

# Colorado Climate Center – *WATF Climate Update*

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Russ Schumacher, state climatologist

Water Availability Task Force

August 22, 2018



Colorado State University



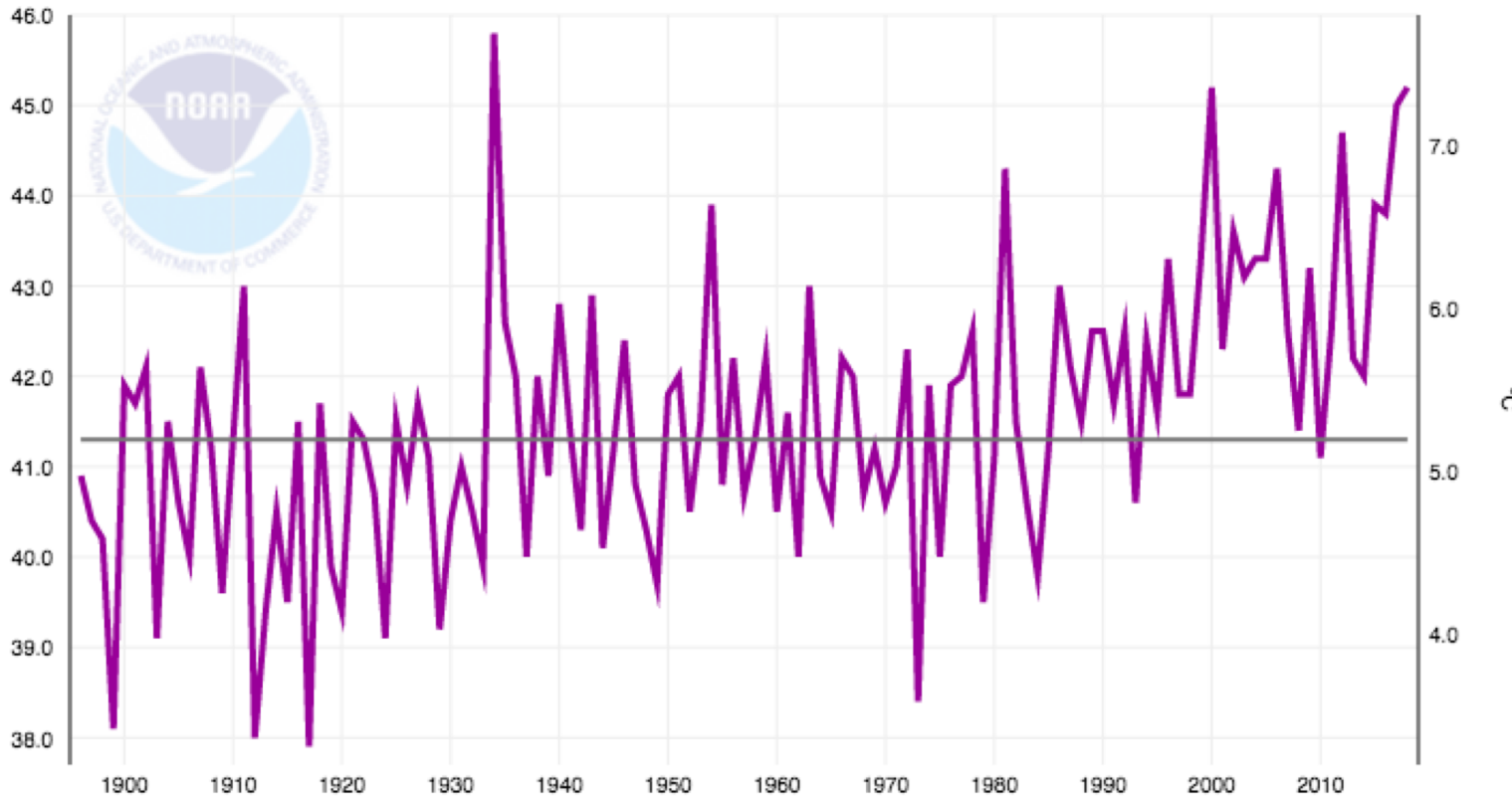
# Water Year 2018 – Temperature



Tied for 2nd warmest in 123-year record (only 1933-34 warmer;  
 +3.9°F above 41.3°F average

Colorado, Average Temperature, October-July

Avg Temperature 1901-2000 Mean: 41.3°F

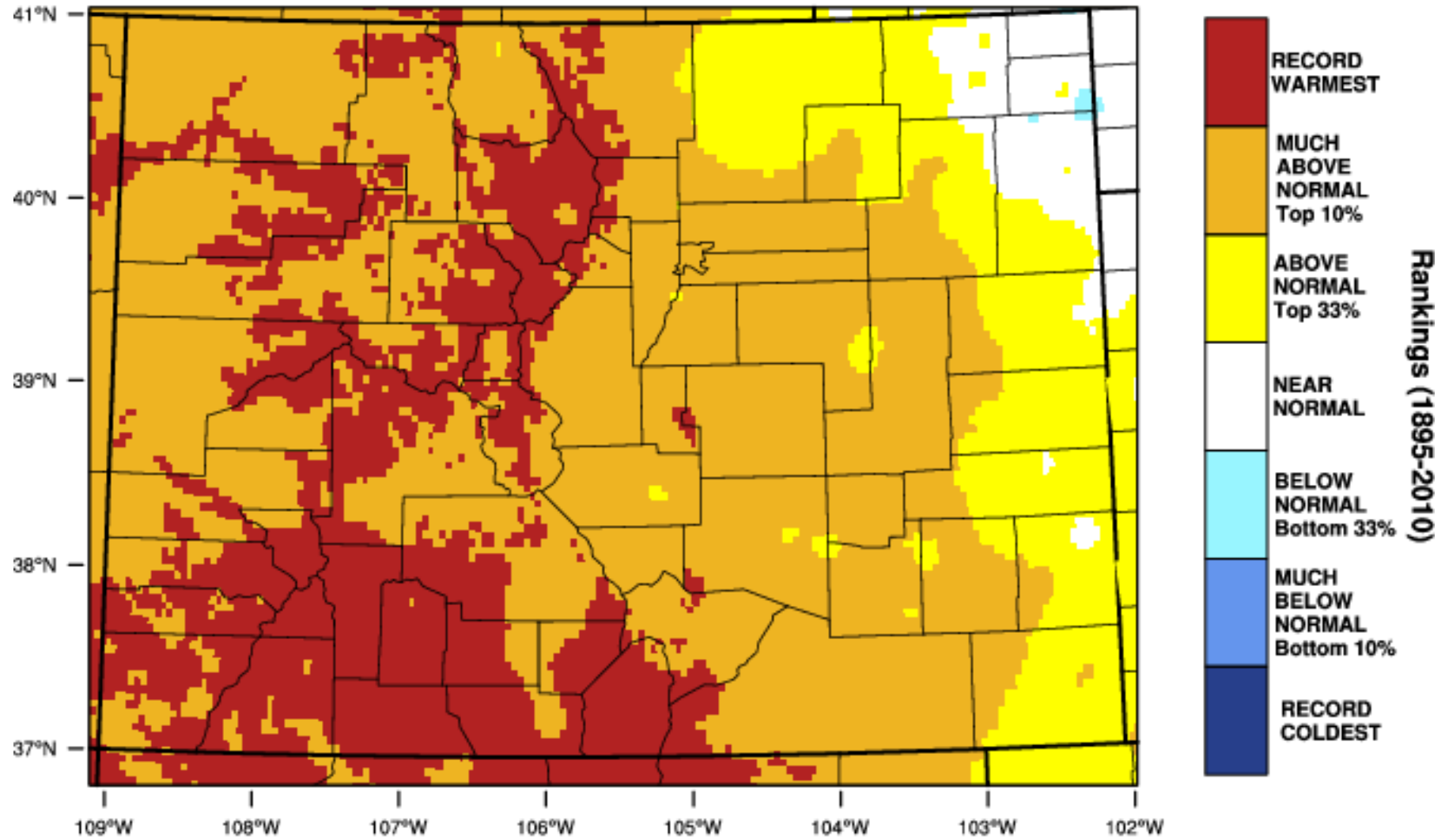


MONTH	RANK
Oct 2017	near average
Nov 2017	1 <sup>st</sup> warmest
Dec 2017	8 <sup>th</sup> warmest
Jan 2018	8 <sup>th</sup> warmest
Feb 2018	near average
Mar 2018	25 <sup>th</sup> warmest
Apr 2018	near average
May 2018	2 <sup>nd</sup> warmest
Jun 2018	3 <sup>rd</sup> warmest
Jul 2018	10 <sup>th</sup> warmest



# Colorado - Mean Temperature

## October-July 2018 Percentile

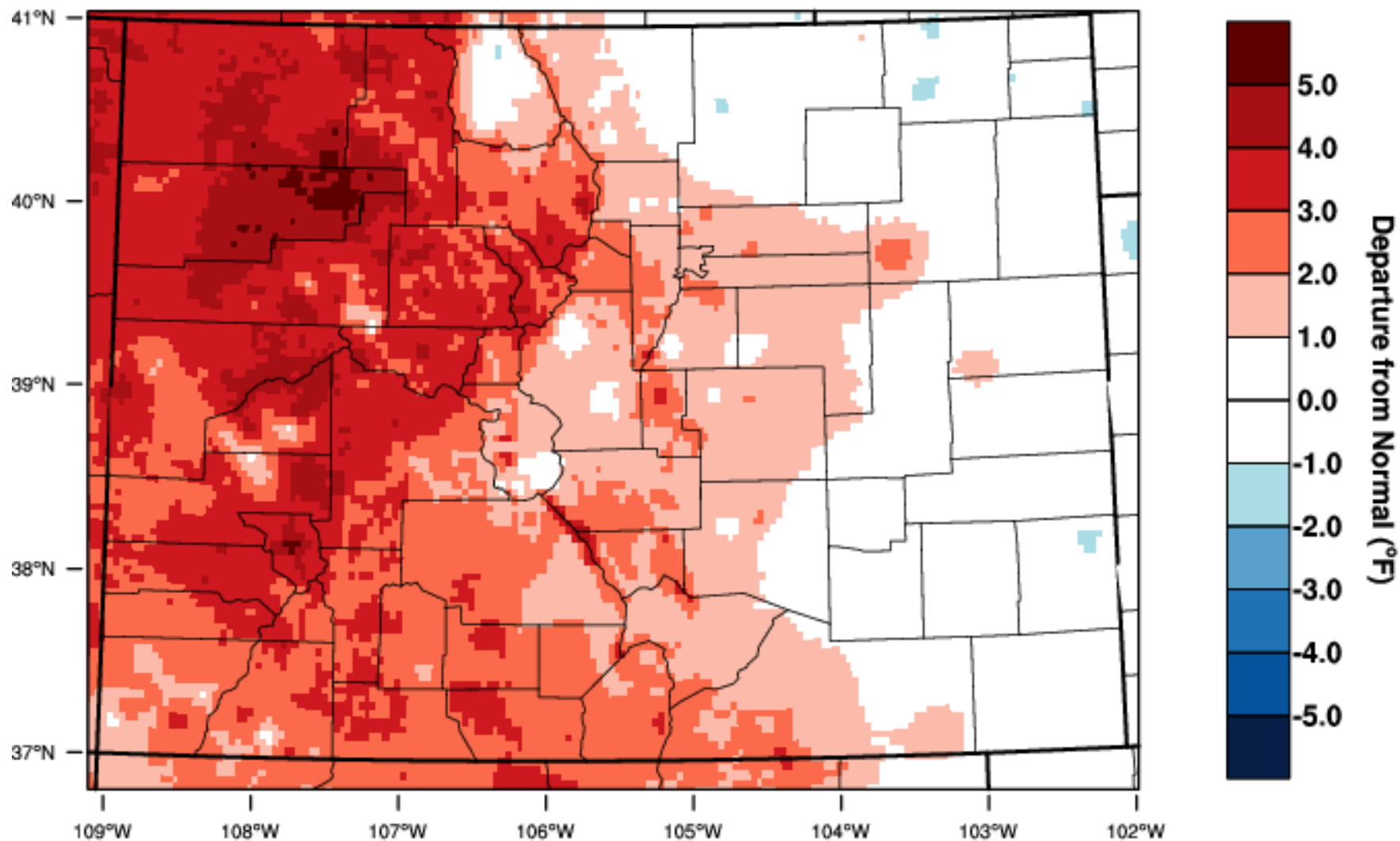


WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 16 AUG 2018



# Colorado - Mean Temperature

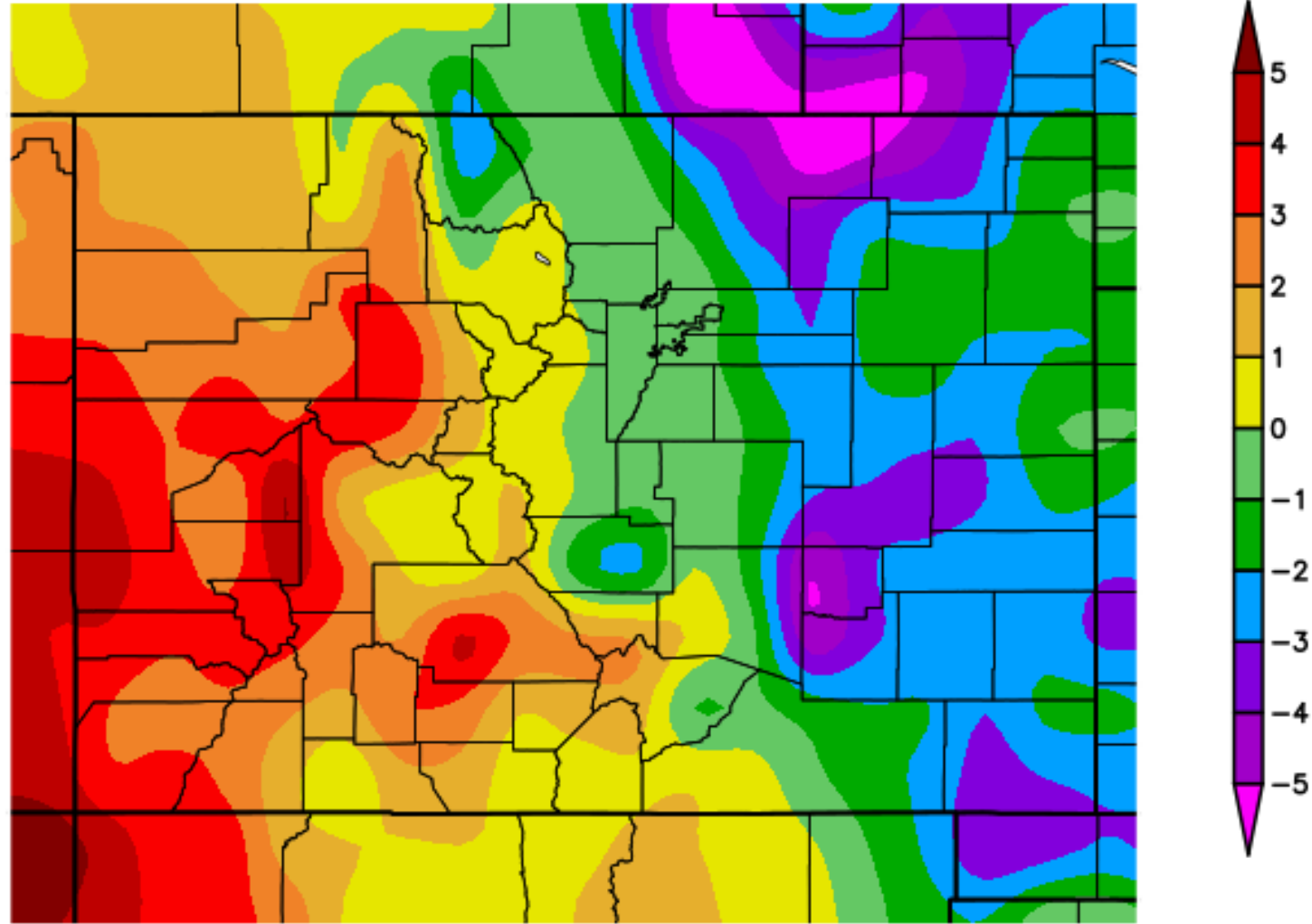
## July 2018 Departure from 1981-2010 Normal



WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 16 AUG 2018



# Departure from Normal Temperature (F) 8/1/2018 – 8/20/2018



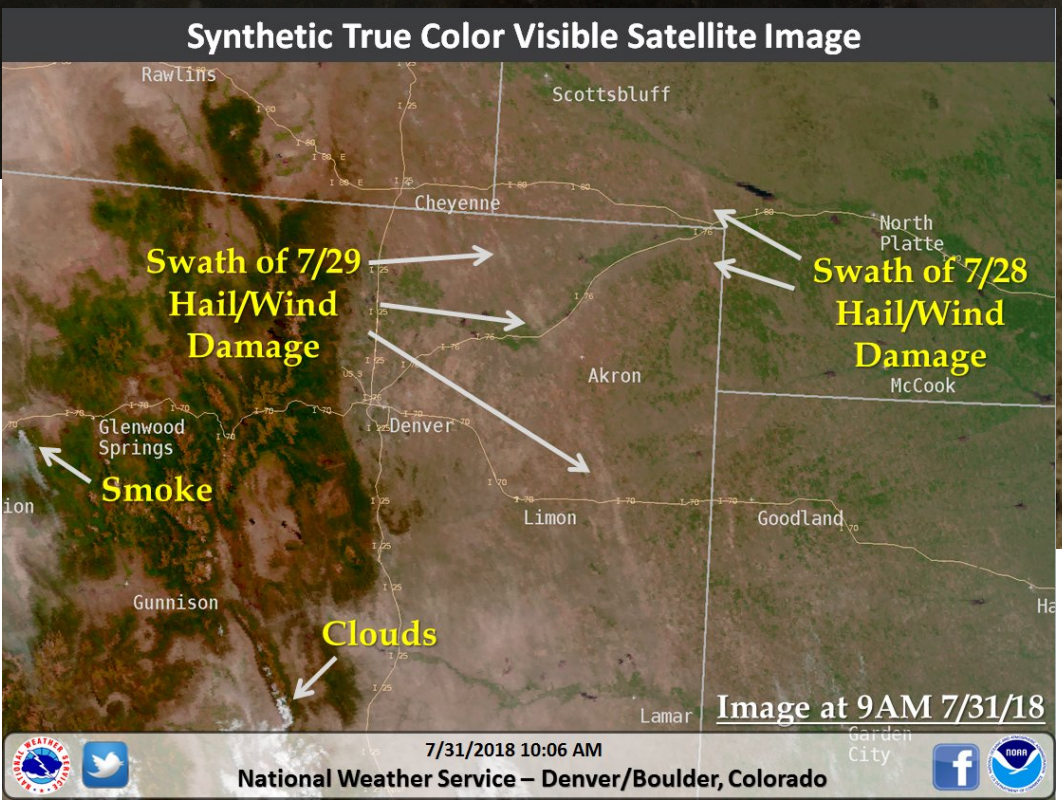
Generated 8/21/2018 at HPRCC using provisional data.

NOAA Regional Climate Centers

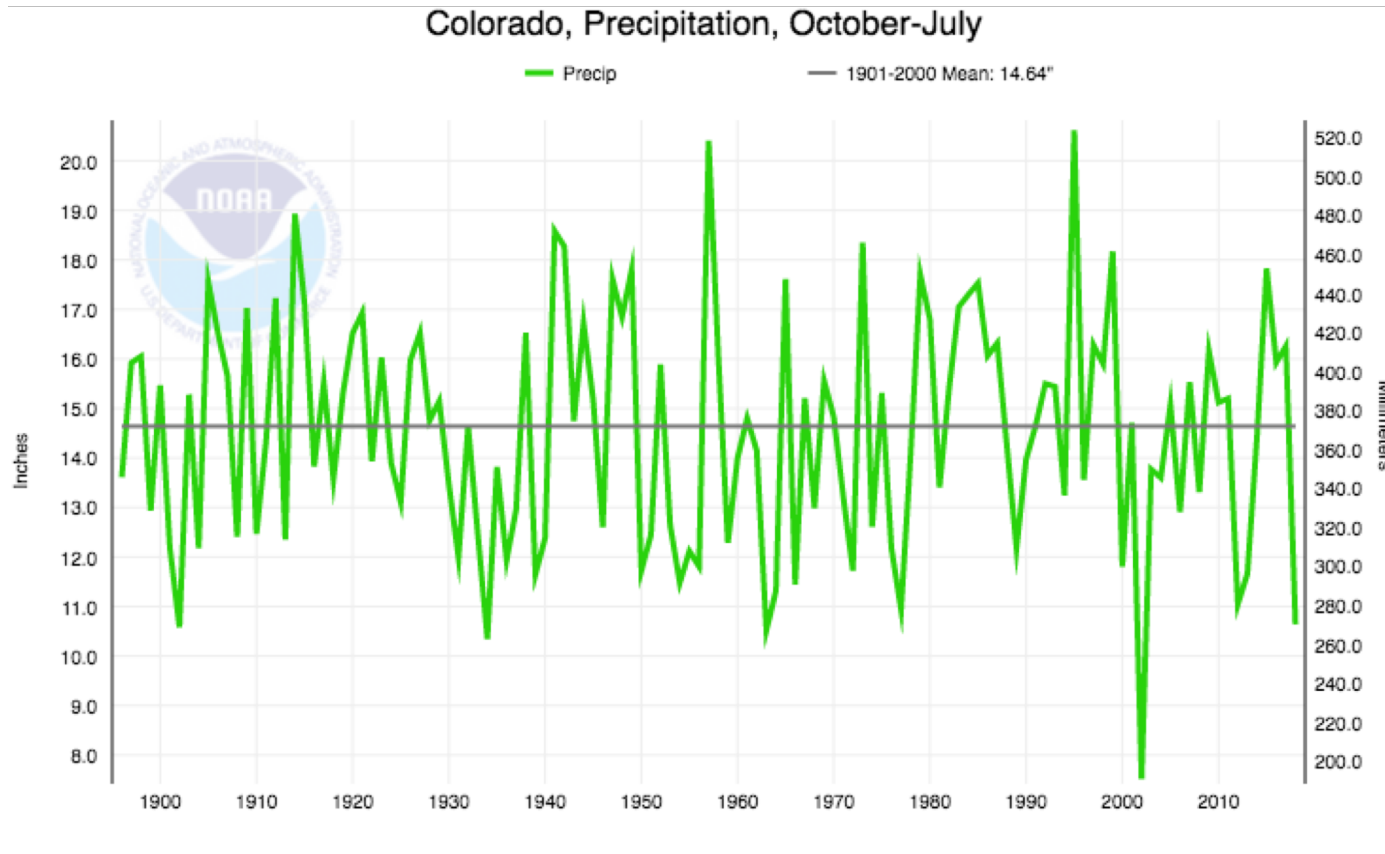




# Water Year 2018 – Precipitation



5th driest in 123-year record (behind 2001-02, 1933-34, 1962-63, 1901-02)  
 -4.00" below 14.64" average

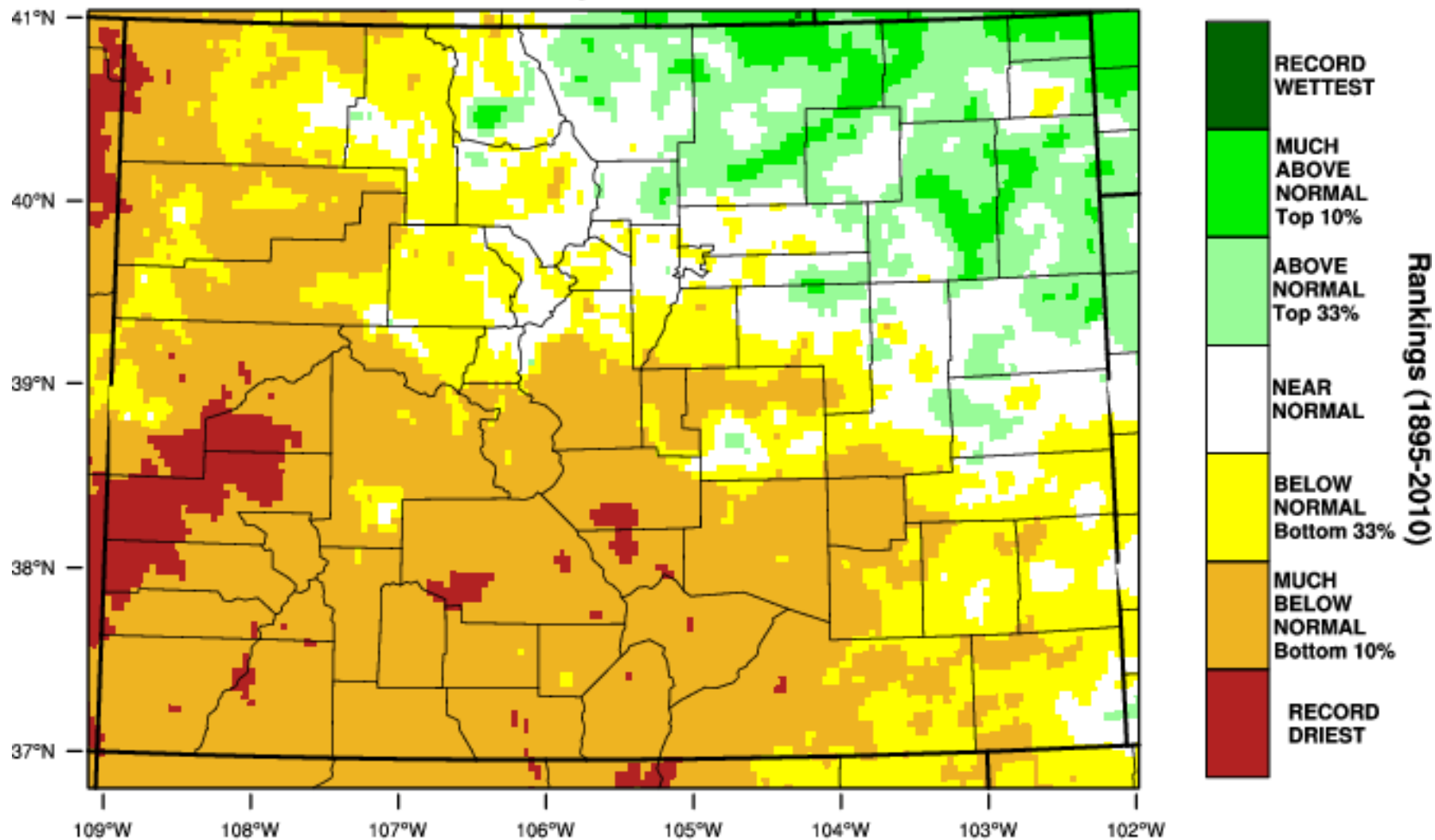


MONTH	RANK
Oct 2017	37 <sup>th</sup> driest
Nov 2017	18 <sup>th</sup> driest
Dec 2017	7 <sup>th</sup> driest
Jan 2018	37 <sup>th</sup> driest
Feb 2018	near average
Mar 2018	26 <sup>th</sup> driest
Apr 2018	34 <sup>th</sup> driest
May 2018	38 <sup>th</sup> driest
Jun 2018	26 <sup>th</sup> driest
Jul 2018	near average





