



Nolan Doesken  
Colorado Climate Center

Presented to  
Water Availability Task Force  
March 21<sup>st</sup>, 2017  
Denver, CO

# Feb 2017 Average Temperature History for Colorado (NCEI)

35.4 F (+8.0)

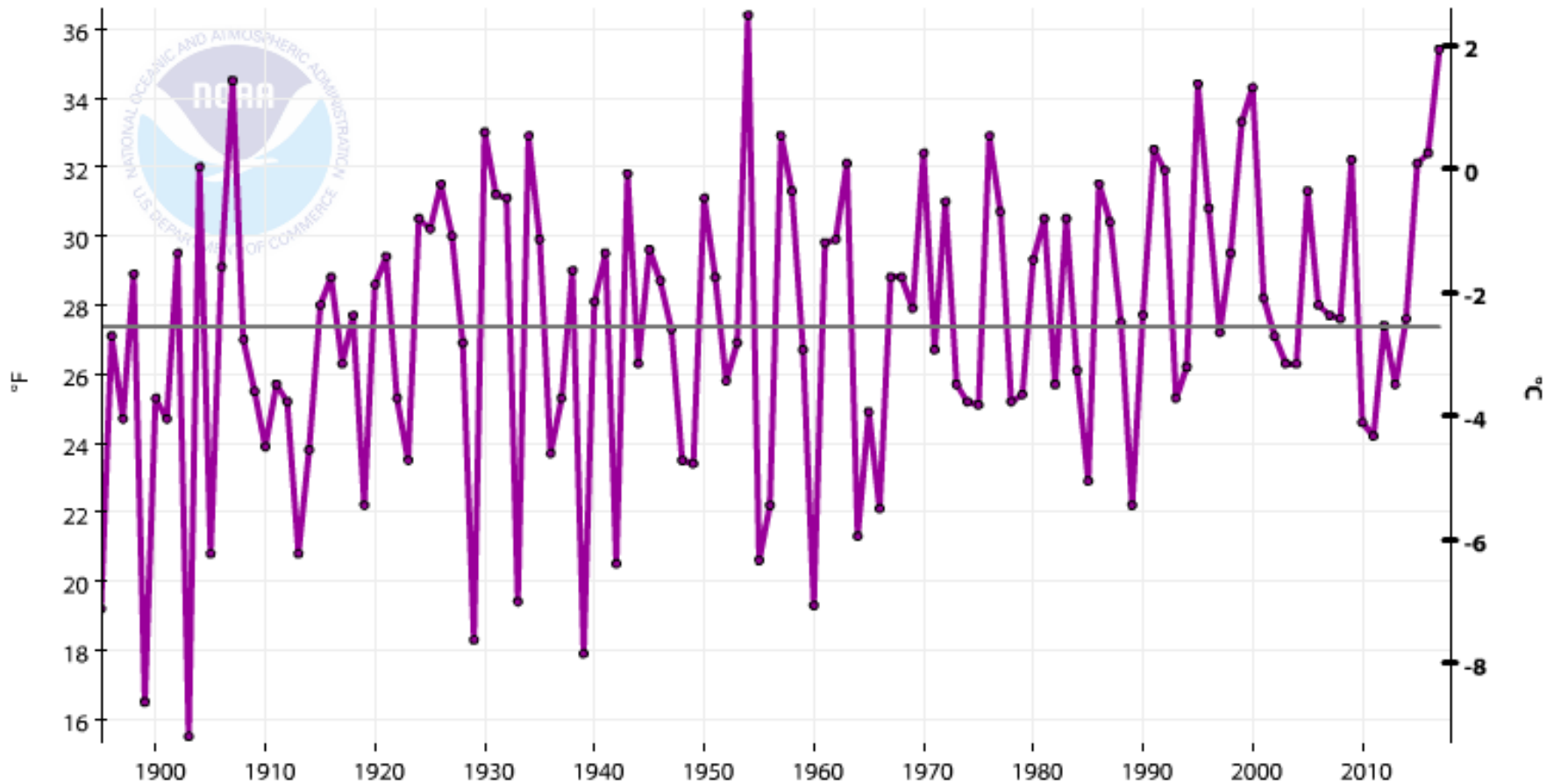
2<sup>nd</sup> warmest on record

9.9 degrees warmer than January

Warmest since 1954 at 36.6 F

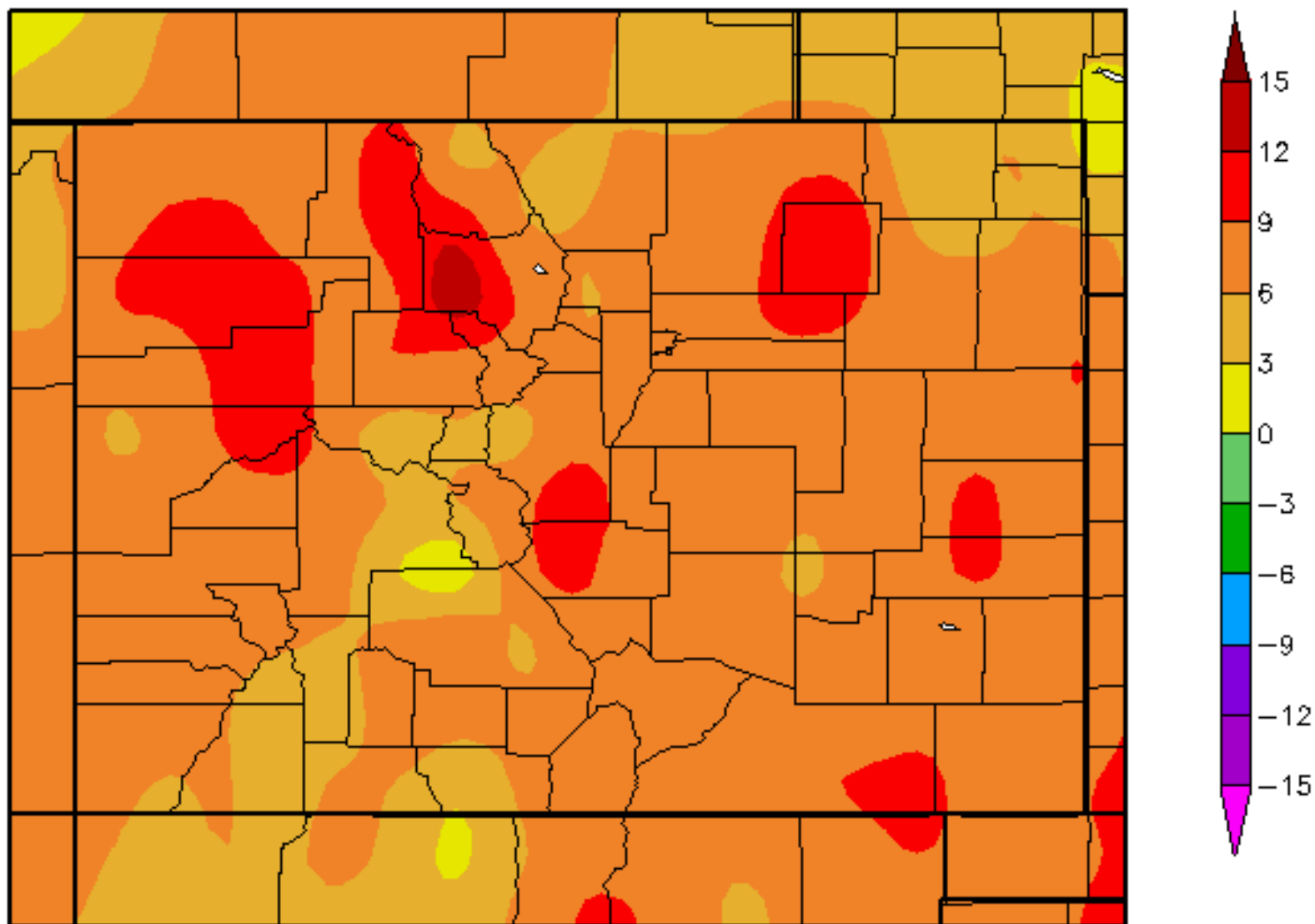
## Colorado, Average Temperature, February

— 1901-2000 Mean: 27.4°F      —●— Avg Temperature



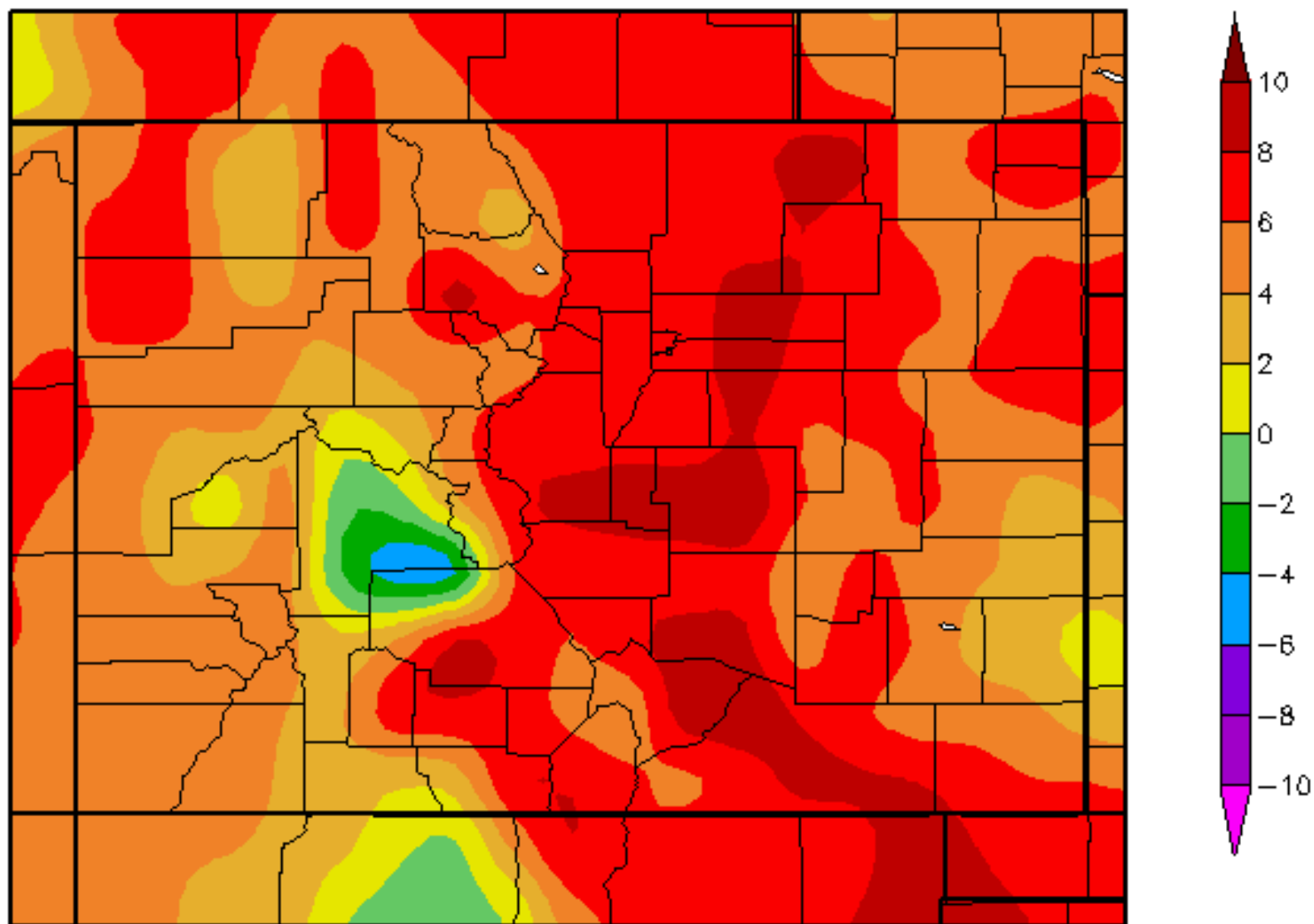
# Departure from Normal Temperature (F)

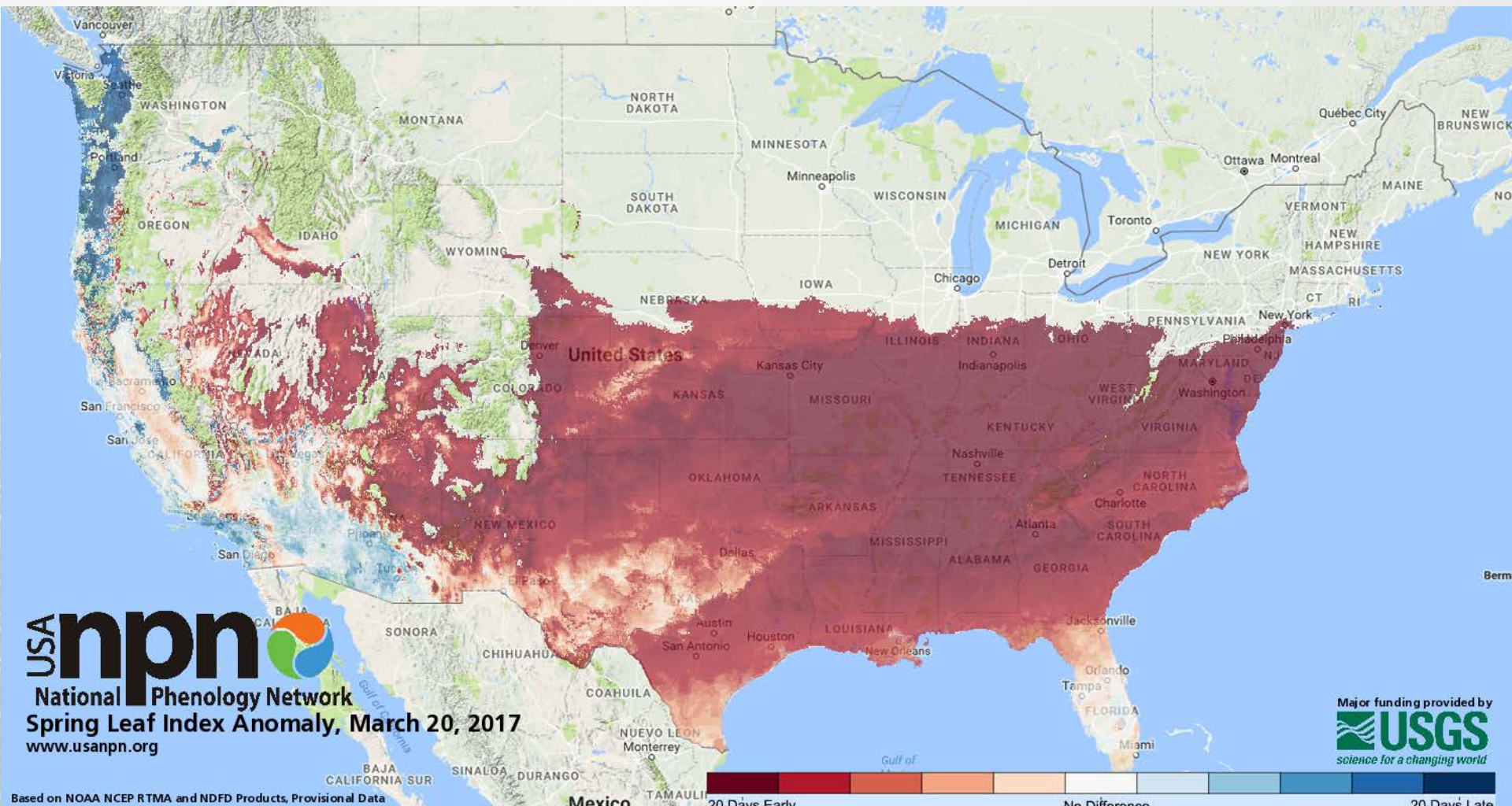
2/1/2017 - 2/28/2017



# Departure from Normal Temperature (F)

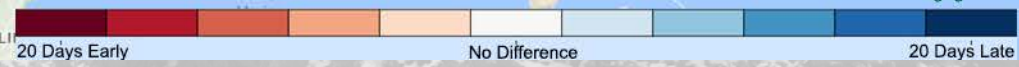
3/1/2017 - 3/19/2017





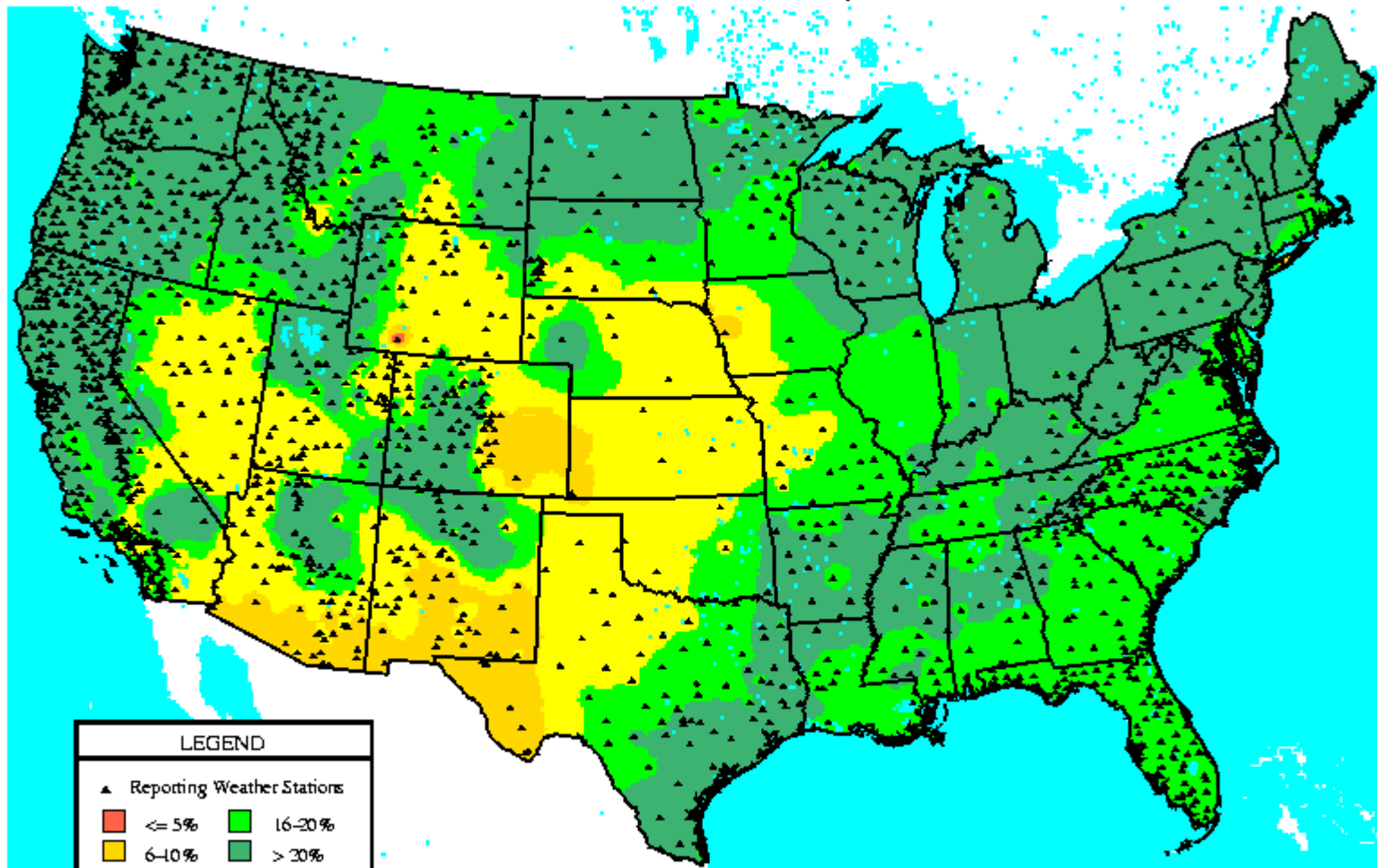
**USA npn**  
 National Phenology Network  
 Spring Leaf Index Anomaly, March 20, 2017  
[www.usanpn.org](http://www.usanpn.org)

Major funding provided by  
**USGS**  
 science for a changing world



Based on NOAA NCEP RTMA and NDFD Products, Provisional Data

Obs. 1000-Hour FM: 19-Mar-17

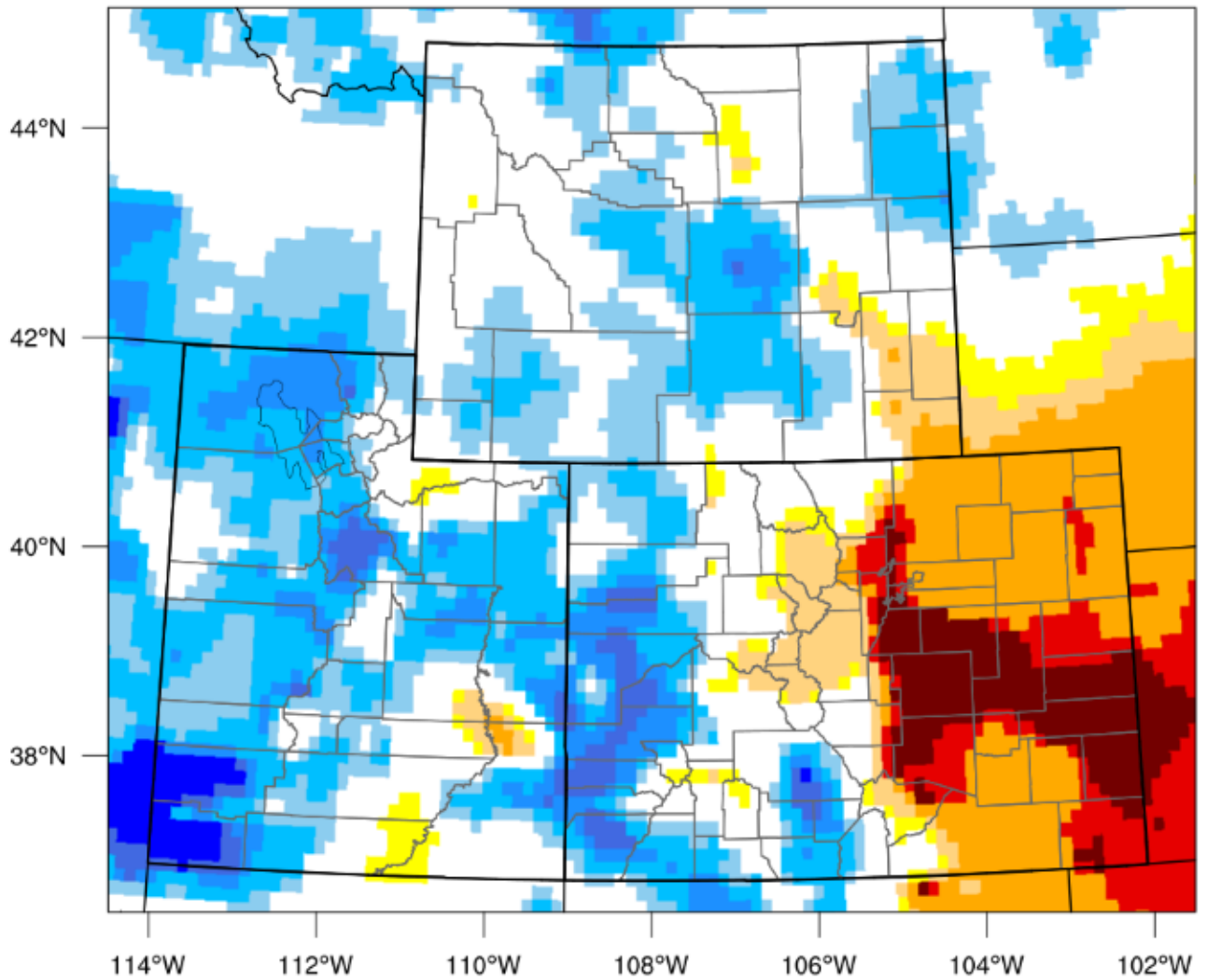


(Inv. Dist.<sup>2</sup> Interp.)

