# Colorado Climate Center – WATF Climate Update

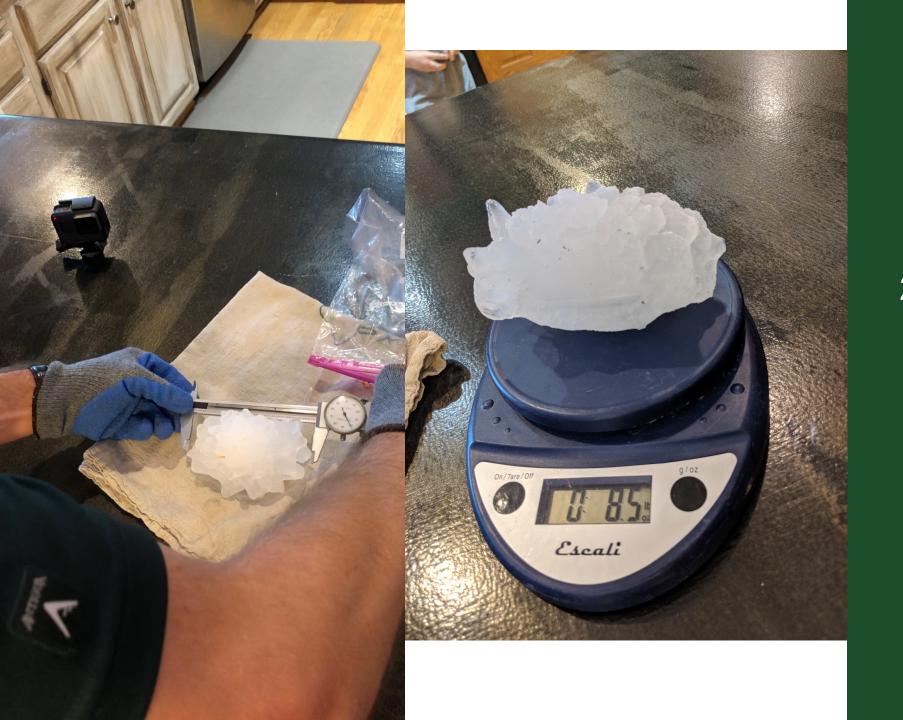
Russ Schumacher, state climatologist

**Water Availability Task Force** 

**August 27, 2019** 





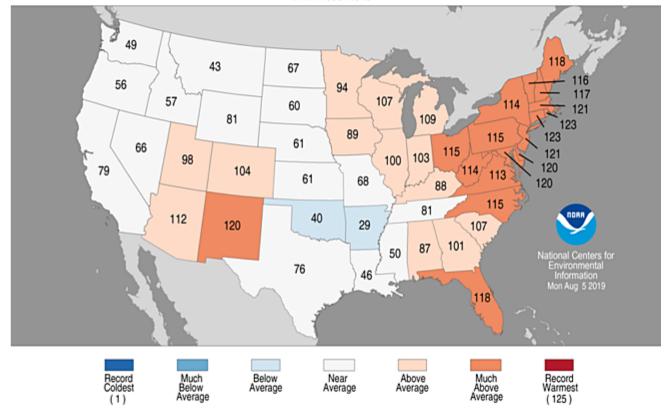


# 2019 Water Year To Date

temperature, precipitation, evaporative demand



# Statewide Average Temperature Ranks July 2019 Period: 1895-2019



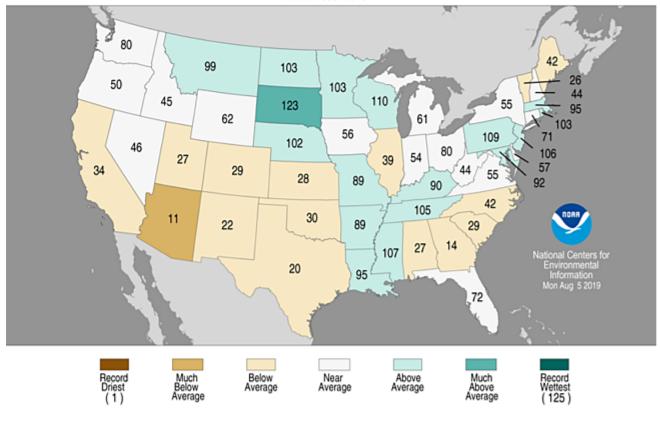
Water year thus far: 0.1°F below the 20th century average

