Colorado Climate Center – *WATF Climate Update*

Becky Bolinger

Water Availability Task Force

November 13, 2018

ATMOSPHERIC SCIENCE
COLORADO STATE UNIVERSITY

COLORADO CLIMATE CENTER

WY2018 Noteworthy Events By Becky Bolinger (Colorado Climate Center)

For the first time ever, a call was placed on the Yampa River on August 22, when flows at Deerlodge Park were a meager 19 cubic feet per second.

*photo courtesy Becky Bolinger

A severe hailstorm battered Colorado Springs on August 6. Baseball-sized hail fell at the Cheyenne Mountain Zoo, killing 5 zoo animals and injuring 14 people. This was one of many large hail events in a very active season.

*photo courtesy Emma Pinell (Facebook)

Two tornadoes were reported in Park County over the summer, taking their total number of tornadoes ever recorded in the county to 7.

*photo courtesy CBS Denver

The Spring Creek Fire and 416 Fire burned a combined 162,000 acres in southern CO. The Spring Creek Fire was human caused on June 27 and the suspect charged with 141 counts of arson. It grew to over 100,000 acres to become the state's 3rd largest wildfire on record.

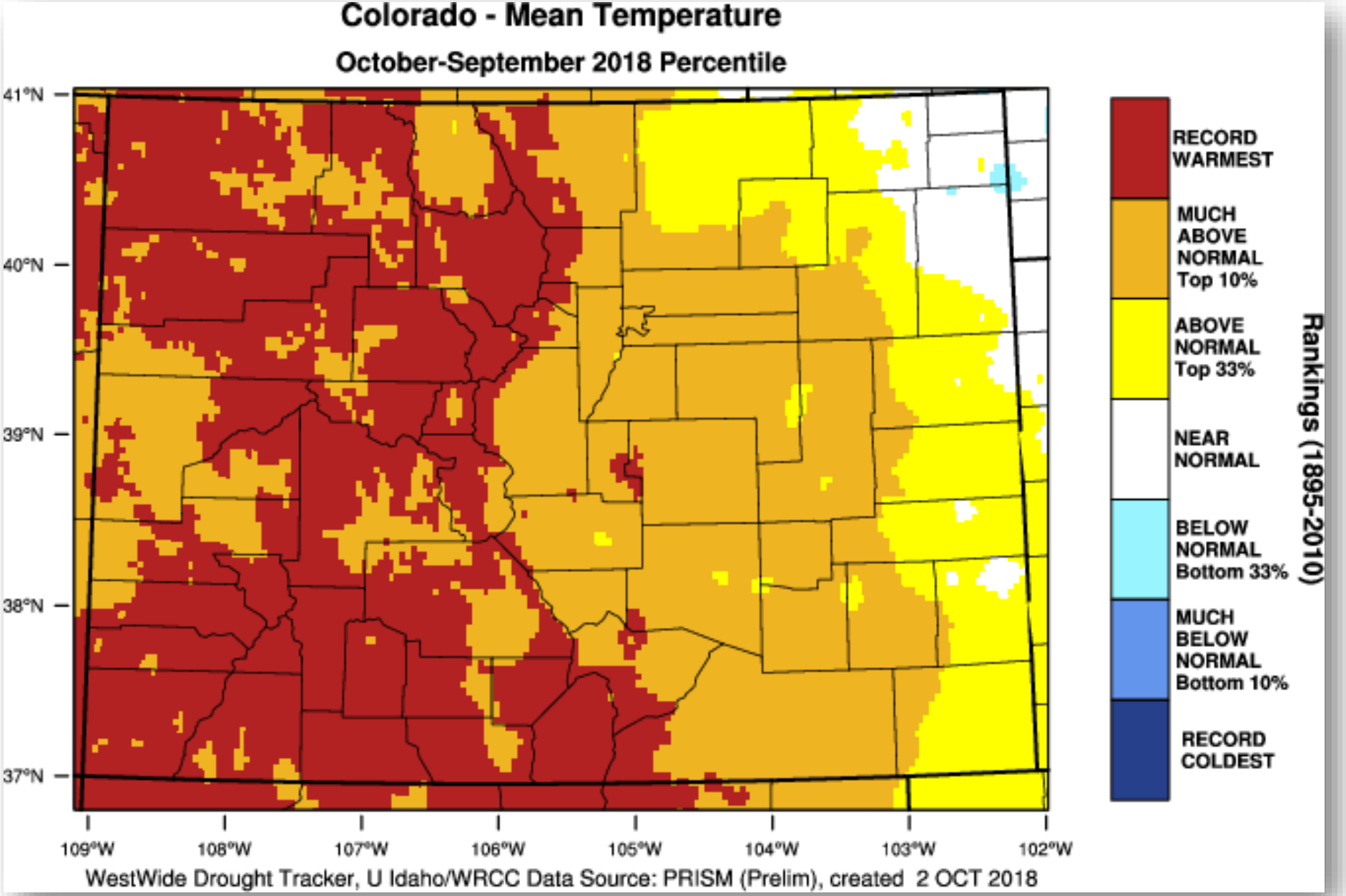
*photo courtesy Tomi Price (Facebook)

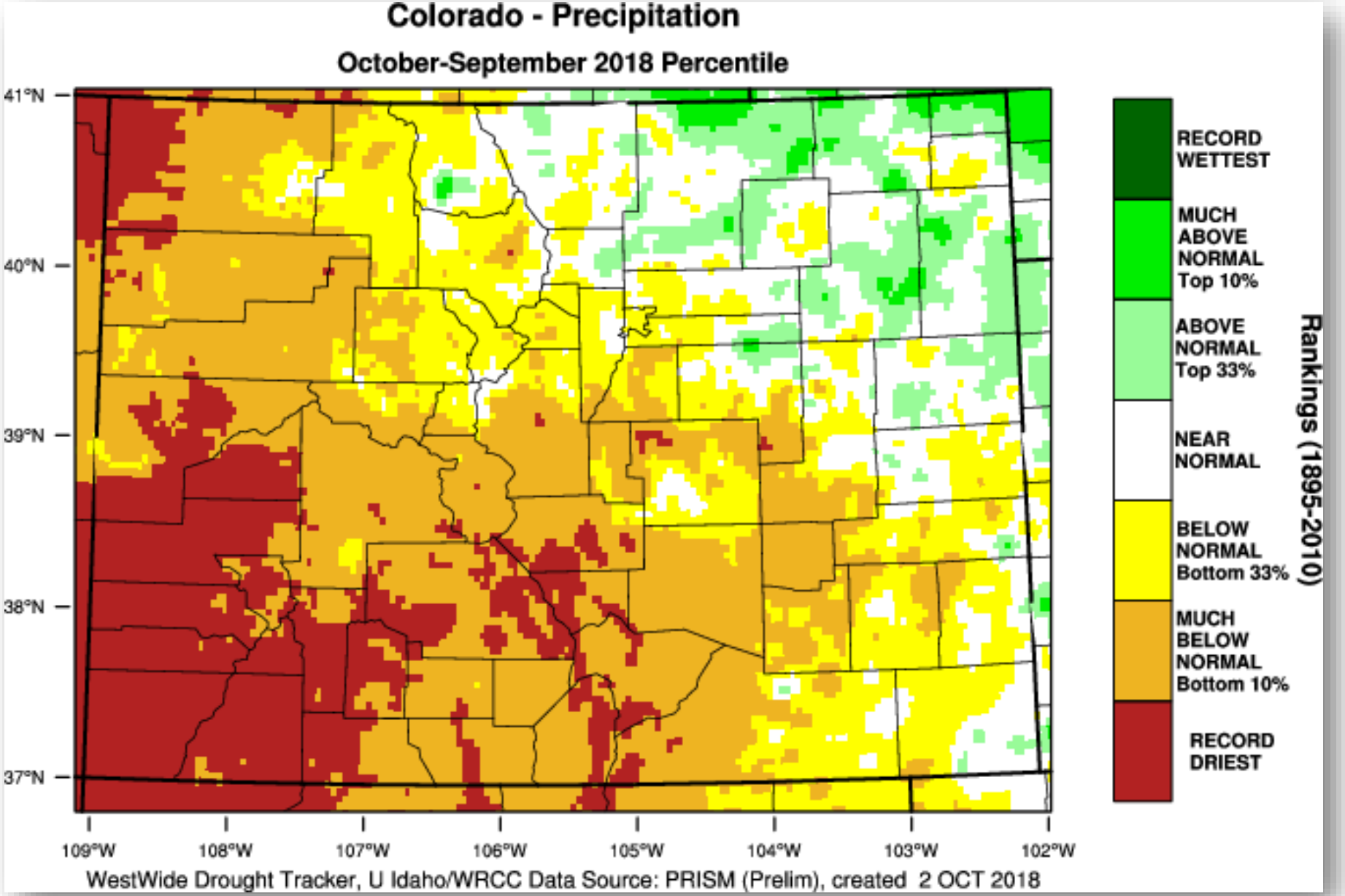
On April 17, a cold front brought significant winds. Extensive damage was reported from the Front Range across the eastern plains where gusts were 70-90mph. Wind was blamed for shutting down DIA runways and starting the Badger Hole Fire in Baca County, which burned more than 30,000 acres.

*photo courtesy Jeremiah Bellile (Twitter)

Water Year 2018

Colorado's Climate in Review…


Colorado - Mean Temperature
October-September 2018 Percentile
41°N
40°N
39°N
38°N
37°N
109°W
108°W
107°W
106°W
105°W
104°W
103°W
102°W
RECORD WARMEST
MUCH ABOVE NORMAL Top 10%
ABOVE NORMAL Top 33%
NEAR NORMAL
BELOW NORMAL Bottom 33%
MUCH BELOW NORMAL Bottom 10%
RECORD COLDEST
Rankings (1895-2010)
WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 2 OCT 2018


Colorado - Precipitation
October-September 2018 Percentile
41°N
40°N
39°N
38°N
37°N
109°W
108°W
107°W
106°W
105°W
104°W
103°W
102°W
RECORD WETTEST
MUCH ABOVE NORMAL Top 10%
ABOVE NORMAL Top 33%
NEAR NORMAL
BELOW NORMAL Bottom 33%
MUCH BELOW NORMAL Bottom 10%
RECORD DRIEST
Rankings (1895-2010)
WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 2 OCT 2018

CO STATEWIDE RANKING in 124-YEAR RECORD

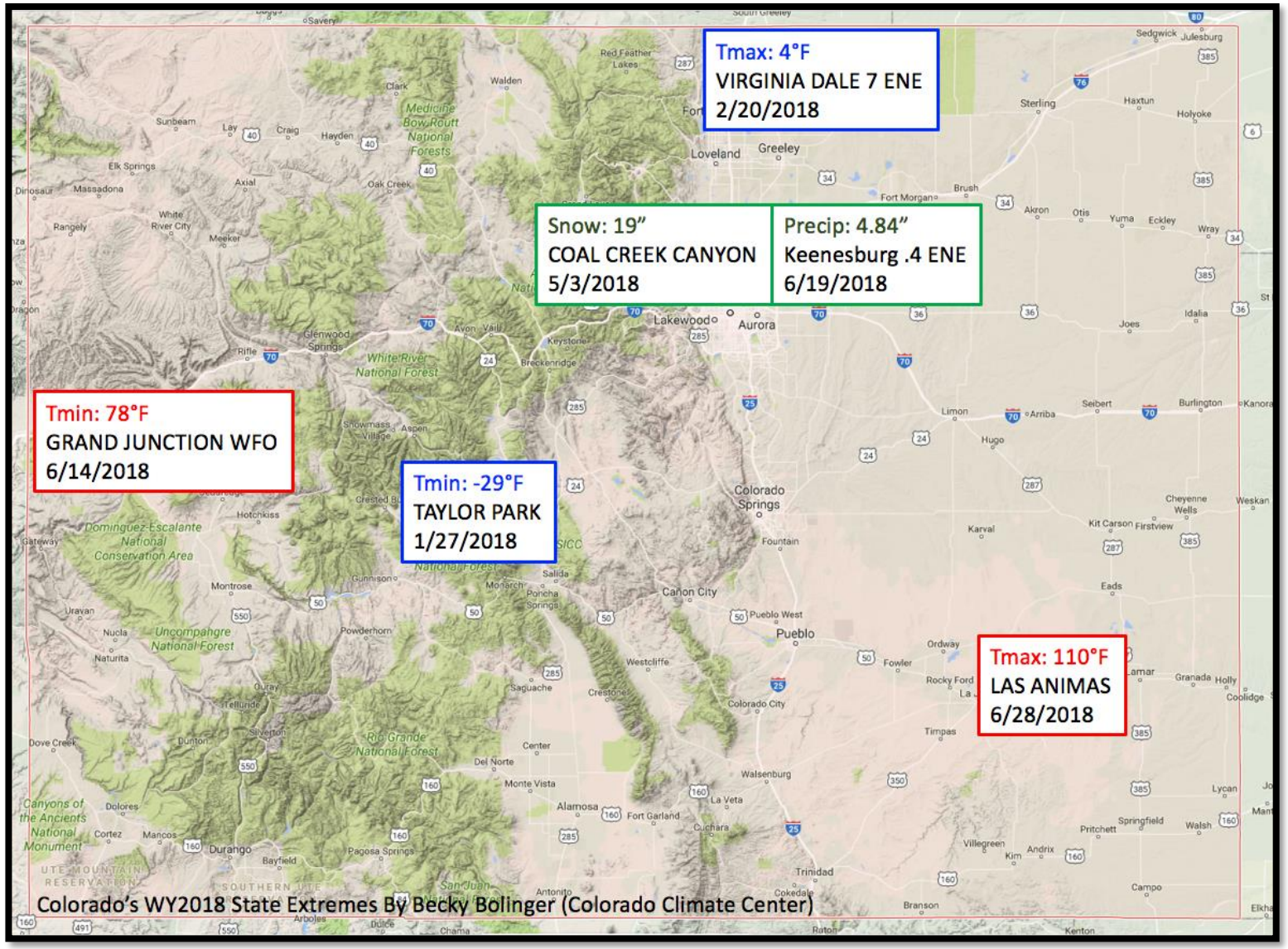
MONTH	T RANK	P RANK
Oct 2017	near average	37th driest
Nov 2017	record warmest	18th driest
Dec 2017	8th warmest	7th driest
Jan 2018	8th warmest	37th driest
Feb 2018	near average	near average
Mar 2018	25th warmest	26th driest
Apr 2018	near average	34th driest
May 2018	2nd warmest	38th driest
Jun 2018	3rd warmest	26th driest
Jul 2018	10th warmest	near average
Aug 2018	33rd warmest	25th driest
Sep 2018	3rd warmest	19th driest
Water Year	record warmest	2nd driest

From NOAA NCEI's National Temperature and Precipitation Rank Maps:
www.ncdc.noaa.gov/sotc/national

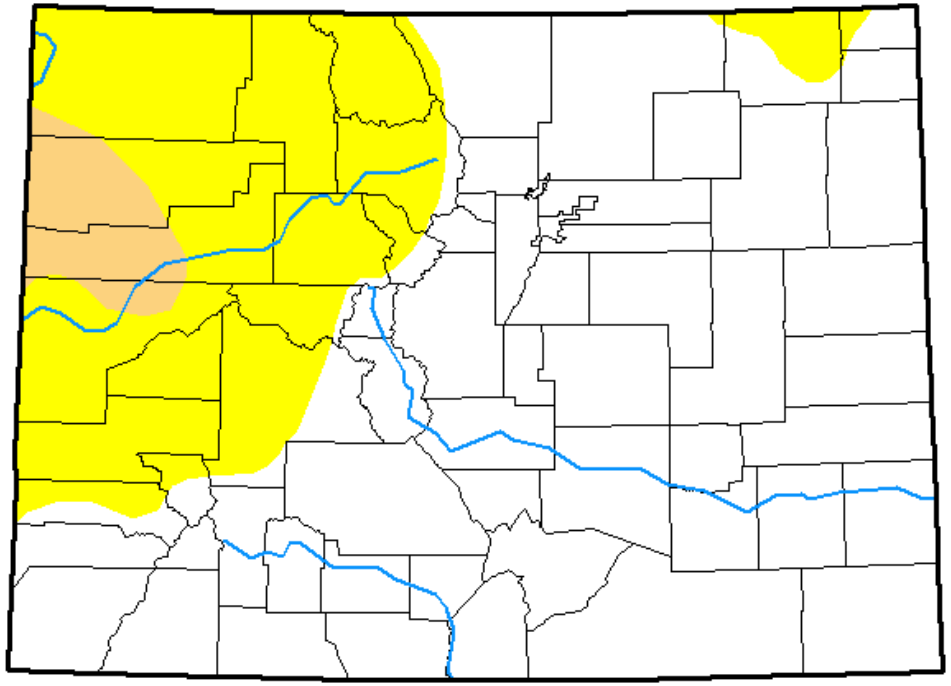
NUMBER OF DAILY AND MONTHLY STATION RECORDS BROKEN in CO

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



U.S. Drought Monitor
Colorado



October 3, 2017
(Released Thursday, Oct. 5, 2017)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	70.54	29.46	3.70	0.00	0.00	0.00
Last Week *09-26-2017*	67.63	32.37	3.72	0.00	0.00	0.00
3 Months Ago *07-04-2017*	85.58	14.42	0.00	0.00	0.00	0.00
Start of Calendar Year *01-03-2017*	31.88	68.12	37.21	2.88	0.00	0.00
Start of Water Year *09-26-2017*	67.63	32.37	3.72	0.00	0.00	0.00
One Year Ago *10-04-2016*	75.77	24.23	2.45	0.00	0.00	0.00

Intensity:

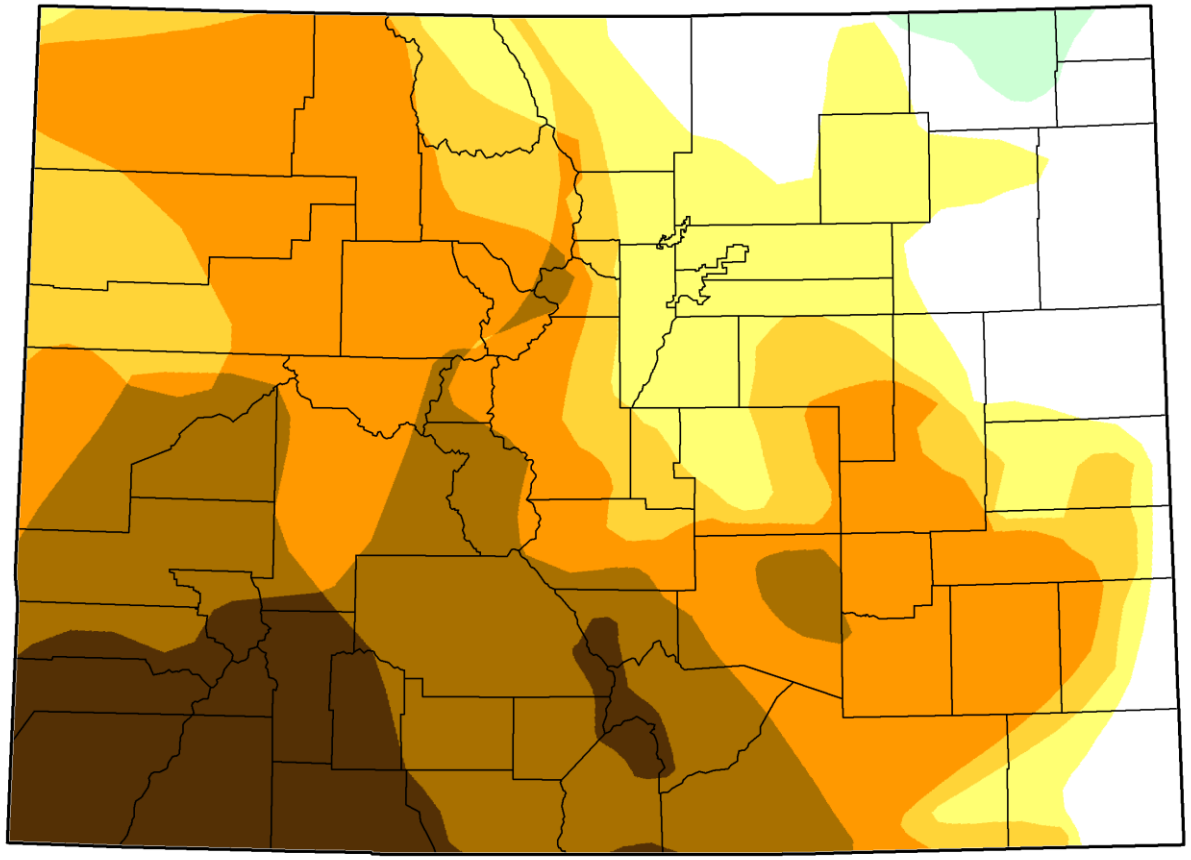
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:
Anthony Artusa
NOAA/NWS/NCEP/CPC

http://droughtmonitor.unl.edu/

U.S. Drought Monitor Class Change - Colorado
1 Year

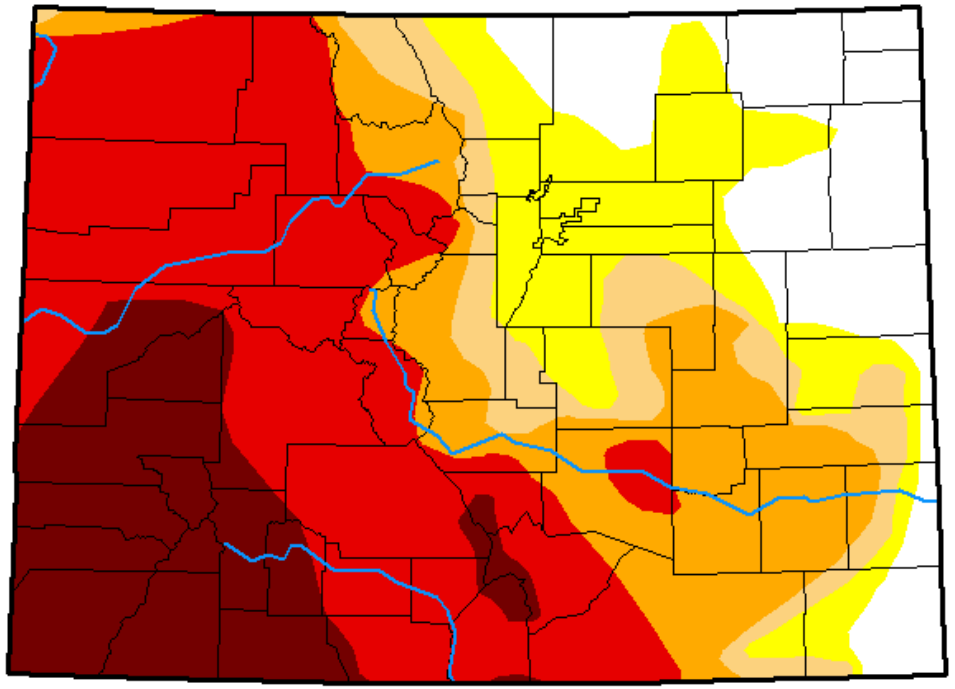


October 2, 2018
compared to
October 3, 2017

http://droughtmonitor.unl.edu

- 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

U.S. Drought Monitor
Colorado



October 2, 2018
(Released Thursday, Oct. 4, 2018)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	14.19	85.81	72.30	64.41	48.47	16.21
Last Week *09-25-2018*	14.19	85.81	72.30	64.41	48.47	16.21
3 Months Ago *07-03-2018*	20.46	79.54	67.30	52.31	36.46	8.81
Start of Calendar Year *01-02-2018*	6.57	93.43	33.53	7.27	0.00	0.00
Start of Water Year *09-25-2018*	14.19	85.81	72.30	64.41	48.47	16.21
One Year Ago *10-03-2017*	70.54	29.46	3.70	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:

David Miskus
NOAA/NWS/NCEP/CPC

http://droughtmonitor.unl.edu/

COLORADO
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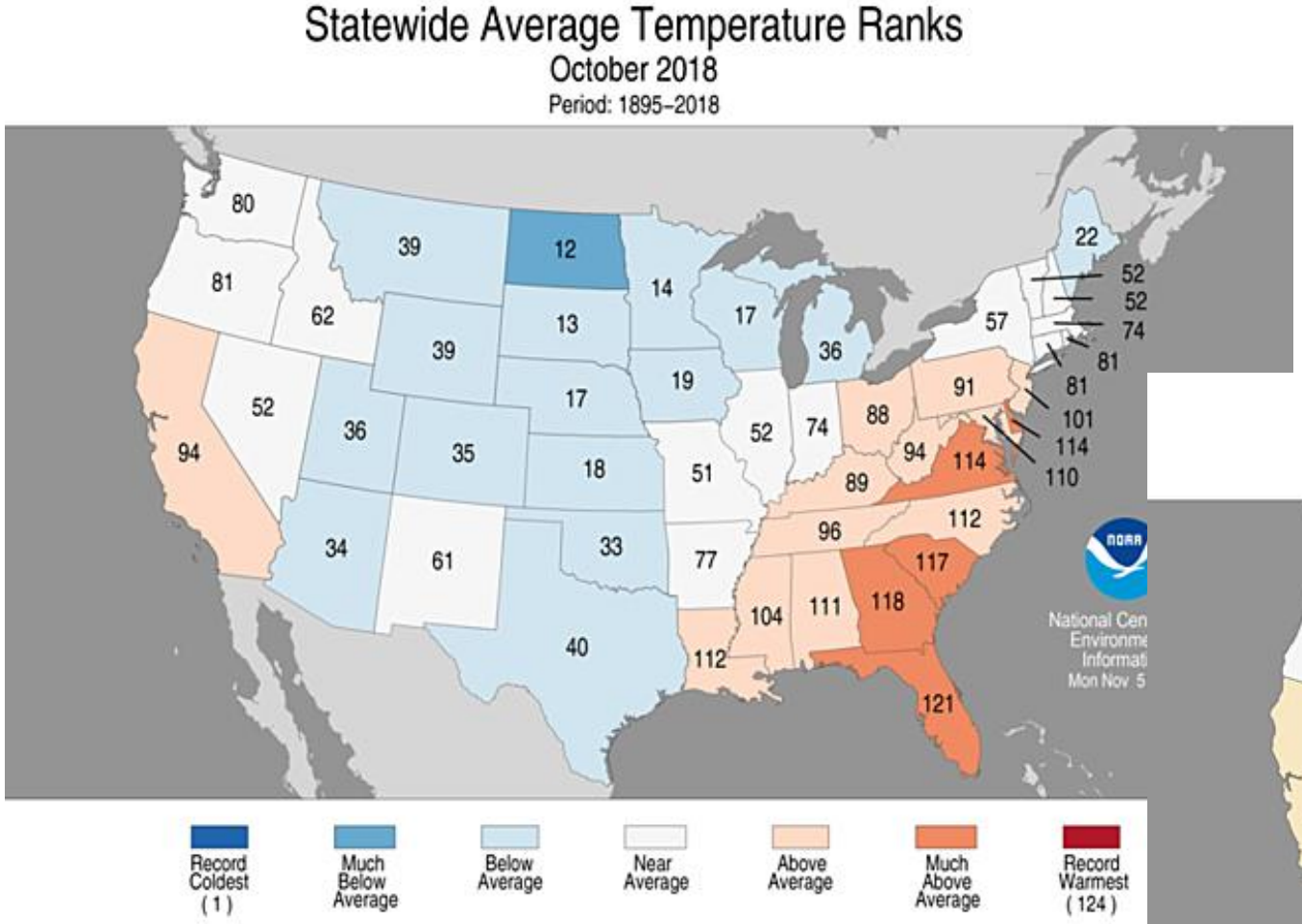
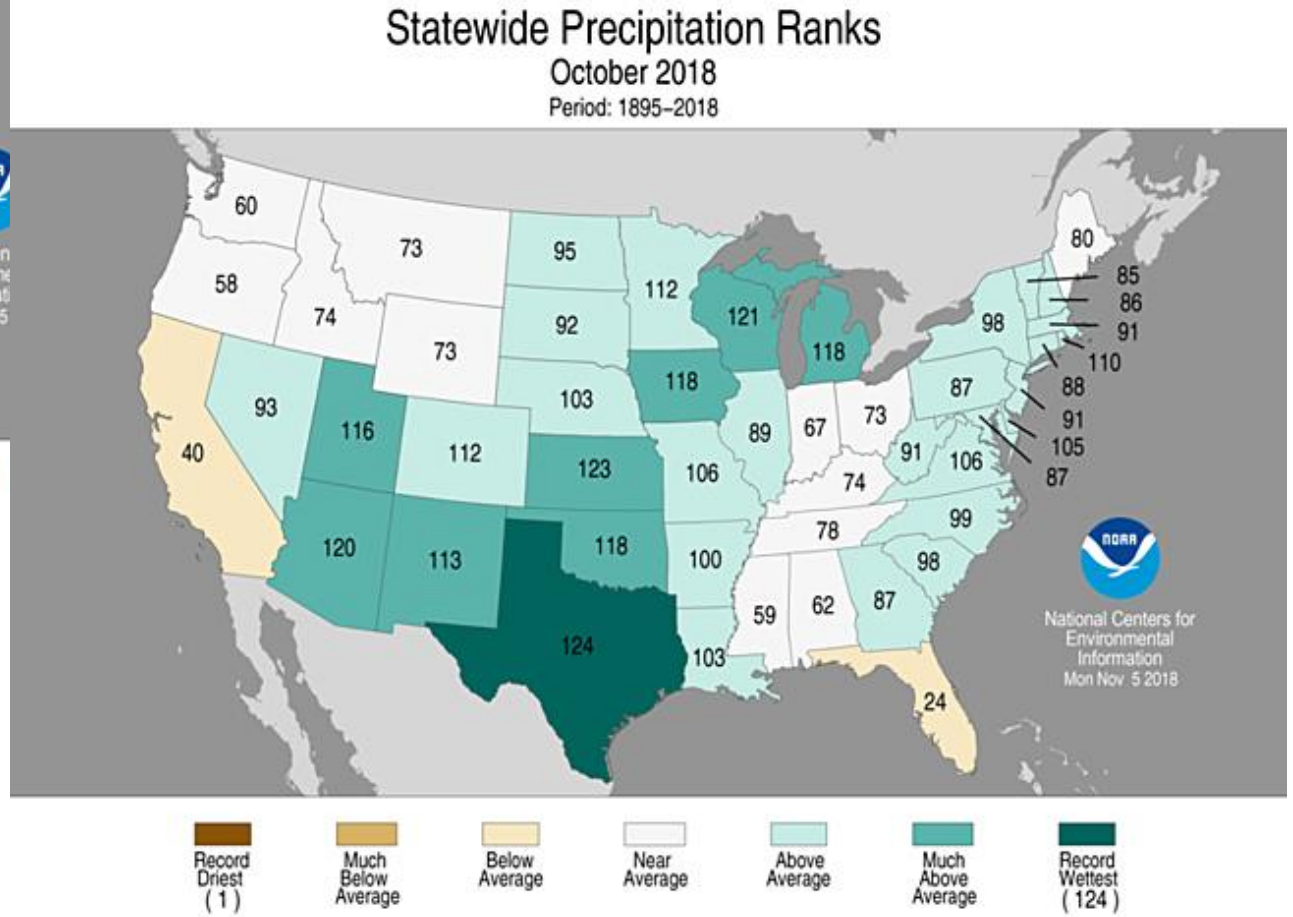
2019 Water Year To Date

