

Colorado Climate Center — *WATF Climate Update*

Peter Goble

Water Availability Task Force

July 23, 2019



ATMOSPHERIC SCIENCE
COLORADO STATE UNIVERSITY

2019 Water Year To Date

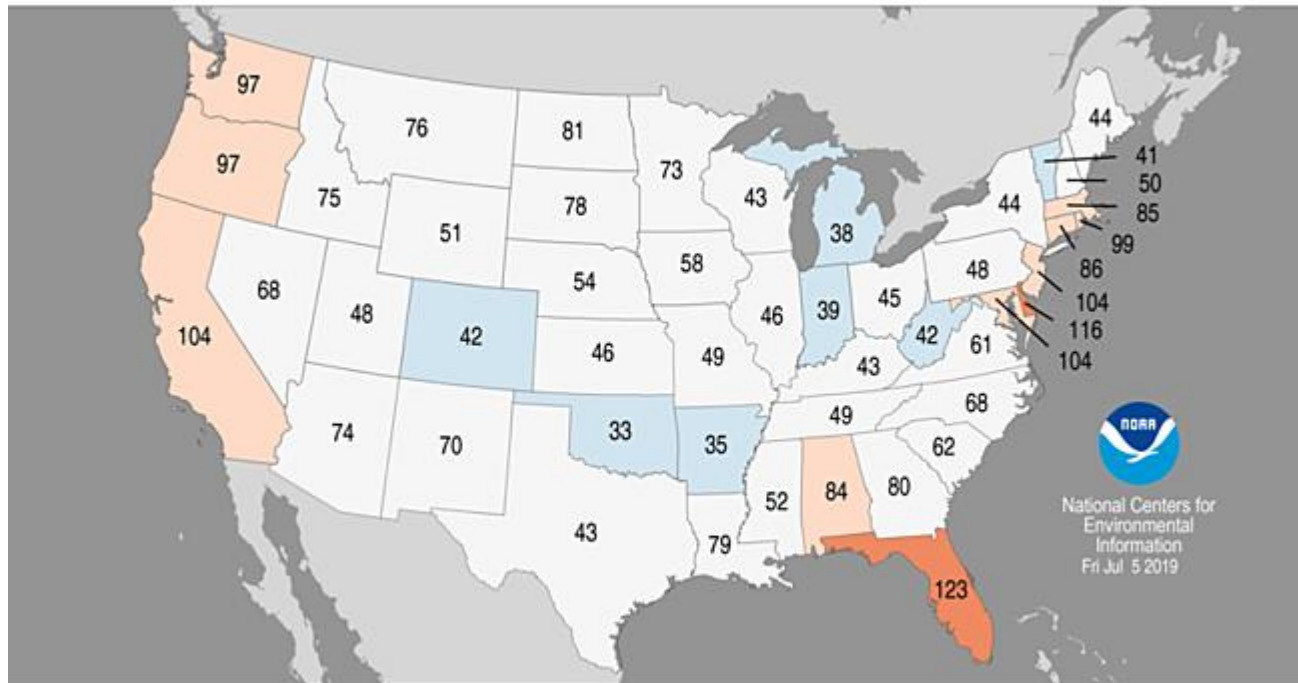
temperature, precipitation,
evaporative demand



Statewide Average Temperature Ranks

June 2019

Period: 1895–2019



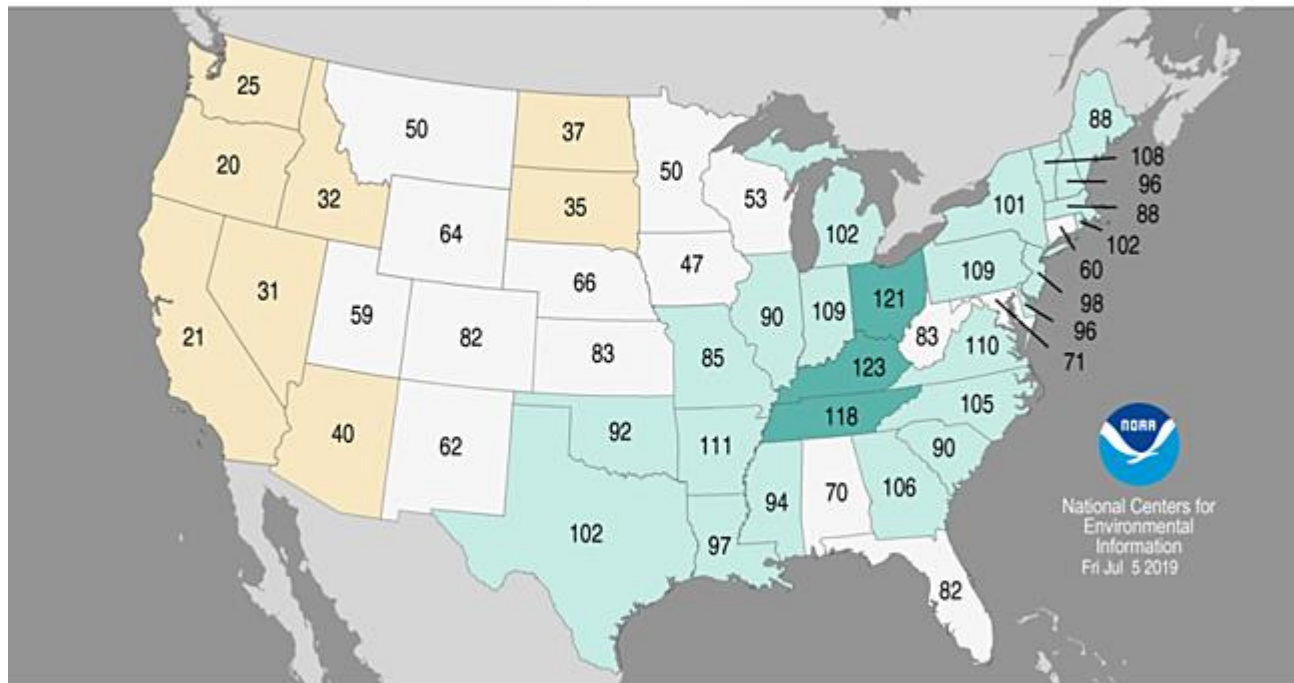
Month	T Rank	
Oct	35 th	coldest
Nov	39 th	coldest
Dec	80 th	average
Jan	36 th	warmest
Feb	28 th	coldest
Mar	66 th	average
Apr	18 th	warmest
May	5 th	Coldest
June	42 nd	Coldest



Statewide Precipitation Ranks

June 2019

Period: 1895–2019



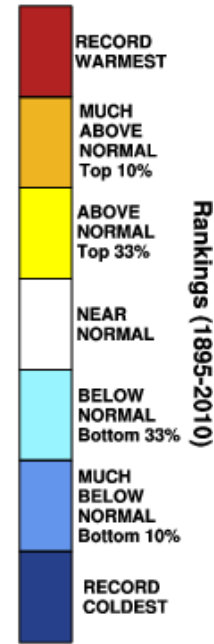
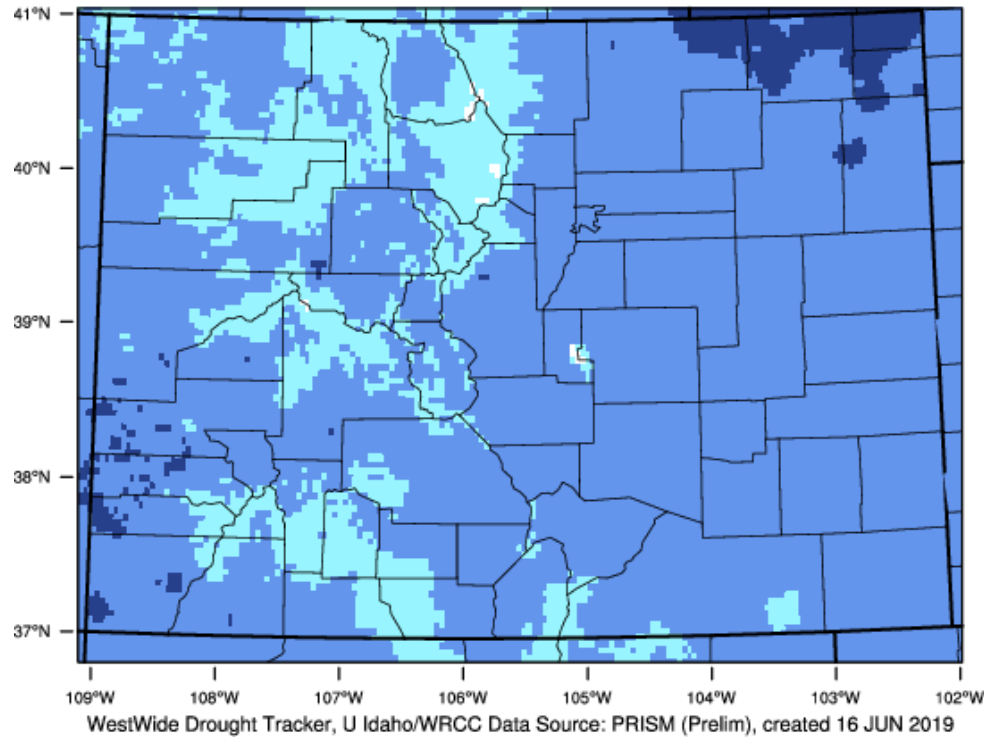
8th wettest October – June

Month	P Rank	
Oct	12 th	wettest
Nov	45 th	average
Dec	31 st	driest
Jan	32 nd	wettest
Feb	17 th	wettest
Mar	6 th	wettest
Apr	42 nd	driest
May	15 th	wettest
June	43 rd	wettest



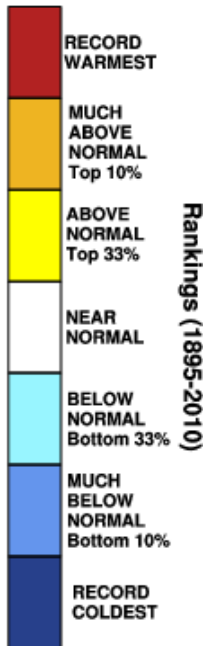
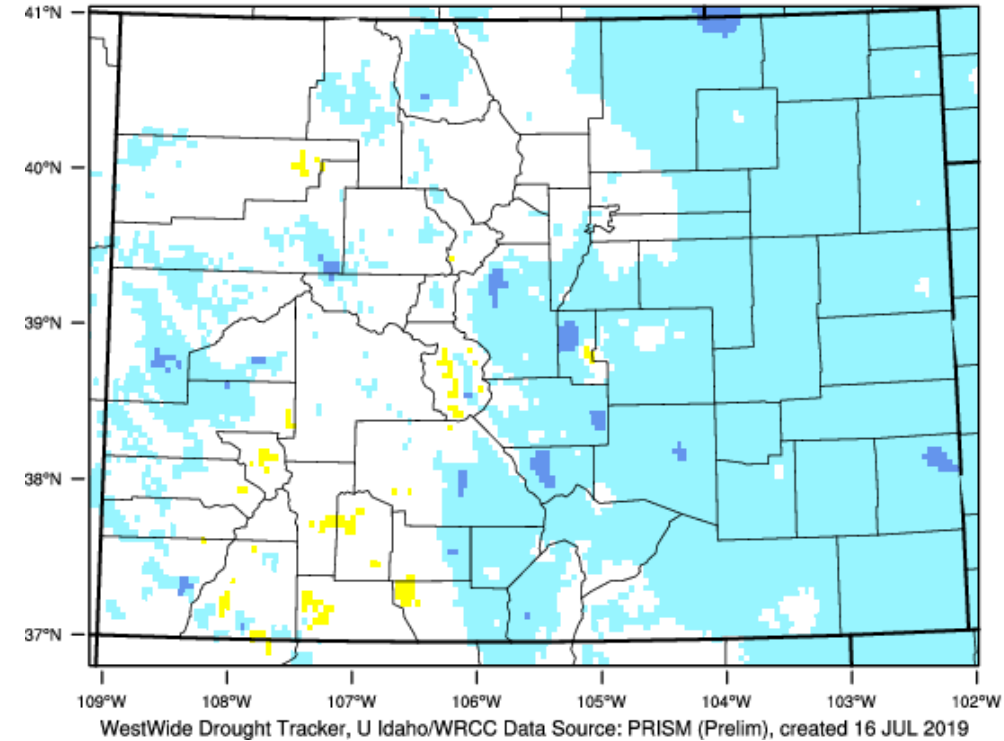
Colorado - Mean Temperature

May 2019 Percentile



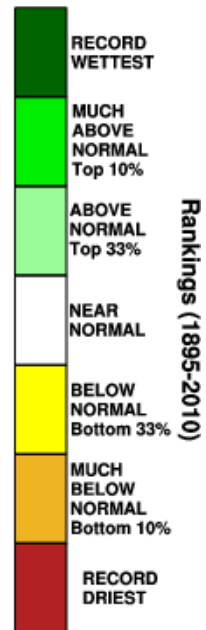
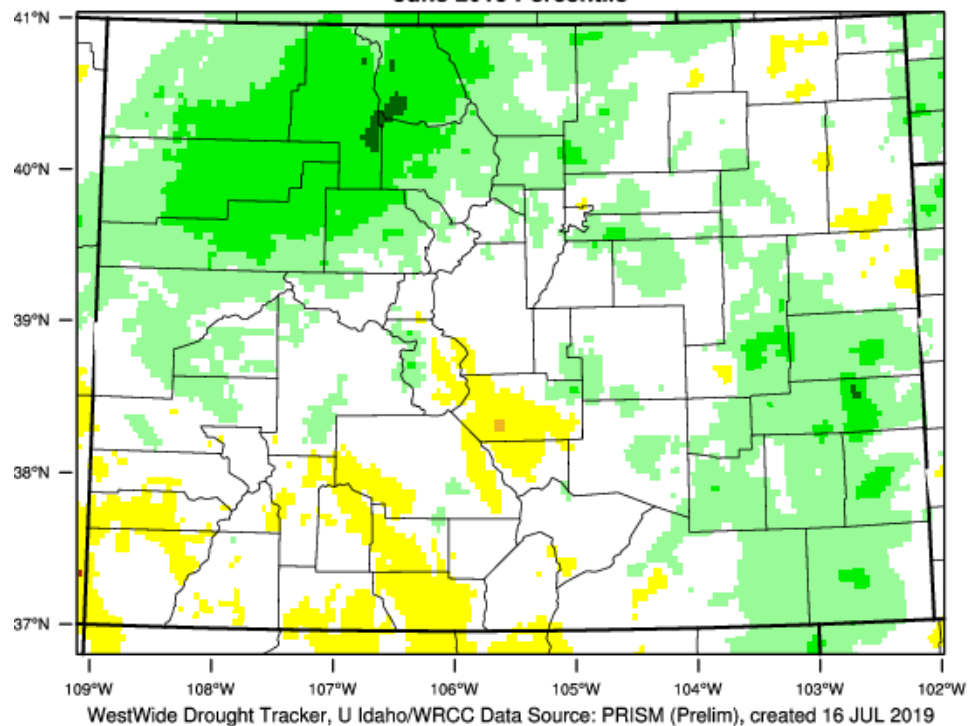
Colorado - Mean Temperature

June 2019 Percentile



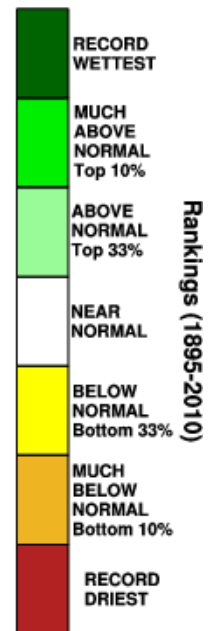
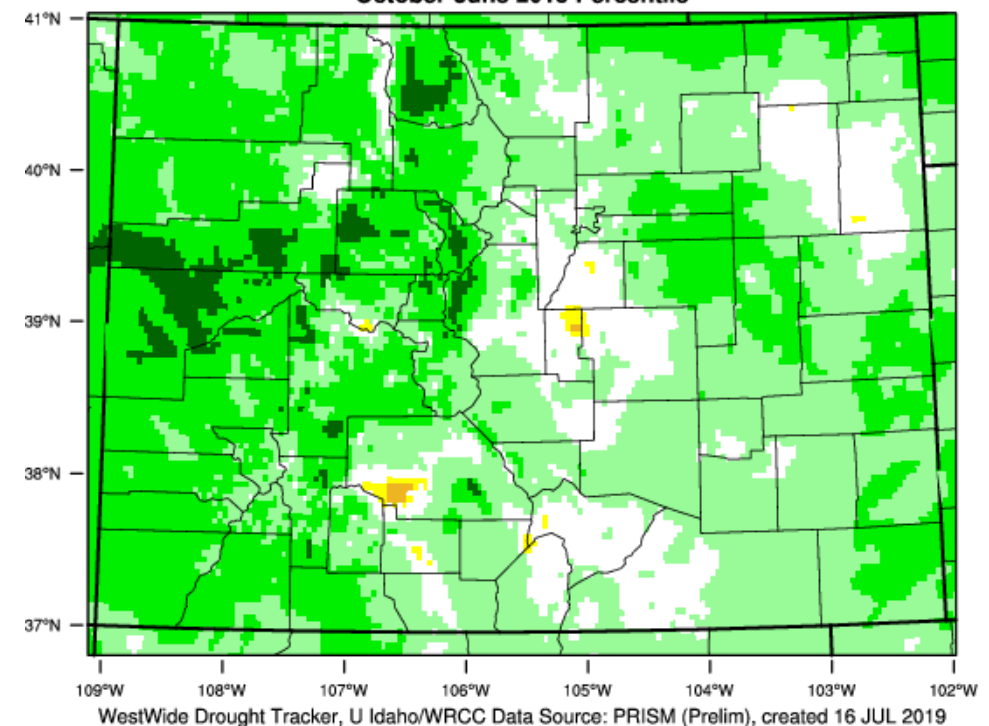
Colorado - Precipitation

June 2019 Percentile

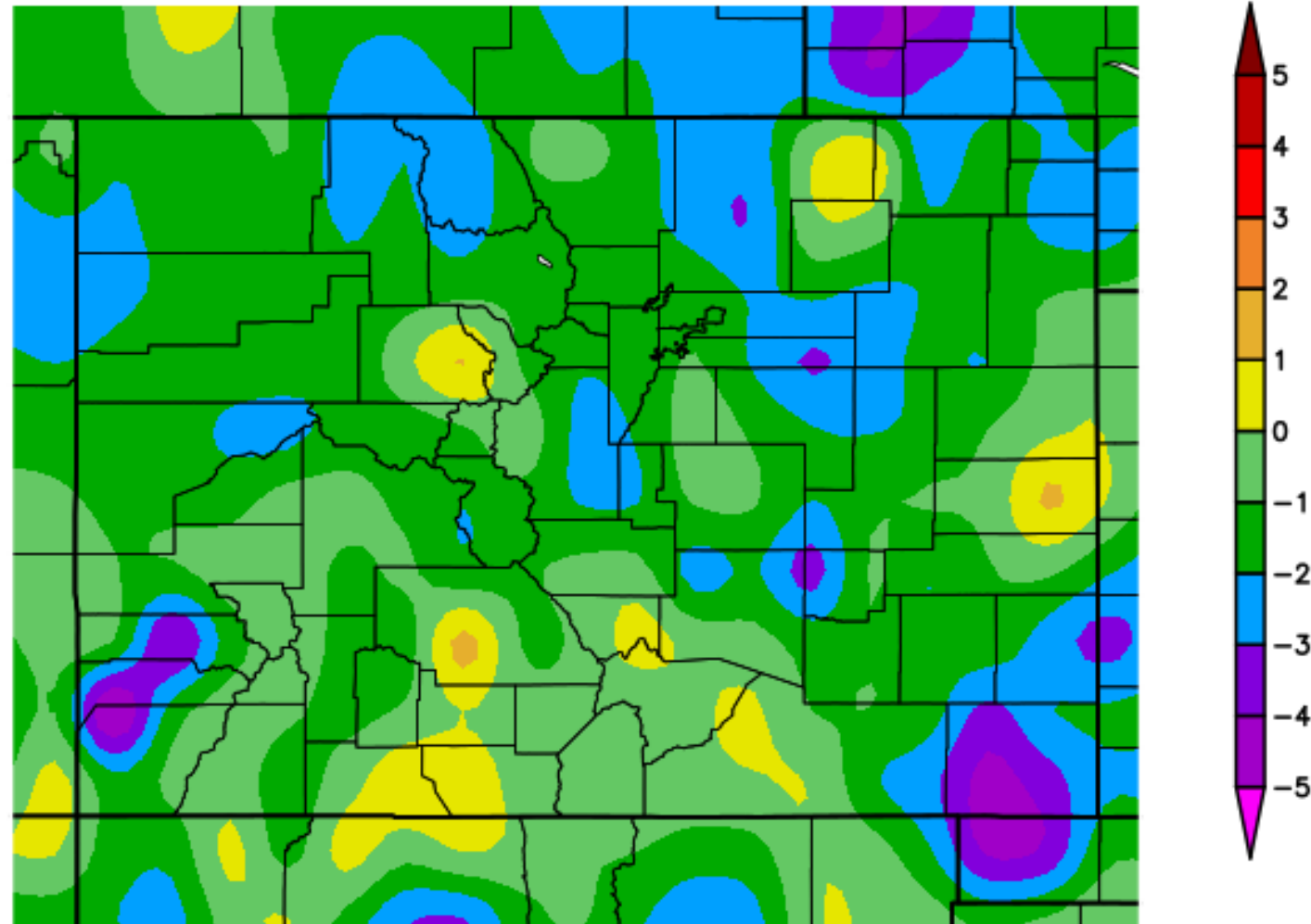


Colorado - Precipitation

October-June 2019 Percentile



Departure from Normal Temperature (F) 6/1/2019 – 6/30/2019

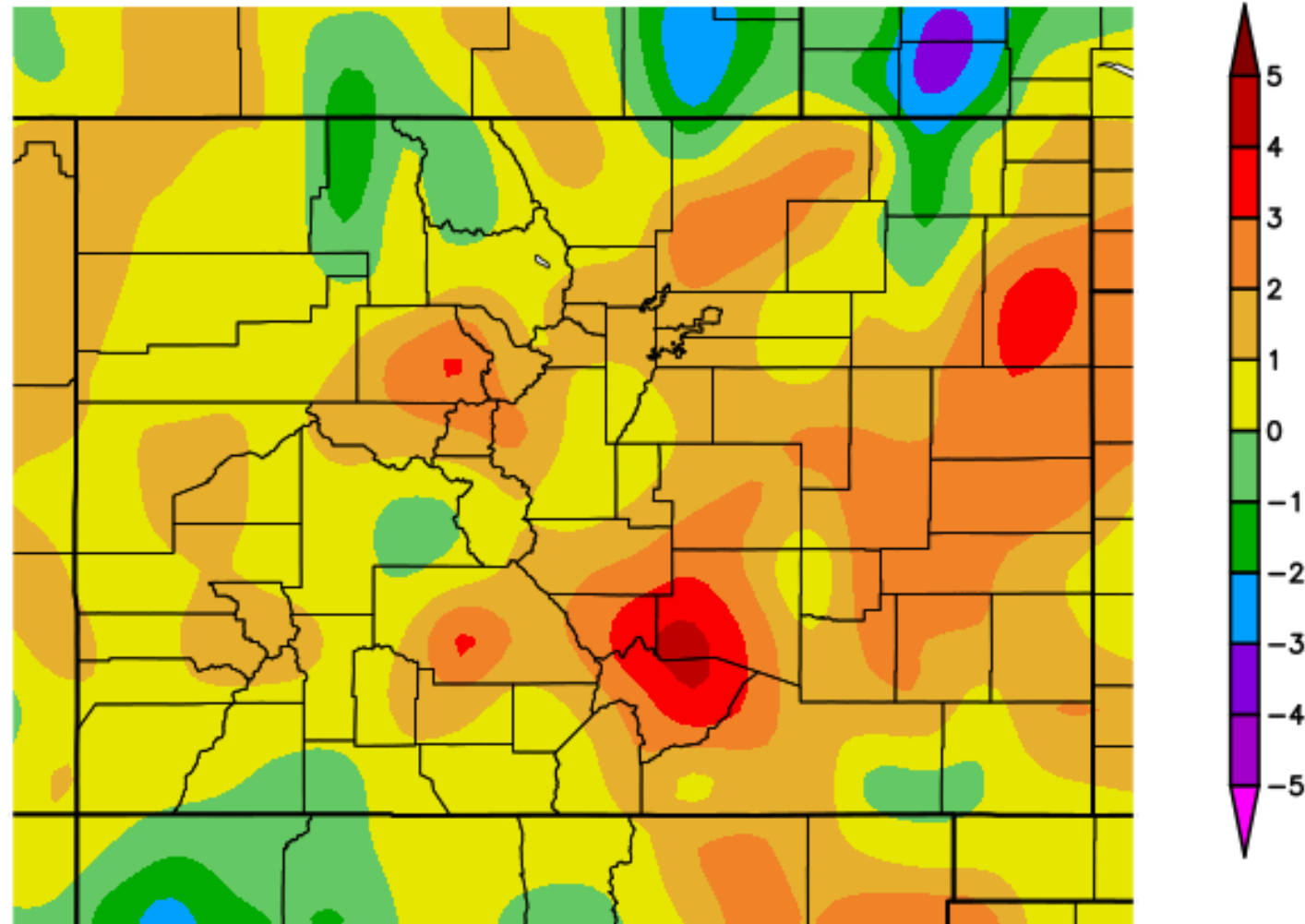


Generated 7/20/2019 at HPRCC using provisional data.

