



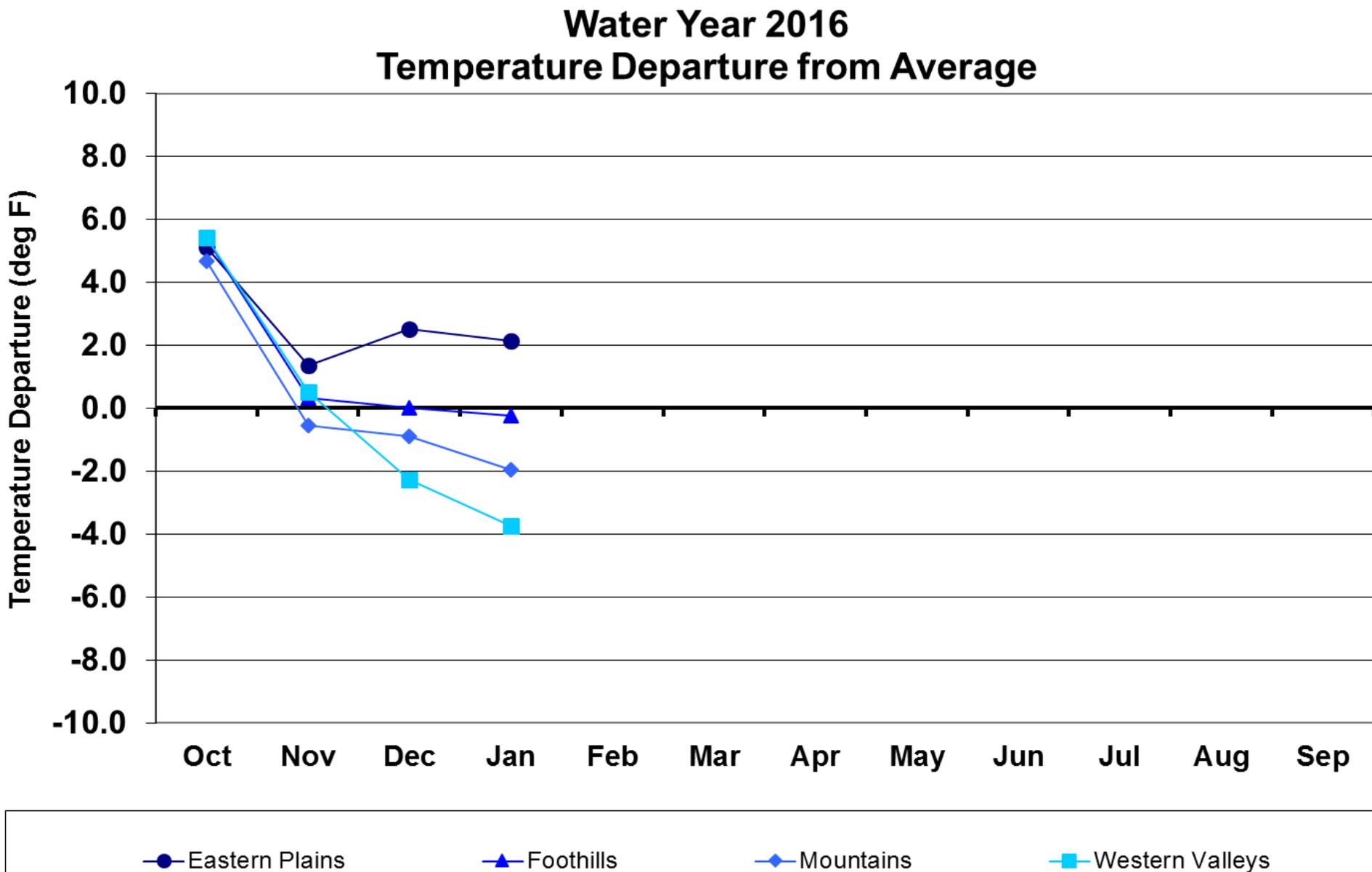
# Climate Update



Nolan Doesken  
Colorado Climate Center

Presented to  
Water Availability Task Force  
February 17, 2016  
Denver, CO

# Water Year 2016 Temperature Departures



# Jan 2015 Average Temperature History for Colorado (NCEI)

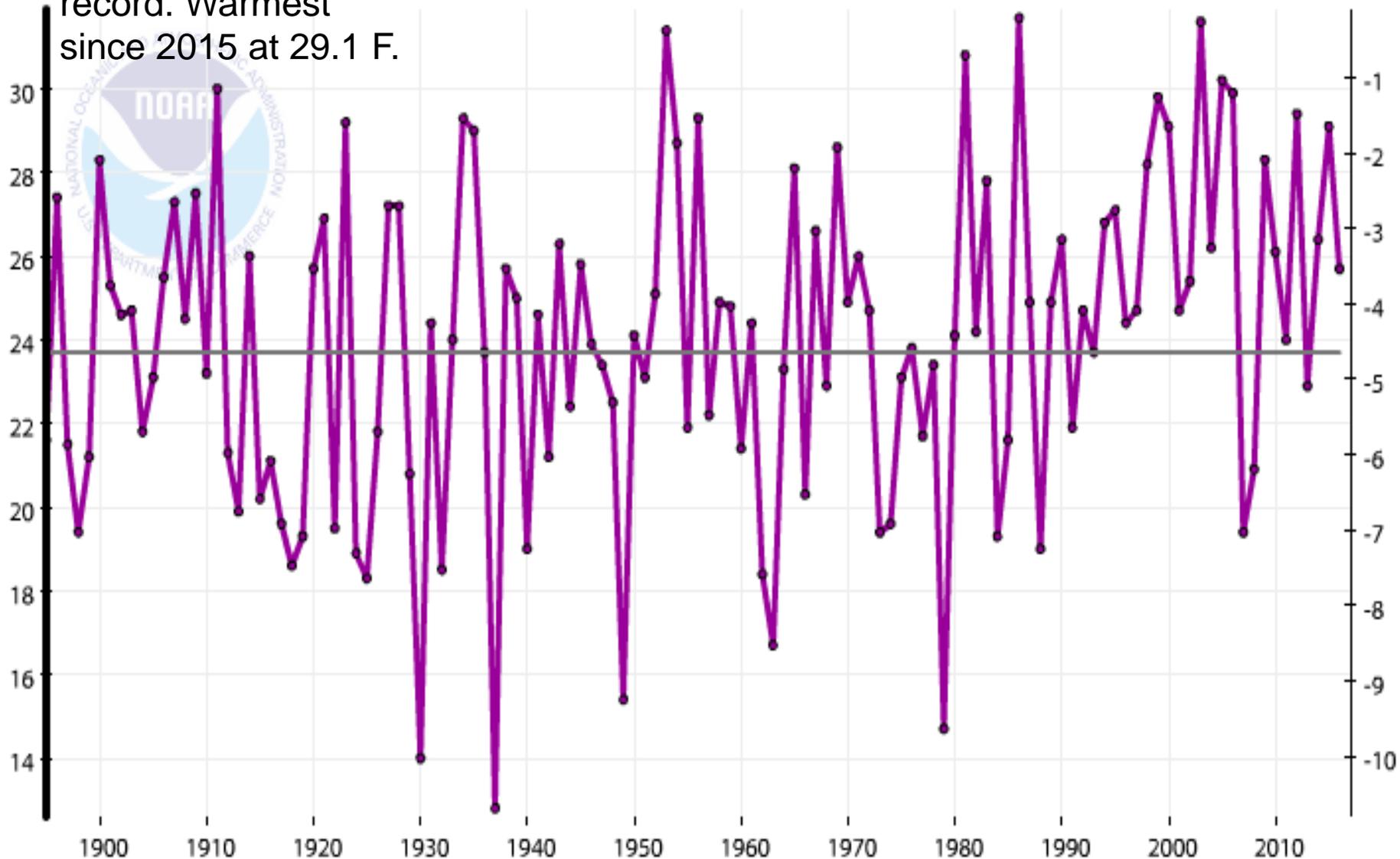
25.7 F (+2.0)

42<sup>nd</sup> warmest on record. Warmest since 2015 at 29.1 F.

## Colorado, Average Temperature, January

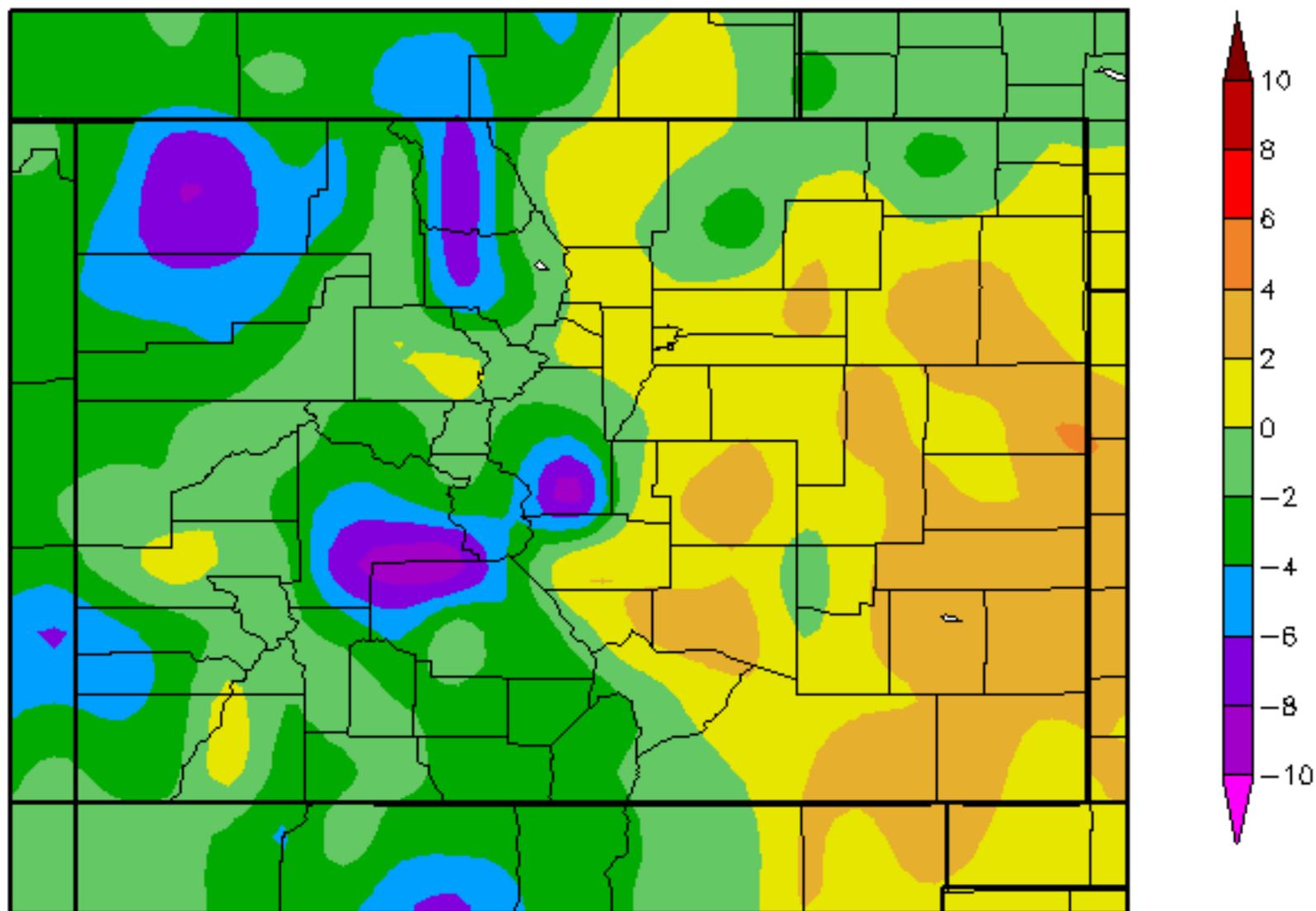
— 1901-2000  
Avg: 23.7°F

—●— Avg Temperature



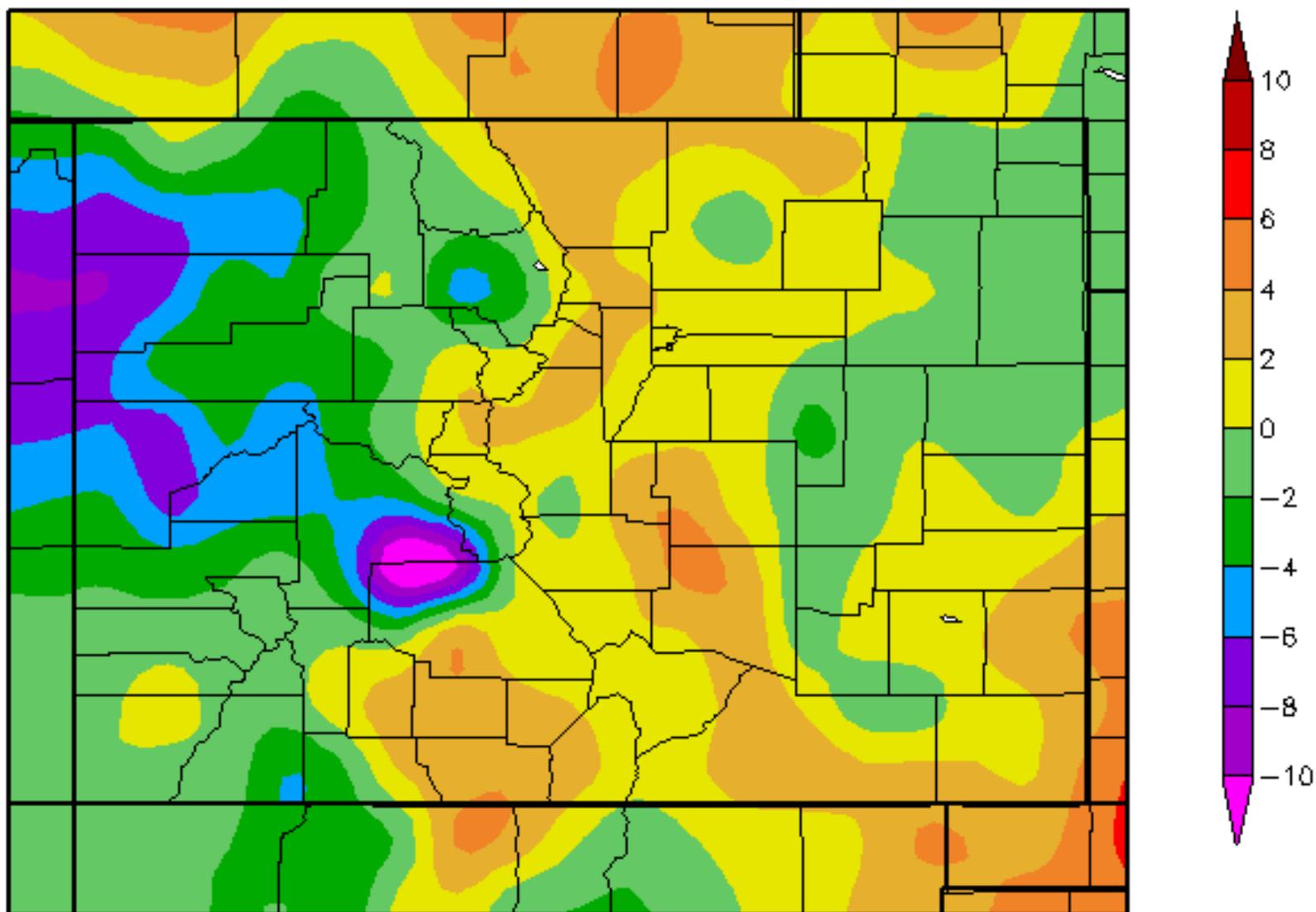
# Departure from Normal Temperature (F)

1/1/2016 - 1/31/2016



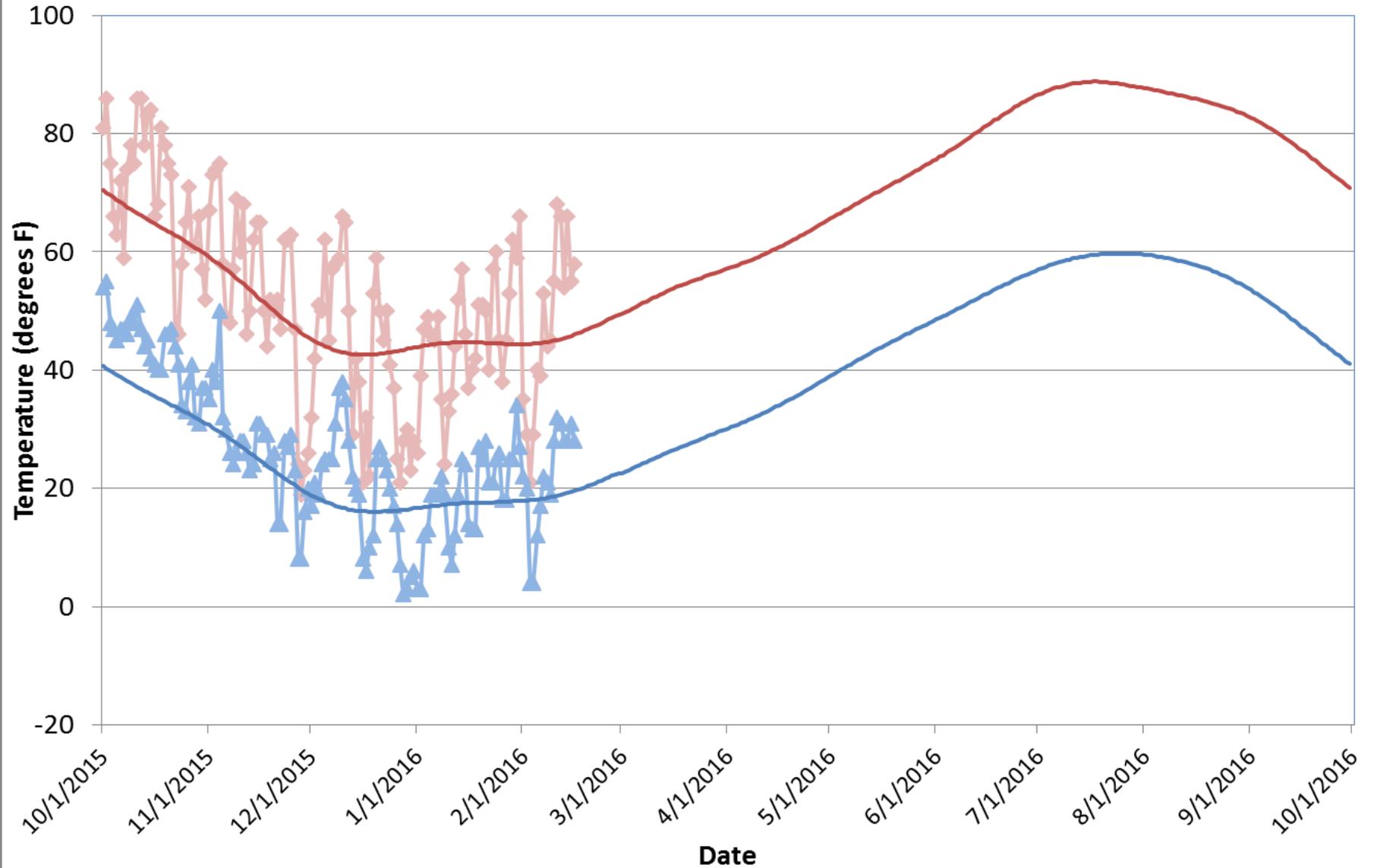
# Departure from Normal Temperature (F)

