



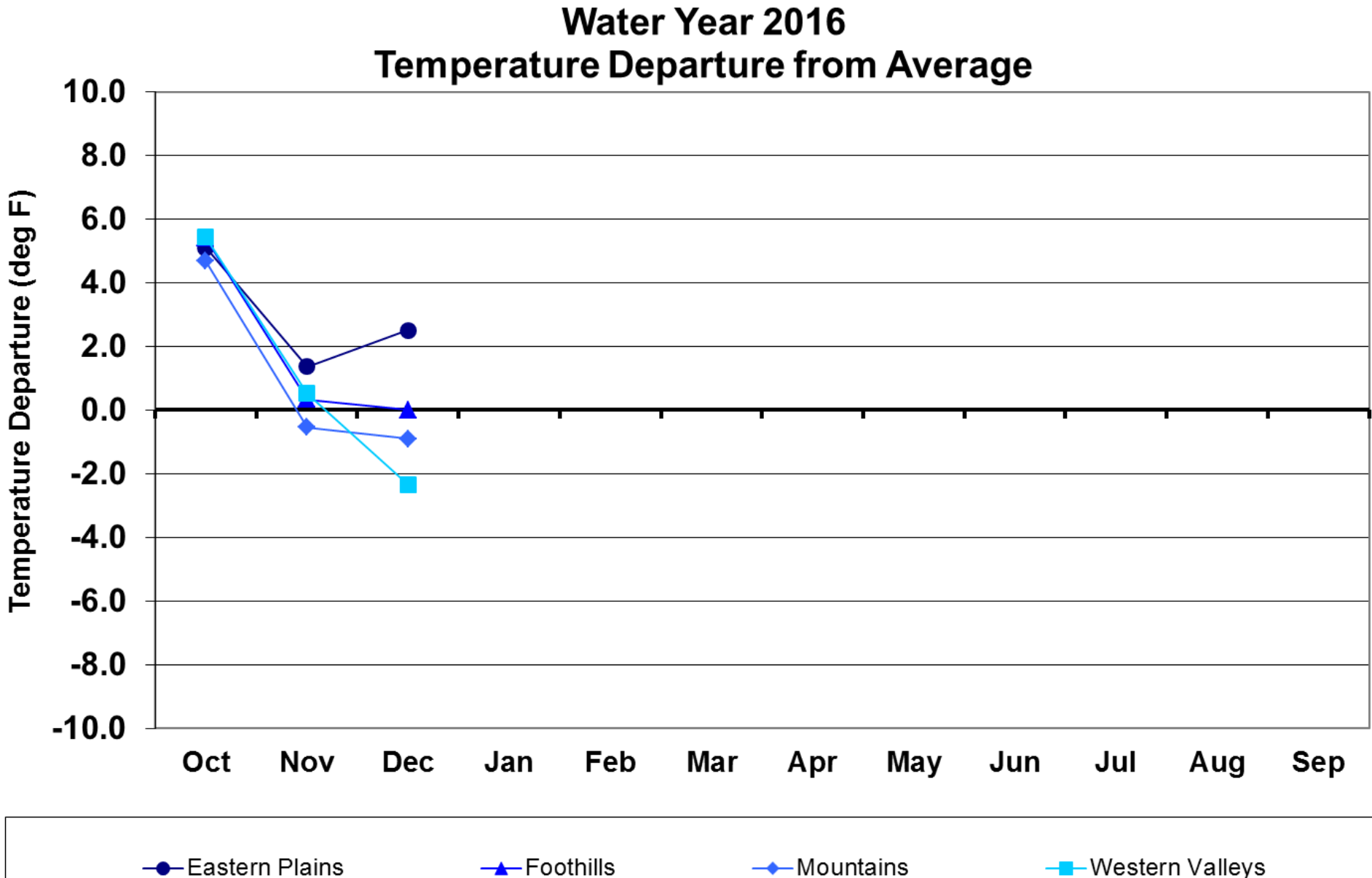
# Climate Update



Nolan Doesken  
Colorado Climate Center

Presented to  
Water Availability Task Force  
January 20, 2016  
Denver, CO

# Water Year 2016 Temperature Departures

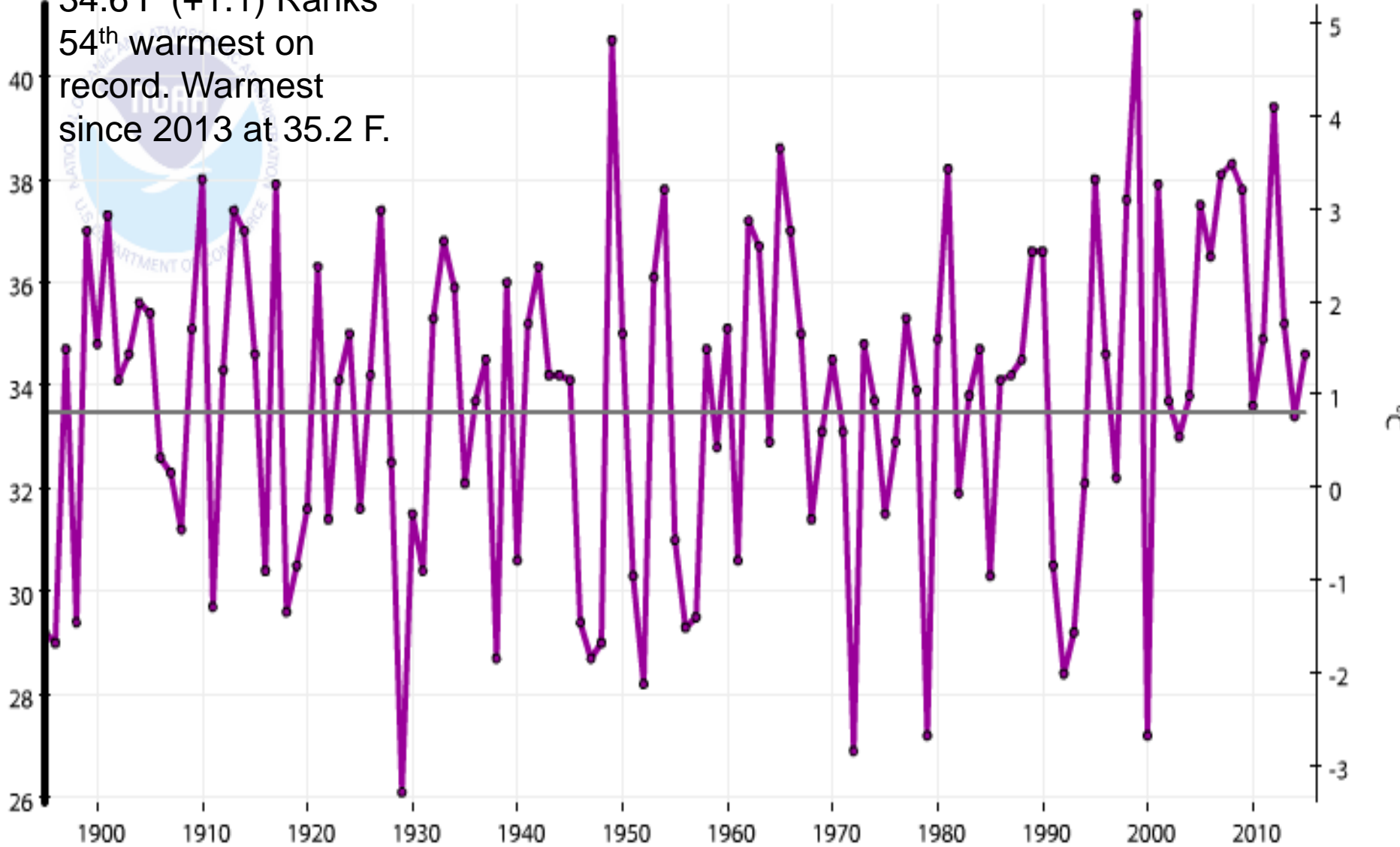


# Nov 2015 Average Temperature History for Colorado (NCEI)

## Colorado, Average Temperature, November

— 1901-2000 Avg: 33.5°F      —●— Avg Temperature

34.6 F (+1.1) Ranks  
54<sup>th</sup> warmest on  
record. Warmest  
since 2013 at 35.2 F.

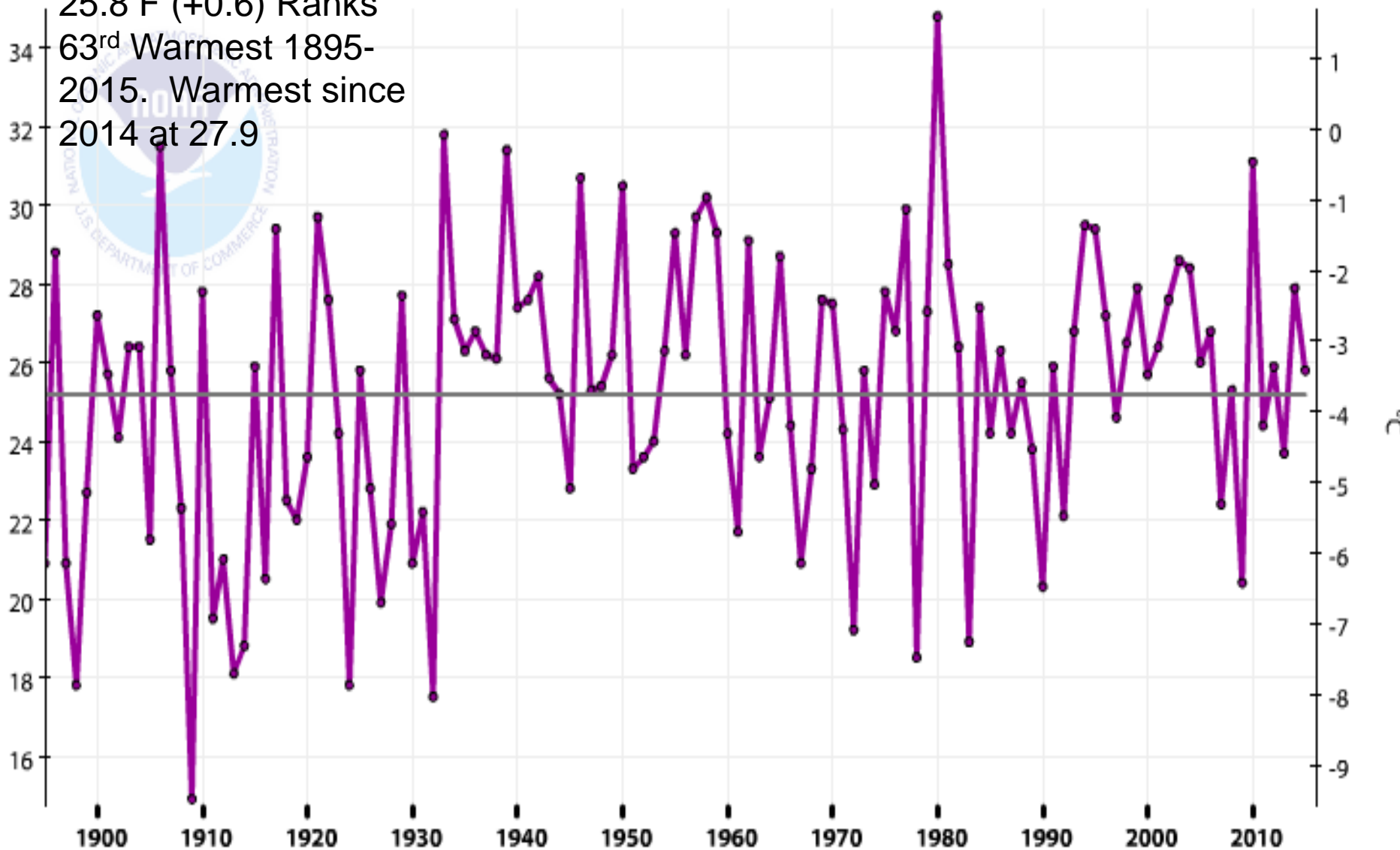


# Dec 2015 Average Temperature History for Colorado (NCEI)

## Colorado, Average Temperature, December

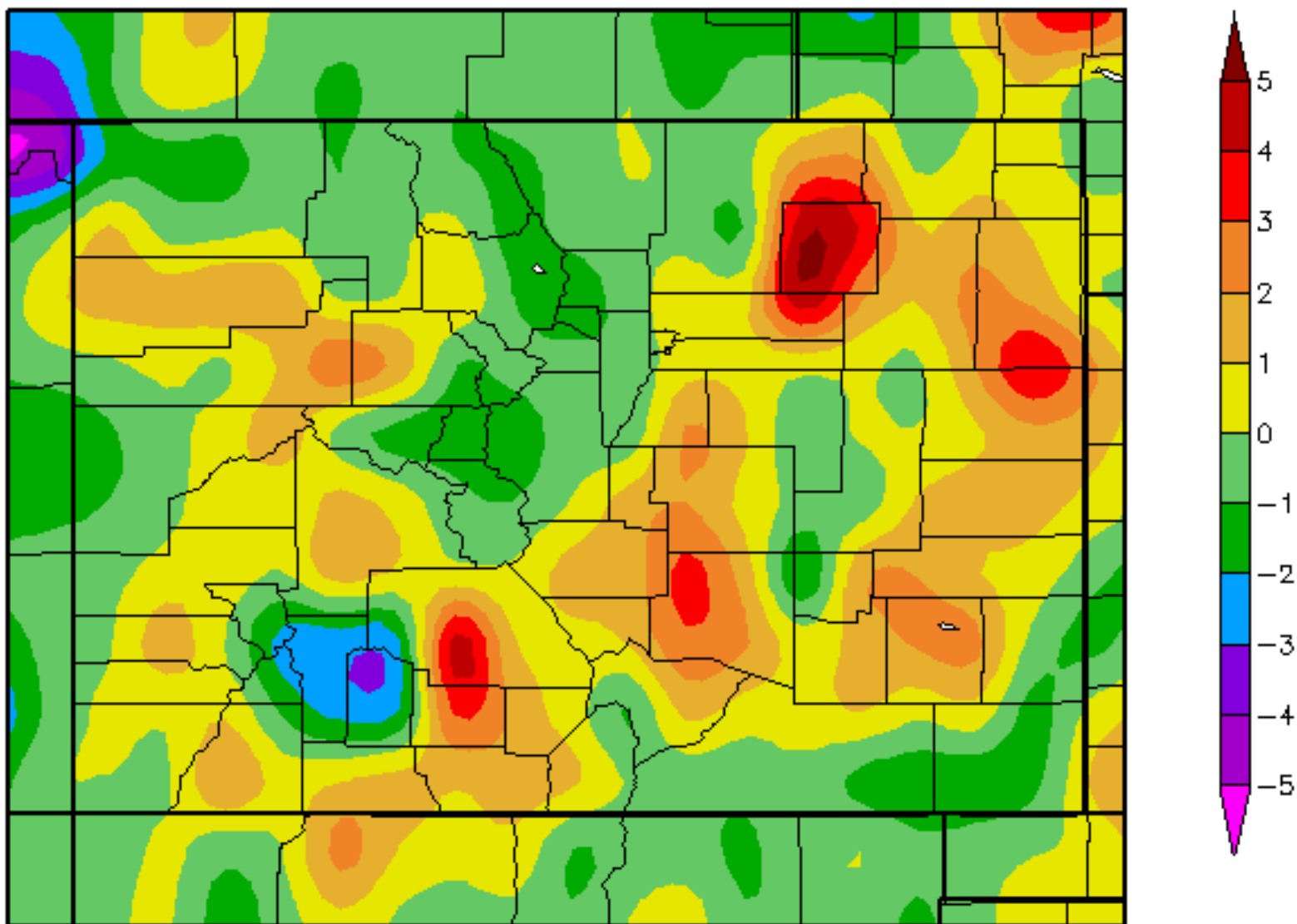
— 1901-2000 Avg: 25.2°F      —●— Avg Temperature

25.8 F (+0.6) Ranks  
63<sup>rd</sup> Warmest 1895-2015. Warmest since 2014 at 27.9



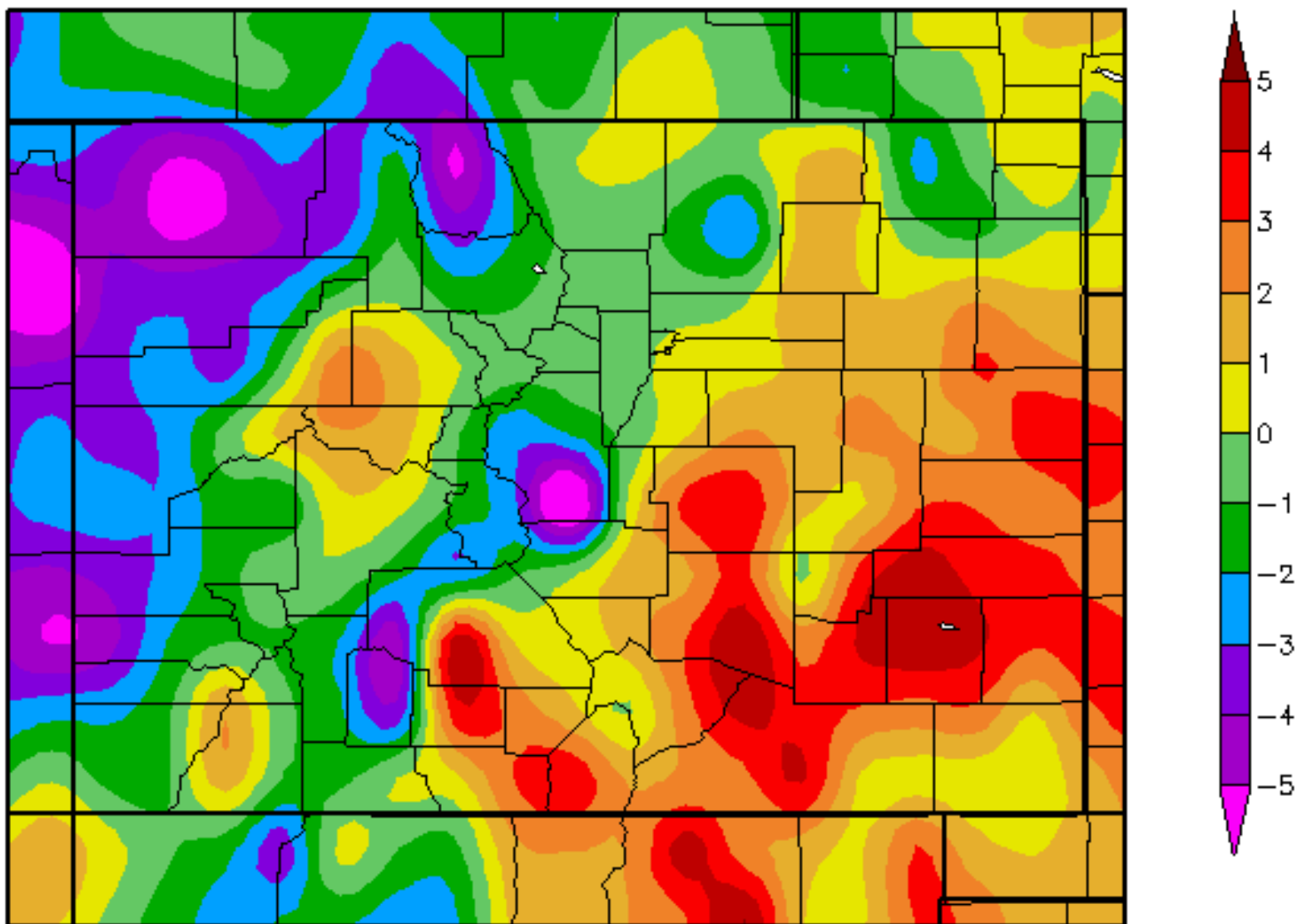
# Departure from Normal Temperature (F)

11/1/2015 - 11/30/2015



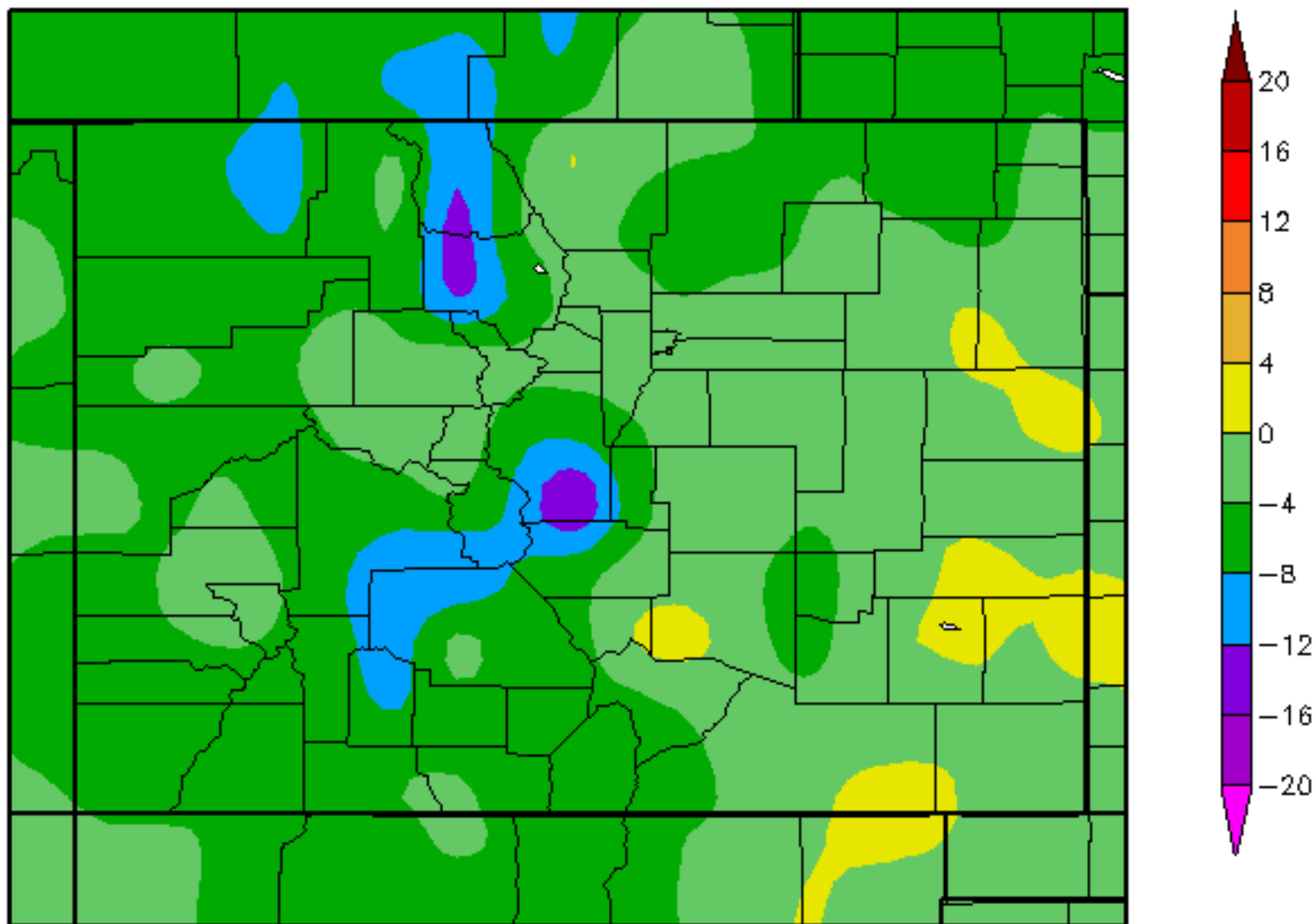
# Departure from Normal Temperature (F)

12/1/2015 – 12/31/2015



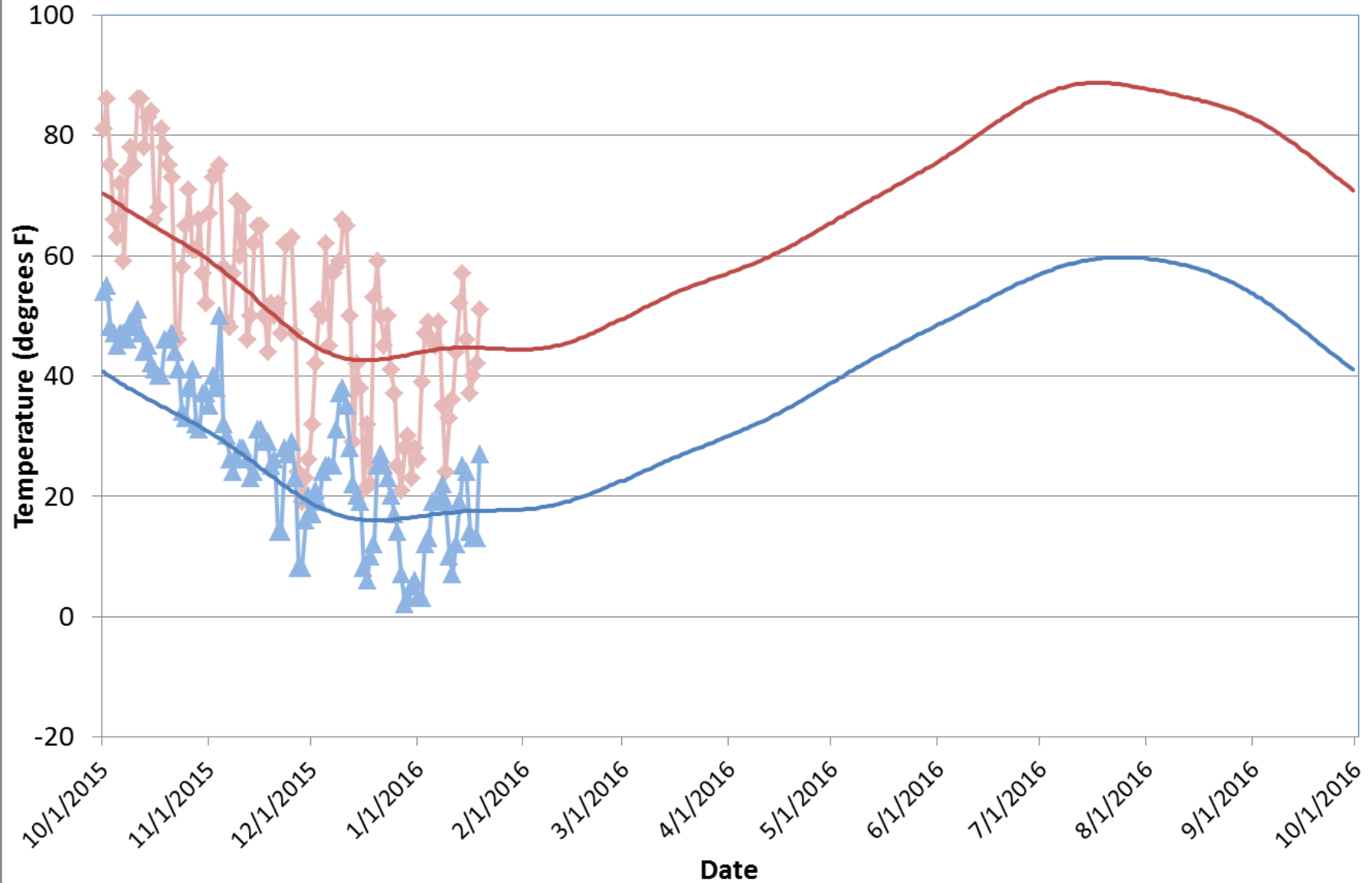
# Departure from Normal Temperature (F)

1/1/2016 - 1/18/2016



# Denver-Stapleton Daily Max/Min Temperatures with Normals, Water Year 2016

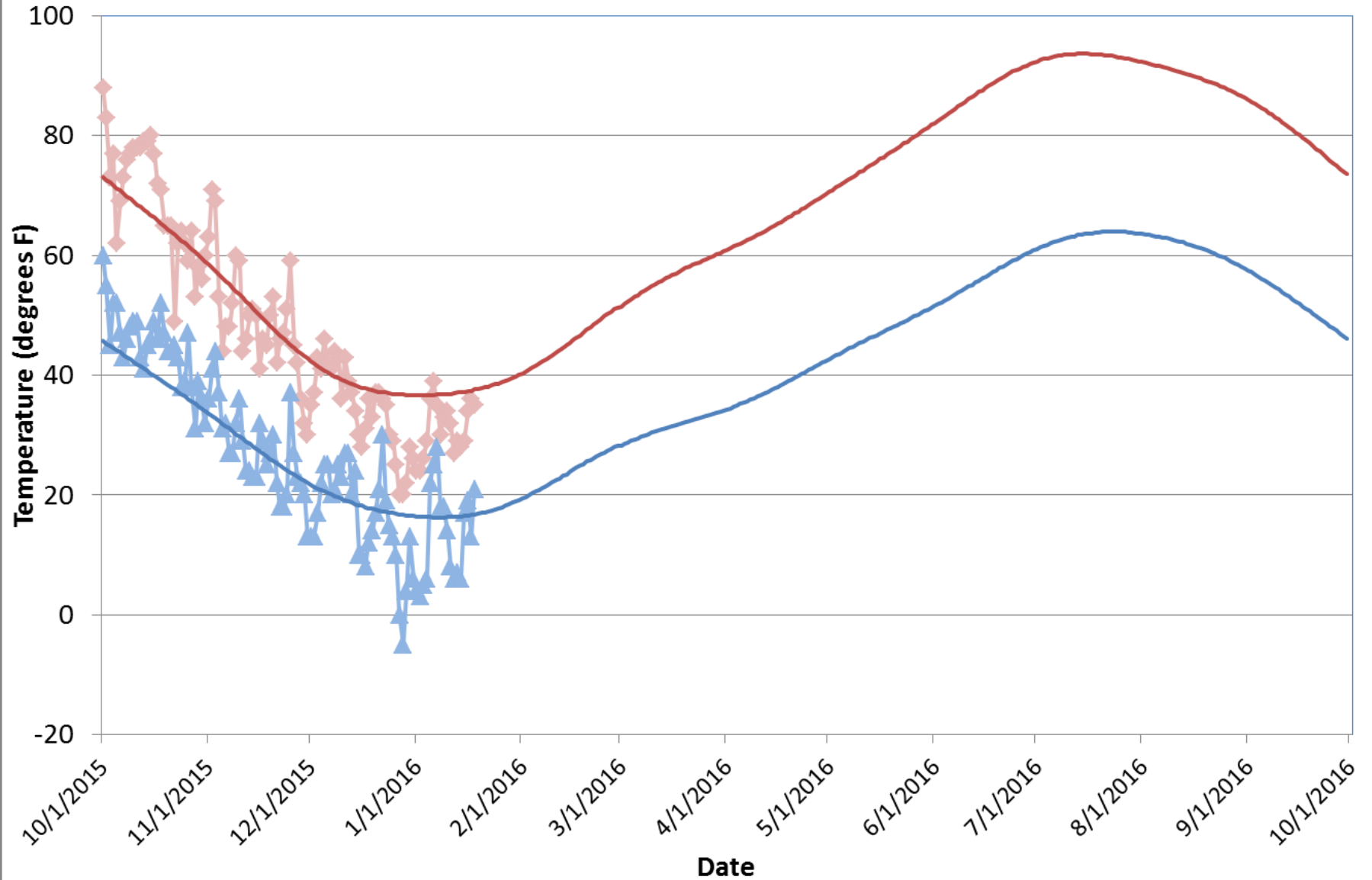
Max Temperature    Normal Max Temp    Min Temperature    Normal Min Temp