NOAA Regional Climate Centers



Departure from Normal Temperature (F) 7/1/2019 – 7/21/2019



Generated 7/22/2019 at HPRCC using provisional data.

NOAA Regional Climate Centers

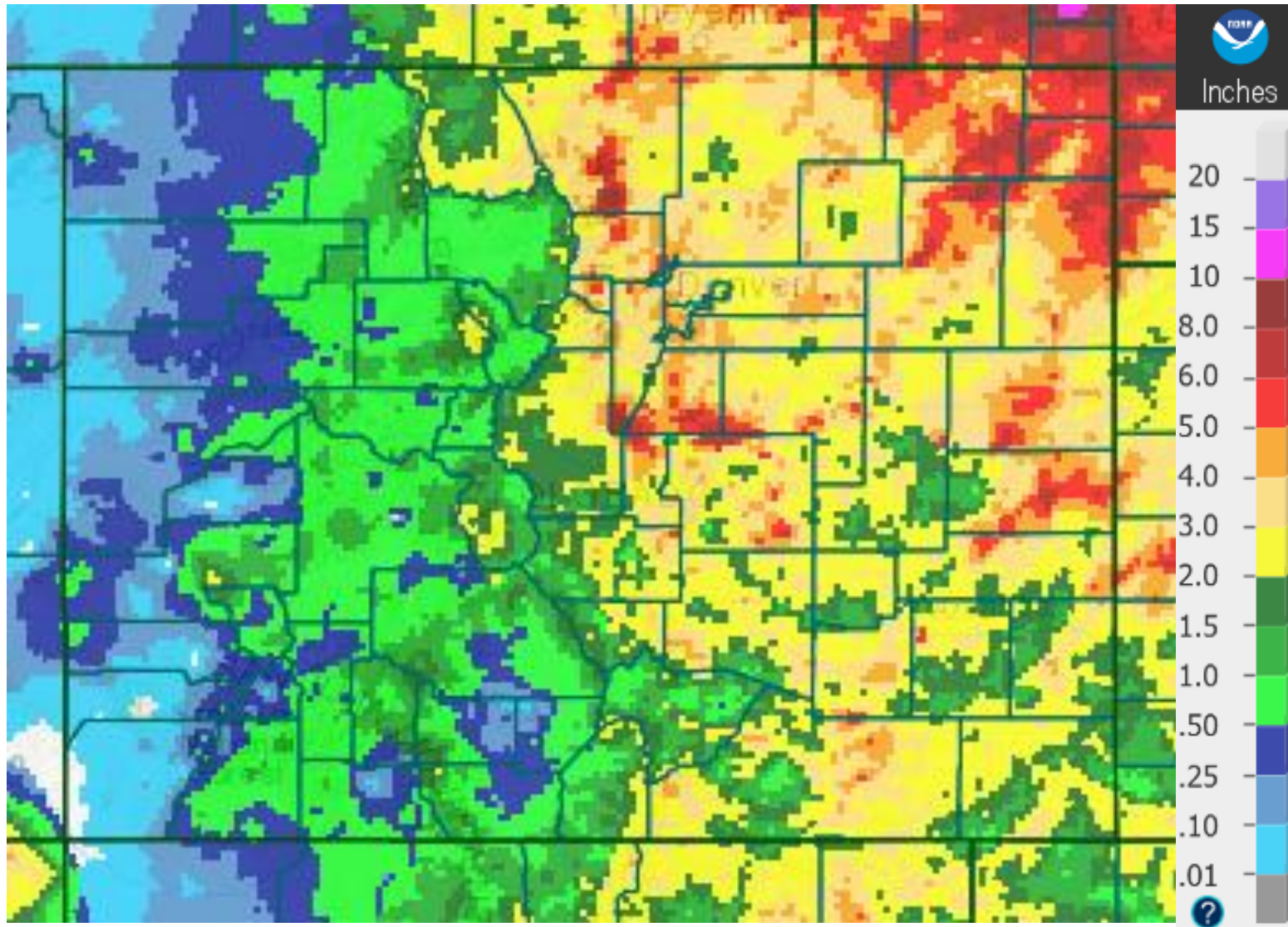


90-Degree Days

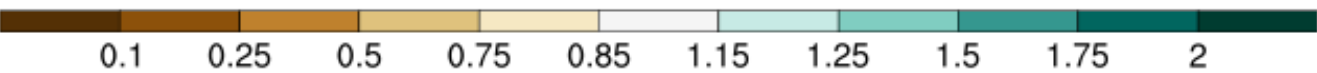
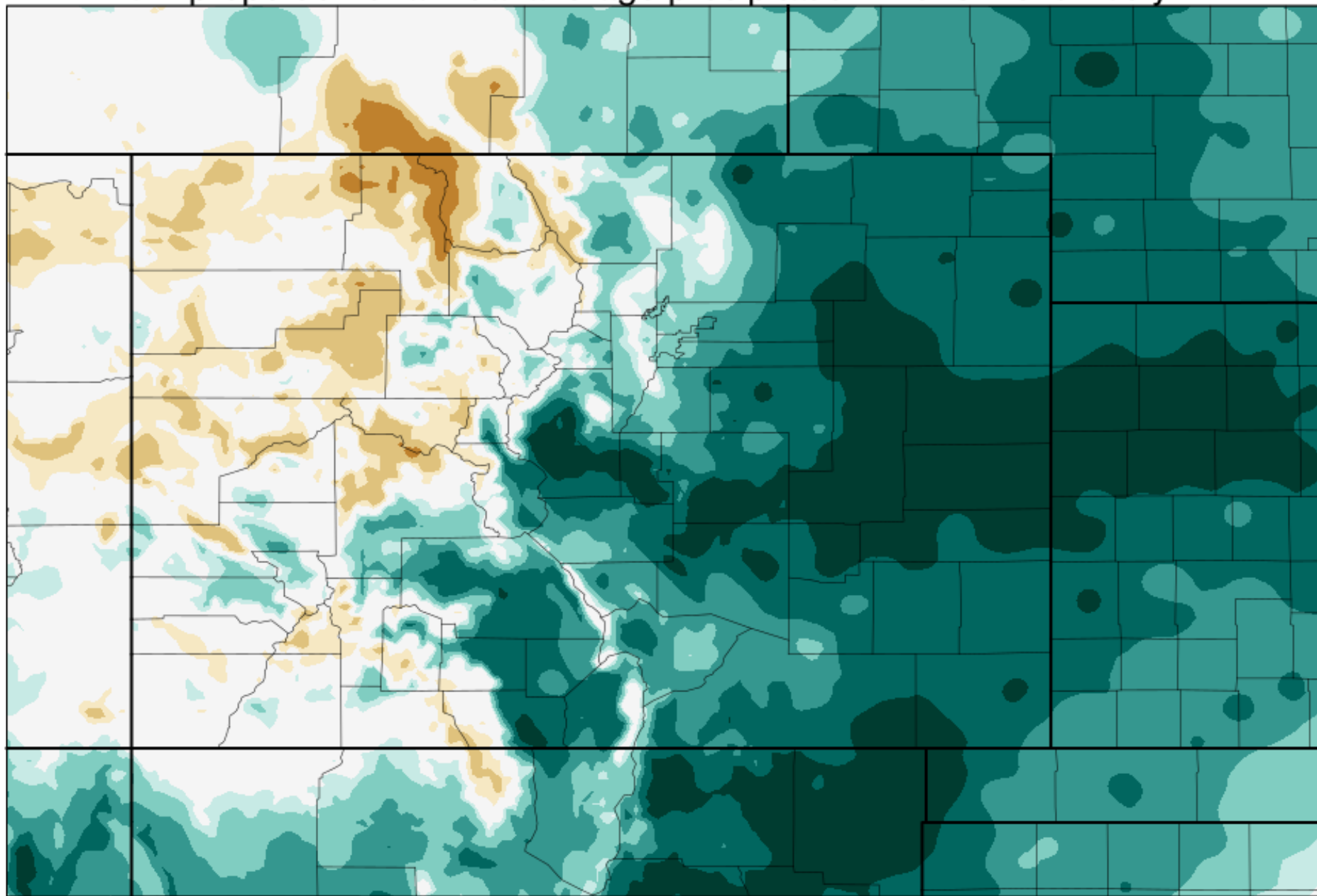
Location	Before July 1	After July 1
Fort Collins	4	11
Boulder	4	10
Denver	4	12
Colorado Springs	5	11
Pueblo	11	15
Akron	4	10
Burlington	7	14
Lamar	10	16
Grand Junction	11	19
Cortez	2	16
Dillon	0	0



