

# Colorado Climate Center – *WATF Climate Update*

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Russ Schumacher, state climatologist

Water Availability Task Force  
August 22, 2018



Colorado State University



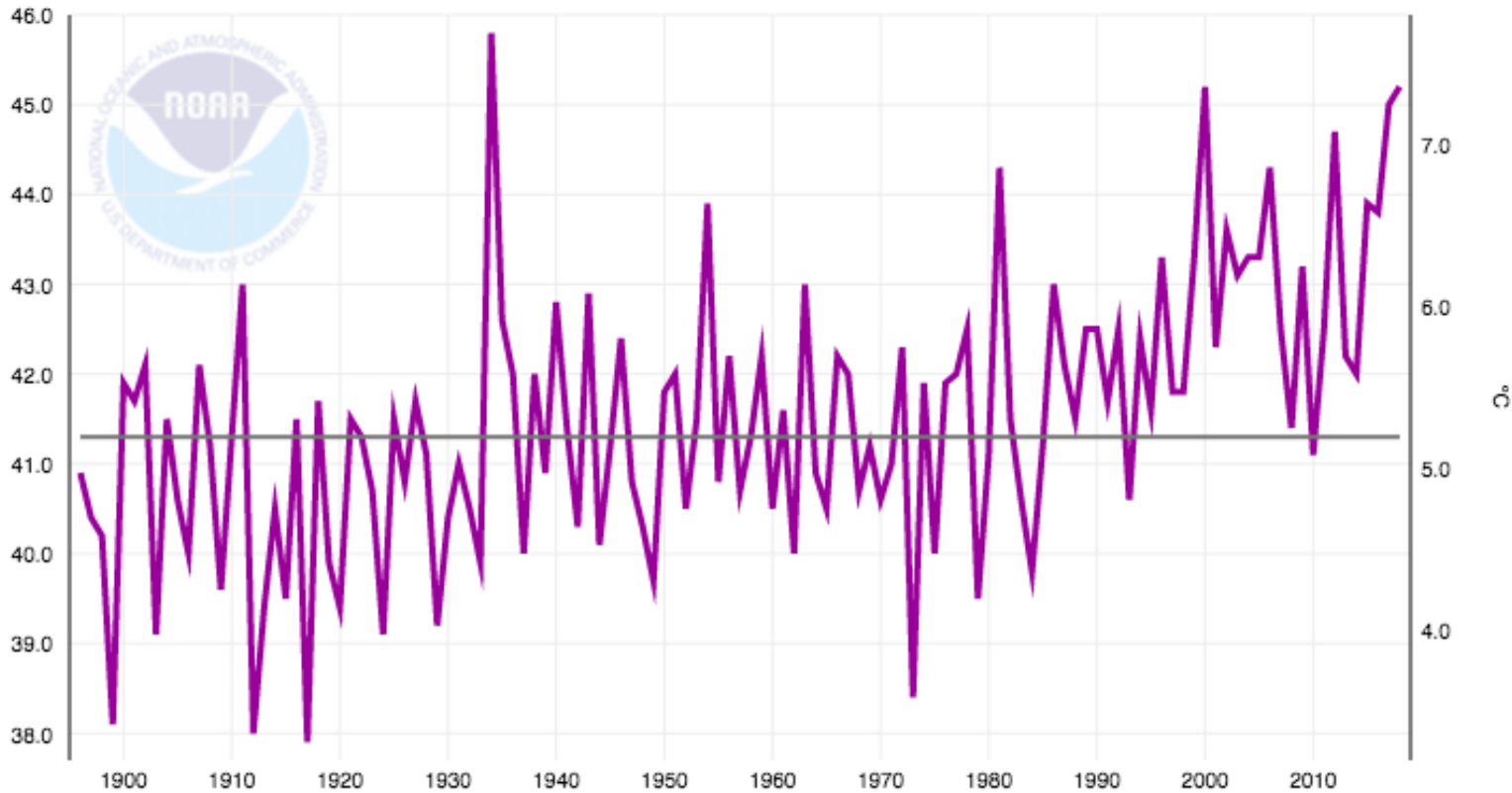
## Water Year 2018 – Temperature



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

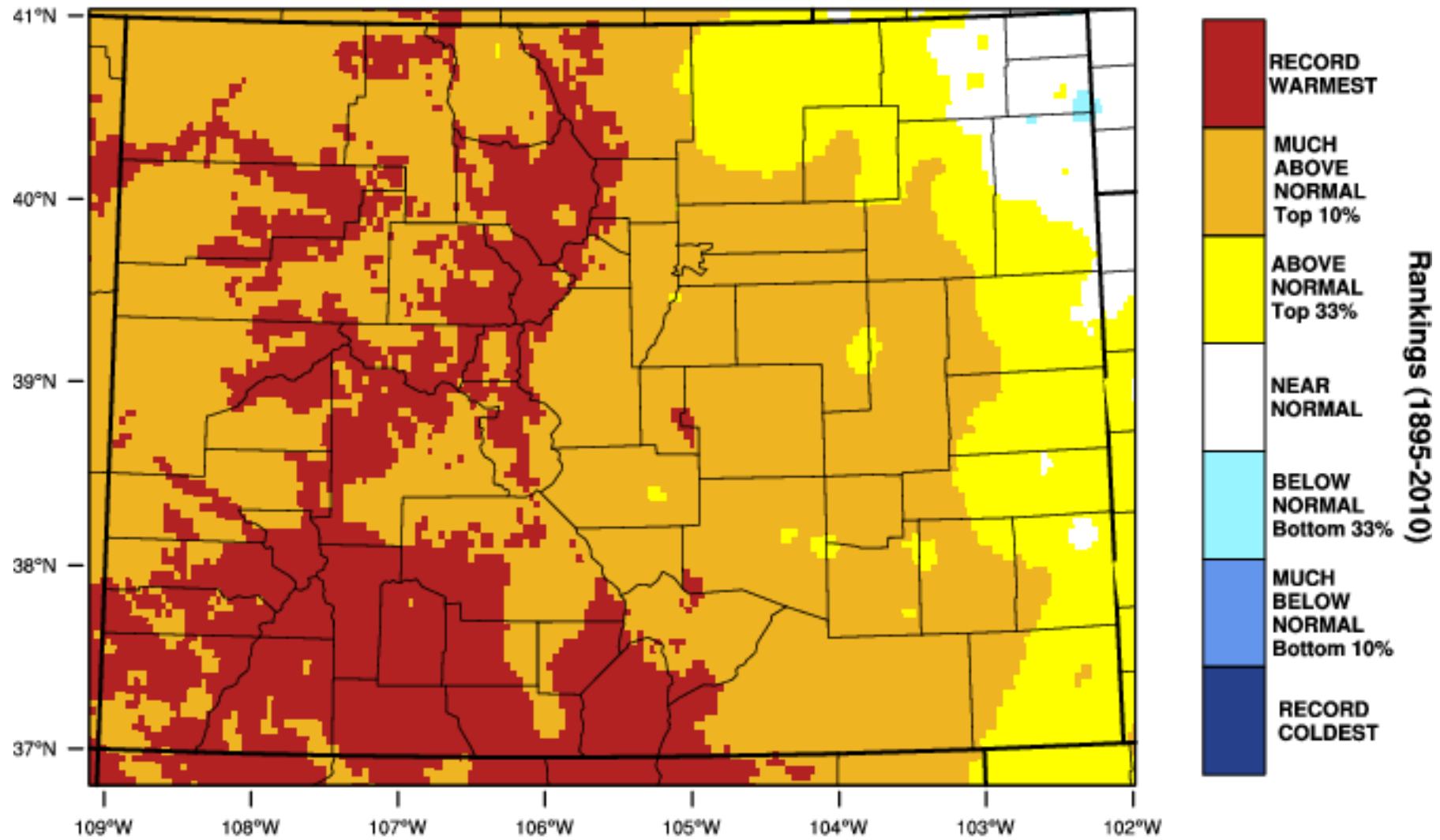


MONTH	RANK
Oct 2017	near average
Nov 2017	1 <sup>st</sup> warmest
Dec 2017	8 <sup>th</sup> warmest
Jan 2018	8 <sup>th</sup> warmest
Feb 2018	near average
Mar 2018	25 <sup>th</sup> warmest
Apr 2018	near average
May 2018	2 <sup>nd</sup> warmest
Jun 2018	3 <sup>rd</sup> warmest
Jul 2018	10 <sup>th</sup>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



# Colorado - Mean Temperature

## October-July 2018 Percentile

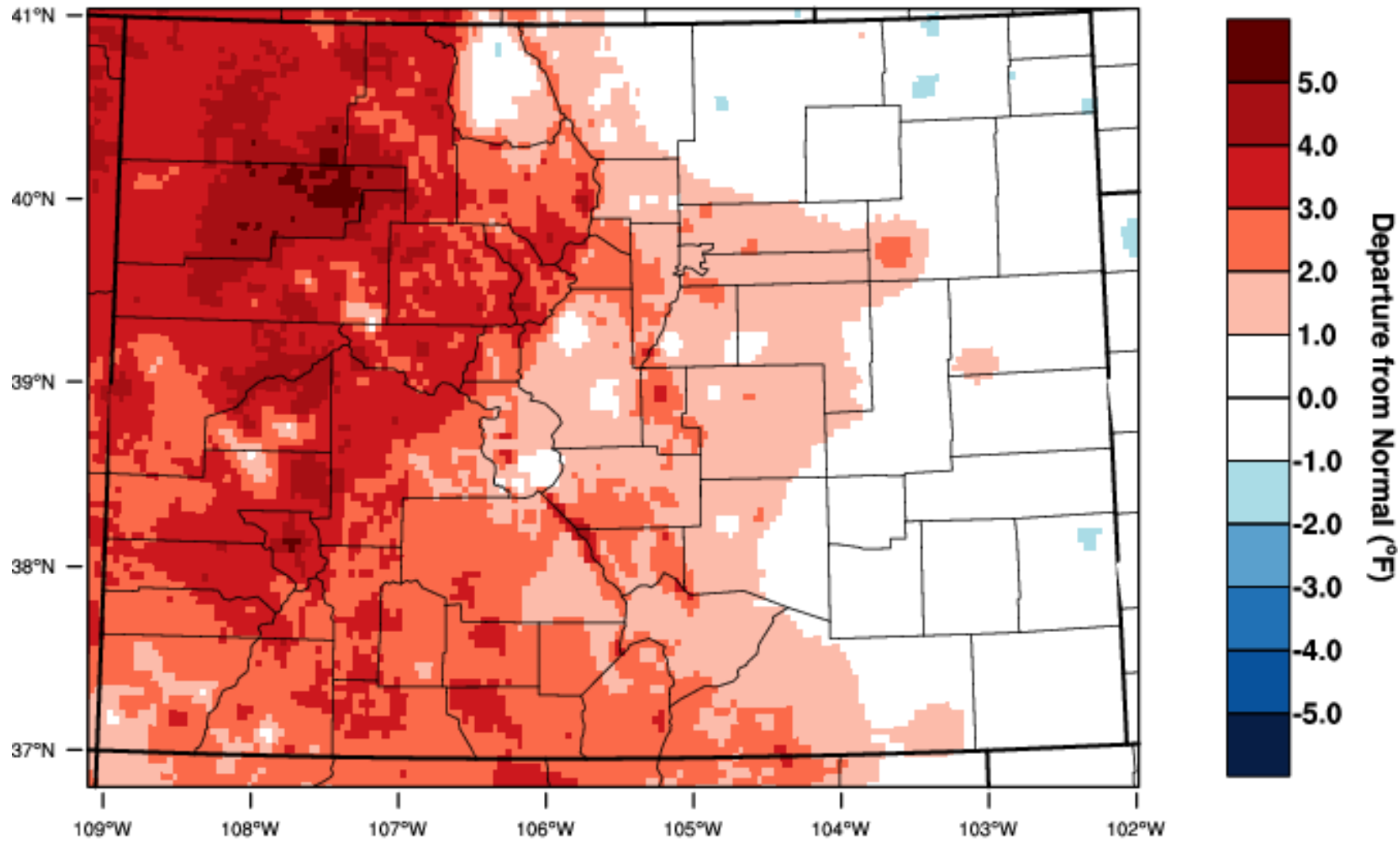


WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 16 AUG 2018



# Colorado - Mean Temperature

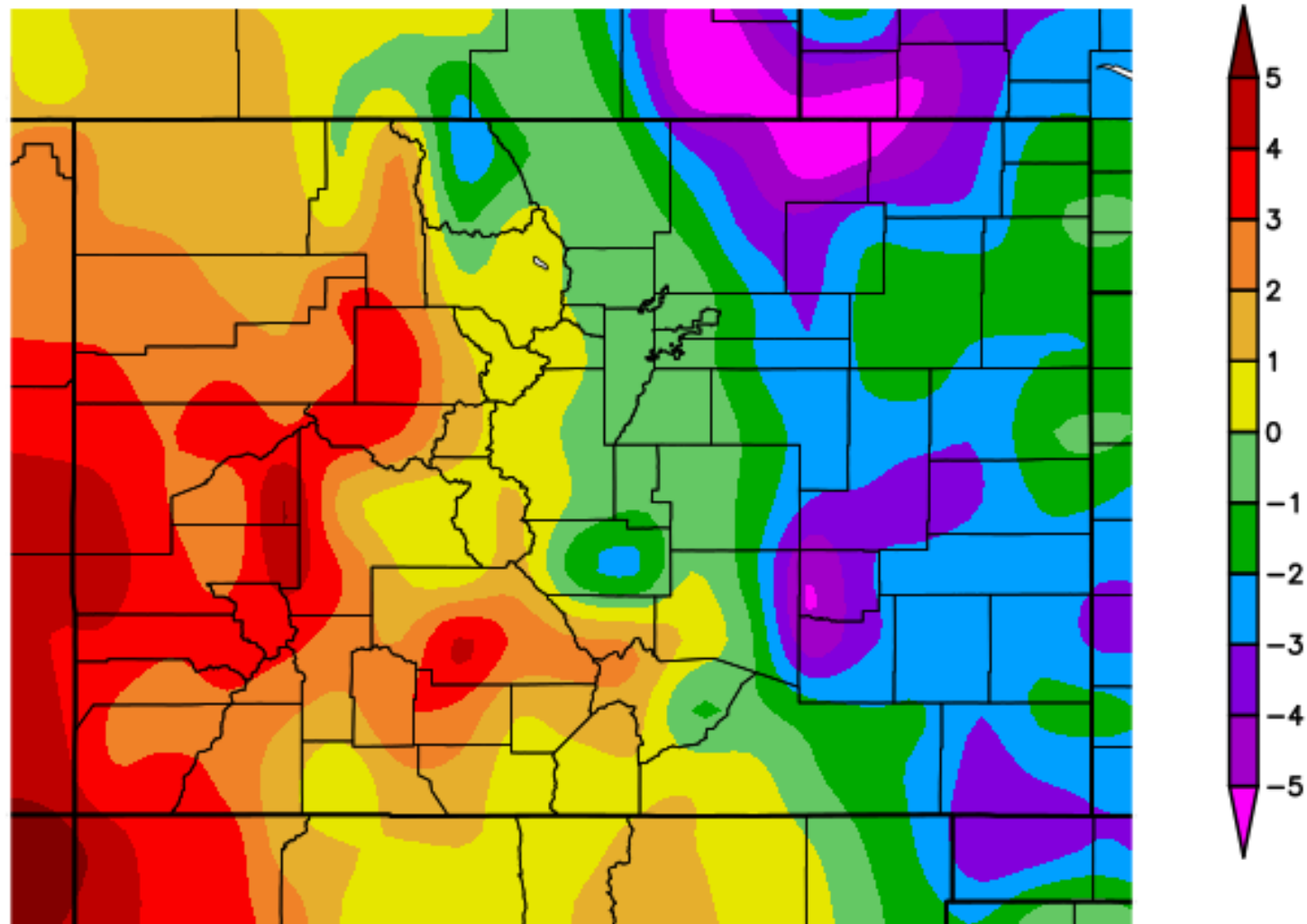
## July 2018 Departure from 1981-2010 Normal



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.

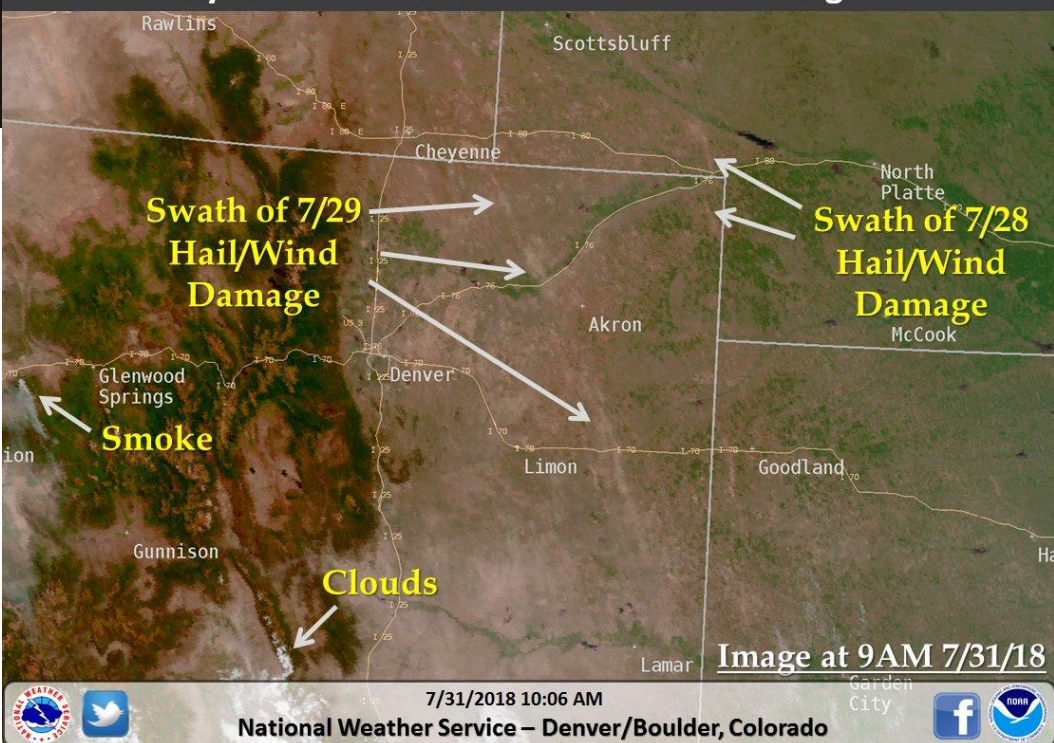
NOAA Regional Climate Centers



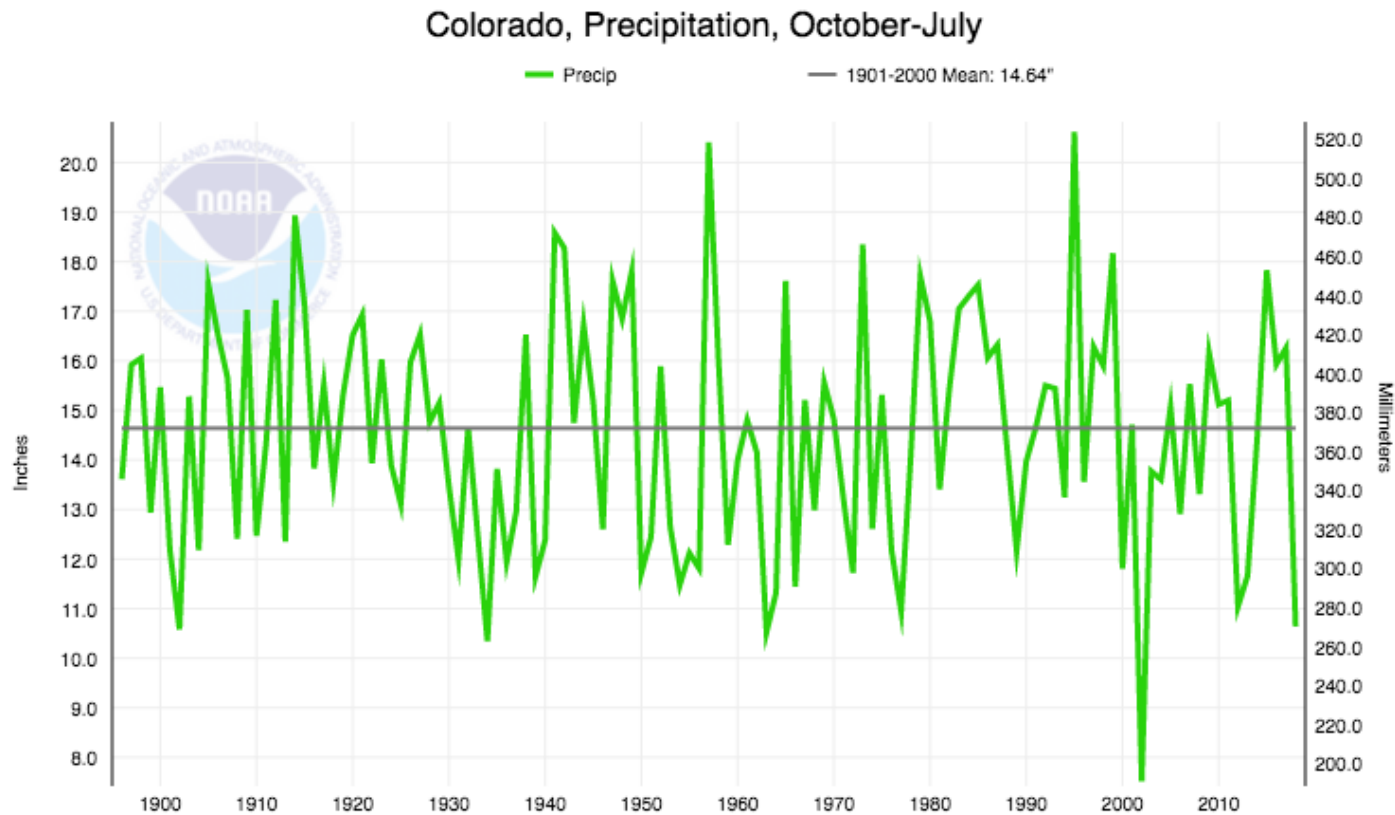


## Water Year 2018 – Precipitation

Synthetic True Color Visible Satellite Image



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

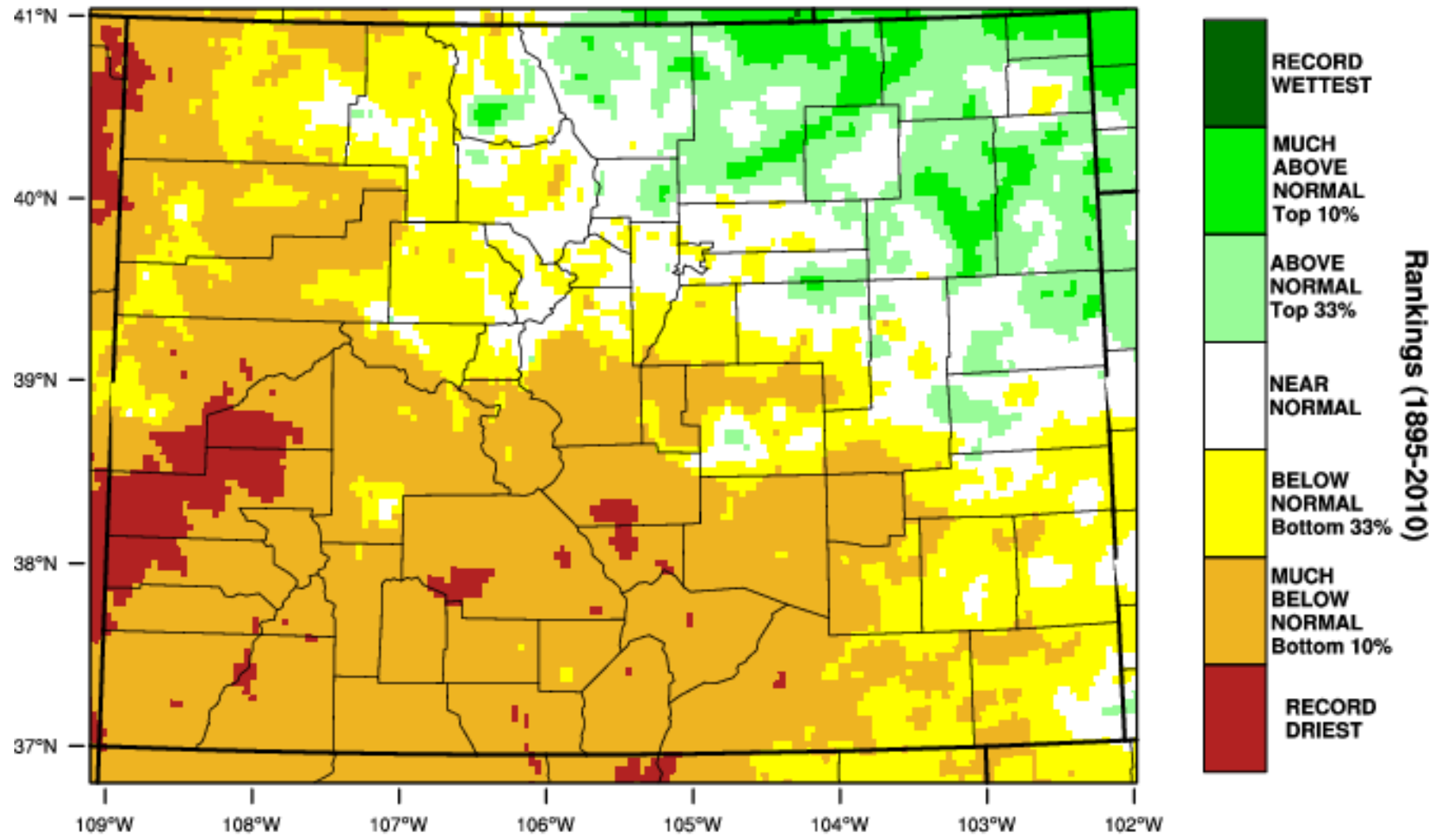


MONTH	RANK
Oct 2017	37 <sup>th</sup> driest
Nov 2017	18 <sup>th</sup> driest
Dec 2017	7 <sup>th</sup> driest
Jan 2018	37 <sup>th</sup> driest
Feb 2018	near average
Mar 2018	26 <sup>th</sup> driest
Apr 2018	34 <sup>th</sup> driest
May 2018	38 <sup>th</sup> driest
Jun 2018	26 <sup>th</sup> driest
Jul 2018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