# Grand Junction Daily Max/Min Temperature with Normals, WY 2016

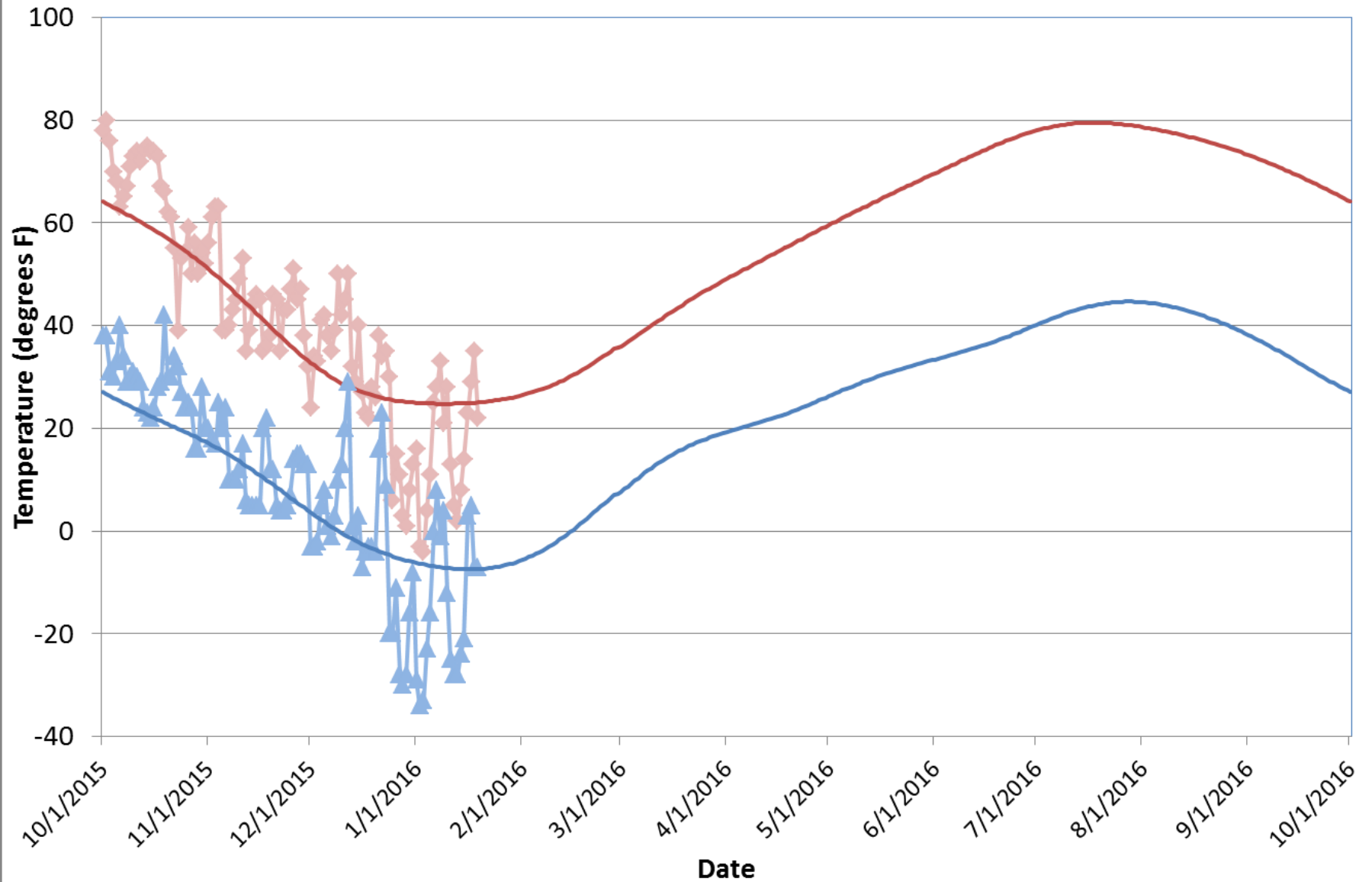
Max Temperature Normal Max Temp Min Temperature Normal Min Temp



# Gunnison Daily Max/Min Temperatures with Normals

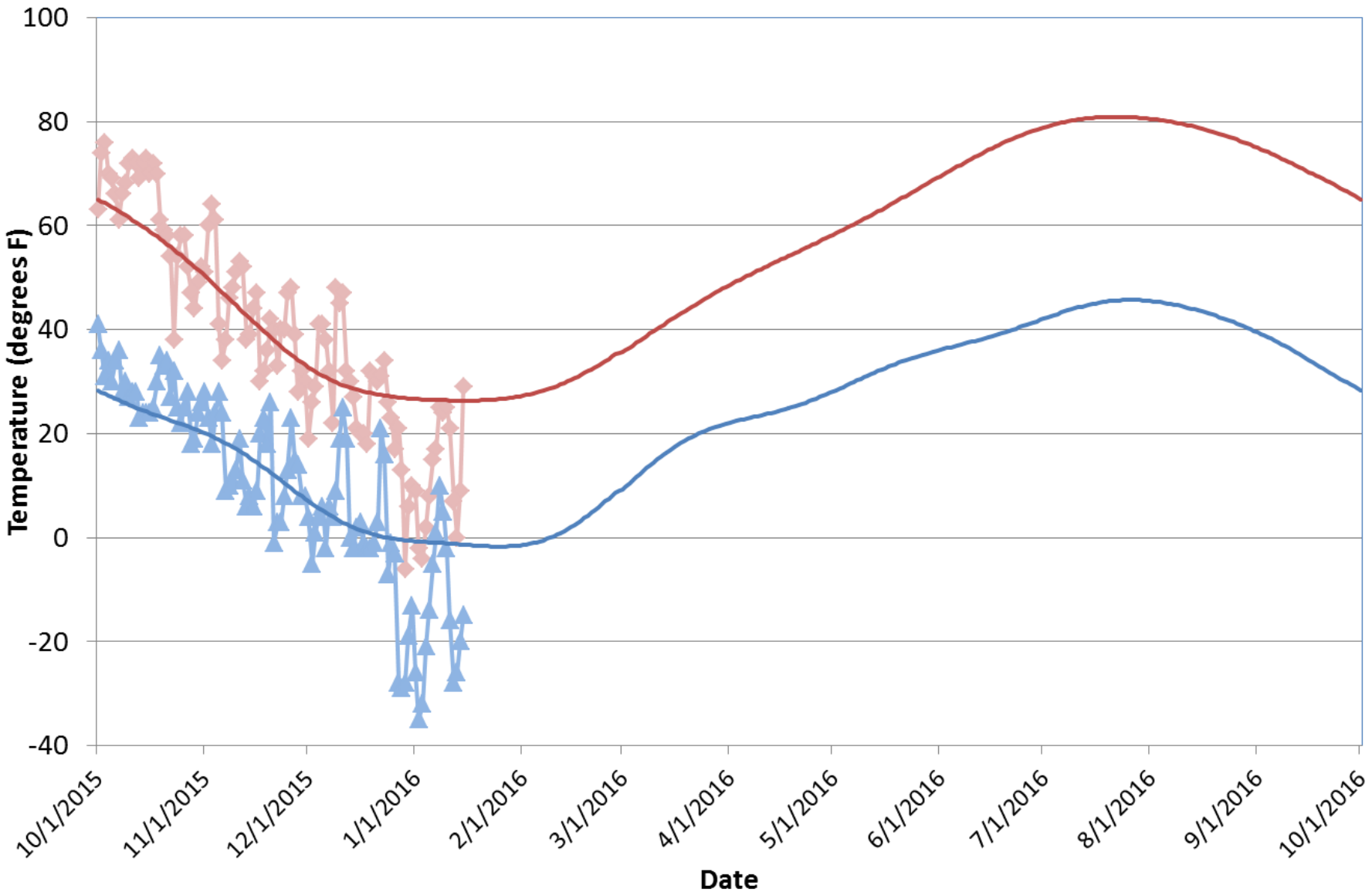
## Water Year 2016

MaxTemperature    MaxTemperatureNormal    MinTemperature    MinTemperatureNormal

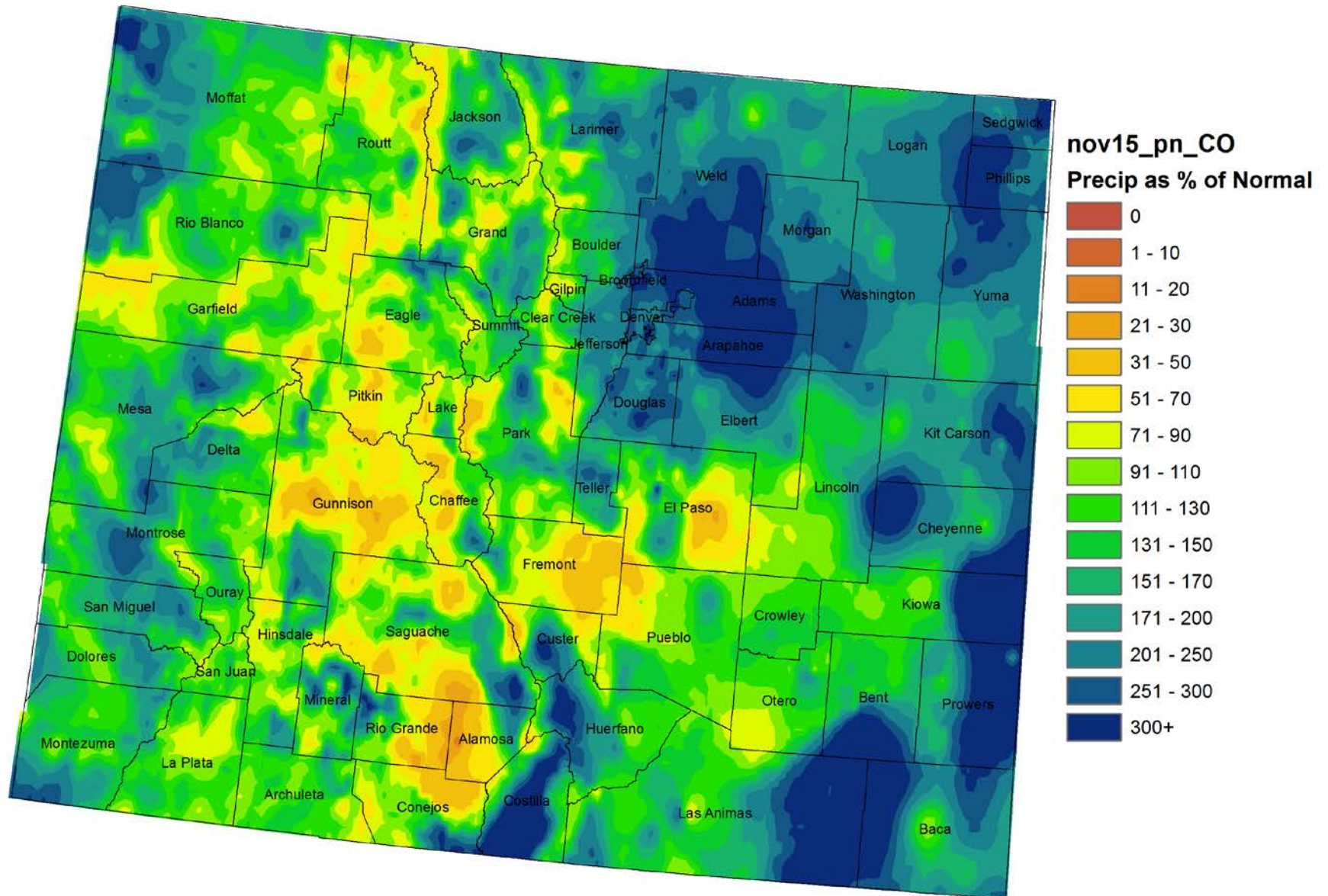


# Kremmling Daily Max/Min Temperature with Normals Water Year 2016

MaxTemperature    MaxTemperatureNormal    MinTemperature    MinTemperatureNormal



# Colorado November 2015 Precipitation as a Percentage of Normal



# Nov 2015 Statewide Precipitation

## Colorado, Precipitation, November

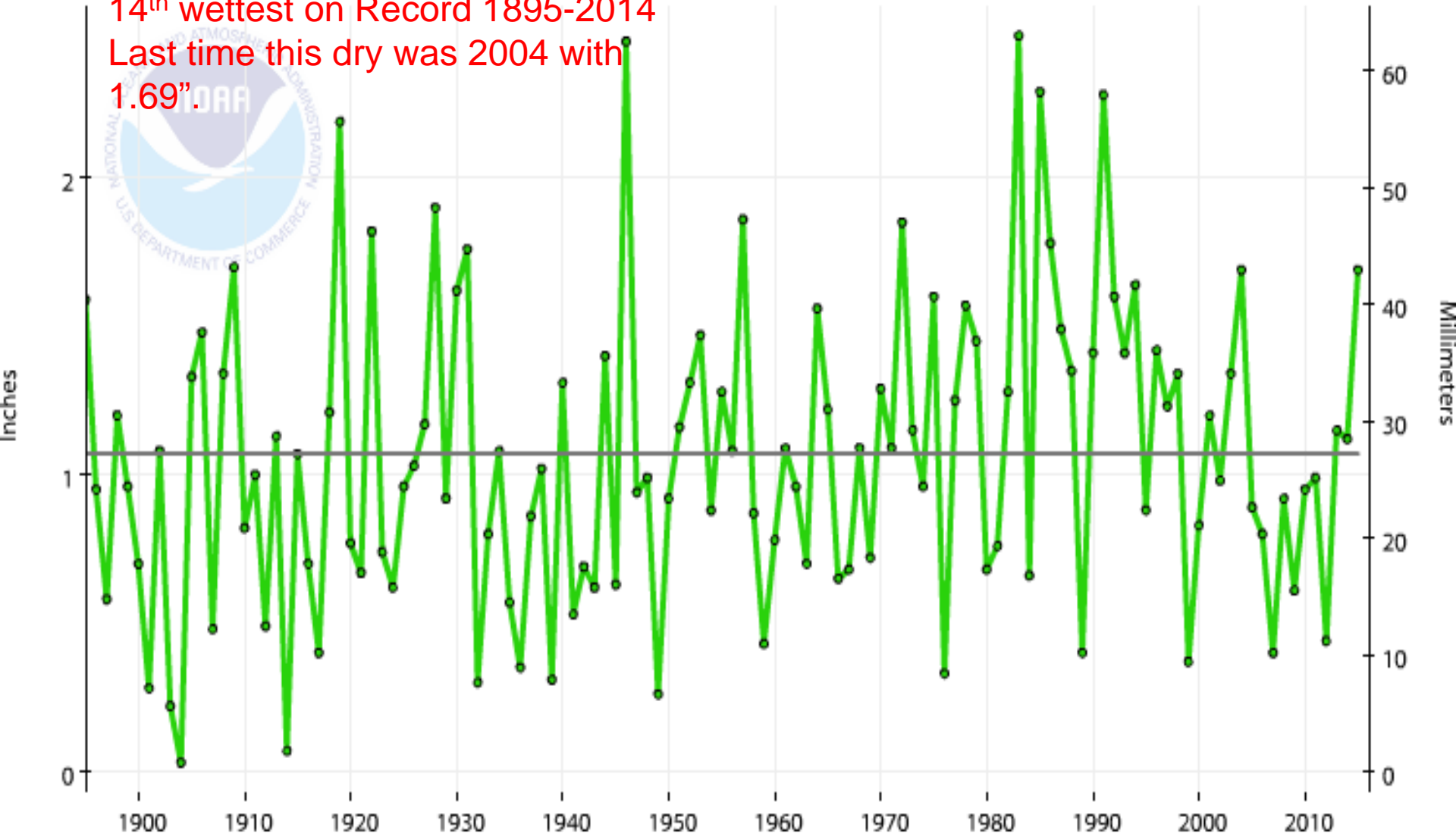
1.69" (+0.62")

14<sup>th</sup> wettest on Record 1895-2014

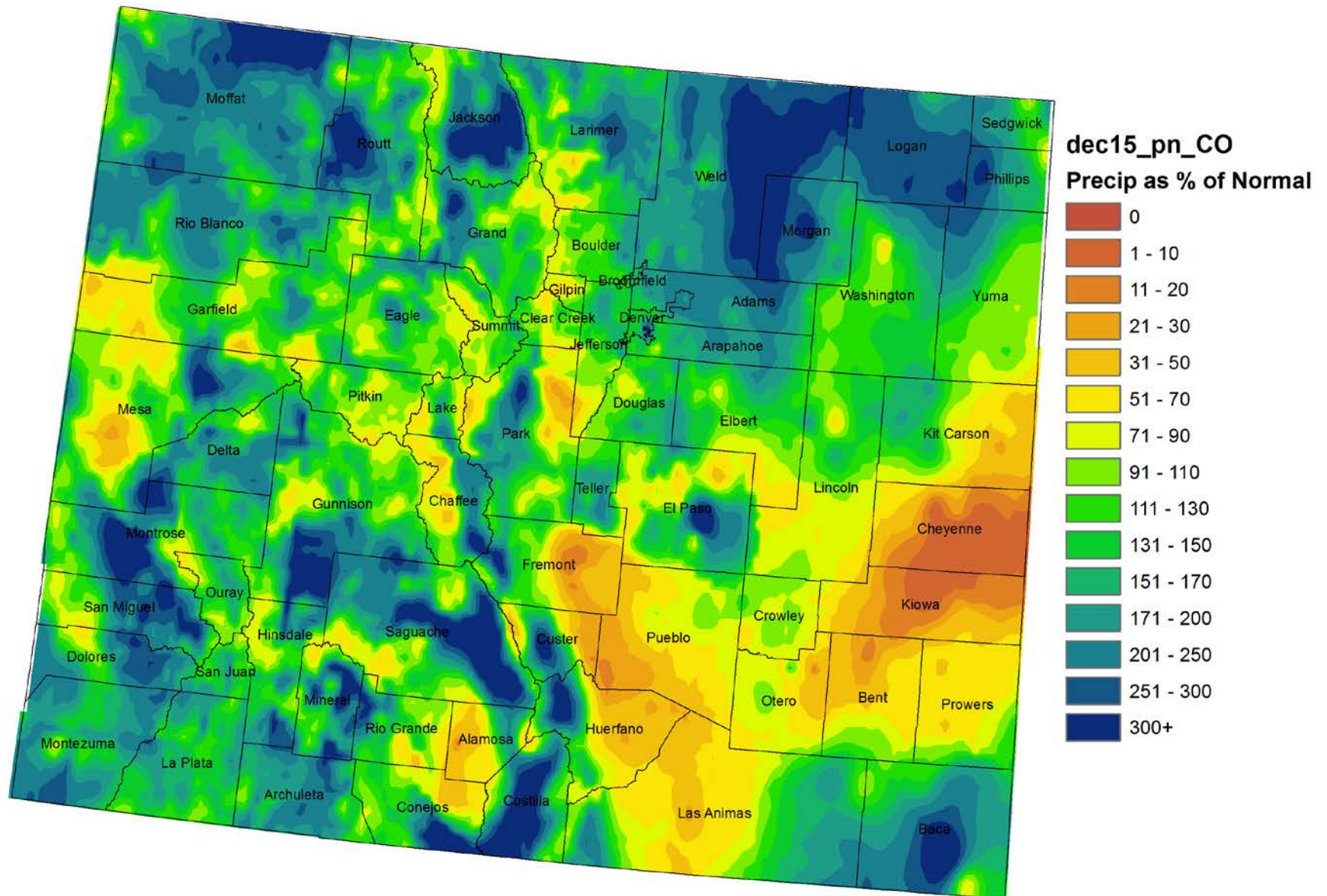
Last time this dry was 2004 with

1.69".

— 1895-2000  
Avg: 1.07"      —●— Precip



# Colorado December 2015 Precipitation as a Percentage of Normal



# Dec 2015 Statewide Precipitation

## Colorado, Precipitation, December

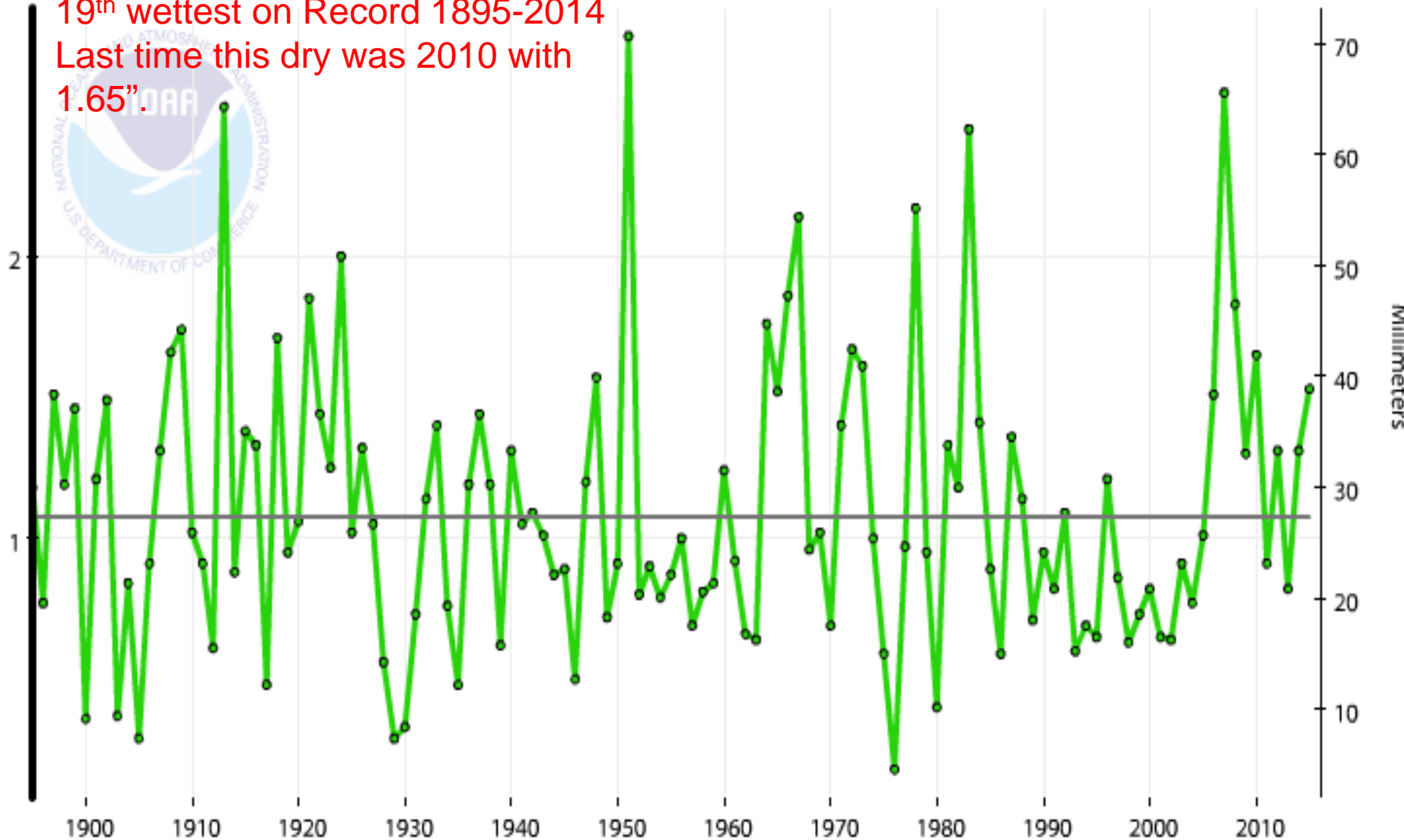
— 1895-2000 Avg: 1.08"      —●— Precip

1.53" (+0.45")

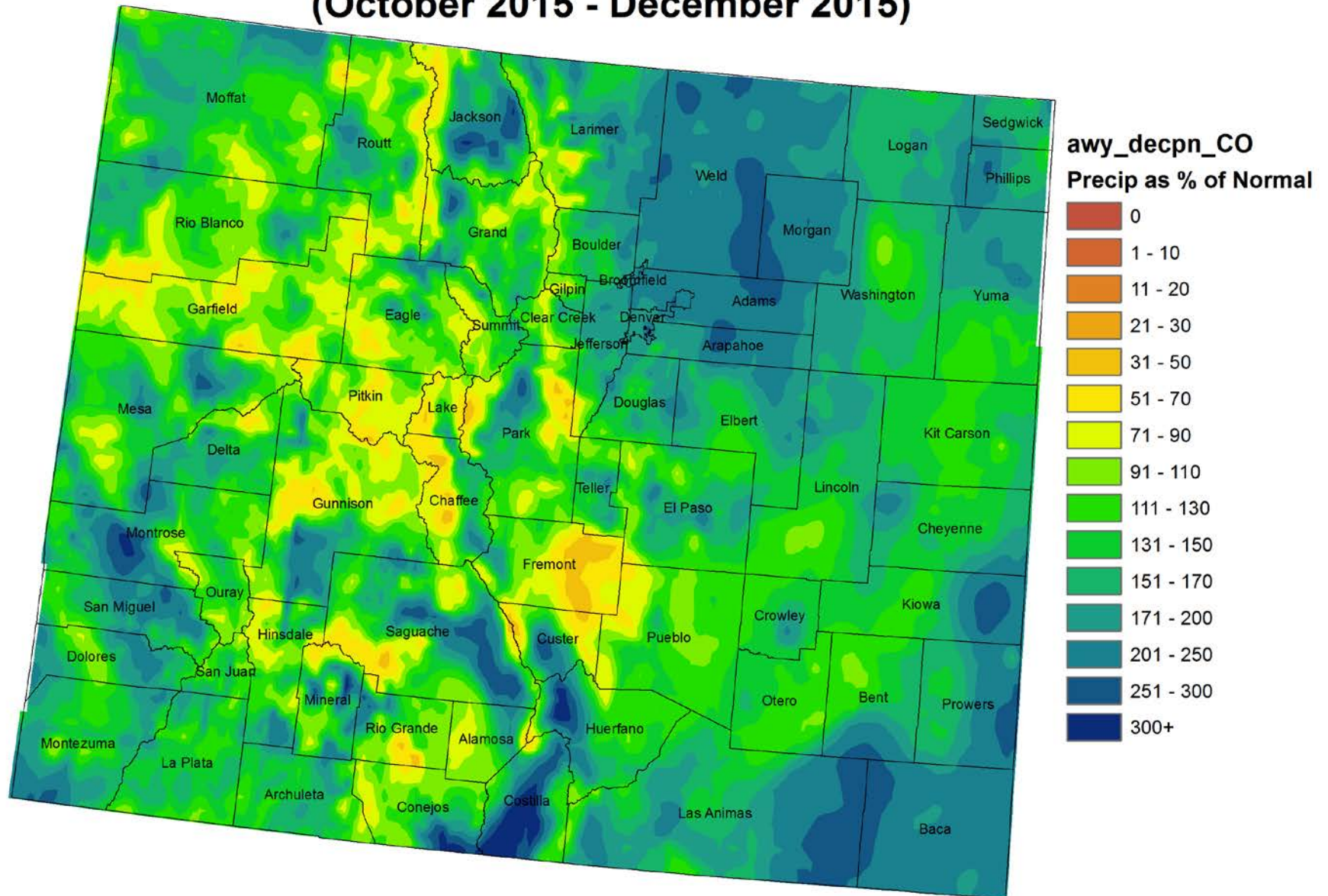
19<sup>th</sup> wettest on Record 1895-2014

Last time this dry was 2010 with

1.65"