Last 30 Days of Precipitation

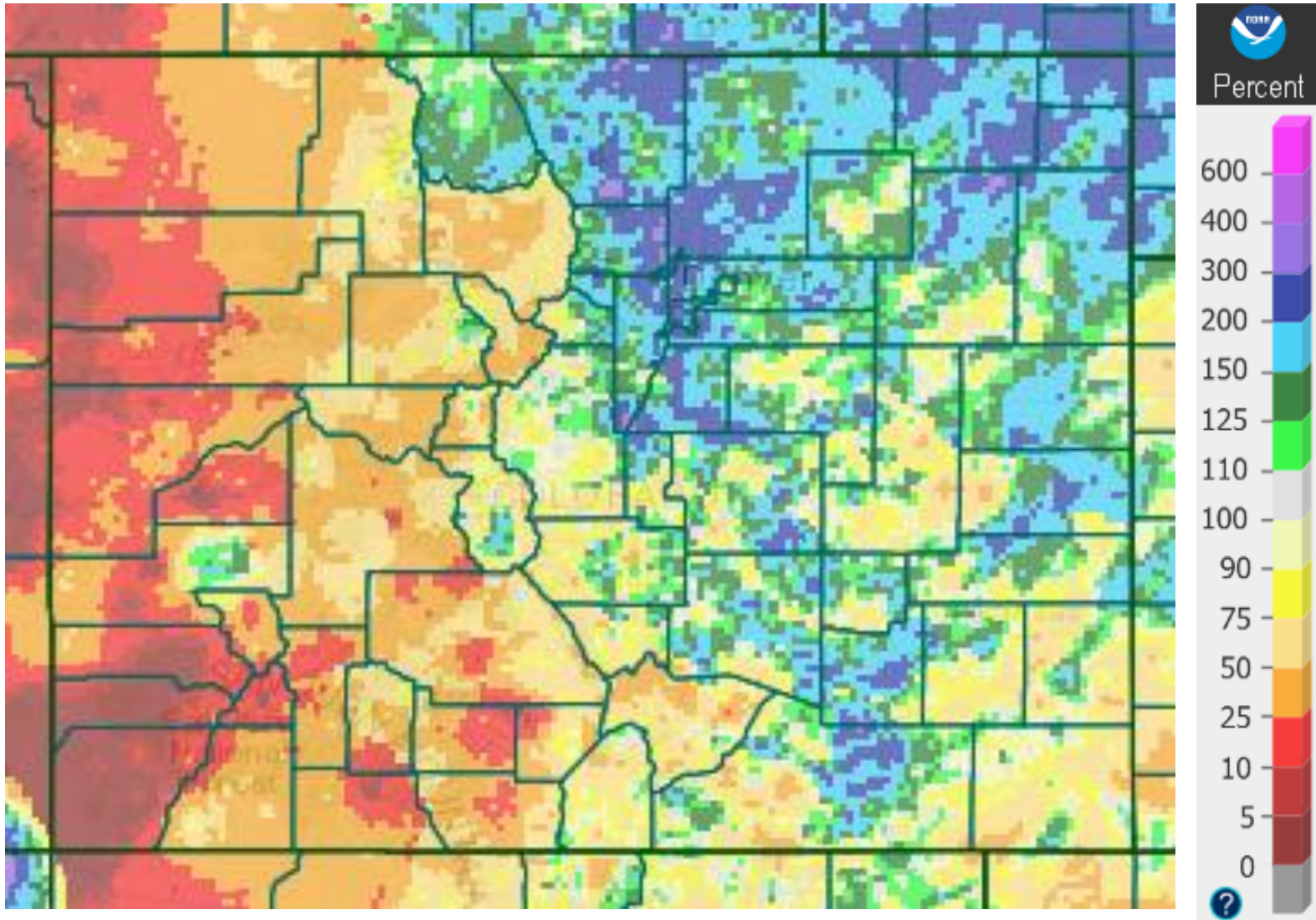


PRISM proportion of annual average precipitation in this month: July

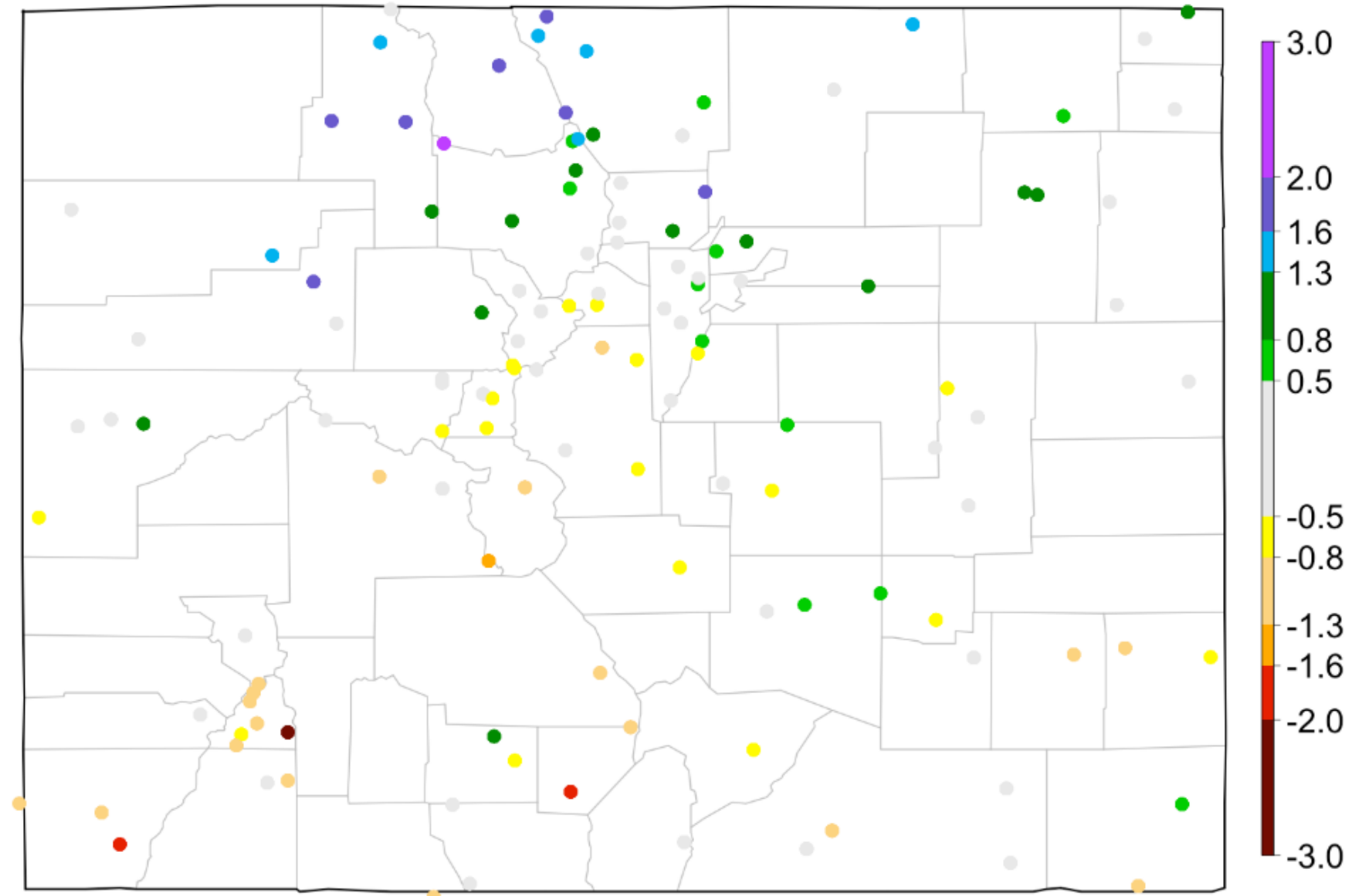


Proportion of precip relative to 1/12th

Last 30 Days % of Precipitation



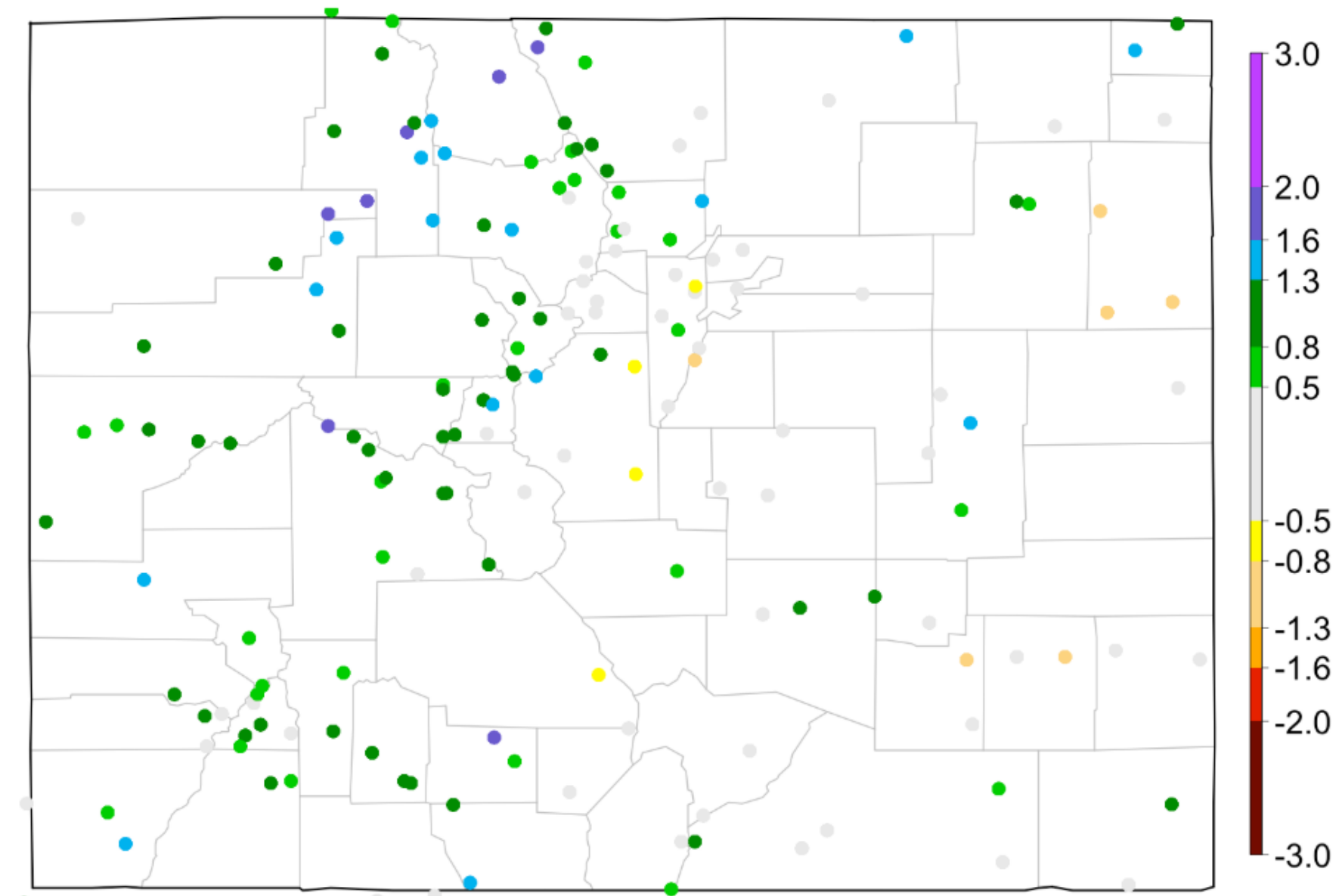
30-day SPI: 6/21/2019 - 7/20/2019



Data from High Plains Regional Climate Center and ACIS



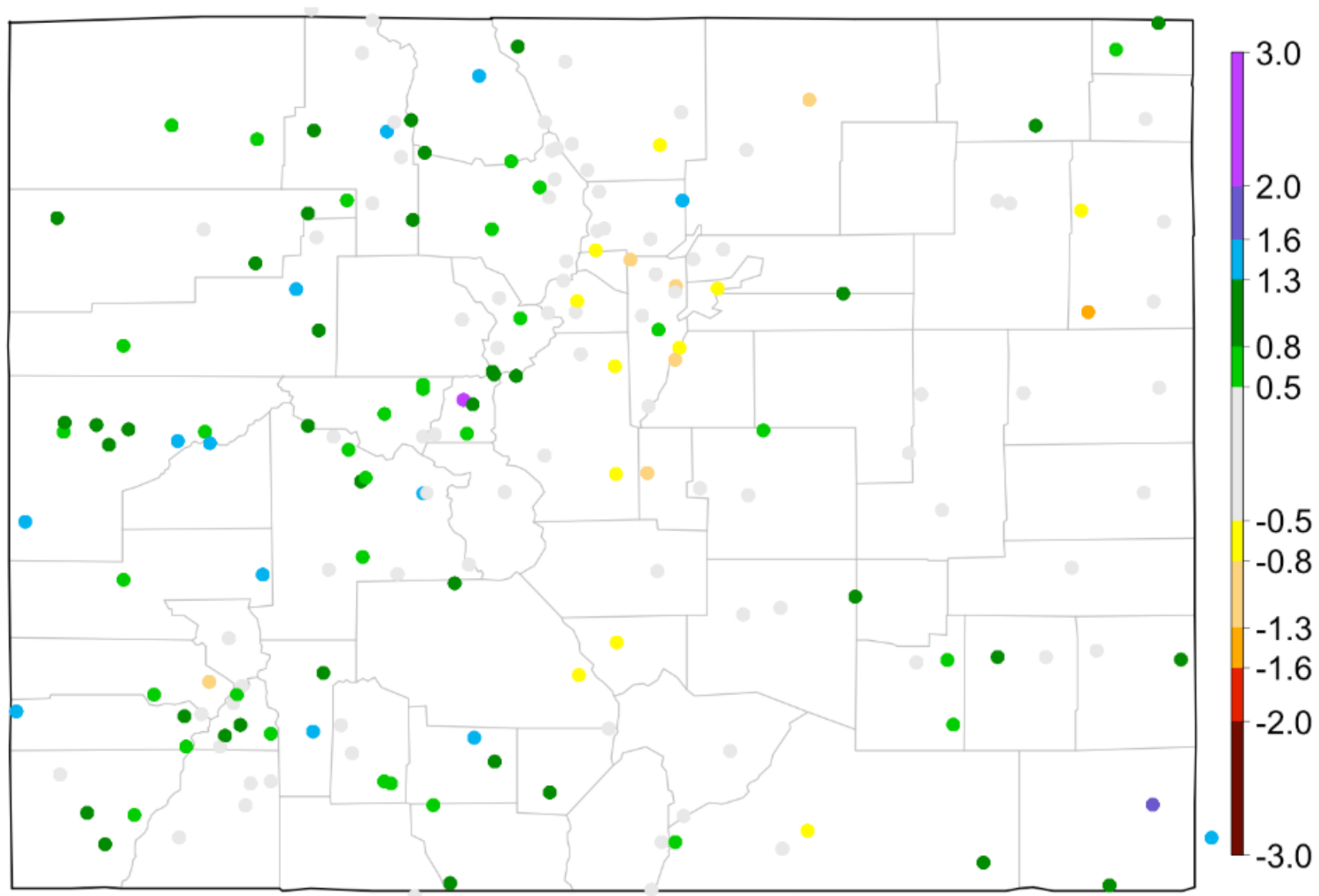
90-day SPI: 4/22/2019 - 7/20/2019



Data from High Plains Regional Climate Center and ACIS



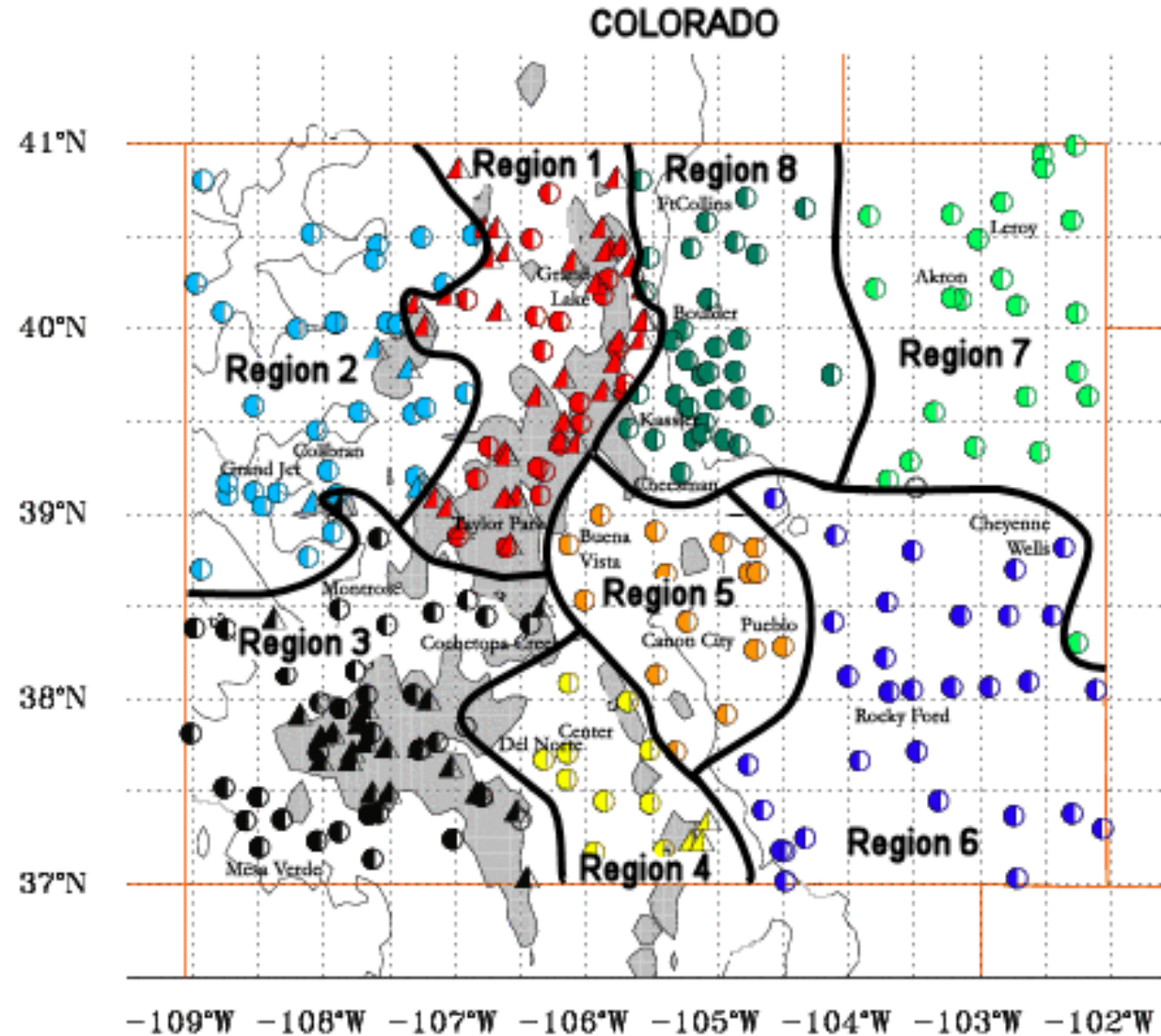
12-month SPI: 7/21/2018 - 7/20/2019



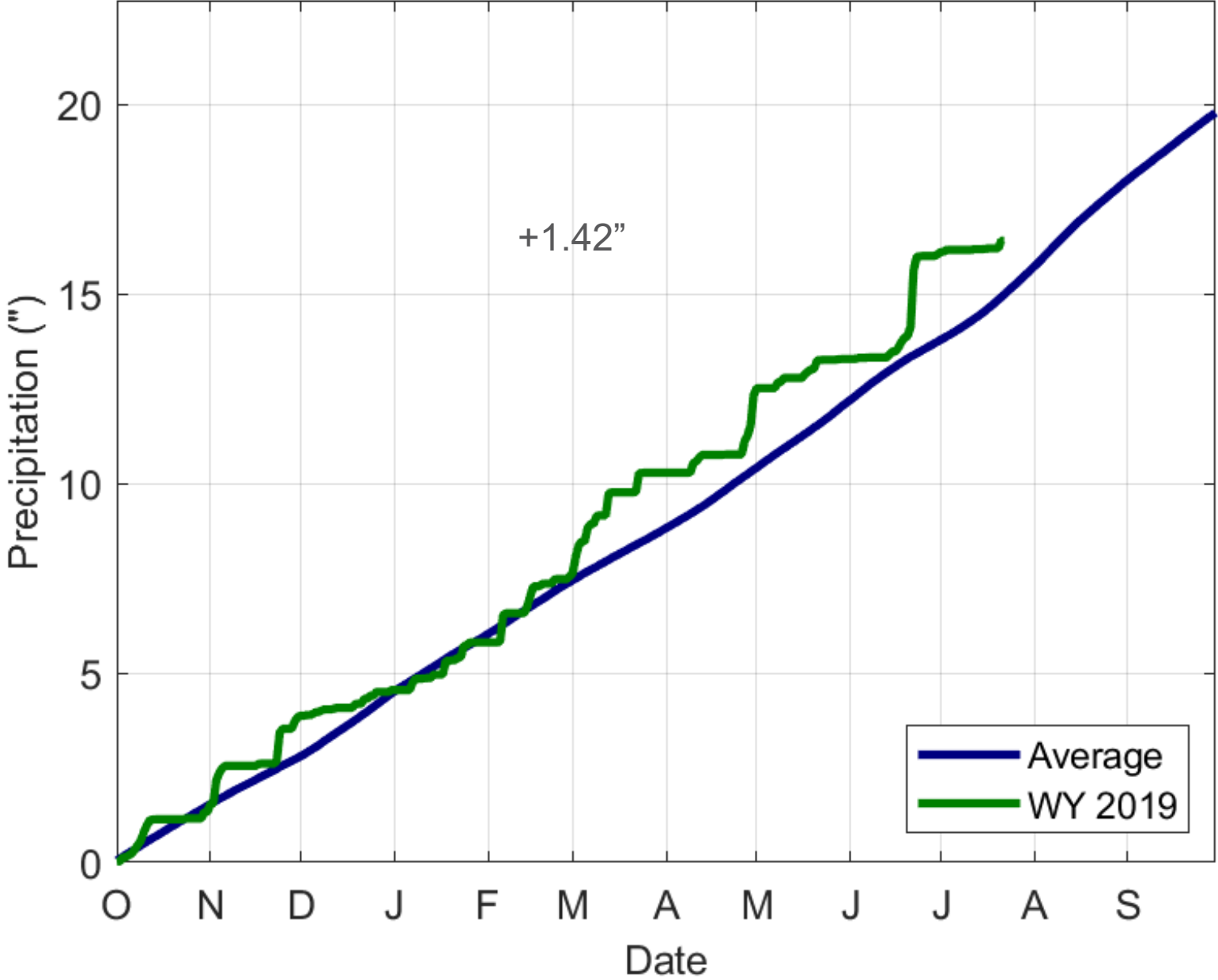
Data from High Plains Regional Climate Center and ACIS



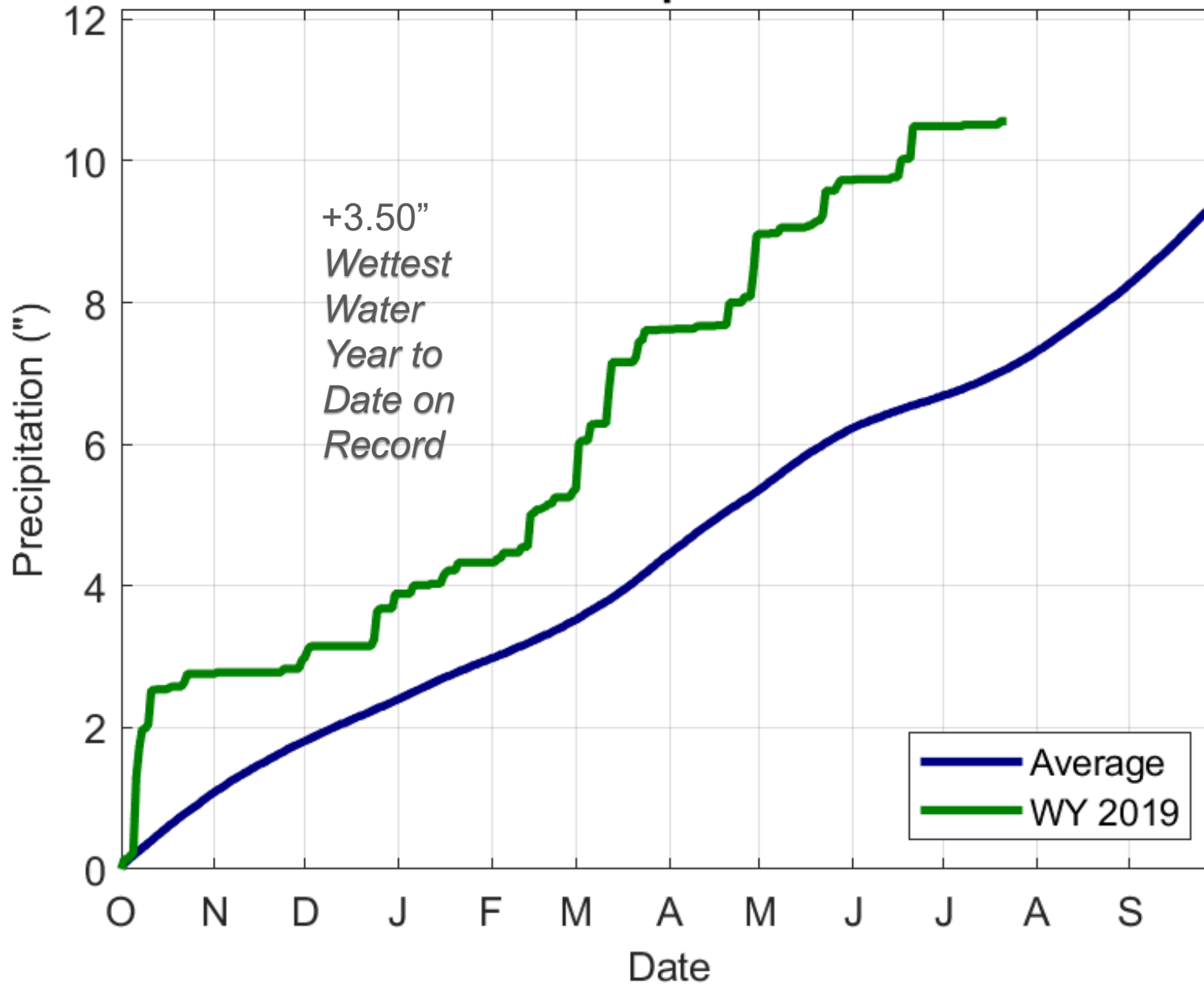
Precipitation by Climate Division



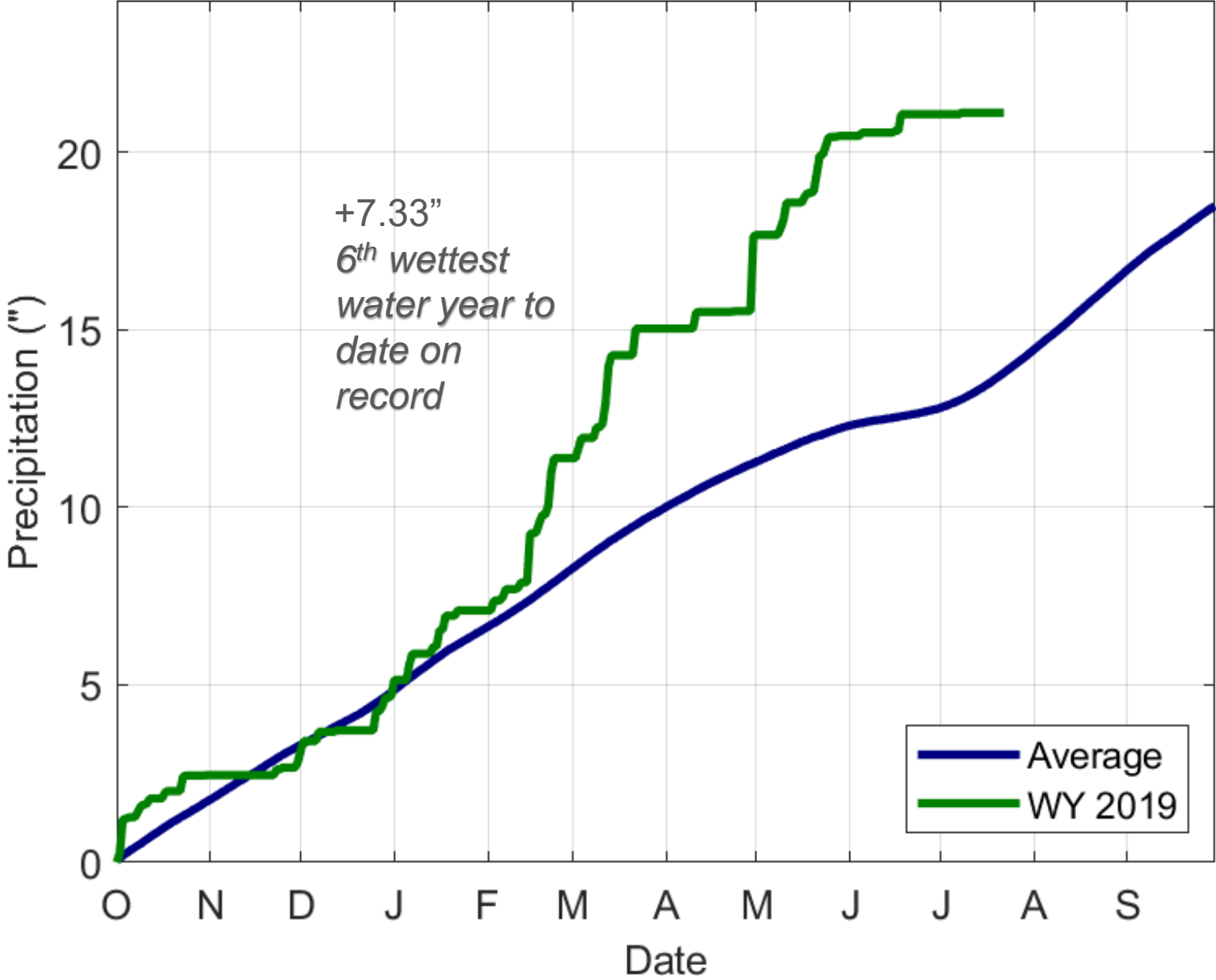
Grand Lake Precipitation Accumulation



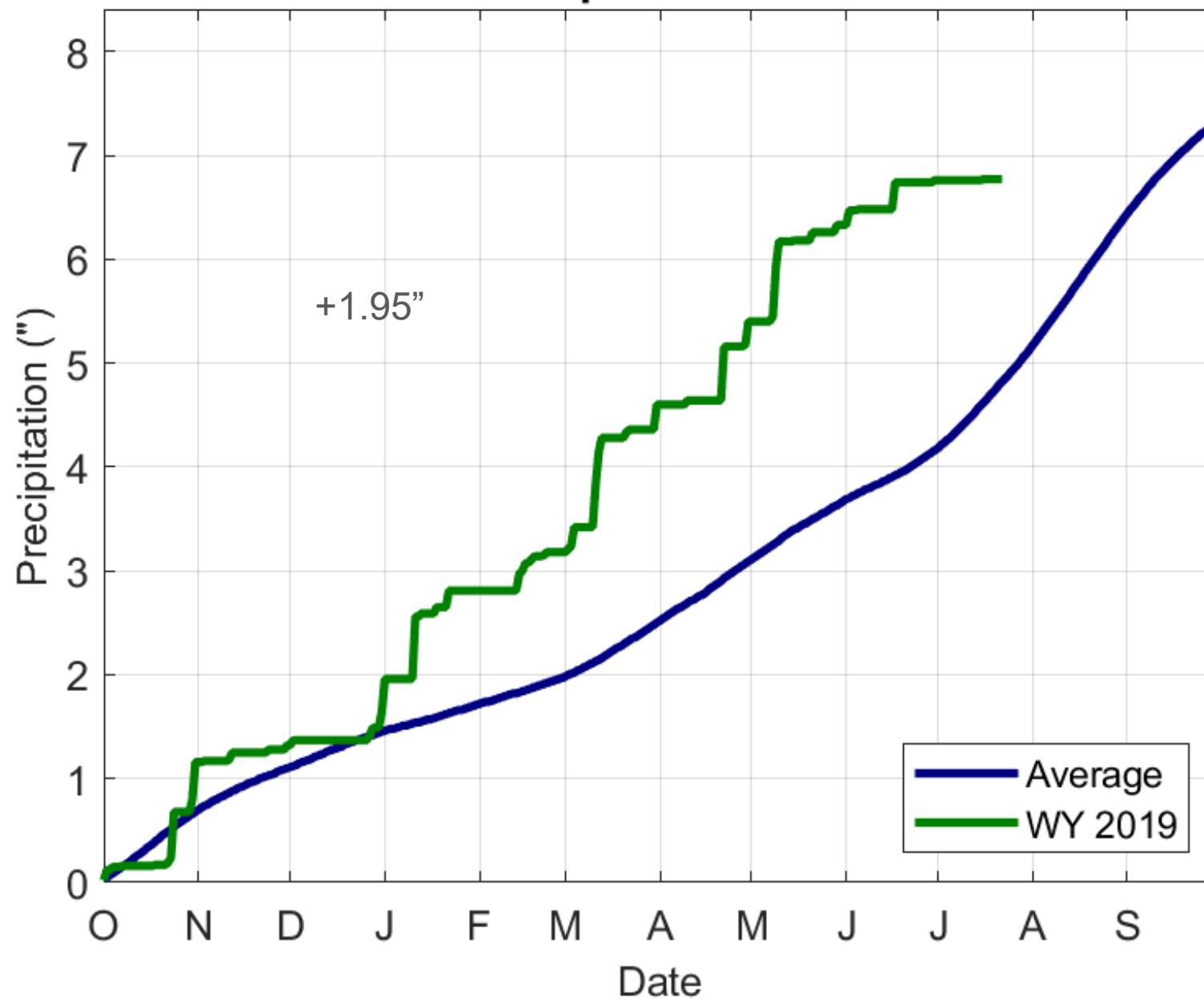
Grand Junction Precipitation Accumulation