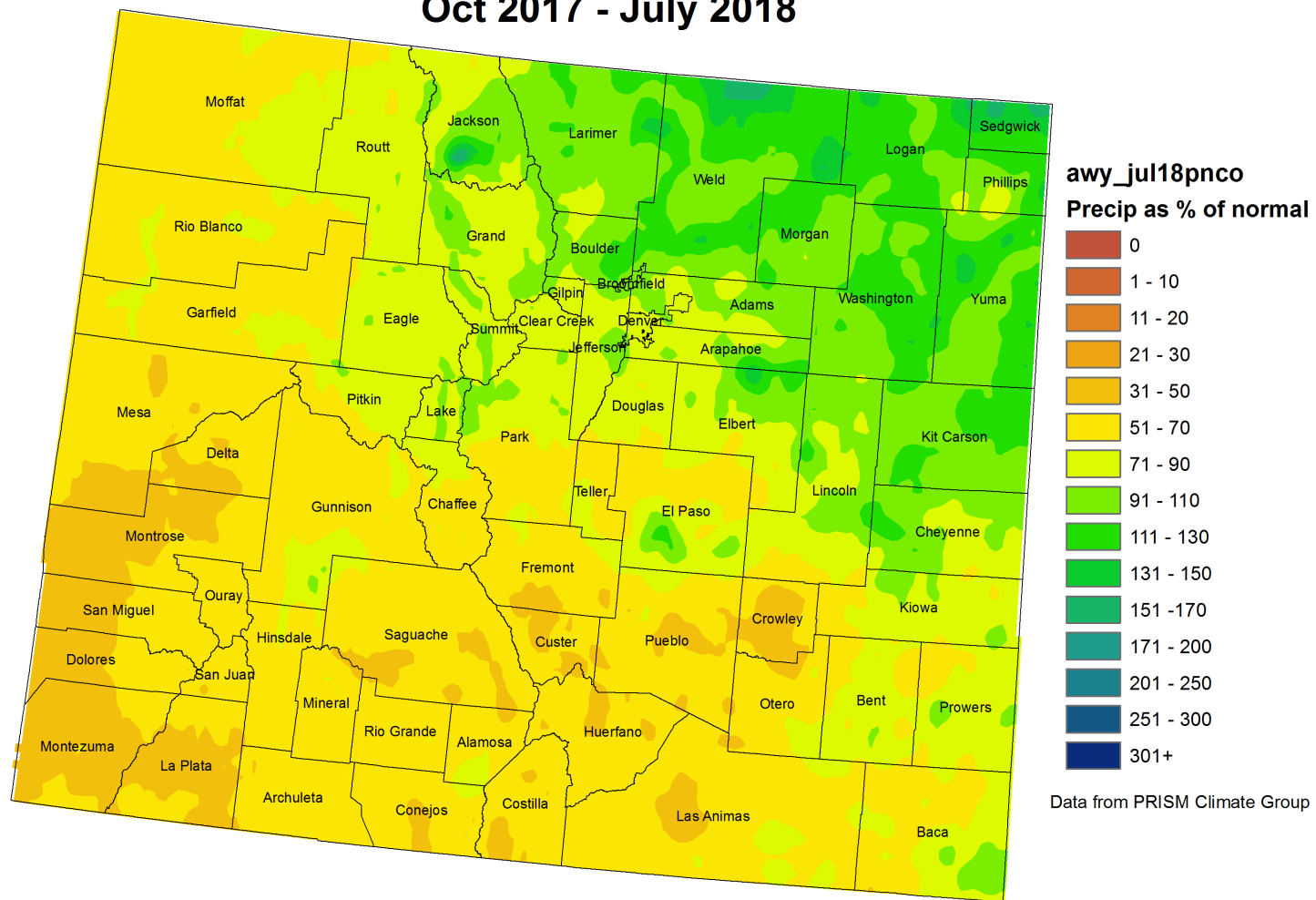
# Colorado - Precipitation October-July 2018 Percentile



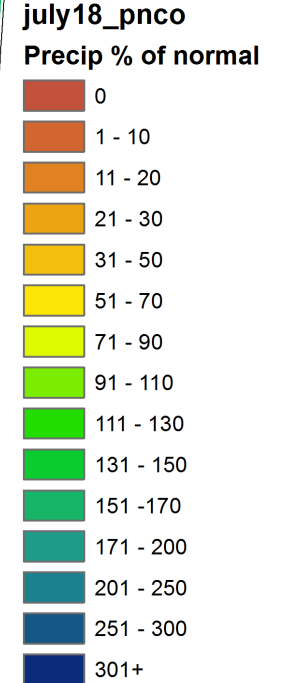
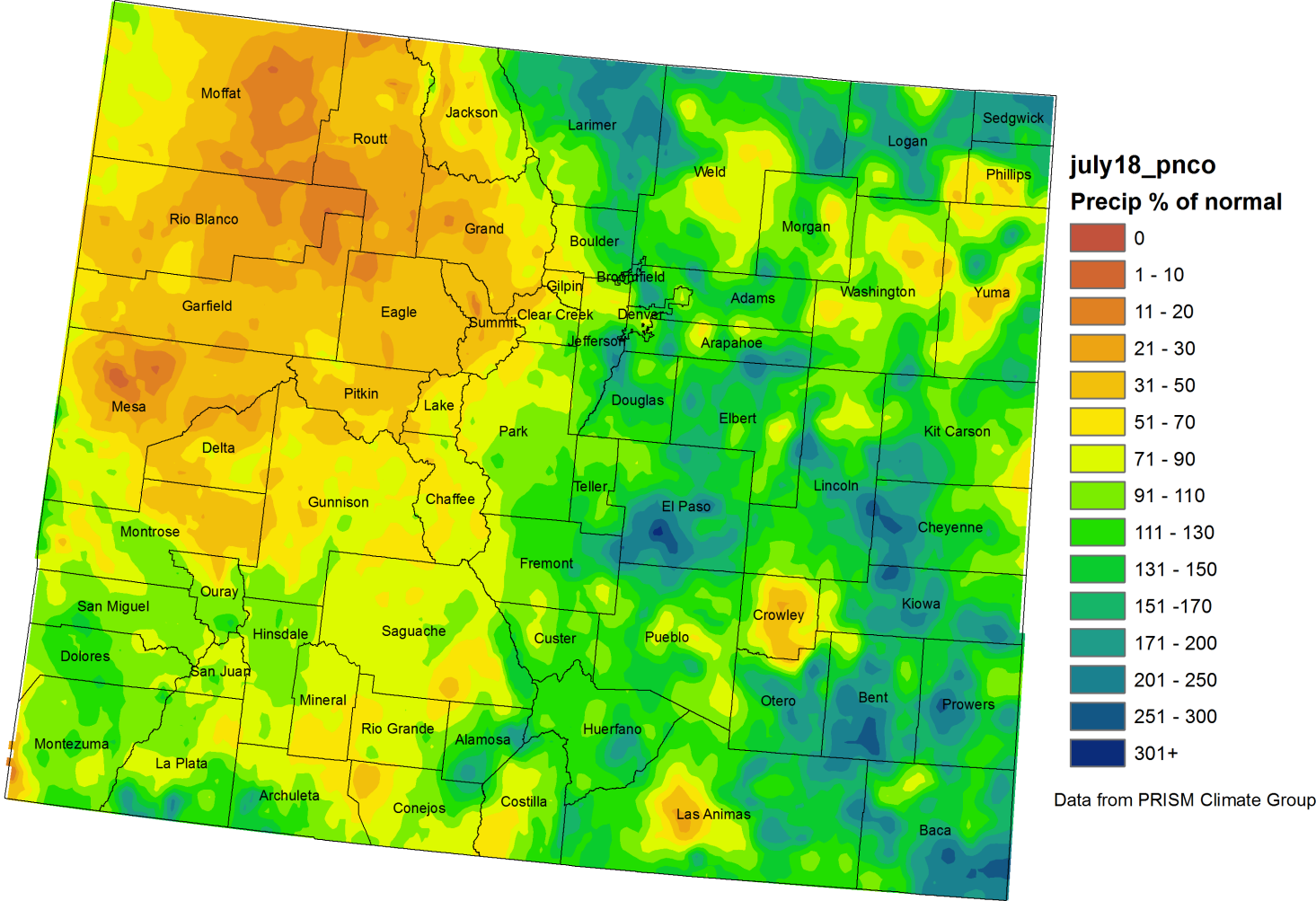
WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 16 AUG 2018



# Colorado Water Year 2018 Precipitation as a Percentage of Normal Oct 2017 - July 2018



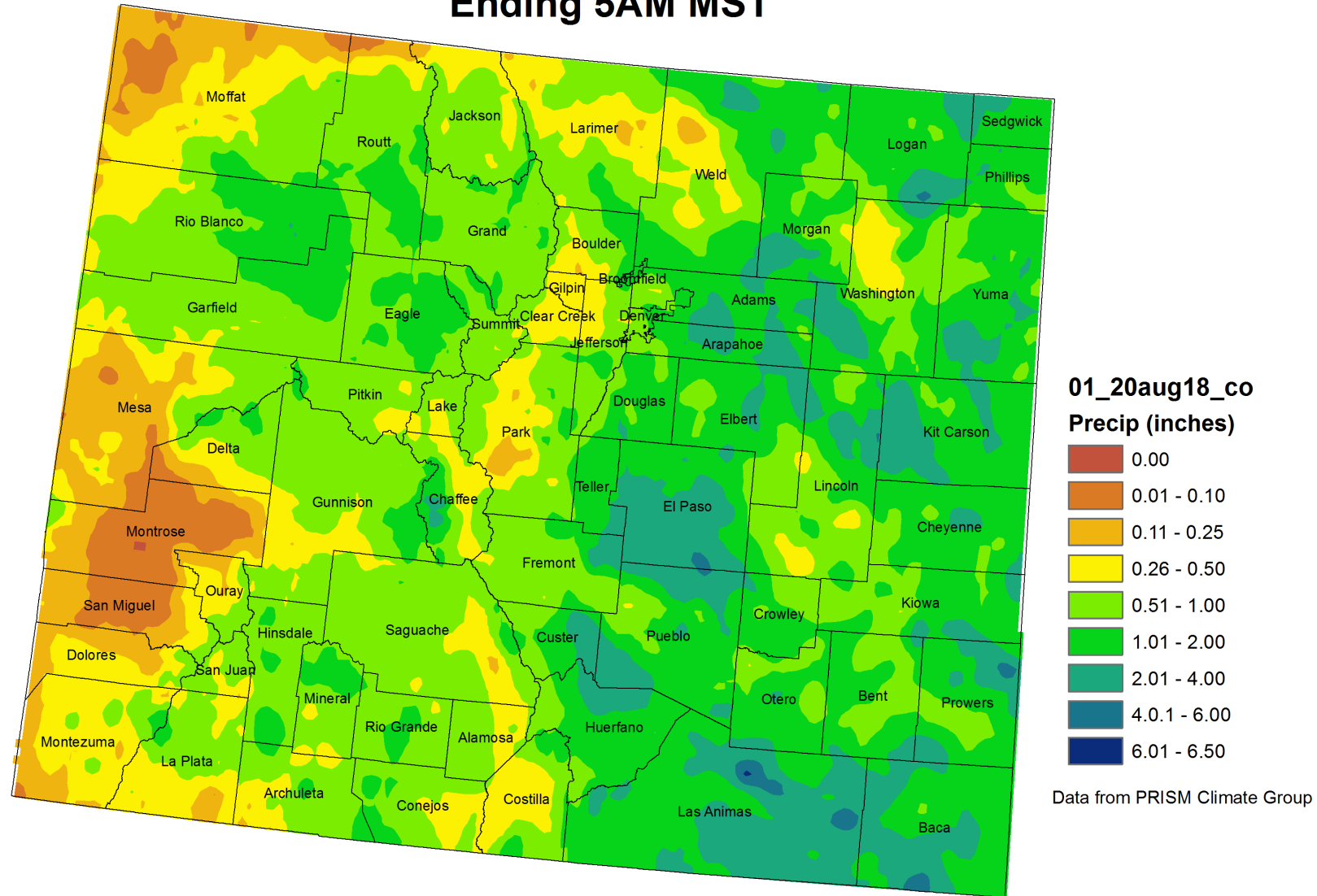
# Colorado July 2018 Precipitation as a Percentage of Normal



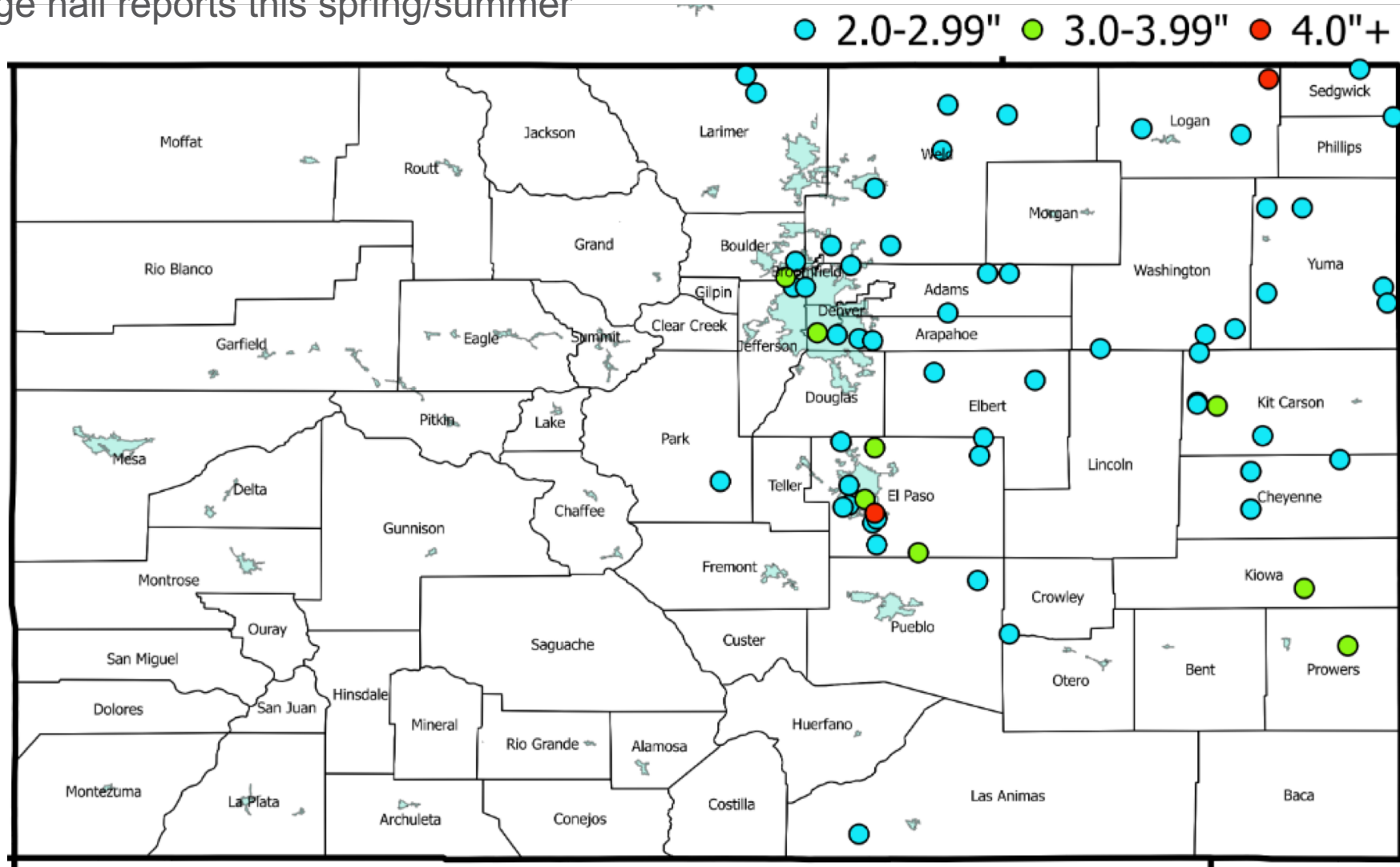
Data from PRISM Climate Group



# Colorado Month to Date Precipitation 1 - 20 August 2018 Ending 5AM MST



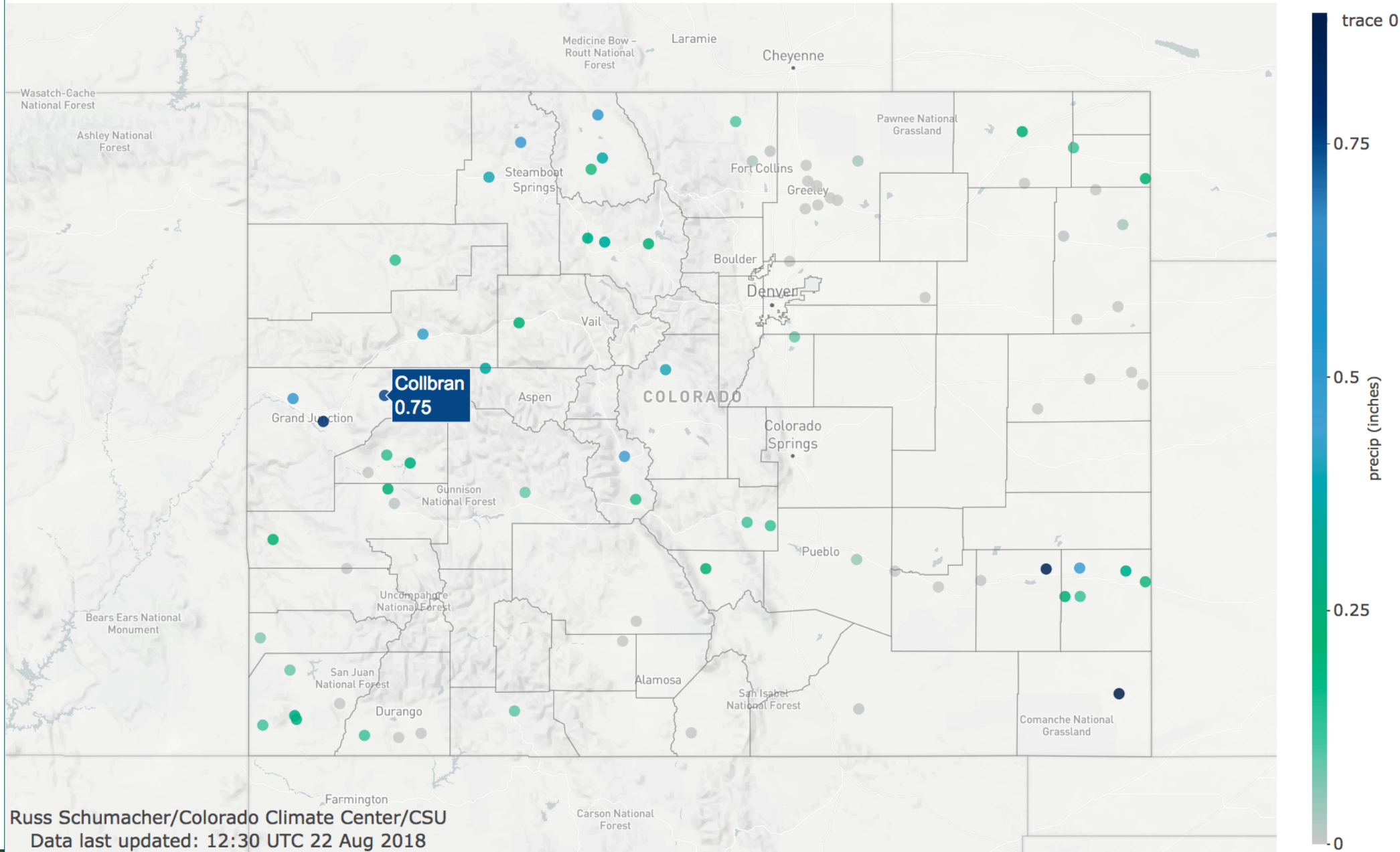
# Large hail reports this spring/summer



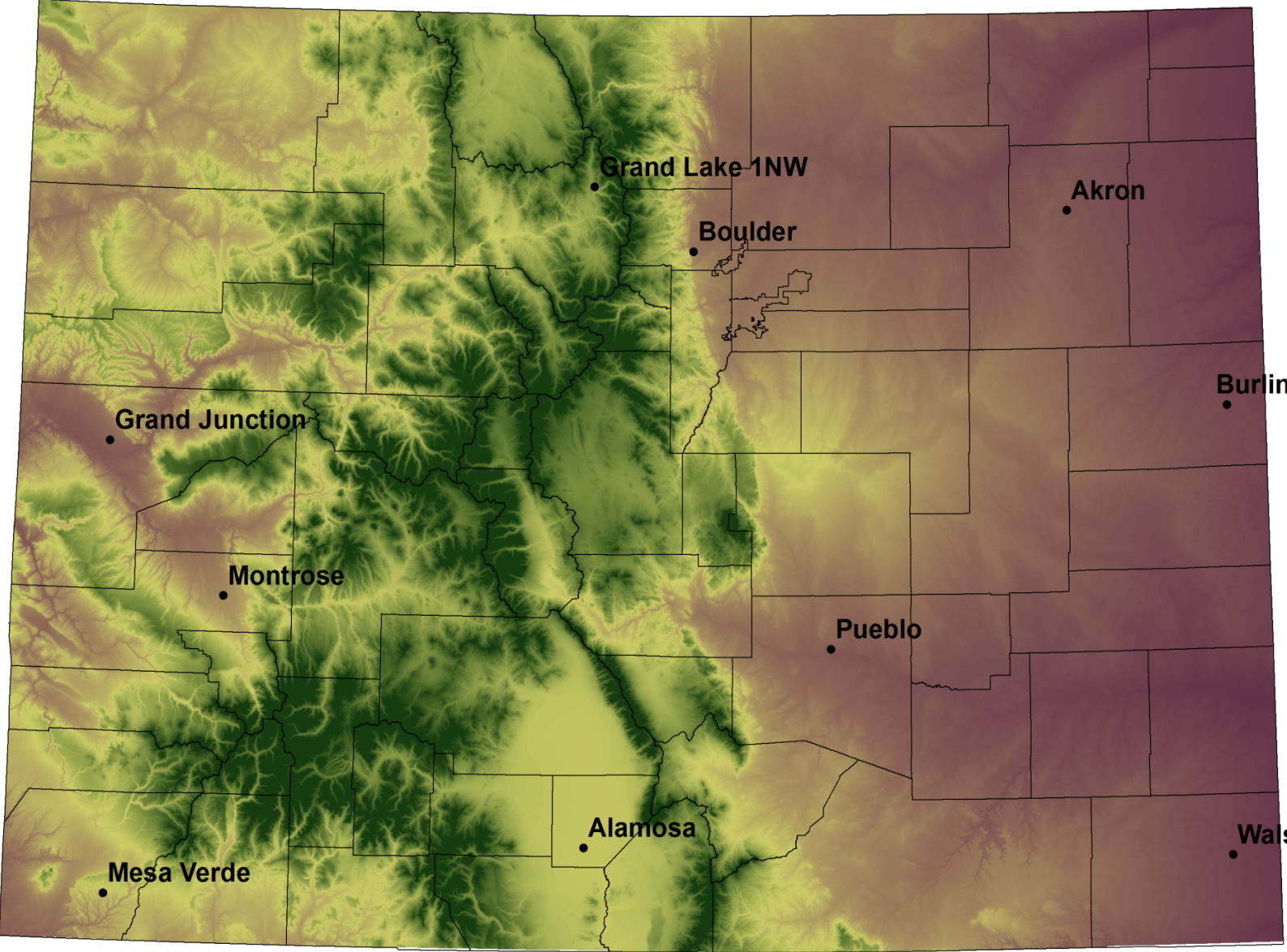
(courtesy of Sam Childs, CSU)



A welcome sight in western Colorado yesterday!