# Colorado - Precipitation

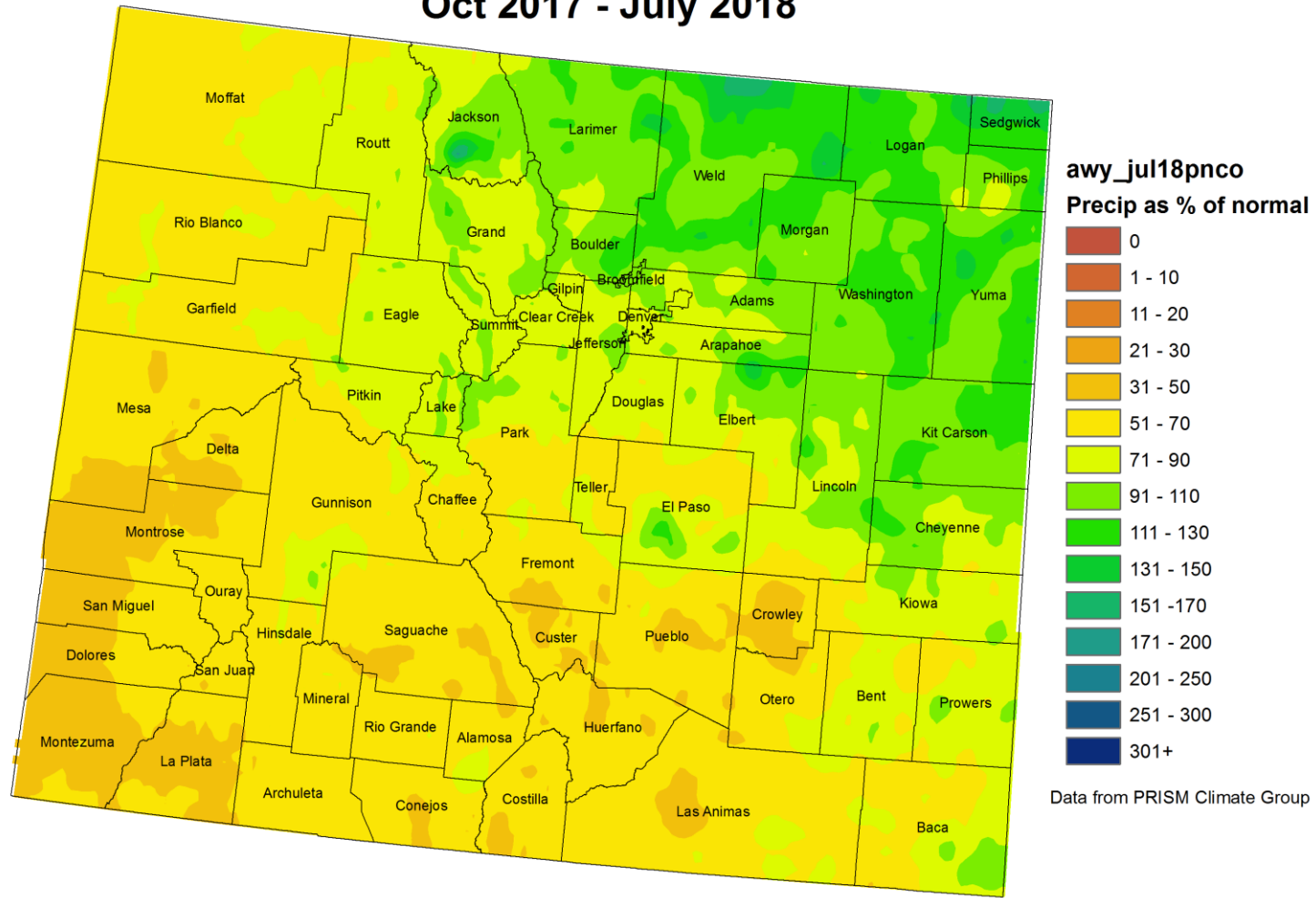
## October-July 2018 Percentile



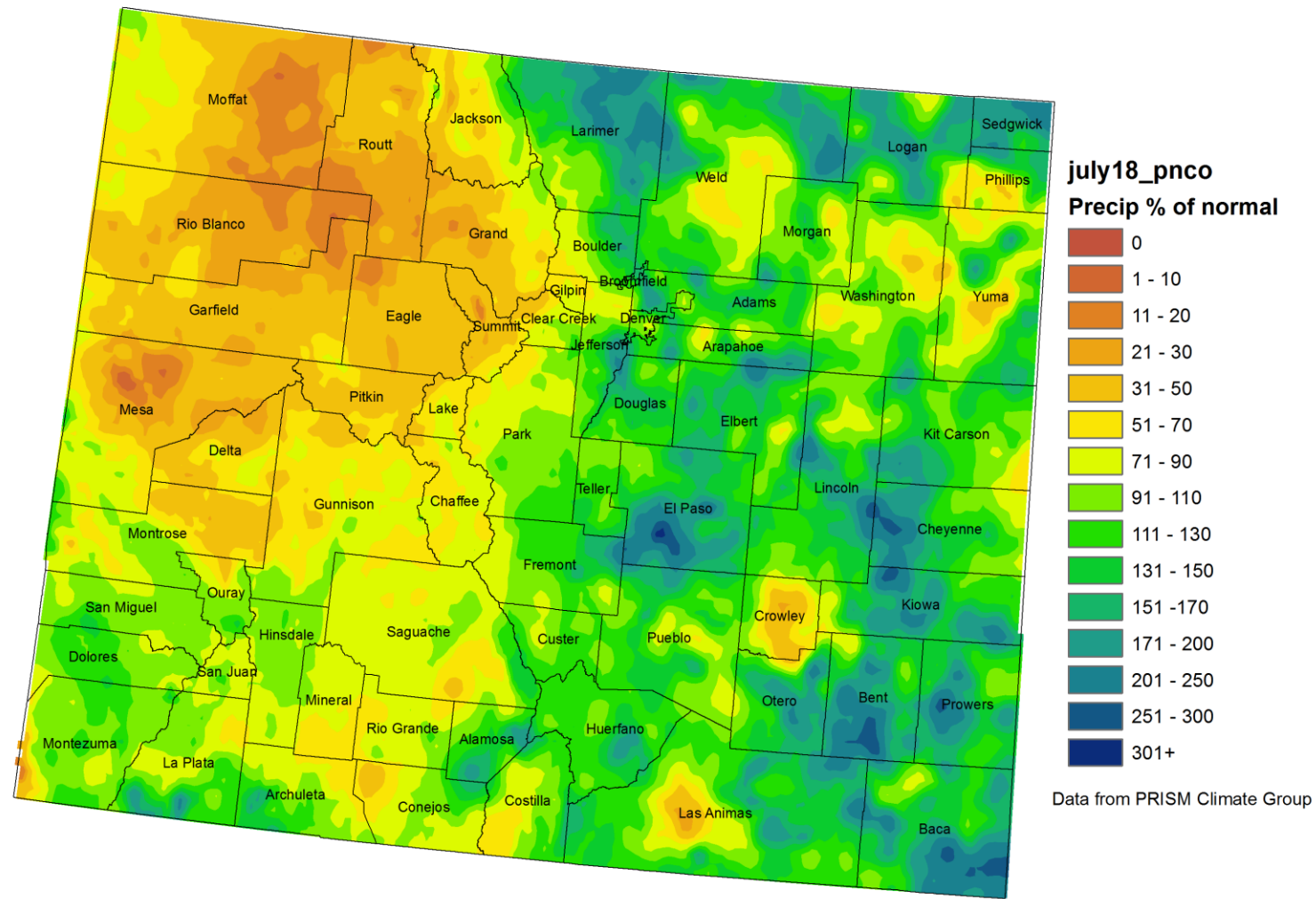
WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 16 AUG 2018



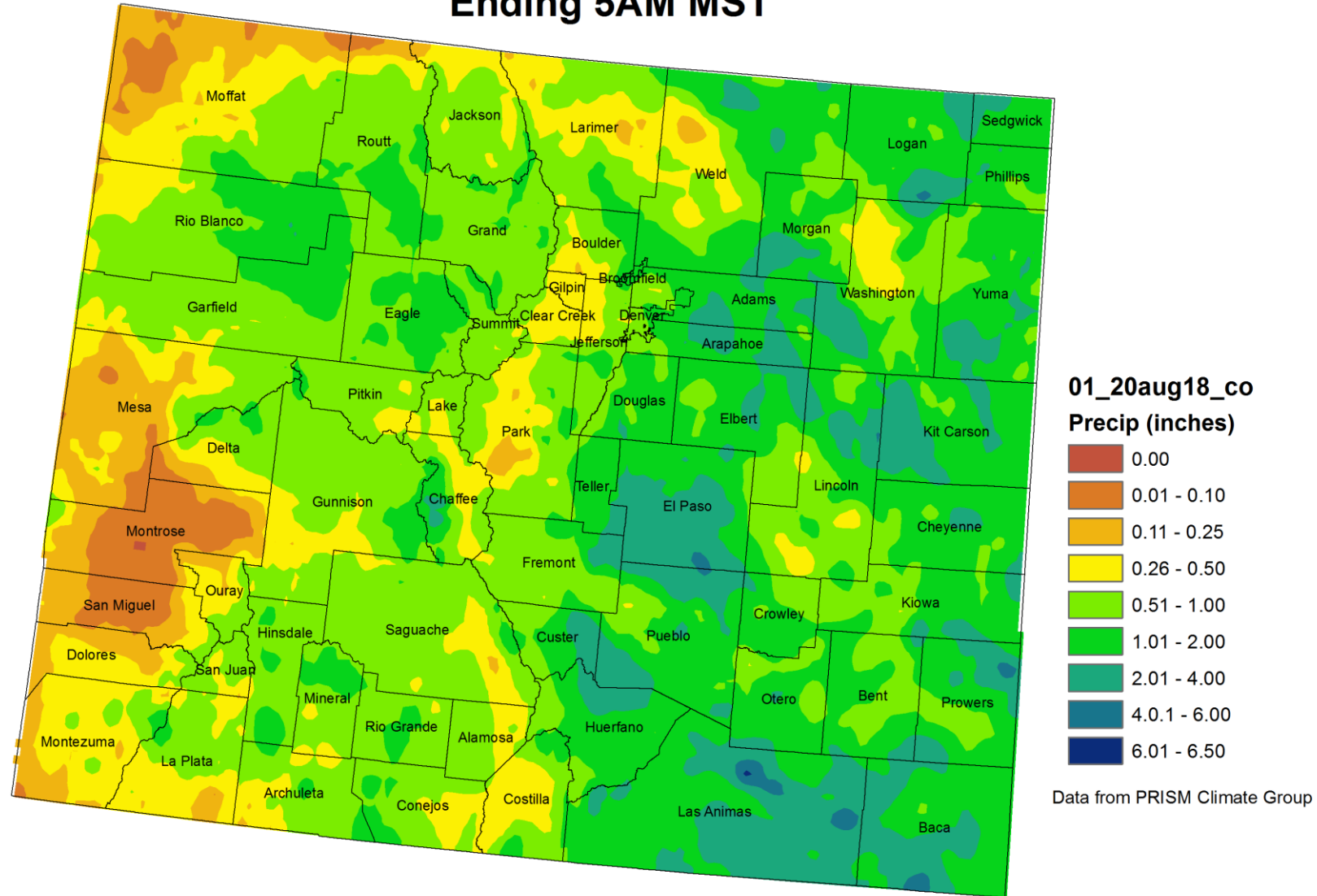
# Colorado Water Year 2018 Precipitation as a Percentage of Normal Oct 2017 - July 2018



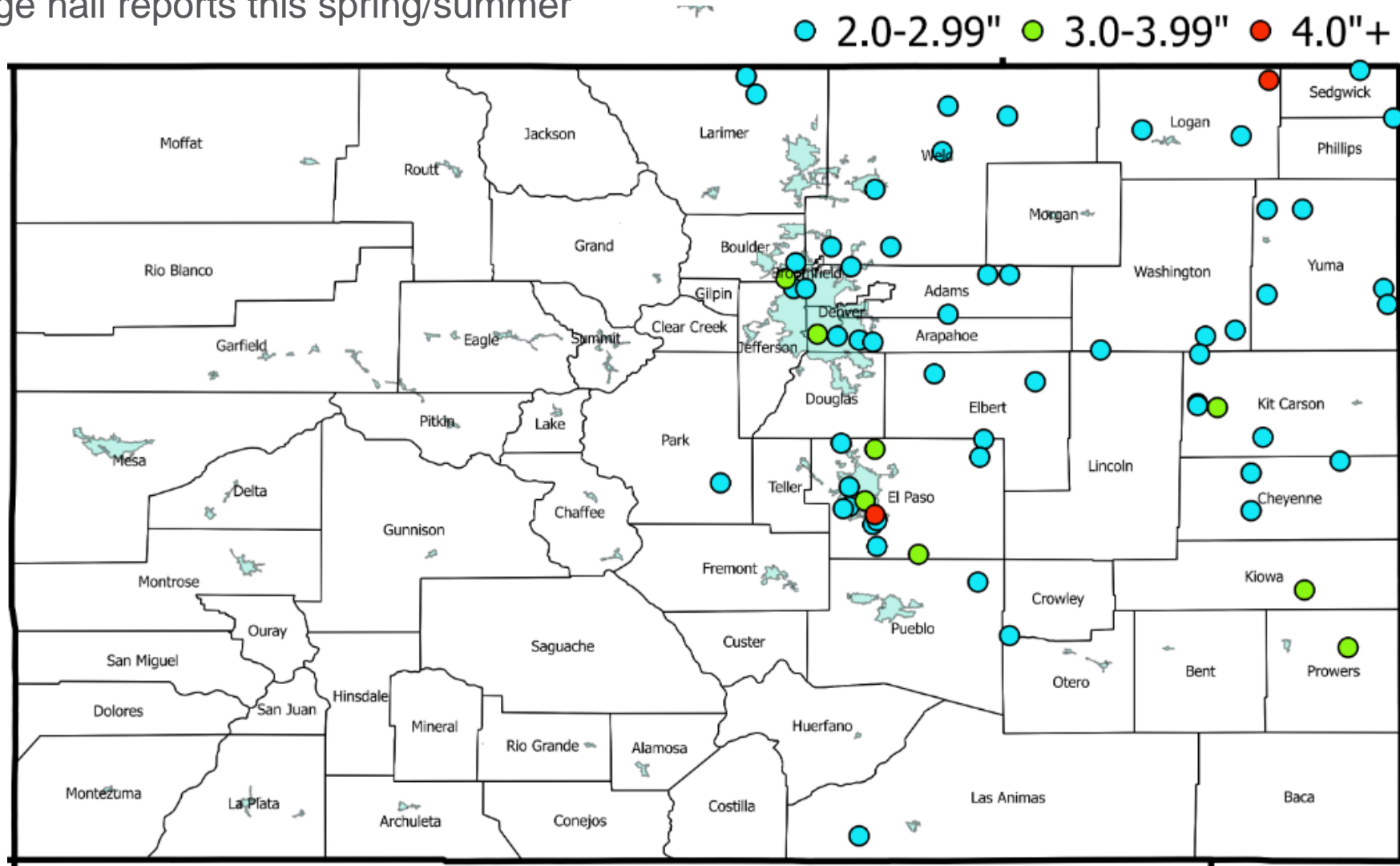
# Colorado July 2018 Precipitation as a Percentage of Normal



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



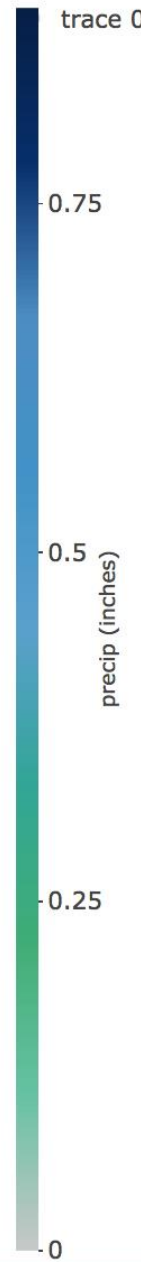
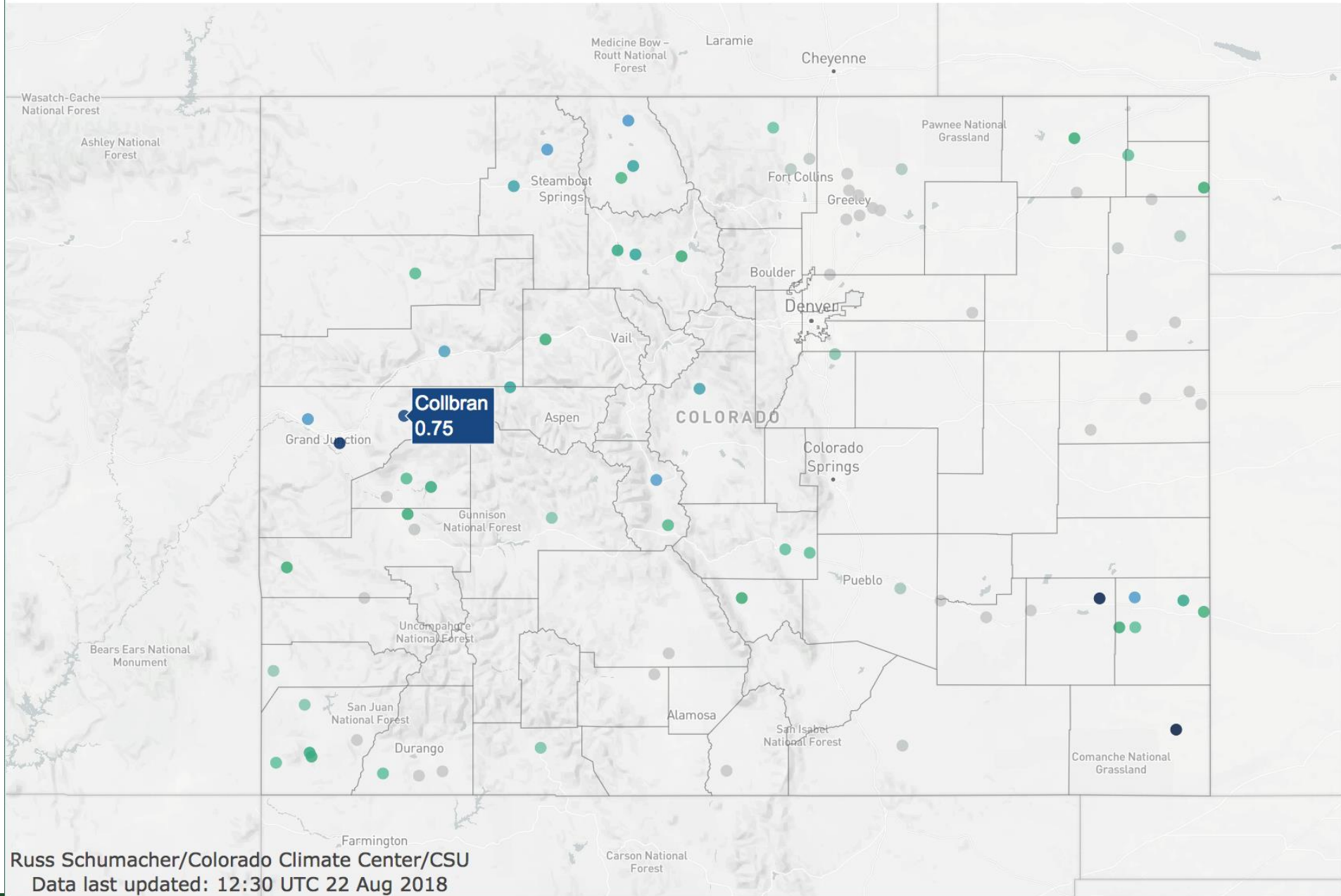
# Large hail reports this spring/summer



(courtesy of Sam Childs, CSU)



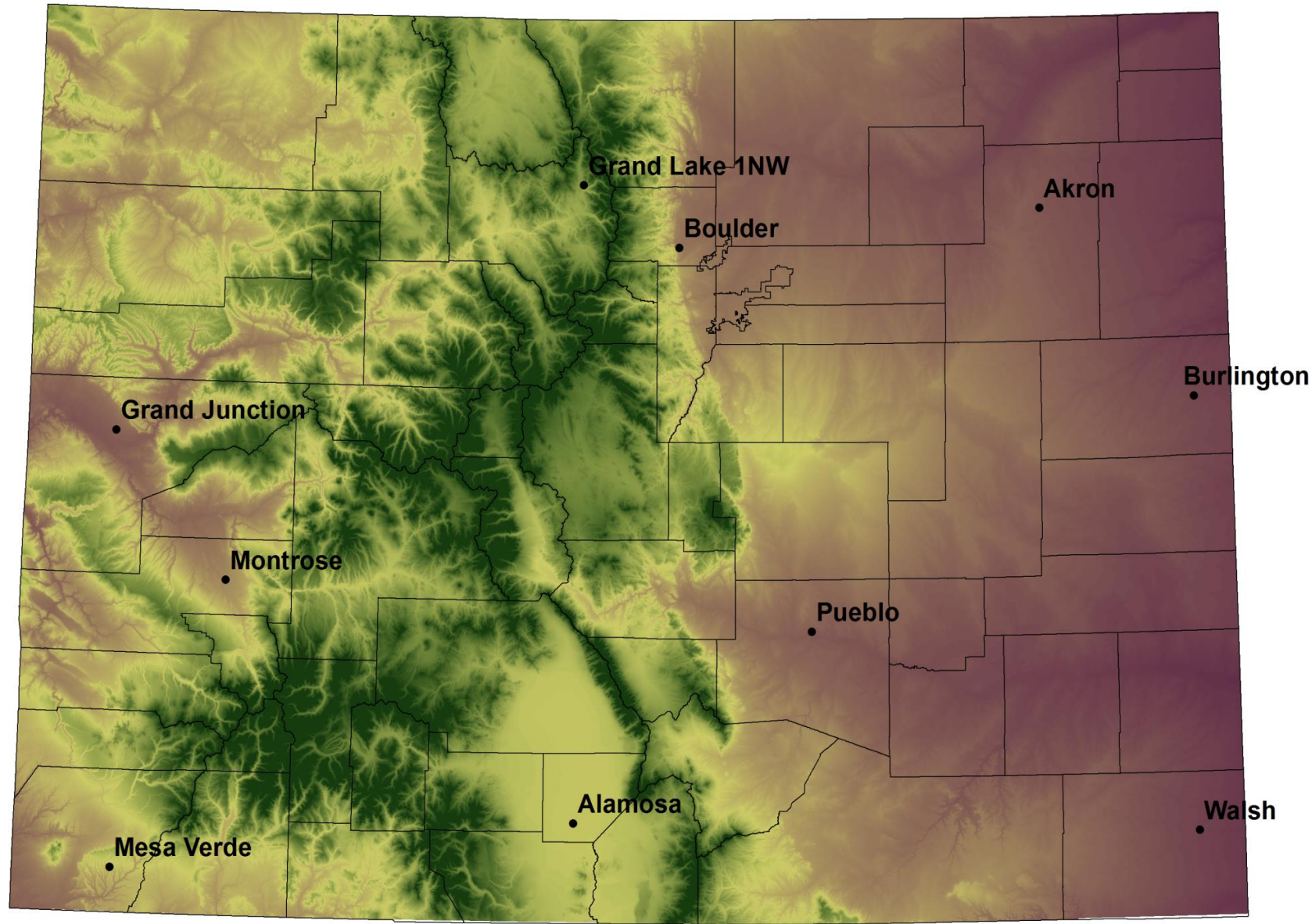
A welcome sight in western Colorado yesterday!