WFAS-MAPS Graphics FIRE BEHAVIOR RESEARCH MISSOULA, MT



# 3-month EDDI categories for March 15, 2017



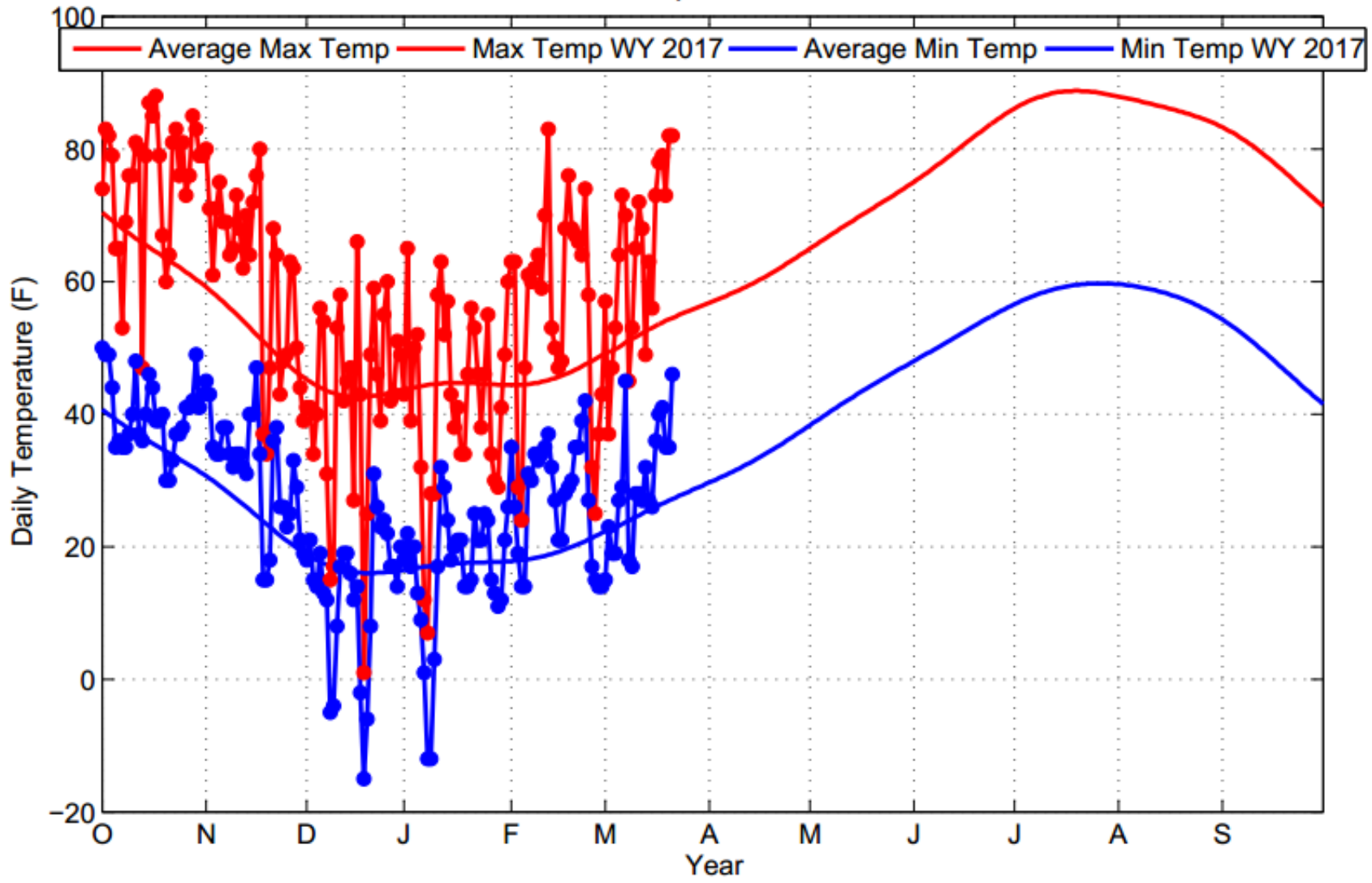
Drought categories

Wetness categories



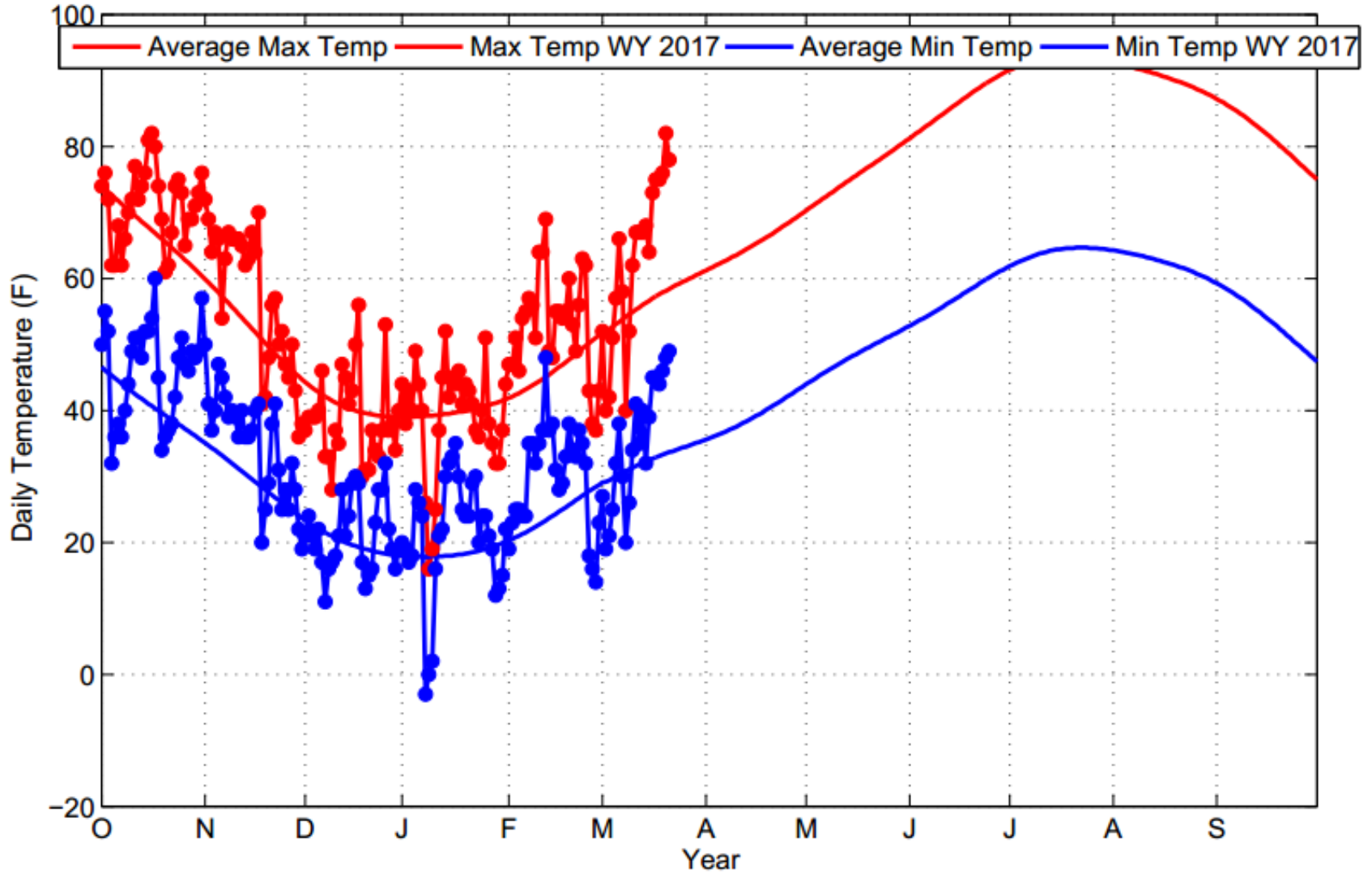
(EDDI-percentile category breaks: 100% = driest; 0% = wettest)

Daily Maximum and Minimum Temperatures at Denver Stapleton for WY 2017

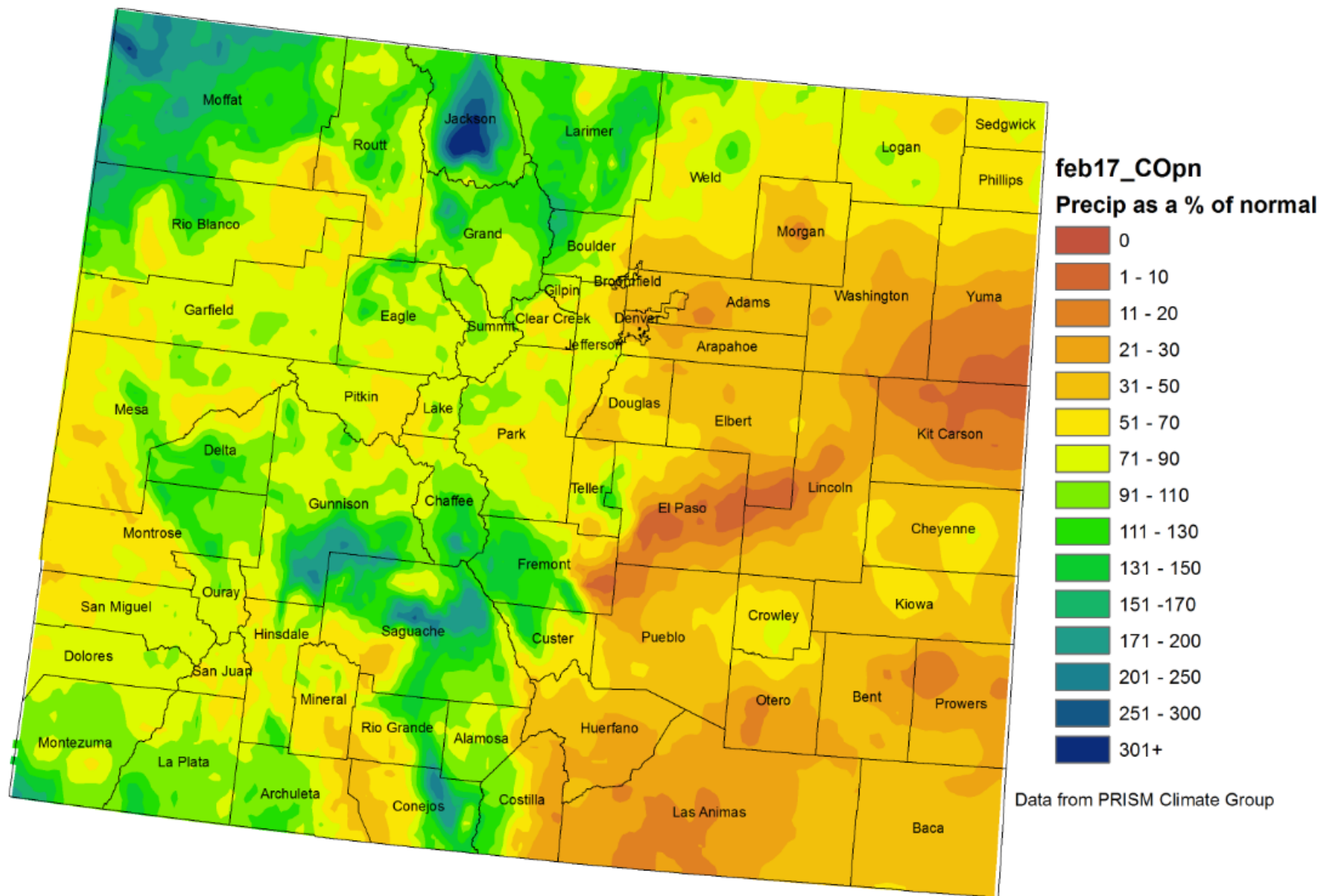




Daily Maximum and Minimum Temperatures  
at Grand Junction for WY 2017



# Colorado February 2017 Precipitation as a Percentage of Normal



# Feb 2017 Statewide Precipitation

0.97" (-0.12")

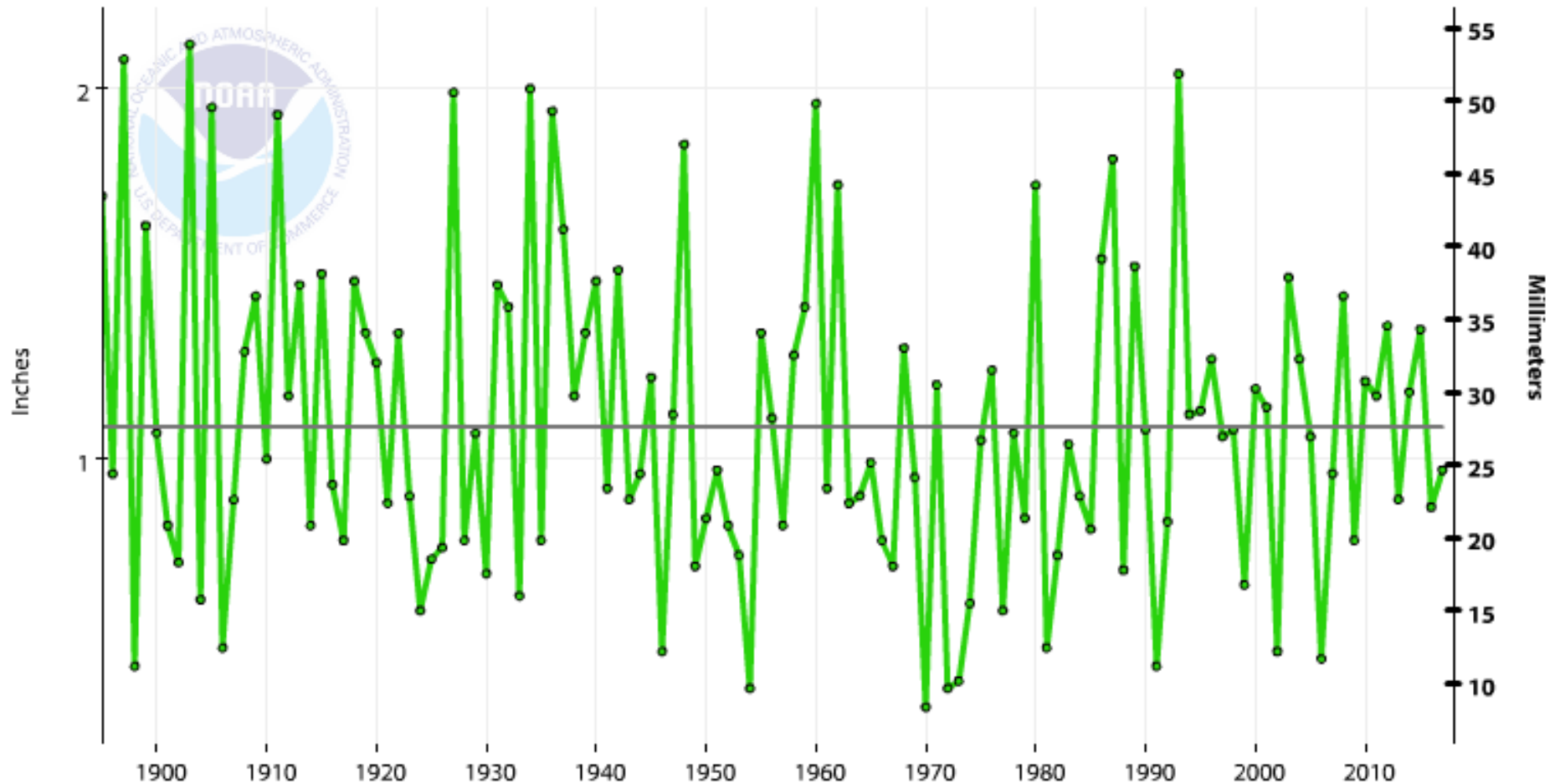
56<sup>th</sup> driest on Record 1895-2016.

Driest since 2016 with 0.87"

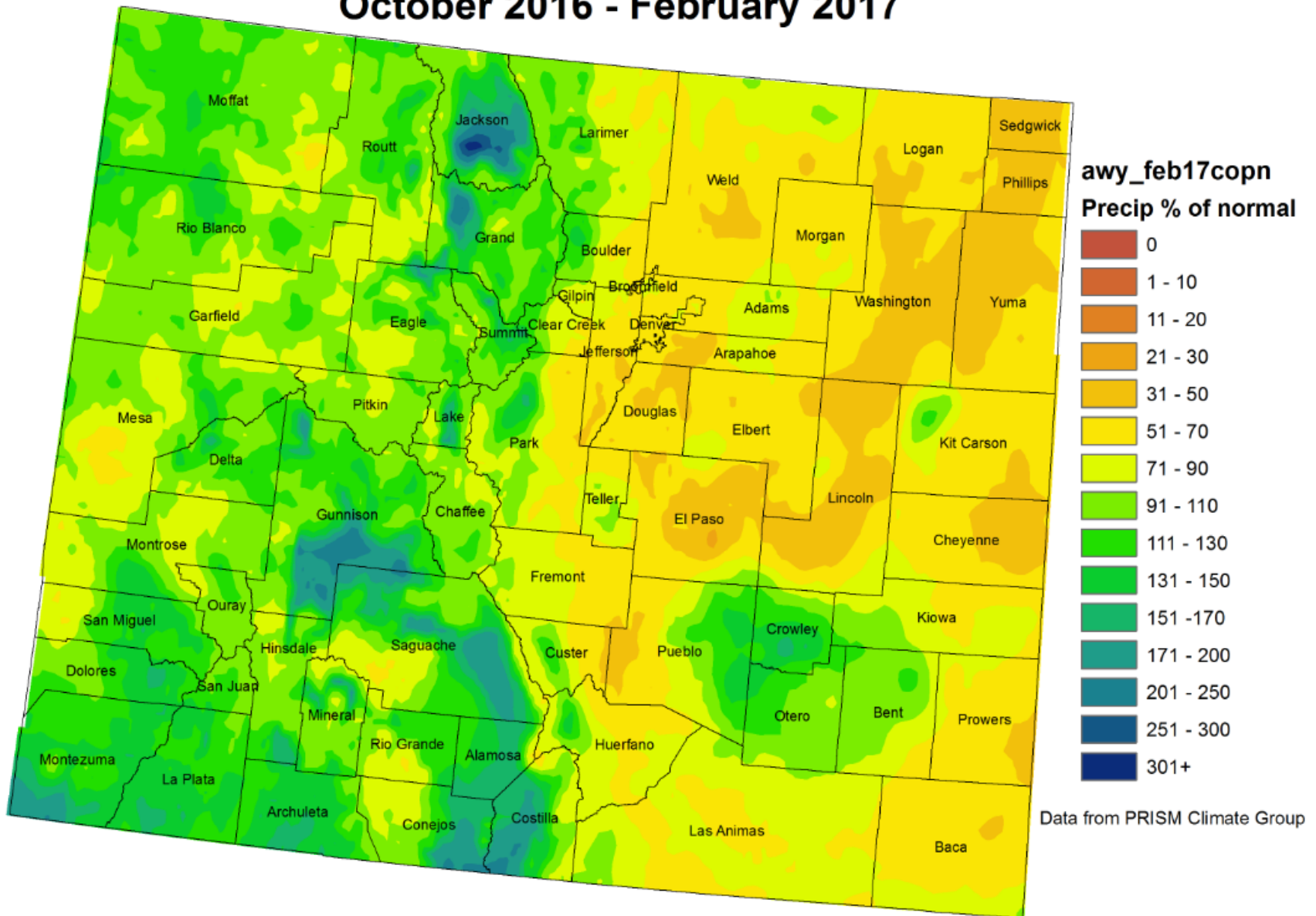


Colorado, Precipitation, February

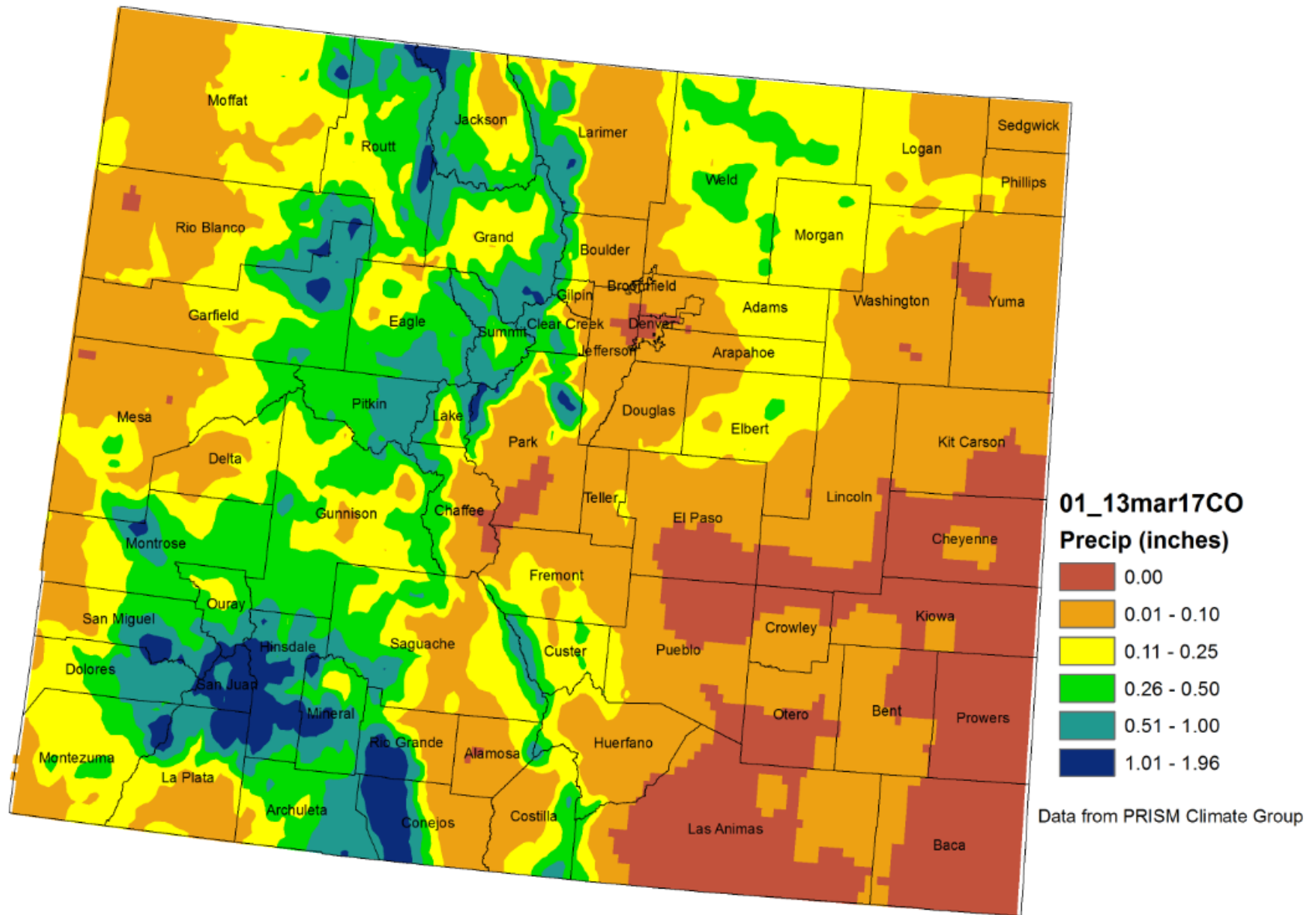
1901-2000 Mean: 1.09" Precip



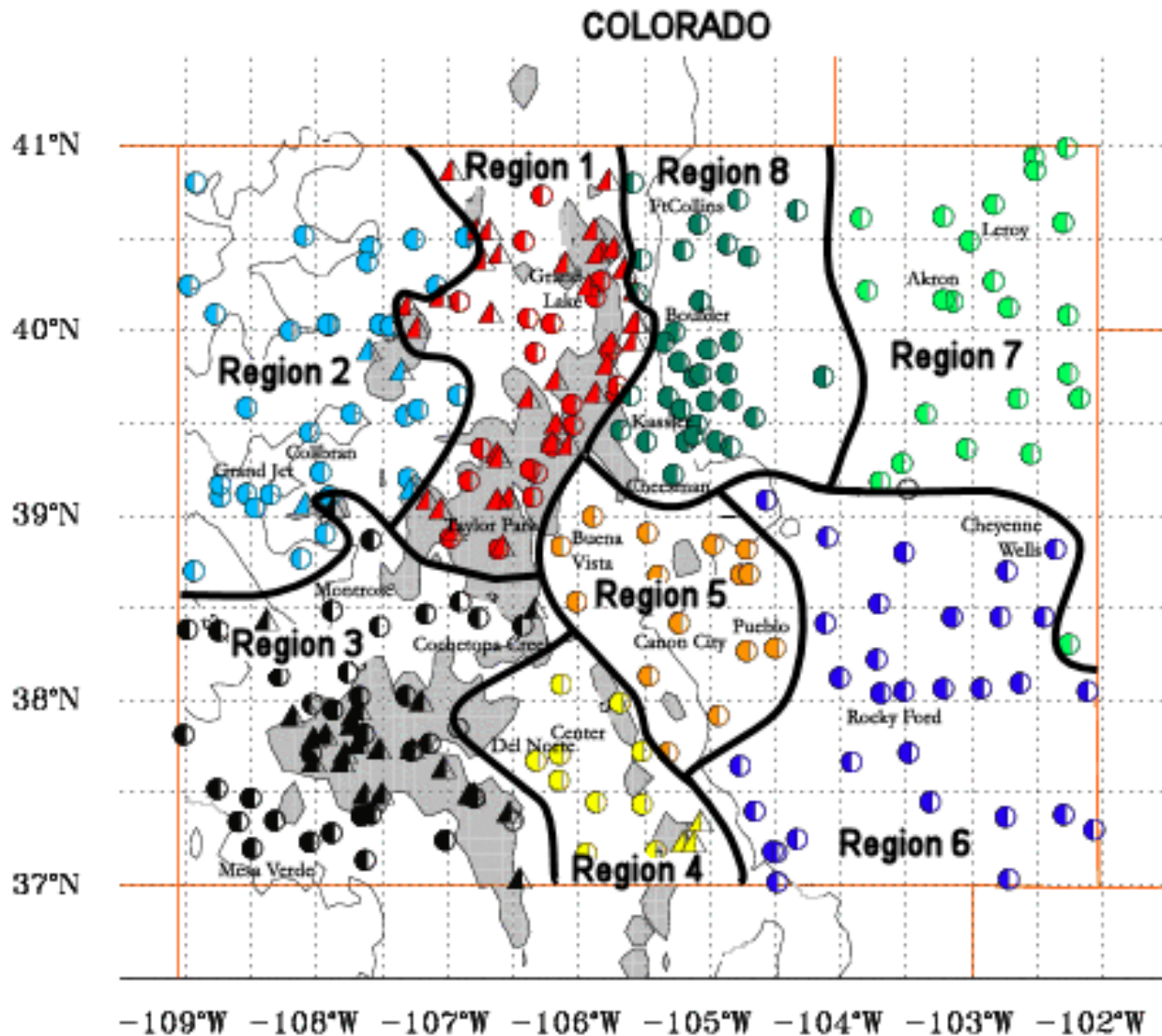
# Colorado Water Year Precipitation as a Percentage of Normal October 2016 - February 2017



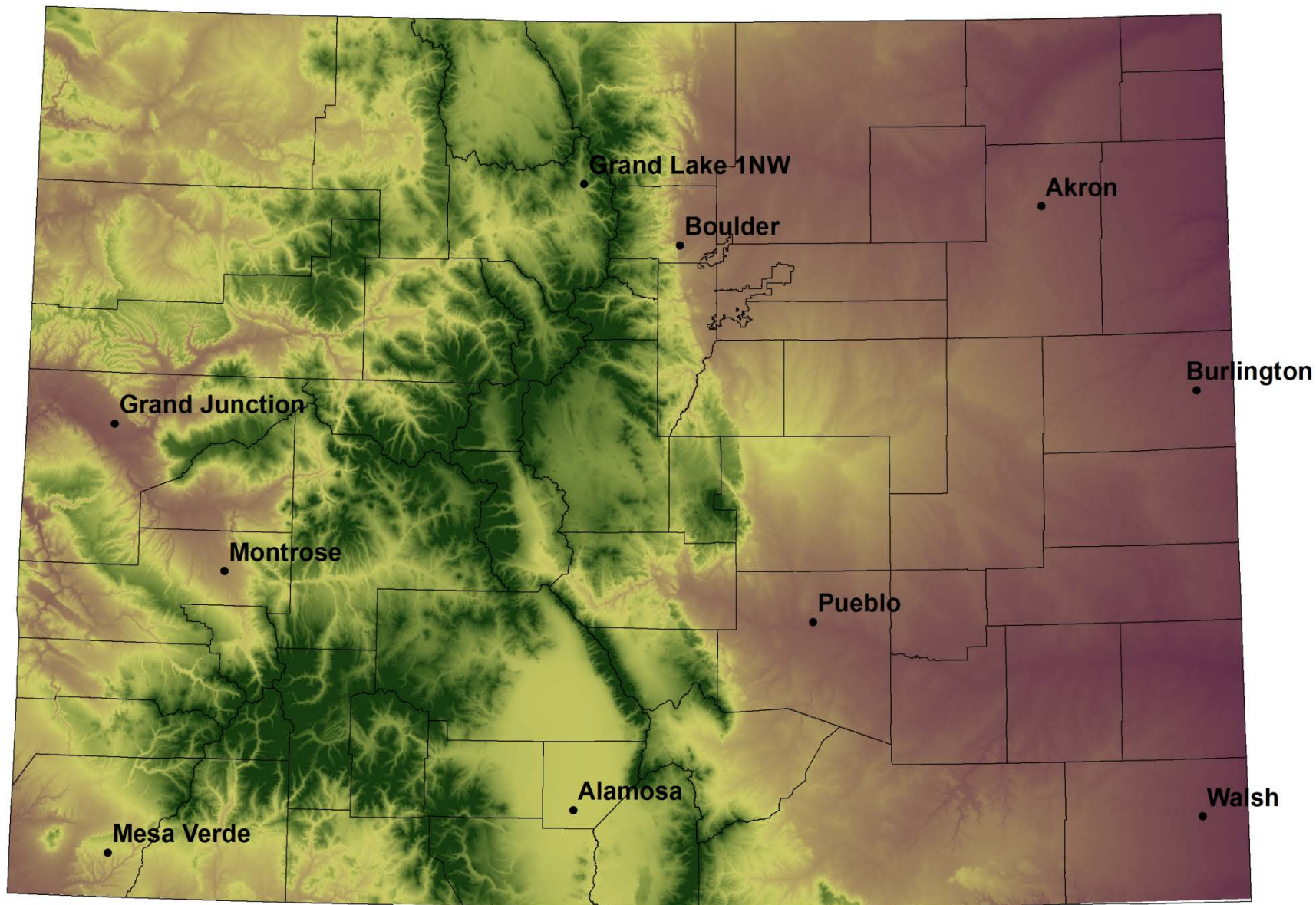
# Colorado Month to Date Precipitation 1 - 13 March 2017 ending 7AM



