

# Colorado Climate Center – *WATF Climate Update*

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Peter Goble

Water Availability Task Force

July 23, 2019



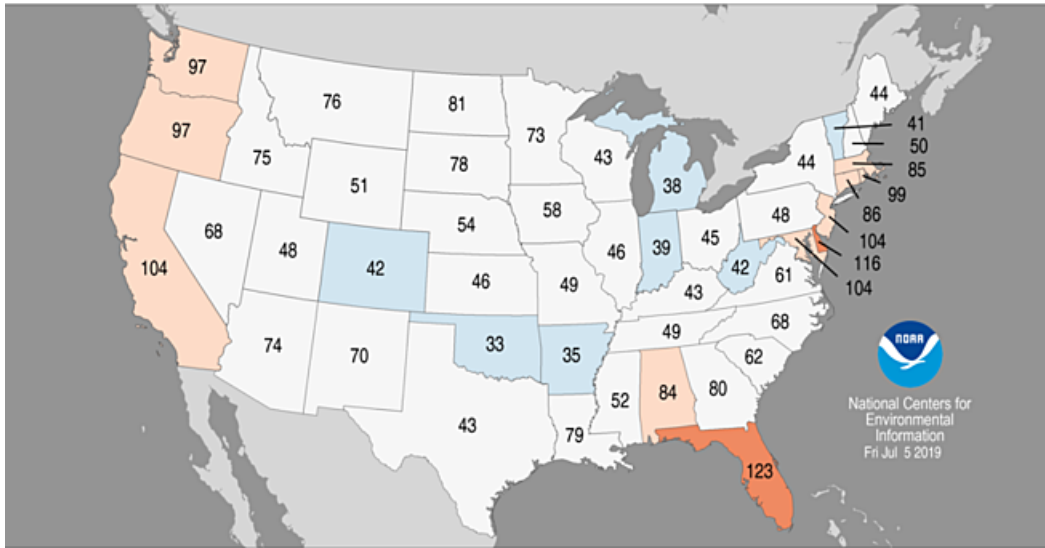
ATMOSPHERIC SCIENCE  
COLORADO STATE UNIVERSITY

## 2019 Water Year To Date

temperature, precipitation,  
evaporative demand

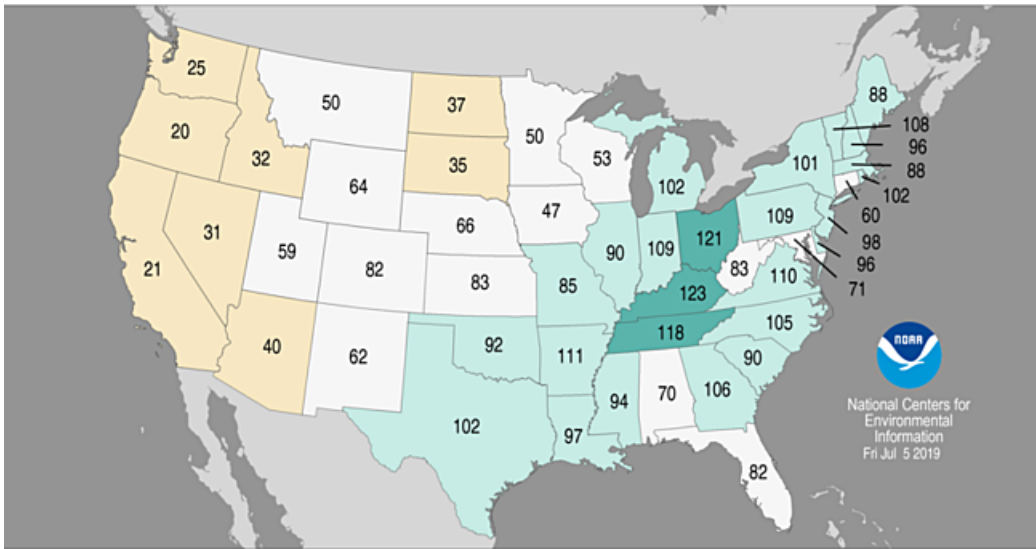


Statewide Average Temperature Ranks  
 June 2019  
 Period: 1895–2019



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

Statewide Precipitation Ranks  
 June 2019  
 Period: 1895–2019

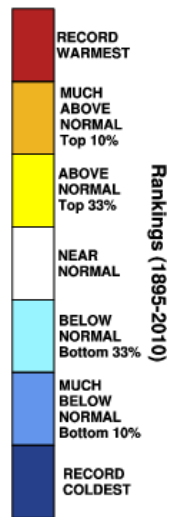
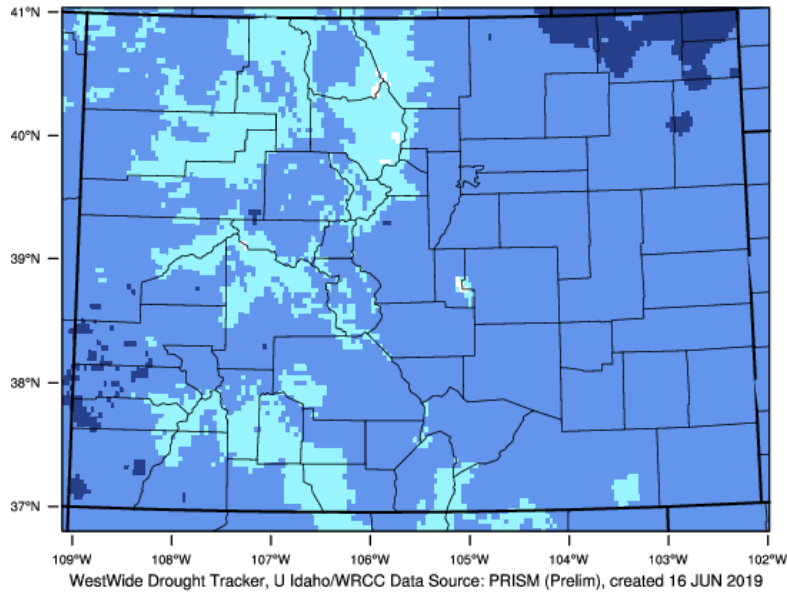


Month	P Rank	
Oct	12 <sup>th</sup>	wettest
Nov	45 <sup>th</sup>	average
Dec	31 <sup>st</sup>	driest
Jan	32 <sup>nd</sup>	wettest
Feb	17 <sup>th</sup>	wettest
Mar	6 <sup>th</sup>	wettest
Apr	42 <sup>nd</sup>	driest
May	15 <sup>th</sup>	wettest
June	43 <sup>rd</sup>	wettest

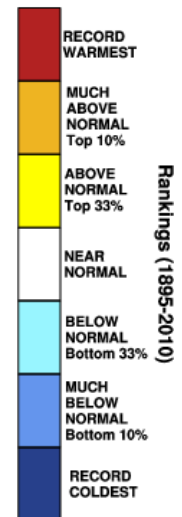
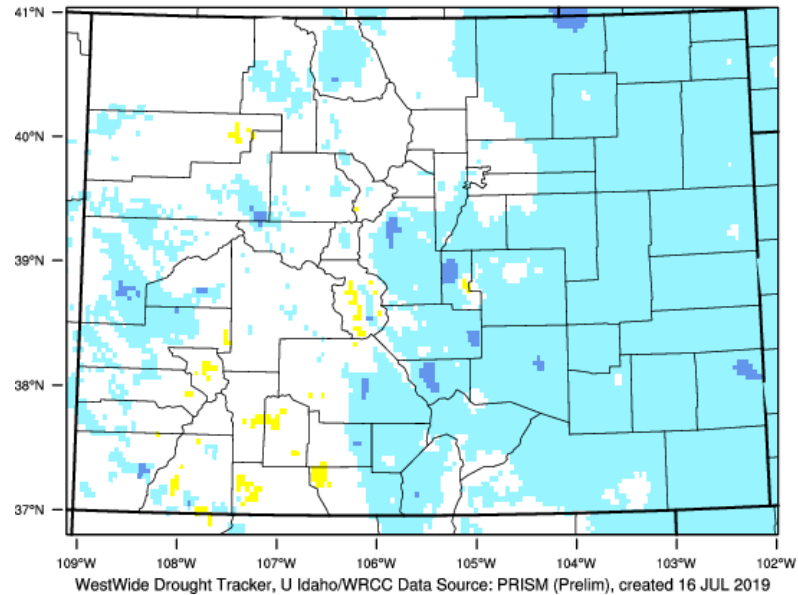
8<sup>th</sup> wettest October – June



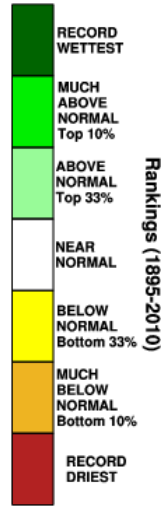
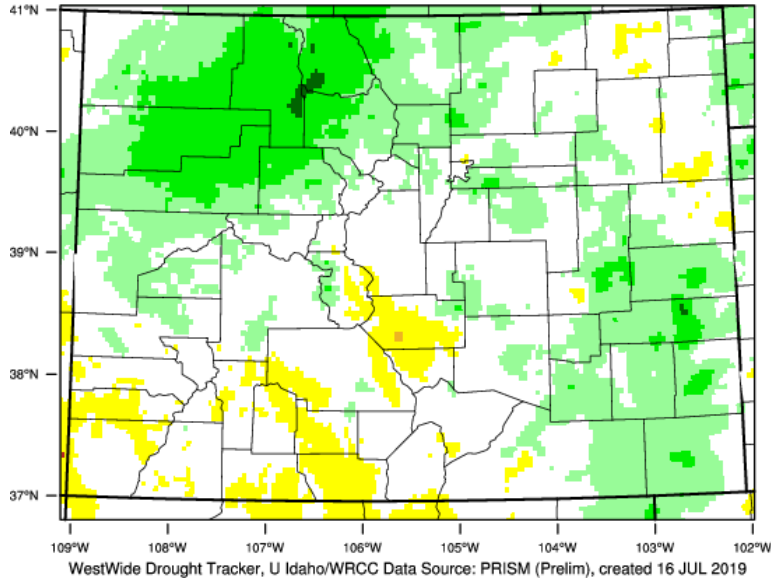
**Colorado - Mean Temperature**  
**May 2019 Percentile**



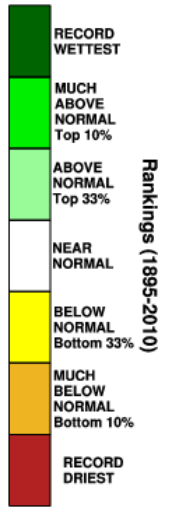
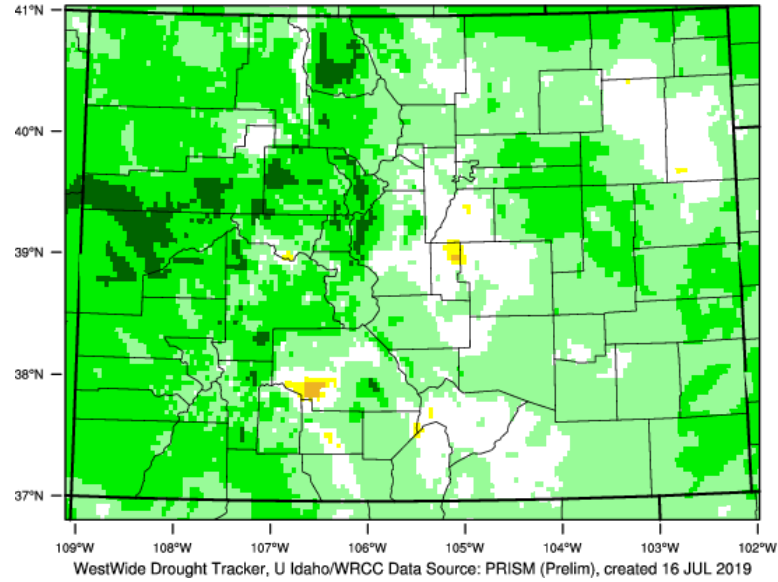
**Colorado - Mean Temperature**  
**June 2019 Percentile**



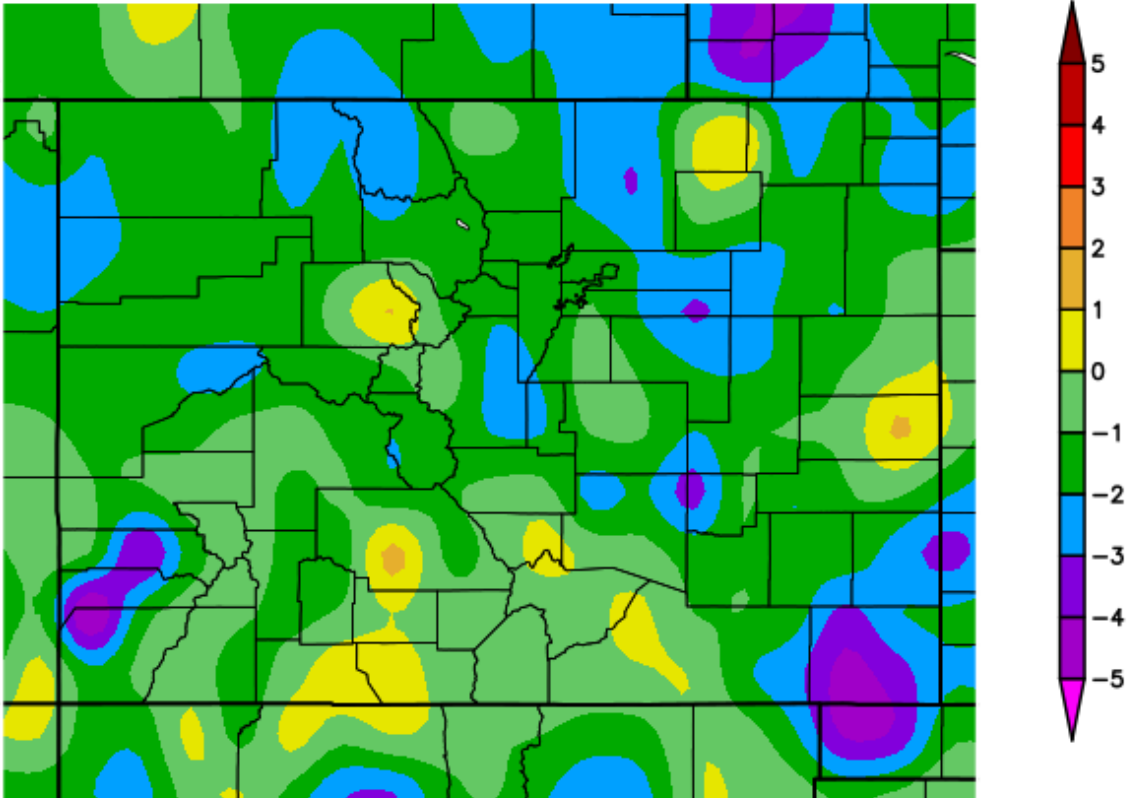
**Colorado - Precipitation**  
June 2019 Percentile



**Colorado - Precipitation**  
October-June 2019 Percentile



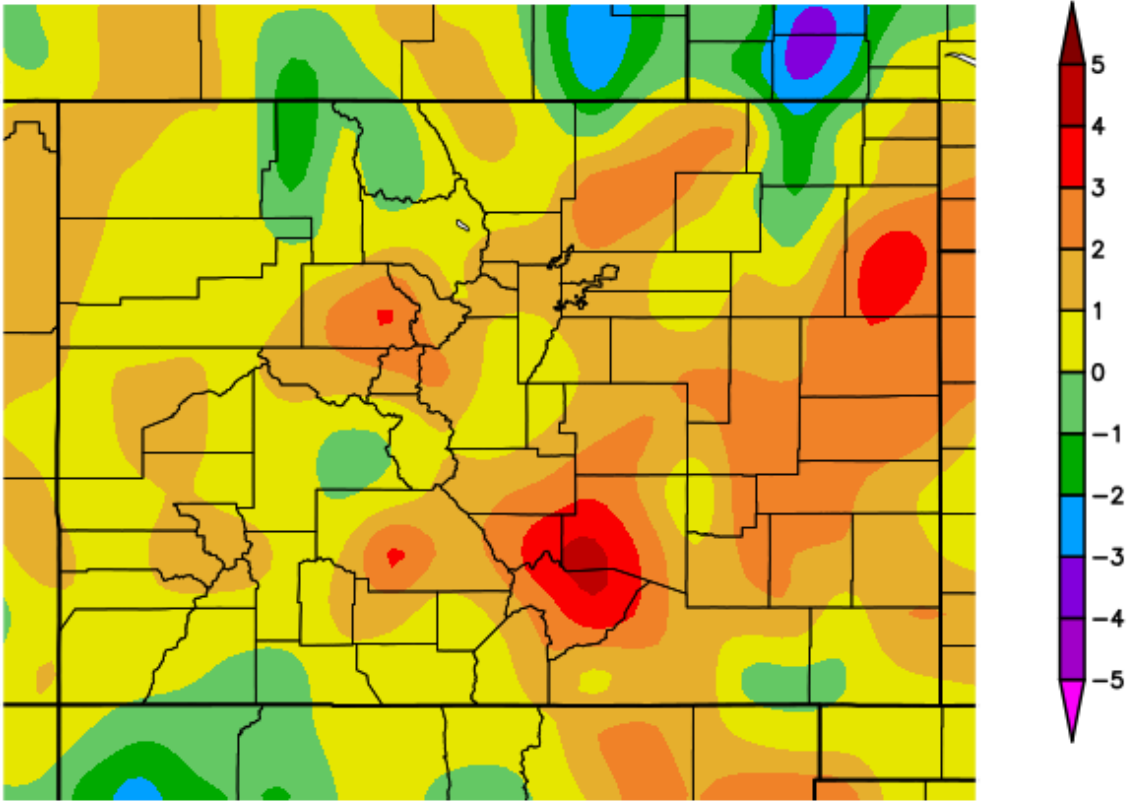
# Departure from Normal Temperature (F) 6/1/2019 – 6/30/2019



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.