# NWS Cooperative Stations for WATF

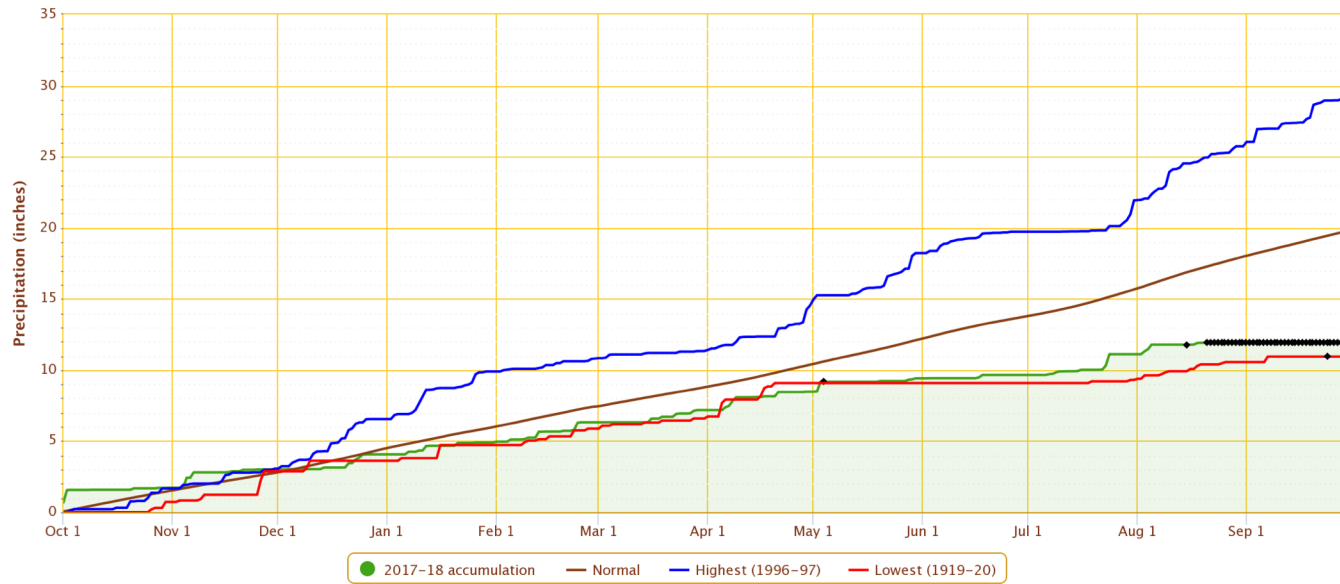


## Water Year 2018 – Station Updates



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

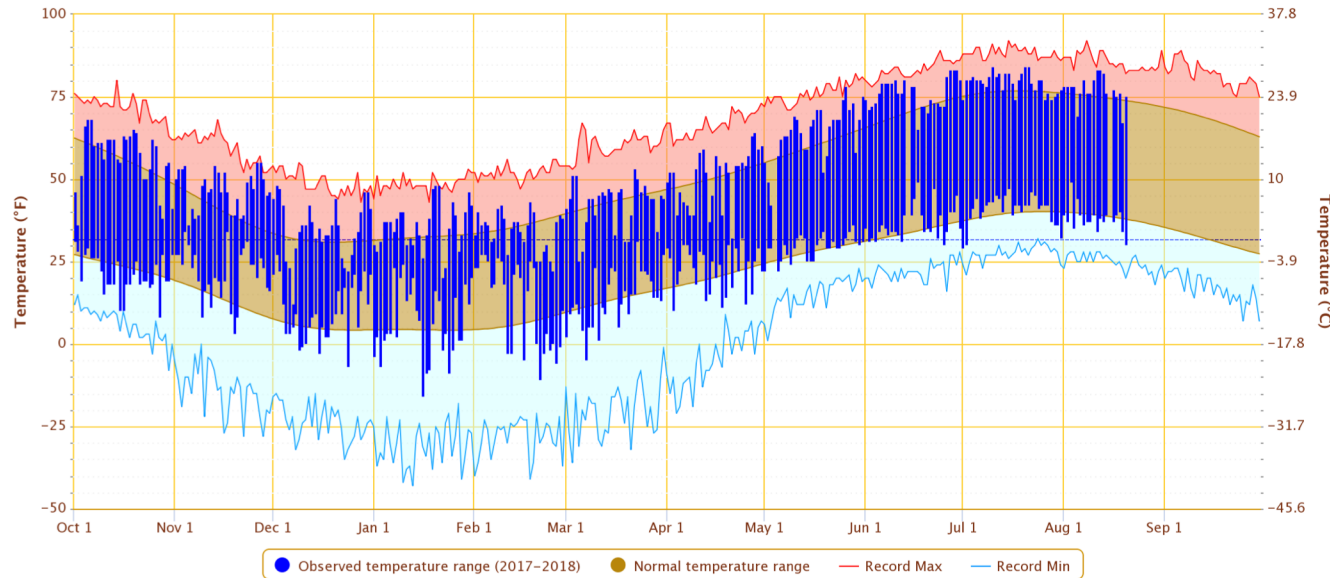
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



Powered by ACIS

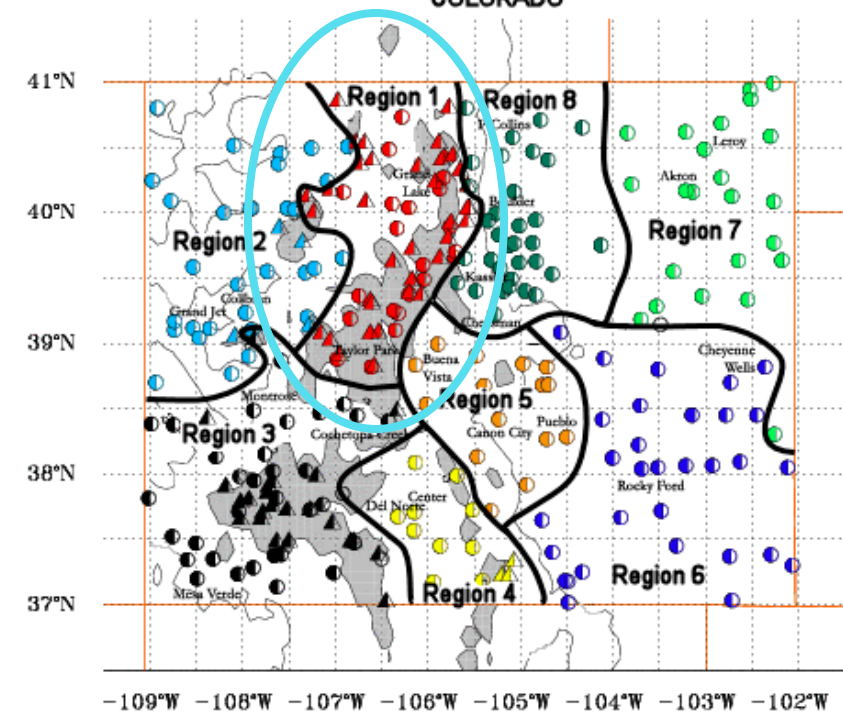
### Daily Temperature Data – GRAND LAKE 1 NW, CO

Period of Record – 1939-10-01 to 2018-08-20. Normals period: 1981-2010. Click and drag to zoom chart.



Powered by ACIS

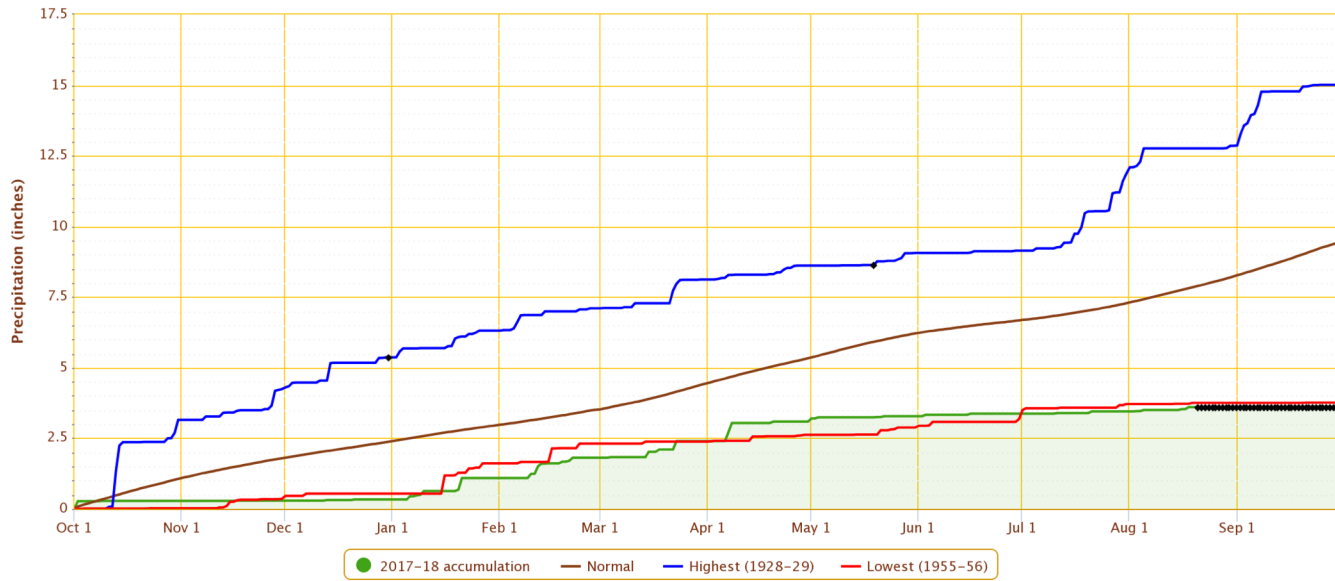
### COLORADO





### Accumulated Precipitation – GRAND JUNCTION WALKER FIELD, CO

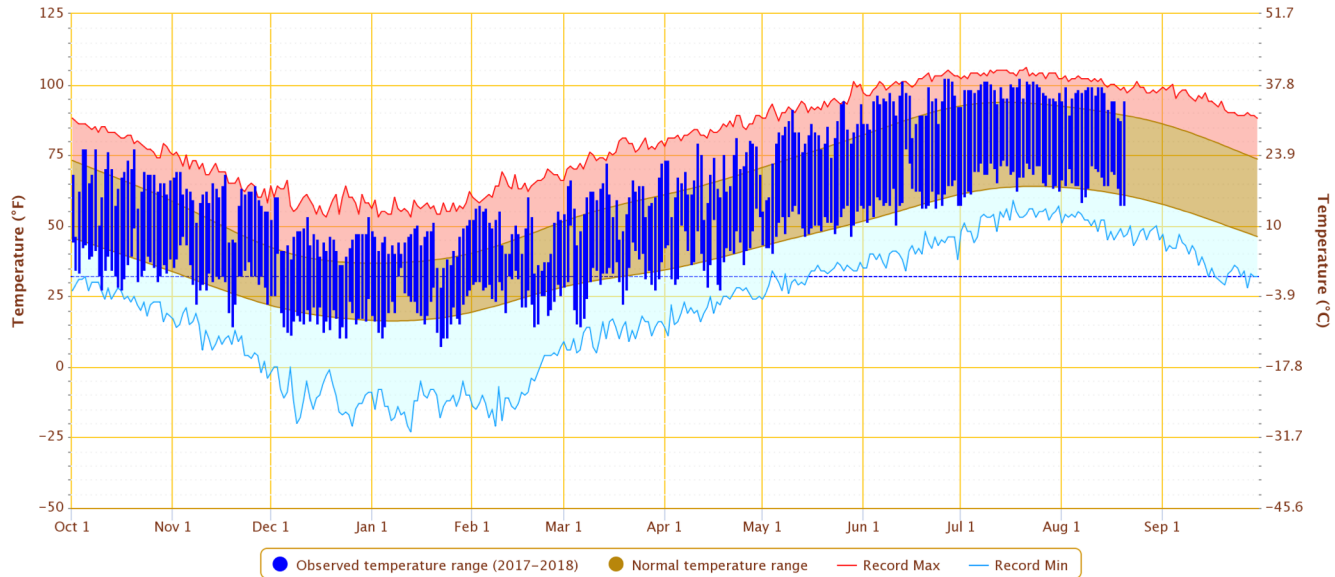
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



Powered by ACIS

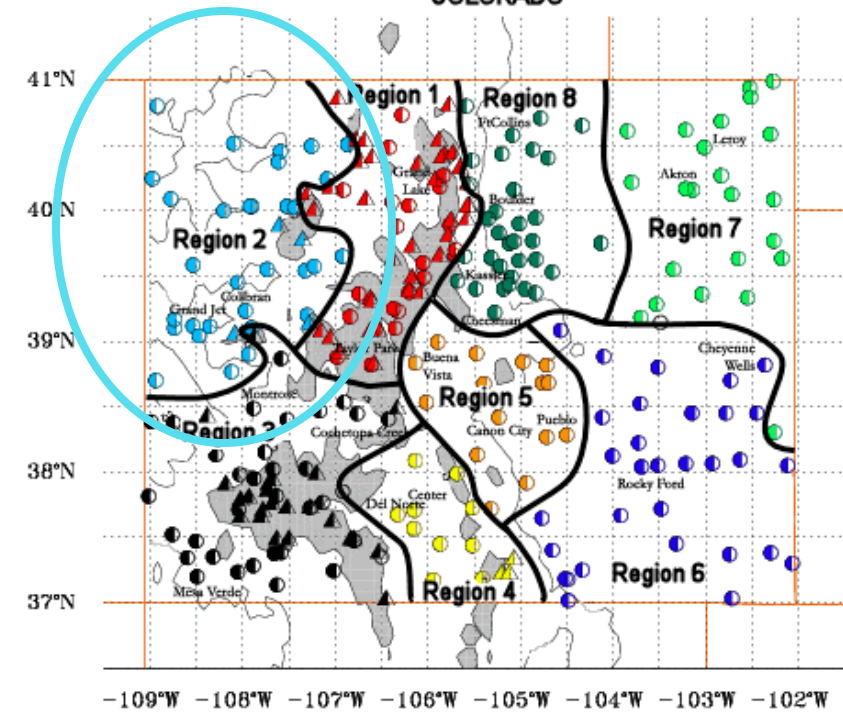
### Daily Temperature Data – GRAND JUNCTION WALKER FIELD, CO

Period of Record – 1900-01-01 to 2018-08-20. Normals period: 1981-2010. Click and drag to zoom chart.



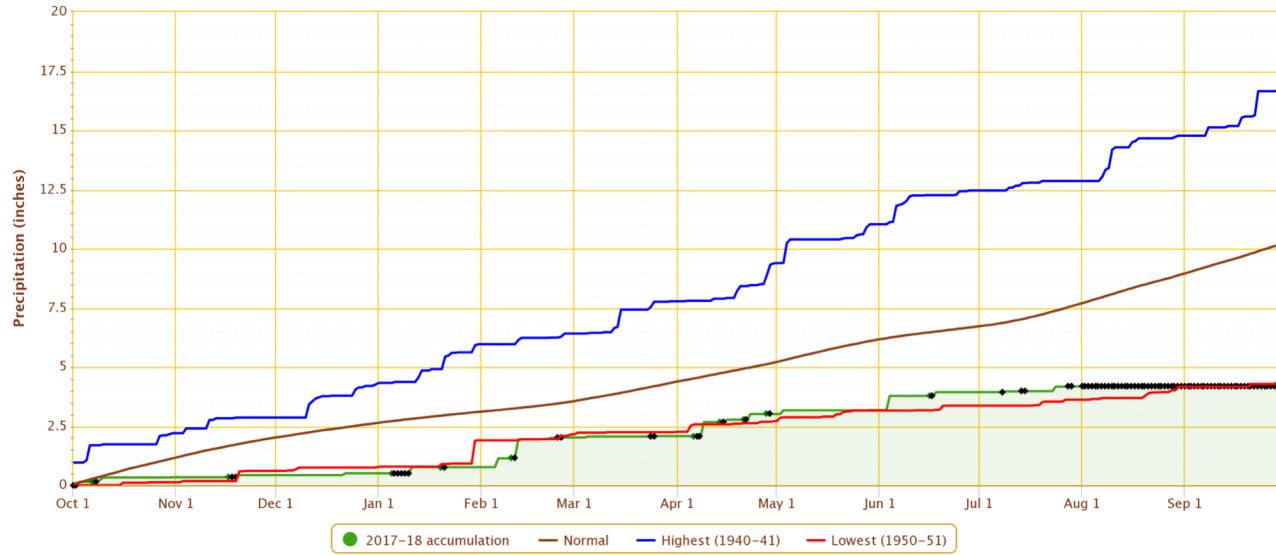
Powered by ACIS

### COLORADO



### Accumulated Precipitation – MONTROSE NO 2, CO

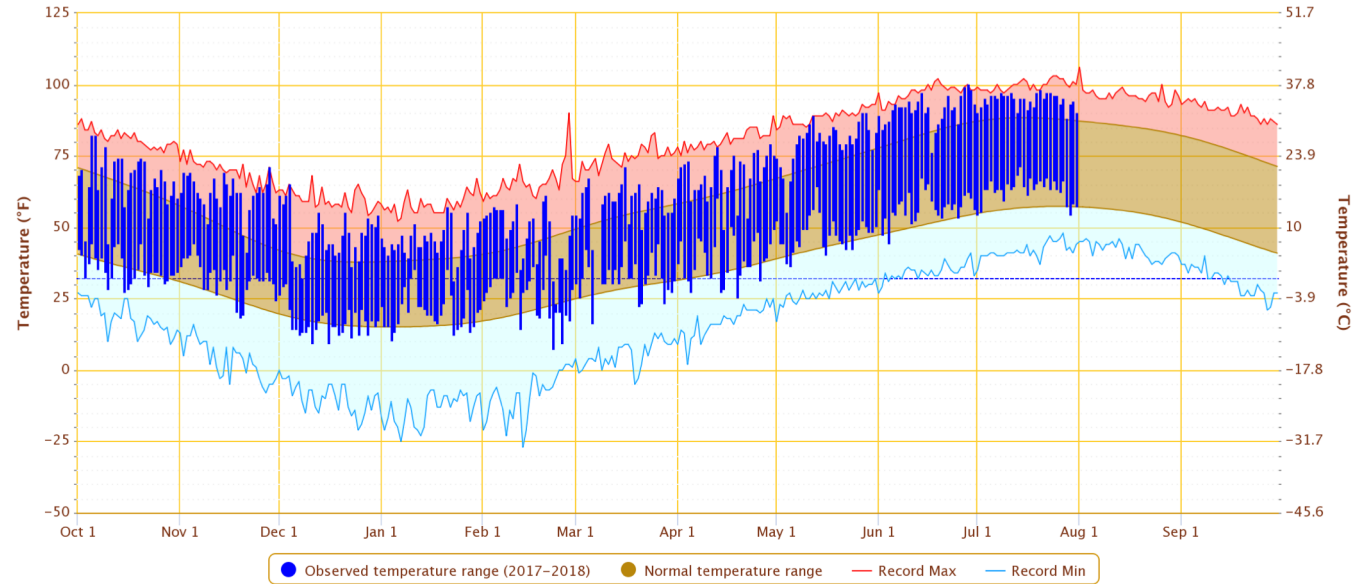
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



Powered by ACIS

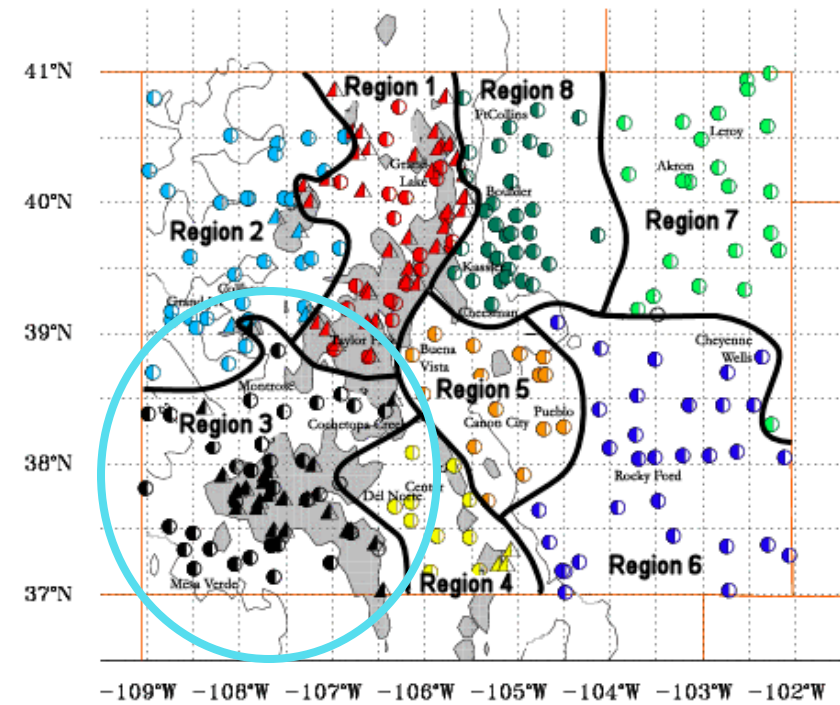
### Daily Temperature Data – MONTROSE NO 2, CO

Period of Record – 1895-10-01 to 2018-07-31. Normals period: 1981-2010. Click and drag to zoom chart.



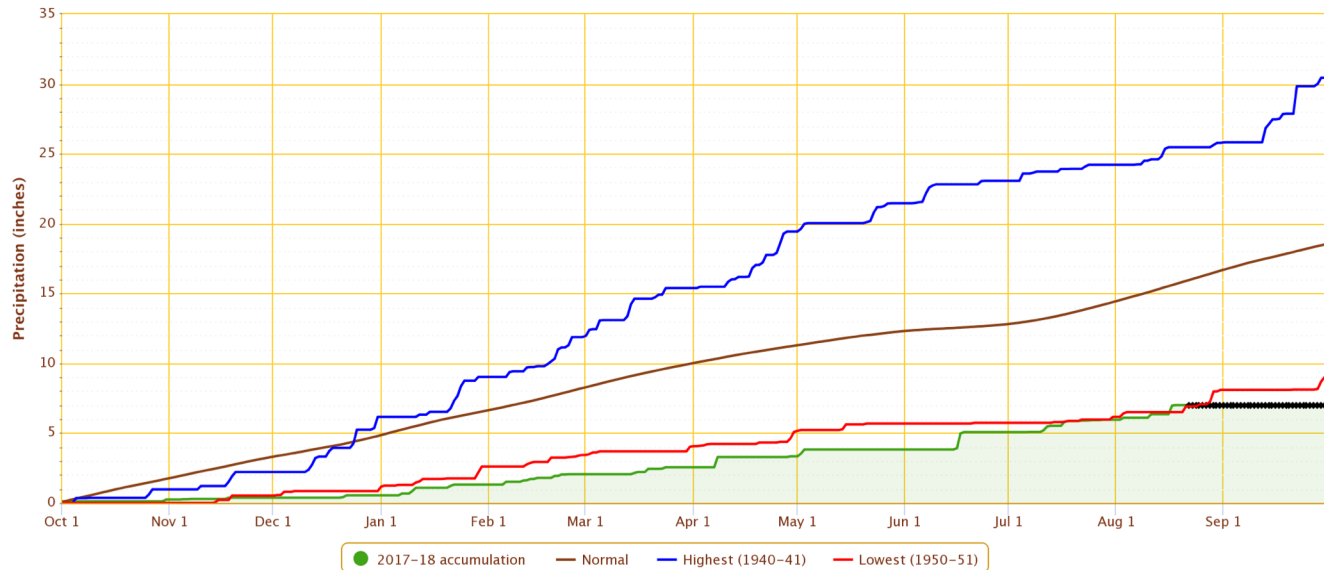
Powered by ACIS

### COLORADO



### Accumulated Precipitation – MESA VERDE NP, CO

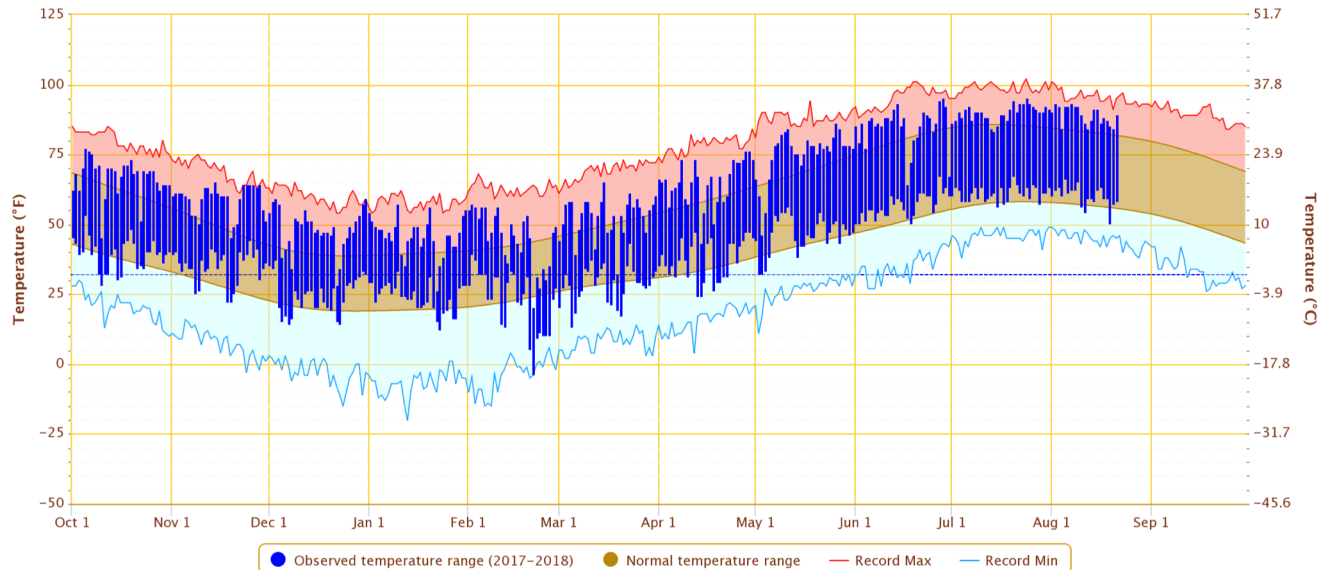
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



Powered by ACIS

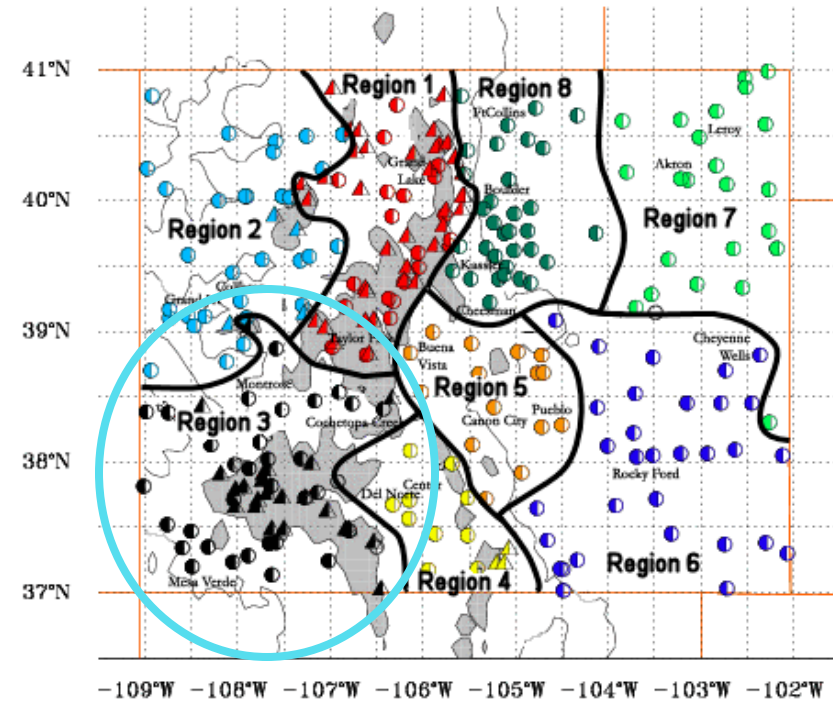
### Daily Temperature Data – MESA VERDE NP, CO

