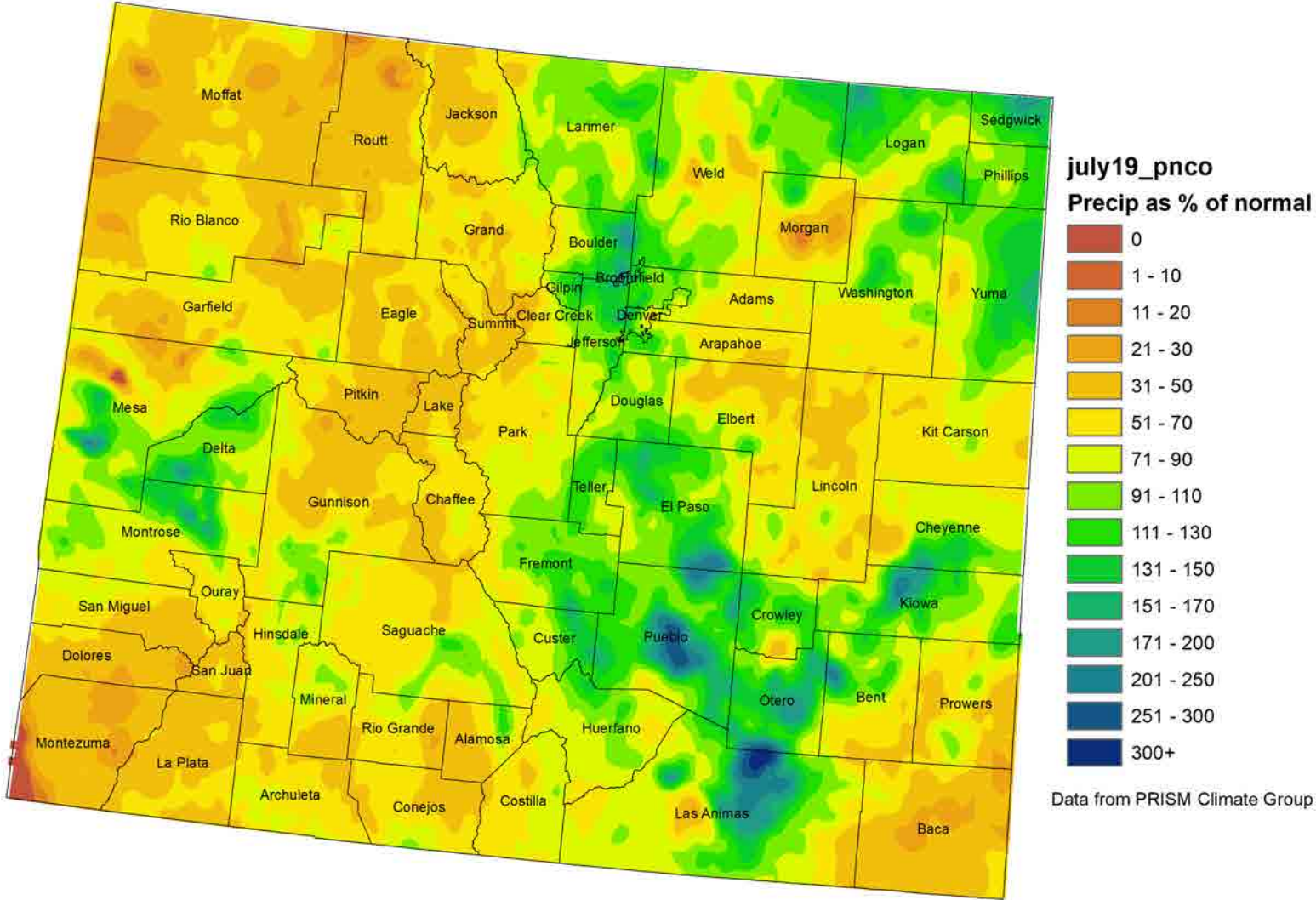


Colorado - Mean Temperature

October-July 2019 Percentile

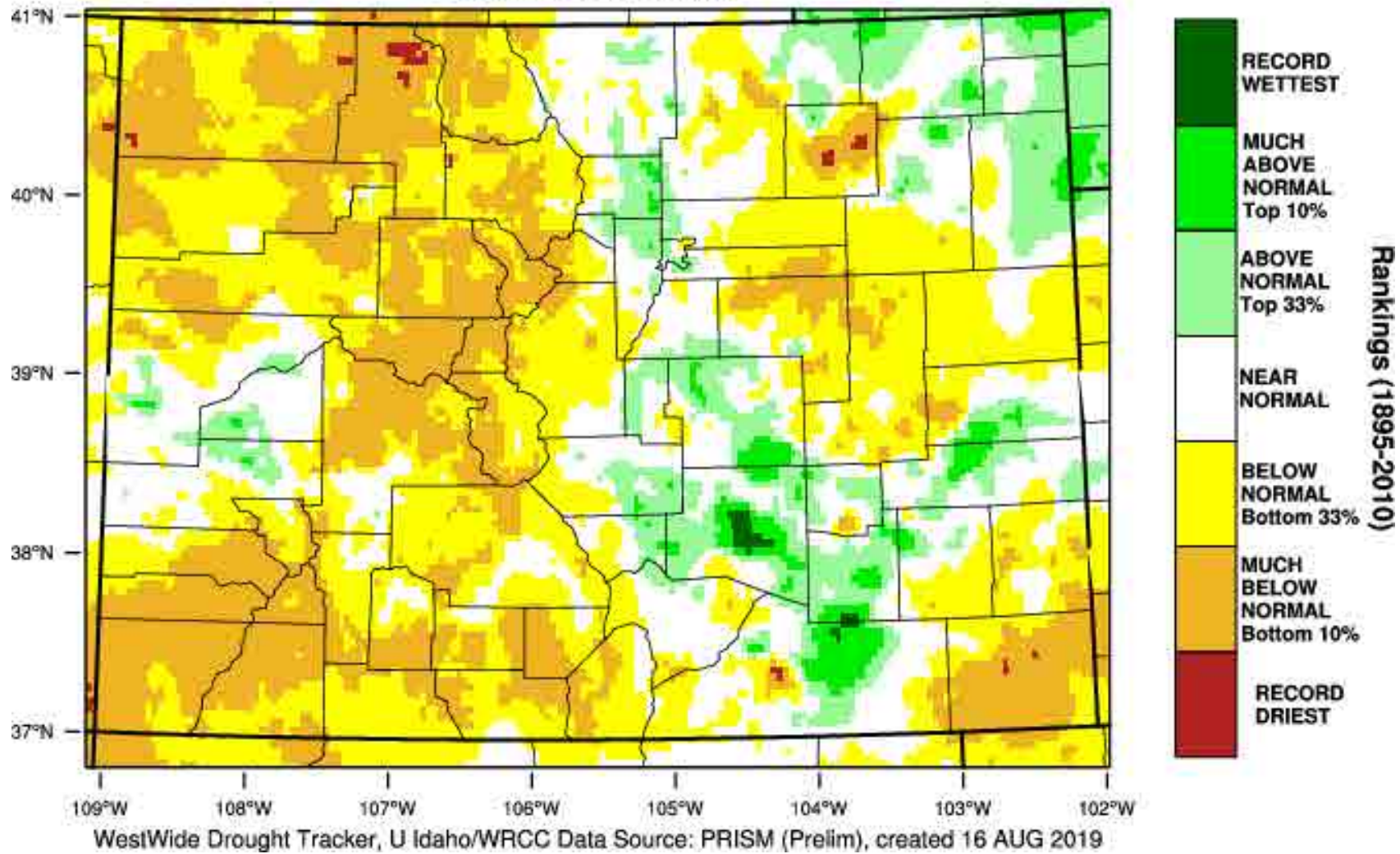


Colorado July 2019 Precipitation as a Percentage of Normal

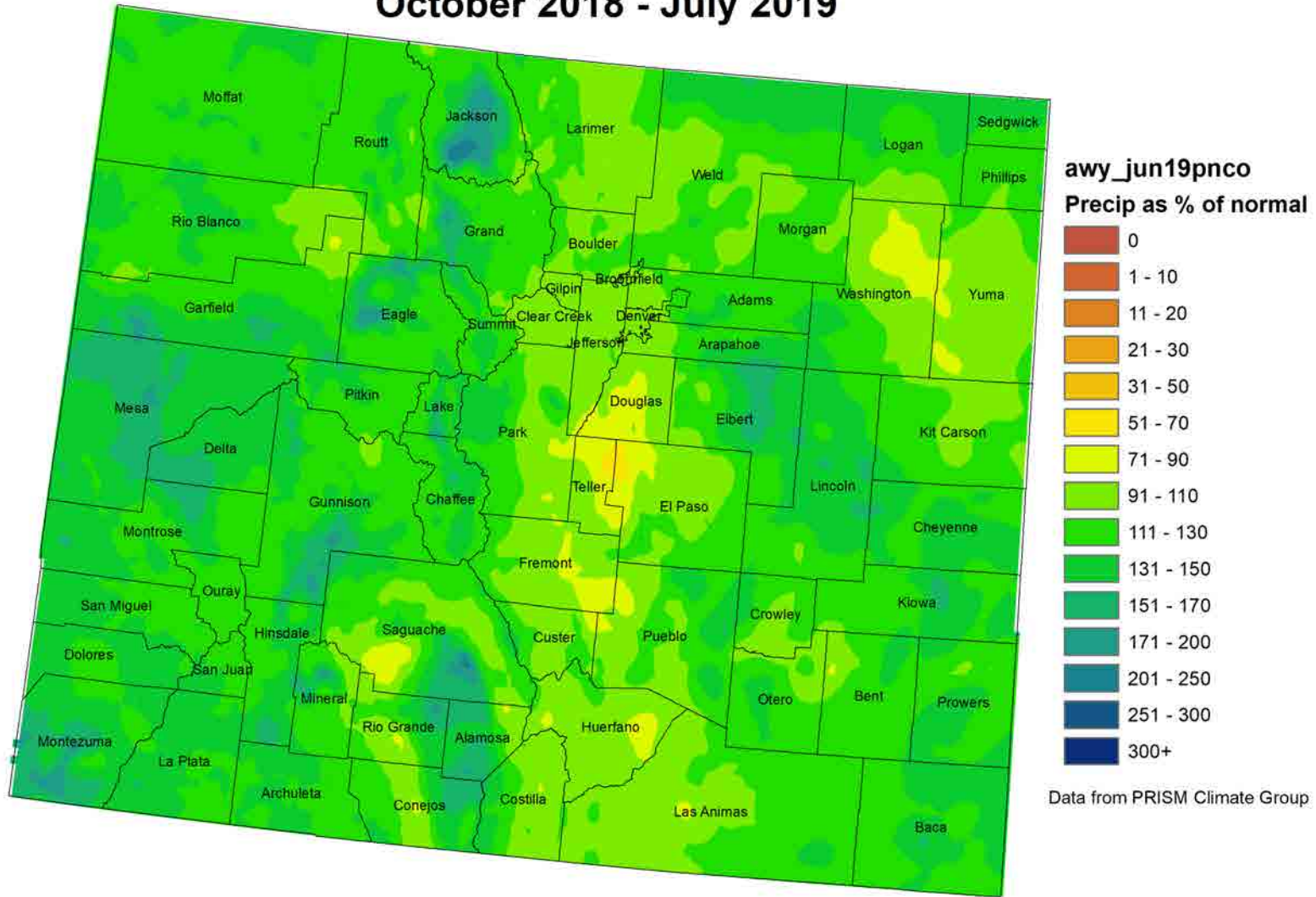


Colorado - Precipitation

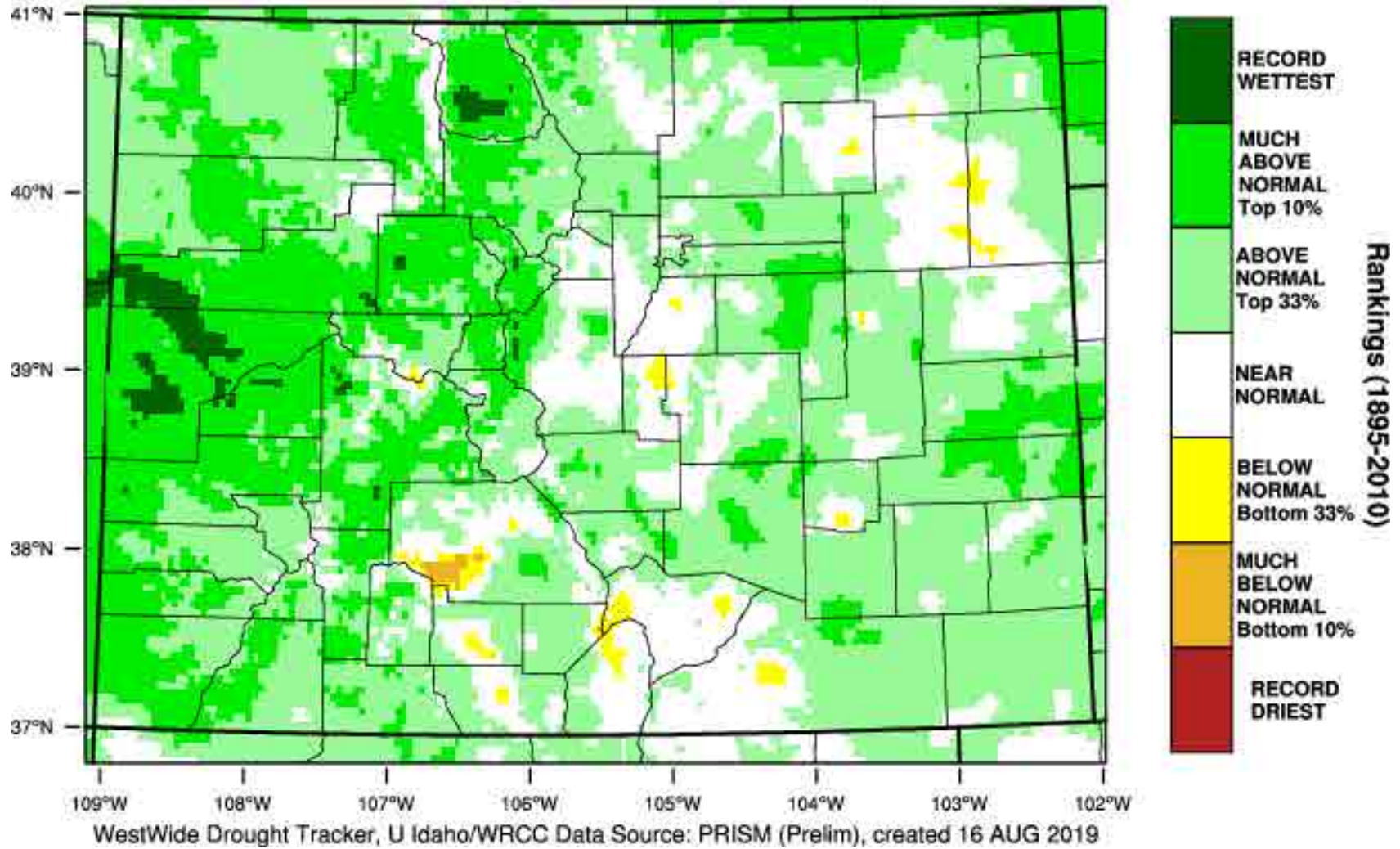
July 2019 Percentile



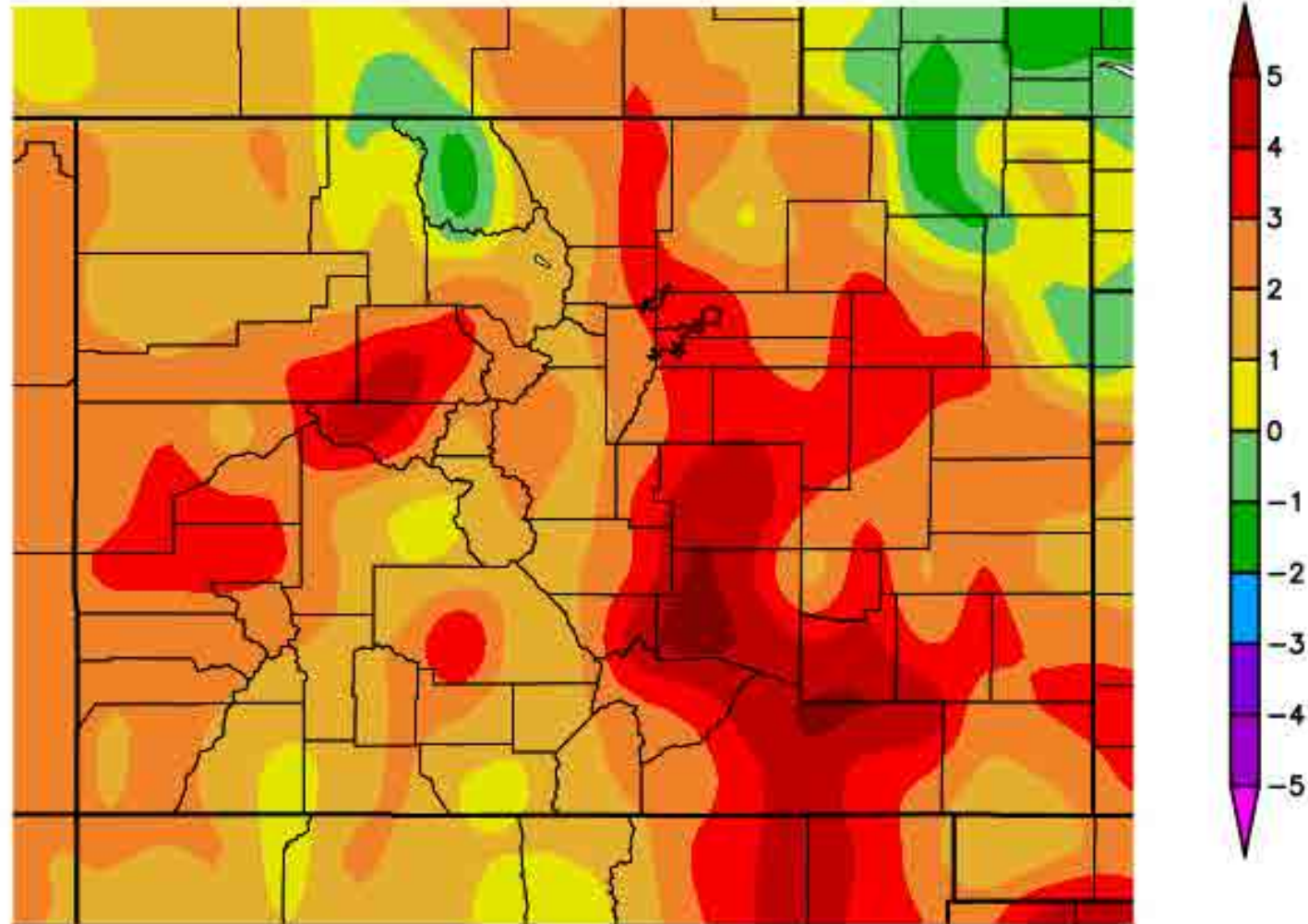
Colorado Water Year 2019 Precipitation as a Percentage of Normal October 2018 - July 2019



Colorado - Precipitation October-July 2019 Percentile



Departure from Normal Temperature (F) 8/1/2019 - 8/25/2019



Generated 8/26/2019 at HPRCC using provisional data.