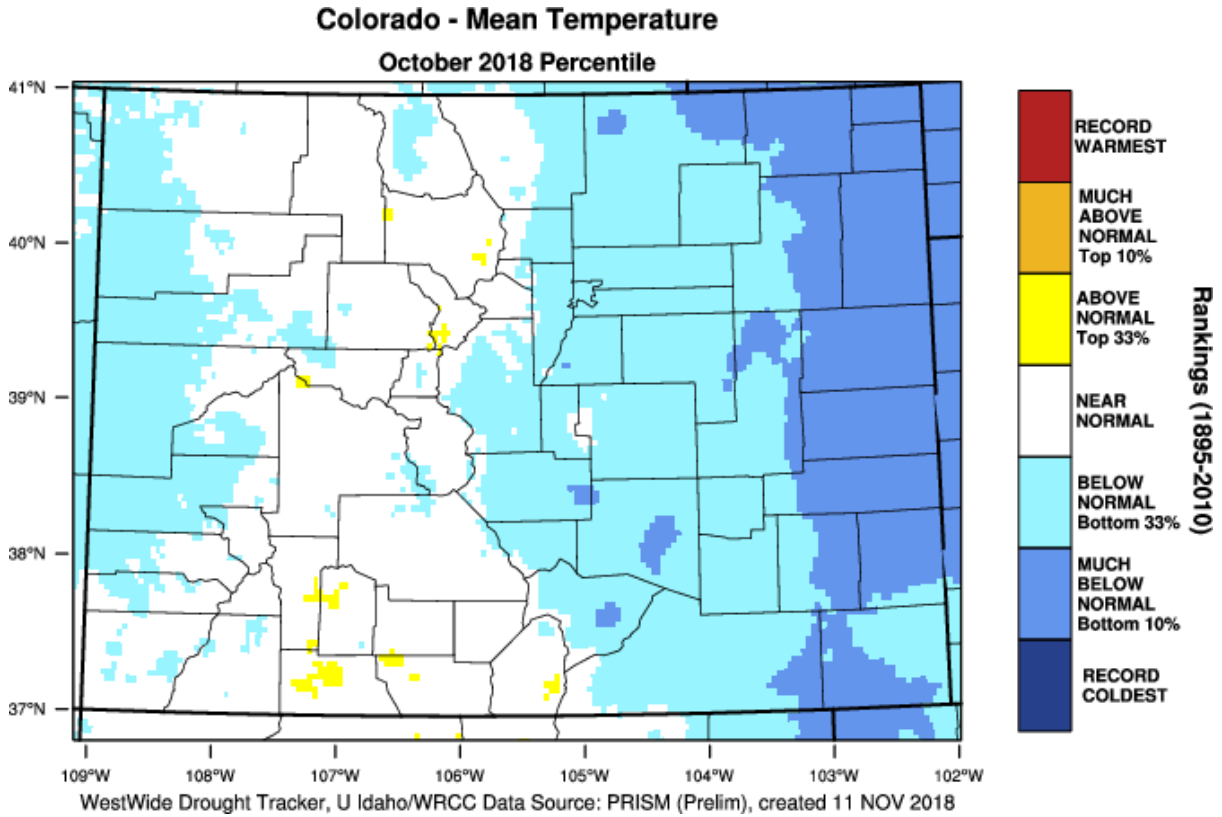
temperature, precipitation,
anomalies, drought conditions



** first month since August 2017 CO has ranked below average for temperature **

** first month since September 2017 CO has ranked above average for precipitation **

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October 2018 Percentile
41°N
40°N
39°N
38°N
37°N
109°W
108°W
107°W
106°W
105°W
104°W
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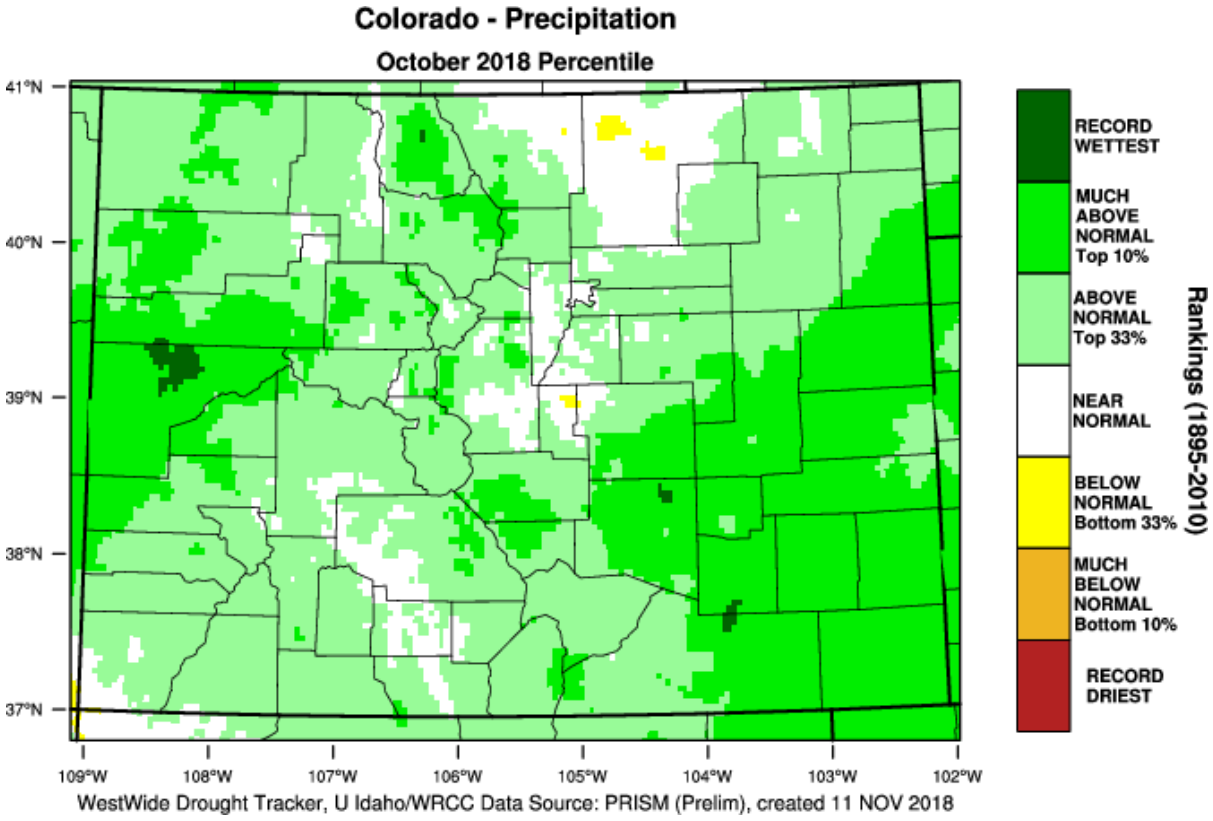
Rankings (1895-2010)
WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 11 NOV 2018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October 2018 Percentile
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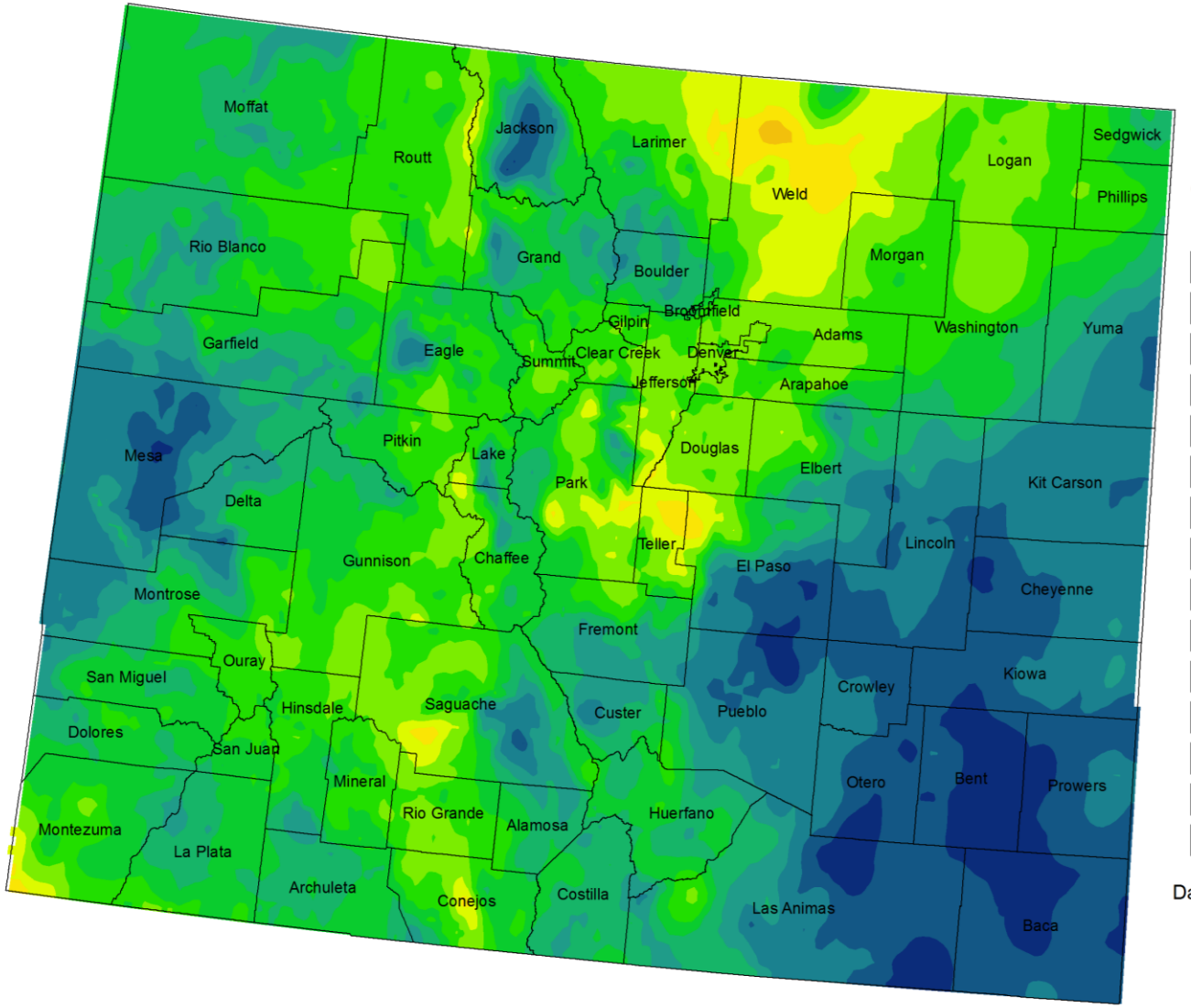
Colorado October 2018 Precipitation as a Percentage of Normal

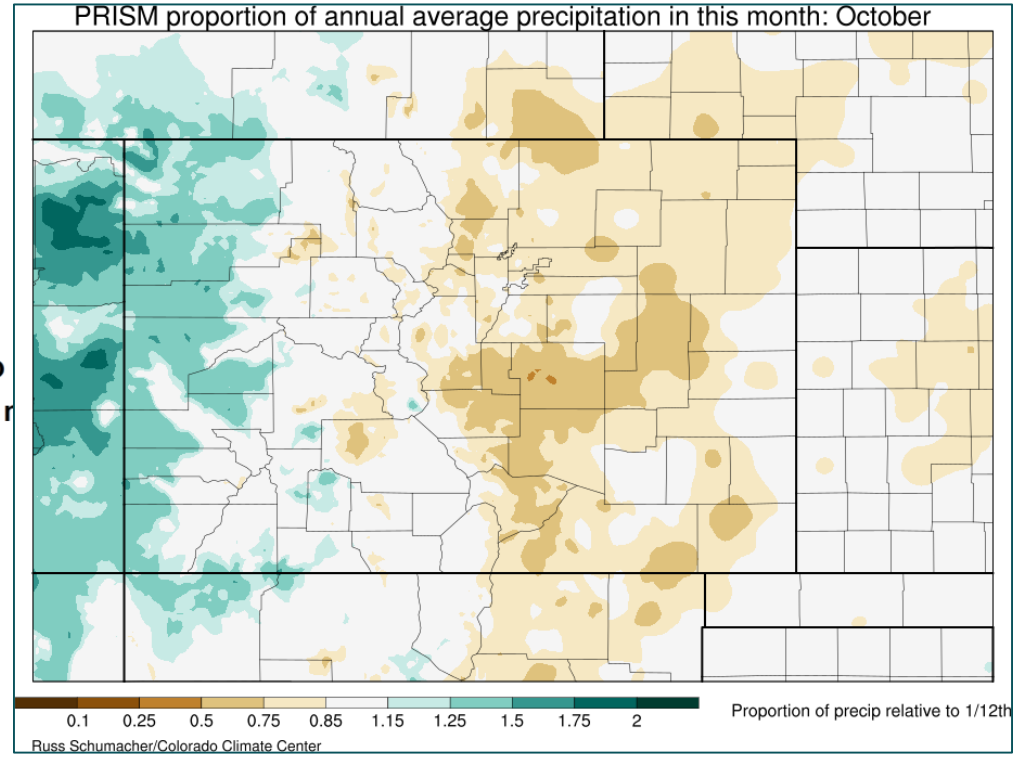


oct2018_pnco

Precip as % of r

- 0
- 0 - 10
- 11 - 20
- 21 - 30
- 31 - 50
- 51 - 70
- 71 - 90
- 91 - 110
- 111 - 130
- 131 - 150
- 151 - 170
- 171 - 200
- 201 - 250
- 251 - 300
- 300+

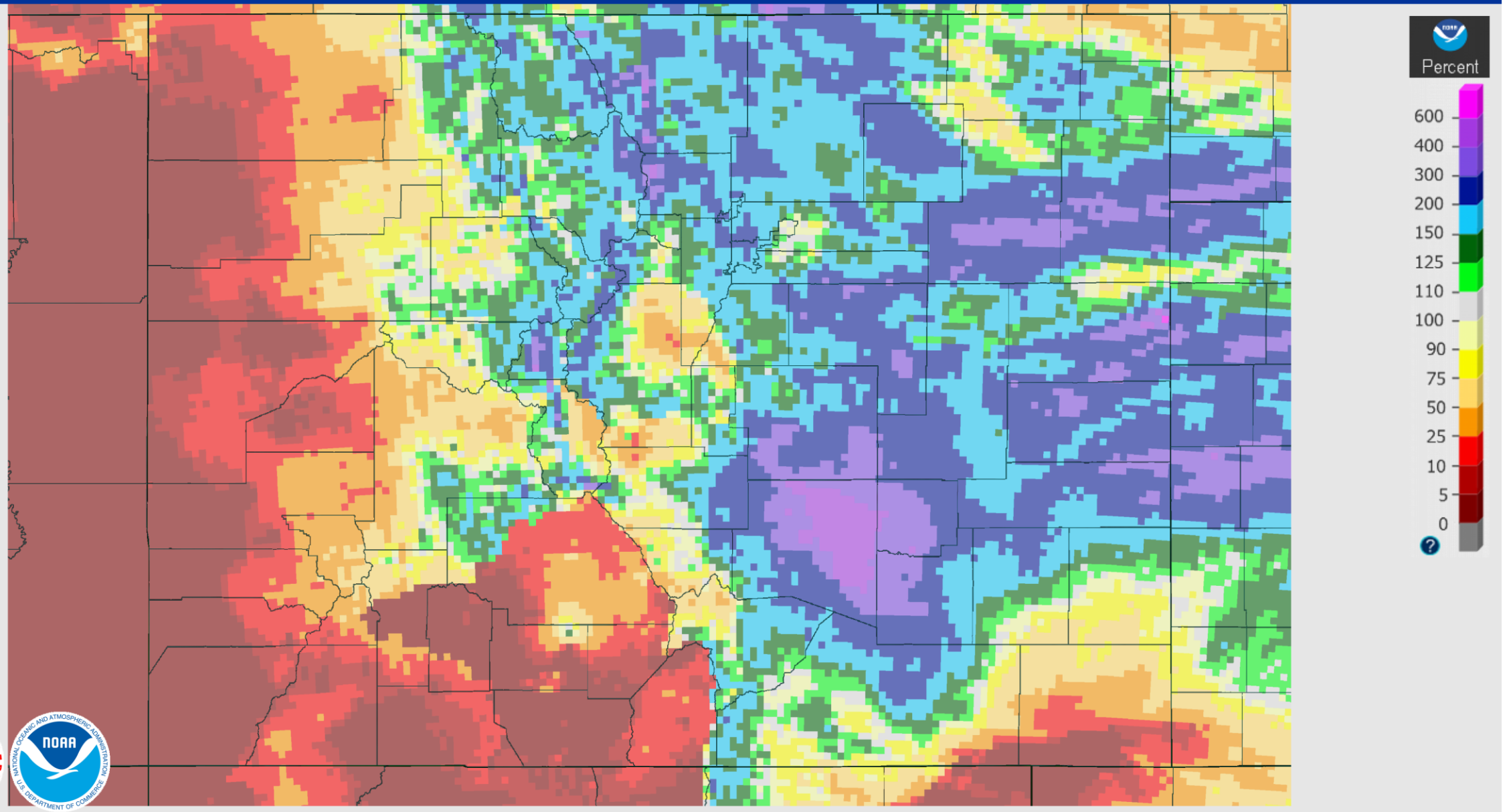
Data from PRISM Climate Group



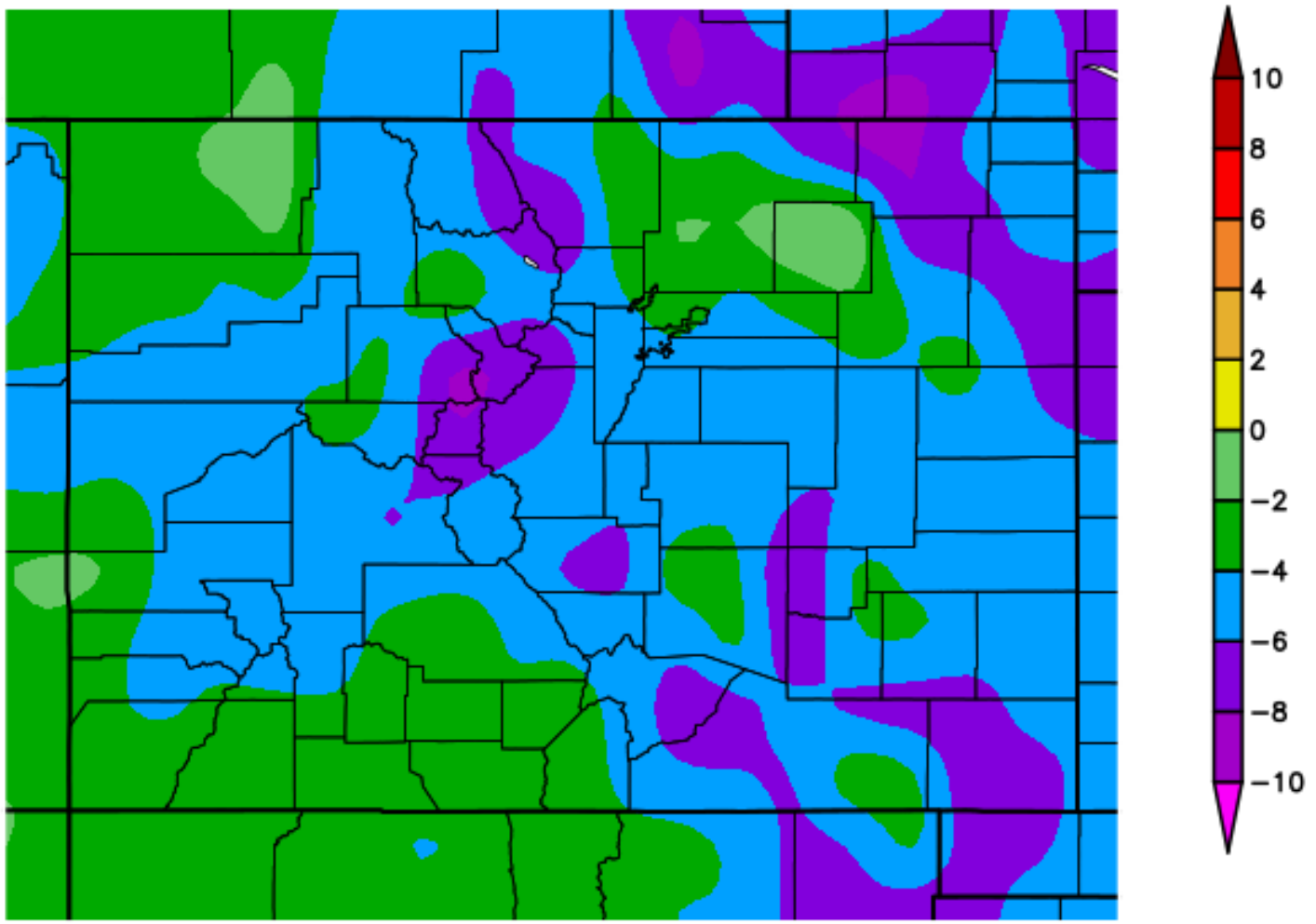
November 12, 2018 Month to Date Percent Precipitation

Created on: November 12, 2018 - 22:50 UTC

Valid on: November 12, 2018 12:00 UTC

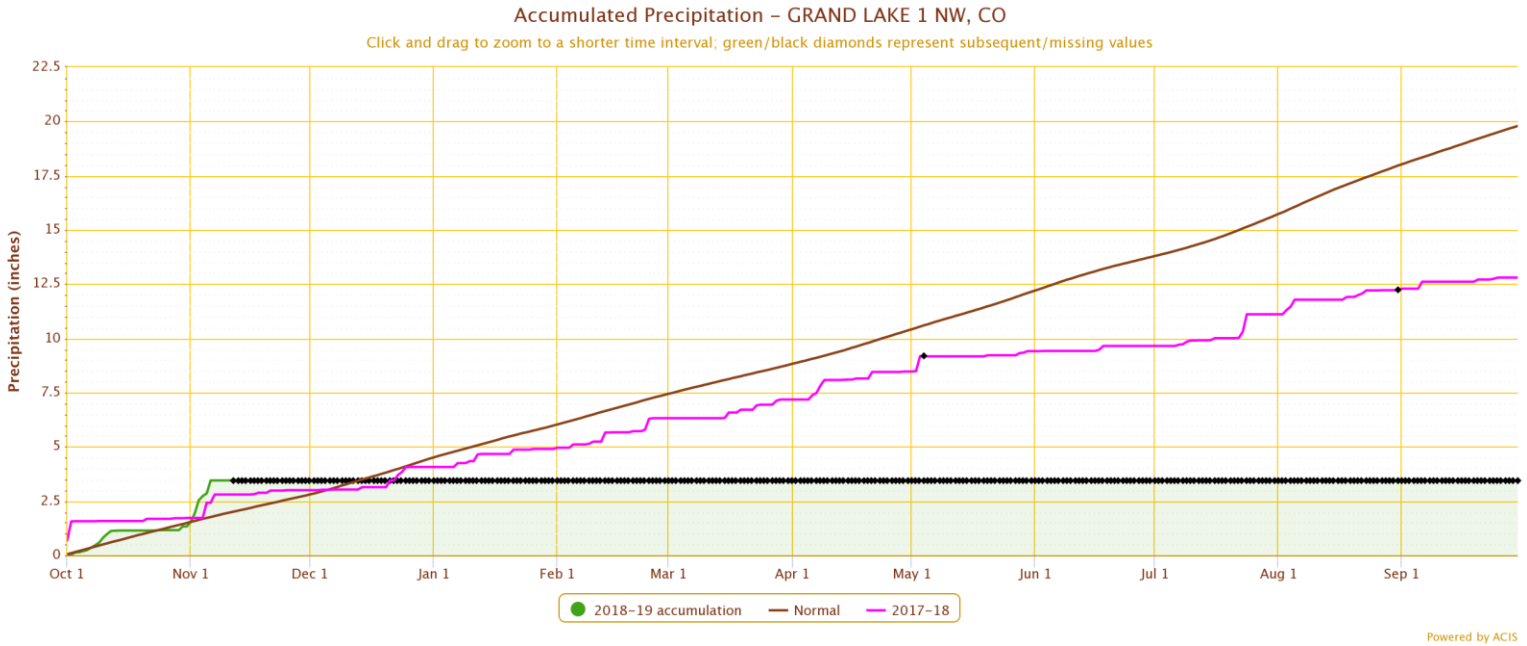


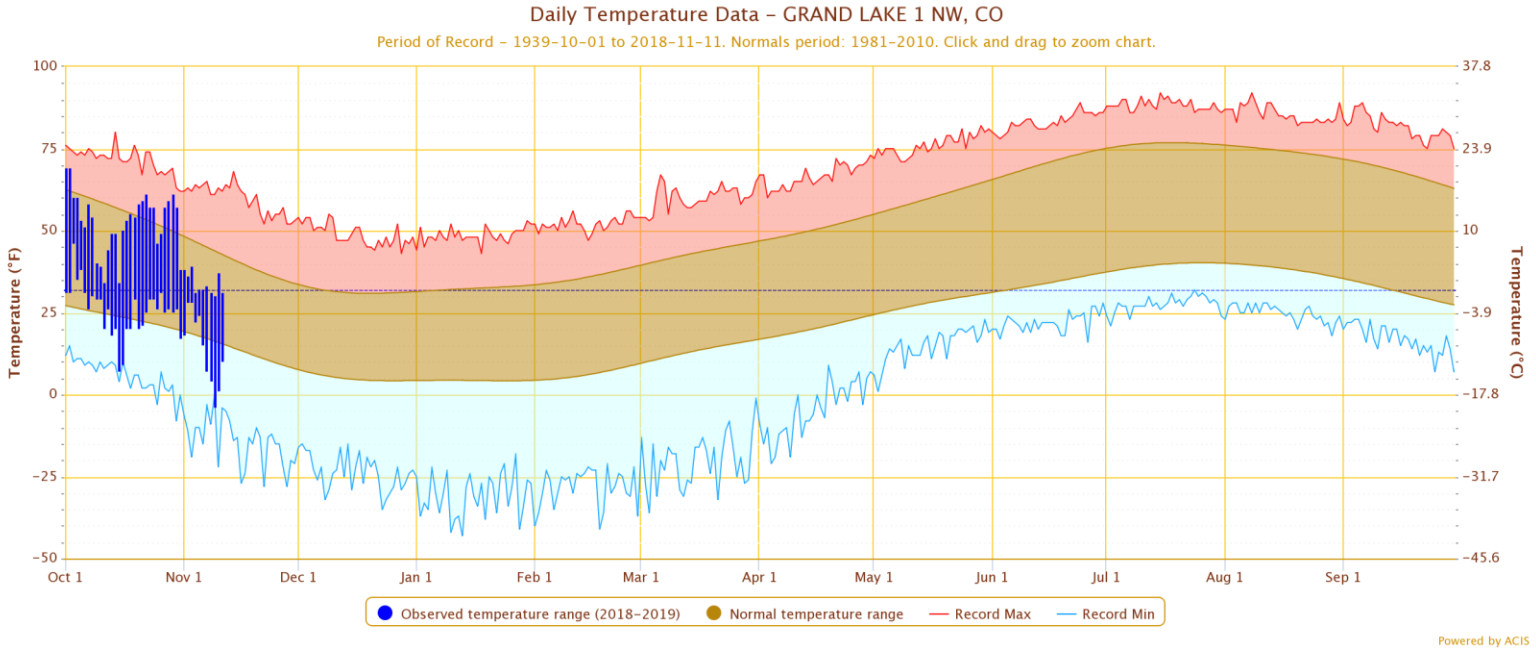
Departure from Normal Temperature (F)
11/1/2018 – 11/11/2018

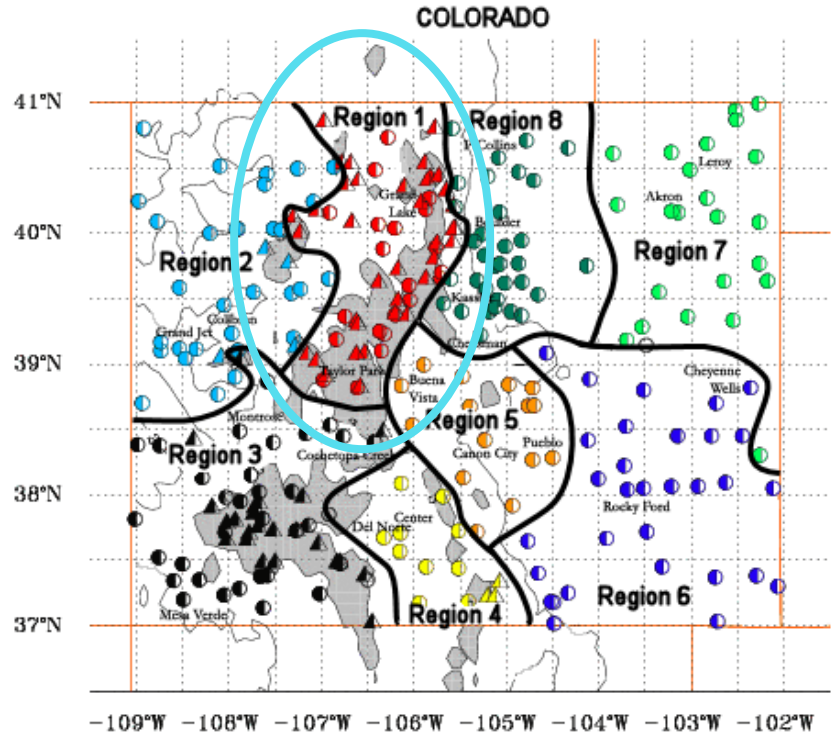


Generated 11/12/2018 at HPRCC using provisional data.