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



# Statewide Precipitation Ranks July 2019

Period: 1895-2019



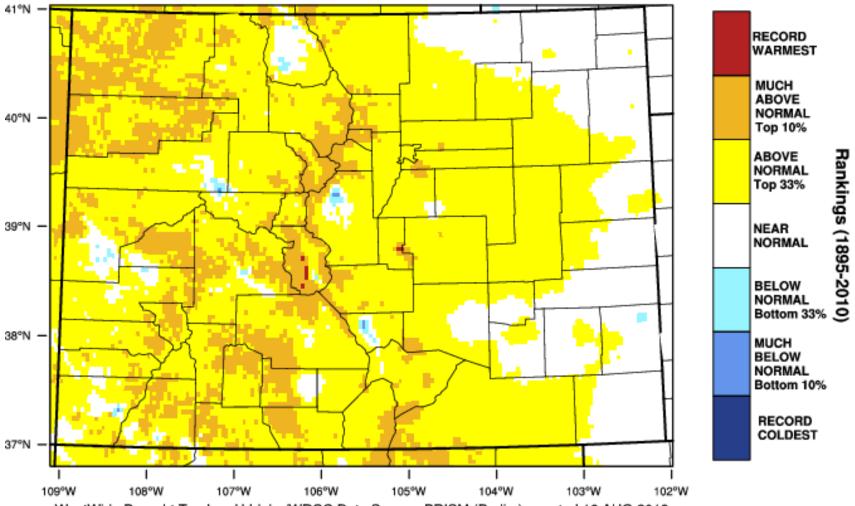
16<sup>th</sup> wettest October – July

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



### Colorado - Mean Temperature

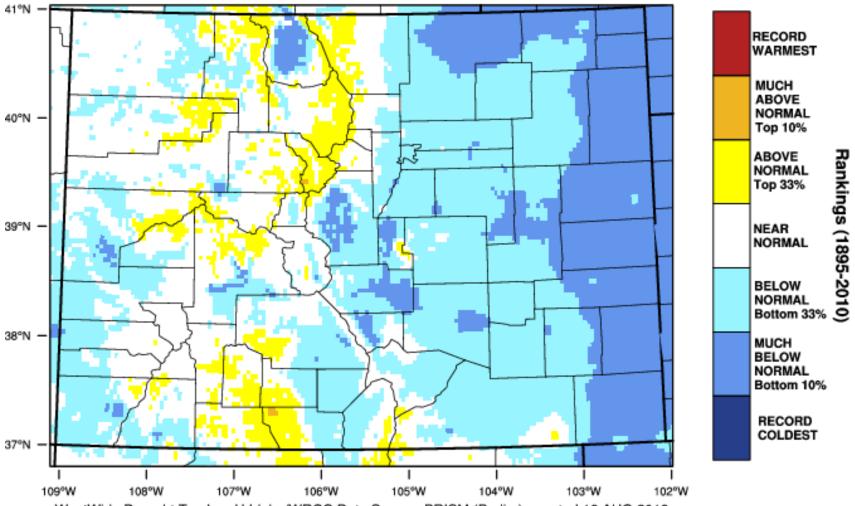






### Colorado - Mean Temperature

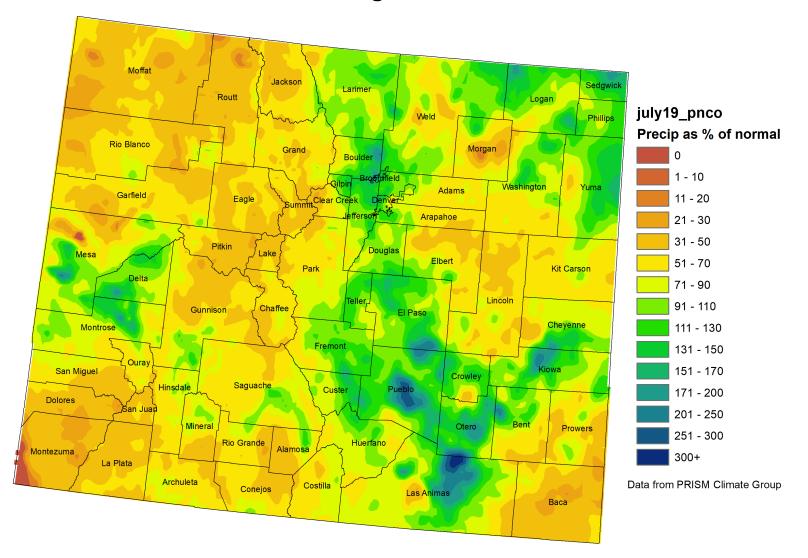
### October-July 2019 Percentile



WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 16 AUG 2019

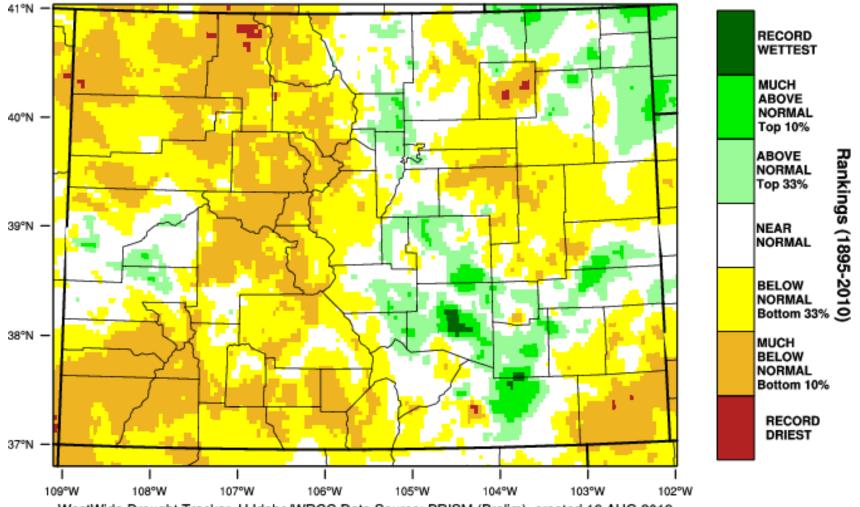


# Colorado July 2019 Precipitation as a Percentage of Normal

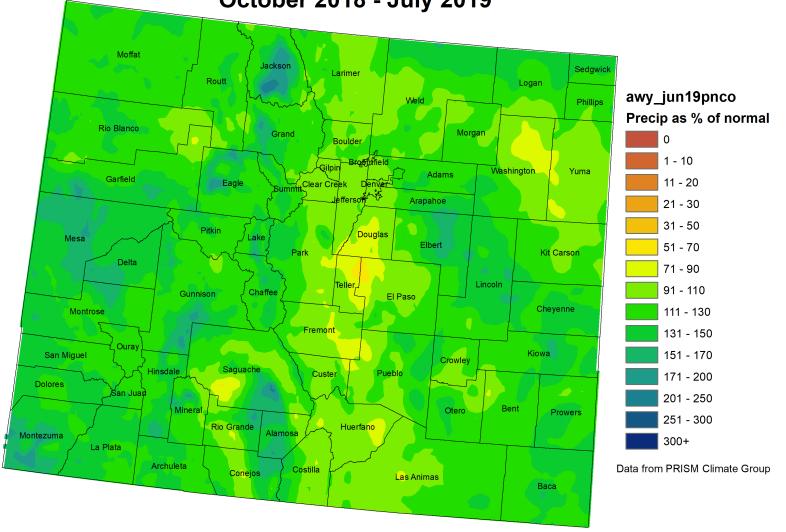


### Colorado - Precipitation



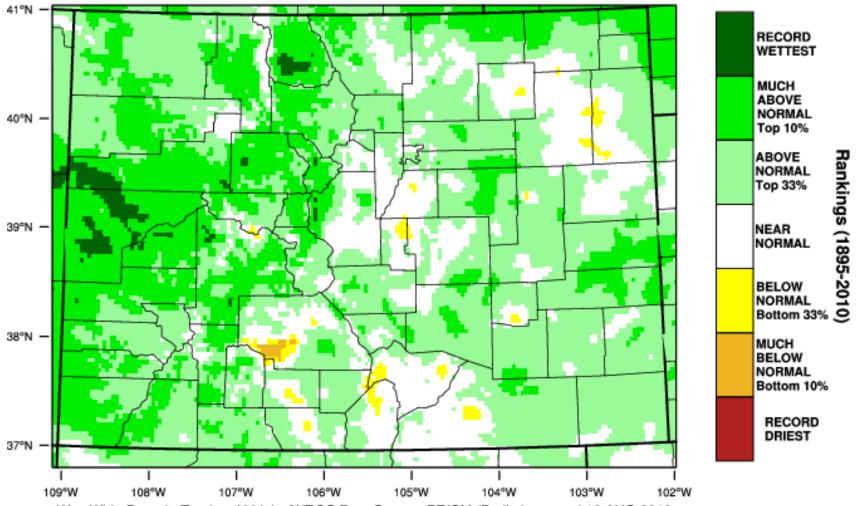


# Colorado Water Year 2019 Precipitation as a Percentage of Normal October 2018 - July 2019



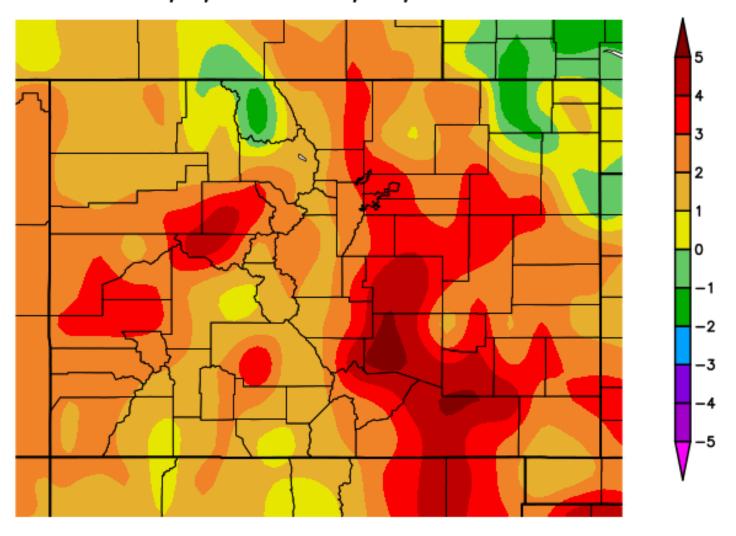
### Colorado - Precipitation

### 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
Danvar	30	34



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

Cortez	45	43
Dillon	0	0



26

49

23

34

46

49

# 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:

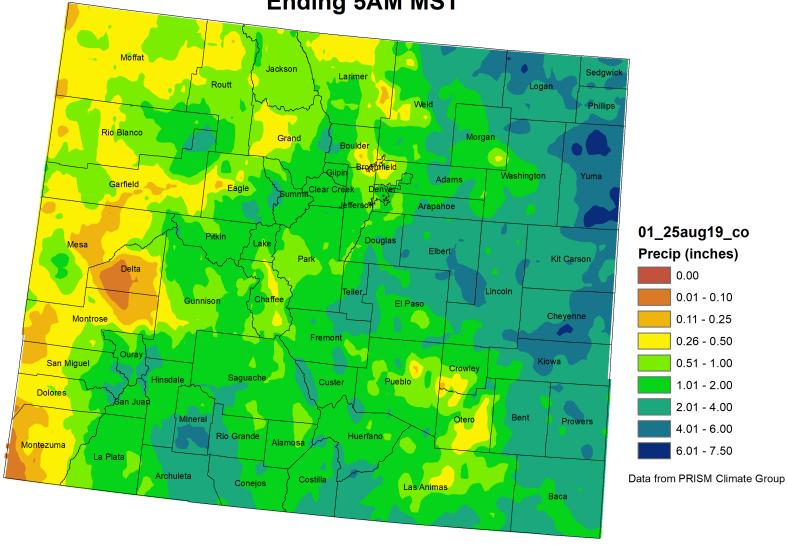
### NUMBER OF DAILY AND MONTHLY STATION RECORDS BROKEN in CO

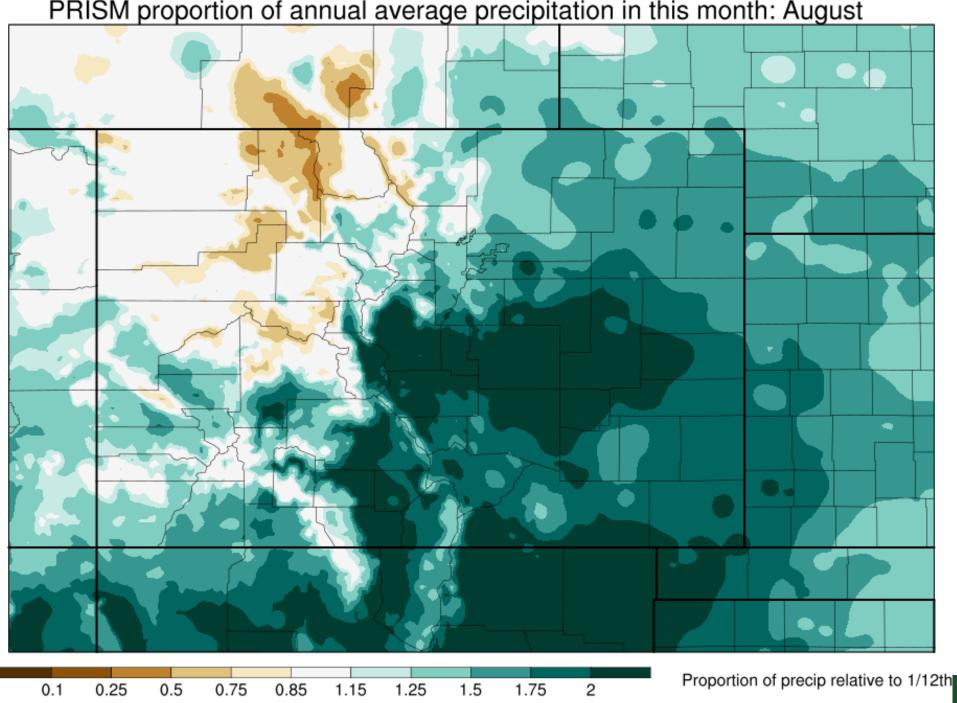
Weather Record Broken	Record broken for a day	Record broken for a month
Highest Max Temperature	1,696	22
Highest Min Temperature	2,971	100
Lowest Max Temperature	560	0
Lowest Min Temperature	292	0
Highest Precipitation	786	17
Highest Snowfall	196	2