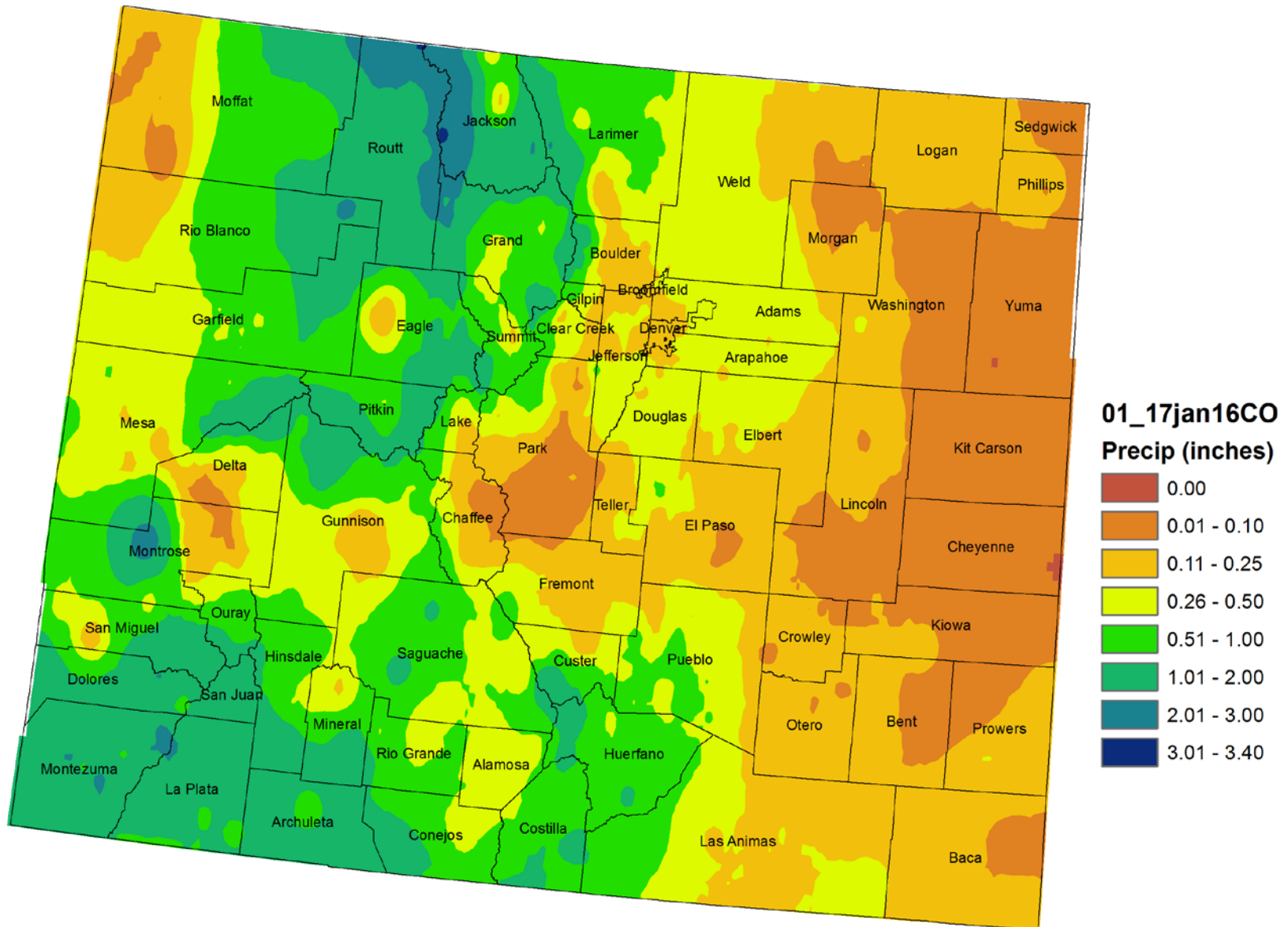


# Colorado Water Year 2016 Precipitation as a Percentage of Normal (October 2015 - December 2015)

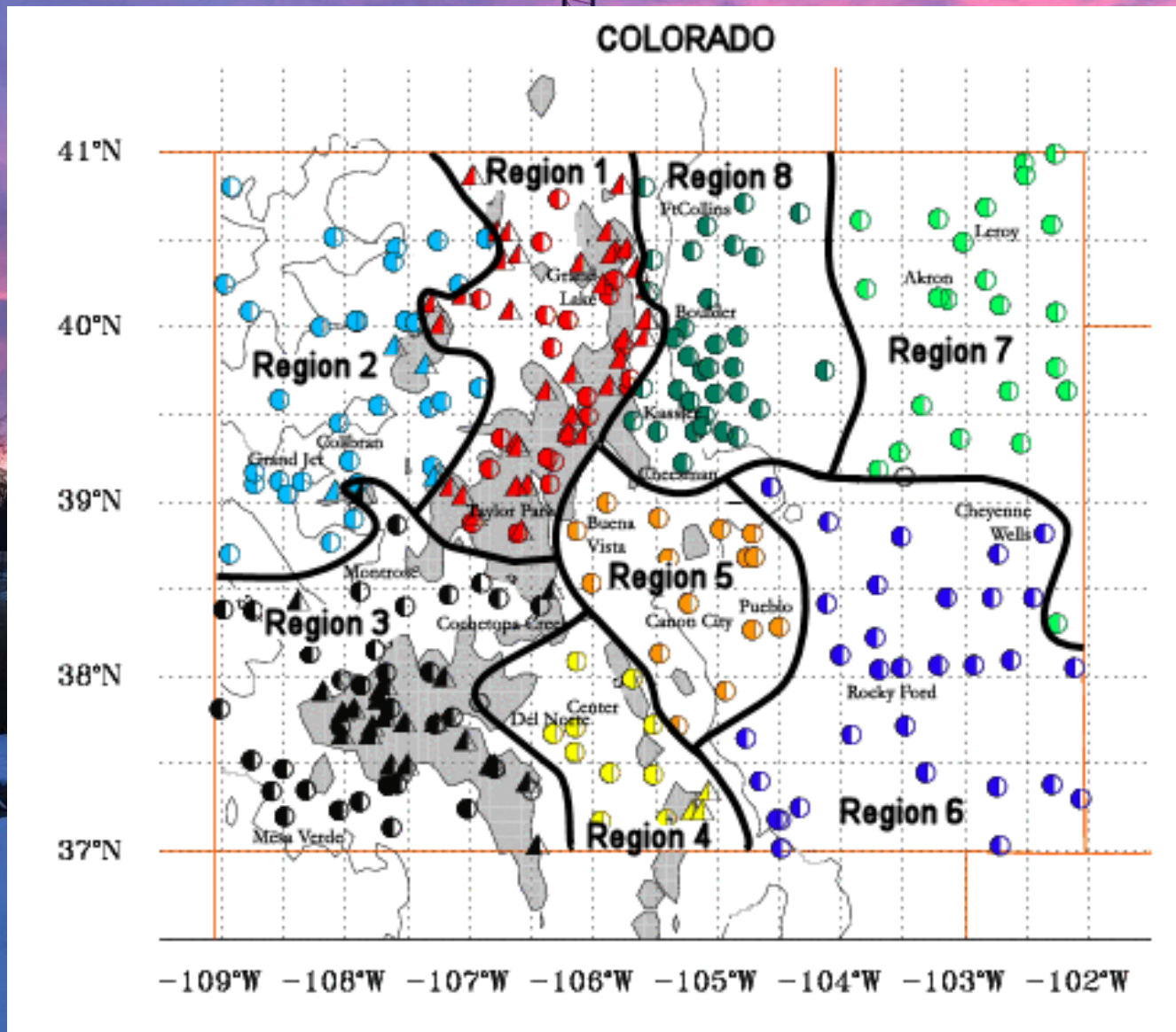




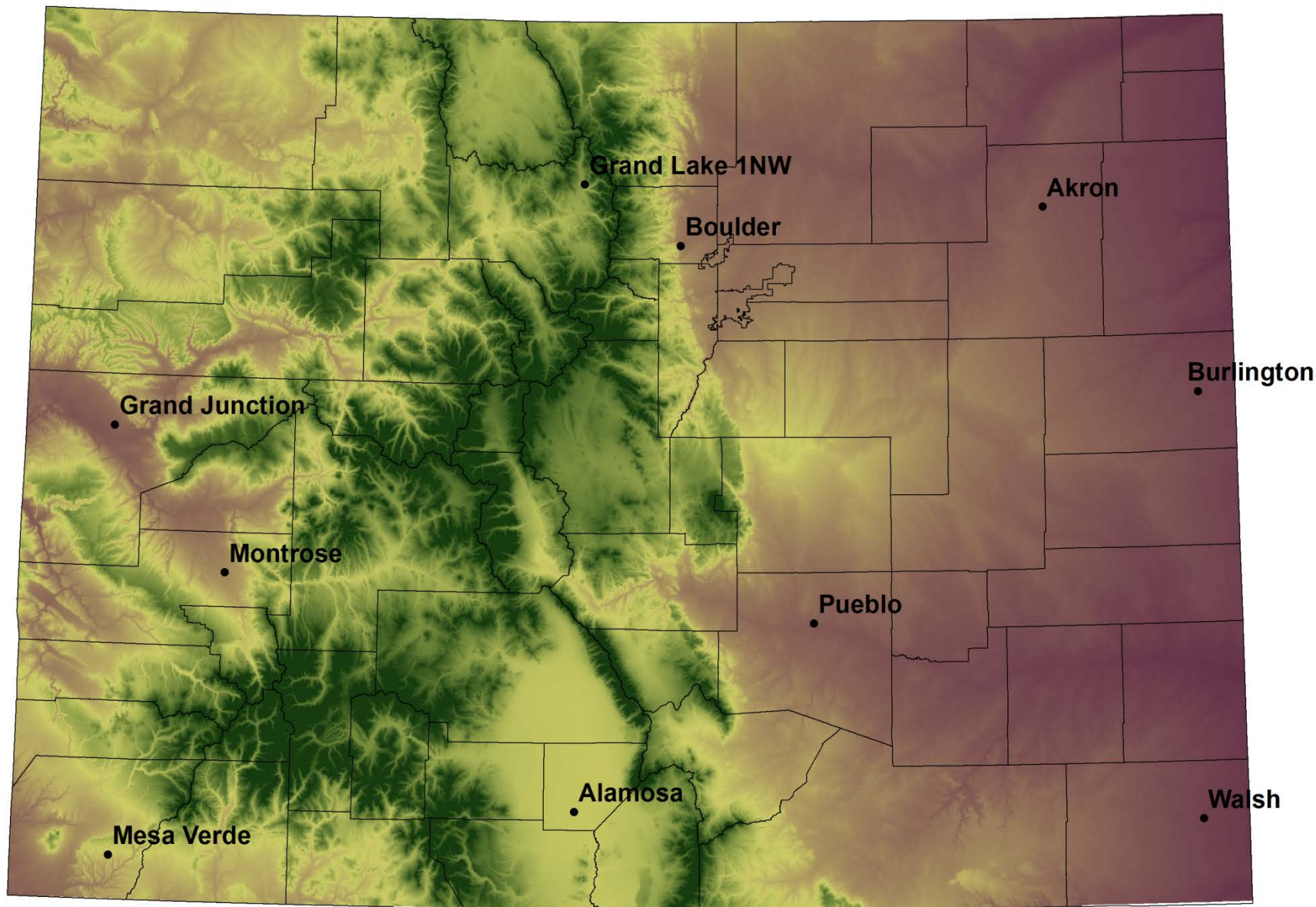
# Colorado Month to Date Precipitation 1 - 17 January 2016