NOAA Regional Climate Centers

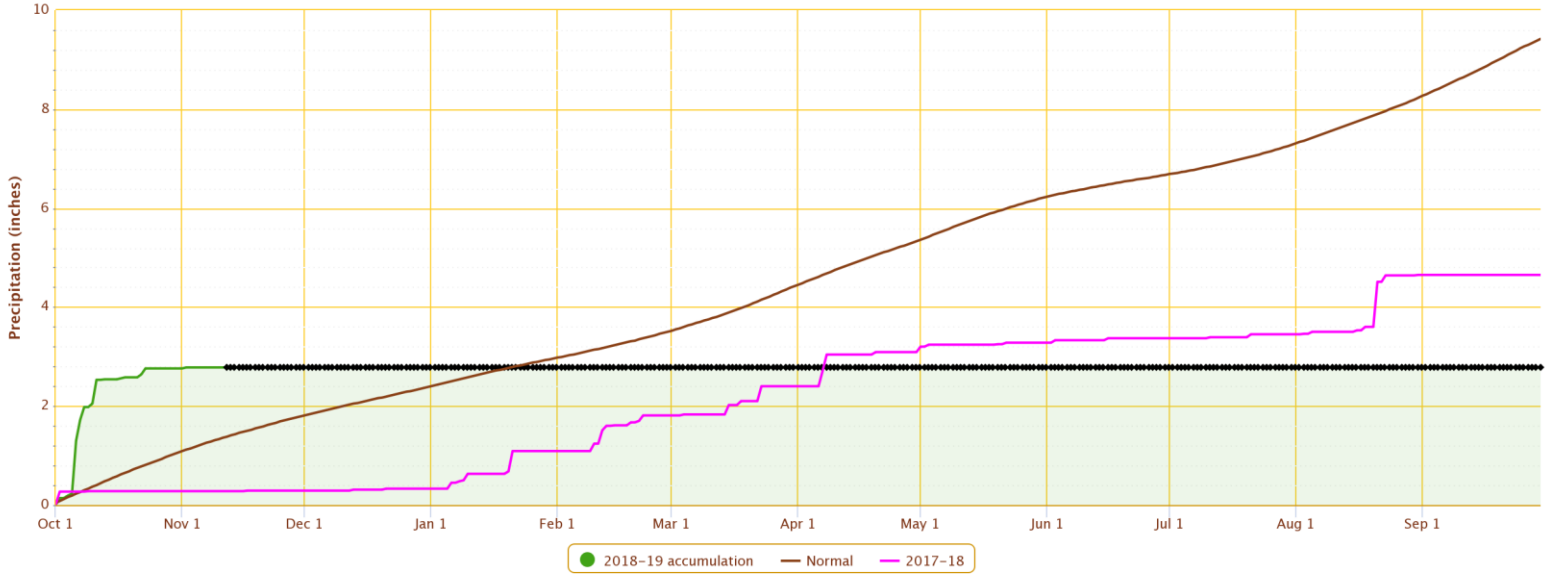

Accumulated Precipitation – GRAND LAKE 1 NW, CO
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values
Precipitation (inches)
22.5
20
17.5
15
12.5
10
7.5
5
2.5
0
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
Aug 1
Sep 1
2018-19 accumulation
Normal
2017-18
Powered by ACIS


Daily Temperature Data – GRAND LAKE 1 NW, CO
Period of Record – 1939-10-01 to 2018-11-11. Normals period: 1981-2010. Click and drag to zoom chart.
Temperature (°F)
100
75
50
25
0
-25
-50
Temperature (°C)
37.8
23.9
10
-3.9
-17.8
-31.7
-45.6
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
Aug 1
Sep 1
Observed temperature range (2018-2019)
Normal temperature range
Record Max
Record Min
Powered by ACIS


COLORADO
Region 1
Region 2
Region 3
Region 4
Region 5
Region 6
Region 7
Region 8
41°N
40°N
39°N
38°N
37°N
-109°W
-108°W
-107°W
-106°W
-105°W
-104°W
-103°W
-102°W
Grand Jct
Taylor Park
Buena Vista
Canon City
Pueblo
Cheyenne Wells
Rocky Ford
Del Norte
Center
Mesa Verde
Akron
Leroy

Accumulated Precipitation – GRAND JUNCTION WALKER FIELD, CO

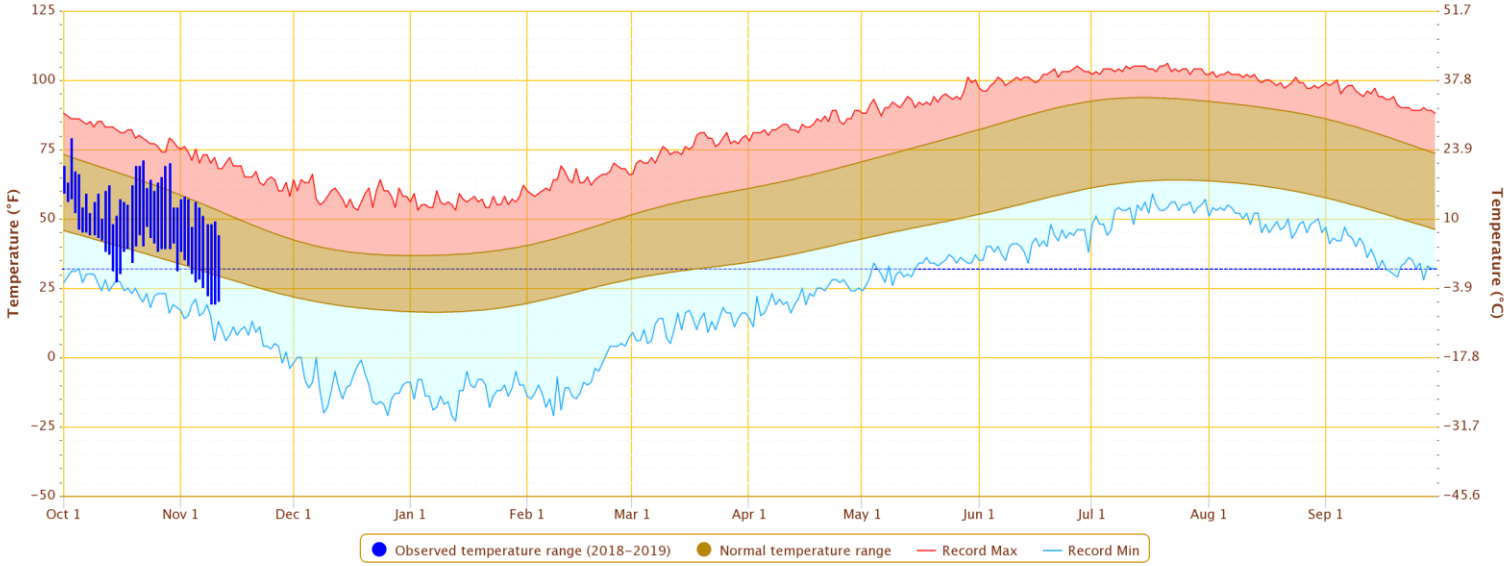
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



Powered by ACIS

Daily Temperature Data – GRAND JUNCTION WALKER FIELD, CO

Period of Record – 1900-01-01 to 2018-11-11. Normals period: 1981-2010. Click and drag to zoom chart.



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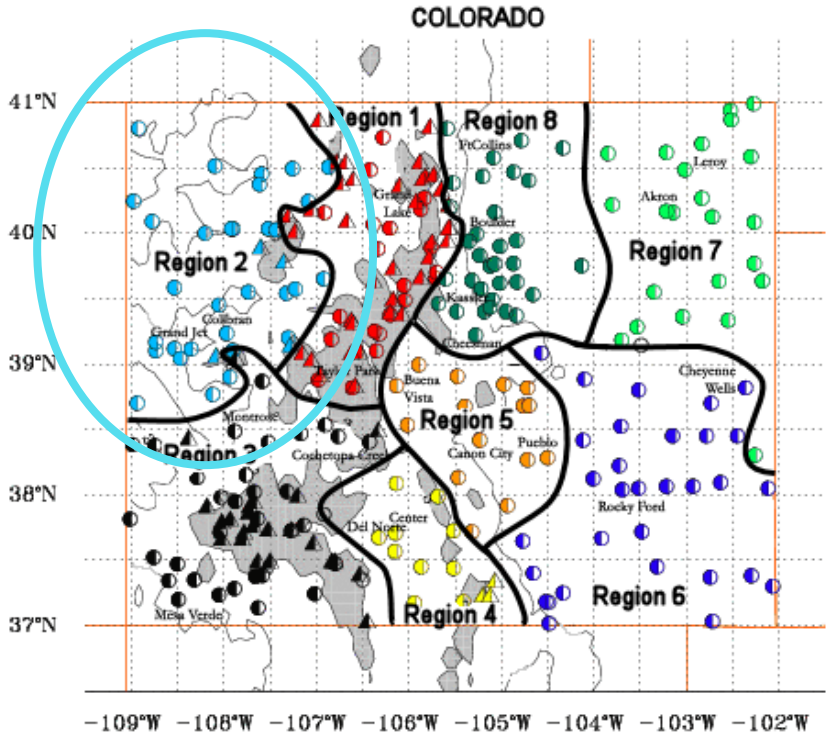
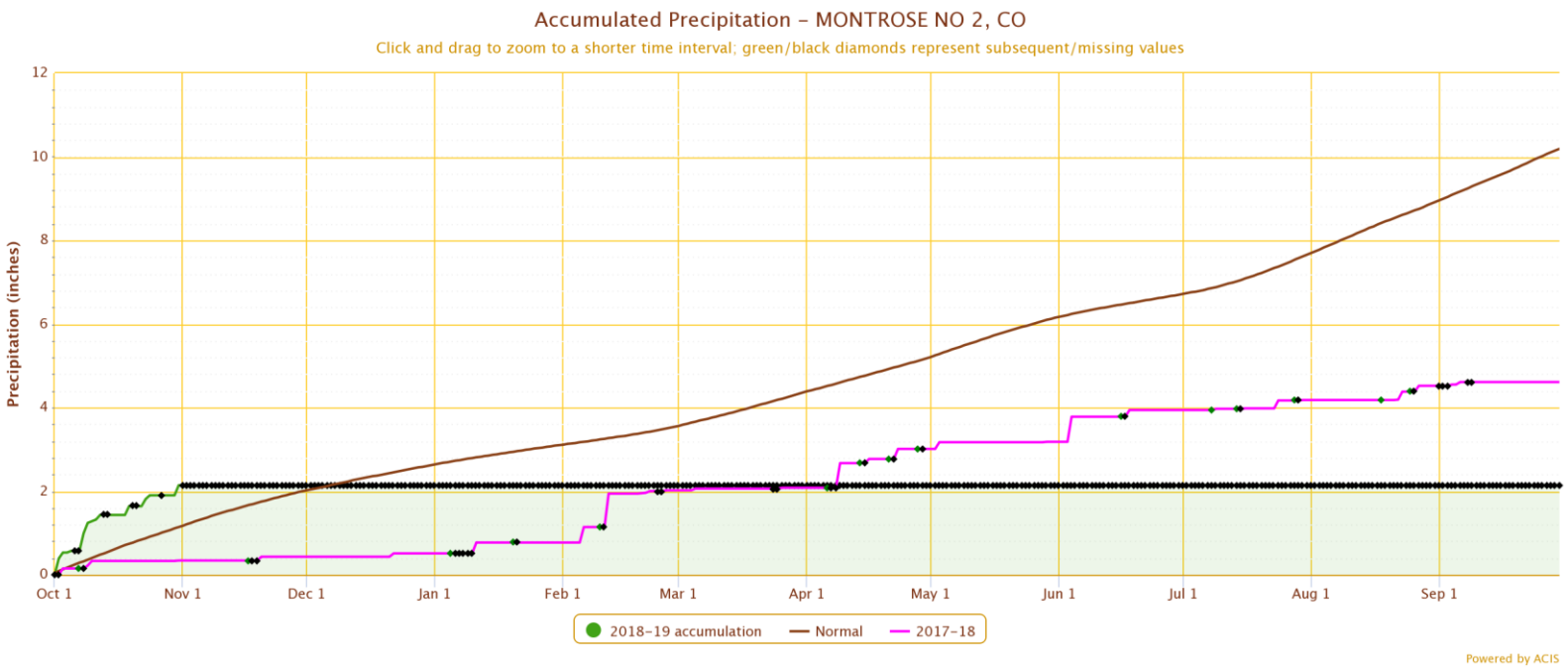
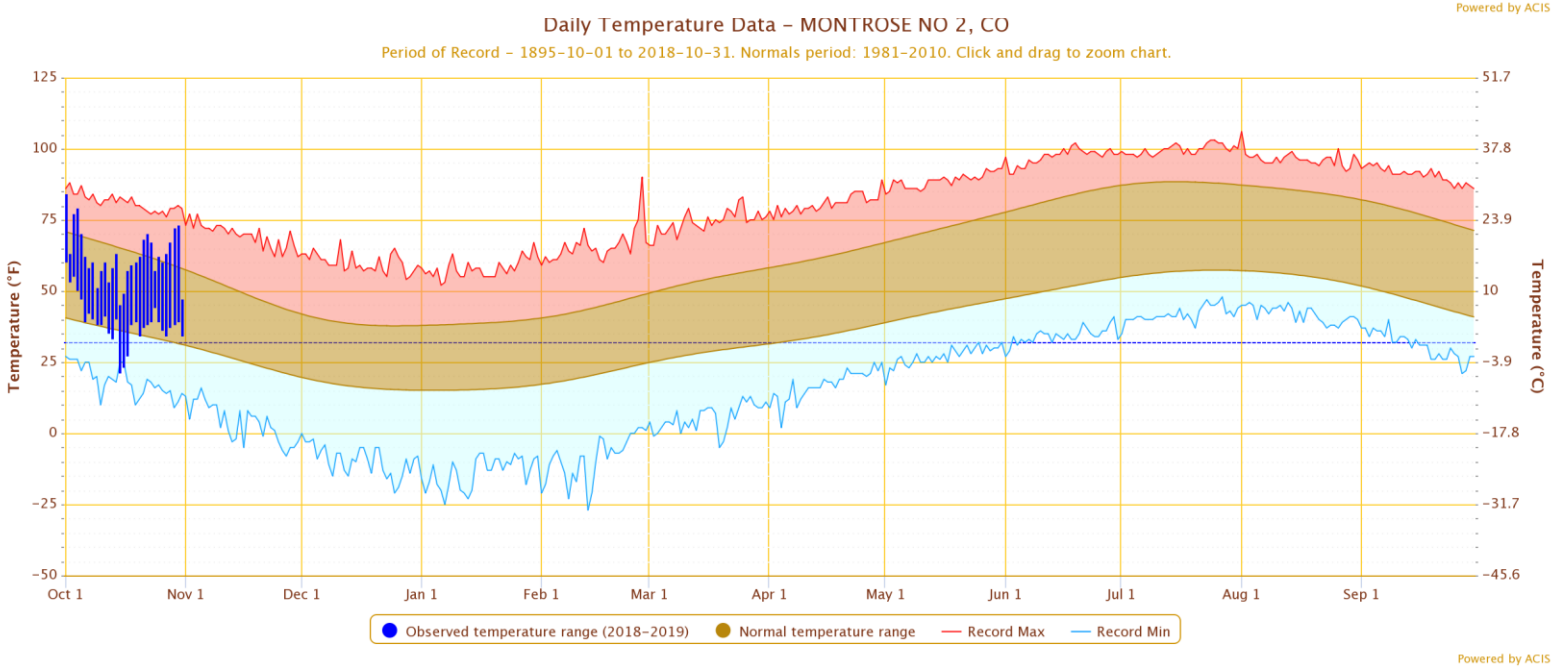
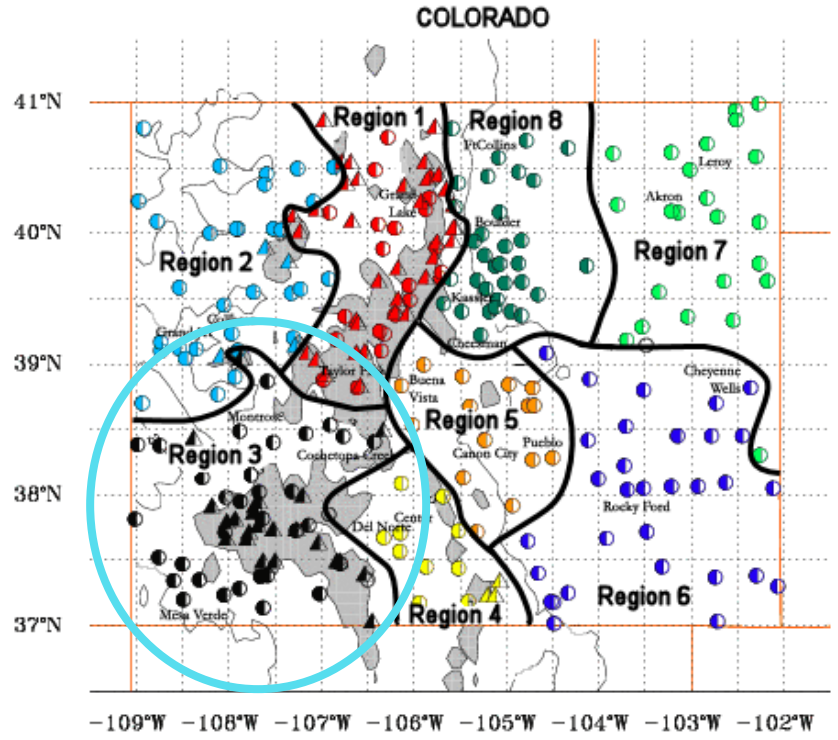
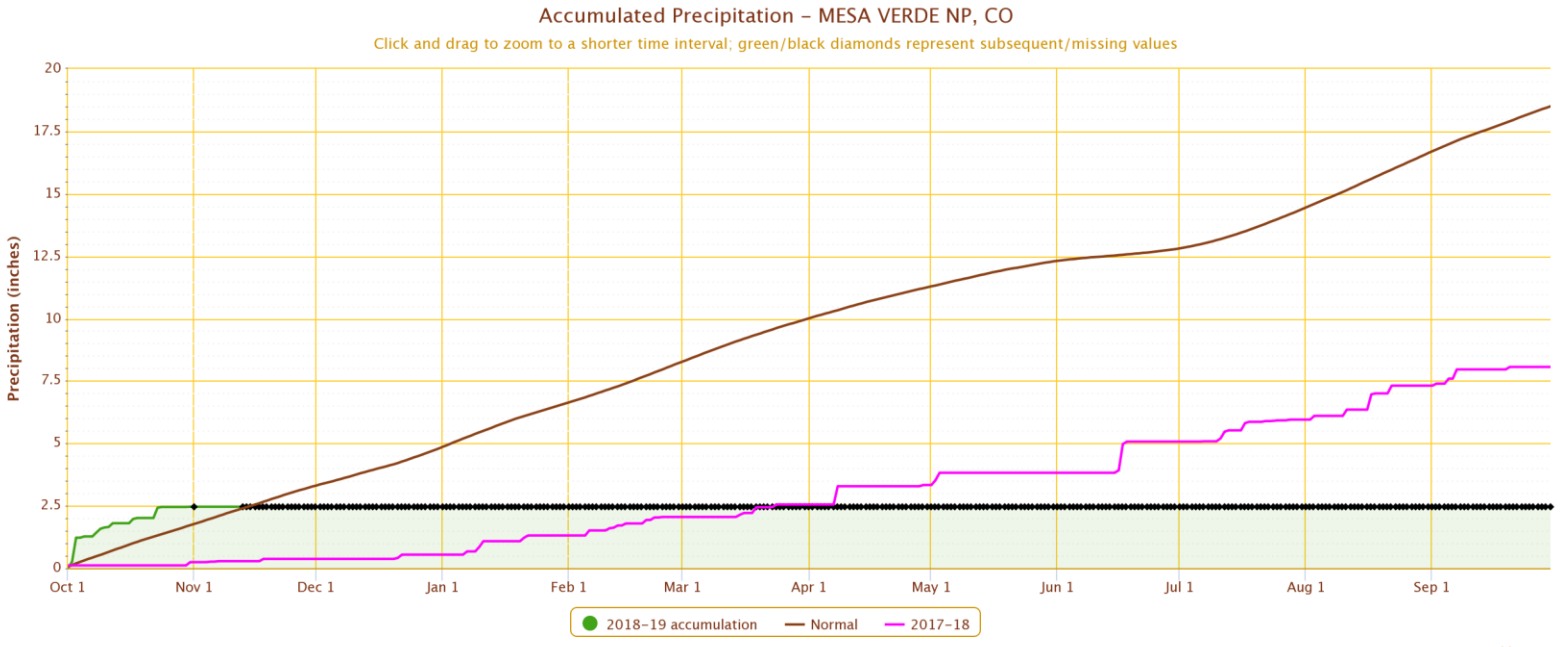
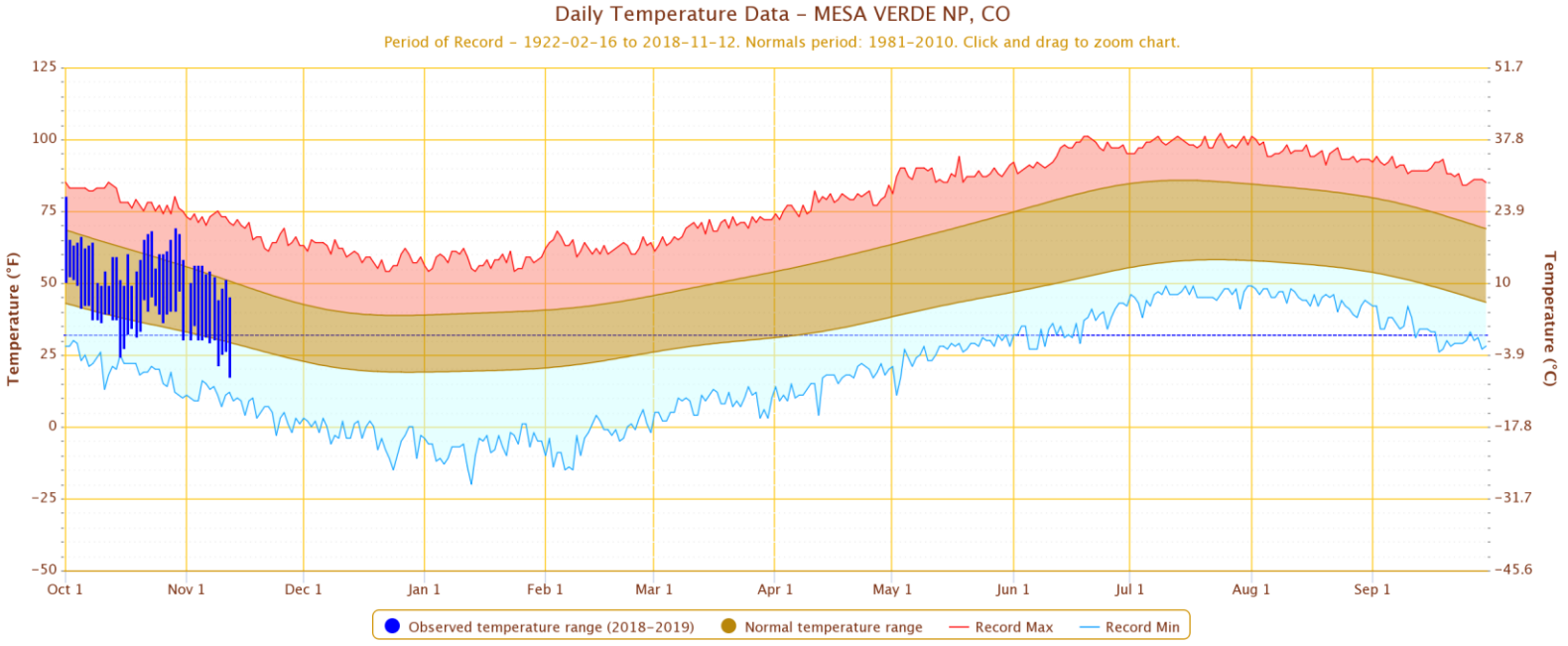


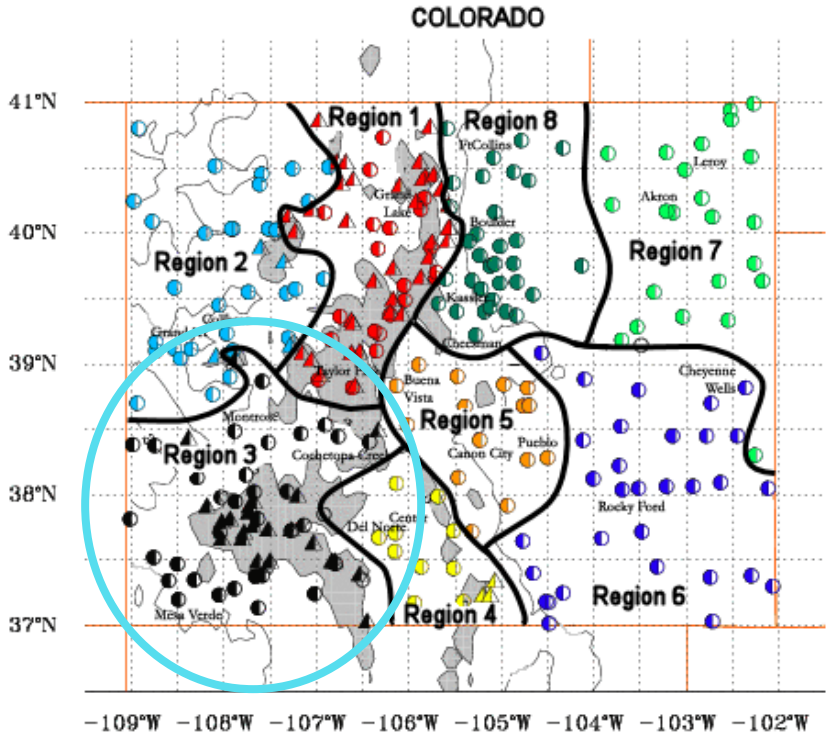

Accumulated Precipitation – MONTROSE NO 2, CO
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values
Precipitation (inches)
0
2
4
6
8
10
12
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
Aug 1
Sep 1
2018-19 accumulation
Normal
2017-18
Powered by ACIS