2/1/2016 - 2/15/2016



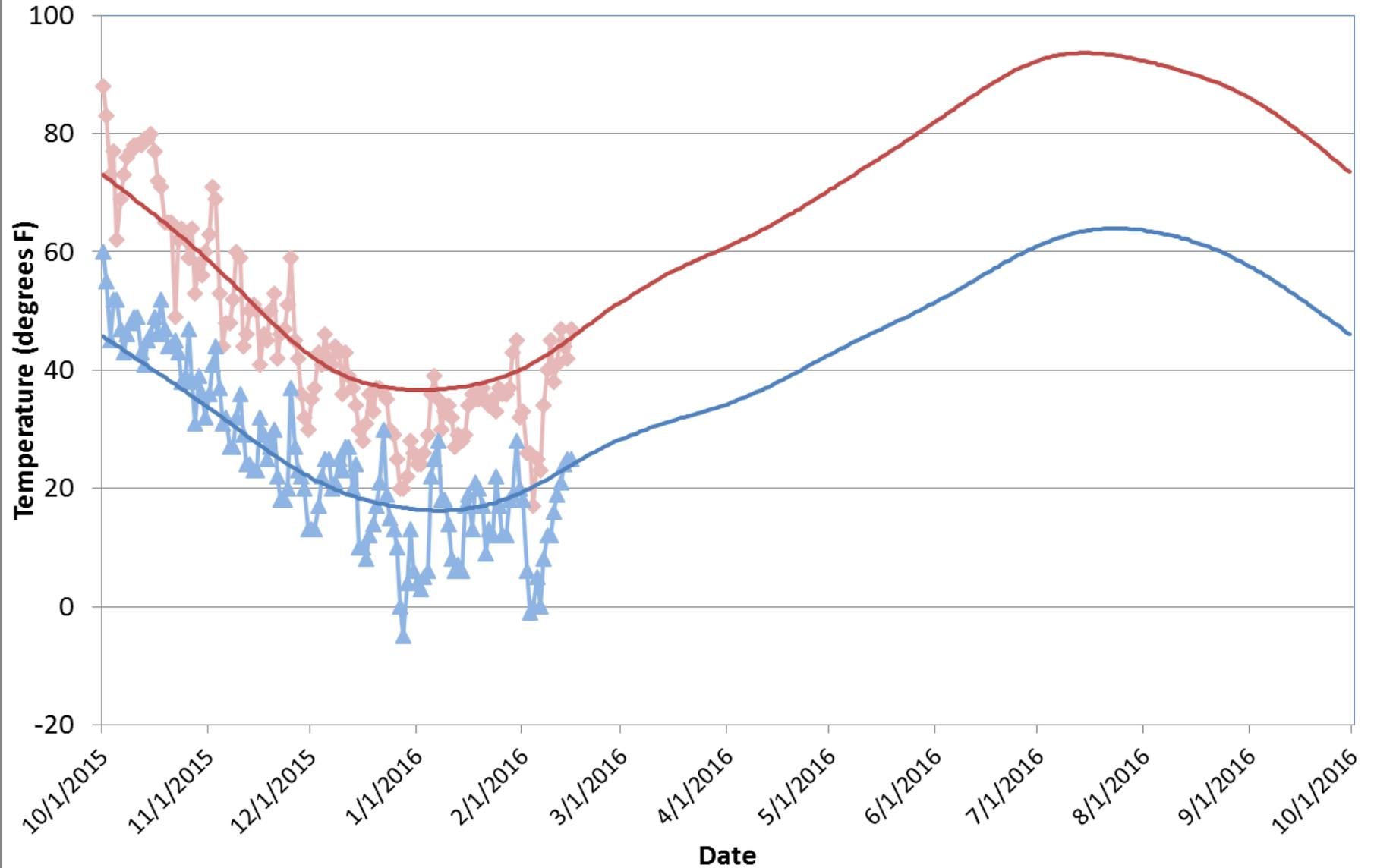
# Denver-Stapleton Daily Max/Min Temperatures with Normals, Water Year 2016

Max Temperature    Normal Max Temp    Min Temperature    Normal Min Temp

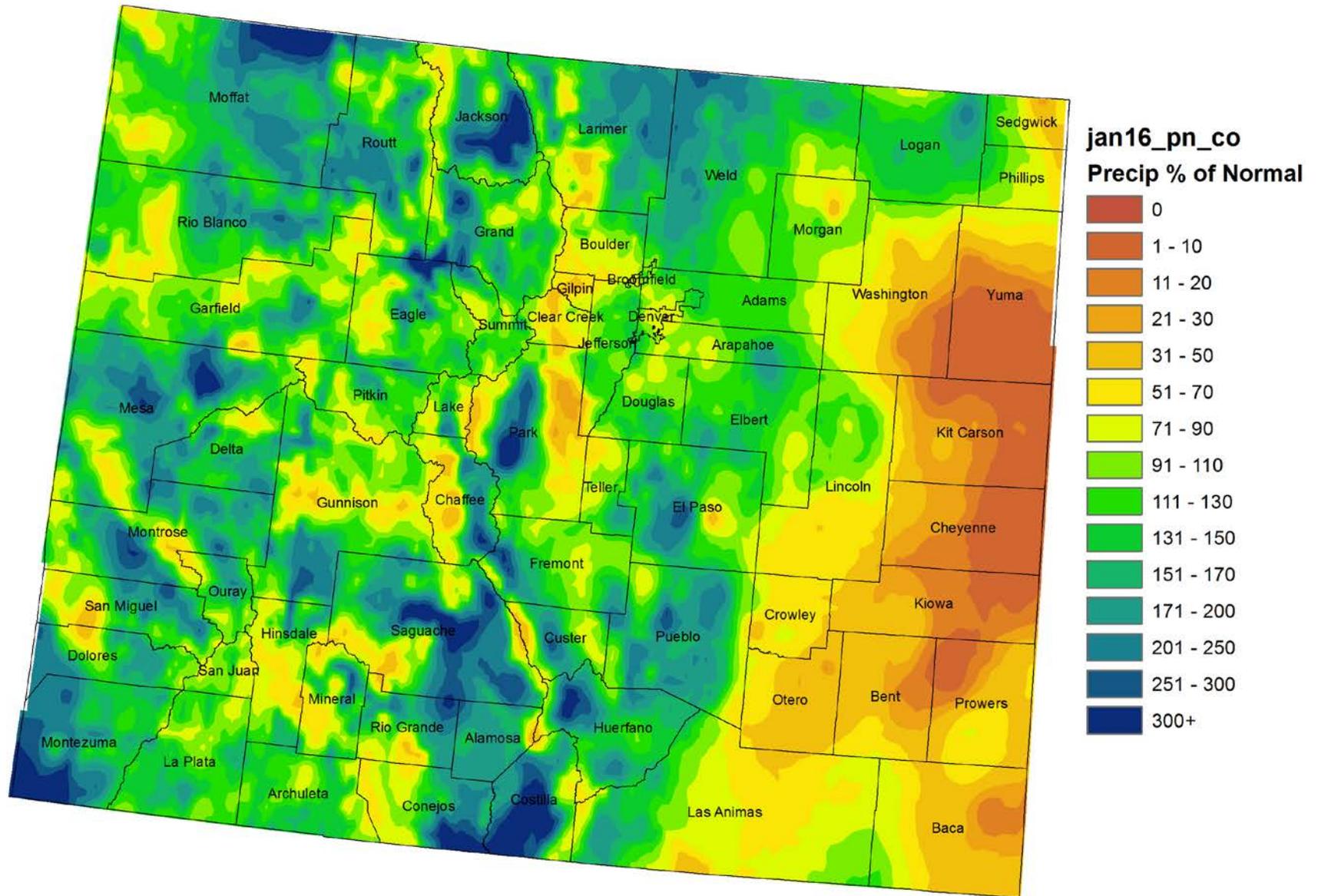


# Grand Junction Daily Max/Min Temperature with Normals, WY 2016

Max Temperature    Normal Max Temp    Min Temperature    Normal Min Temp



# Colorado January 2016 Precipitation as a Percentage of Normal



# Jan 2015 Statewide Precipitation

Colorado, Precipitation, January

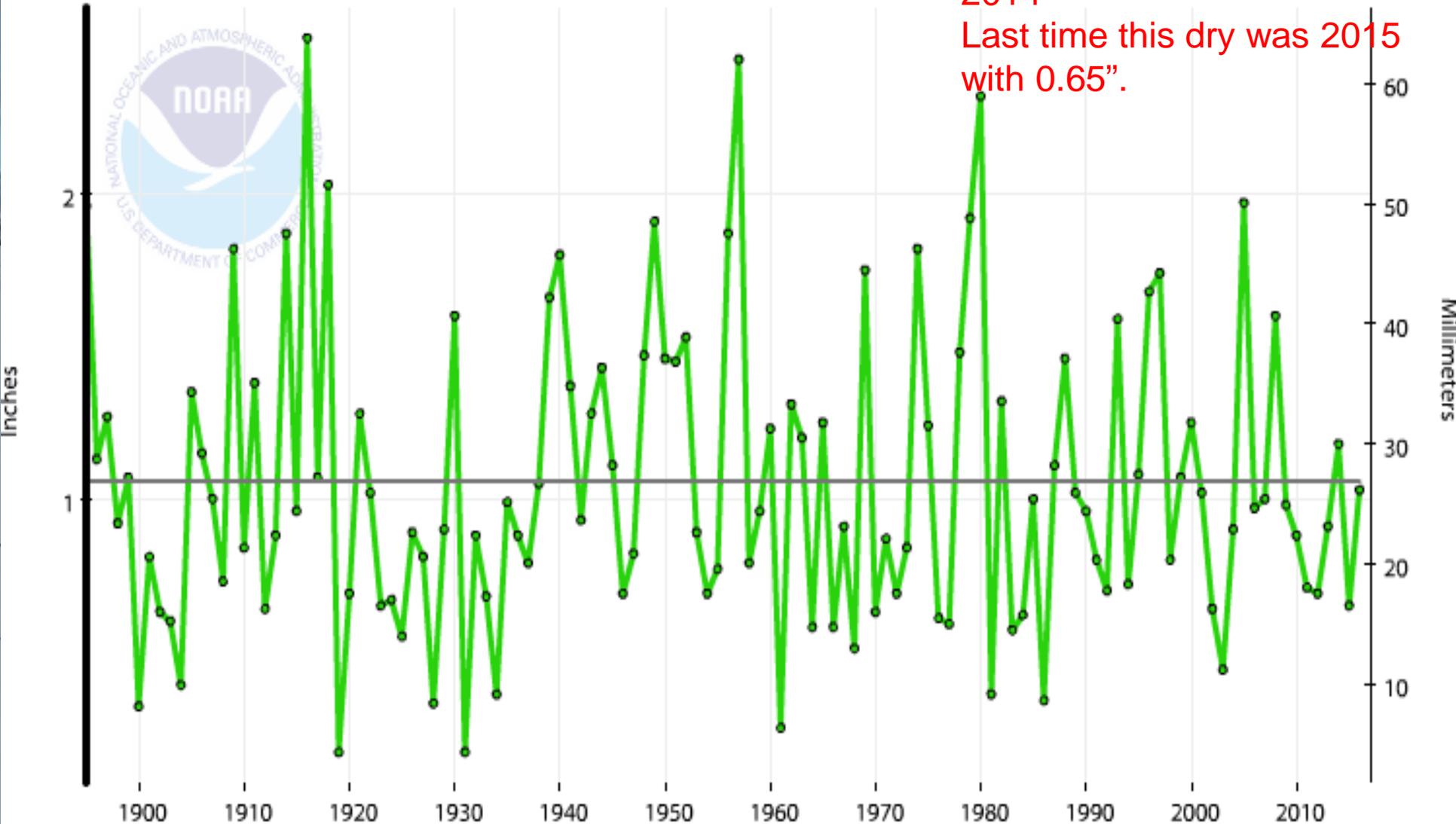
— 1901-2000  
Avg: 1.06"

—●— Precip

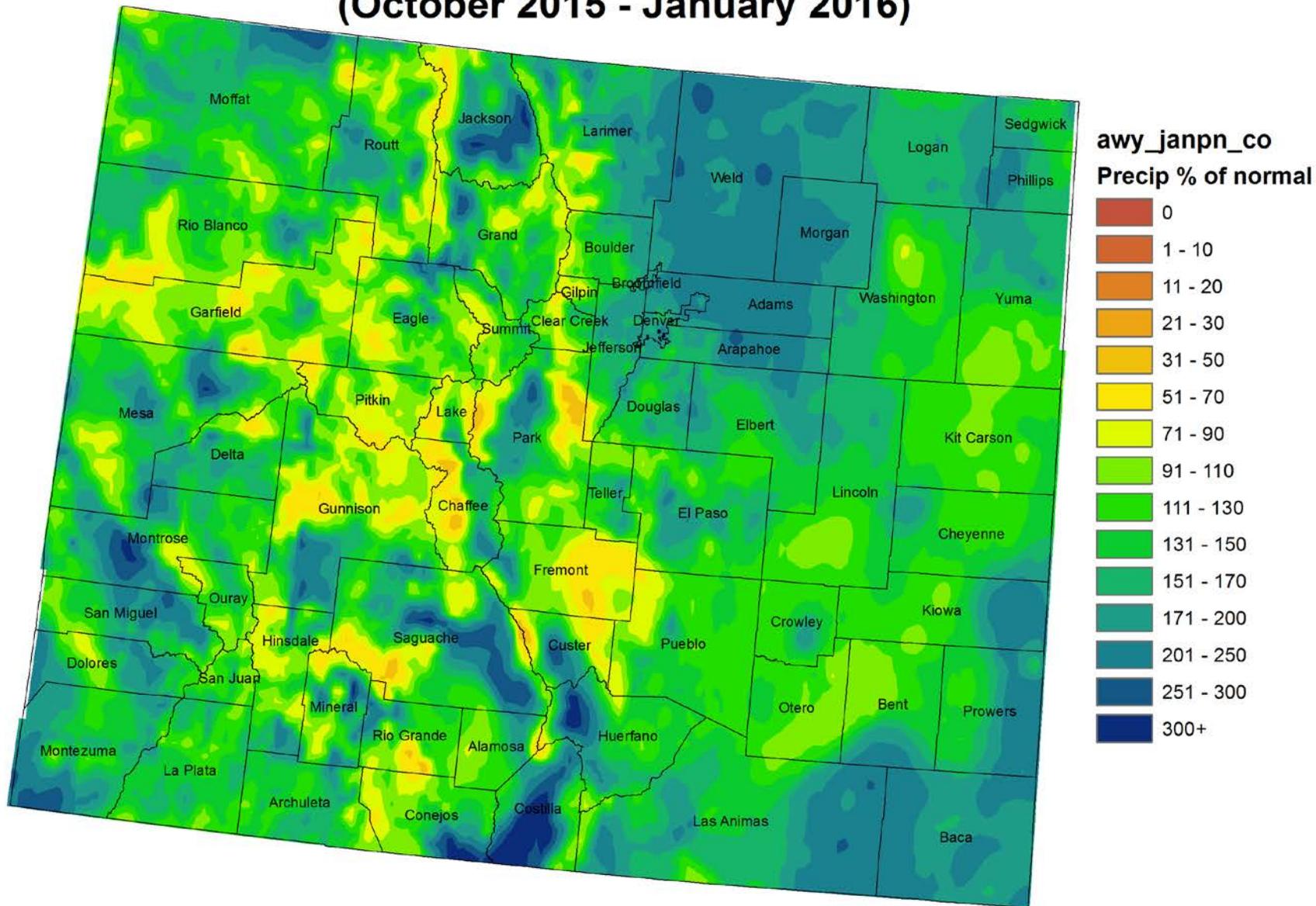
1.03" (-0.03")

72<sup>nd</sup> driest on Record 1895-2014

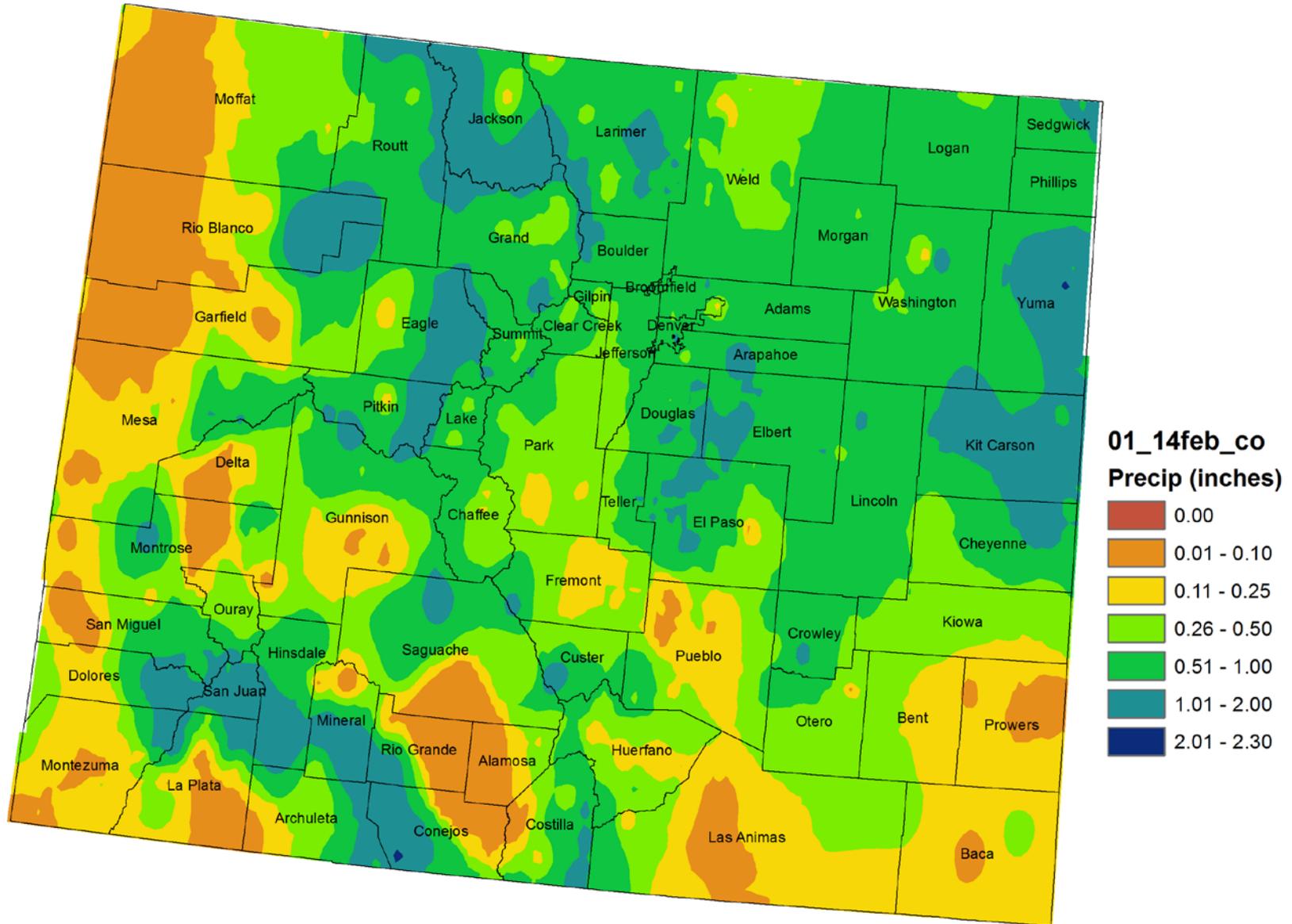
Last time this dry was 2015 with 0.65".