Russ Schumacher/Colorado Climate Center/CSU  
Data last updated: 12:30 UTC 22 Aug 2018



# NWS Cooperative Stations for WATF

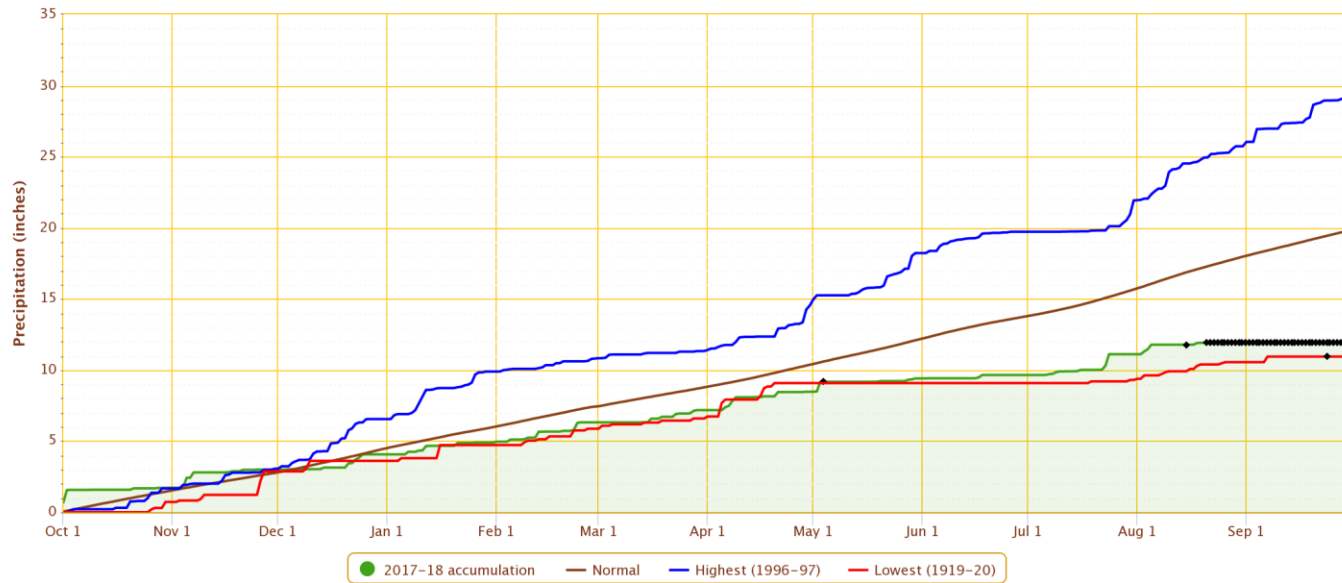


## Water Year 2018 – Station Updates



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

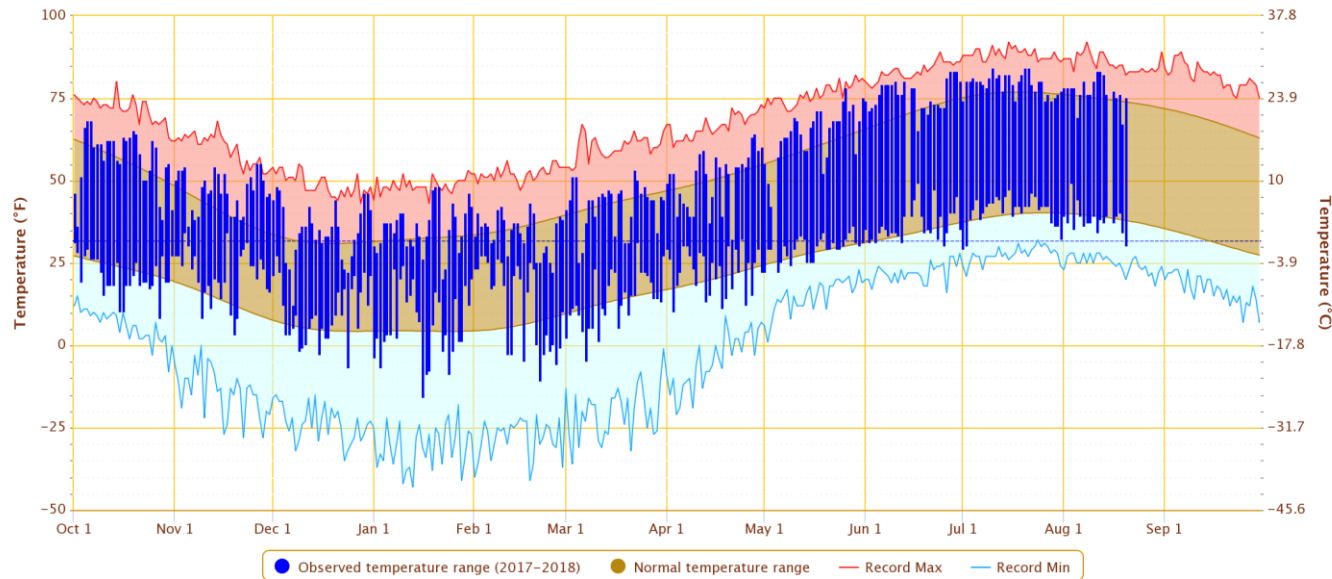
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



Powered by ACIS

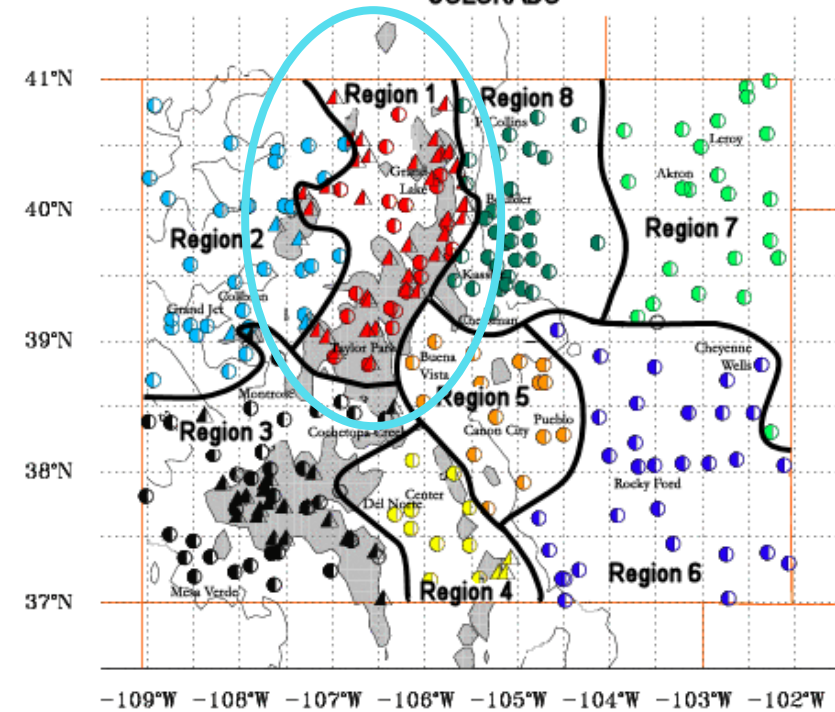
### Daily Temperature Data - GRAND LAKE 1 NW, CO

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



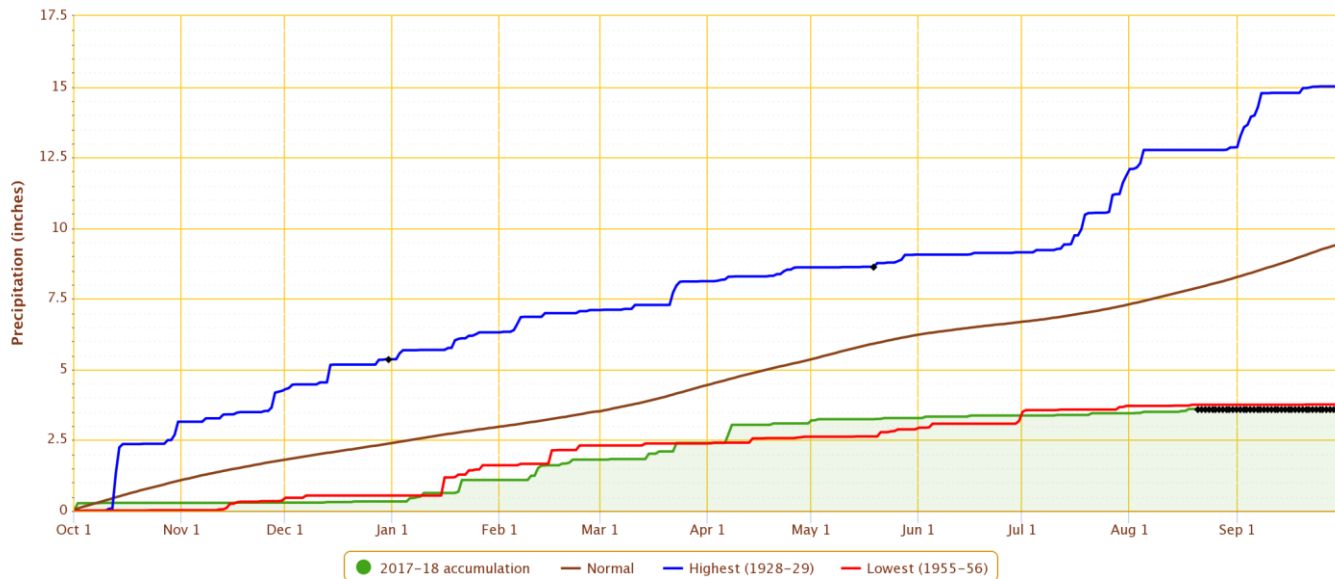
Powered by ACIS

### COLORADO



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

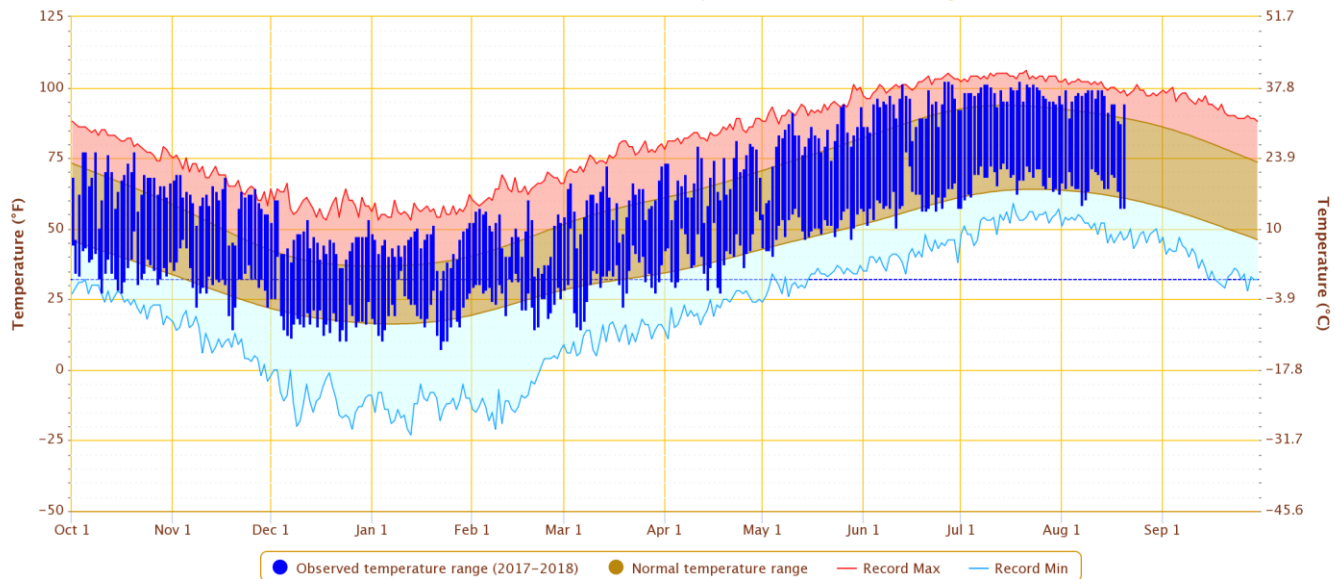
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



Powered by ACIS

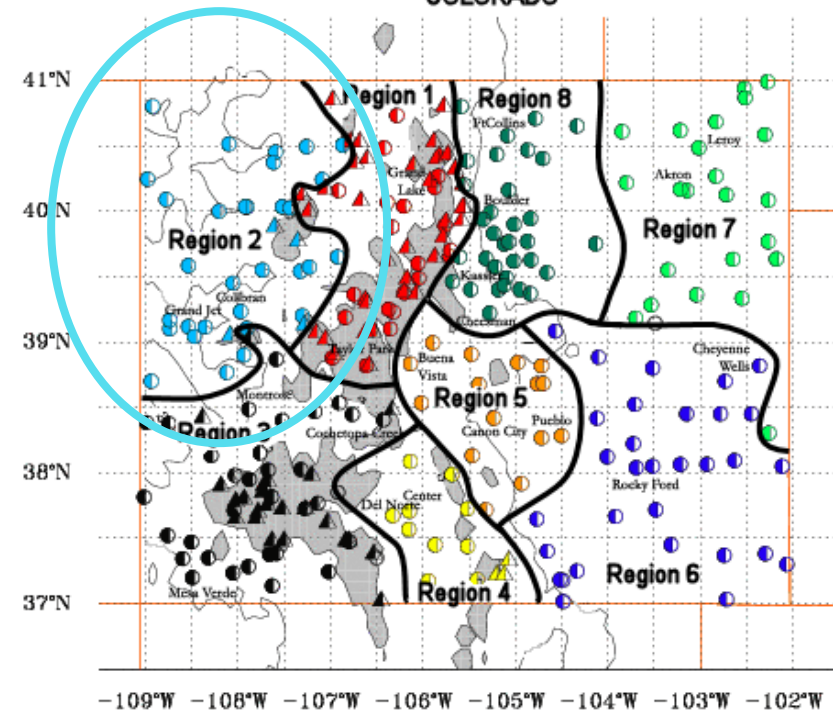
### Daily Temperature Data – GRAND JUNCTION WALKER FIELD, CO

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



Powered by ACIS

### COLORADO

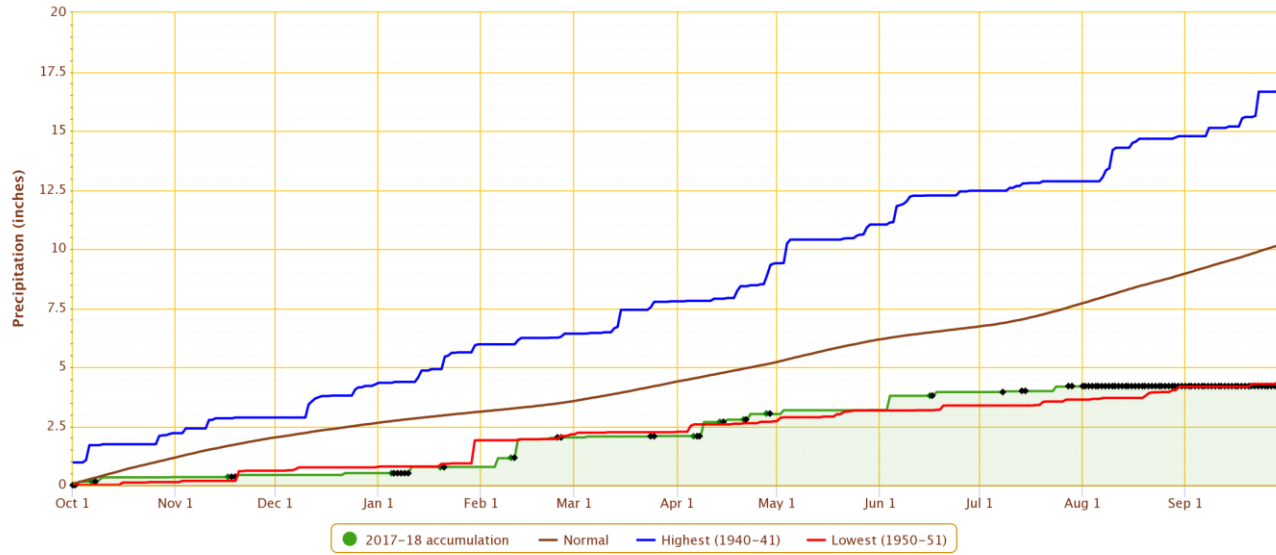


-109°W -108°W -107°W -106°W -105°W -104°W -103°W -102°W



### Accumulated Precipitation – MONTROSE NO 2, CO

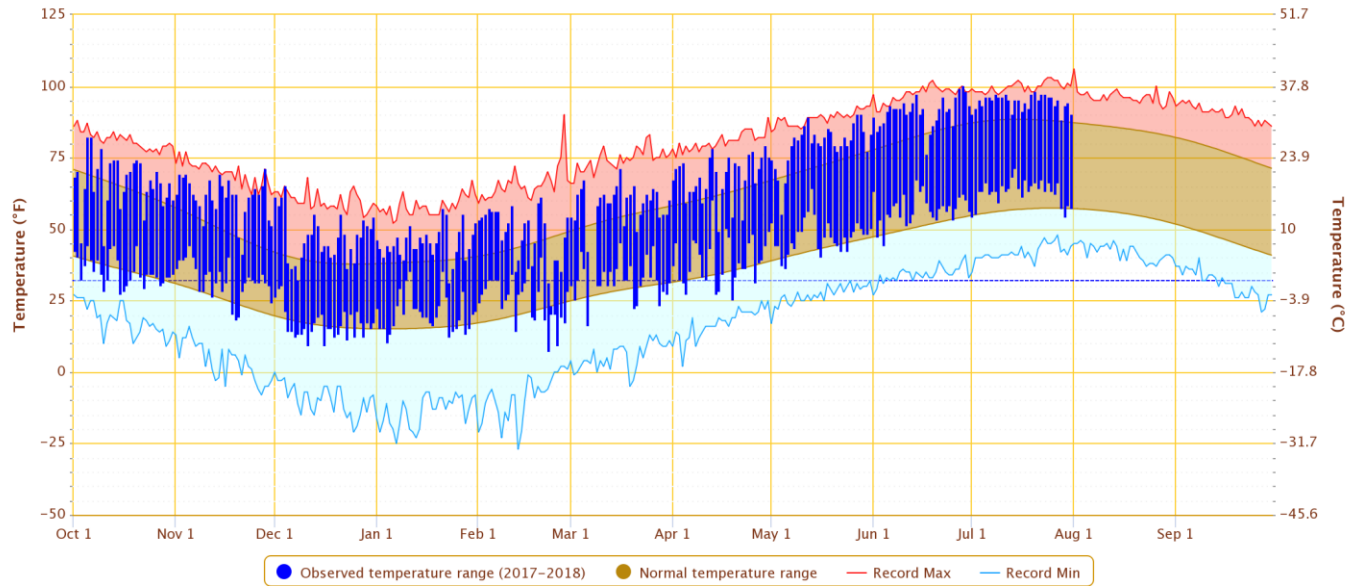
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



Powered by ACIS

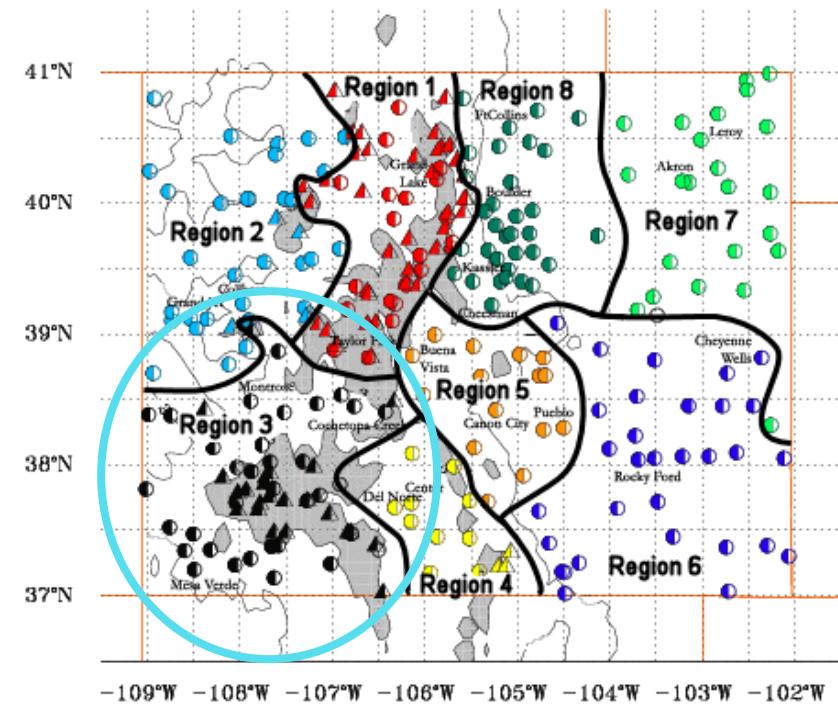
### Daily Temperature Data – MONTROSE NO 2, CO

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



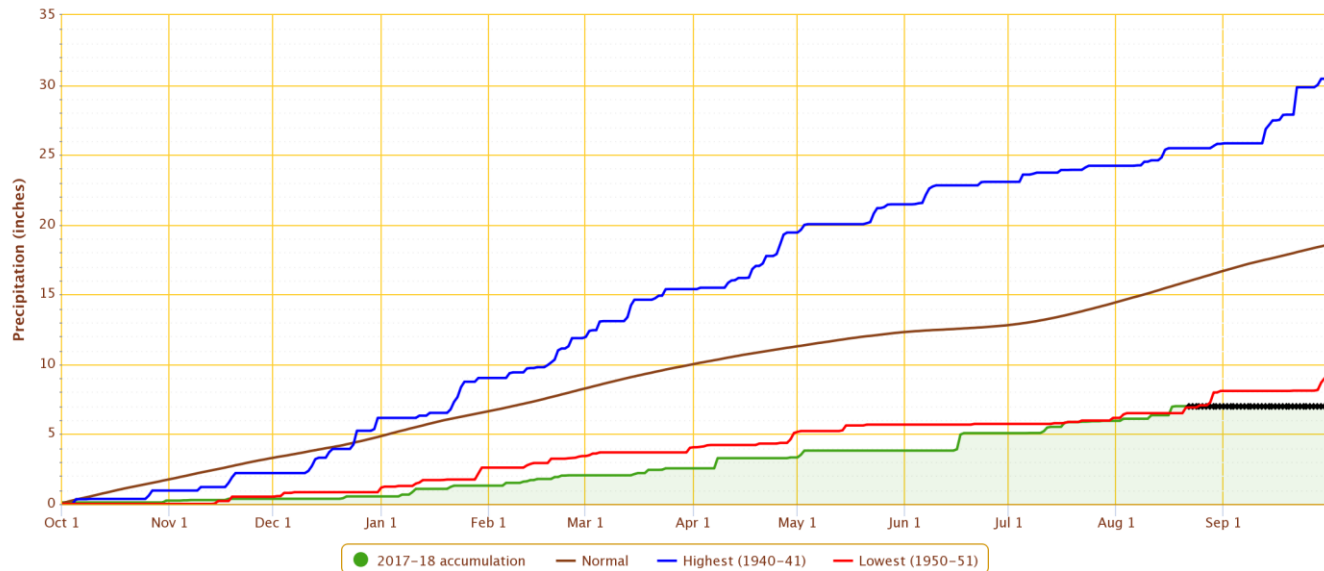
Powered by ACIS

### COLORADO



### Accumulated Precipitation – MESA VERDE NP, CO

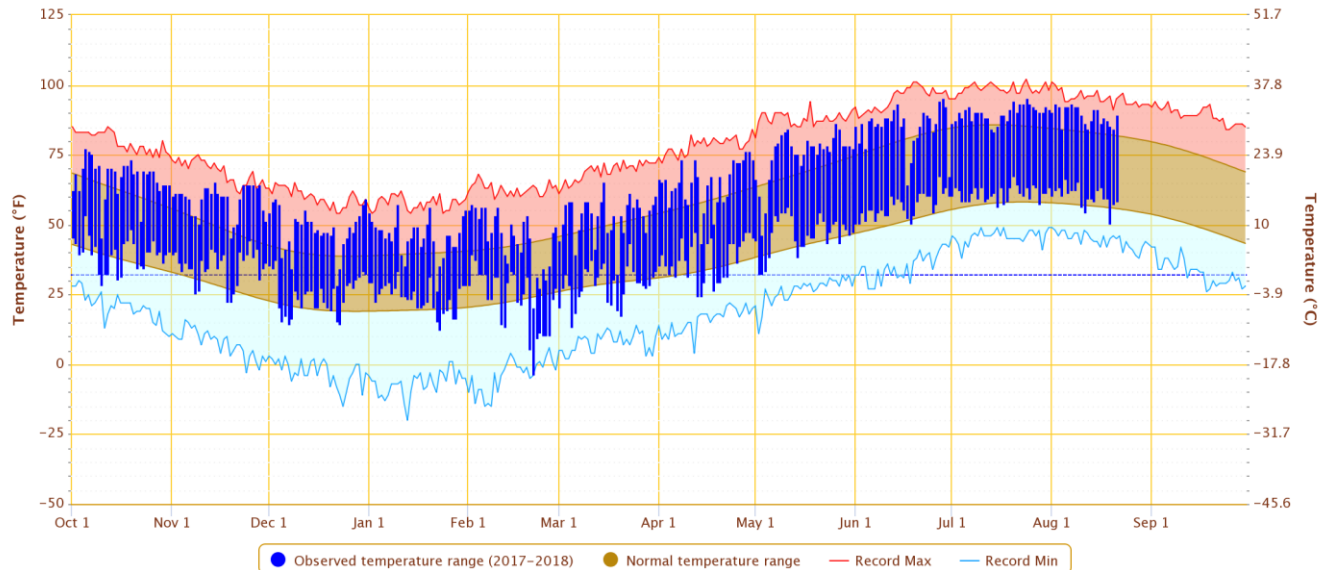
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



Powered by ACIS

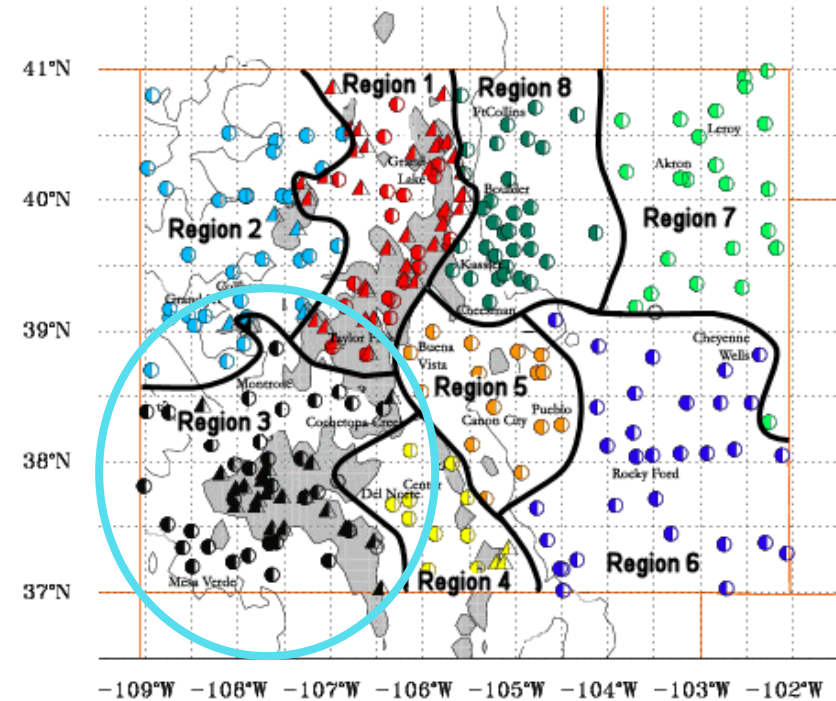
### Daily Temperature Data – MESA VERDE NP, CO