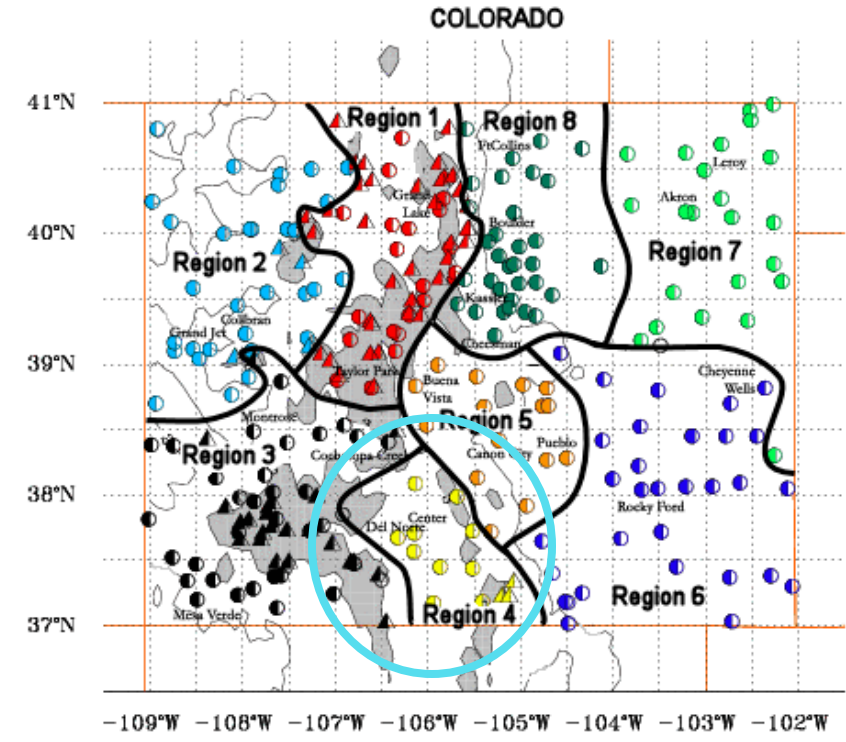
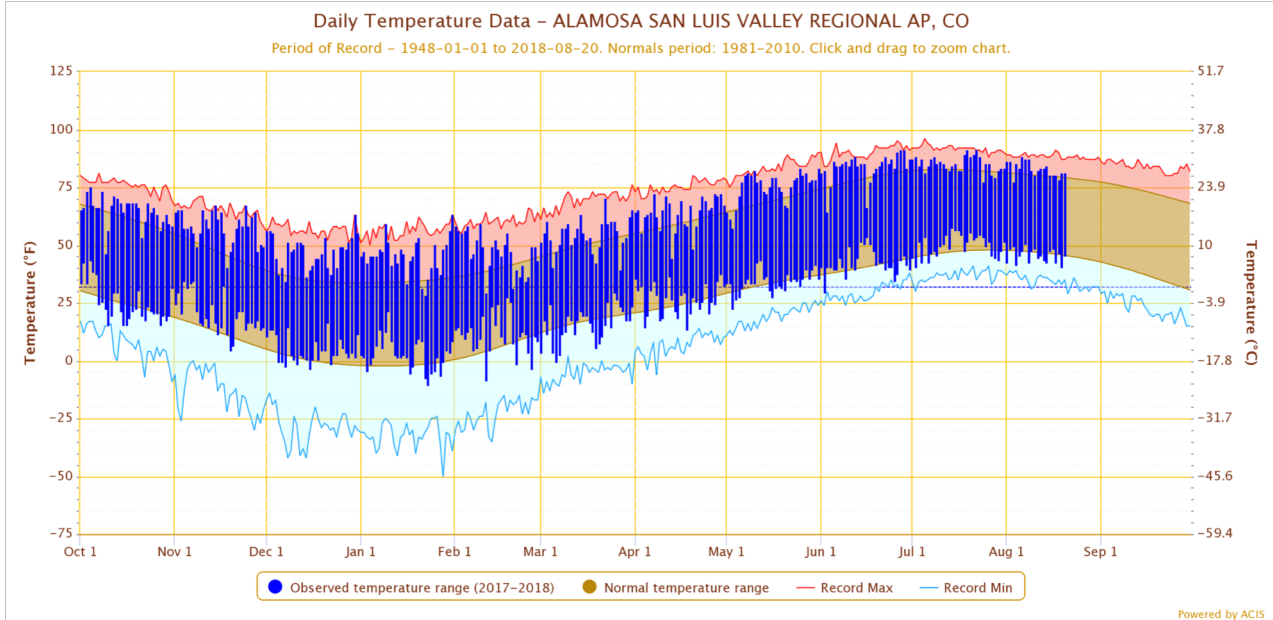
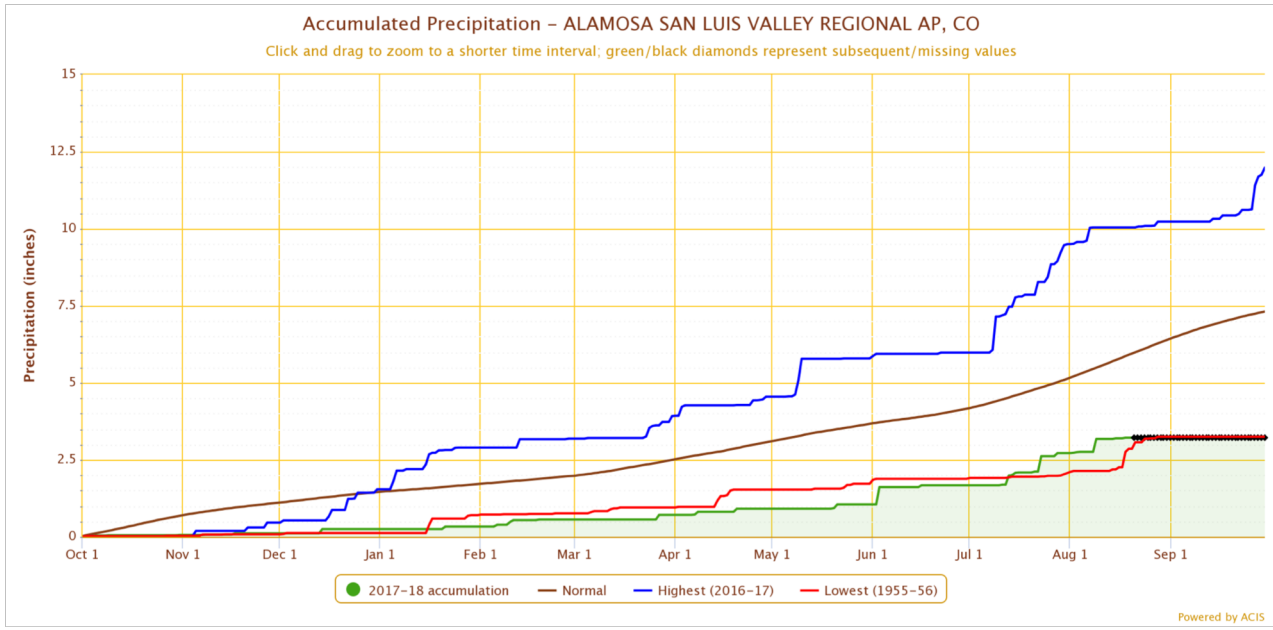
Period of Record – 1922-02-16 to 2018-08-21. Normals period: 1981-2010. Click and drag to zoom chart.



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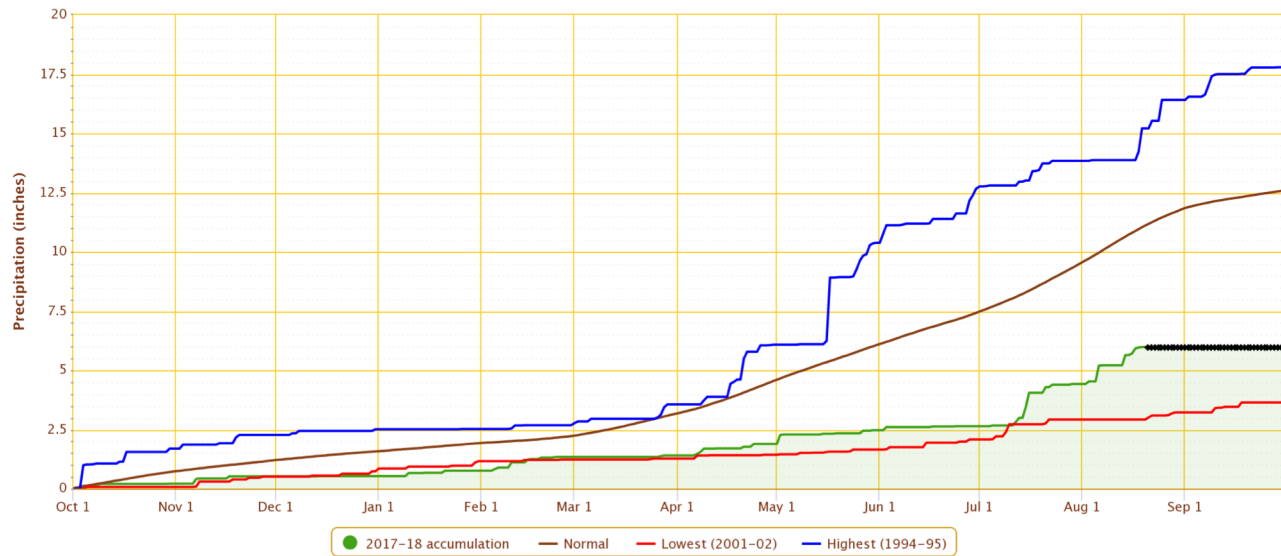
### COLORADO





### Accumulated Precipitation – PUEBLO MEMORIAL AP, CO

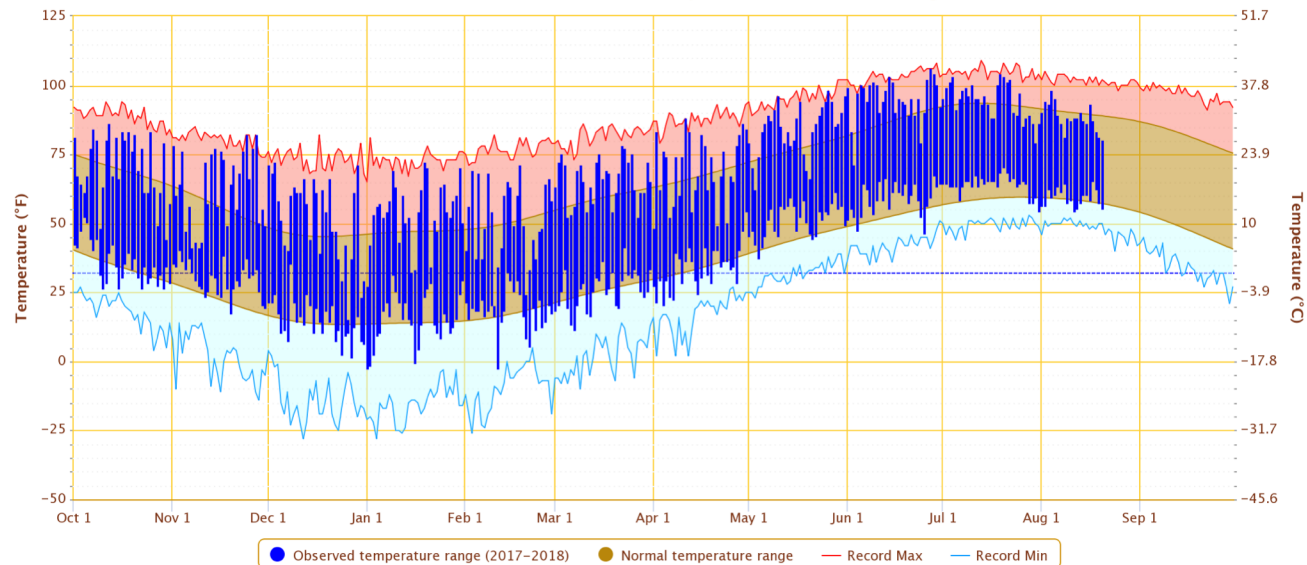
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



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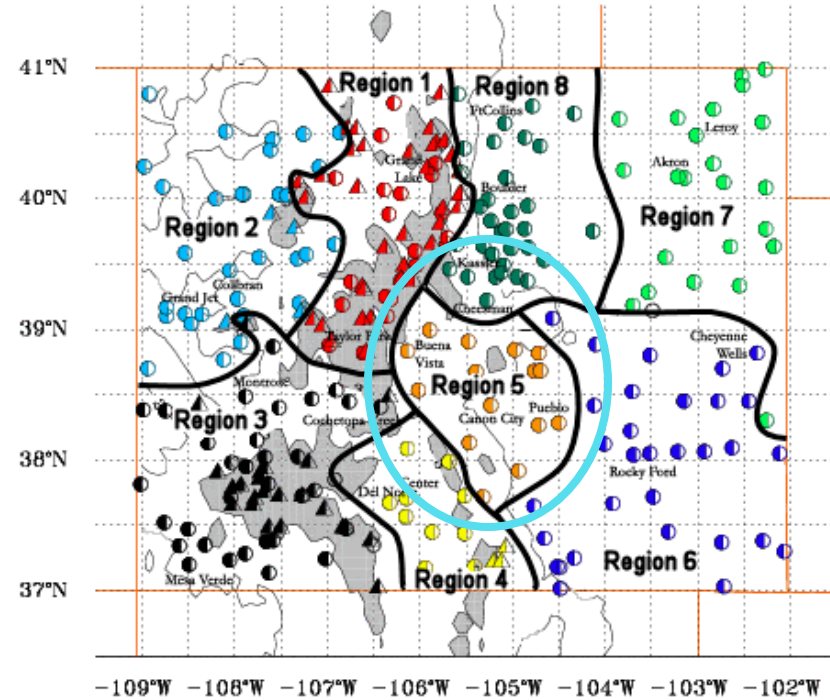
### Daily Temperature Data – PUEBLO MEMORIAL AP, CO

Period of Record – 1954-06-16 to 2018-08-20. Normals period: 1981-2010. Click and drag to zoom chart.



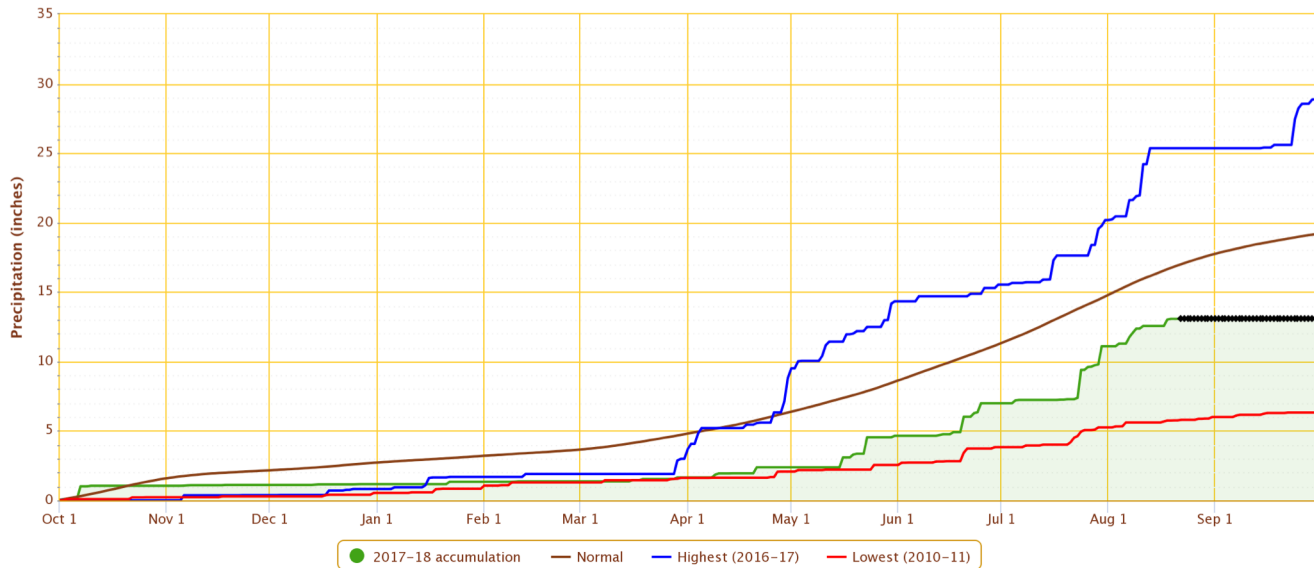
Powered by ACIS

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### Accumulated Precipitation – WALSH 1 W, CO

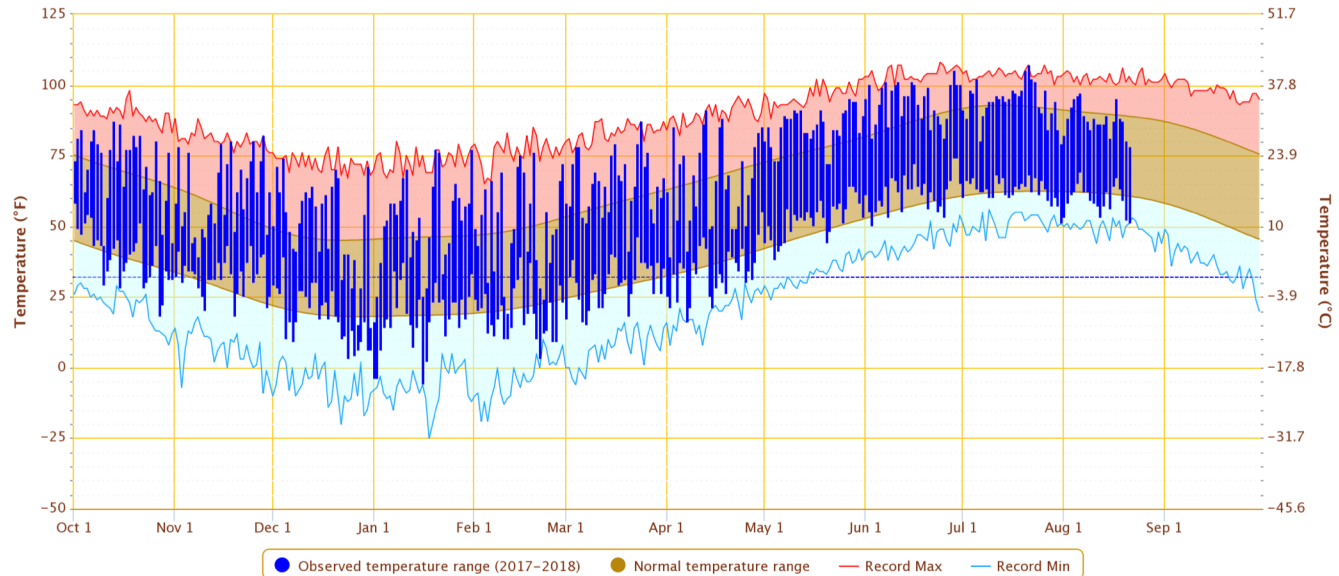
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



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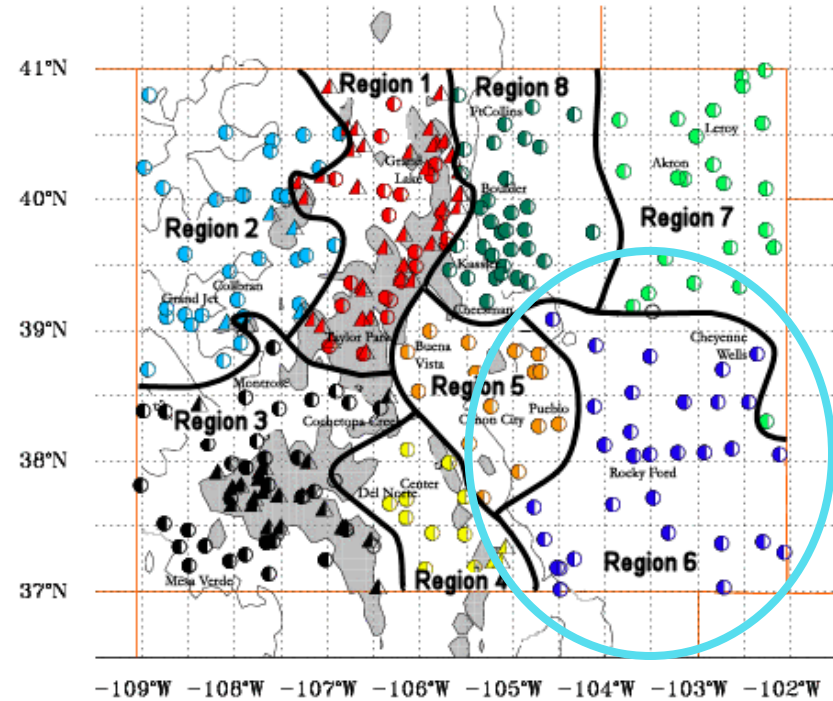
### Daily Temperature Data – WALSH 1 W, CO

Period of Record – 1967-09-01 to 2018-08-21. Normals period: 1981-2010. Click and drag to zoom chart.



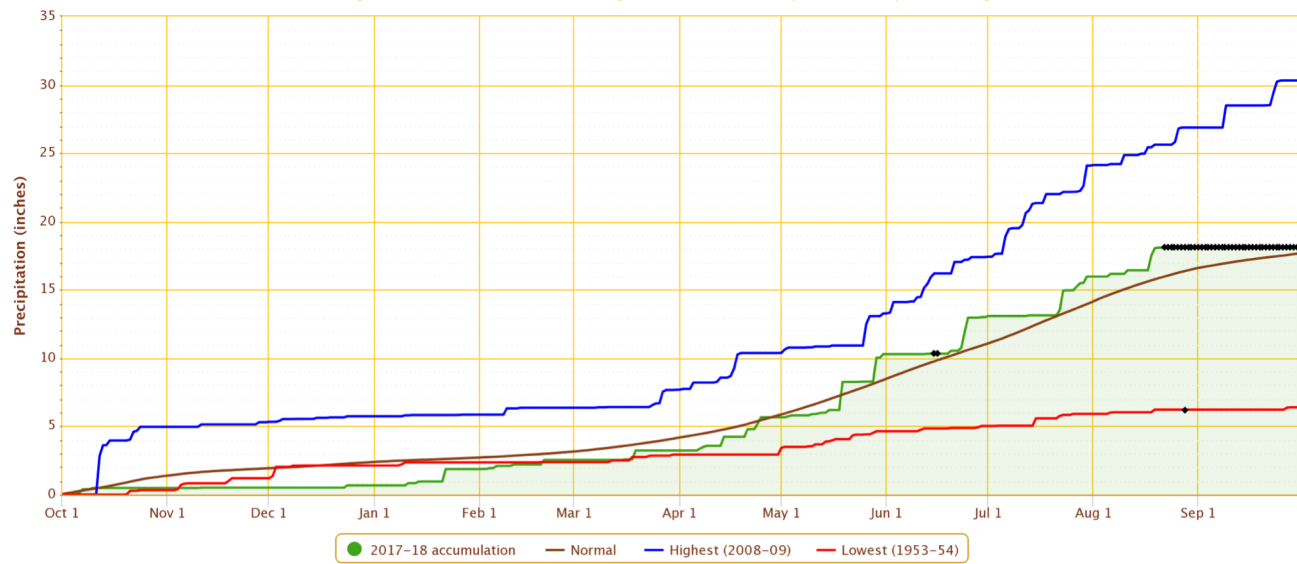
Powered by ACIS

### COLORADO



### Accumulated Precipitation – BURLINGTON, CO

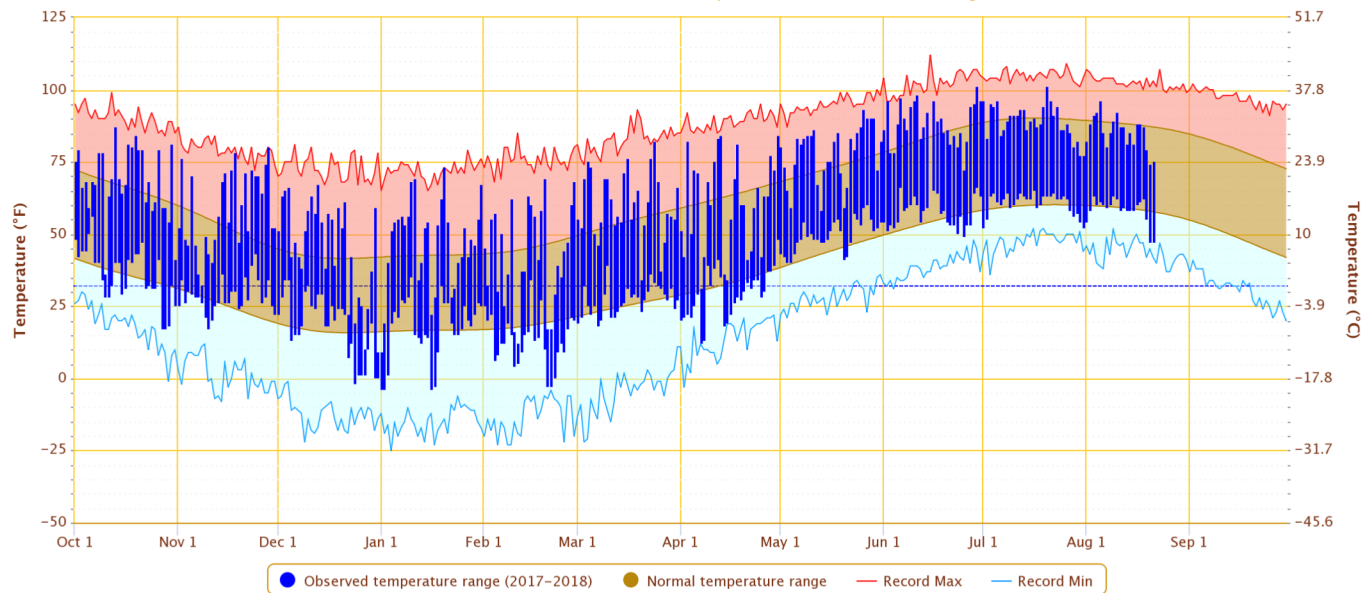
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



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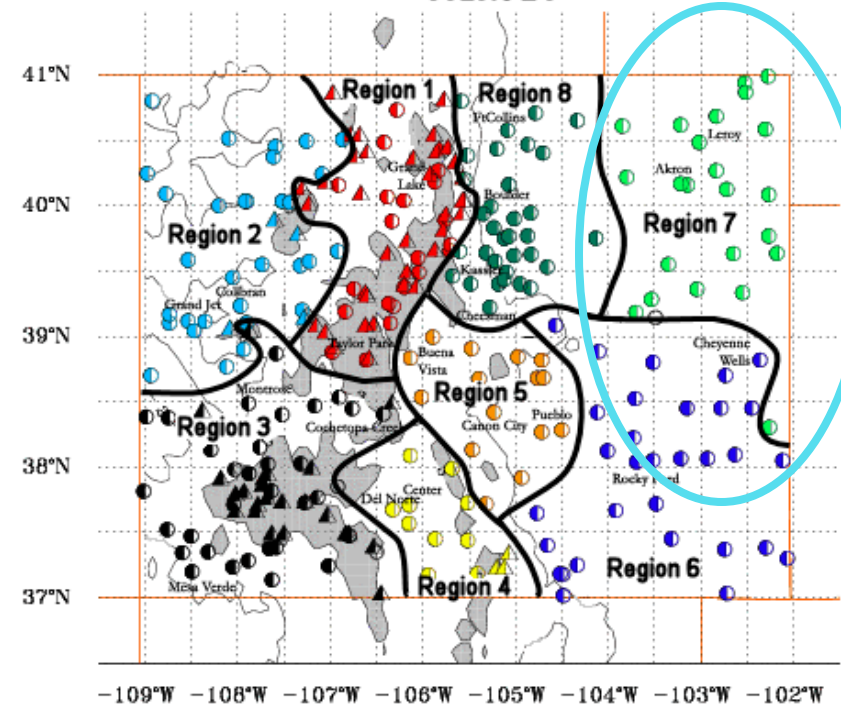
### Daily Temperature Data – BURLINGTON, CO

Period of Record – 1903-12-01 to 2018-08-21. Normals period: 1981-2010. Click and drag to zoom chart.