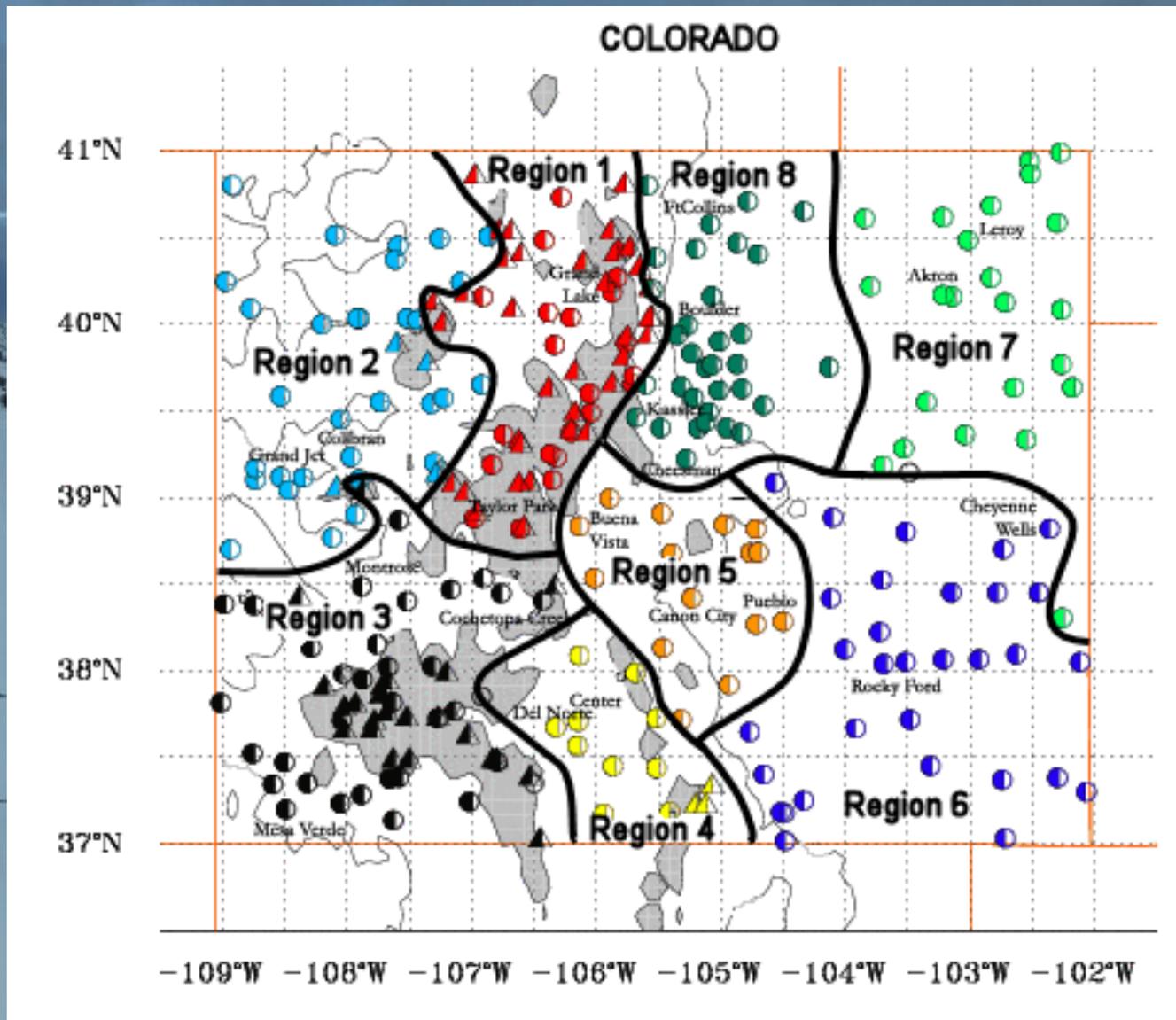
# Colorado Water Year 2016 Precipitation as a Percentage of Normal (October 2015 - January 2016)



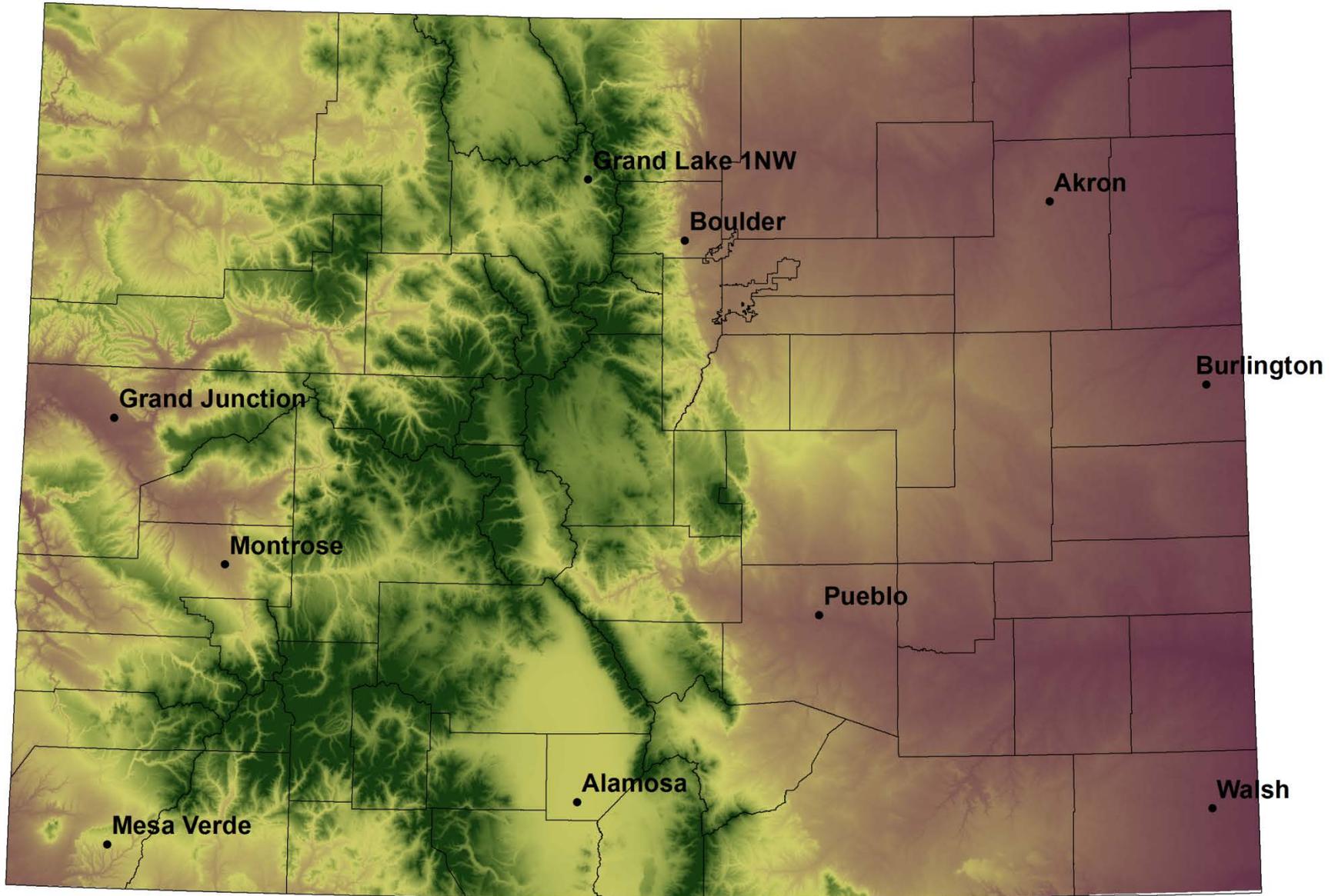
# Colorado Month to Date Precipitation 1 - 14 February 2016