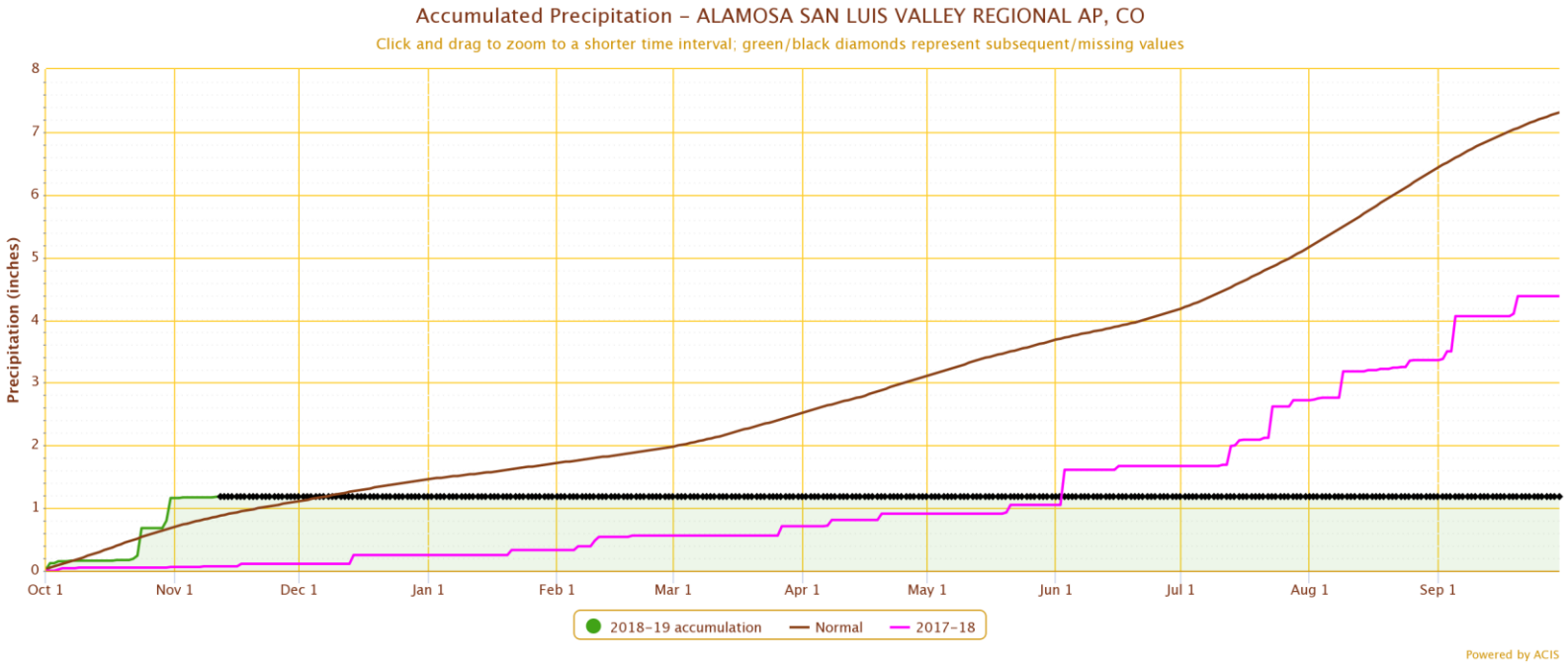

Daily Temperature Data – MONTROSE NO 2, CO
Period of Record – 1895-10-01 to 2018-10-31. Normals period: 1981-2010. Click and drag to zoom chart.
Temperature (°F)
125
100
75
50
25
0
-25
-50
Temperature (°C)
51.7
37.8
23.9
10
-3.9
-17.8
-31.7
-45.6
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
Aug 1
Sep 1
Observed temperature range (2018-2019)
Normal temperature range
Record Max
Record Min
Powered by ACIS

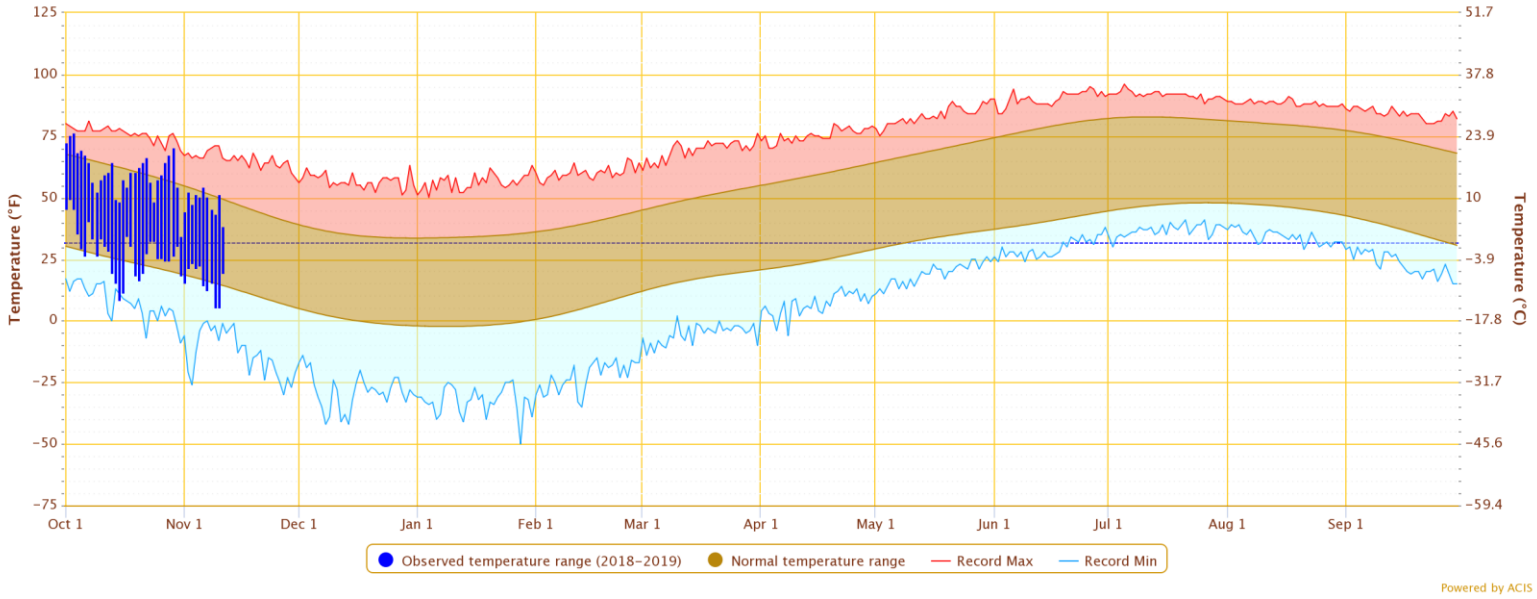

COLORADO
41°N
40°N
39°N
38°N
37°N
-109°W
-108°W
-107°W
-106°W
-105°W
-104°W
-103°W
-102°W
Region 1
Region 2
Region 3
Region 4
Region 5
Region 6
Region 7
Region 8
Fort Collins
Leroy
Akron
Boulder
Grand Lake
Kassler
Cheyenne Wells
Buena Vista
Montrose
Cañon City
Pueblo
Rocky Ford
Del Norte
Mesa Verde

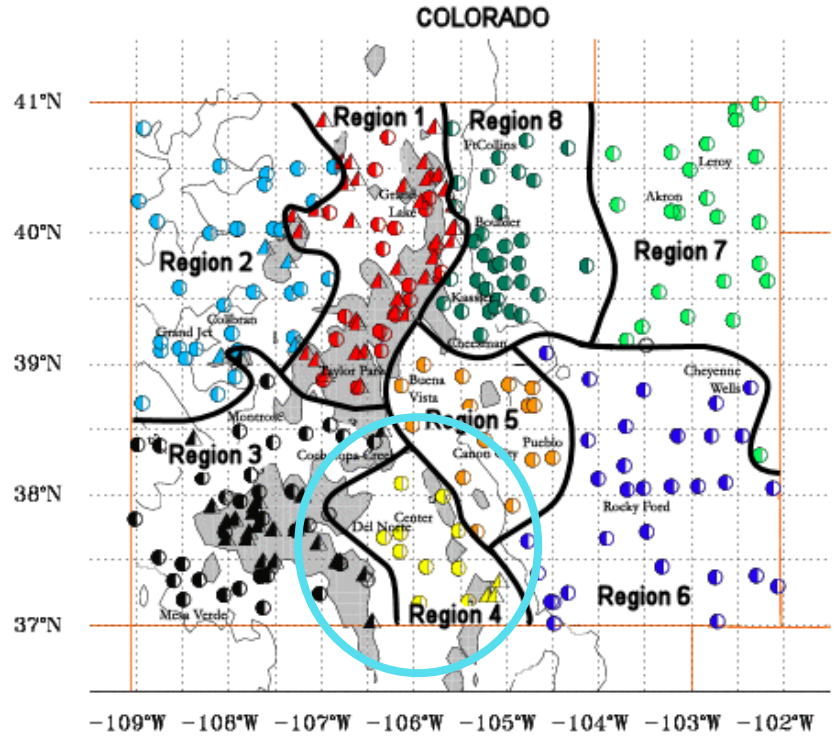

Accumulated Precipitation – MESA VERDE NP, CO
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values
Precipitation (inches)
20
17.5
15
12.5
10
7.5
5
2.5
0
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
Aug 1
Sep 1
2018-19 accumulation
Normal
2017-18
Powered by ACIS

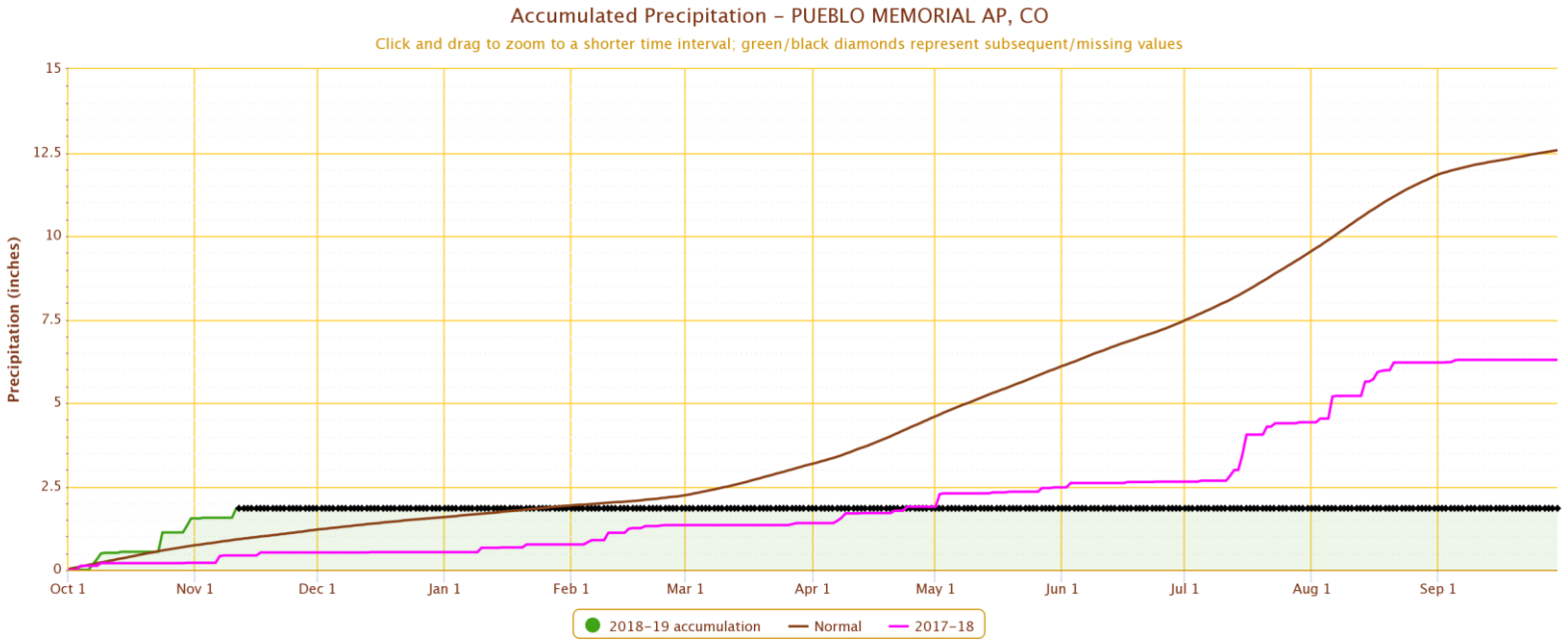

Daily Temperature Data – MESA VERDE NP, CO
Period of Record – 1922-02-16 to 2018-11-12. Normals period: 1981-2010. Click and drag to zoom chart.
Temperature (°F)
125
100
75
50
25
0
-25
-50
Temperature (°C)
51.7
37.8
23.9
10
-3.9
-17.8
-31.7
-45.6
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
Aug 1
Sep 1
Observed temperature range (2018-2019)
Normal temperature range
Record Max
Record Min
Powered by ACIS

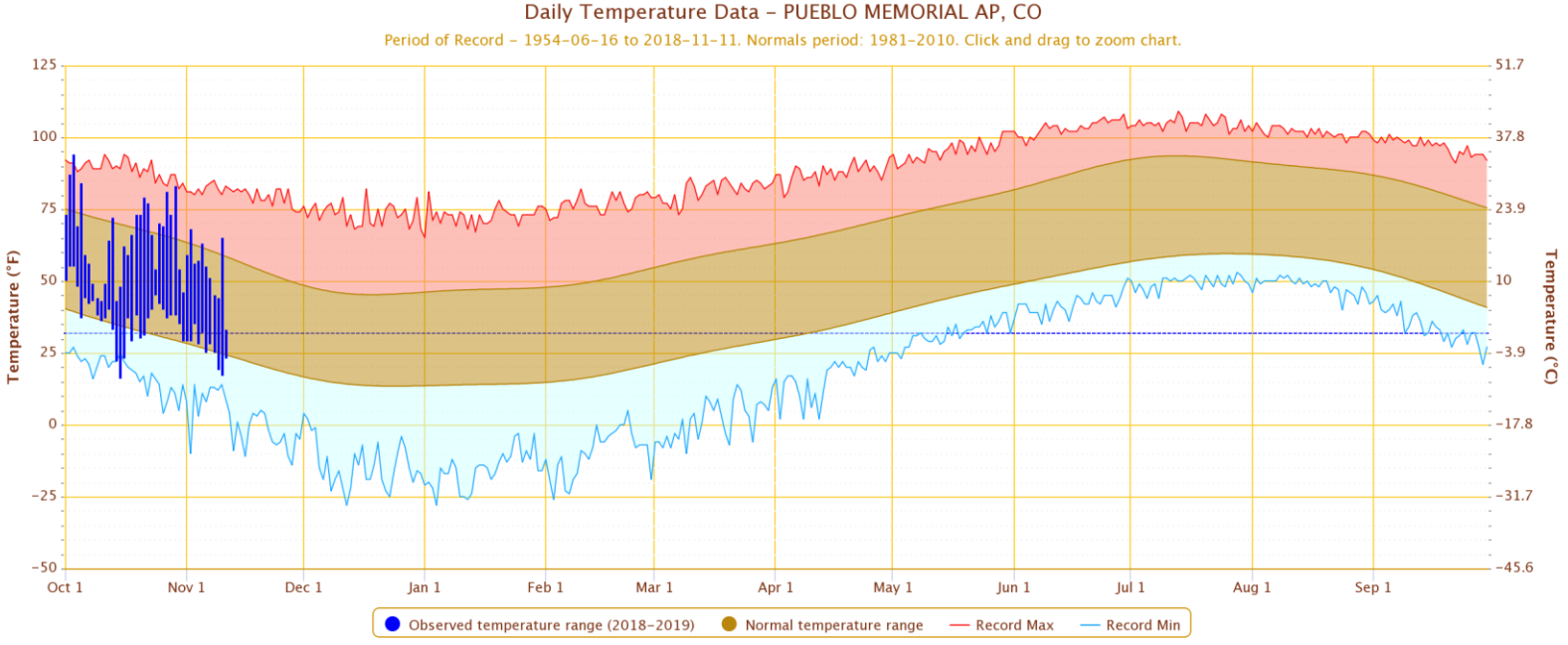

COLORADO
41°N
40°N
39°N
38°N
37°N
Region 1
Region 2
Region 3
Region 4
Region 5
Region 6
Region 7
Region 8
Ft Collins
Leroy
Akron
Boulder
Grand Lake
Kassler
Cheyenne Wells
Buena Vista
Pueblo
Canon City
Rocky Ford
Del Norte
Mesa Verde
−109°W
−108°W
−107°W
−106°W
−105°W
−104°W
−103°W
−102°W

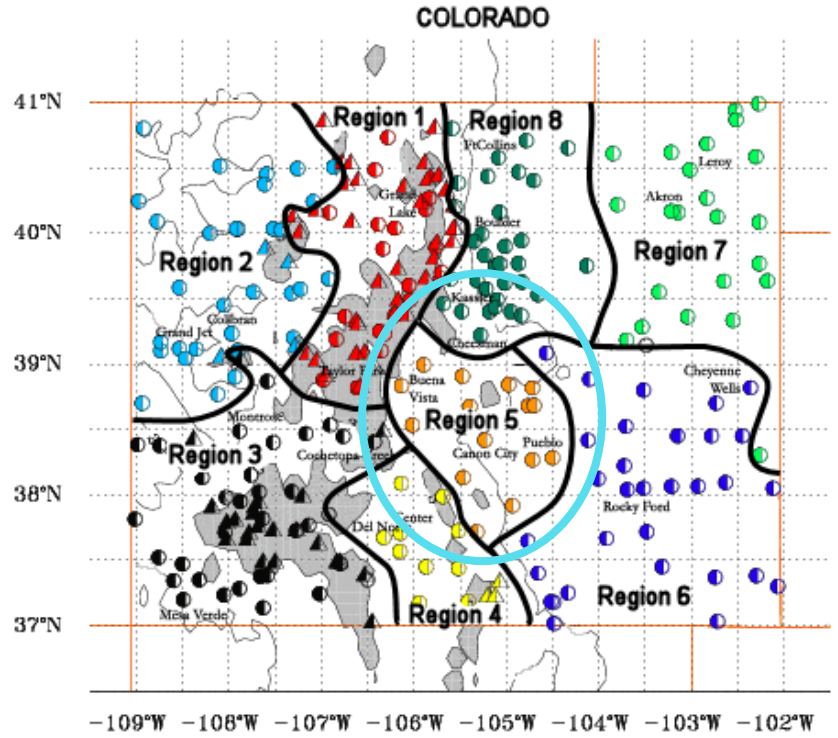

Accumulated Precipitation – ALAMOSA SAN LUIS VALLEY REGIONAL AP, CO
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values
Precipitation (inches)
0
1
2
3
4
5
6
7
8
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
Aug 1
Sep 1
2018-19 accumulation
Normal
2017-18
Powered by ACIS


Daily Temperature Data – ALAMOSA SAN LUIS VALLEY REGIONAL AP, CO
Period of Record – 1948-01-01 to 2018-11-11. Normals period: 1981-2010. Click and drag to zoom chart.
Temperature (°F)
125
100
75
50
25
0
-25
-50
-75
Temperature (°C)
51.7
37.8
23.9
10
-3.9
-17.8
-31.7
-45.6
-59.4
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
Aug 1
Sep 1
Observed temperature range (2018-2019)
Normal temperature range
Record Max
Record Min
Powered by ACIS


COLORADO
Region 1
Region 2
Region 3
Region 4
Region 5
Region 6
Region 7
Region 8
41°N
40°N
39°N
38°N
37°N
-109°W
-108°W
-107°W
-106°W
-105°W
-104°W
-103°W
-102°W
Fort Collins
Leroy
Akron
Boulder
Grand Junction
Gunnison
Taylor Park
Buena Vista
Cheyenne Wells
Montrose
Pueblo
Rocky Ford
Del Norte
Center
Mesa Verde

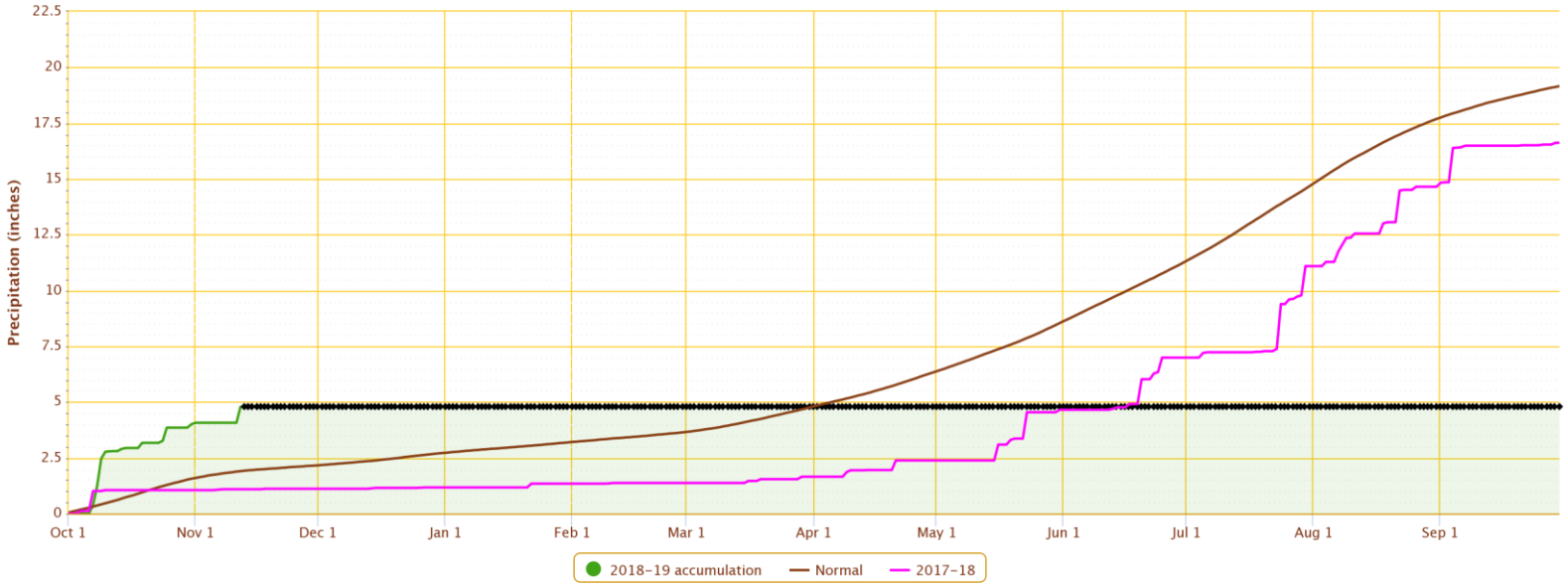

Accumulated Precipitation – PUEBLO MEMORIAL AP, CO
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values
Precipitation (inches)
15
12.5
10
7.5
5
2.5
0
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
Aug 1
Sep 1
2018-19 accumulation
Normal
2017-18
Powered by ACIS


Daily Temperature Data – PUEBLO MEMORIAL AP, CO
Period of Record – 1954-06-16 to 2018-11-11. Normals period: 1981-2010. Click and drag to zoom chart.
Temperature (°F)
125
100
75
50
25
0
-25
-50
Temperature (°C)
51.7
37.8
23.9
10
-3.9
-17.8
-31.7
-45.6
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
Aug 1
Sep 1
Observed temperature range (2018-2019)
Normal temperature range
Record Max
Record Min
Powered by ACIS


COLORADO
41°N
40°N
39°N
38°N
37°N
−109°W
−108°W
−107°W
−106°W
−105°W
−104°W
−103°W
−102°W
Region 1
Region 2
Region 3
Region 4
Region 5
Region 6
Region 7
Region 8
Fort Collins
Greeley
Lake
Boulder
Leroy
Akron
Grand Junction
Gunnison
Montrose
Buena Vista
Canon City
Pueblo
Cheyenne Wells
Rocky Ford
Del Norte
Mesa Verde

Accumulated Precipitation – WALSH 1 W, CO

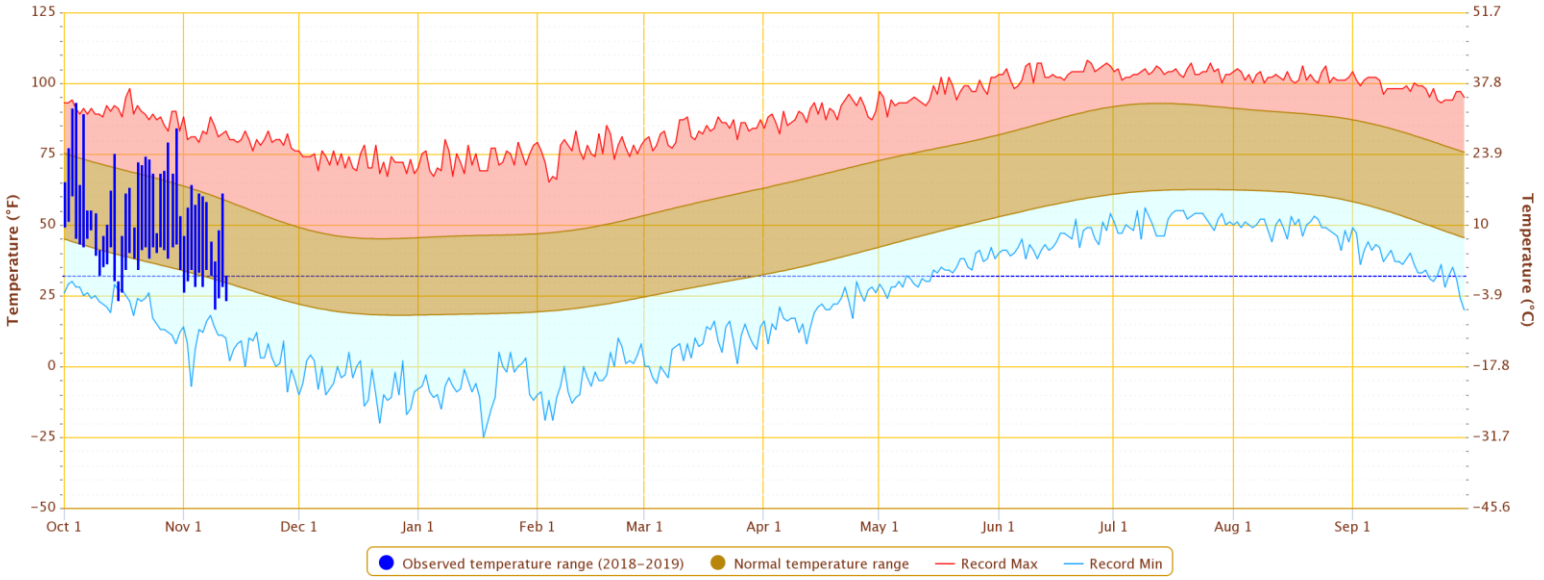
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



Powered by ACIS

Daily Temperature Data – WALSH 1 W, CO

Period of Record – 1967-09-01 to 2018-11-12. Normals period: 1981-2010. Click and drag to zoom chart.