# Climate divisions defined by Dr. Klaus Wolter of NOAA's Climate Diagnostic Center in Boulder, CO

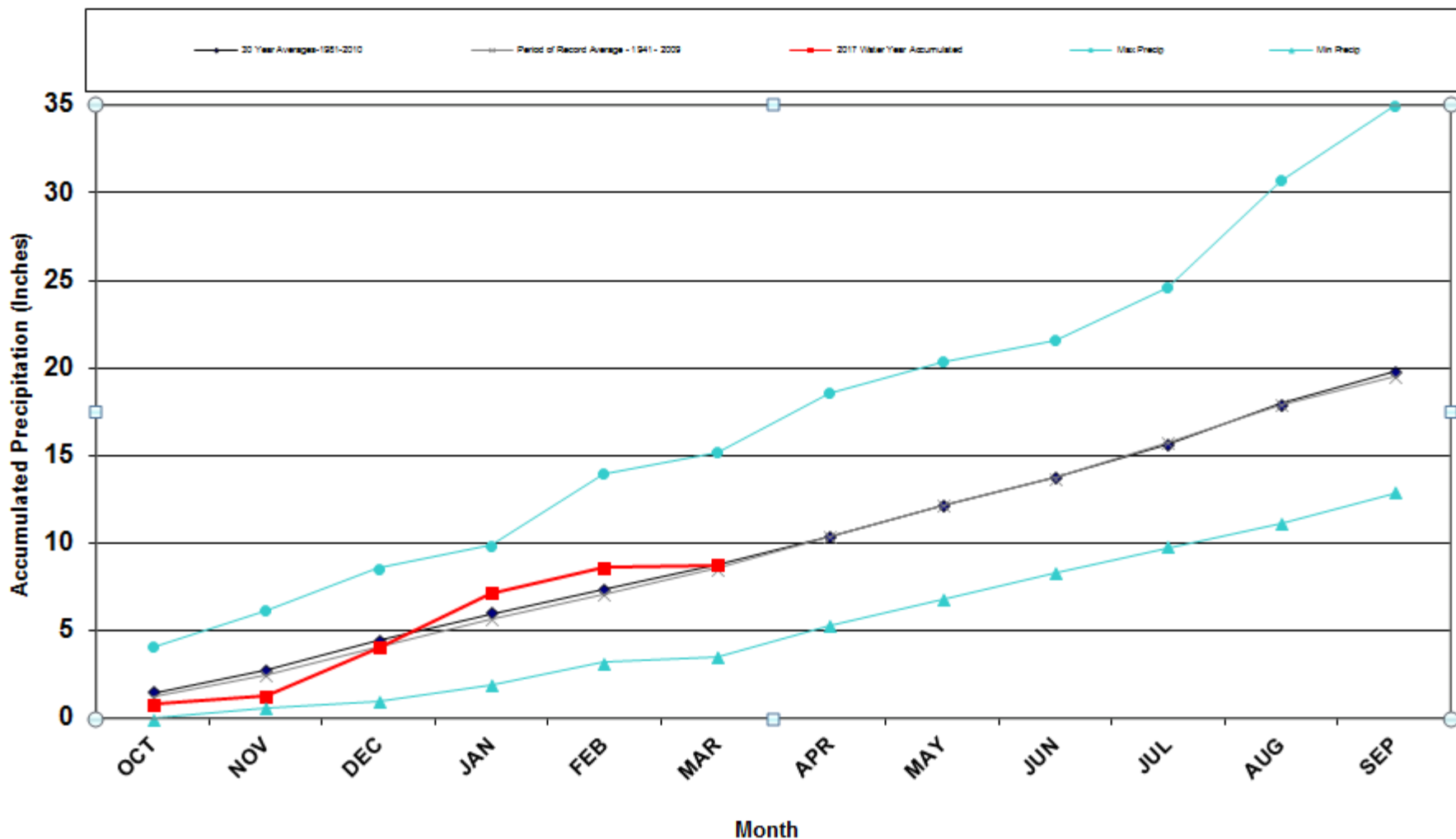


# NWS Cooperative Stations for WATF



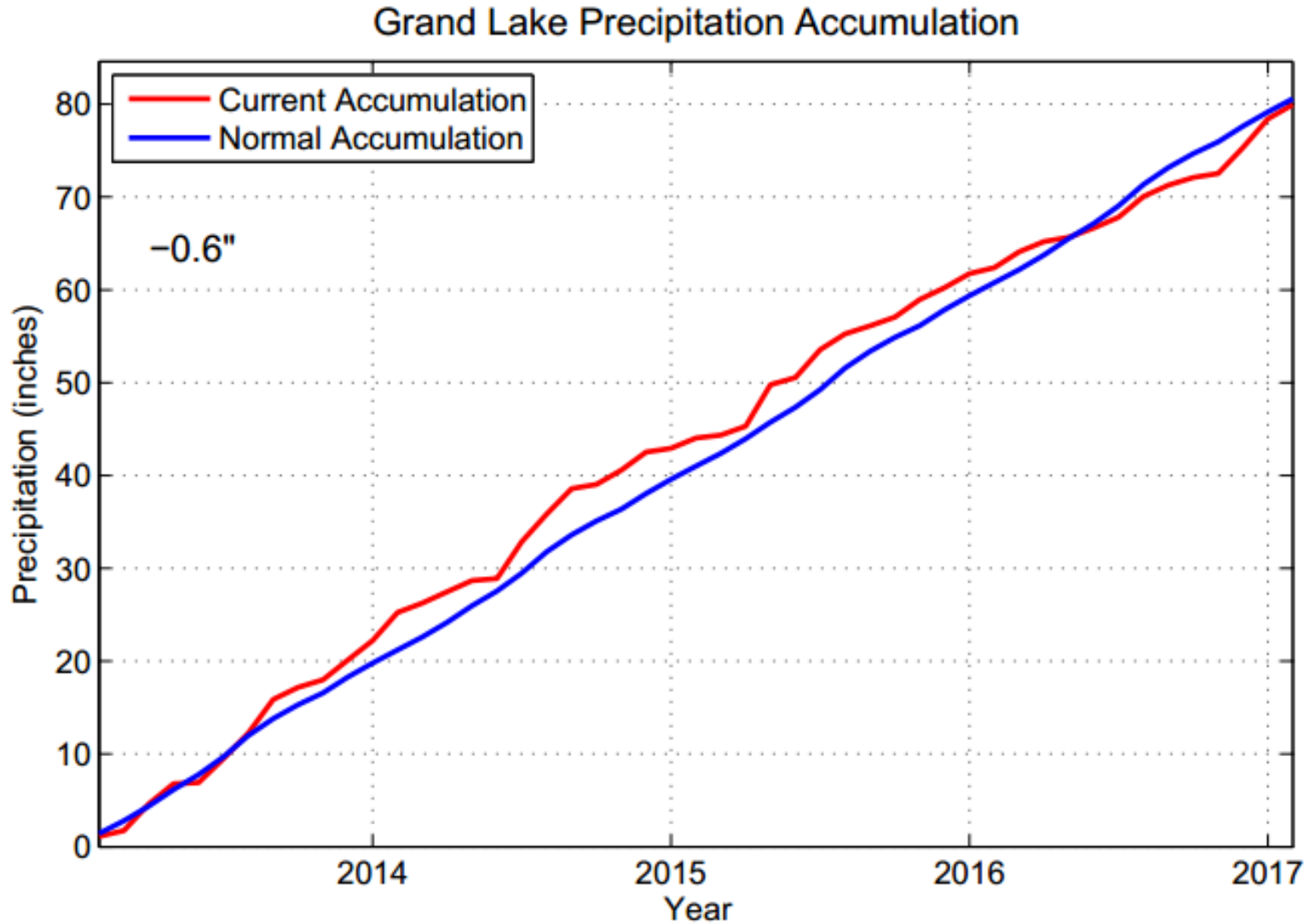
# Division 1 – Grand Lake 1NW

## Grand Lake 1 NW 2017 Water Year



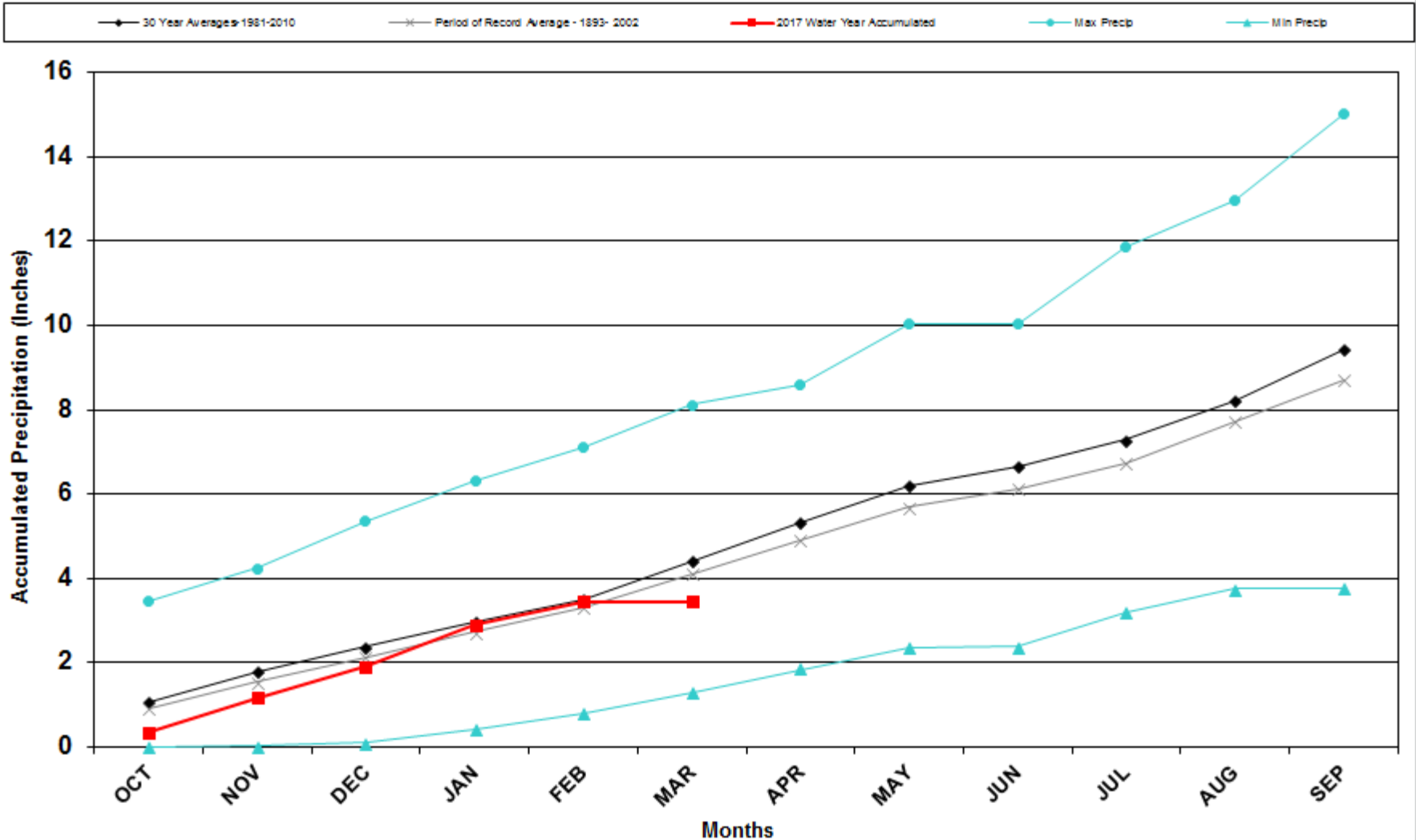


# Division 1 – Grand Lake 1NW



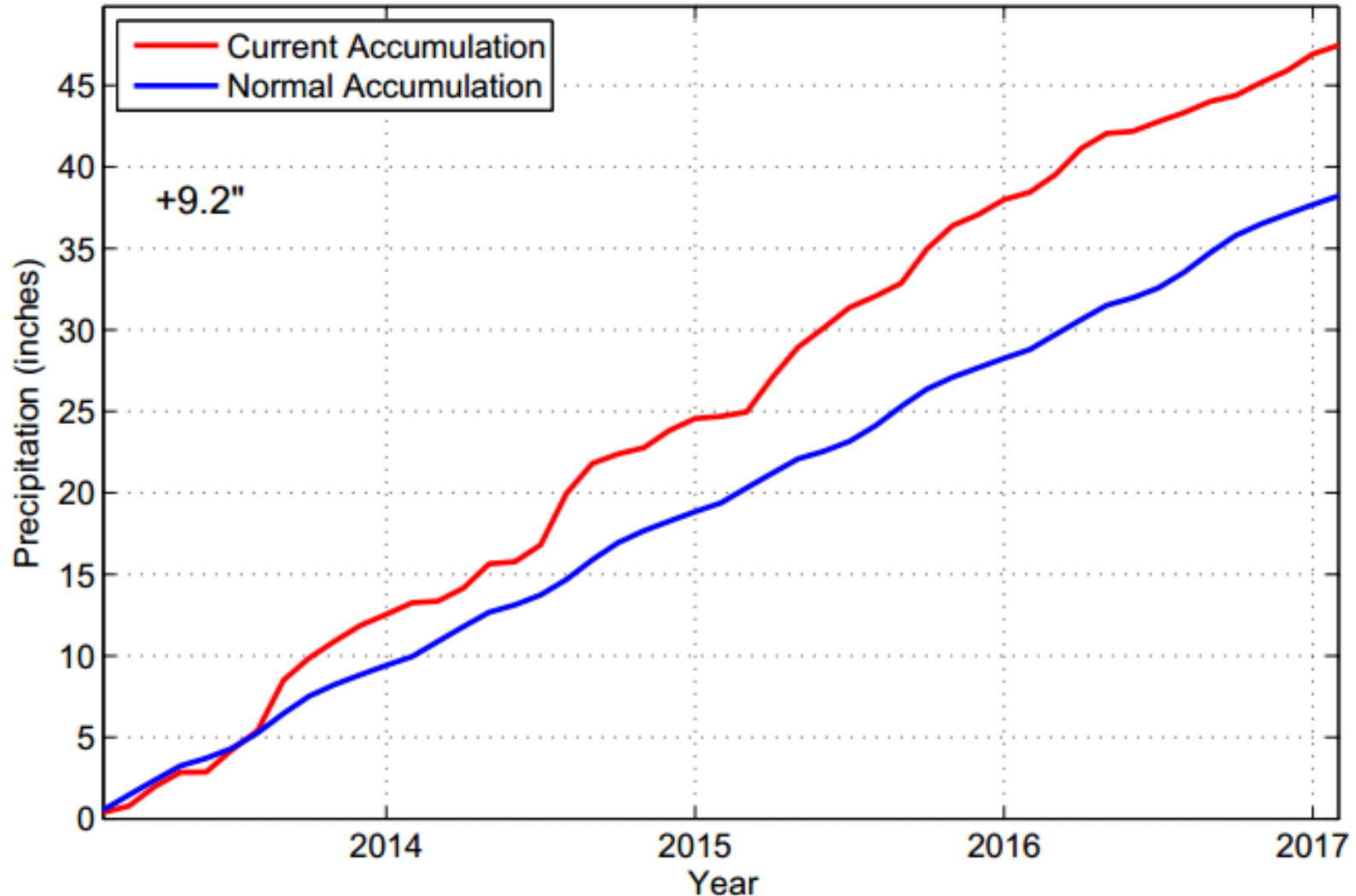
# Division 2 – Grand Junction

## Grand Junction WSFO 2017 Water Year



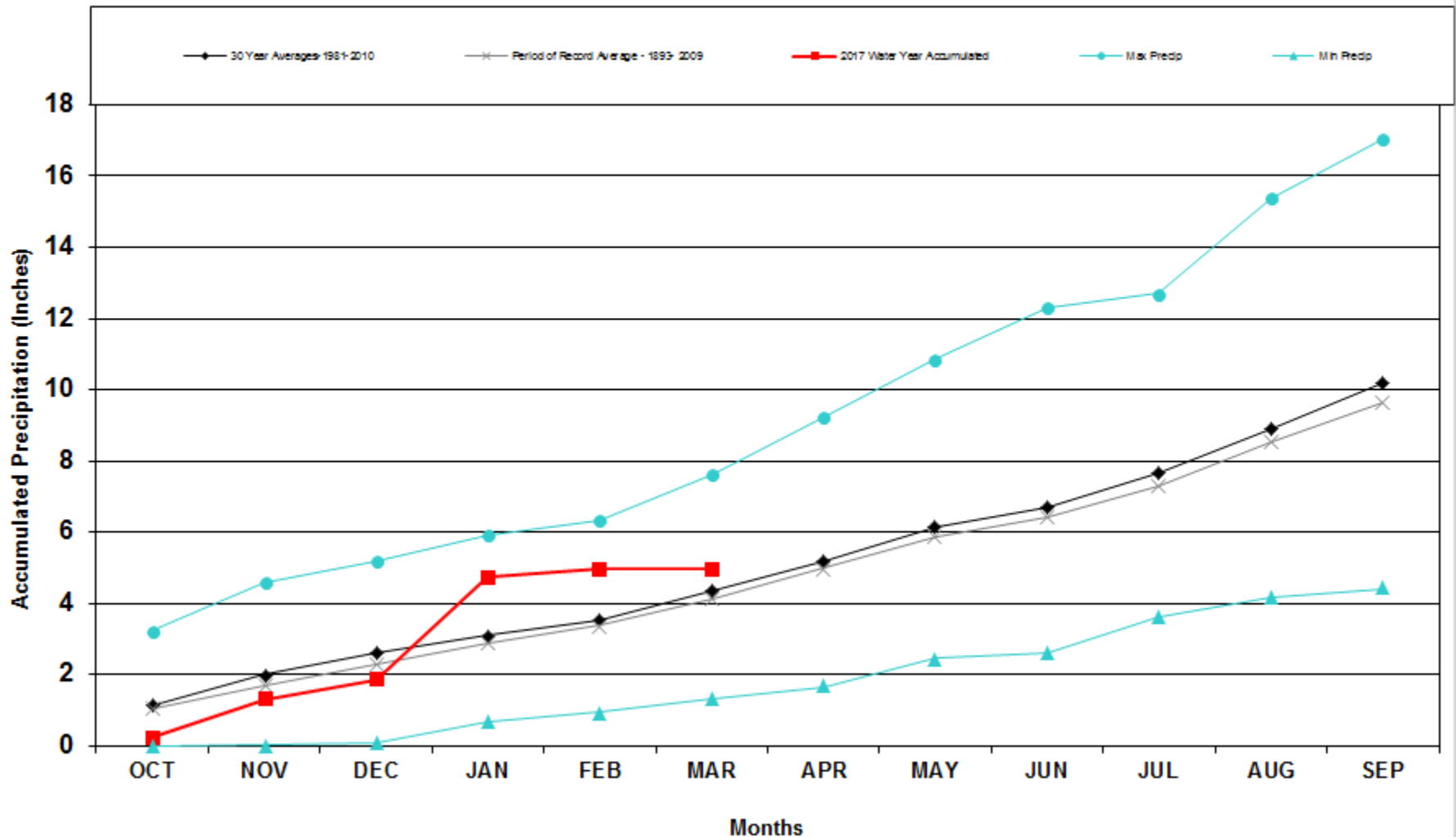
# Division 2 – Grand Junction

Grand Junction Precipitation Accumulation



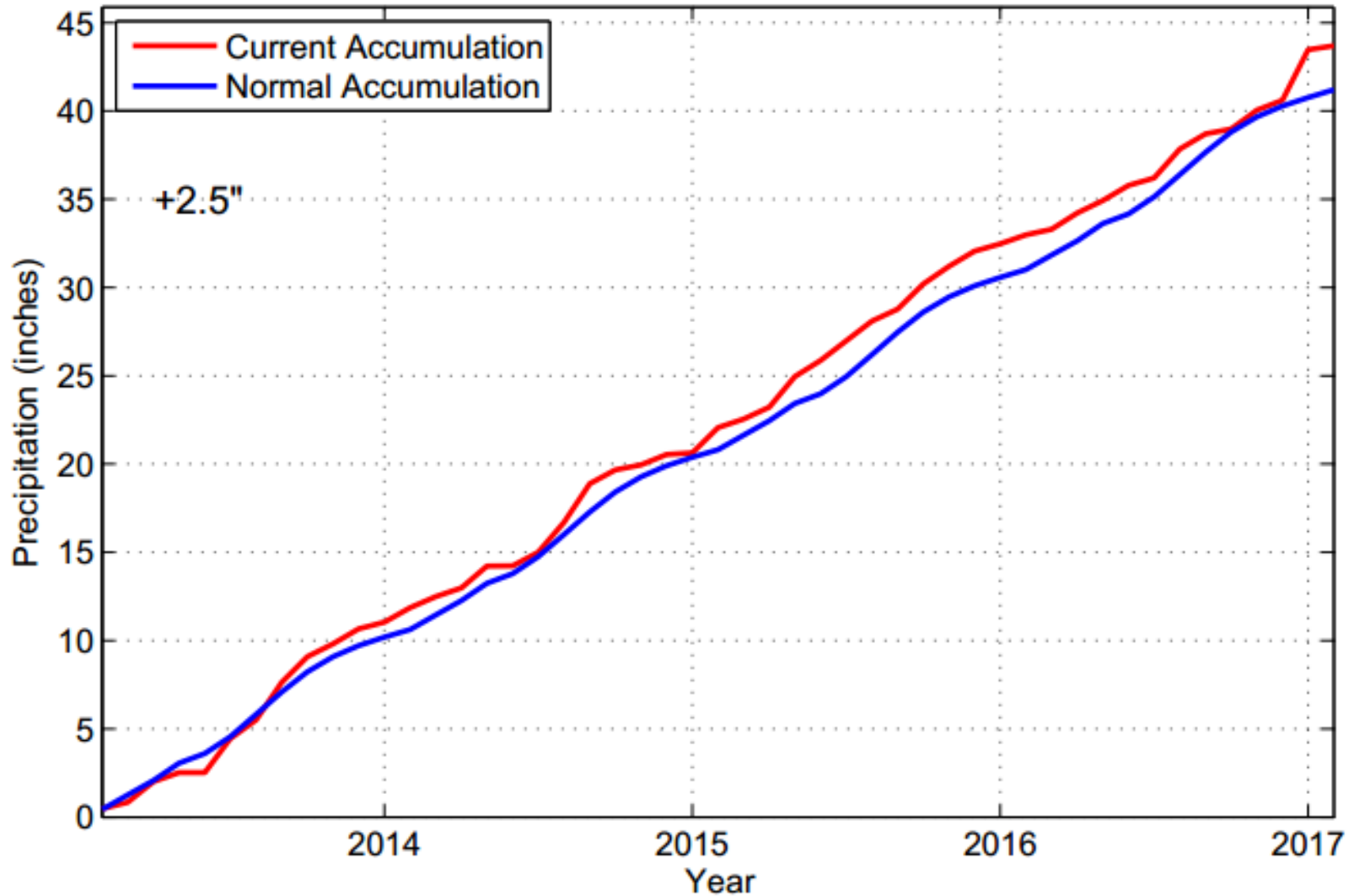
# Division 3 – Montrose

## Montrose #2 2017 Water Year



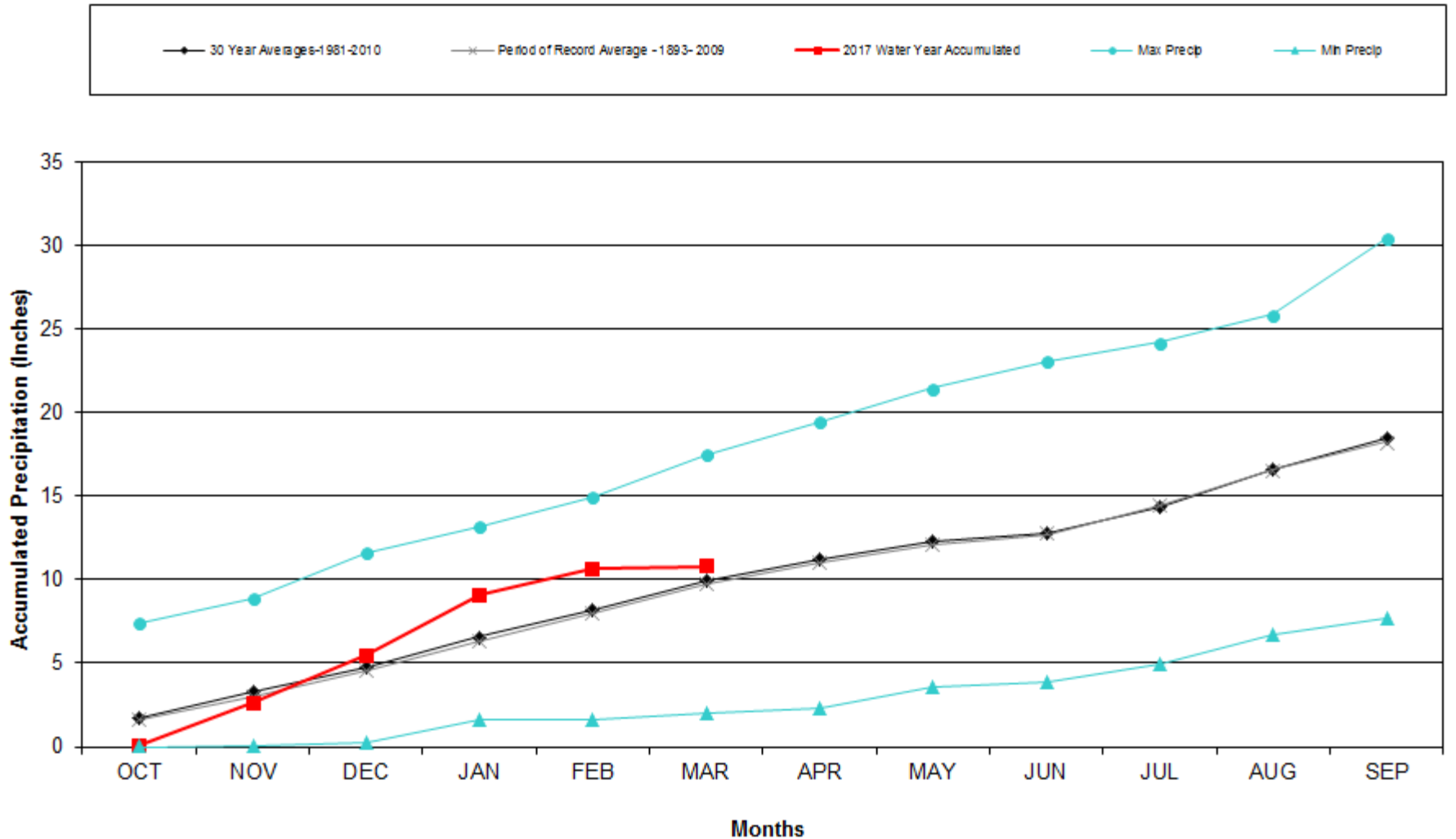
# Division 3 – Montrose

Montrose Precipitation Accumulation



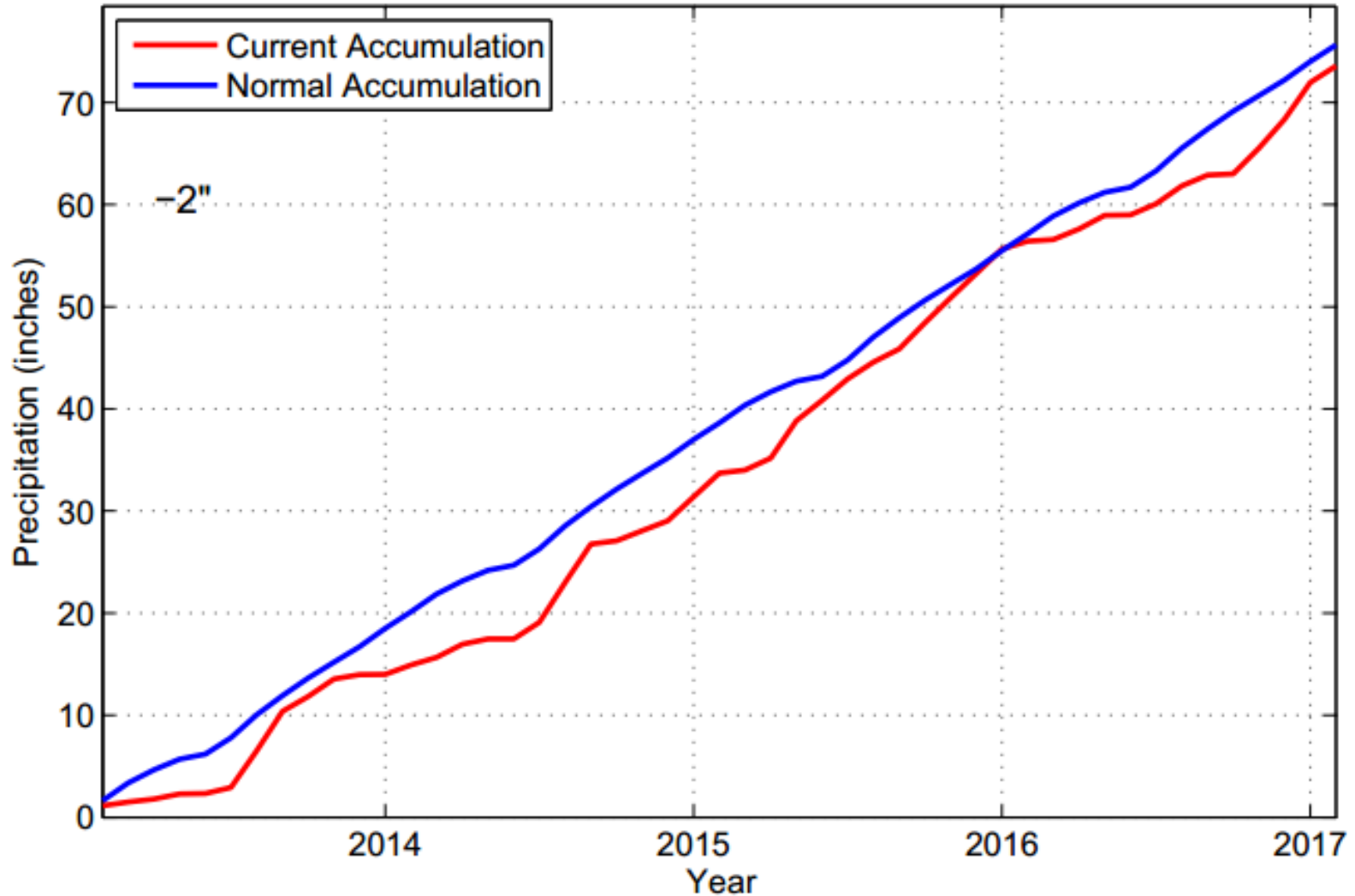