NOAA Regional Climate Centers

90-Degree Days

90 Degree Days	2019 Total	Since July 1st
Fort Collins	31	27
Boulder	33	29
Denver	30	34
		26
		49
		23
		34
		46
		49
Cortez	45	43
Dillon	0	0



NWS Pueblo ✓
@NWSPueblo

The temperature has met or exceeded 99 degrees in Pueblo the last 6 days (Aug 15-20). This is the latest 3, 4, 5, and 6 day stretch of 99+ degree days at Pueblo Memorial Airport since data collection began in 1954.

[#cowx](#)

7:05 PM · Aug 20, 2019 · [Twitter Web App](#)



Daily records

(Water year thus far:
Oct 1 – Aug 21)

Weather Record Broken	Record broken for a day	Record broken for a month
Highest max temperature	234	5
Highest min temperature	940	37
Lowest max temperature	1373	20
Lowest min temperature	718	5
Precipitation	1241	45
Snowfall	364	9

Source: <https://www.ncdc.noaa.gov/cdo-web/datatools/records>

Note: we are currently investigating the observation of 115F at John Martin Dam on July 20, which if confirmed would be a new state record for maximum temperature



Compare to
last water
year:

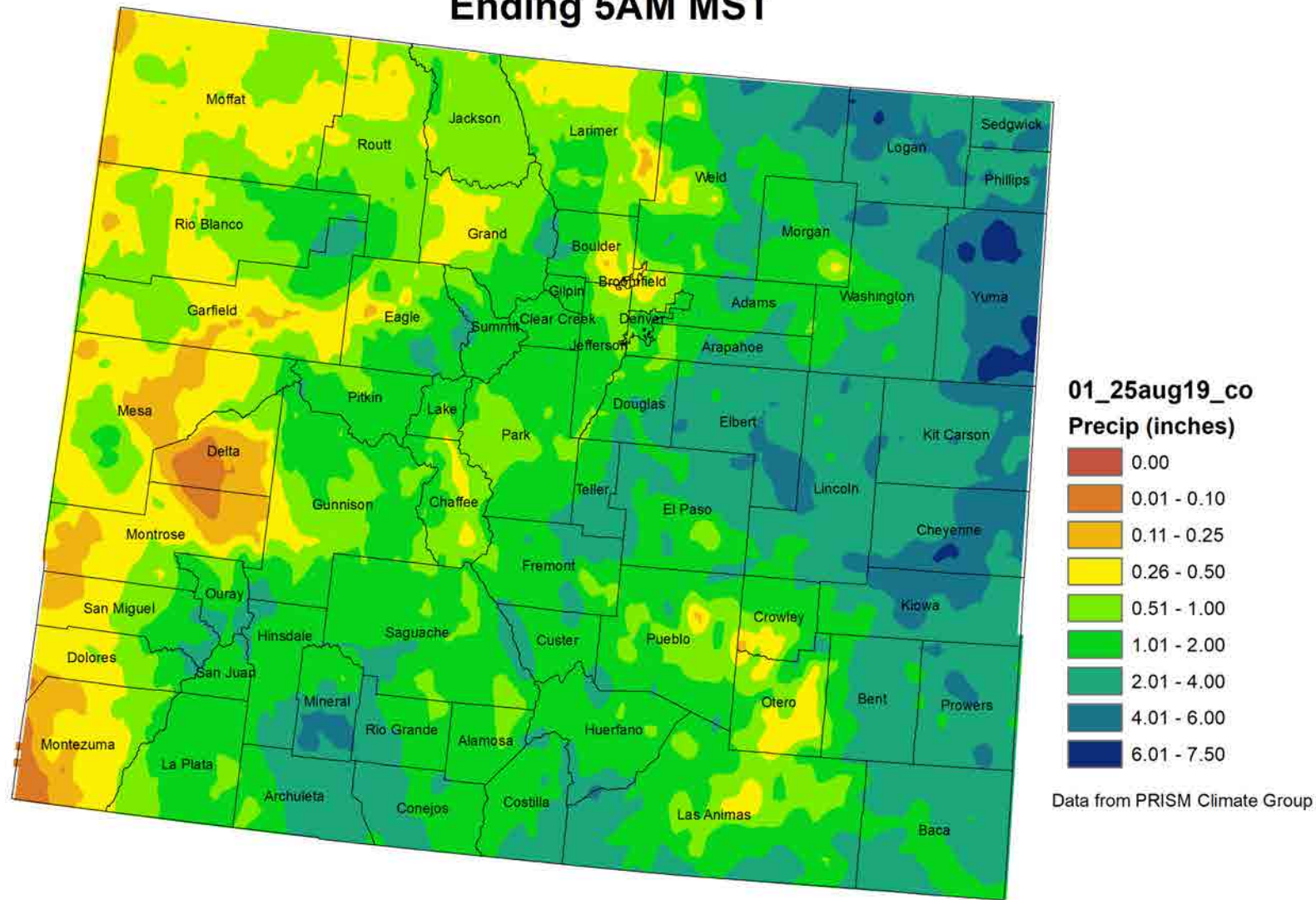
NUMBER OF DAILY AND MONTHLY STATION RECORDS BROKEN in CO

Weather Record Broken	Record broken for a day	Record broken for a month
Highest Max Temperature	1,696	22
Highest Min Temperature	2,971	100
Lowest Max Temperature	560	0
Lowest Min Temperature	292	0
Highest Precipitation	786	17
Highest Snowfall	196	2

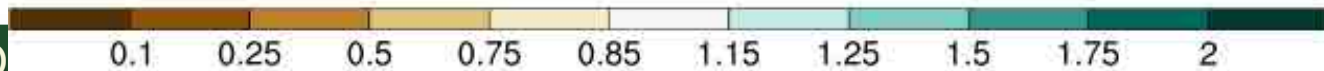
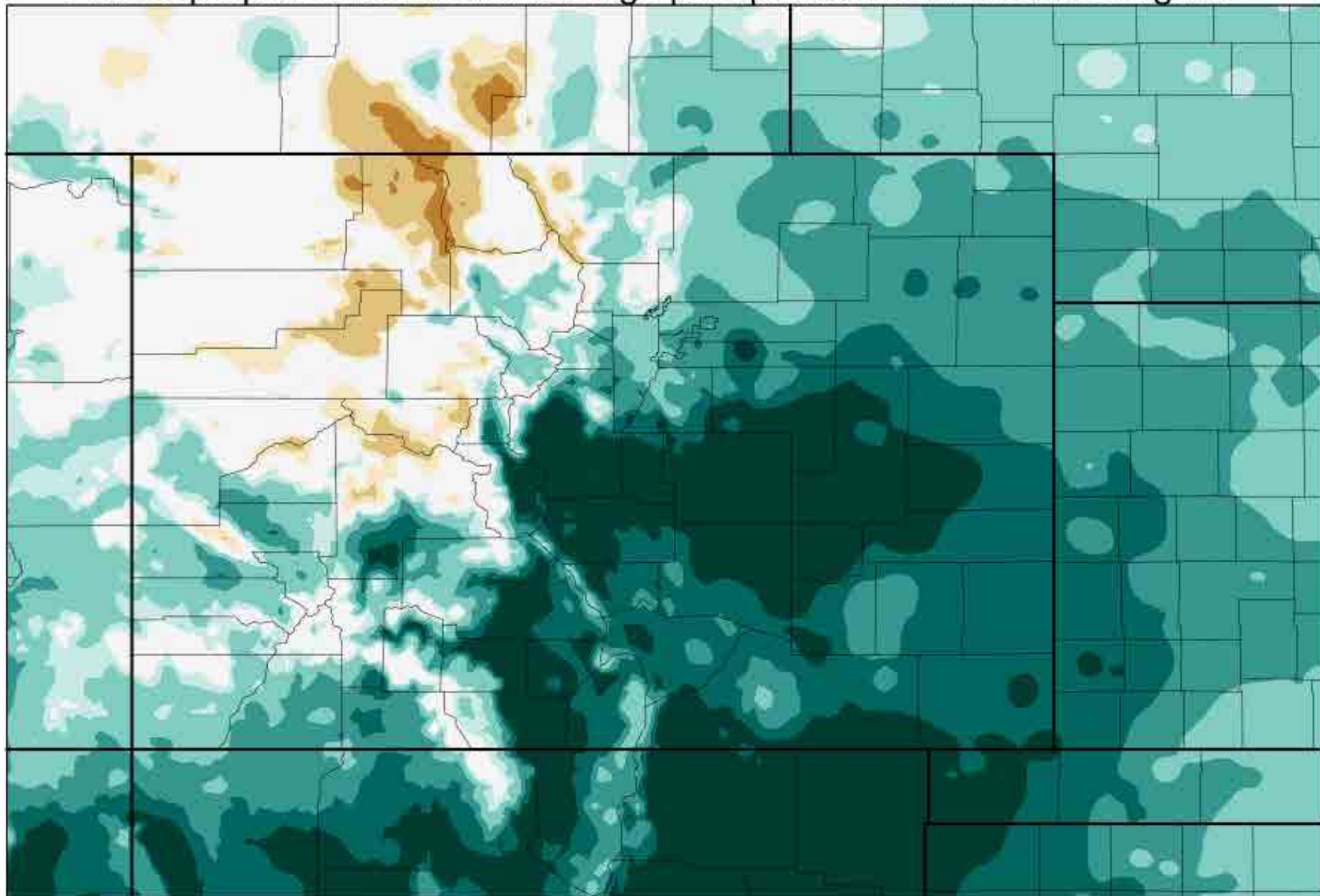
From NOAA NCEP's Select U.S. Records: www.ncdc.noaa.gov/extremes/records