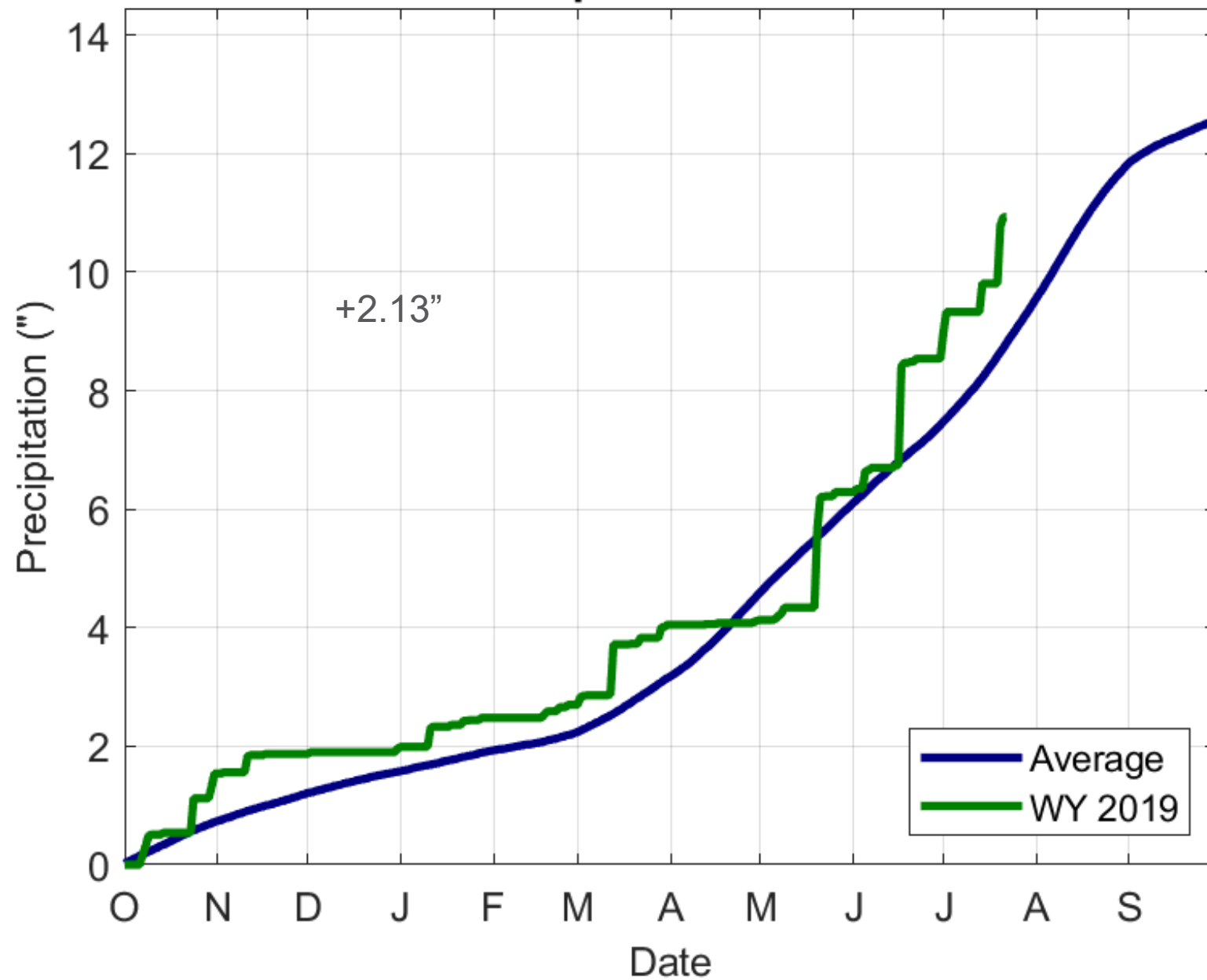
Mesa Verde Precipitation Accumulation



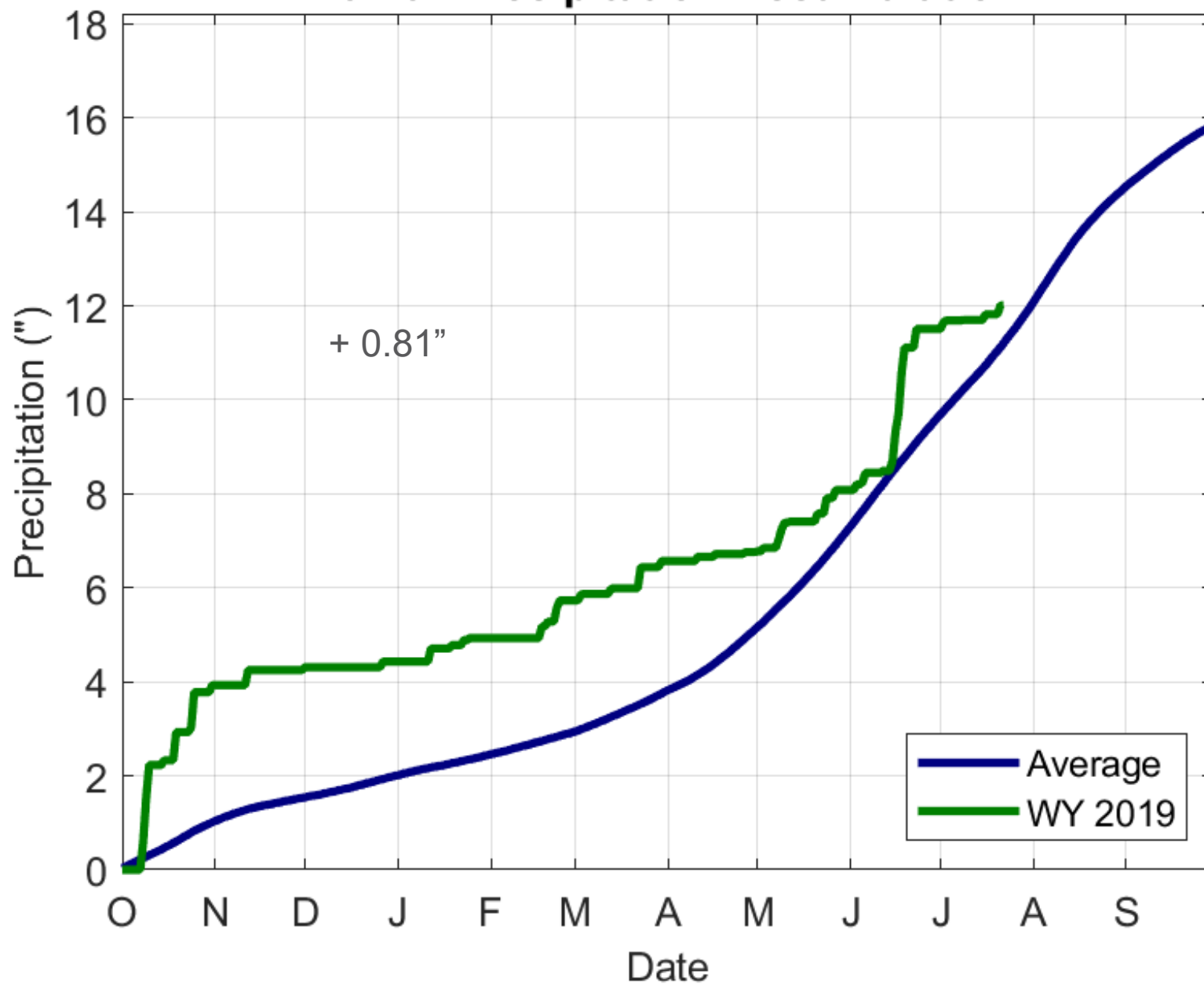
Alamosa Precipitation Accumulation



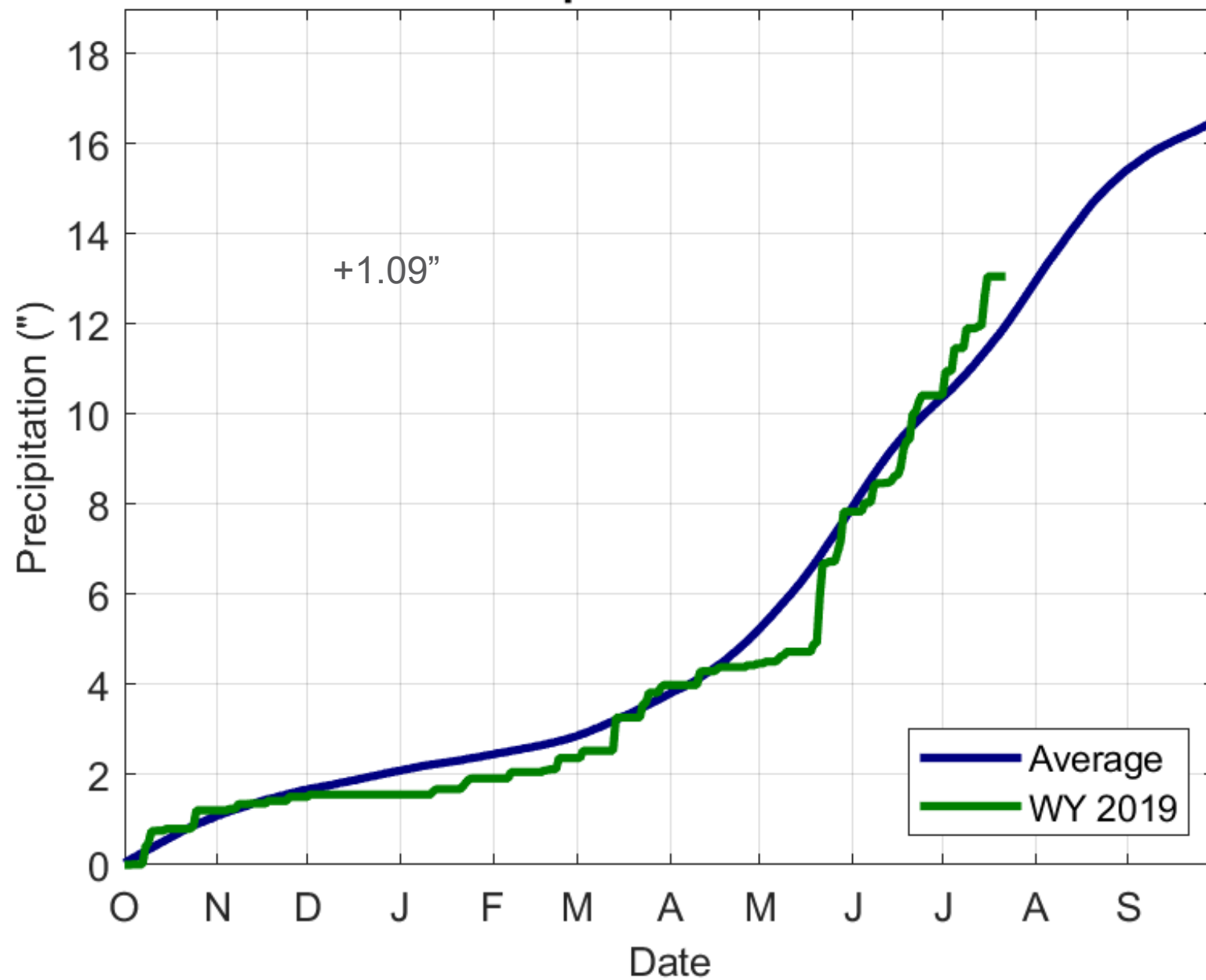
Pueblo Precipitation Accumulation



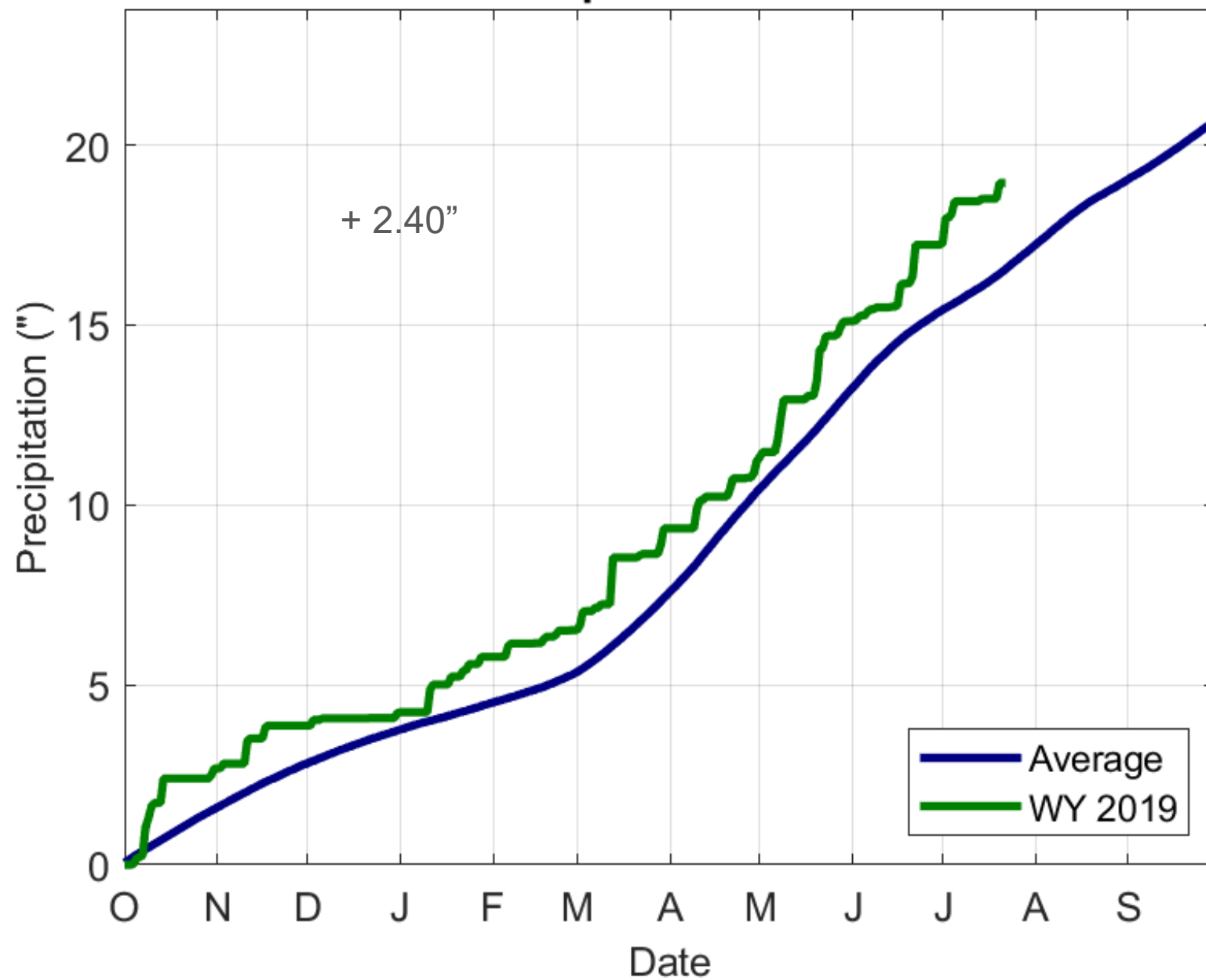
Lamar Precipitation Accumulation



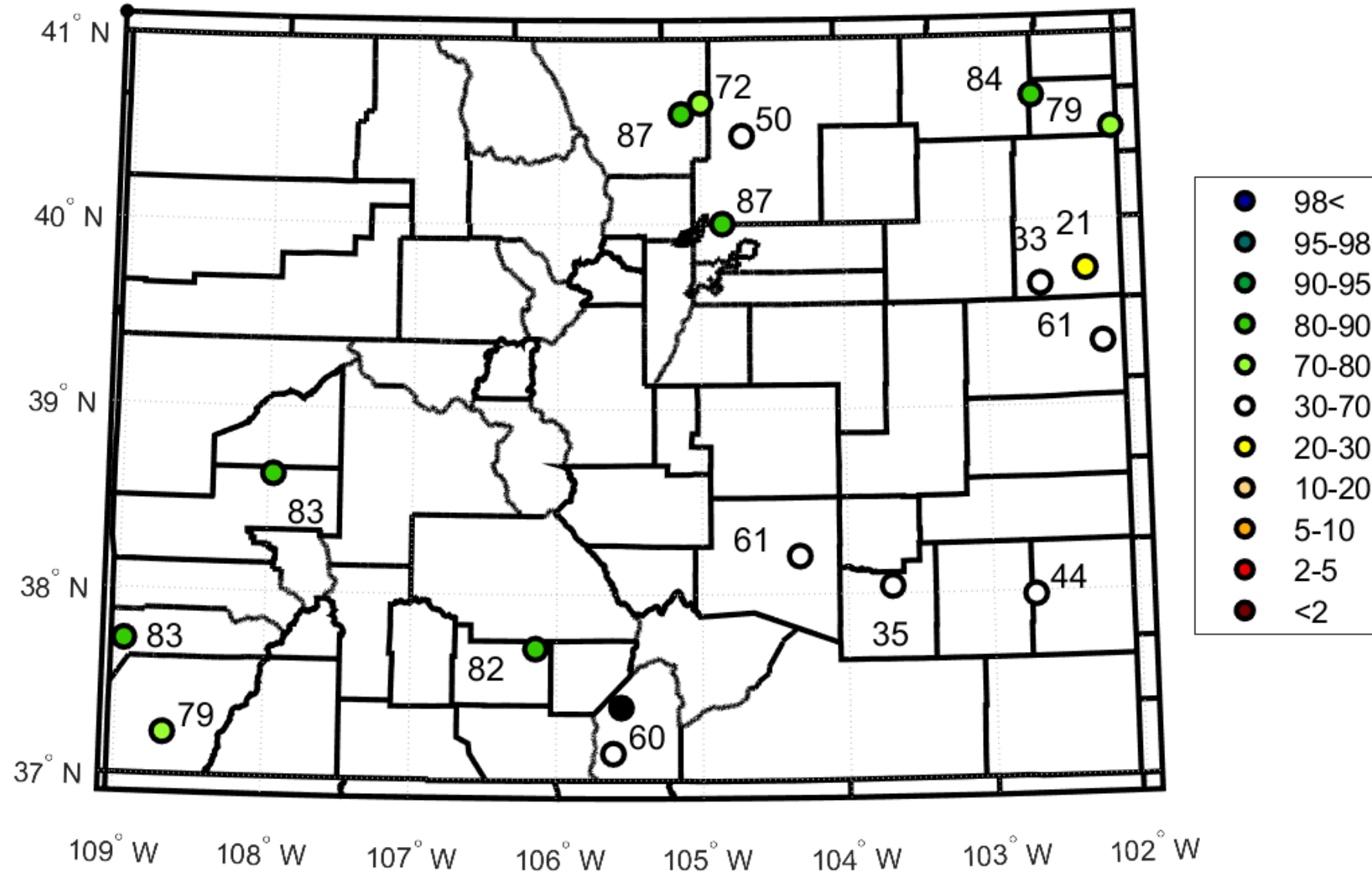
Akron Precipitation Accumulation



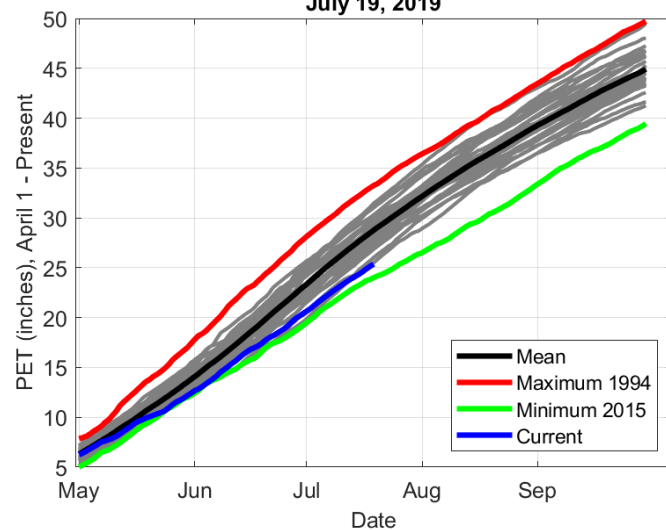
Boulder Precipitation Accumulation



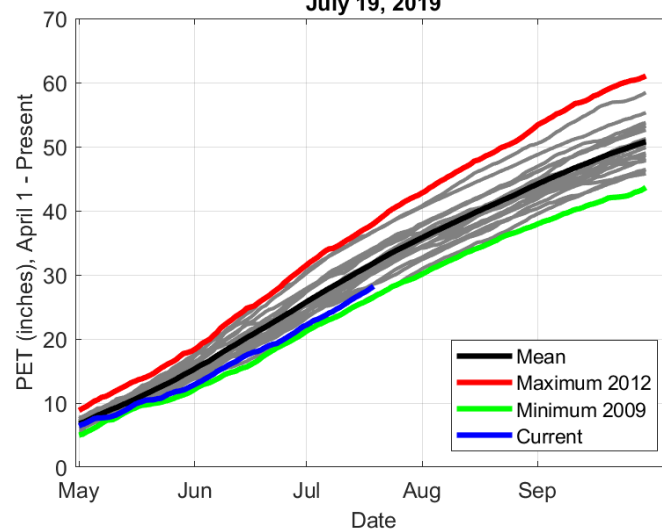
Growing Season Water Balance (P/PET) Percentiles July 19, 2019



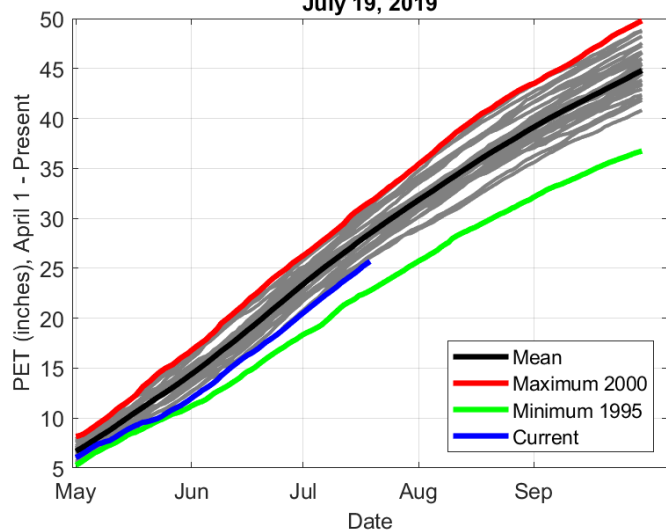
**Olathe Growing Season Evaporative Demand
July 19, 2019**



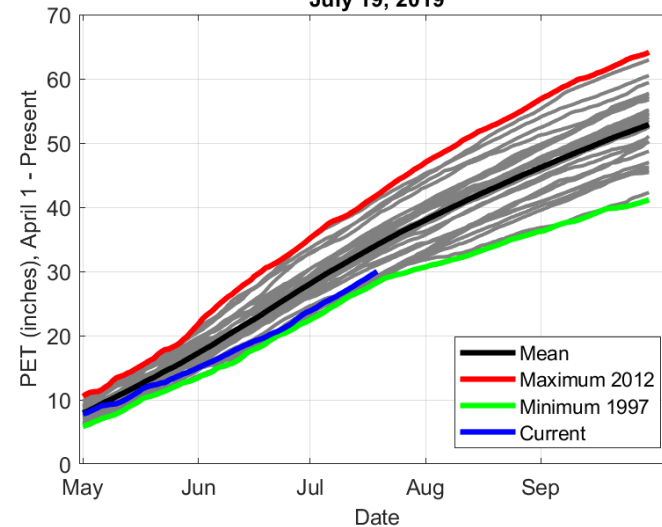
**Haxtun Growing Season Evaporative Demand
July 19, 2019**