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

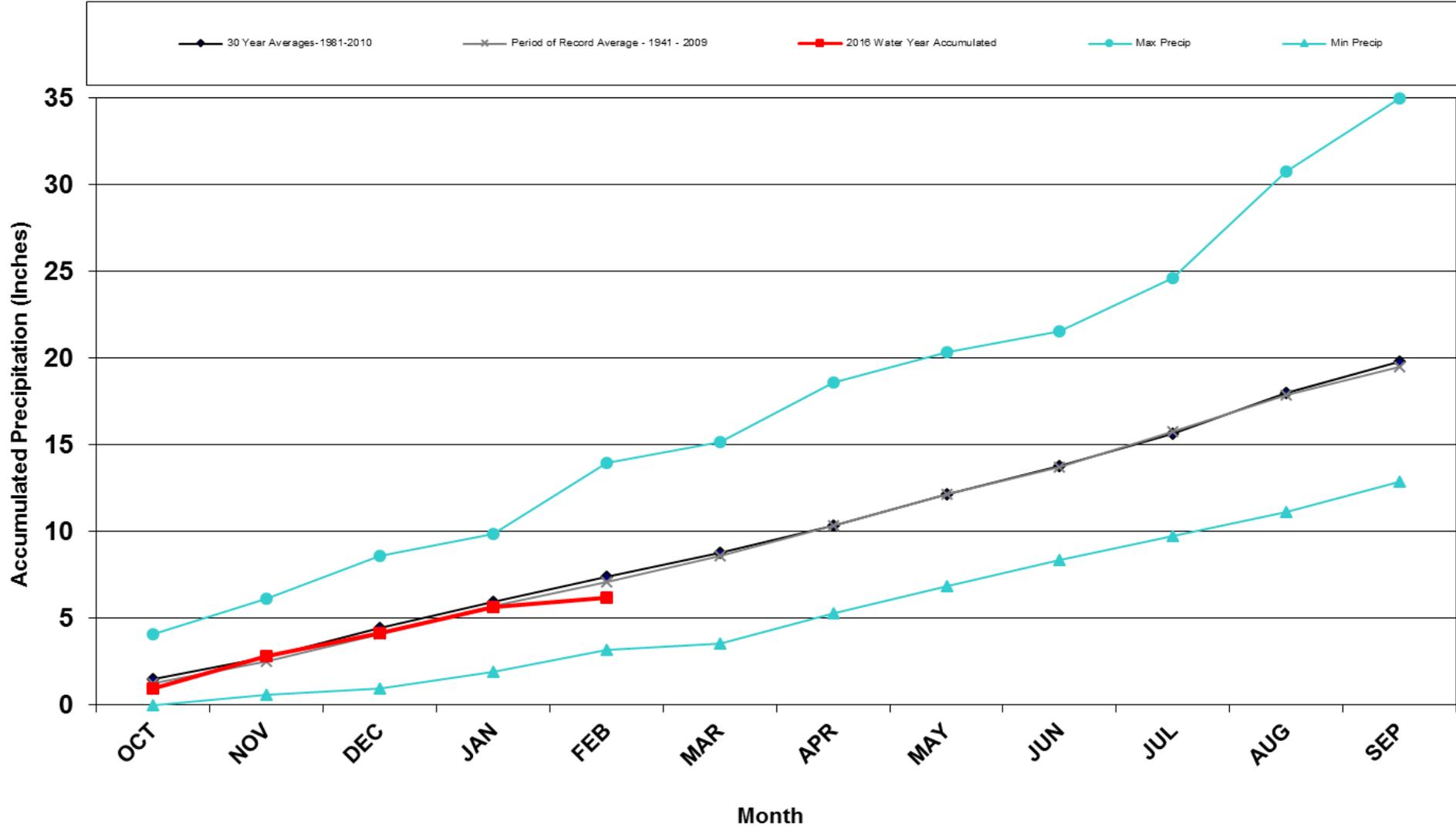


# NWS Cooperative Stations for WATF



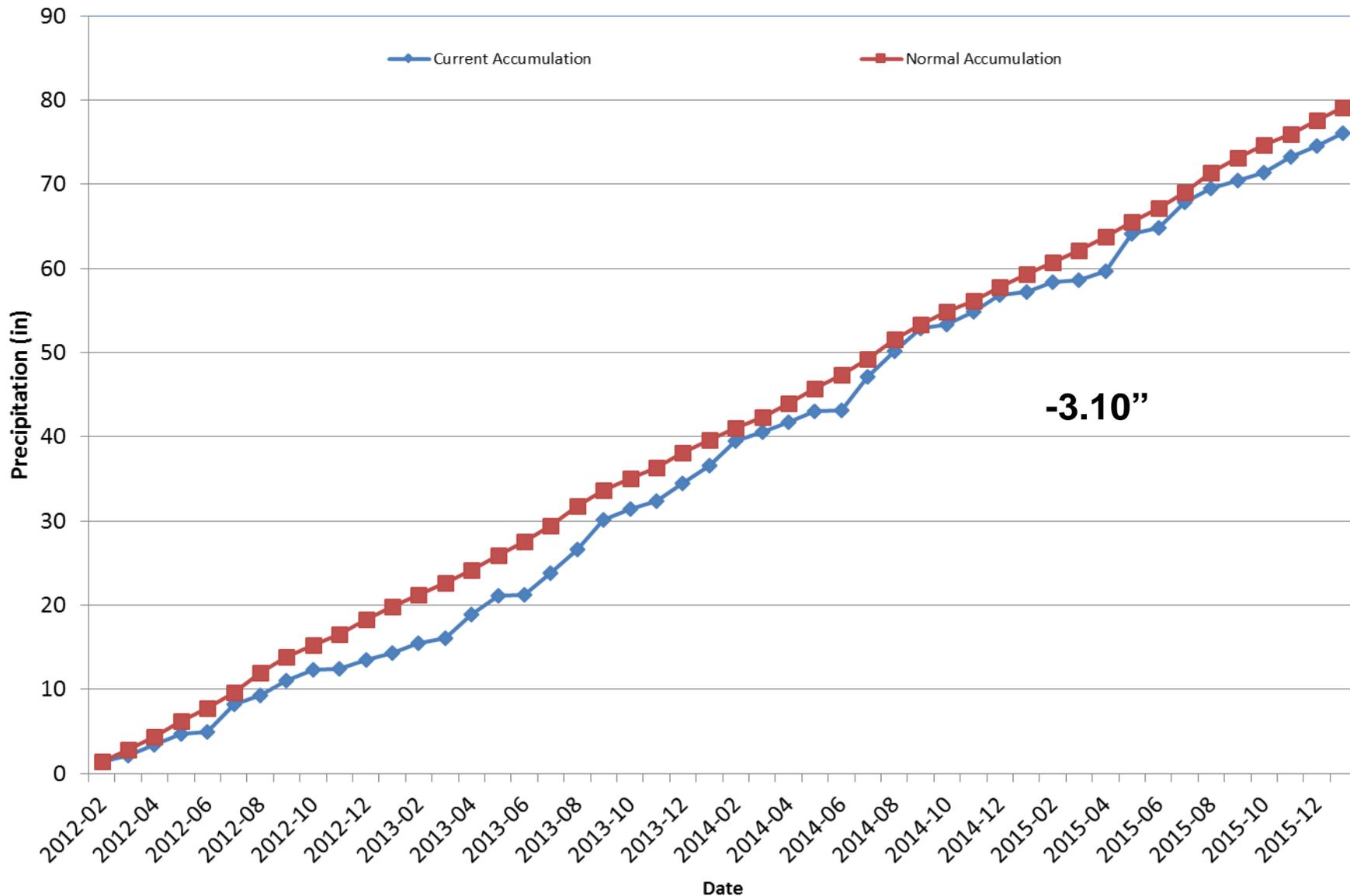
# Division 1 – Grand Lake 1NW

## Grand Lake 1 NW 2016 Water Year



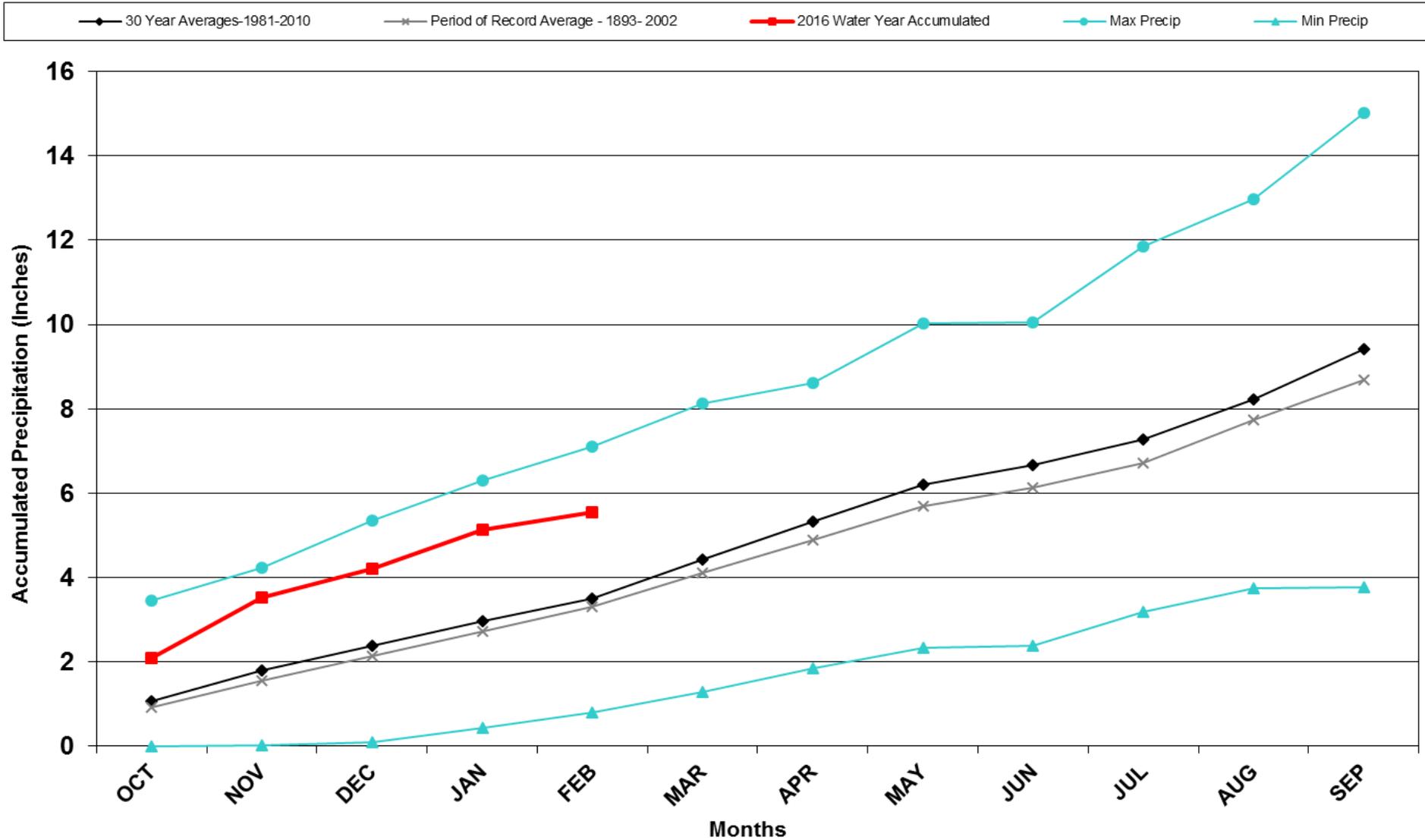
# Division 1 – Grand Lake 1NW

## Grand Lake 1NW Precipitation Accumulation



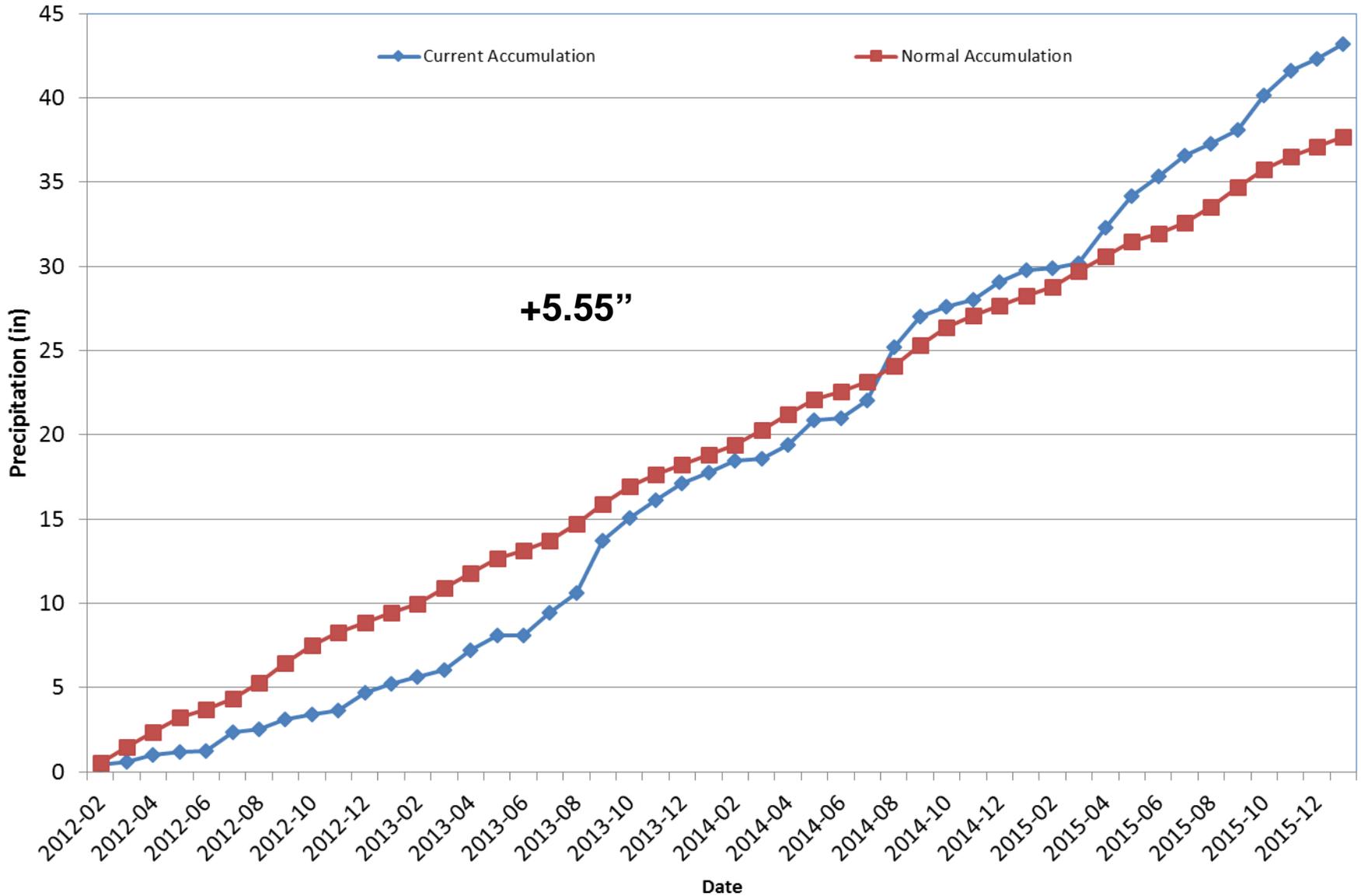
# Division 2 – Grand Junction

## Grand Junction WSFO 2016 Water Year



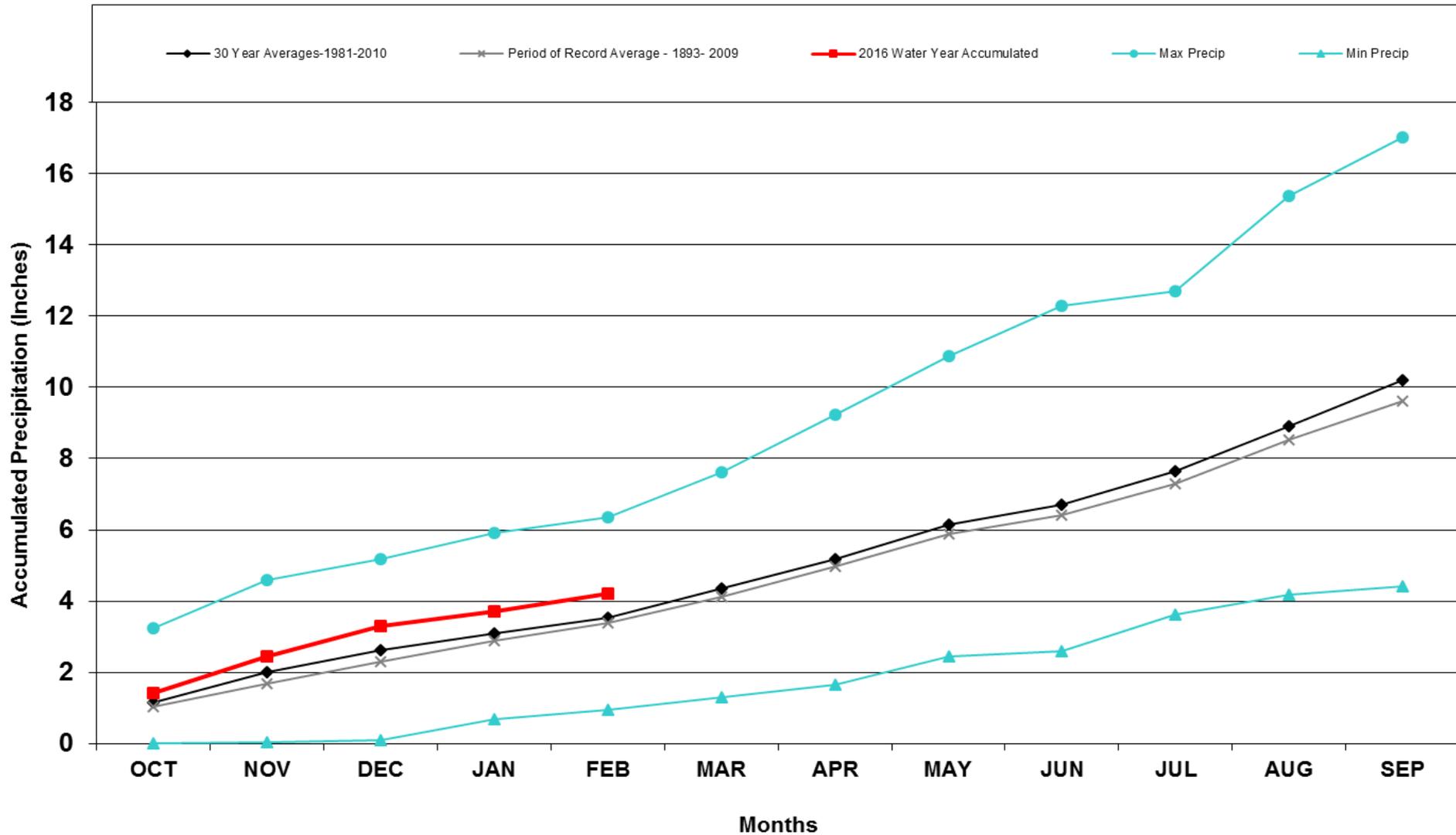
# Division 2 – Grand Junction

## Grand Junction Precipitation Accumulation



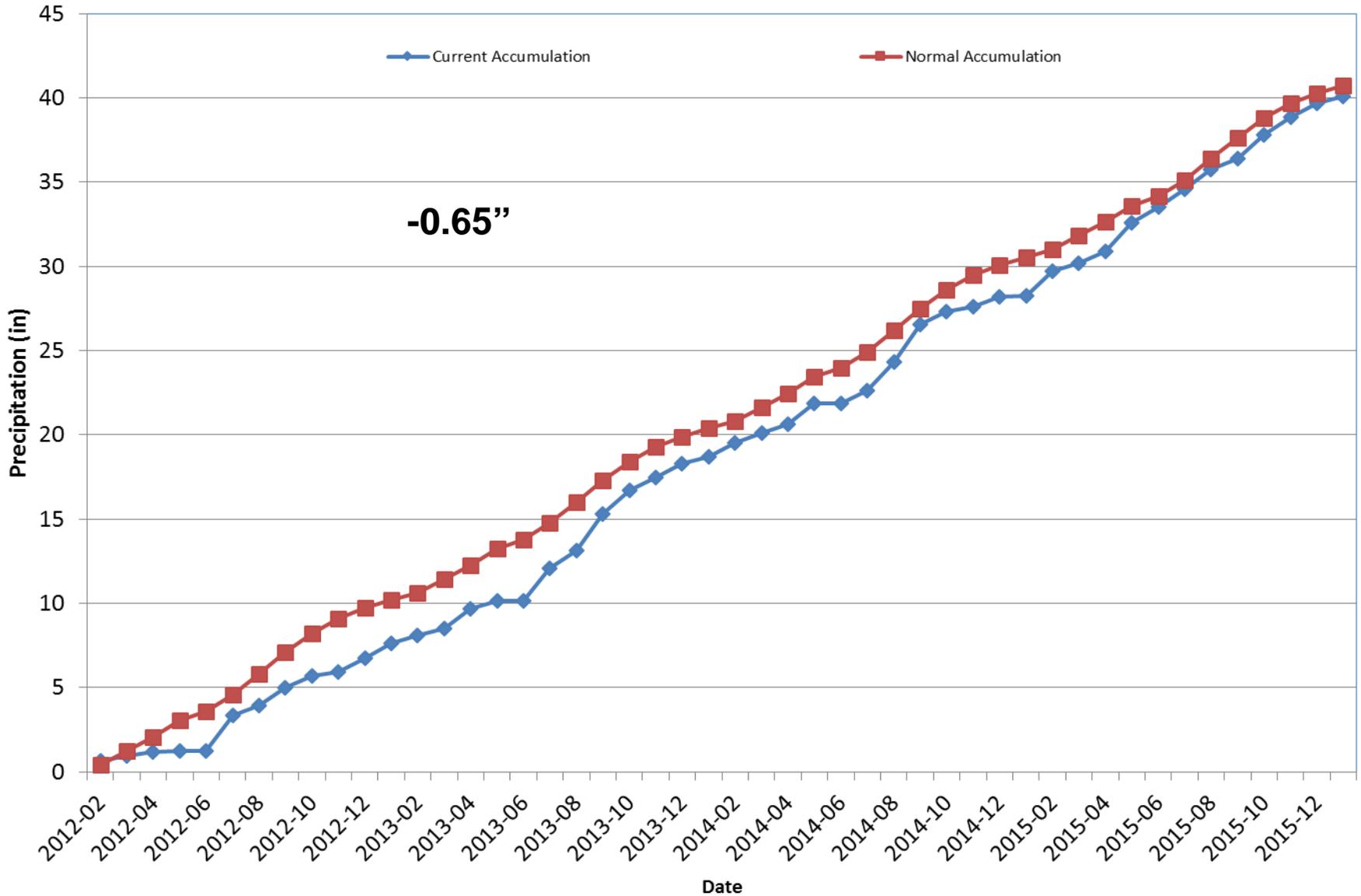