Colorado Month to Date Precipitation 1 - 25 August 2019 Ending 5AM MST



PRISM proportion of annual average precipitation in this month: August



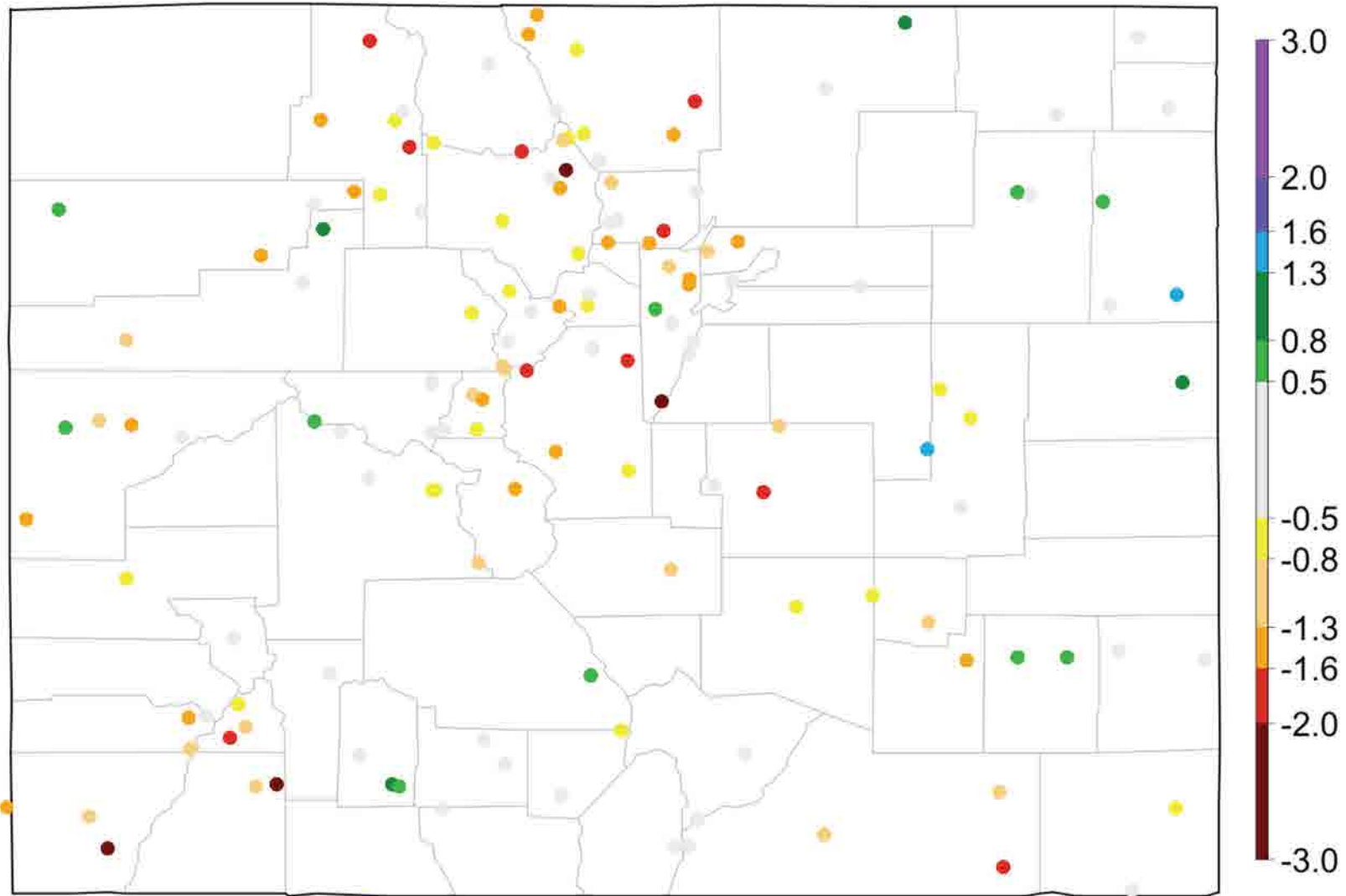
Proportion of precip relative to 1/12th

COLO

Russ Schumacher/Colorado Climate Center



30-day SPI: 7/26/2019 - 8/24/2019

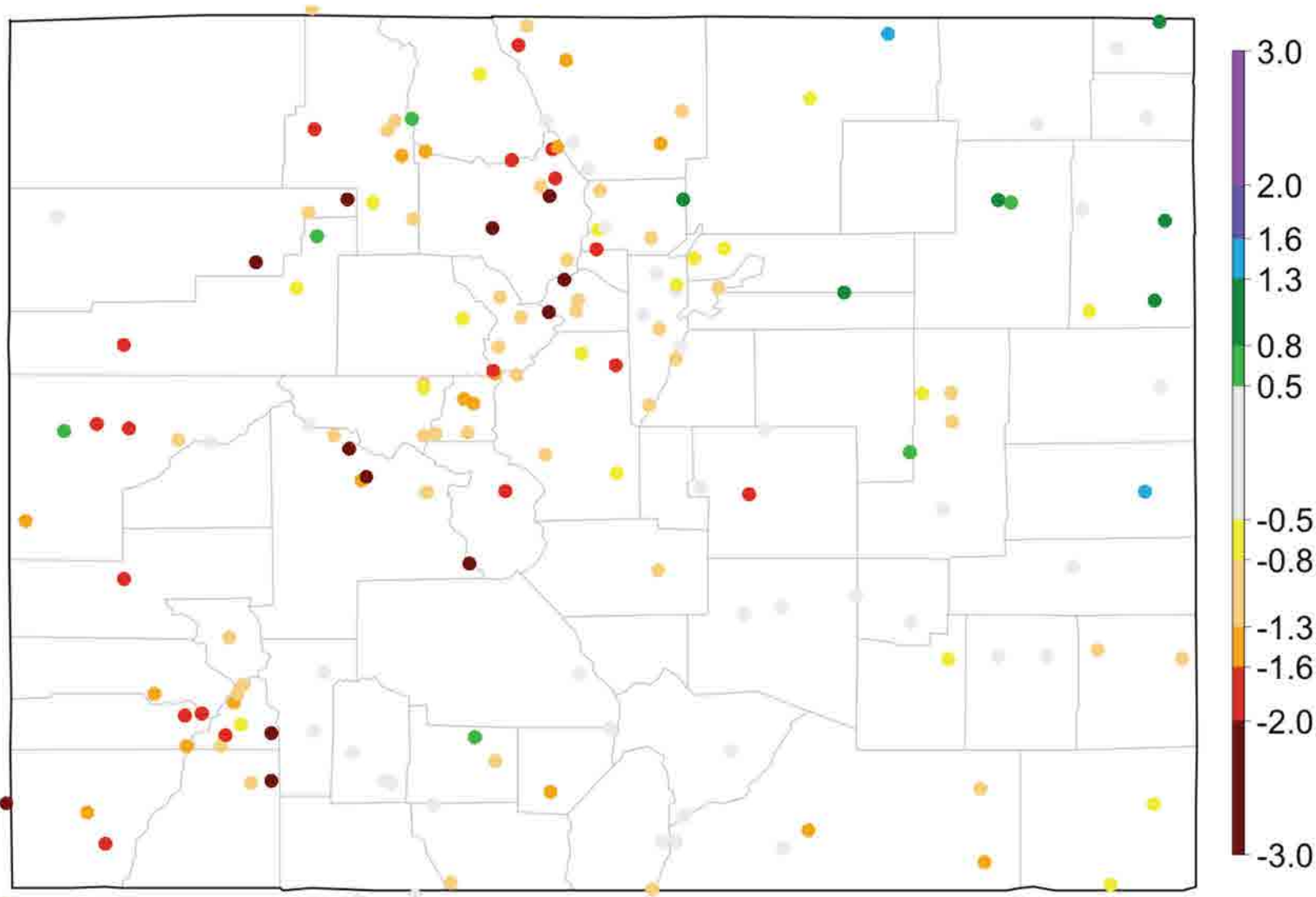


Data from High Plains Regional Climate Center and ACIS

<http://climate.colostate.edu/~drought/spi.html>



60-day SPI: 6/26/2019 - 8/24/2019

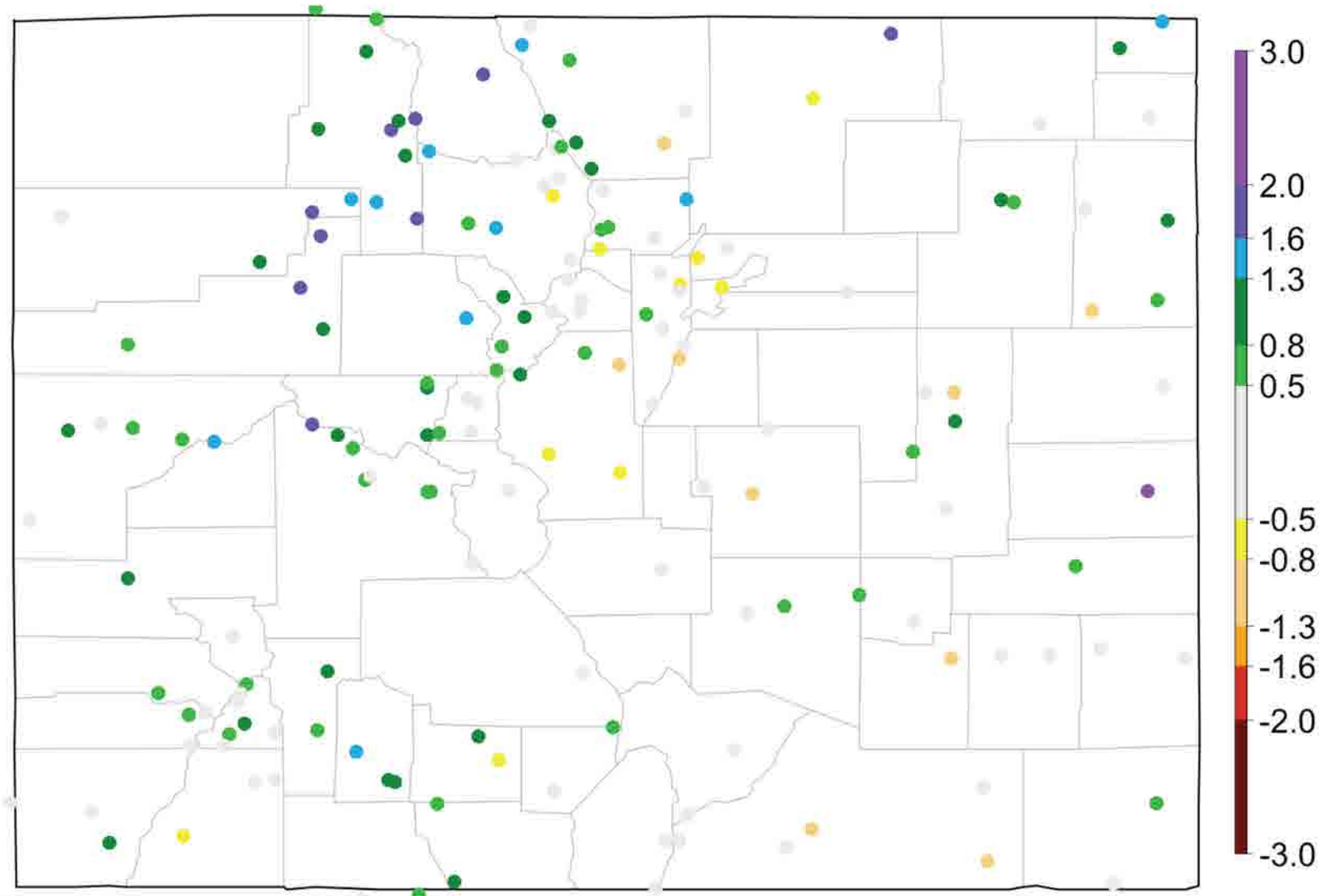


Data from High Plains Regional Climate Center and ACIS

<http://climate.colostate.edu/~drought/spi.html>



120-day SPI: 4/27/2019 - 8/24/2019

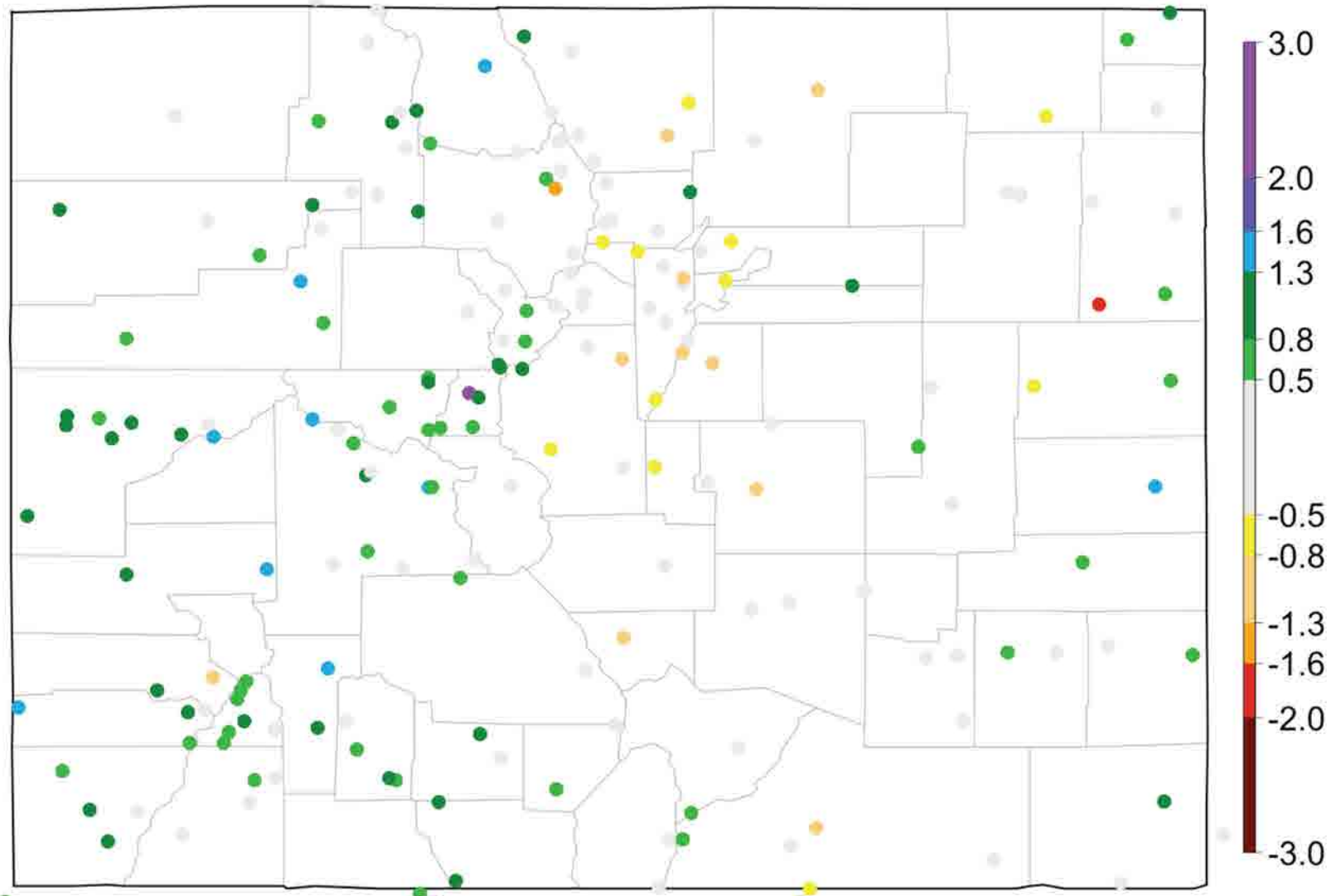


Data from High Plains Regional Climate Center and ACIS

<http://climate.colostate.edu/~drought/spi.html>



12-month SPI: 8/25/2018 - 8/24/2019

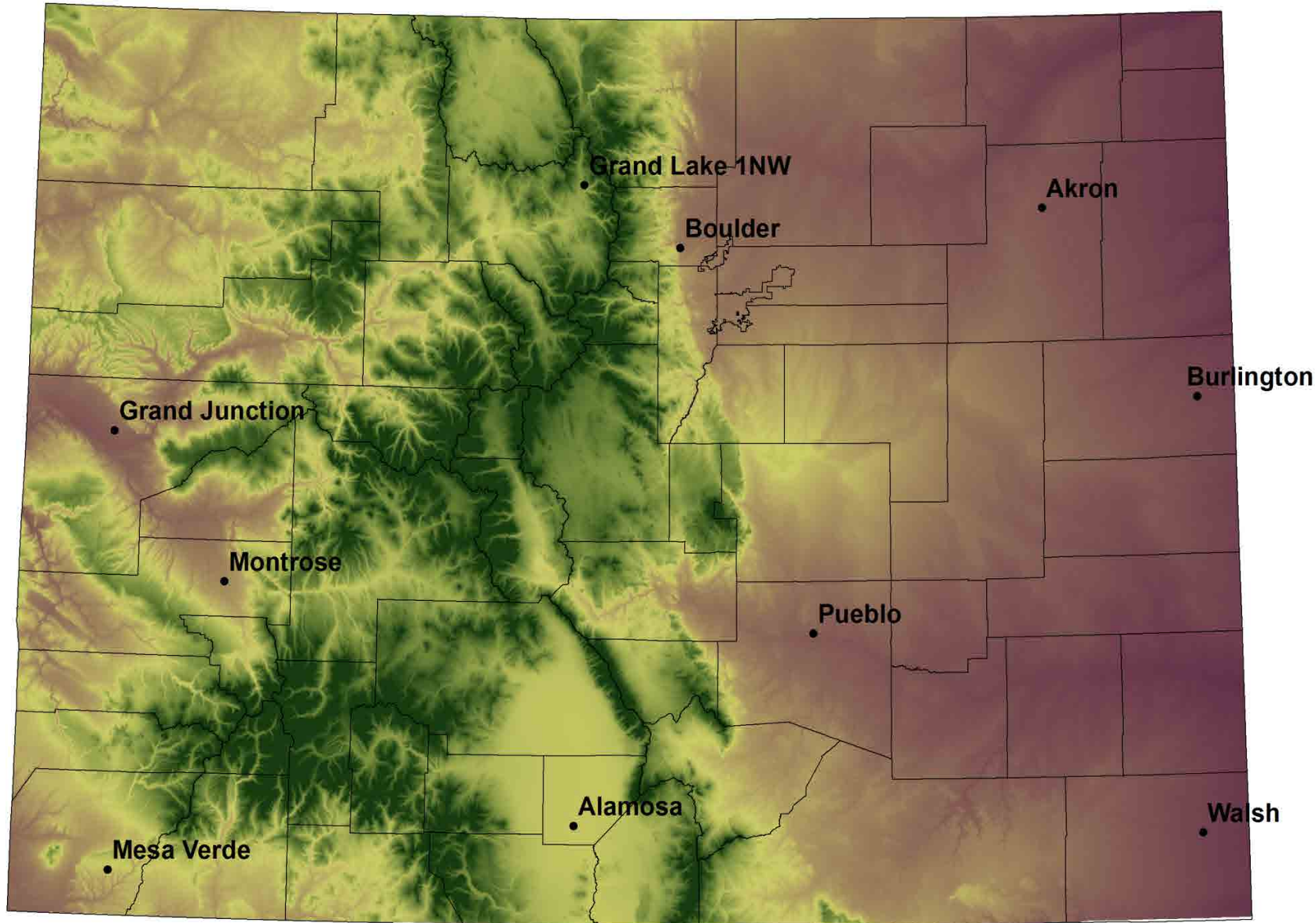


Data from High Plains Regional Climate Center and ACIS

<http://climate.colostate.edu/~drought/spi.html>



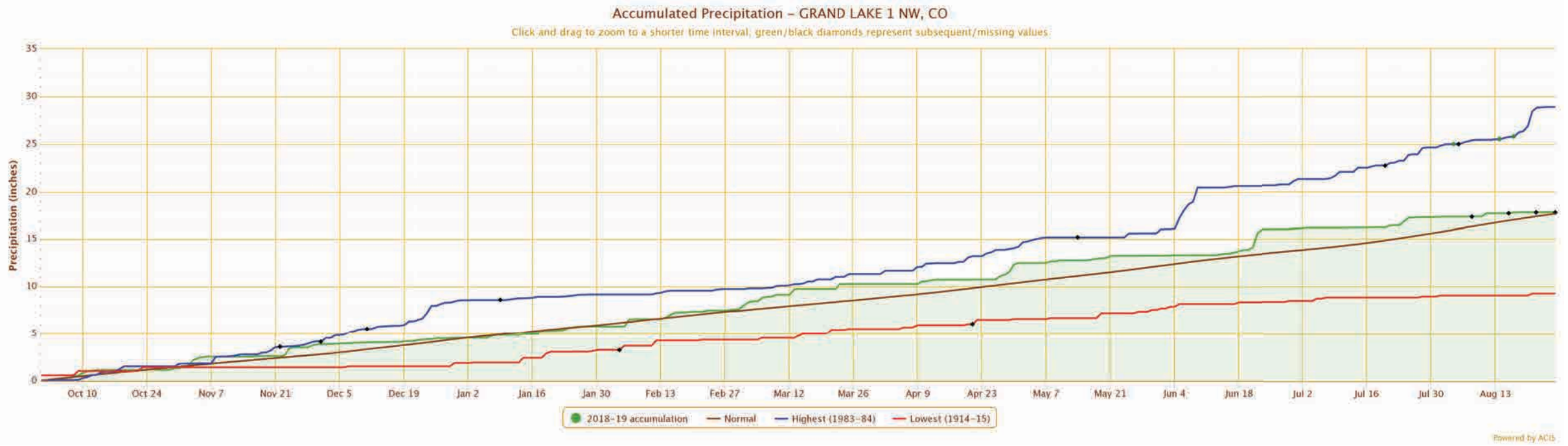
NWS Cooperative Stations for WATF



Water Year 2019 – Station Updates



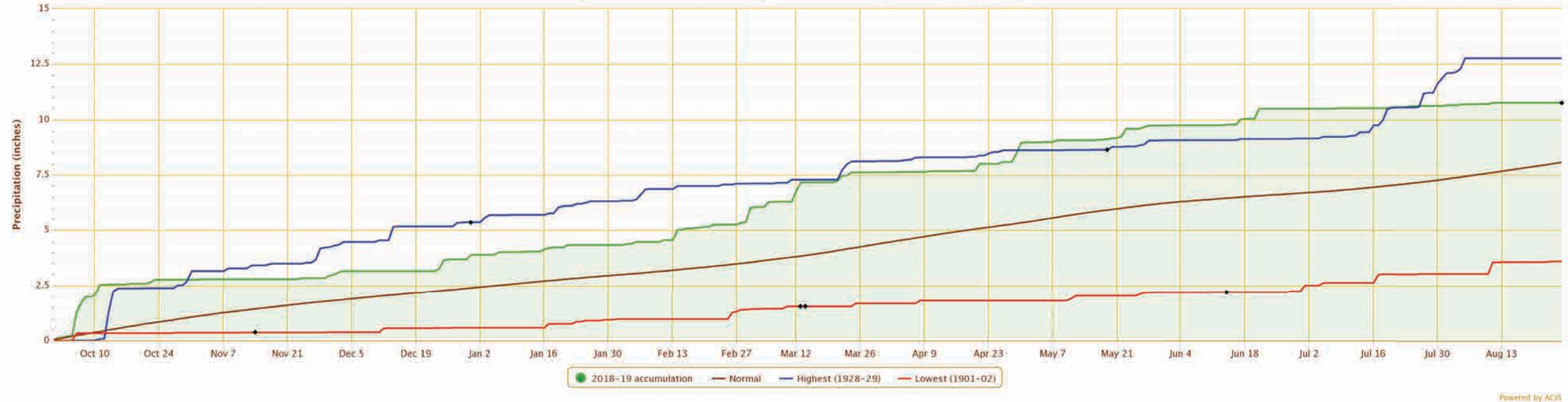
Grand Lake



Grand Junction

Accumulated Precipitation – GRAND JUNCTION WALKER FIELD, CO

Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



5th wettest on record through this point in the water year

But July-August have been 2nd driest on record...

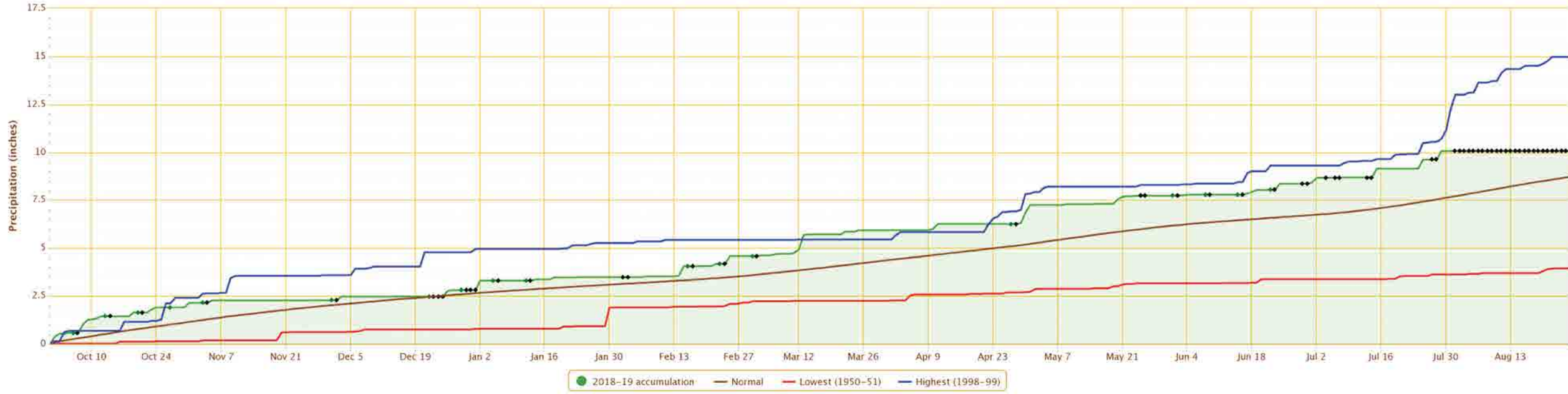
2.7" above average



Montrose

Accumulated Precipitation – MONTROSE NO 2, CO

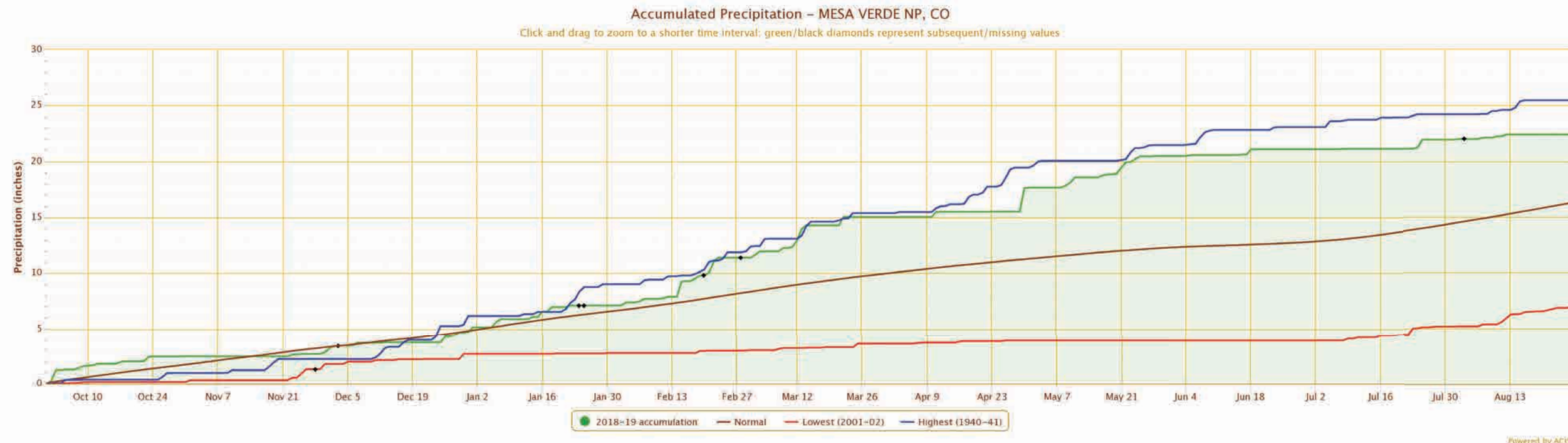
Click and drag to zoom to a shorter time interval. green/black diamonds represent subsequent/missing values.