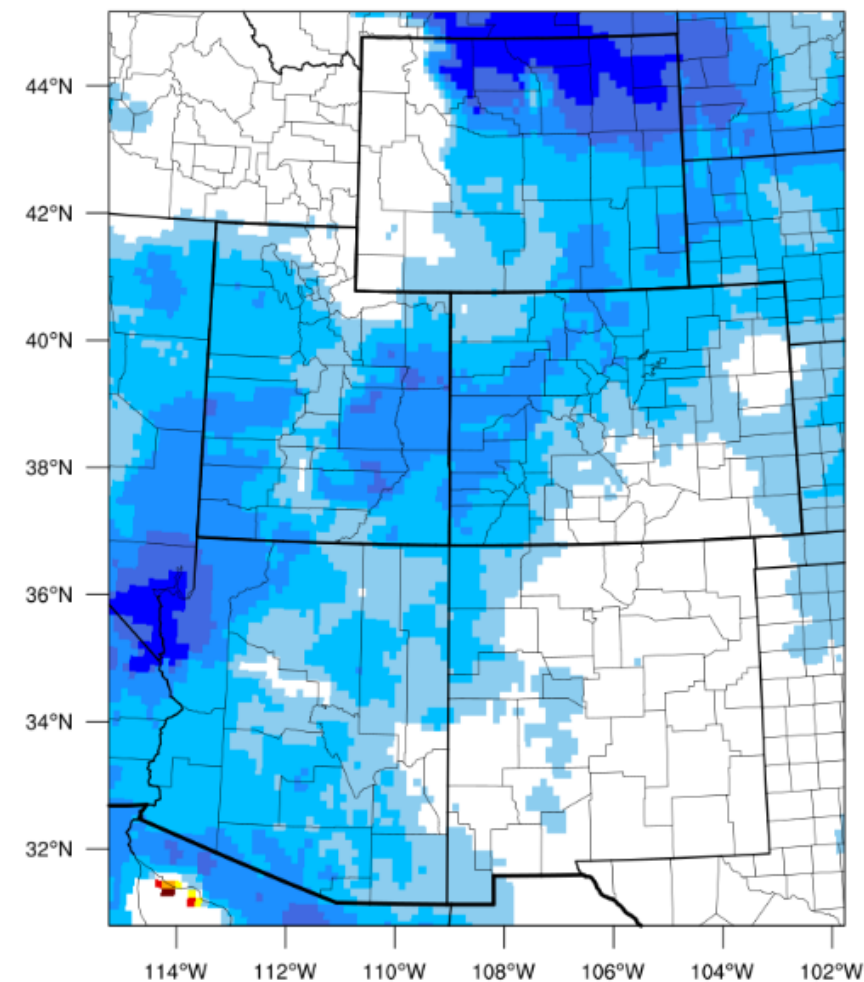
**Cortez Growing Season Evaporative Demand
July 19, 2019**



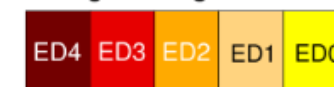
**Avondale Growing Season Evaporative Demand
July 19, 2019**



3-month EDDI categories for July 13, 2019



Drought categories



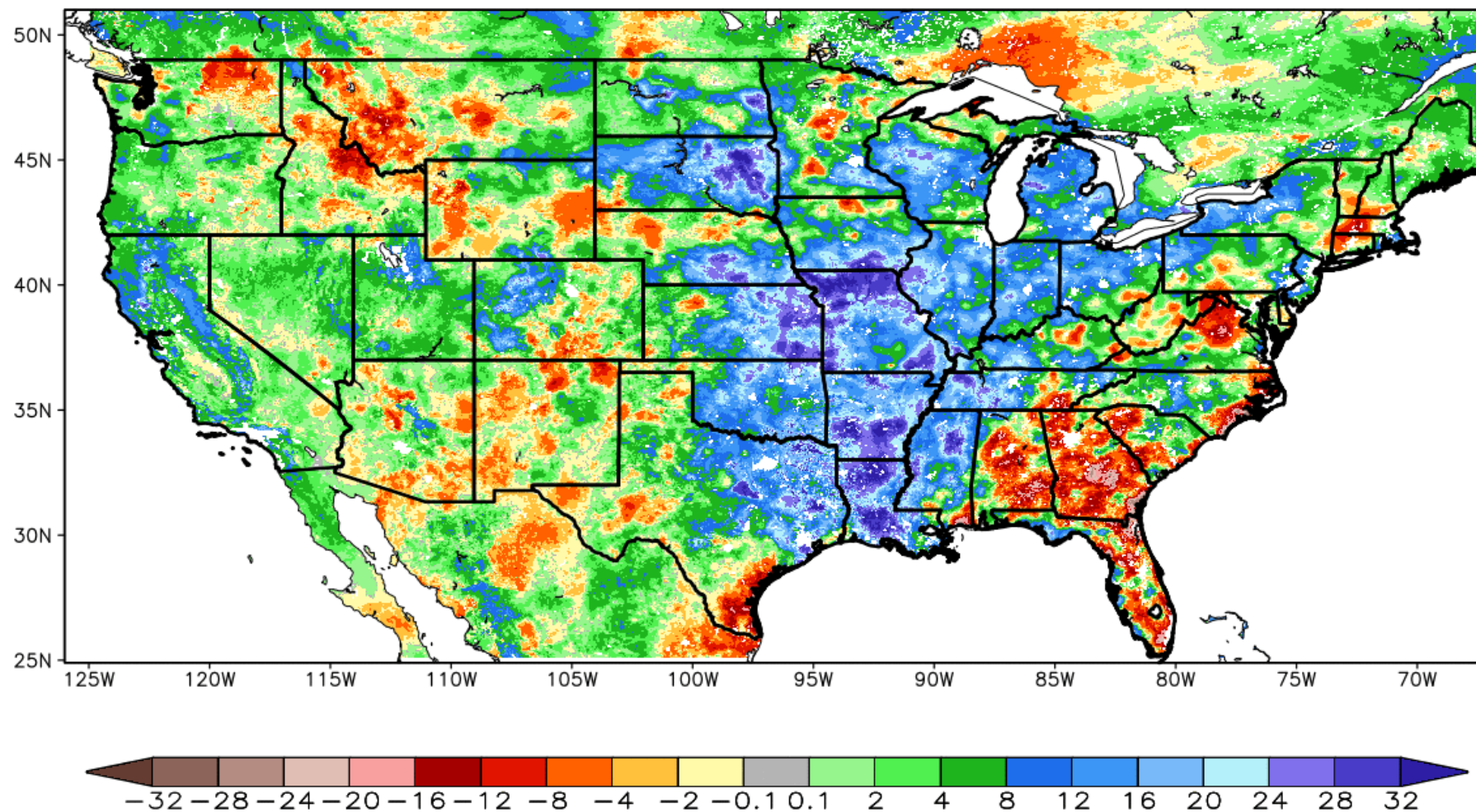
Wetness categories



100% 98% 95% 90% 80% 70% 30% 20% 10% 5% 2% 0%
(EDDI-percentile category breaks: 100% = driest; 0% = wettest)

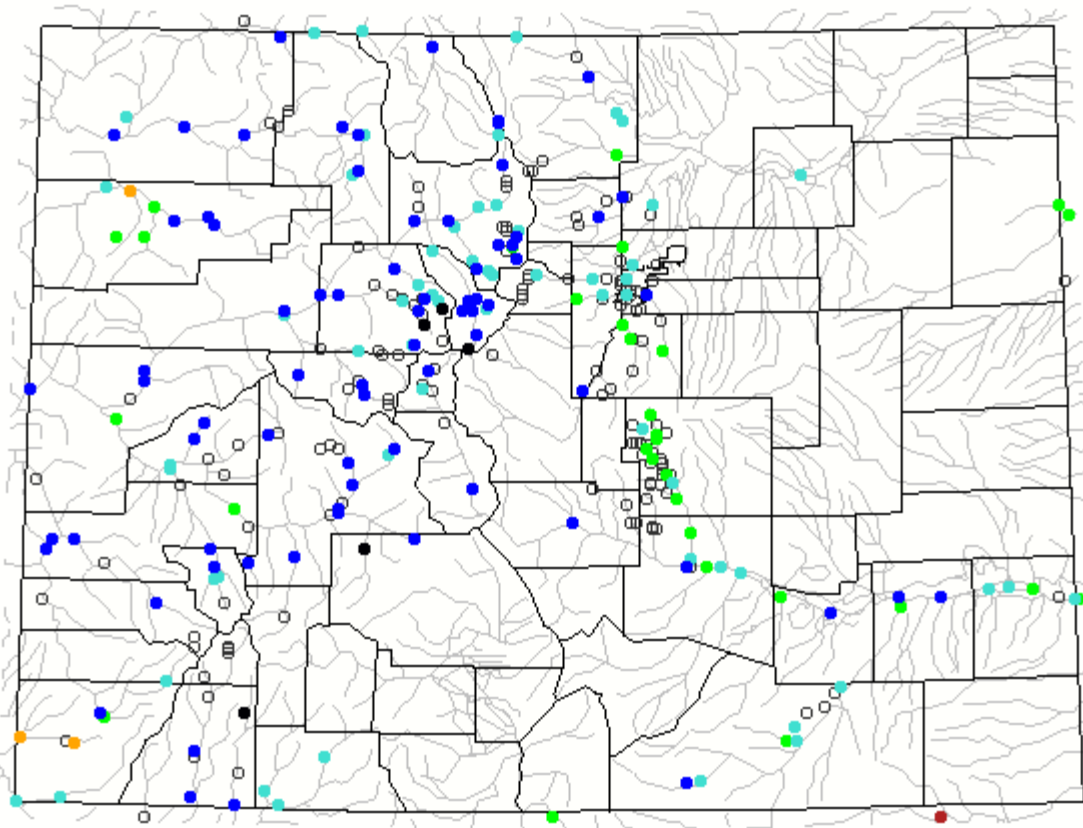


1-Year Difference in Column Relative Soil Moisture (%) valid 12z 21 Jul 2019



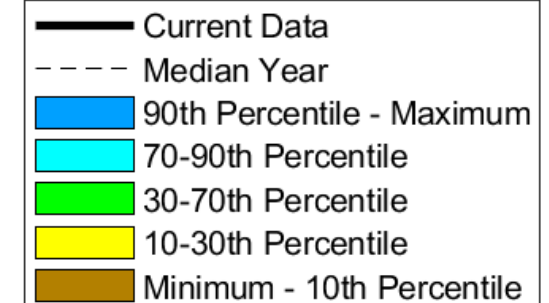
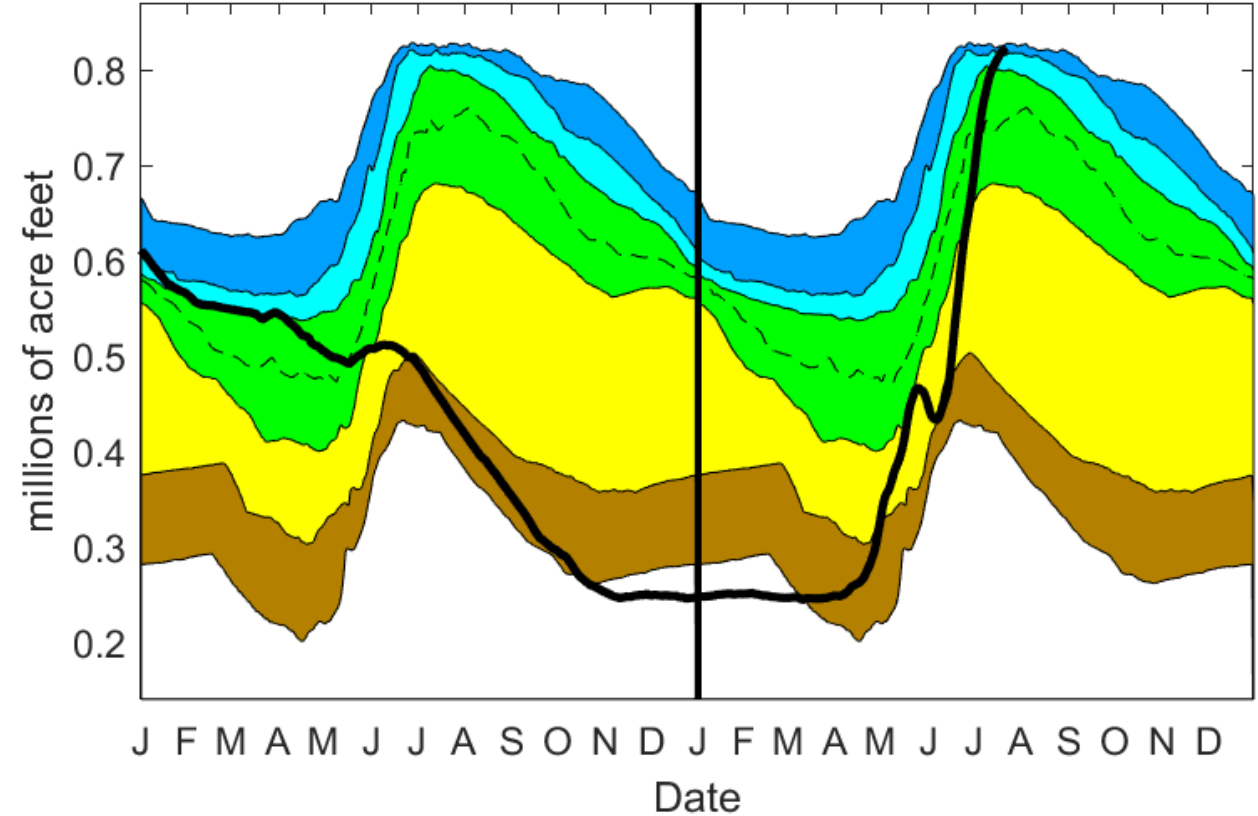
USGS Stream Gage Percentiles

Sunday, July 21, 2019



Explanation - Percentile classes							
Low	<10 Much below normal	10-24 Below normal	25-75 Normal	76-90 Above normal	>90 Much above normal	High	Not-ranked

Blue Mesa Reservoir Level 2019-07-22 117 Percent of 1981-2017 Average



Drought

National Drought

Colorado Drought

Colorado Drought Facts

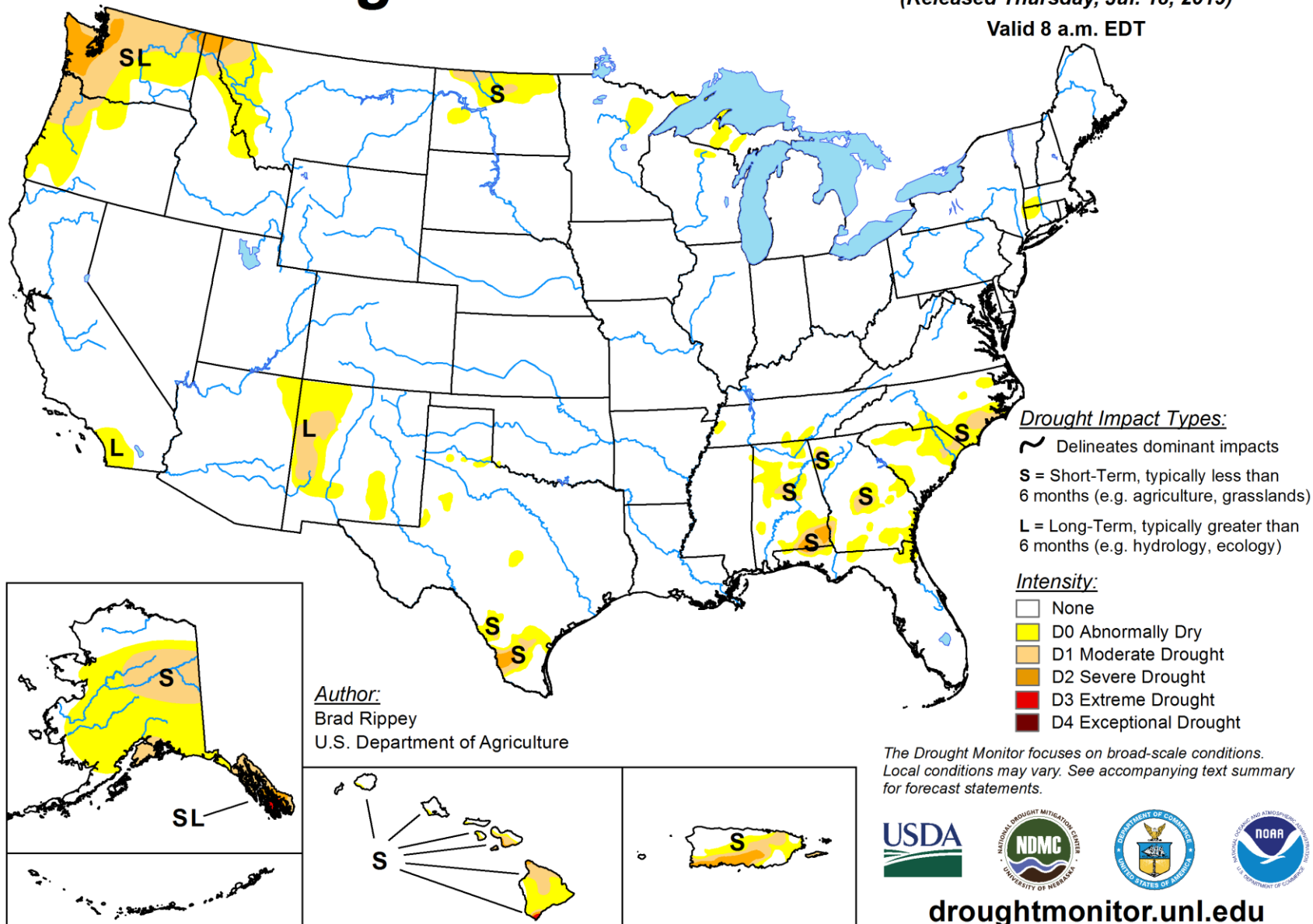


U.S. Drought Monitor

July 16, 2019

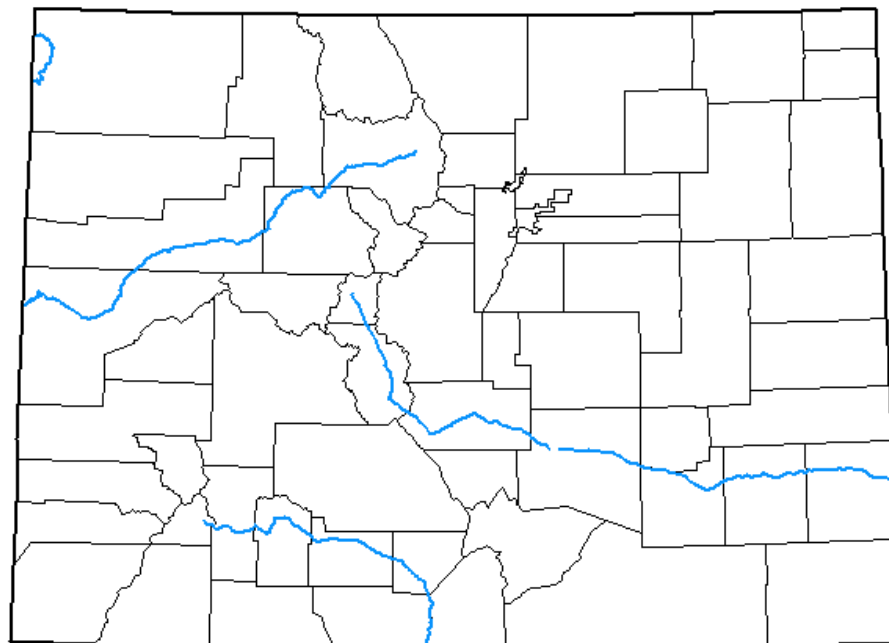
(Released Thursday, Jul. 18, 2019)

Valid 8 a.m. EDT



where's the color???

U.S. Drought Monitor Colorado



July 16, 2019
(Released Thursday, Jul. 18, 2019)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	100.00	0.00	0.00	0.00	0.00	0.00
Last Week 07-09-2019	100.00	0.00	0.00	0.00	0.00	0.00
3 Months Ago 04-16-2019	78.01	21.99	4.74	0.00	0.00	0.00
Start of Calendar Year 01-01-2019	17.94	82.06	66.26	54.91	27.11	11.22
Start of Water Year 09-25-2018	14.19	85.81	72.30	64.41	48.47	16.21
One Year Ago 07-17-2018	17.50	82.50	76.96	60.62	40.08	13.32

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. See accompanying text summary for forecast statements.

Author:

Brad Rippey
U.S. Department of Agriculture



droughtmonitor.unl.edu



Colorado Drought Monitor Facts

- Last month, we reported:
 - Since the beginning of the US Drought Monitor, our state has never been completely free of D0 – D4.
 - Our record smallest amount of D0 occurred in May 2001, when only 0.13% of our state showed D0.
- Since then:
 - We became the last state to finally report a week of no D0-D4.
 - We've had 4 weeks of no D0-D4

Week	None	D0-D4
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
2019-05-21	99.99	0.01
2001-05-08	99.87	0.13