# Division 3 – Mesa Verde NP

## Mesa Verde NP 2017 Water Year



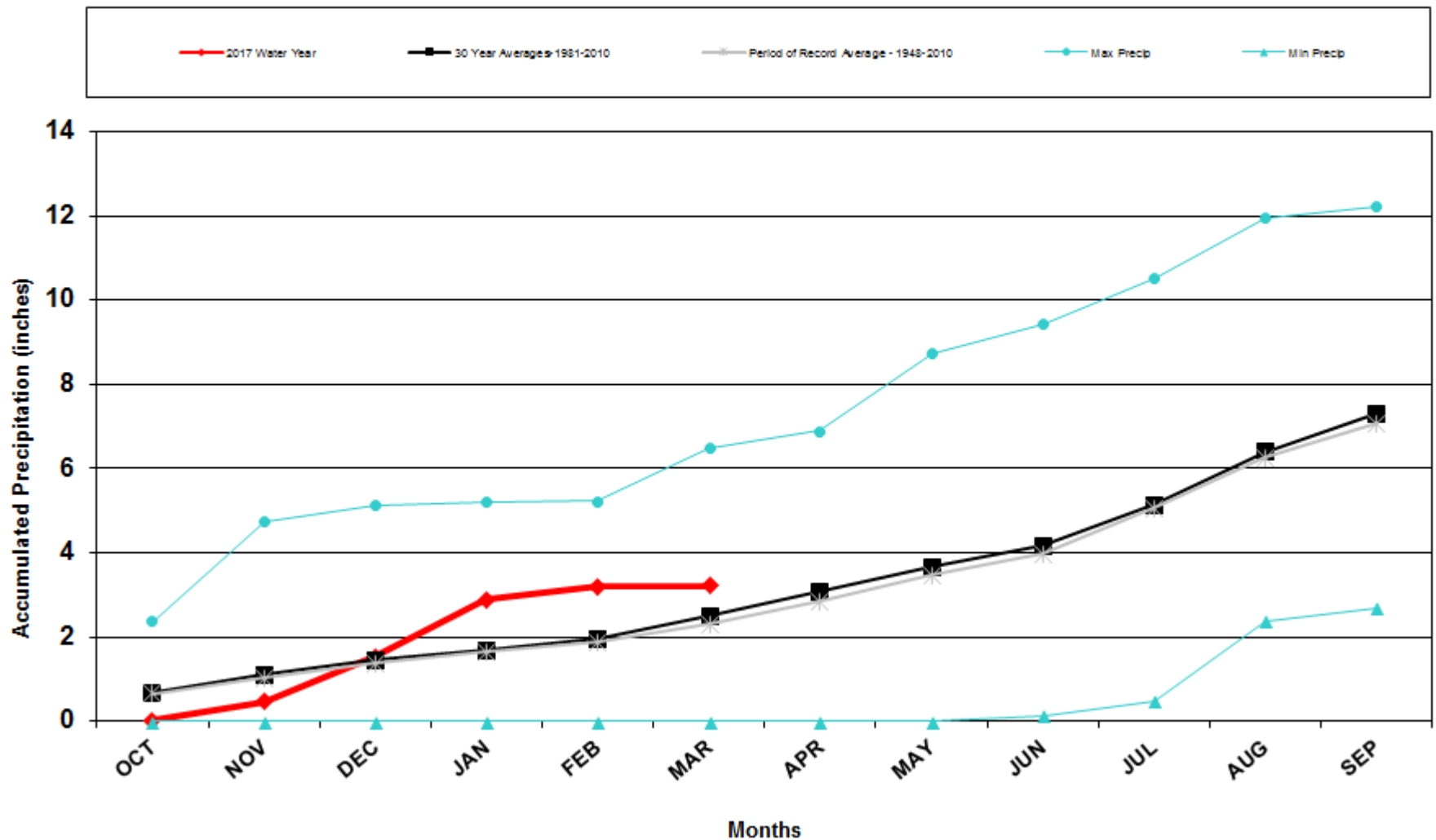
# Division 3 – Mesa Verde NP

Mesa Verde Precipitation Accumulation



# Division 4 – Alamosa

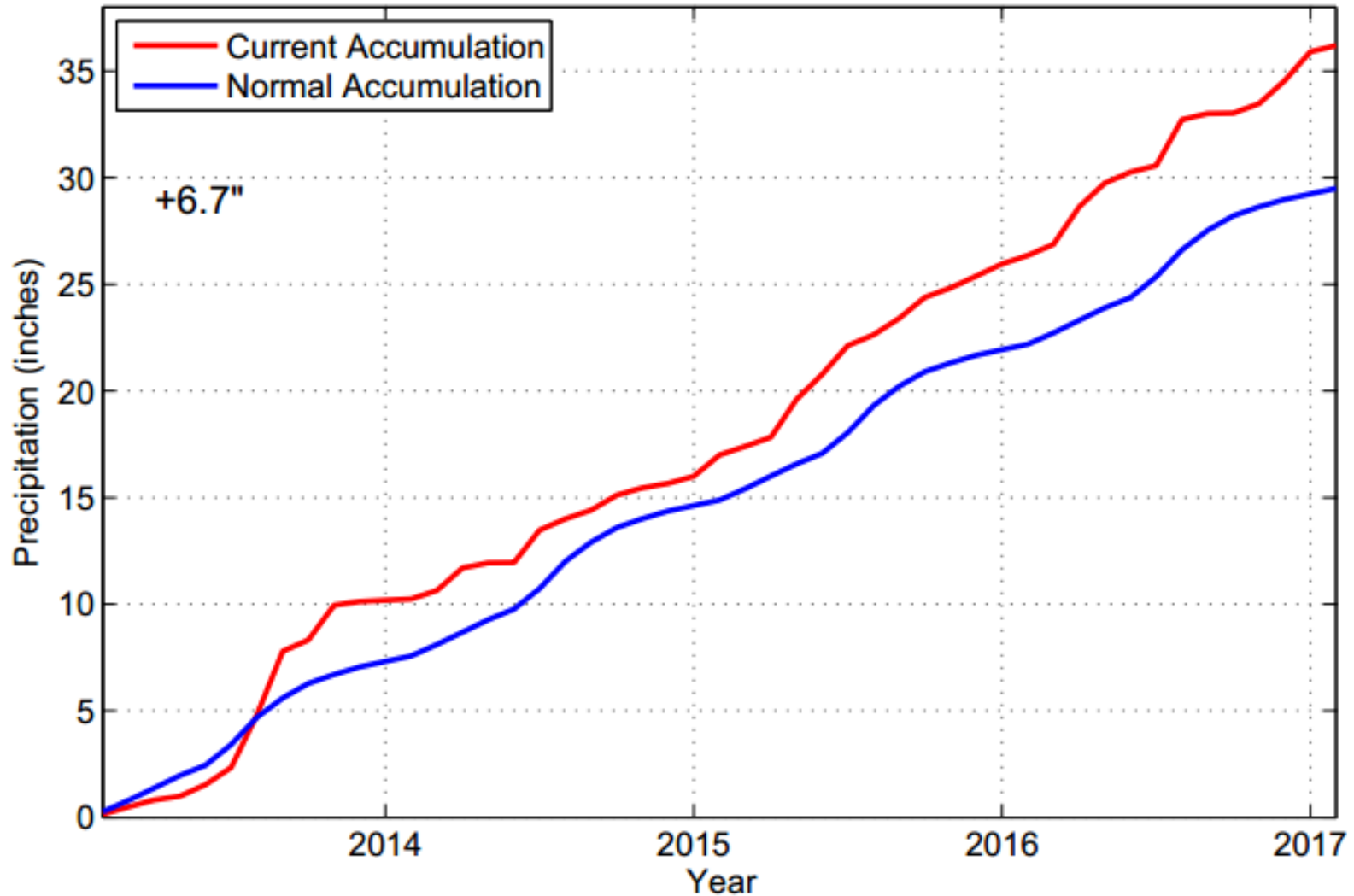
## Alamosa WSO 2017 Water Year





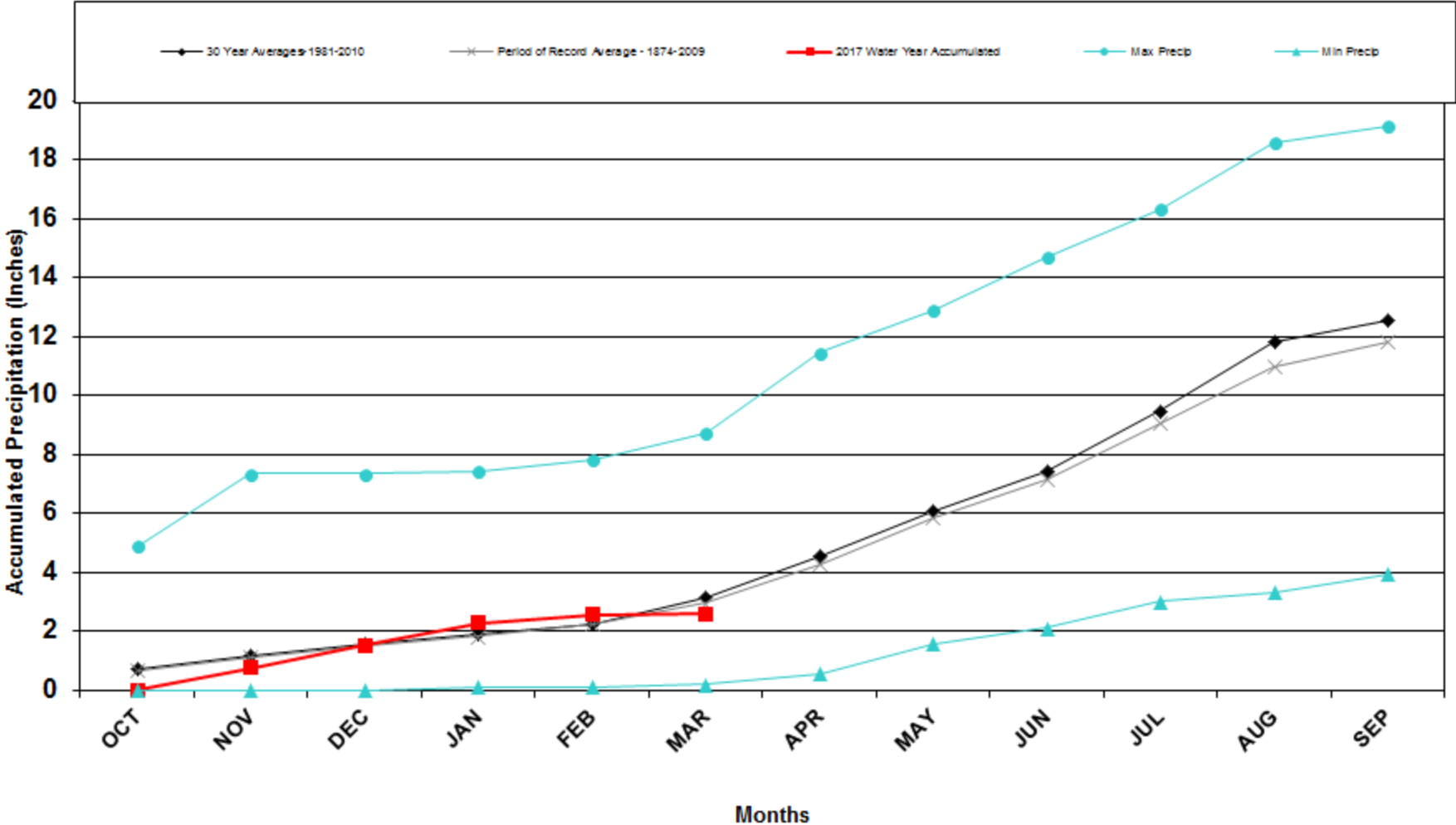
# Division 4 – Alamosa

Alamosa Precipitation Accumulation



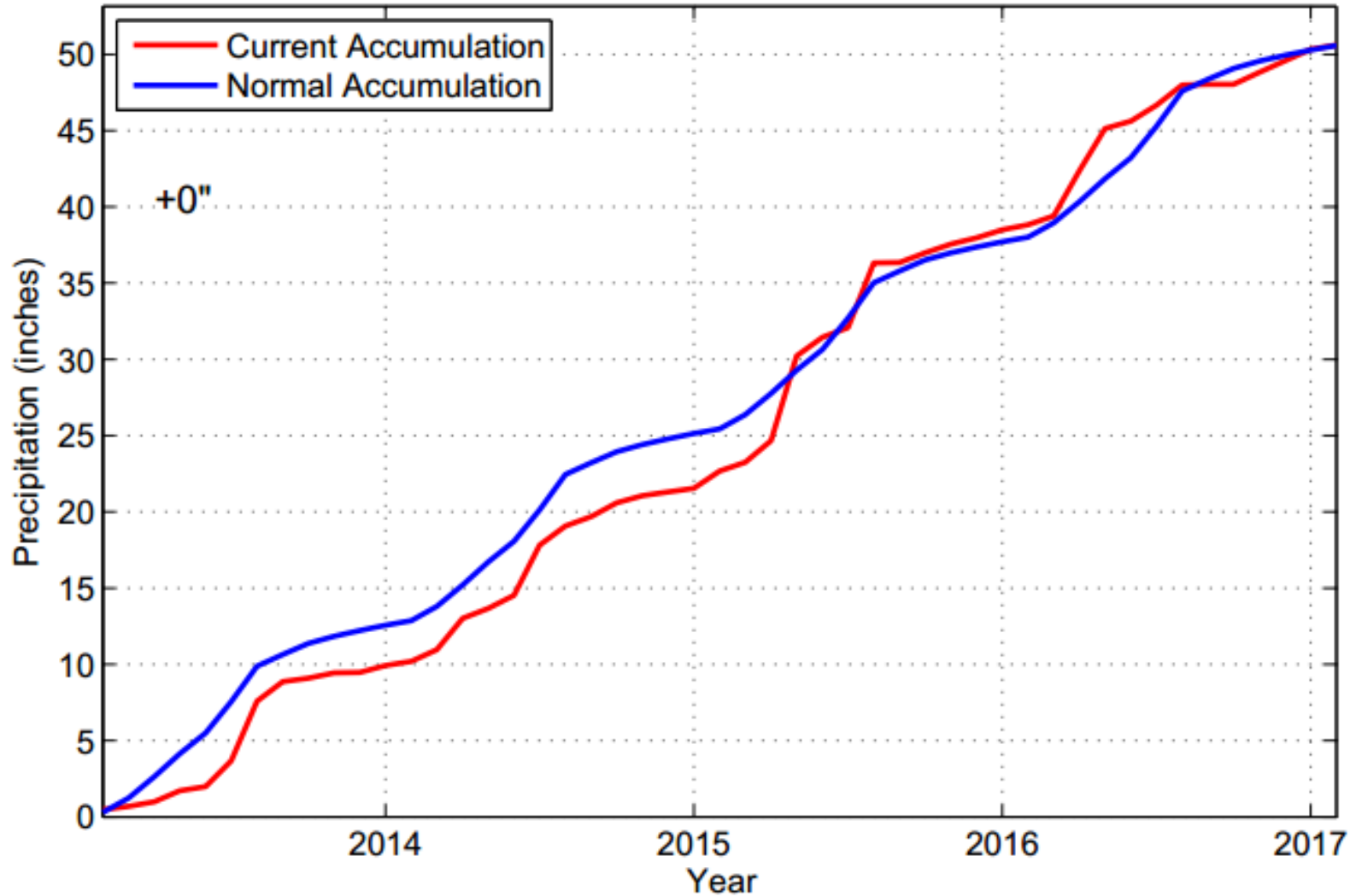
# Division 5 – Pueblo

## Pueblo WSO 2017 Water Year



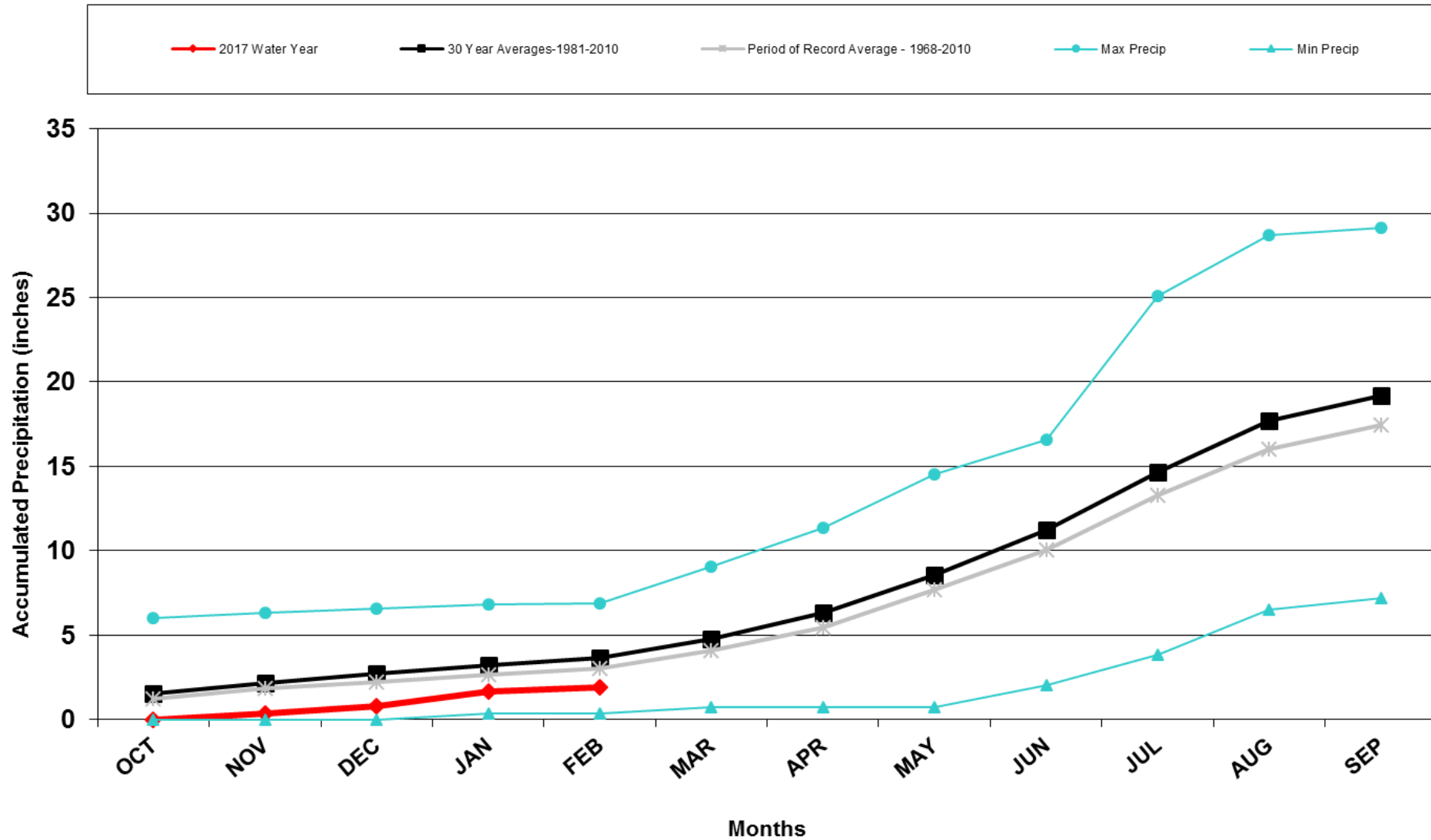
# Division 5 – Pueblo

Pueblo Precipitation Accumulation

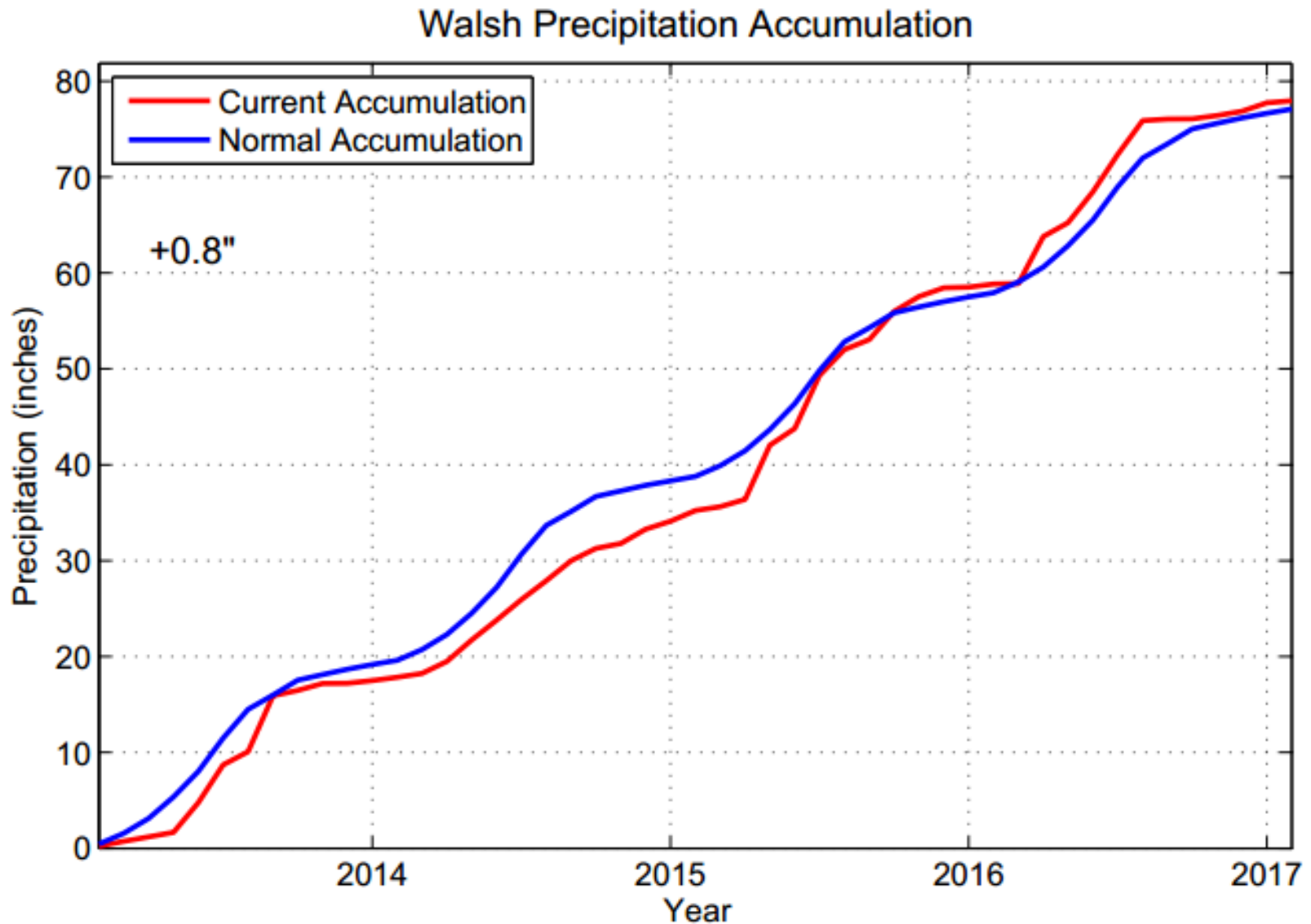


# Division 6 - Walsh

## Walsh 2017 Water Year

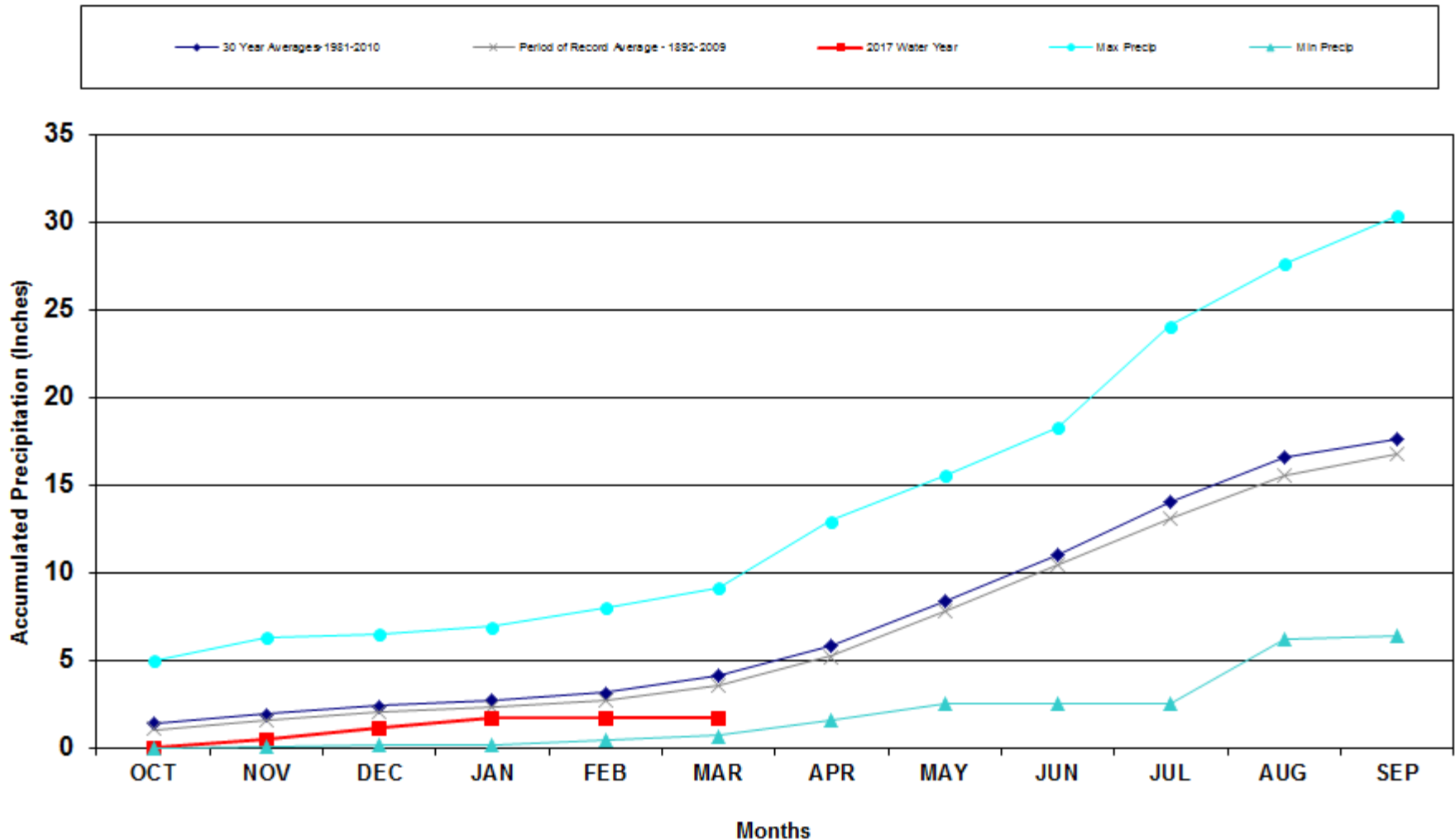


# Division 6 - Walsh

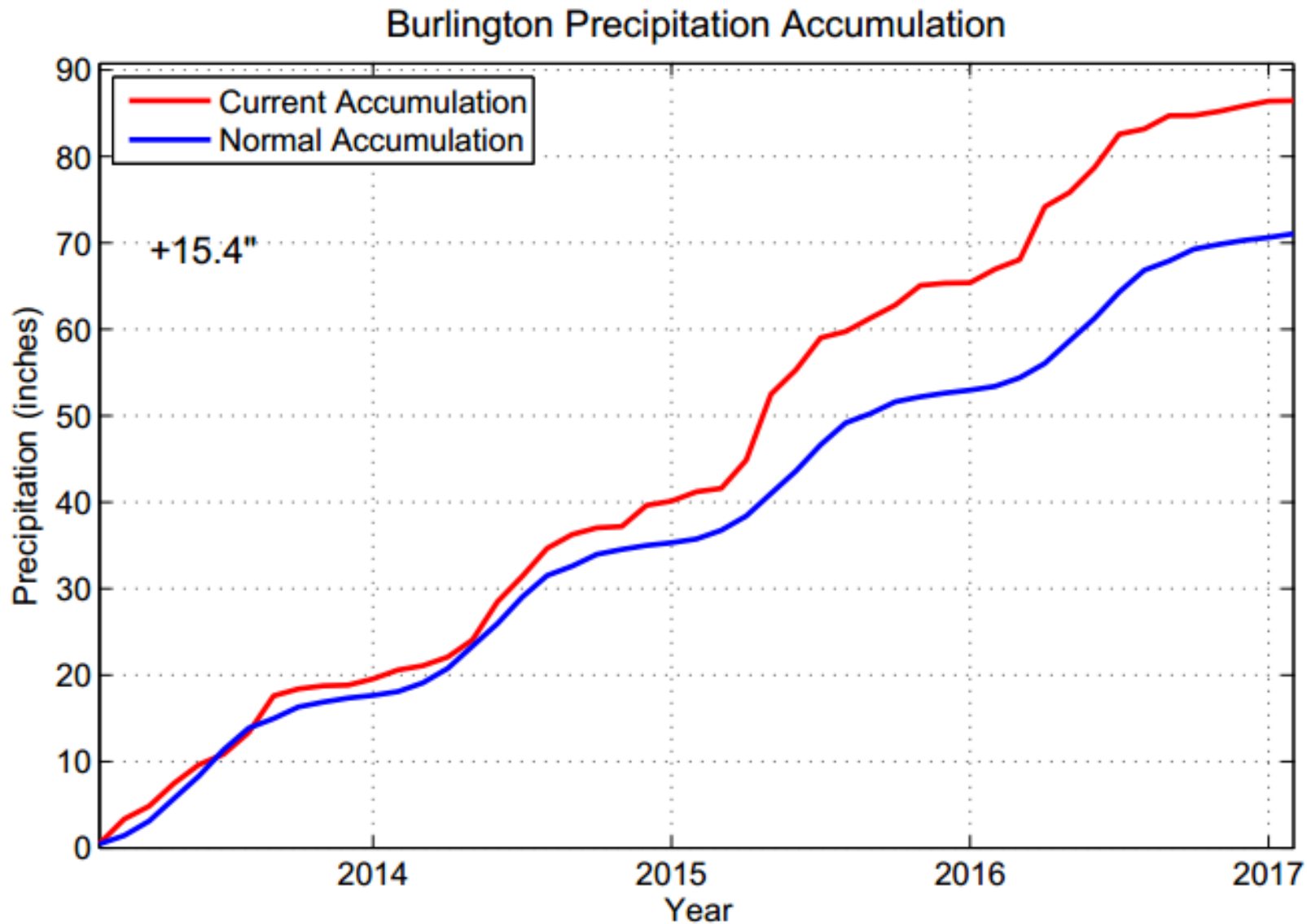


# Division 6 - Burlington

## Burlington 2017 Water Year

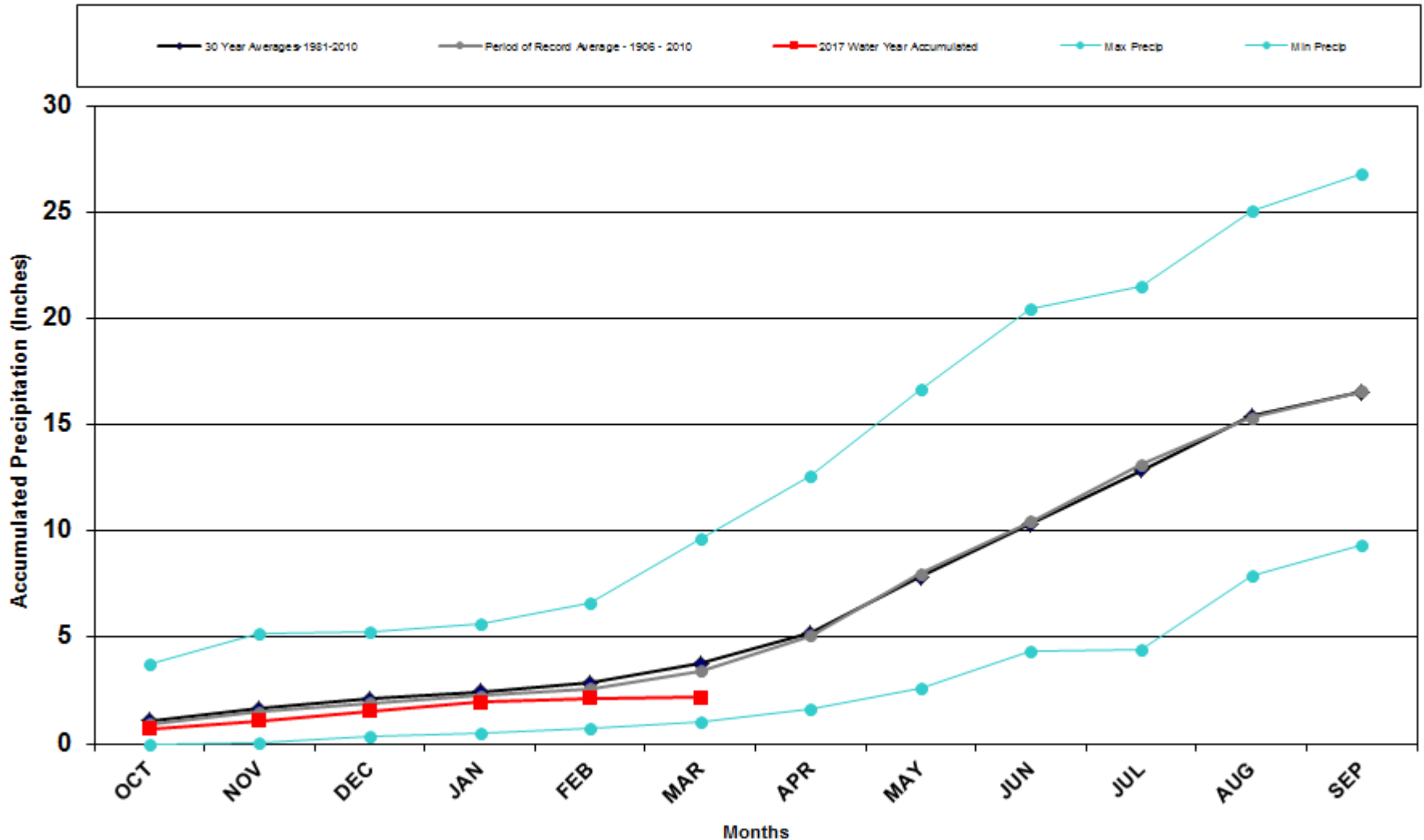