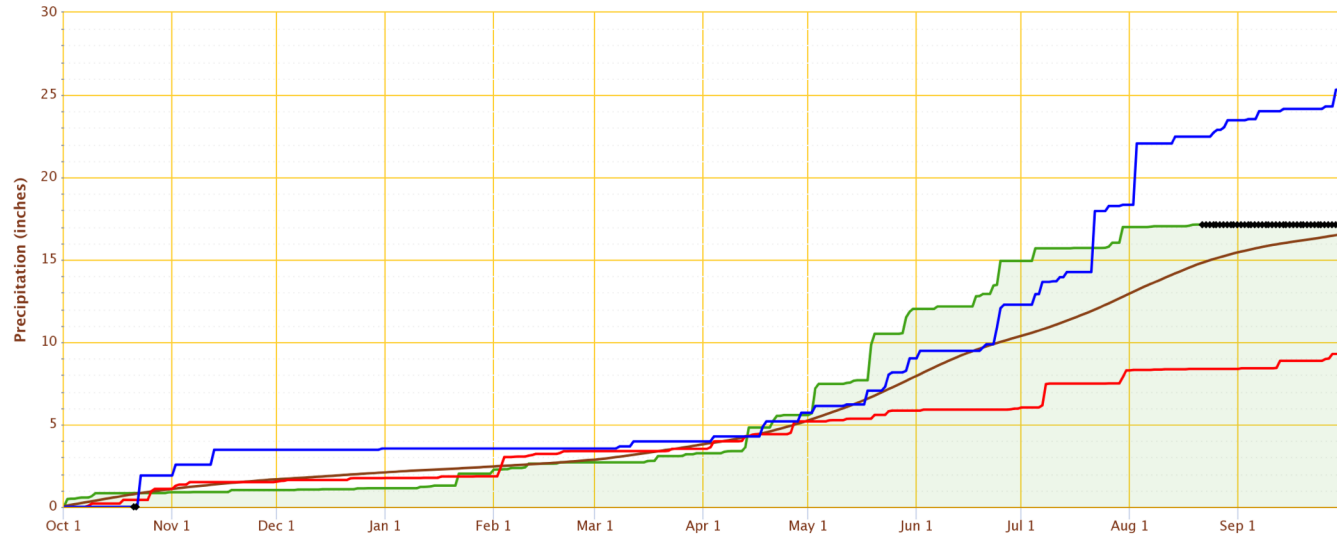
Powered by ACIS

### COLORADO



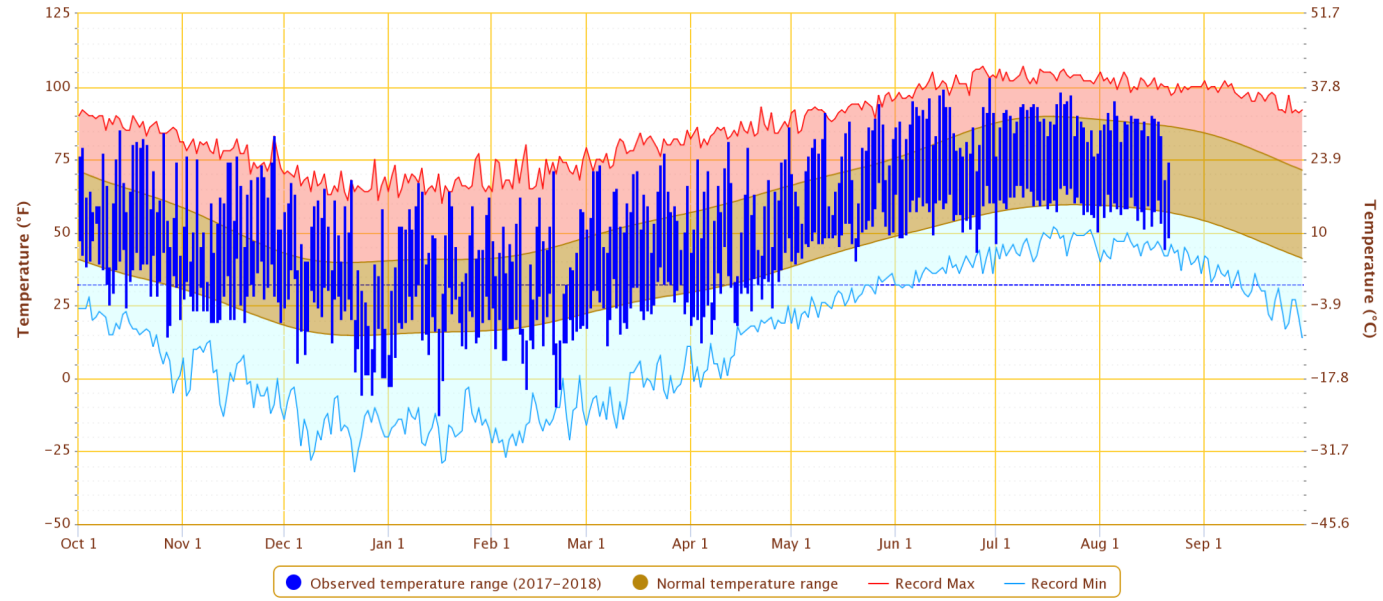
### Accumulated Precipitation – AKRON 4 E, CO

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



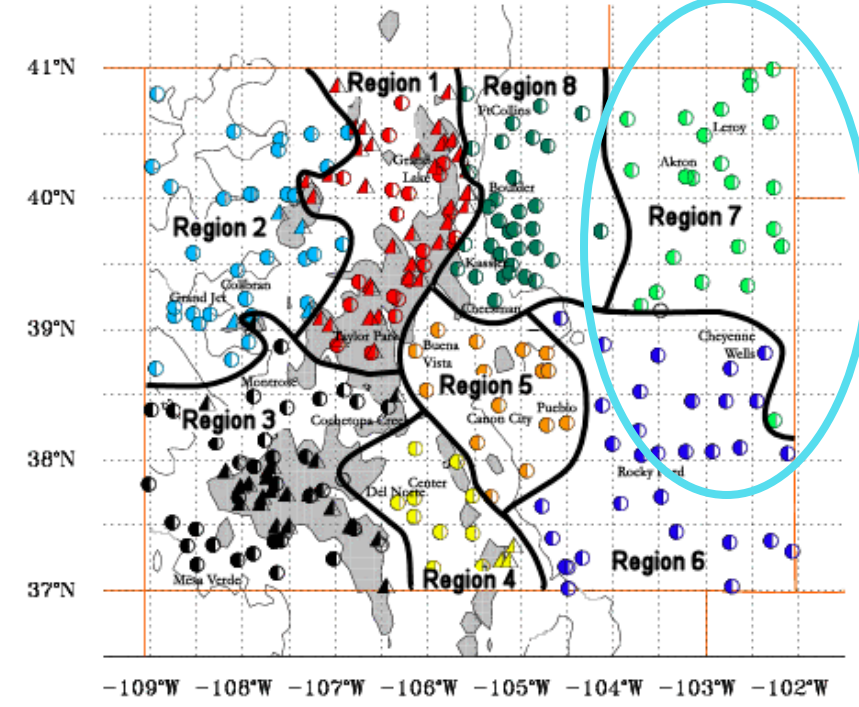
### Daily Temperature Data – AKRON 4 E, CO

Period of Record – 1893-06-01 to 2018-08-21. Normals period: 1981-2010. Click and drag to zoom chart.



Powered by ACIS

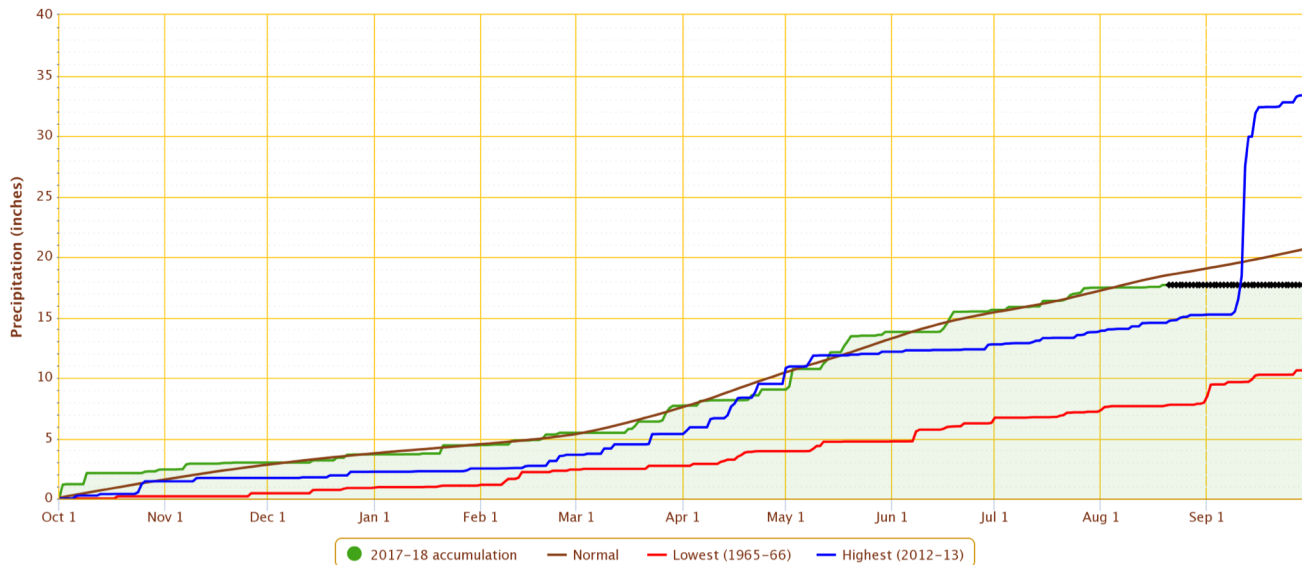
### COLORADO





### Accumulated Precipitation – BOULDER, CO

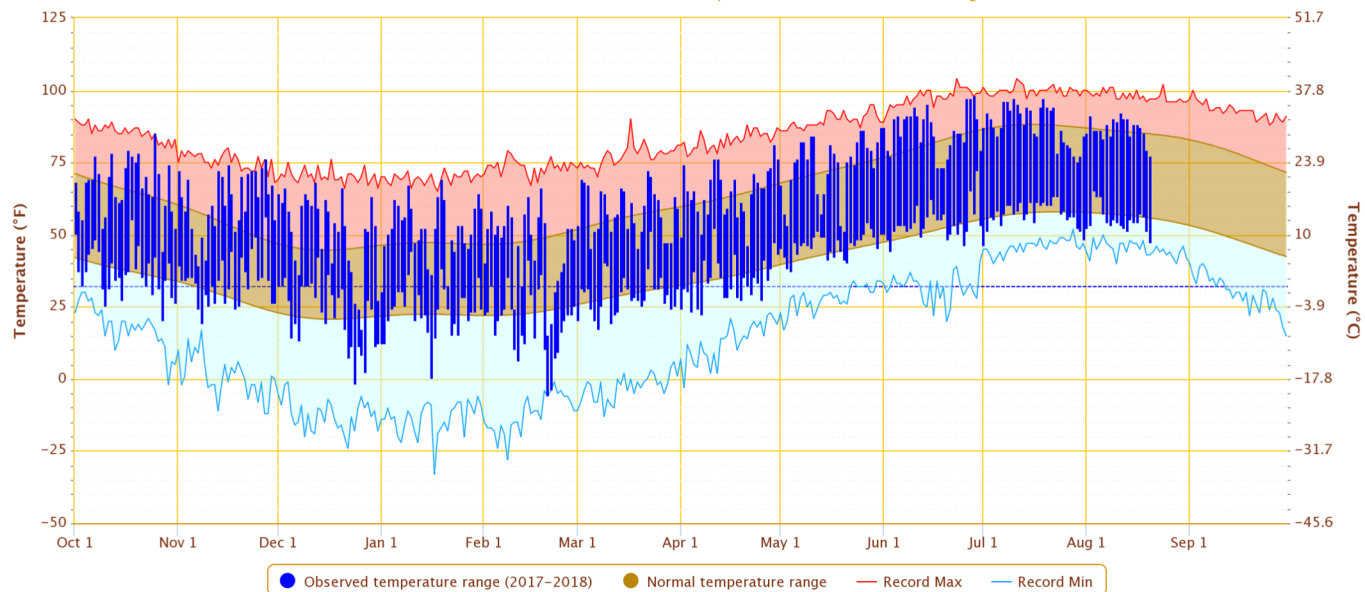
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



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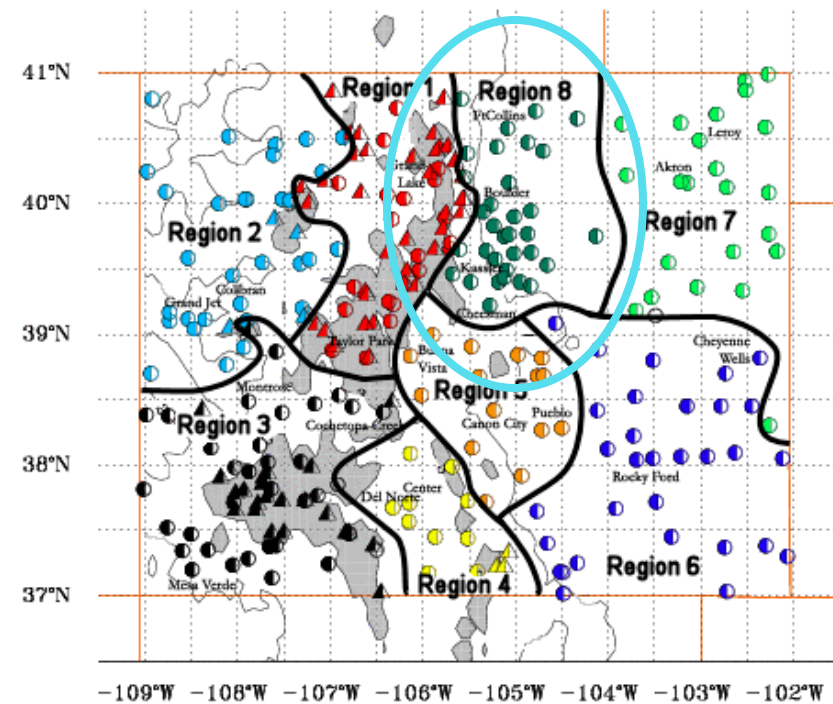
### Daily Temperature Data – BOULDER, CO

Period of Record – 1893-10-01 to 2018-08-20. Normals period: 1981-2010. Click and drag to zoom chart.

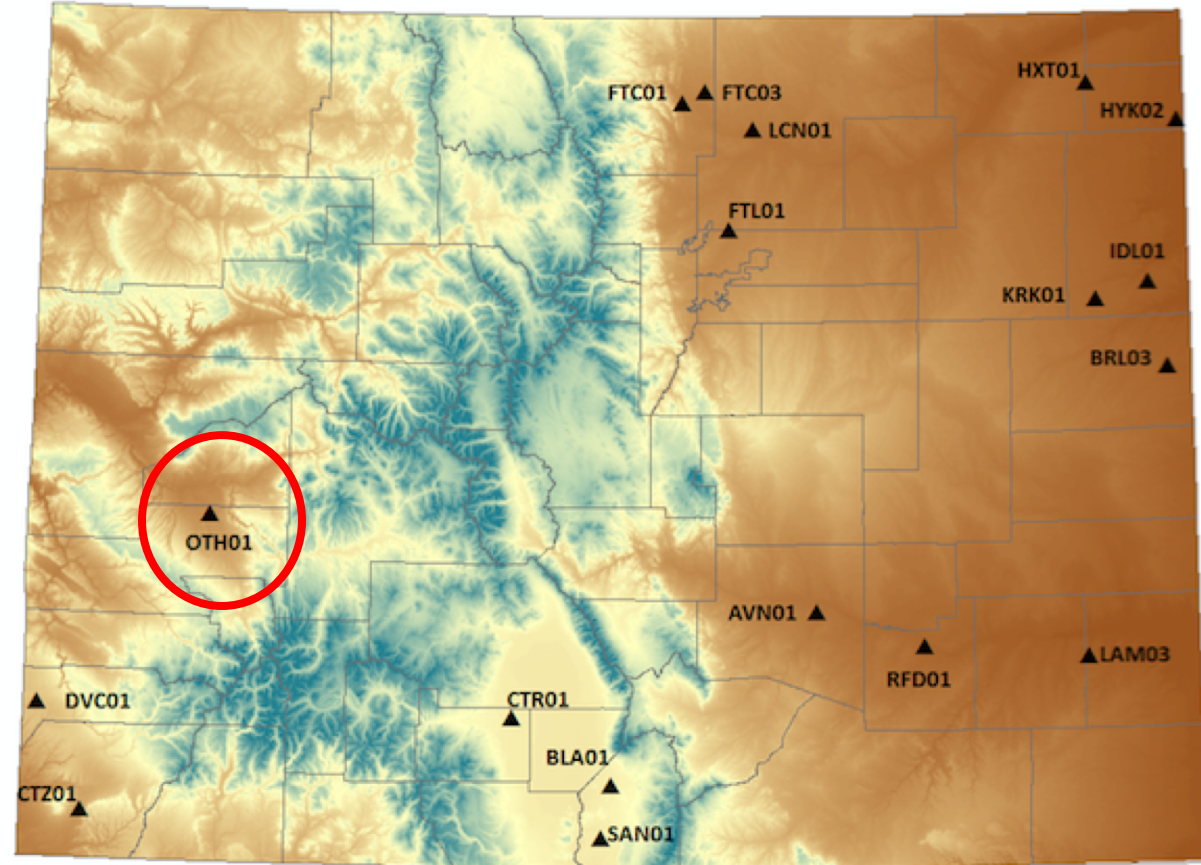
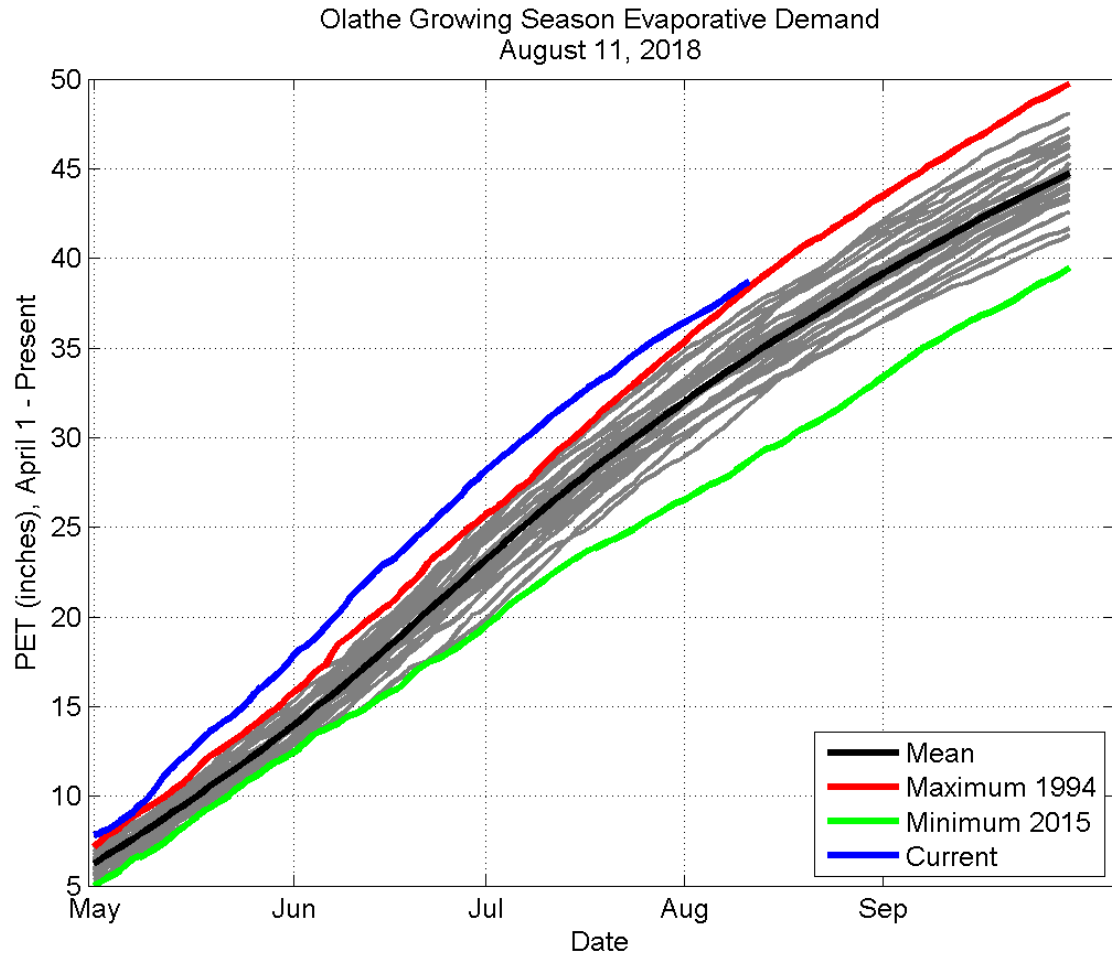


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### COLORADO

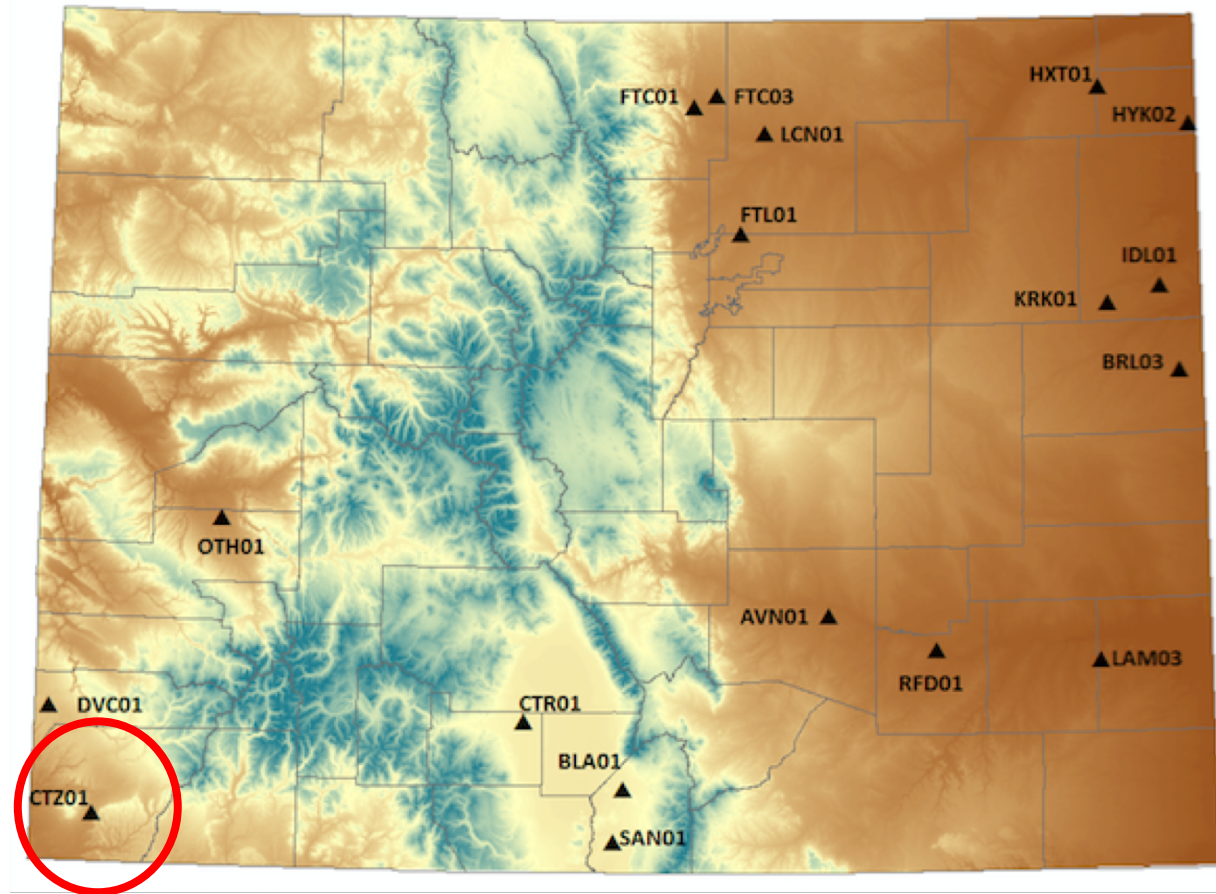
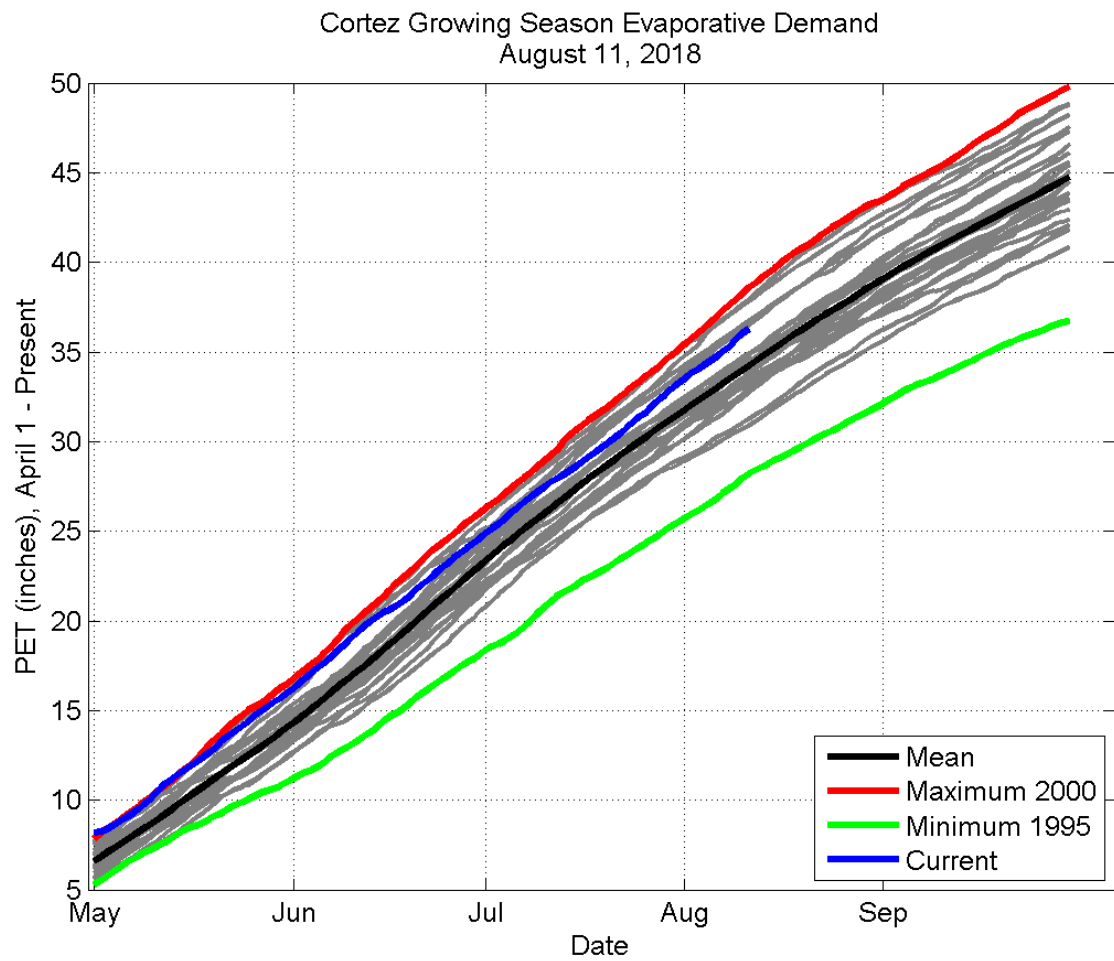