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



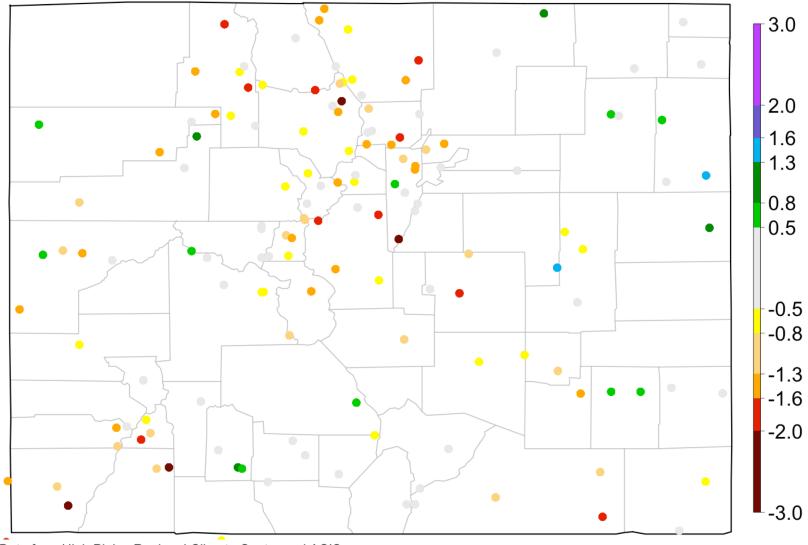
### Colorado Month to Date Precipitation 1 - 25 August 2019 Ending 5AM MST





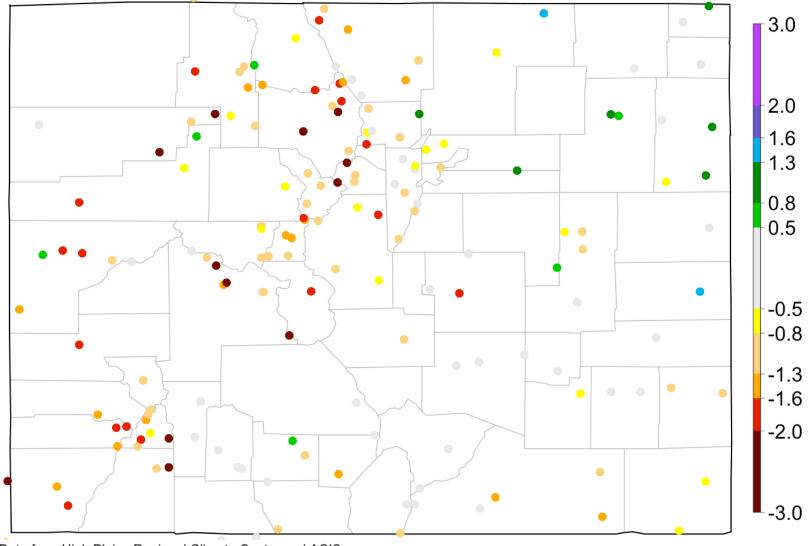


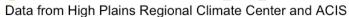
### 30-day SPI: 7/26/2019 - 8/24/2019



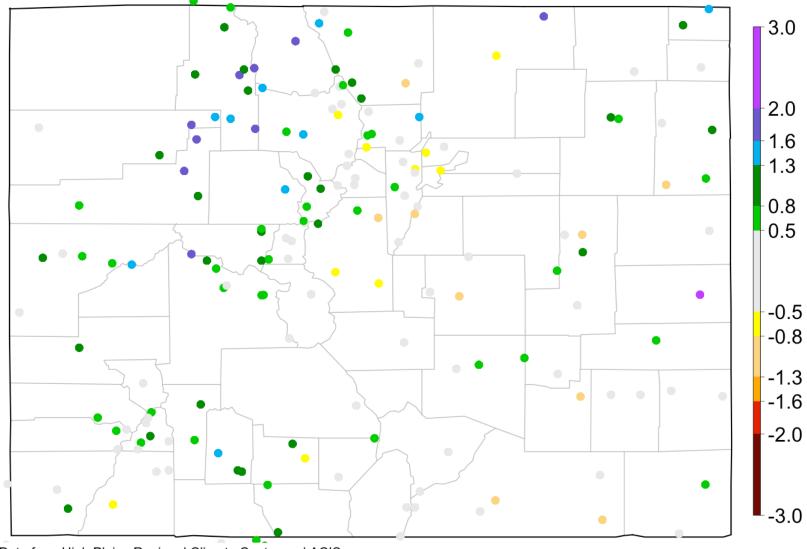
Data from High Plains Regional Climate Center and ACIS