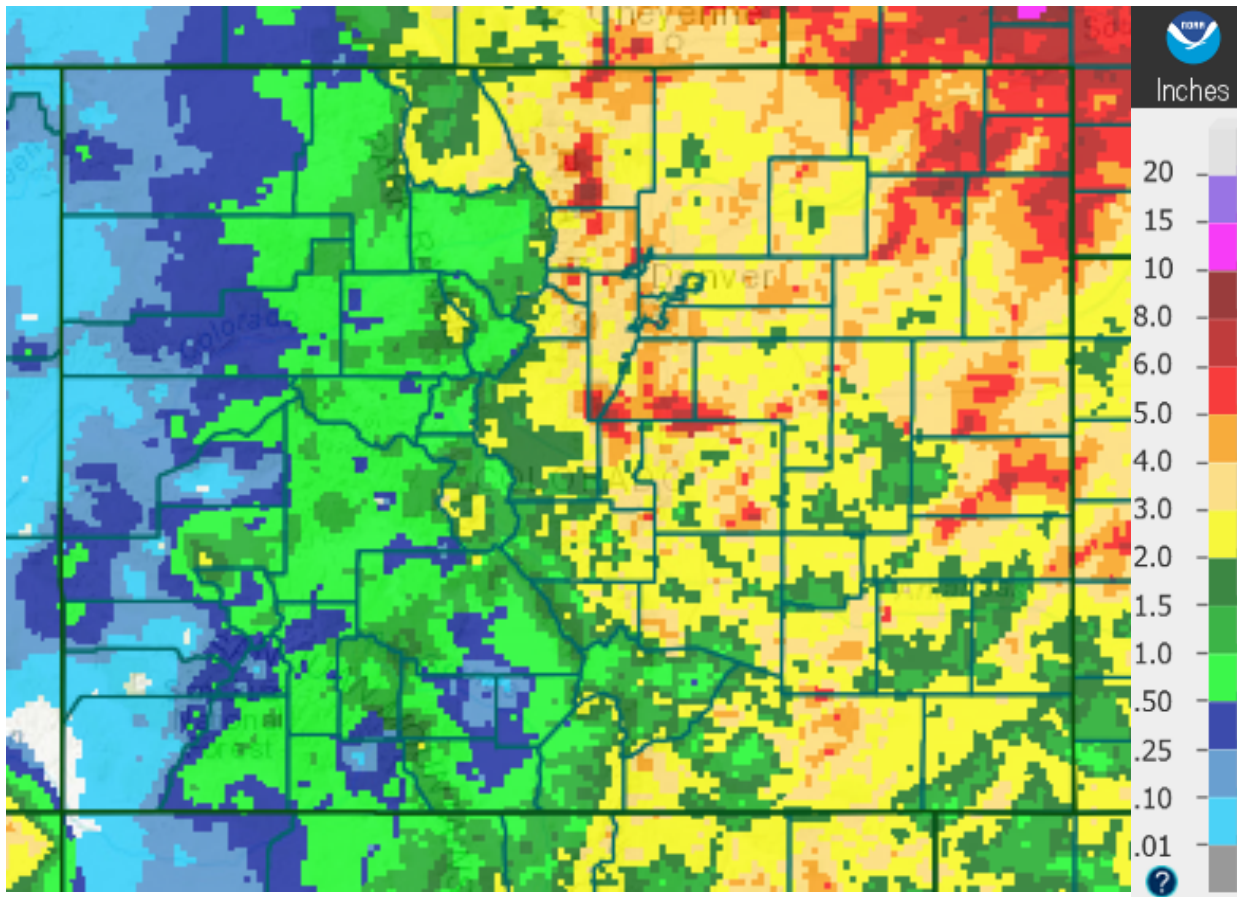
NOAA Regional Climate Centers

# 90-Degree Days

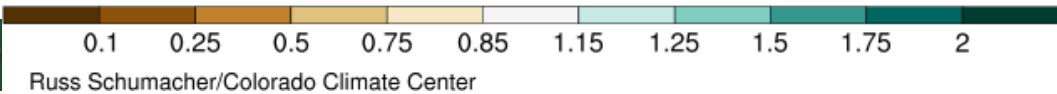
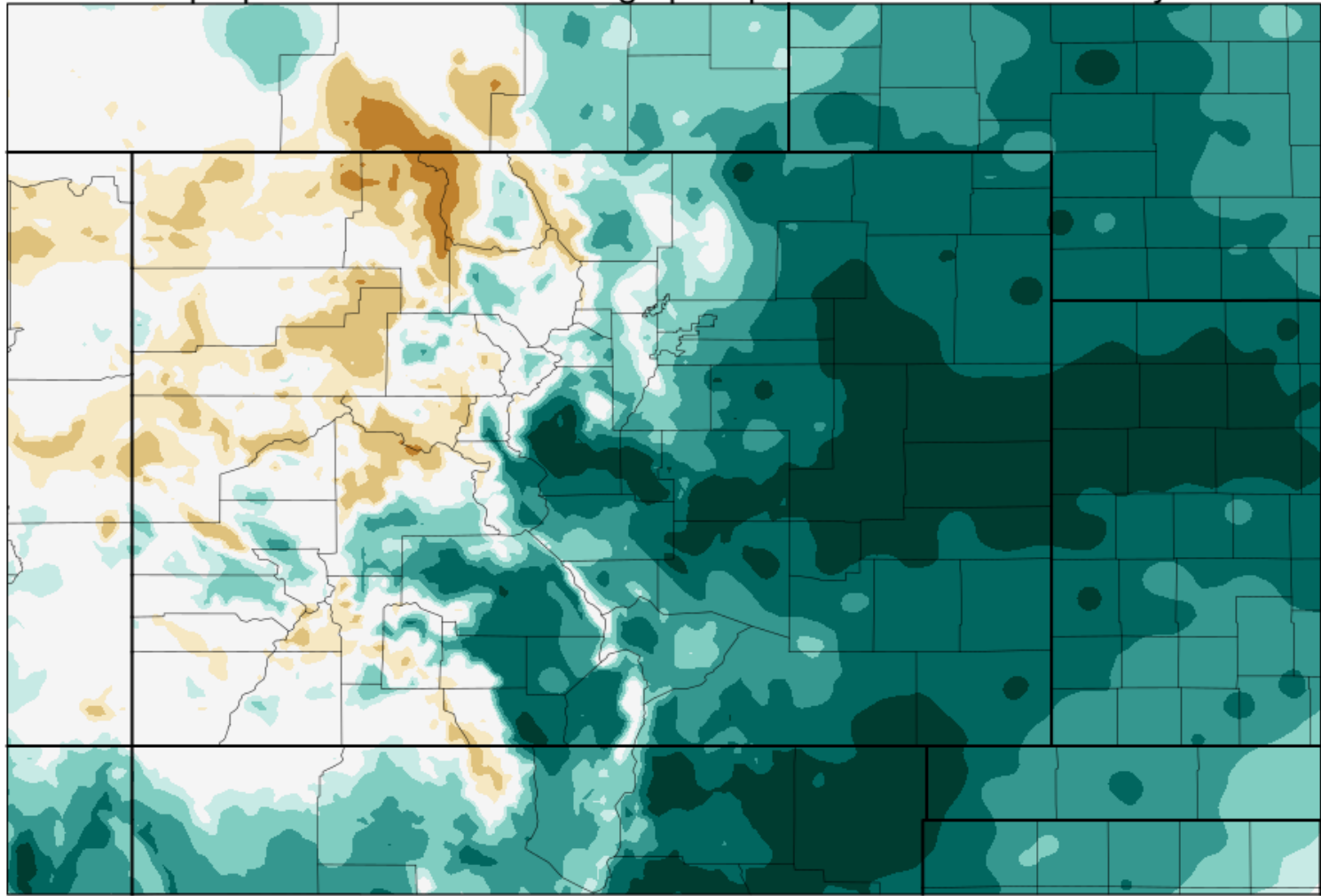
Location	Before July 1	After July 1
Fort Collins	4	11
Boulder	4	10
Denver	4	12
Colorado Springs	5	11
Pueblo	11	15
Akron	4	10
Burlington	7	14
Lamar	10	16
Grand Junction	11	19
Cortez	2	16
Dillon	0	0