# Division 6 - Burlington



# Division 7 – Akron

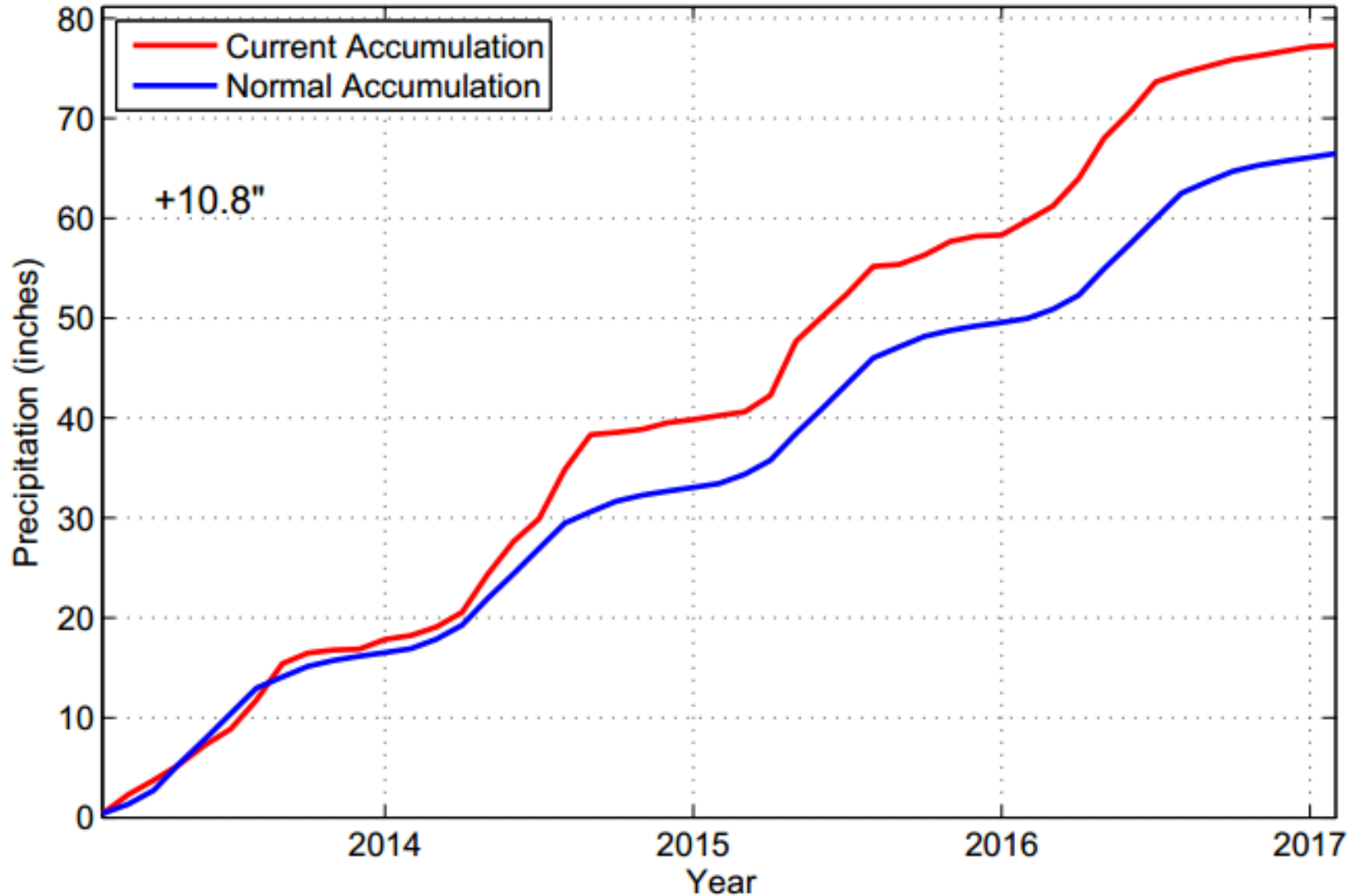
## Akron 4E 2017 Water Year





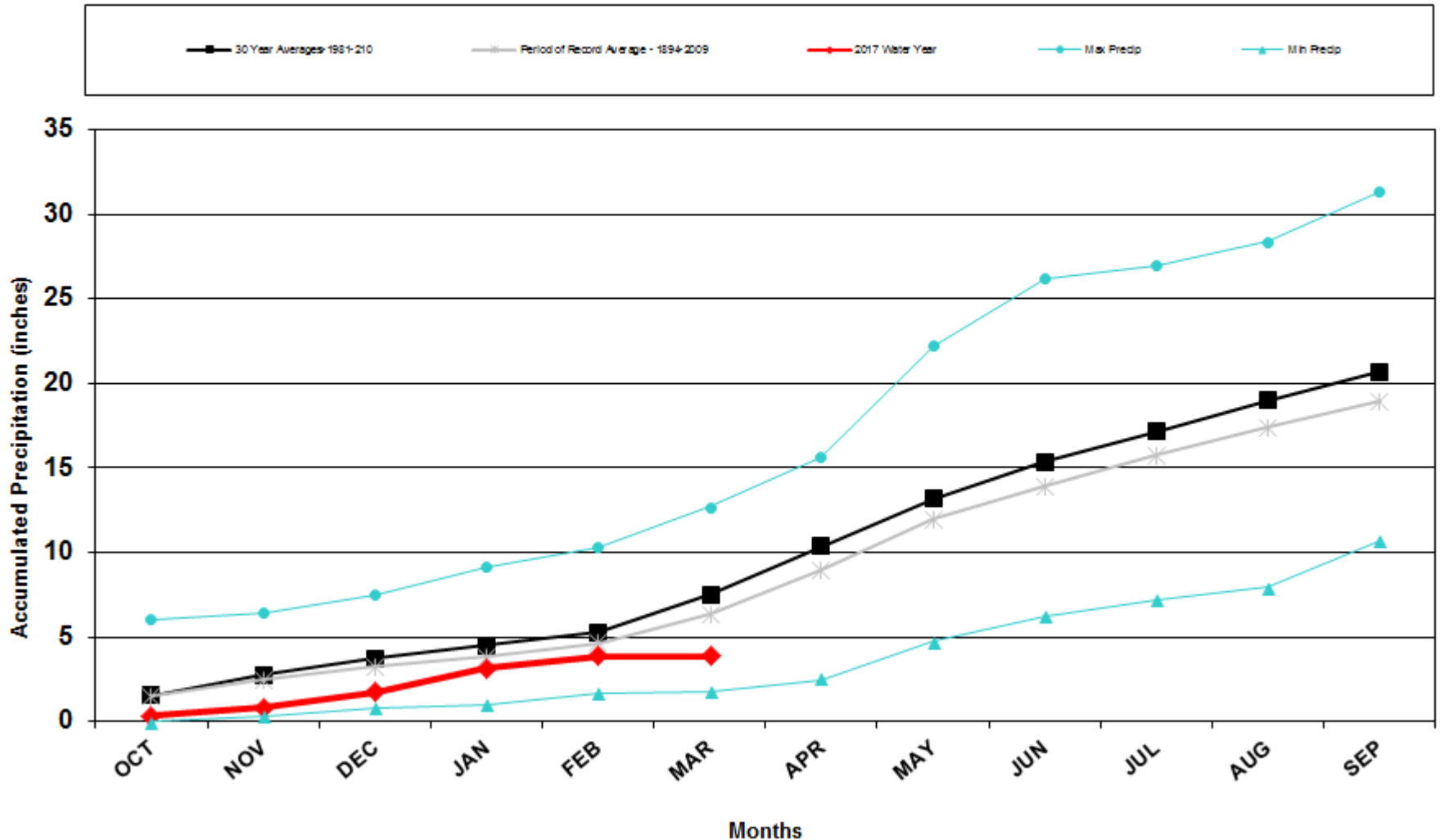
# Division 7 – Akron

Akron Precipitation Accumulation



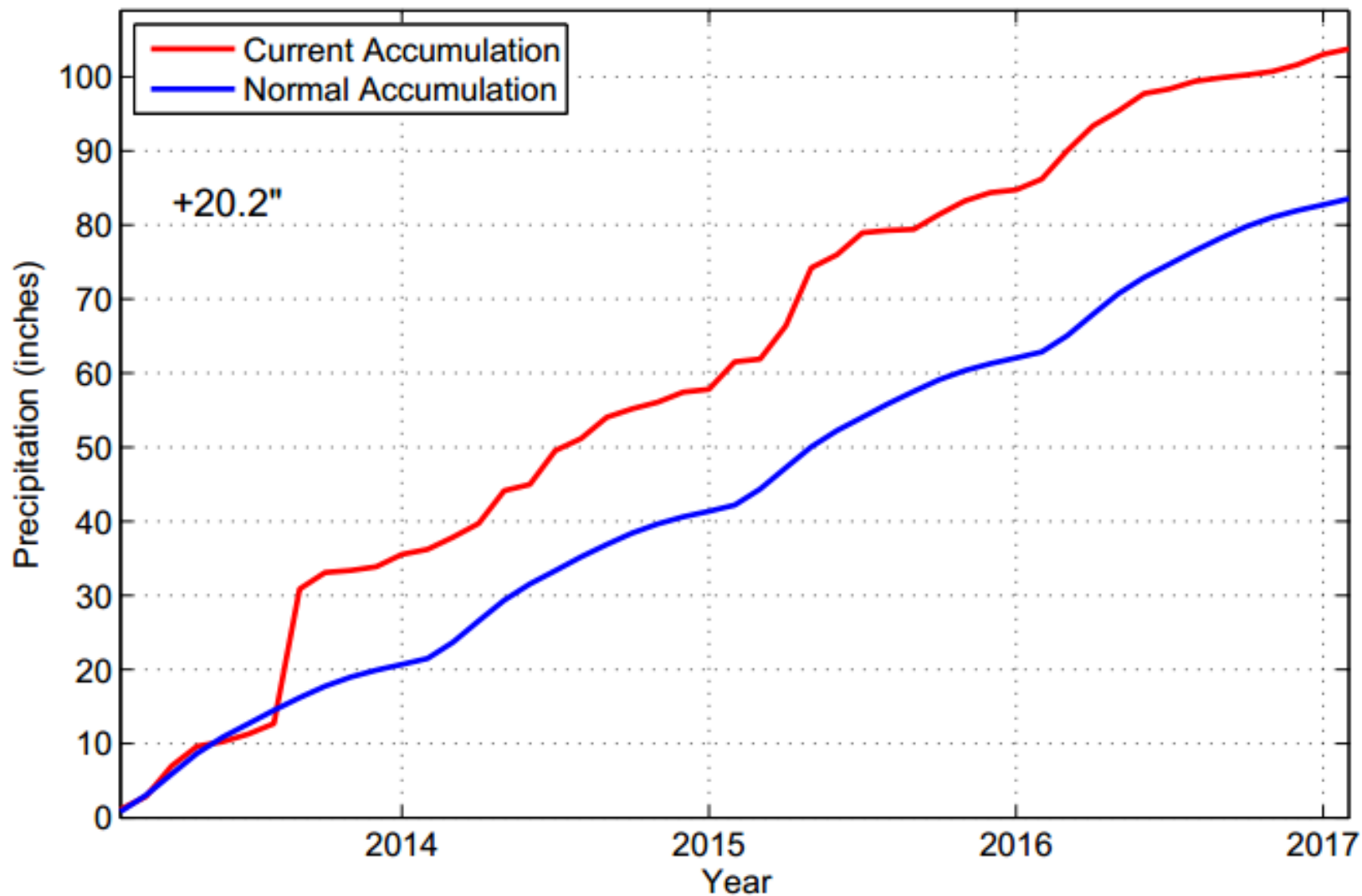
# Division 8 - Boulder

## Boulder 2017 Water Year



# Division 8 - Boulder

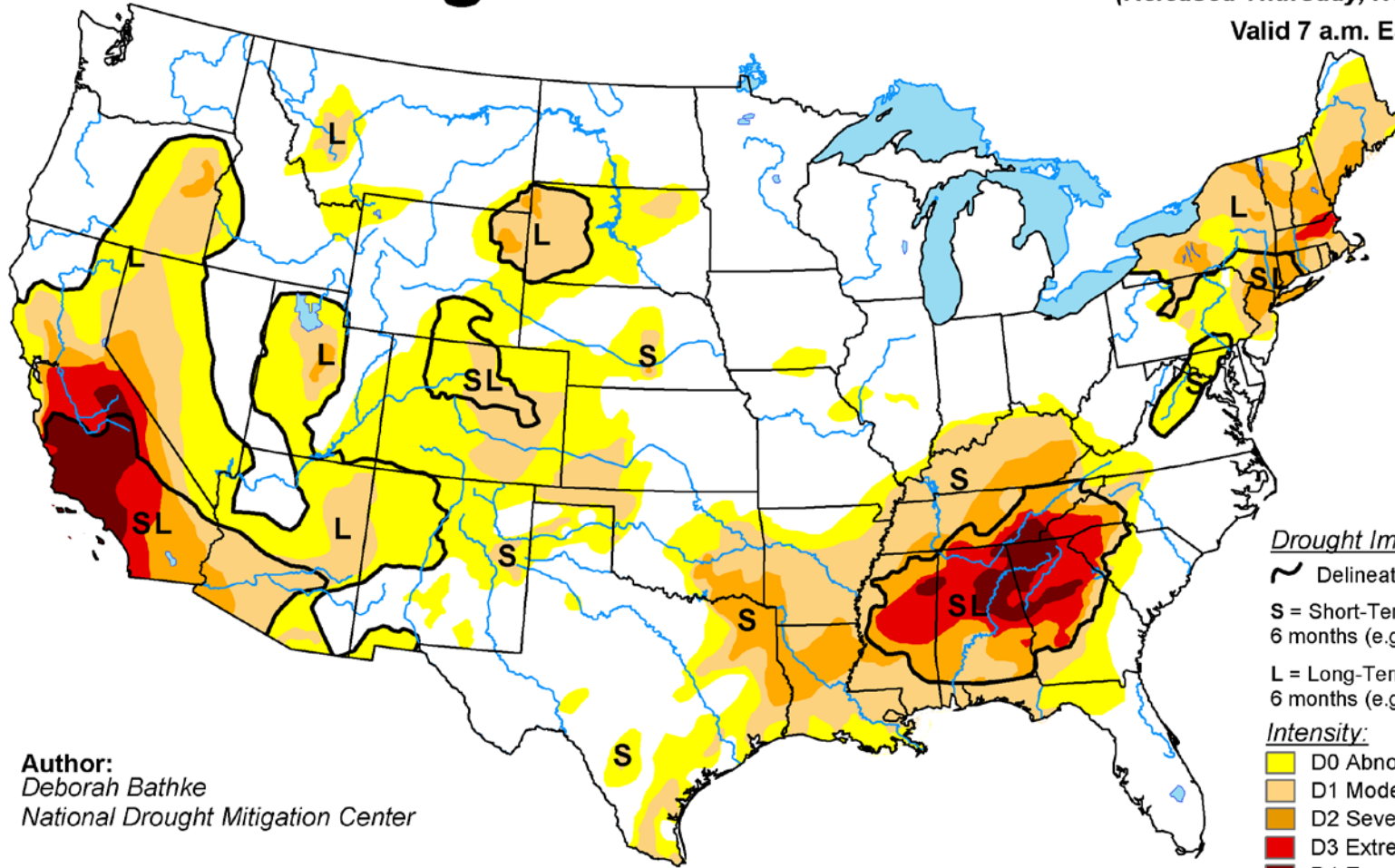
## Boulder Precipitation Accumulation



# U.S. Drought Monitor

November 8, 2016  
(Released Thursday, Nov. 10, 2016)

Valid 7 a.m. EST



**Author:**  
Deborah Bathke  
National Drought Mitigation Center

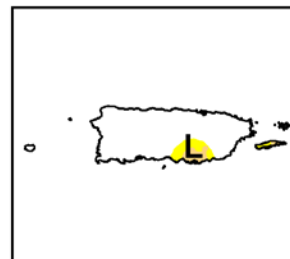
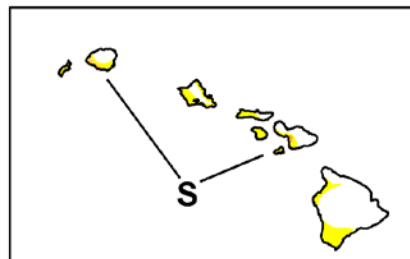
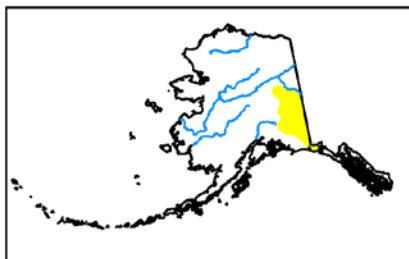
Drought Impact Types:

- ~ 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.