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

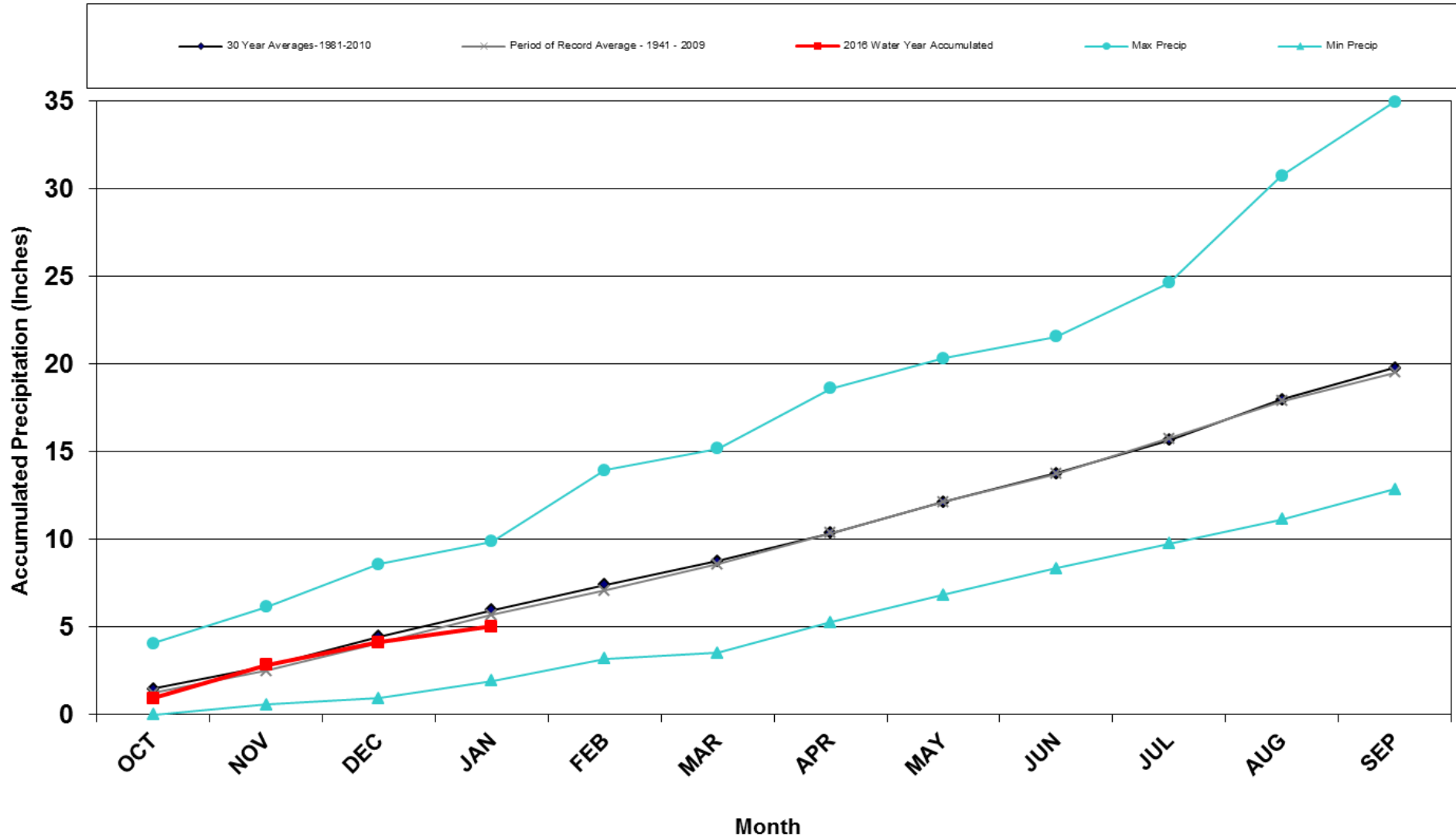


# NWS Cooperative Stations for WATF



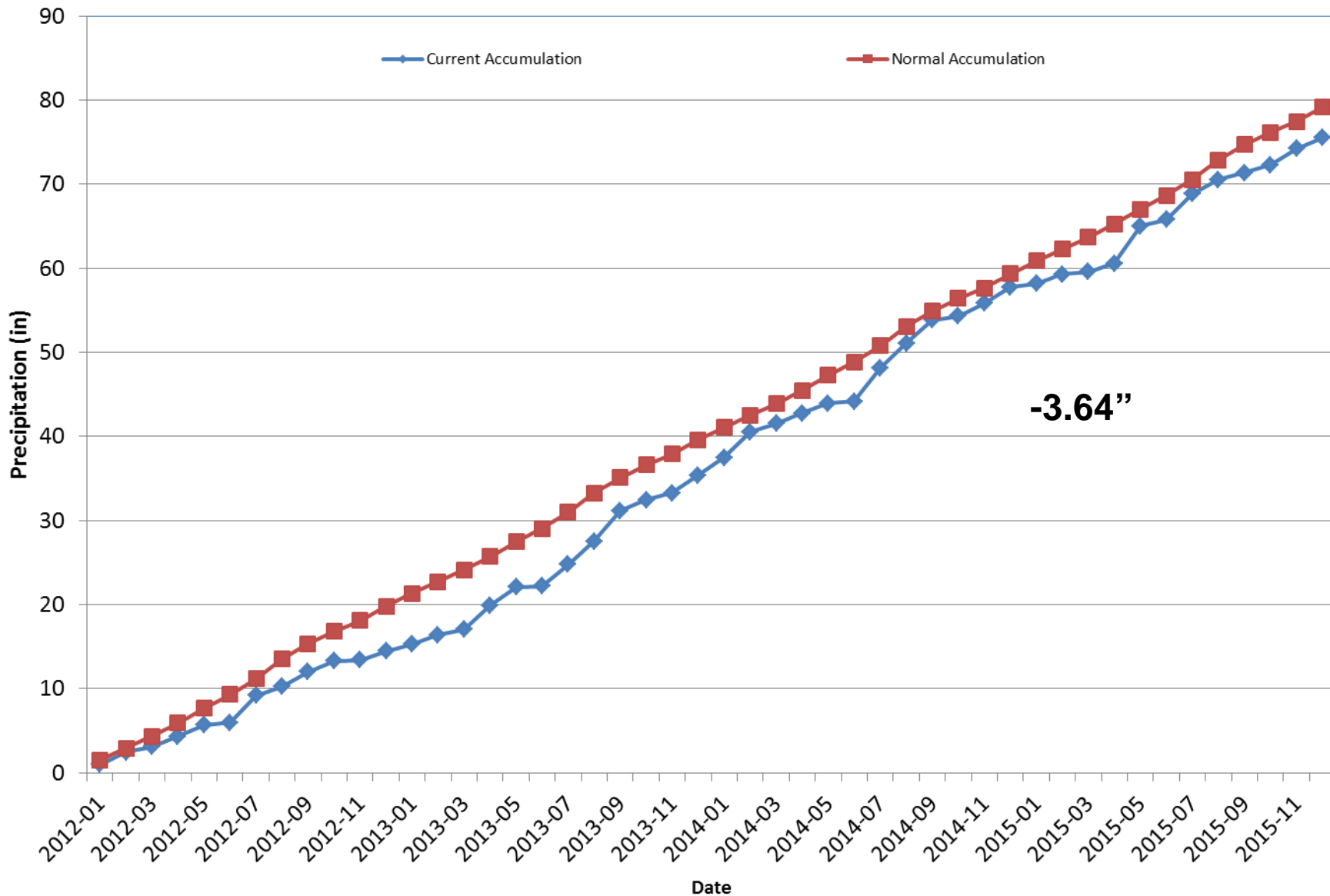
# Division 1 – Grand Lake 1NW

## Grand Lake 1 NW 2016 Water Year



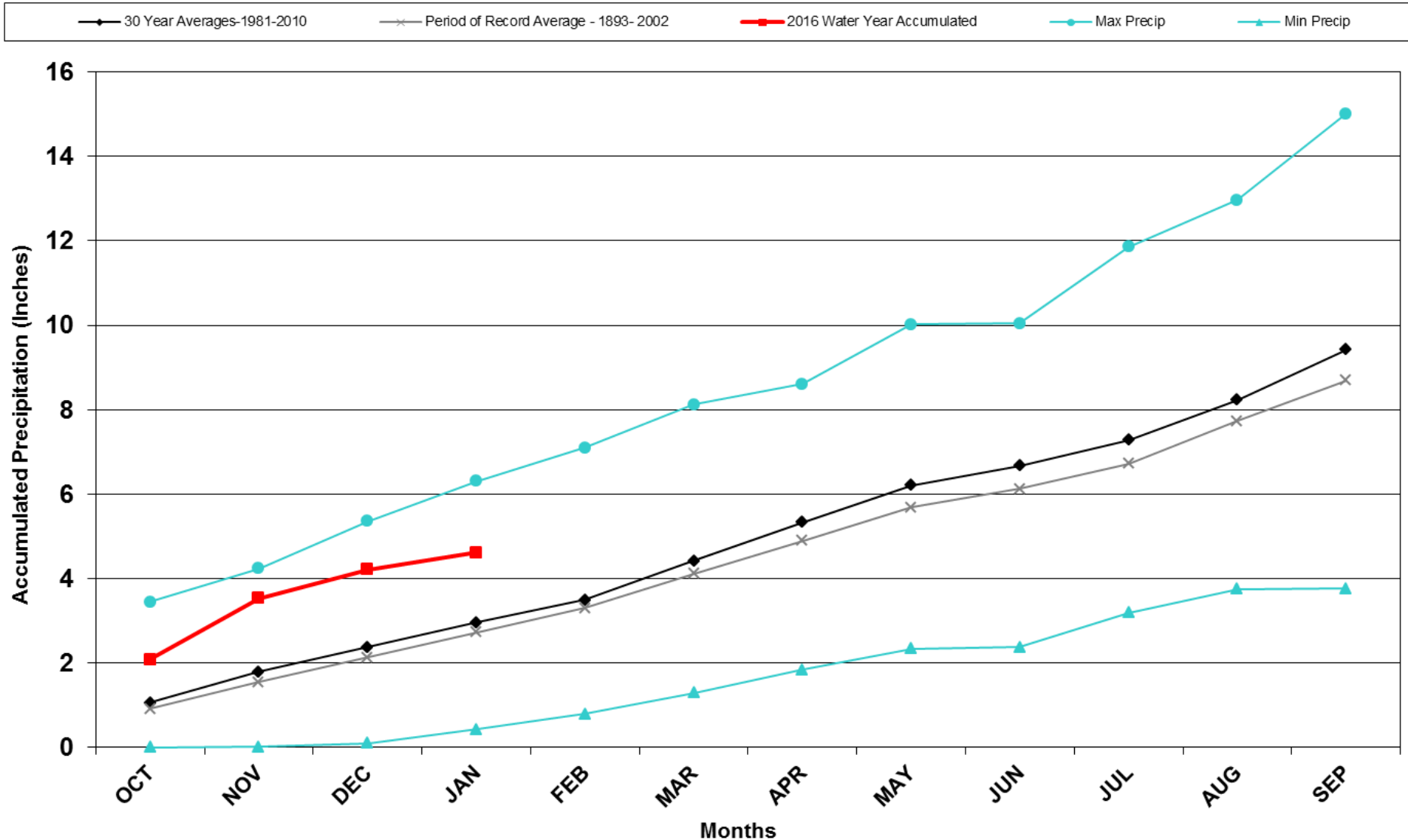
# Division 1 – Grand Lake 1NW

## Grand Lake 1NW Precipitation Accumulation



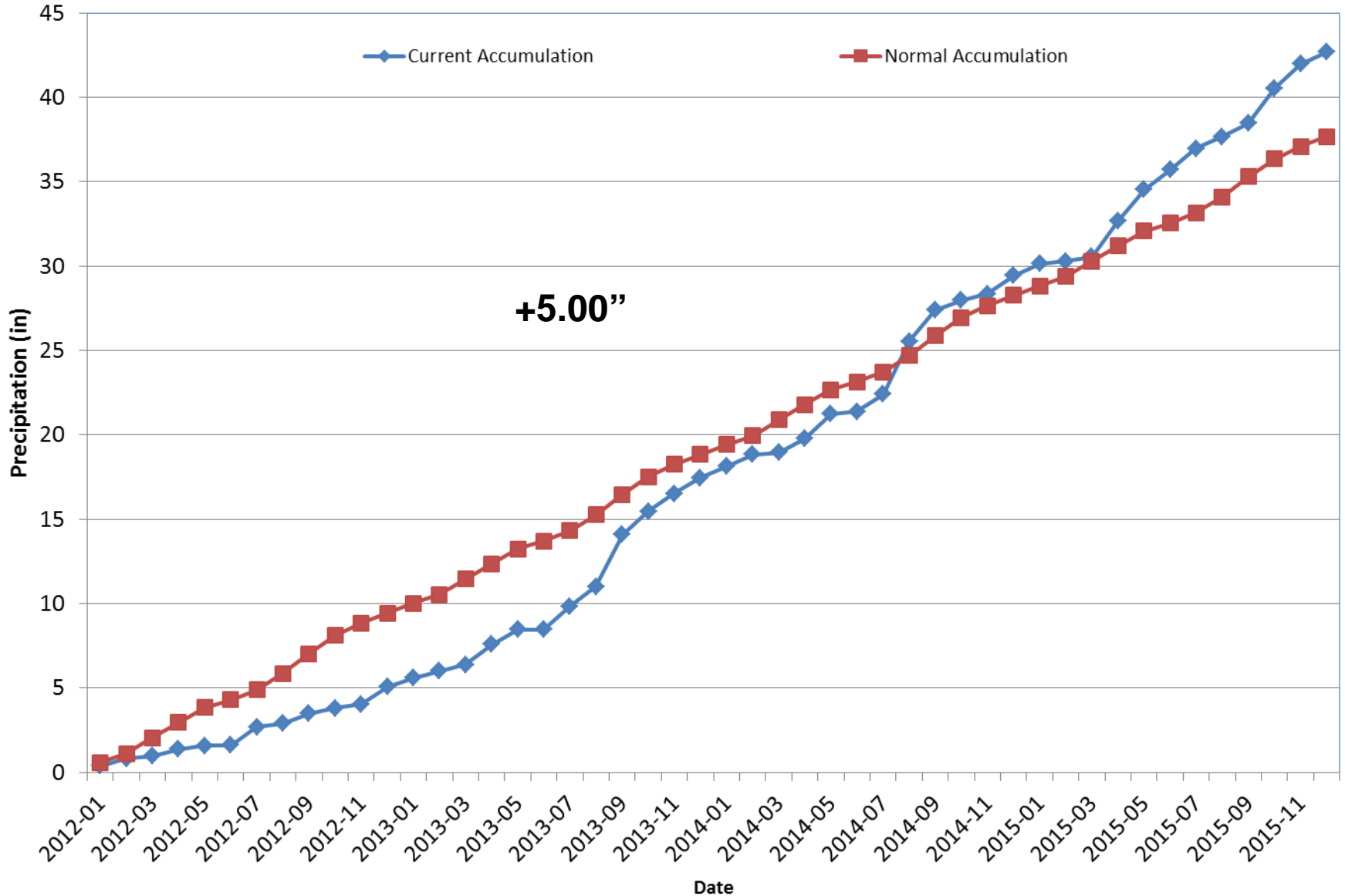
# Division 2 – Grand Junction

## Grand Junction WSFO 2016 Water Year



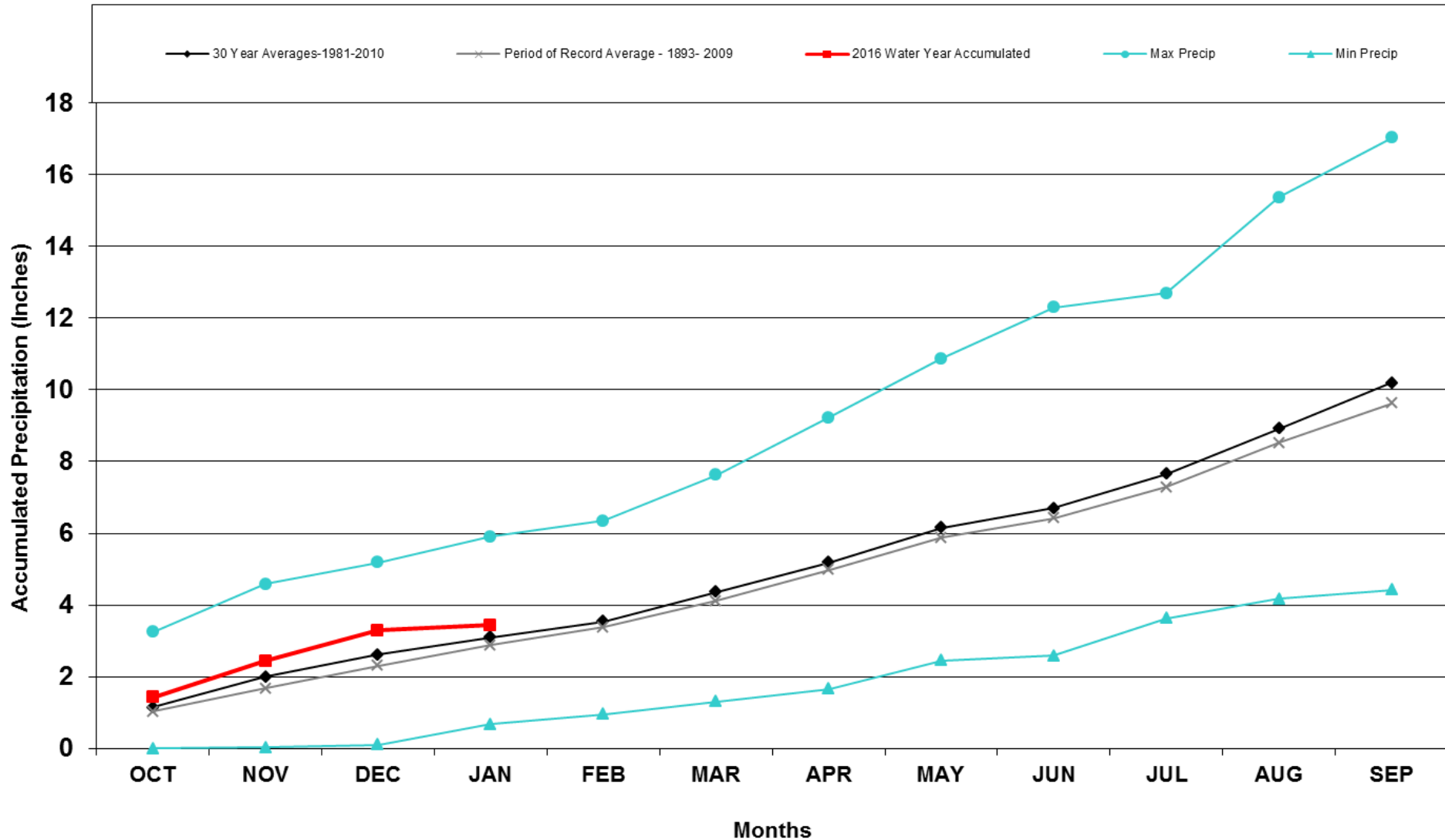
# Division 2 – Grand Junction

## Grand Junction Precipitation Accumulation



# Division 3 – Montrose

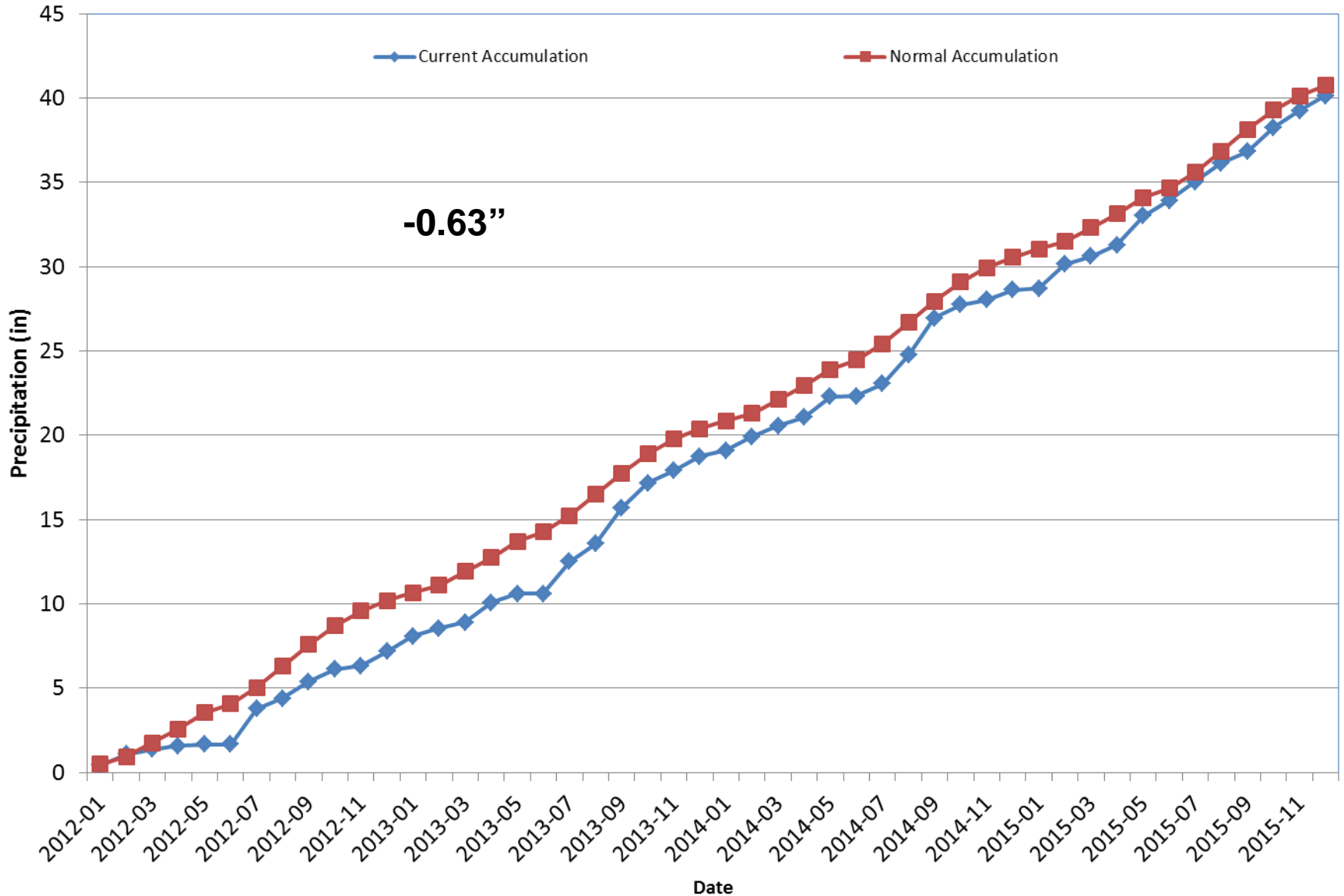
## Montrose #2 2016 Water Year





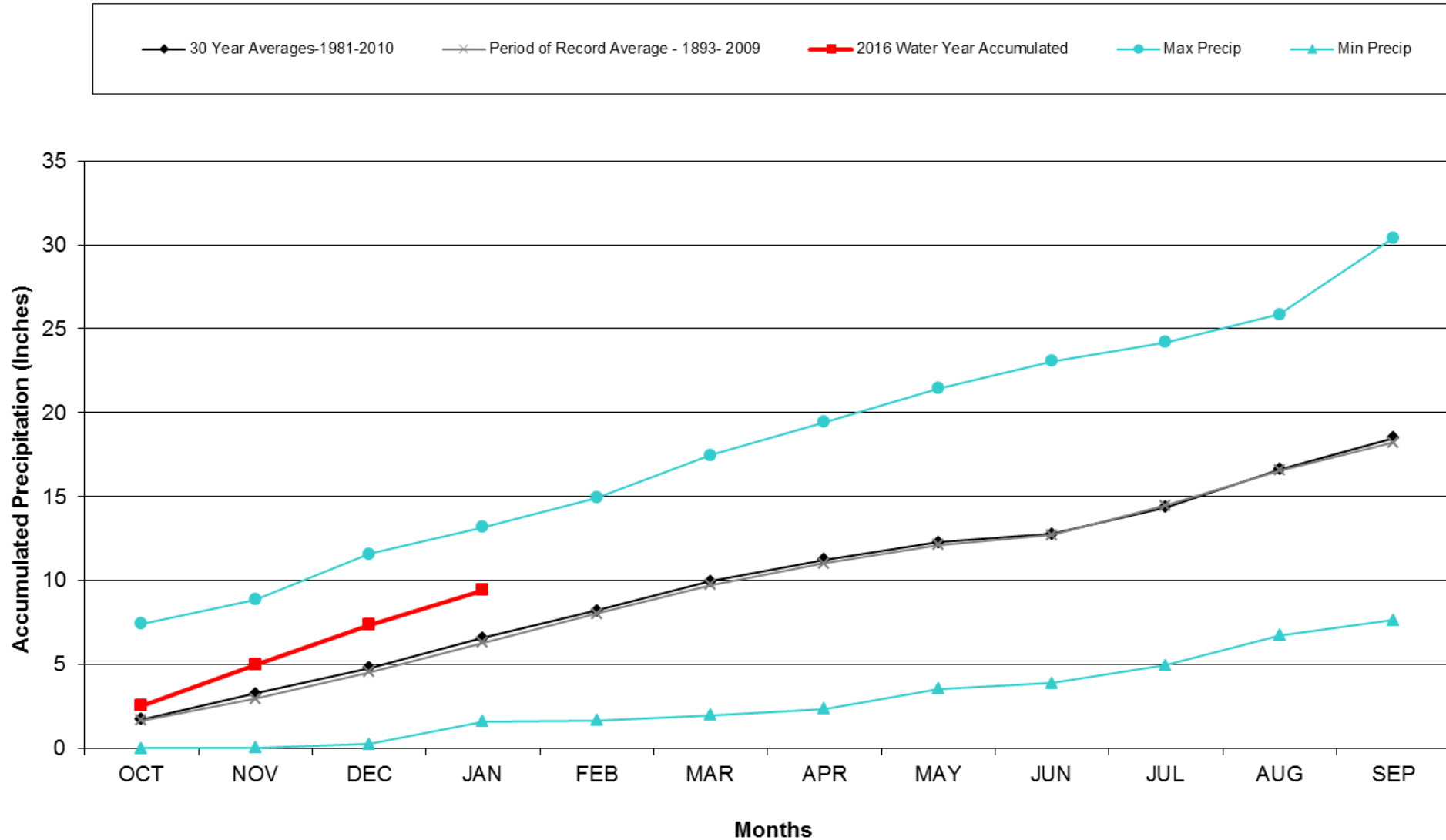
# Division 3 – Montrose

## Montrose #2 Precipitation Accumulation



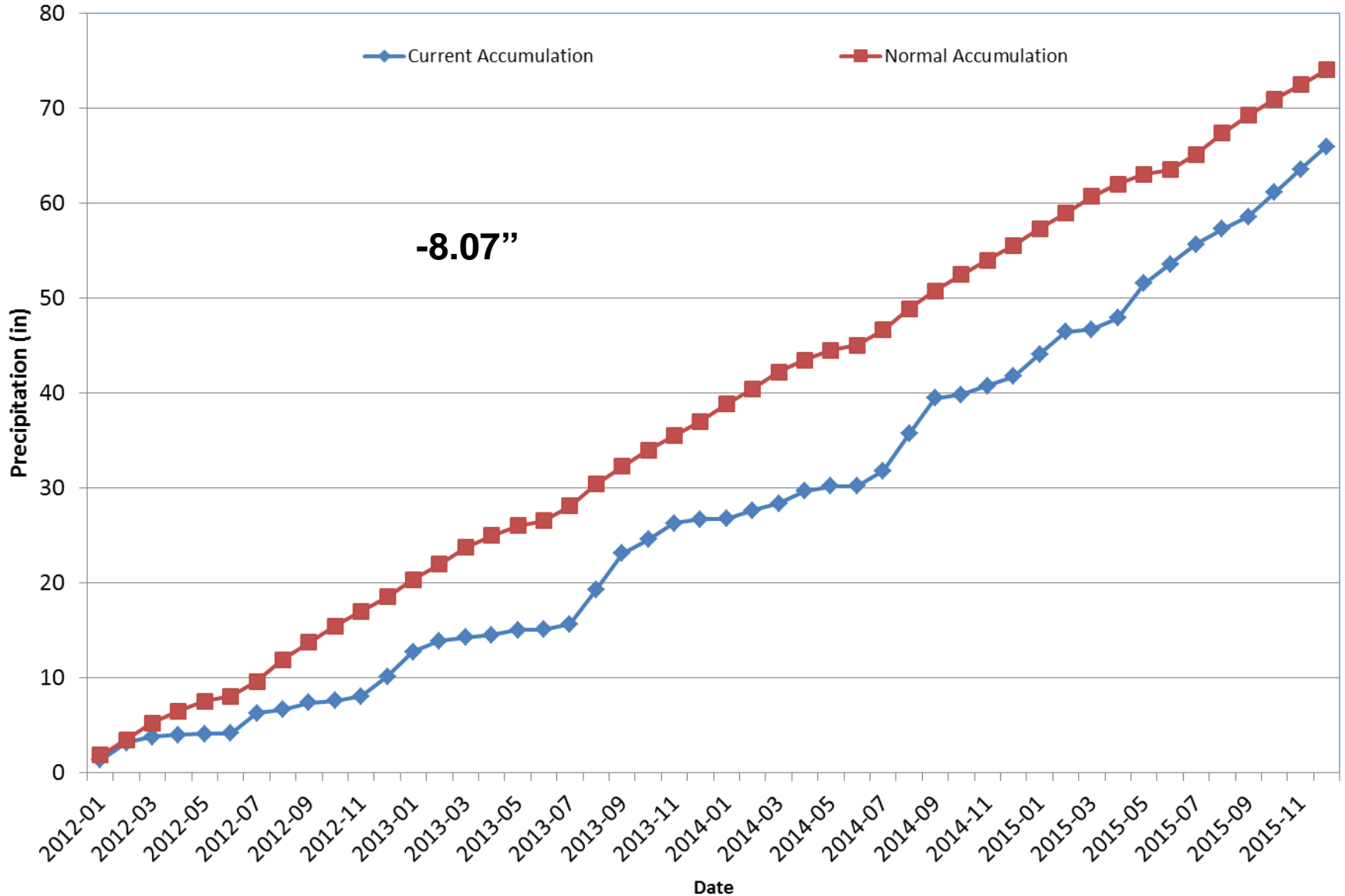
# Division 3 – Mesa Verde NP

## Mesa Verde NP 2016 Water Year



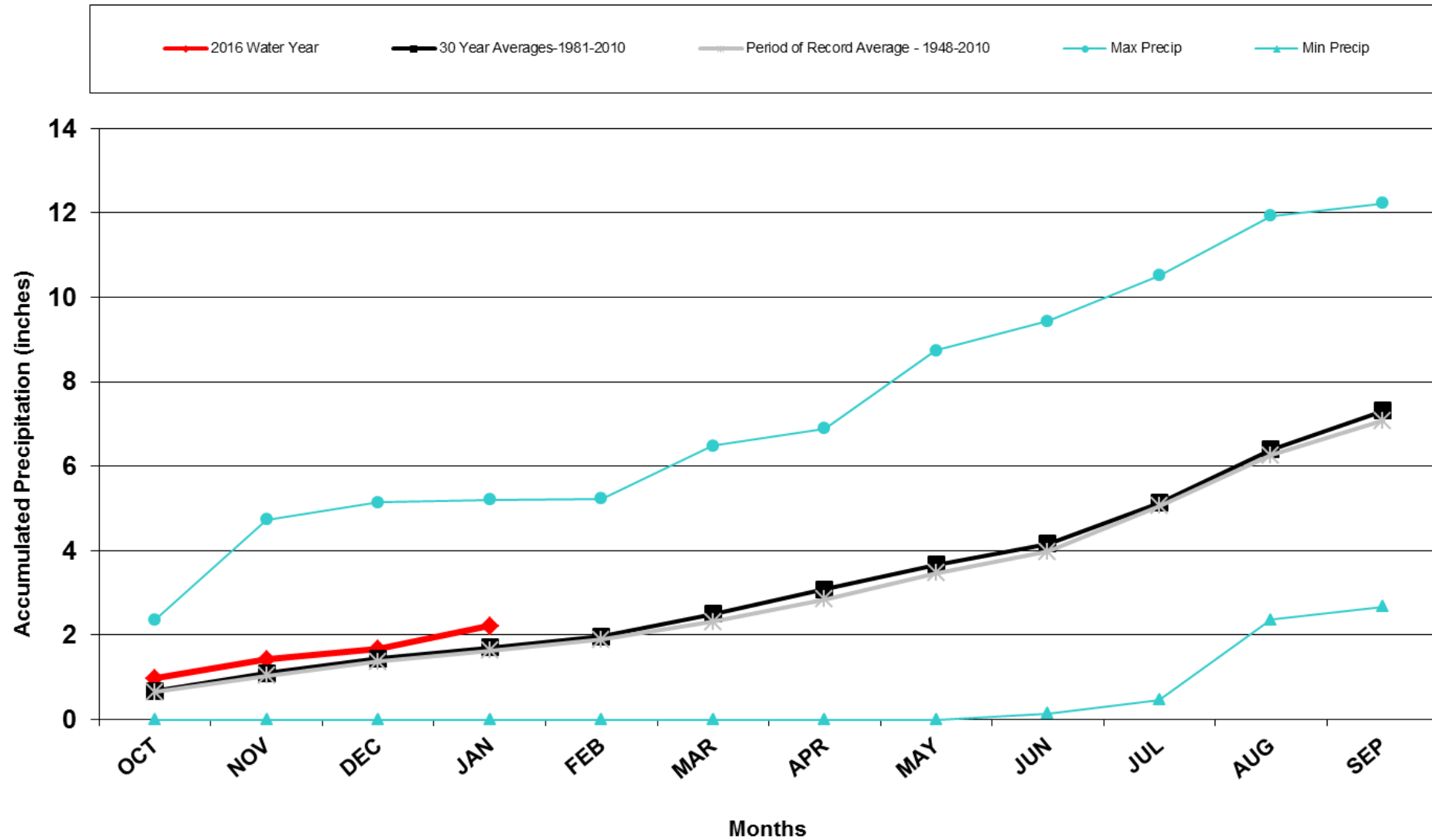
# Division 3 – Mesa Verde NP

## Mesa Verde NP Precipitation Accumulation



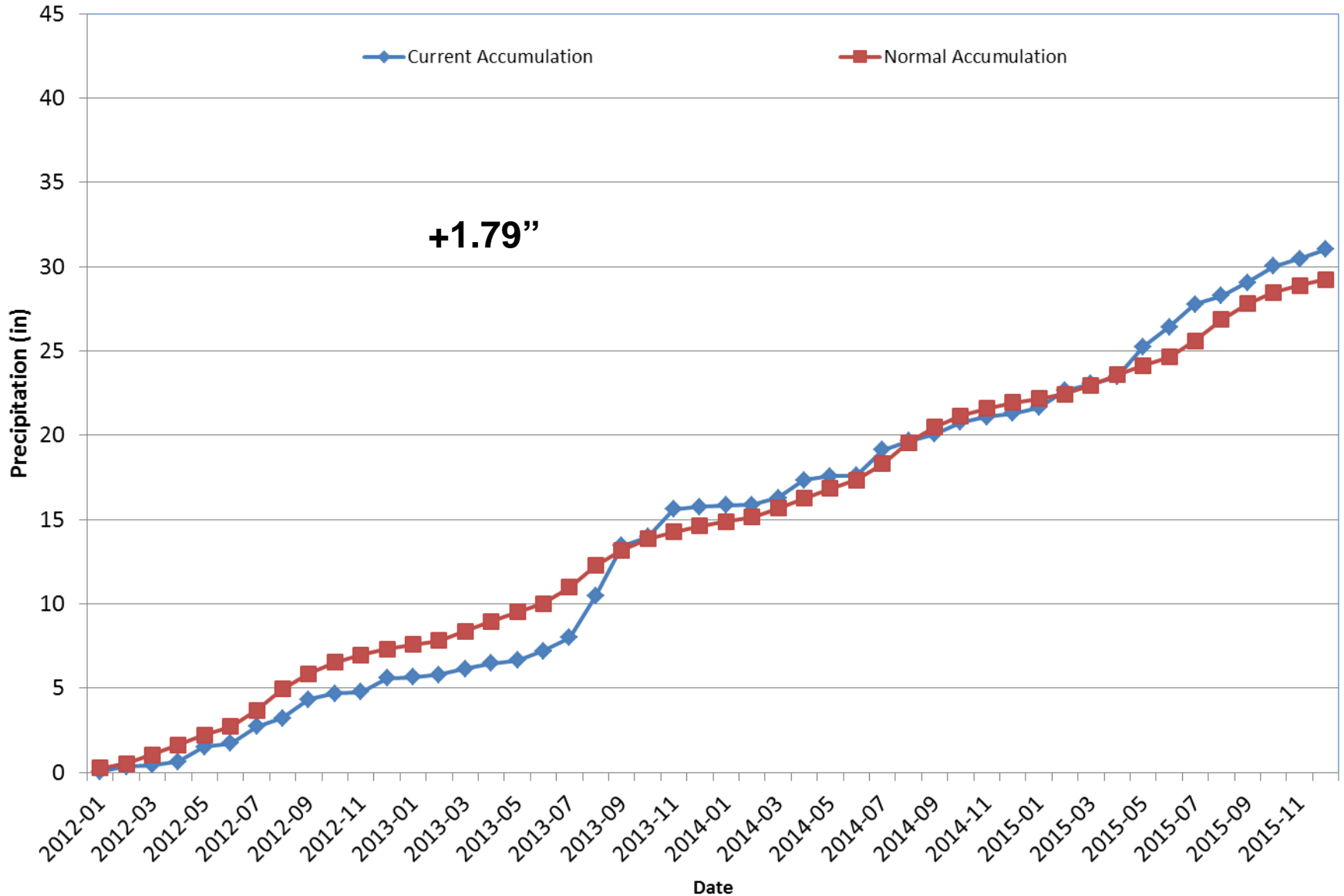
# Division 4 – Alamosa

## Alamosa WSO 2016 Water Year



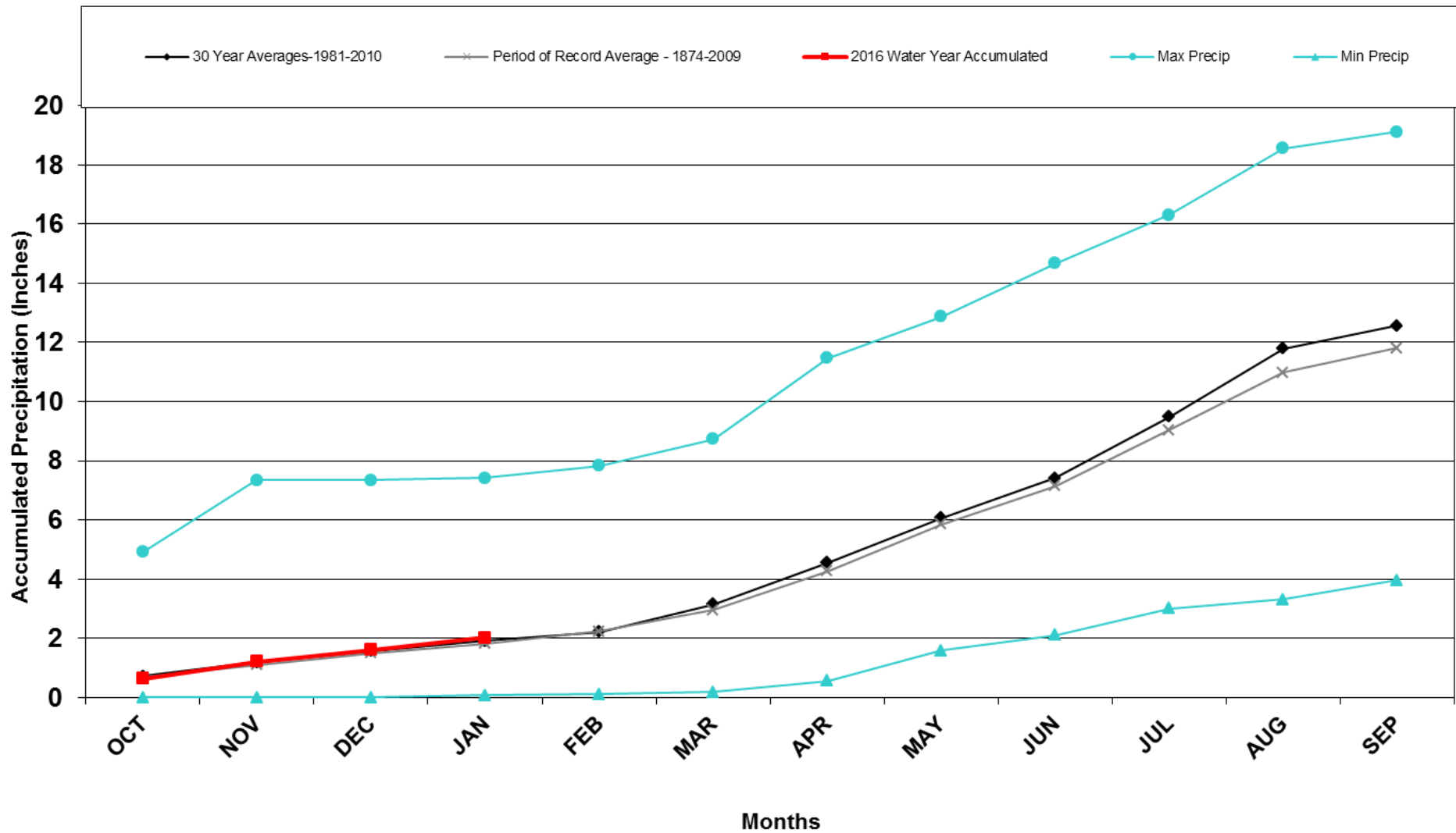