# Last 30 Days of Precipitation

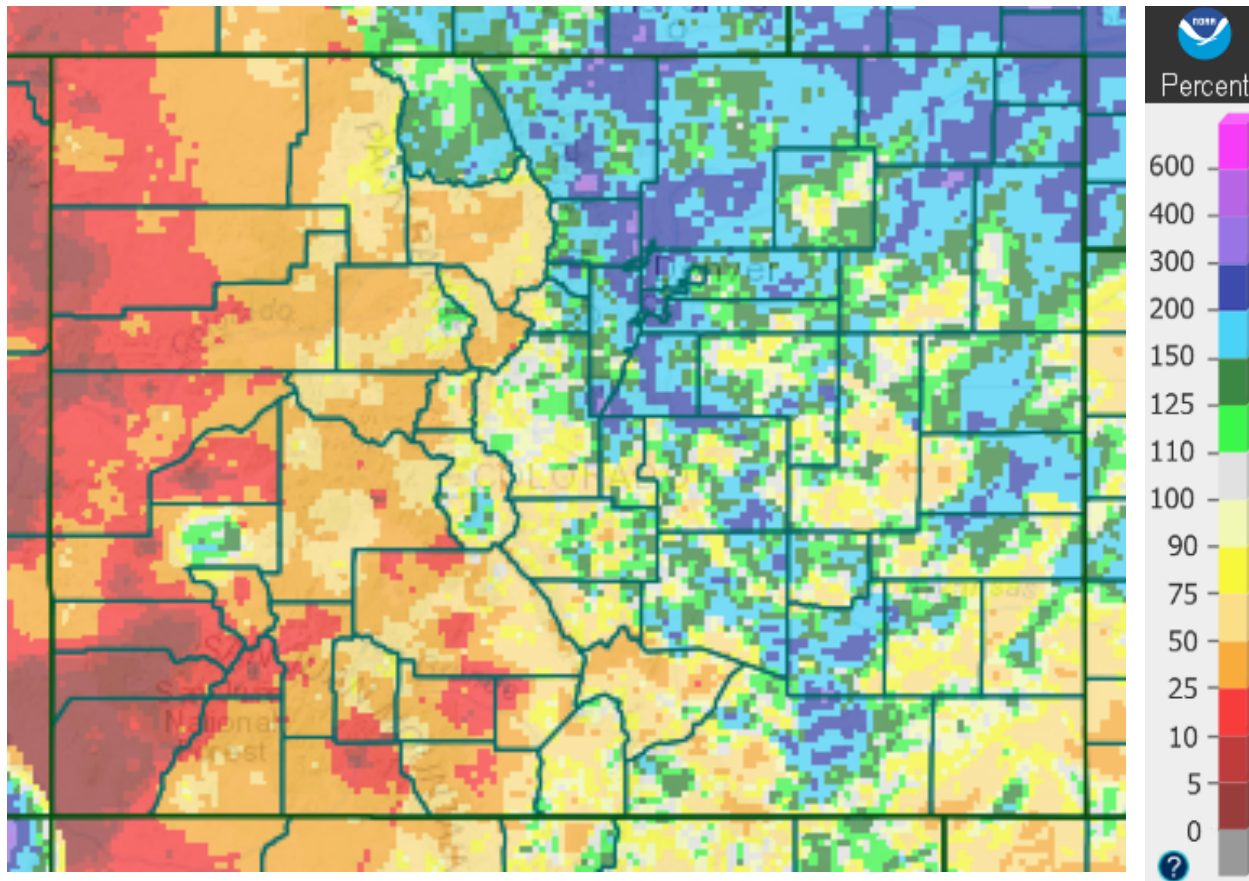


# PRISM proportion of annual average precipitation in this month: July

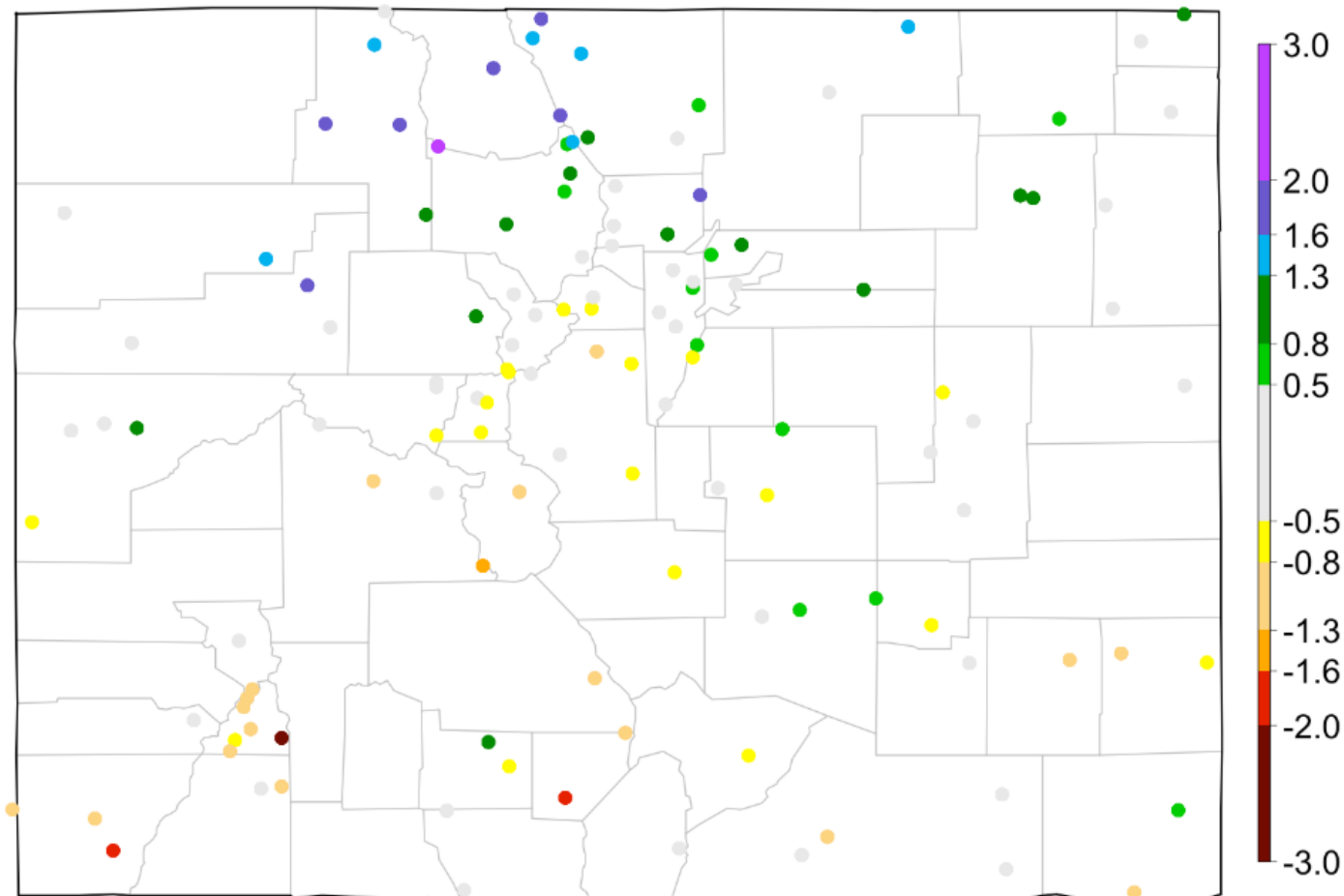


Proportion of precip relative to 1/12th

## Last 30 Days % of Precipitation



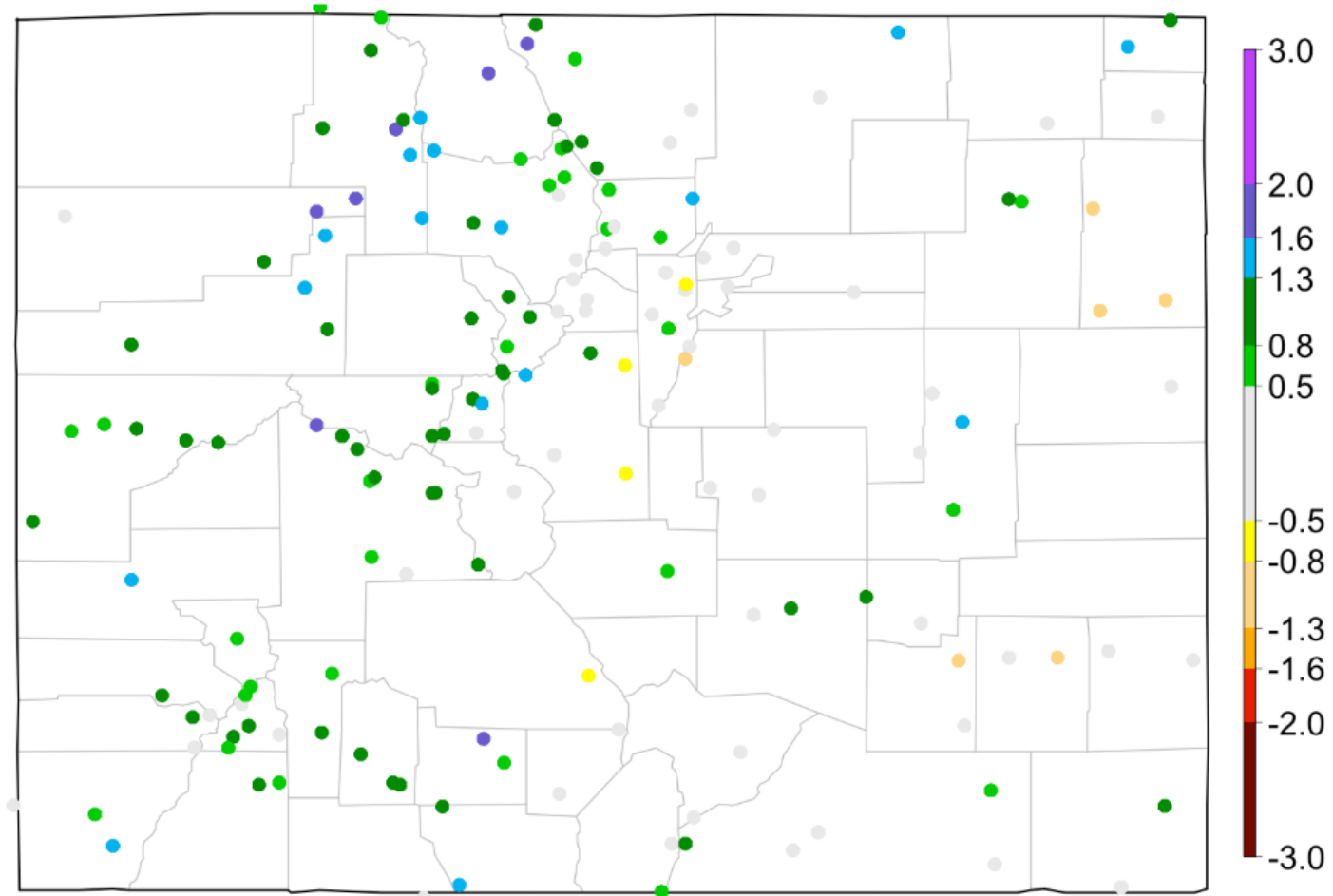
### 30-day SPI: 6/21/2019 - 7/20/2019



Data from High Plains Regional Climate Center and ACIS



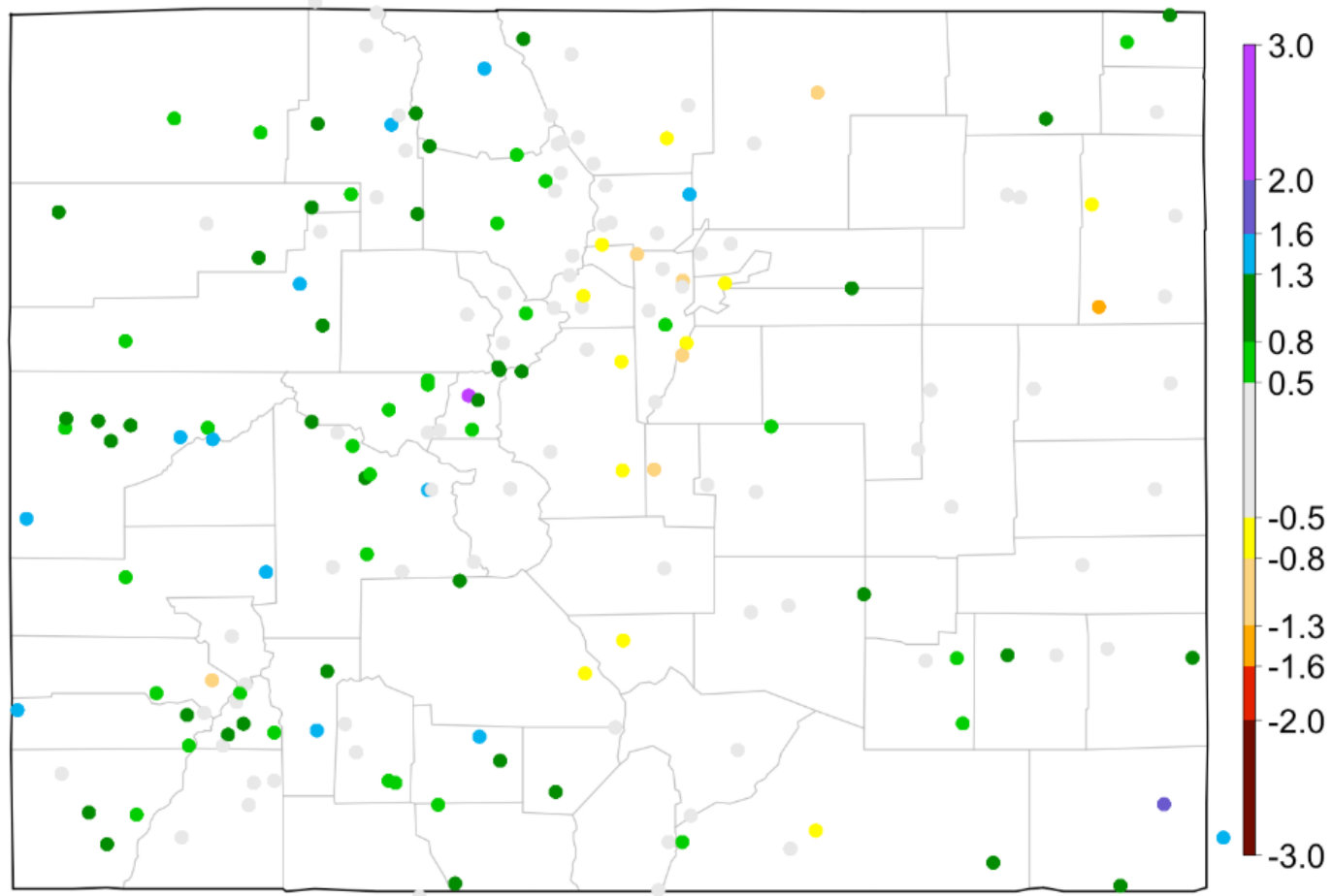
### 90-day SPI: 4/22/2019 - 7/20/2019



Data from High Plains Regional Climate Center and ACIS



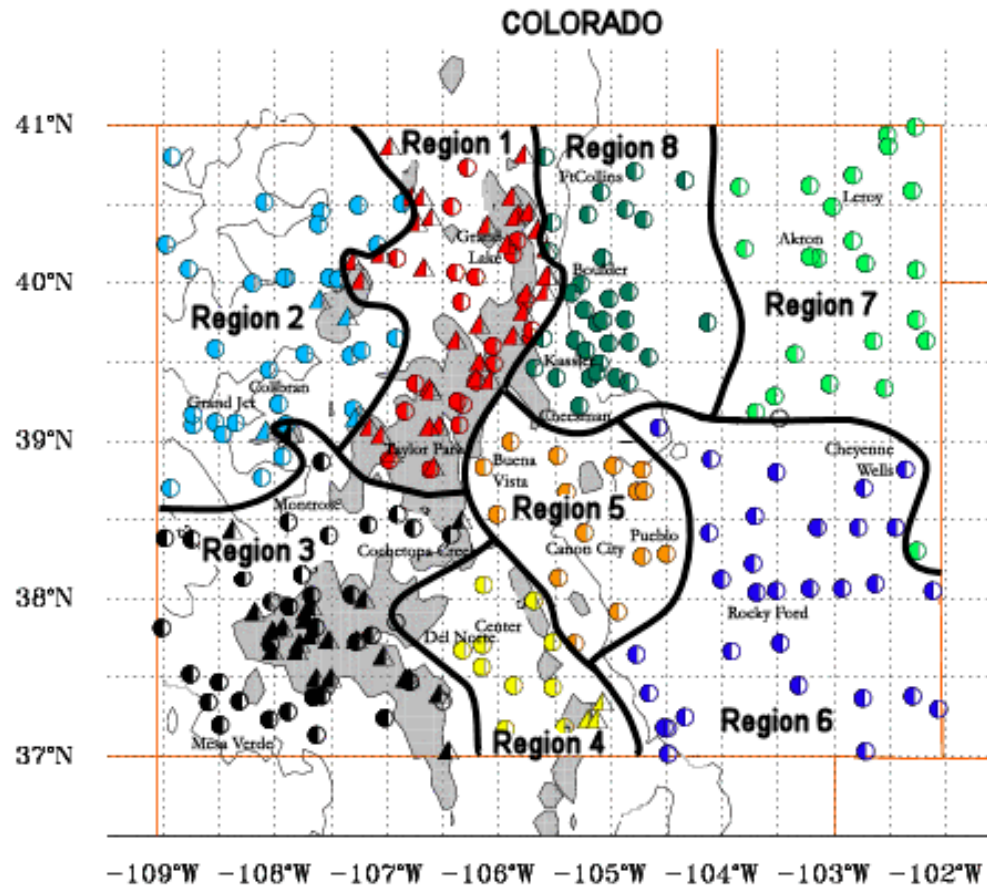
# 12-month SPI: 7/21/2018 - 7/20/2019



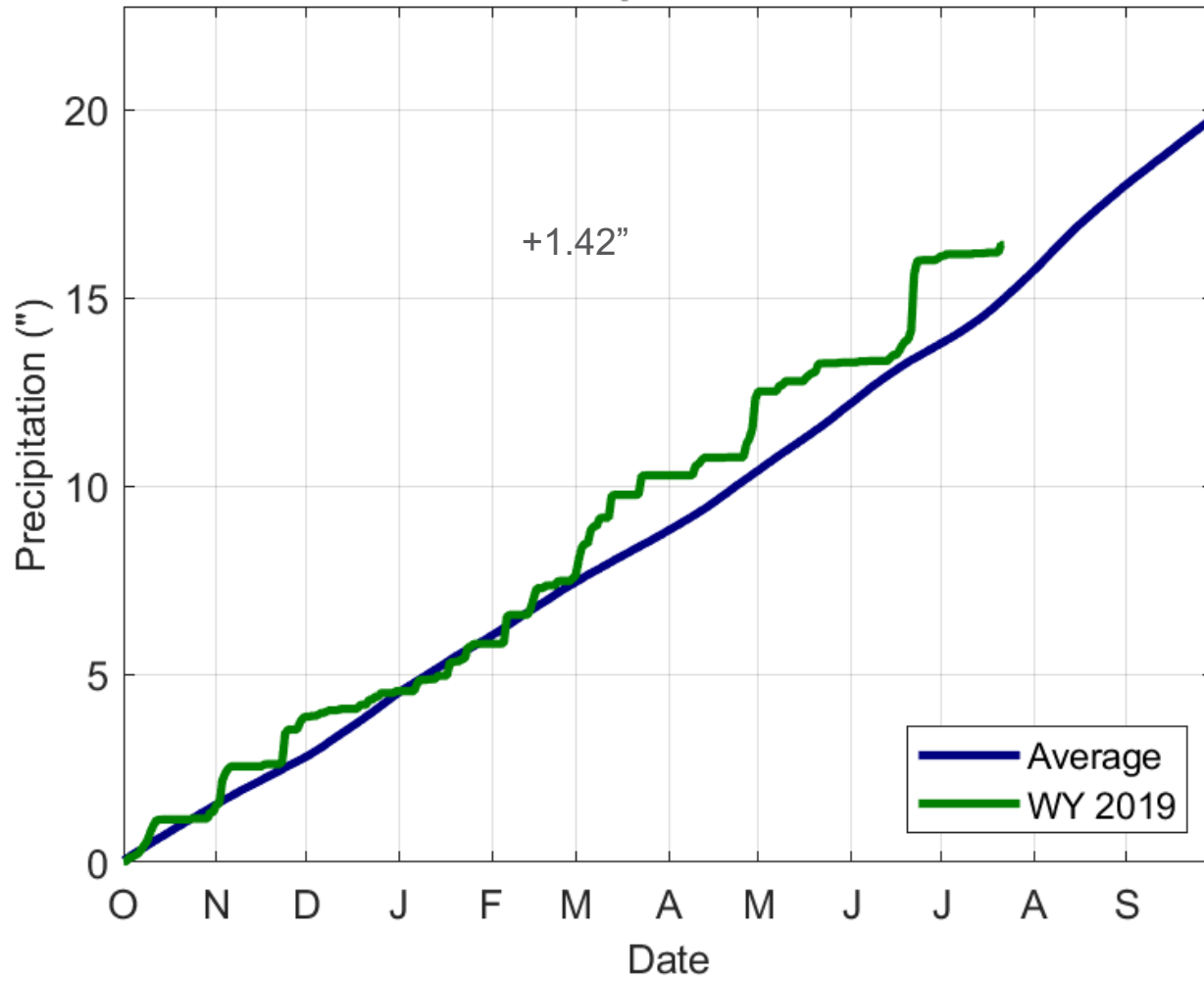
Data from High Plains Regional Climate Center and ACIS



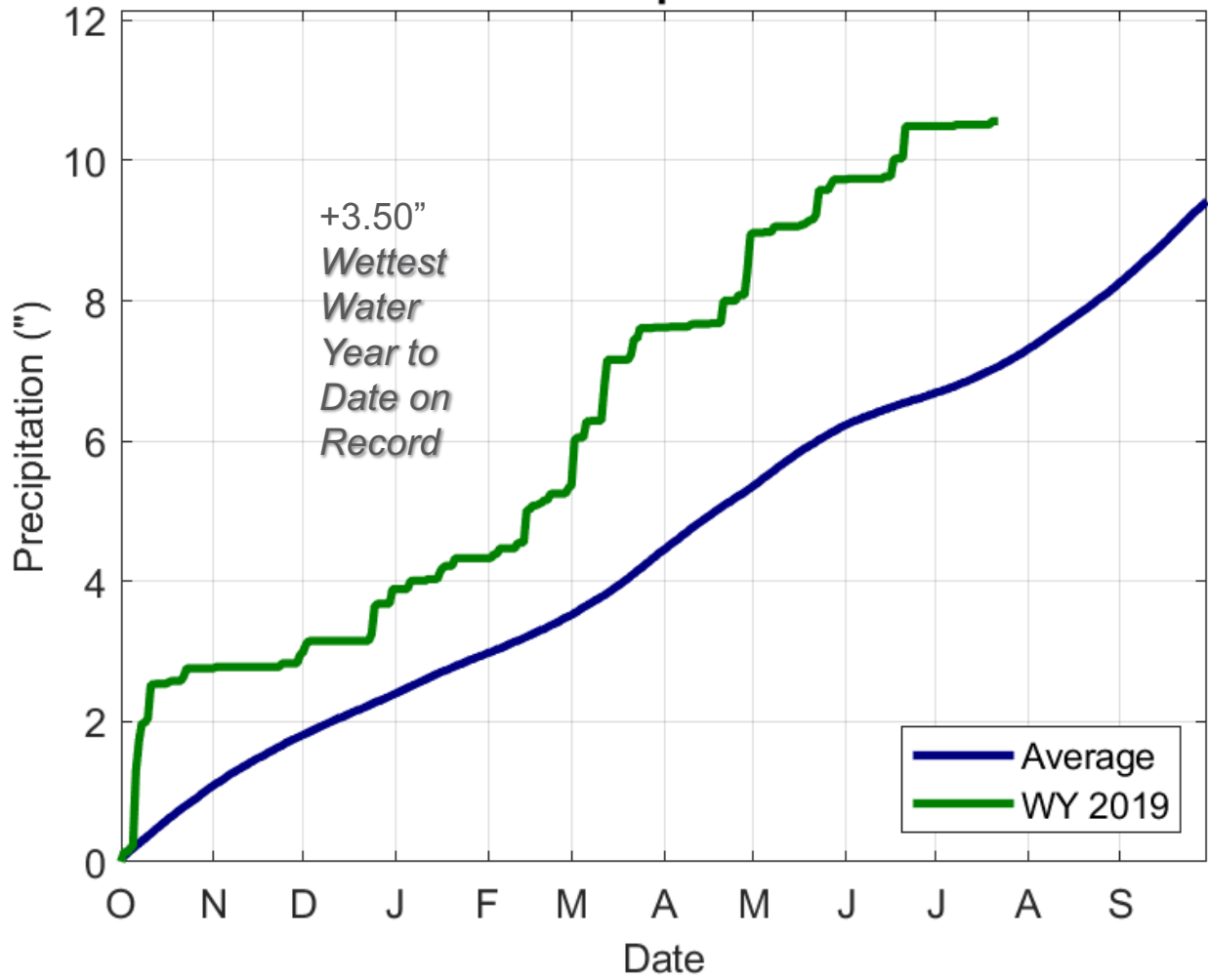
## Precipitation by Climate Division



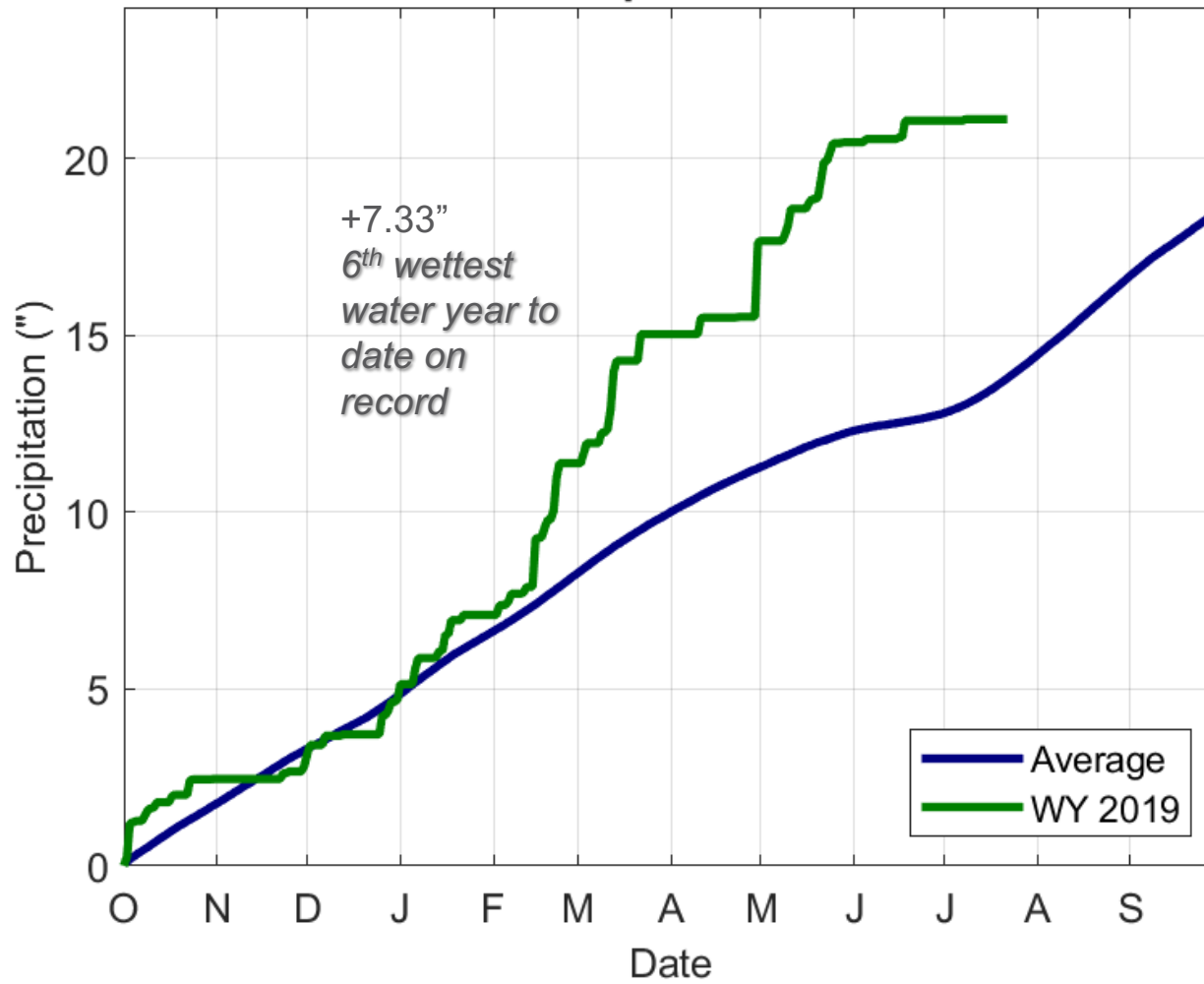
# Grand Lake Precipitation Accumulation



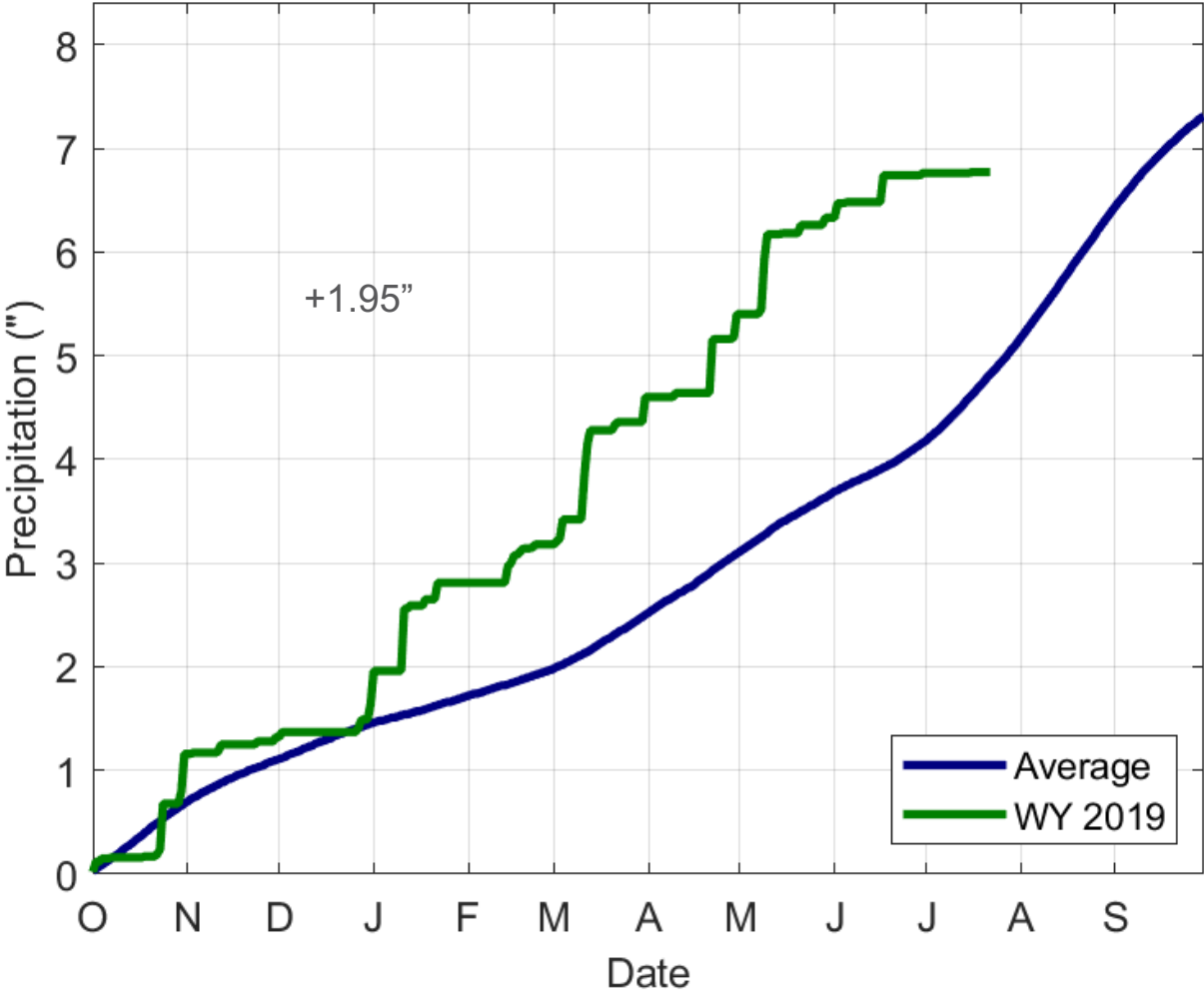
### Grand Junction Precipitation Accumulation