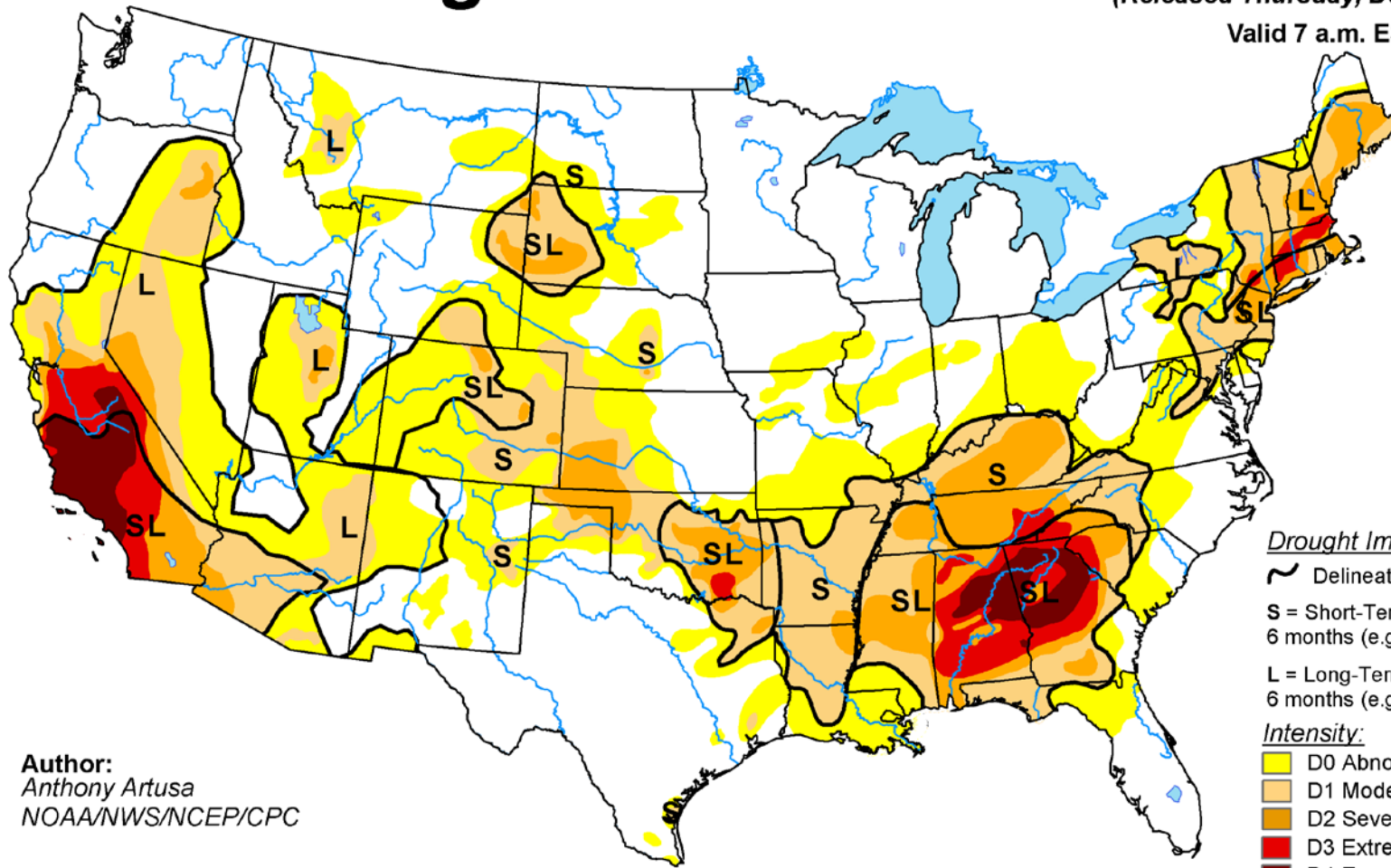


<http://droughtmonitor.unl.edu/>

# U.S. Drought Monitor

December 13, 2016  
(Released Thursday, Dec. 15, 2016)

Valid 7 a.m. EST



Author:  
Anthony Artusa  
NOAA/NWS/NCEP/CPC

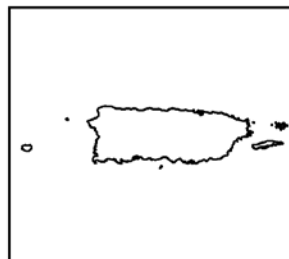
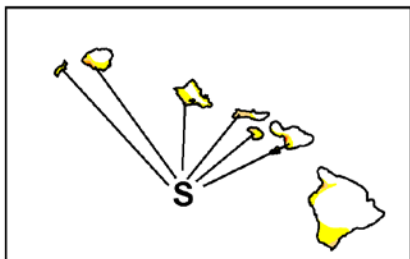
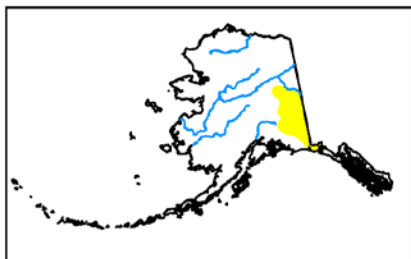
### Drought Impact Types:

- ~ 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

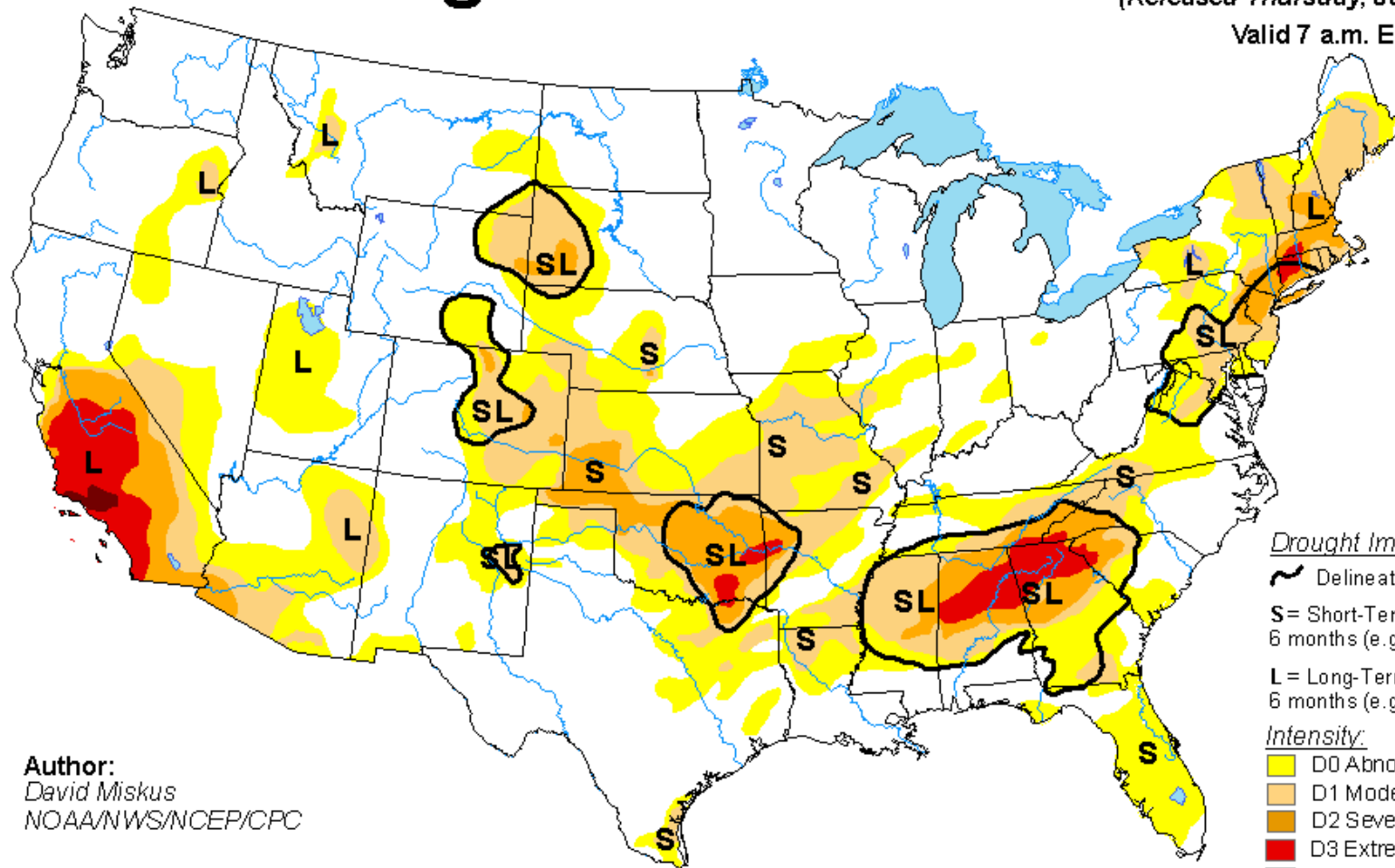
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.



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


# U.S. Drought Monitor

January 10, 2017  
 (Released Thursday, Jan. 12, 2017)  
 Valid 7 a.m. EST








**Author:**  
 David Miskus  
 NOAA/NWS/NCEP/CPC

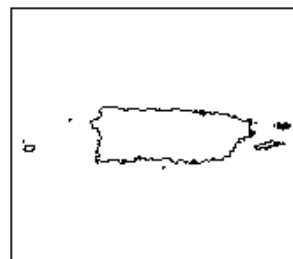
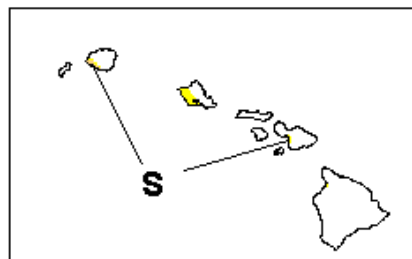
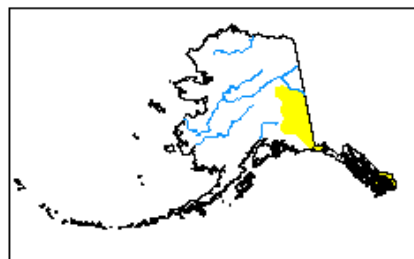
### Drought Impact Types:

-  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.



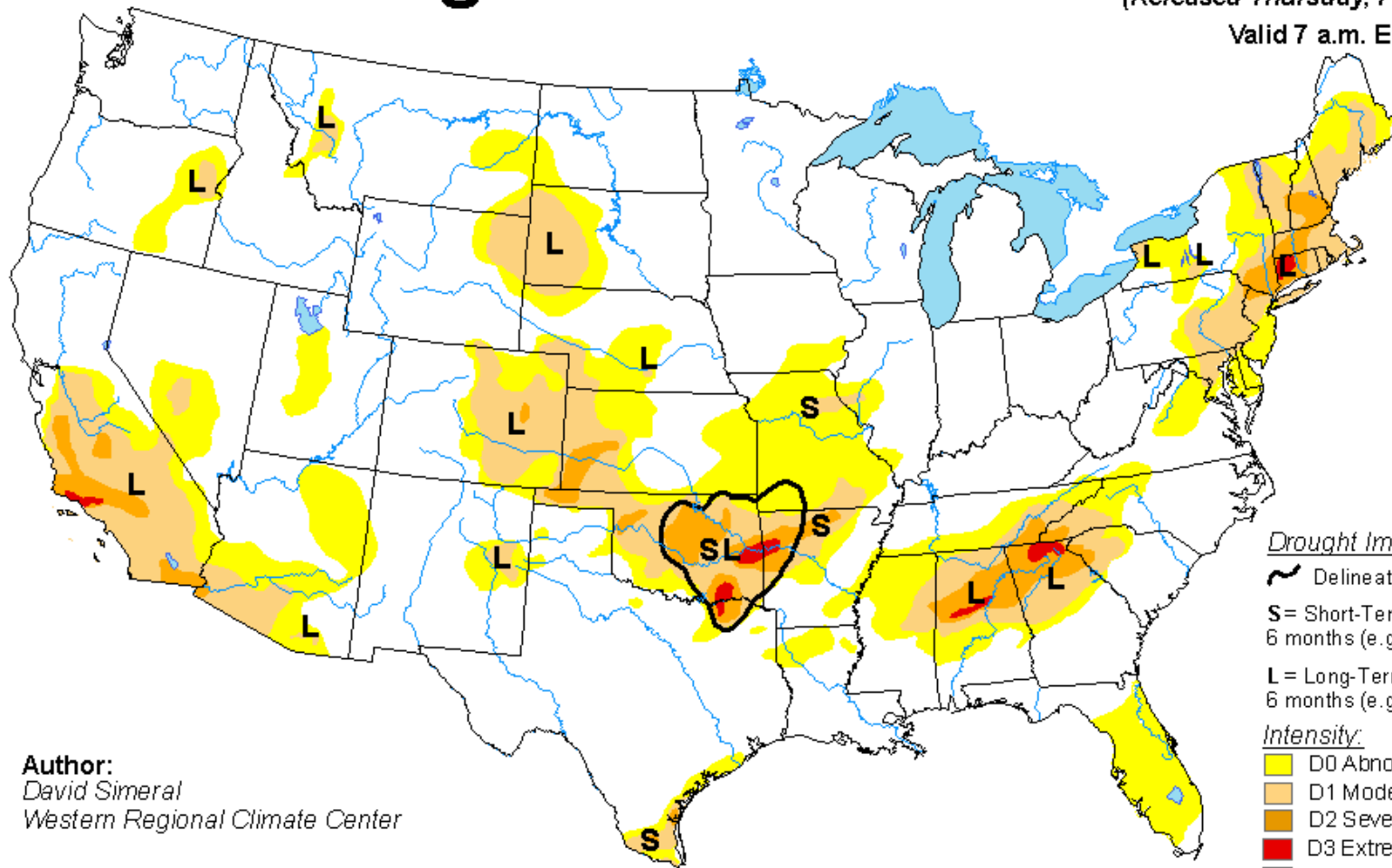
<http://droughtmonitor.unl.edu/>

# U.S. Drought Monitor

February 7, 2017

(Released Thursday, Feb. 9, 2017)

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

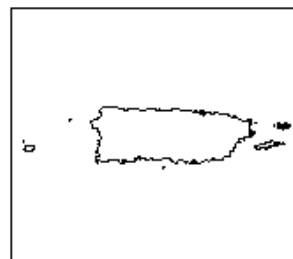
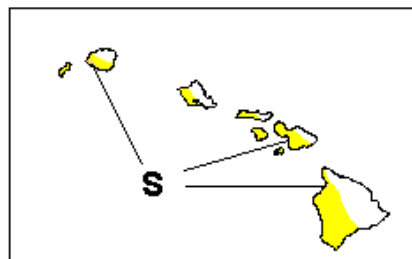
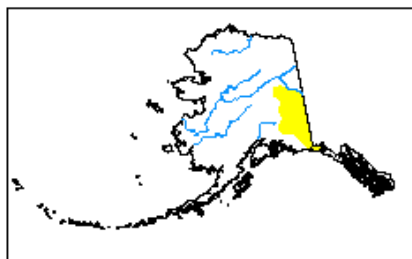
D1 Moderate Drought

D2 Severe Drought

D3 Extreme Drought

D4 Exceptional Drought

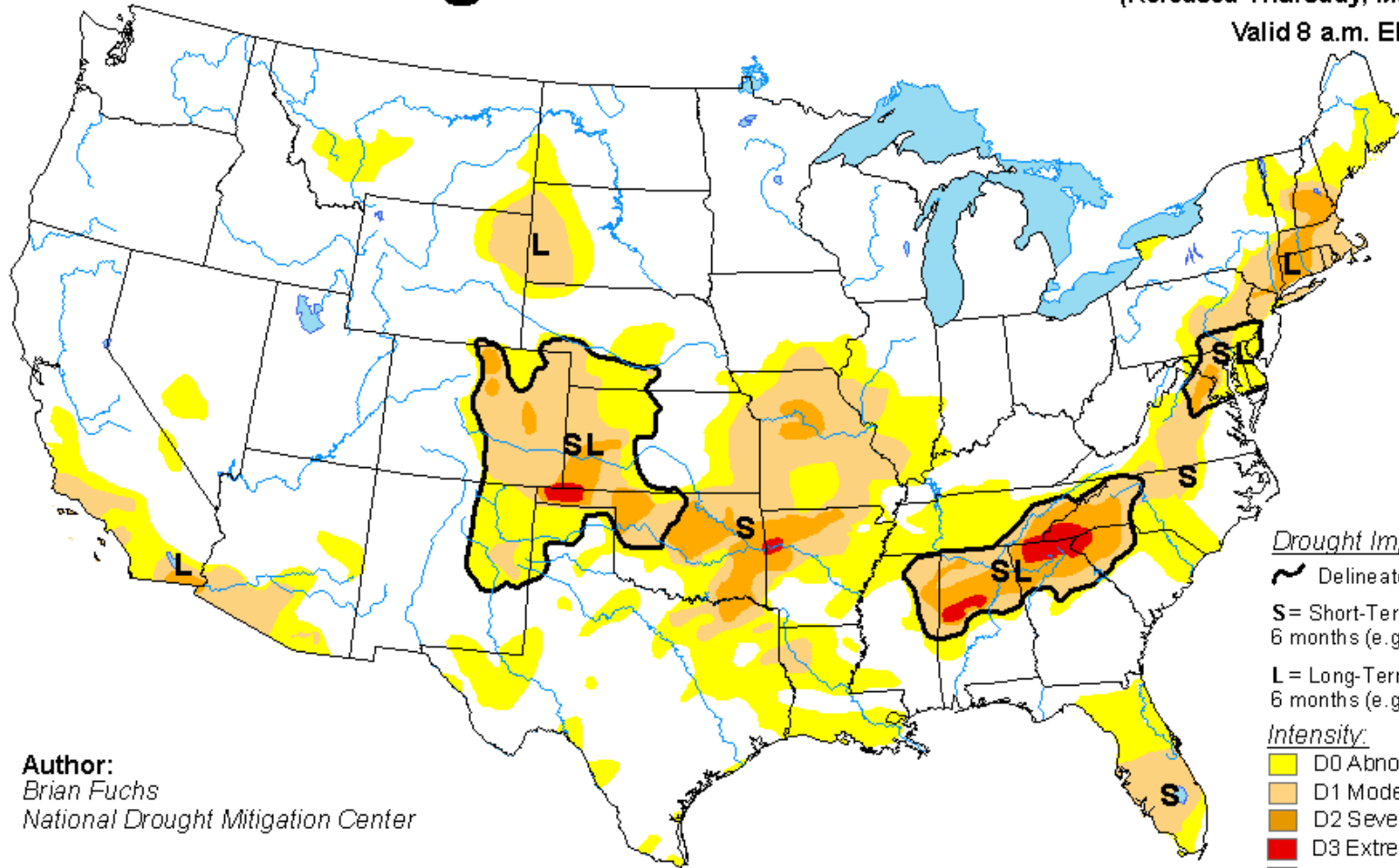
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.



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

# U.S. Drought Monitor

March 14, 2017  
(Released Thursday, Mar. 16, 2017)  
Valid 8 a.m. EDT



**Author:**  
Brian Fuchs  
National Drought Mitigation Center

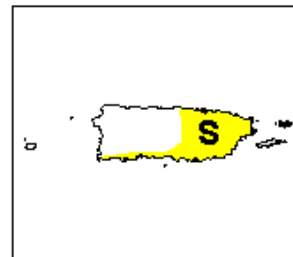
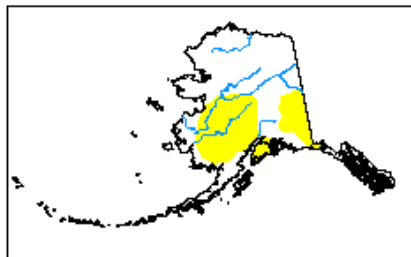
### Drought Impact Types:

- ~ 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:

- Yellow: D0 Abnormally Dry
- Light Orange: D1 Moderate Drought
- Orange: D2 Severe Drought
- Dark Orange: D3 Extreme Drought
- Red: 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/>



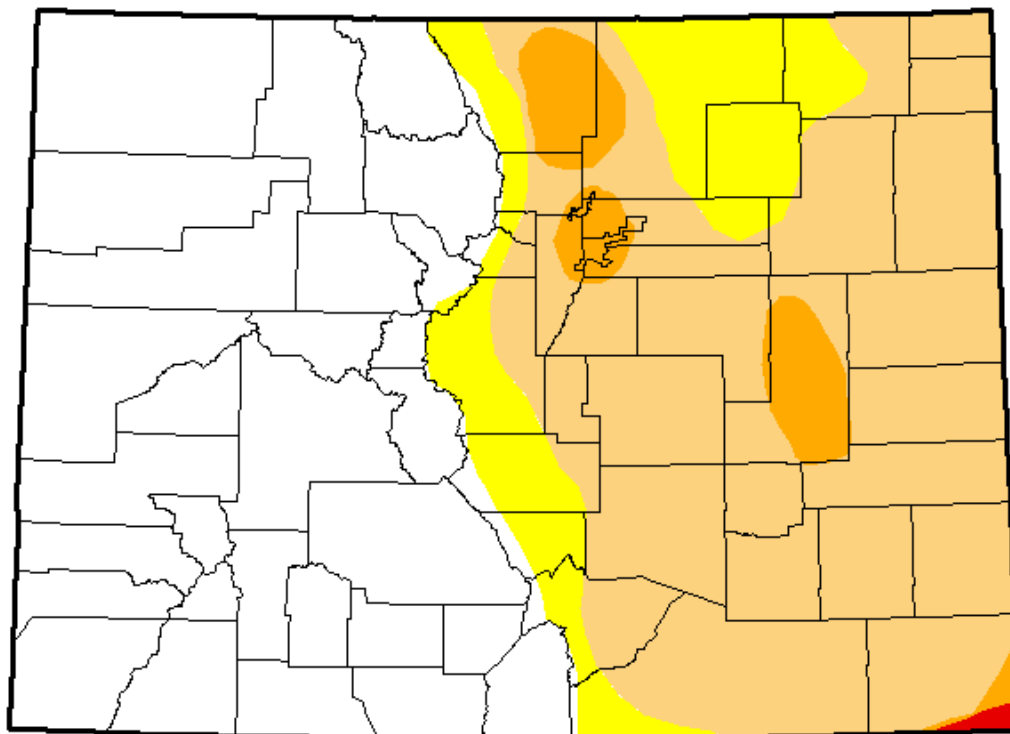
# U.S. Drought Monitor

## Colorado

**March 14, 2017**  
 (Released Thursday, Mar. 16, 2017)  
 Valid 8 a.m. EDT

*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	48.05	51.95	41.82	4.43	0.20	0.00
<b>Last Week</b> <i>3/7/2017</i>	48.04	51.96	37.11	1.98	0.20	0.00
<b>3 Months Ago</b> <i>12/13/2016</i>	1.66	98.34	38.38	2.88	0.00	0.00
<b>Start of Calendar Year</b> <i>1/3/2017</i>	31.88	68.12	37.21	2.88	0.00	0.00
<b>Start of Water Year</b> <i>9/27/2016</i>	70.49	29.51	2.45	0.00	0.00	0.00
<b>One Year Ago</b> <i>3/15/2016</i>	72.25	27.75	0.03	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.*