# Division 4 – Alamosa

## Alamosa WSO Precipitation Accumulation



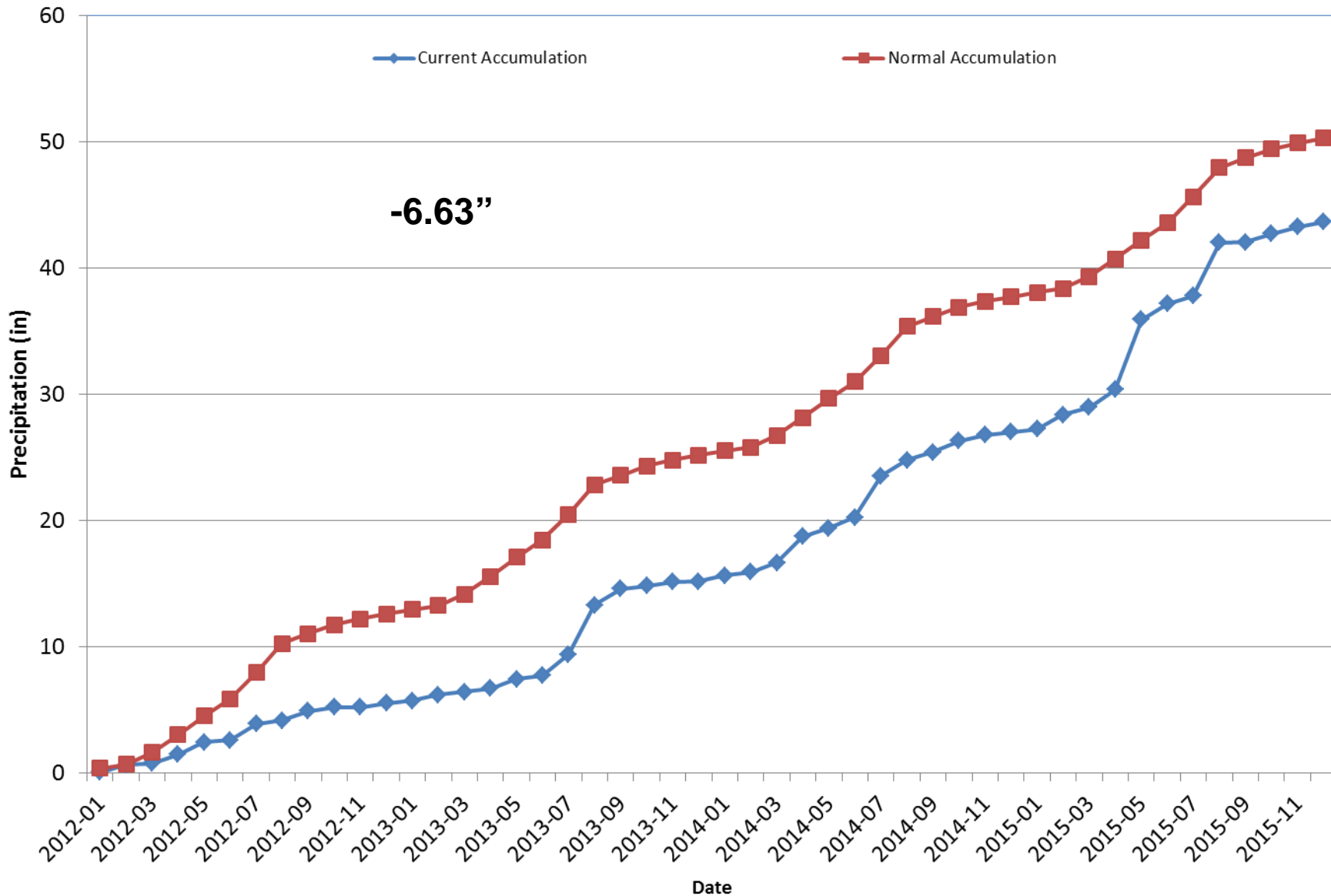
# Division 5 – Pueblo

## Pueblo WSO 2016 Water Year



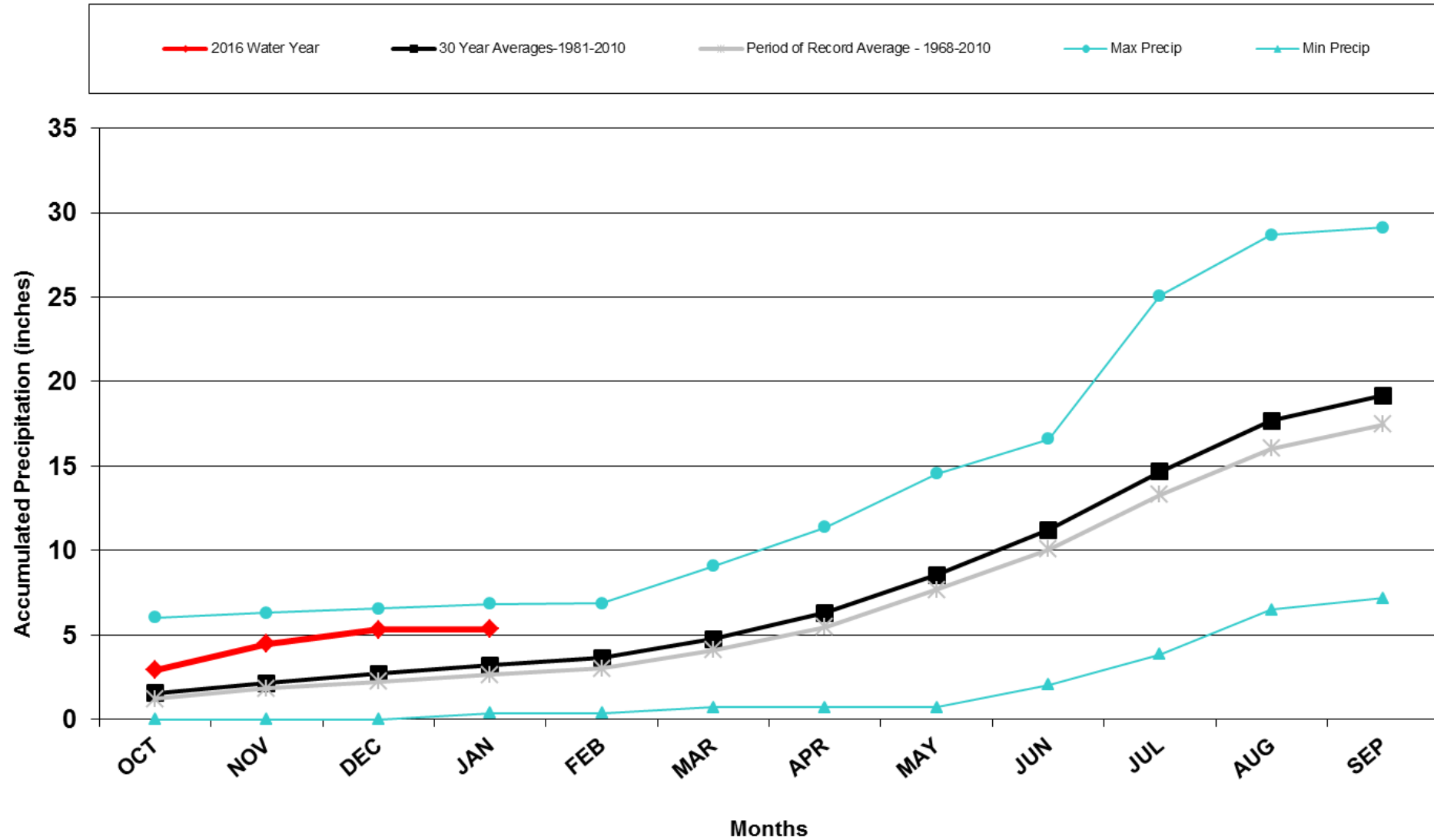
# Division 5 – Pueblo

## Pueblo Memorial AP Precipitation Accumulation



# Division 6 - Walsh

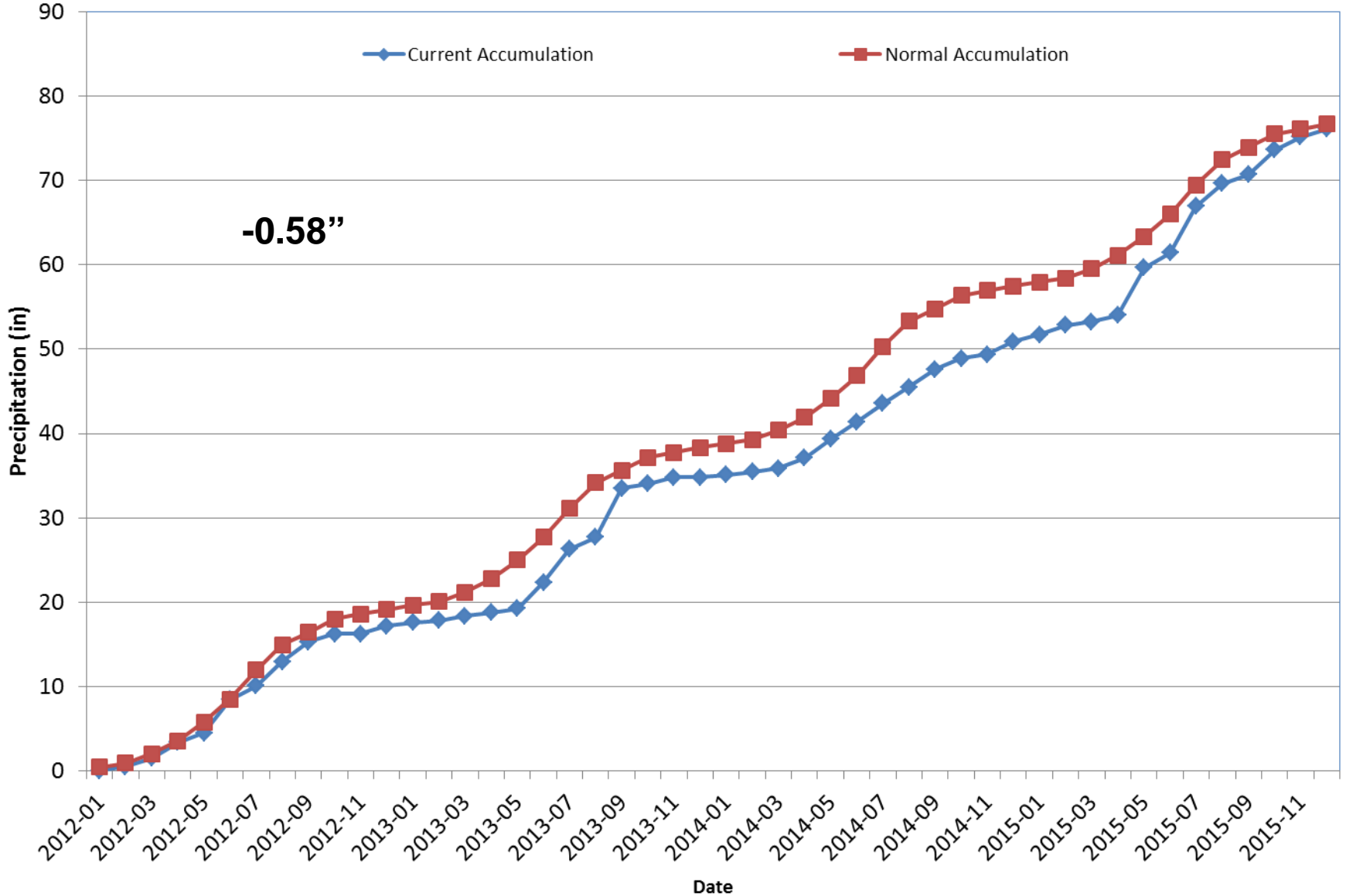
## Walsh 2016 Water Year





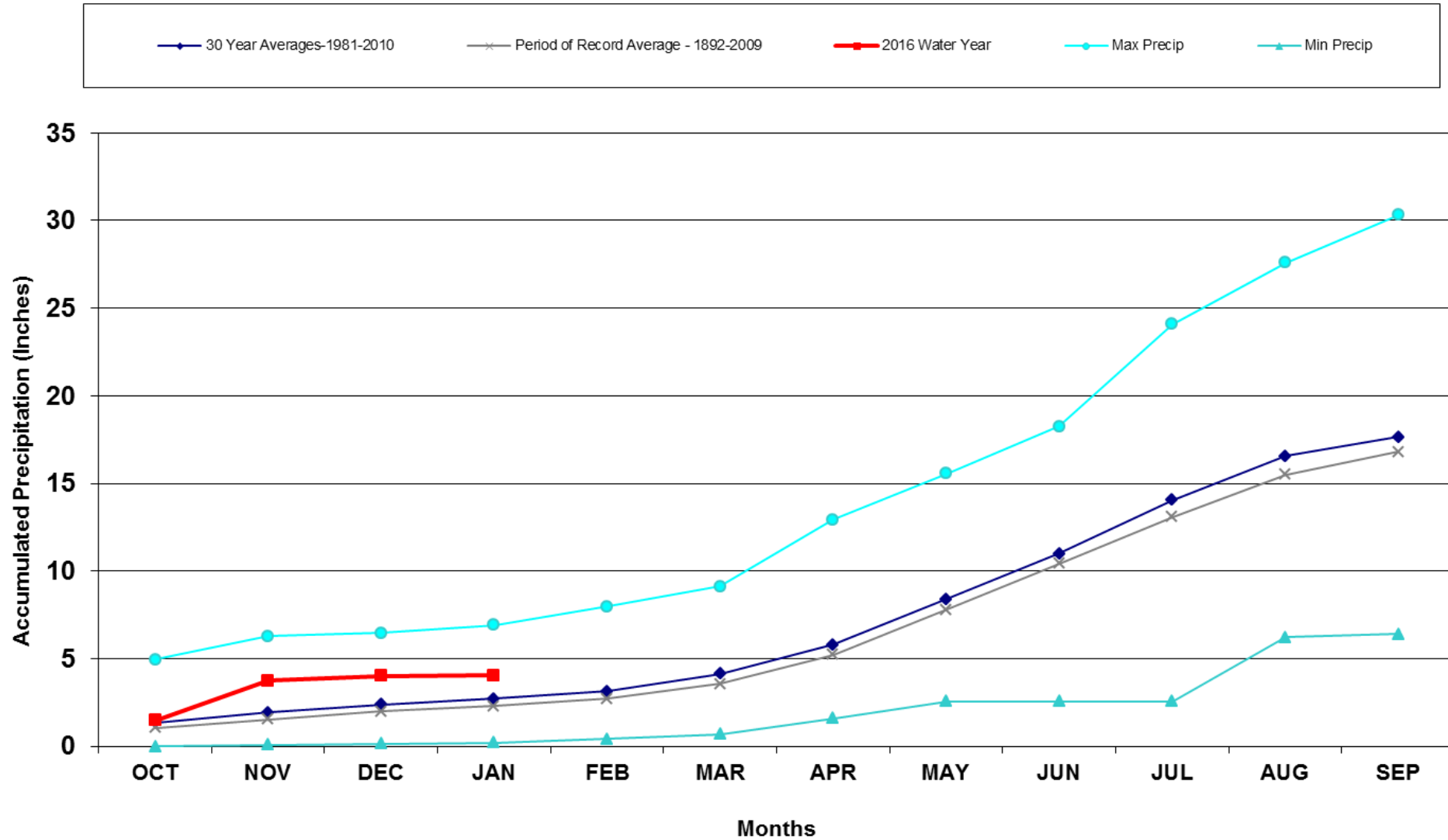
# Division 6 - Walsh

## Walsh 1W Precipitation Accumulation



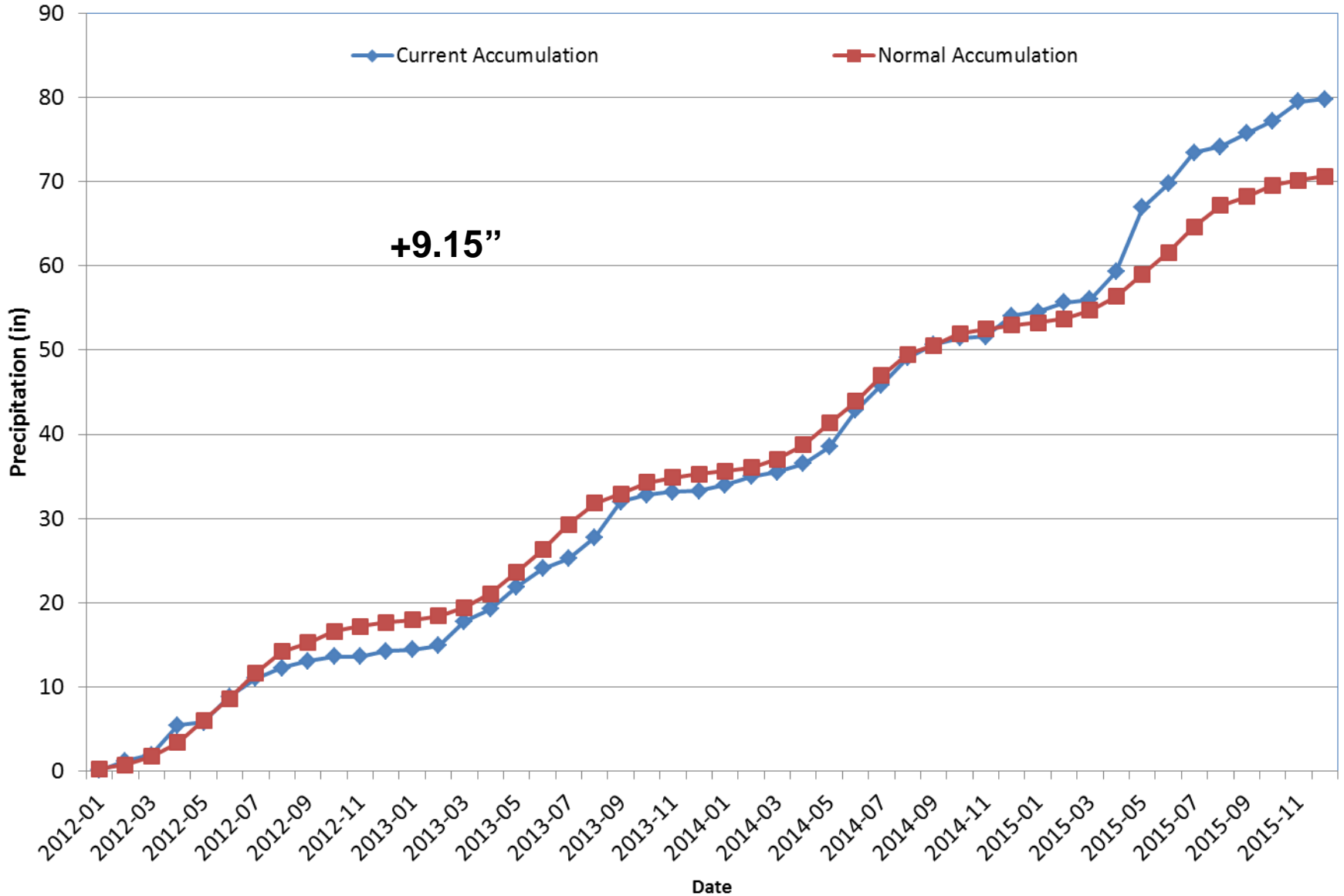
# Division 6 - Burlington

## Burlington 2016 Water Year



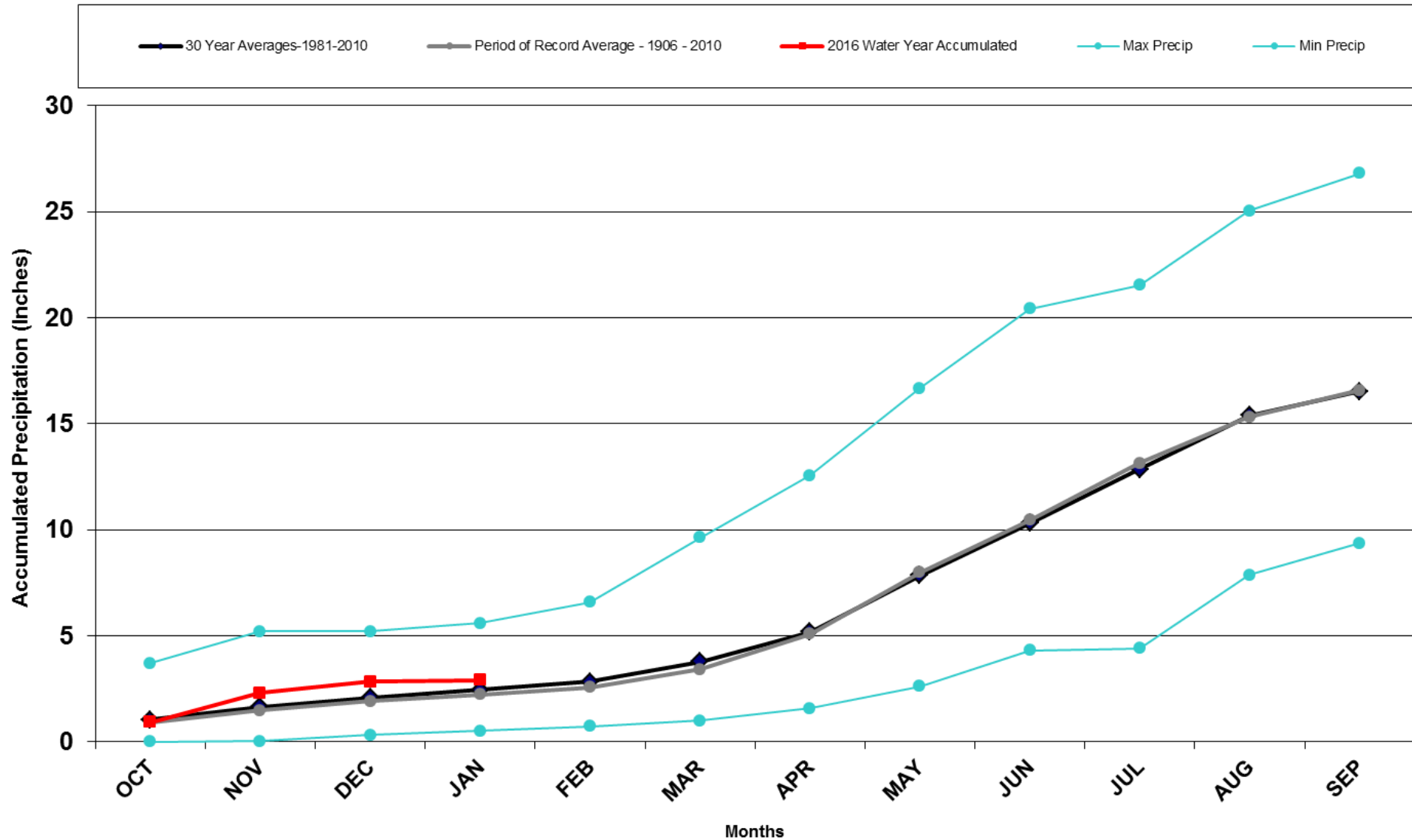
# Division 6 - Burlington

## Burlington, CO Precipitation Accumulation



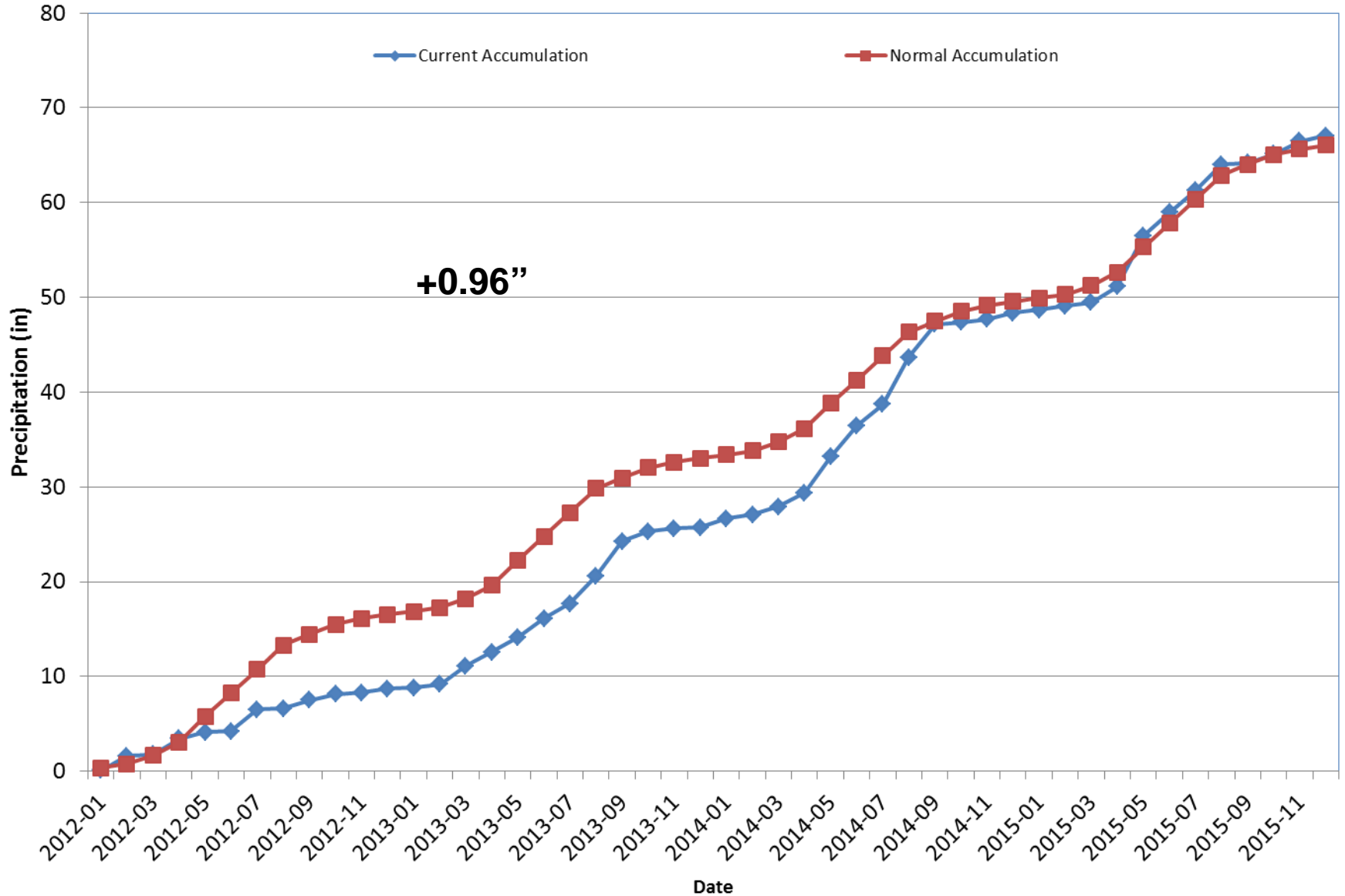
# Division 7 – Akron

## Akron 4E 2016 Water Year



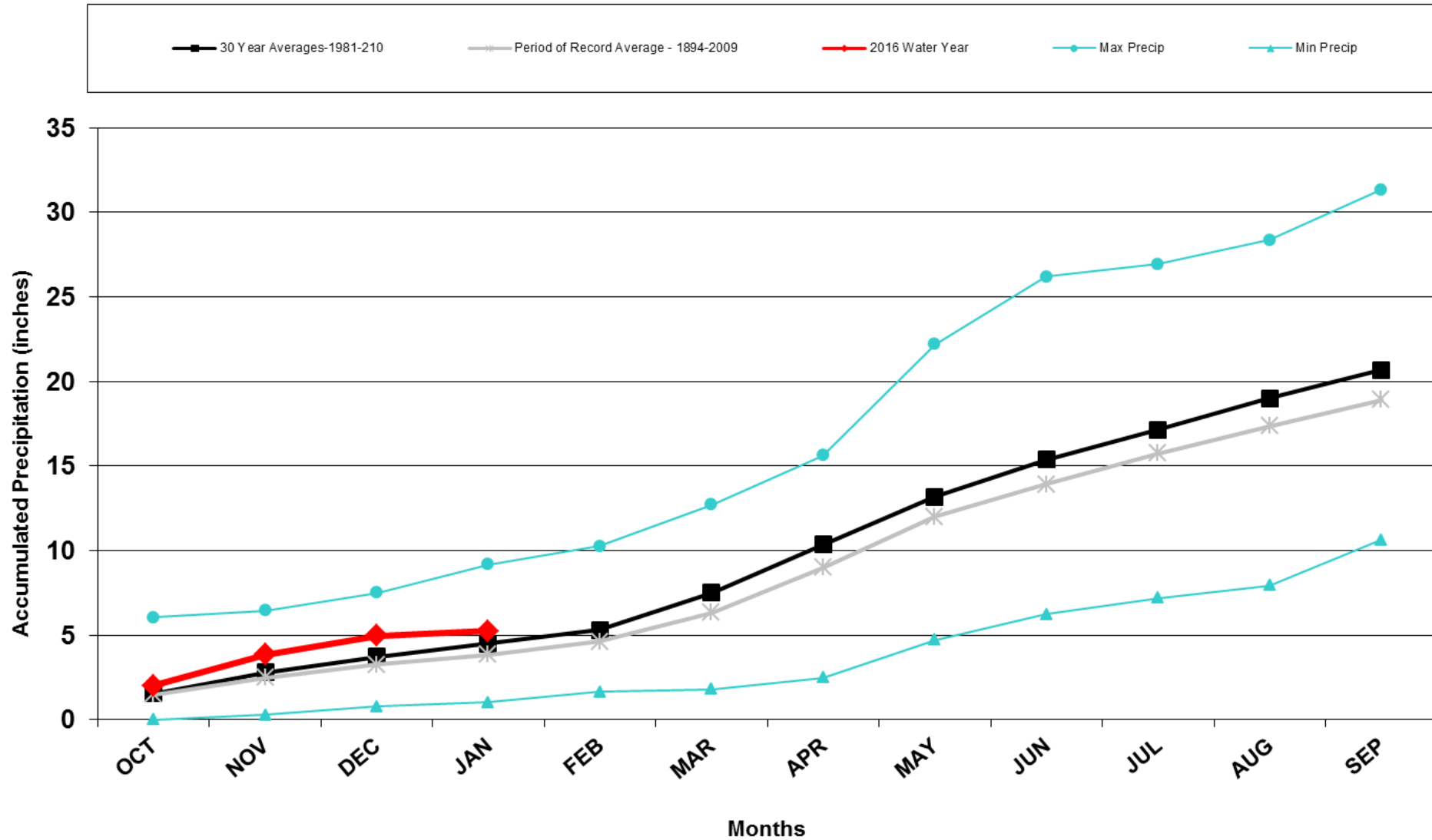
# Division 7 – Akron

## Akron 4E Precipitation Accumulation



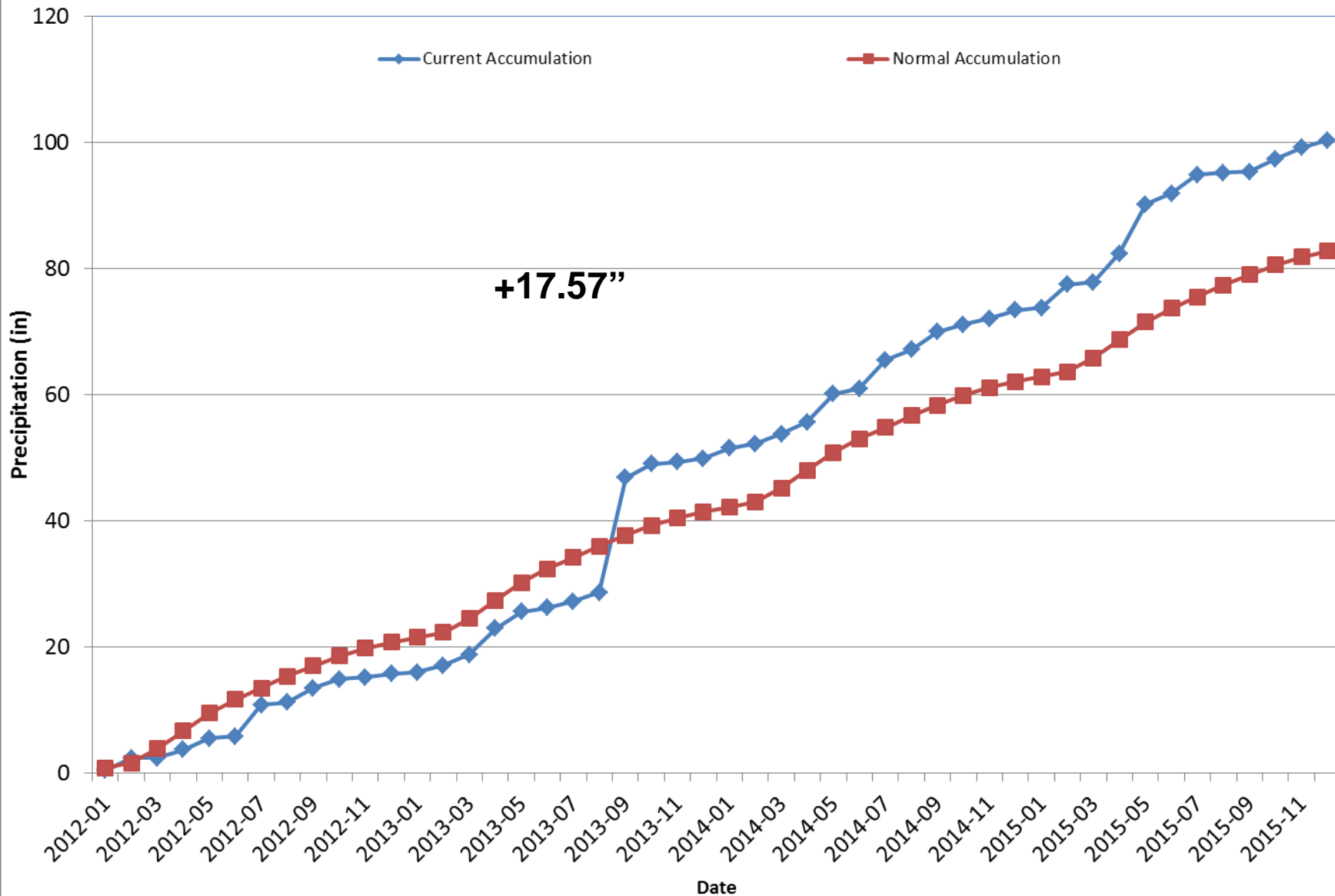
# Division 8 - Boulder

## Boulder 2016 Water Year



# Division 8 - Boulder

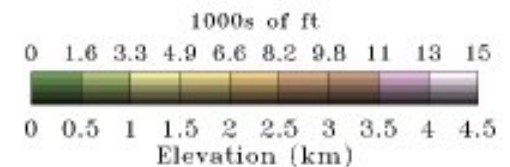
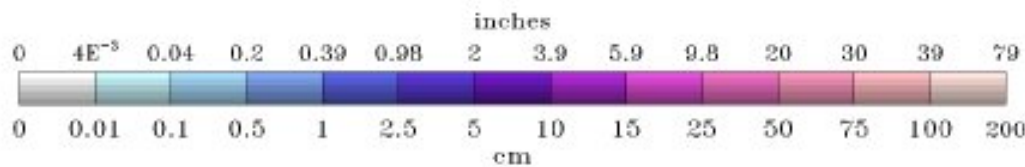
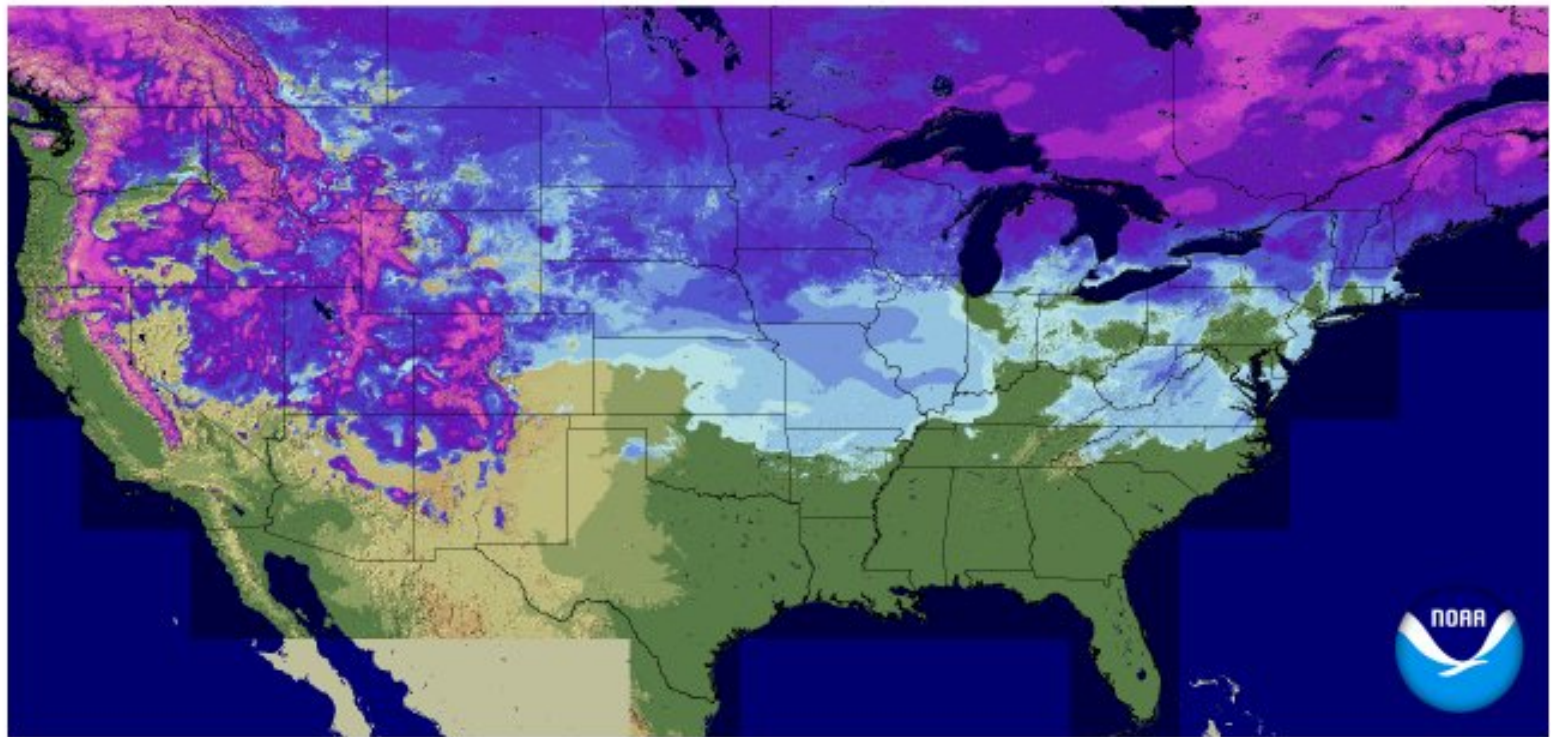
## Boulder Precipitation Accumulation