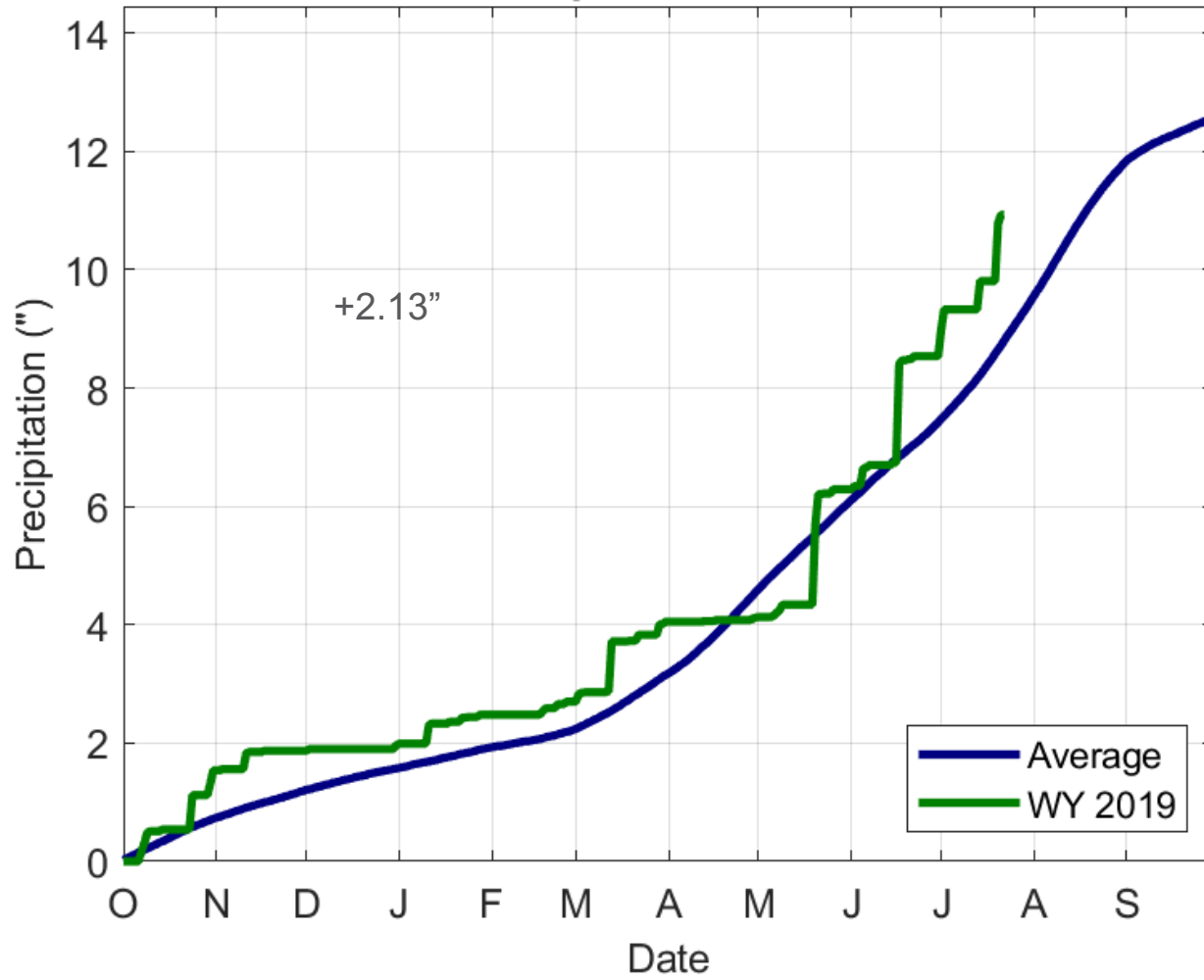
# Mesa Verde Precipitation Accumulation



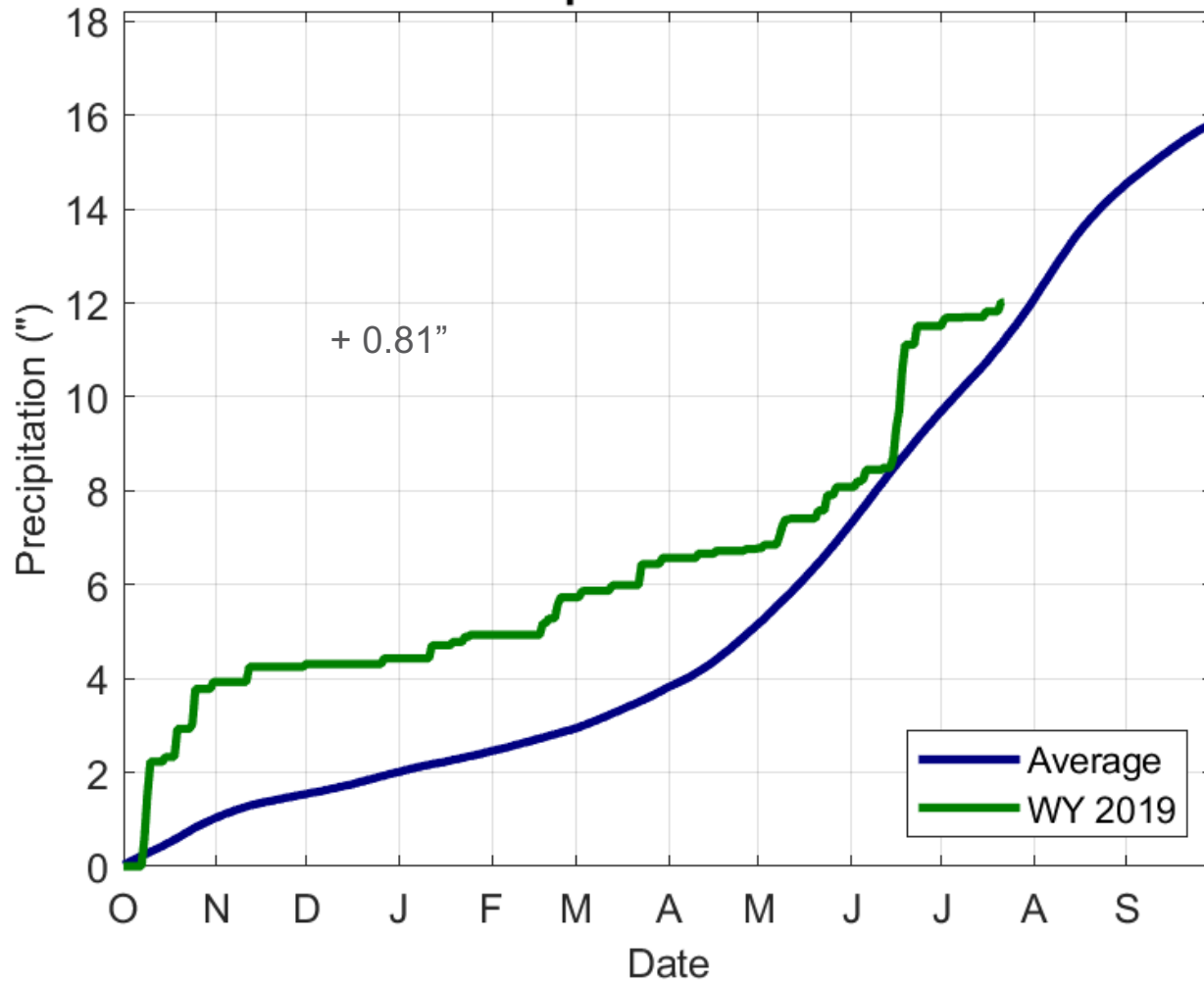
# Alamosa Precipitation Accumulation



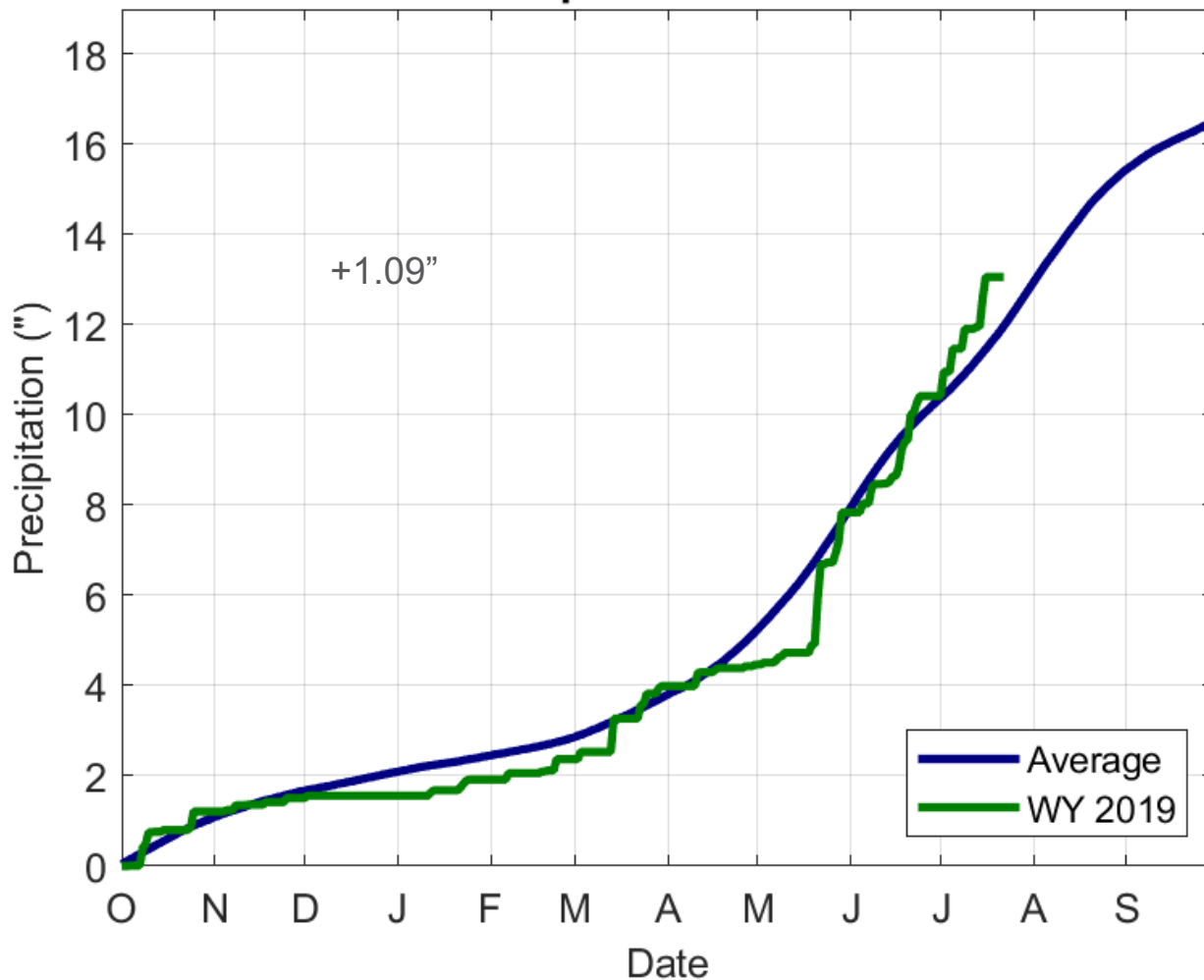
### Pueblo Precipitation Accumulation



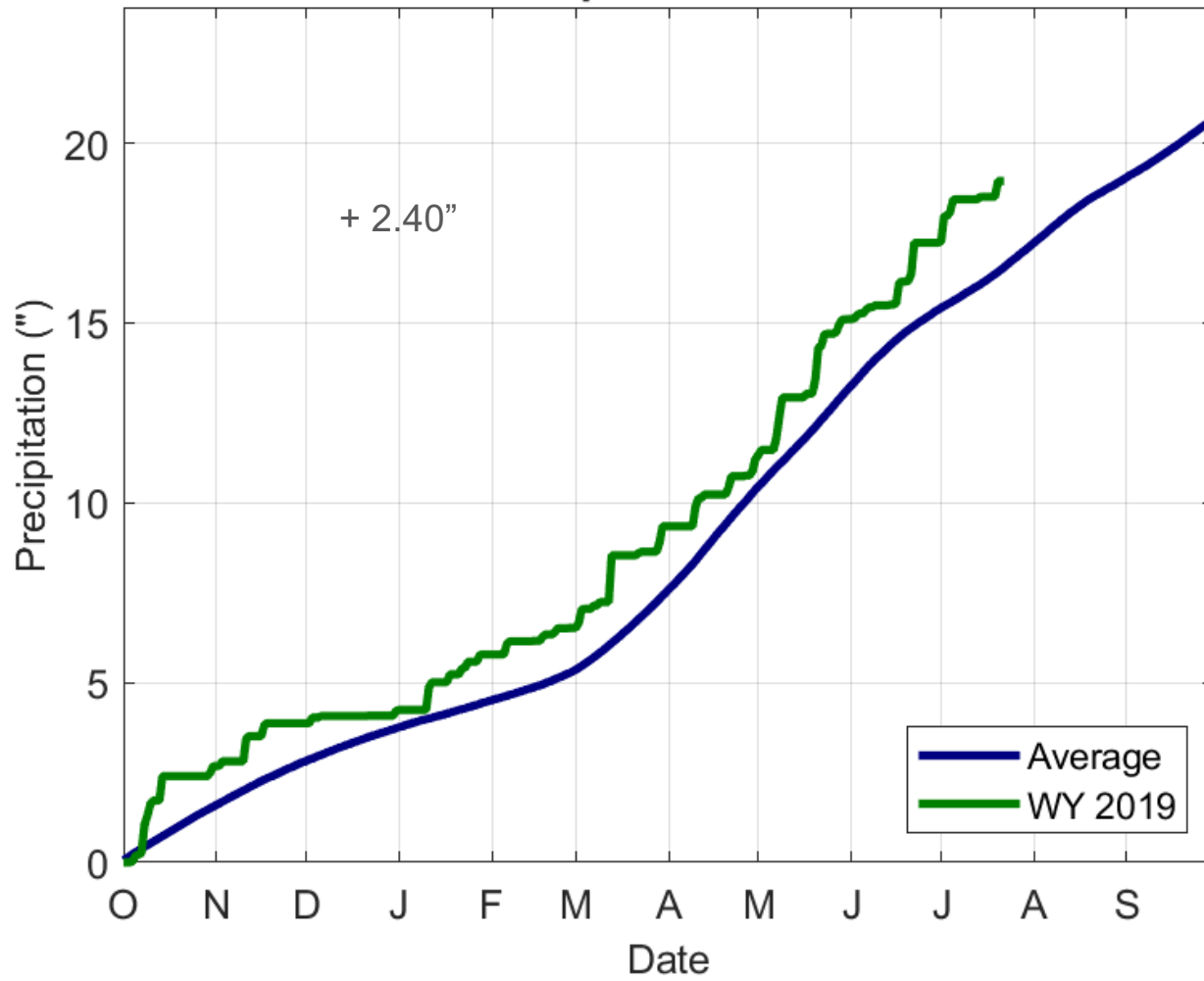
### Lamar Precipitation Accumulation



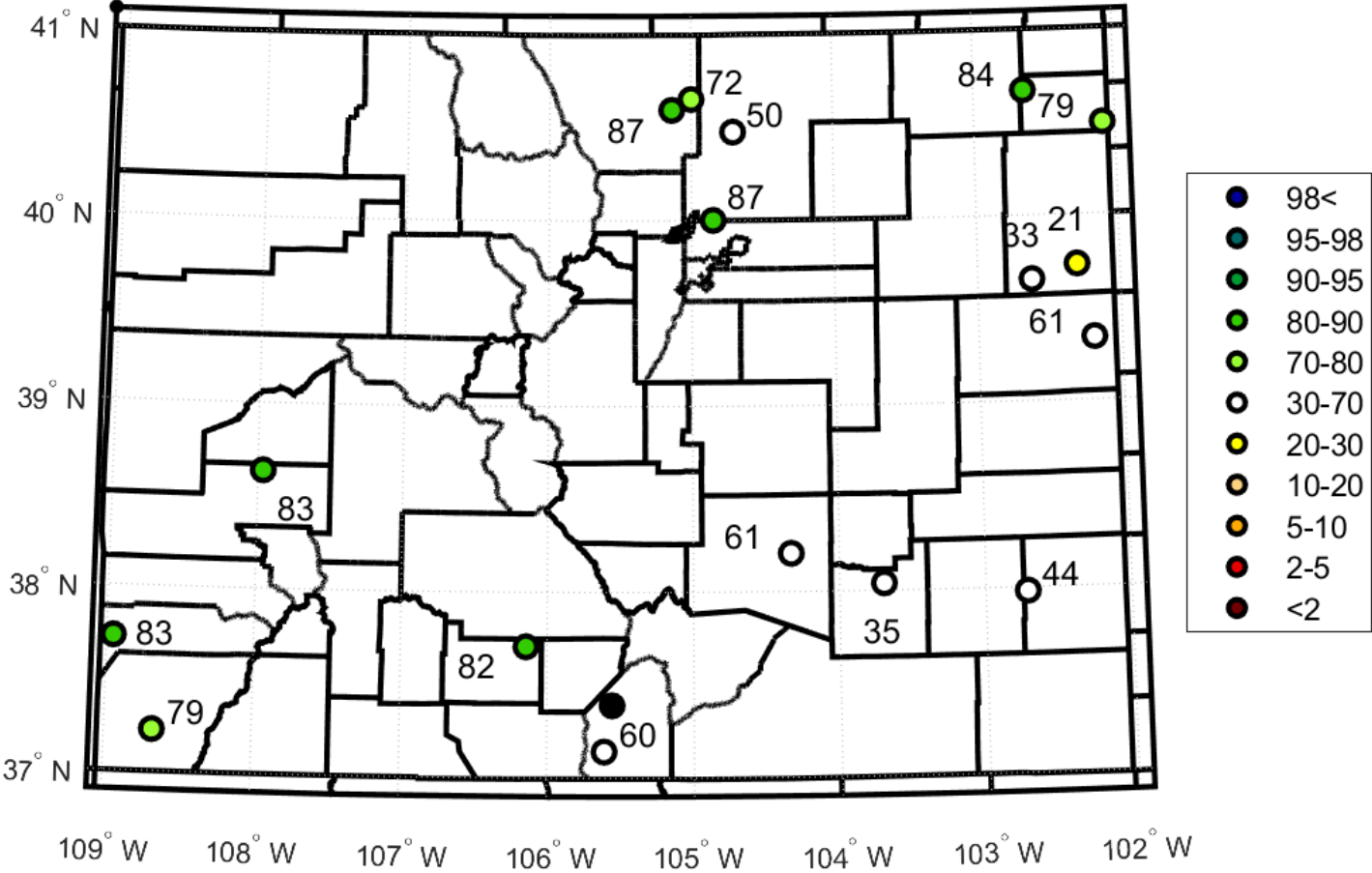
### Akron Precipitation Accumulation

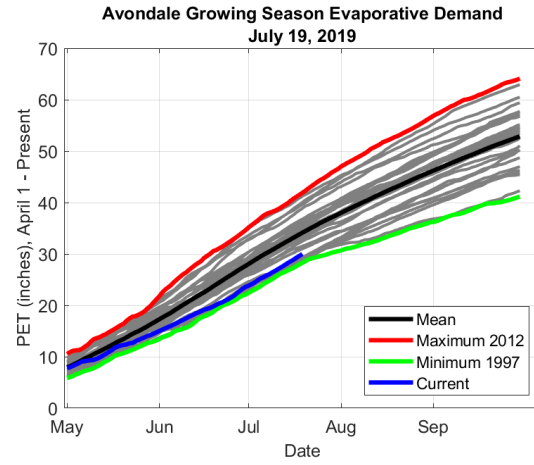
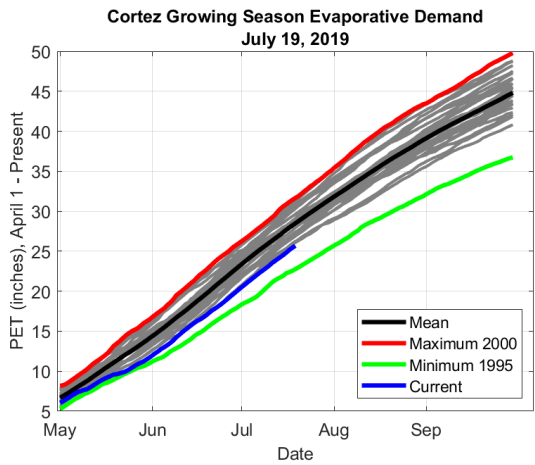
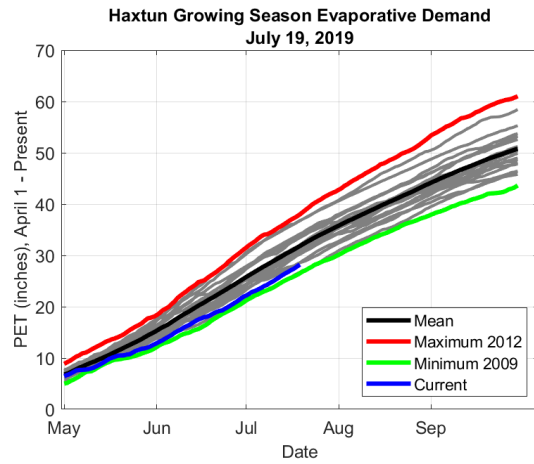
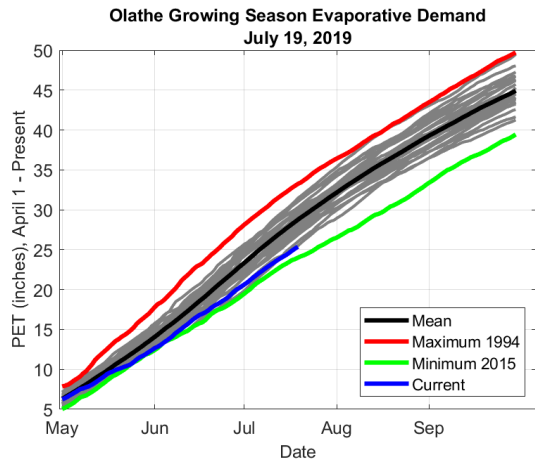


### Boulder Precipitation Accumulation

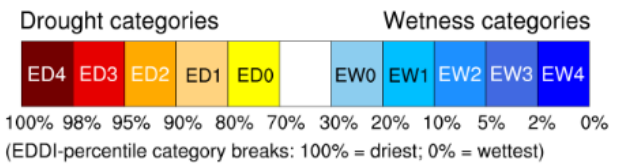
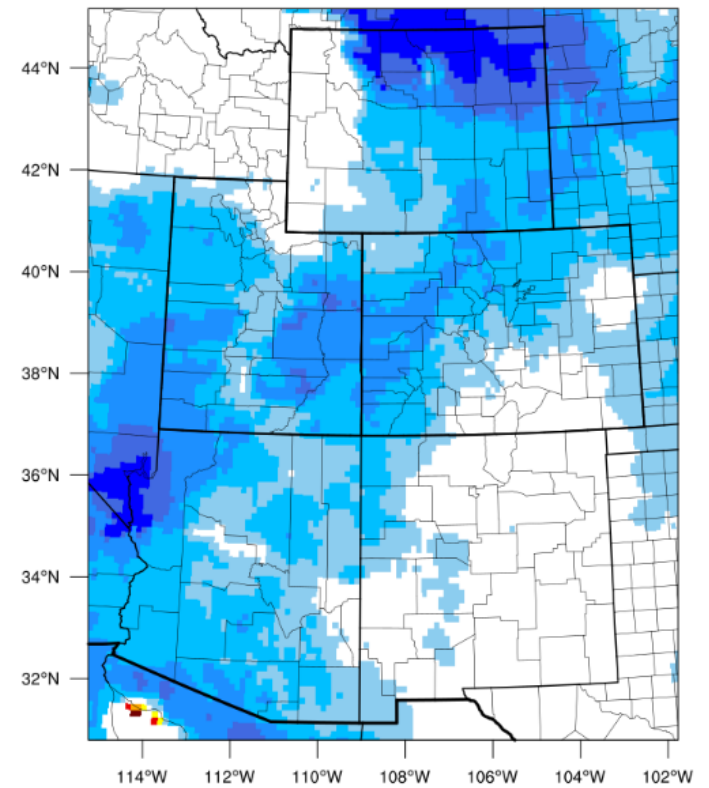


### Growing Season Water Balance (P/PET) Percentiles July 19, 2019

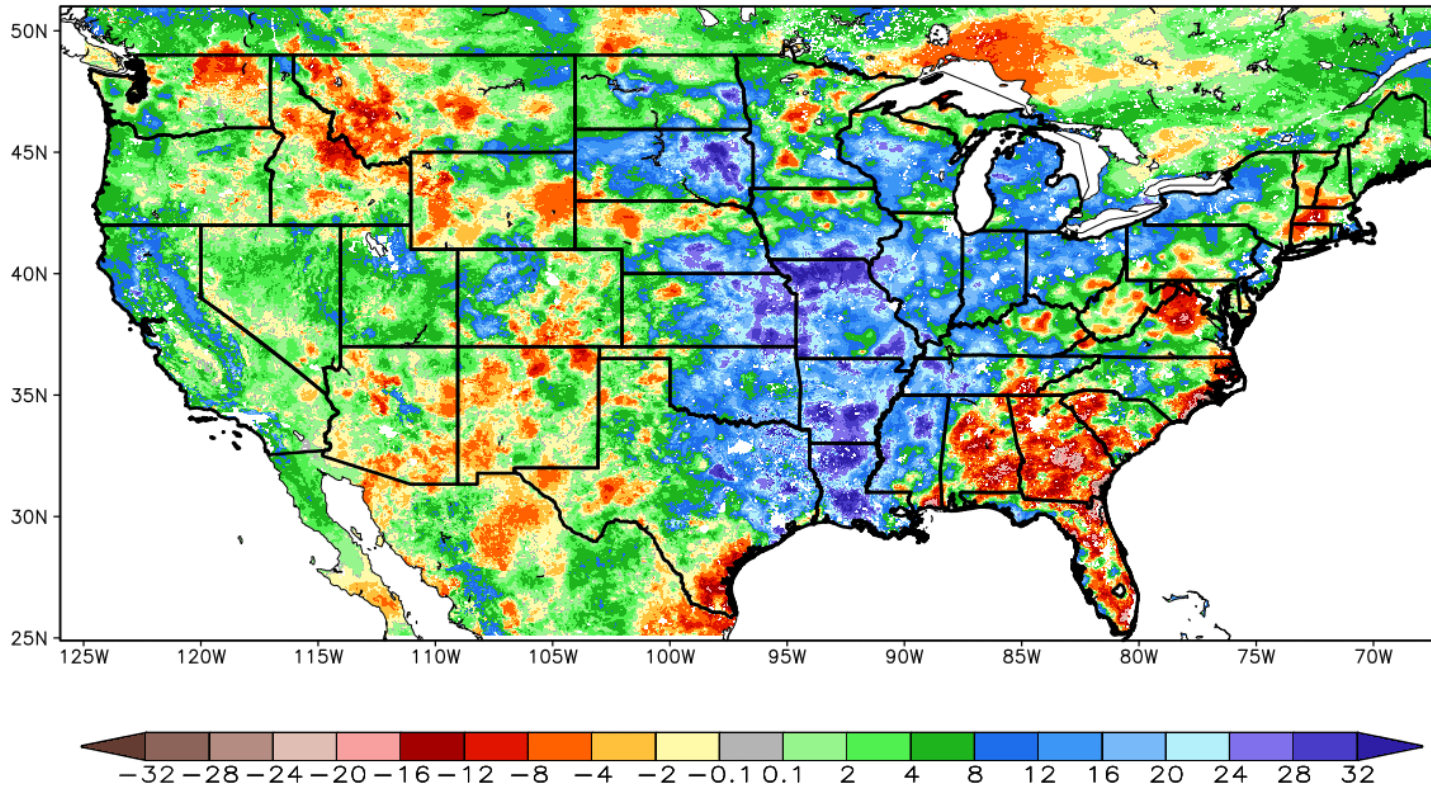




### 3-month EDDI categories for July 13, 2019

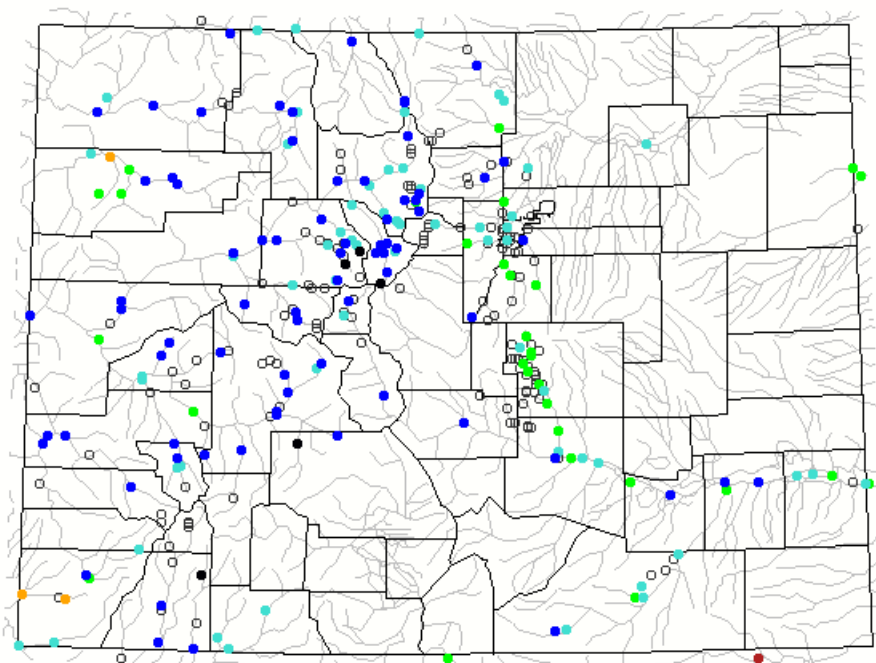


1-Year Difference in Column Relative Soil Moisture (%) valid 12z 21 Jul 2019



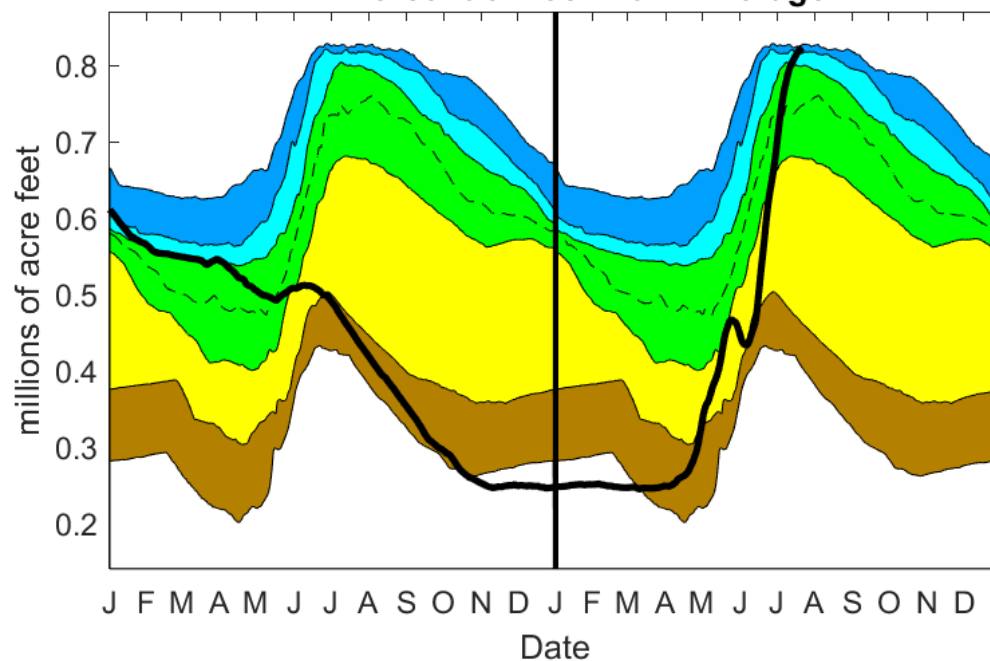
# USGS Stream Gage Percentiles

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