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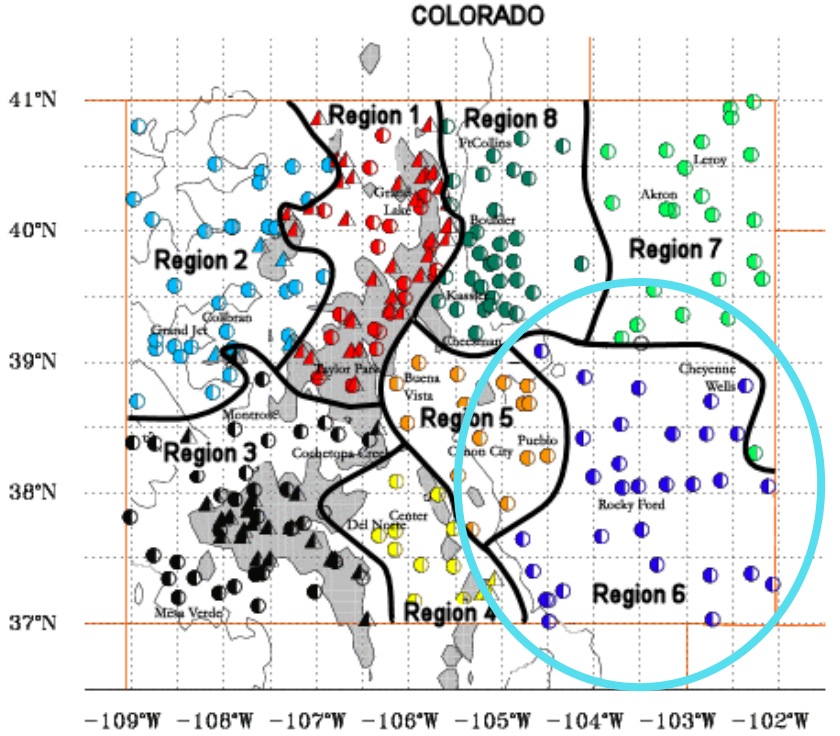
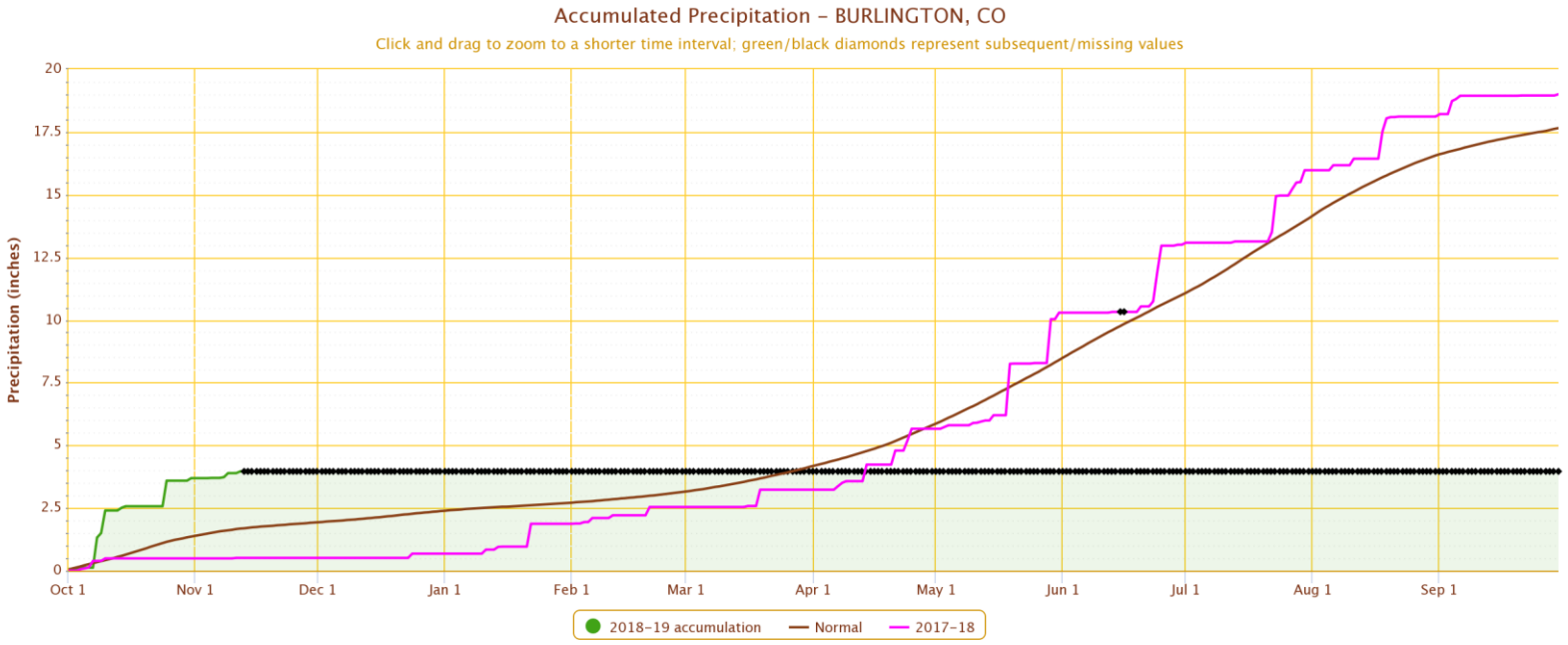
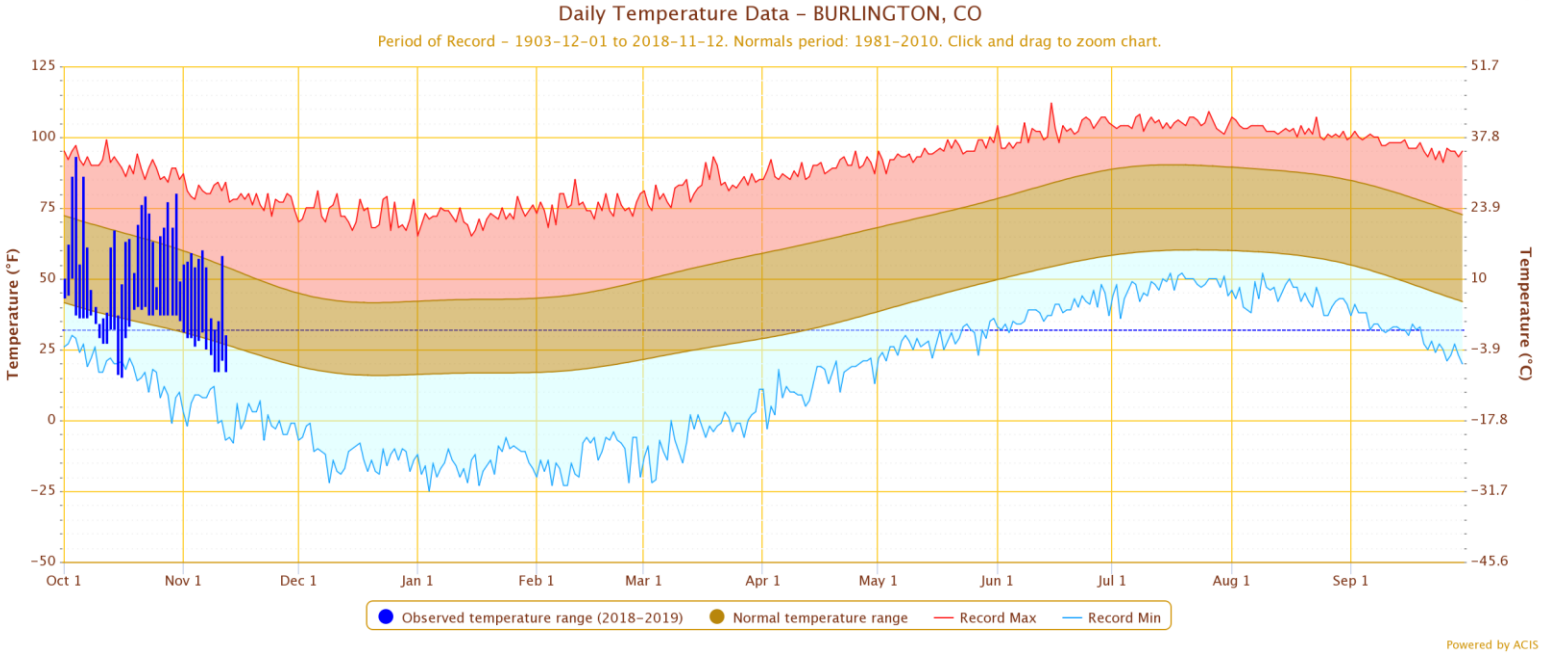
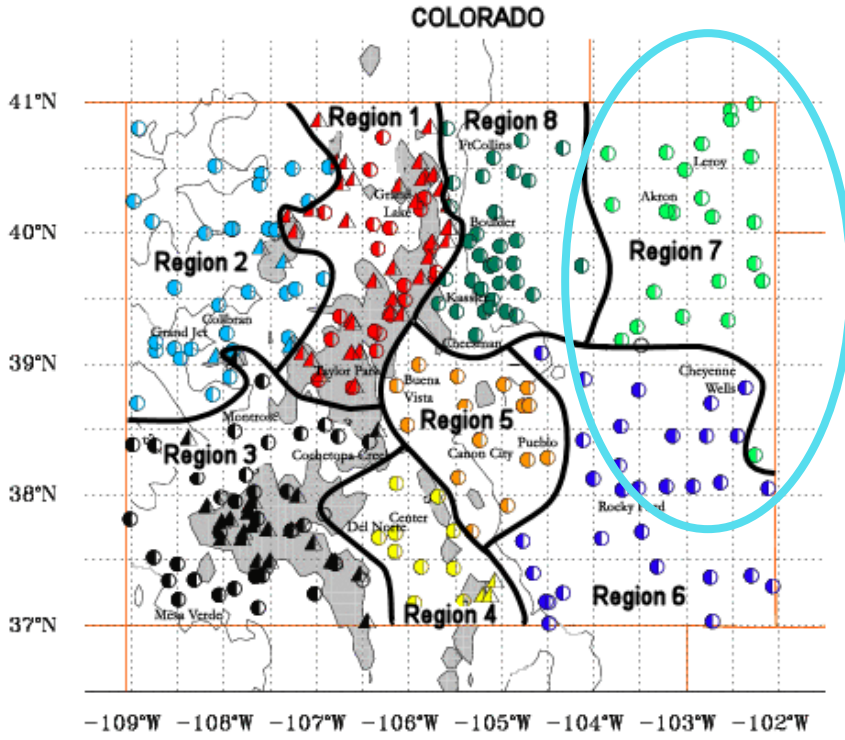
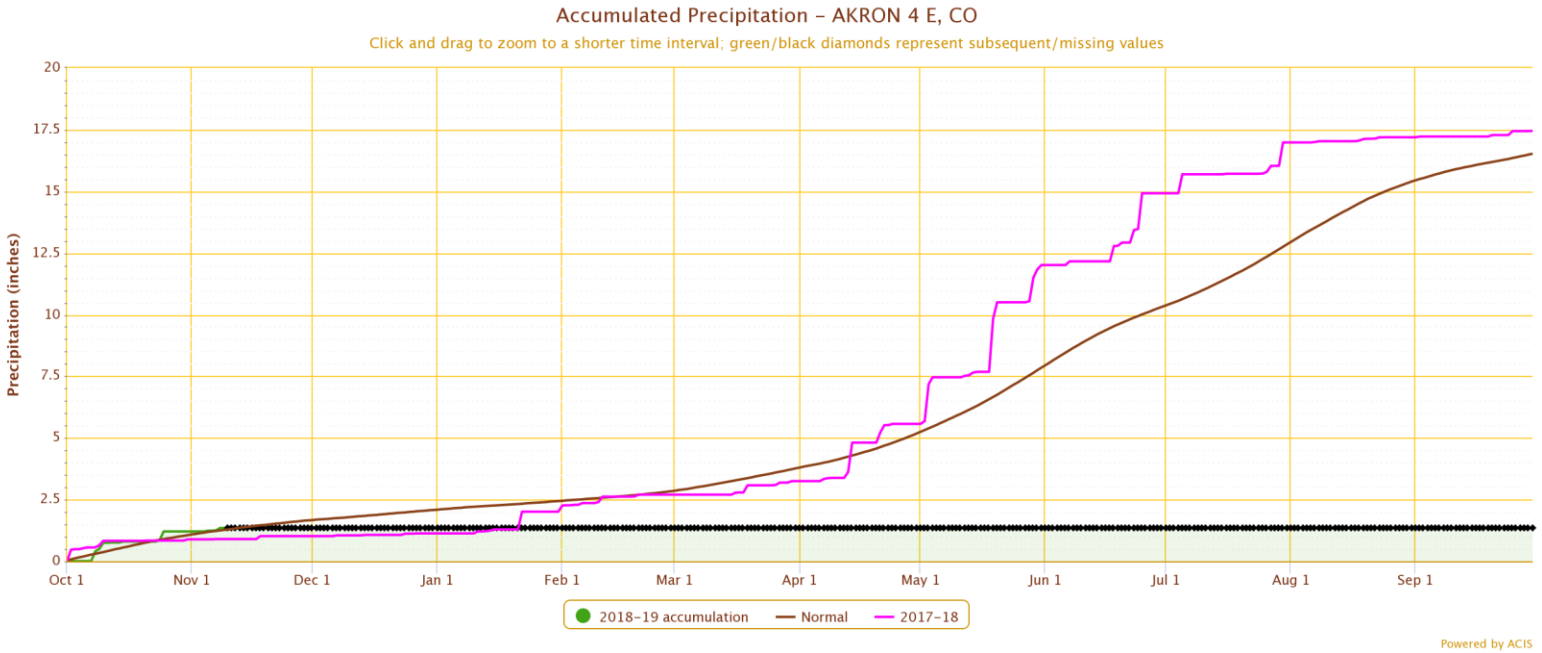
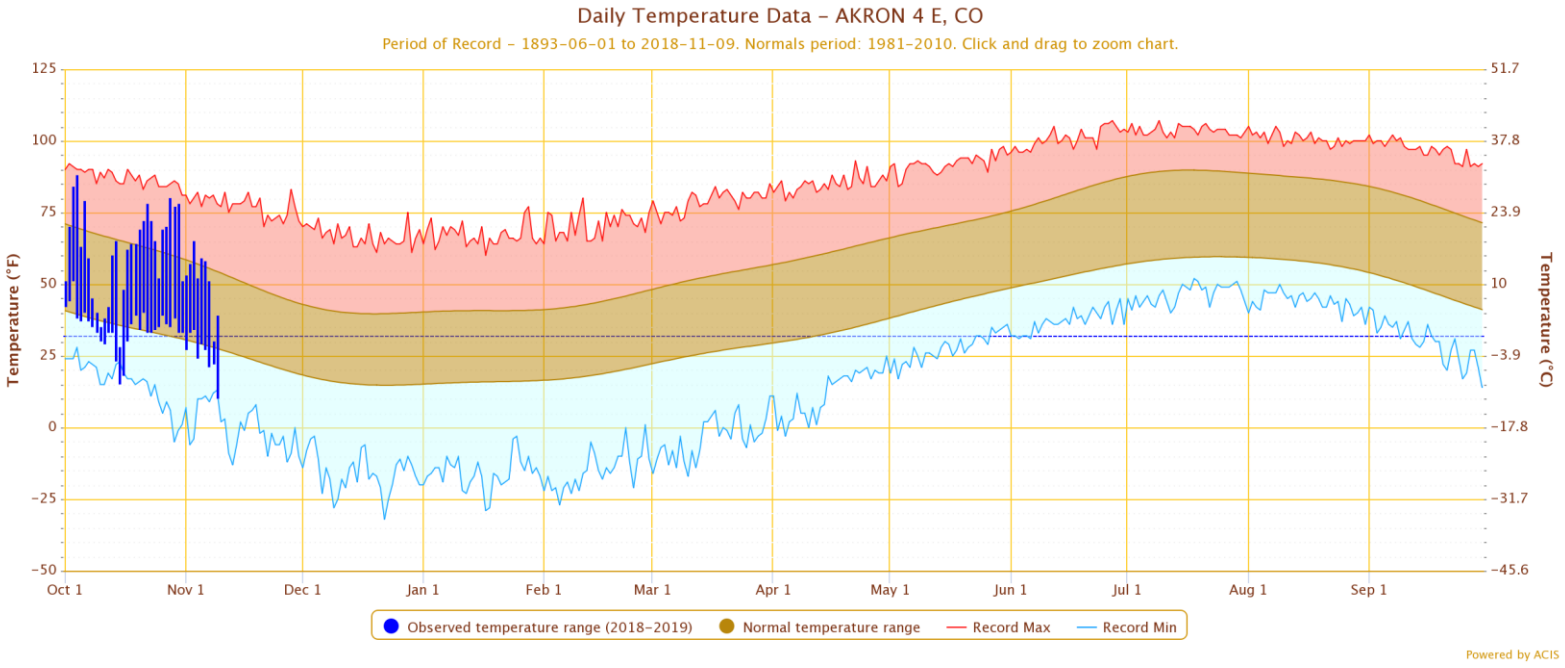


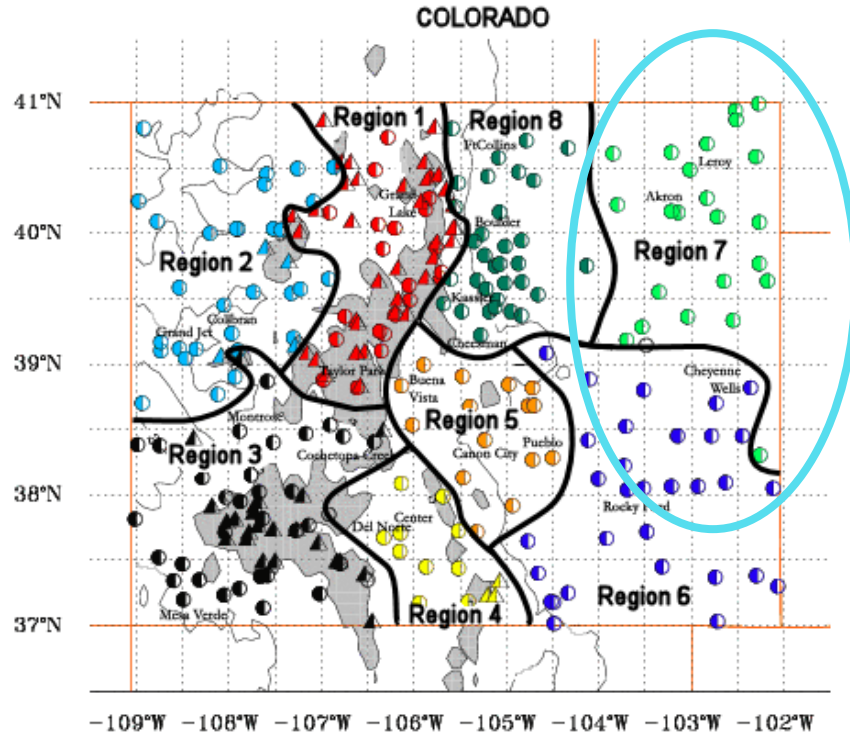

Accumulated Precipitation – BURLINGTON, CO
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values
Precipitation (inches)
20
17.5
15
12.5
10
7.5
5
2.5
0
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
Aug 1
Sep 1
2018-19 accumulation
Normal
2017-18
Powered by ACIS

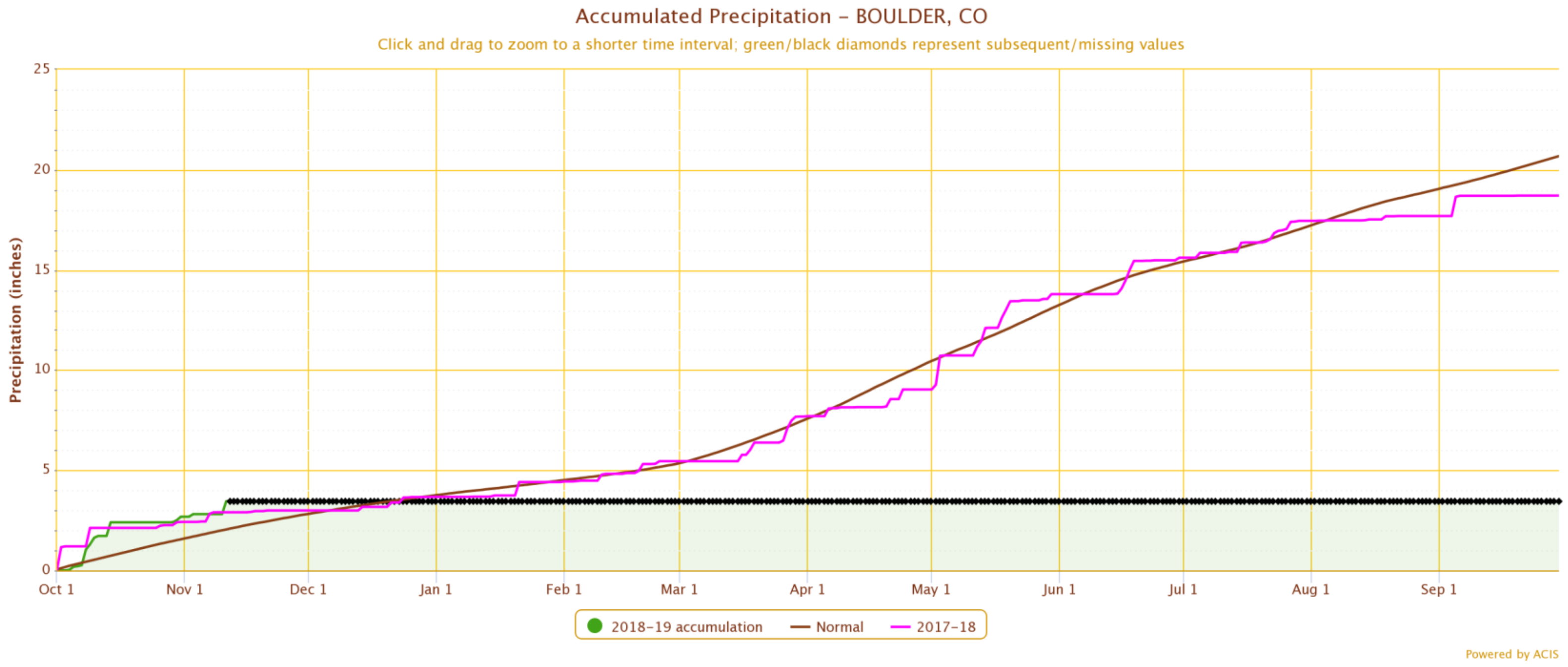

Daily Temperature Data – BURLINGTON, CO
Period of Record - 1903-12-01 to 2018-11-12. Normals period: 1981-2010. Click and drag to zoom chart.
Temperature (°F)
125
100
75
50
25
0
-25
-50
Temperature (°C)
51.7
37.8
23.9
10
-3.9
-17.8
-31.7
-45.6
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
Aug 1
Sep 1
Observed temperature range (2018-2019)
Normal temperature range
Record Max
Record Min
Powered by ACIS


COLORADO
41°N
40°N
39°N
38°N
37°N
−109°W
−108°W
−107°W
−106°W
−105°W
−104°W
−103°W
−102°W
Region 1
Region 2
Region 3
Region 4
Region 5
Region 6
Region 7
Region 8
Fort Collins
Greeley
Lake
Boulder
Leroy
Akron
Kassler
Golden
Grand Jct
Glenwood
Taylor Park
Buena Vista
Cheyenne Wells
Monrose
Coshetopa Creek
Canon City
Pueblo
Center
Del Norte
Mesa Verde

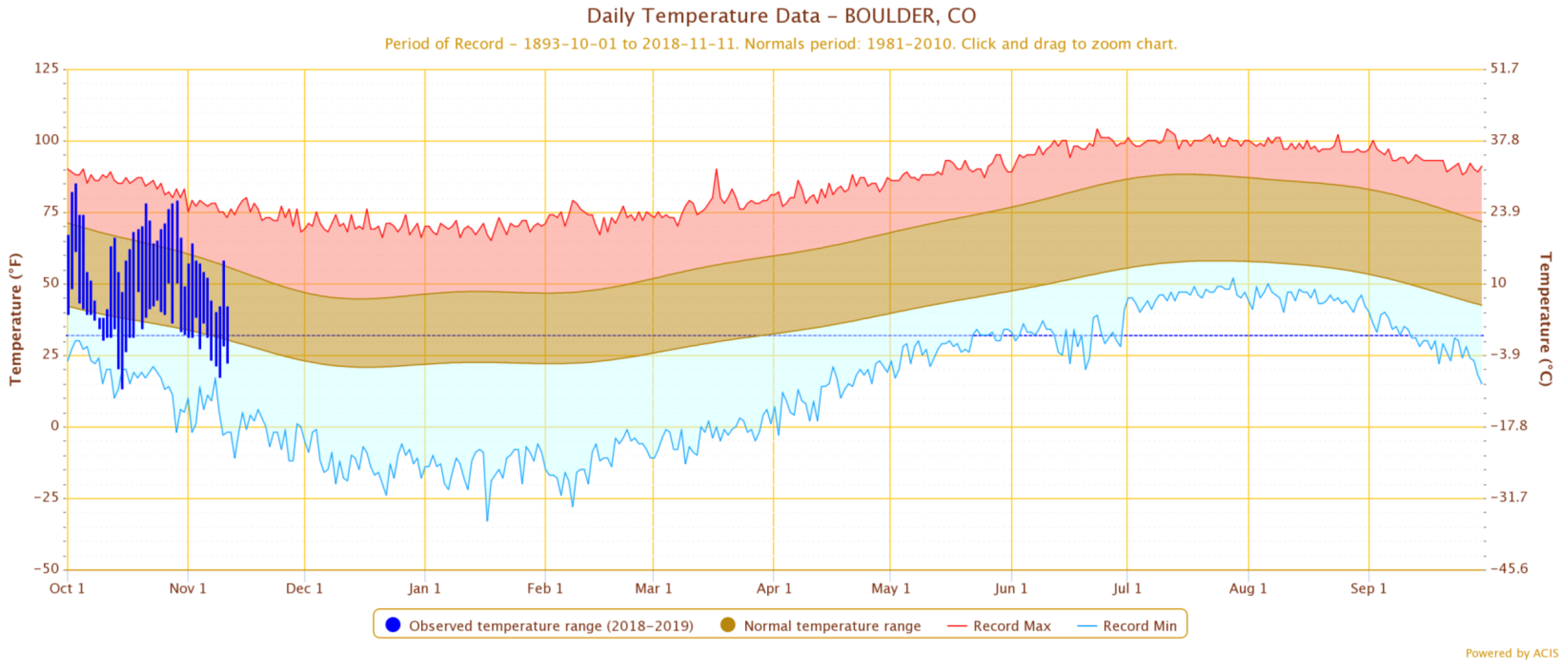

Accumulated Precipitation – AKRON 4 E, CO
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values
Precipitation (inches)
20
17.5
15
12.5
10
7.5
5
2.5
0
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
Aug 1
Sep 1
2018-19 accumulation
Normal
2017-18
Powered by ACIS


Daily Temperature Data – AKRON 4 E, CO
Period of Record – 1893-06-01 to 2018-11-09. Normals period: 1981-2010. Click and drag to zoom chart.
Temperature (°F)
125
100
75
50
25
0
-25
-50
Temperature (°C)
51.7
37.8
23.9
10
-3.9
-17.8
-31.7
-45.6
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
Aug 1
Sep 1
Observed temperature range (2018-2019)
Normal temperature range
Record Max
Record Min
Powered by ACIS

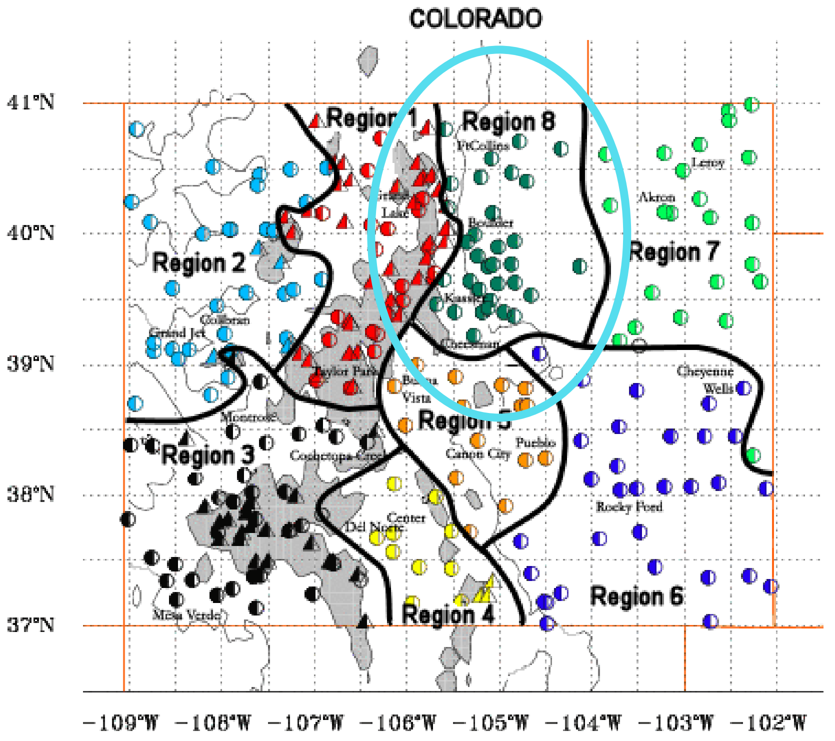

COLORADO
41°N
40°N
39°N
38°N
37°N
-109°W
-108°W
-107°W
-106°W
-105°W
-104°W
-103°W
-102°W
Region 1
Region 2
Region 3
Region 4
Region 5
Region 6
Region 7
Region 8
Ft Collins
Greeley
Akron
Leroy
Boulder
Grand Lake
Grand Jct
Gunnison
Taylor Park
Buena Vista
Cheyenne Wells
Monticello
Cortez
Canon City
Pueblo
Del Norte
Center
Mesa Verde



Accumulated Precipitation – BOULDER, CO
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values
Precipitation (inches)
25
20
15
10
5
0
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
Aug 1
Sep 1
2018–19 accumulation
Normal
2017–18
Powered by ACIS

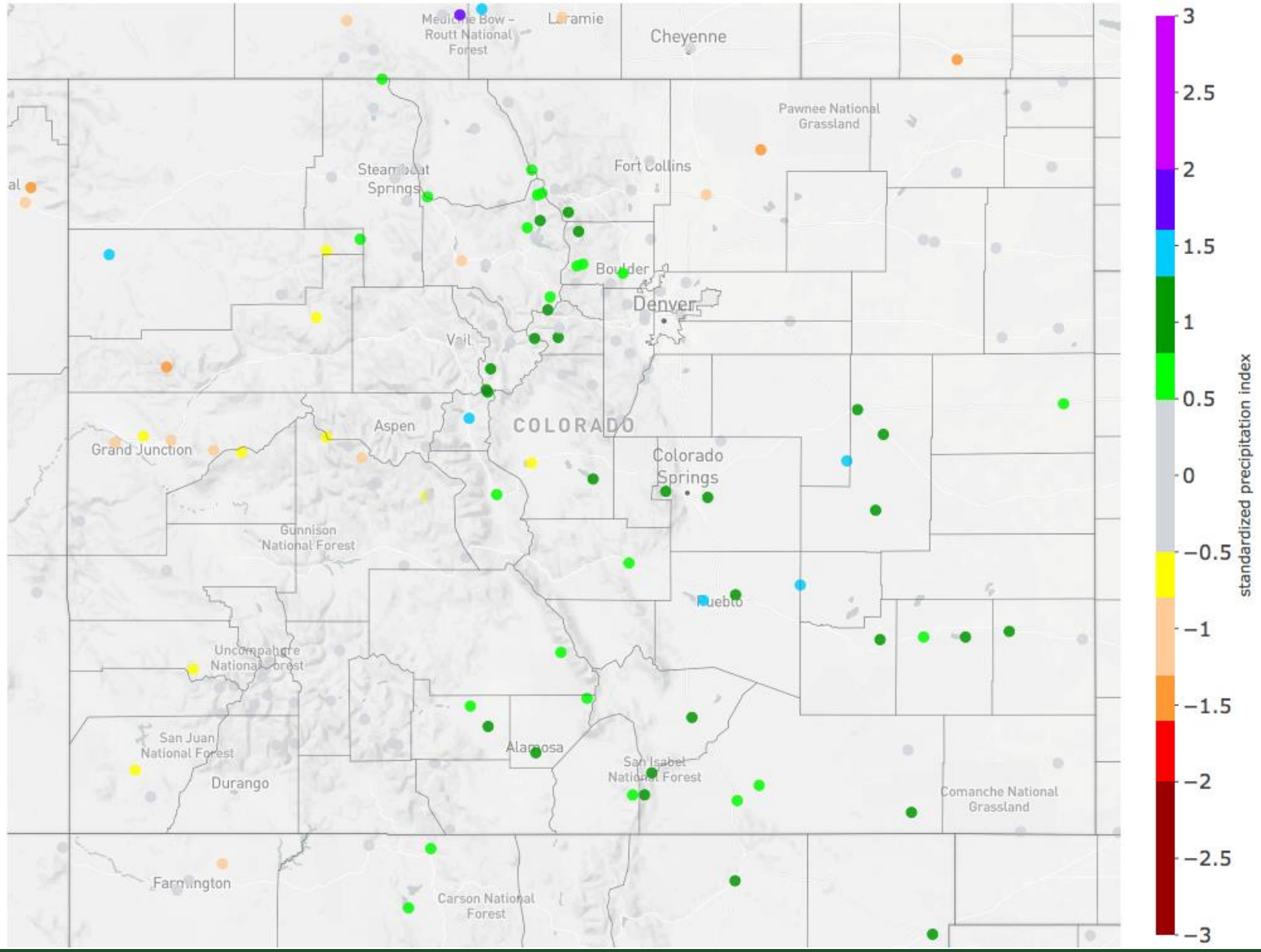


Daily Temperature Data – BOULDER, CO
Period of Record – 1893-10-01 to 2018-11-11. Normals period: 1981-2010. Click and drag to zoom chart.
Temperature (°F)
Temperature (°C)
125
100
75
50
25
0
-25
-50
51.7
37.8
23.9
10
-3.9
-17.8
-31.7
-45.6
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
Aug 1
Sep 1
Observed temperature range (2018–2019)
Normal temperature range
Record Max
Record Min
Powered by ACIS