Outlook

Next 7 days

8-14 day Outlook

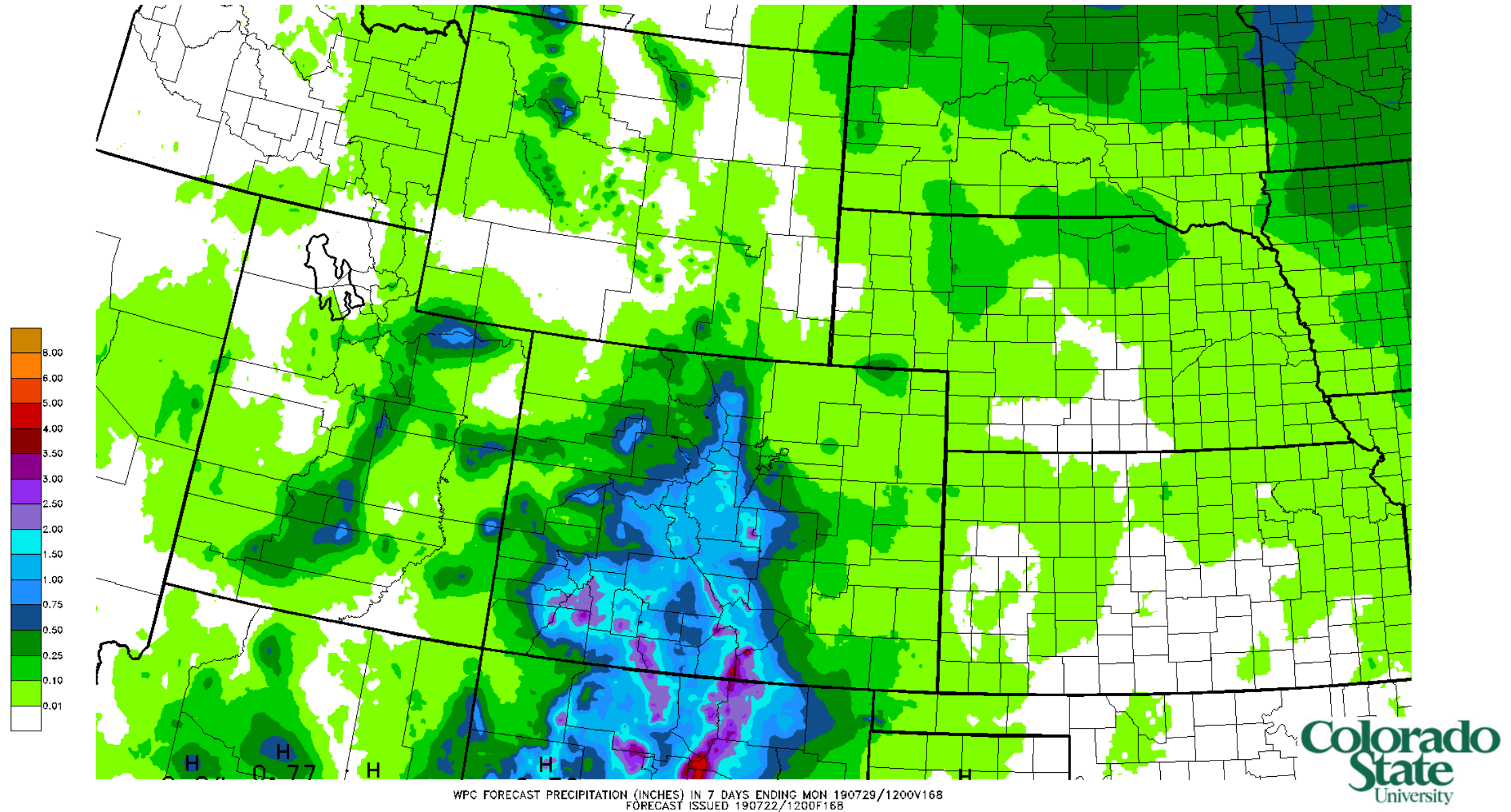
CPC Outlooks

Precipitation Projections

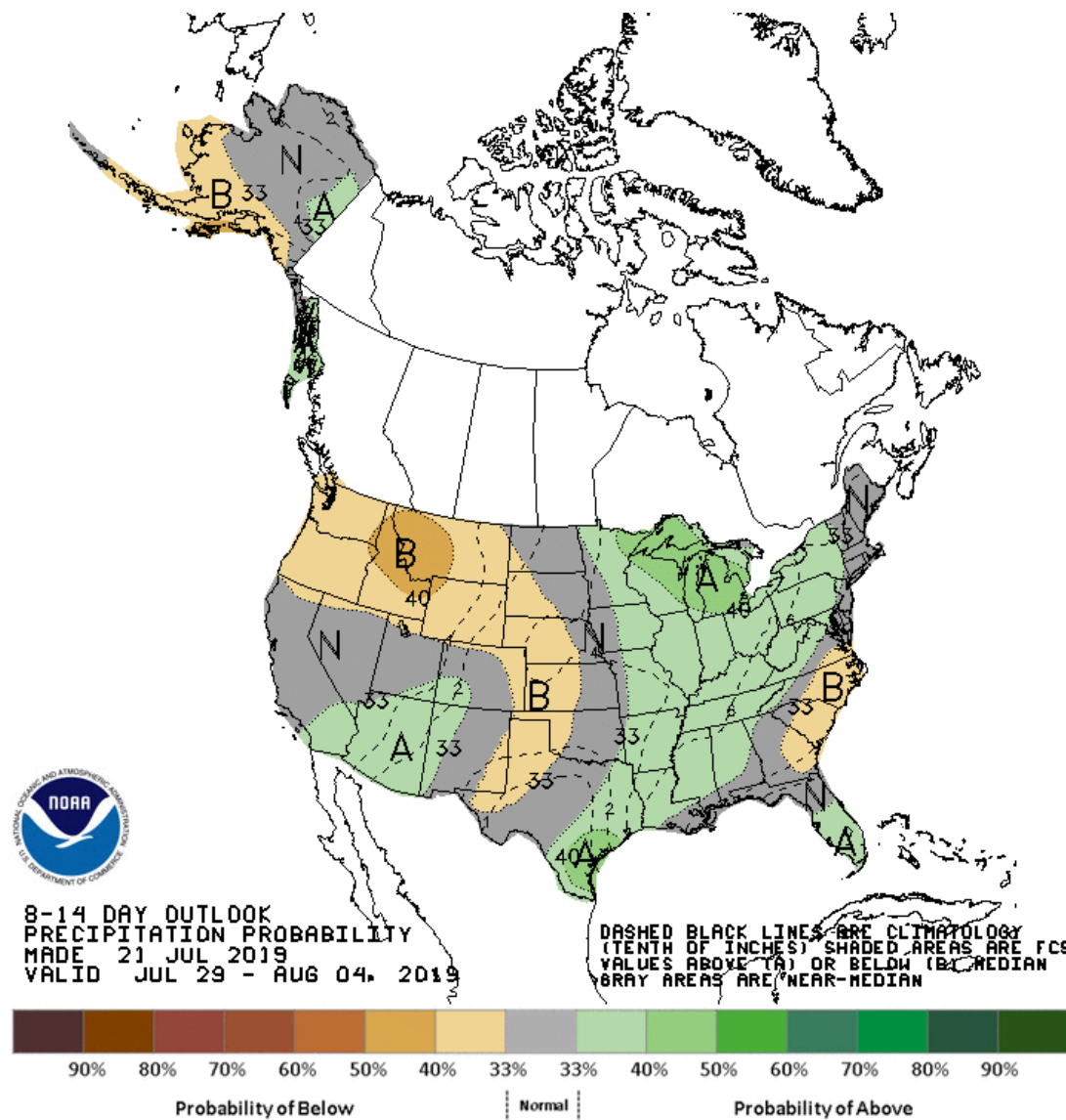
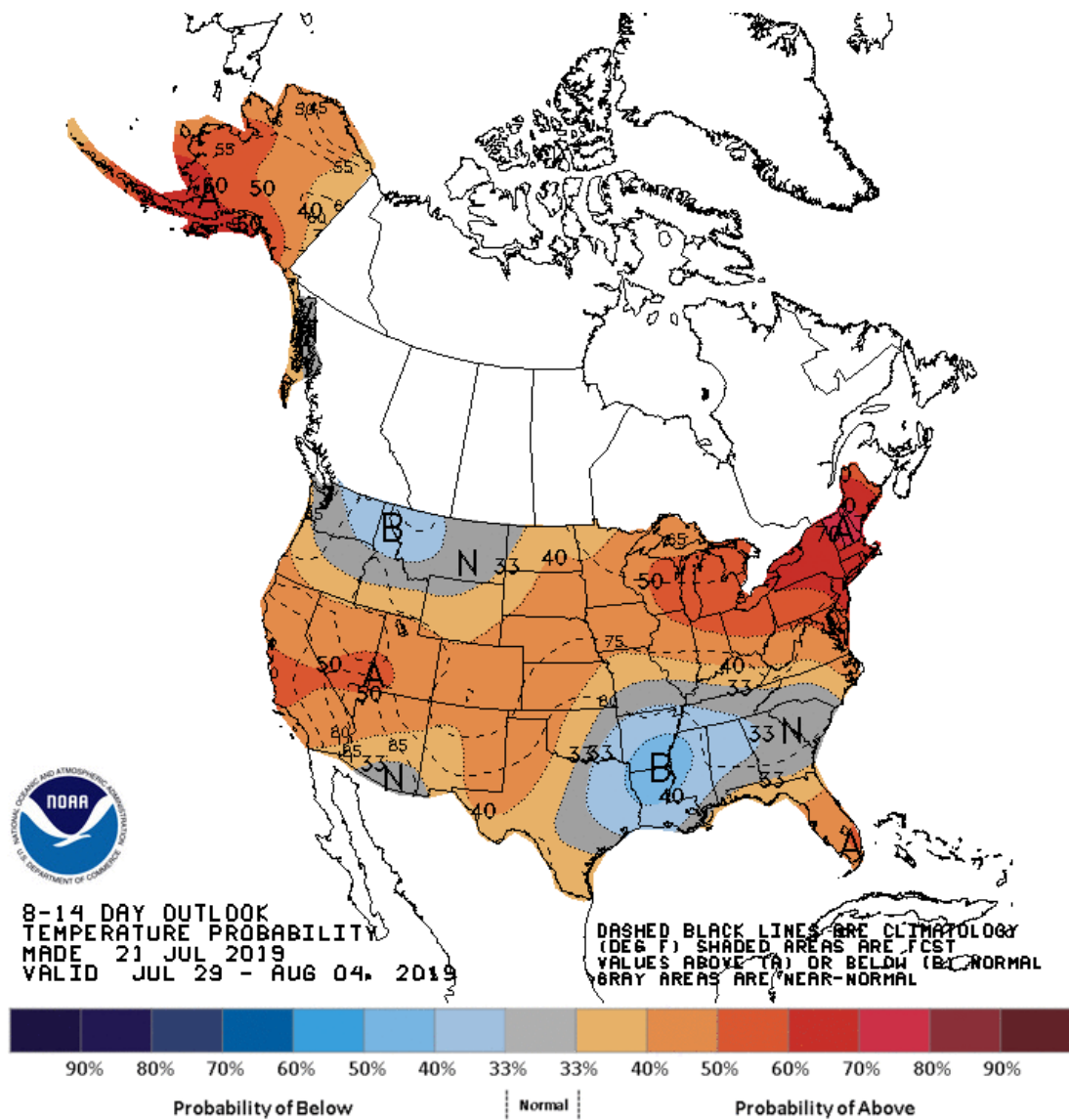
What is happening with El Niño?



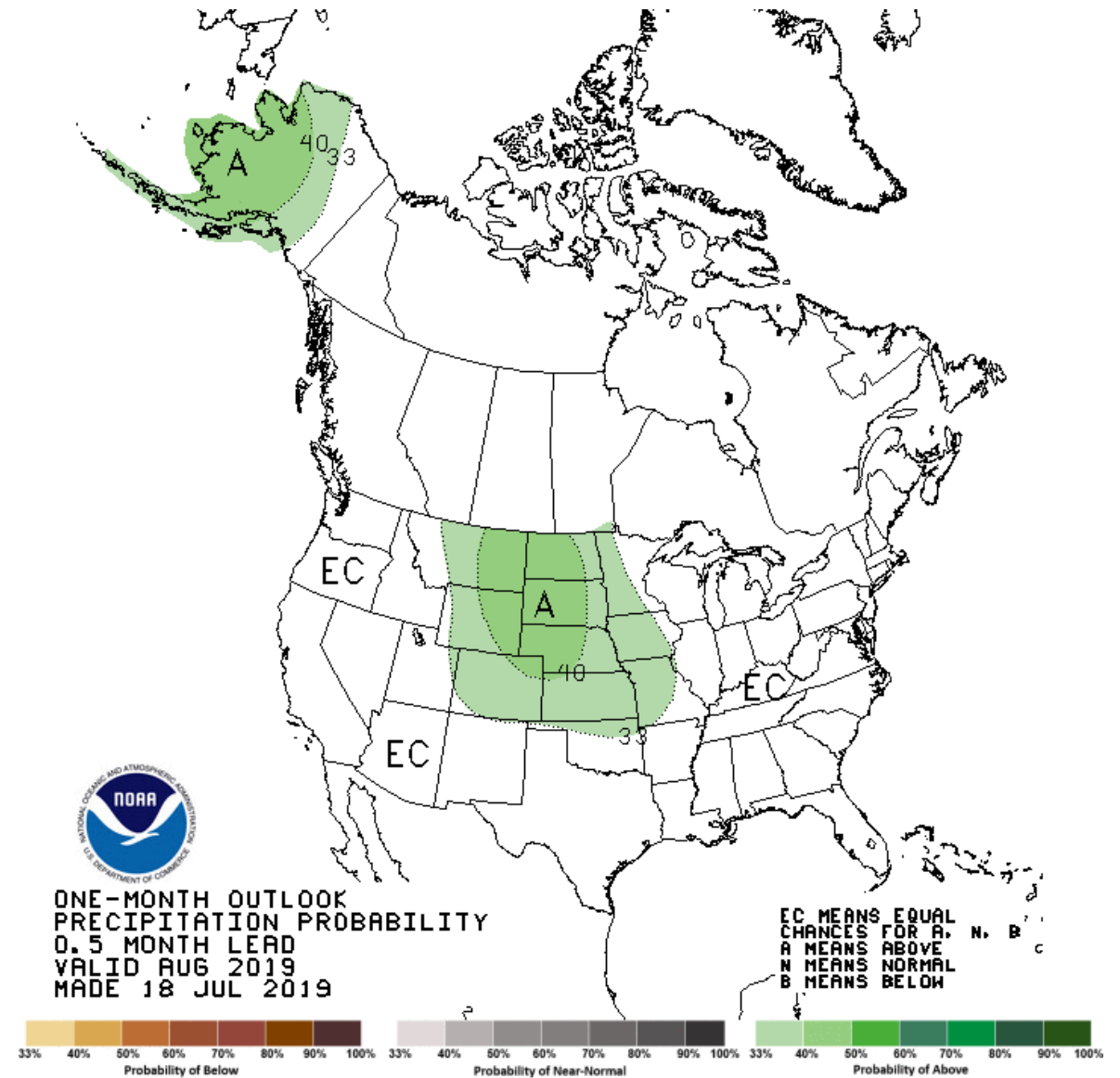
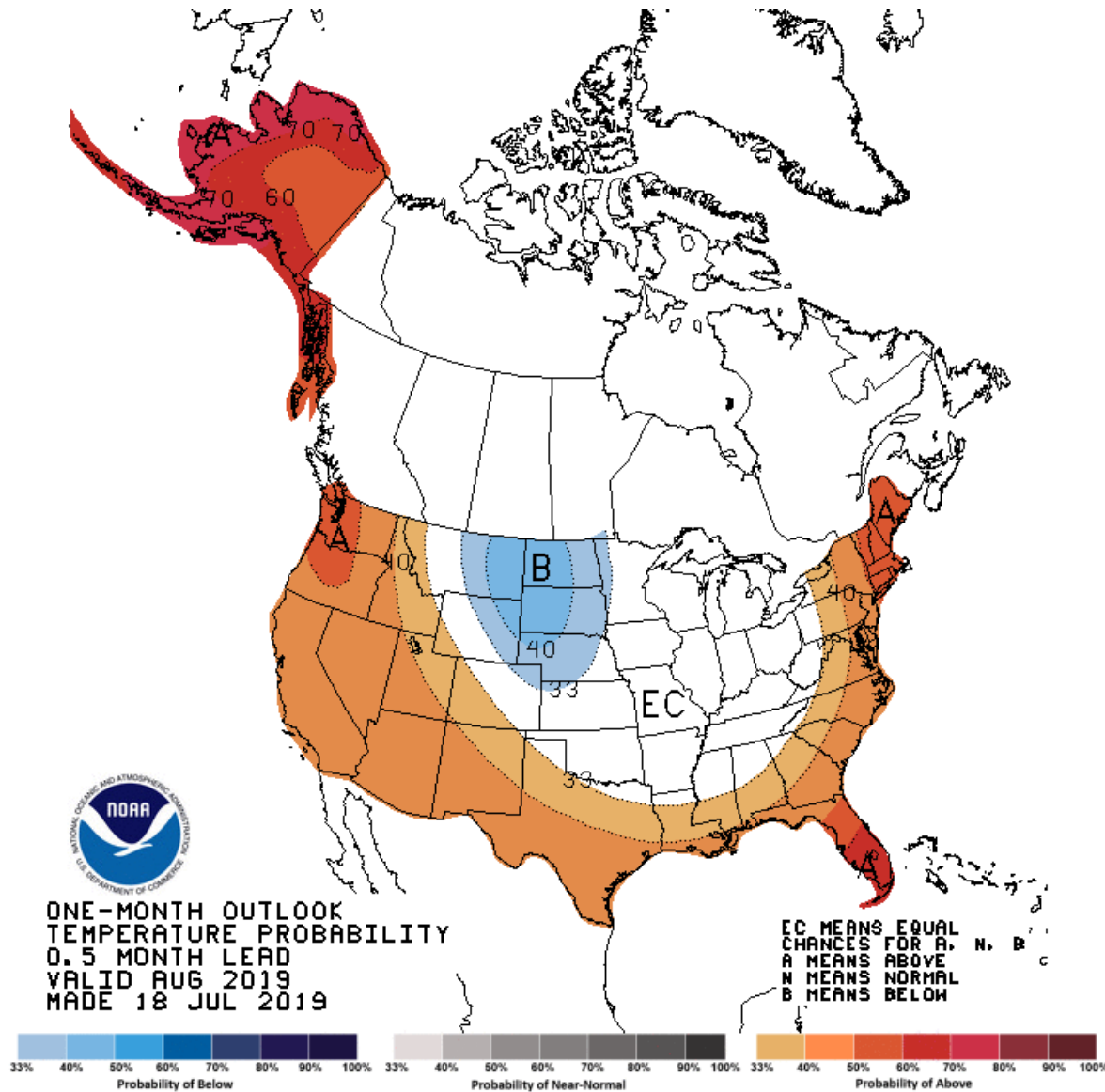
NOAA 7-day precip forecast



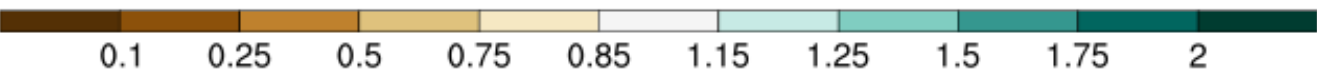
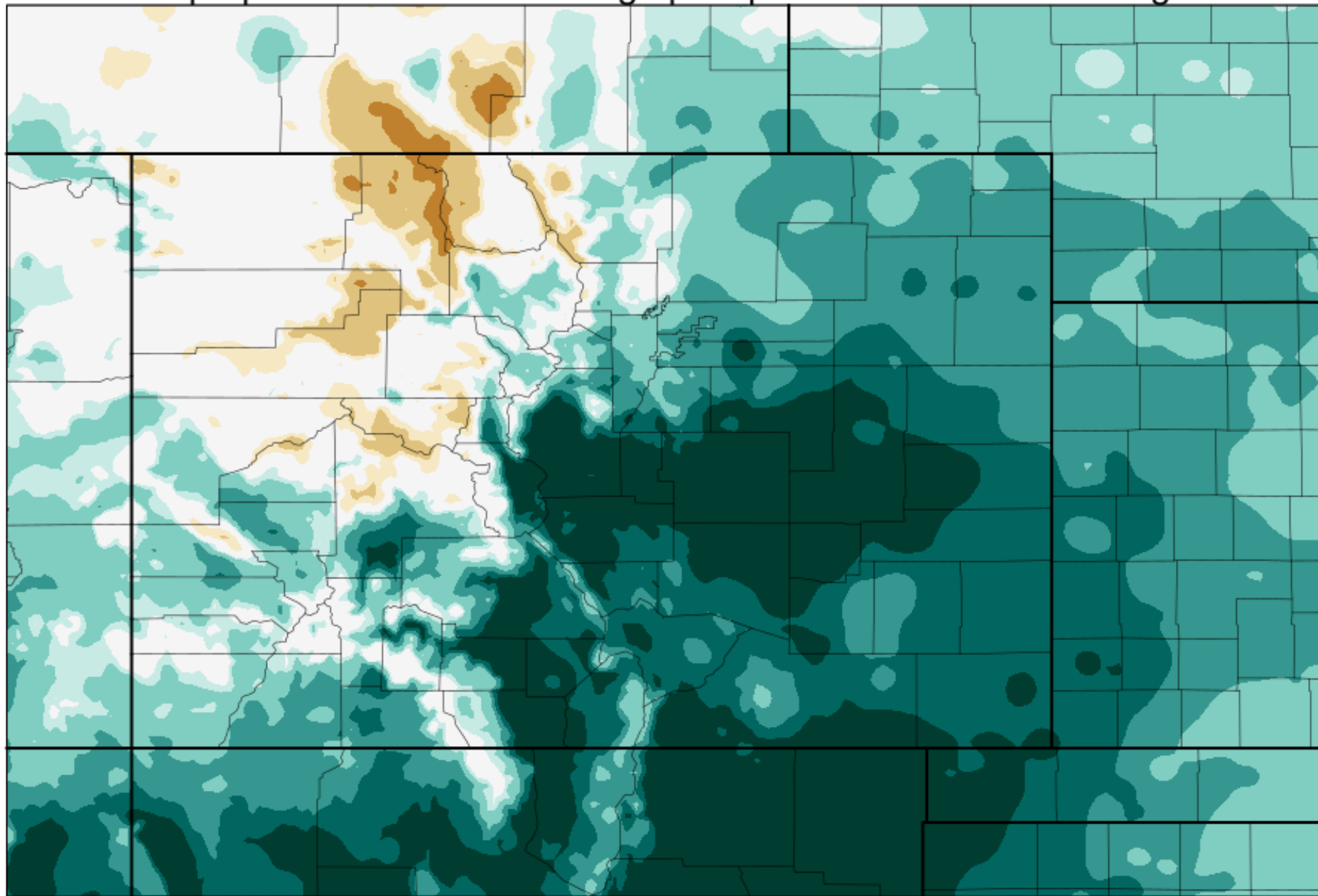
8-14 day outlook