- Current Data
- Median Year
- 90th Percentile - Maximum
- 70-90th Percentile
- 30-70th Percentile
- 10-30th Percentile
- Minimum - 10th Percentile



# Drought

National Drought

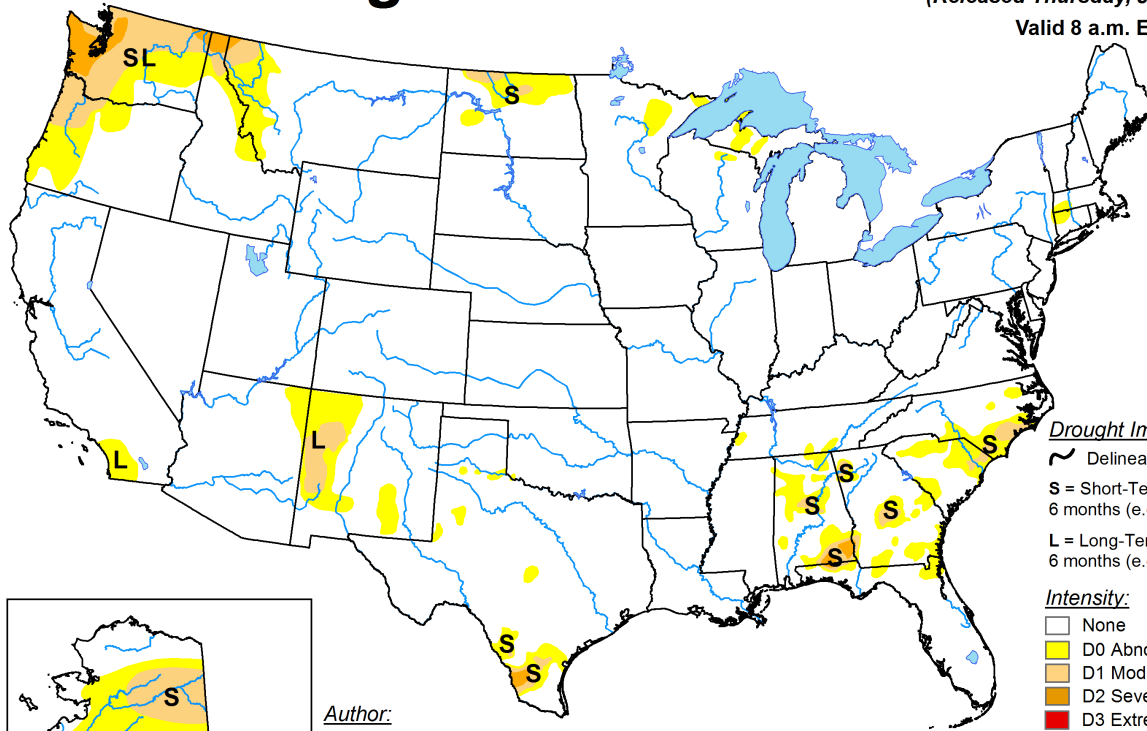
Colorado Drought

Colorado Drought Facts



# U.S. Drought Monitor

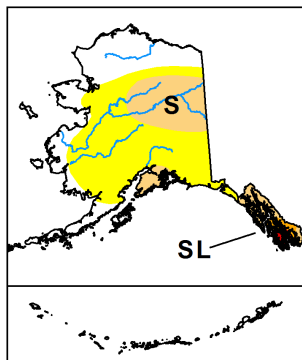
**July 16, 2019**  
 (Released Thursday, Jul. 18, 2019)  
 Valid 8 a.m. EDT



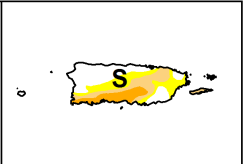
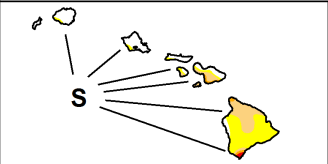
**Drought Impact Types:**  
 ~ Delineates dominant impacts  
 S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)  
 L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

**Intensity:**  
 □ None  
 □ D0 Abnormally Dry  
 □ D1 Moderate Drought  
 □ D2 Severe Drought  
 □ D3 Extreme Drought  
 □ D4 Exceptional Drought

*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

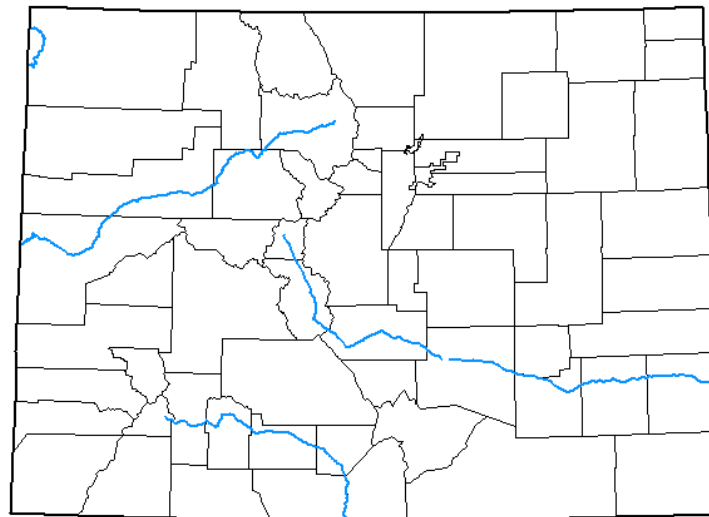


[droughtmonitor.unl.edu](http://droughtmonitor.unl.edu)

# U.S. Drought Monitor Colorado

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

where's the color???