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

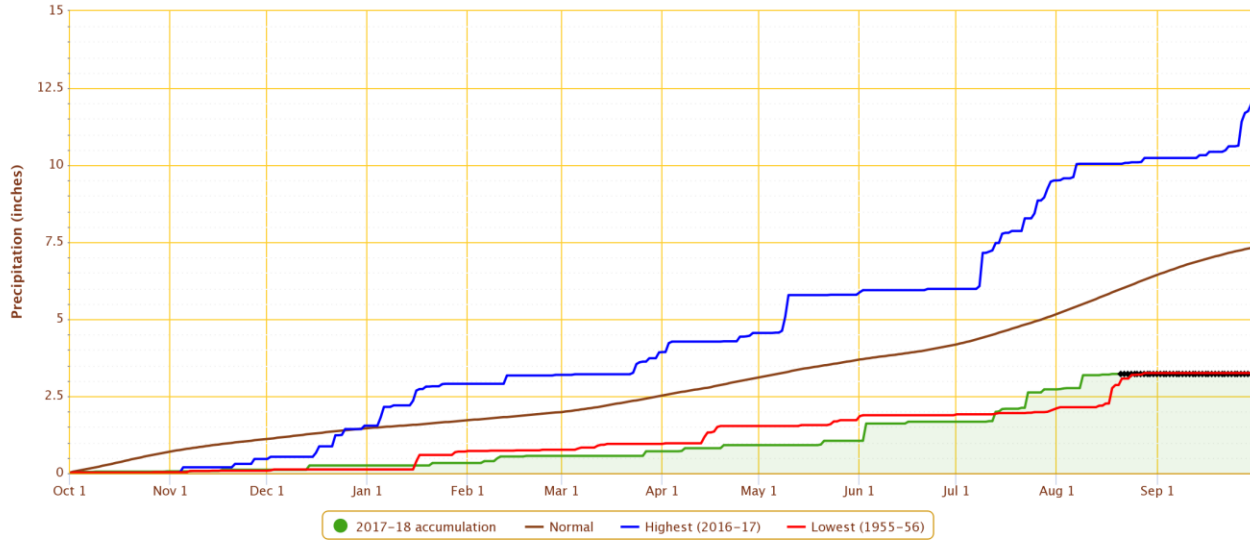


-109°W -108°W -107°W -106°W -105°W -104°W -103°W -102°W



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

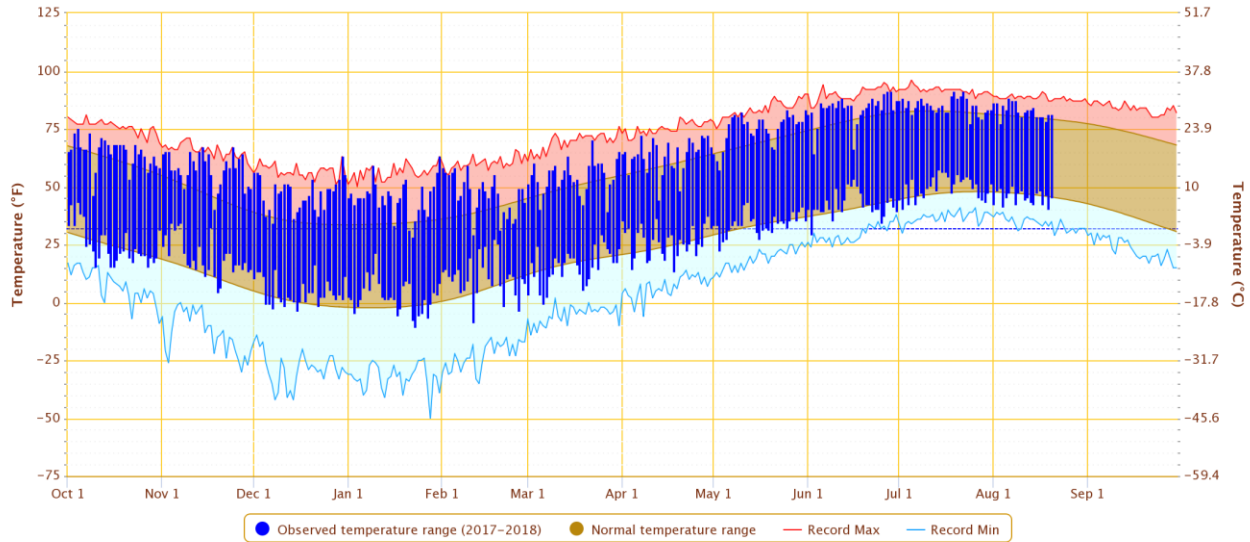
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



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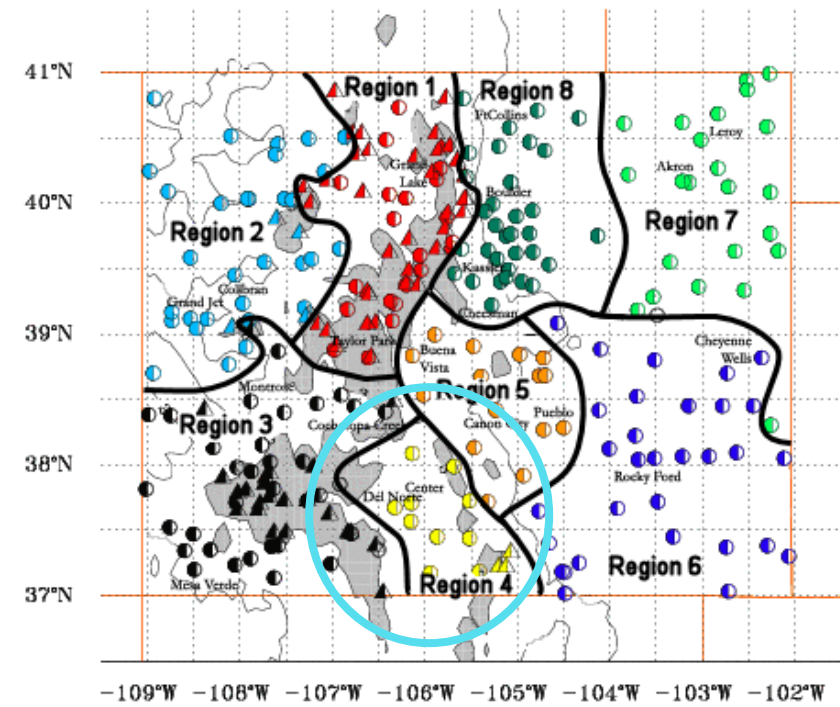
### Daily Temperature Data – ALAMOSA SAN LUIS VALLEY REGIONAL AP, CO

Period of Record – 1948-01-01 to 2018-08-20. Normals period: 1981-2010. Click and drag to zoom chart.



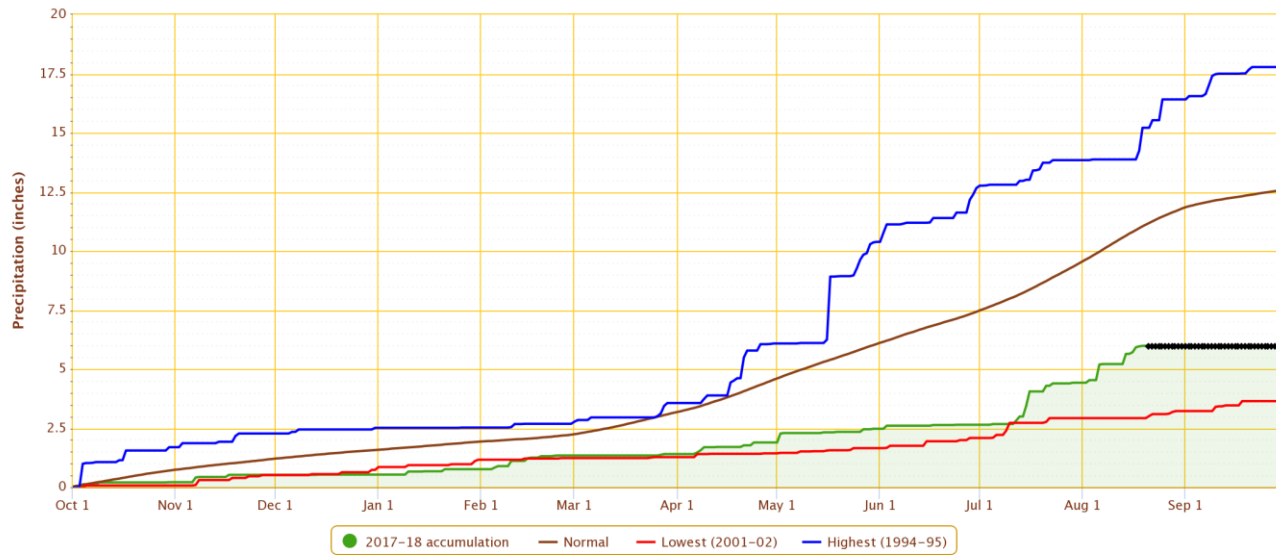
Powered by ACIS

### COLORADO



### Accumulated Precipitation – PUEBLO MEMORIAL AP, CO

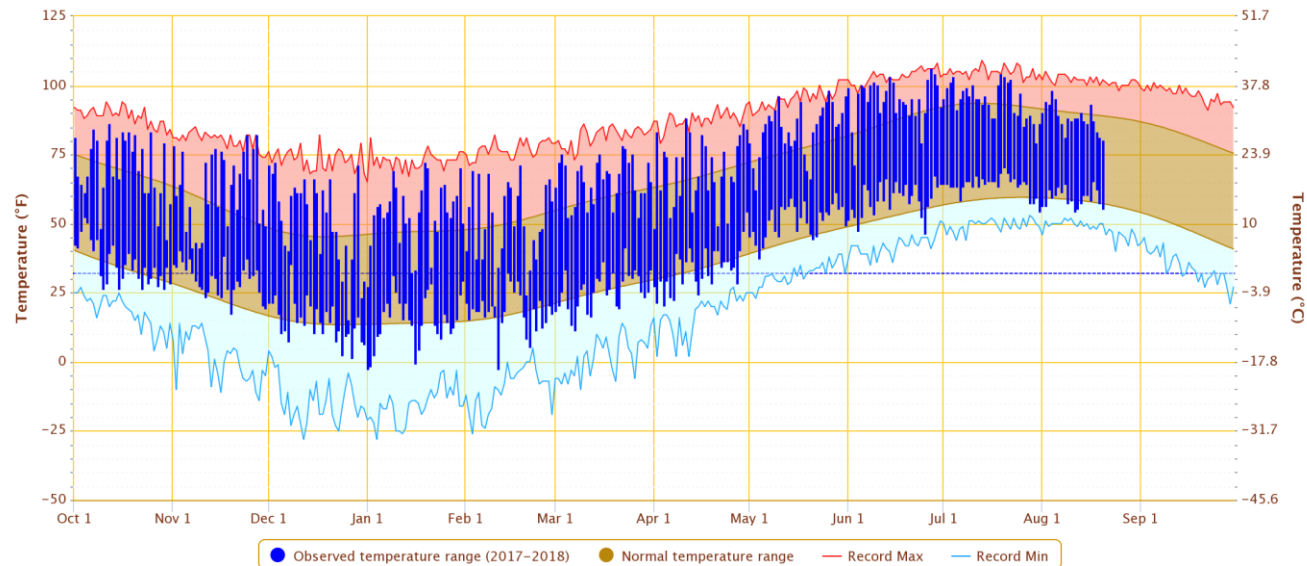
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



Powered by ACIS

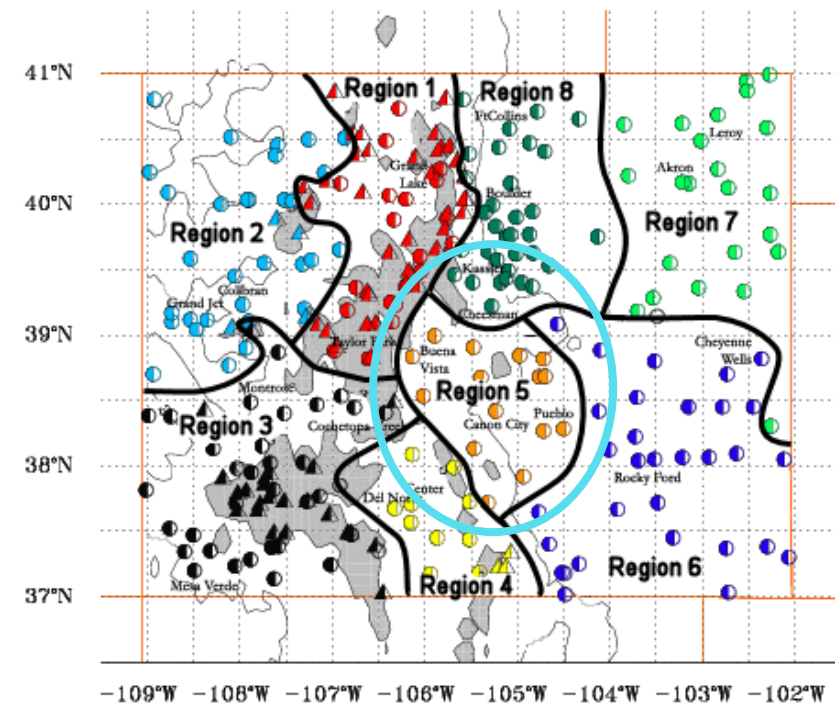
### Daily Temperature Data – PUEBLO MEMORIAL AP, CO

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



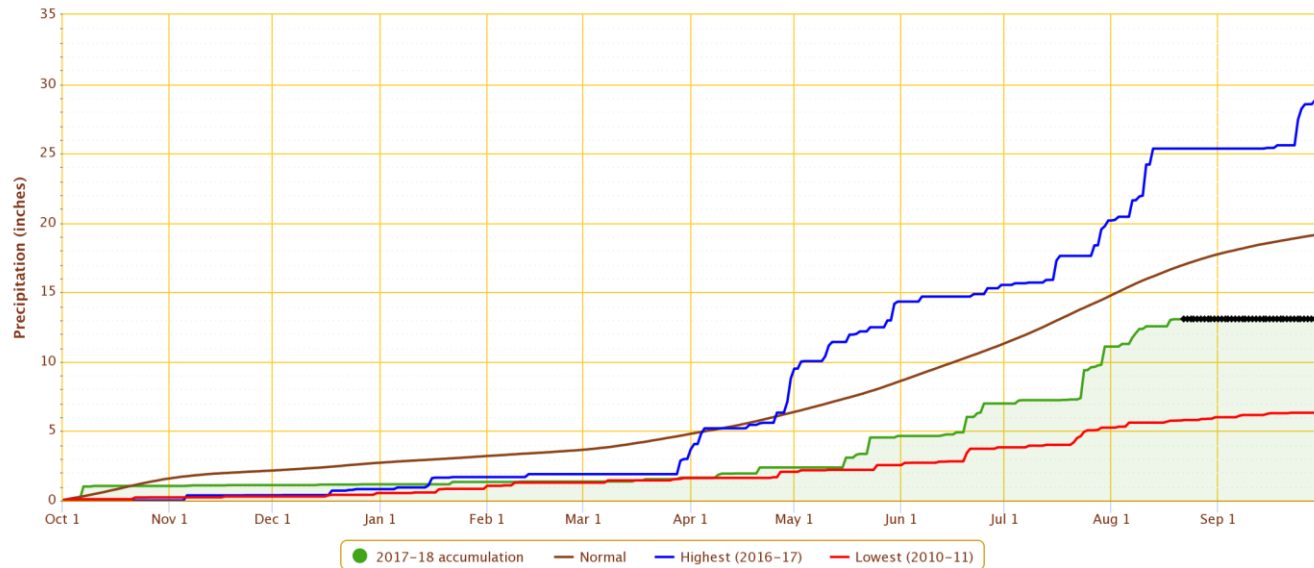
Powered by ACIS

### COLORADO



### Accumulated Precipitation – WALSH 1 W, CO

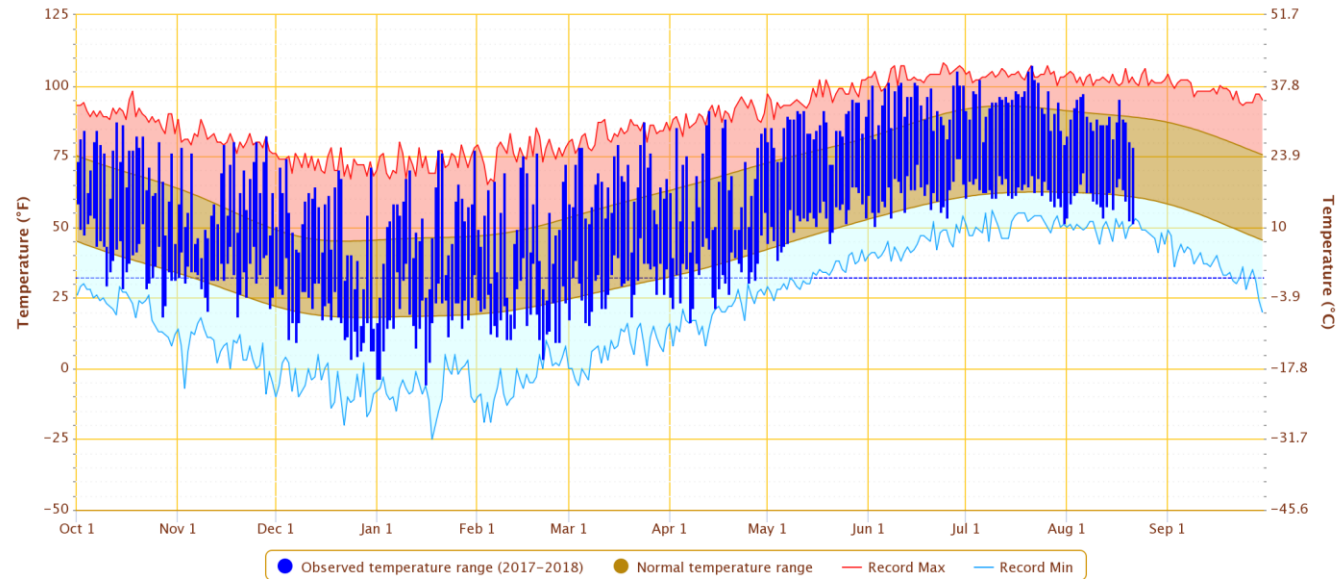
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



Powered by ACIS

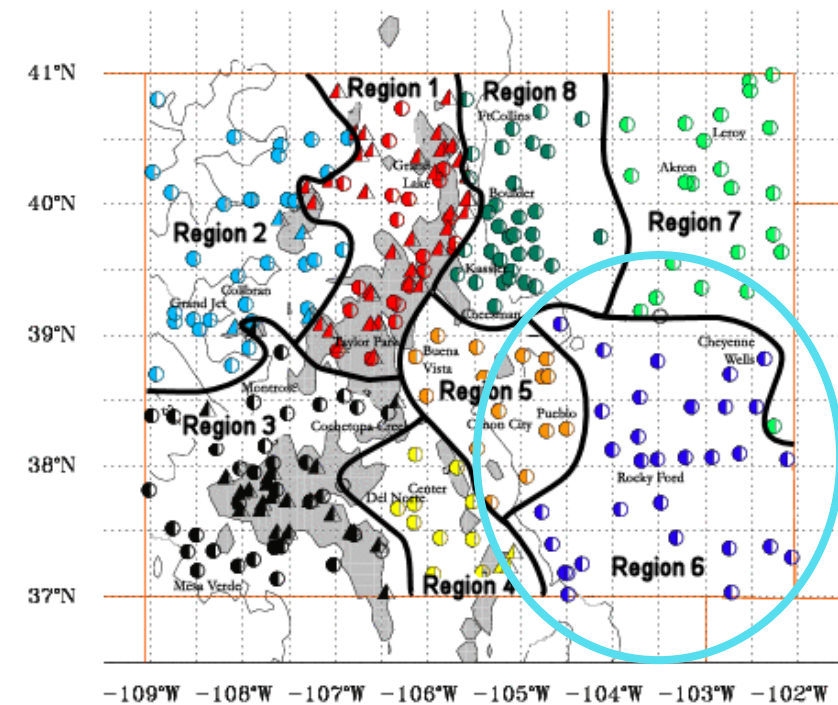
### Daily Temperature Data – WALSH 1 W, CO

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



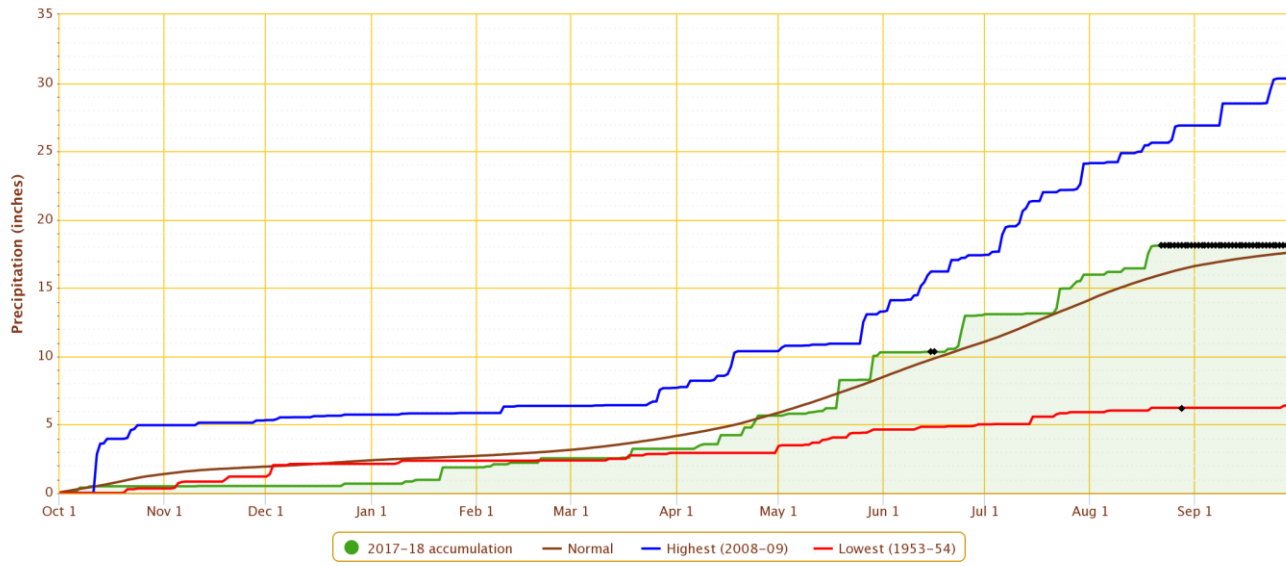
Powered by ACIS

### COLORADO



### Accumulated Precipitation – BURLINGTON, CO

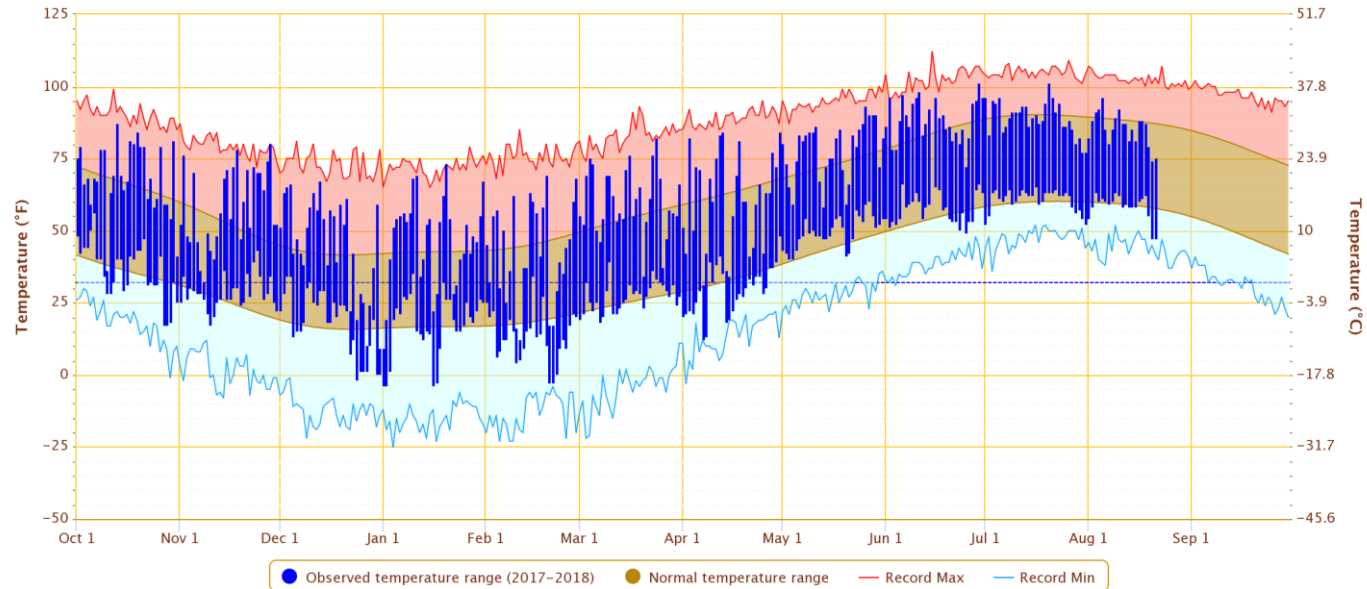
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