Powered by ACP



Mesa Verde NP



Powered by ACIS

8th wettest on record through this point in the water year

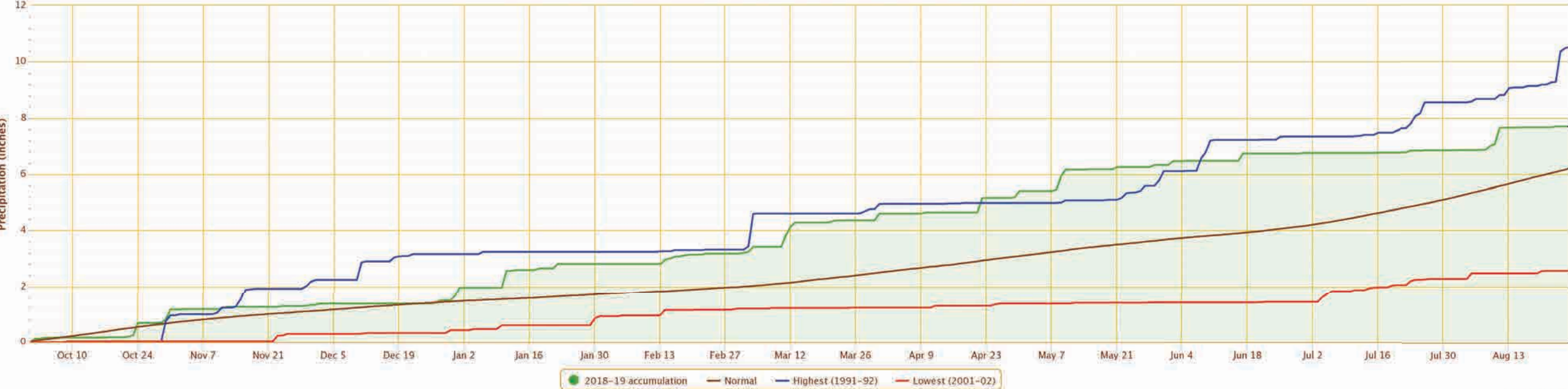
6.1" above average



Alamosa

Accumulated Precipitation – ALAMOSA SAN LUIS VALLEY REGIONAL AP, CO

Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



Powered by ACIS

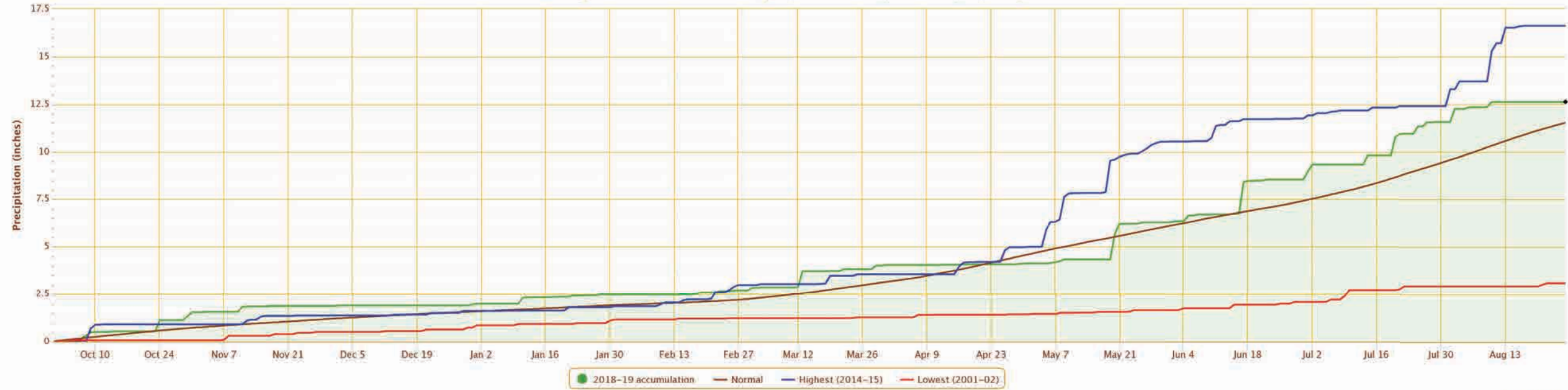
1.5" above average



Pueblo

Accumulated Precipitation – PUEBLO MEMORIAL AP, CO

Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



Powered by ACIS

1.1" above average



Walsh

Accumulated Precipitation - WALSH 1 W, CO
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



Powered by ACIS

2nd wettest on record through this point in the water year

But 4.1" below average since July 3

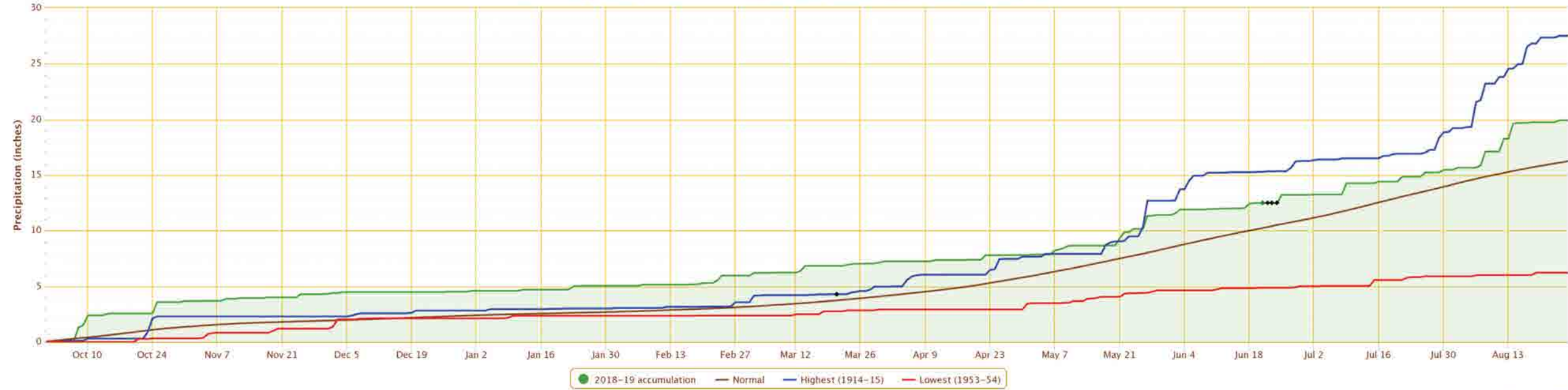
6.2" above average



Burlington

Accumulated Precipitation – BURLINGTON, CO

Click and drag to zoom to a shorter time interval, green/black diamonds represent subsequent/missing values



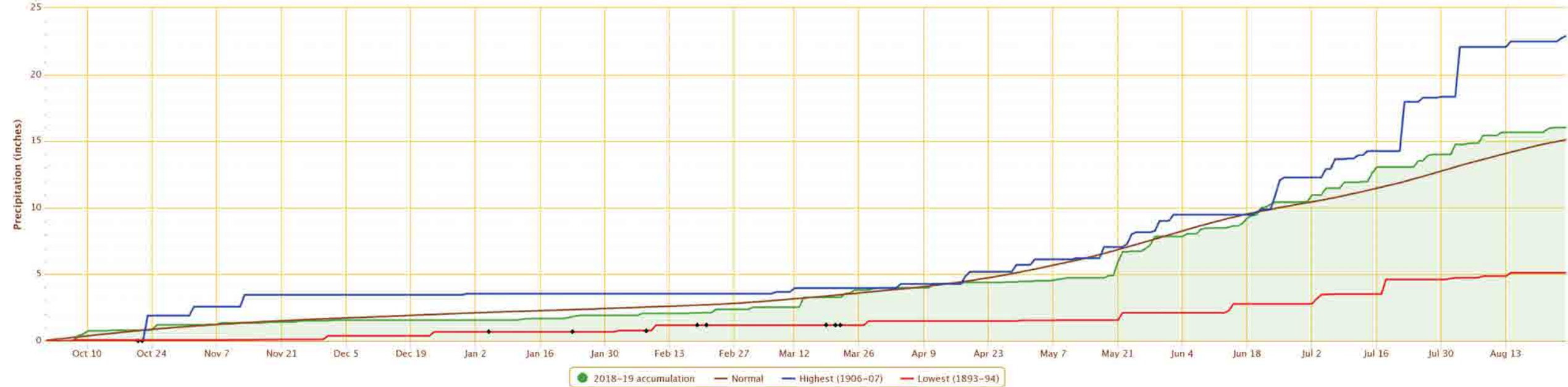
Powered by ACTS



Akron

Accumulated Precipitation - AKRON 4 E, CO

Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



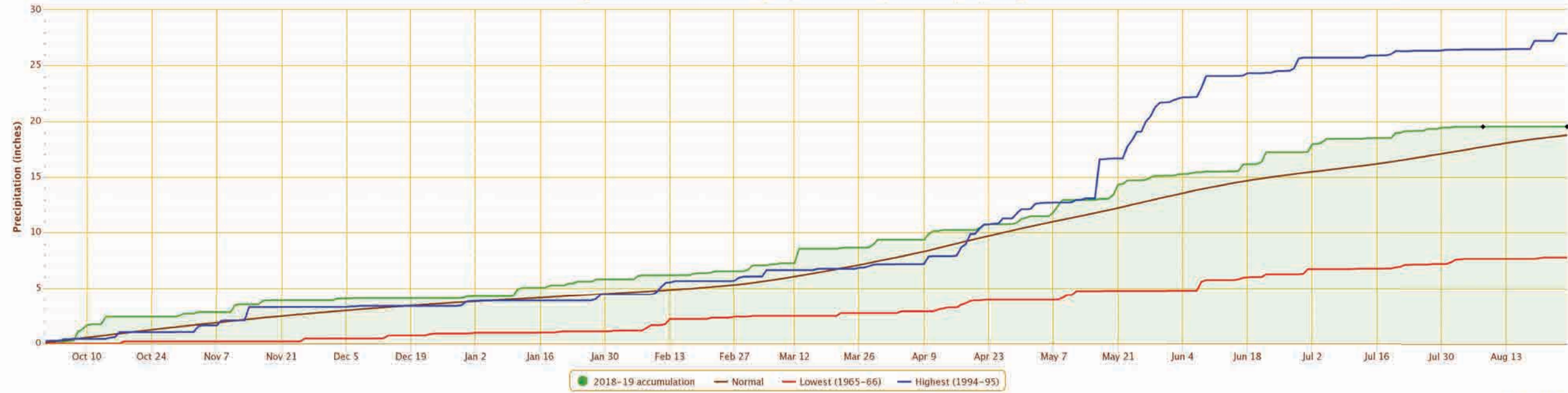
Powered by ACIS



Boulder

Accumulated Precipitation - BOULDER, CO

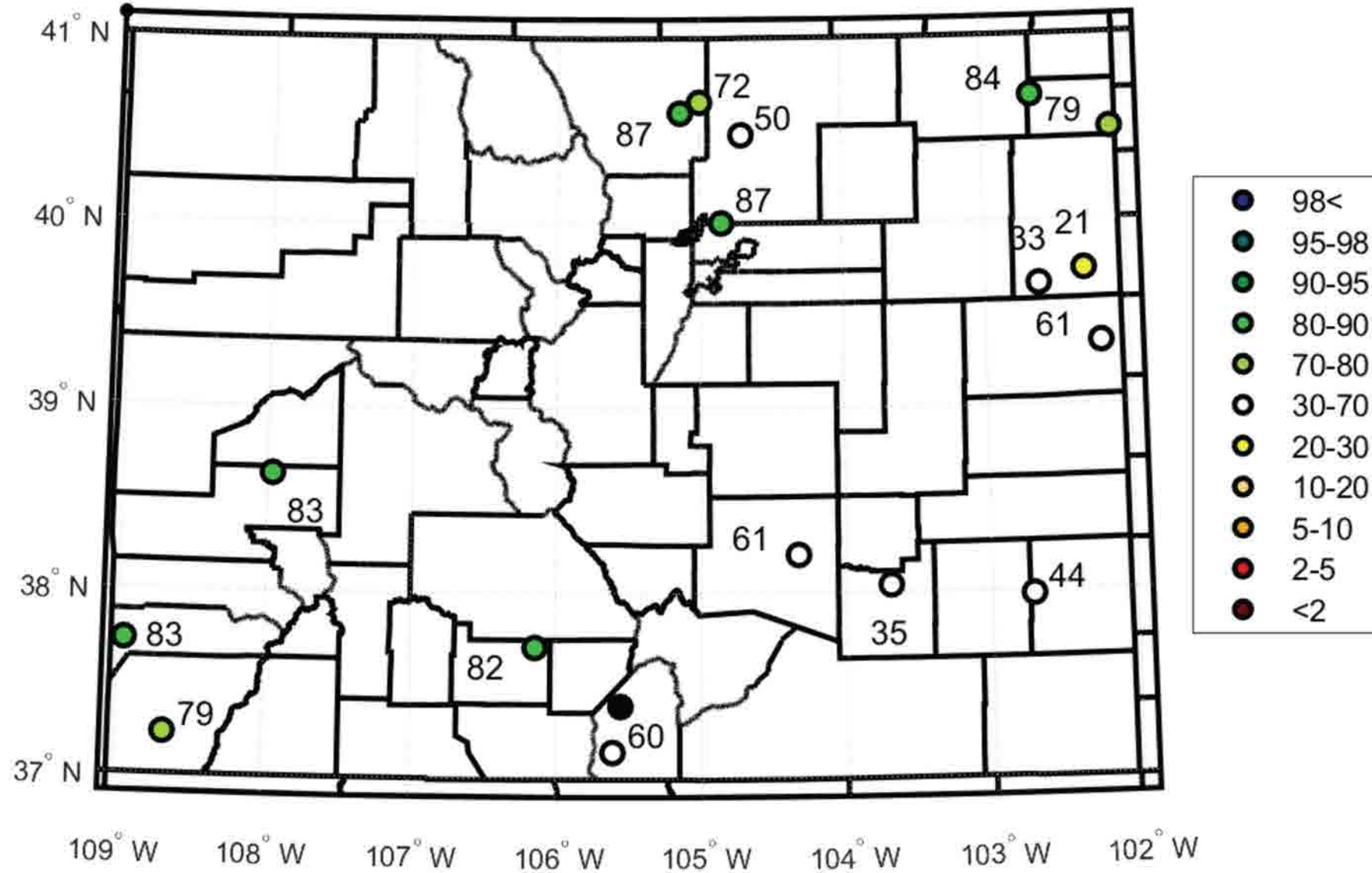
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



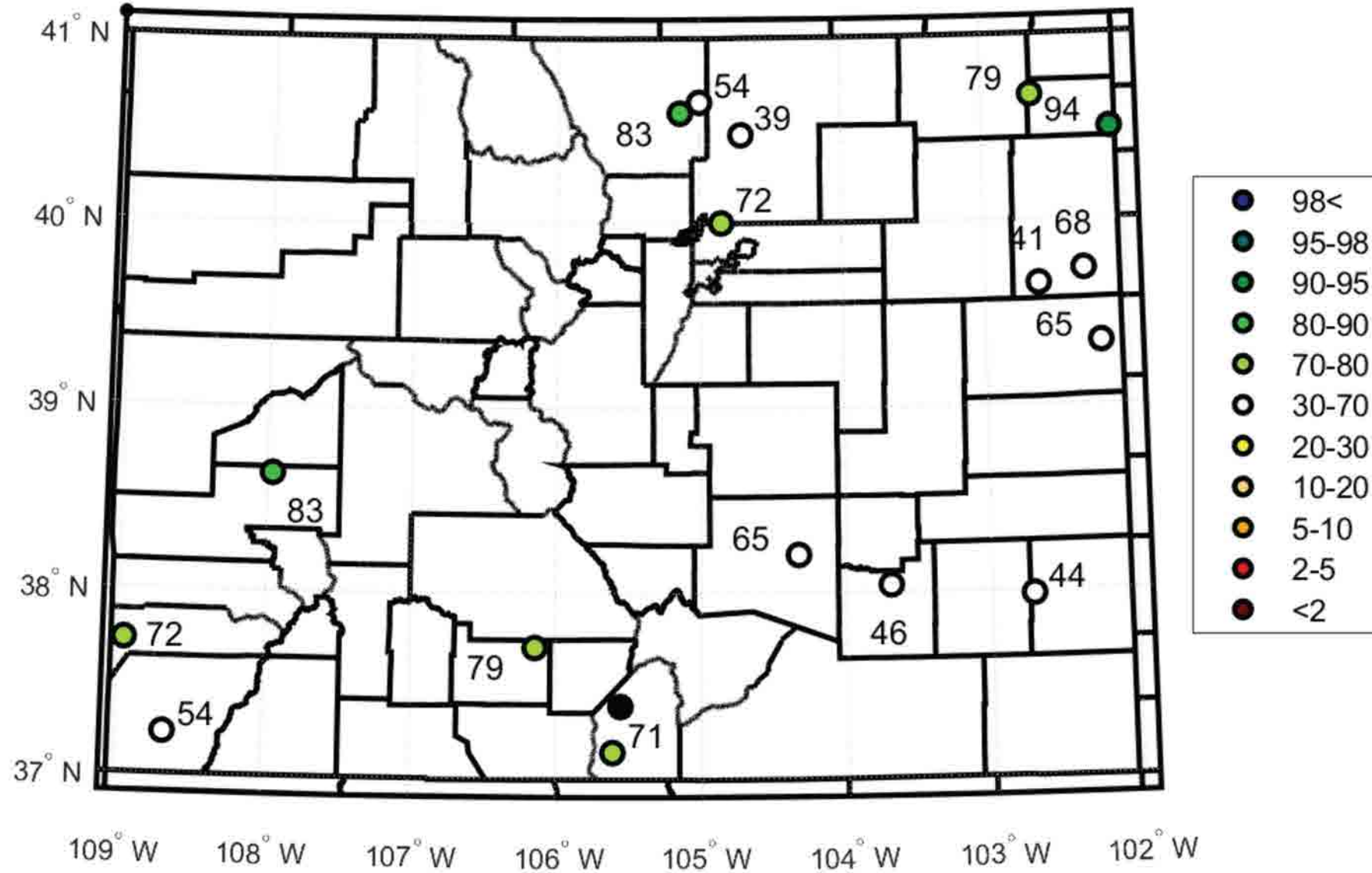
Powered by ACIS



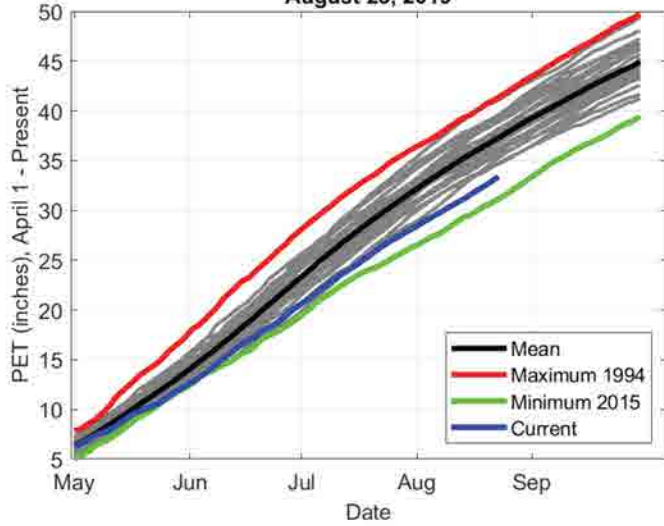
Growing Season Water Balance (P/PET) Percentiles July 19, 2019