# Evaporative demand from CoAgMET

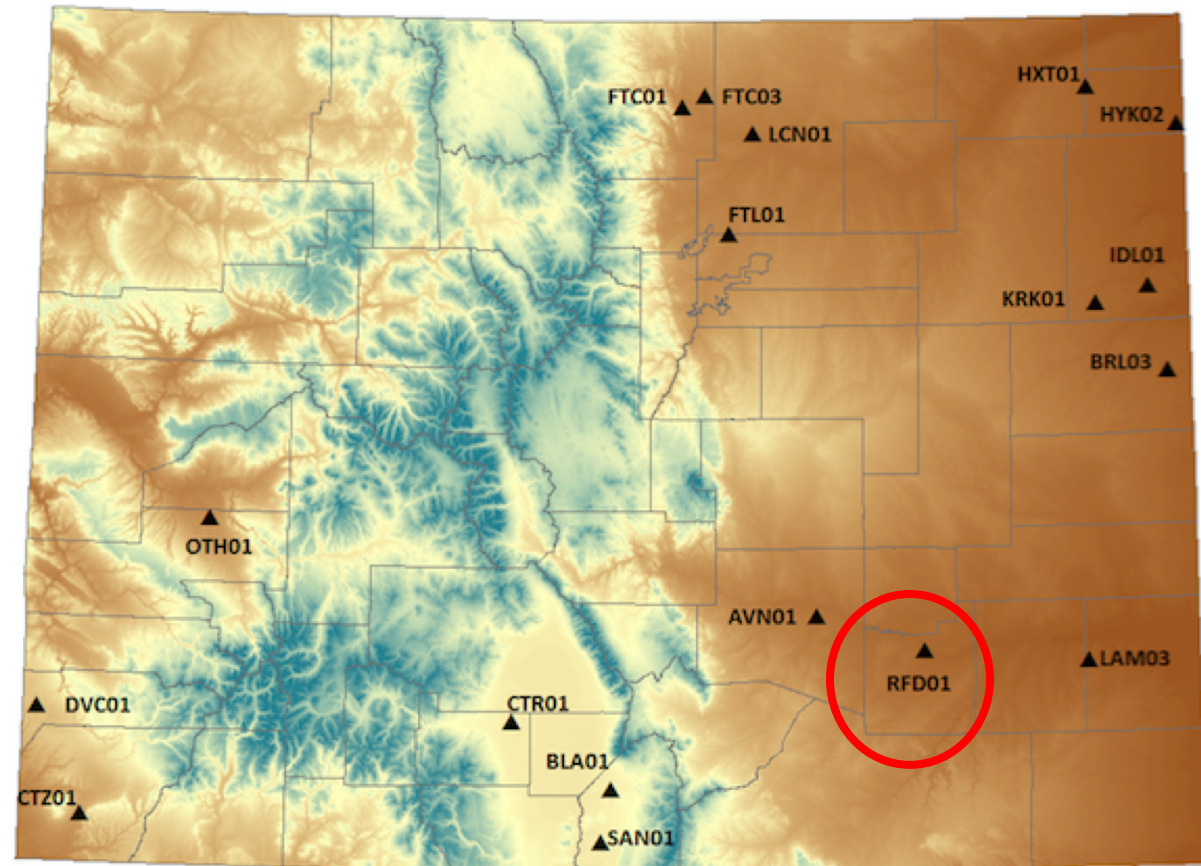
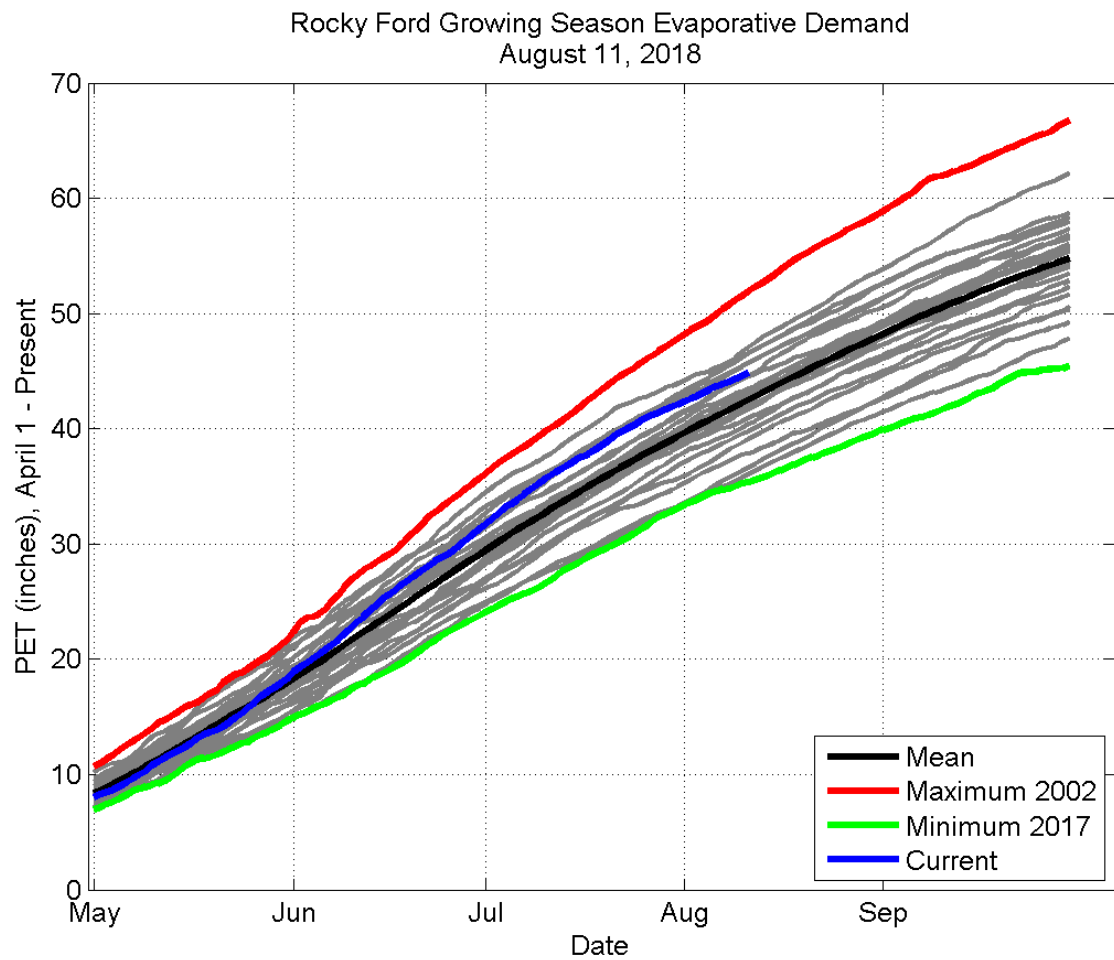


Above average = atmosphere has been “thirsty”  
(warm, windy, sunny conditions)

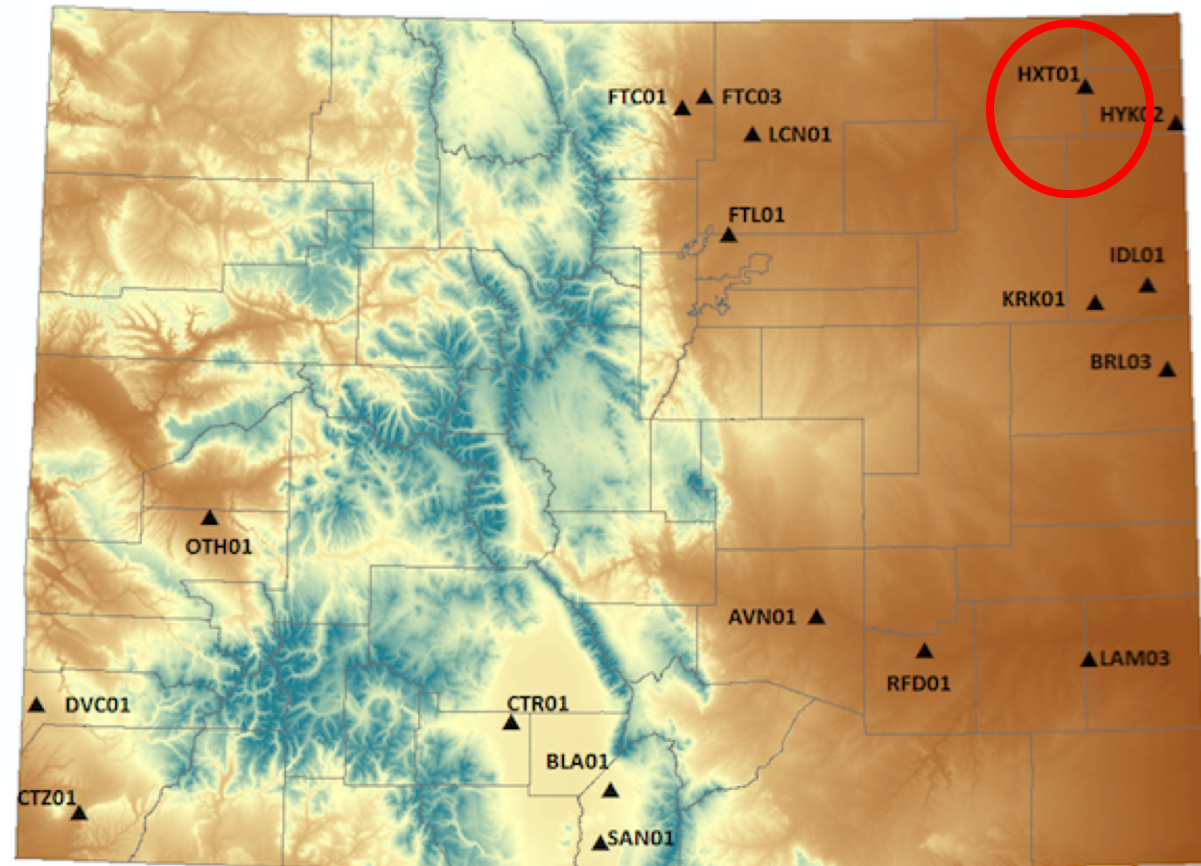
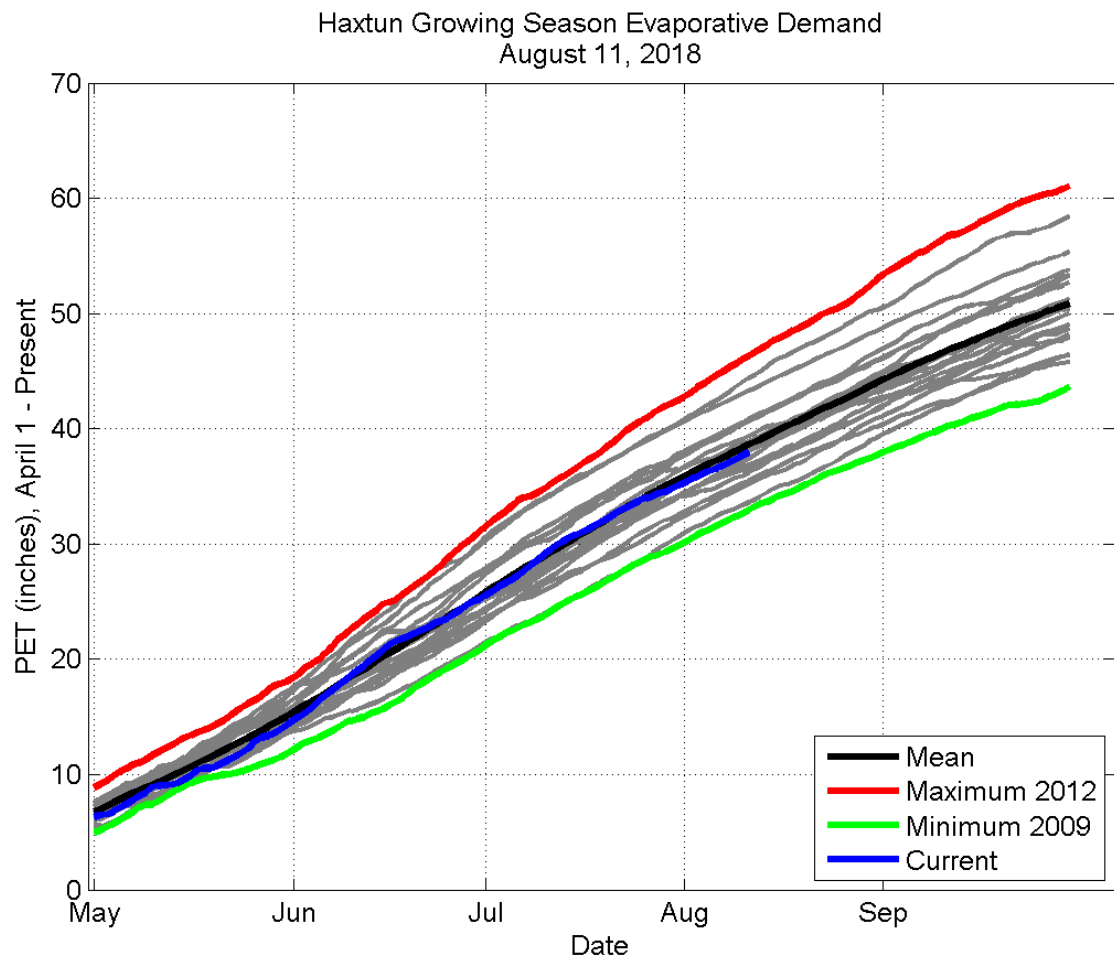
# Evaporative demand from CoAgMET