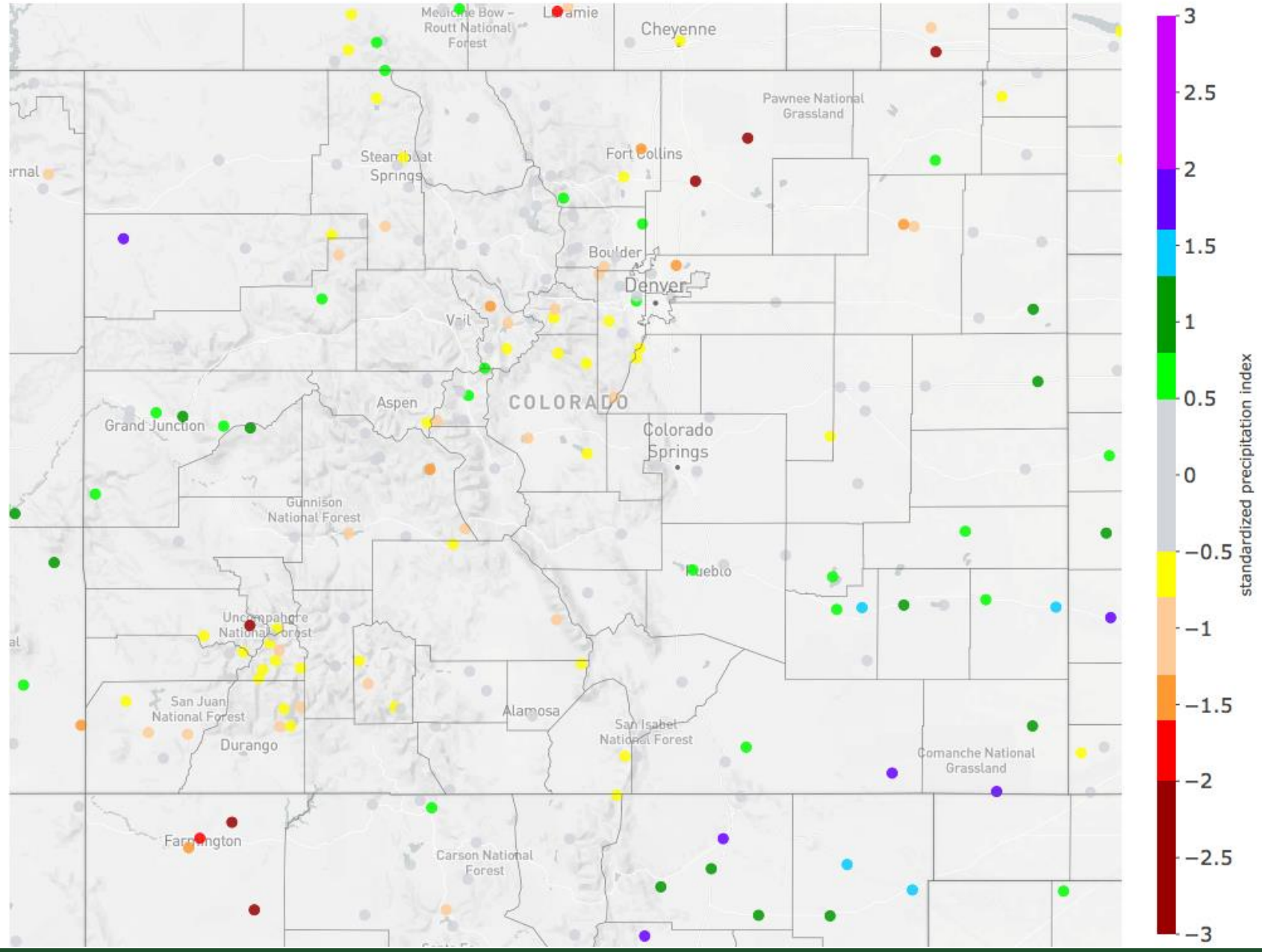


COLORADO
41°N
40°N
39°N
38°N
37°N
Region 1
Region 8
Region 2
Region 7
Region 3
Region 5
Region 4
Region 6
FtCollins
Leroy
Akron
Boulder
Grand Jct
Taylor Park
Buena Vista
Montrose
Cochetopa Creek
Canon City
Pueblo
Cheyenne Wells
Rocky Ford
Center
Del Norte
Mesa Verde
-109°W
-108°W
-107°W
-106°W
-105°W
-104°W
-103°W
-102°W

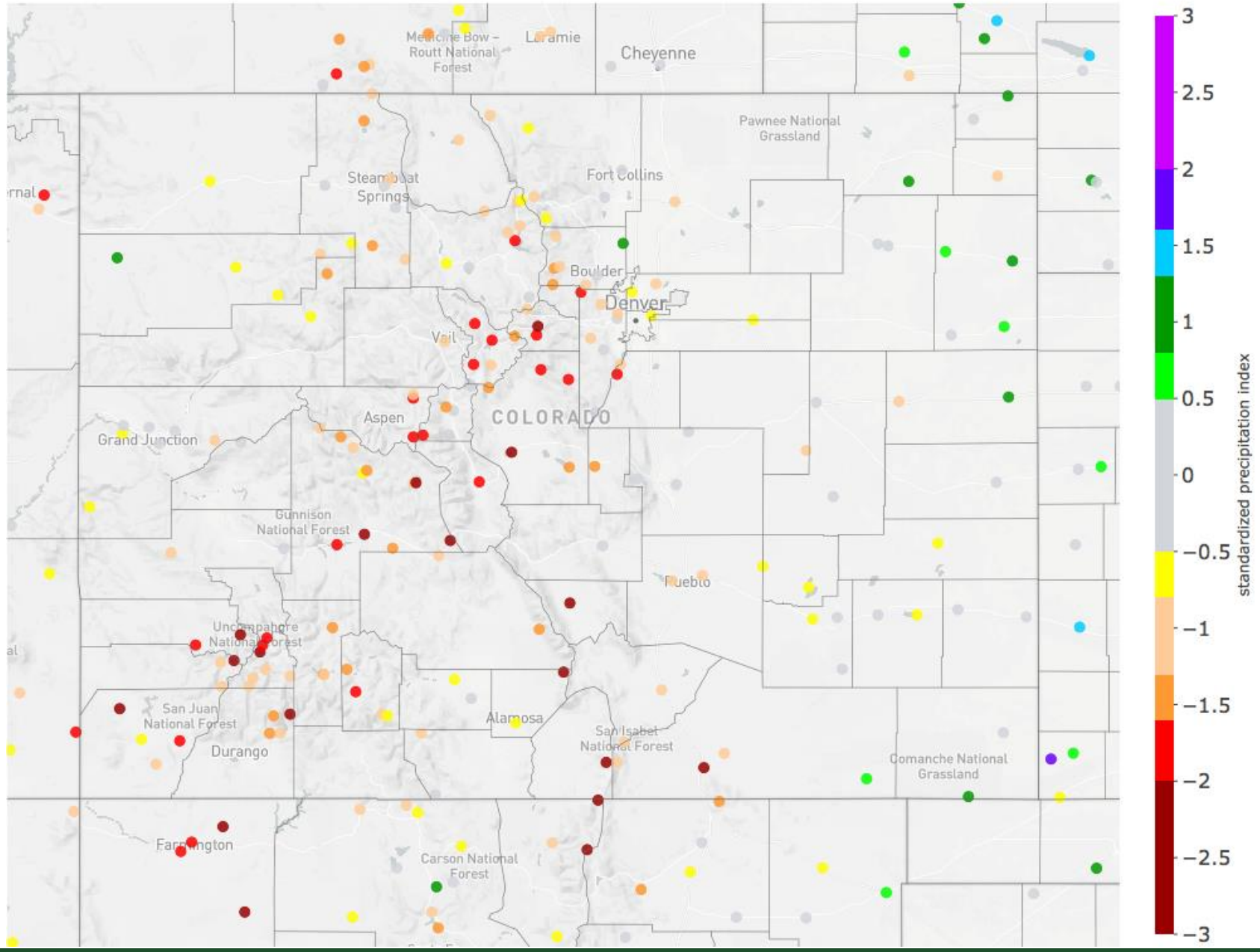
30-day Standardized Precipitation Index: 10/13/2018 - 11/11/2018



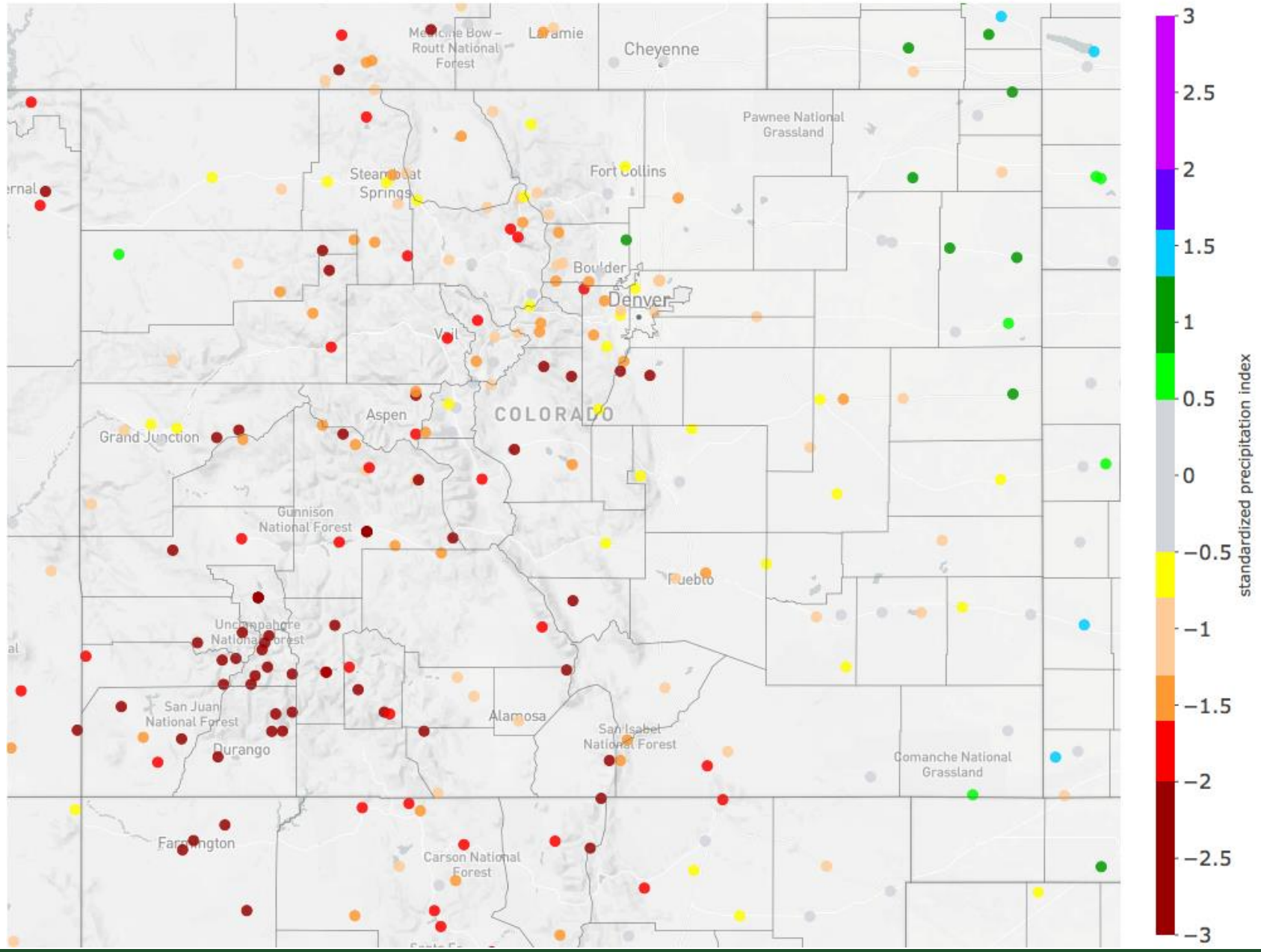
90-day Standardized Precipitation Index: 8/14/2018 - 11/11/2018



9-month Standardized Precipitation Index: 2/12/2018 - 11/11/2018



12-month Standardized Precipitation Index: 11/12/2017 - 11/11/2018

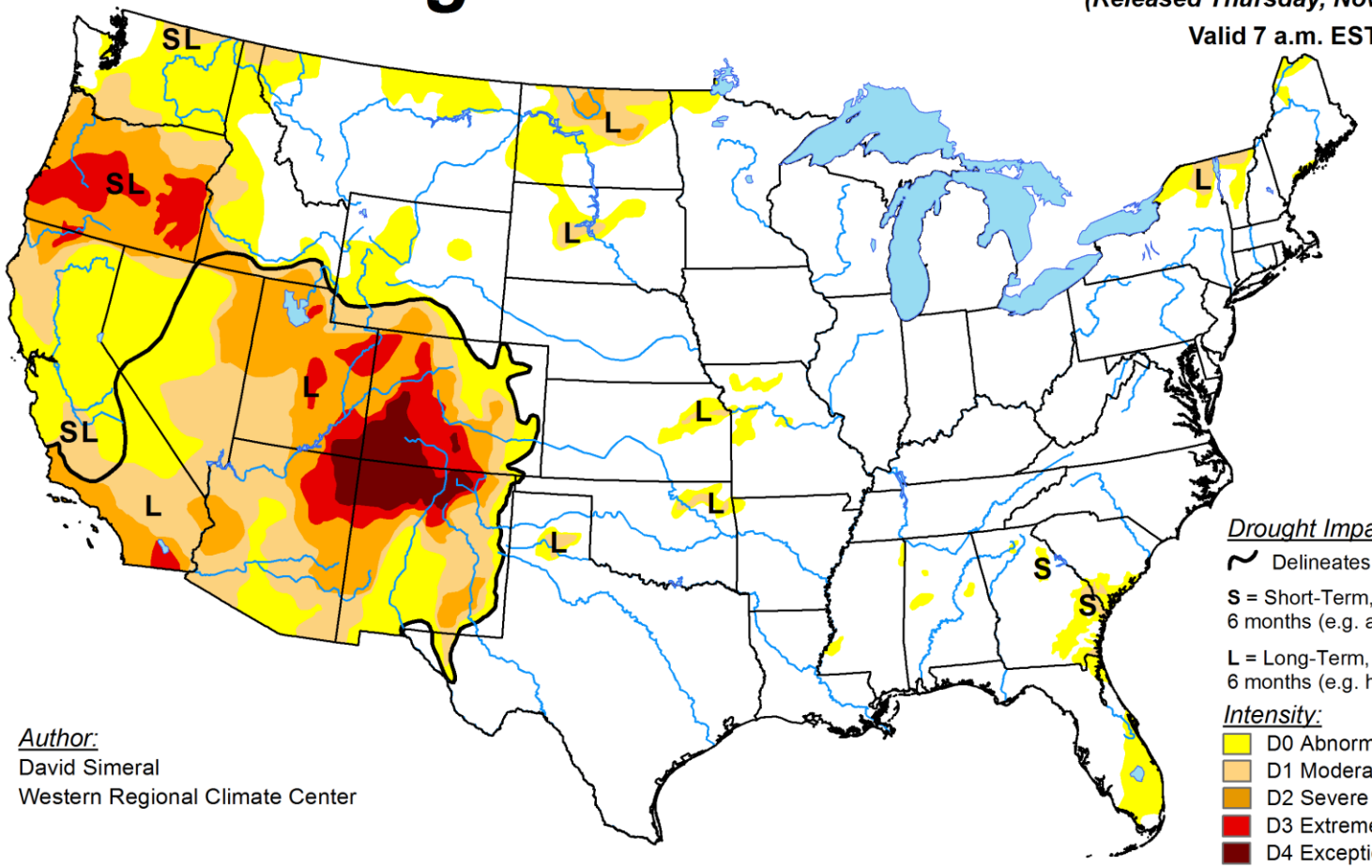


U.S. Drought Monitor

November 6, 2018

(Released Thursday, Nov. 8, 2018)

Valid 7 a.m. EST



Author:
David Simeral
Western Regional Climate Center

Drought Impact Types:

~ Delineates dominant impacts

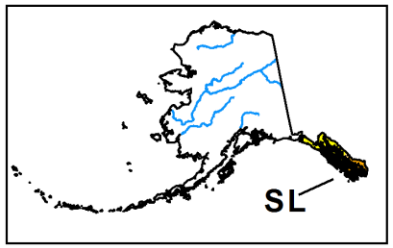
S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)

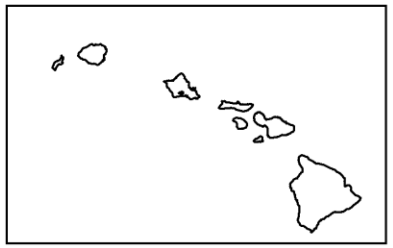
L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

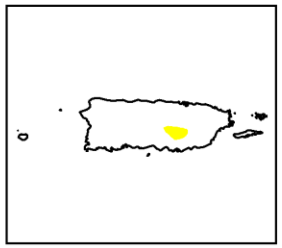
Intensity:

- 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.



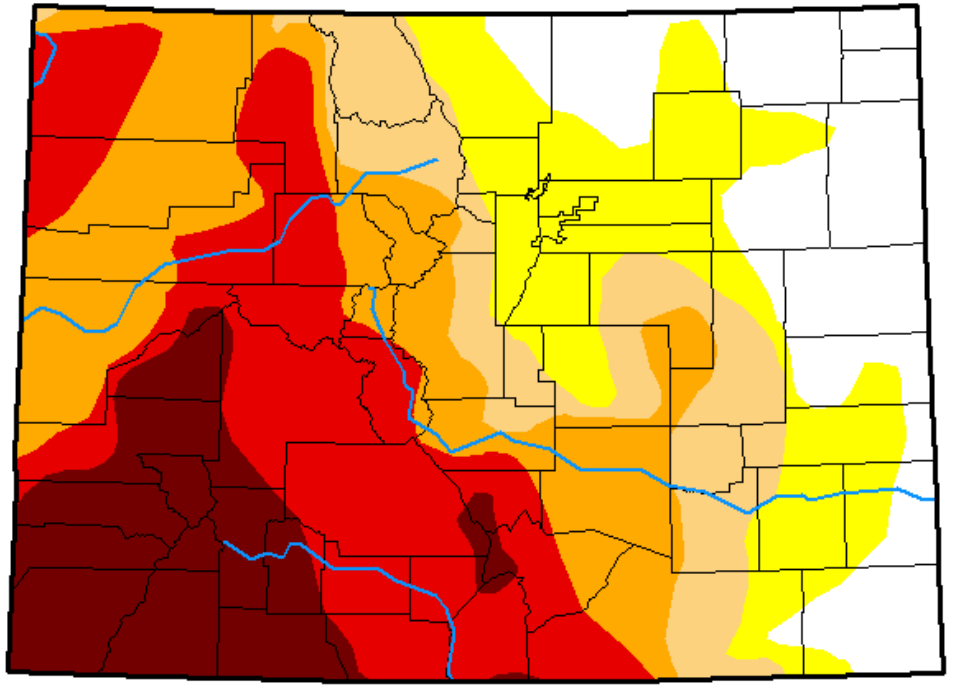




USDA NDMC NOAA

http://droughtmonitor.unl.edu/

U.S. Drought Monitor
Colorado



November 6, 2018
(Released Thursday, Nov. 8, 2018)
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	16.64	83.36	66.80	54.82	35.19	13.37
Last Week *10-30-2018*	16.64	83.36	66.80	57.07	37.48	13.64
3 Months Ago *08-07-2018*	18.20	81.80	75.86	64.65	35.10	8.50
Start of Calendar Year *01-02-2018*	6.57	93.43	33.53	7.27	0.00	0.00
Start of Water Year *09-25-2018*	14.19	85.81	72.30	64.41	48.47	16.21
One Year Ago *11-07-2017*	71.26	28.74	1.22	0.00	0.00	0.00

Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

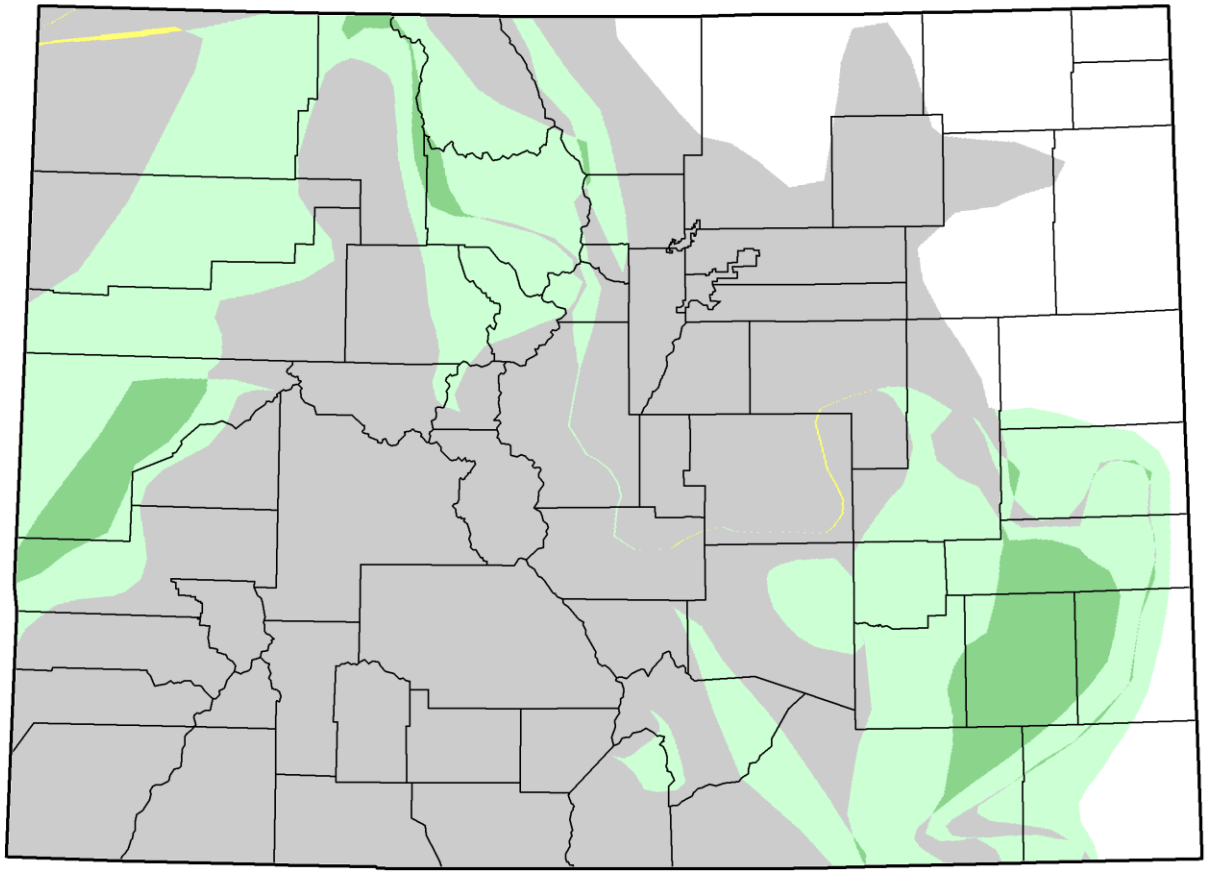
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:
David Simeral
Western Regional Climate Center

http://droughtmonitor.unl.edu/

U.S. Drought Monitor Class Change - Colorado

Start of Water Year



November 6, 2018
compared to
September 25, 2018

http://droughtmonitor.unl.edu

- 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

COLORADO
CLIMATE
CENTER

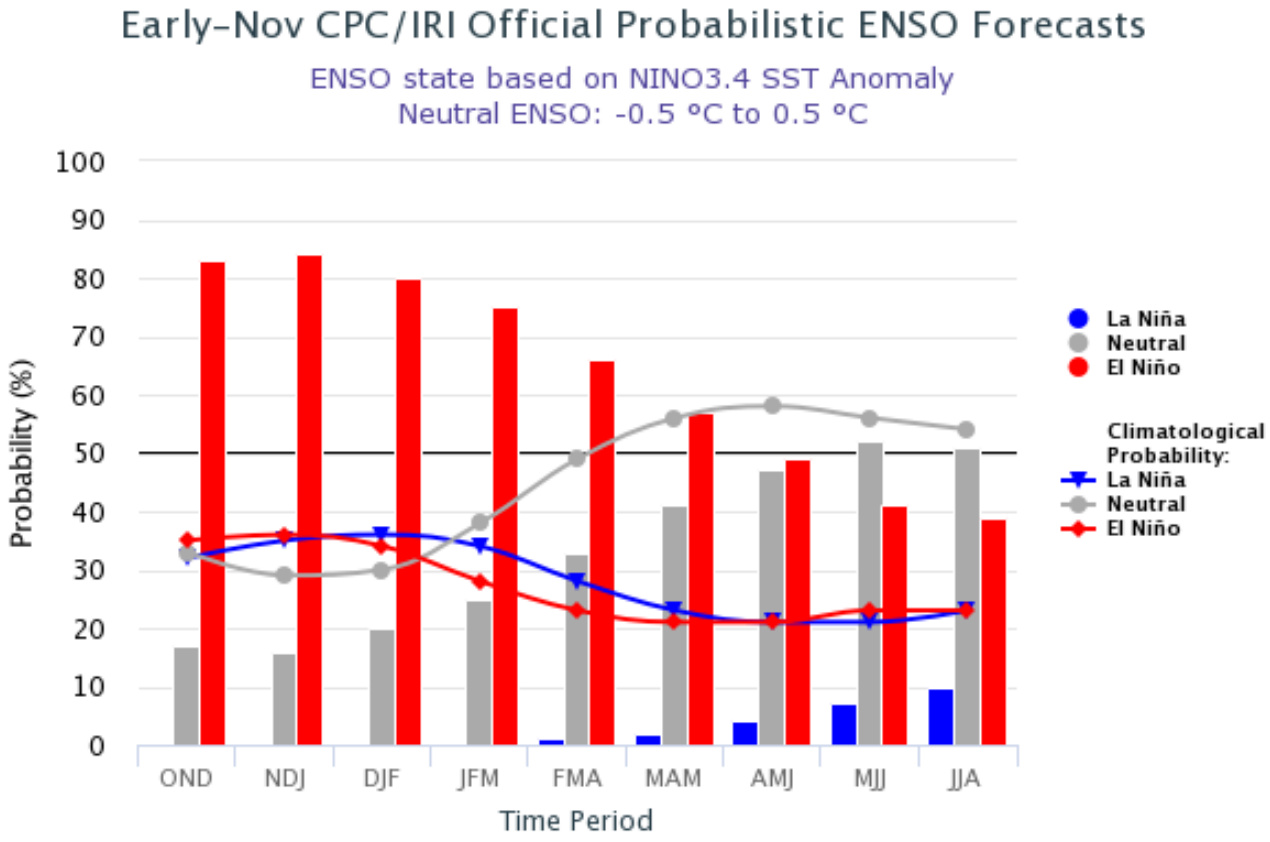
Winter Outlook

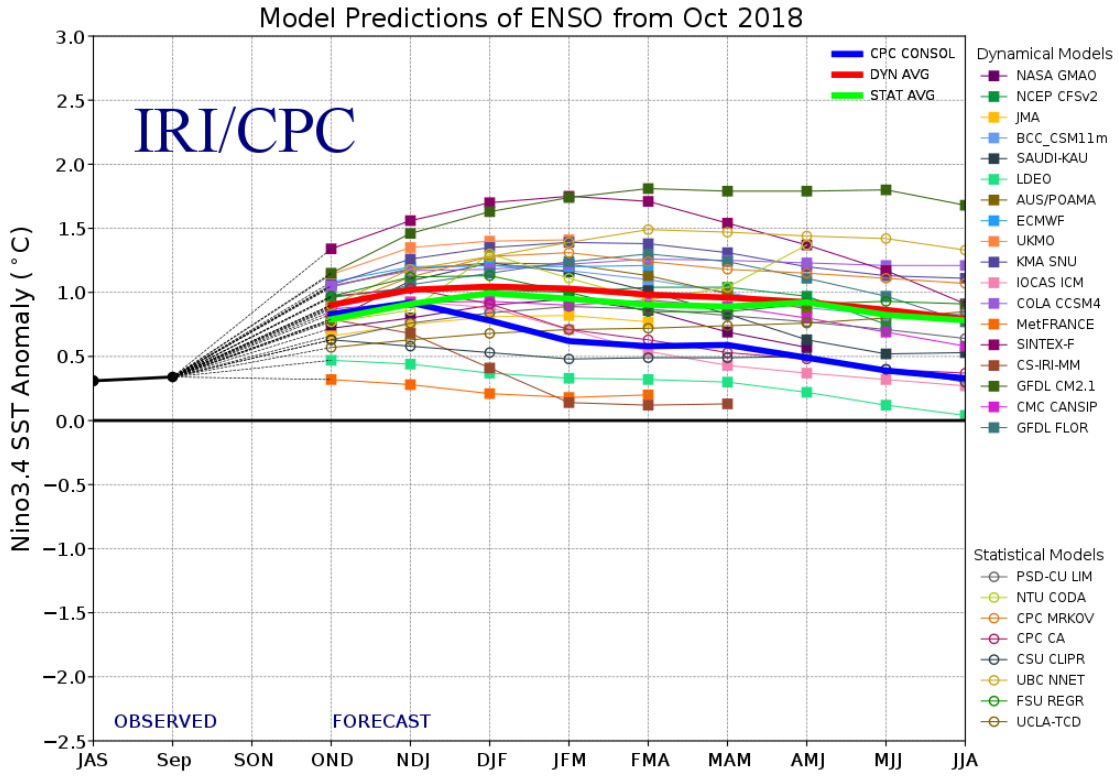
What does El Niño mean?