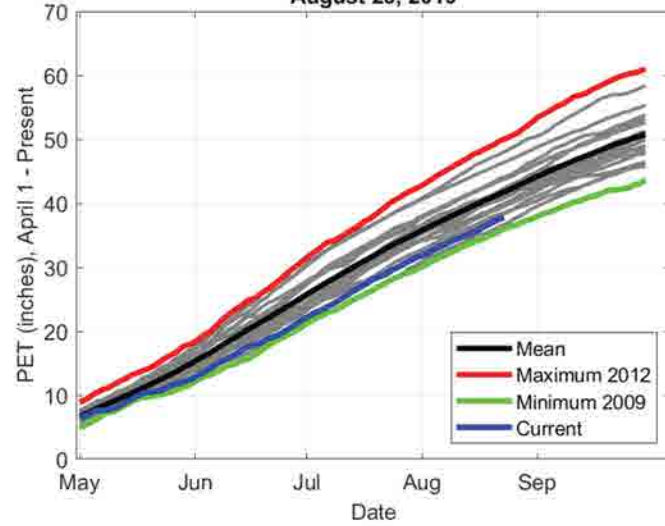
Growing Season Water Balance (P/PET) Percentiles August 23, 2019



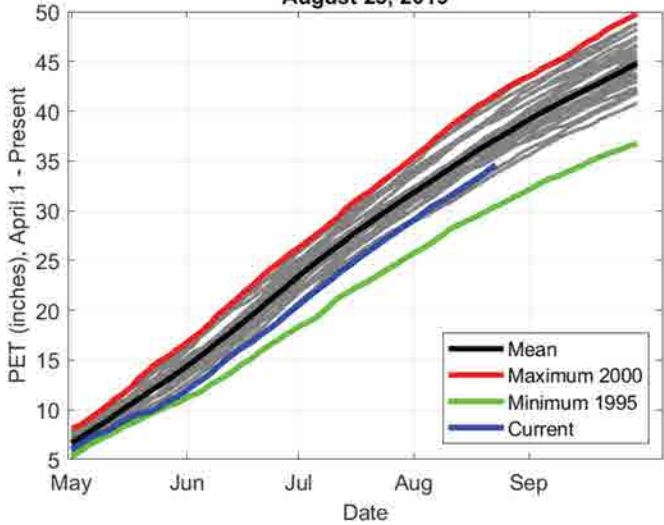
Olathe Growing Season Evaporative Demand
August 23, 2019



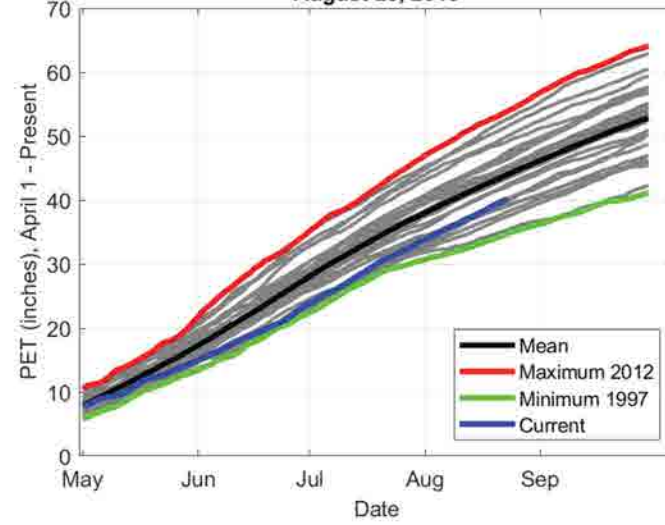
Haxtun Growing Season Evaporative Demand
August 23, 2019



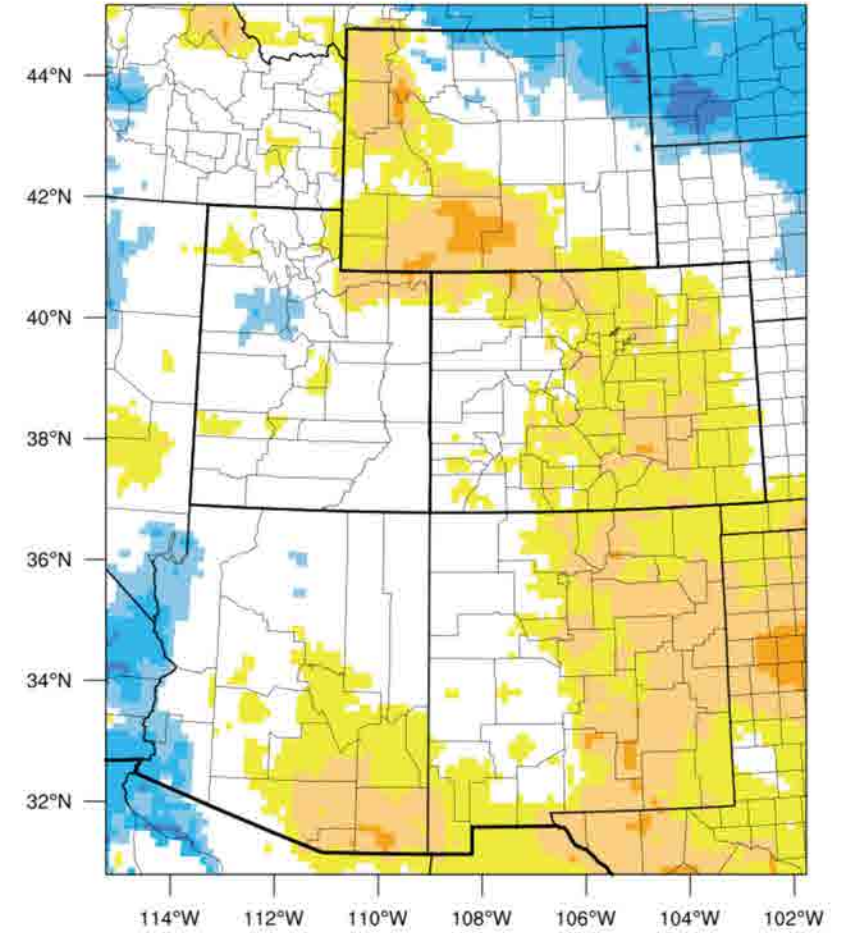
Cortez Growing Season Evaporative Demand
August 23, 2019



Avondale Growing Season Evaporative Demand
August 23, 2019



1-month EDDI categories for August 21, 2019



Drought categories



Wetness categories



100% 98% 95% 90% 80% 70% 30% 20% 10% 5% 2% 0%

(EDDI-percentile category breaks: 100% = driest; 0% = wettest)

Generated by NOAA/ESRL/Physical Sciences Division





Drought

National Drought

Colorado Drought

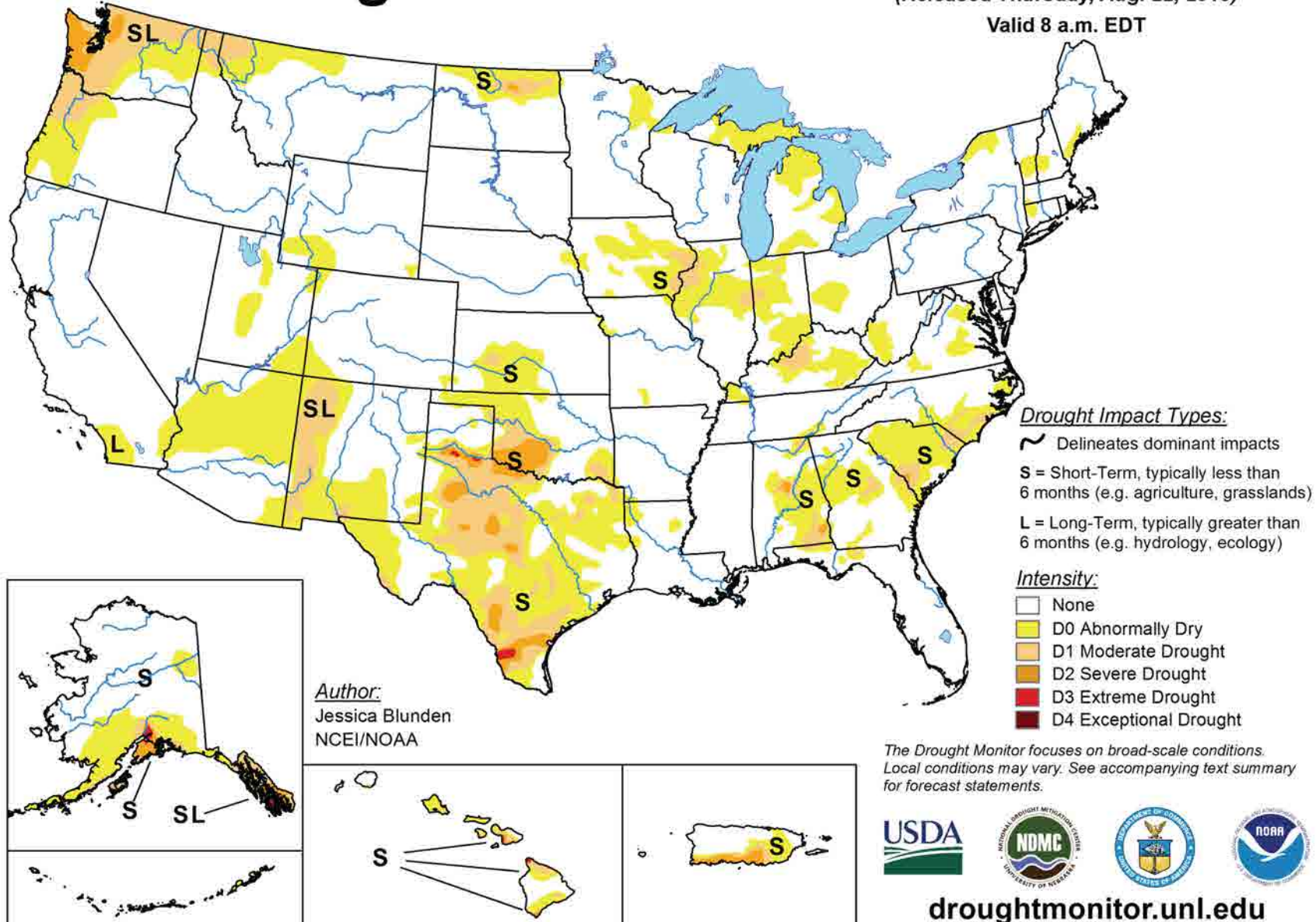
Colorado Drought Facts



U.S. Drought Monitor

August 20, 2019
(Released Thursday, Aug. 22, 2019)

Valid 8 a.m. EDT

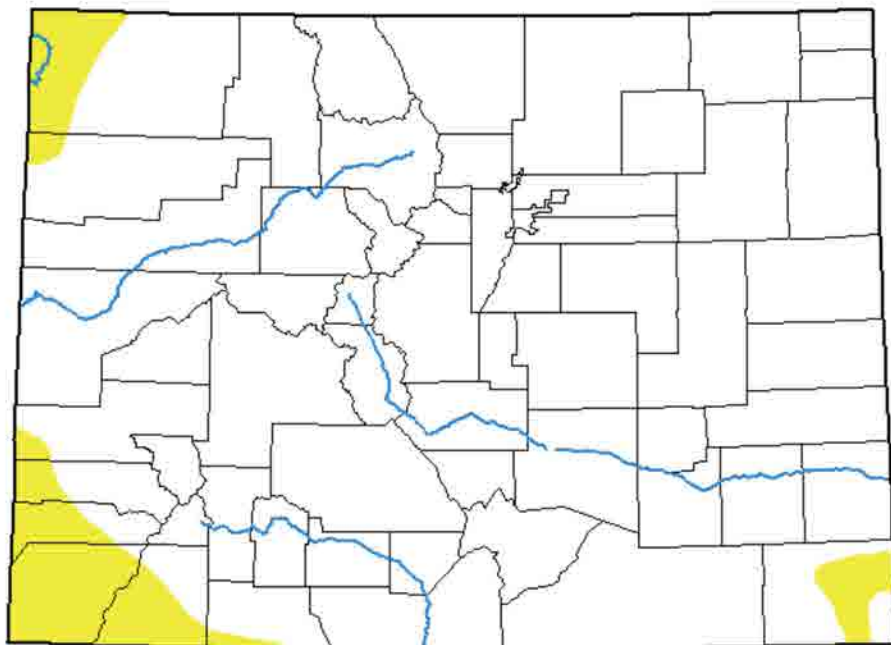


droughtmonitor.unl.edu



U.S. Drought Monitor Colorado

August 20, 2019
(Released Thursday, Aug. 22, 2019)
Valid 8 a.m. EDT



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	93.35	6.65	0.00	0.00	0.00	0.00
Last Week <i>08-13-2019</i>	93.35	6.65	0.00	0.00	0.00	0.00
3 Months Ago <i>05-21-2019</i>	99.99	0.01	0.00	0.00	0.00	0.00
Start of Calendar Year <i>01-01-2019</i>	17.94	82.06	66.26	54.91	27.11	11.22
Start of Water Year <i>09-25-2018</i>	14.19	85.81	72.30	64.41	48.47	16.21
One Year Ago <i>08-21-2018</i>	18.57	81.43	74.46	65.88	45.46	8.50

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. See accompanying text summary for forecast statements.

Author

Jessica Blunden
NCEI/NOAA



droughtmonitor.unl.edu



Colorado Drought Monitor Facts

- Prior to May of this year:
 - Since the beginning of the US Drought Monitor, our state had never been completely free of D0 – D4.
 - Our previous record smallest amount of D0 occurred in May 2001, when only 0.13% of our state showed D0.
- As of May 28, 2019:
 - We became the last state to finally report a week of no D0-D4.
 - We had 8 straight weeks of an empty map, but that streak ended on July 23

Week	None	D0-D4
2019-05-21	99.99	0.01
2019-05-28	100.00	0.00
2019-06-04	100.00	0.00
2019-06-11	100.00	0.00
2019-06-18	100.00	0.00
2019-06-25	100.00	0.00
2019-07-02	100.00	0.00
2019-07-09	100.00	0.00
2019-07-16	100.00	0.00
2019-07-23	96.93	3.07



Outlook

Next 7 days

8-14 day Outlook

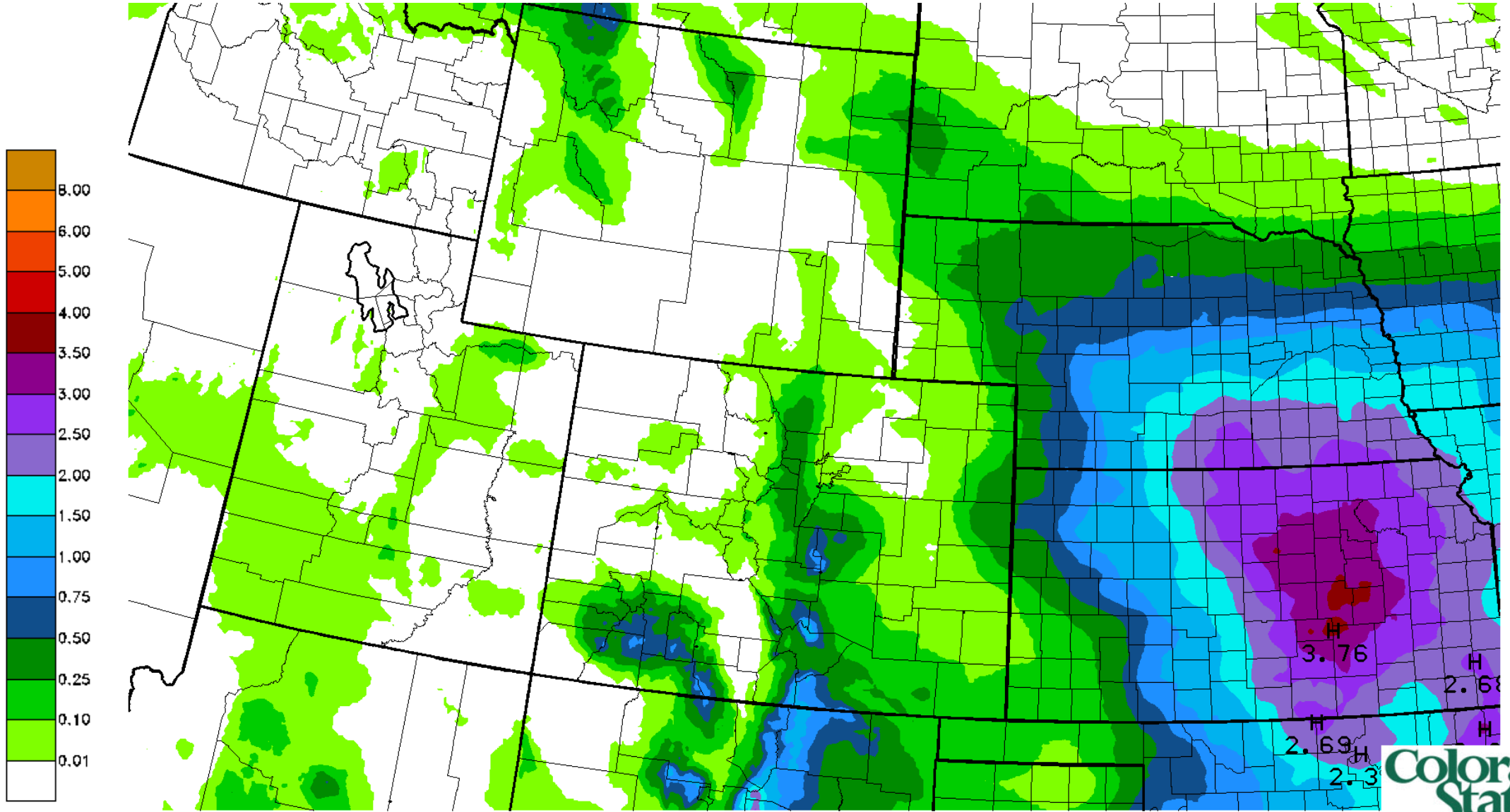
CPC Outlooks

Precipitation Projections

What is happening with El Niño?