# Division 3 – Montrose

## Montrose #2 2016 Water Year



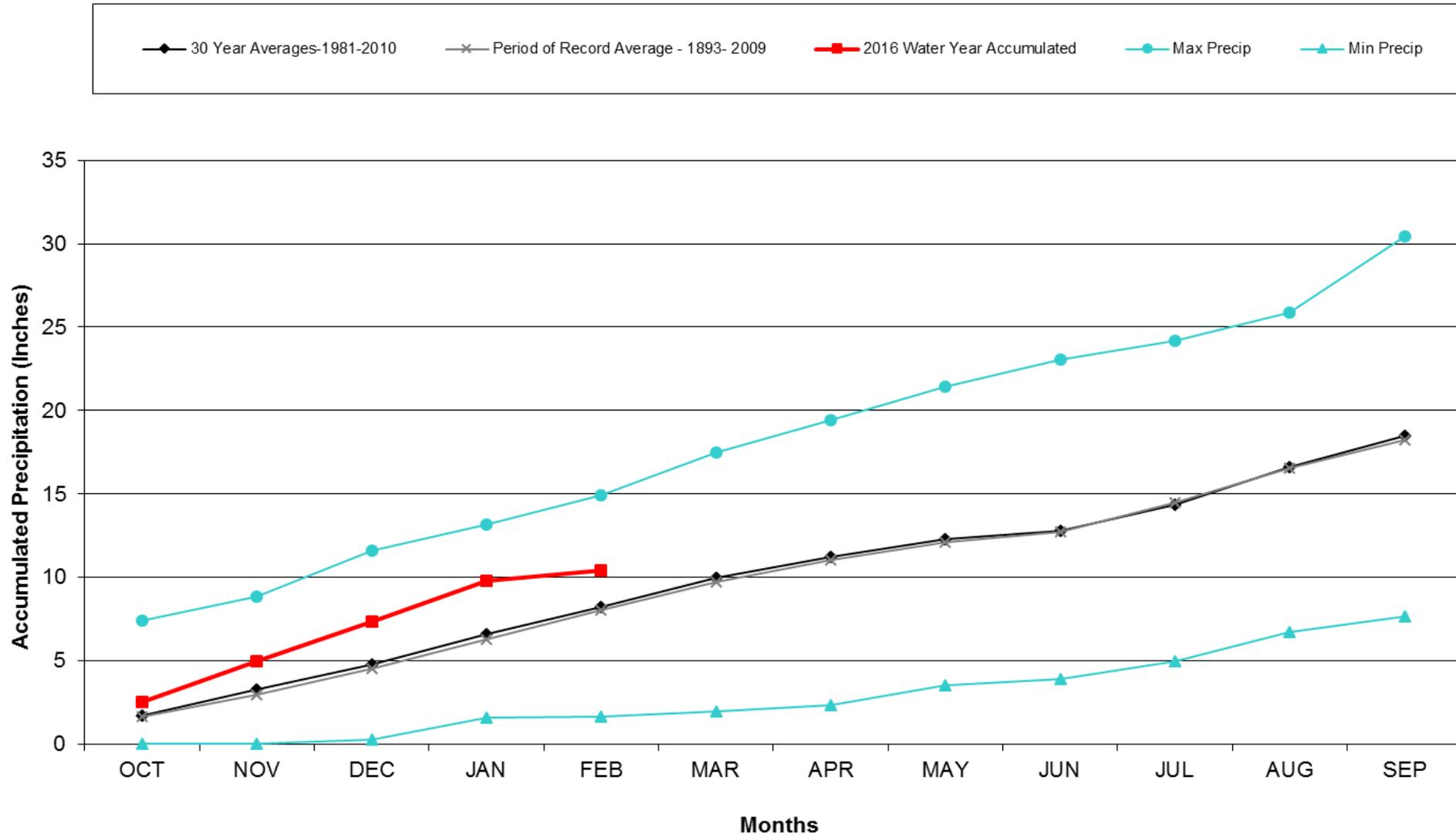
# Division 3 – Montrose

## Montrose #2 Precipitation Accumulation



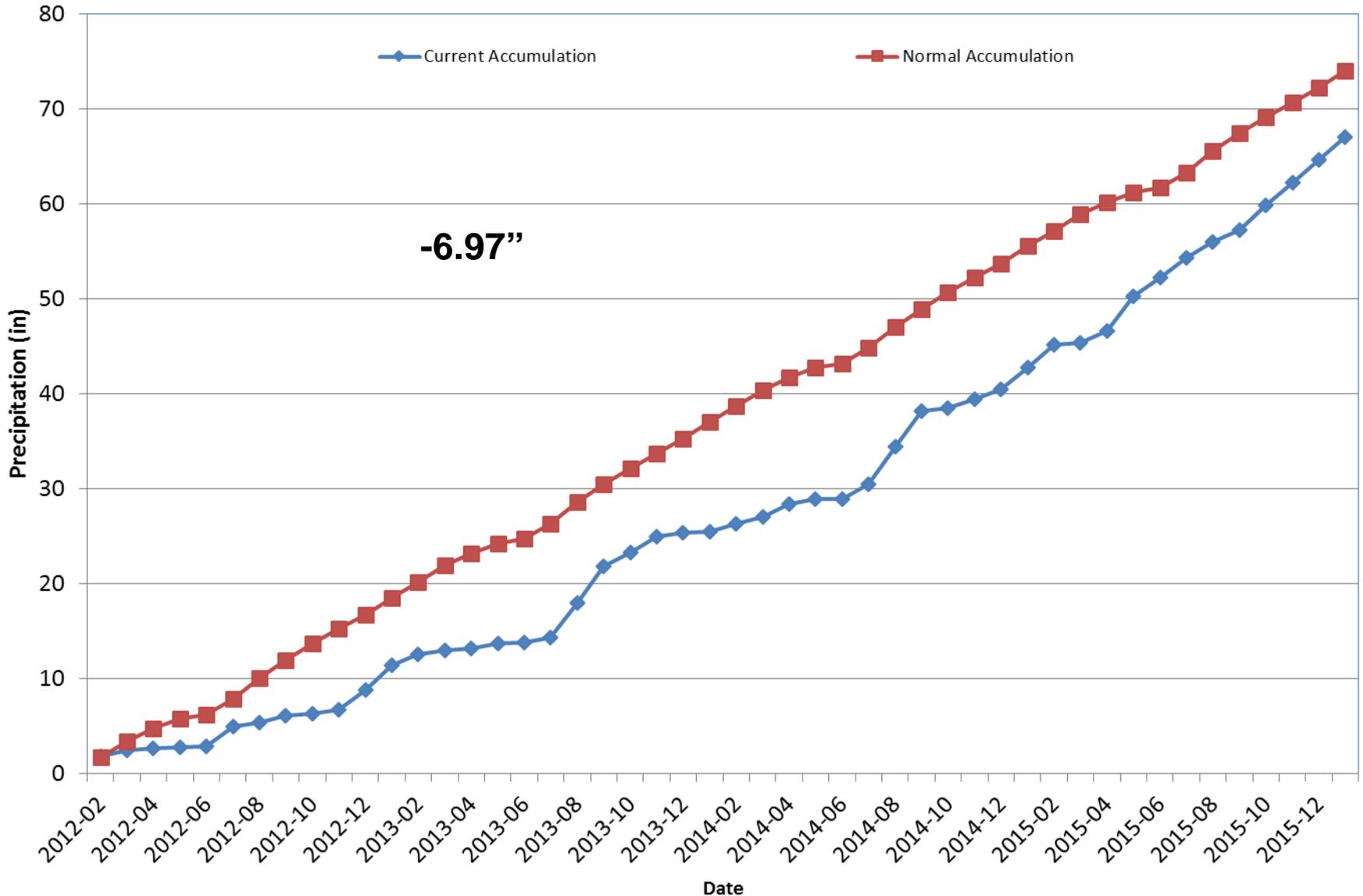
# Division 3 – Mesa Verde NP

## Mesa Verde NP 2016 Water Year



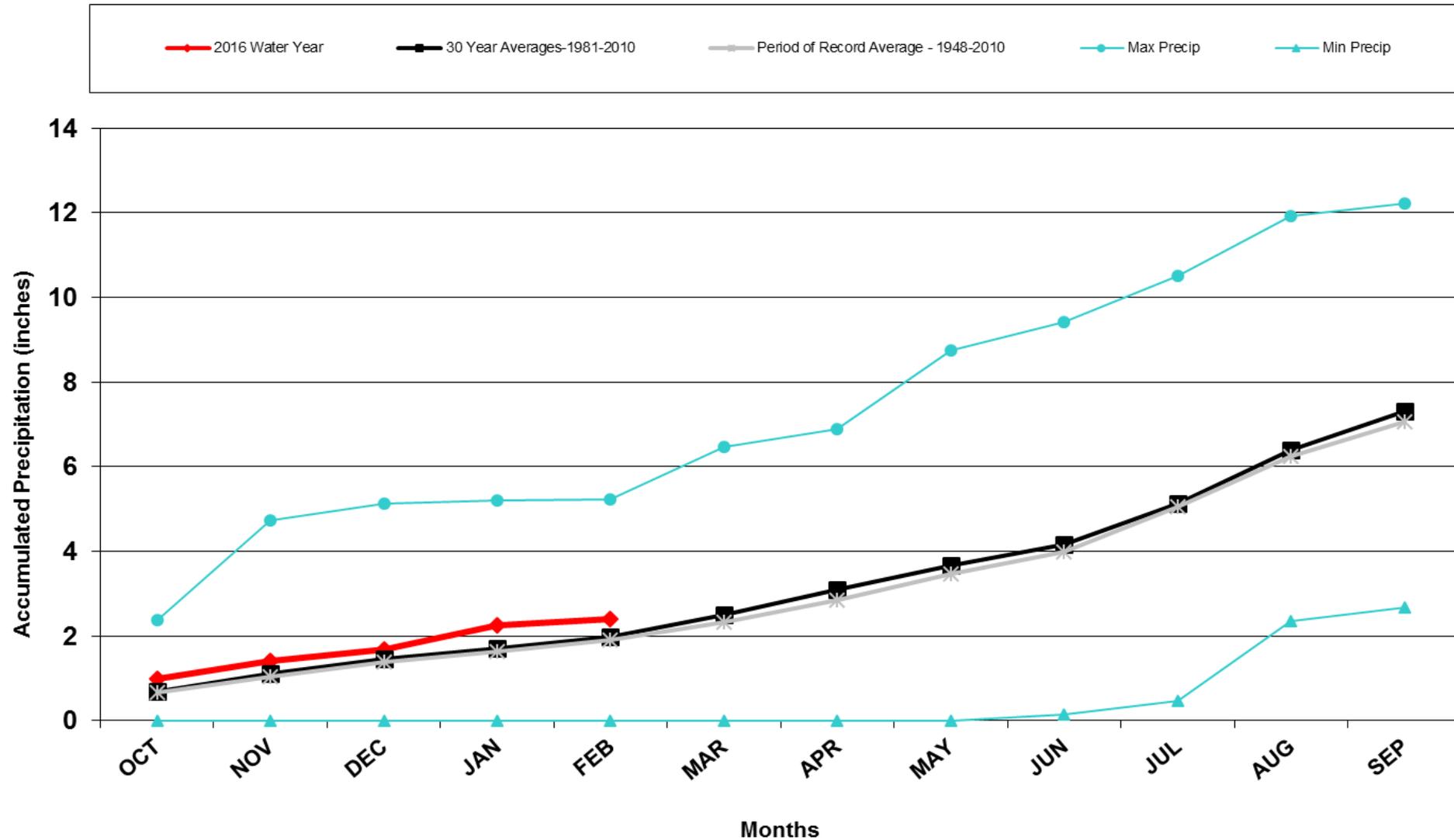
# Division 3 – Mesa Verde NP

## Mesa Verde NP Precipitation Accumulation



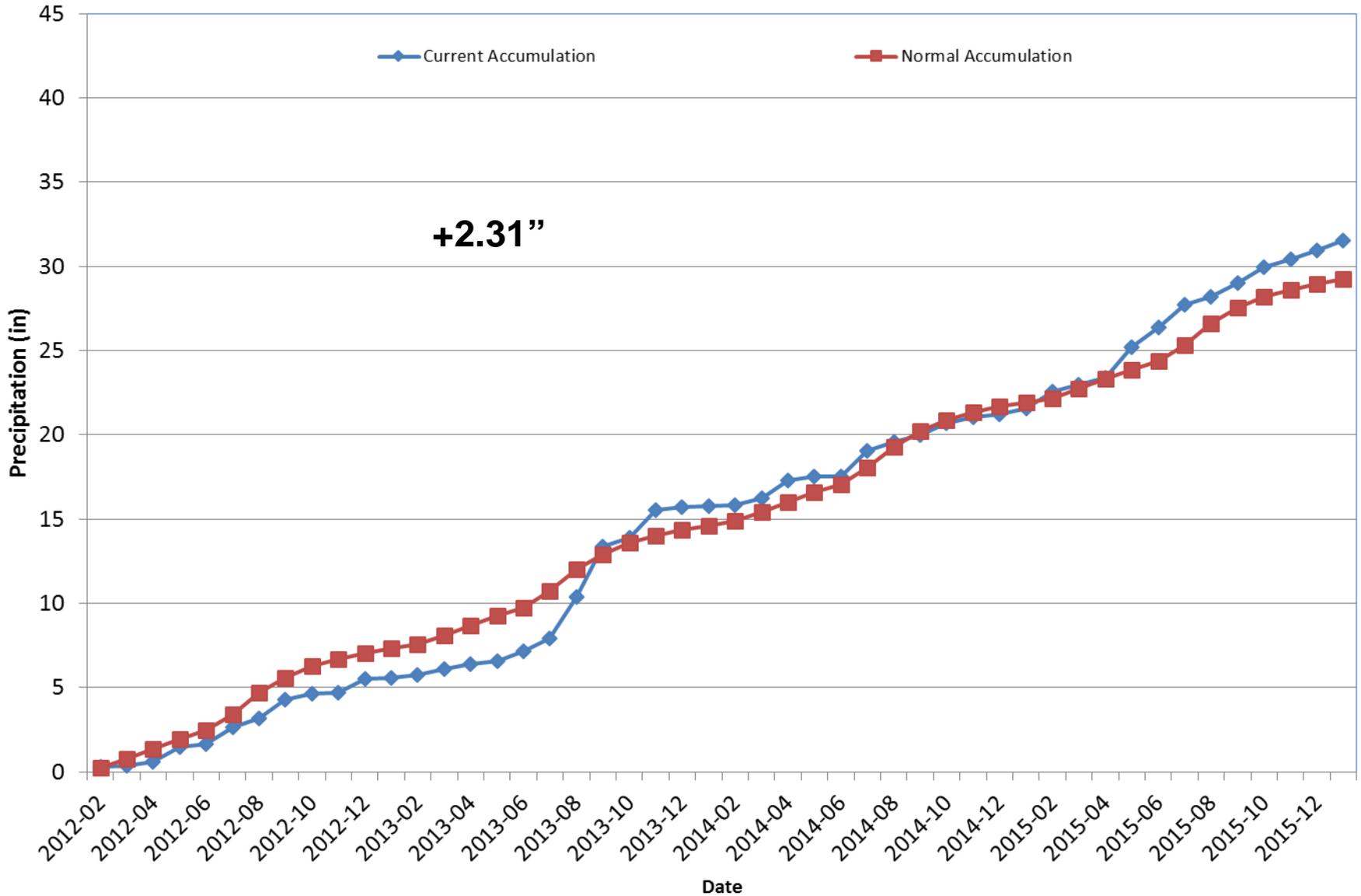
# Division 4 – Alamosa

## Alamosa WSO 2016 Water Year



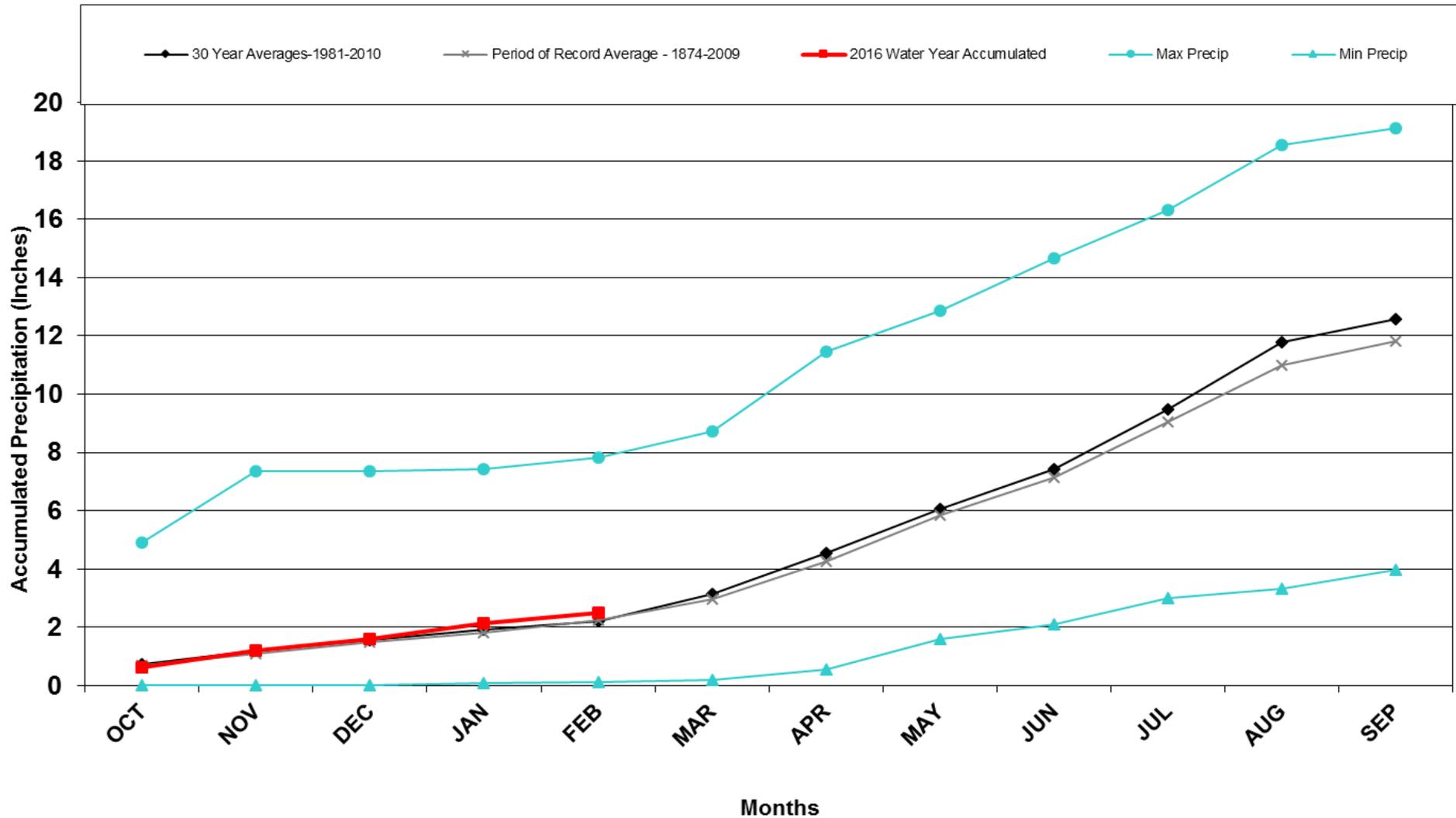
# Division 4 – Alamosa

## Alamosa WSO Precipitation Accumulation



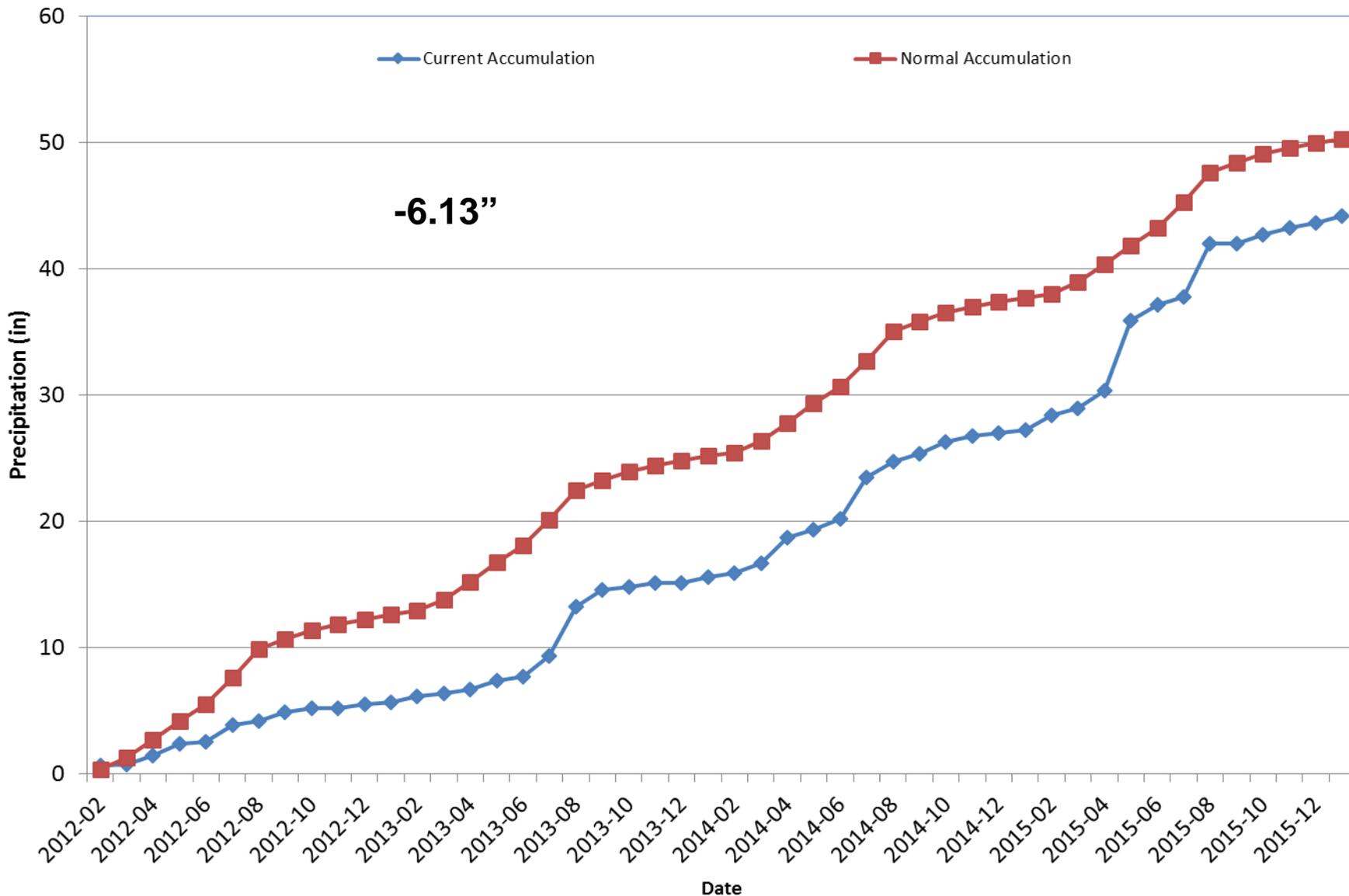
# Division 5 – Pueblo

## Pueblo WSO 2016 Water Year



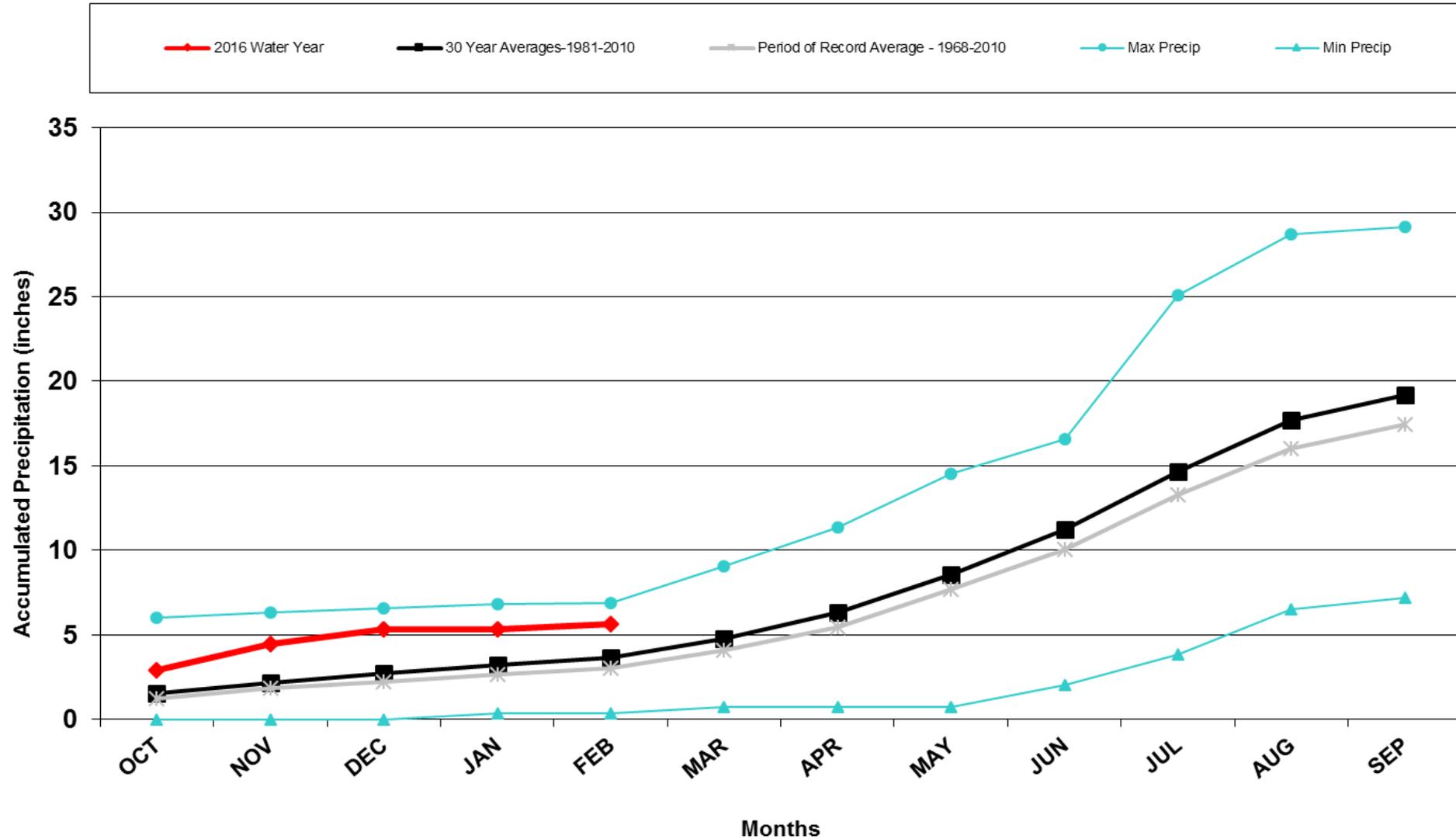