Drought Conditions (Percent Area)

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

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:

Brad Rippey  
U.S. Department of Agriculture



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# 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

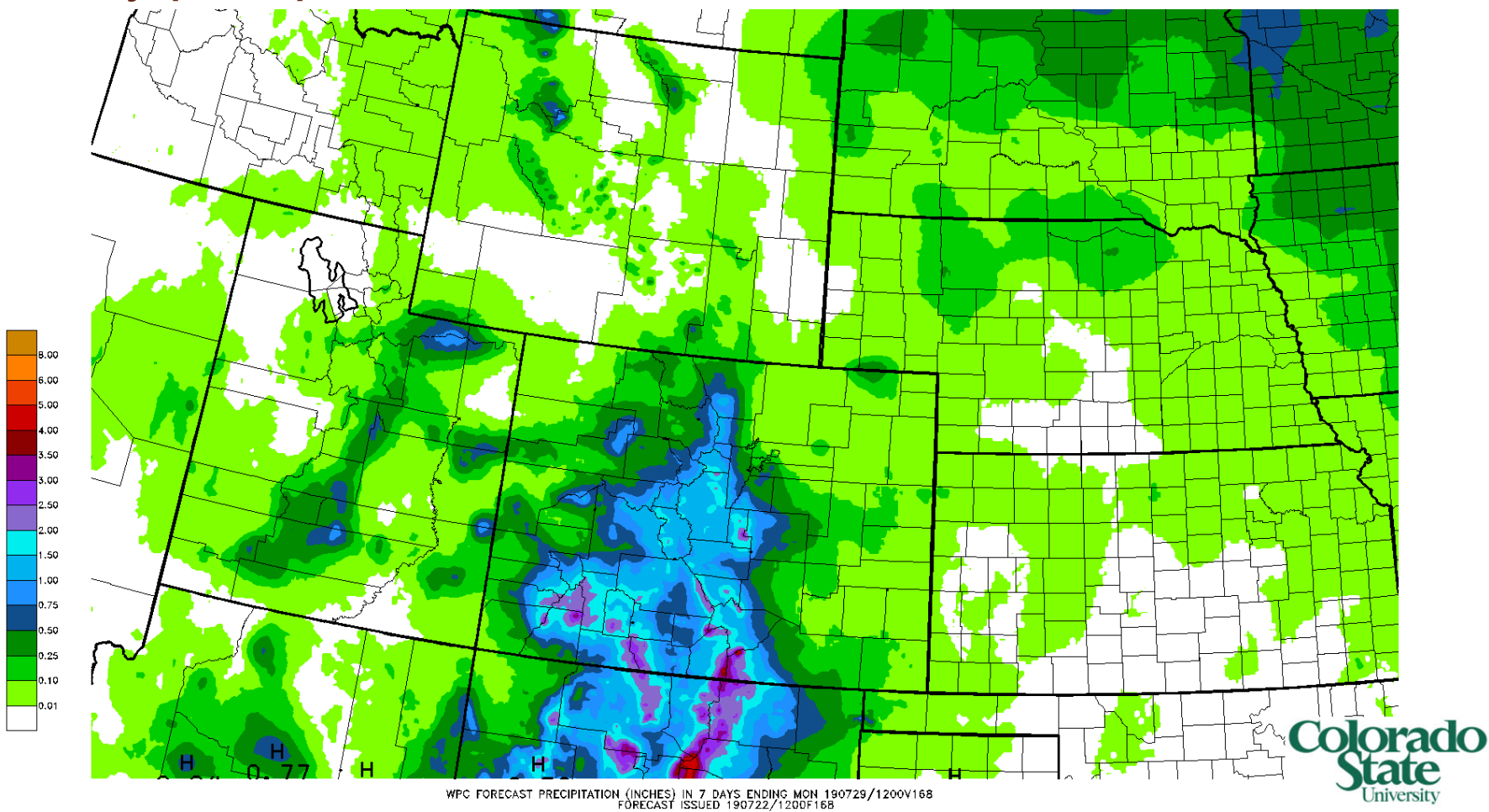
CPC Outlooks

Precipitation Projections

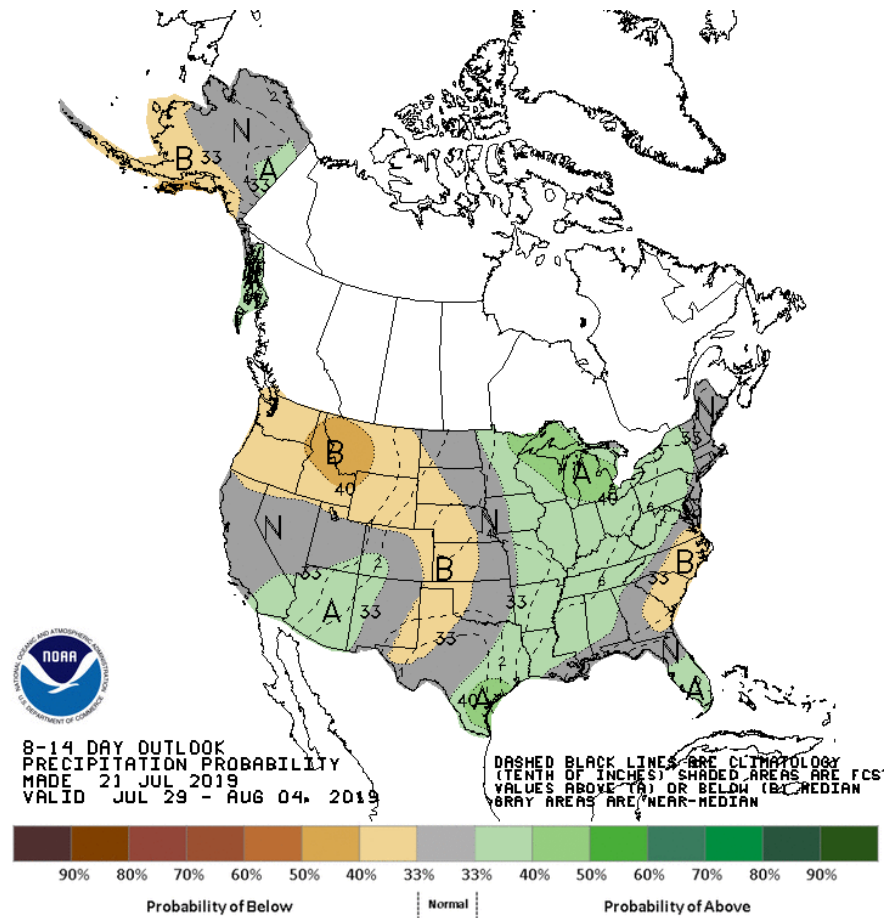
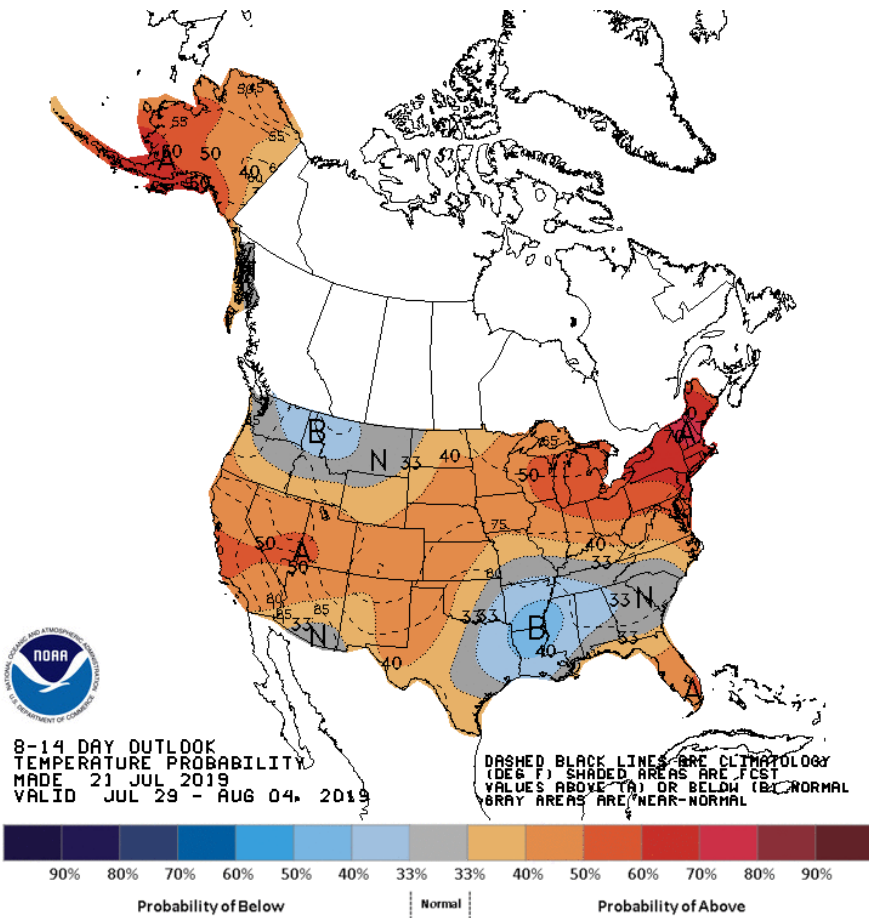
What is happening with El Niño?



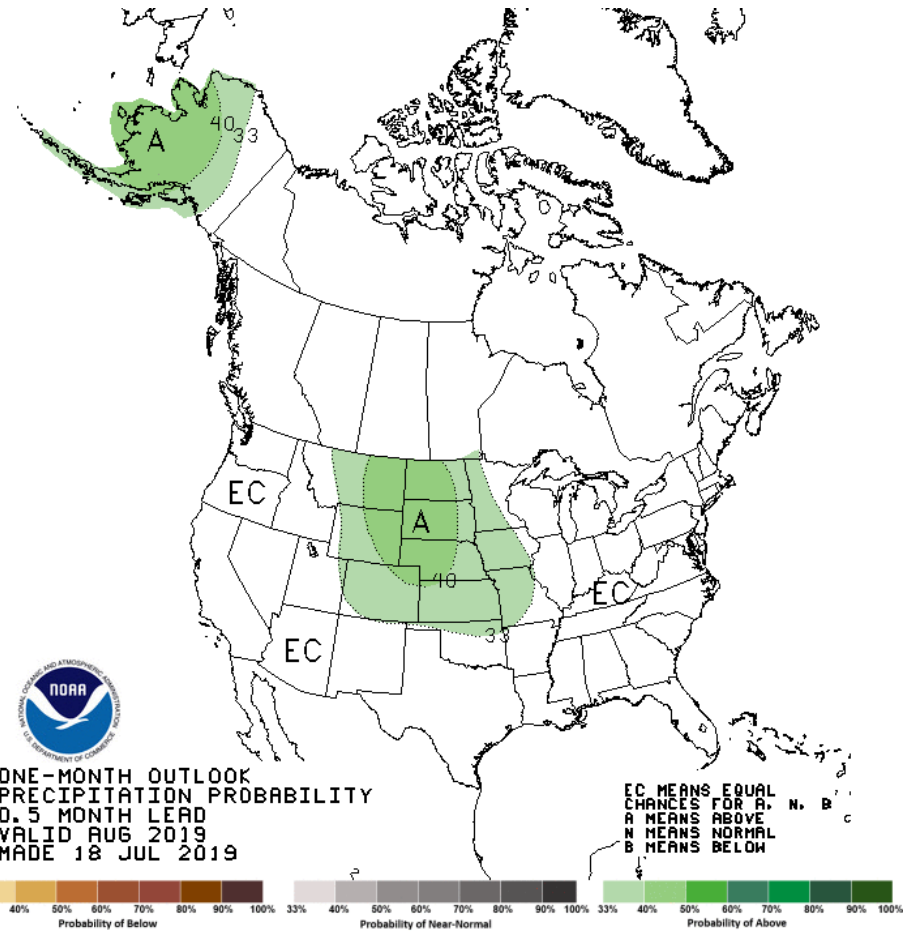
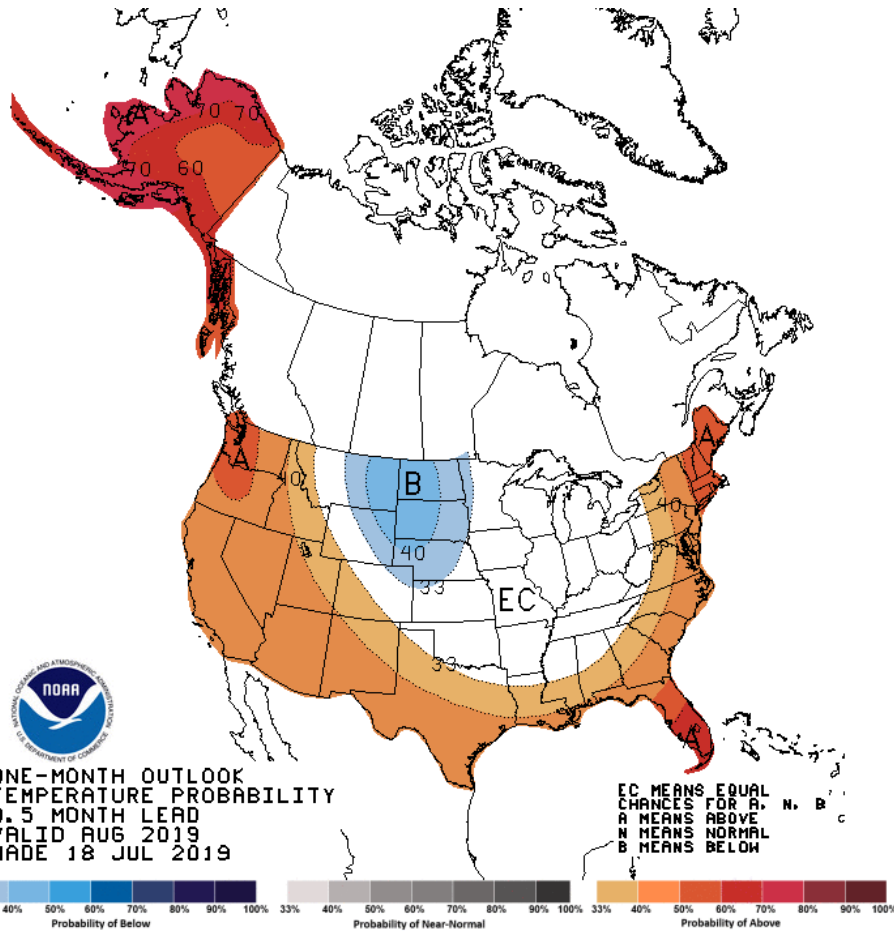
# NOAA 7-day precip forecast