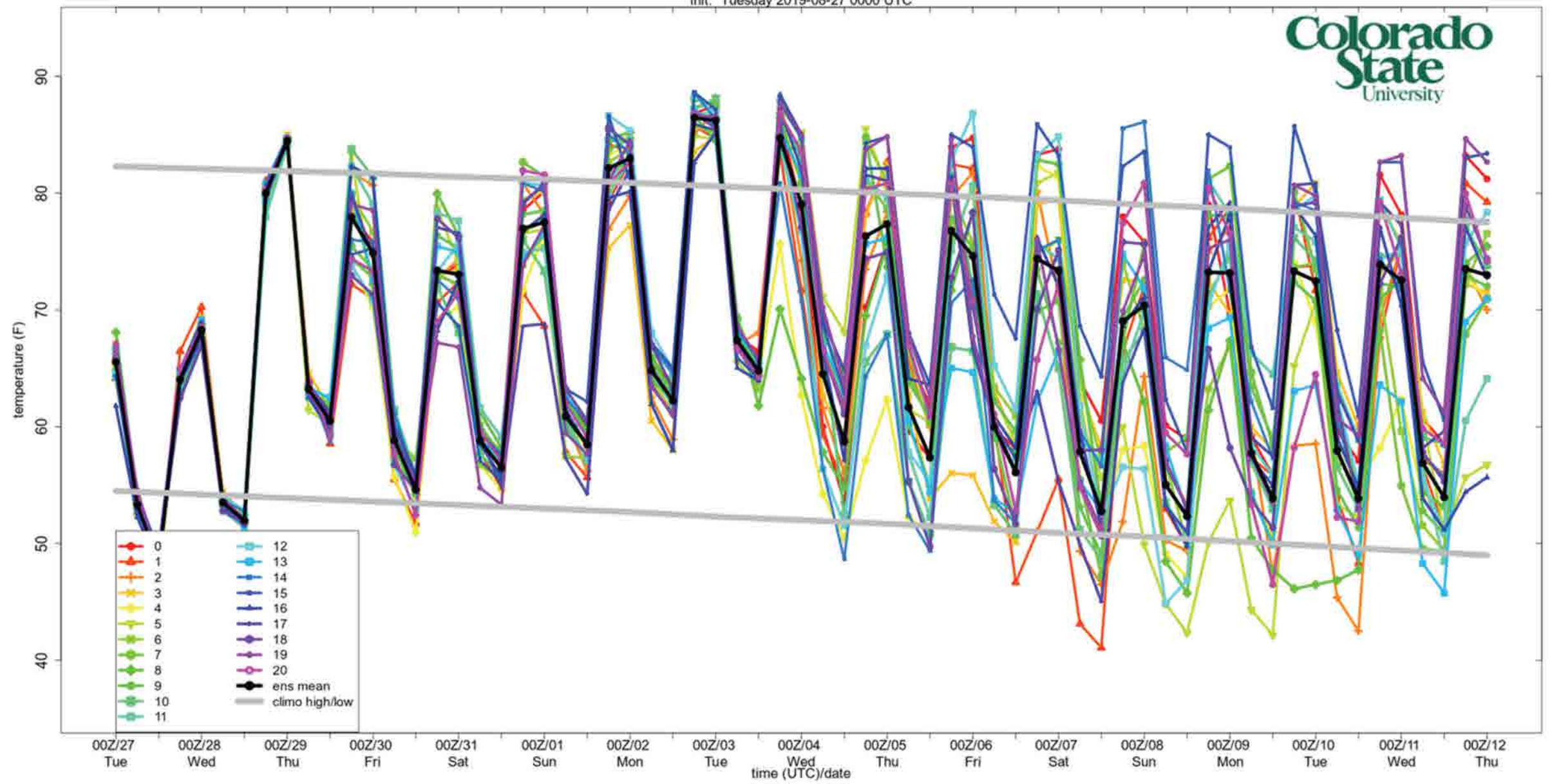
NOAA 7-day precip forecast



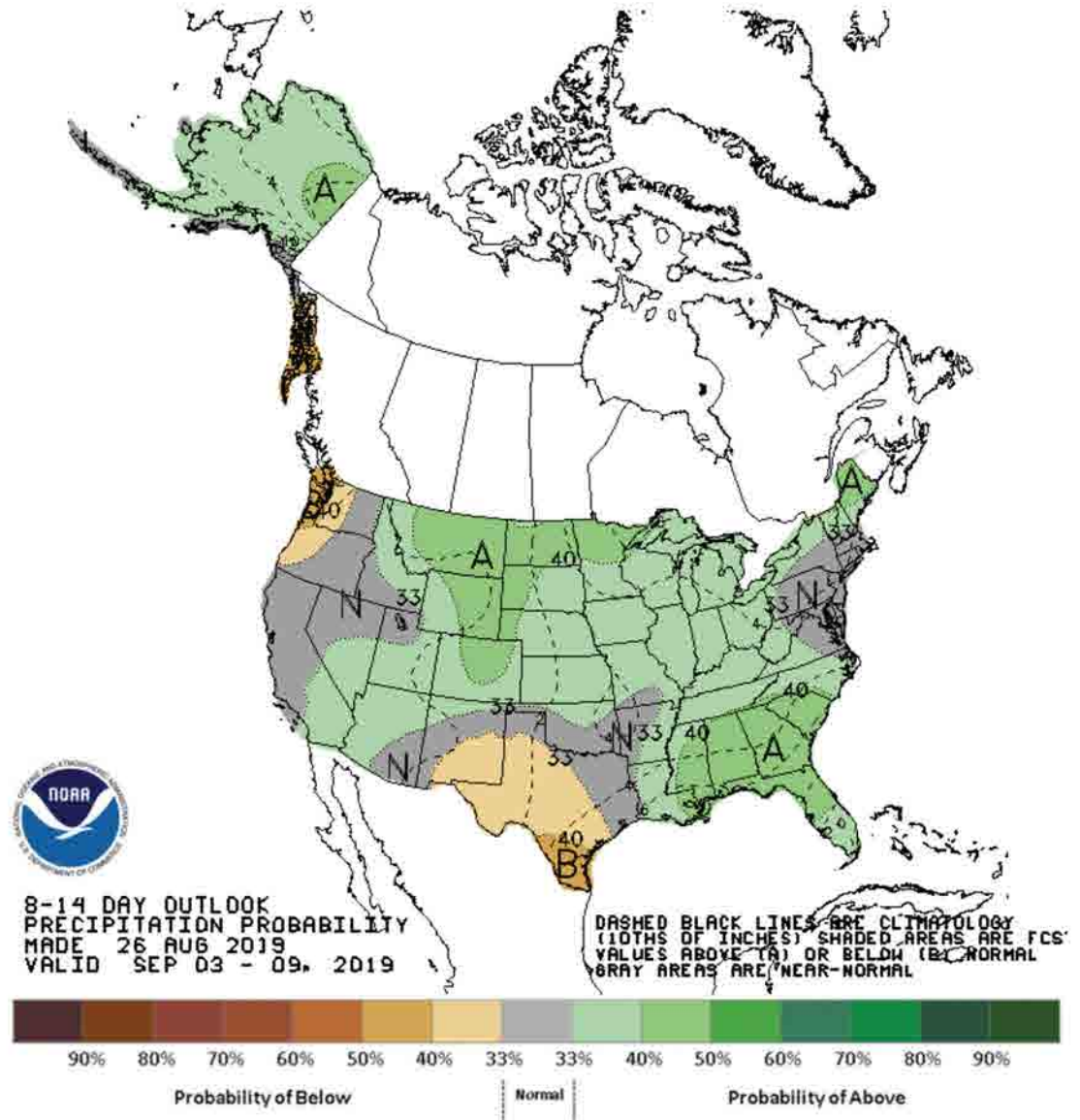
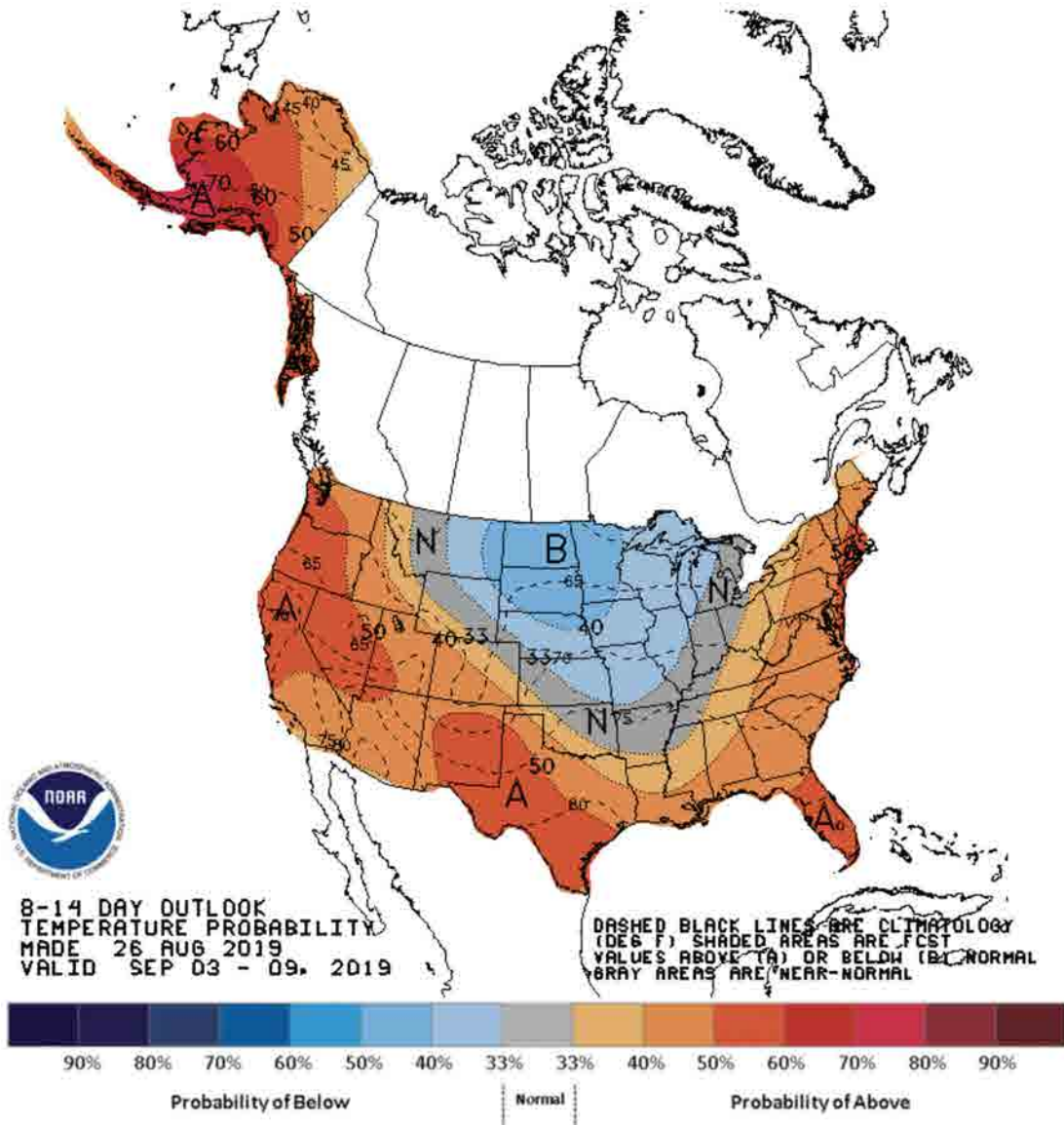
WPC FORECAST PRECIPITATION (INCHES) IN 7 DAYS ENDING TUE 190903/0000V168
FORECAST ISSUED 190827/0000F168



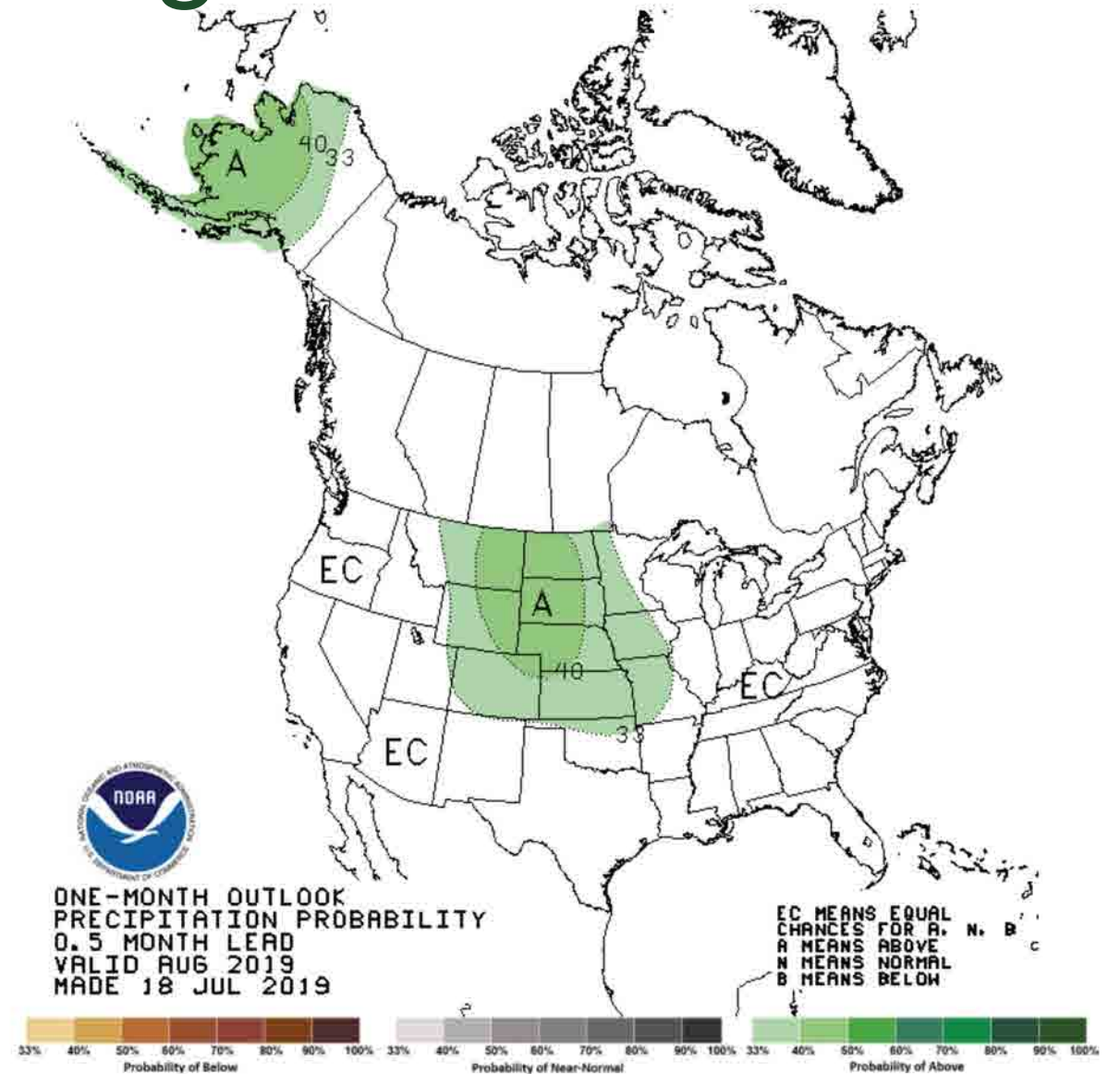
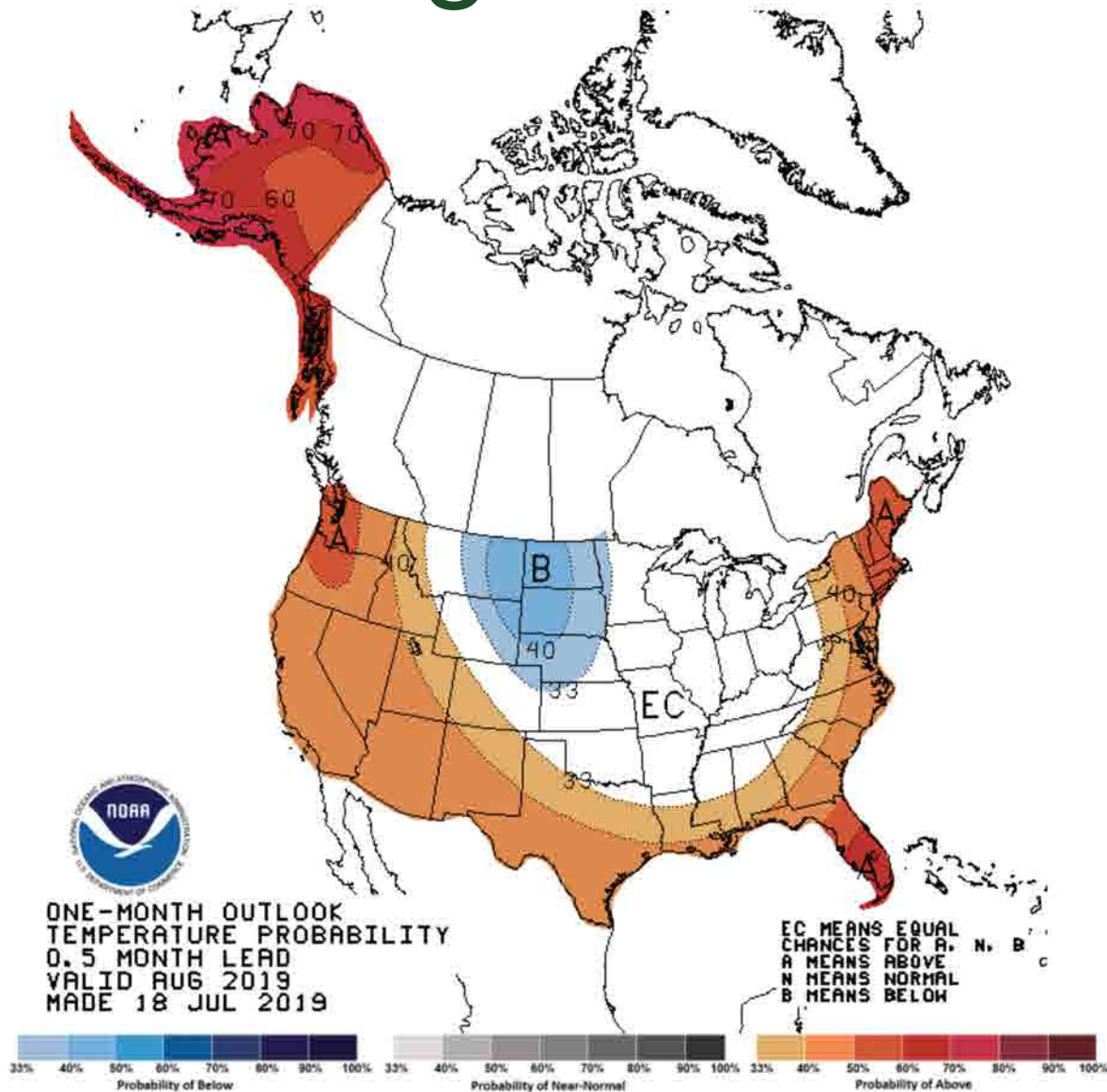
NCEP GEFS 2-m temperature at Fort Collins
init: Tuesday 2019-08-27 0000 UTC