# National Snow Analysis

## Snow Water Equivalent

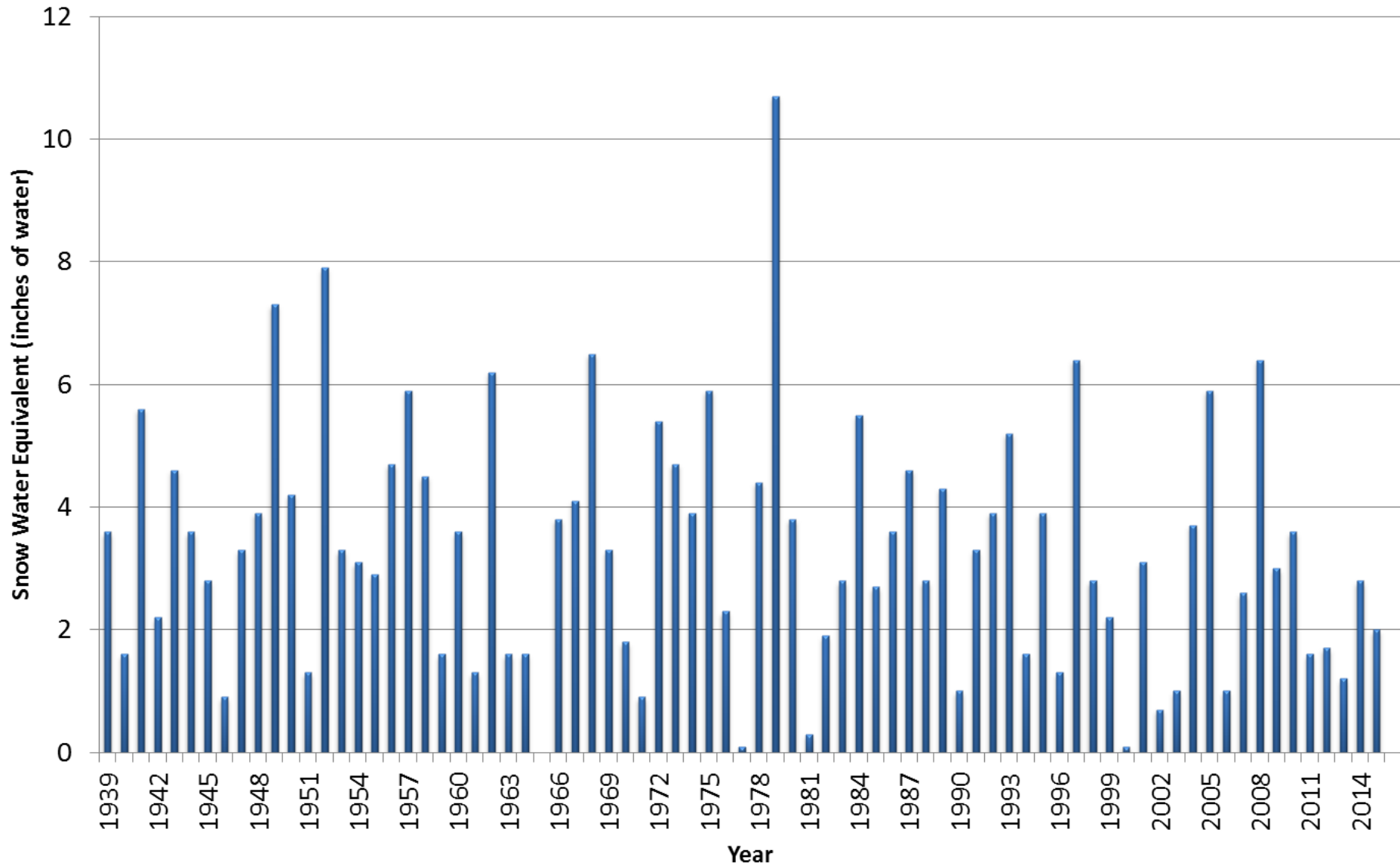
2016-01-20 06 UTC





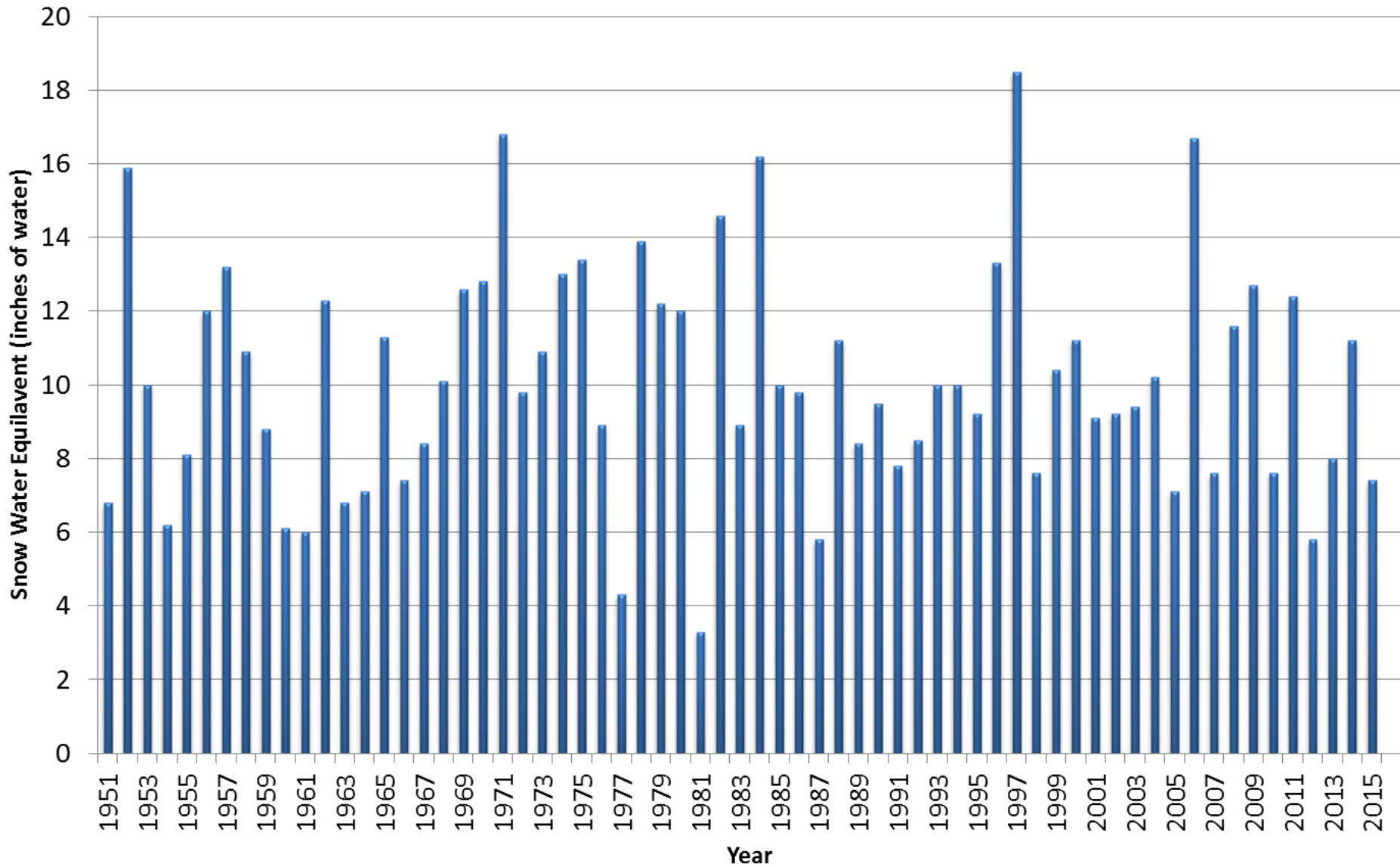
# Santa Maria Snow Course Feb 1 Snow Water Equivalent

Mineral County



# Yampa View Snow Course Feb 1 Snow Water

Routt County      Equilavent

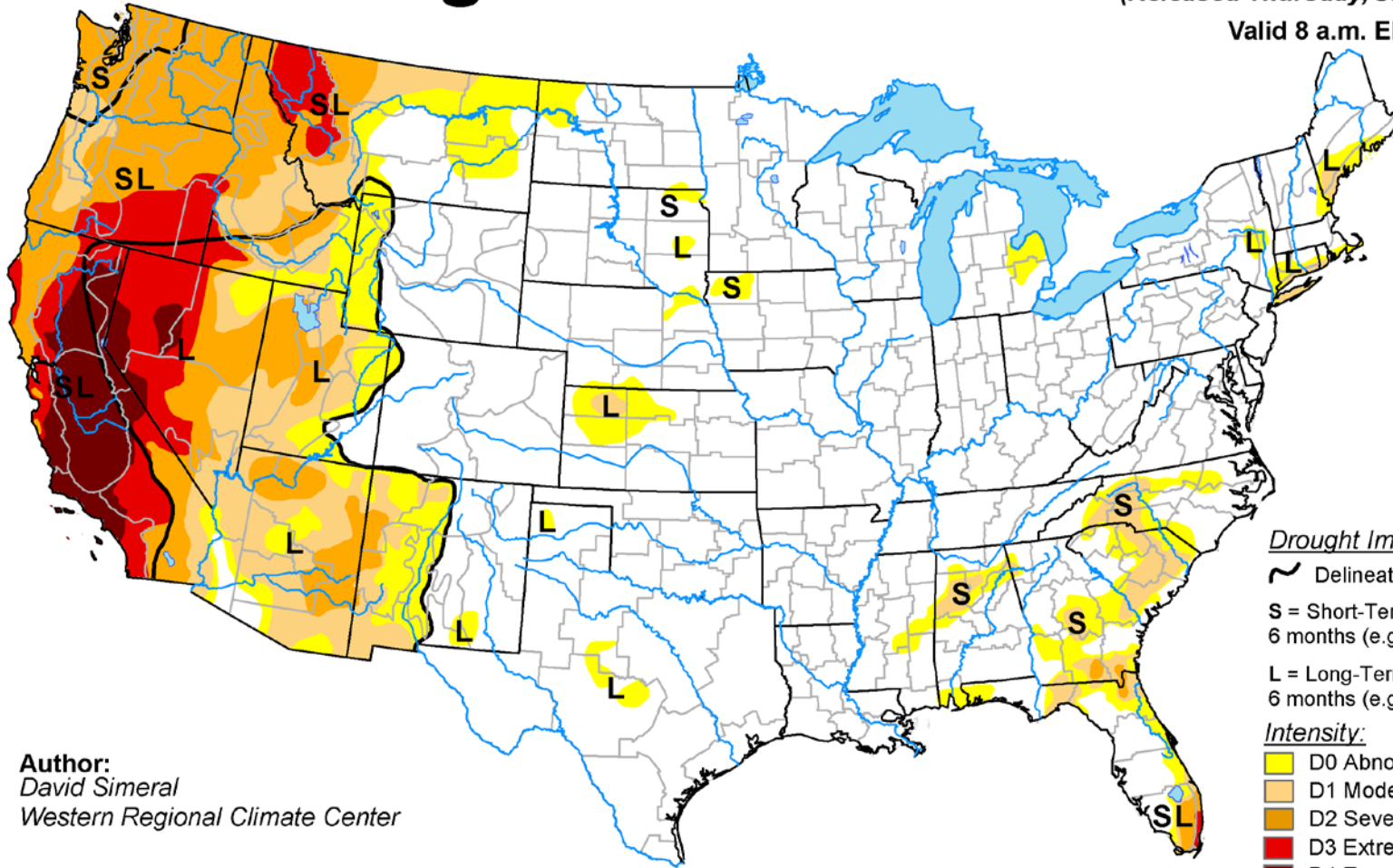


# U.S. Drought Monitor

July 14, 2015

(Released Thursday, Jul. 16, 2015)

Valid 8 a.m. EDT



**Author:**  
David Simeral  
Western Regional Climate Center

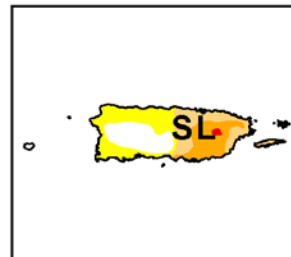
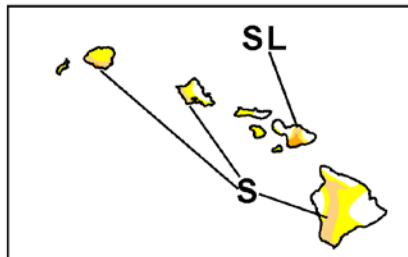
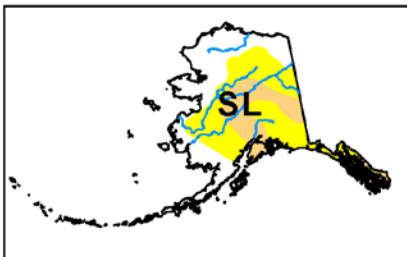
Drought Impact Types:

- ~ 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

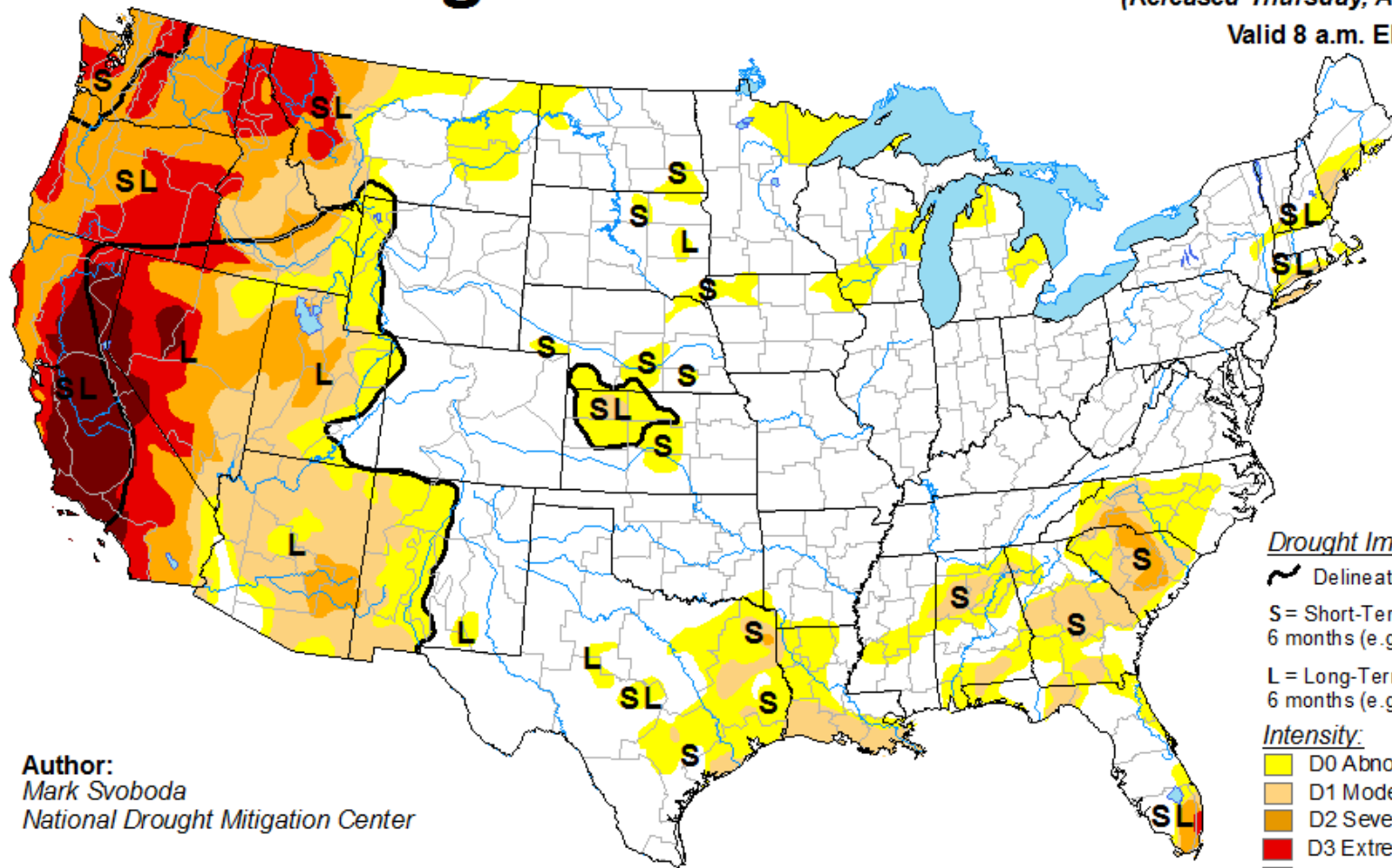
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.



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

# U.S. Drought Monitor

August 4, 2015  
(Released Thursday, Aug. 6, 2015)  
Valid 8 a.m. EDT



Author:  
Mark Svoboda  
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

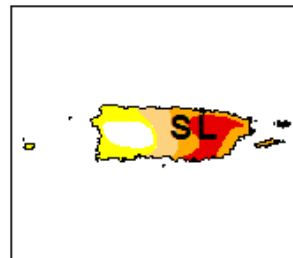
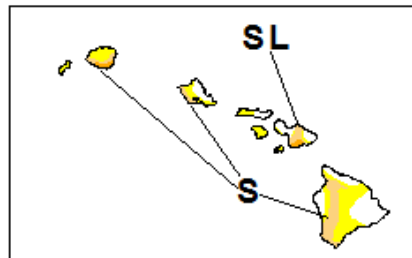
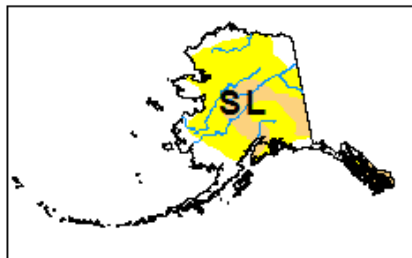
Light Orange: D1 Moderate Drought

Dark Orange: D2 Severe Drought

Red: D3 Extreme Drought

Dark Red: D4 Exceptional Drought

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

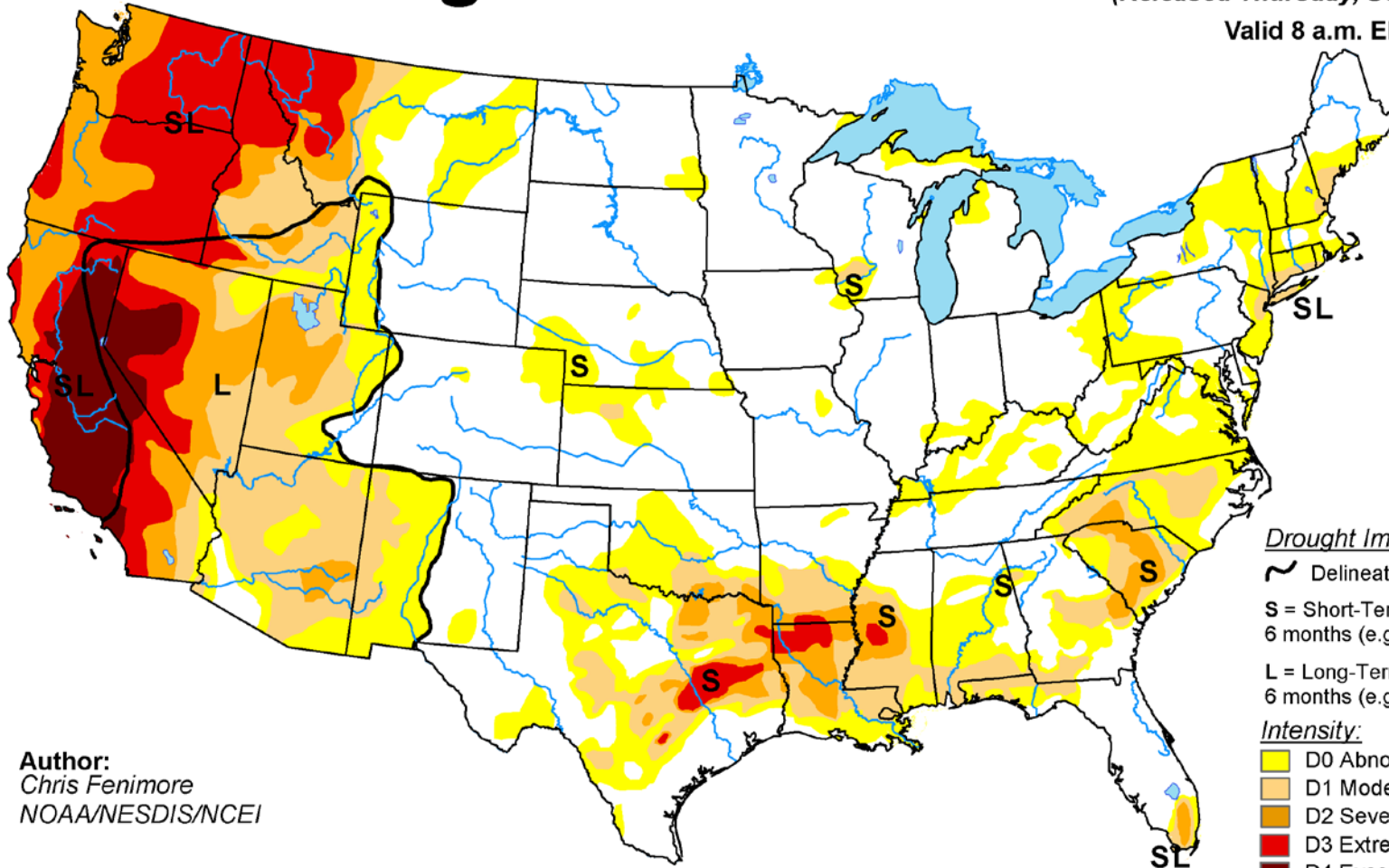


<http://droughtmonitor.unl.edu/>

# U.S. Drought Monitor

September 15, 2015  
(Released Thursday, Sep. 17, 2015)

Valid 8 a.m. EDT



**Author:**  
Chris Fenimore  
NOAA/NESDIS/NCEI

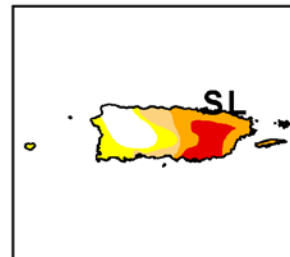
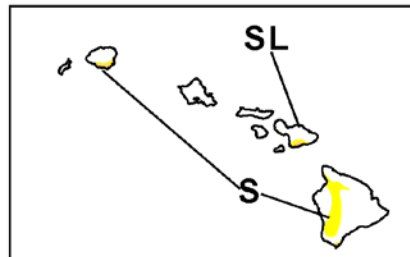
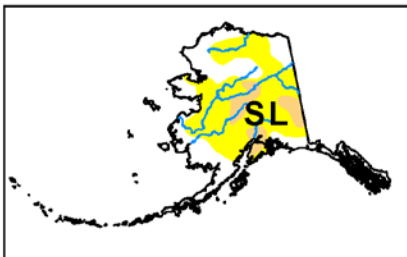
Drought Impact Types:

- ~ 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

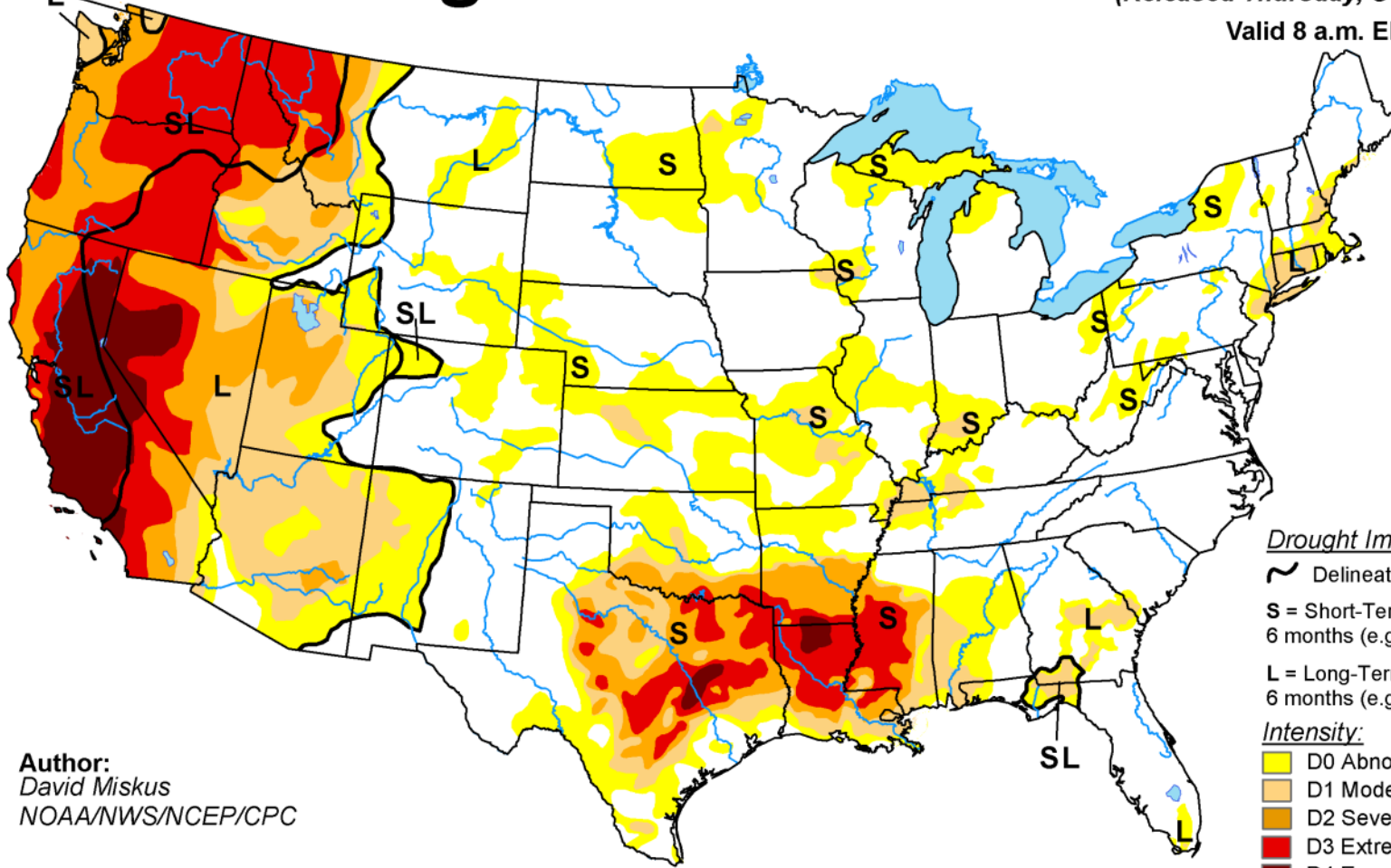
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.