Powered by ACIS

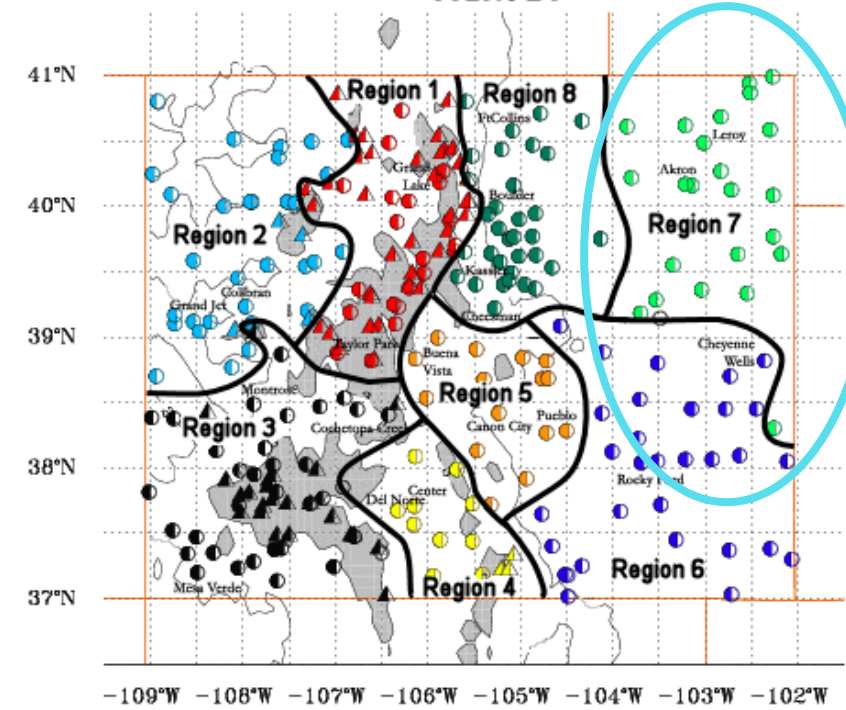
### Daily Temperature Data – BURLINGTON, CO

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



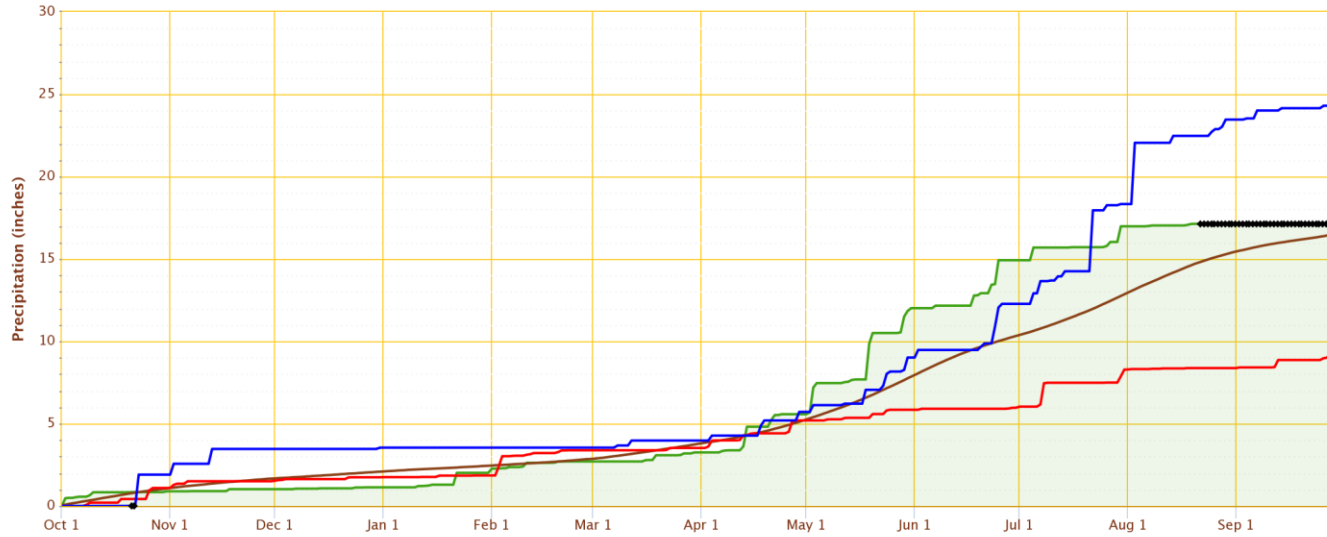
Powered by ACIS

### COLORADO



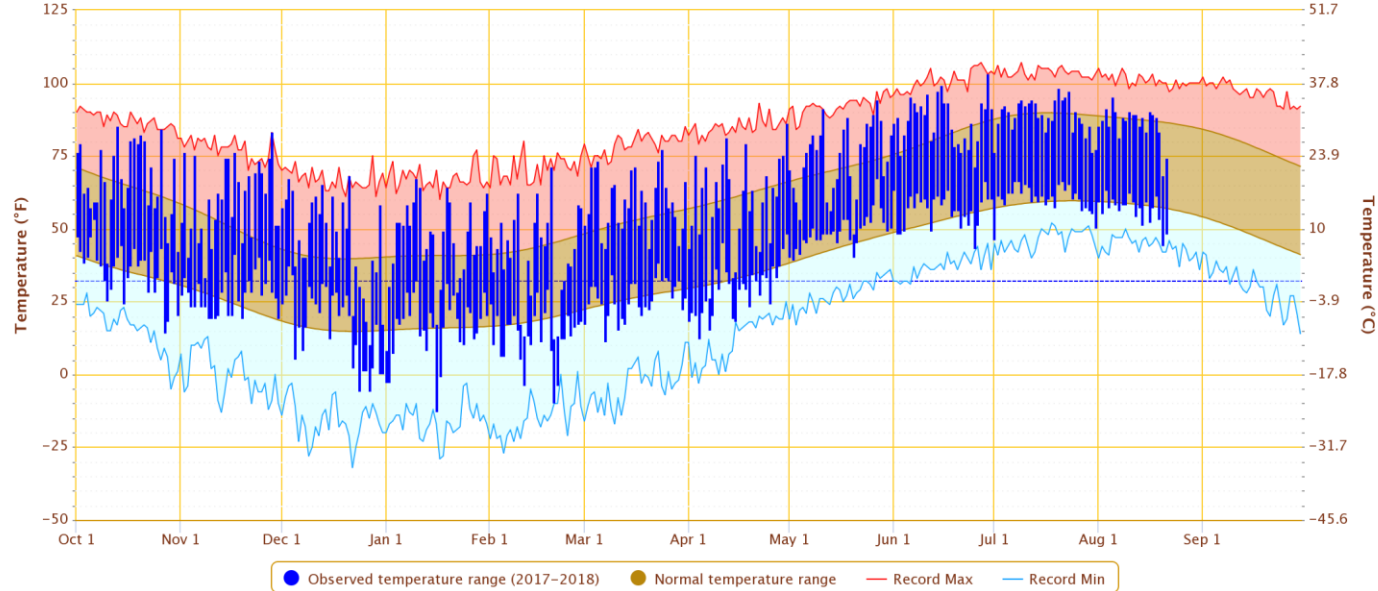
### Accumulated Precipitation – AKRON 4 E, CO

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



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

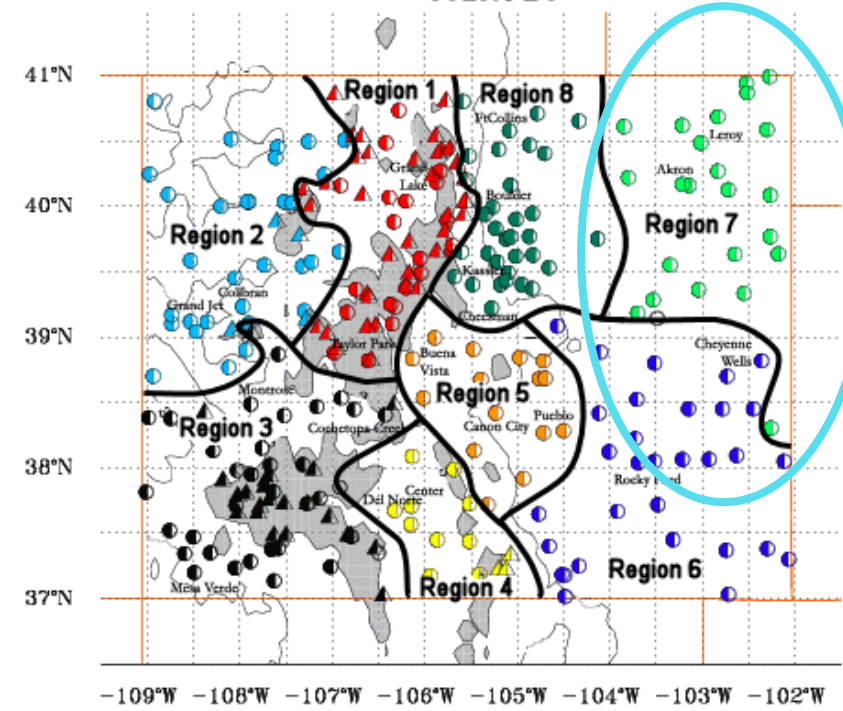
Period of Record – 1893-06-01 to 2018-08-21. Normals period: 1981-2010. Click and drag to zoom chart.



● Observed temperature range (2017-2018) ■ Normal temperature range — Record Max — Record Min

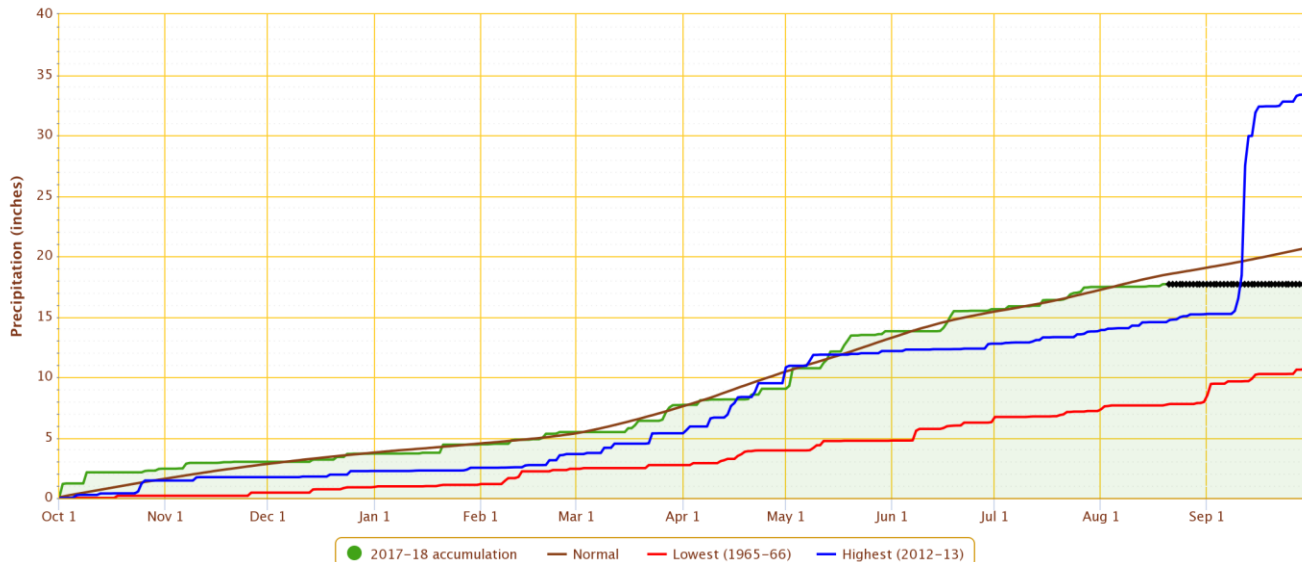
Powered by ACIS

### COLORADO



### Accumulated Precipitation - BOULDER, CO

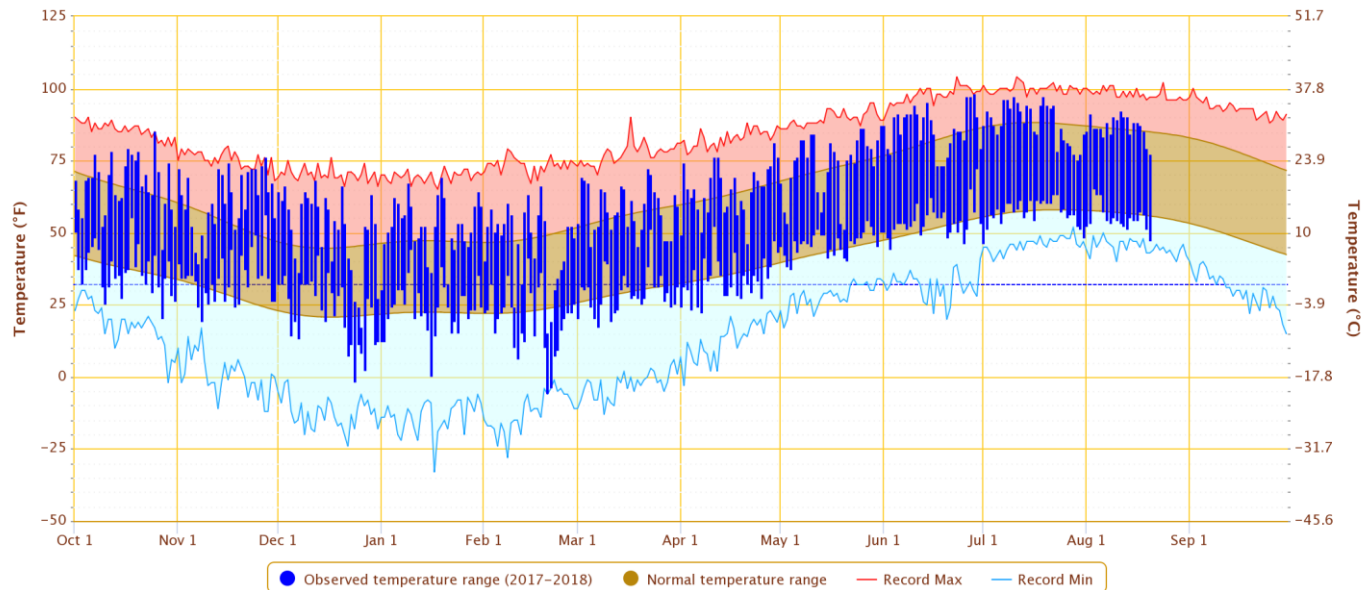
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



### Daily Temperature Data - BOULDER, CO

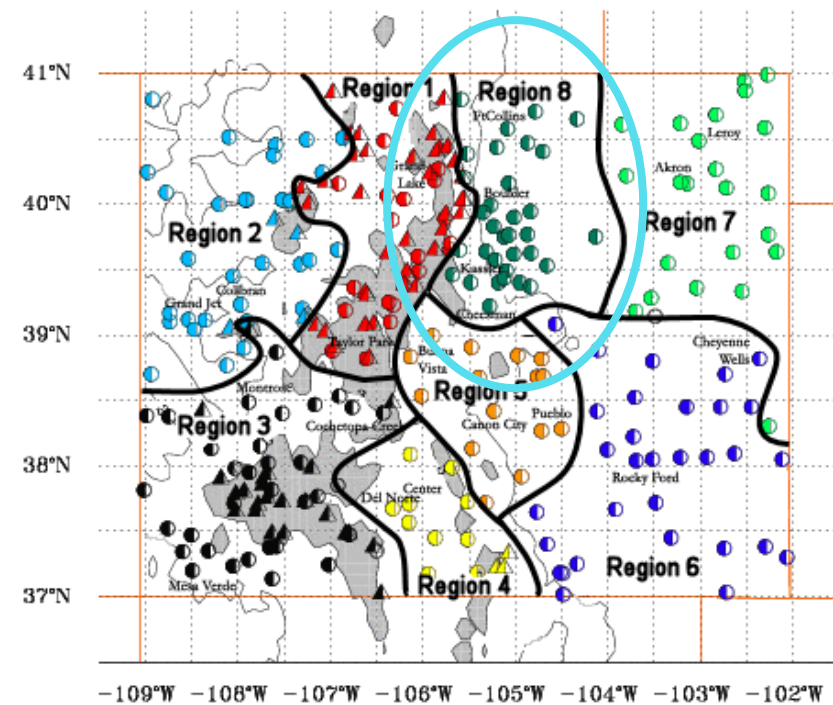
Period of Record - 1893-10-01 to 2018-08-20. Normals period: 1981-2010. Click and drag to zoom chart.

Powered by ACIS

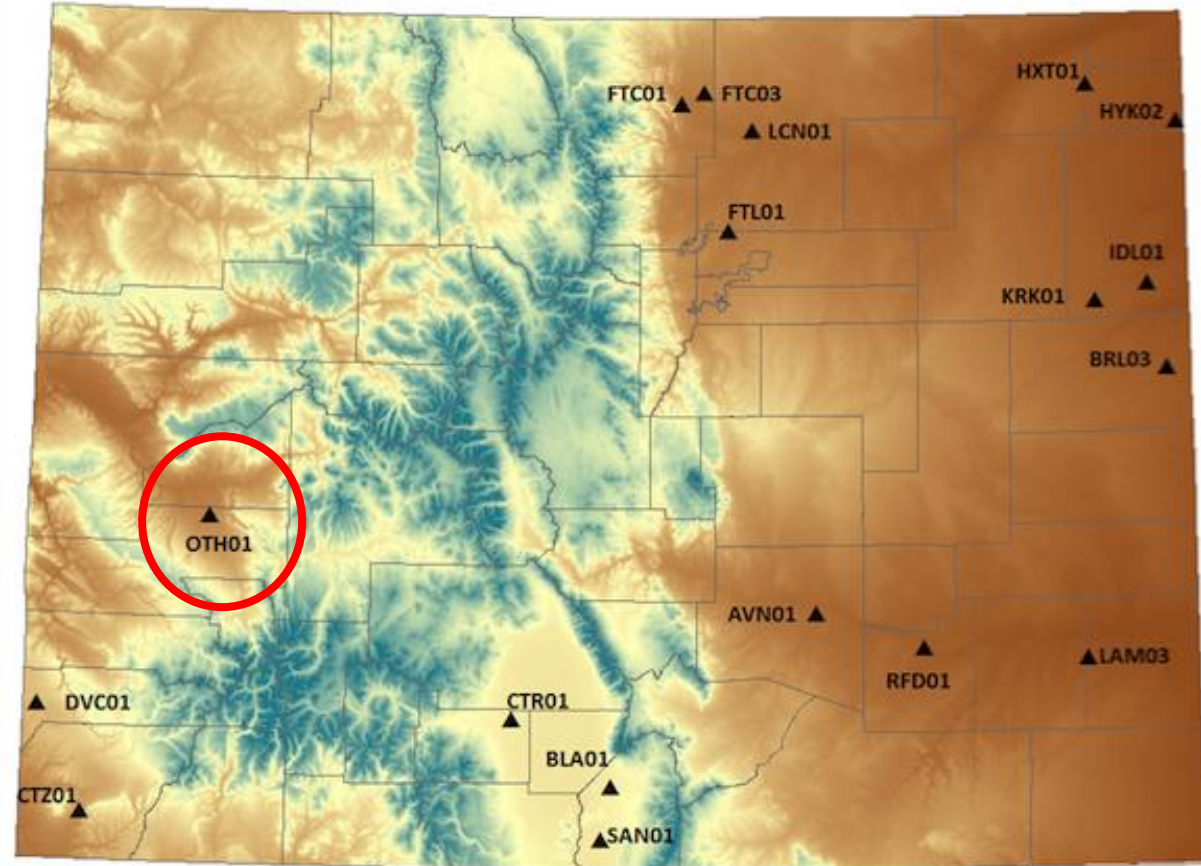
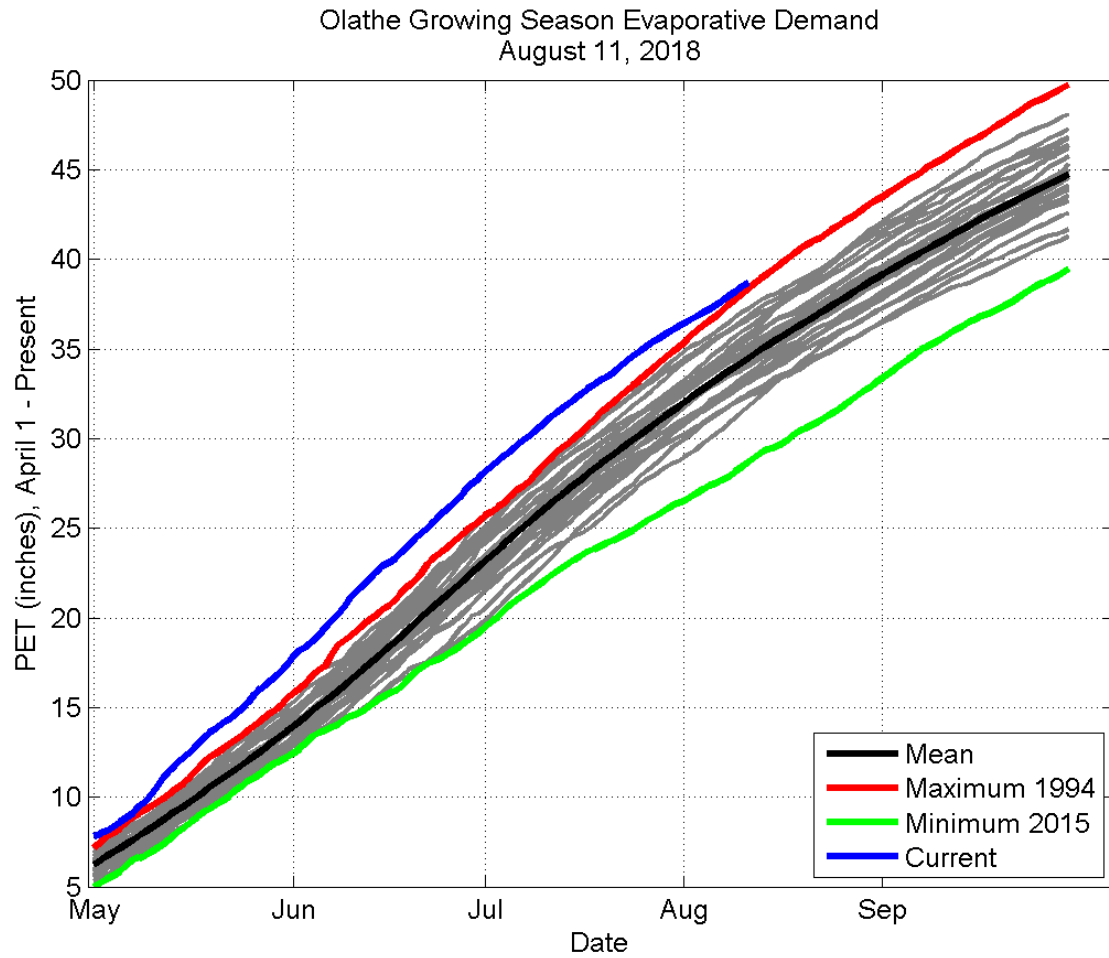