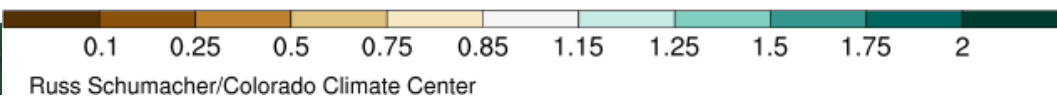
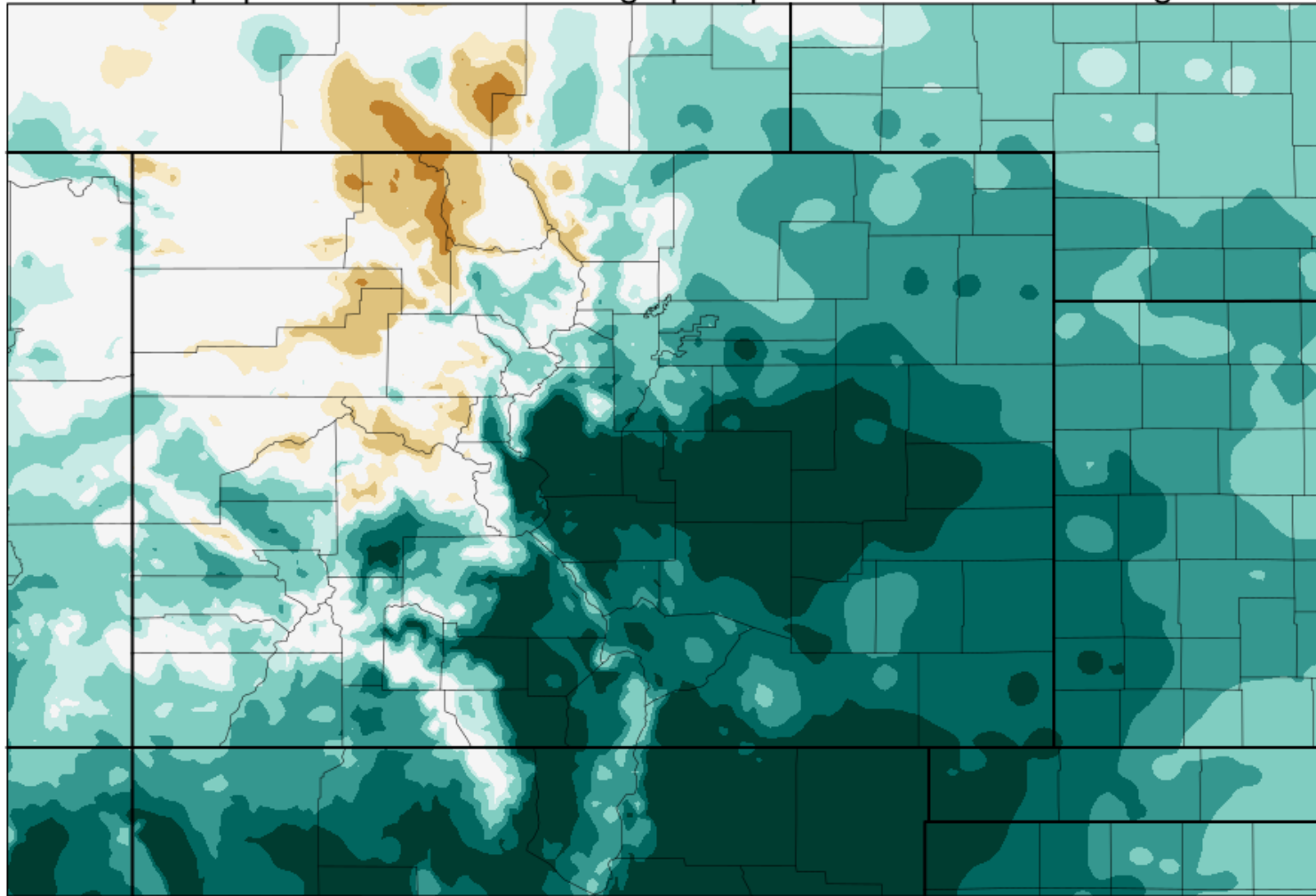
# 8-14 day outlook



# One Month Outlook



# PRISM proportion of annual average precipitation in this month: August

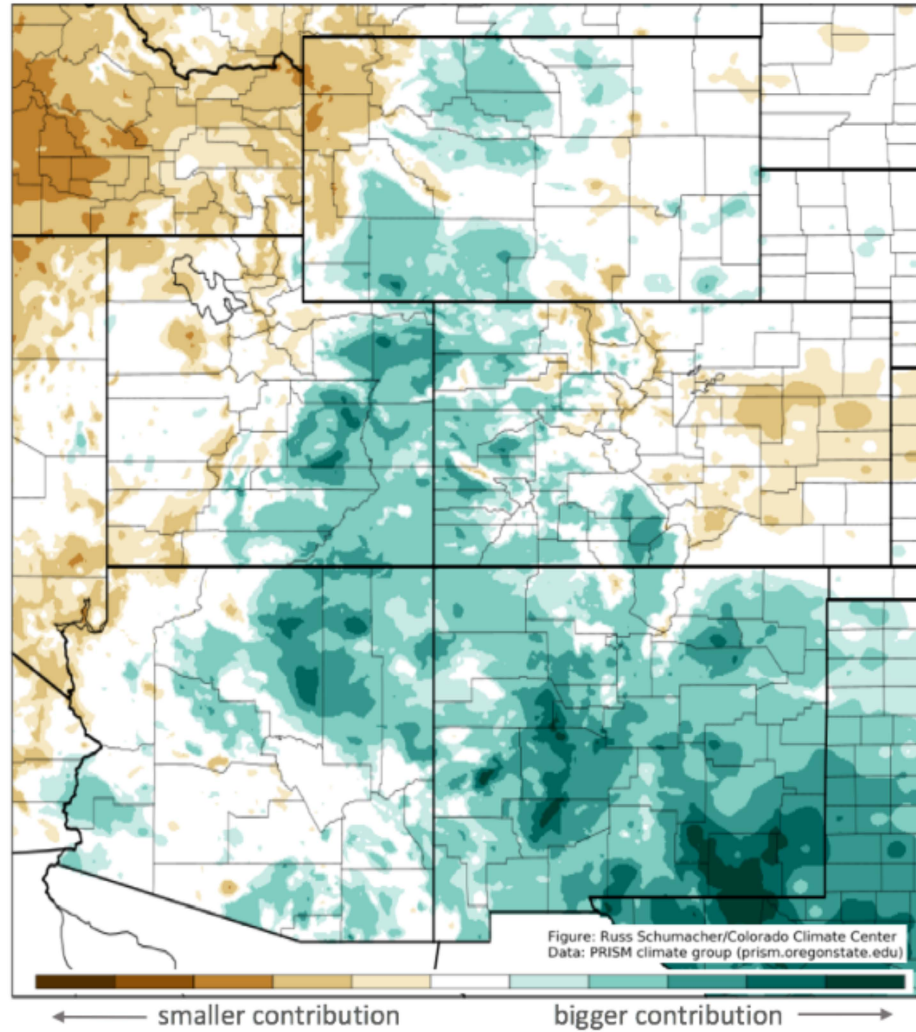


Proportion of precip relative to 1/12th

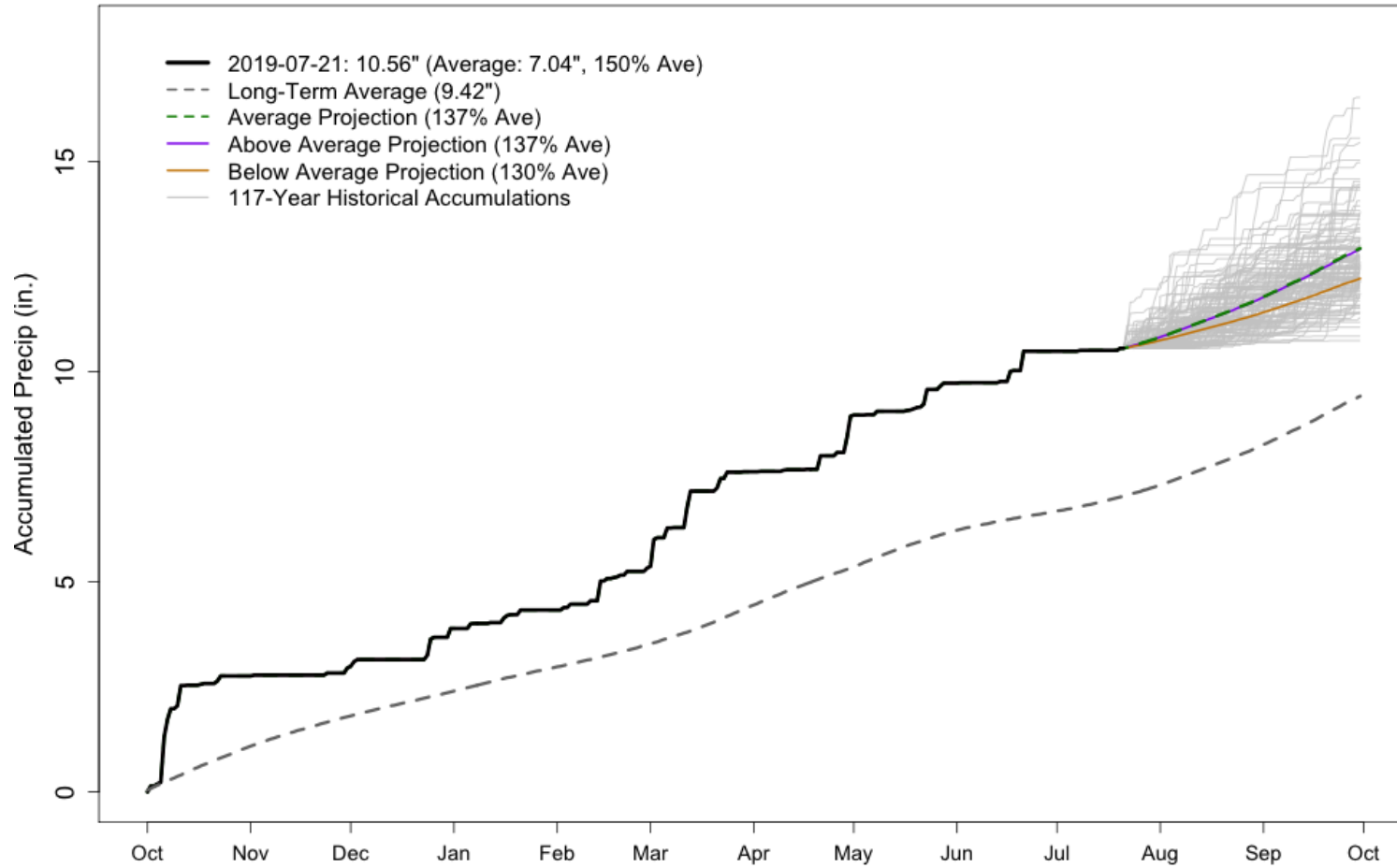
Russ Schumacher/Colorado Climate Center



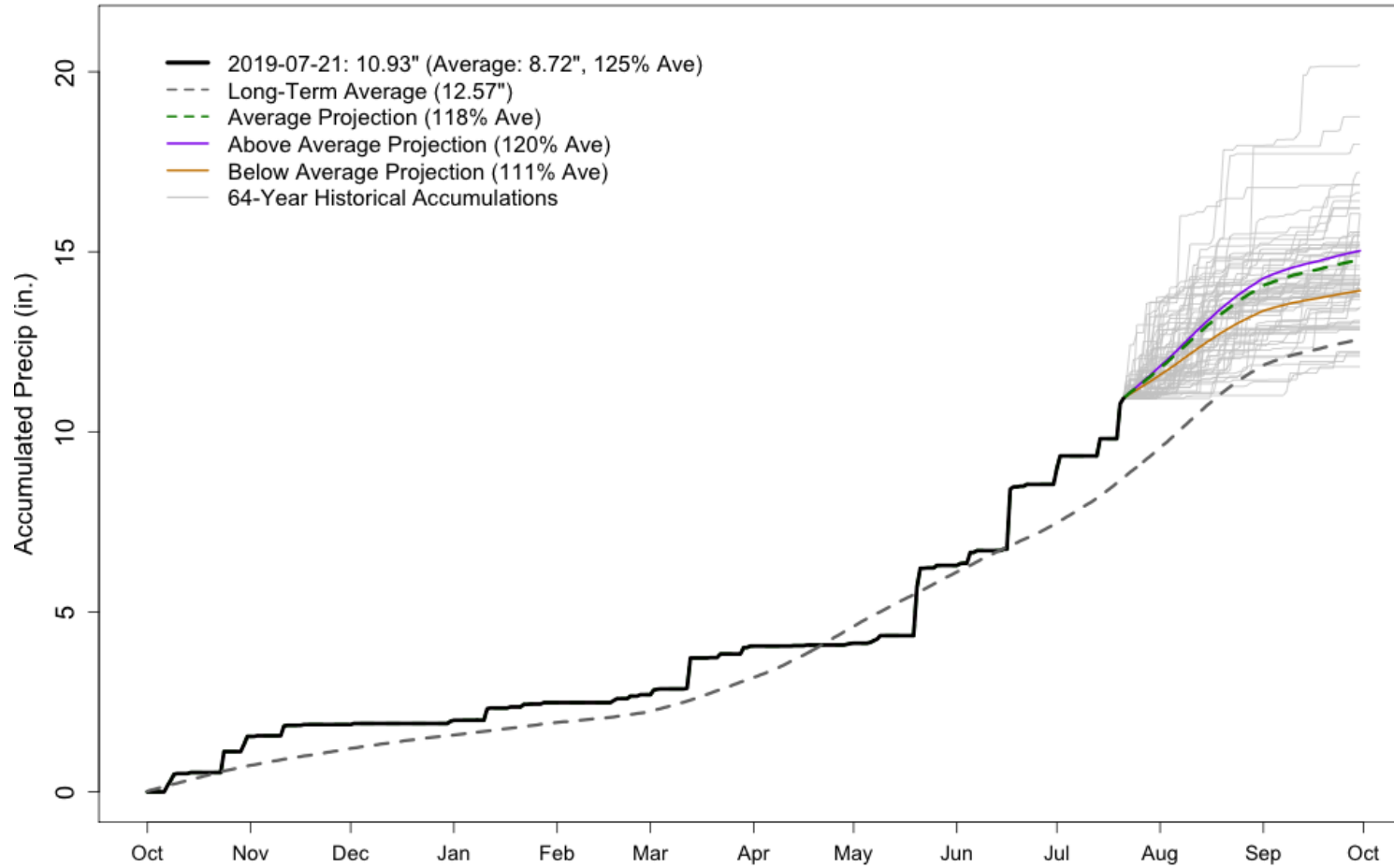
### September climatological contribution to annual average precipitation



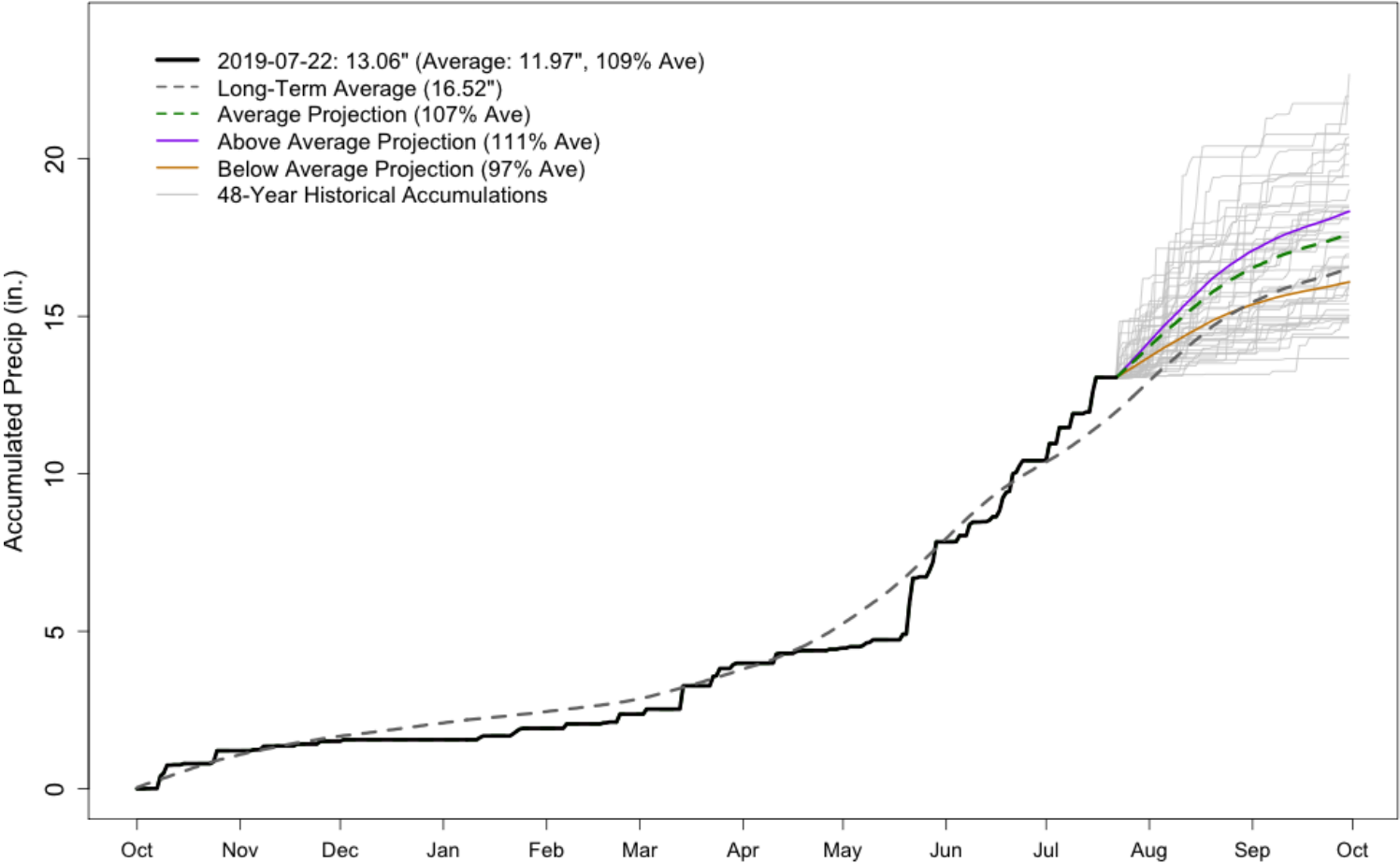
## GRAND JUNCTION WALKER FIELD WY2019 Precipitation Projections



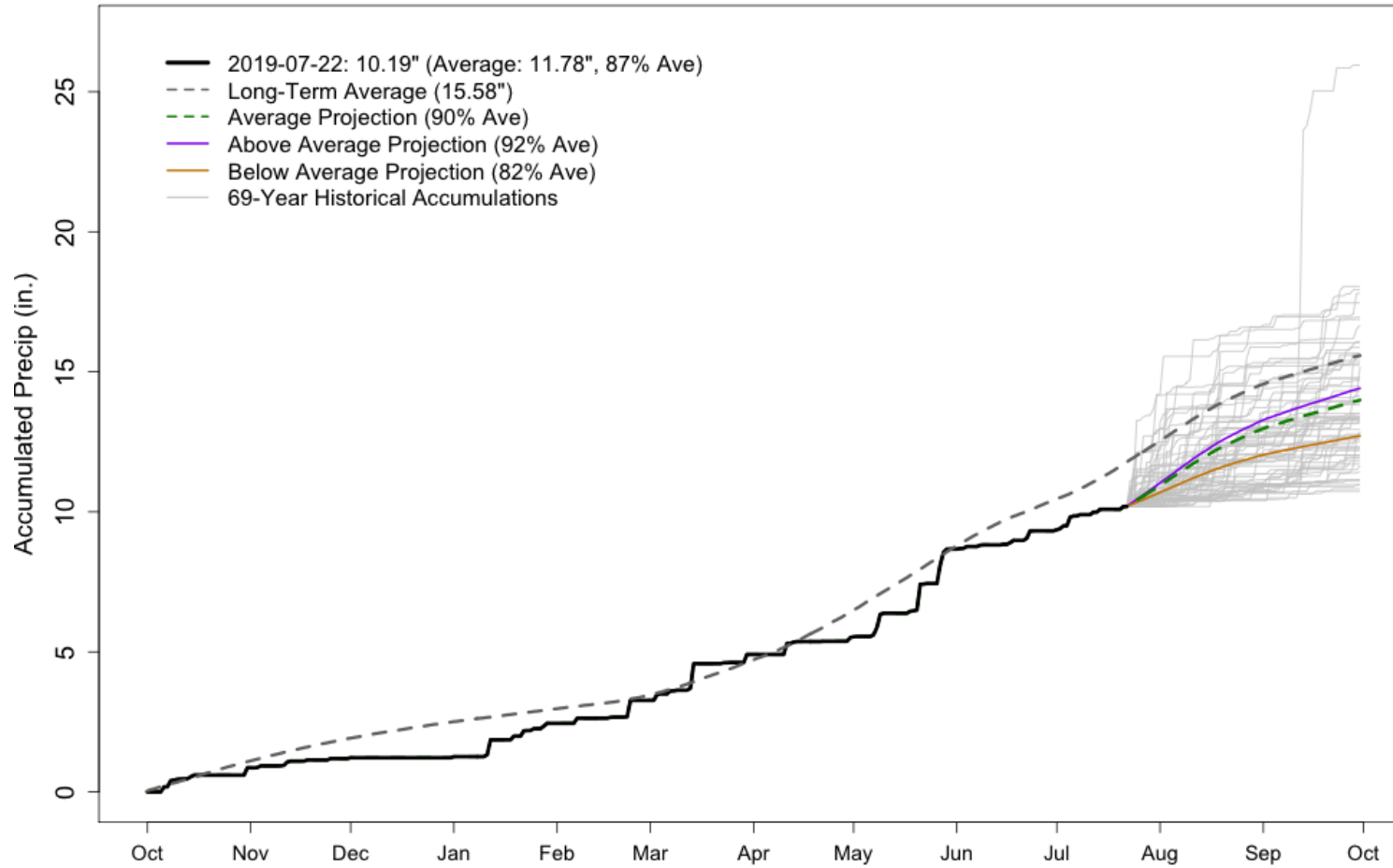
## PUEBLO MEMORIAL AP WY2019 Precipitation Projections