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



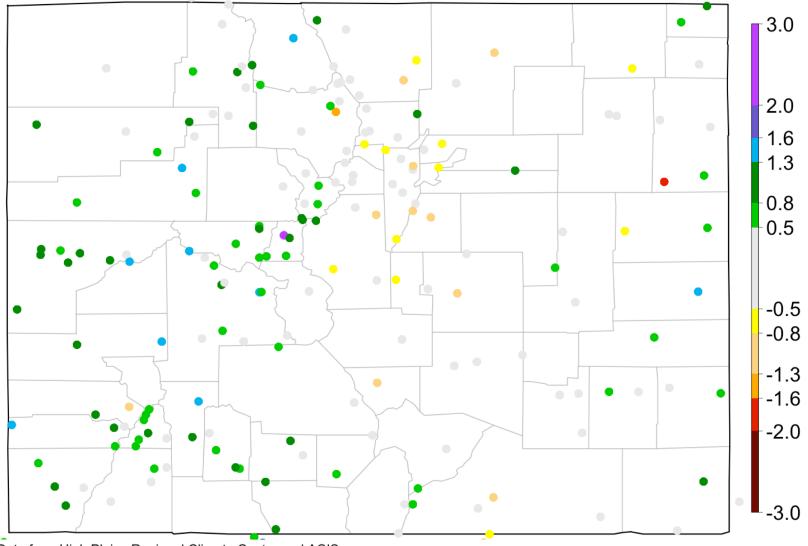


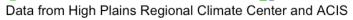
### 120-day SPI: 4/27/2019 - 8/24/2019



Data from High Plains Regional Climate Center and ACIS

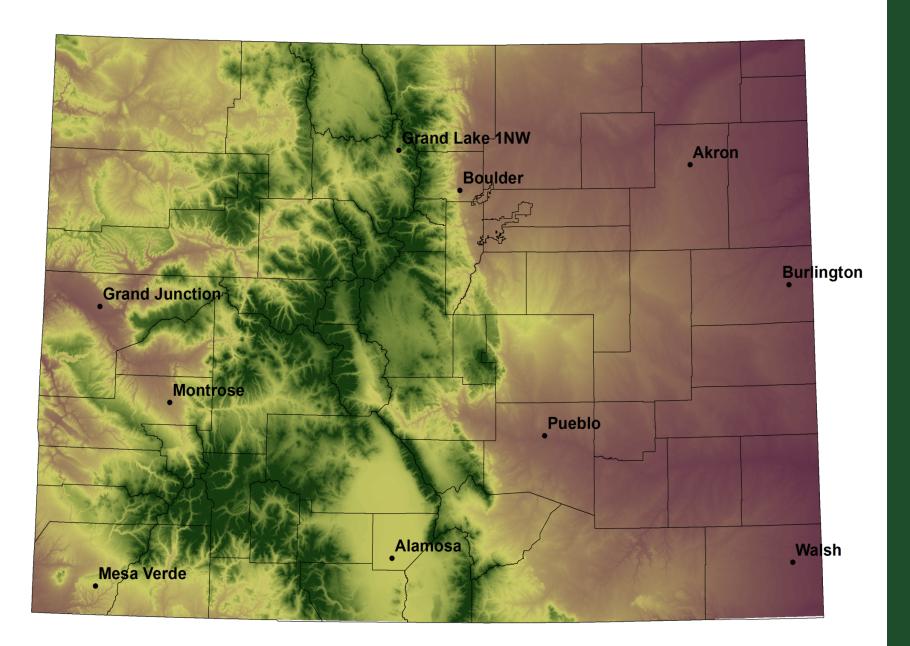
### 12-month SPI: 8/25/2018 - 8/24/2019





### NWS Cooperative Stations for WATF





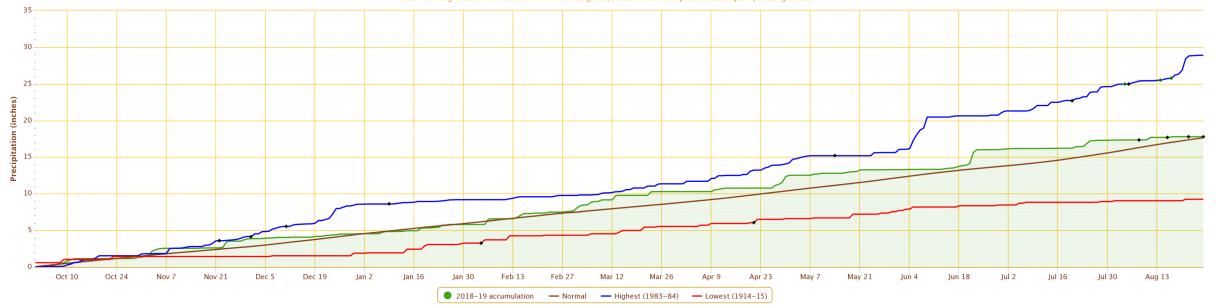
# Water Year 2019 – Station Updates



## **Grand Lake**

#### Accumulated Precipitation - GRAND LAKE 1 NW, CO

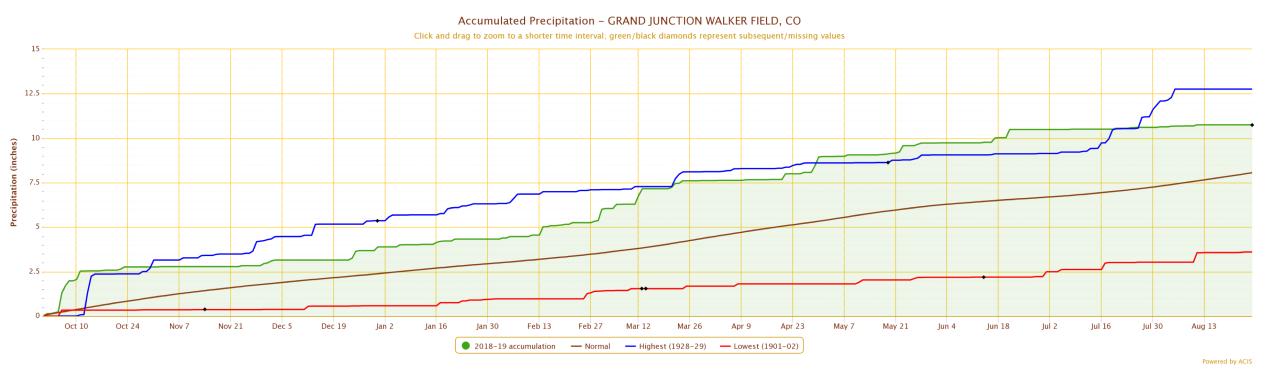
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



Powered by ACIS



### **Grand Junction**



5<sup>th</sup> wettest on record through this point in the water year

2.7" above average

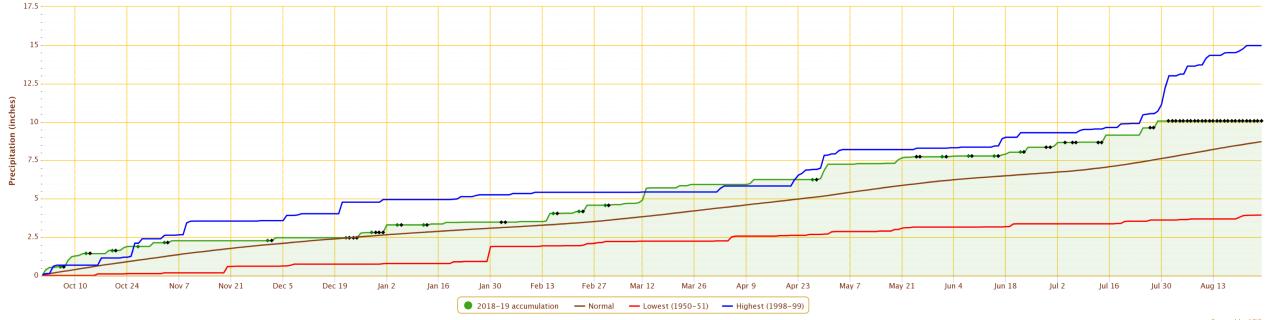
But July-August have been 2<sup>nd</sup> driest on record...



## Montrose

### Accumulated Precipitation - MONTROSE NO 2, CO



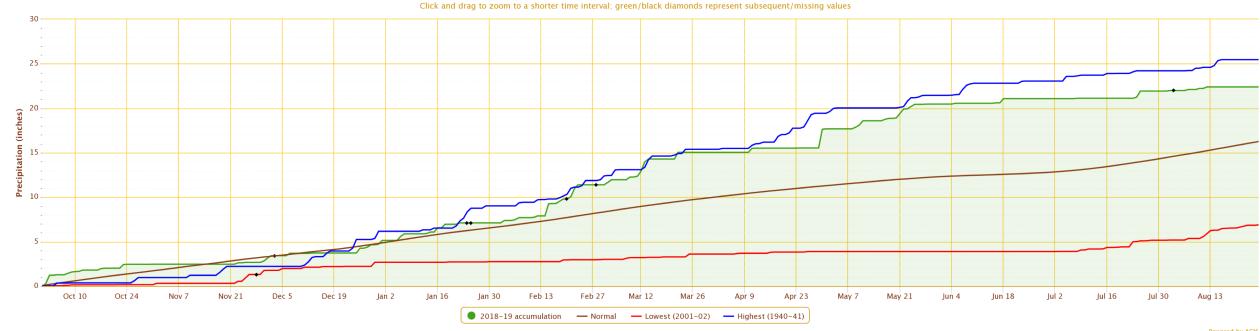


Powered by ACIS



### Mesa Verde NP





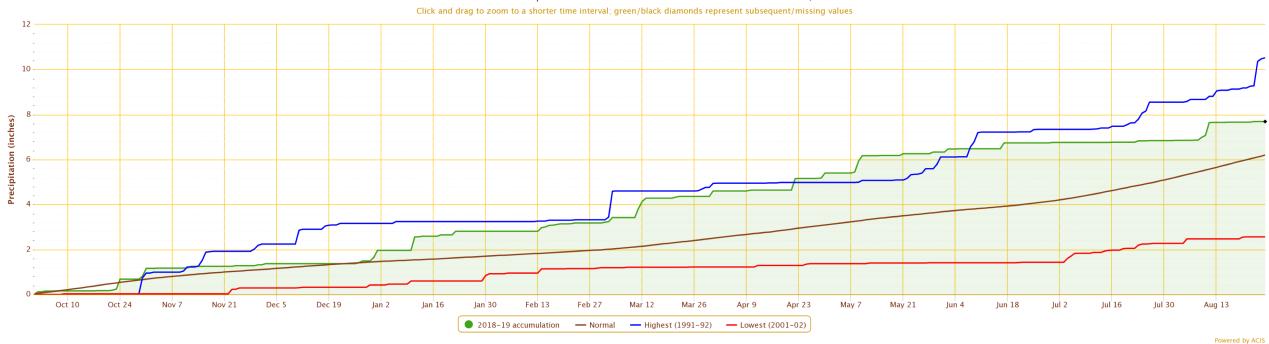
8<sup>th</sup> wettest on record through this point in the water year

6.1" above average



### Alamosa

#### Accumulated Precipitation - ALAMOSA SAN LUIS VALLEY REGIONAL AP, CO

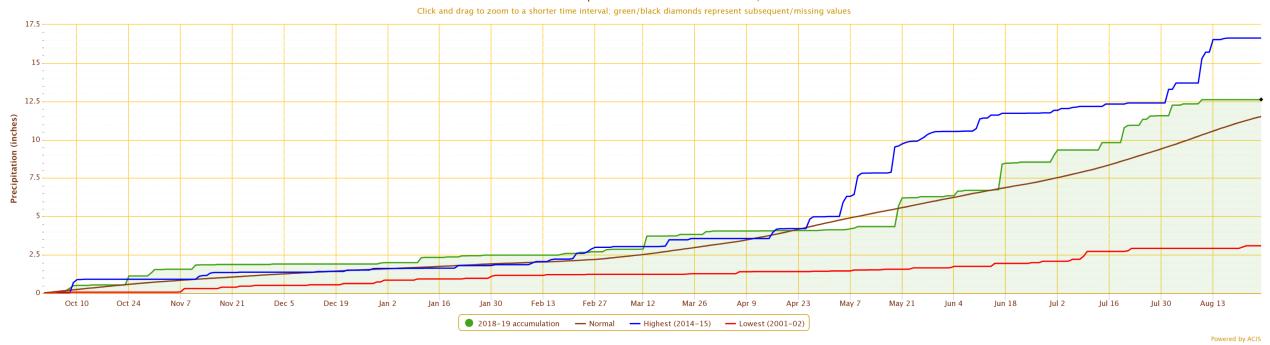


1.5" above average



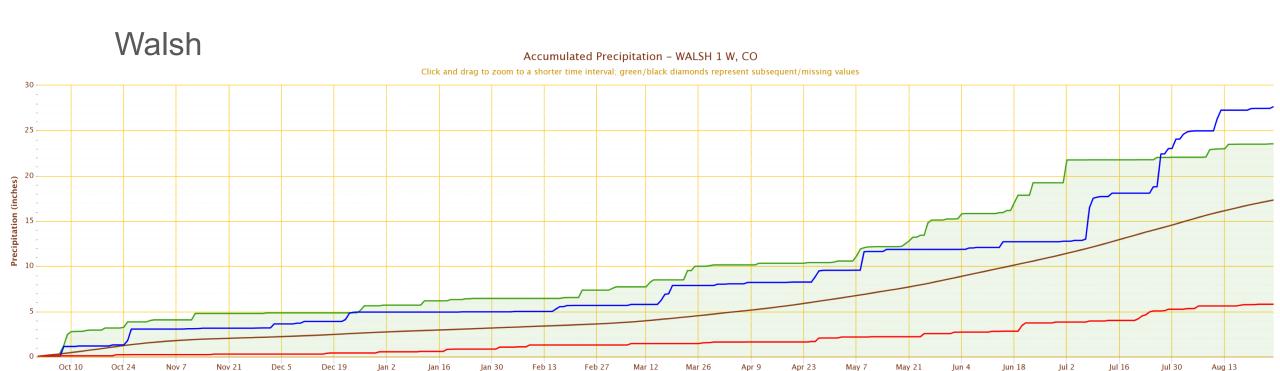
# Pueblo

### Accumulated Precipitation - PUEBLO MEMORIAL AP, CO



1.1" above average





- Highest (1997-98)