One Month Outlook

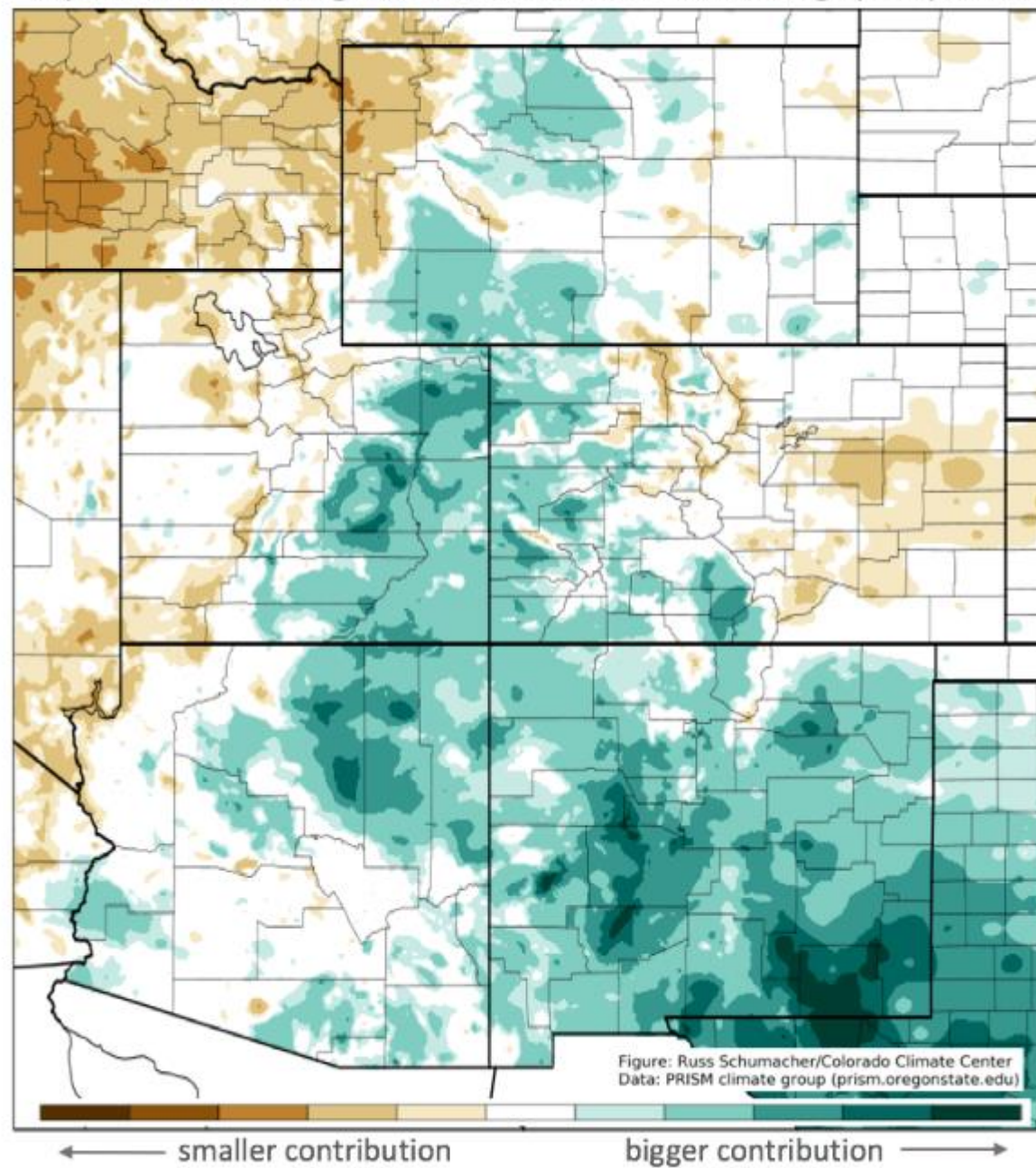


PRISM proportion of annual average precipitation in this month: August

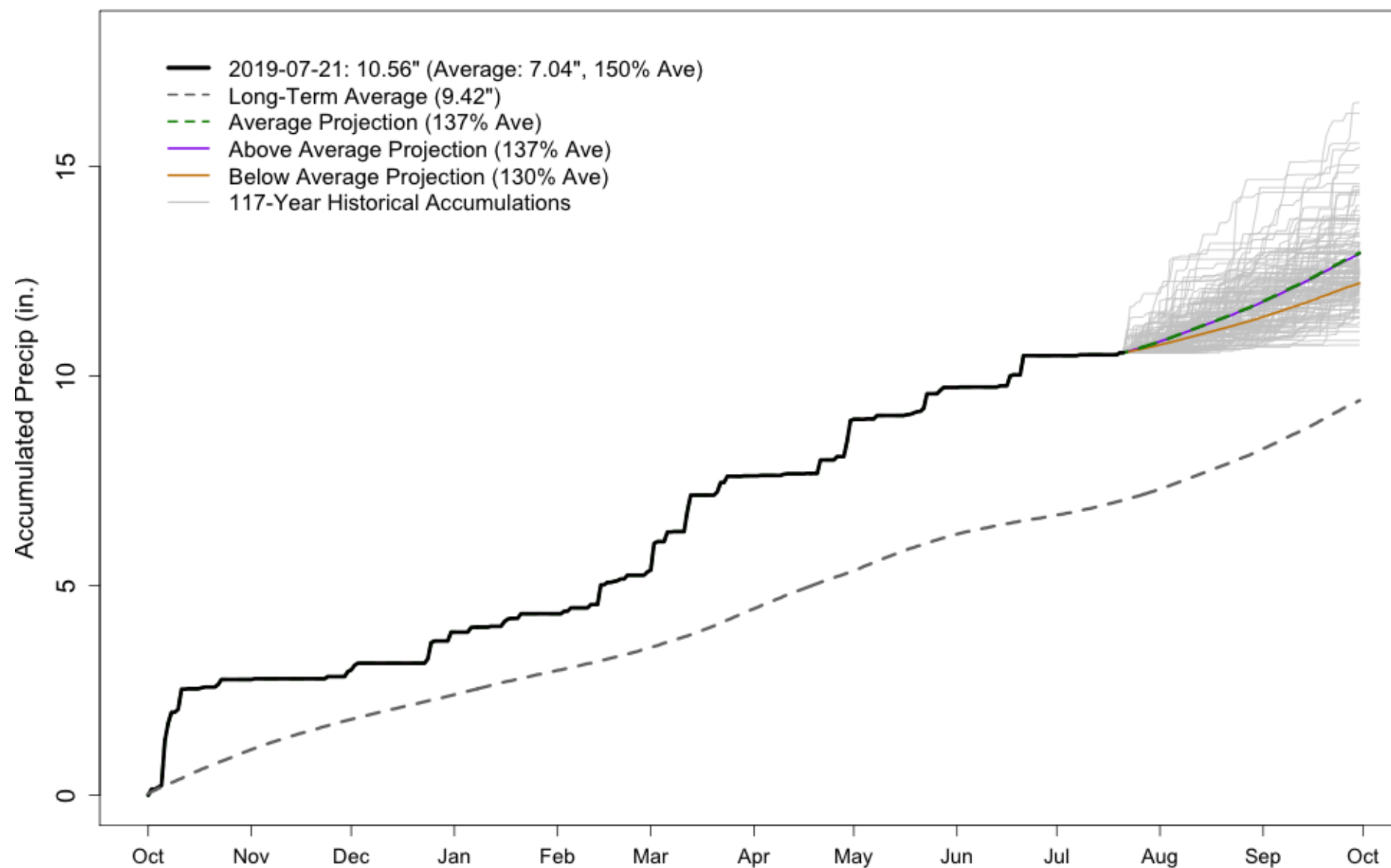


Proportion of precip relative to 1/12th

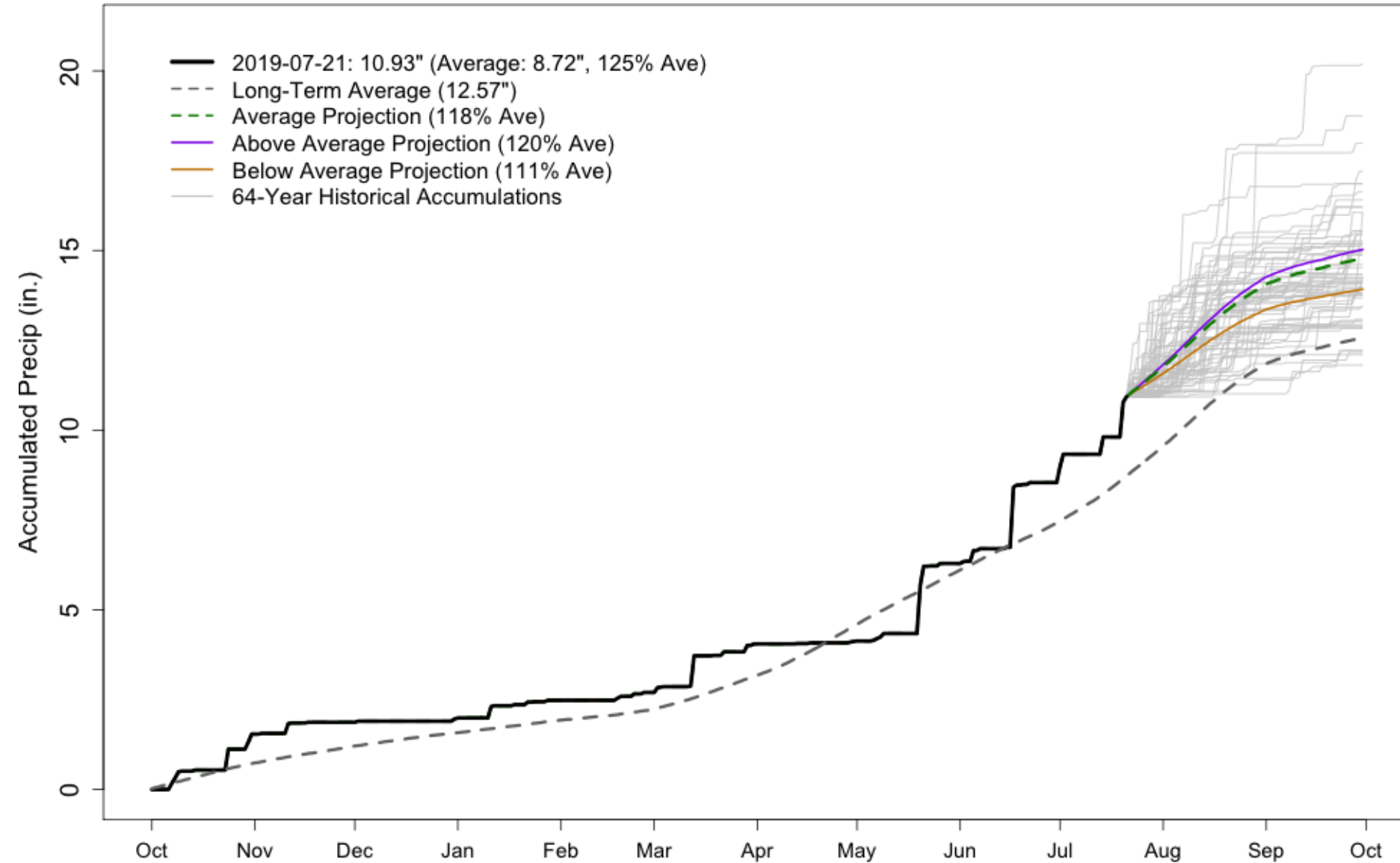
September climatological contribution to annual average precipitation



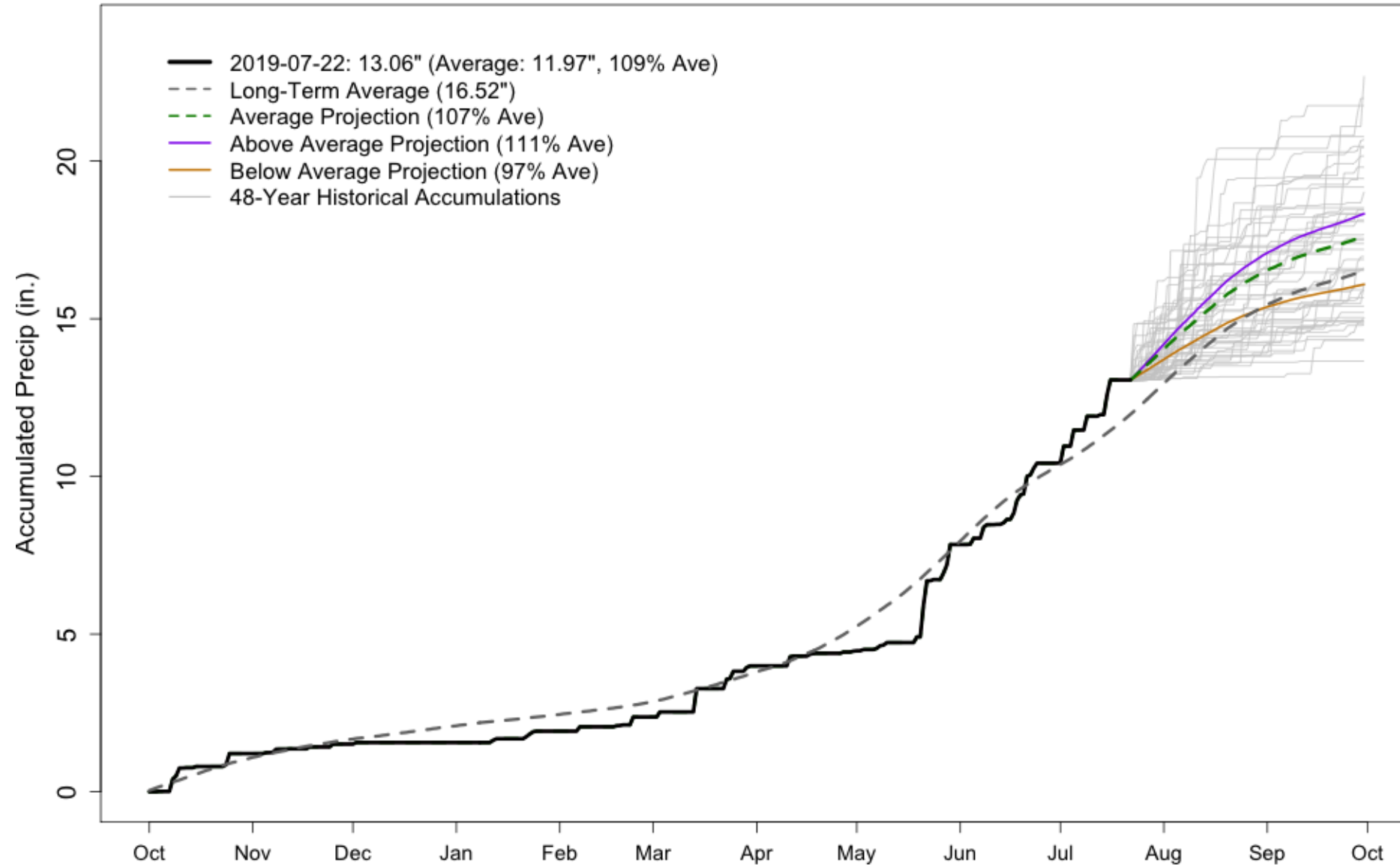
GRAND JUNCTION WALKER FIELD WY2019 Precipitation Projections



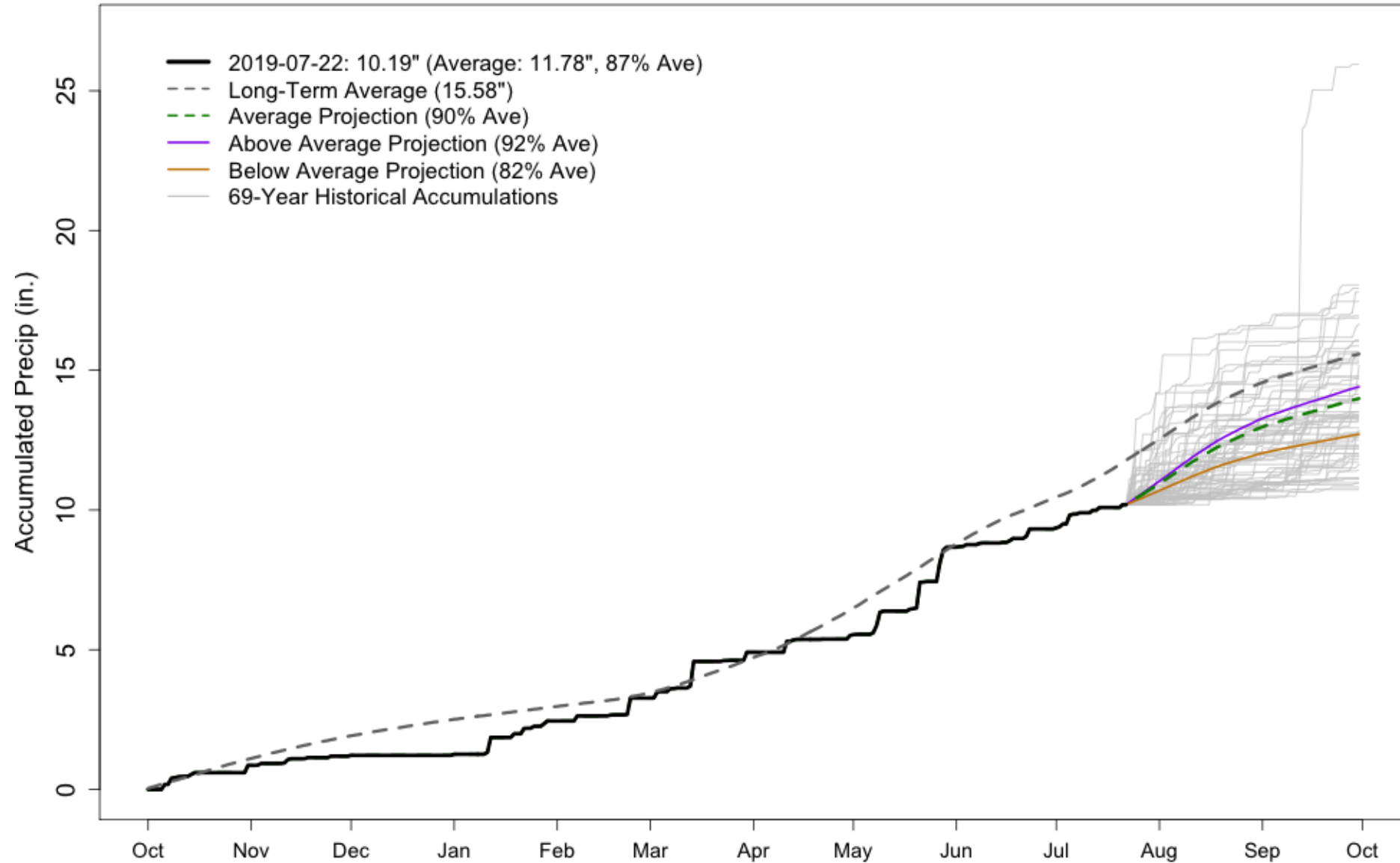
PUEBLO MEMORIAL AP WY2019 Precipitation Projections



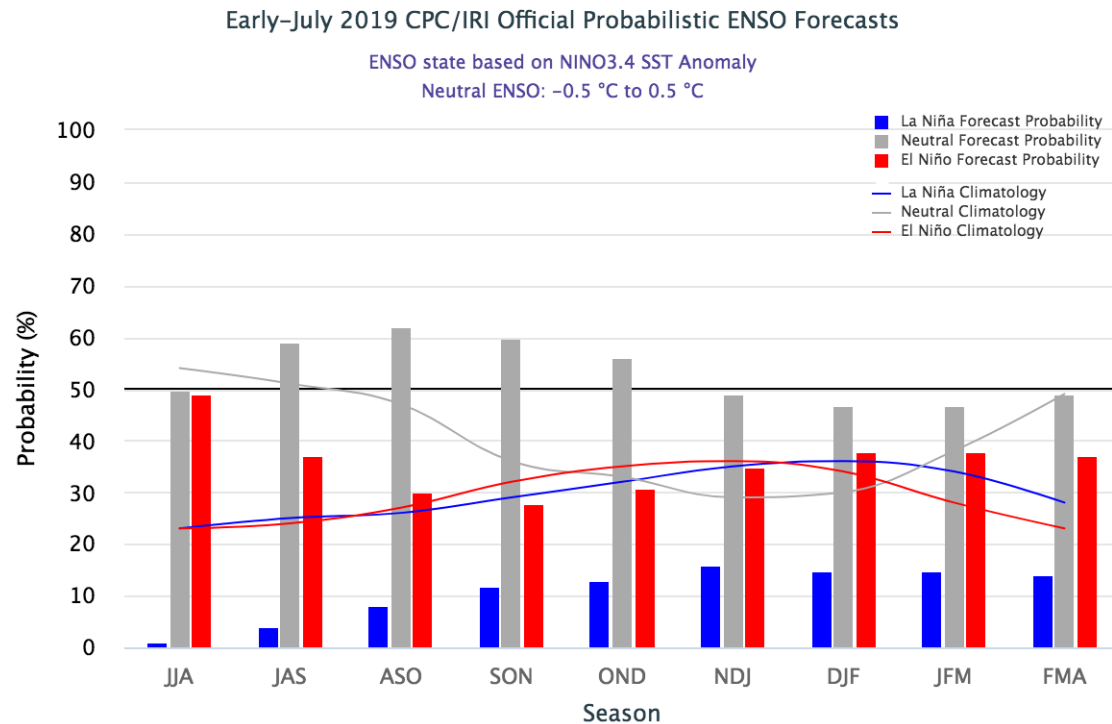
AKRON 4 E WY2019 Precipitation Projections



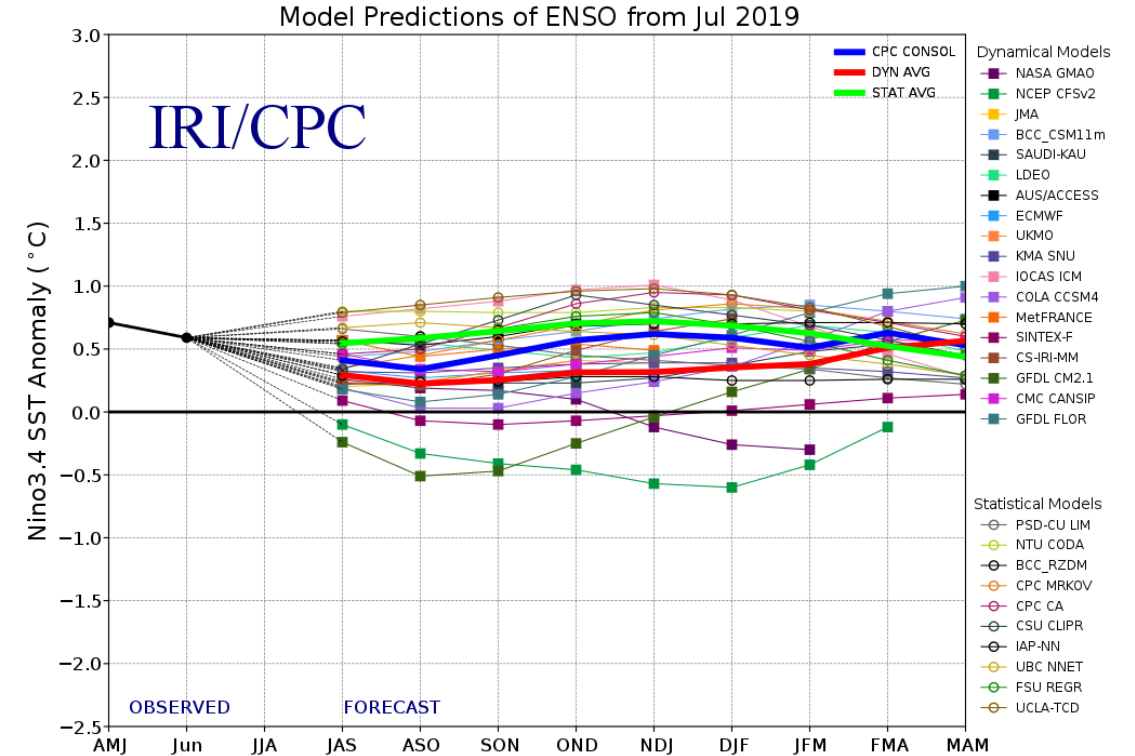
DENVER-STAPELTON WY2019 Precipitation Projections



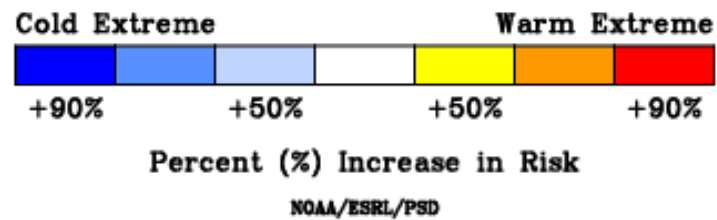
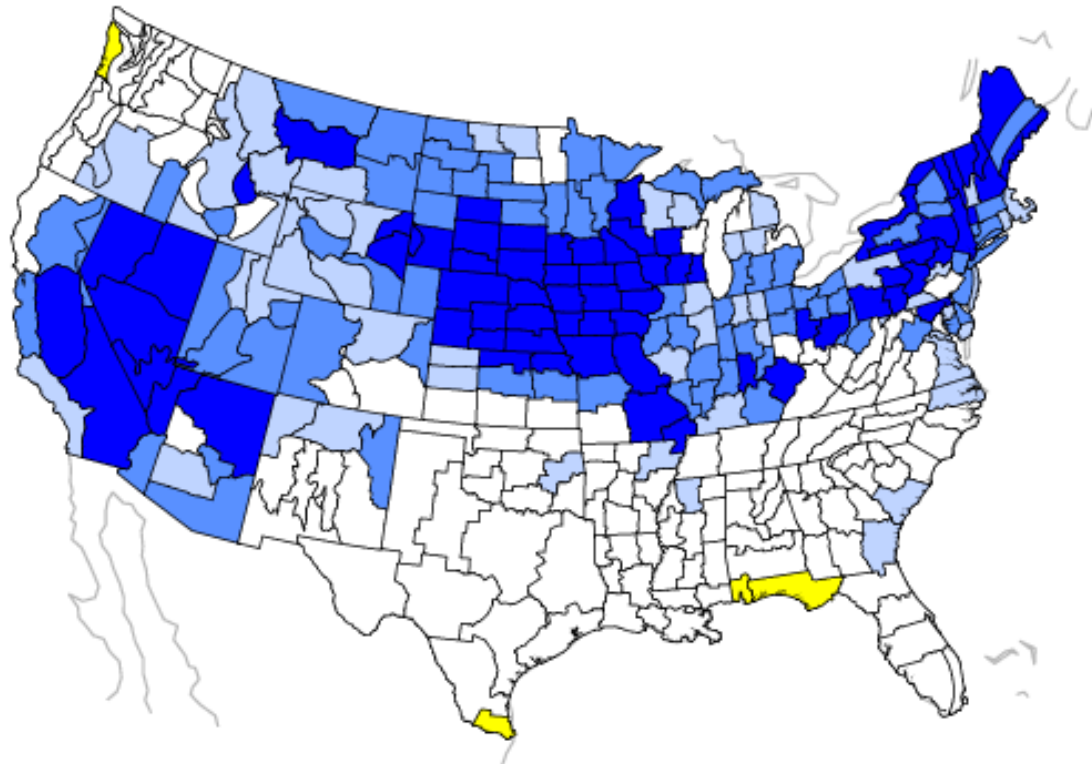
What's the El Niño forecast?