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

# U.S. Drought Monitor

October 13, 2015  
(Released Thursday, Oct. 15, 2015)  
Valid 8 a.m. EDT



Author:  
David Miskus  
NOAA/NWS/NCEP/CPC

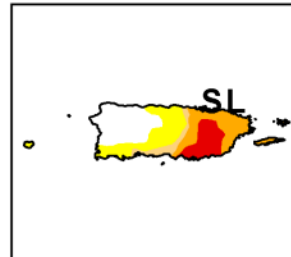
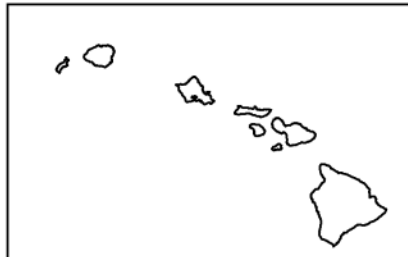
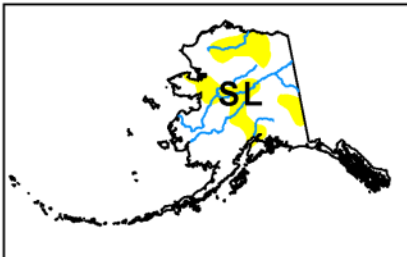
### Drought Impact Types:

- ~ 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:

- Yellow: D0 Abnormally Dry
- Light Orange: D1 Moderate Drought
- Dark Orange: D2 Severe Drought
- Red: D3 Extreme Drought
- Dark Red: D4 Exceptional Drought

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

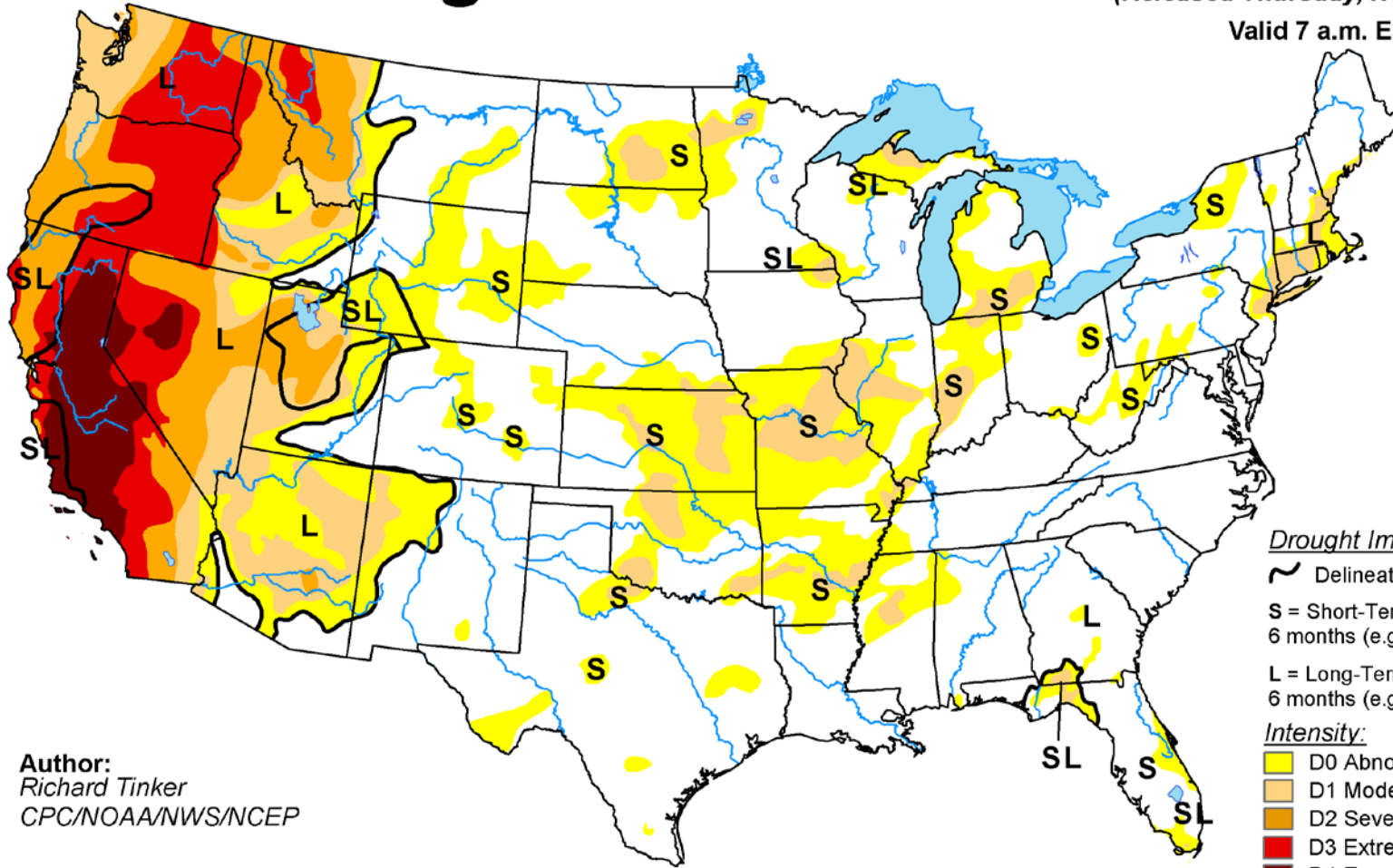


<http://droughtmonitor.unl.edu/>

# U.S. Drought Monitor


November 10, 2015  
(Released Thursday, Nov. 12, 2015)

Valid 7 a.m. EST








**Author:**  
Richard Tinker  
CPC/NOAA/NWS/NCEP

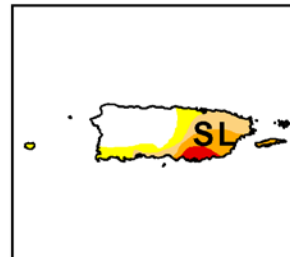
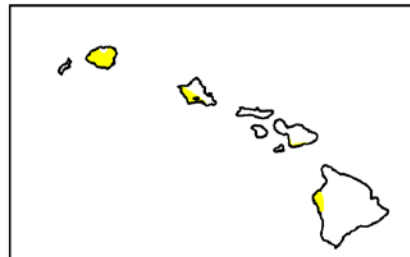
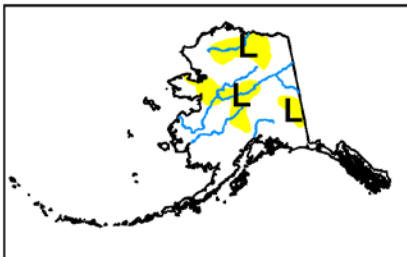
### Drought Impact Types:

-  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.

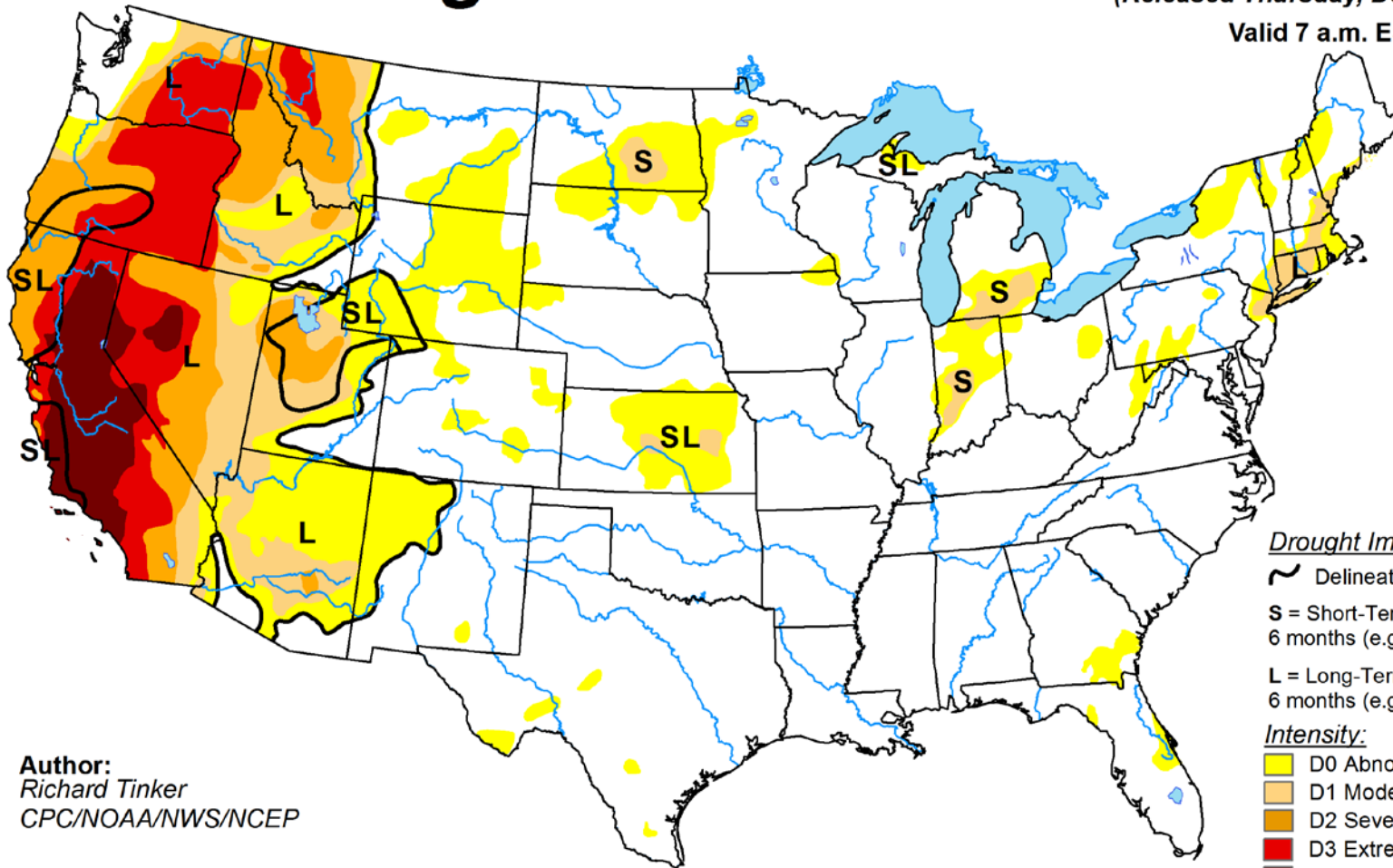


<http://droughtmonitor.unl.edu/>

# U.S. Drought Monitor


December 8, 2015  
(Released Thursday, Dec. 10, 2015)

Valid 7 a.m. EST








**Author:**  
Richard Tinker  
CPC/NOAA/NWS/NCEP

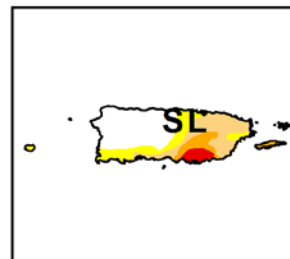
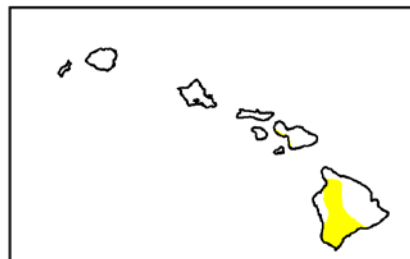
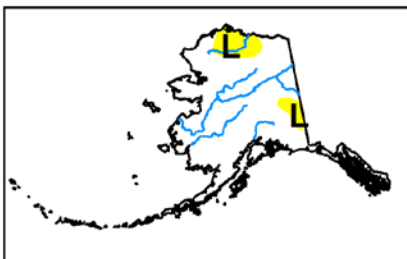
**Drought Impact Types:**

-  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.



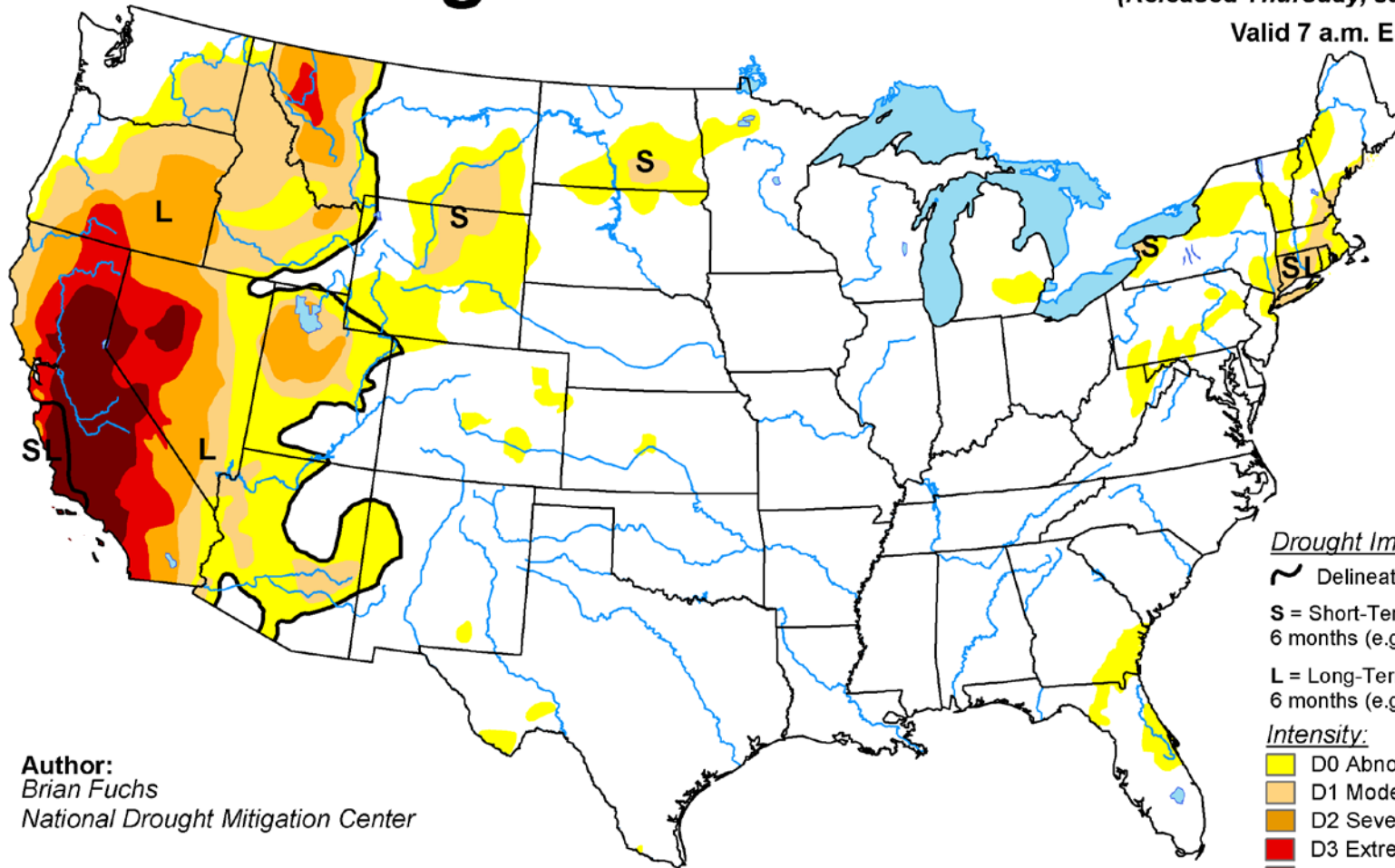
<http://droughtmonitor.unl.edu/>



# U.S. Drought Monitor

January 12, 2016  
(Released Thursday, Jan. 14, 2016)

Valid 7 a.m. EST



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

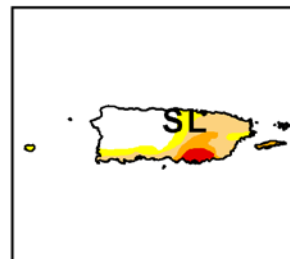
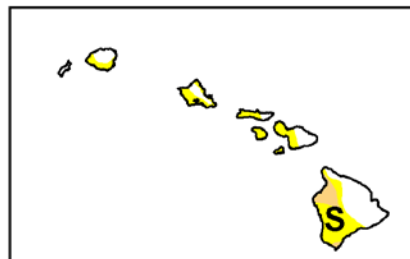
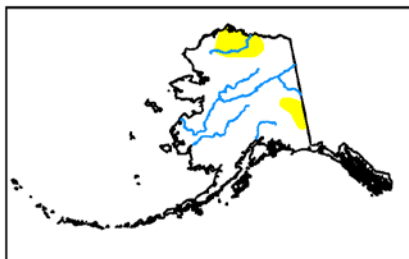
### Drought Impact Types:

- ~ 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
- Red: D3 Extreme Drought
- Dark Red: D4 Exceptional Drought

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

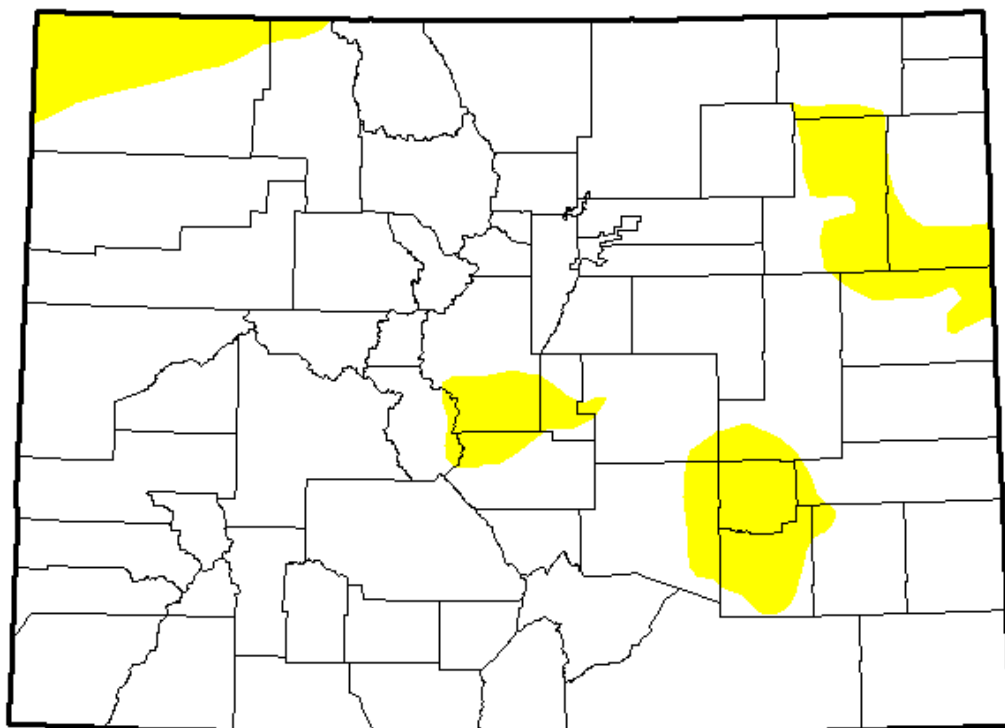
# U.S. Drought Monitor

## Colorado

**January 12, 2016**  
 (Released Thursday, Jan. 14, 2016)  
 Valid 7 a.m. EST

*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	89.98	10.02	0.00	0.00	0.00	0.00
<b>Last Week</b> <i>1/5/2016</i>	90.02	9.98	0.00	0.00	0.00	0.00
<b>3 Months Ago</b> <i>10/13/2015</i>	65.61	34.39	0.00	0.00	0.00	0.00
<b>Start of Calendar Year</b> <i>12/29/2015</i>	90.02	9.98	0.00	0.00	0.00	0.00
<b>Start of Water Year</b> <i>9/29/2015</i>	71.49	28.51	0.00	0.00	0.00	0.00
<b>One Year Ago</b> <i>1/13/2015</i>	69.87	30.13	21.26	12.26	0.00	0.00



Intensity:

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

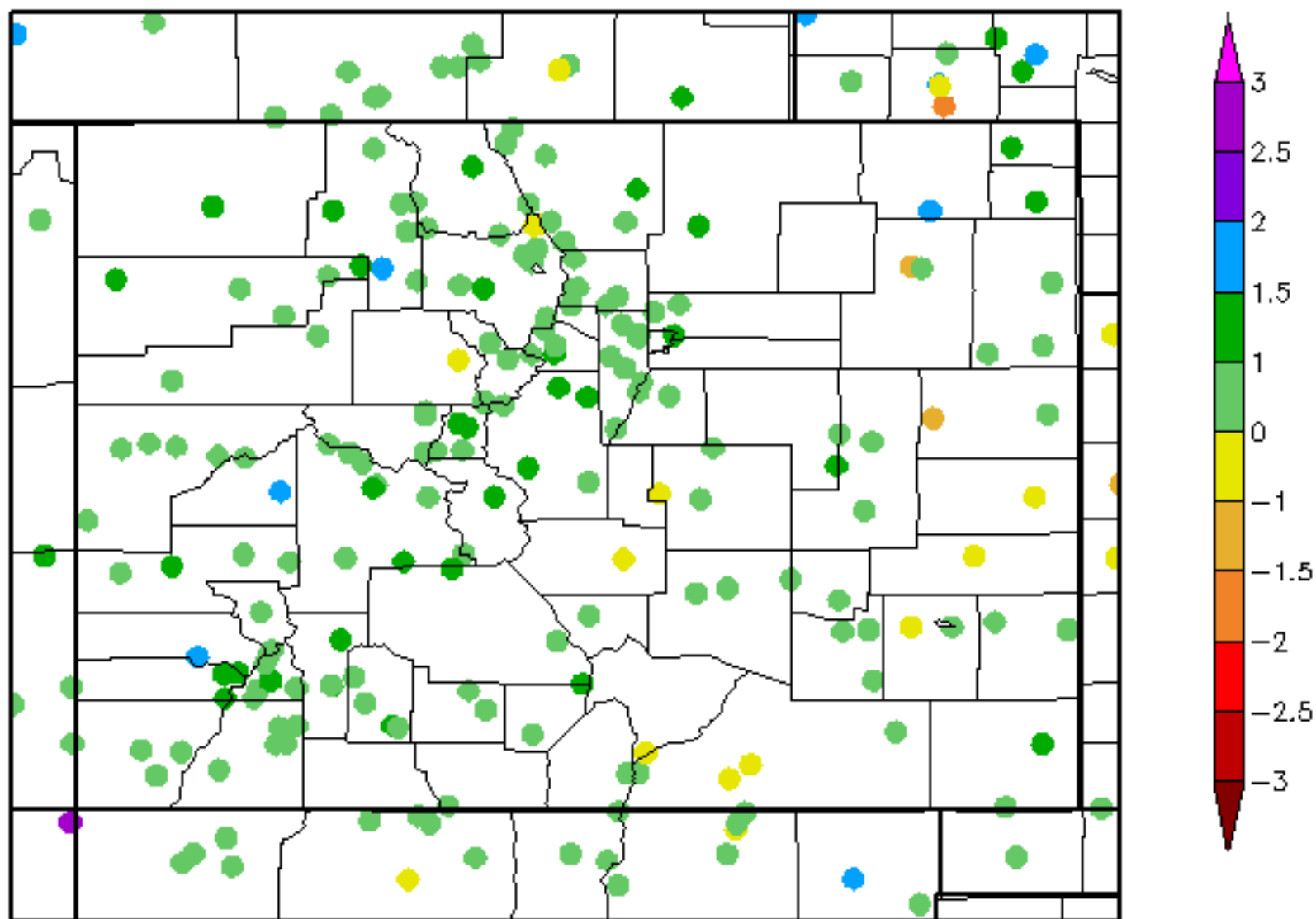
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**Author:**  
 Brian Fuchs  
 National Drought Mitigation Center