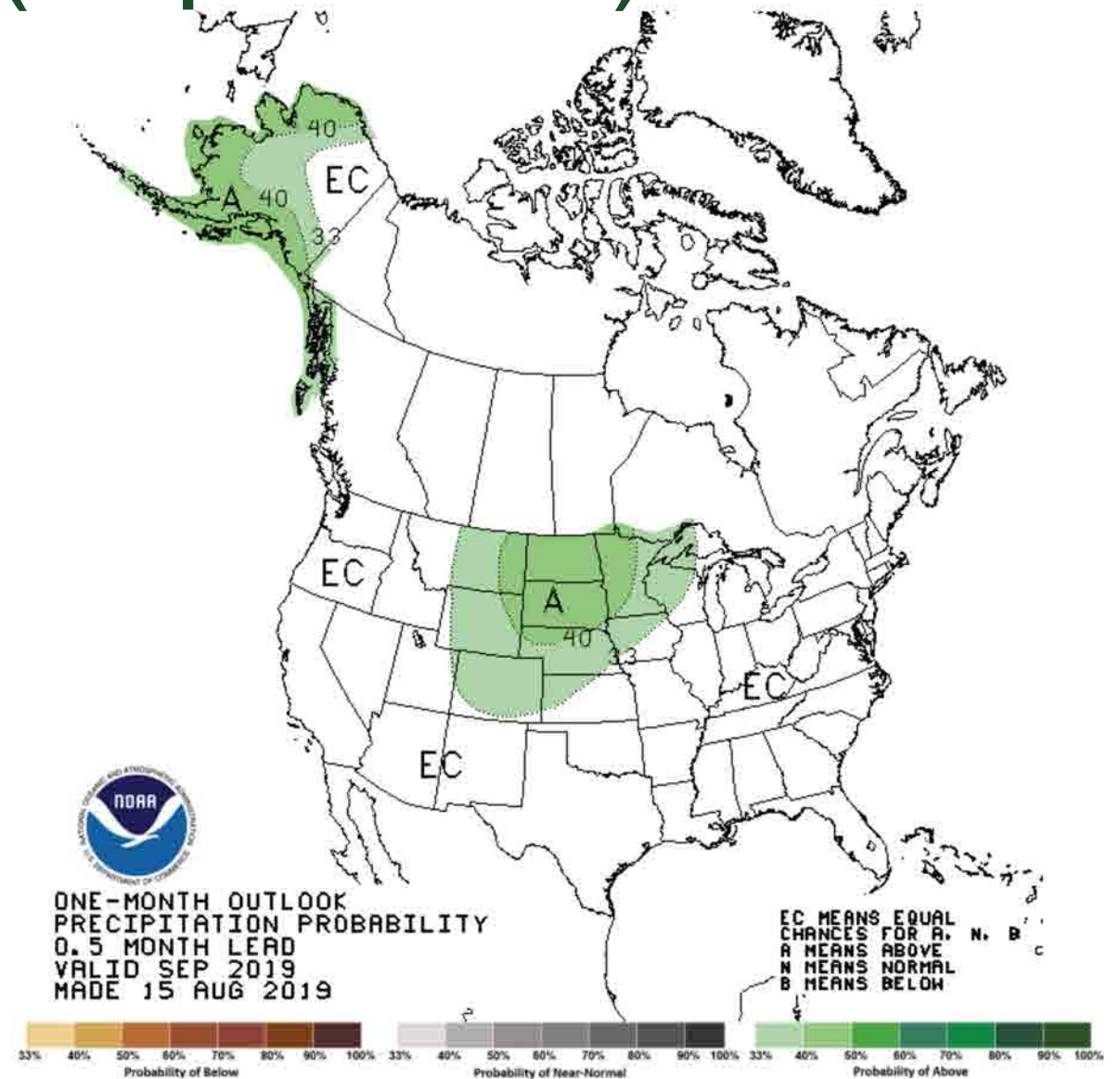
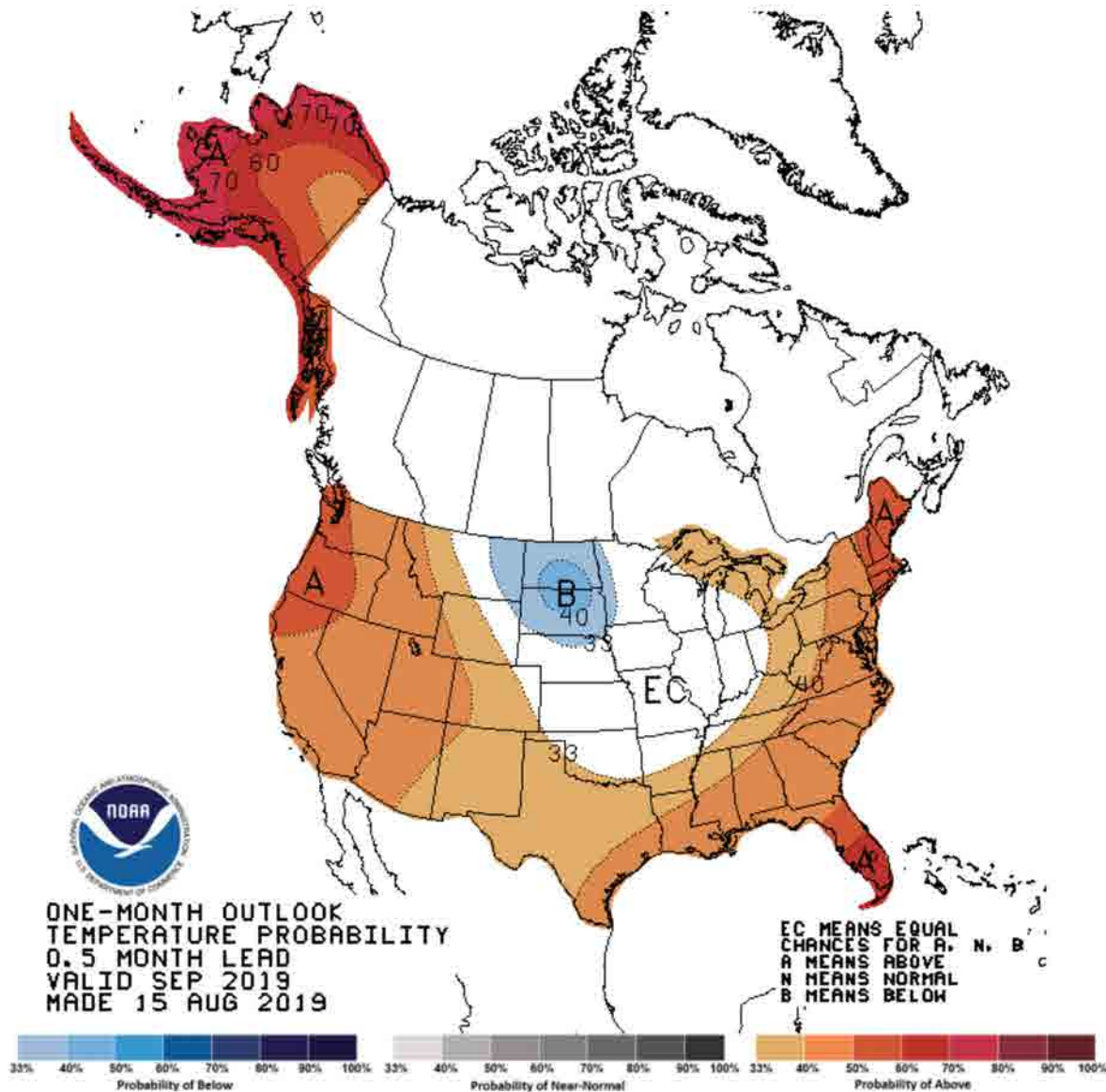
8-14 day outlook



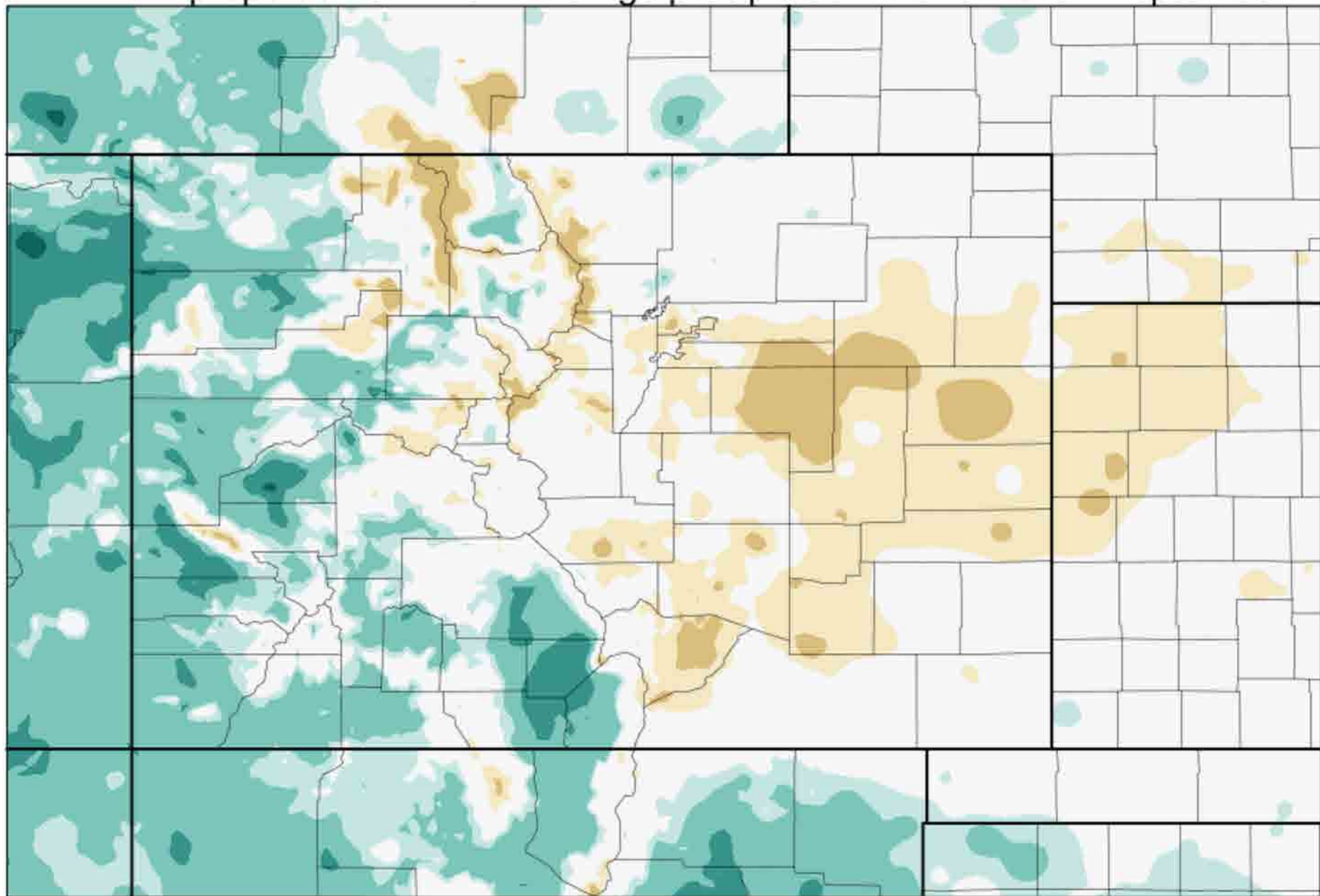
Looking back at the August outlook...



One month outlook (September)