# Evaporative demand from CoAgMET



# Evaporative demand from CoAgMET

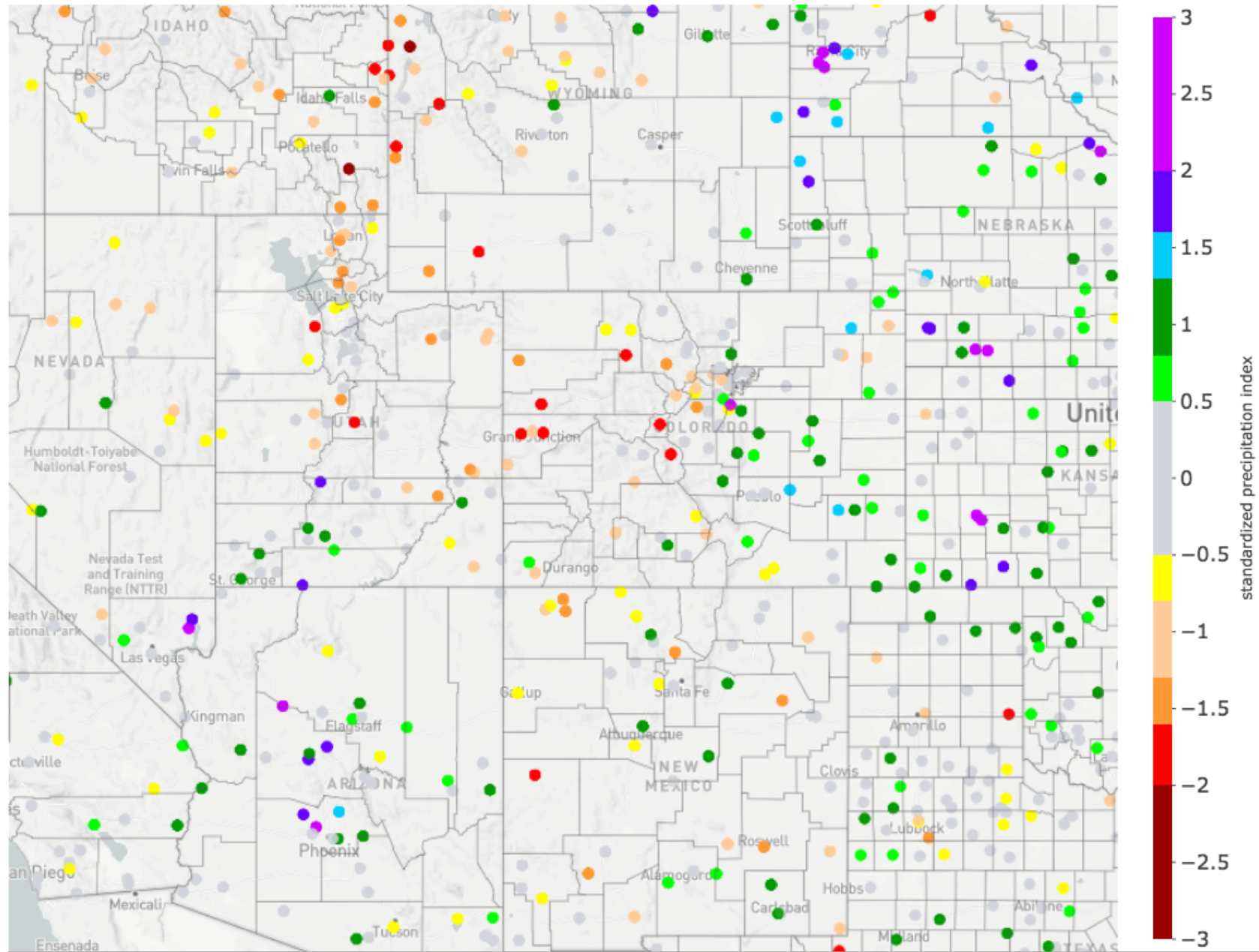




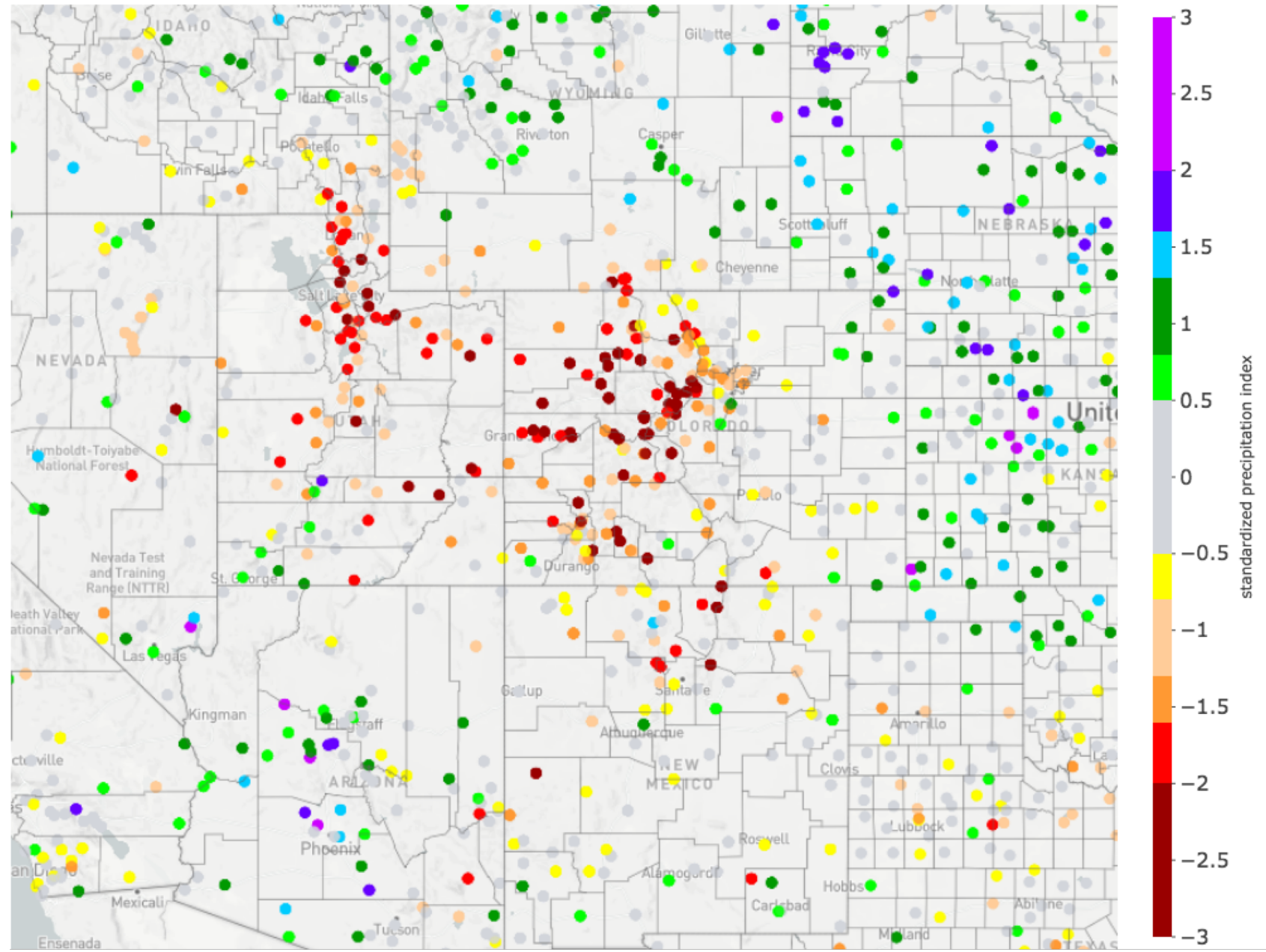
# Colorado Drought



# 30-day Standardized Precipitation Index

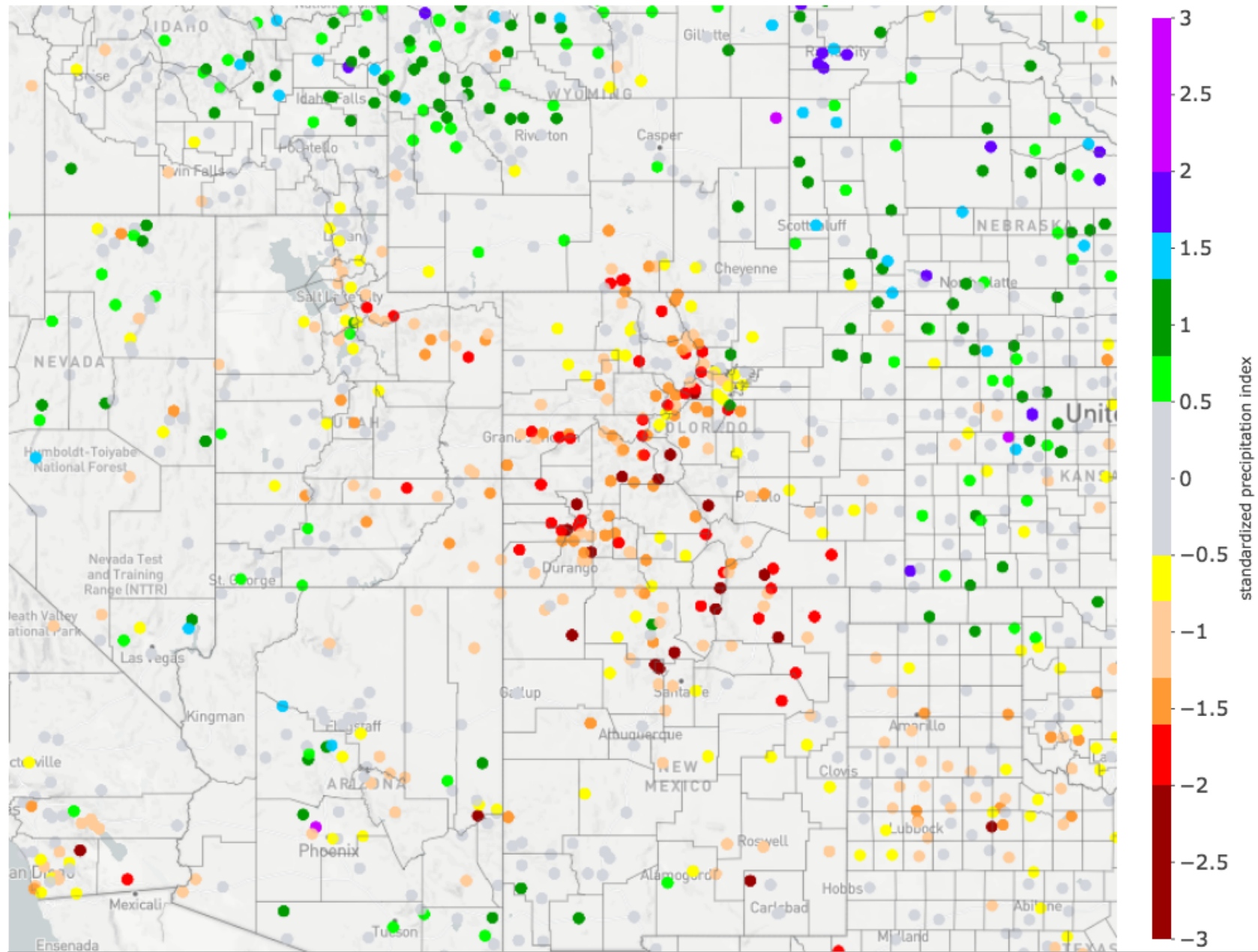


# 90-day Standardized Precipitation Index

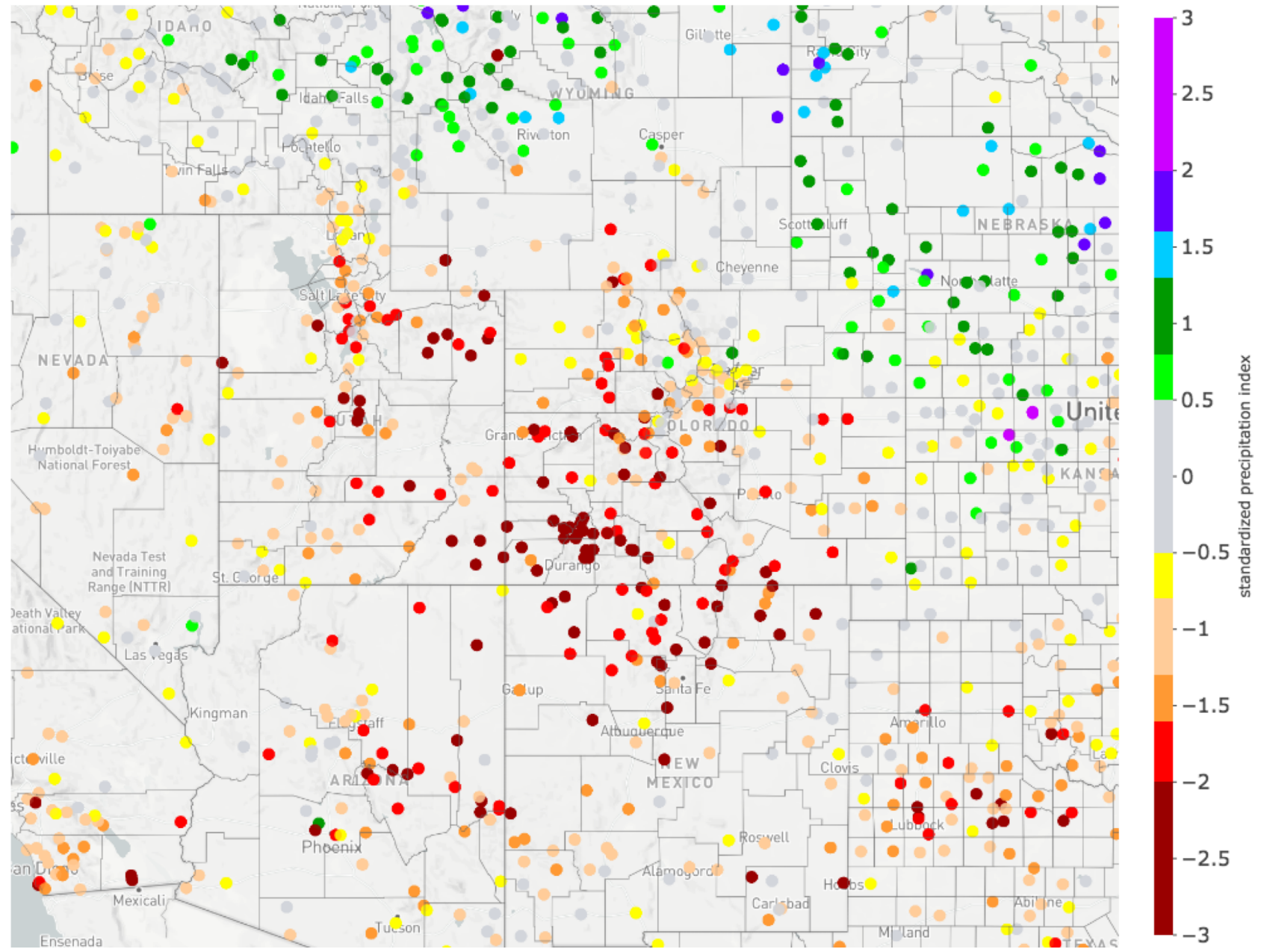




# 6-month Standardized Precipitation Index

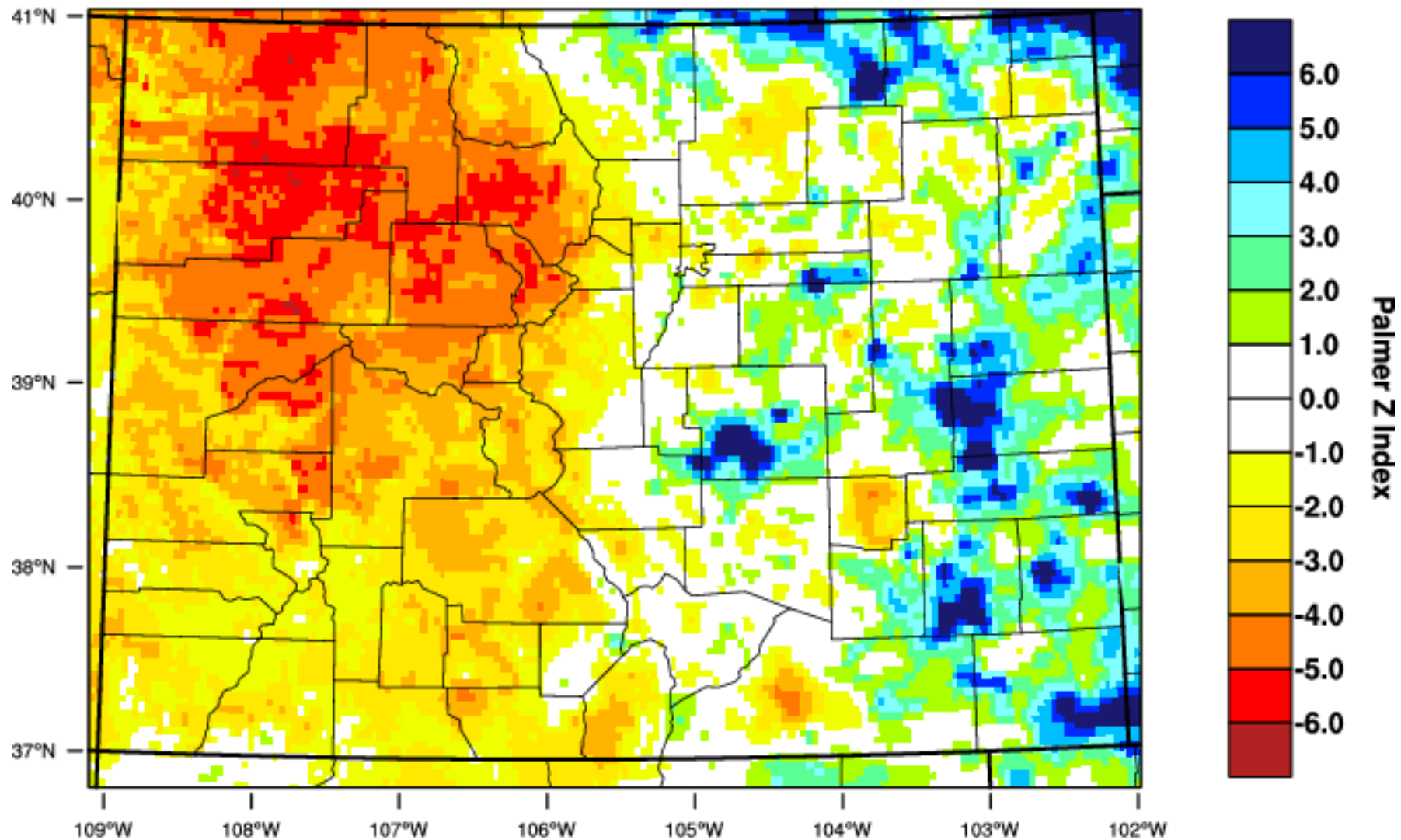


# Water-year-to-date Standardized Precipitation Index



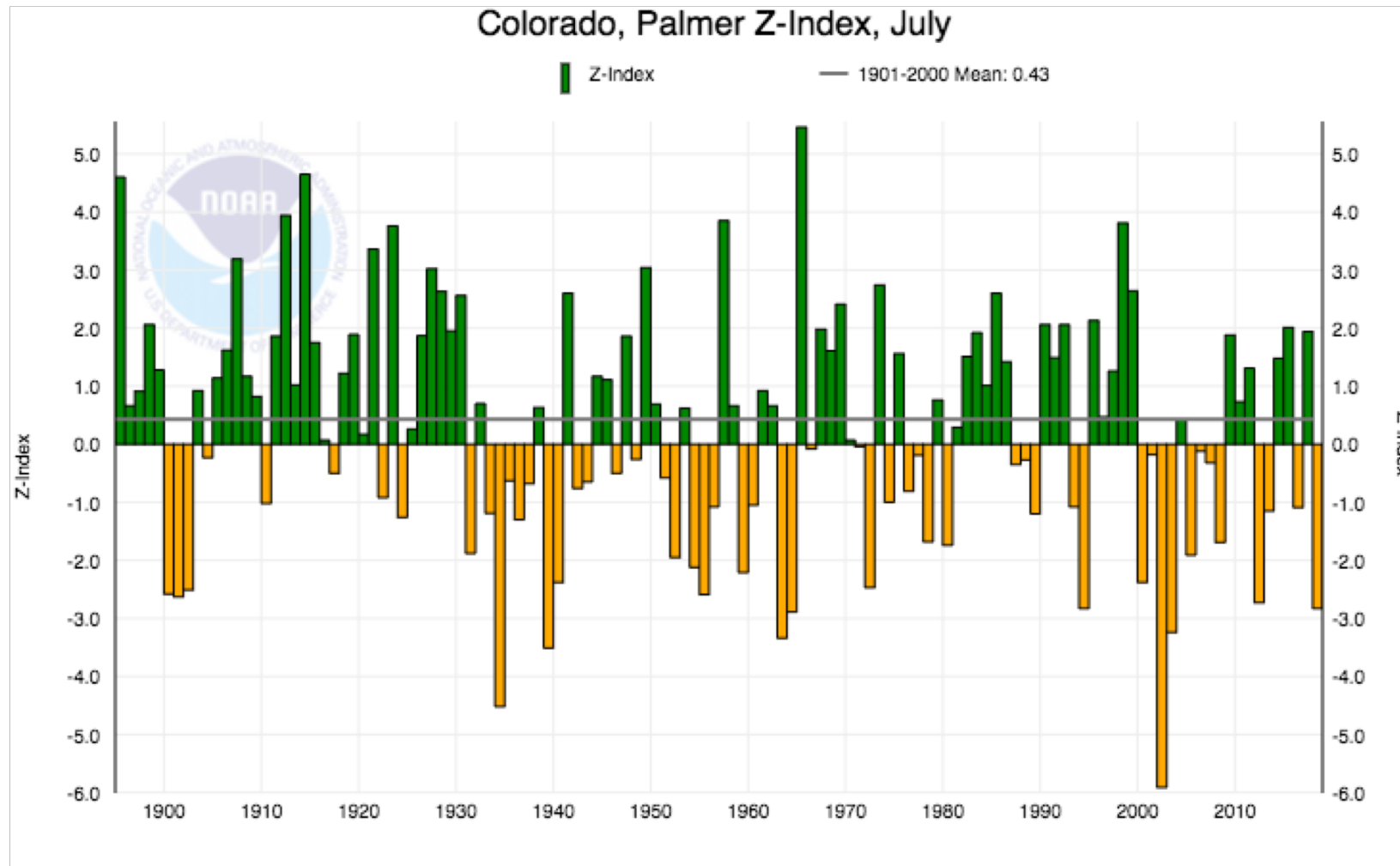
# Colorado - Palmer Z-Index

## July 2018



WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 16 AUG 2018

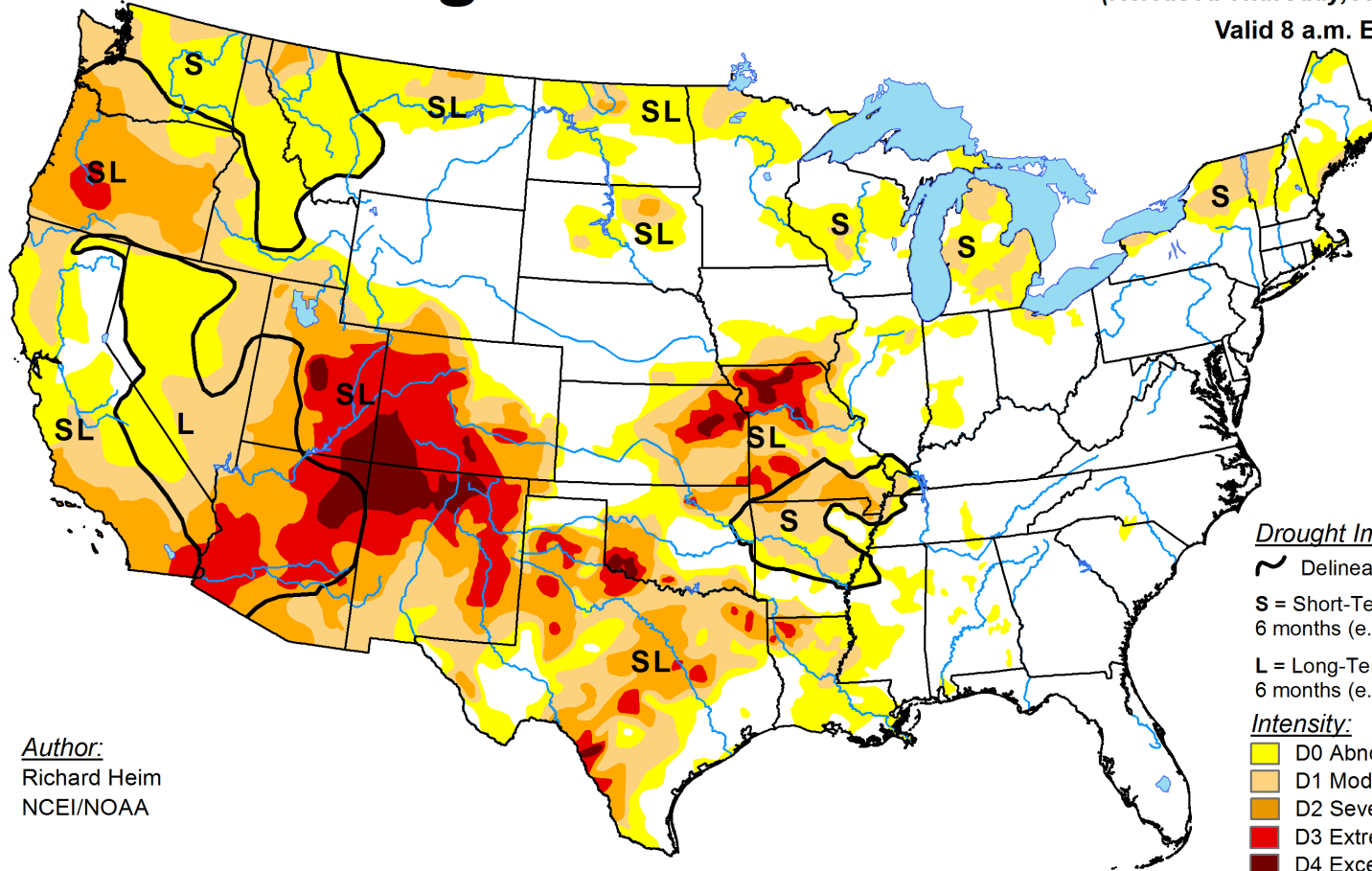




# U.S. Drought Monitor

August 14, 2018  
(Released Thursday, Aug. 16, 2018)

Valid 8 a.m. EDT



*Author:*  
Richard Heim  
NCEI/NOAA

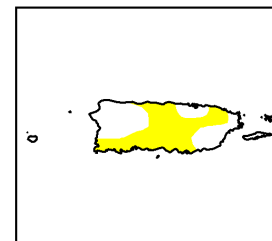
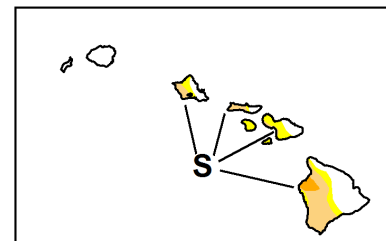
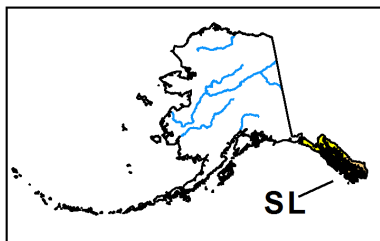
Drought Impact Types:

- ~ 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:

- 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.

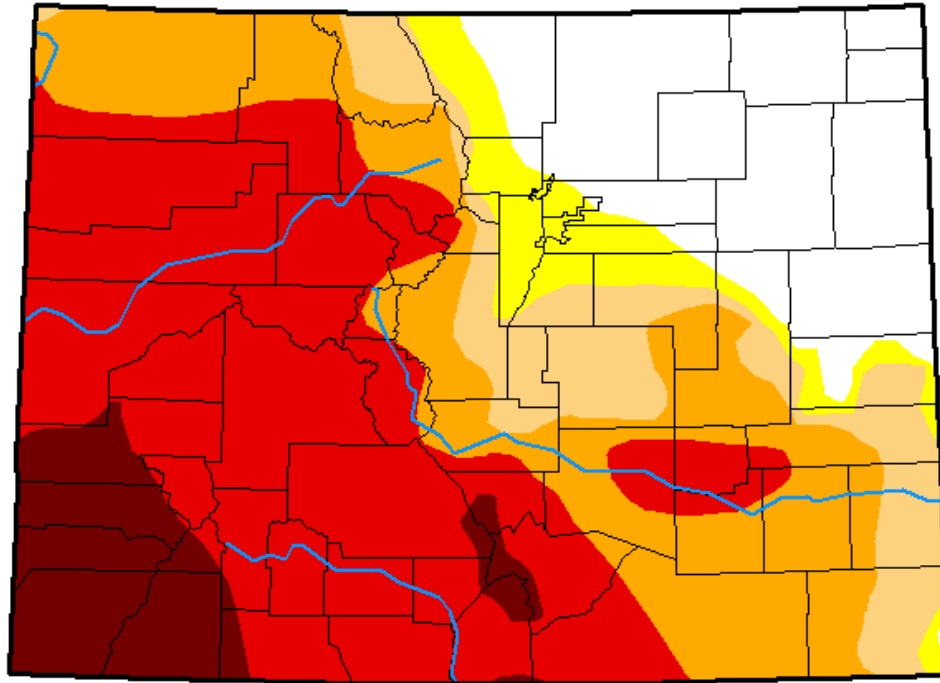


<http://droughtmonitor.unl.edu/>



# U.S. Drought Monitor Colorado

**August 14, 2018**  
(Released Thursday, Aug. 16, 2018)  
Valid 8 a.m. EDT



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	18.63	81.37	75.86	65.91	45.46	8.50
<b>Last Week</b> <i>08-07-2018</i>	18.20	81.80	75.86	64.65	35.10	8.50
<b>3 Months Ago</b> <i>05-15-2018</i>	20.49	79.51	65.53	51.14	30.89	7.79
<b>Start of Calendar Year</b> <i>01-02-2018</i>	6.57	93.43	33.53	7.27	0.00	0.00
<b>Start of Water Year</b> <i>09-26-2017</i>	67.63	32.37	3.72	0.00	0.00	0.00
<b>One Year Ago</b> <i>08-15-2017</i>	85.18	14.82	0.00	0.00	0.00	0.00

Intensity:

- 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:

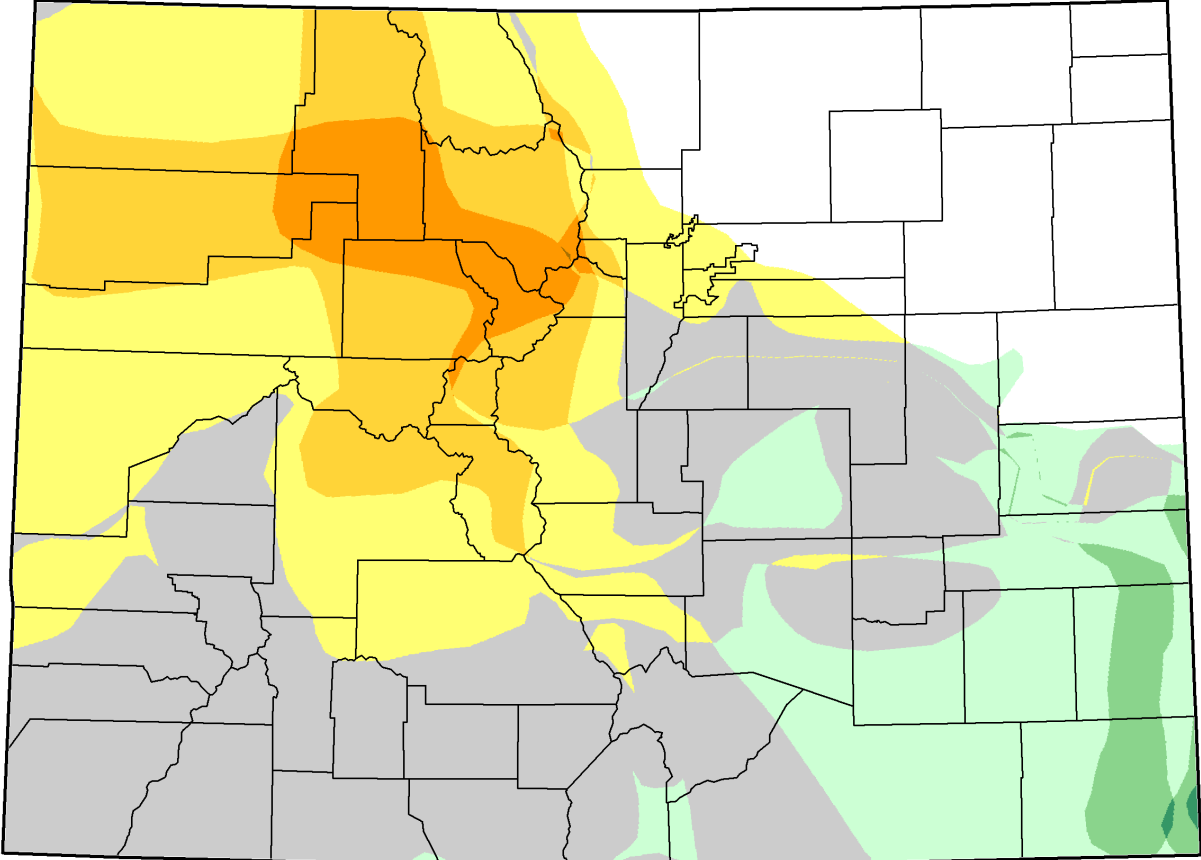
Richard Heim  
NCEI/NOAA



<http://droughtmonitor.unl.edu/>



# U.S. Drought Monitor Class Change - Colorado 2 Months

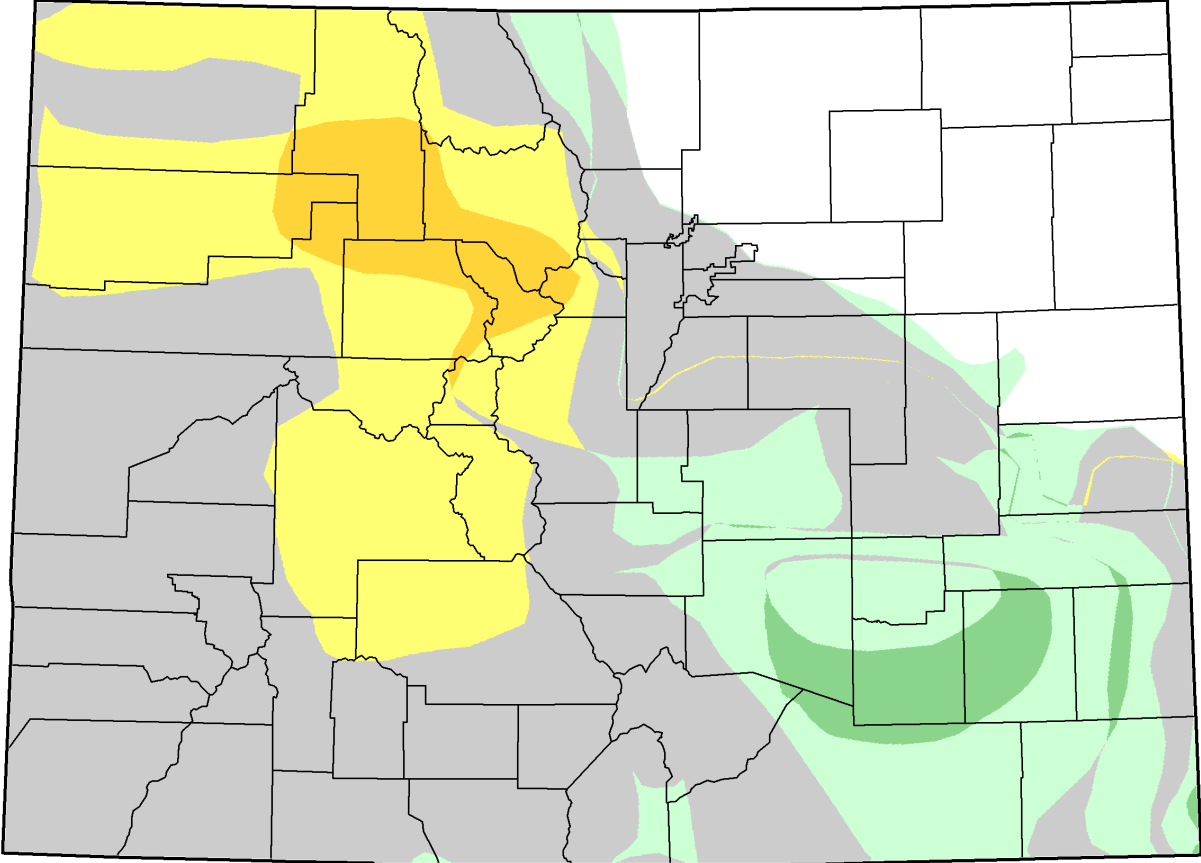


August 14, 2018  
compared to  
June 19, 2018

<http://droughtmonitor.unl.edu>



# U.S. Drought Monitor Class Change - Colorado 1 Month



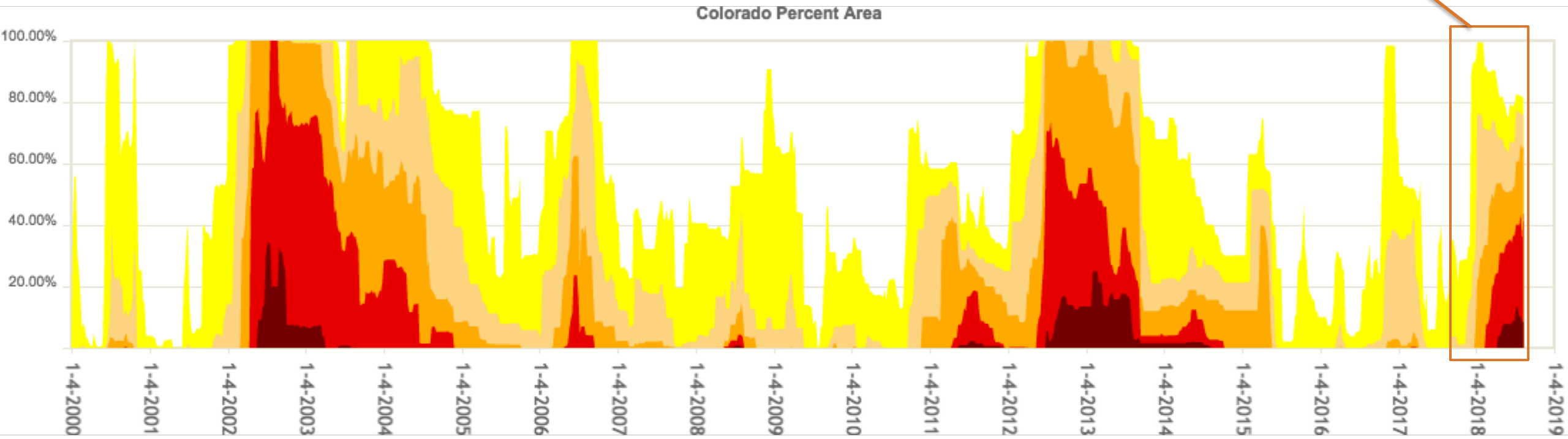
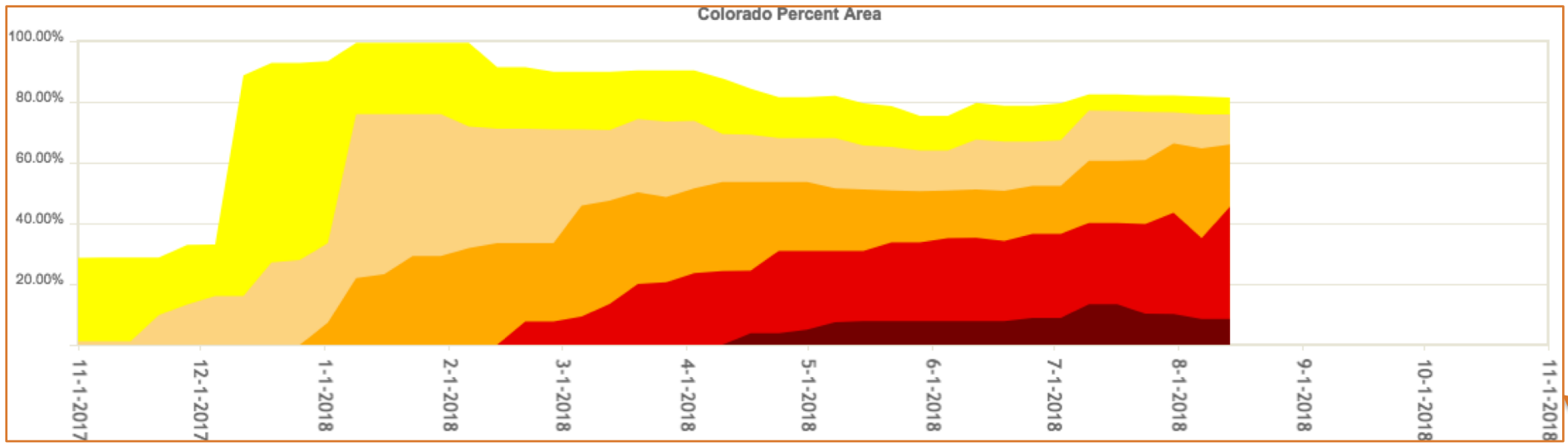
- 5 Class Degradation
- 4 Class Degradation
- 3 Class Degradation
- 2 Class Degradation
- 1 Class Degradation
- No Change
- 1 Class Improvement
- 2 Class Improvement
- 3 Class Improvement
- 4 Class Improvement
- 5 Class Improvement

August 14, 2018  
compared to  
July 17, 2018

<http://droughtmonitor.unl.edu>





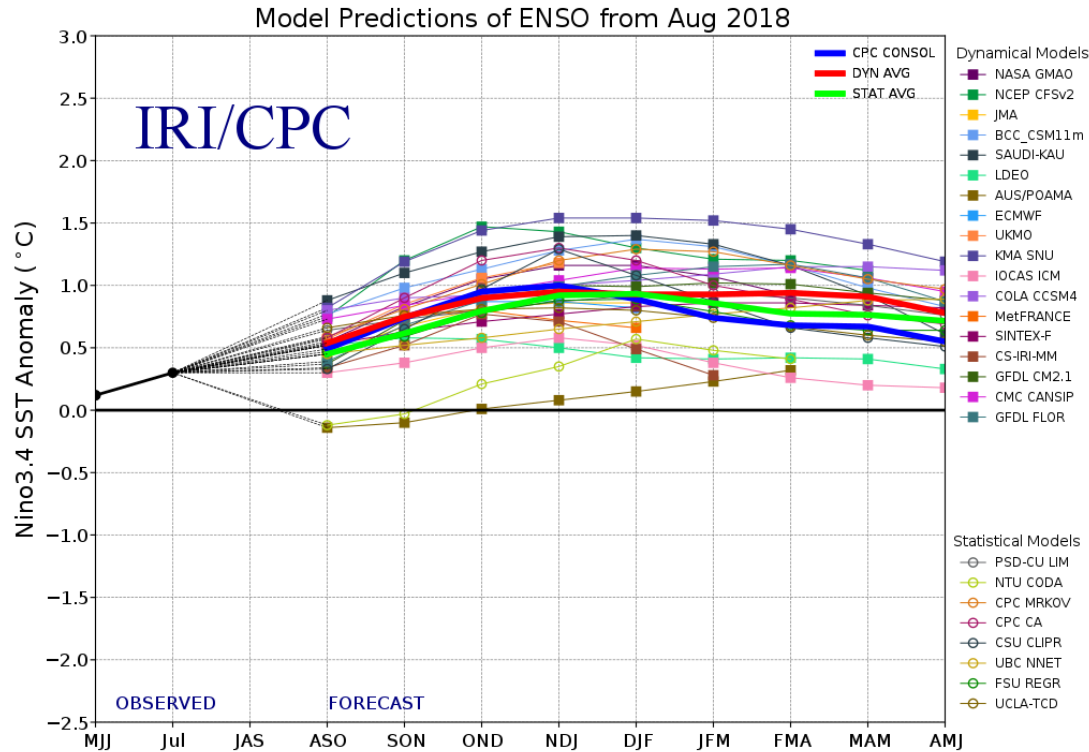




# Outlook

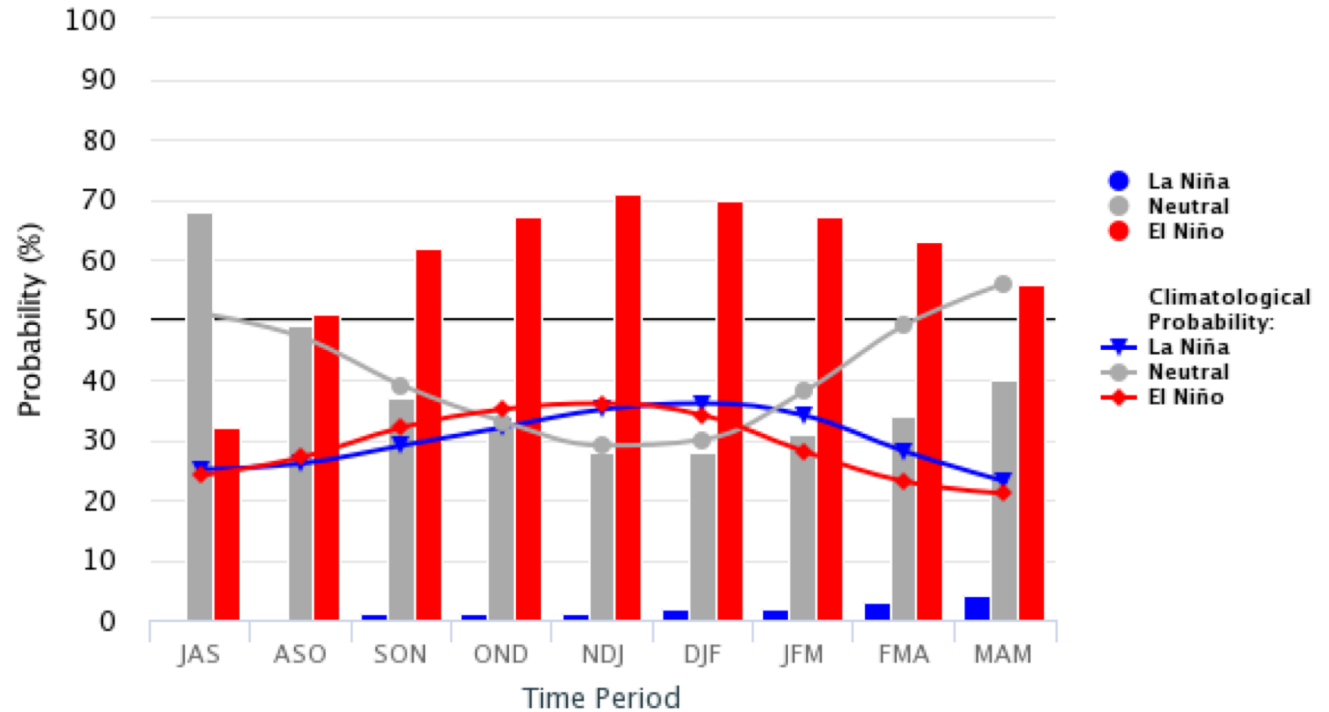


# El Niño-Southern Oscillation (ENSO)

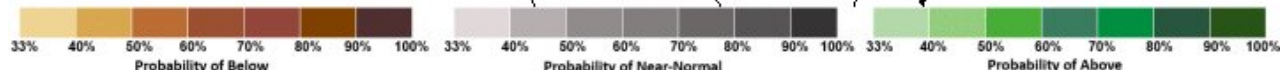
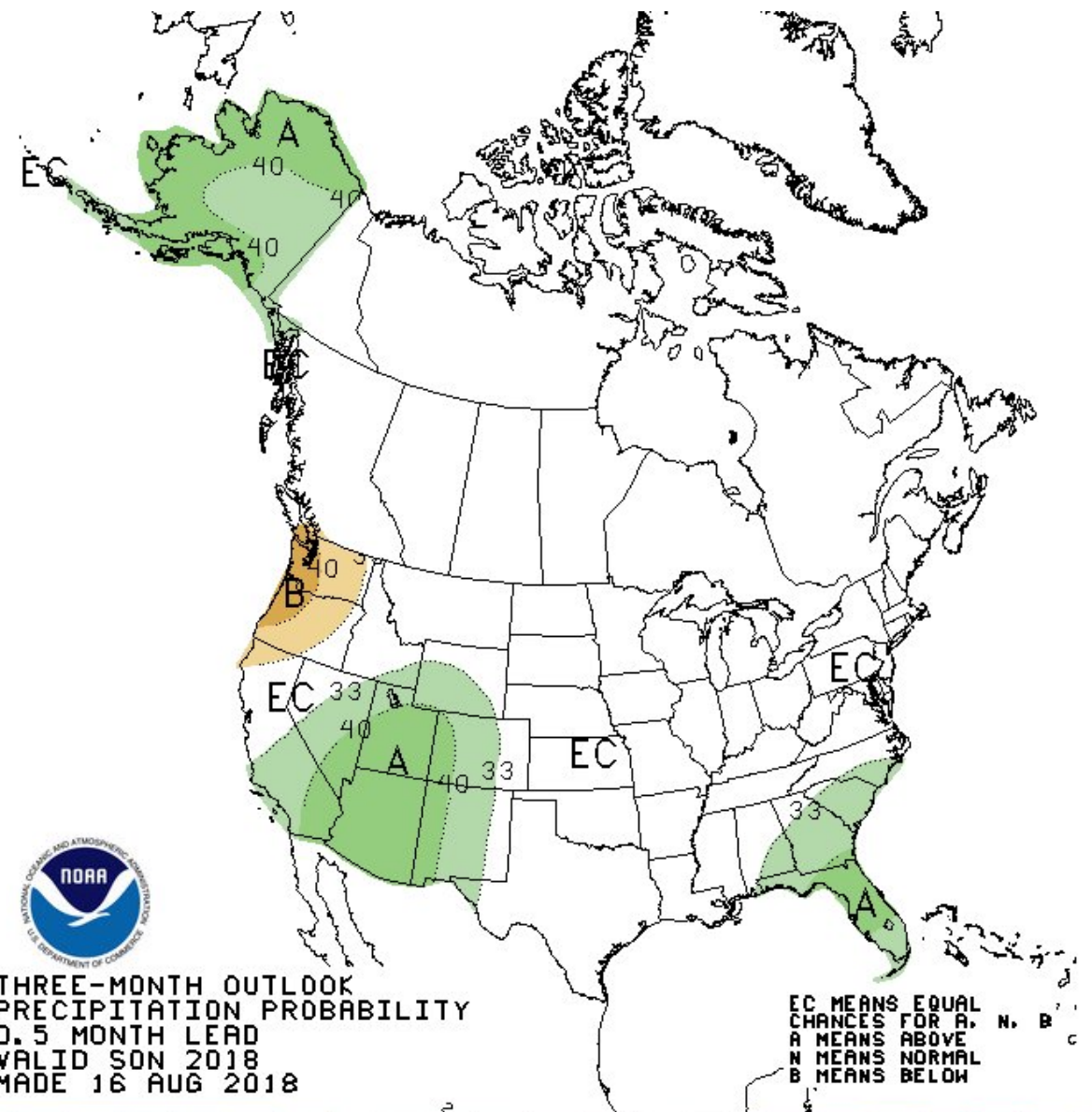
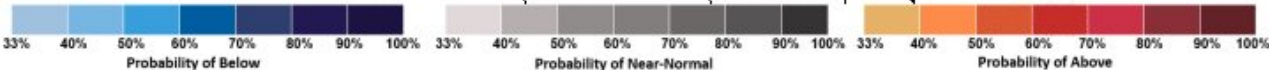
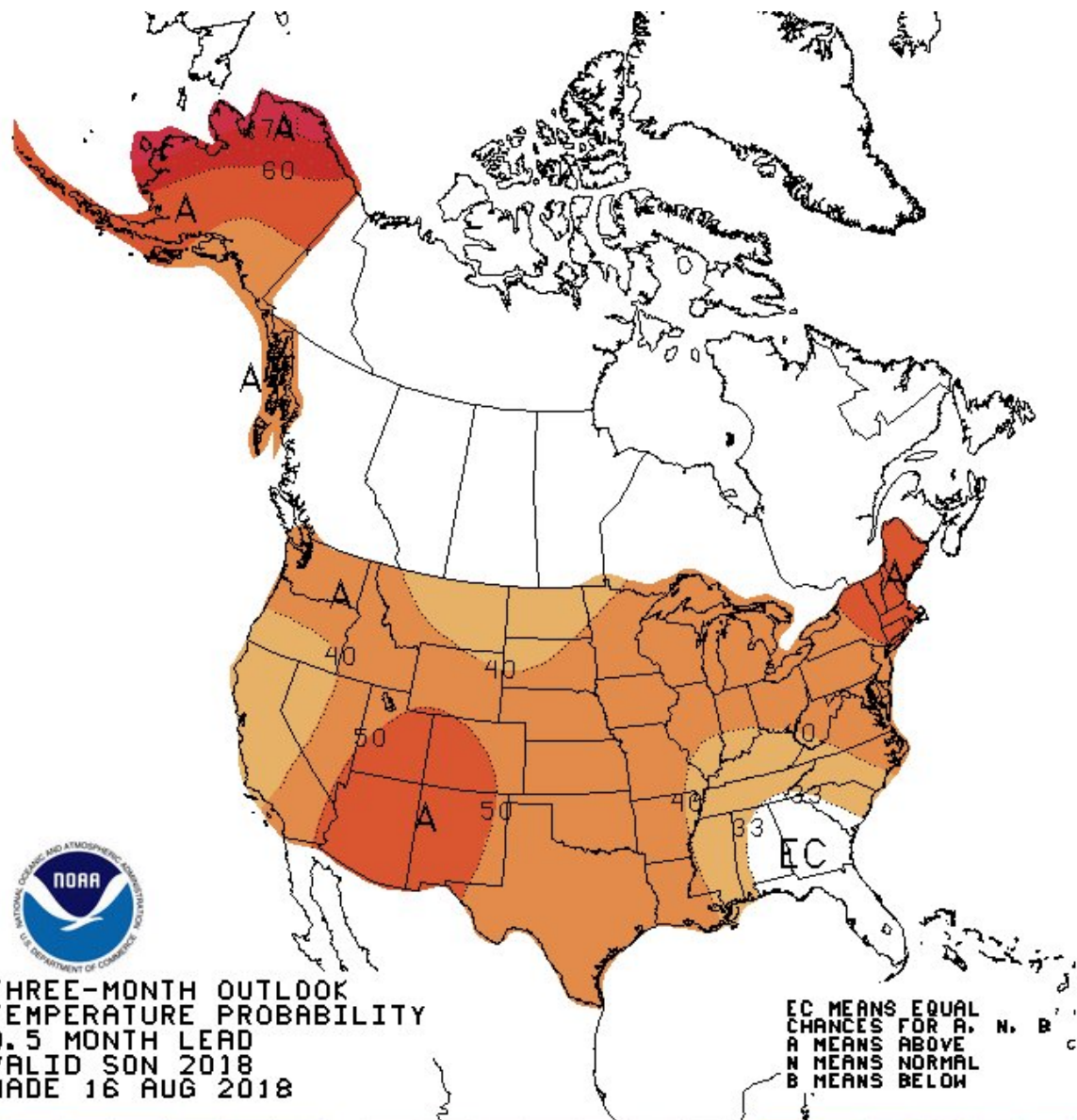


## Early-Aug CPC/IRI Official Probabilistic ENSO Forecasts

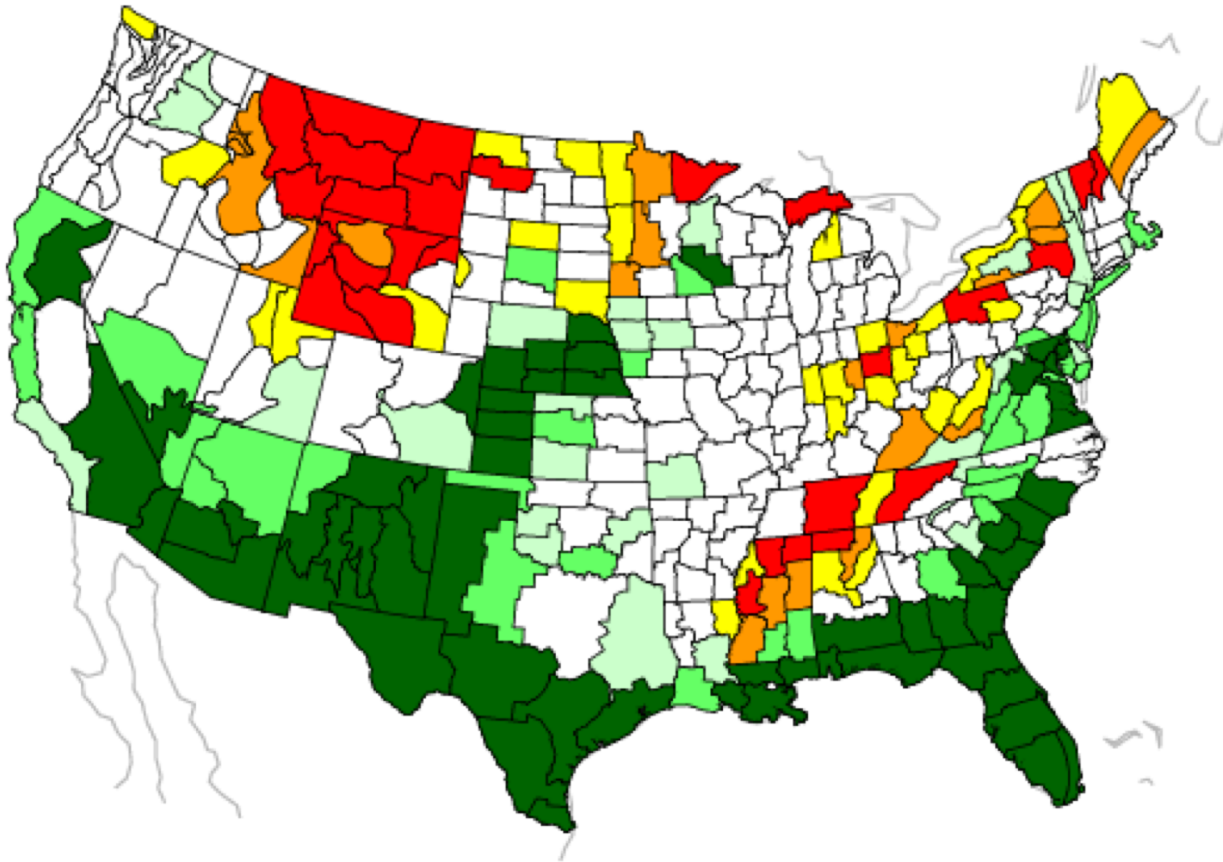
ENSO state based on NINO3.4 SST Anomaly  
Neutral ENSO: -0.5 °C to 0.5 °C



~70% chance of El Niño by late fall



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

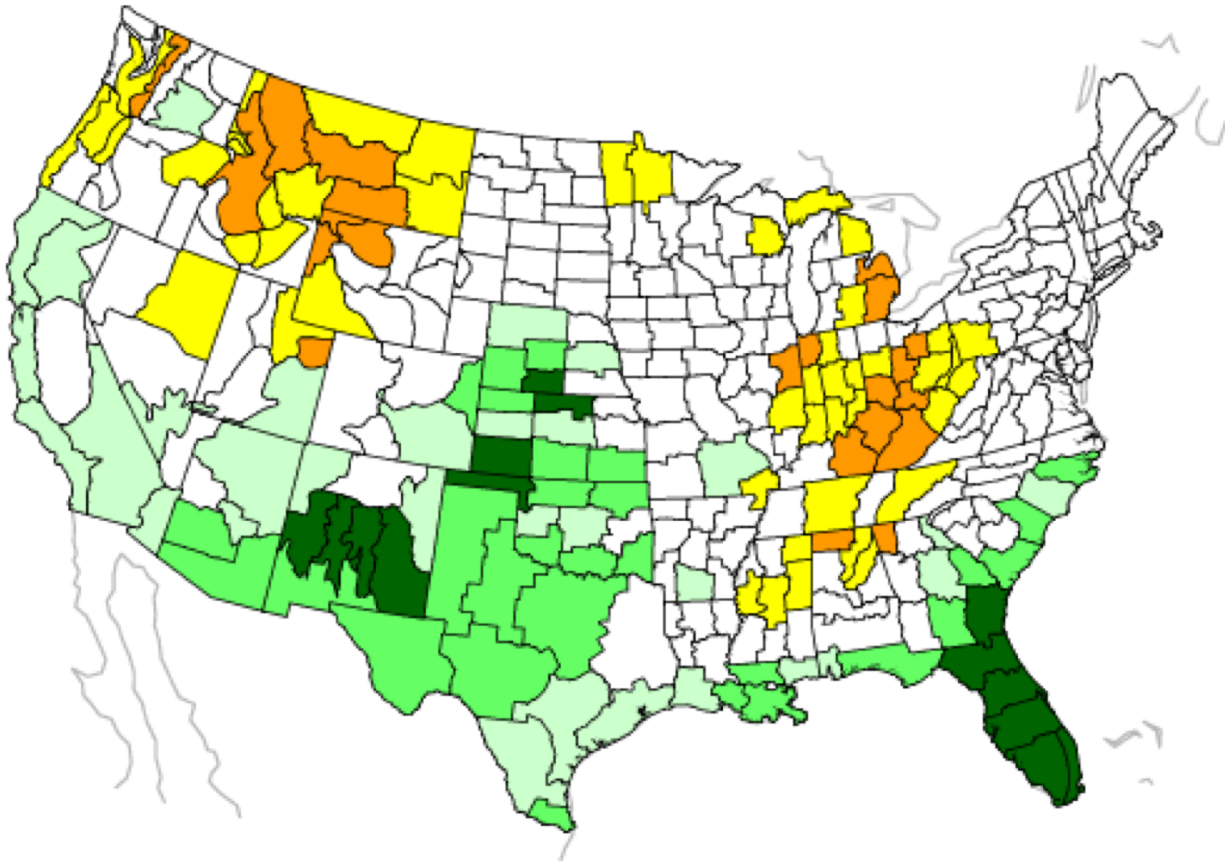


Percent (%) Increase in Risk

NOAA/ESRL/PSD

How does El Niño tilt the odds for winter extremes in Colorado?

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



Percent (%) Decrease in Risk

NOAA/ESRL/PSD

How does El Niño tilt the odds for winter extremes in Colorado?



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Thank you

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