CPC Outlooks

Is a wet October important?

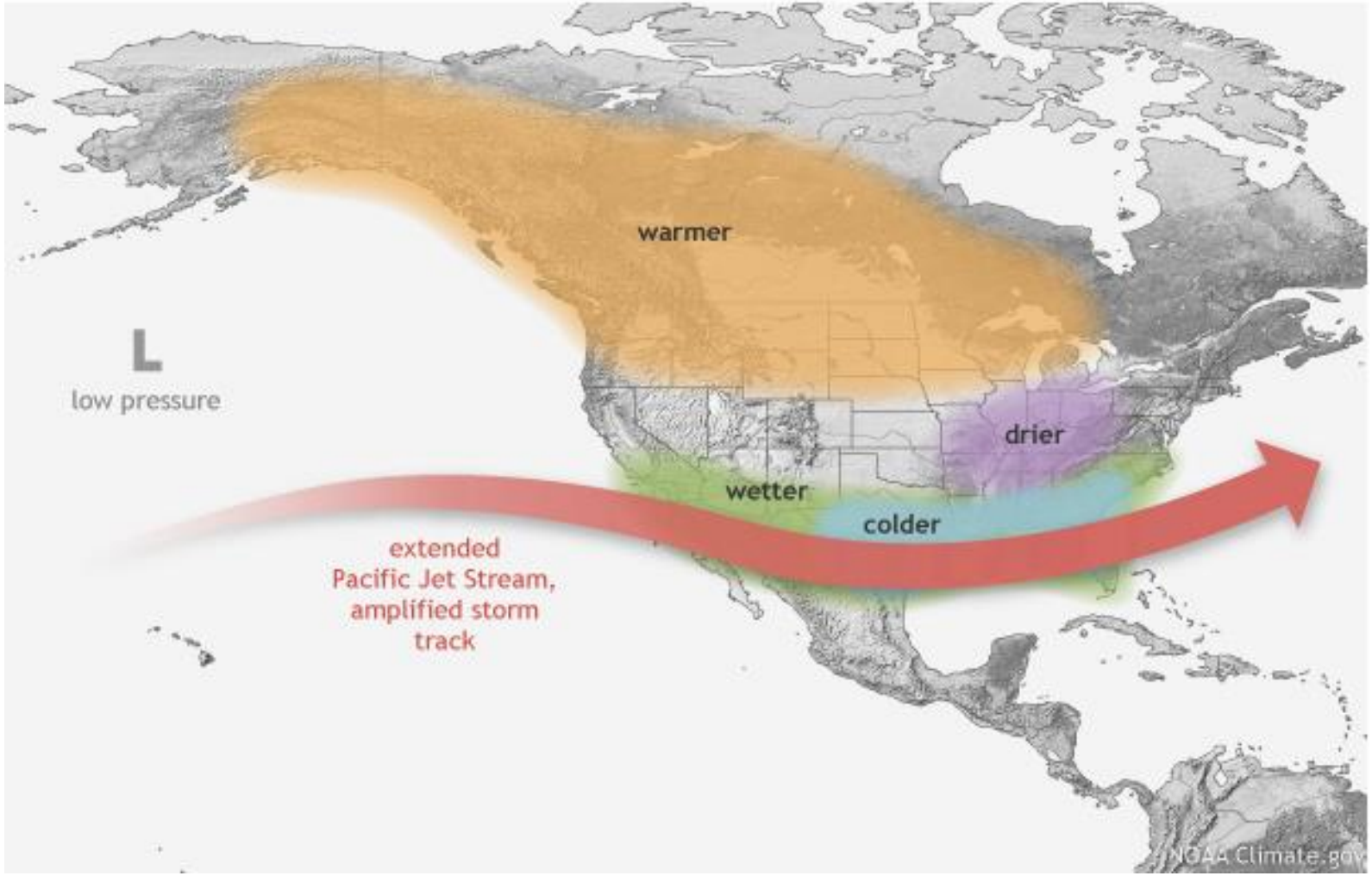
What's the El Niño forecast?





An El Niño Watch is in effect…

WINTER EL NIÑO PATTERN

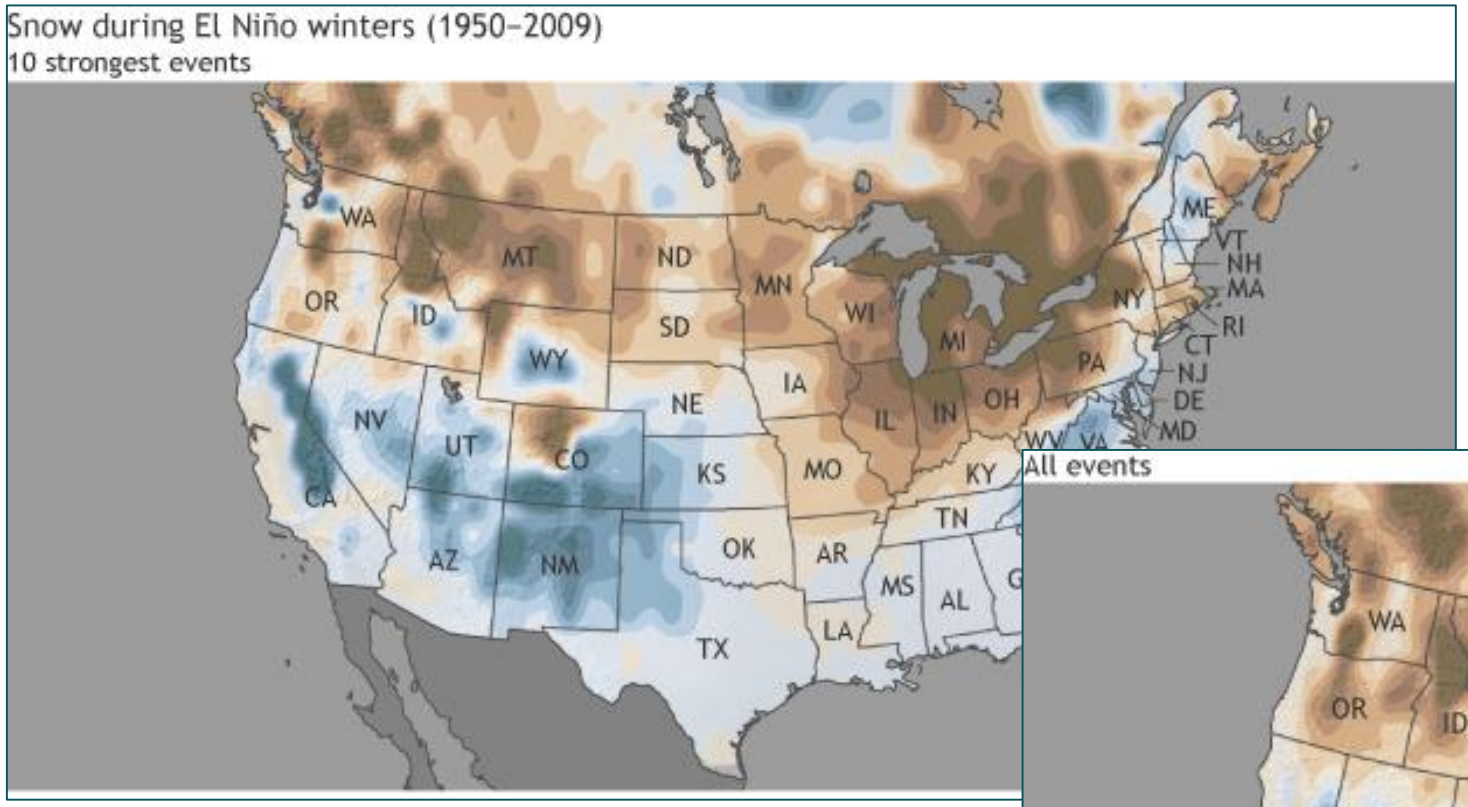


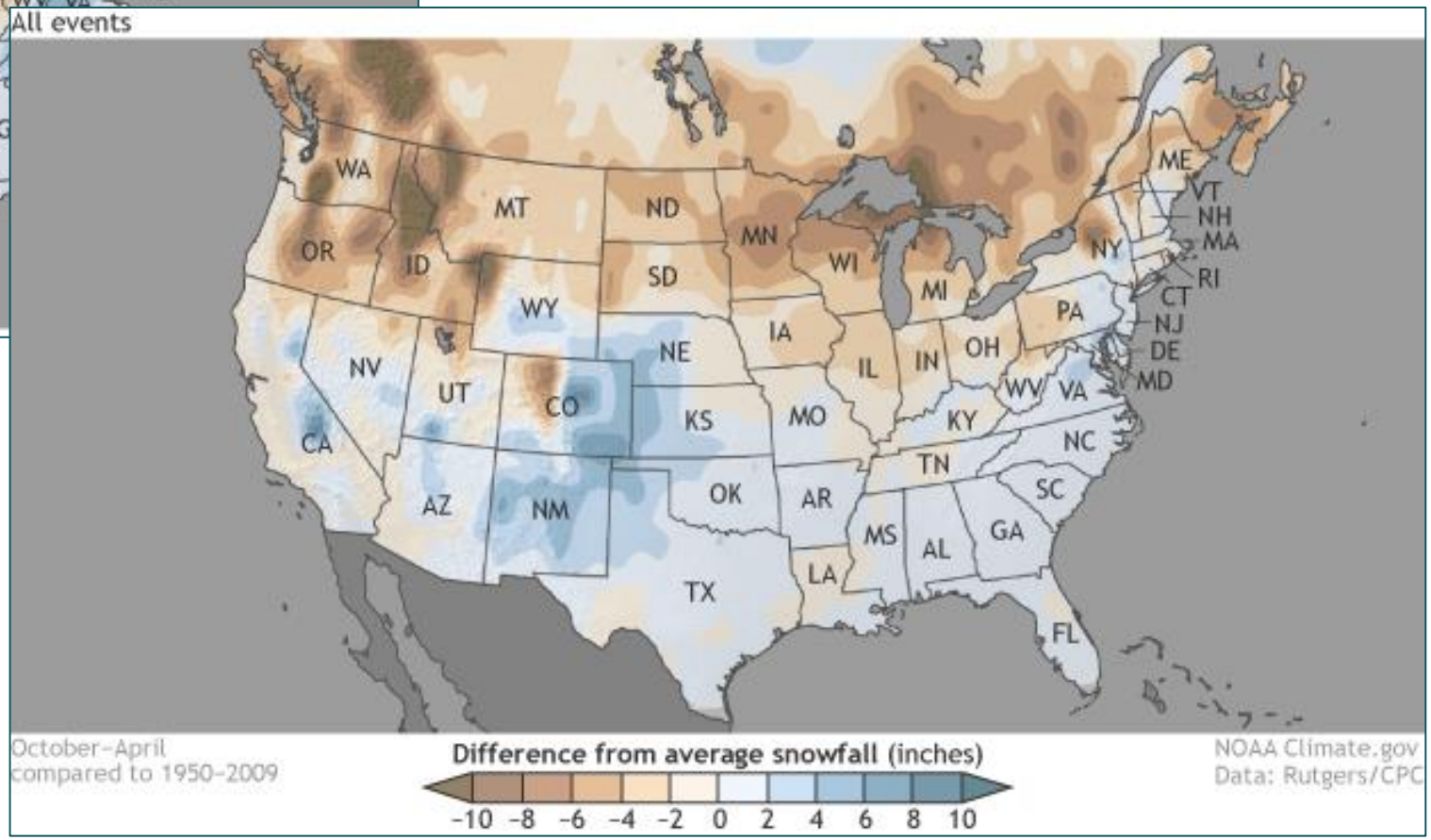
Warmer to the north

More likely to be dry to the north

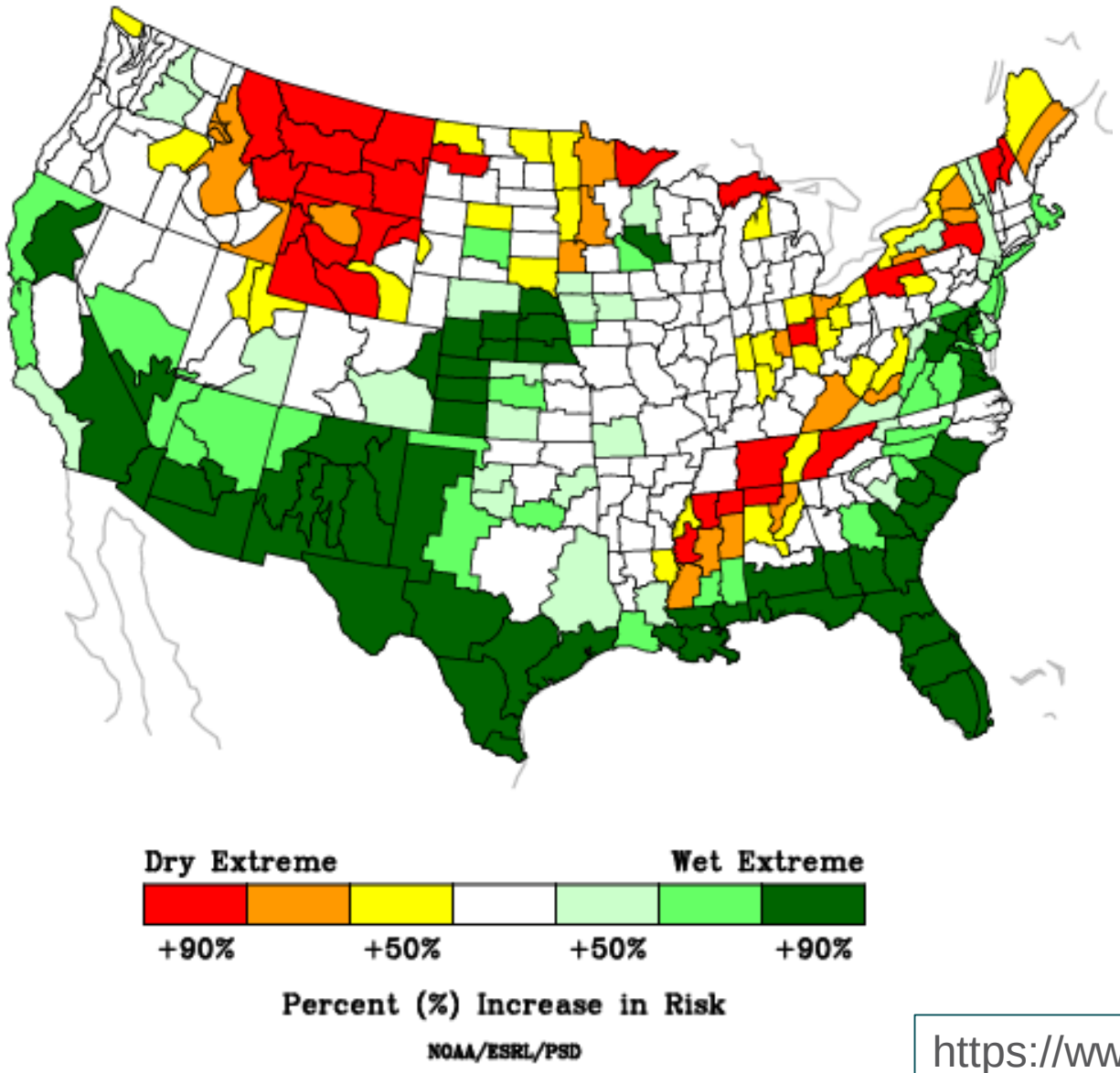
More likely to be wet to the south

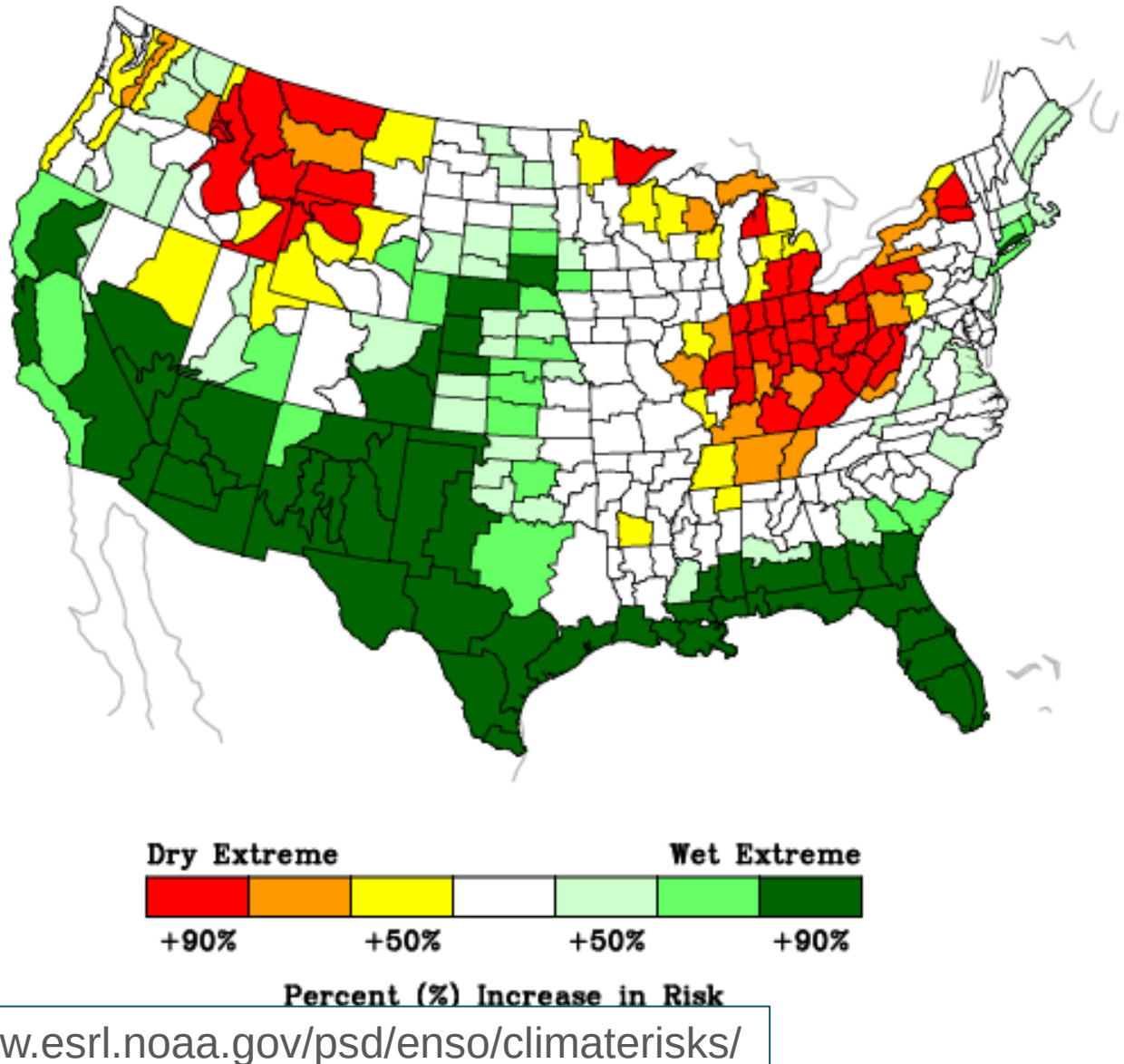
from climate.gov





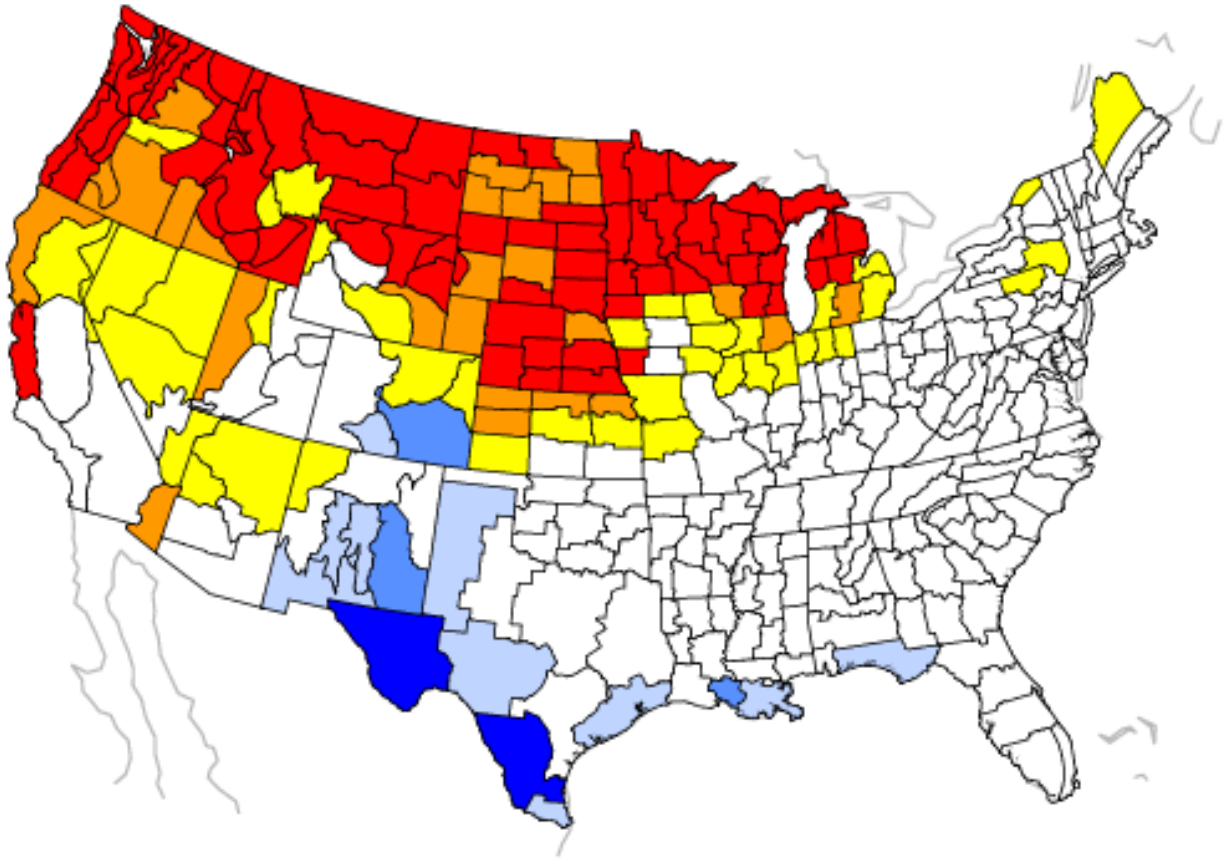
from climate.gov

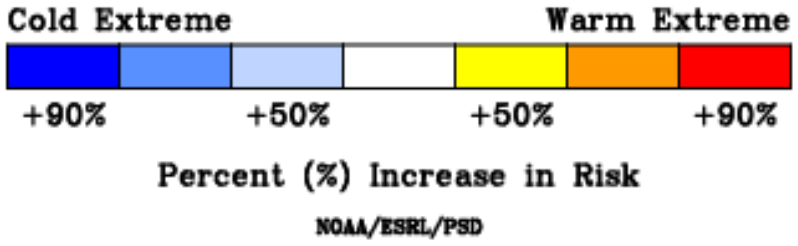




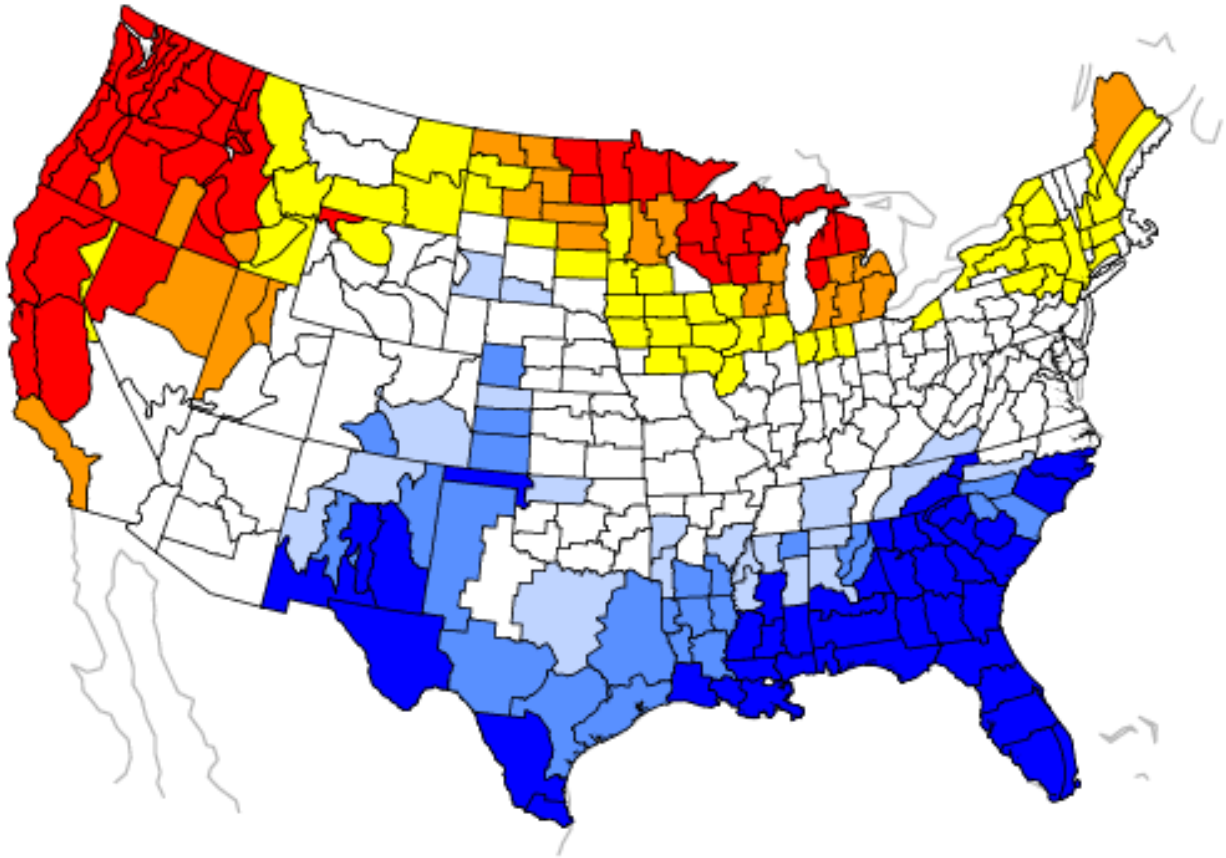
https://www.esrl.noaa.gov/psd/enso/climaterisks/

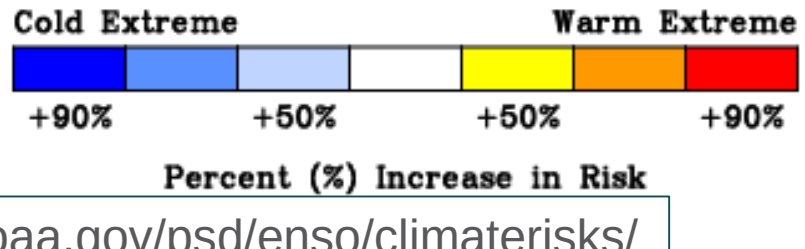
DJF Temperature During El Nino
Increased Risk of Warm or Cold Extremes