PRISM proportion of annual average precipitation in this month: September

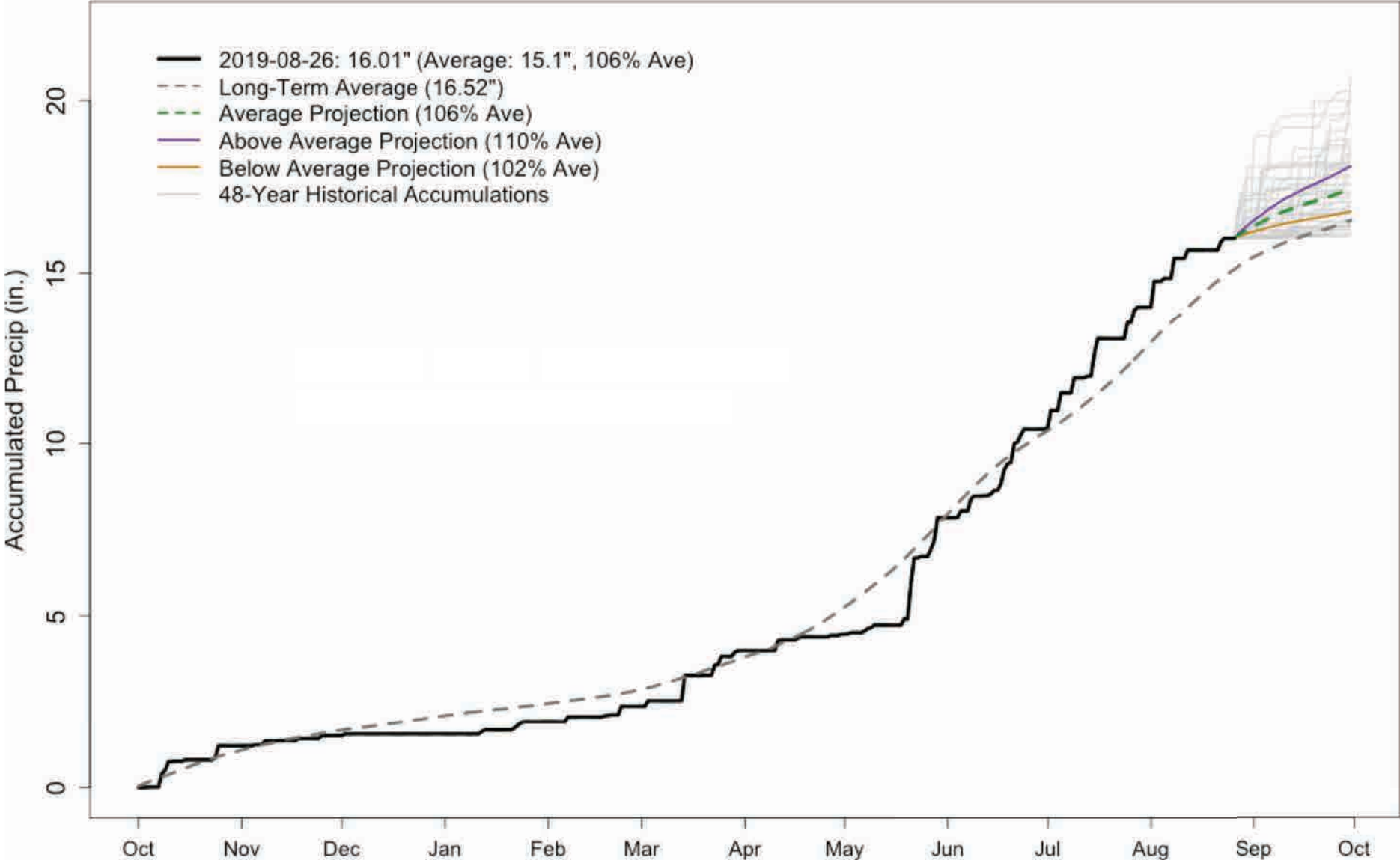


0.1 0.25 0.5 0.75 0.85 1.15 1.25 1.5 1.75 2

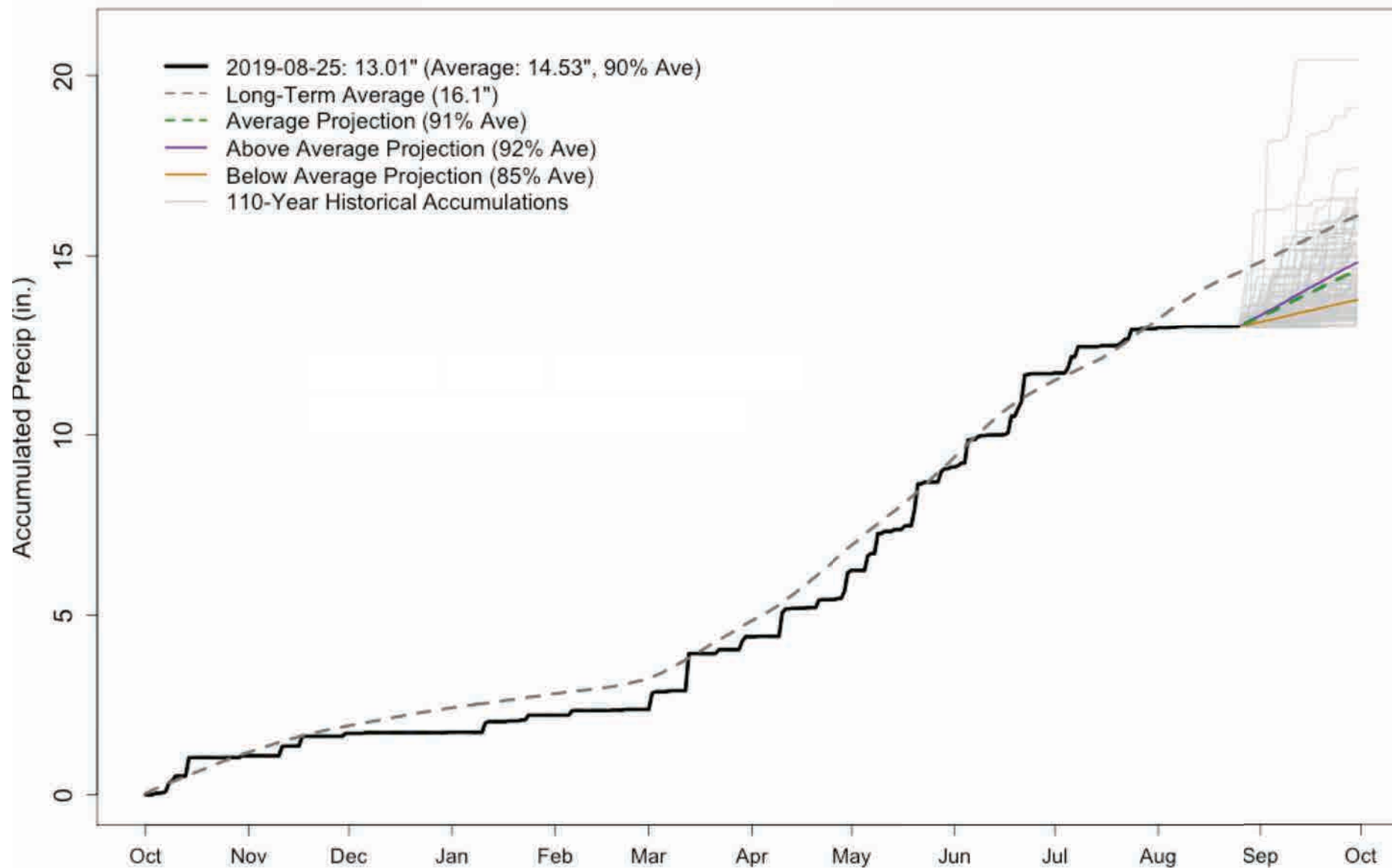
Proportion of precip relative to 1/12th



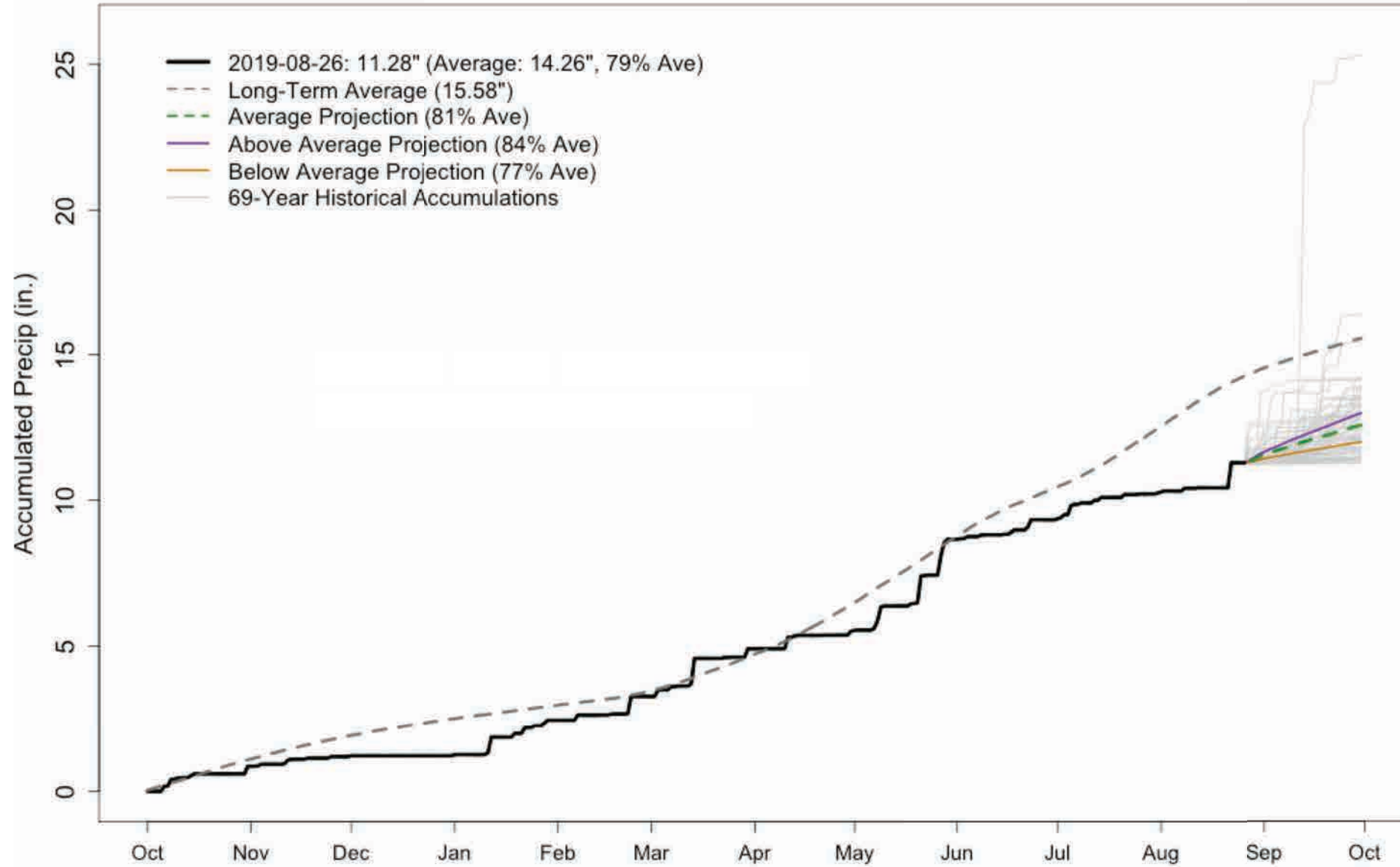
AKRON 4 E WY2019 Precipitation Projections



FORT COLLINS WY2019 Precipitation Projections



DENVER-STAPLETON WY2019 Precipitation Projections



What's the El Niño forecast?

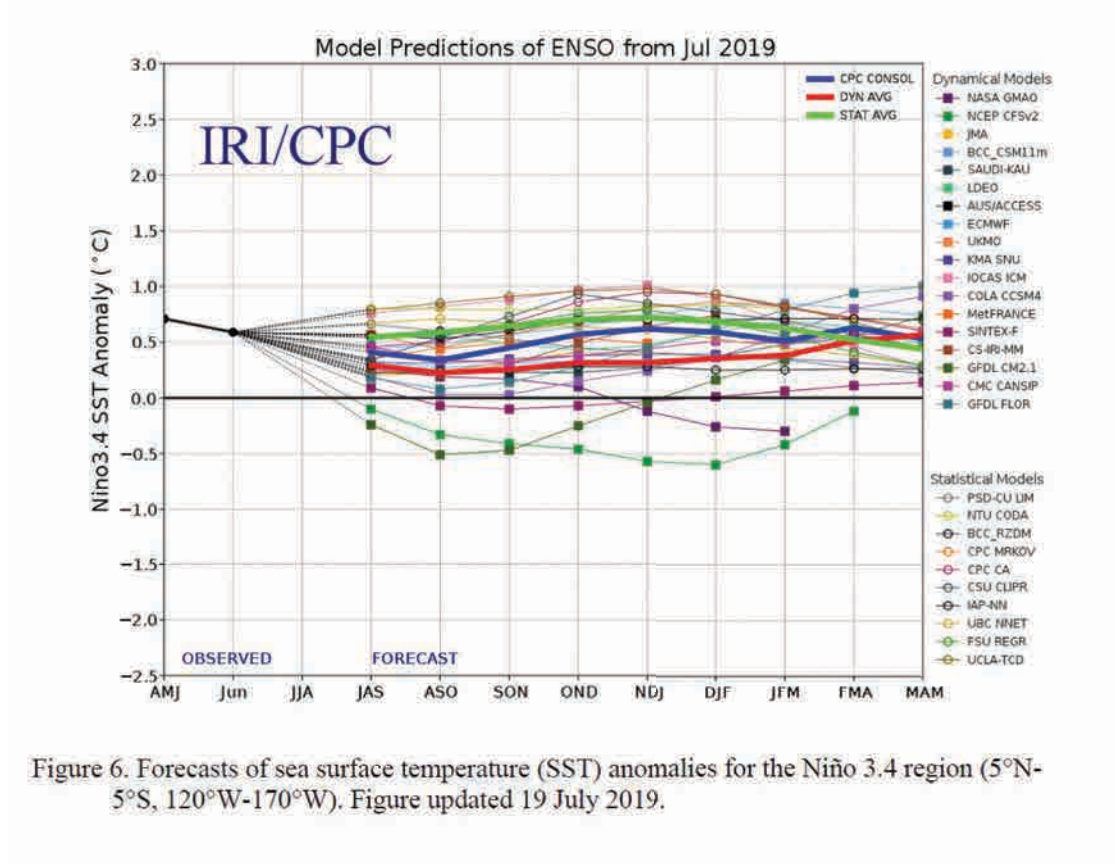
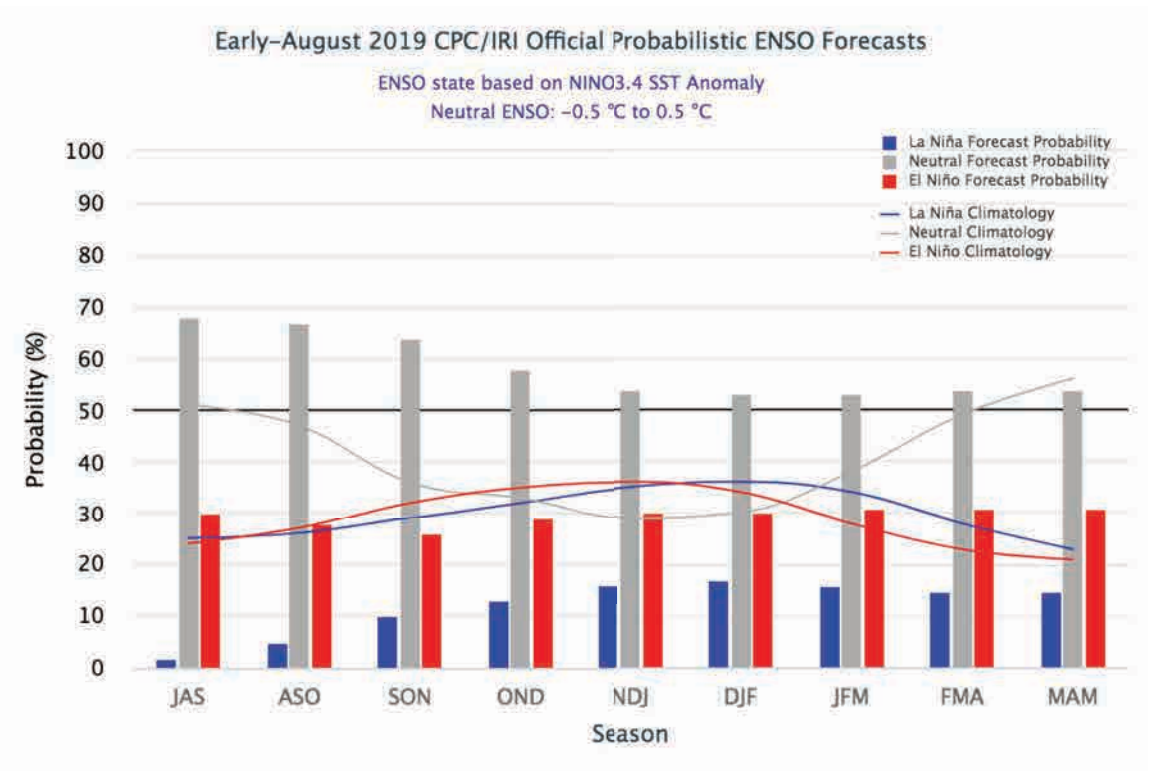
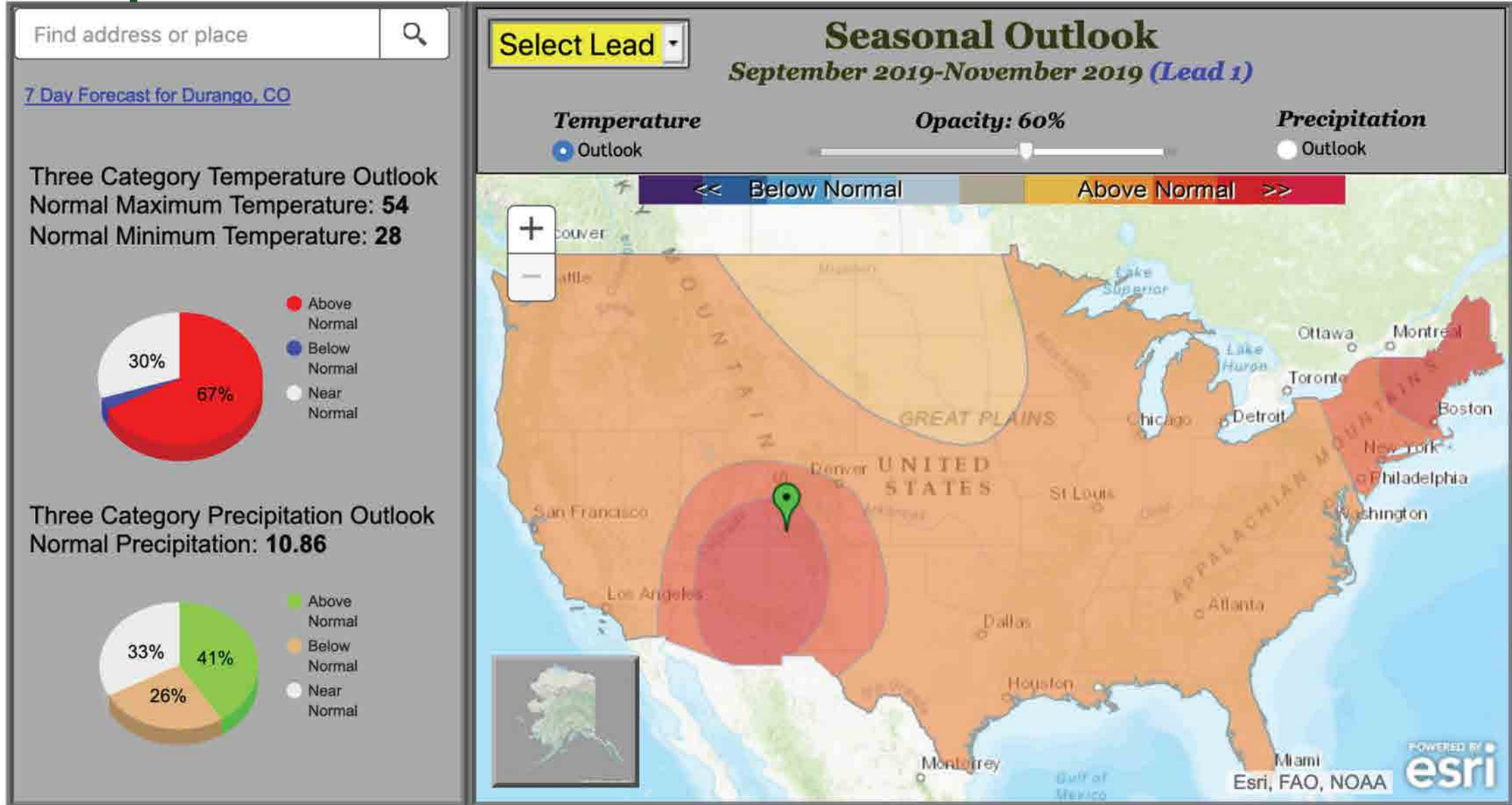


Figure 6. Forecasts of sea surface temperature (SST) anomalies for the Niño 3.4 region (5°N-5°S, 120°W-170°W). Figure updated 19 July 2019.

The El Niño is now over...back to neutral conditions
Neutral conditions likely to continue through winter

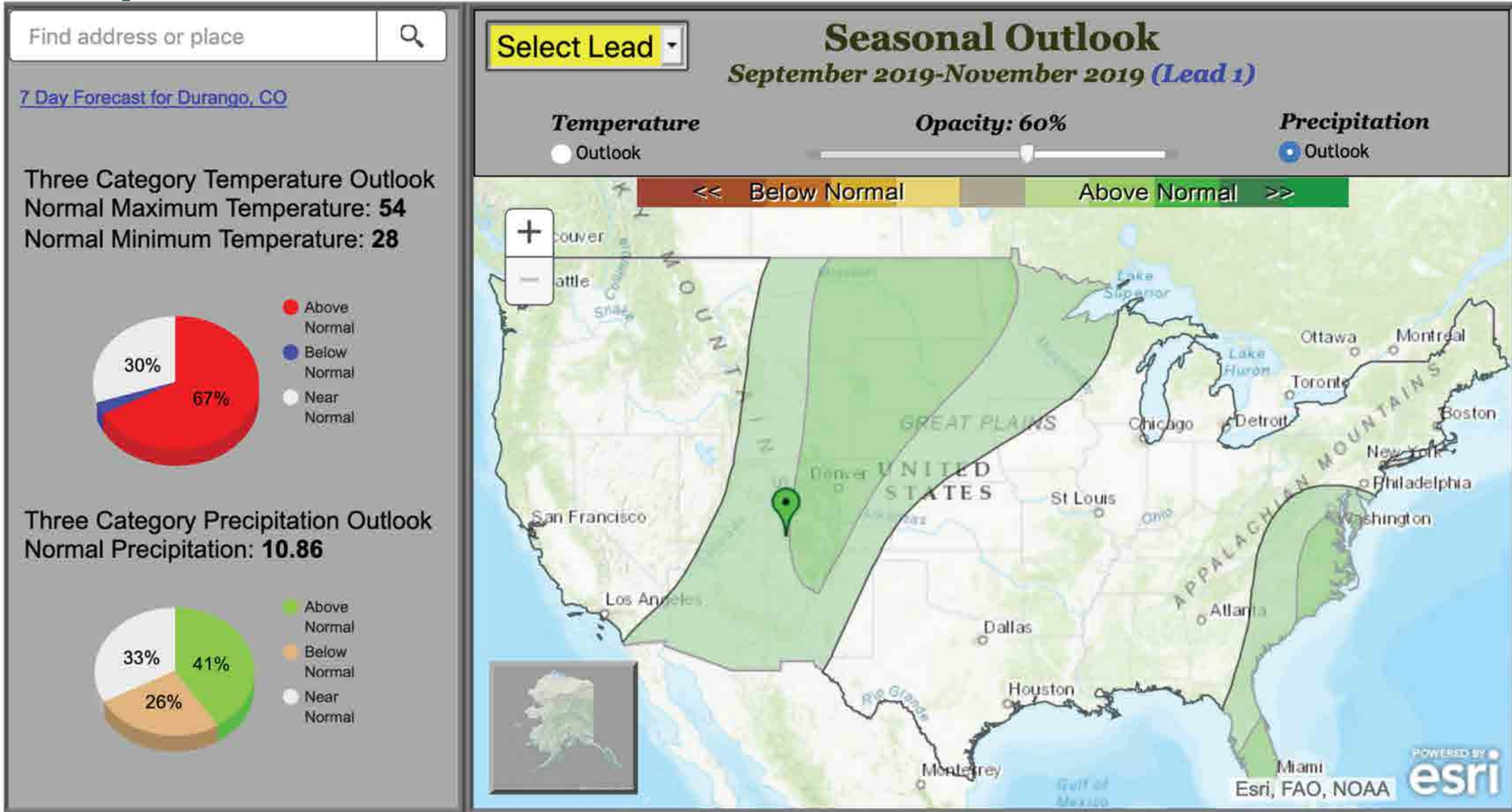


Sept-Oct-Nov Outlook



Sept-Oct-Nov Outlook

Tendency toward warm, wet conditions projected through January



Summary points

- After a cool May and June, July was warm across all but the far eastern Plains
- July was dry across western Colorado, with typical spotty rains east of the divide
- August has been hot! Lots of record high temperatures, will be among the top few warmest Augusts on record
- Not much monsoon; some very rainy (and hail-y) spots on the plains but many developing dry spots as well
- Still no drought in Colorado, but D0 (abnormally dry) has returned and is likely to expand this week. The great winter is now in tension with recent hot, dry conditions
- Continued warm and dry in the short term, longer-term outlooks tend toward warm and wet
- El Niño has ended and neutral conditions likely to continue through winter



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To view this and other presentations:
http://climate.colostate.edu/ccc_archive.html

Thank you!



ATMOSPHERIC SCIENCE
COLORADO STATE UNIVERSITY