- Lowest (2010-11)

2018–19 accumulation

Powered by ACIS

2<sup>nd</sup> wettest on record through this point in the water year

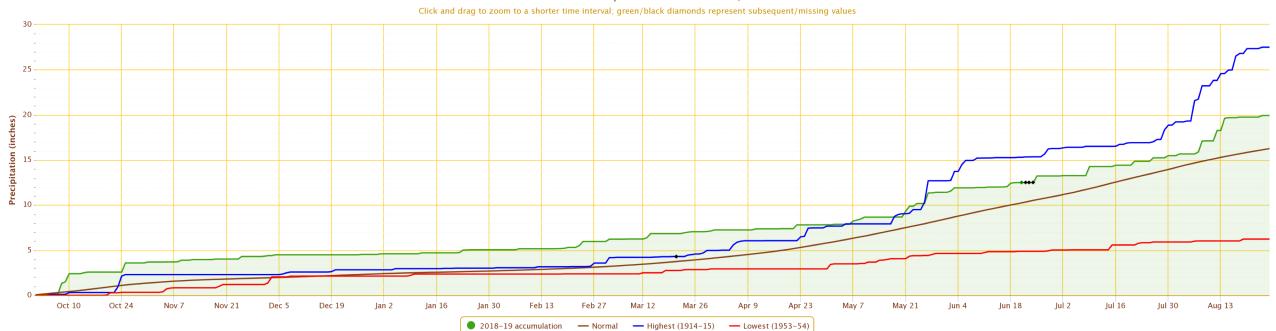
6.2" above average

But 4.1" below average since July 3



# Burlington

#### Accumulated Precipitation - BURLINGTON, CO



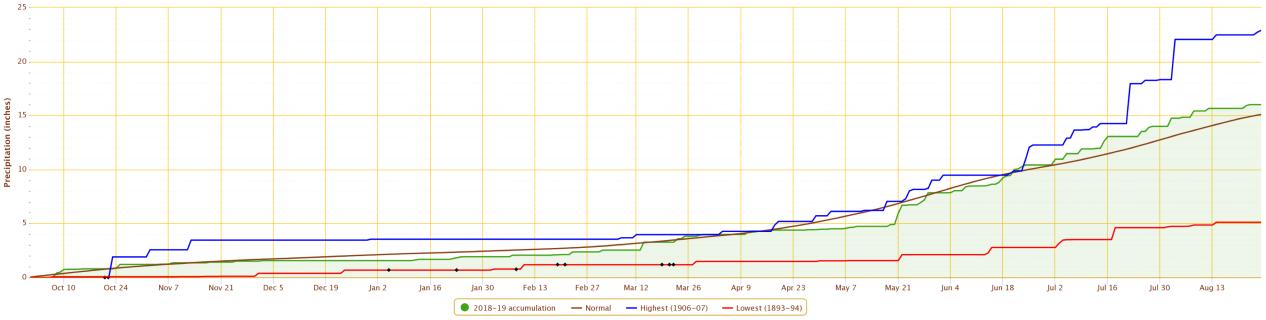
Powered by ACIS



## Akron

### Accumulated Precipitation - AKRON 4 E, CO



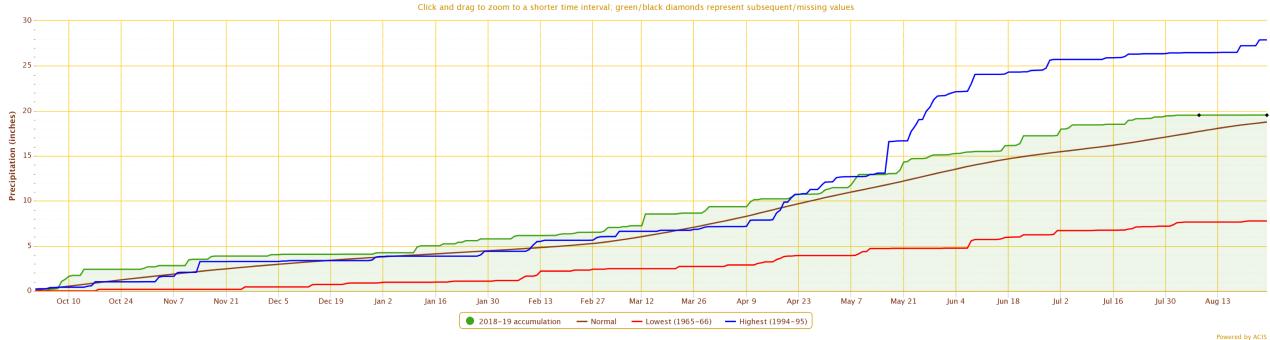


Powered by ACIS



# Boulder

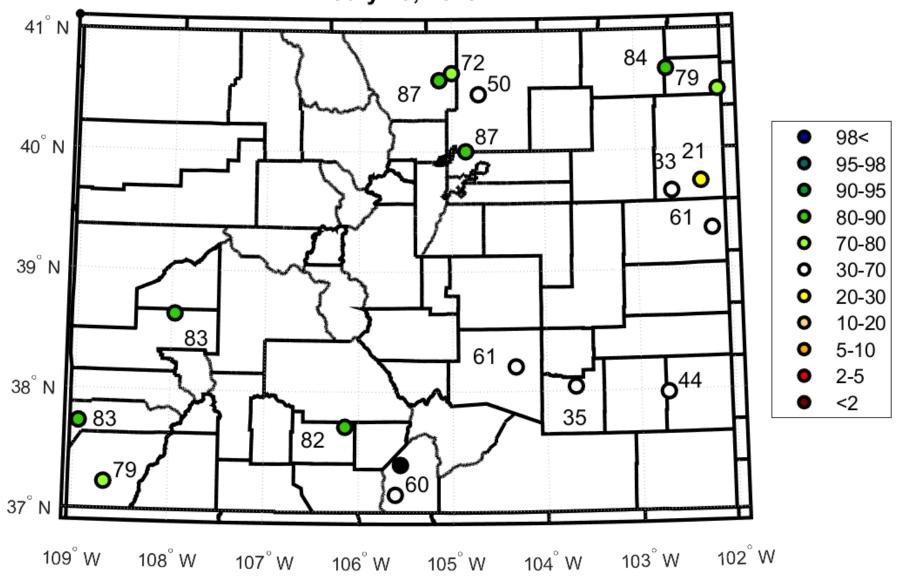
### Accumulated Precipitation – BOULDER, CO



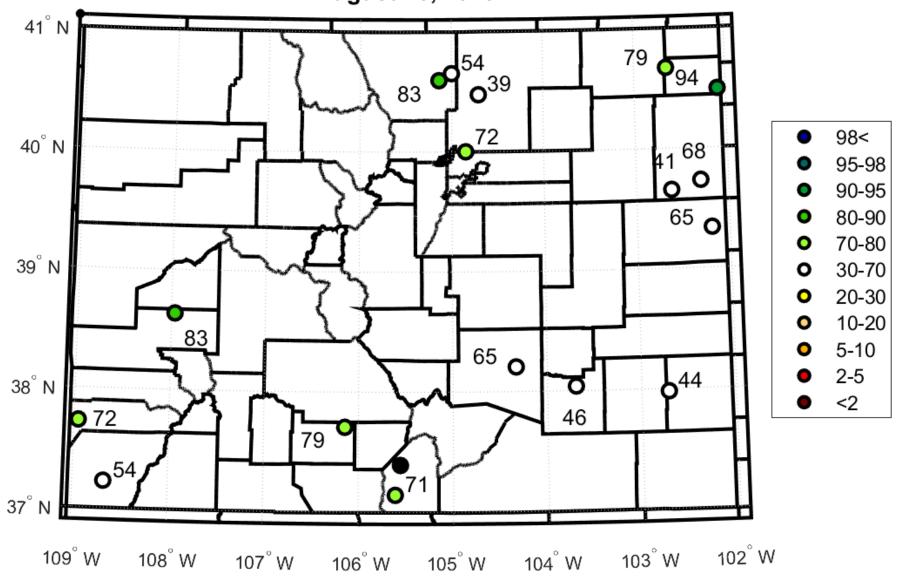
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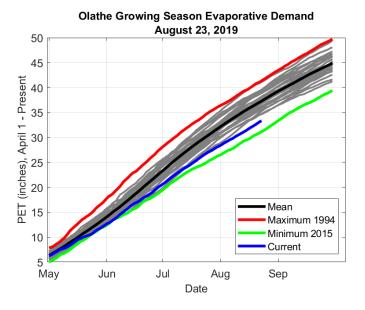


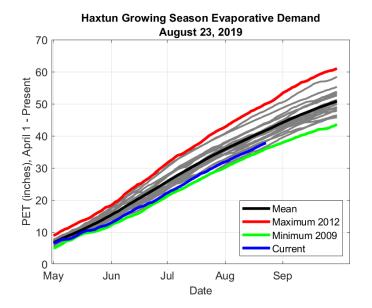
# Growing Season Water Balance (P/PET) Percentiles July 19, 2019