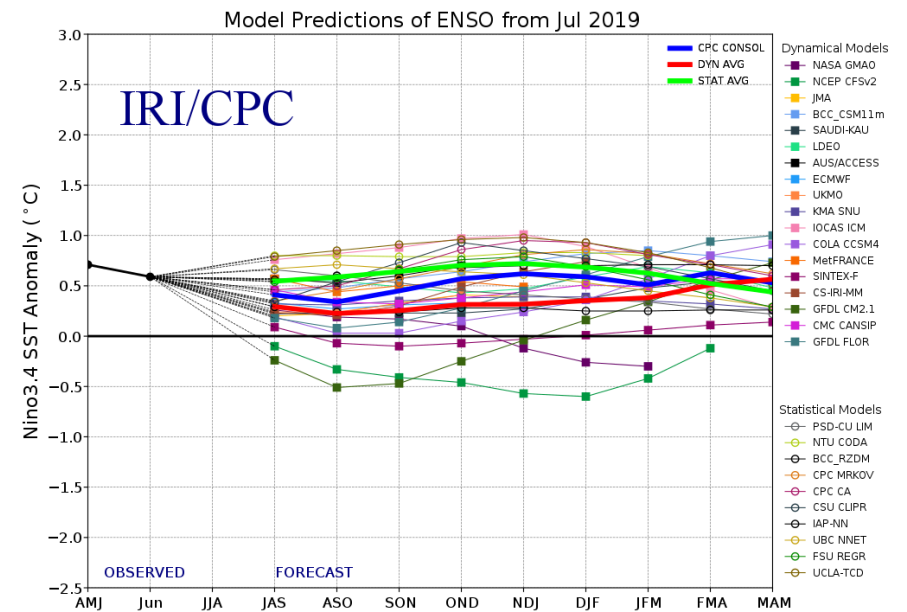
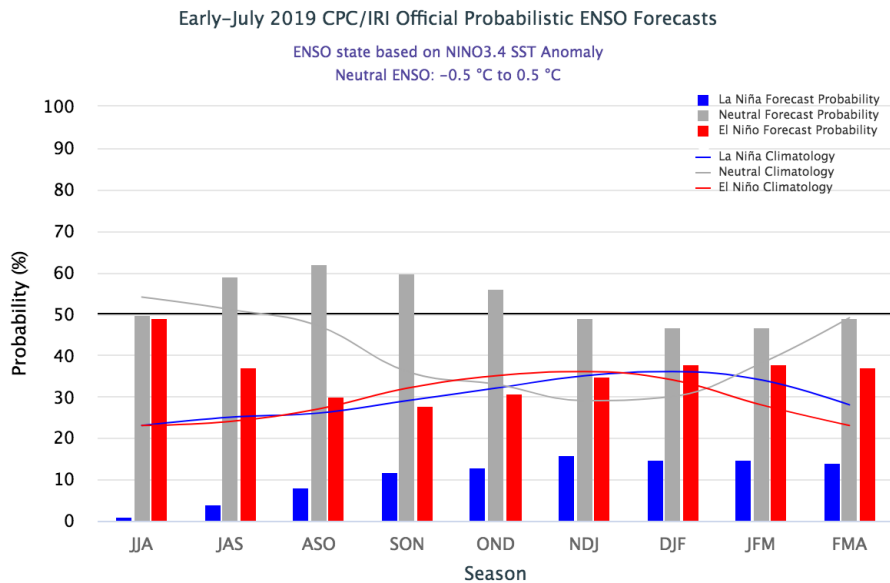
# AKRON 4 E WY2019 Precipitation Projections



## DENVER-STAPELTON WY2019 Precipitation Projections



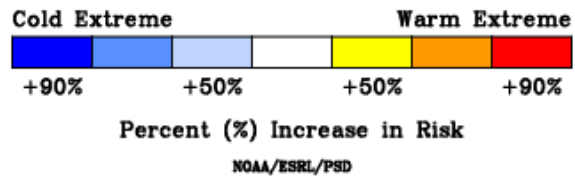
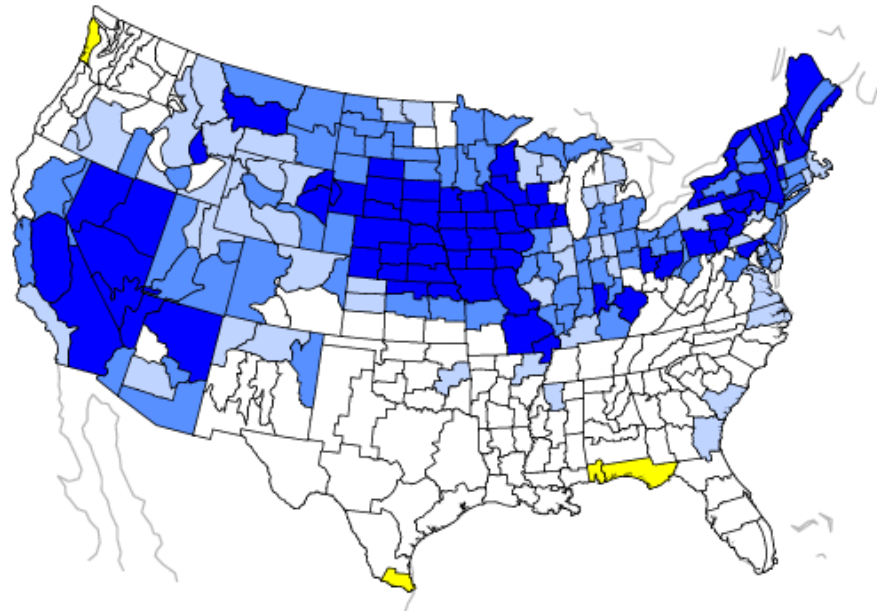
# What's the El Niño forecast?



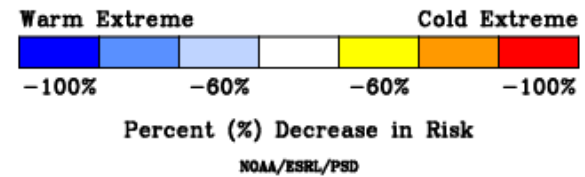
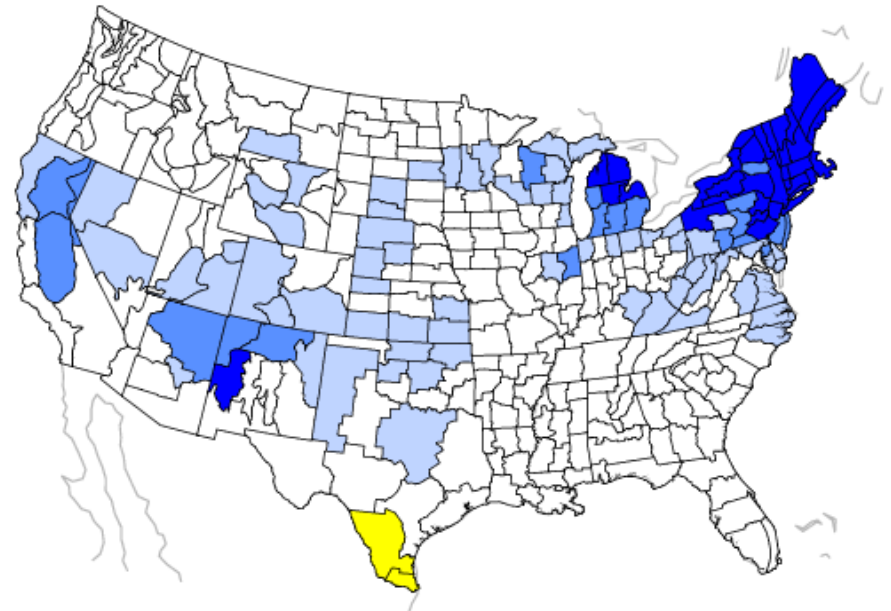
An El Niño advisory is in effect...



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



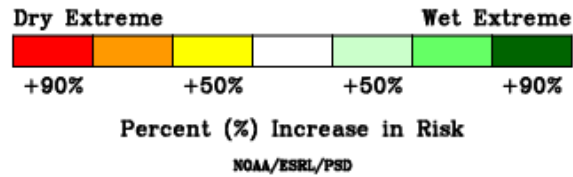
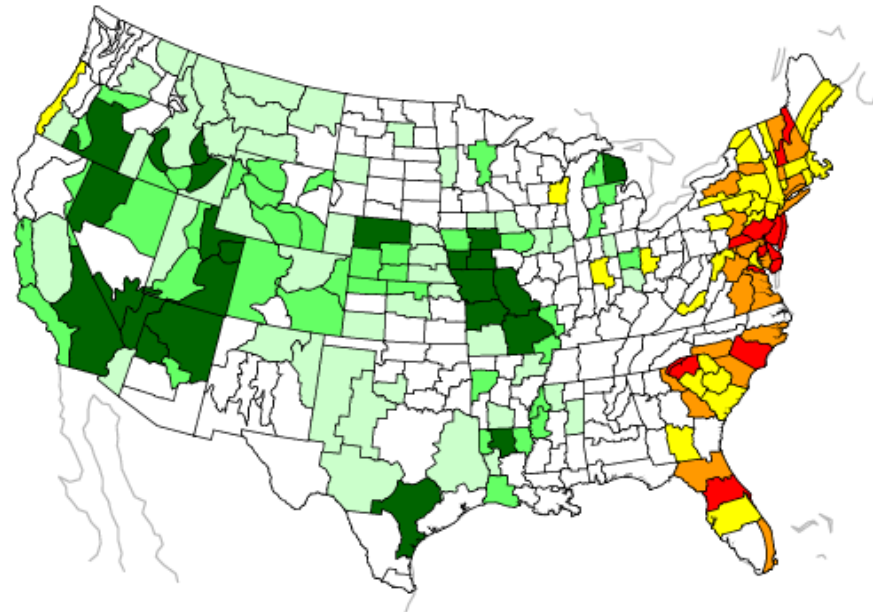
ASO Temperature During El Nino  
Decreased Risk of Warm or Cold Extremes



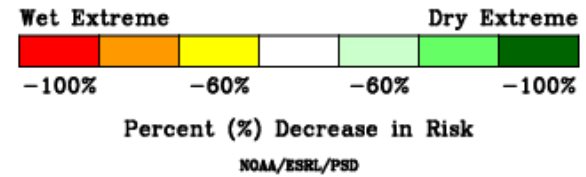
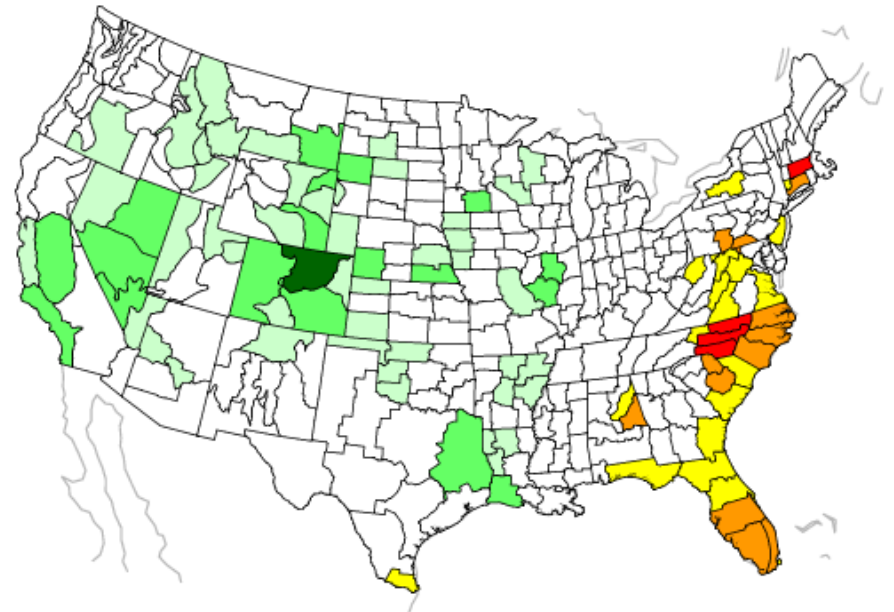
<https://www.esrl.noaa.gov/psd/enso/climaterisks/>



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



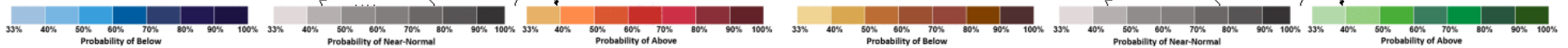
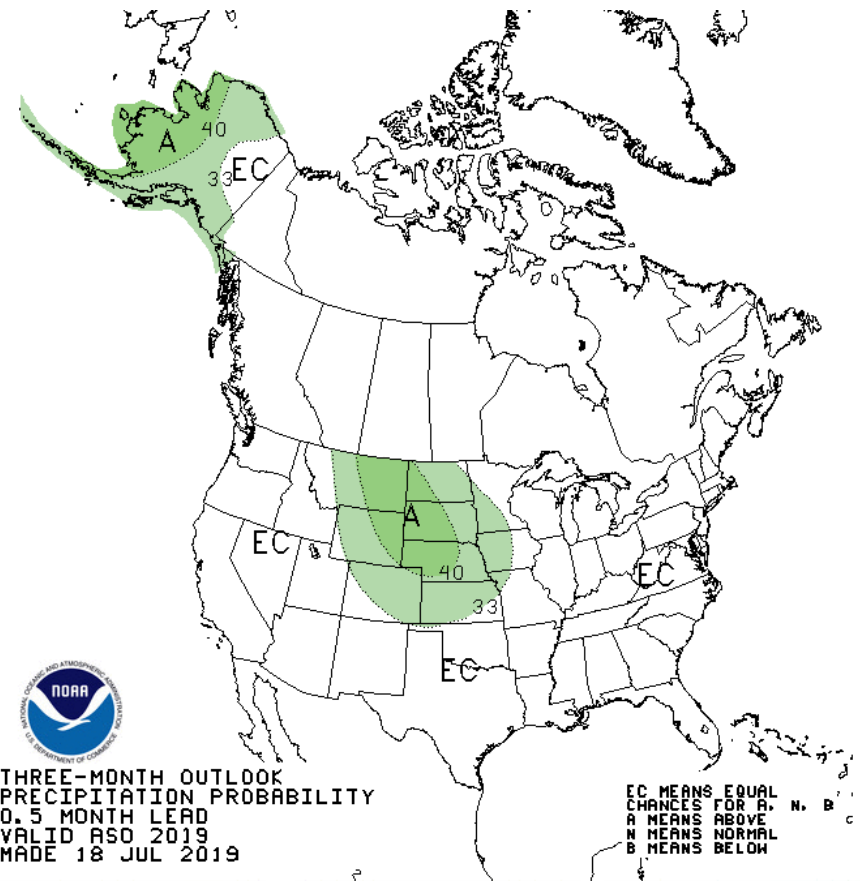
ASO Precipitation During El Nino  
Decreased Risk of Wet or Dry Extremes

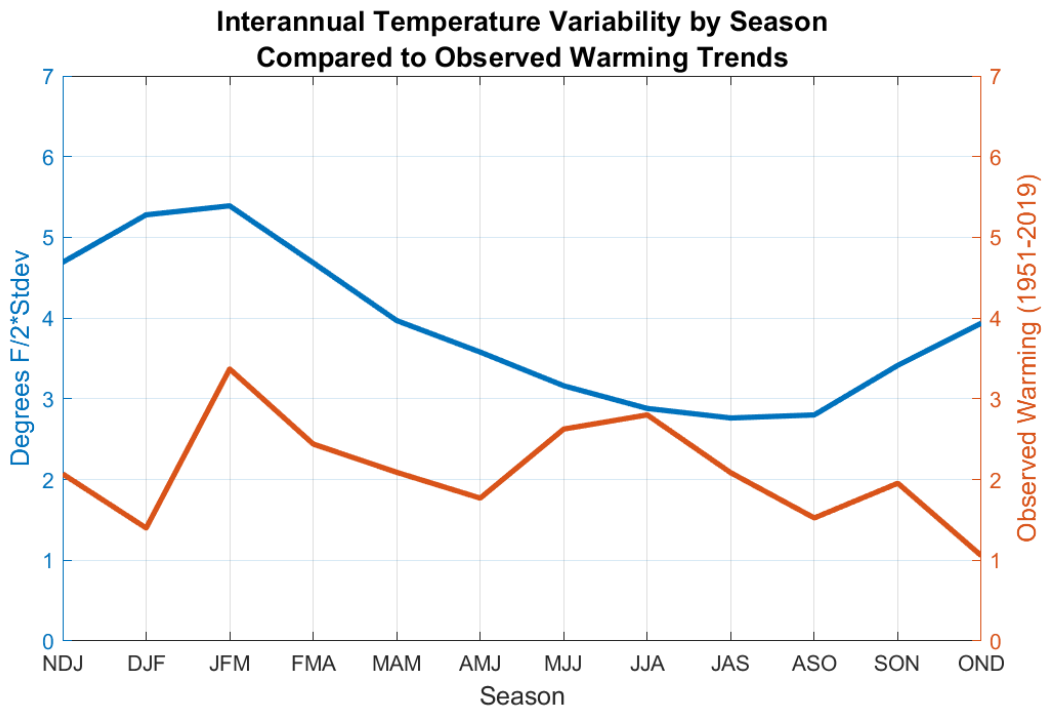


<https://www.esrl.noaa.gov/psd/enso/climaterisks/>



# 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 20<sup>th</sup> 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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**Thank you**

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