Powered by ACIS

### COLORADO

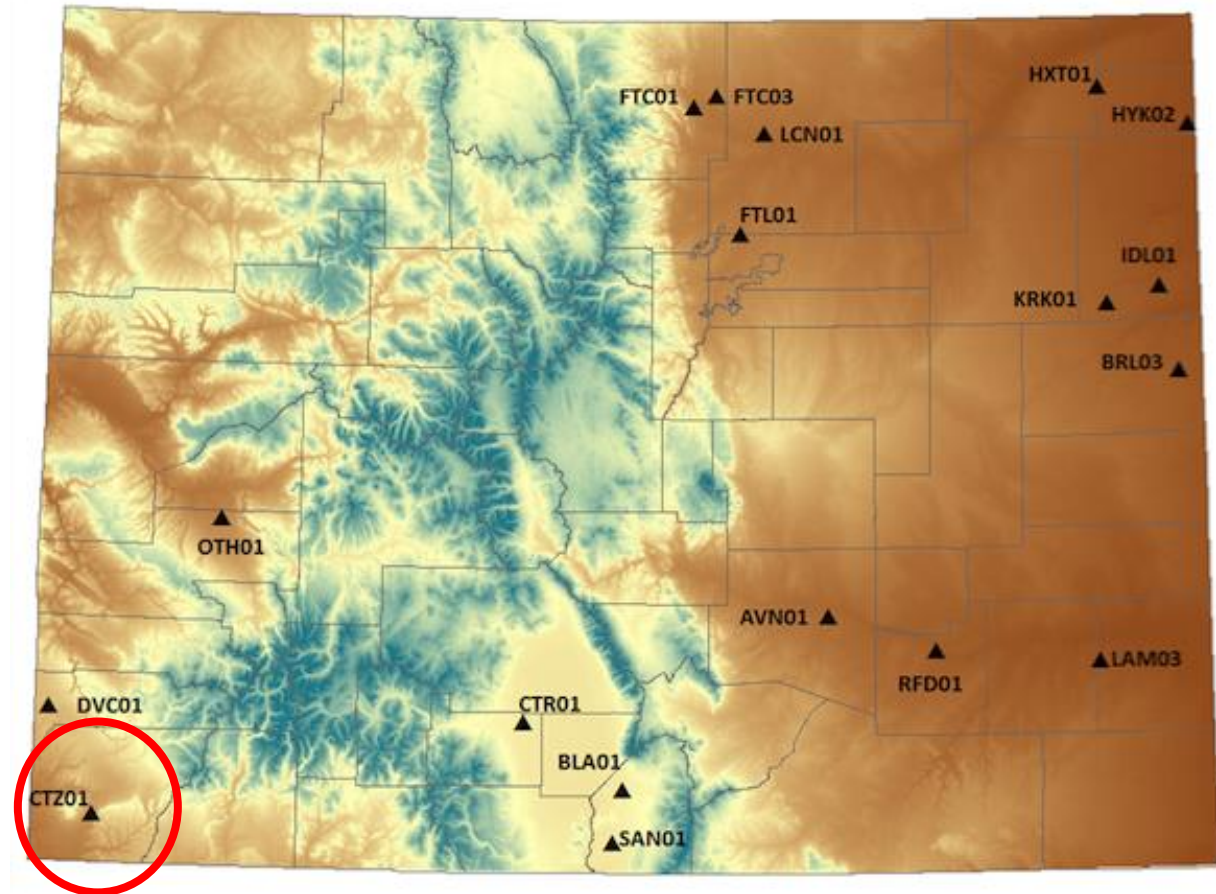
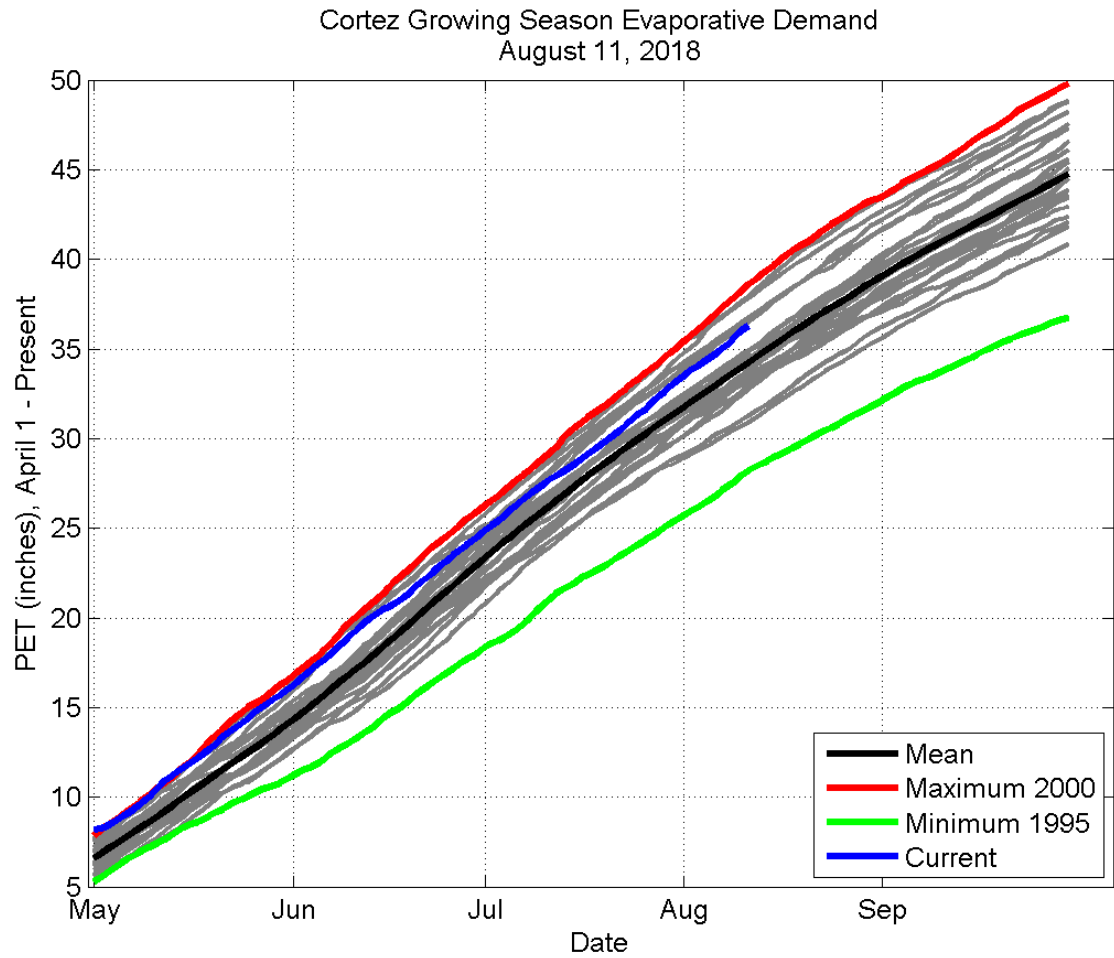


# Evaporative demand from CoAgMET

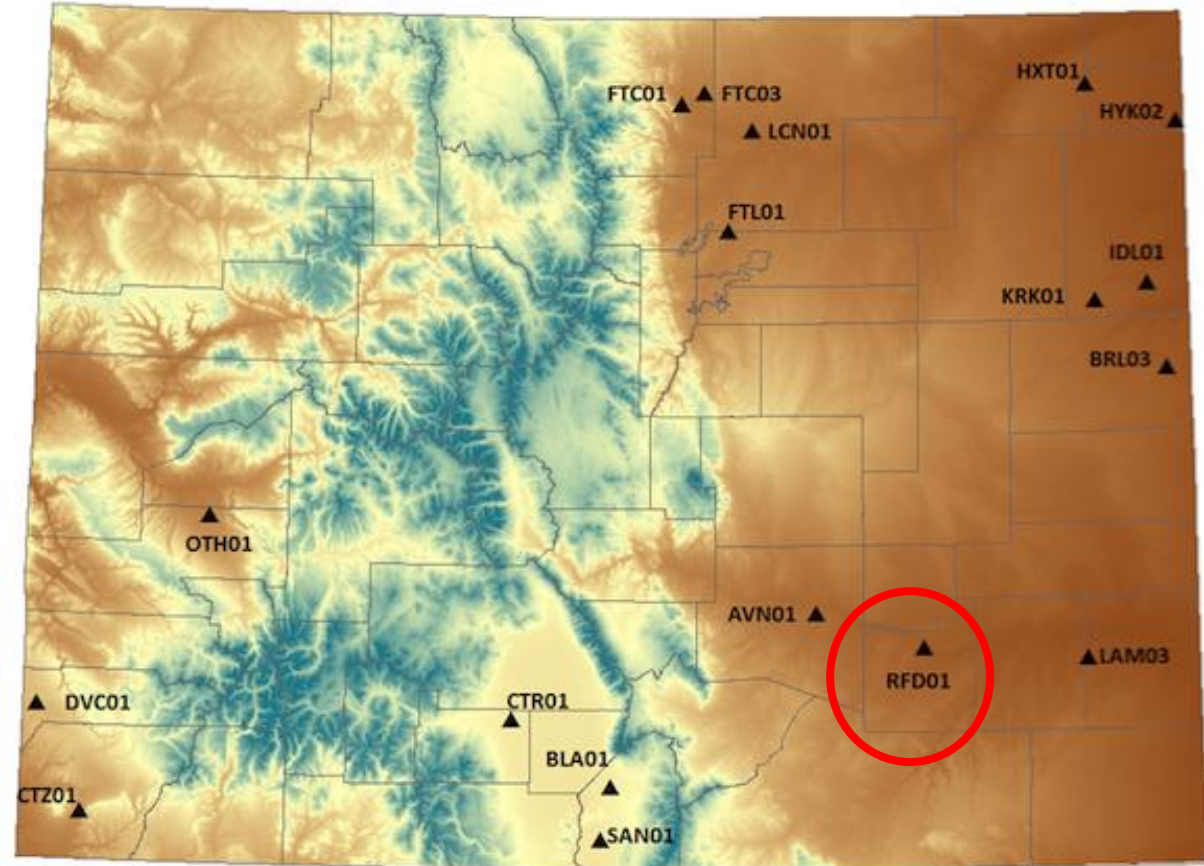
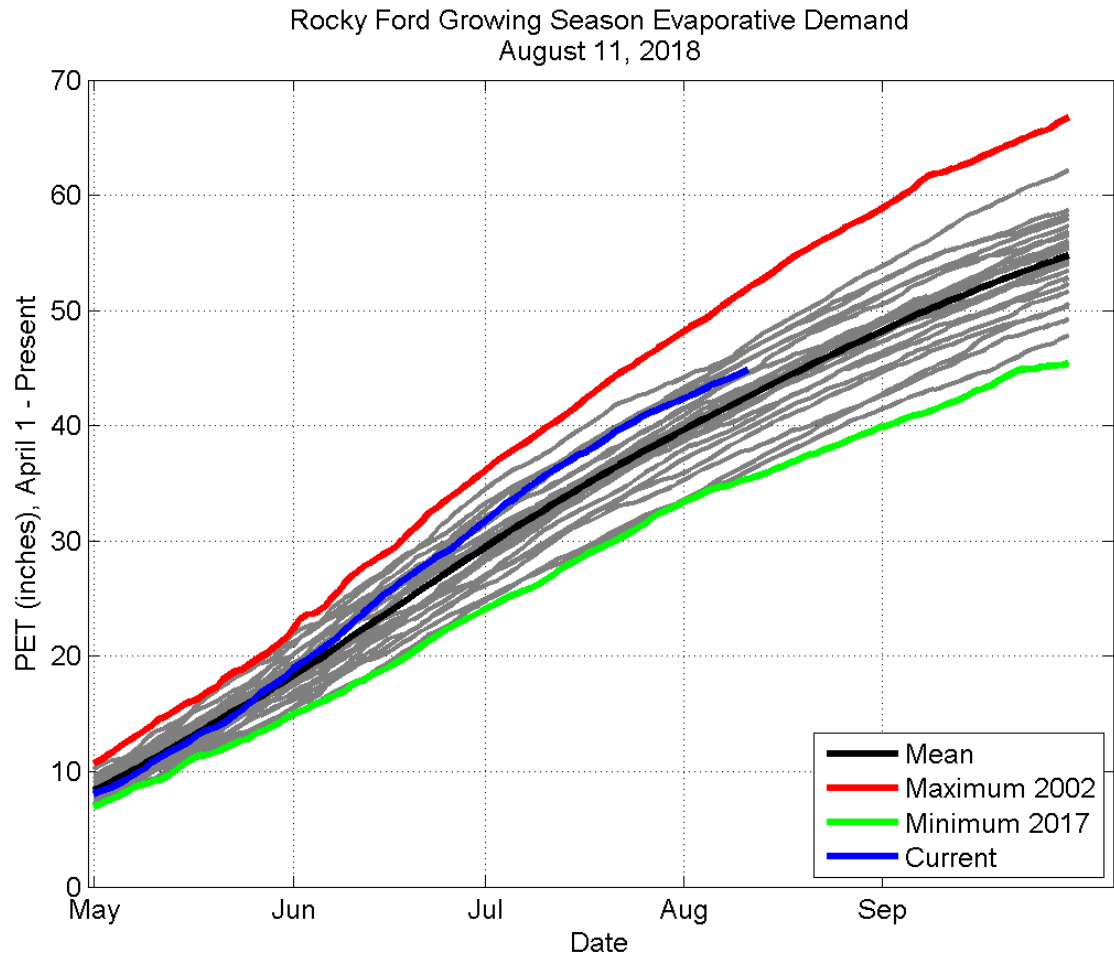


Above average = atmosphere has been “thirsty”  
(warm, windy, sunny conditions)

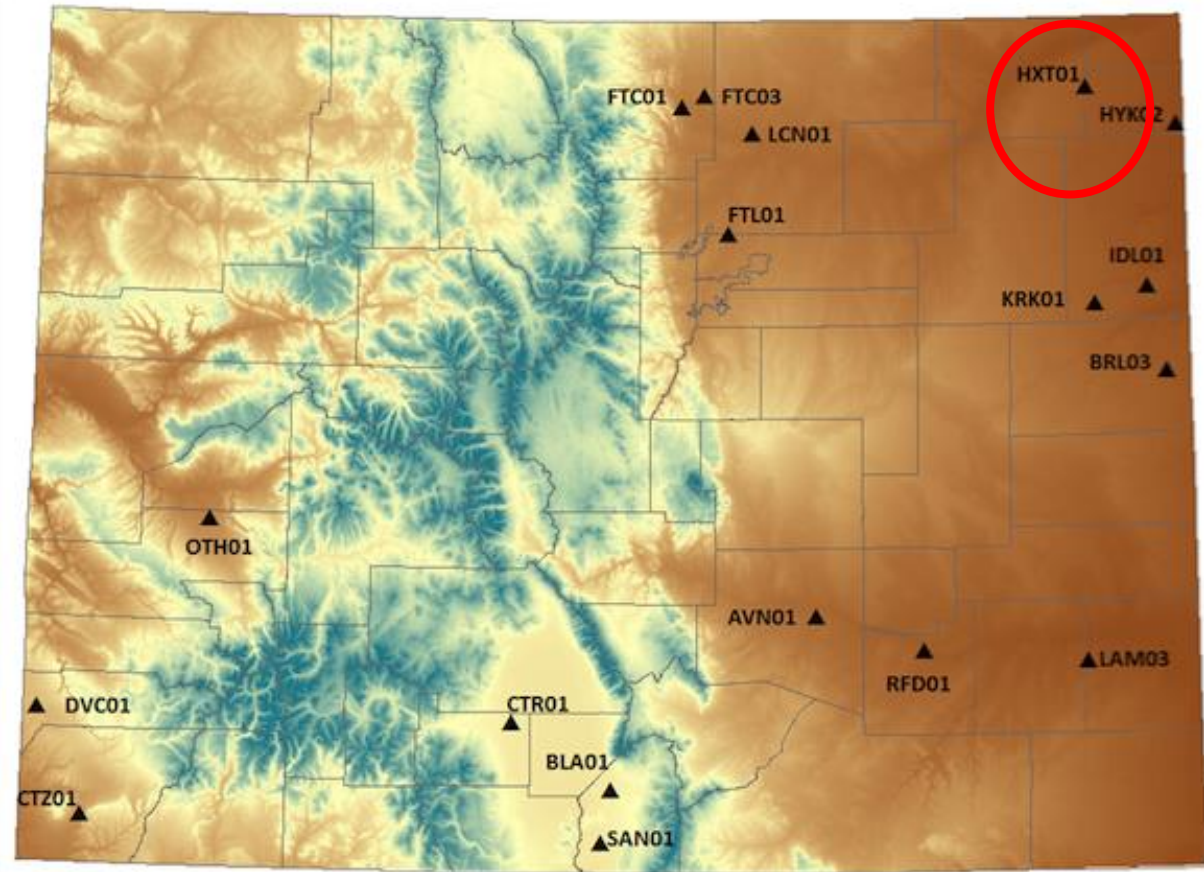
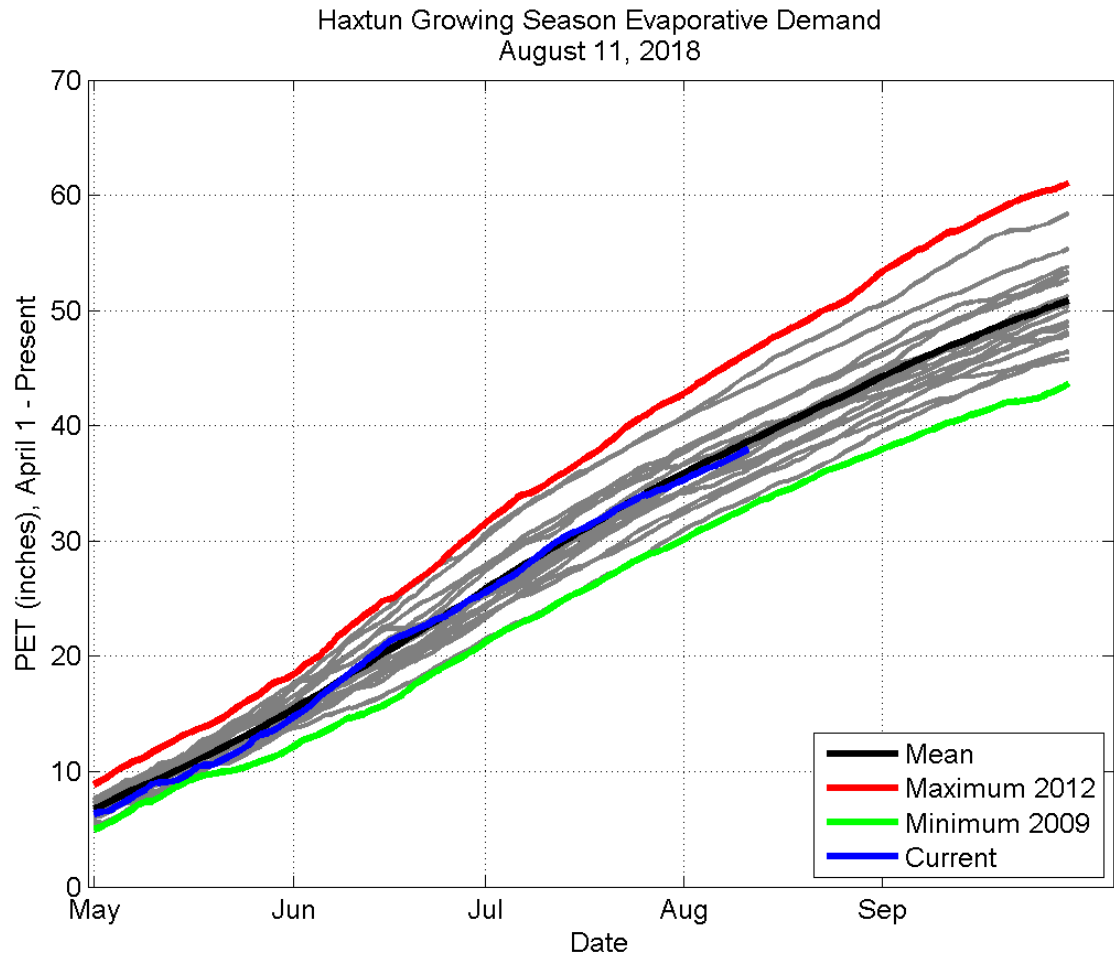
# Evaporative demand from CoAgMET