# Division 5 – Pueblo

## Pueblo Memorial AP Precipitation Accumulation



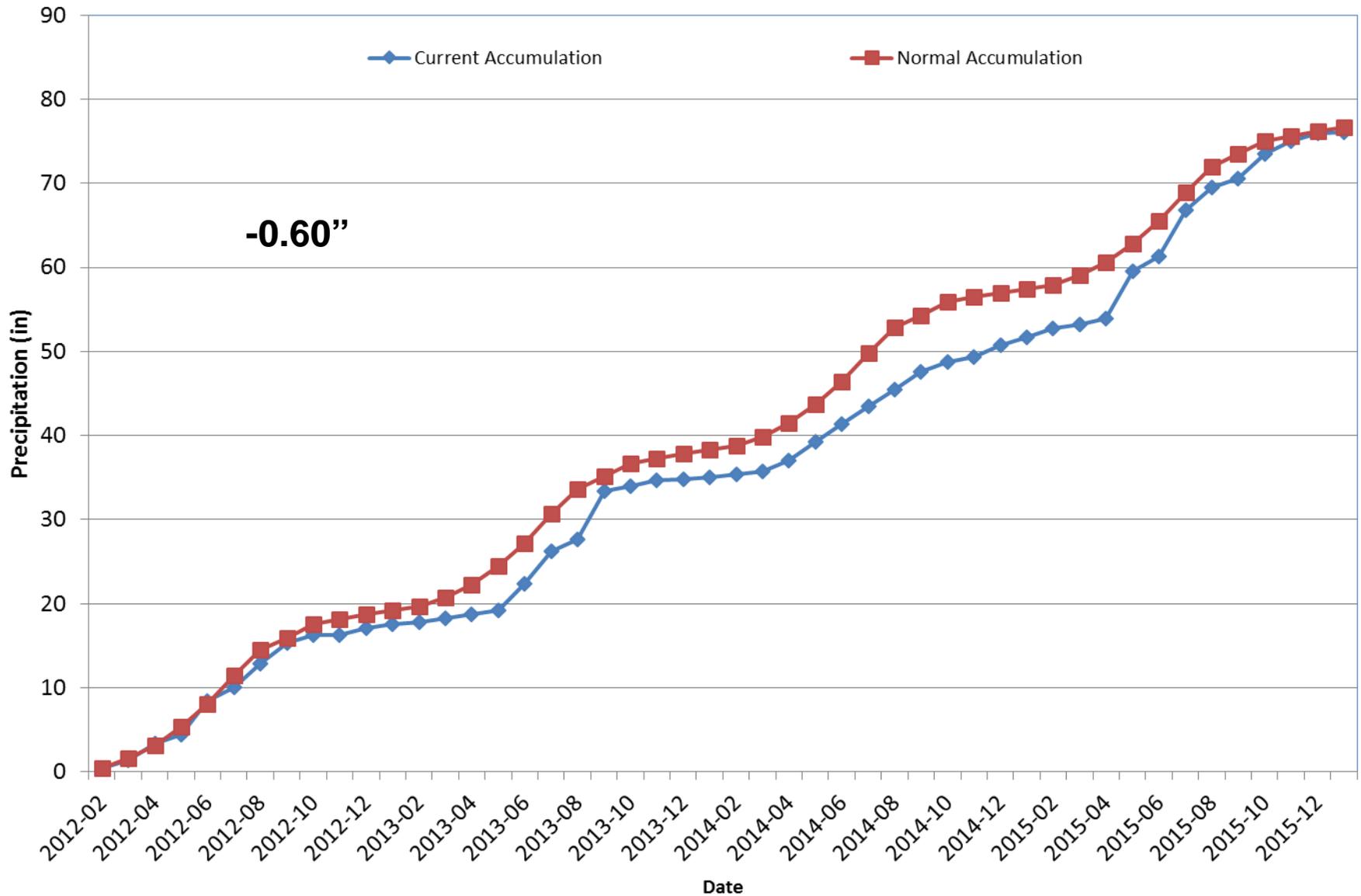
# Division 6 - Walsh

## Walsh 2016 Water Year



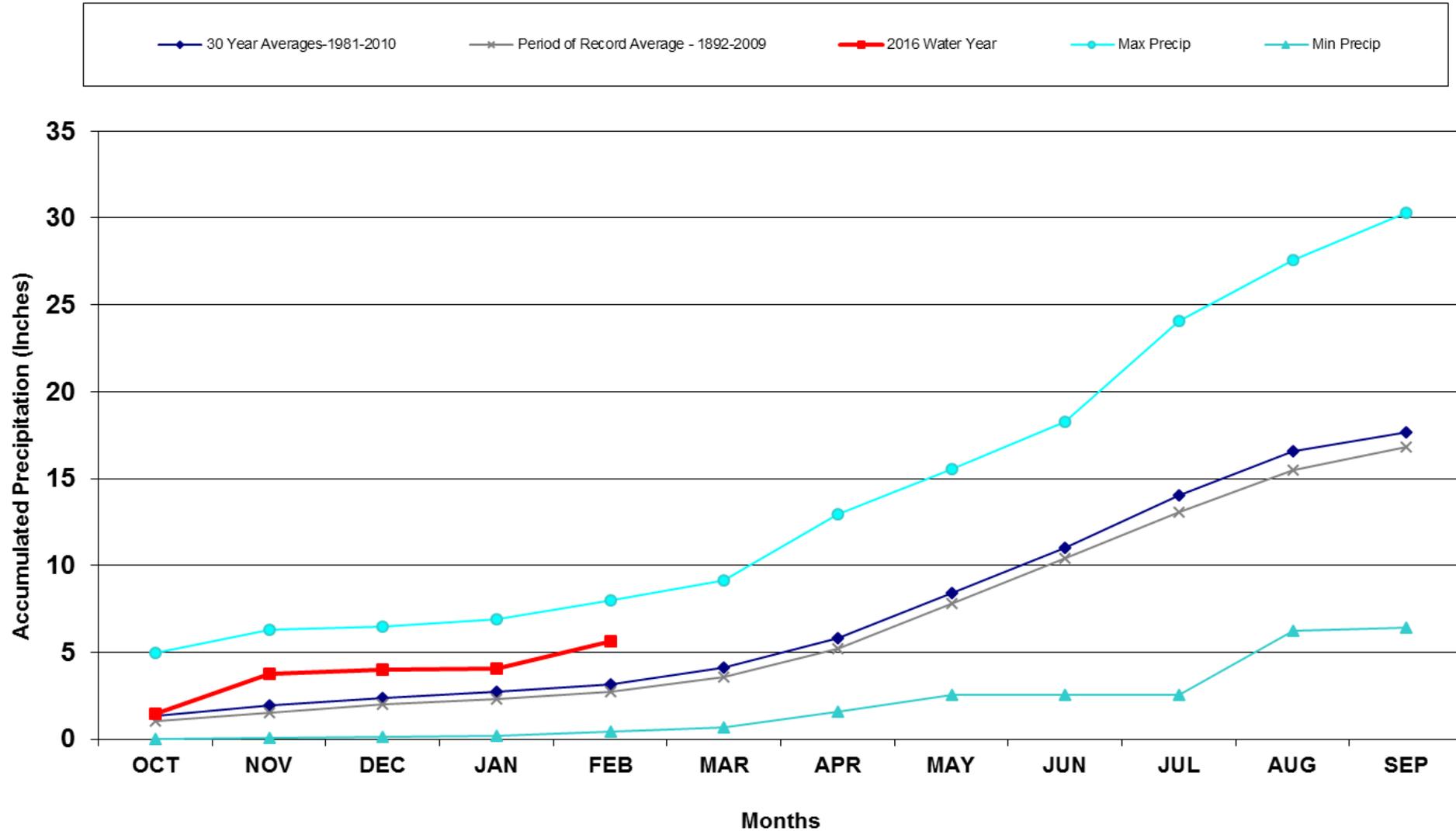
# Division 6 - Walsh

## Walsh 1W Precipitation Accumulation



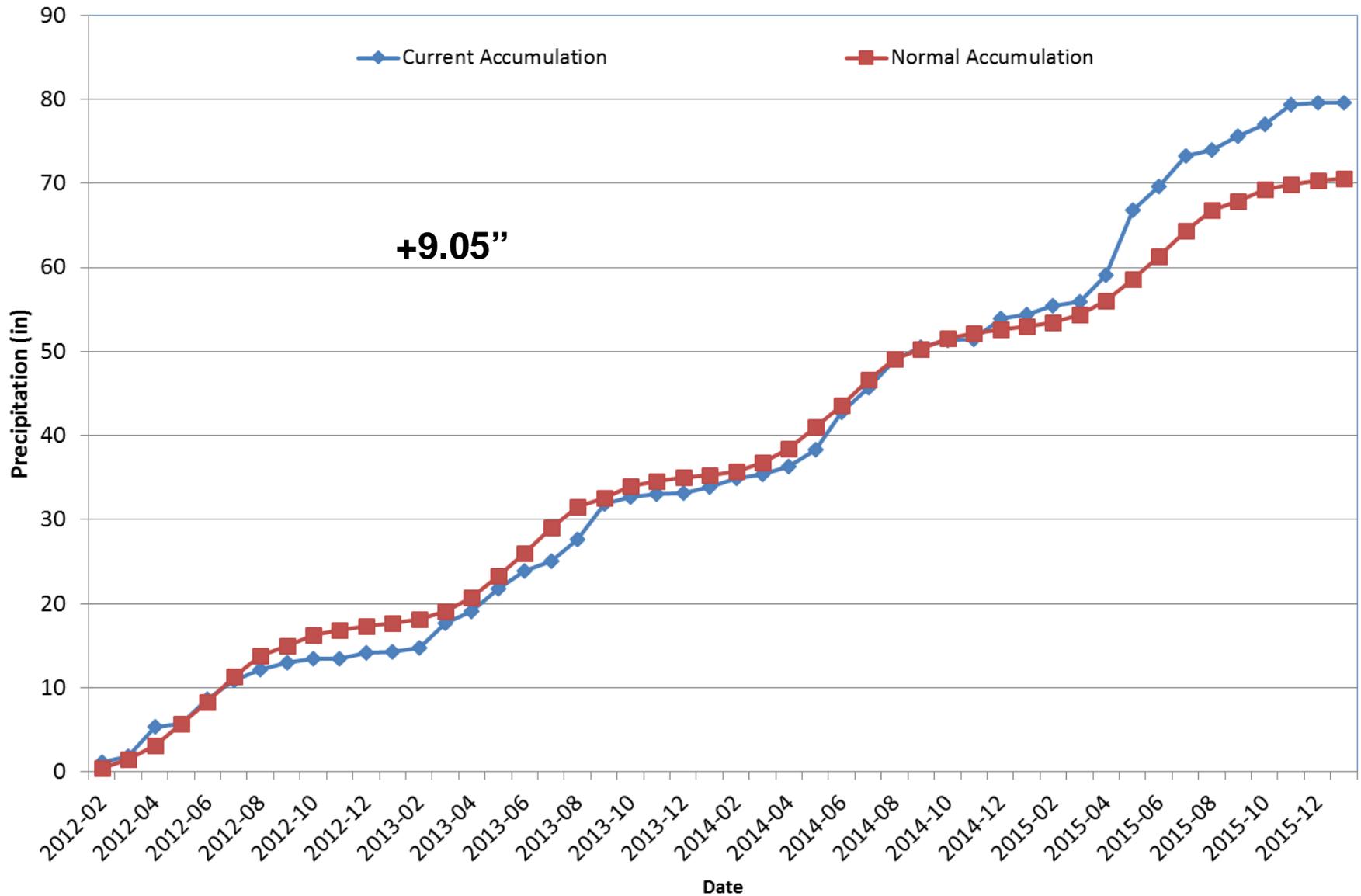
# Division 6 - Burlington

## Burlington 2016 Water Year



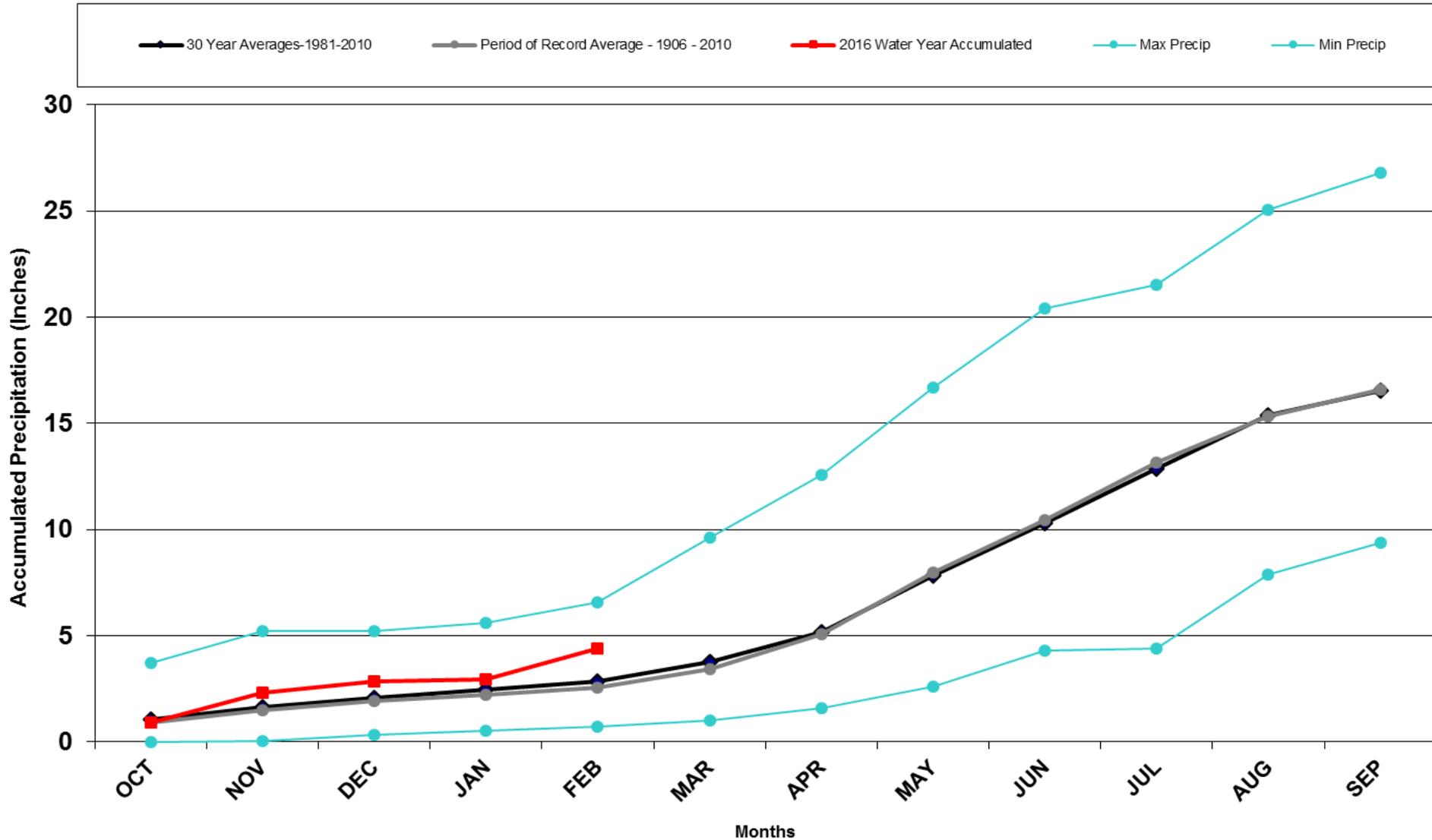
# Division 6 - Burlington

## Burlington, CO Precipitation Accumulation



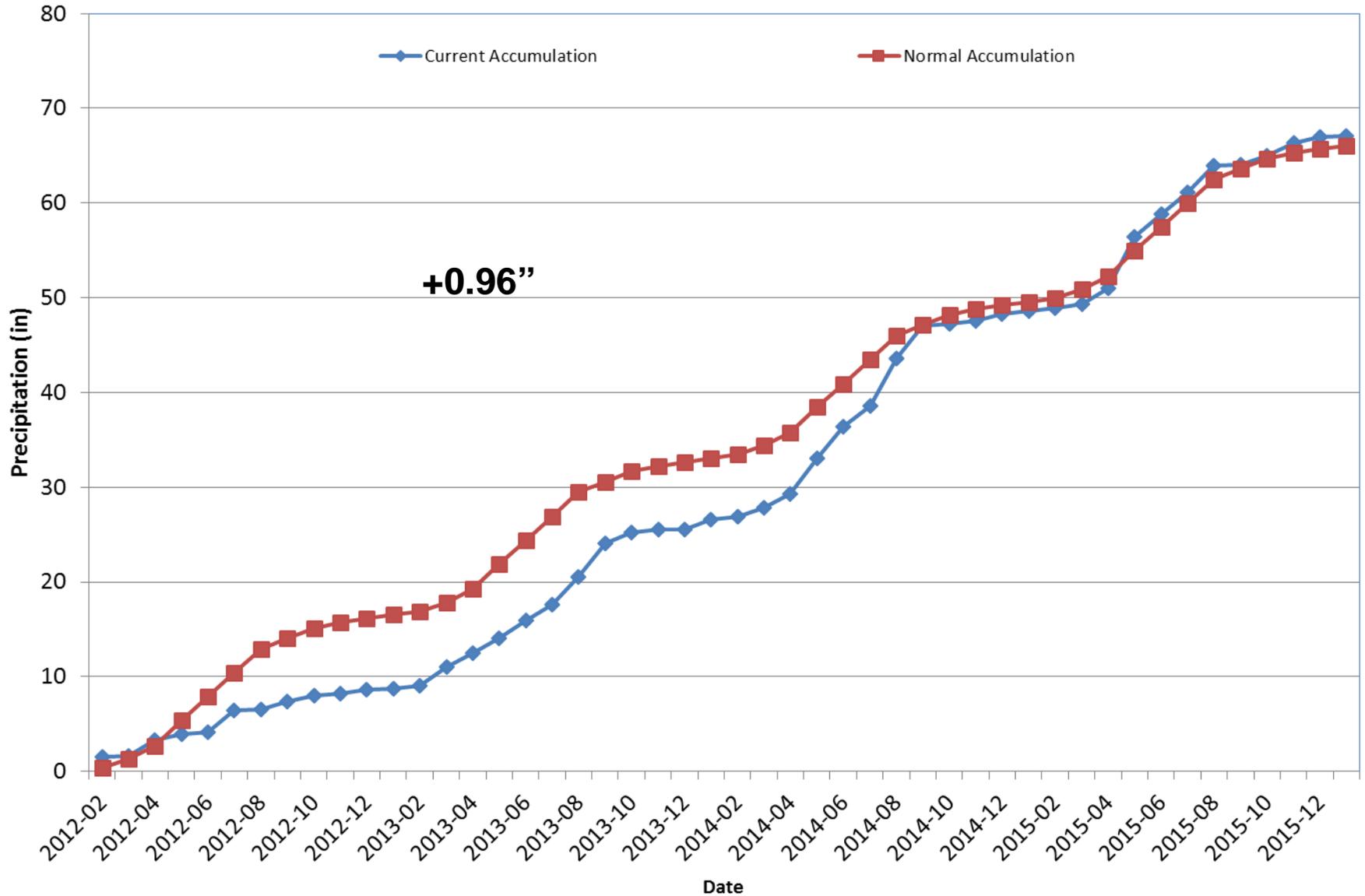
# Division 7 – Akron

## Akron 4E 2016 Water Year



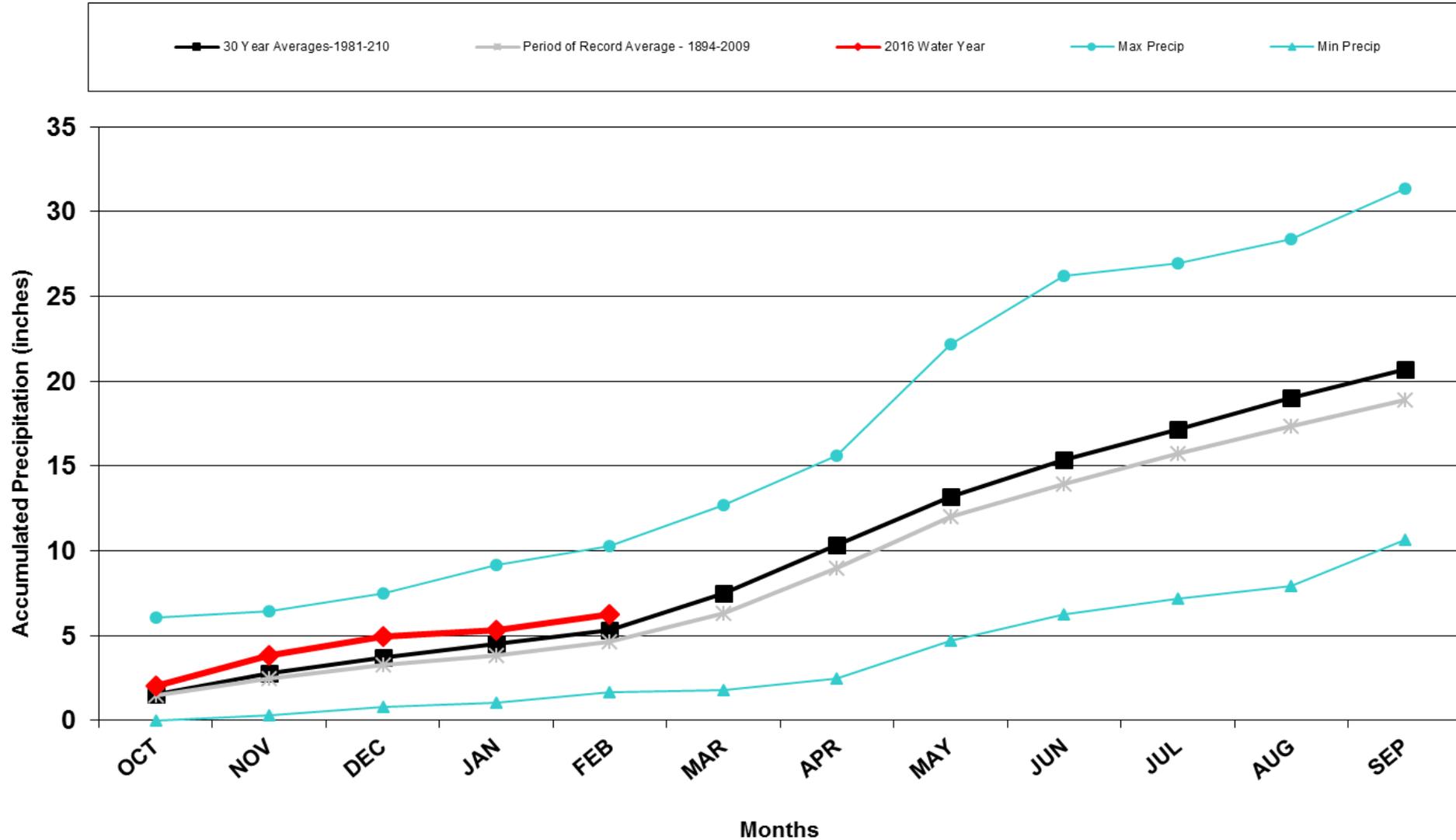