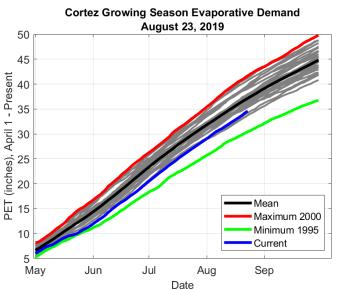


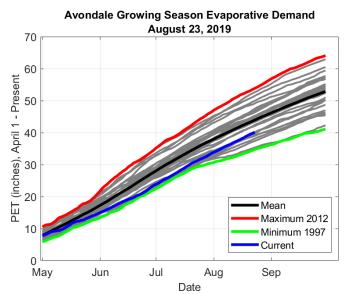
### Growing Season Water Balance (P/PET) Percentiles August 23, 2019

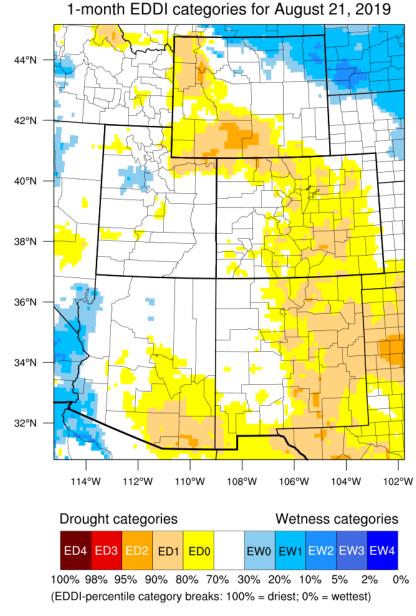












Generated by NOAA/ESRL/Physical Sciences Division







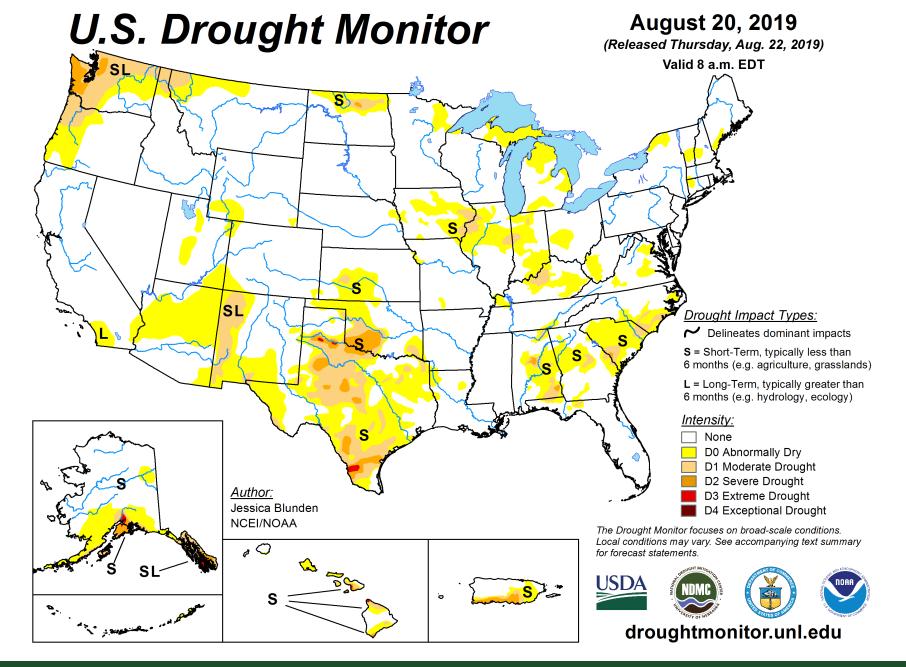
# Drought

National Drought

Colorado Drought

Colorado Drought Facts





# 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 08-13-2019	93.35	6.65	0.00	0.00	0.00	0.00
3 Month's Ago 05-21-2019	99.99	0.01	0.00	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 08-21-2018	18.57	81.43	74.46	65.88	45.46	8.50

#### 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:

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 <b>♦</b>
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

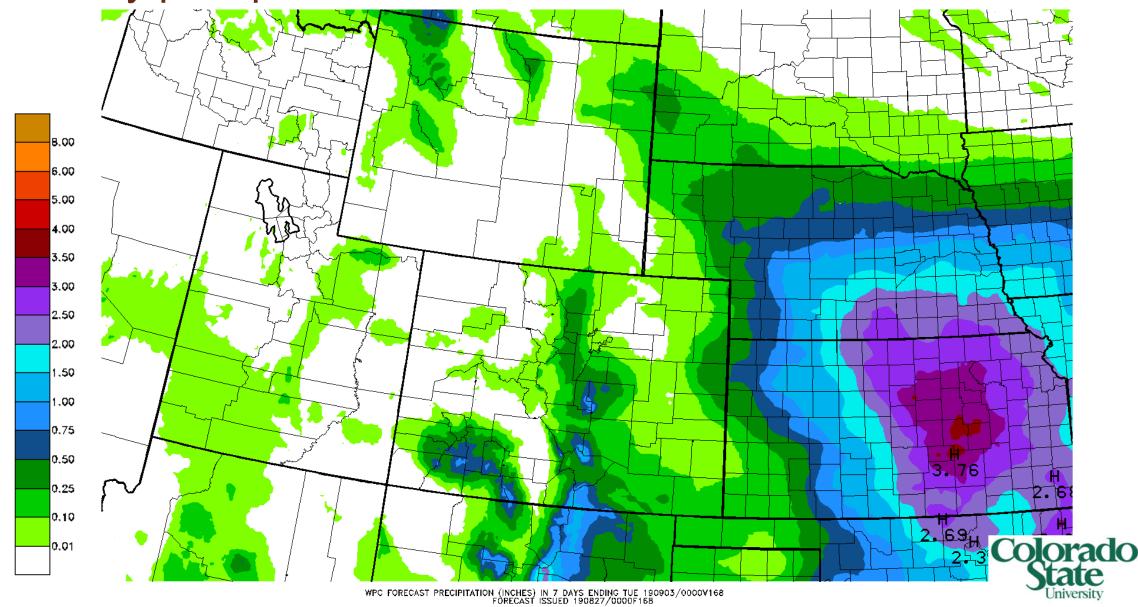
CPC Outlooks

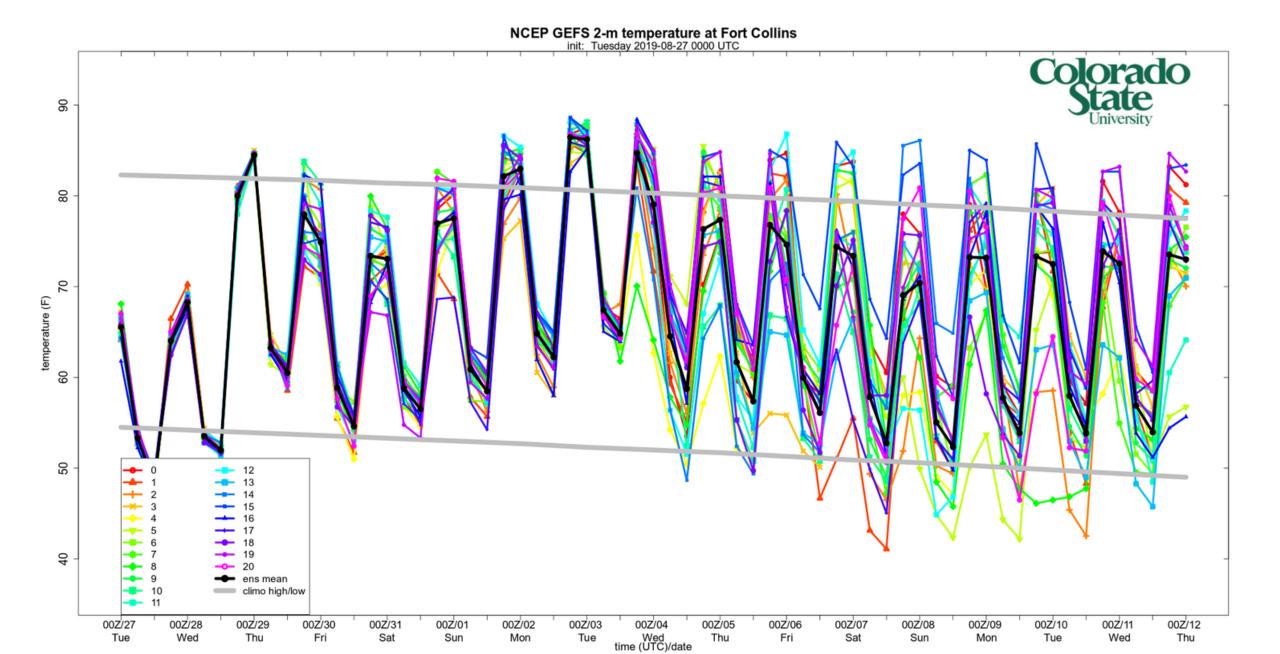
**Precipitation Projections** 

What is happening with El Niño?