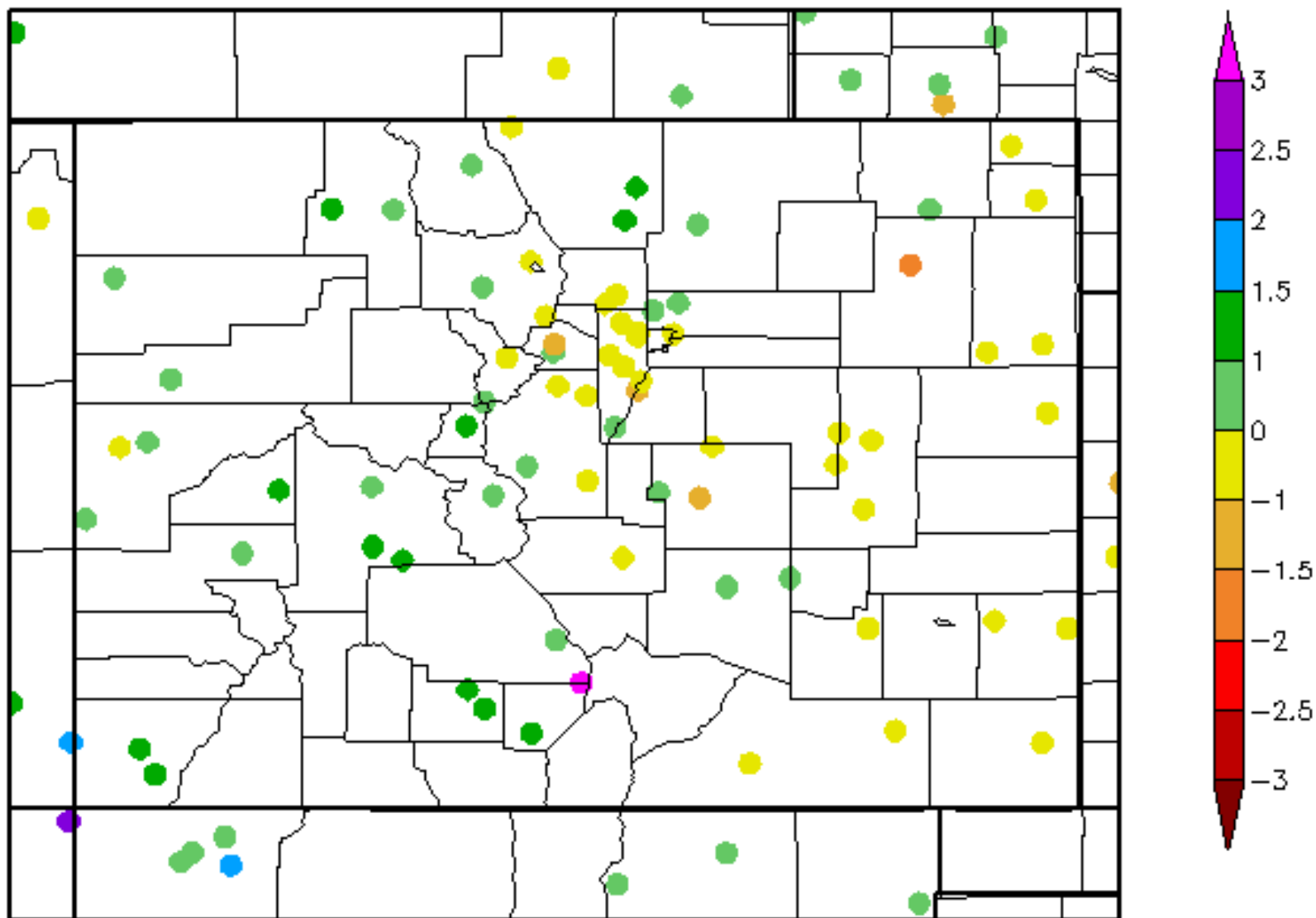
# Monthly SPI

12/1/2015 - 12/31/2015



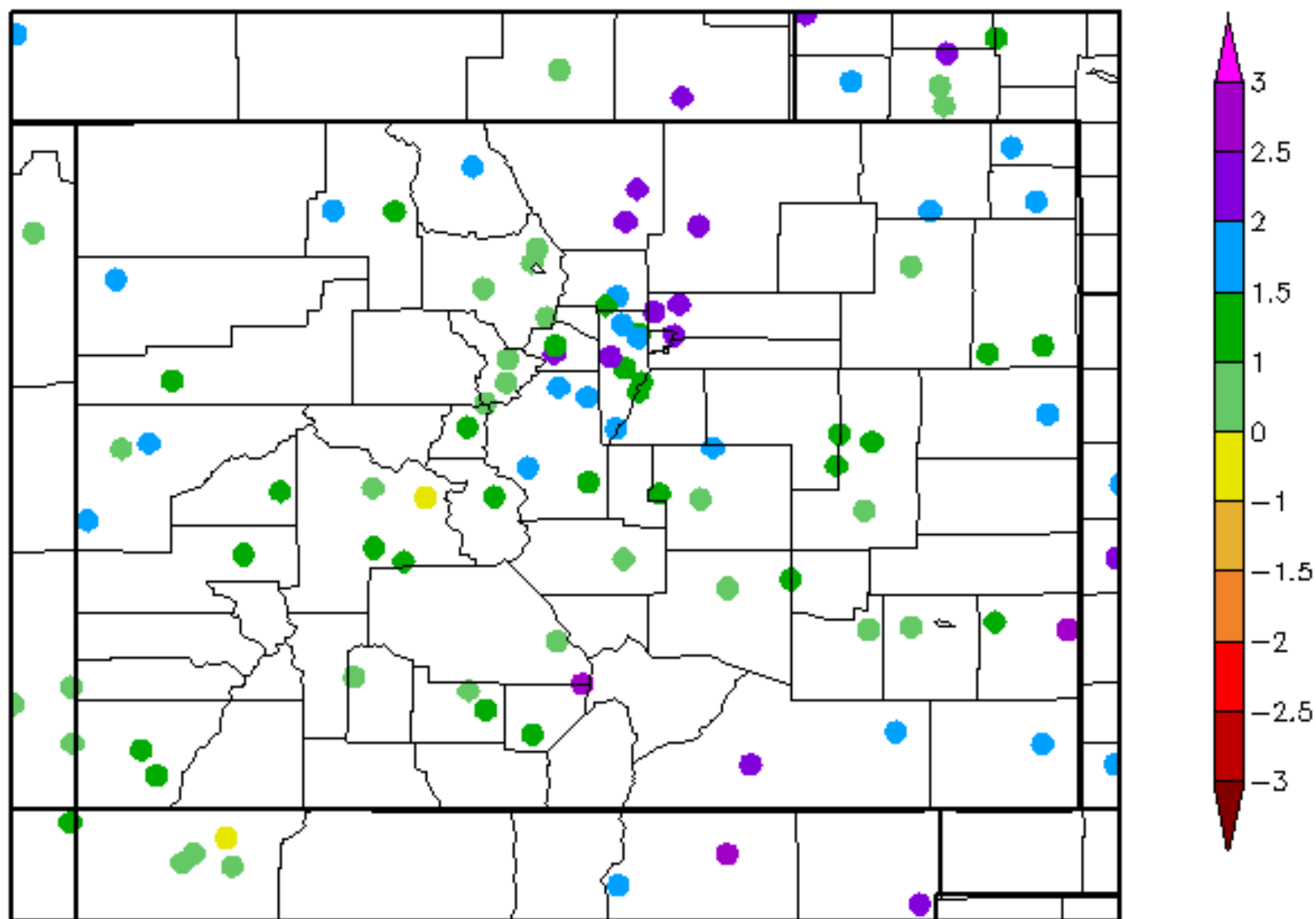
# 30 Day SPI

12/20/2015 - 1/18/2016



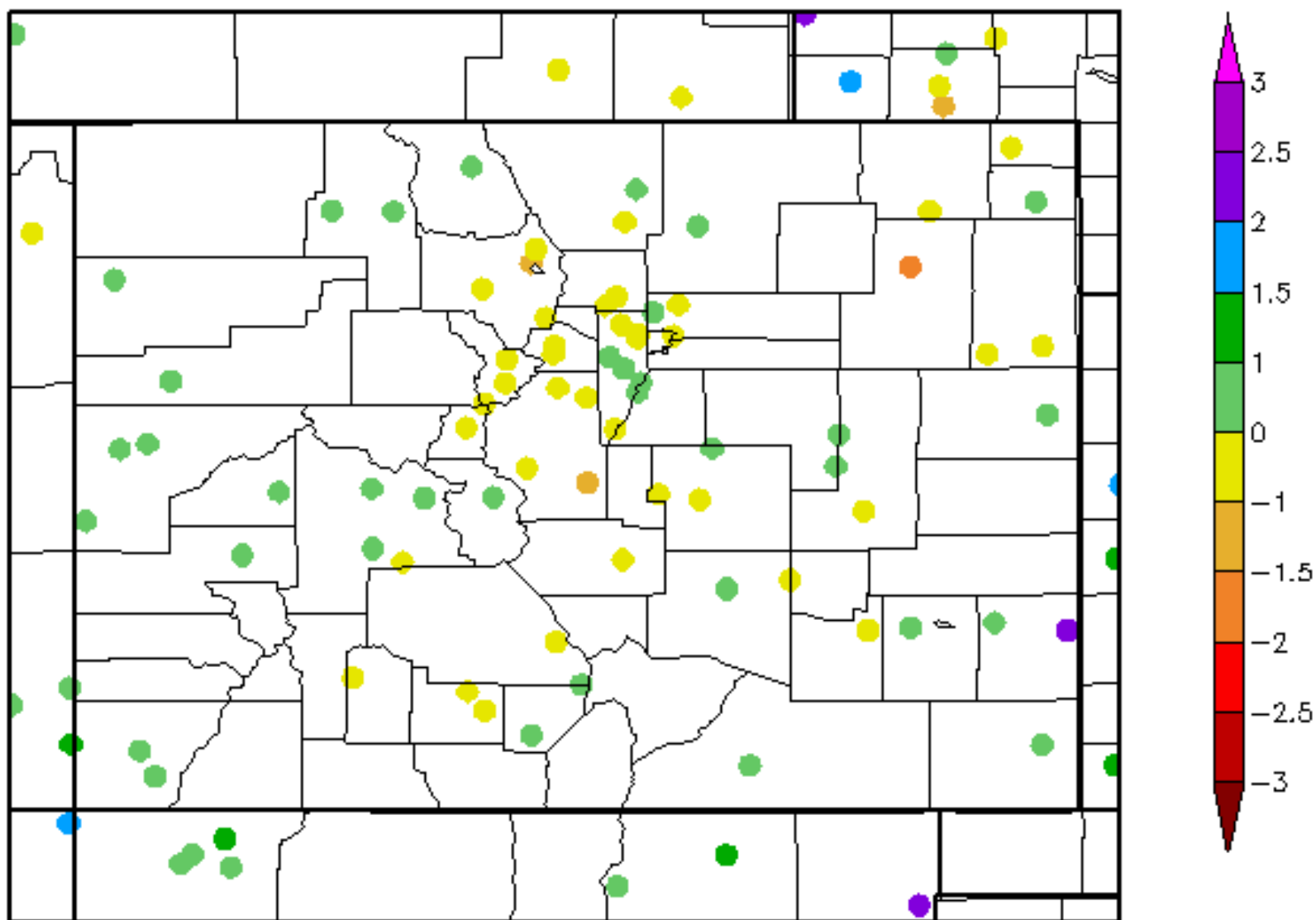
# 90 Day SPI

10/21/2015 - 1/18/2016



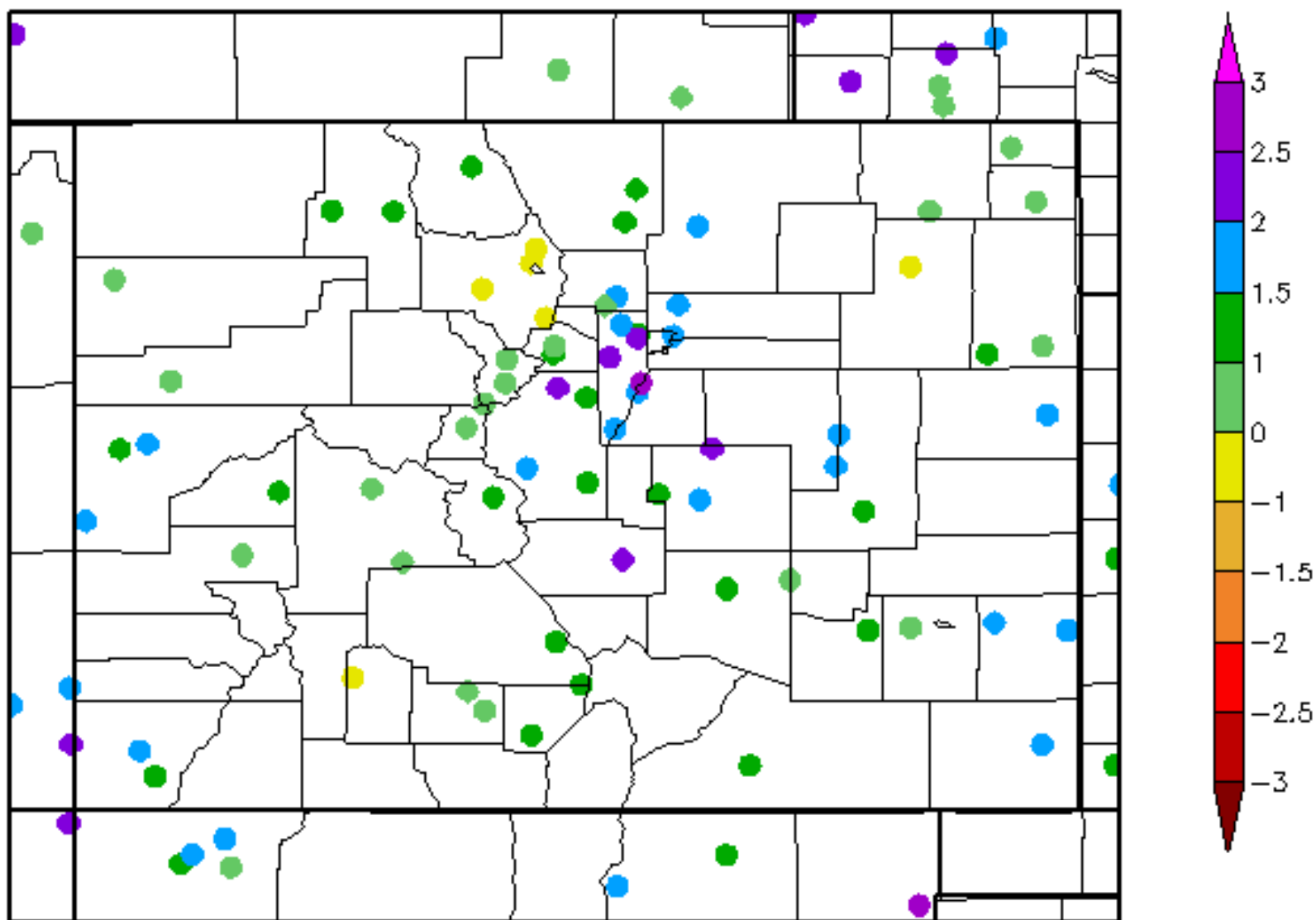
# 6 Month SPI

7/19/2015 - 1/18/2016



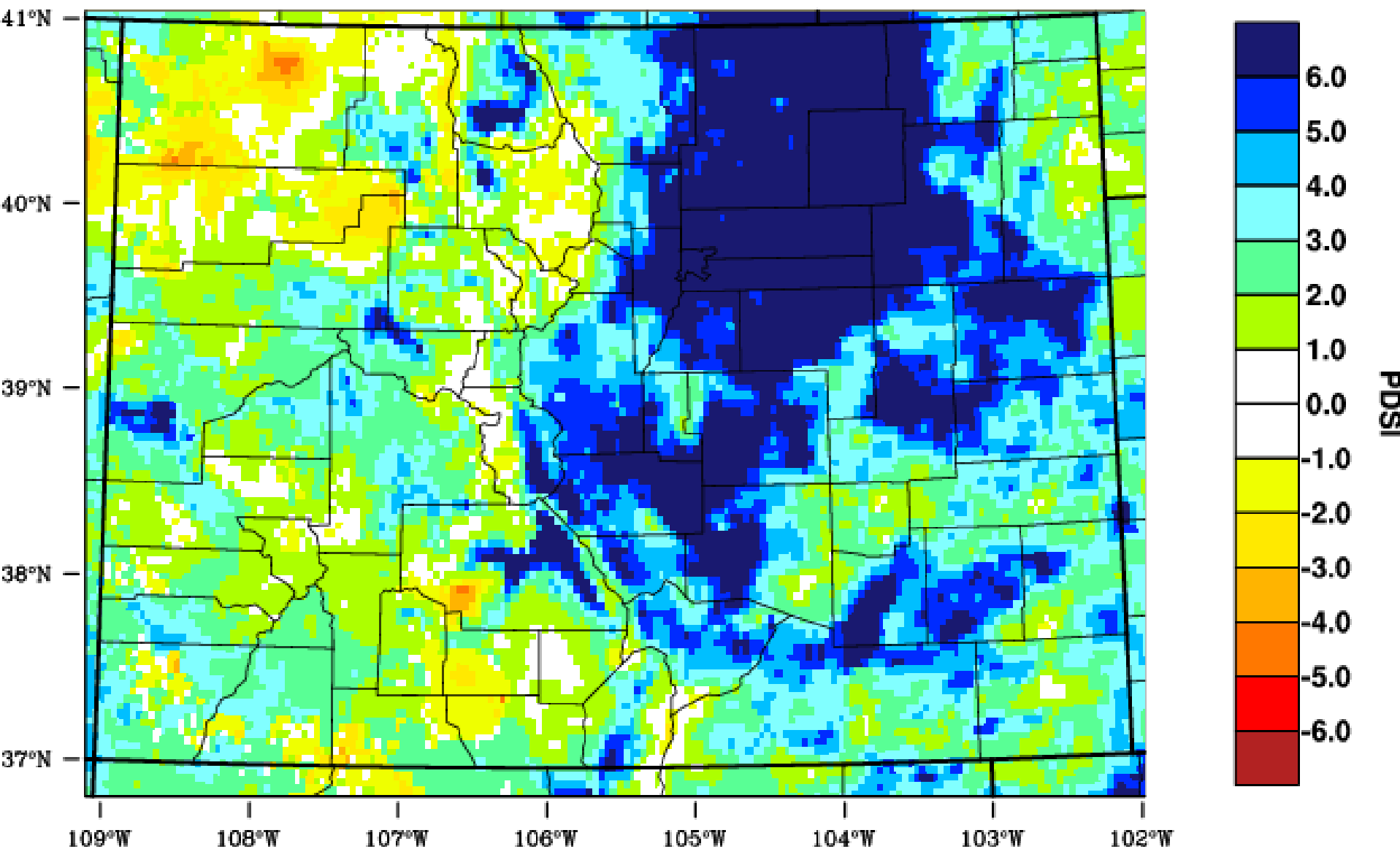
# 12 Month SPI

1/19/2015 - 1/18/2016



# Colorado - PDSI

August 2015

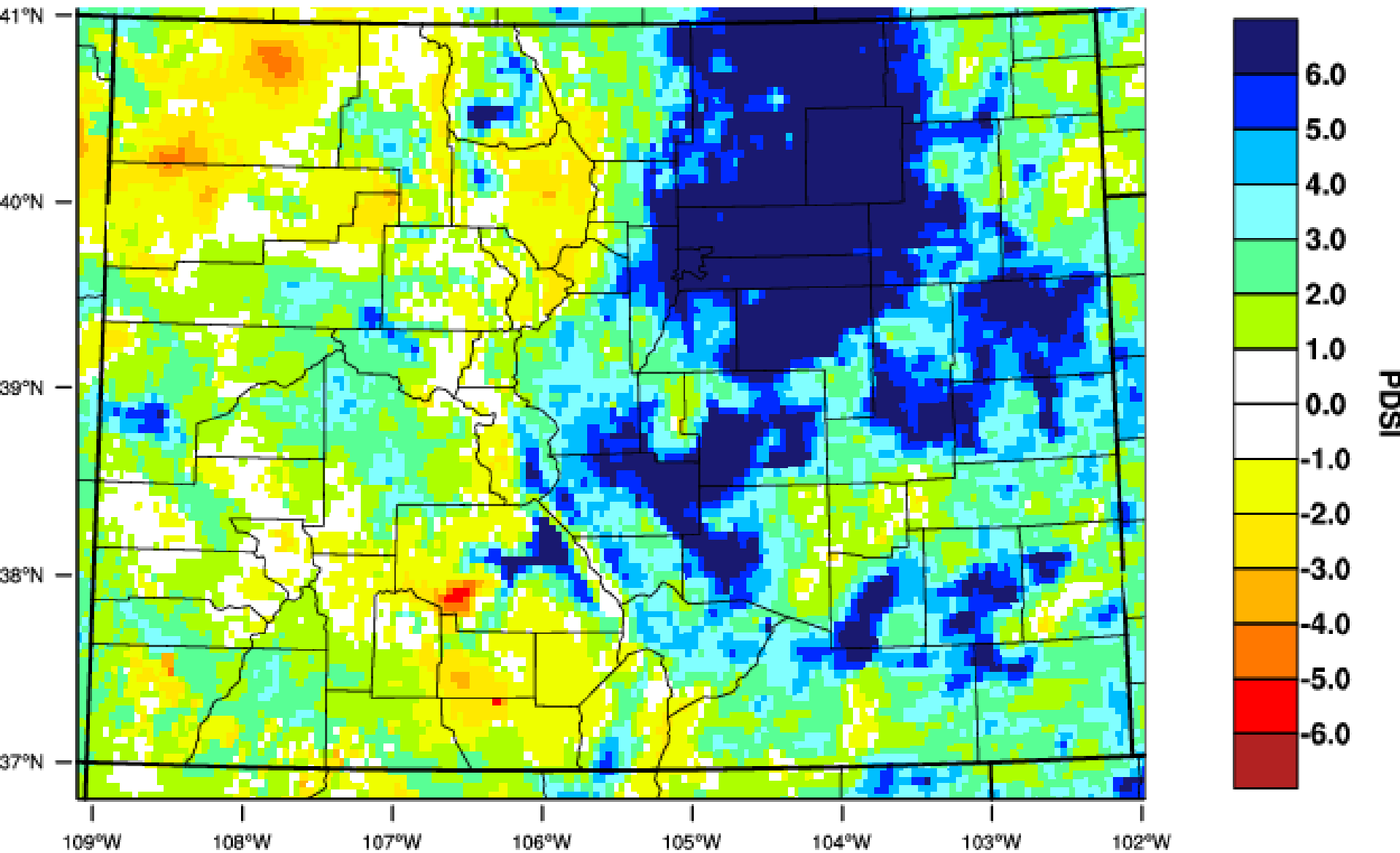


WestWide Drought Tracker - WRCC/UI Data Source - PRISM (Prelim), created 16 SEP 2015



# Colorado - PDSI

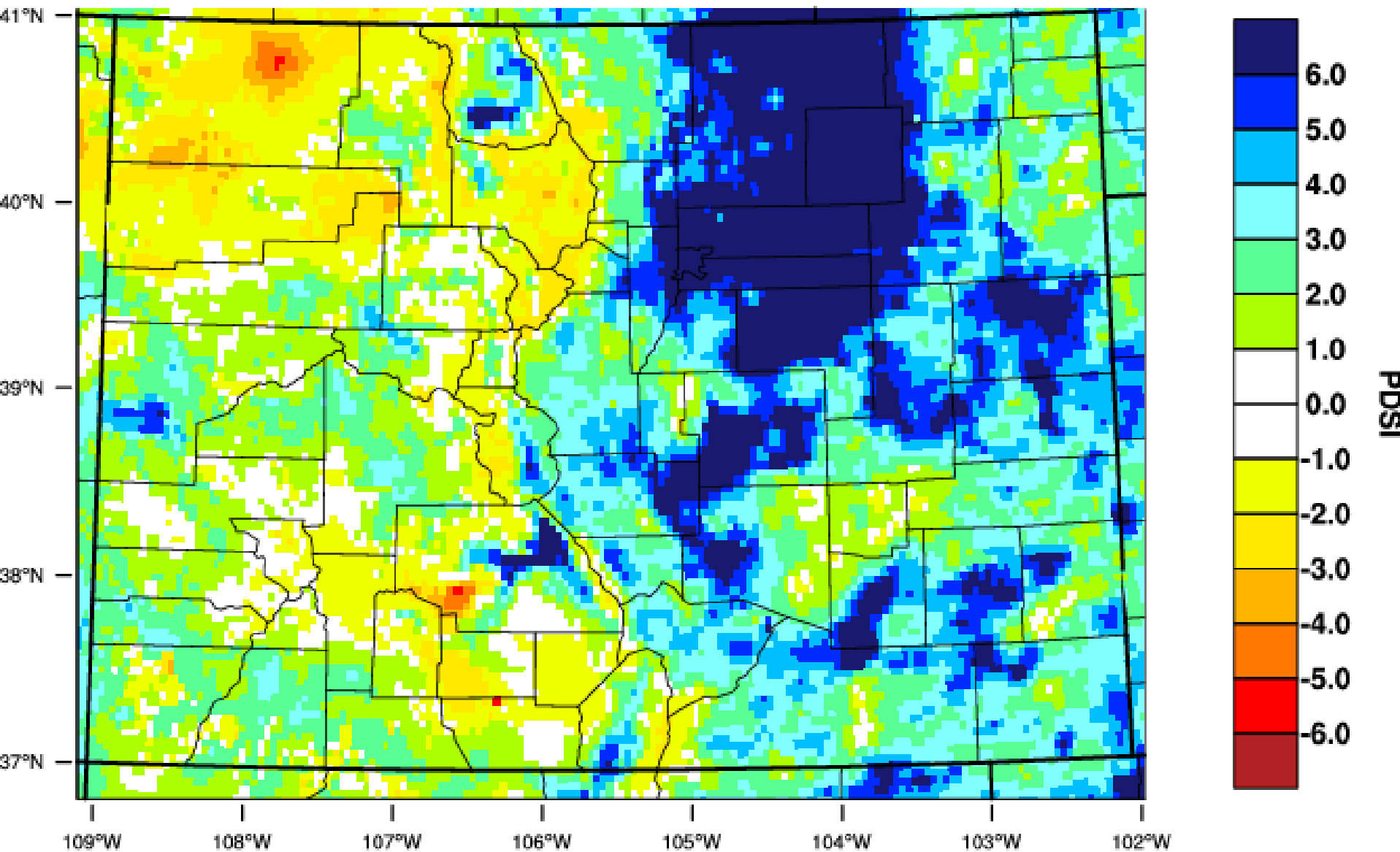
## September 2015



WestWide Drought Tracker - Uidaho/WRCC Data Source - PRISM (Prelim), created 16 OCT 2015

# Colorado - PDSI

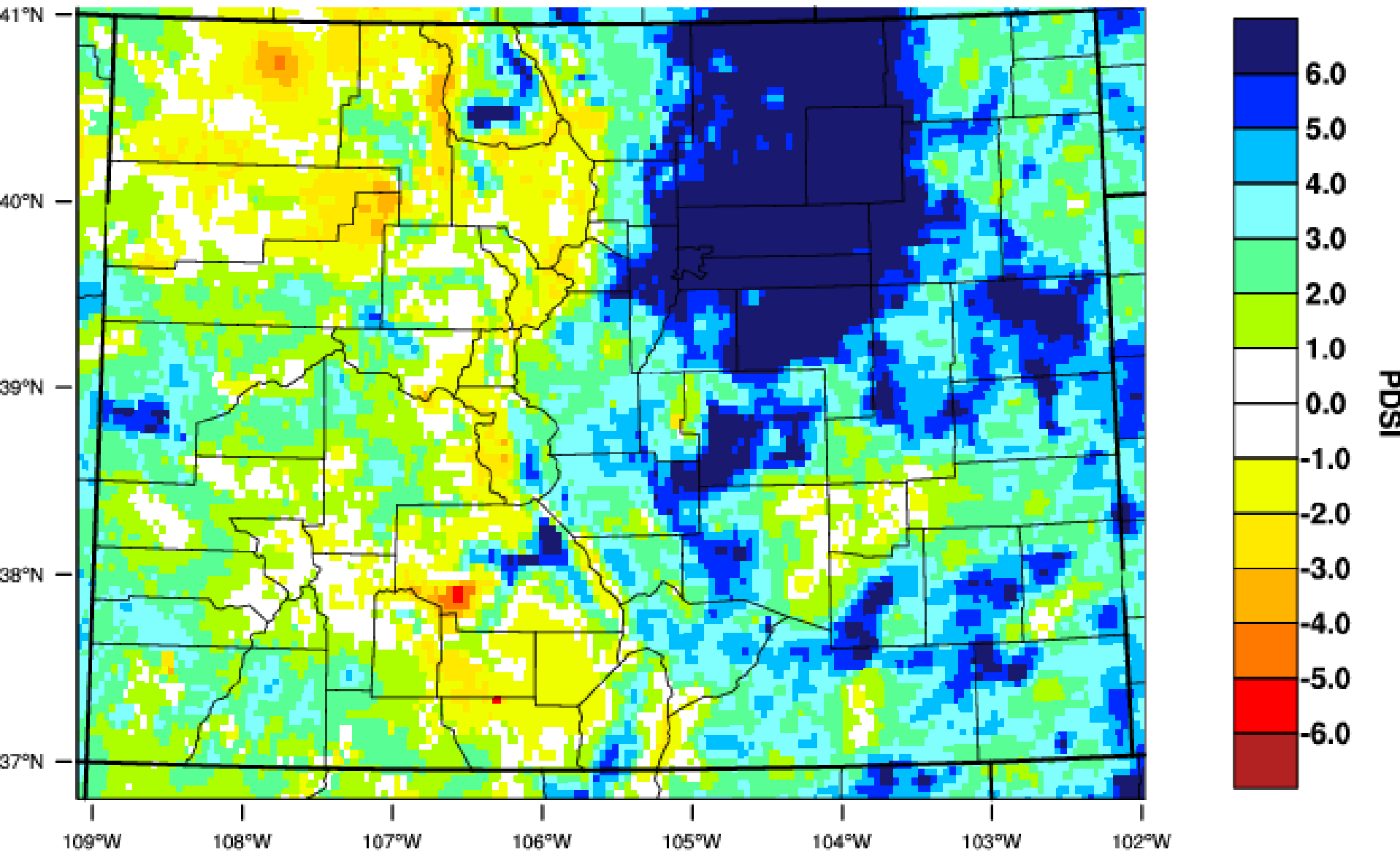
October 2015



WestWide Drought Tracker - UIdaho/WRCC Data Source - PRISM (Prelim), created 16 NOV 2015

# Colorado - PDSI

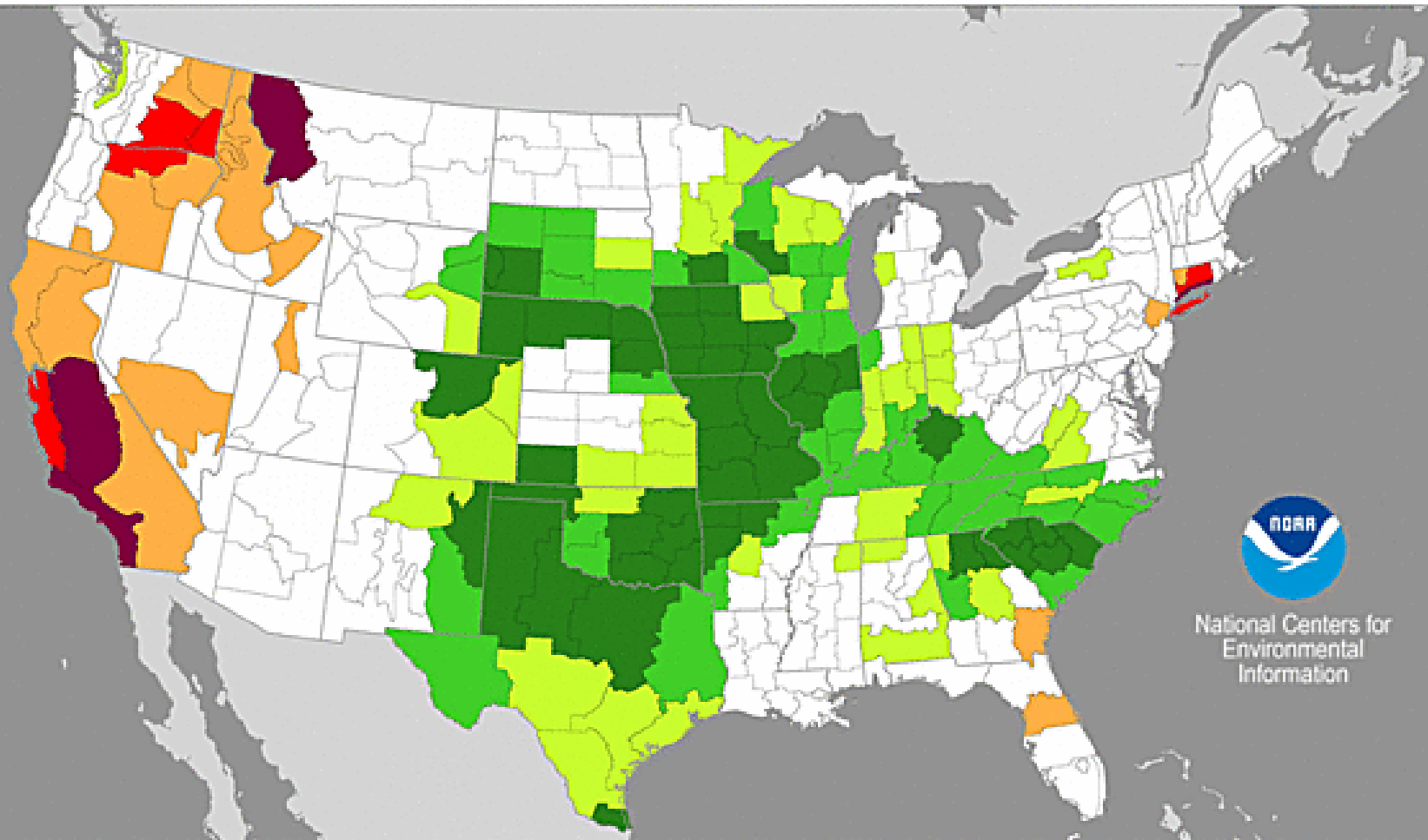
November 2015










WestWide Drought Tracker - UIdaho/WRCC Data Source - PRISM (Prelim), created 16 DEC 2015

# Palmer Drought Severity Index

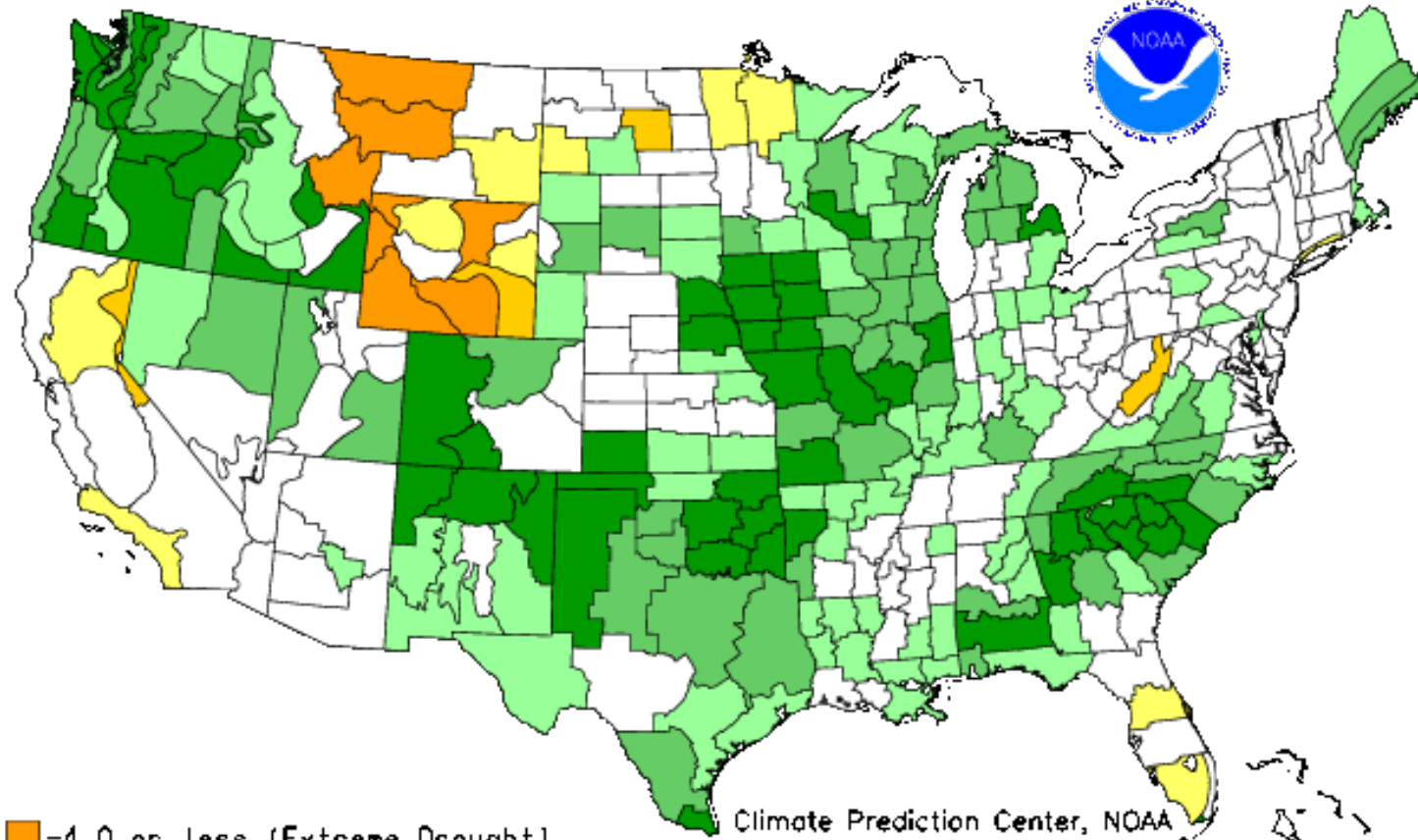
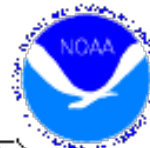
December, 2015










National Centers for Environmental Information

extreme drought	severe drought	moderate drought	mid-range	moderately moist	very moist	extremely moist
						
-4.00 and below	-3.00 to -3.99	-2.00 to -2.99	-1.99 to +1.99	+2.00 to +2.99	+3.00 to +3.99	+4.00 and above

Drought Severity Index by Division  
Weekly Value for Period Ending JAN 16, 2016  
Long Term Palmer



-  -4.0 or less (Extreme Drought)
-  -3.0 to -3.9 (Severe Drought)
-  -2.0 to -2.9 (Moderate Drought)
-  -1.9 to +1.9 (Near Normal)

-  +2.0 to +2.9 (Unusual Moist Spell)
-  +3.0 to +3.9 (Very Moist Spell)
-  +4.0 and above (Extremely Moist)

# Colorado Climate Center

Data and Power Point Presentations available for downloading

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



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