# Division 7 – Akron

## Akron 4E Precipitation Accumulation



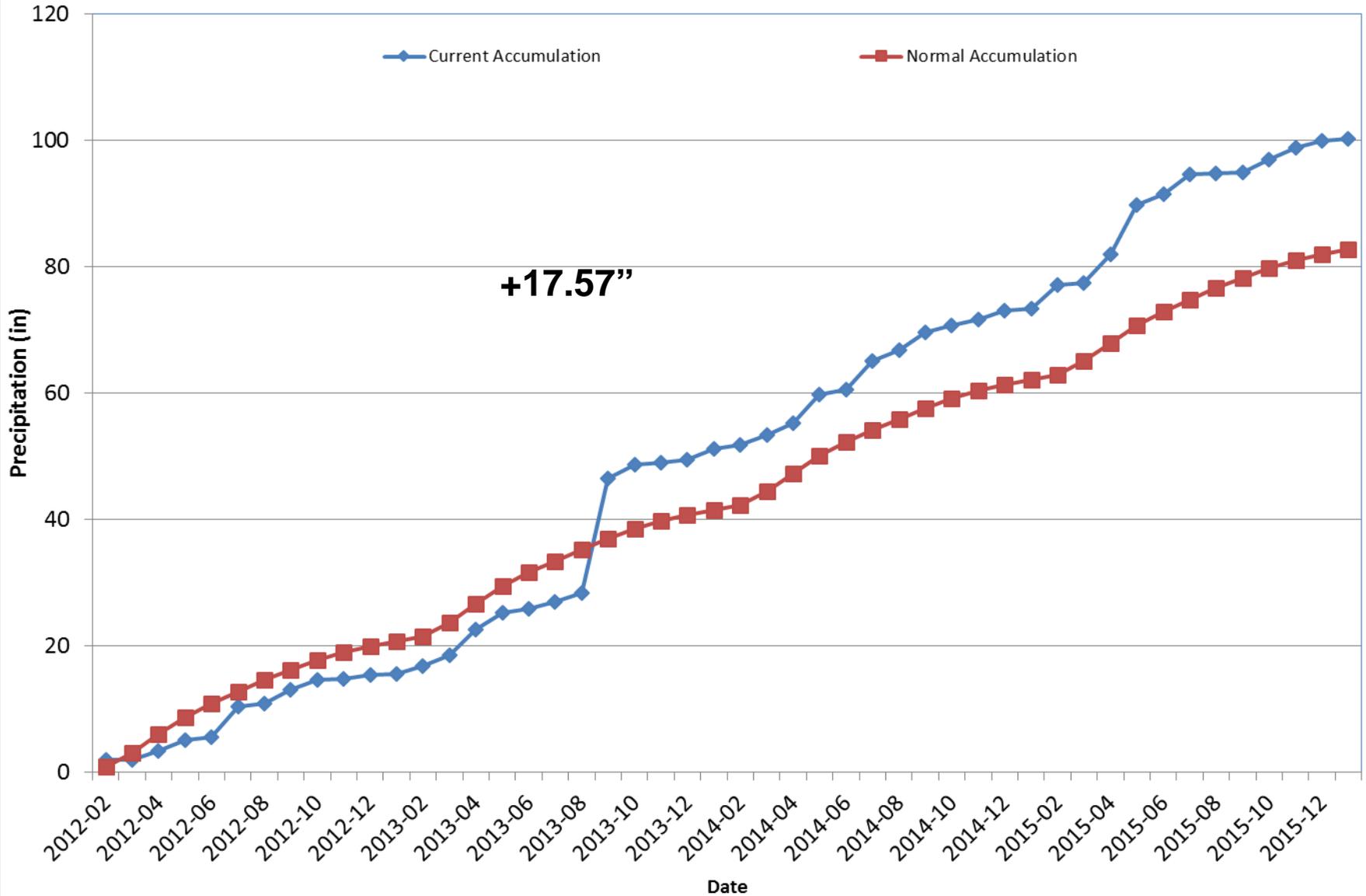
# Division 8 - Boulder

## Boulder 2016 Water Year



# Division 8 - Boulder

## Boulder Precipitation Accumulation



# National Snow Analysis, 20 Jan 16

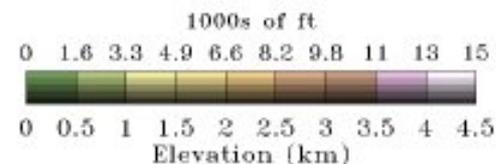
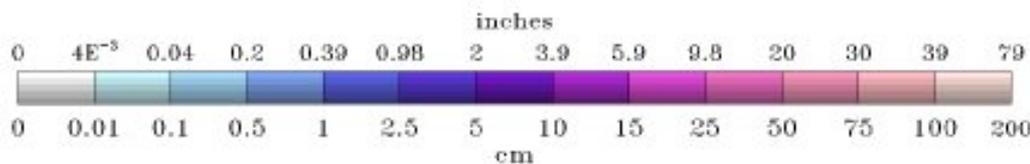
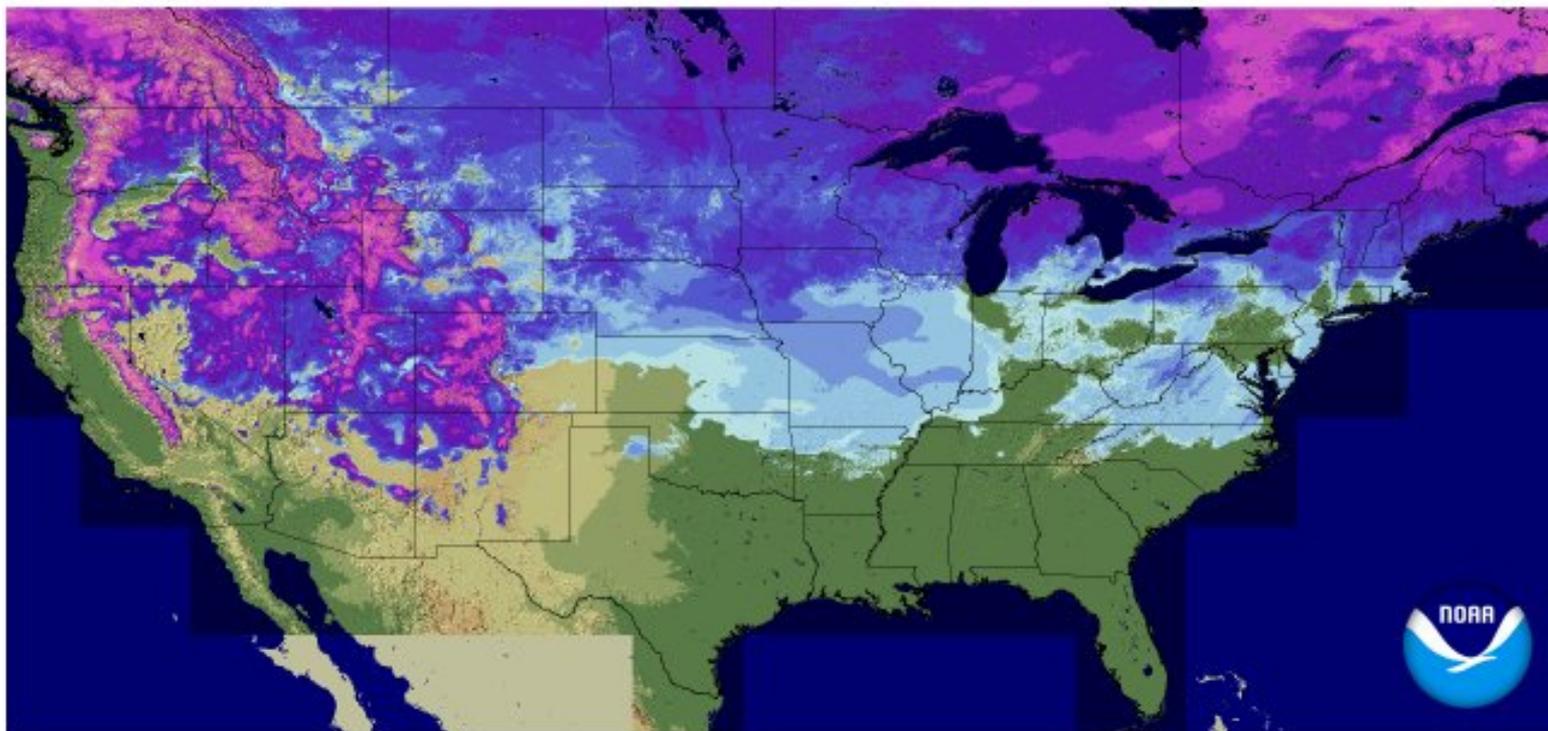
National Snow 2015-  
Analysis 2016

NATIONAL  
WATER  
CENTER

NWCC

## Snow Water Equivalent

2016-01-20 06 UTC



# Snow Analysis, 16 Feb 2016

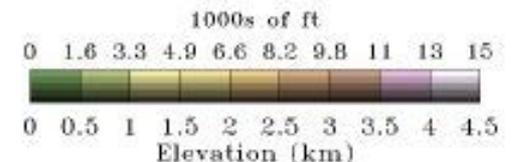
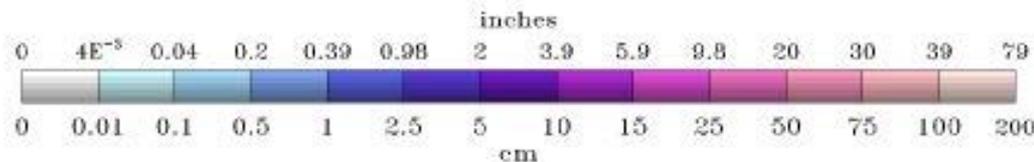
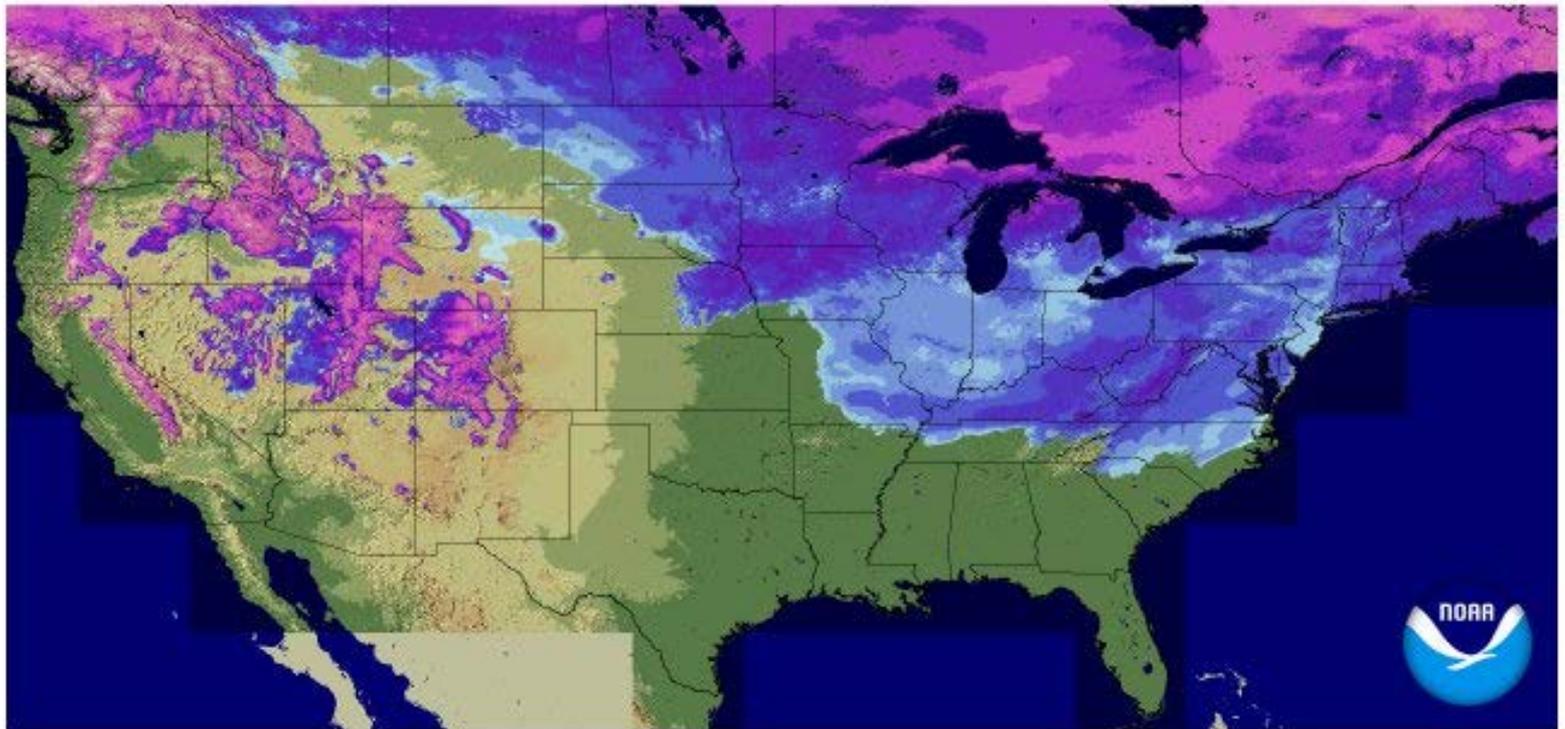
National Snow 2015-2016 Analysis 2016