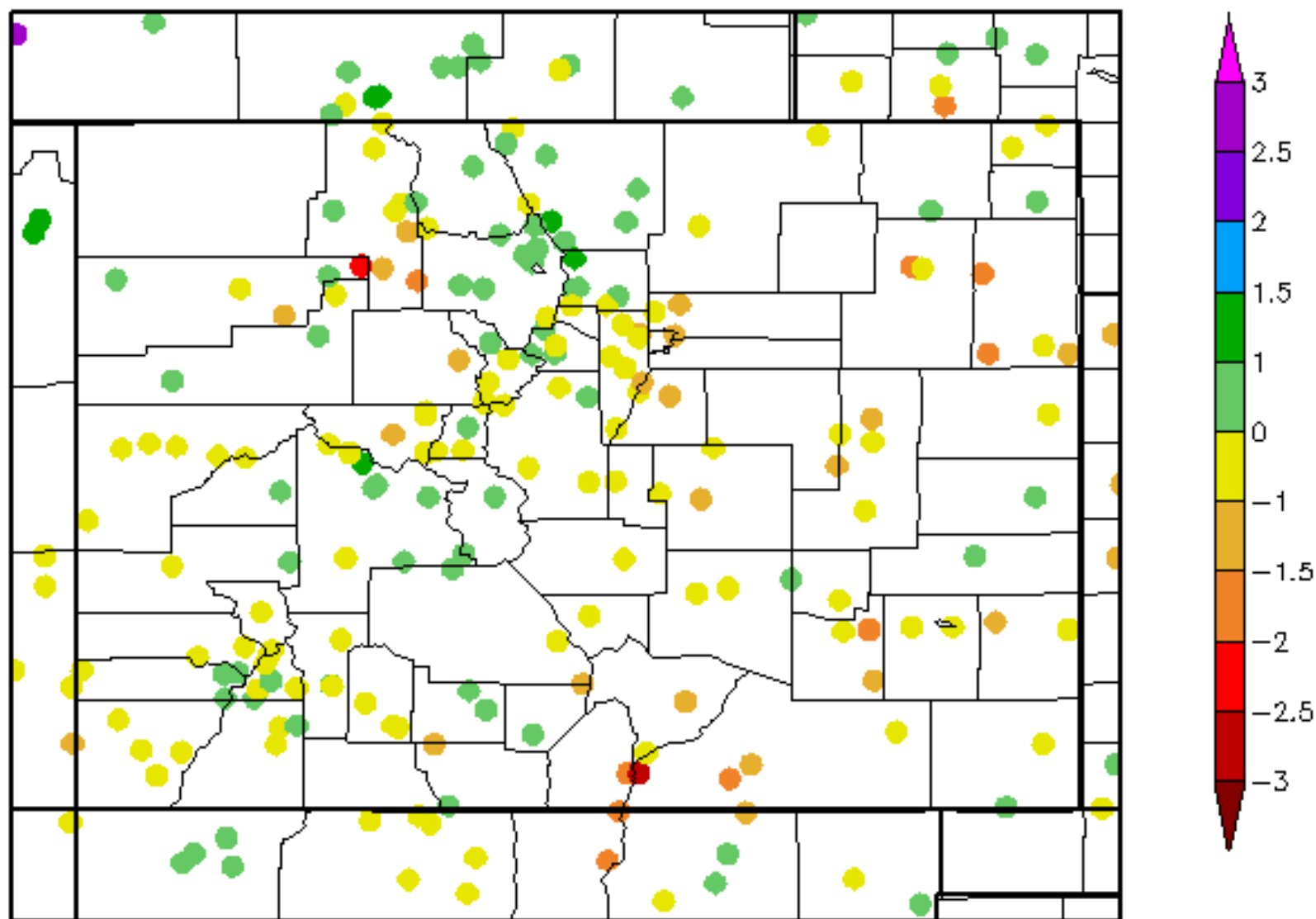
**Author:**

*Brian Fuchs*  
 National Drought Mitigation Center



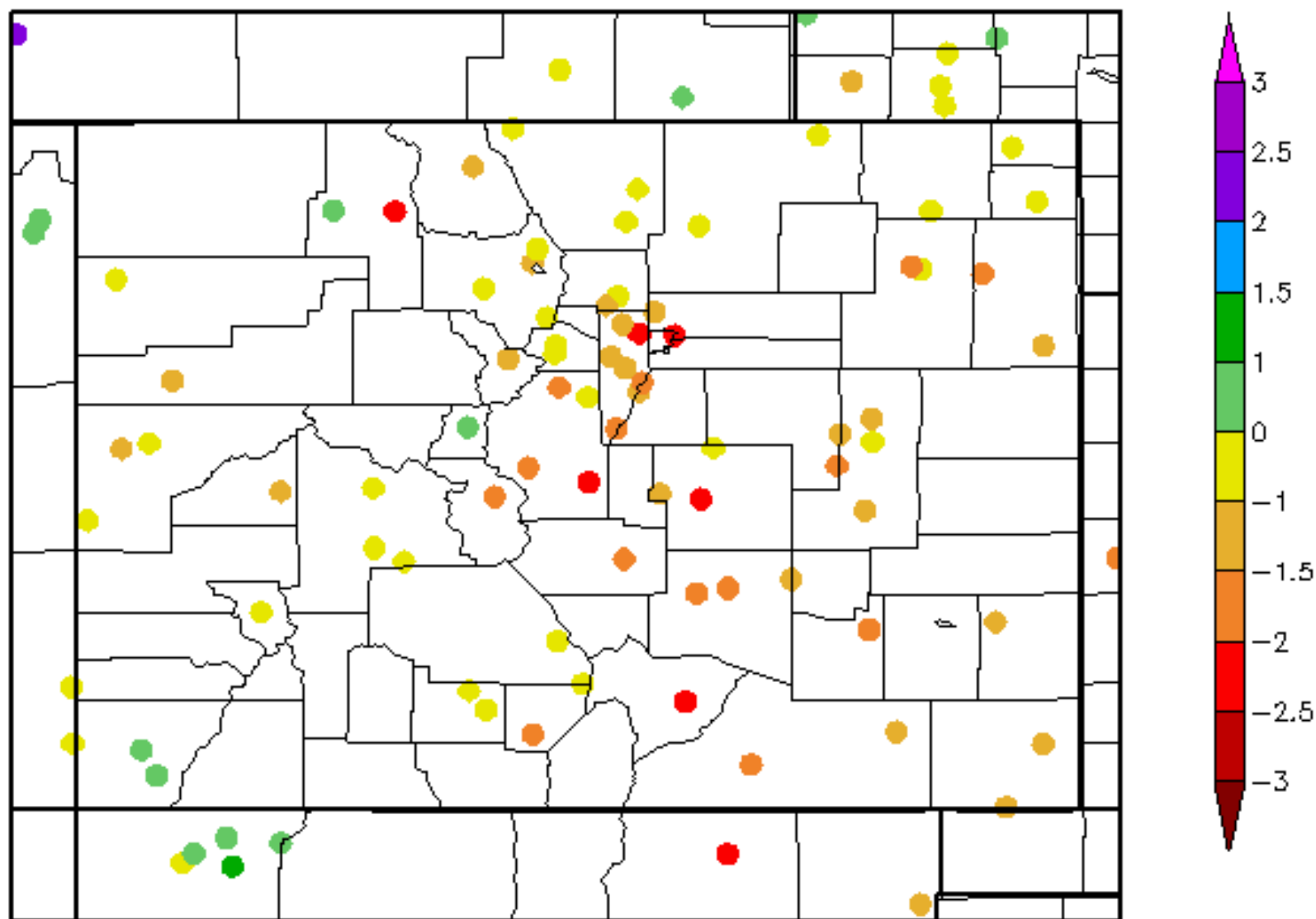
# Monthly SPI

2/1/2017 - 2/28/2017



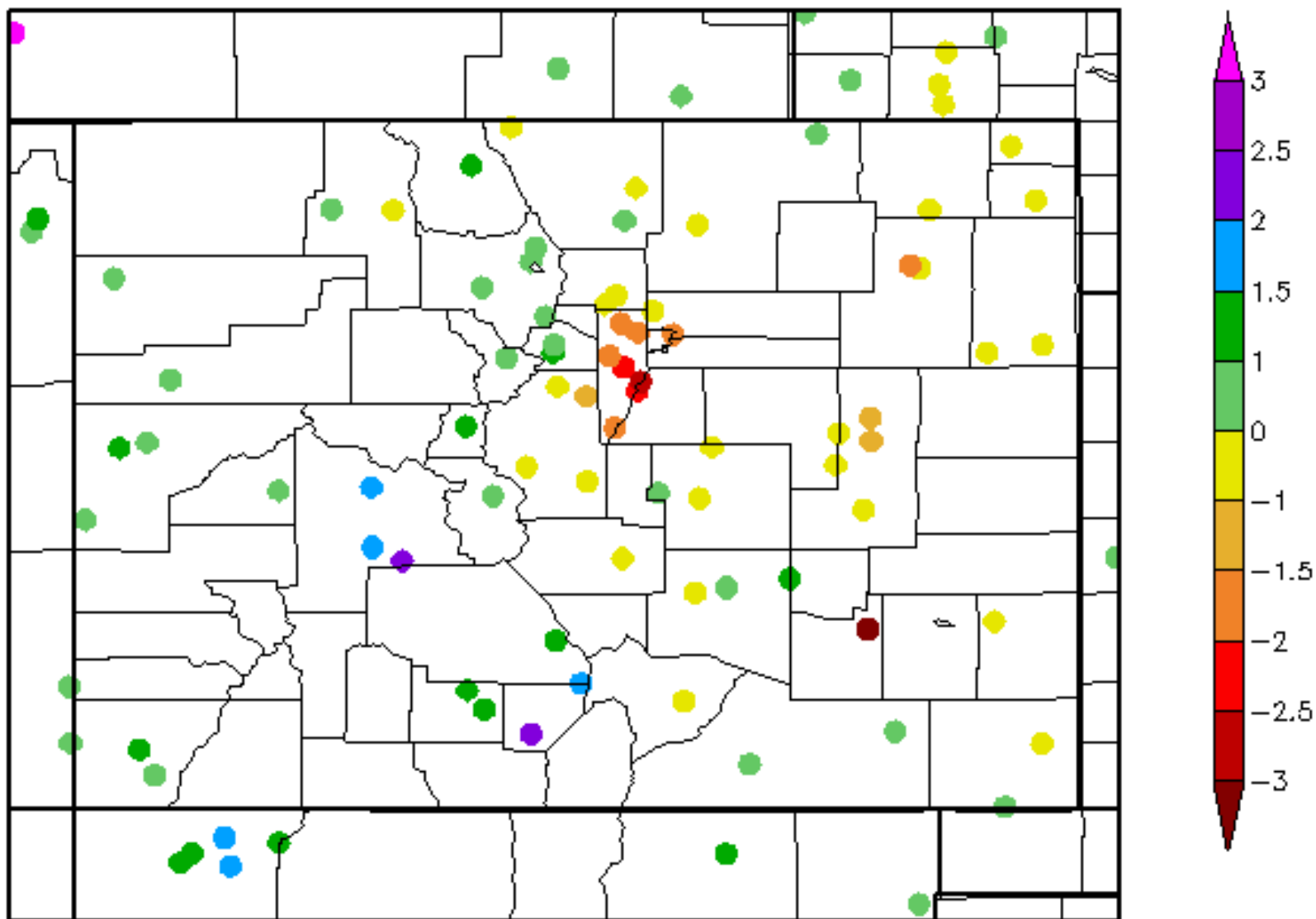
# 30 Day SPI

2/18/2017 - 3/19/2017



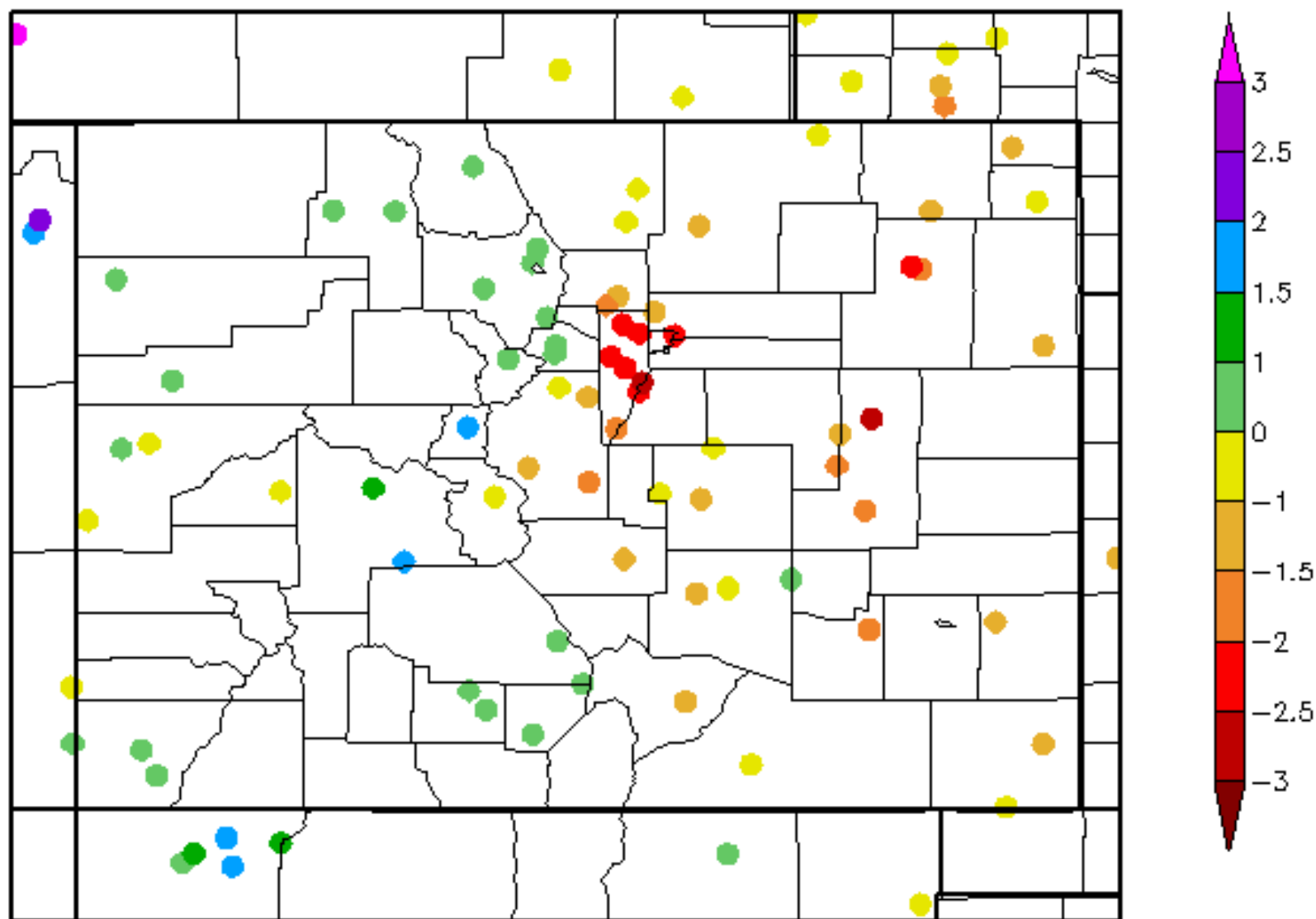
# 90 Day SPI

12/20/2016 - 3/19/2017

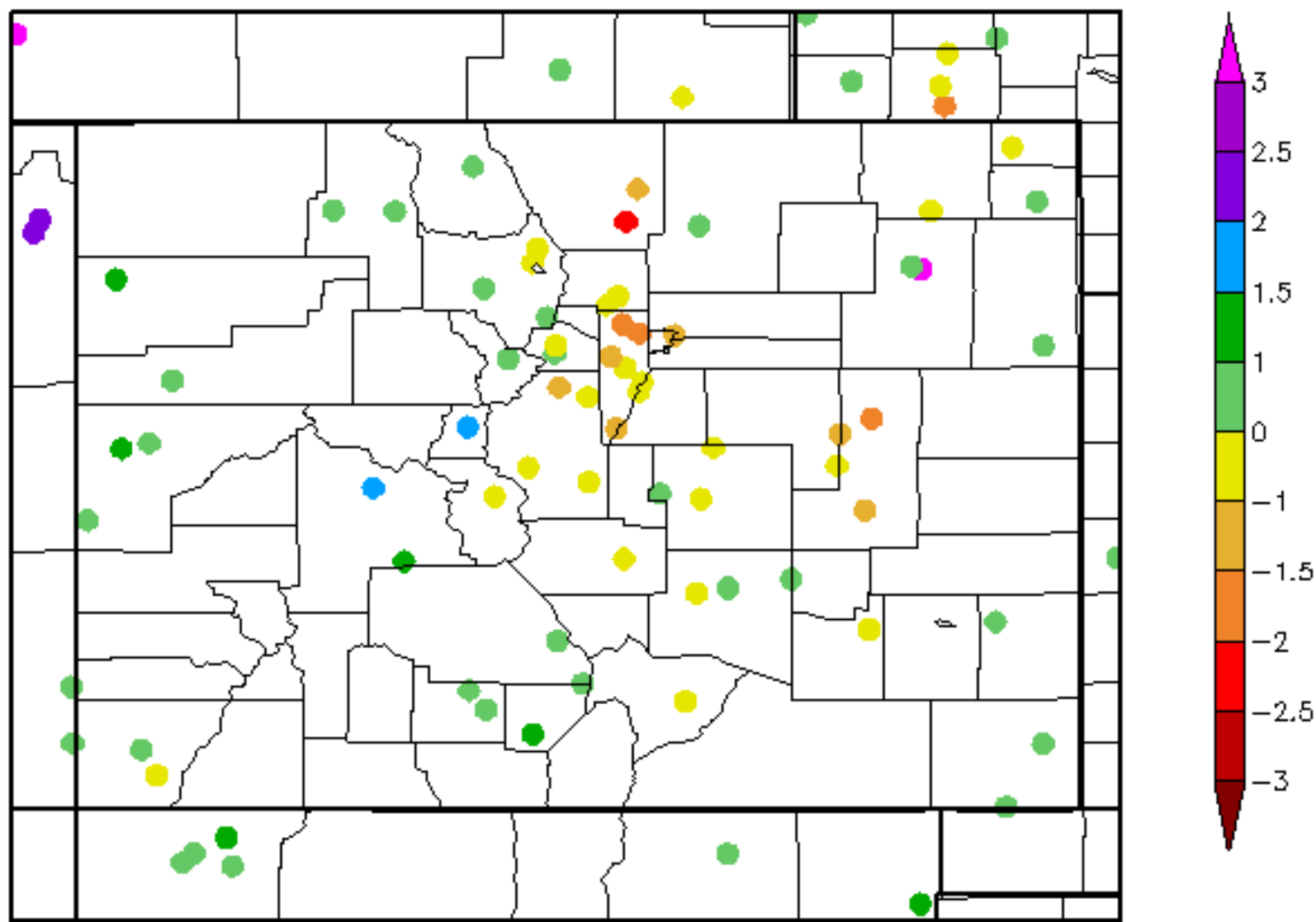


# 6 Month SPI

9/20/2016 - 3/19/2017

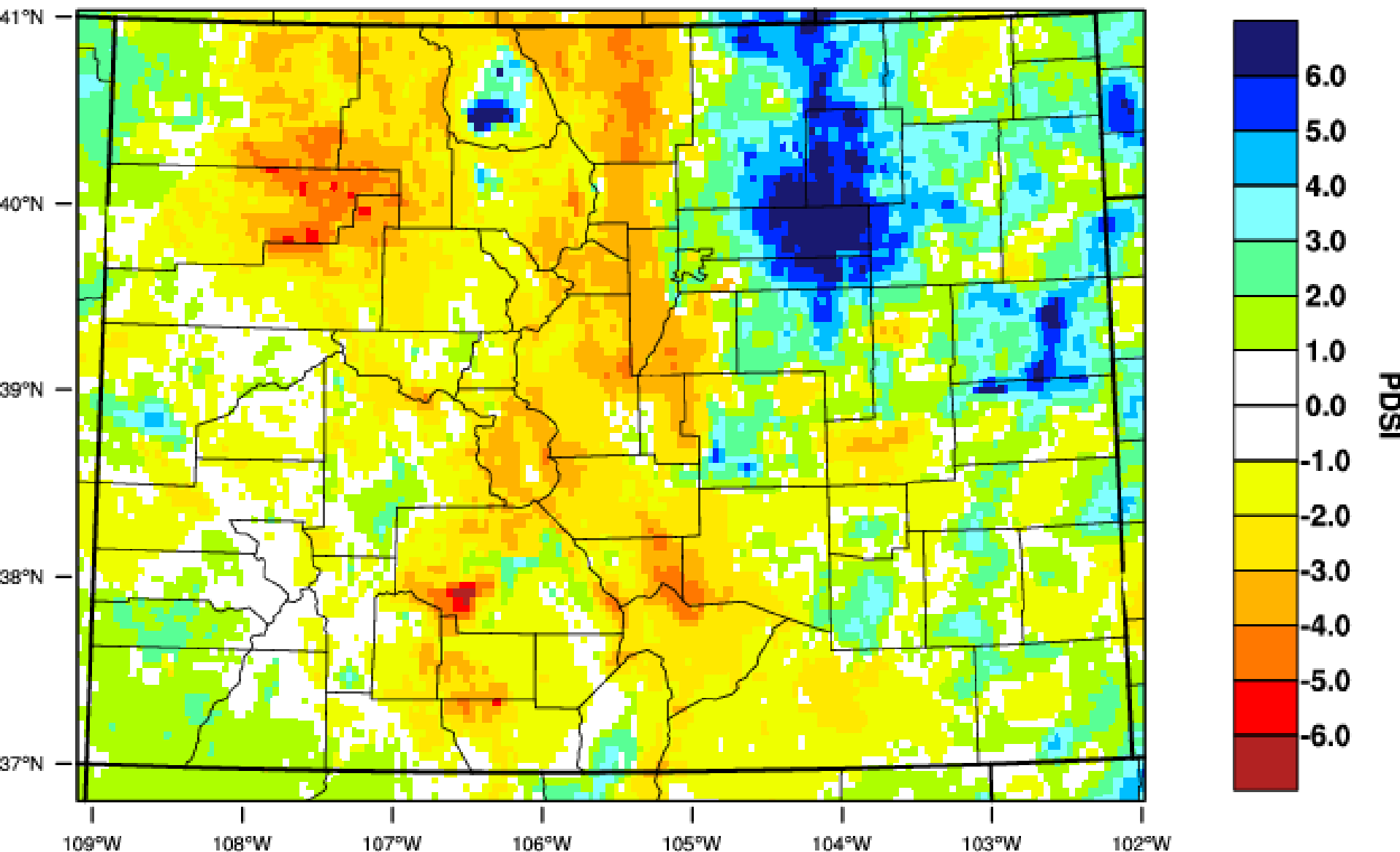


# 12 Month SPI 3/20/2016 - 3/19/2017



# Colorado - PDSI

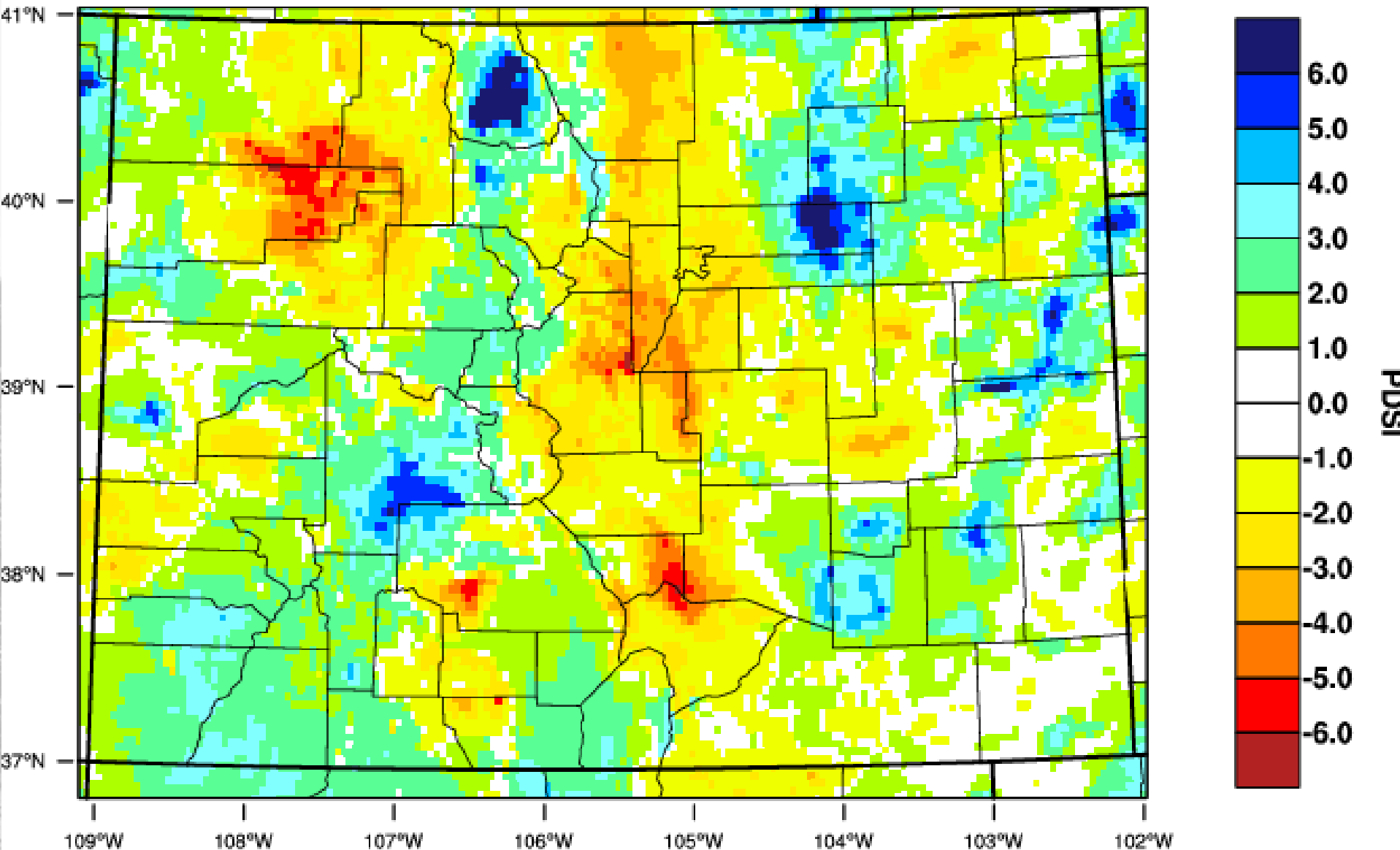
December 2016



WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 7 JAN 2017

# Colorado - PDSI

January 2017

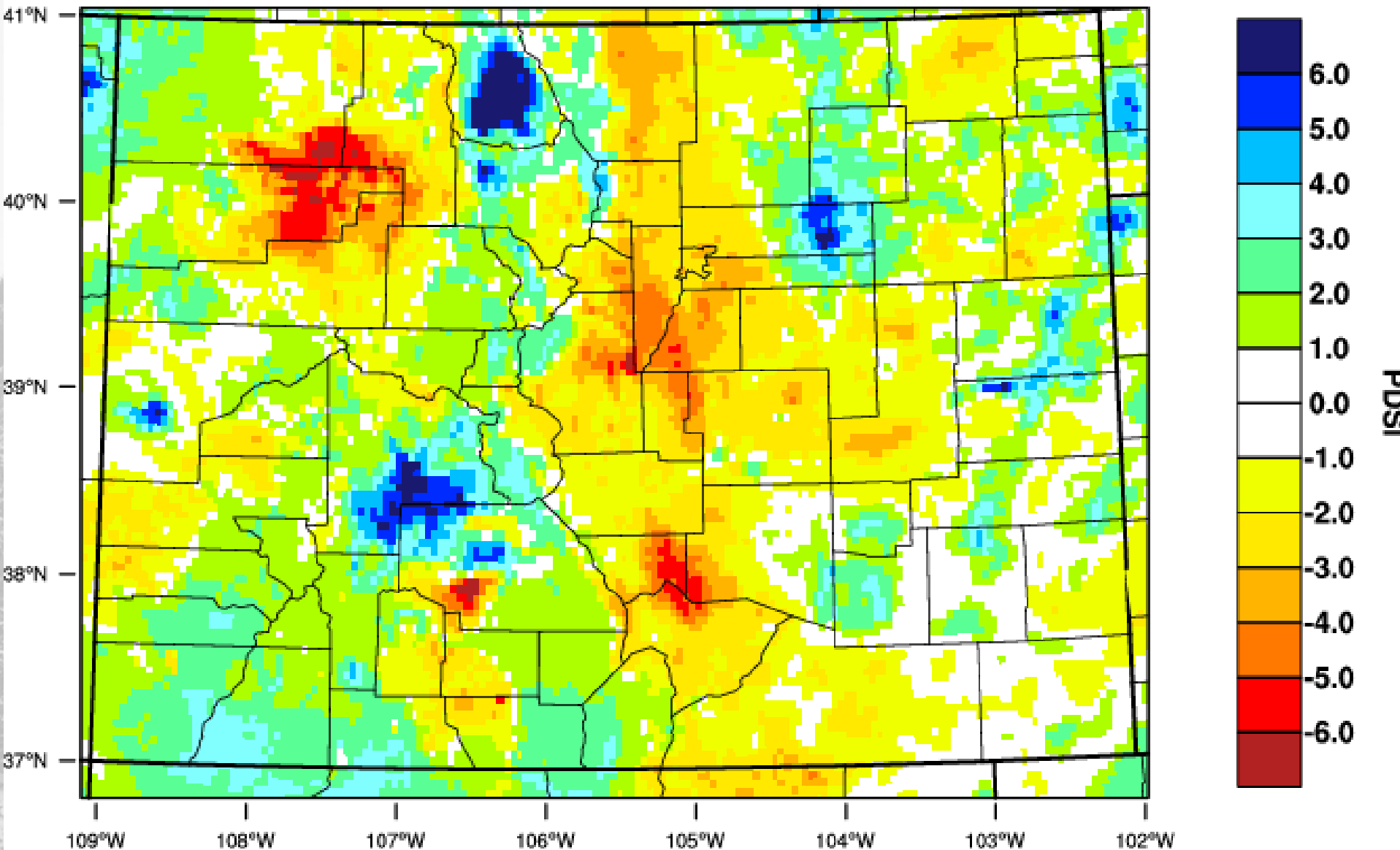


WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 11 FEB 2017



# Colorado - PDSI

February 2017

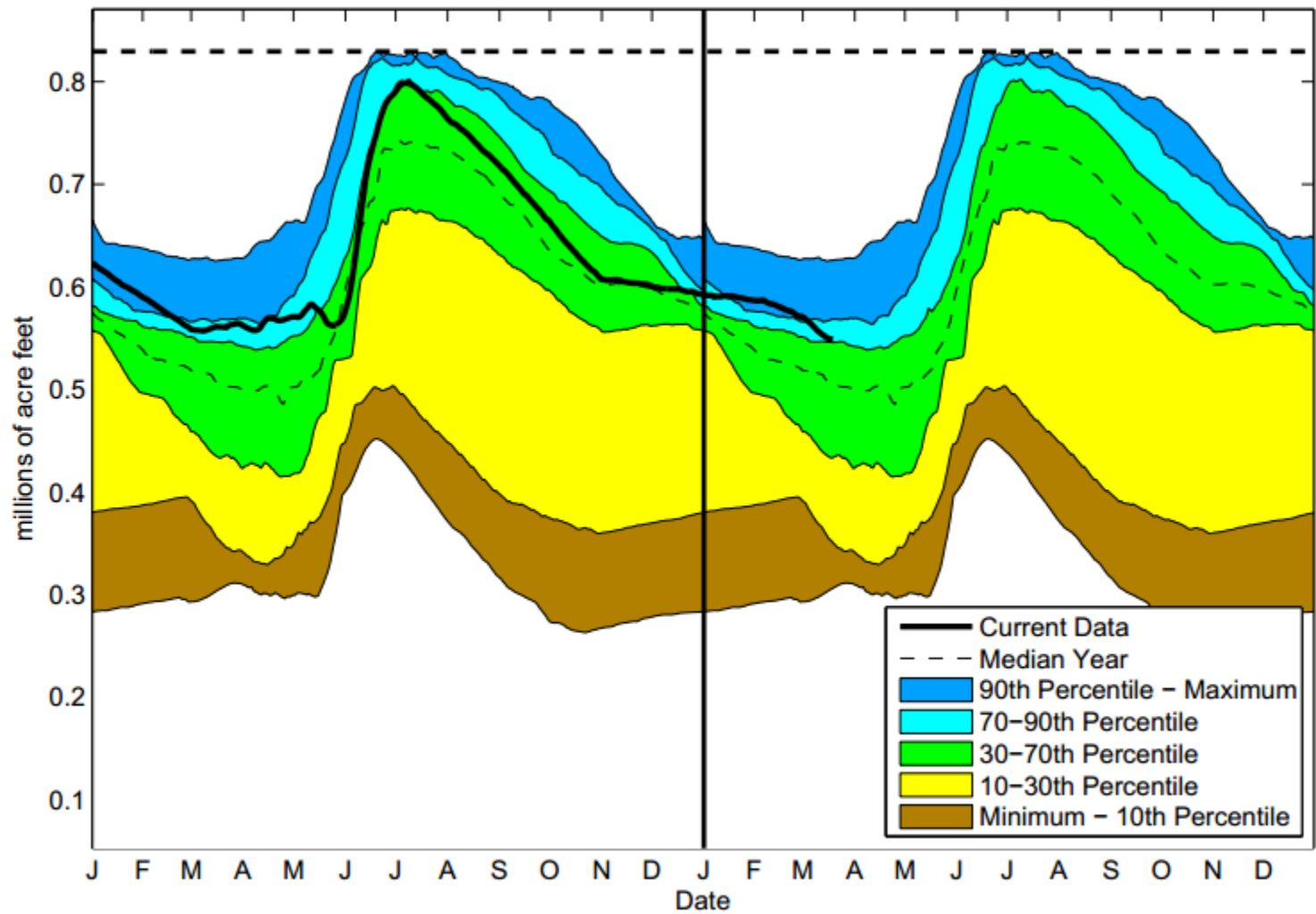


WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 16 MAR 2017

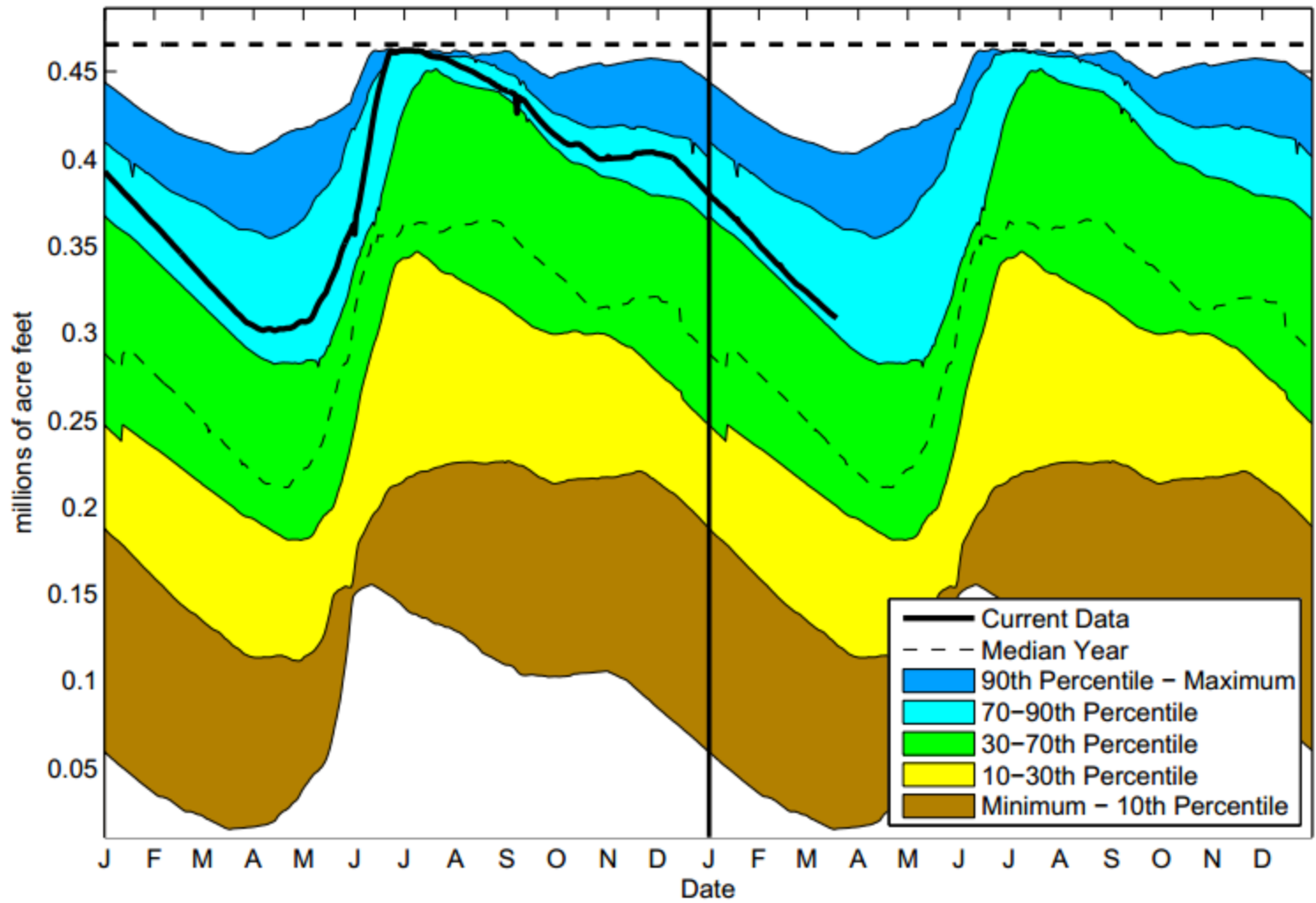
# Reservoir and Soils Update



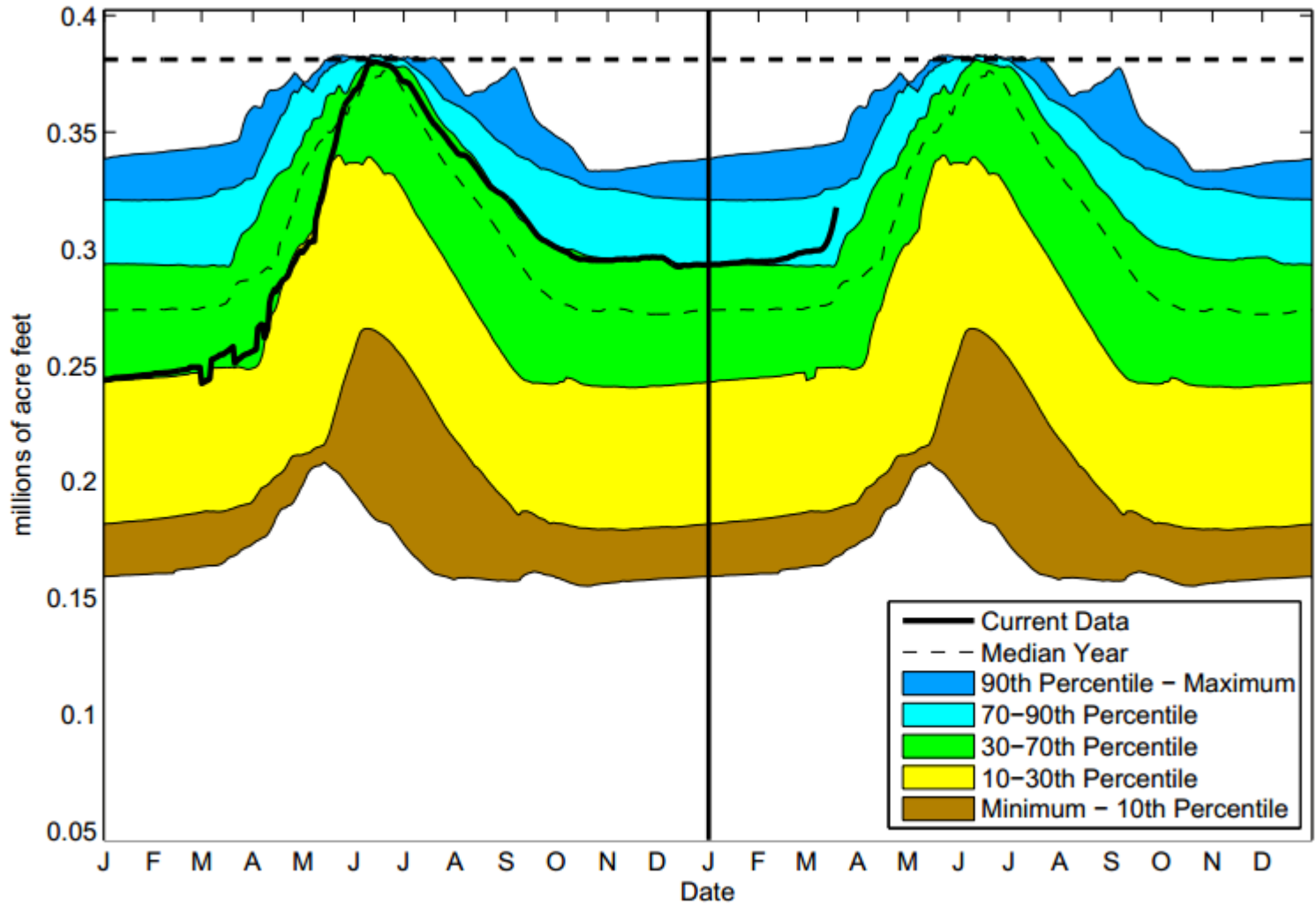
Blue Mesa Reservoir Level 3/19/2017  
114 Percent of 1985-2015 Average



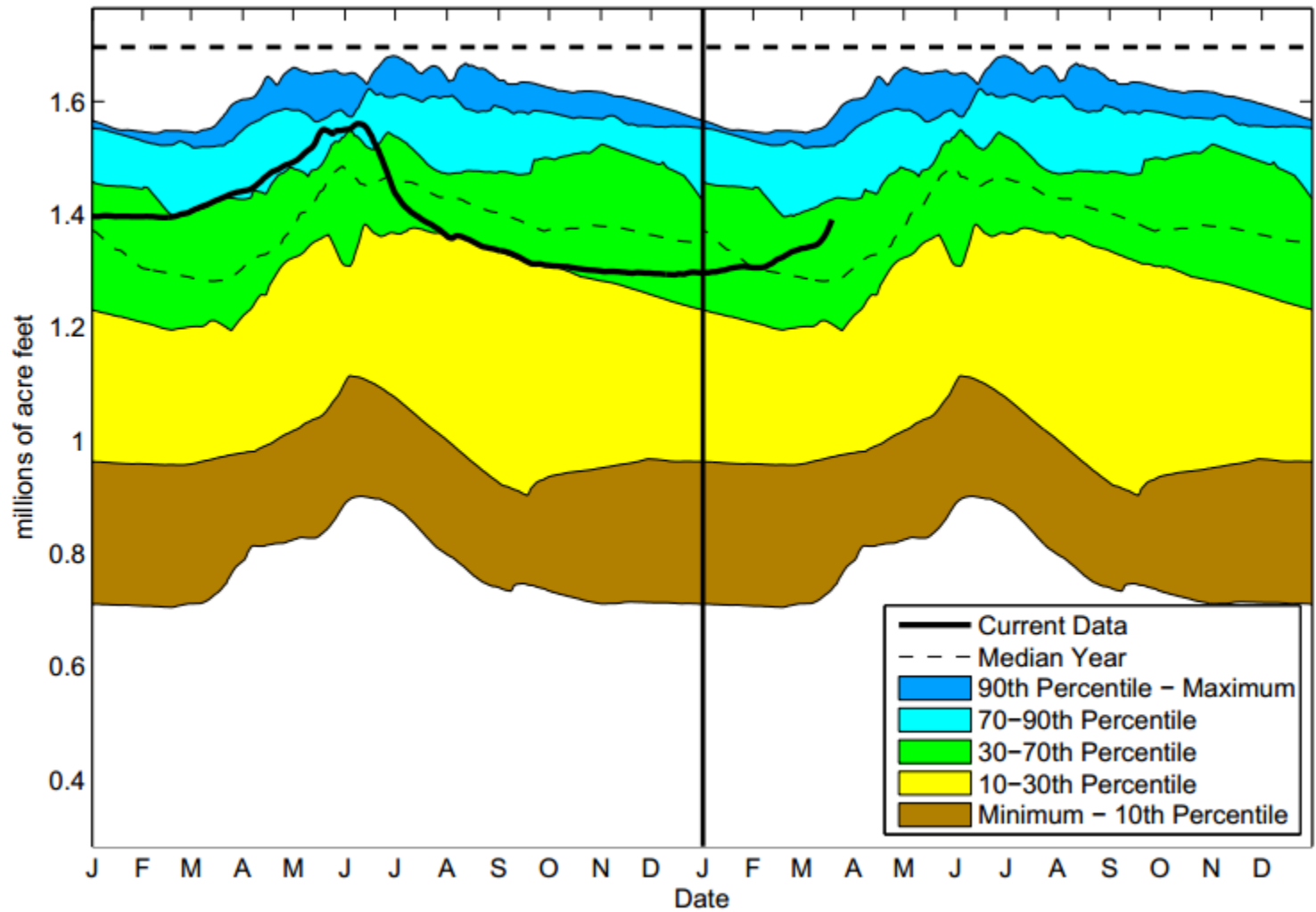
Lake Granby Reservoir Level 3/19/2017  
129 Percent of 2000-2015 Average



McPhee Reservoir Level 3/19/2017  
118 Percent of 1985-2015 Average



Navajo Reservoir Level 3/19/2017  
109 Percent of 1985-2015 Average





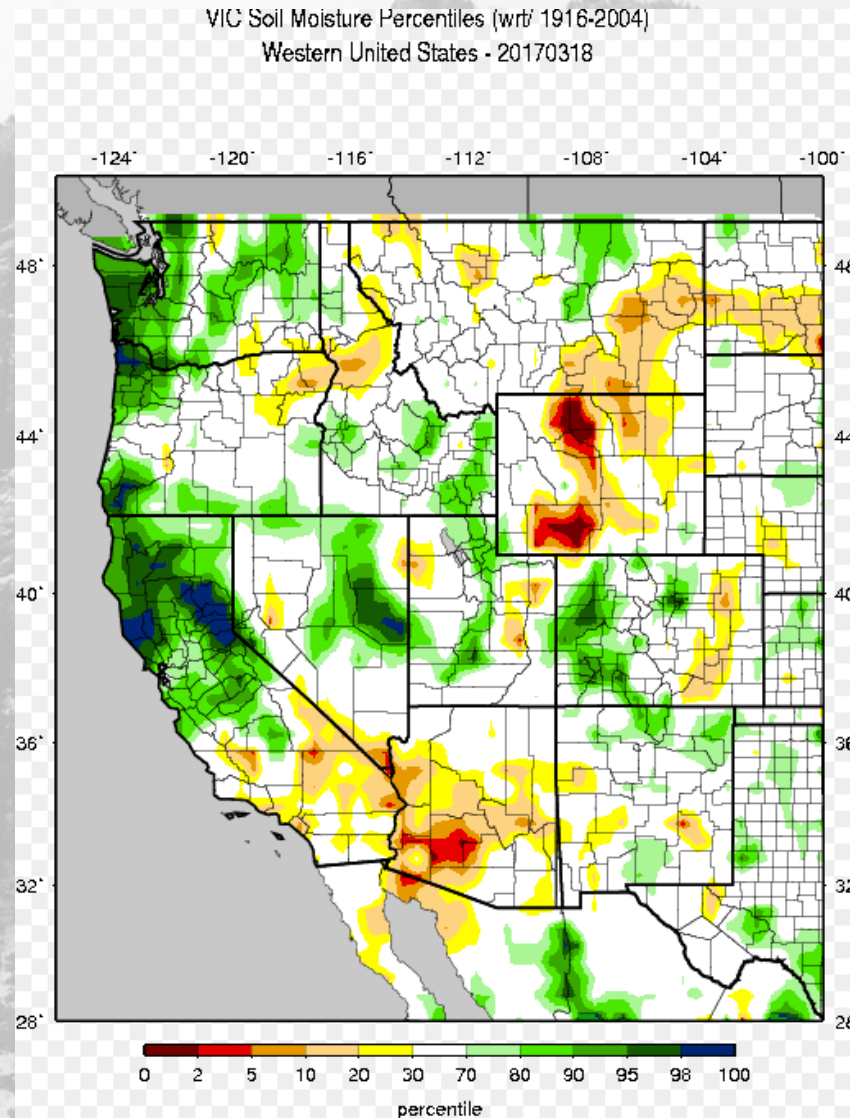
# Raw Water Supply Daily Report

Day: Sunday  
Date: 3/19/2017

<b>Reservoir Operations:</b>							
	Inflow (cfs)	Outflow (cfs)	Elevation (feet)	Storage (ac-ft)	Change (ac-ft)	Full Elev. (feet)	Capacity (ac-ft)
<b>South Platte System:</b>							
Antero	15	6	8,939.59	15,172	19	8,942	19,881
Eleven Mile	83	65	8,597.45	99,315	34	8,597	97,779
Cheesman	150	117	6,834.24	72,535	66	6,842	79,064
Strontia Springs	299	124	5,992.42	6,915	-88	6,002	7,863