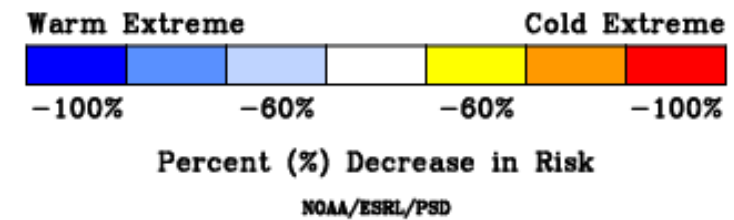
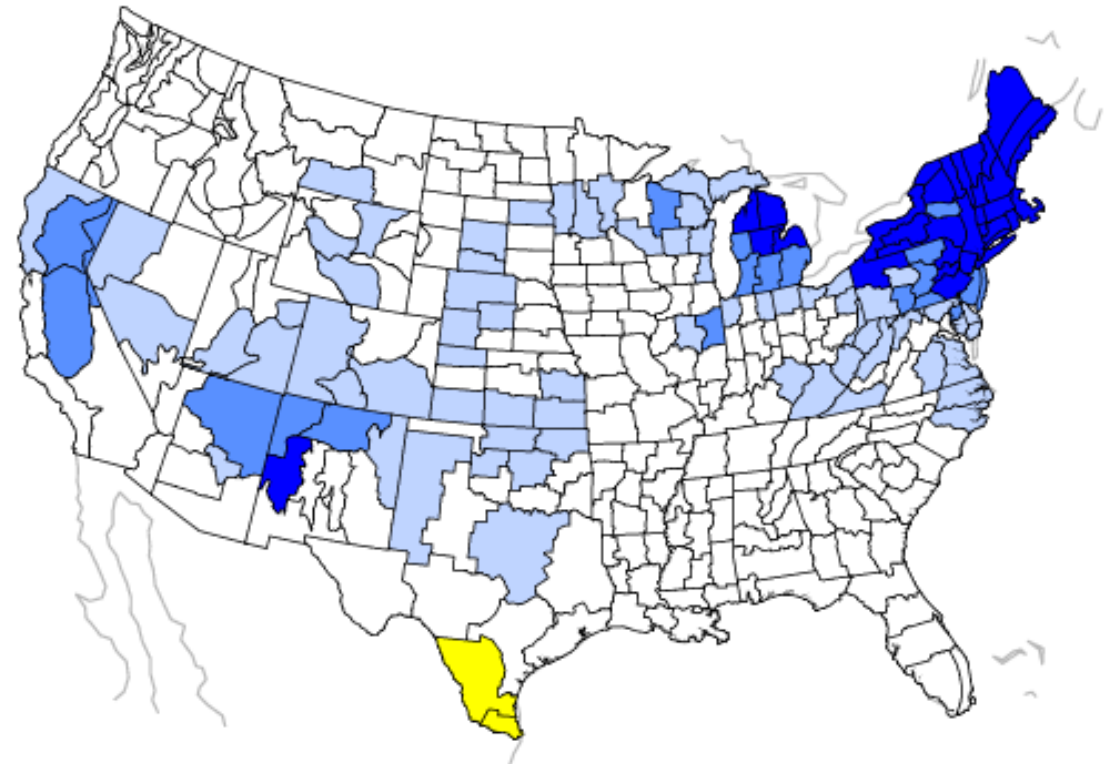
An El Niño advisory is in effect...



ASO Temperature During El Nino
Increased Risk of Warm or Cold Extremes

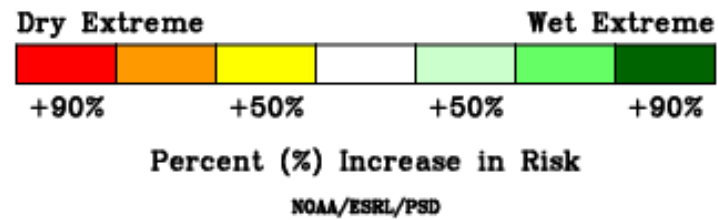
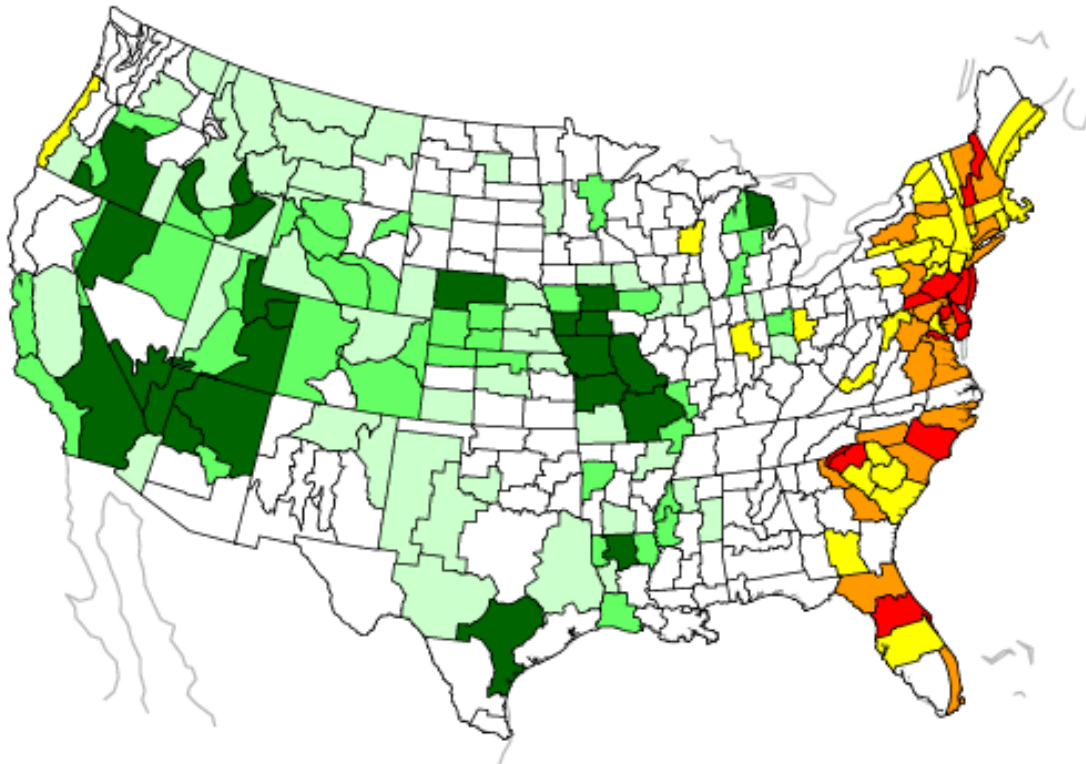


ASO Temperature During El Nino
Decreased Risk of Warm or Cold Extremes

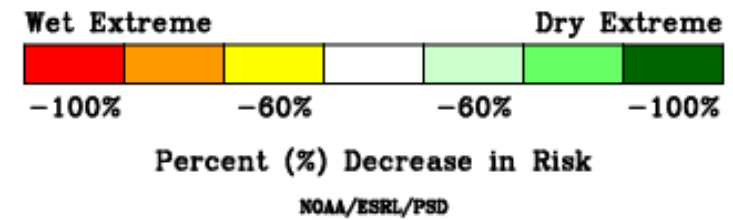
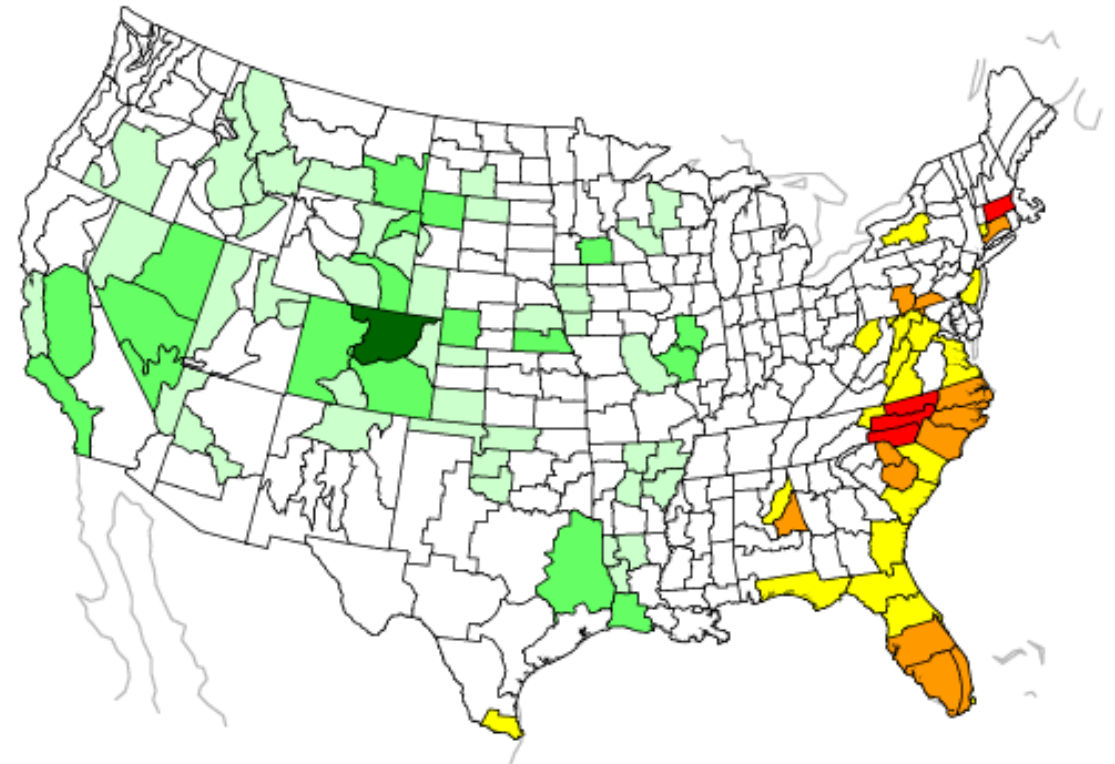


<https://www.esrl.noaa.gov/psd/enso/climaterisks/>

ASO Precipitation During El Nino
Increased Risk of Wet or Dry Extremes

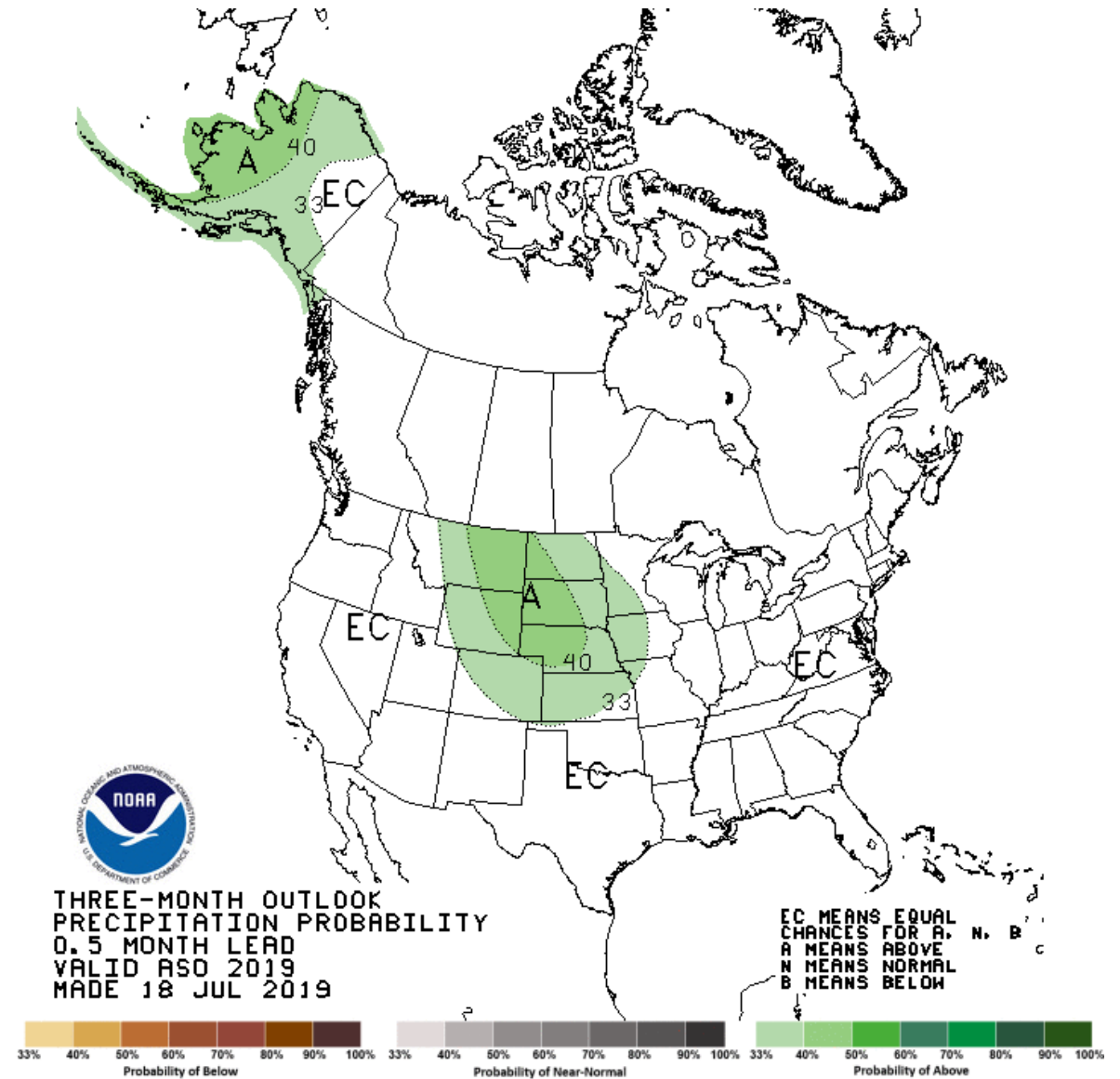
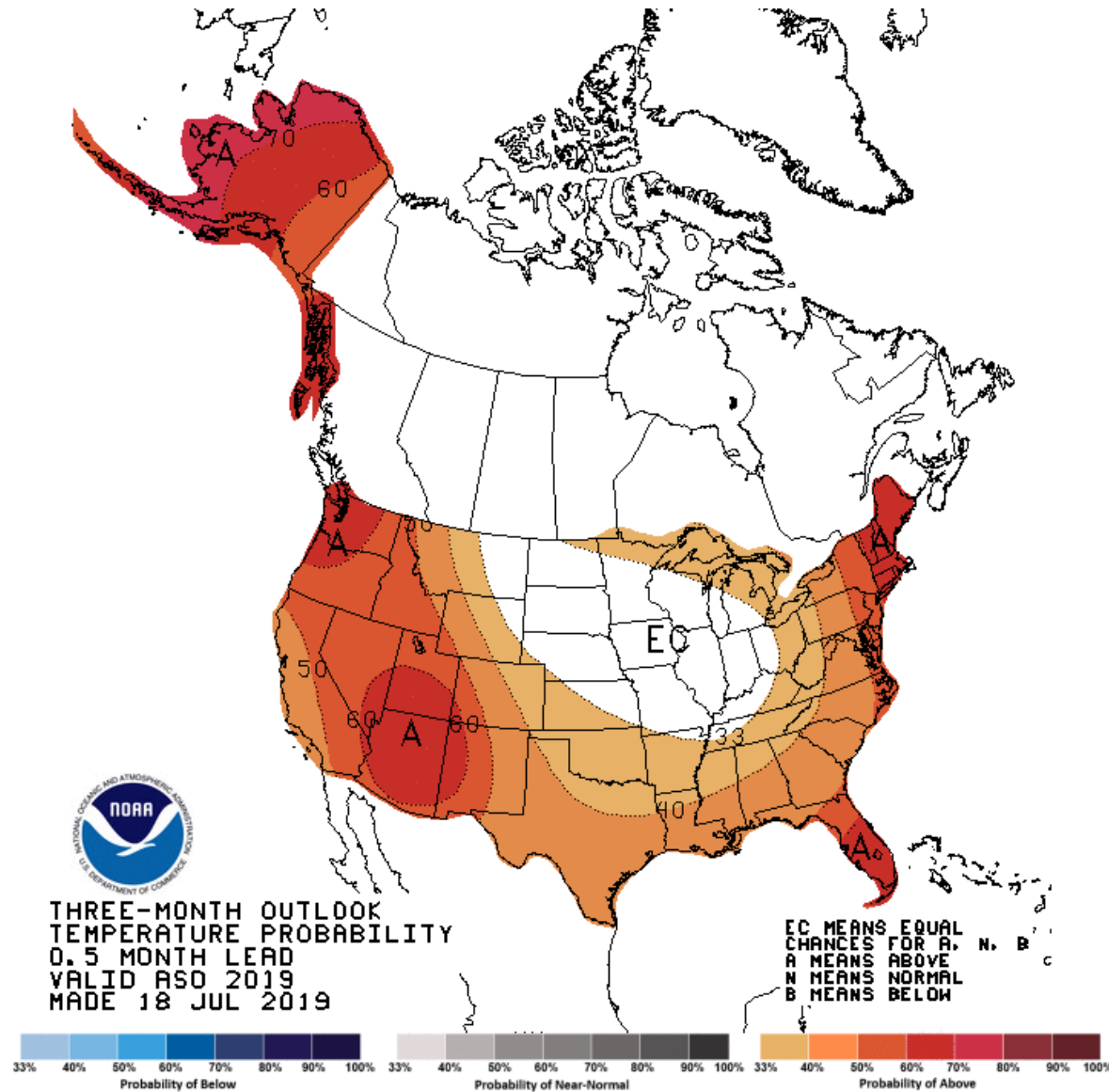


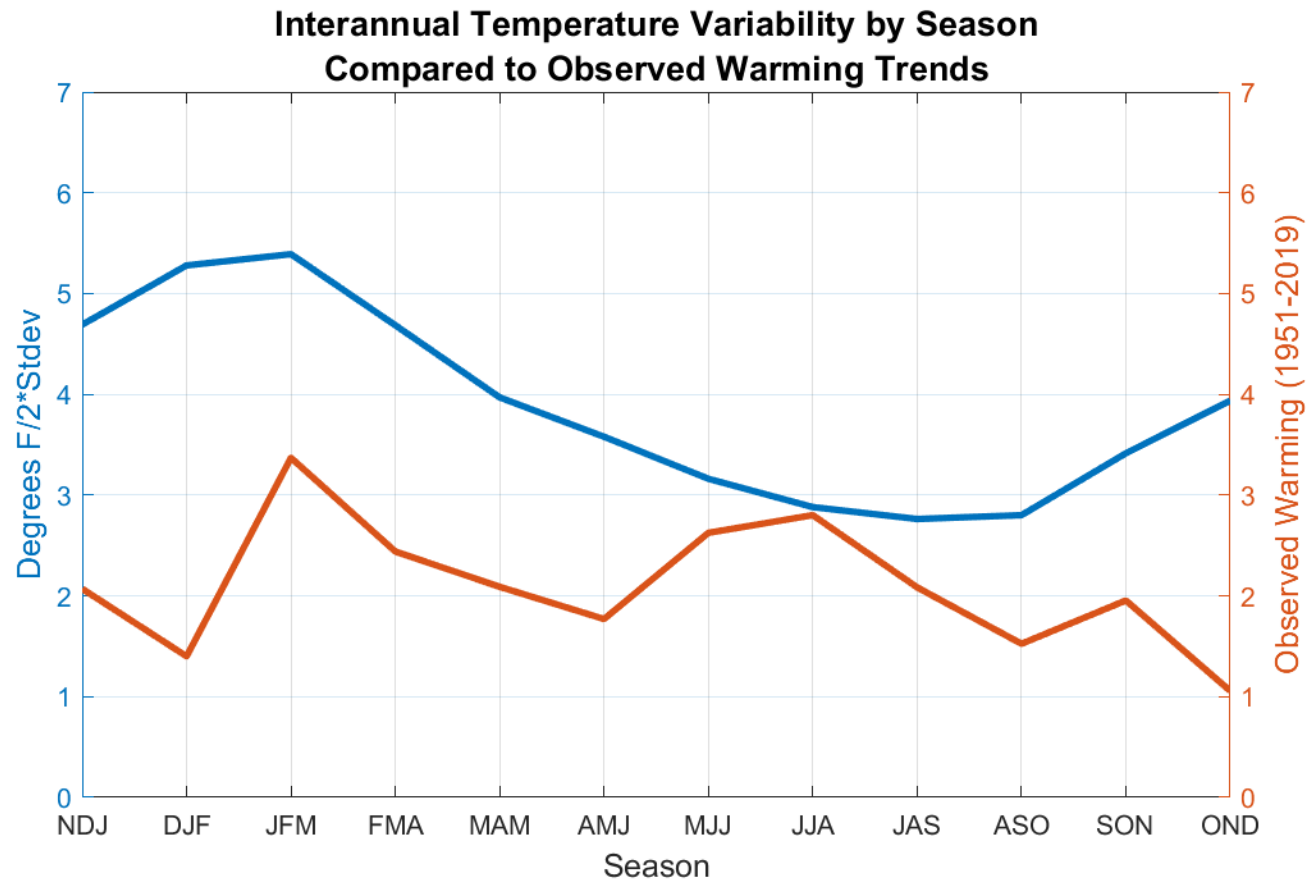
ASO Precipitation During El Nino
Decreased Risk of Wet or Dry Extremes



<https://www.esrl.noaa.gov/psd/enso/climaterisks/>

Jul-Aug-Sep Outlook





- Increased odds of above normal temperatures are common in summer and early fall
- Our temperatures vary naturally the least in summer and early fall of any season
- Thus climate trends impact the forecast more

Key Points

- June was a little cooler and wetter than normal for most of Colorado (not as big an anomaly as May)
- Our summer heat had a slow start, but hit with full force last week
- Our water supplies are coasting on the wet winter and spring
- Still drought free according to USDM
- Late summer weather is very likely to be warmer than our 20th century normal
- The monsoon hasn't really kicked into gear yet for southern Colorado, but we have had plenty of moisture from the gulf and central plains
- Due in part to El Niño, the precipitation outlook is tilted in favor of wetter than normal conditions



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

Thank you



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COLORADO STATE UNIVERSITY