# Evaporative demand from CoAgMET



# Evaporative demand from CoAgMET

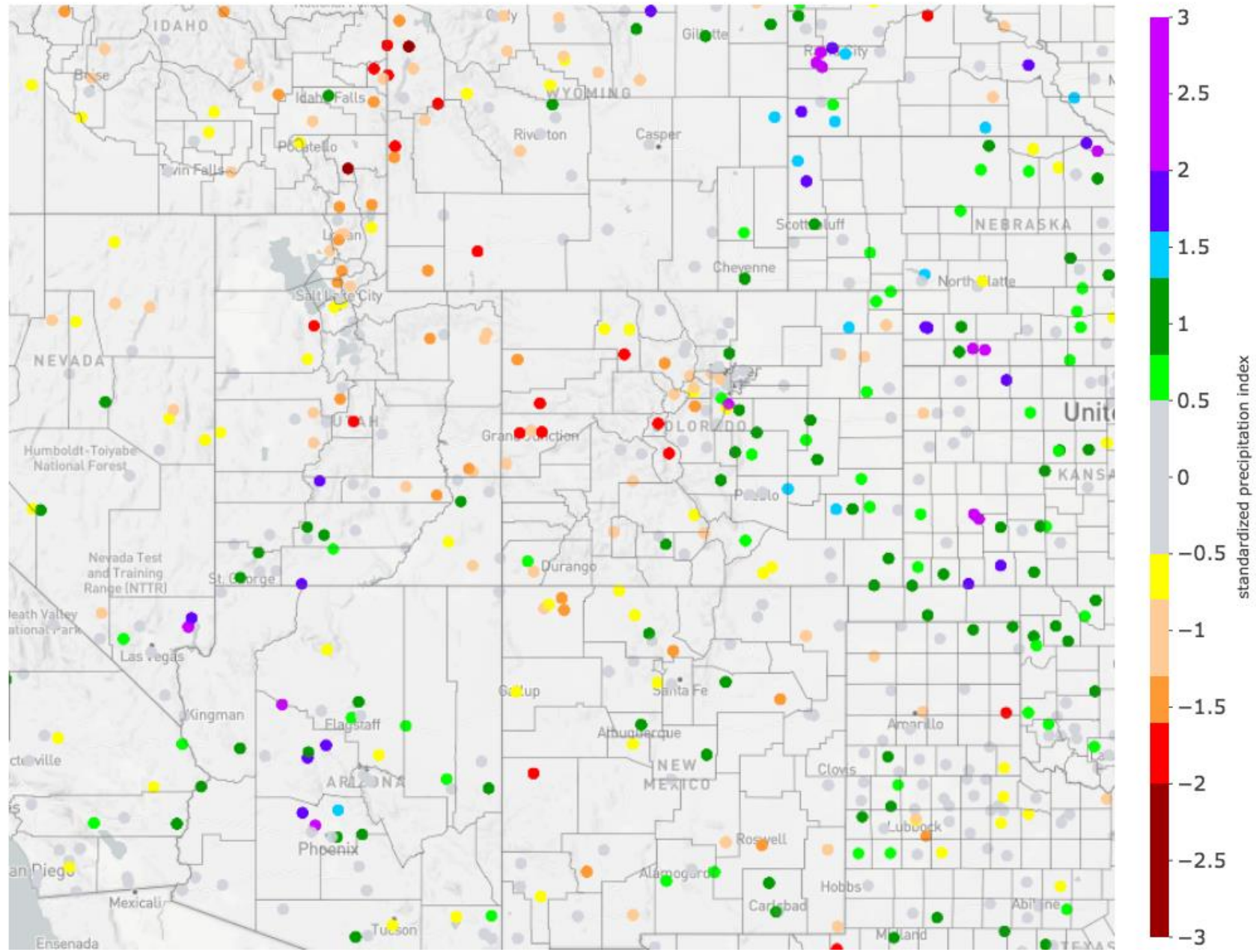




## Colorado Drought

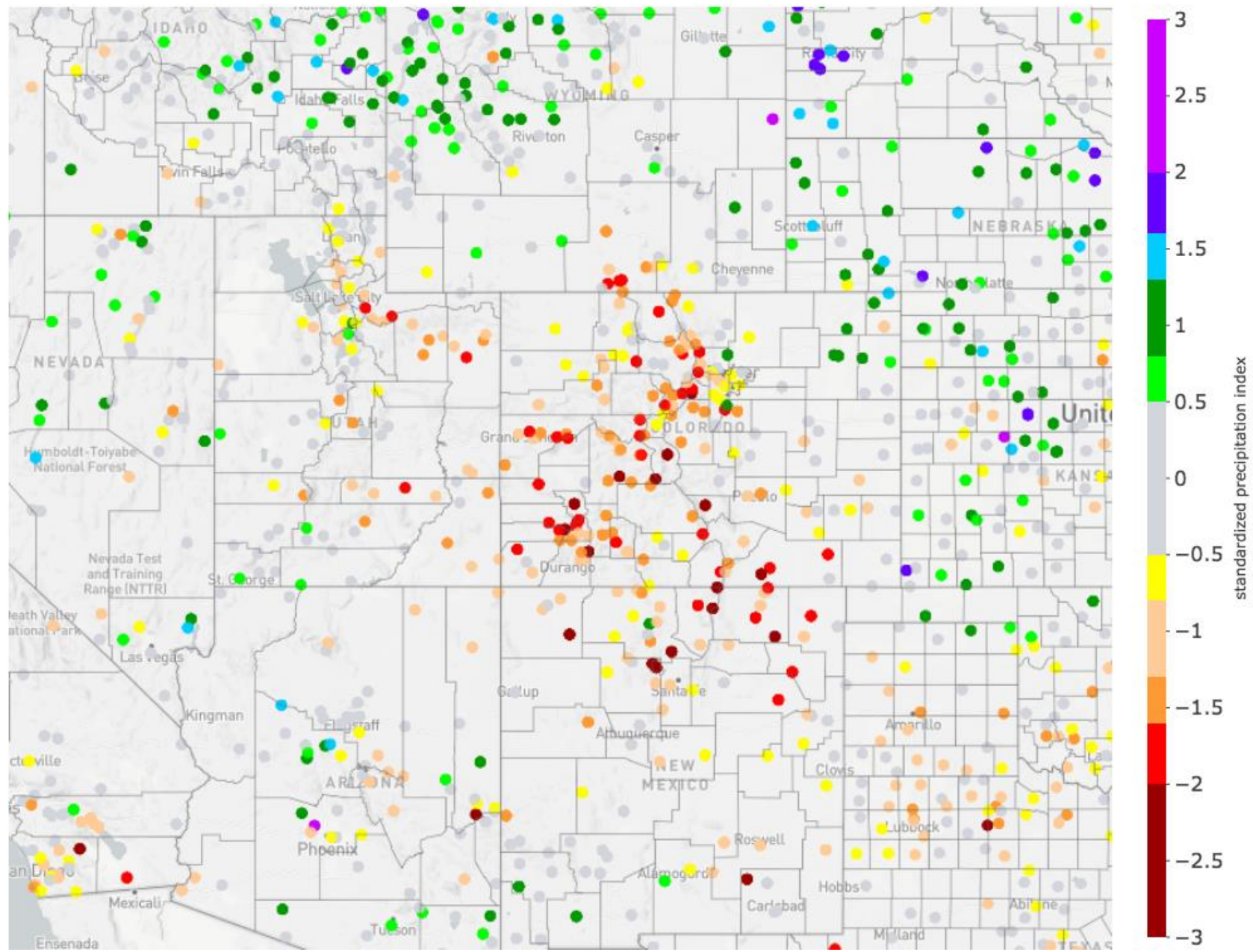


# 30-day Standardized Precipitation Index

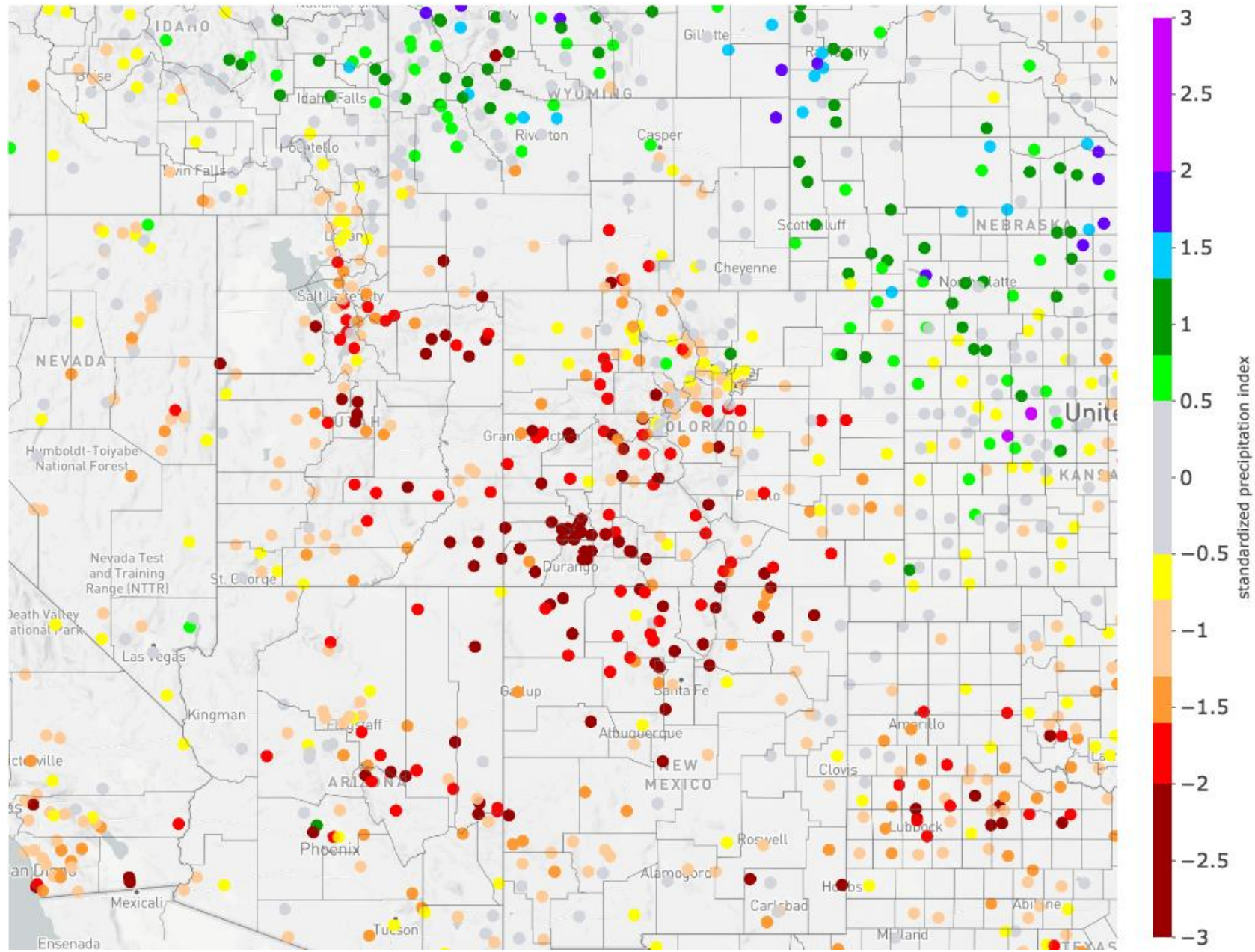




# 6-month Standardized Precipitation Index

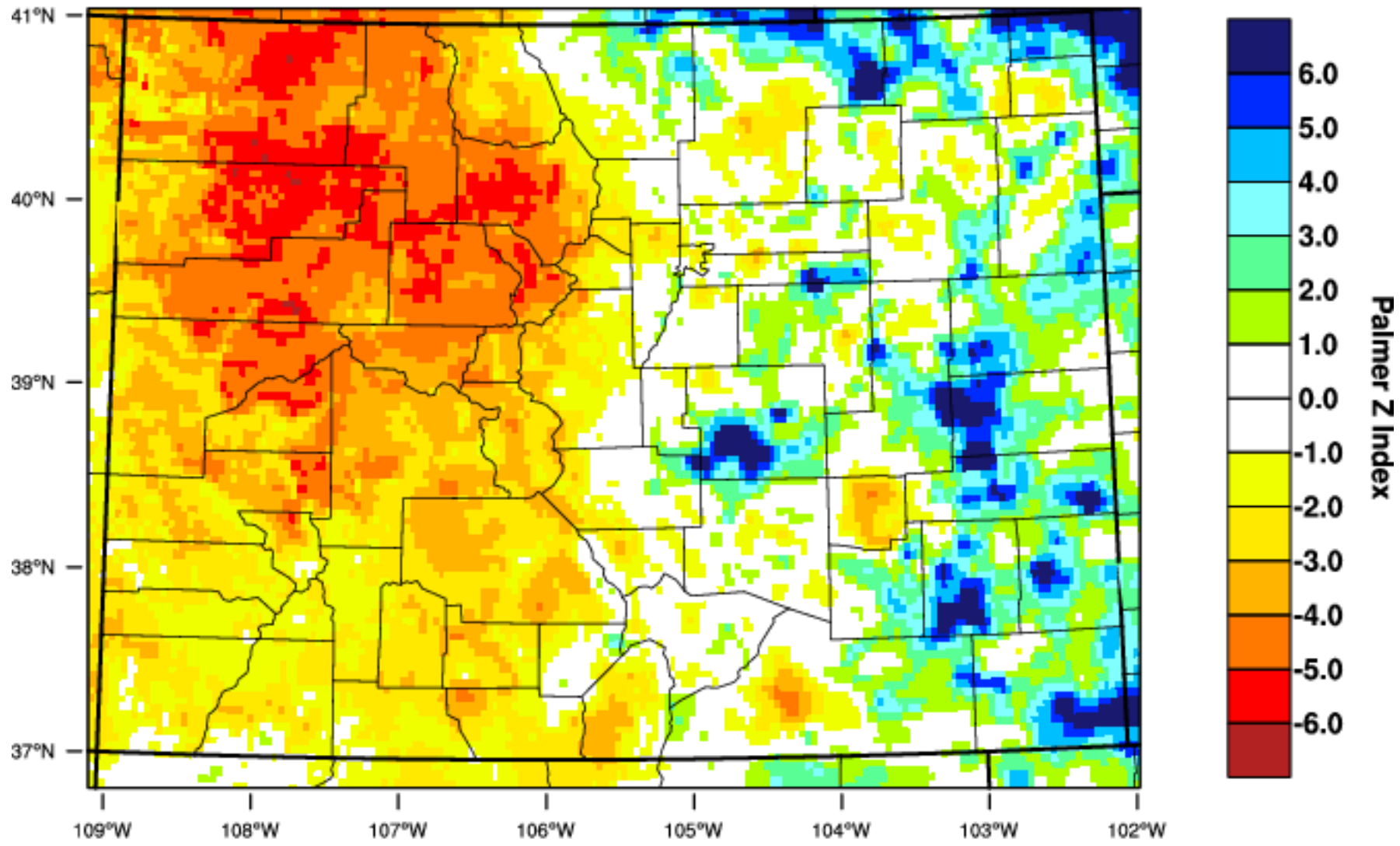


# Water-year-to-date Standardized Precipitation Index



# Colorado - Palmer Z-Index

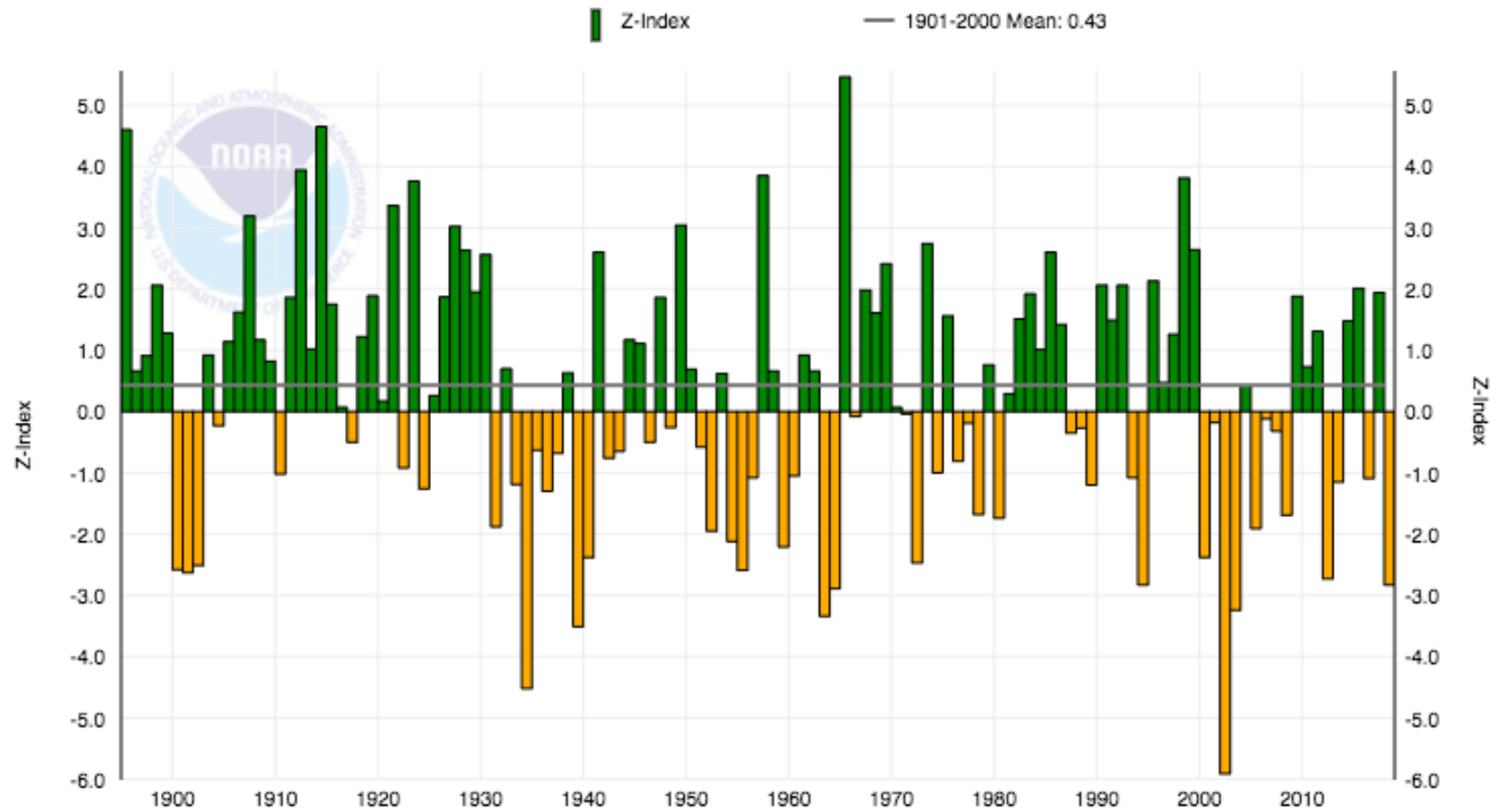
## July 2018



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



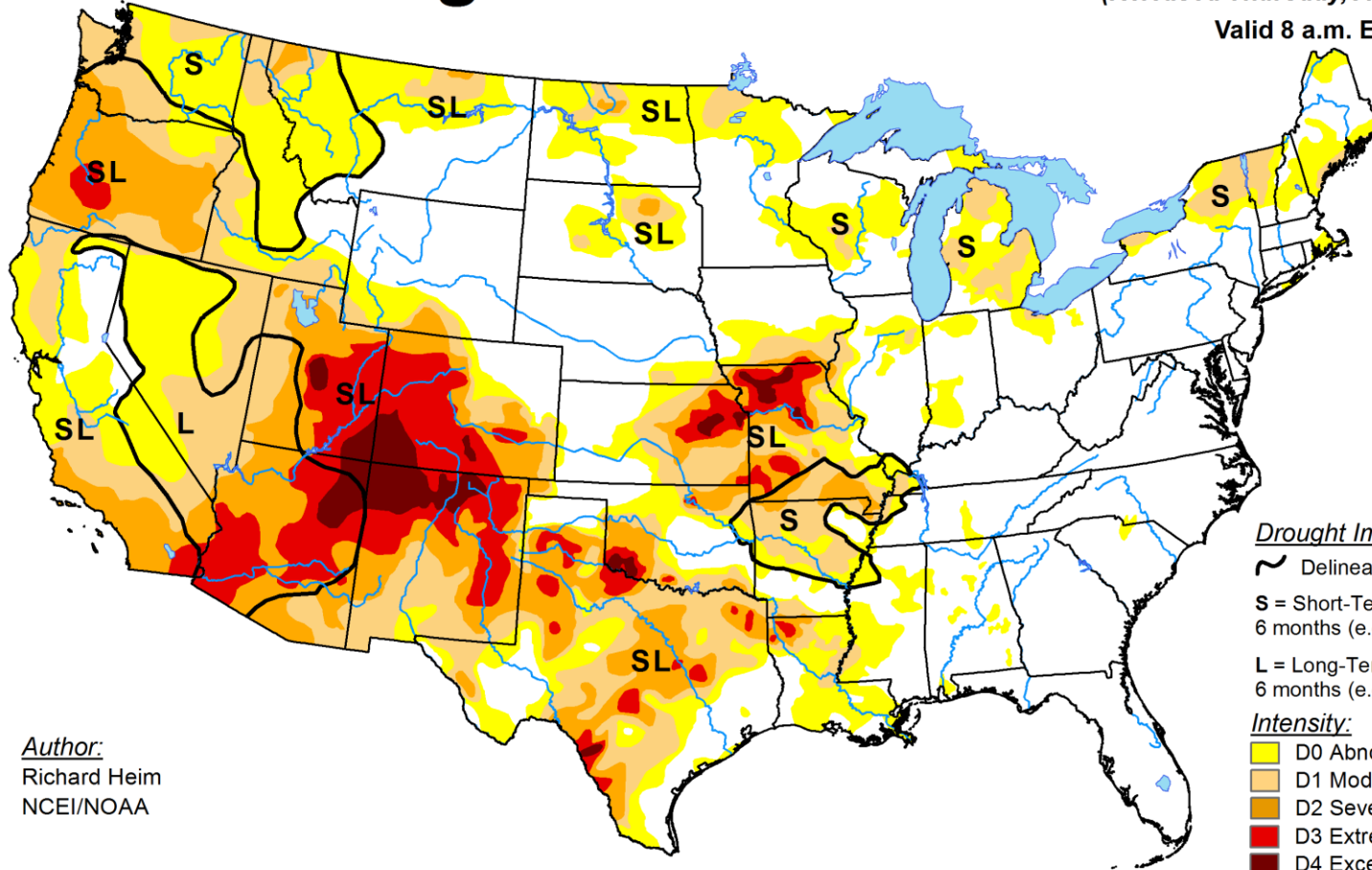
# Colorado, Palmer Z-Index, July



# U.S. Drought Monitor

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

Valid 8 a.m. EDT



*Author:*  
Richard Heim  
NCEI/NOAA

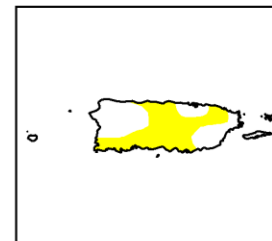
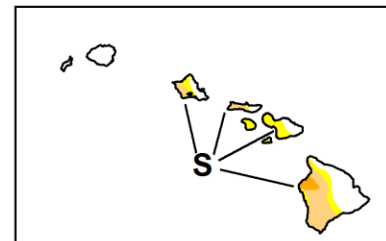
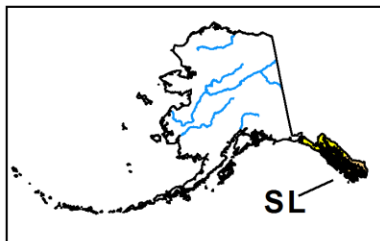
***Drought Impact Types:***

- ~ 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.*

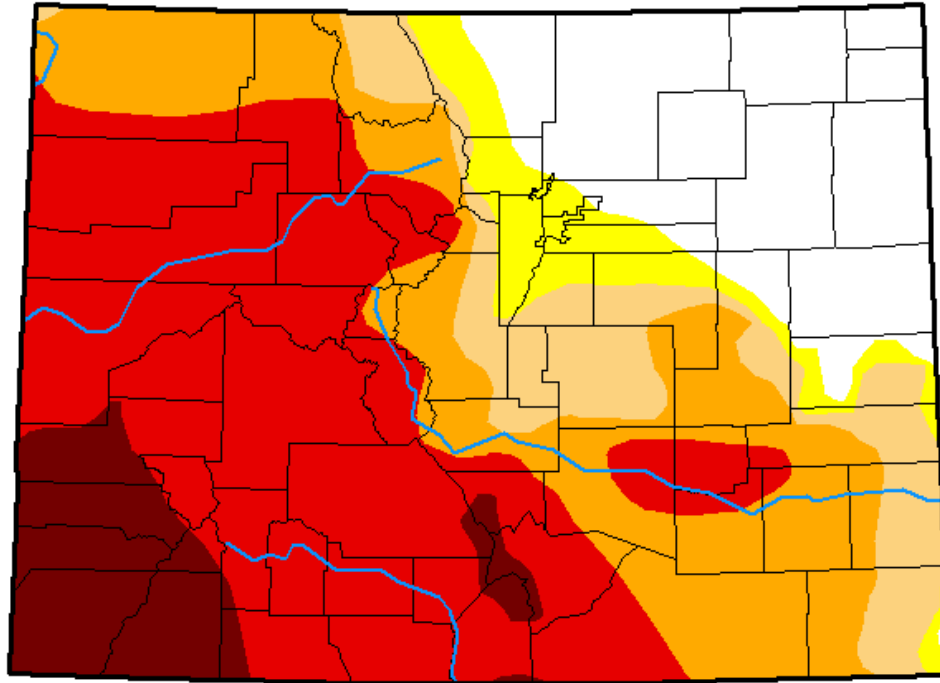


<http://droughtmonitor.unl.edu/>



# 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:

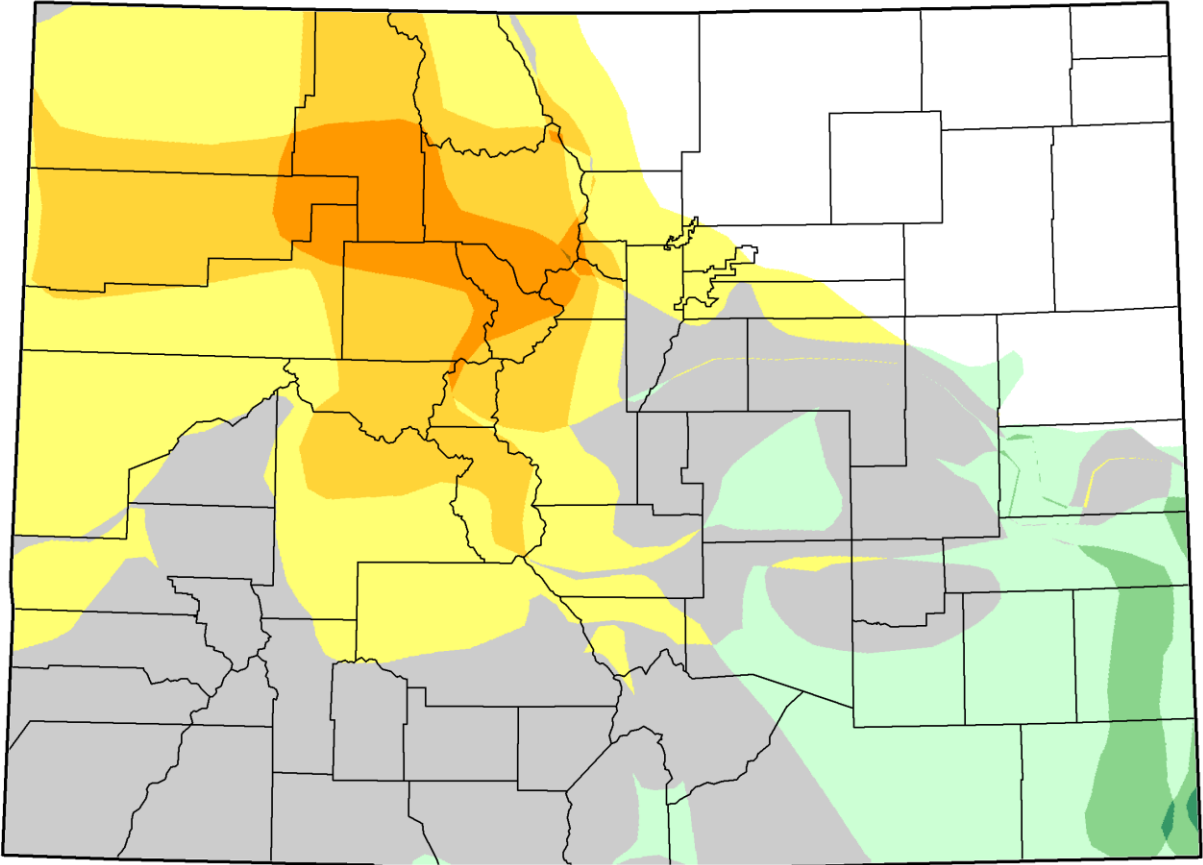
Richard Heim  
NCEI/NOAA














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



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



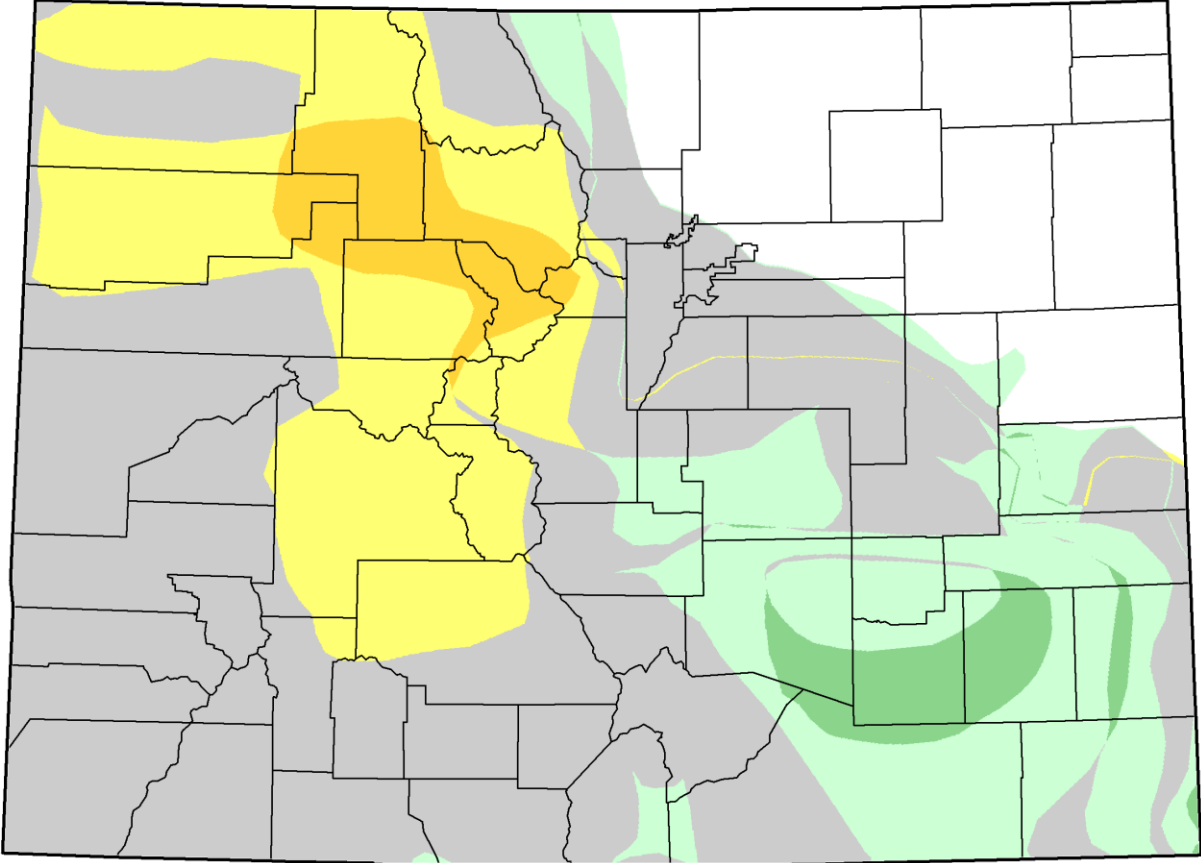
-  5 Class Degradation
-  4 Class Degradation
-  3 Class Degradation
-  2 Class Degradation
-  1 Class Degradation
-  No Change
-  1 Class Improvement
-  2 Class Improvement
-  3 Class Improvement
-  4 Class Improvement
-  5 Class Improvement