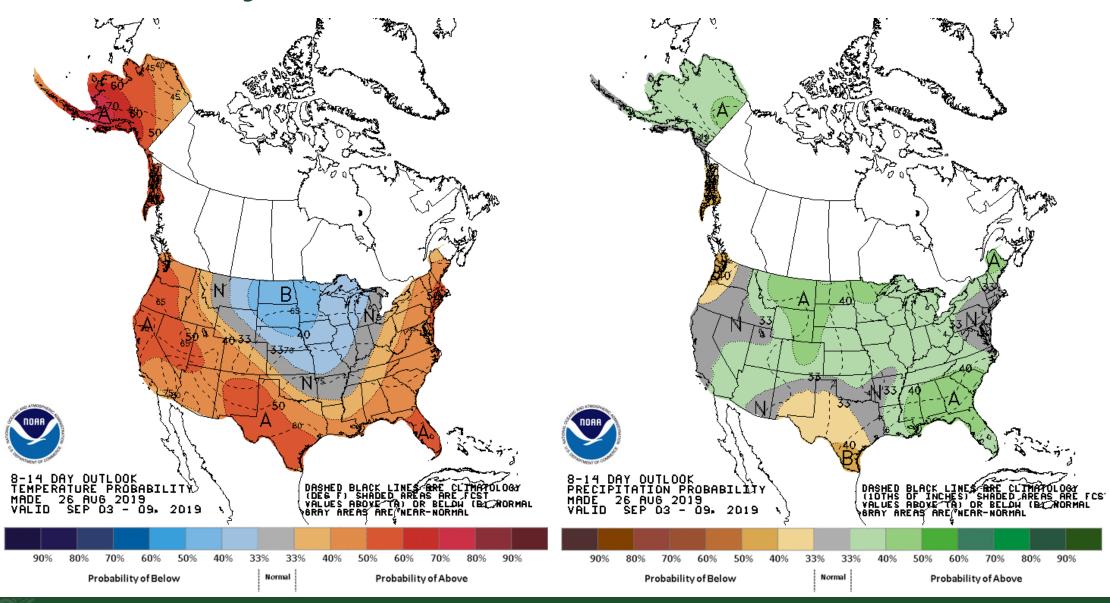
### NOAA 7-day precip forecast





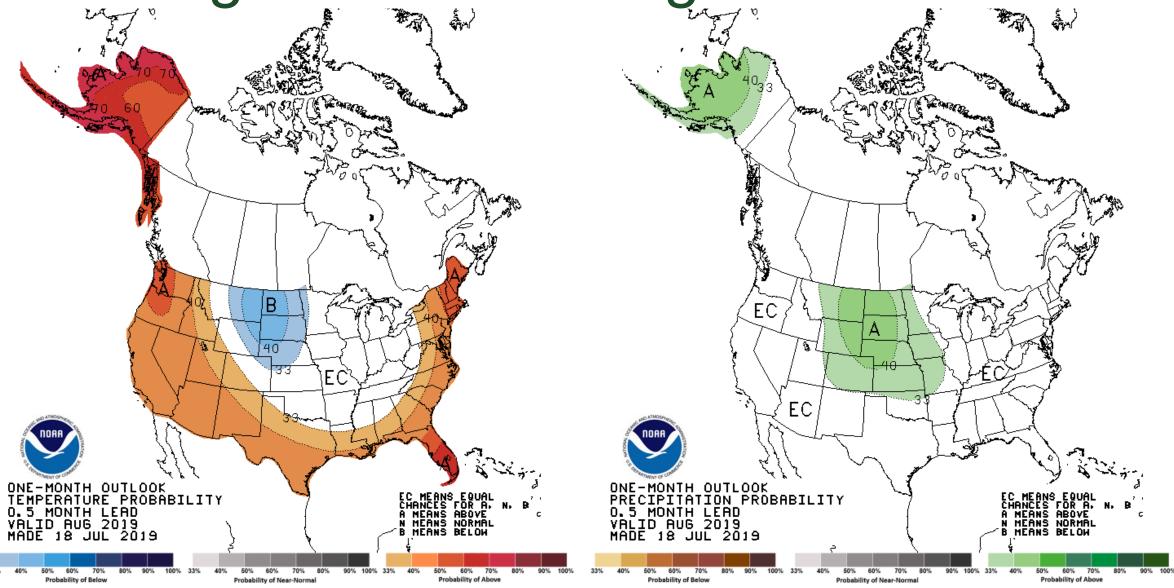


# 8-14 day outlook





Looking back at the August outlook...





One month outlook (September) ONE-MONTH OUTLOOK ONE-MONTH OUTLOOK EC MEANS EQUAL CHANCES FOR A. N. B A MEANS ABOVE N MEANS NORMAL B MEANS BELON EC MEANS EQUAL CHANCES FOR A. A MEANS ABOVE N MEANS NORMAL B MEANS BELOW PRECIPITATION PROBABILITY TEMPERATURE PROBABILITY 0.5 MONTH LEAD VALID SEP 2019 MADE 15 AUG 2019 0.5 MONTH LEAD VALID SEP 2019 MADE 15 AUG 2019