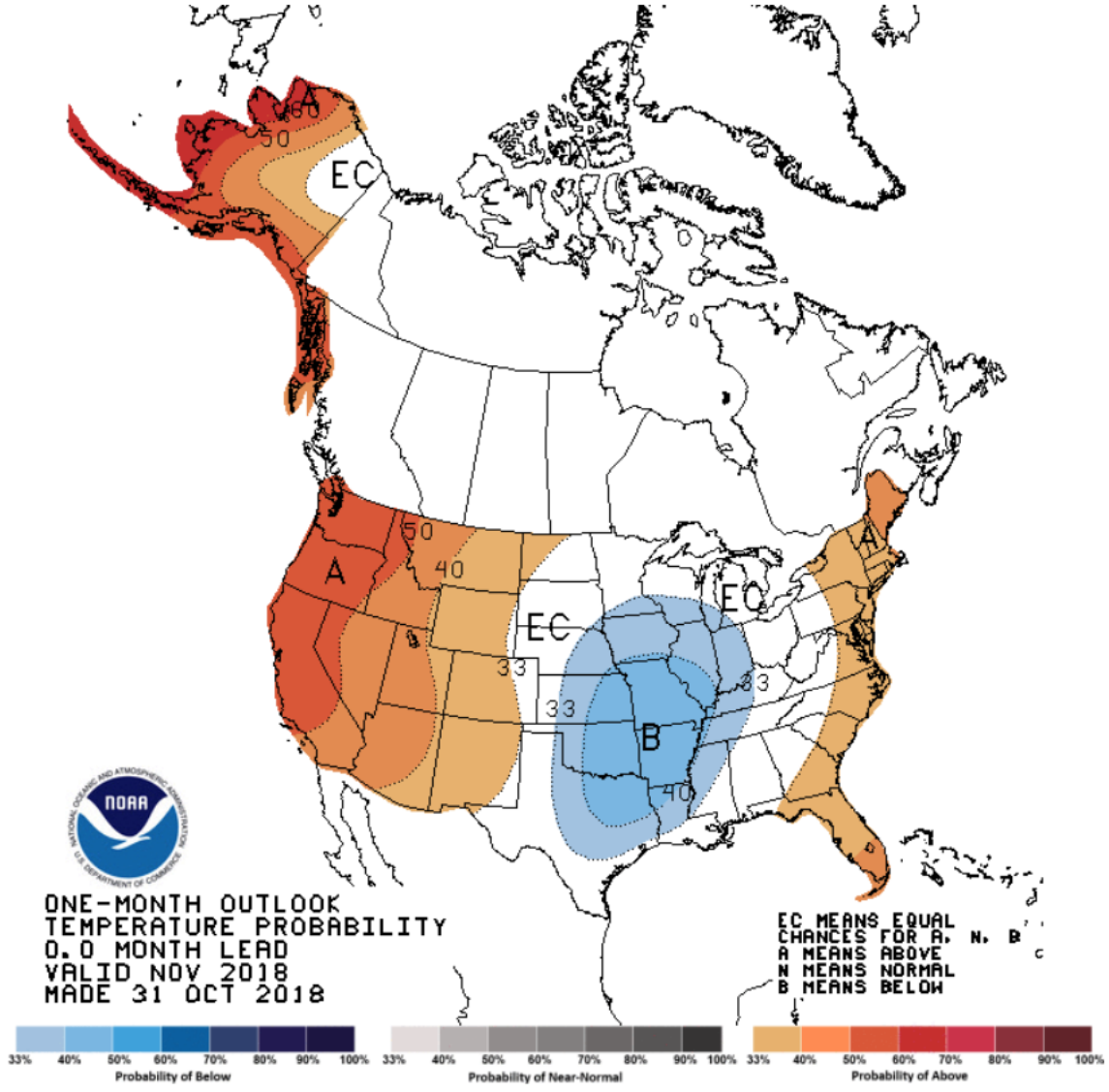
JFM Temperature During El Nino
Increased Risk of Warm or Cold Extremes

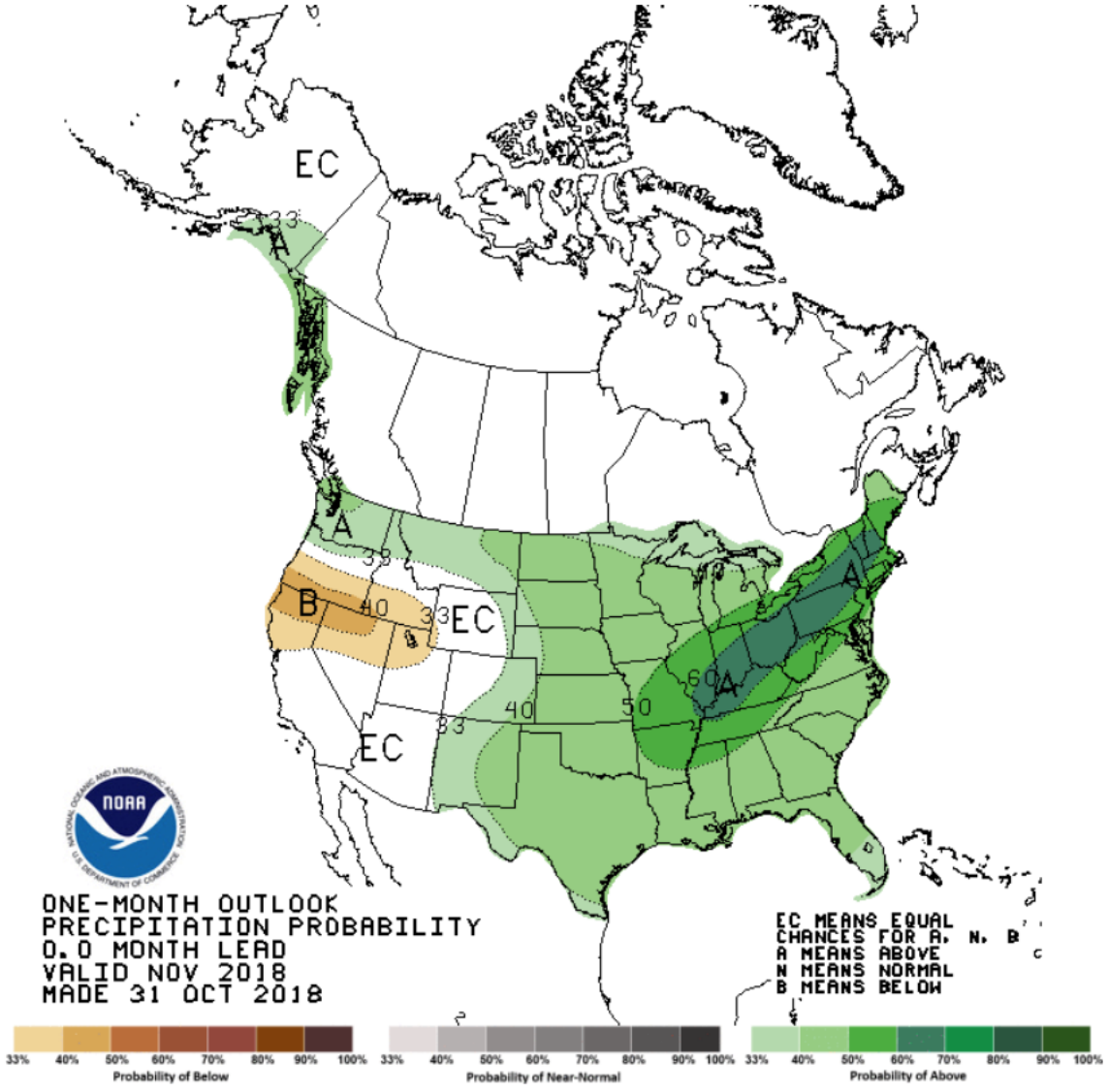




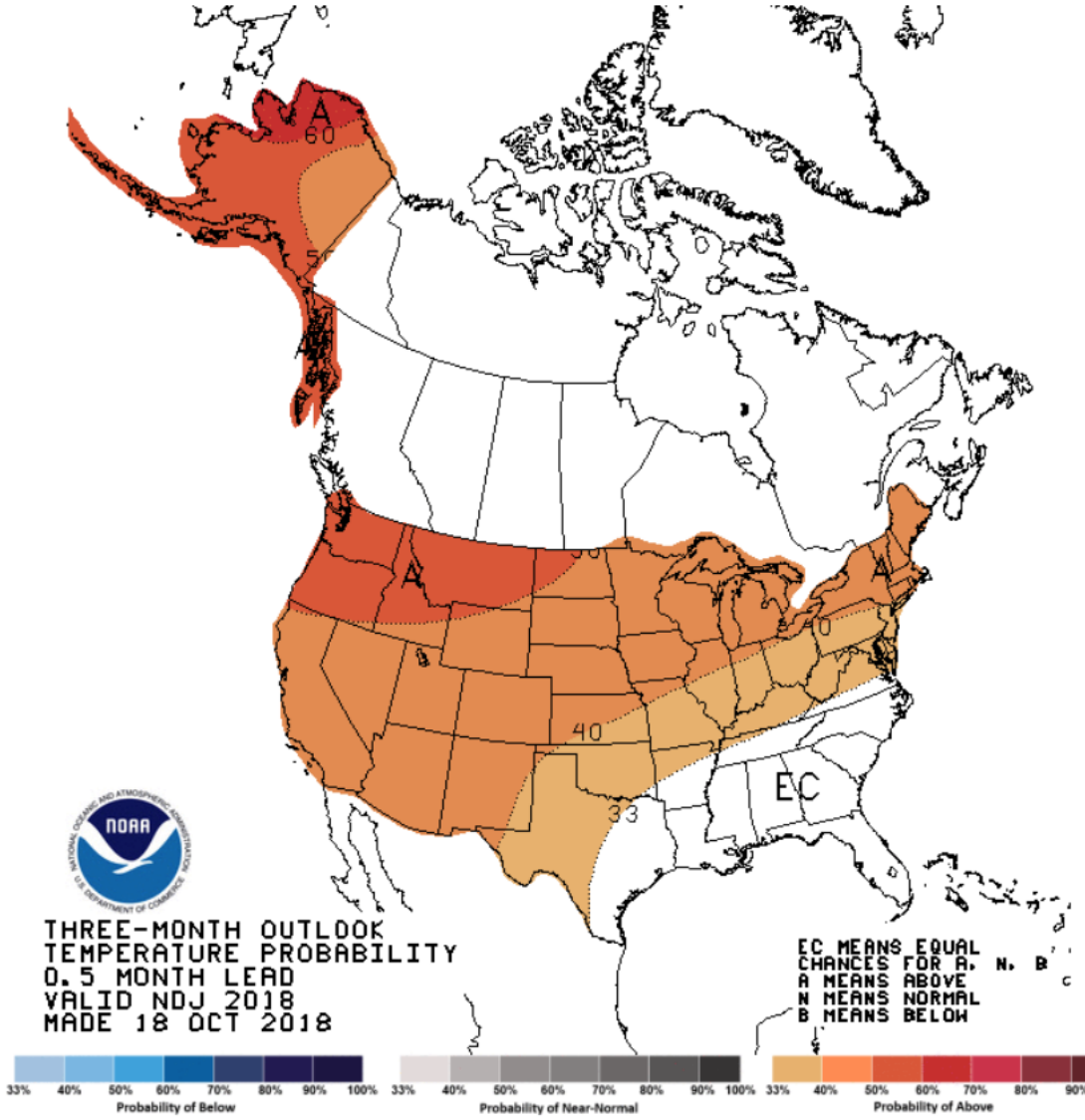
https://www.esrl.noaa.gov/psd/enso/climaterisks/

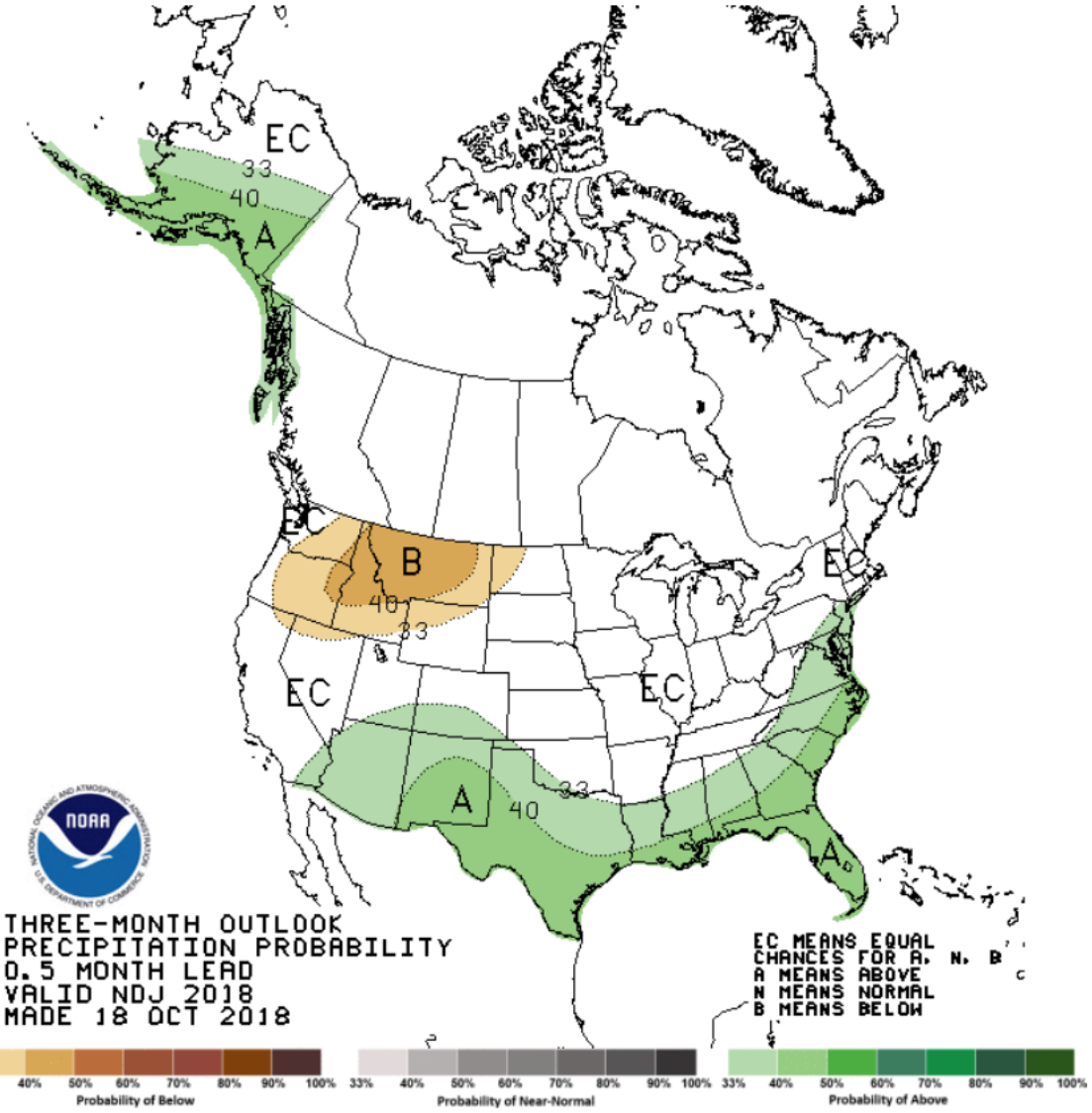
One Month Outlook





Nov-Dec-Jan Outlook





CPC and Model Outlooks…

- ✓ Warmer than average temperatures are likely to be dominant for fall, winter, and into spring

- ✓ CPC seasonal outlook shows classic El Niño signature:
  - ✓ Increased probability of wetter than average conditions in the southern part of the state
  - ✓ Increased probability of drier than average conditions to the north, but could possibly make its way into northern CO

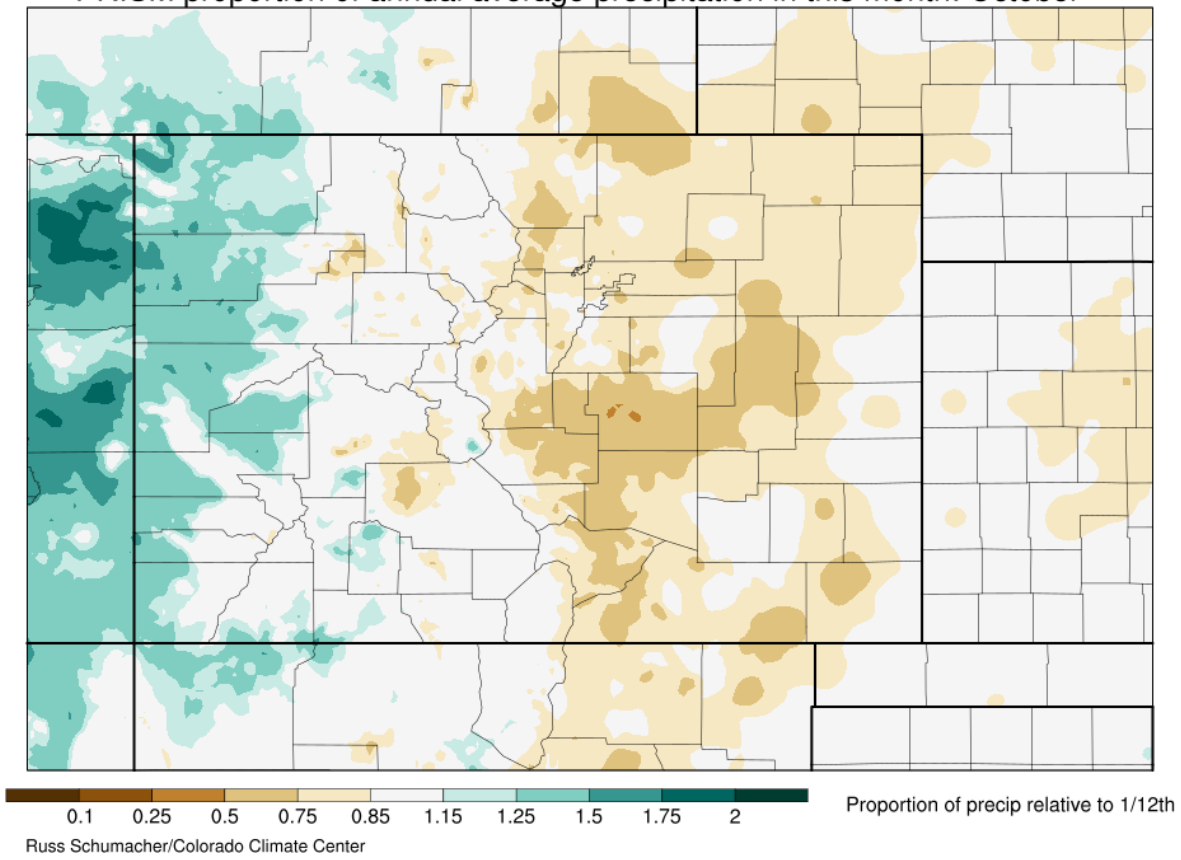
- ✓ North American Multi-Model Ensemble is showing some confidence in a wet spring for the entire state
- ✓ Stay tuned for adjustments in January – if the forecast holds then, that'll be a very good sign

Key Takeaway El Niño Points…

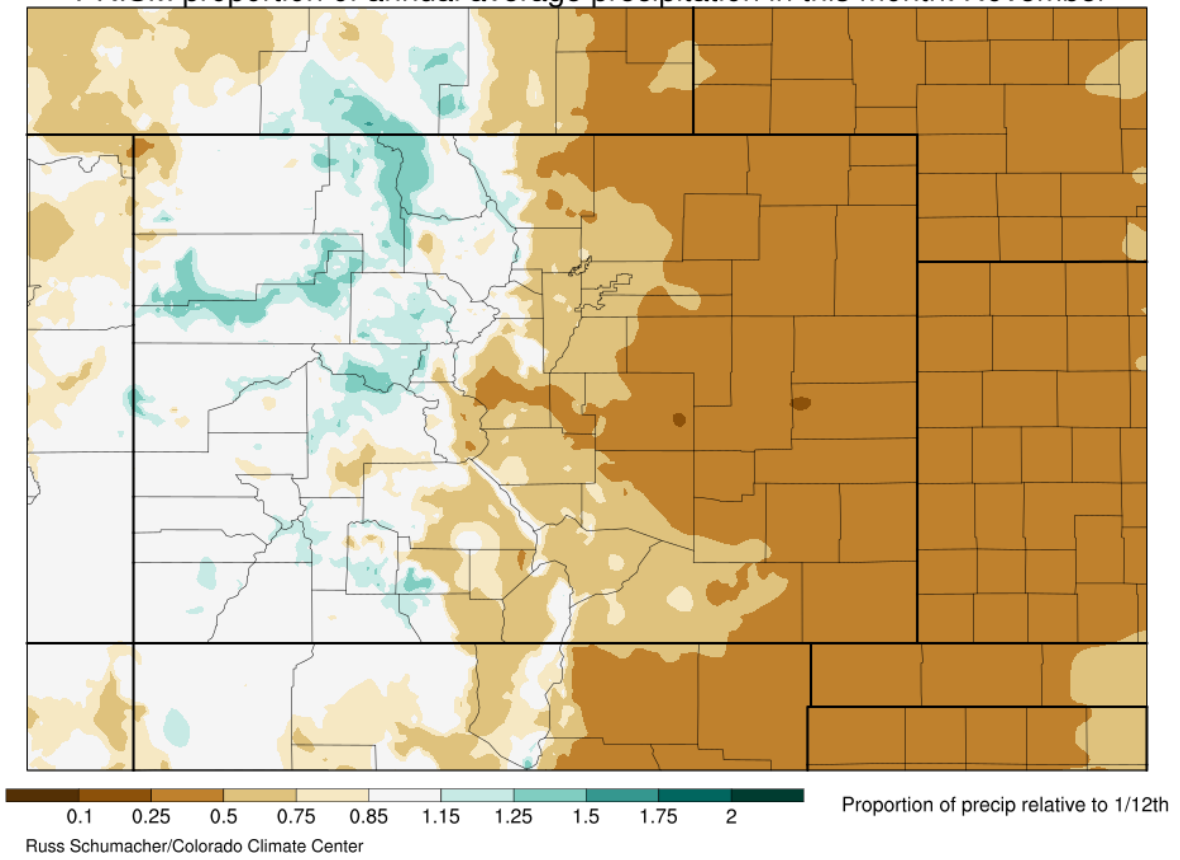
- ✓ Expect a weak-to-moderate El Niño event within the next month
- ✓ Not always clear what that will mean for Colorado….
  - ✓ but more common to see warmer conditions to the north
  - ✓ and more common to see wetter conditions to the south
- ✓ Northern Colorado mountains don't fare as well for snowfall
- ✓ Eastern plains tend to see more snow
- ✓ Generally an increased risk of wet extremes to the south and an increased risk of dry extremes to the north
  - ✓ This is good news for drought relief around the Four Corners
  - ✓ This is bad news for the more recently parched Yampa basin
- ✓ Despite temperature signals, expect to see warmer than average winter

Is a wet start to WY2019 significant?

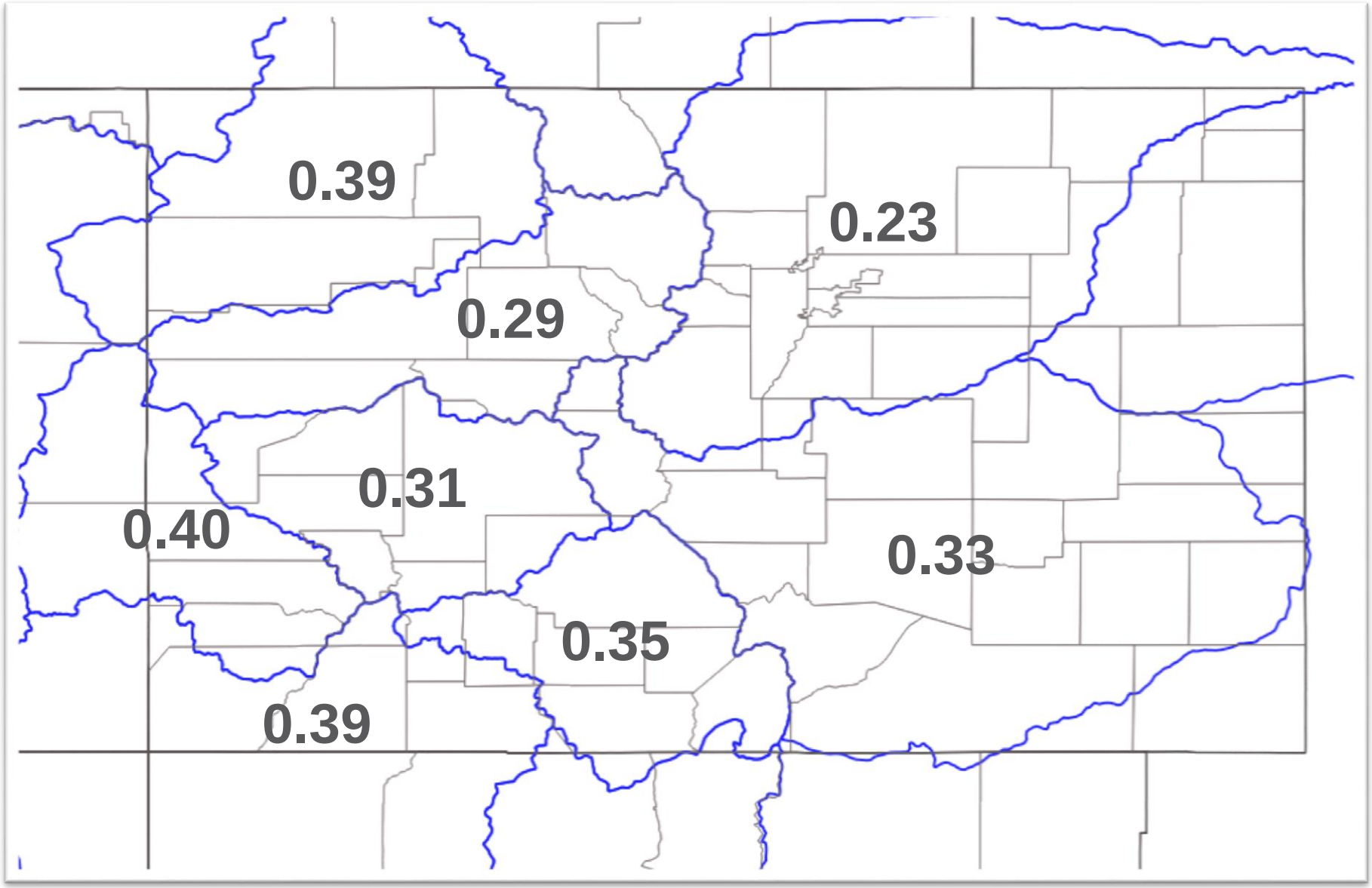
PRISM proportion of annual average precipitation in this month: October



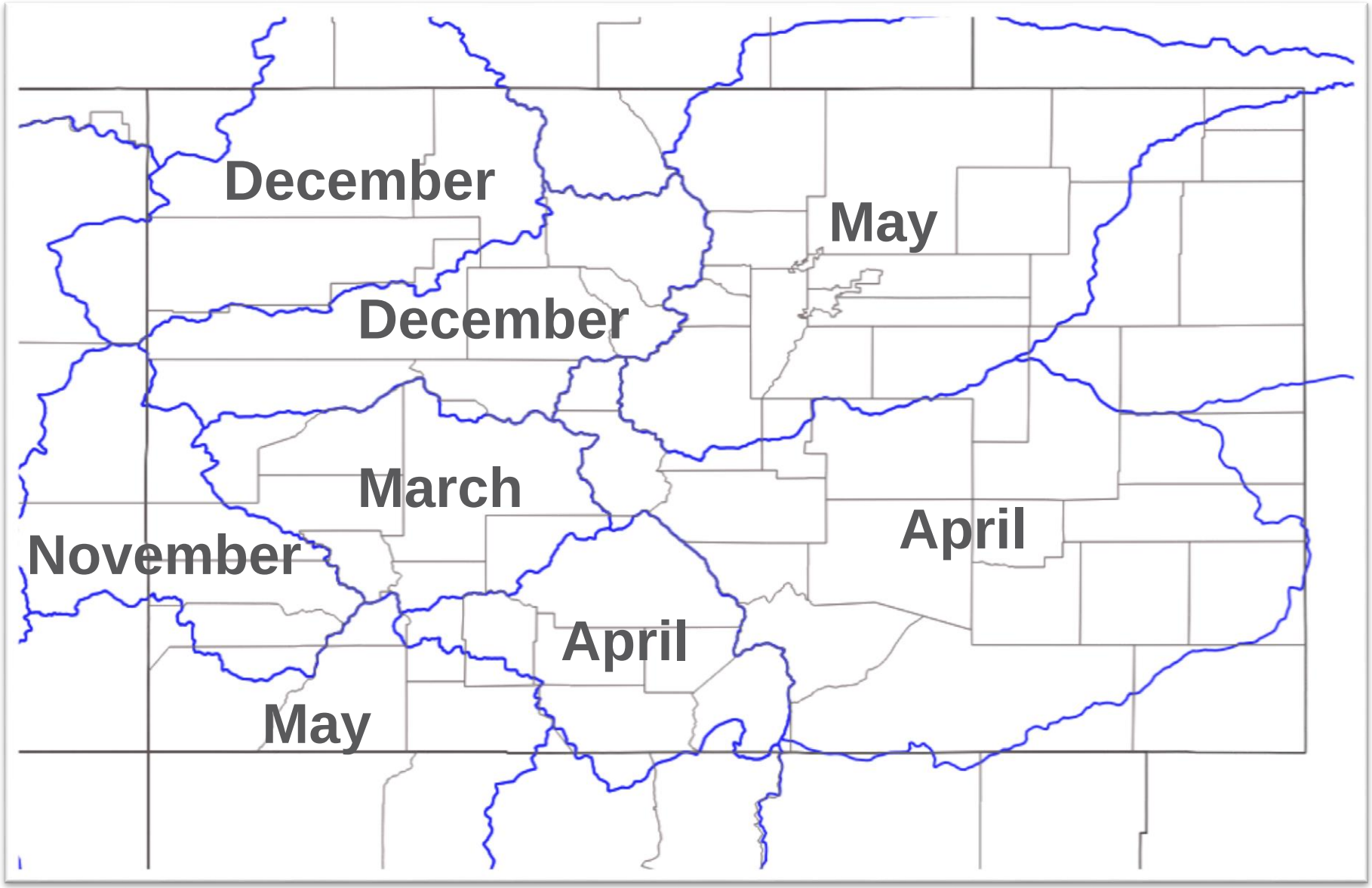
PRISM proportion of annual average precipitation in this month: November



Correlation between October precipitation and water year accumulations



Month with the highest correlation to the total water year accumulations



Based on similar Octobers in history, what is the expected water year accumulation?

Basin	October 2018 Precip	Composite WY Total
South Platte	Above Average	Average
Arkansas	Much Above Average	113%
Rio Grande	Above Average	104%
San Juan	Much Above Average	109%
Dolores	Much Above Average	110%
Gunnison	Much Above Average	105%
Colorado	Much Above Average	109%
Yampa-White	Much Above Average	112%

Key Takeaway October Points…

- ✓ October-November are important contributing months for portions of the west slope
- ✓ The western basins show a strong correlation between what happens in October and how the water year ends up
- ✓ Spring months are clearly more important in defining the annual totals for the Eastern Plains
- ✓ Winter months are the winners for the western basins
- ✓ A ”much above average” October is generally promising for the water year
- ✓ It’s early and there’s still a lot of room for variability!

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

Thank you

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