**August 14, 2018  
compared to  
June 19, 2018**

<http://droughtmonitor.unl.edu>



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

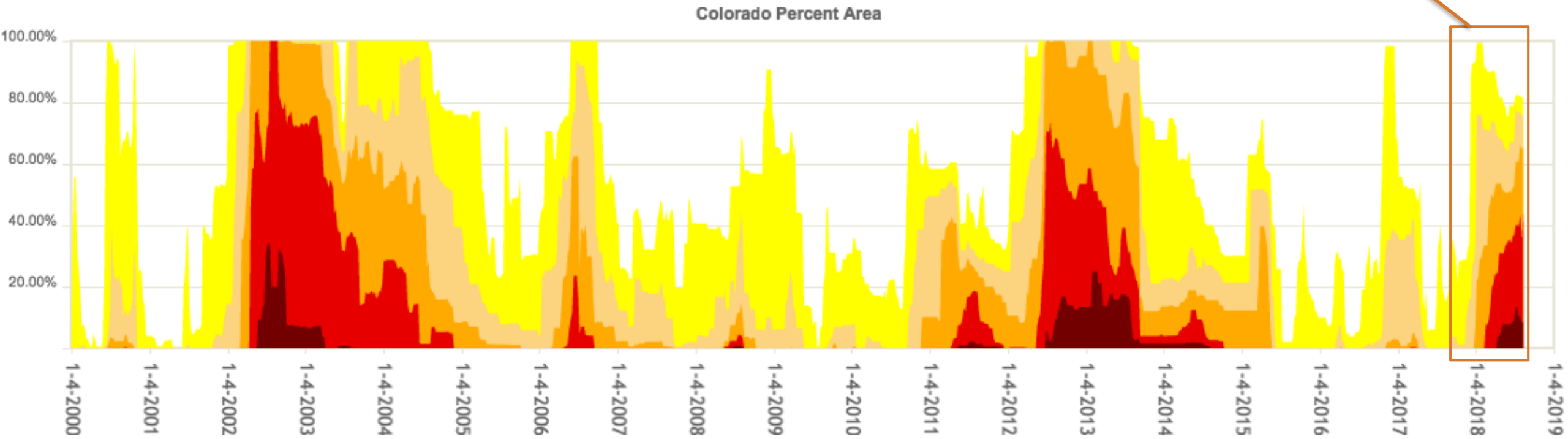
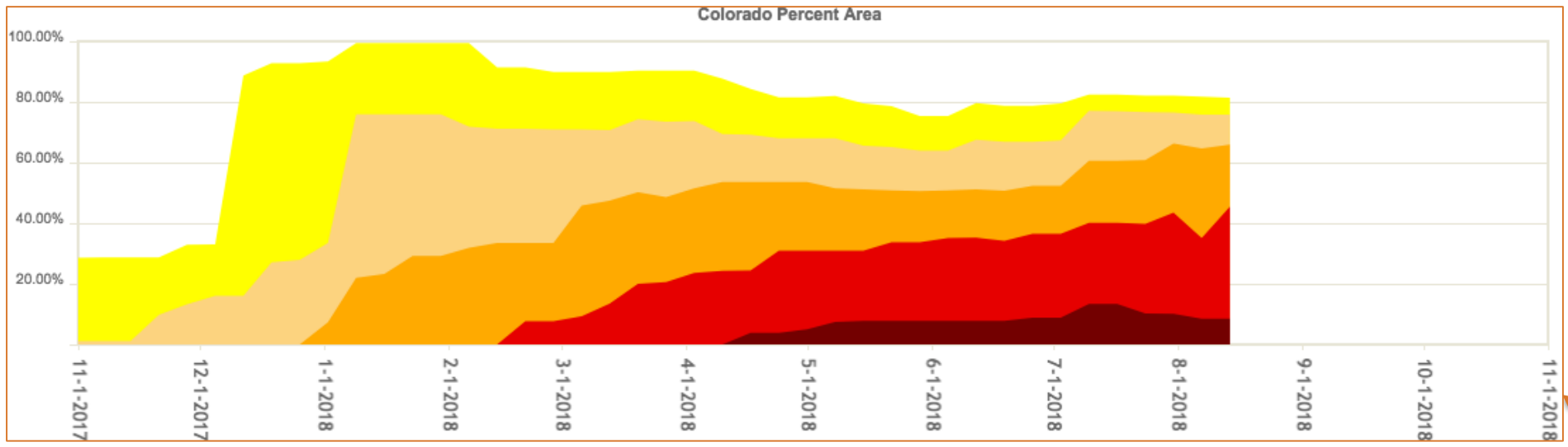


-  5 Class Degradation
-  4 Class Degradation
-  3 Class Degradation
-  2 Class Degradation
-  1 Class Degradation
-  No Change
-  1 Class Improvement
-  2 Class Improvement
-  3 Class Improvement
-  4 Class Improvement
-  5 Class Improvement

**August 14, 2018  
compared to  
July 17, 2018**

<http://droughtmonitor.unl.edu>



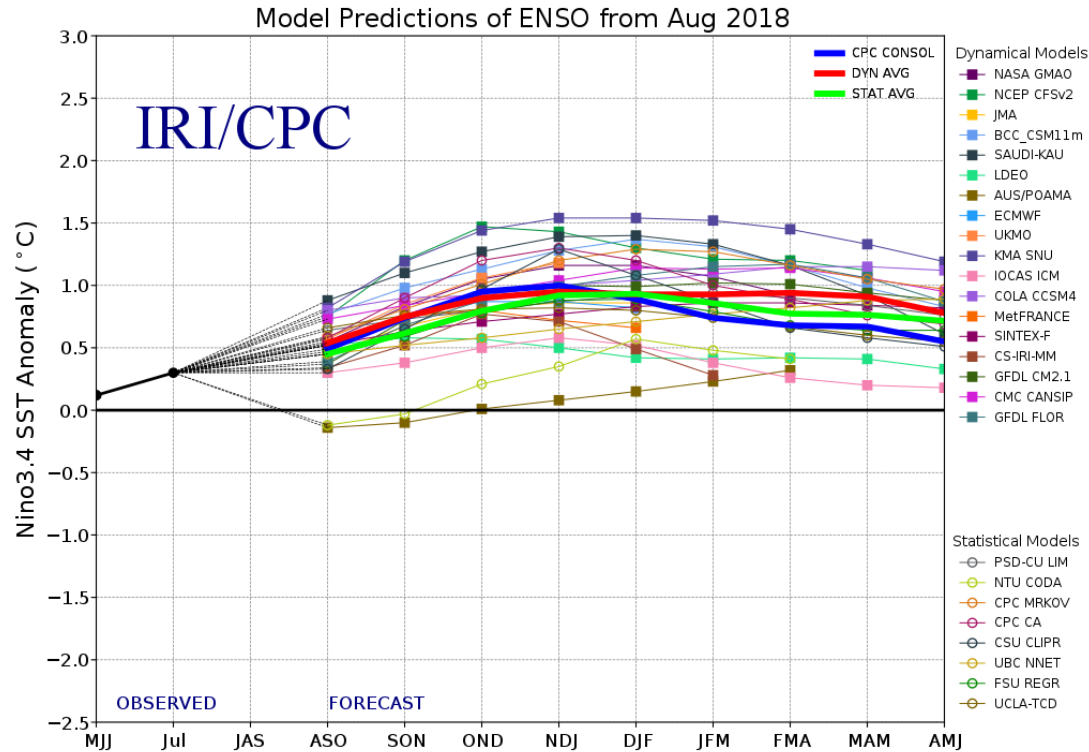




# Outlook

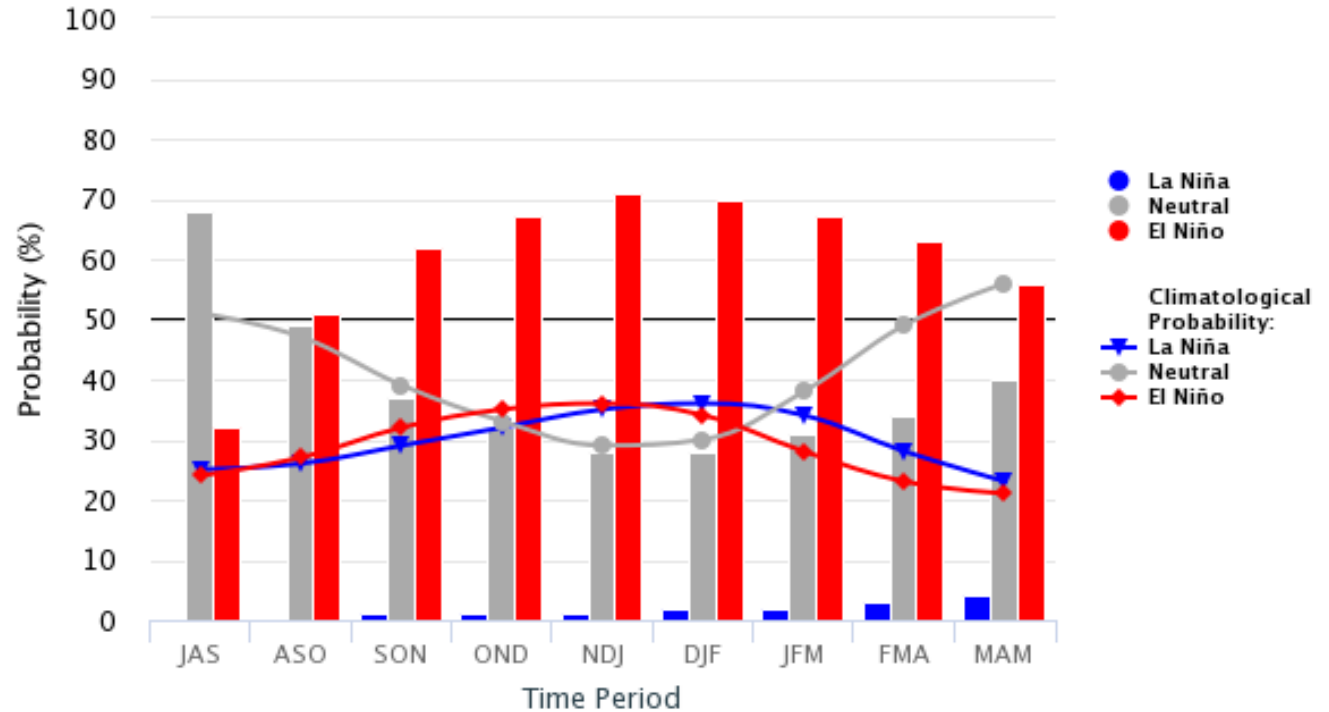


# El Niño-Southern Oscillation (ENSO)

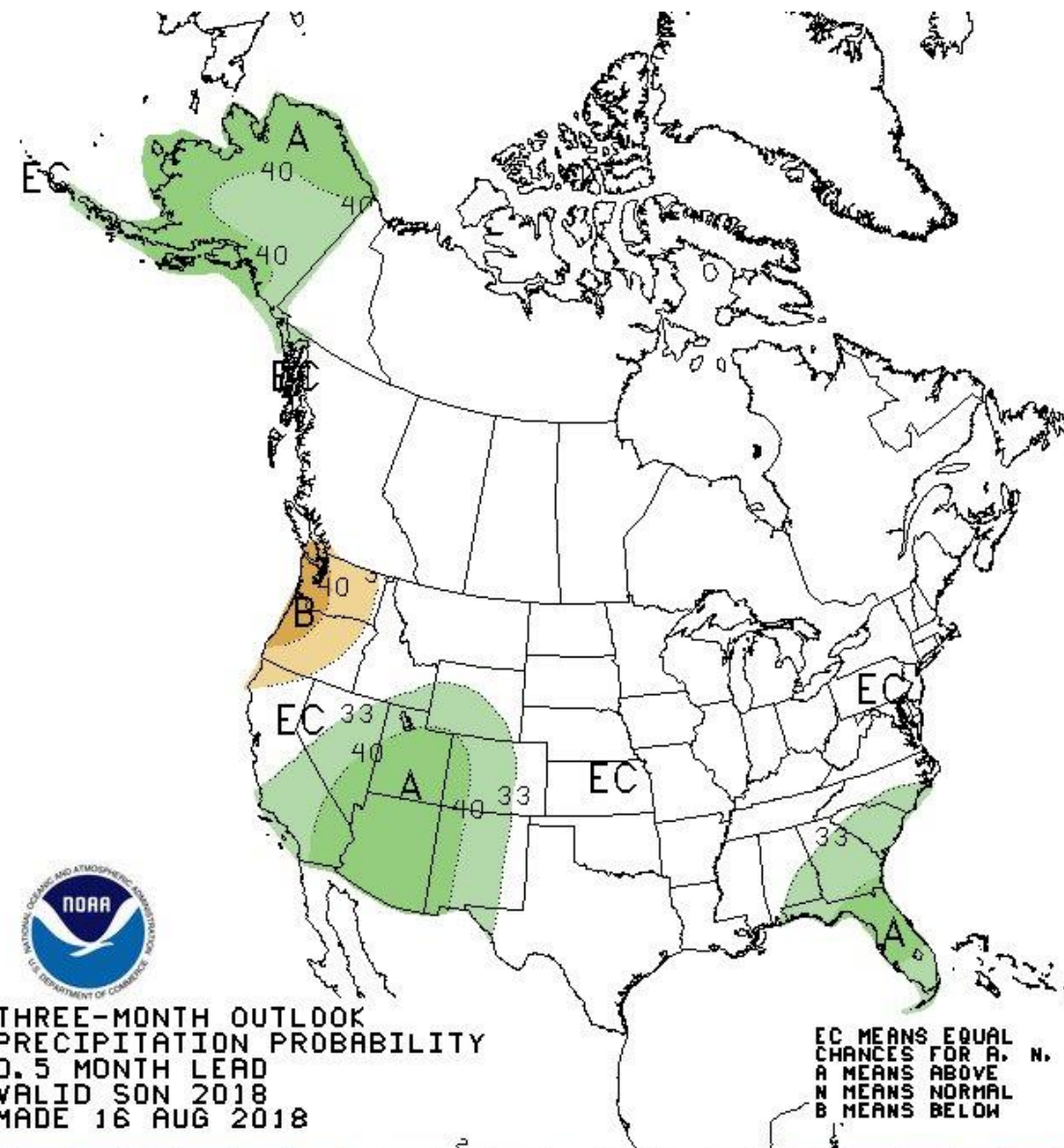
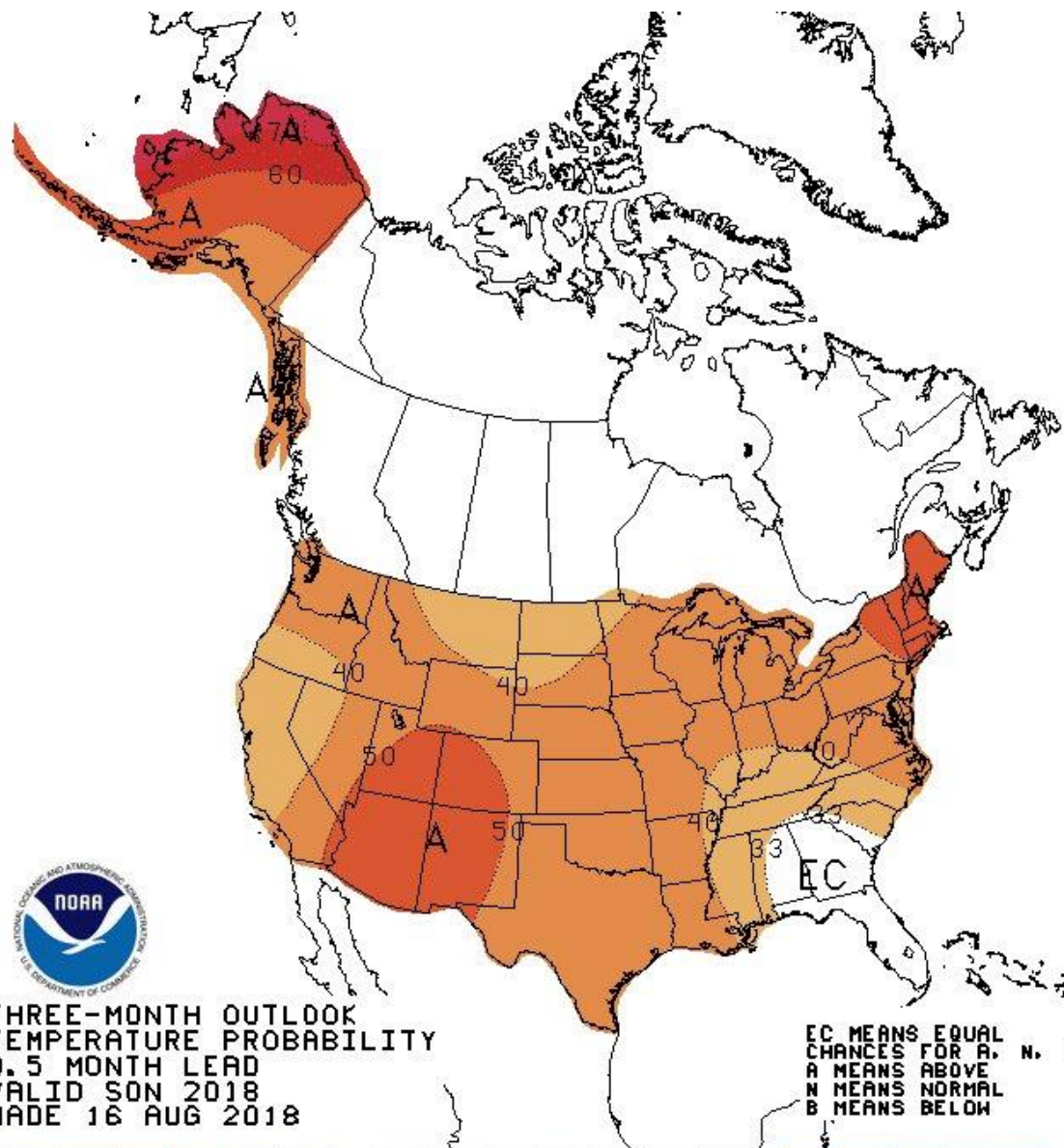


## Early-Aug CPC/IRI Official Probabilistic ENSO Forecasts

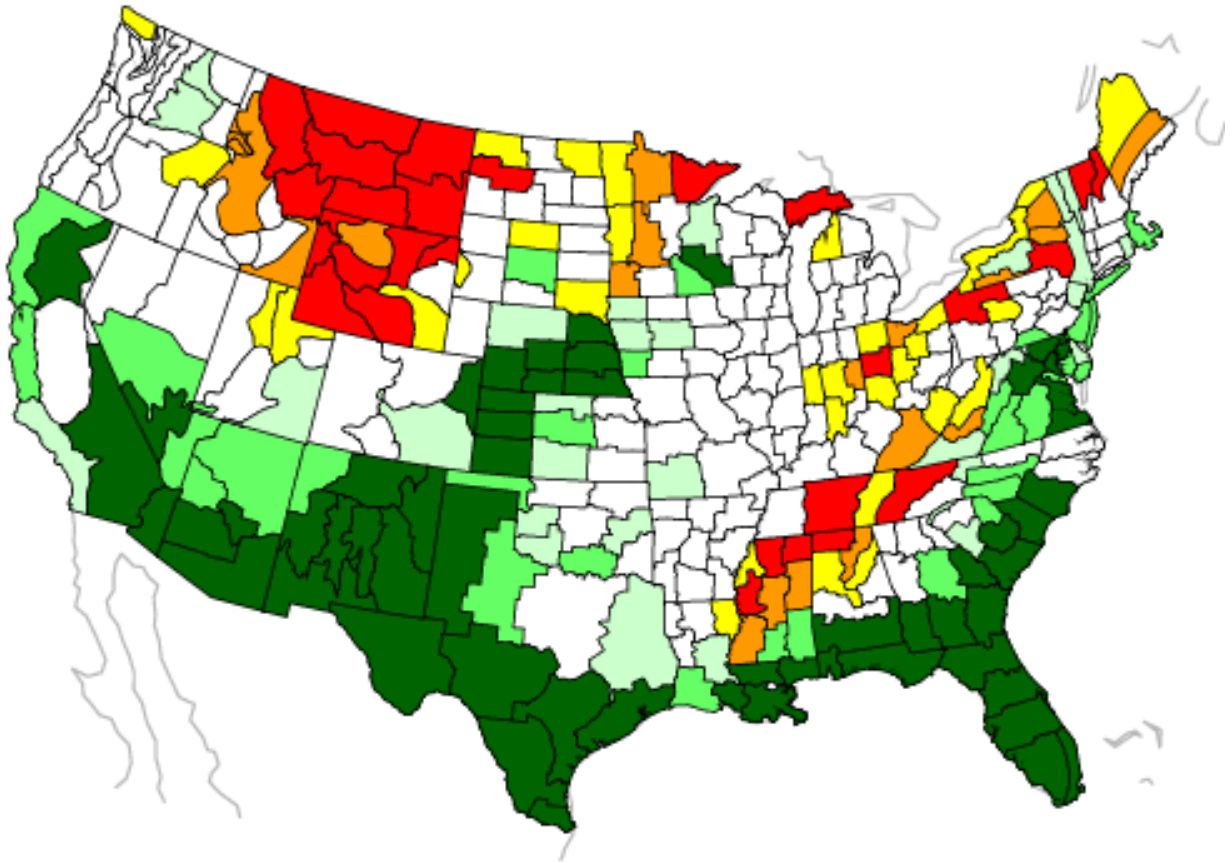
ENSO state based on NINO3.4 SST Anomaly  
Neutral ENSO: -0.5 °C to 0.5 °C



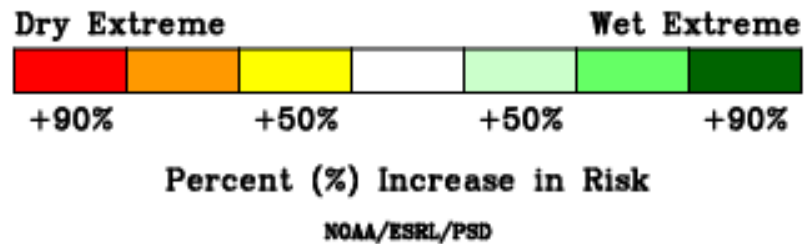
~70% chance of El Niño by late fall



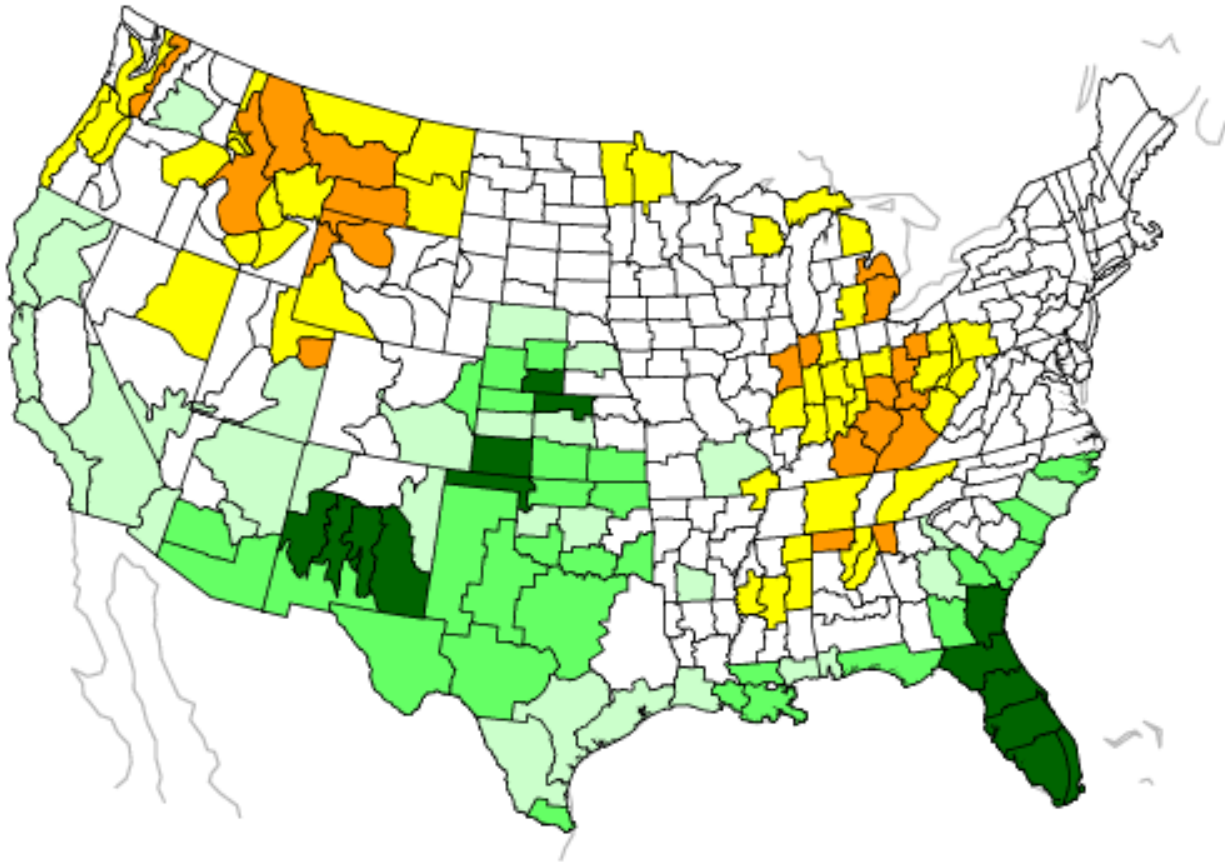
DJF Precipitation During El Nino  
Increased Risk of Wet or Dry Extremes



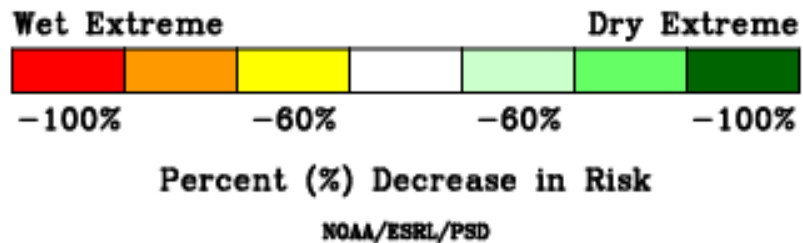
How does El Niño tilt the odds for winter extremes in Colorado?



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



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



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Thank you

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