Probability of Below



80%

Probability of Above

80%

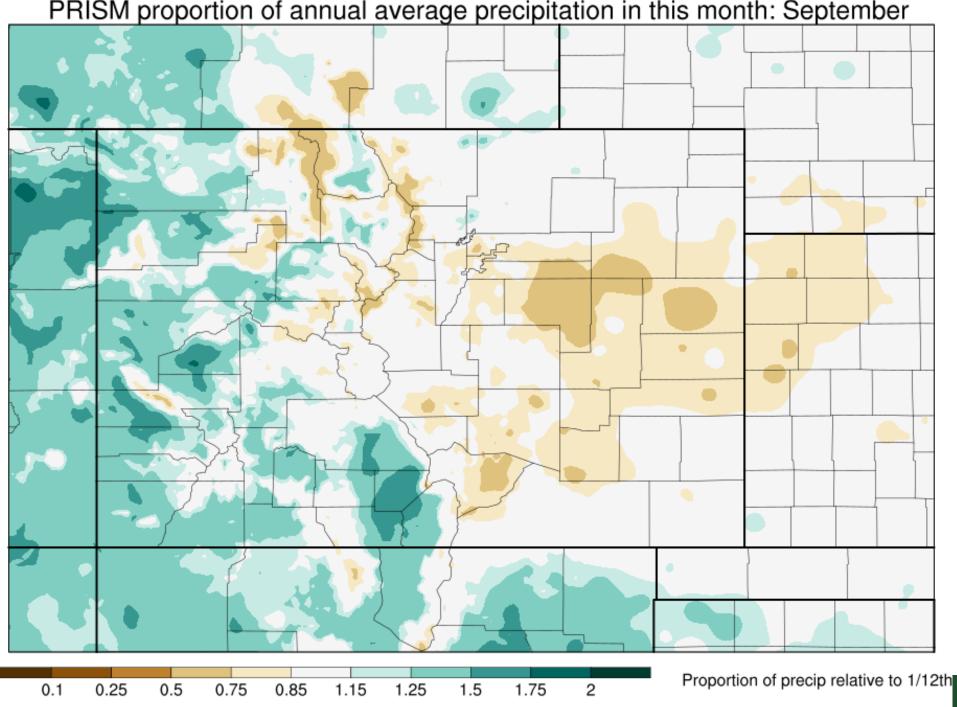
Probability of Near-Normal

Probability of Below

80%

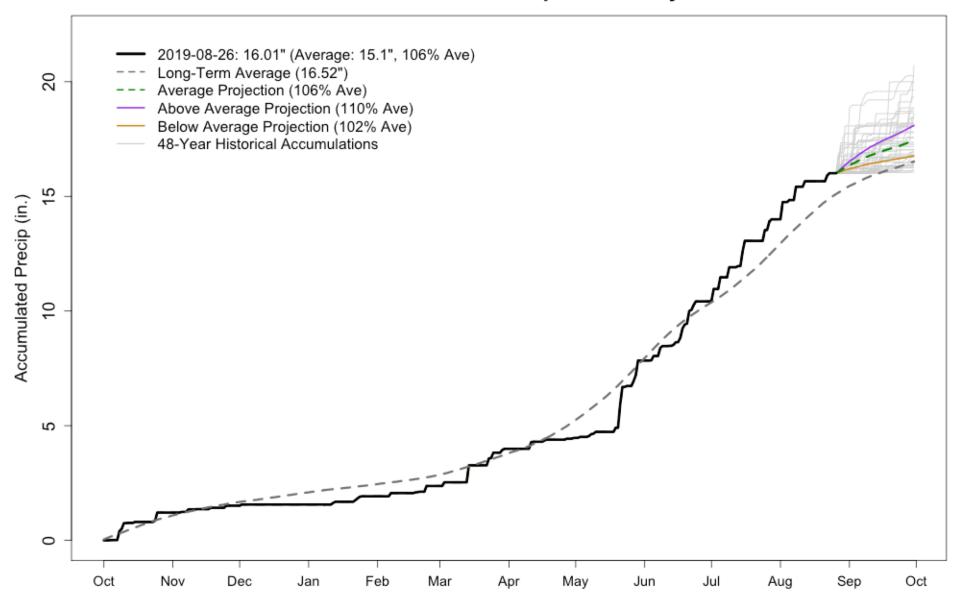
Probability of Near-Normal

Probability of Above



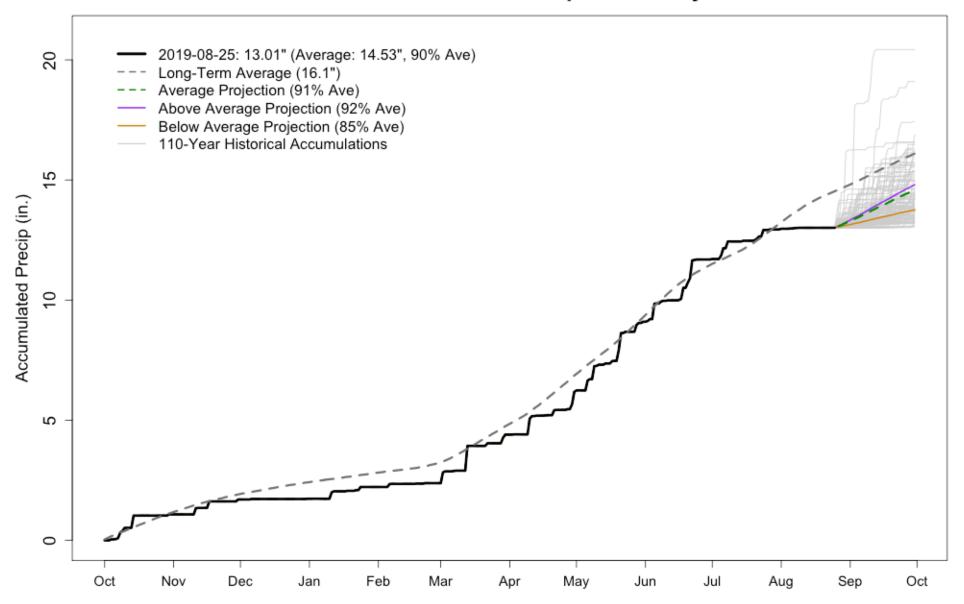


### **AKRON 4 E WY2019 Precipitation Projections**



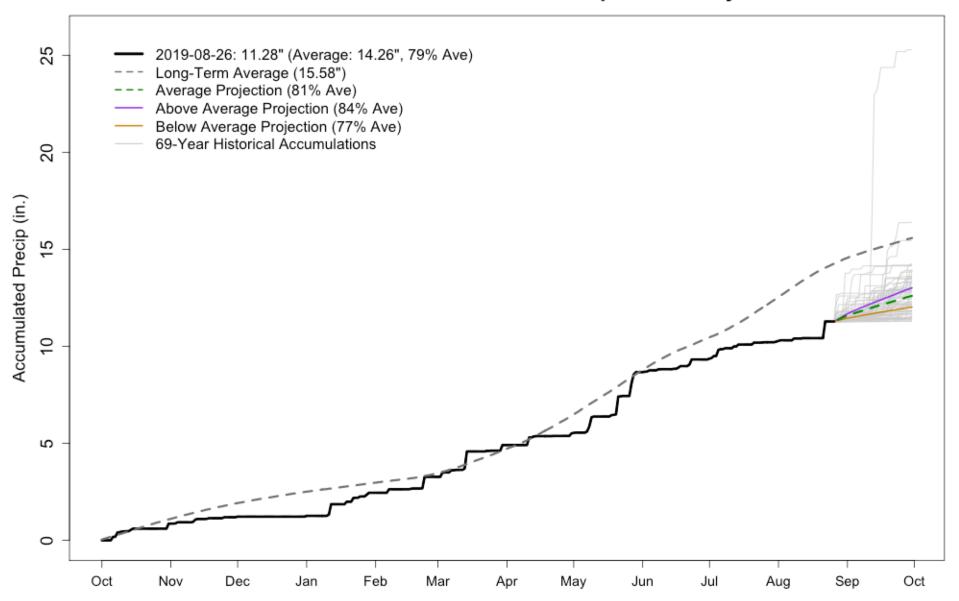


### **FORT COLLINS WY2019 Precipitation Projections**



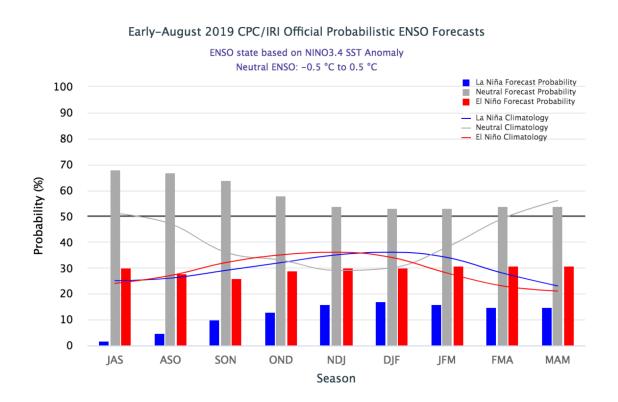


### **DENVER-STAPLETON WY2019 Precipitation Projections**





## What's the El Niño forecast?



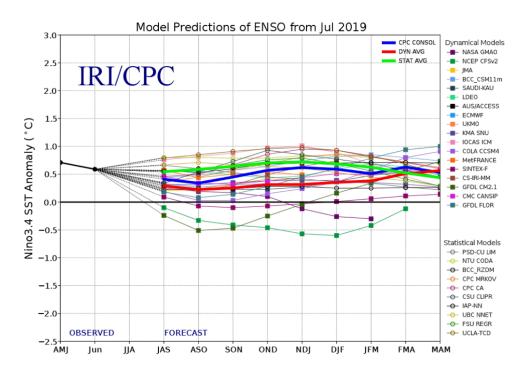
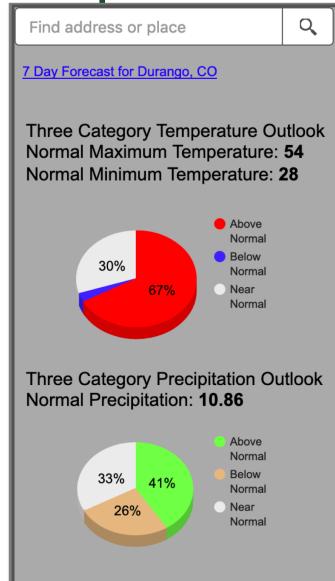


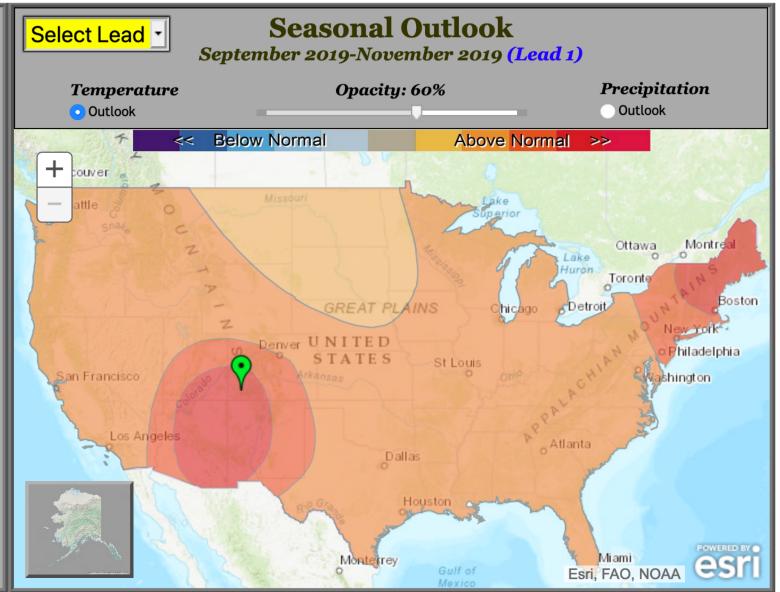
Figure 6. Forecasts of sea surface temperature (SST) anomalies for the Niño 3.4 region (5°N-5°S, 120°W-170°W). Figure updated 19 July 2019.

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



# Sept-Oct-Nov Outlook

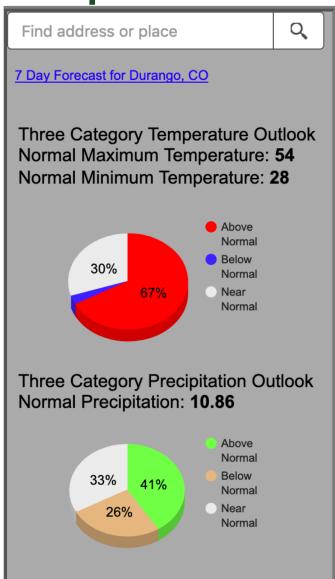


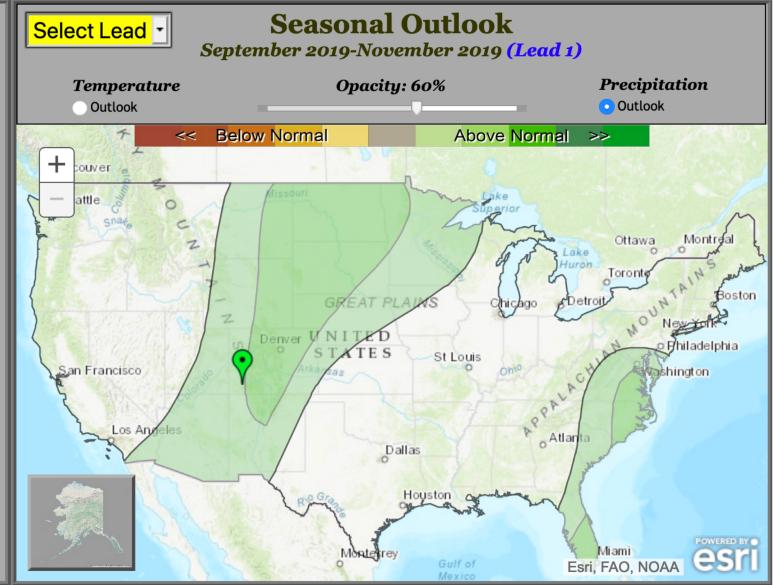




# Sept-Oct-Nov Outlook

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!