Chatfield	48	60	5,431.04	25,729	-41	5,432	27,076
Marston	87	77	5,529.79	13,932	25	5,538	19,256
Soda Lakes	---	---	---	1,041	0		1,680
Platte Canyon	0	---	5,528.32	651	-2	5,533	910
South Complex	1	1	---	2,784	-2		3,561
Harriman	---	---	5,621.80	698	7	5,623	762
<b>Moffat System:</b>							
Gross	36	14	7,222.33	21,706	45	7,282	41,811
Ralston	2	0	6,024.02	7,419	-41	6,046	10,776
Upper Long Lake	0	0	6,075.01	836	-1	6,088	1,519
Lower Long Lake	0	0	5,895.85	17	0	5,908	268
<b>Western Slope:</b>							
Dillon	164	81	9,003.88	217,911	-84	9,017	257,304
Williams Fork	92	72	7,794.95	72,729	39	7,811	96,822
Meadow Creek	1	1	9,942.57	18	0	9,995	5,370
<b>Total System:</b>				<b>559,407</b>	<b>-23</b>		<b>671,702</b>
<b>Non-system</b>							
Wolford Mountain	51	51	7,477.95	50,500	0	7,489	65,985
Green Mountain	248	270	7,894.02	63,785	-45	7,950	153,639
Spinney Mountain	20	75	---	35,679	N/A		53,651

<b>Raw Water Distribution:</b>	
<i>(all flows in cubic feet per second, cfs)</i>	
<b>South Platte System:</b>	
Roberts Tunnel	125
Conduit 26 to Foothills TP	174
Conduit 20 to Marston Lake	87
From Diversion Dam	87
From Last Chance Pump	0
From Chatfield Pumps	0
Conduit 15 to Marston Lake	0
High Line Canal Total Flow	0
City Ditch at Washington Park	0
Harriman Ditch Total Flow	14
Metro Sewer Effluent Exchange	0
Bi-City Effluent Exchange	0
South Complex Exchange	0
Recycling Plant	0
<b>Moffat System:</b>	
Moffat Tunnel	15
Jones Pass Tunnel	0
South Boulder Canal	0
Long Lake Feeder Ditch	0
Ralston to Moffat TP	0
Ralston/Clear Creek Canal	0

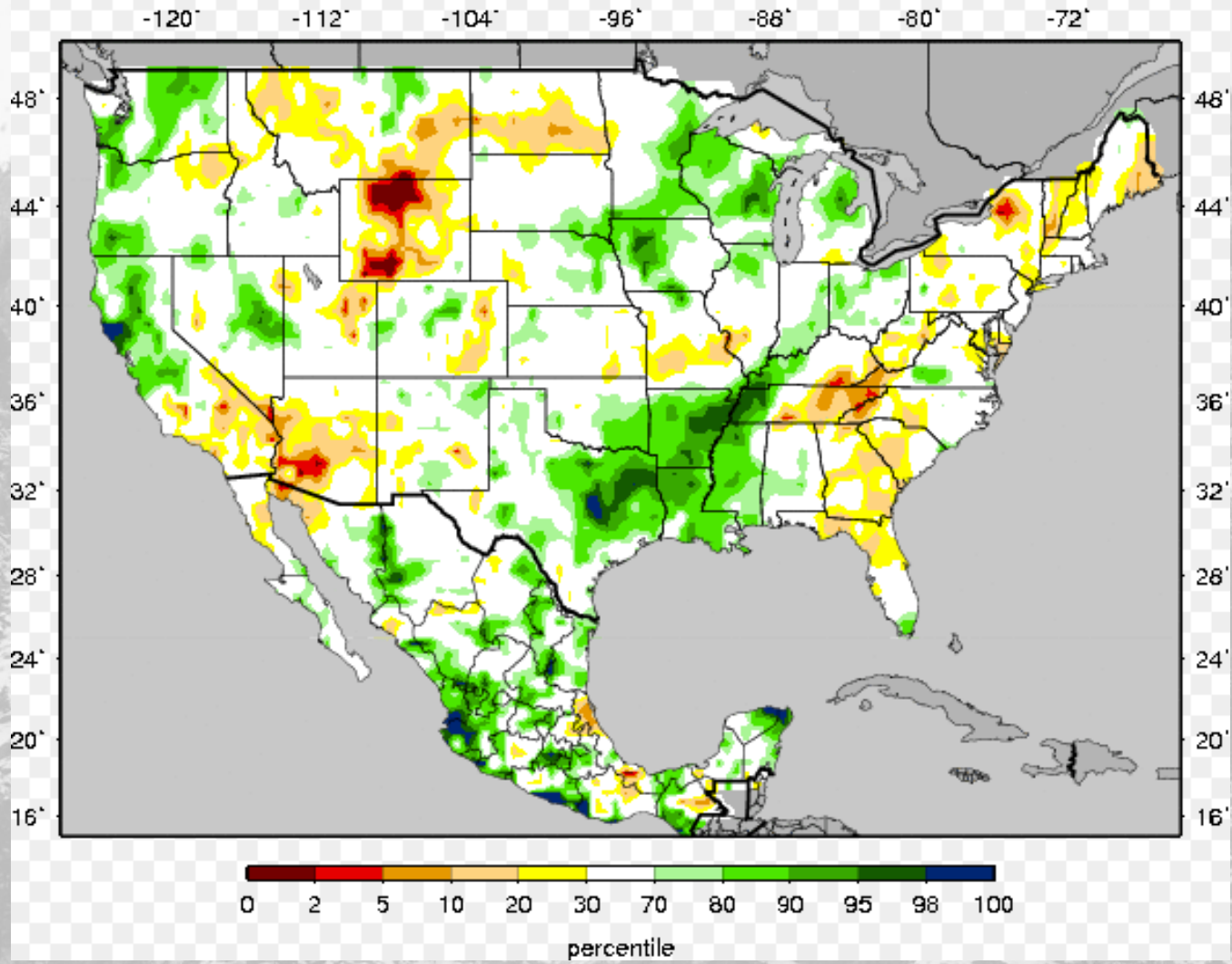
# Soil Moisture Update





# VIC Total Moisture Storage Percentiles (wrt/ 1916-2004)

20170318



# Colorado Climate Center

**Data and Power Point Presentations available for downloading**

**<http://ccc.atmos.colostate.edu/droughtpresentations.php>**