NATIONAL WATER CENTER

NWCC

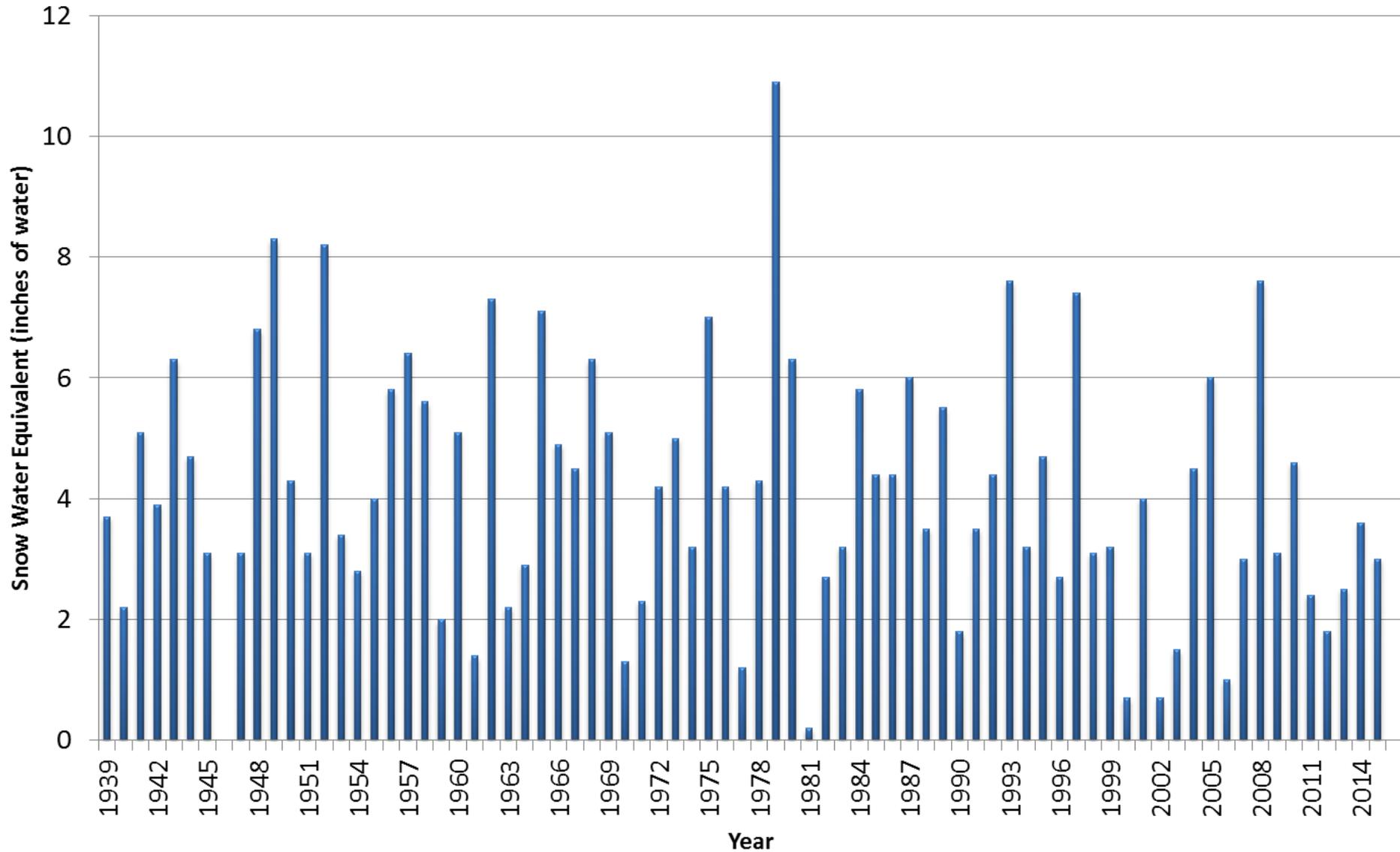
## Snow Water Equivalent

2016-02-16 06 UTC



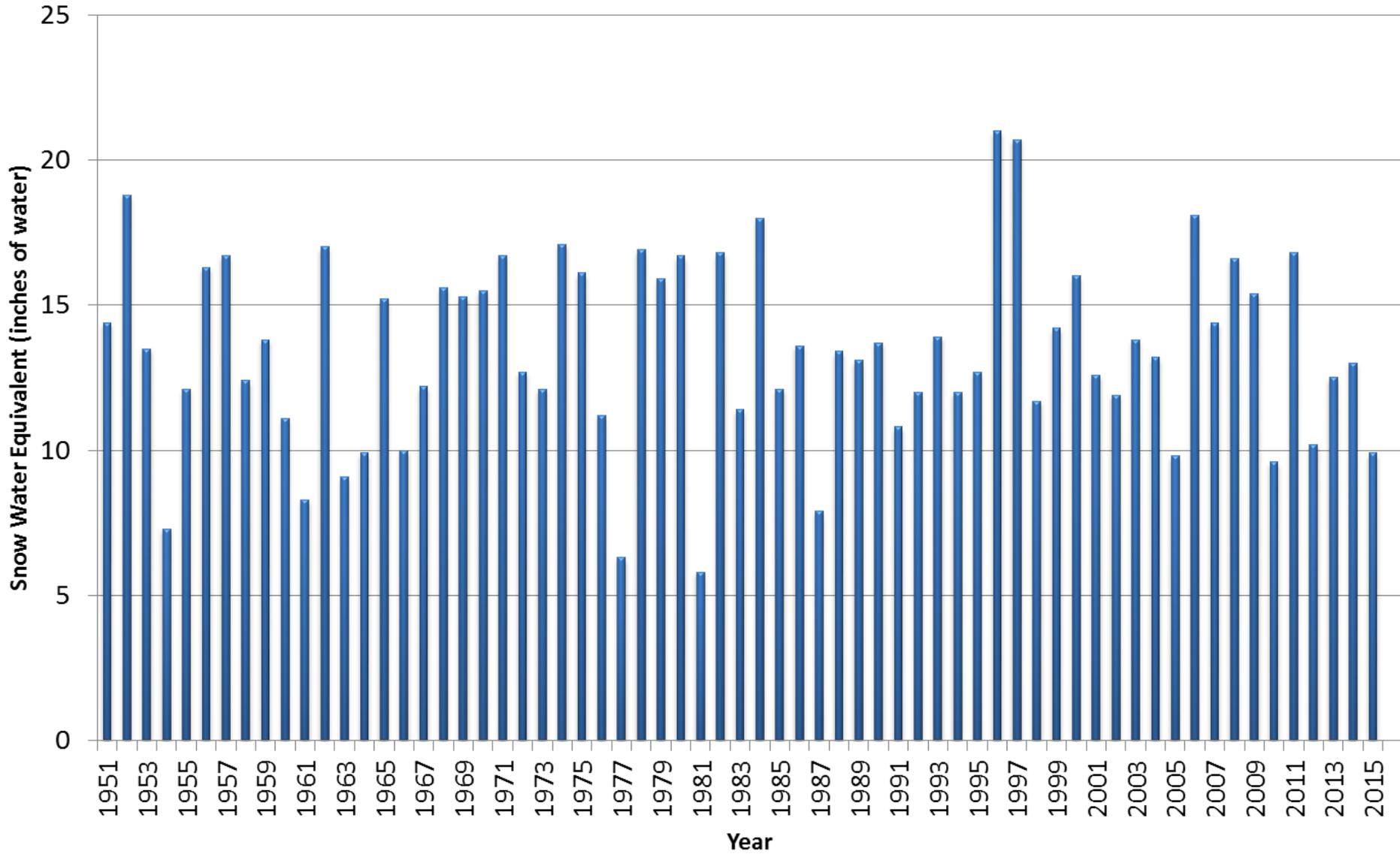
# Santa Maria Snow Course March 1 Snow Water Equivalent

Mineral County



# Yampa View Snow Course March 1 Snow Water Equivalent

Routt County Equivalent



A photograph of a winter landscape. The foreground is a snow-covered field with a wire fence. In the middle ground, there are snow-covered hills and a line of trees. The sky is overcast and grey.

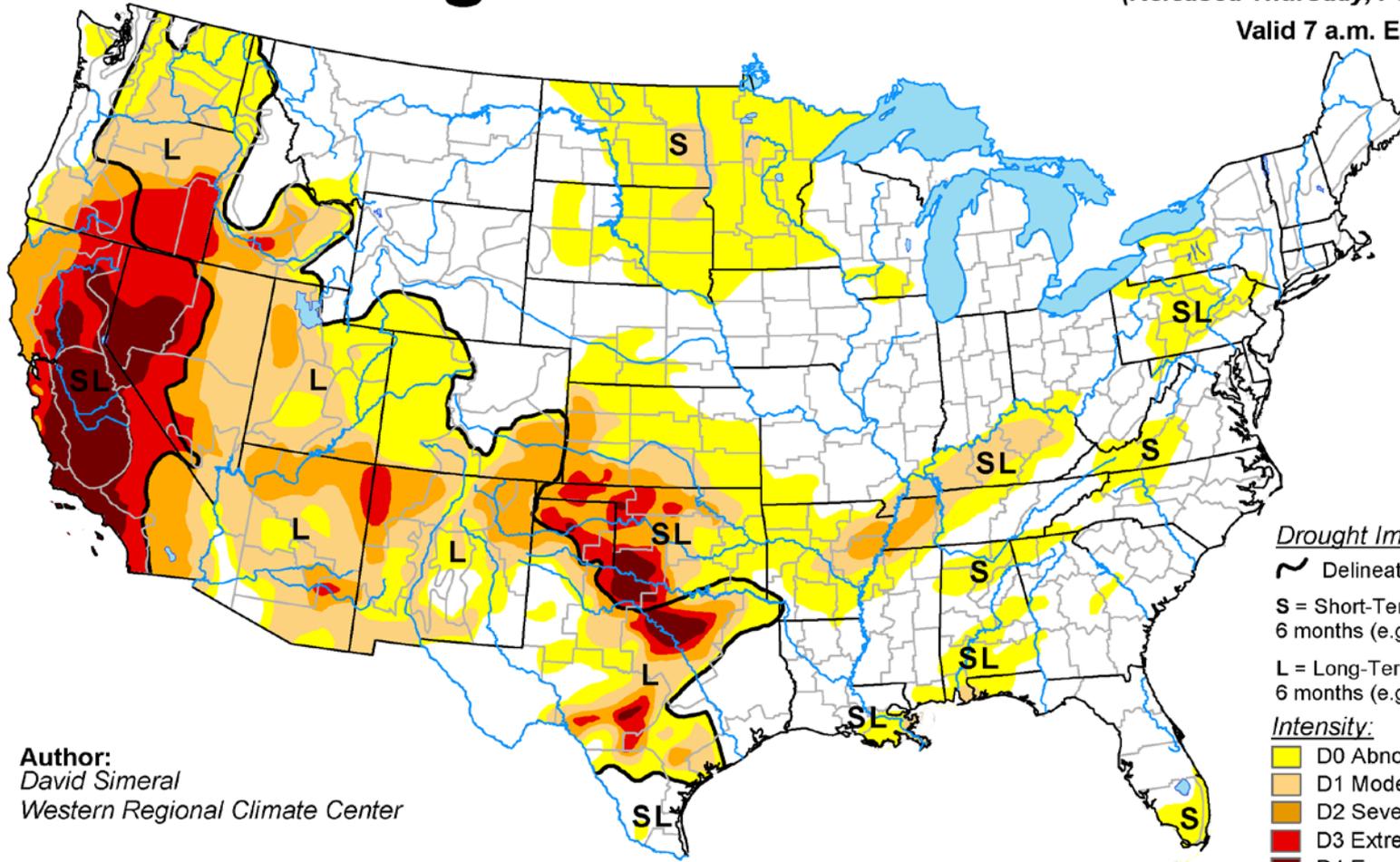
# How have our drought conditions varied over the past year?

- **We've had a good year overall**

# U.S. Drought Monitor

February 10, 2015  
(Released Thursday, Feb. 12, 2015)

Valid 7 a.m. EST



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

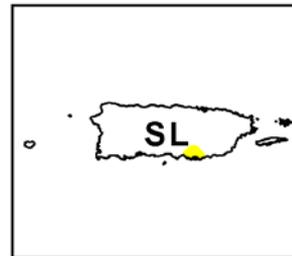
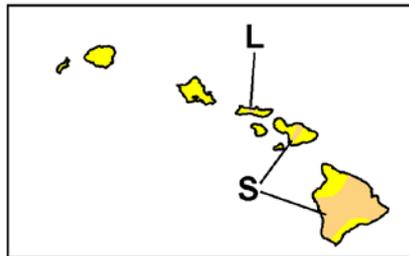
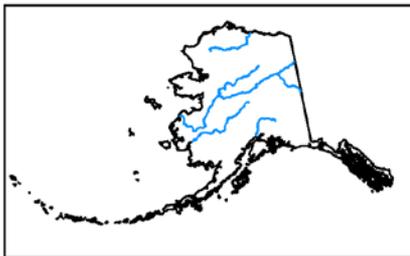
### Drought Impact Types:

- ~ 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:

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

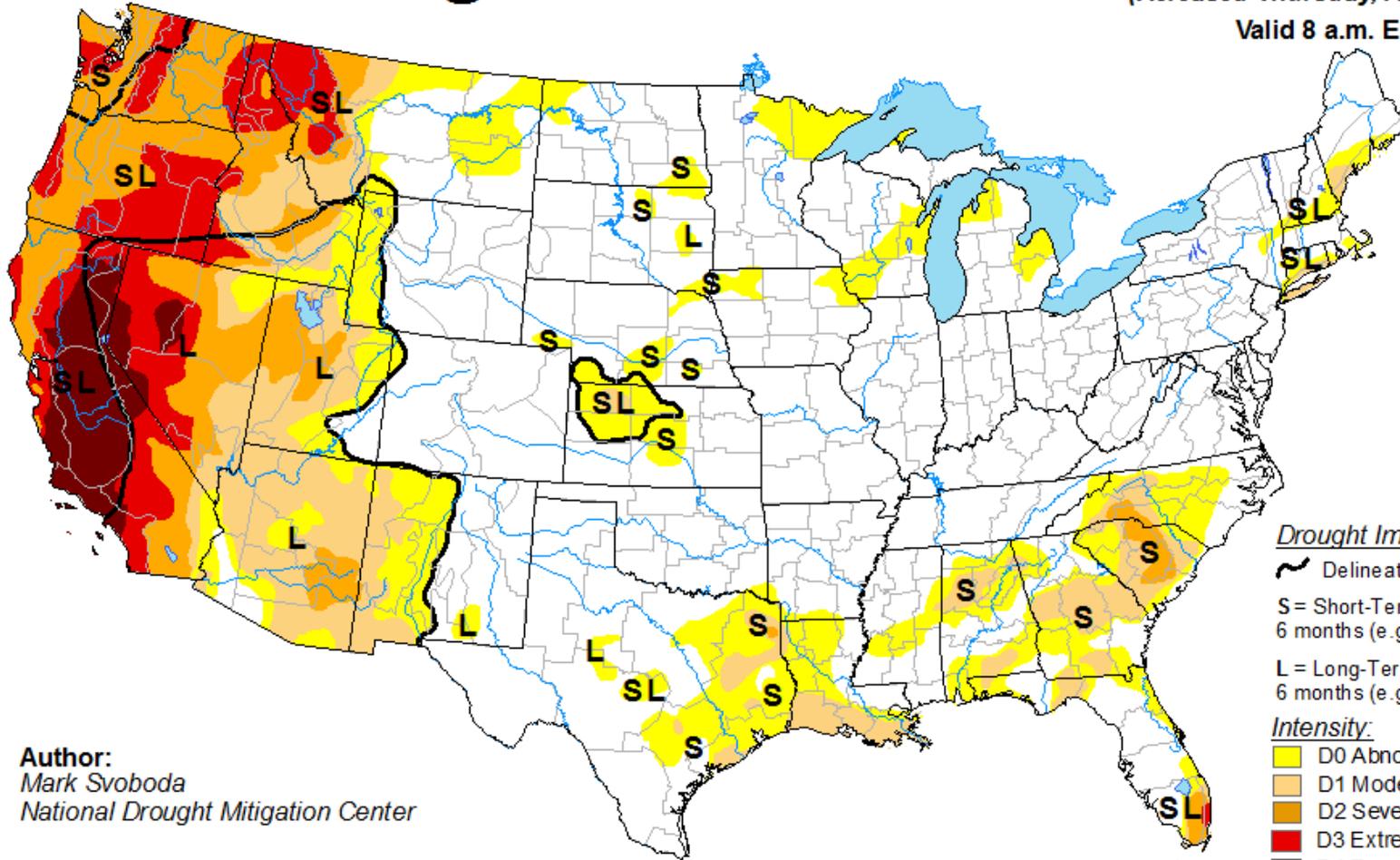
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.



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

# U.S. Drought Monitor

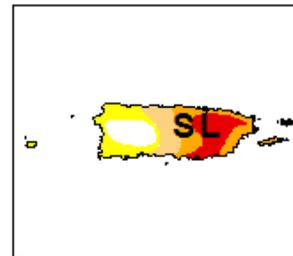
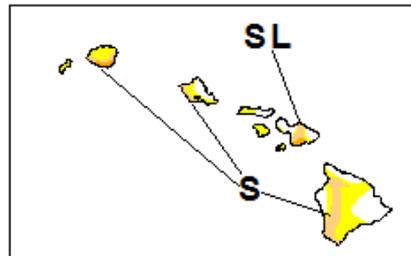
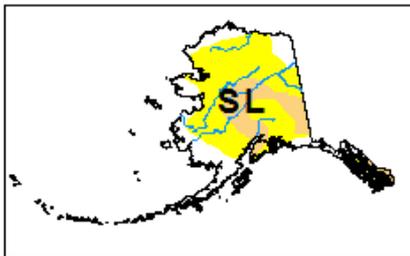
August 4, 2015  
(Released Thursday, Aug. 6, 2015)  
Valid 8 a.m. EDT



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)
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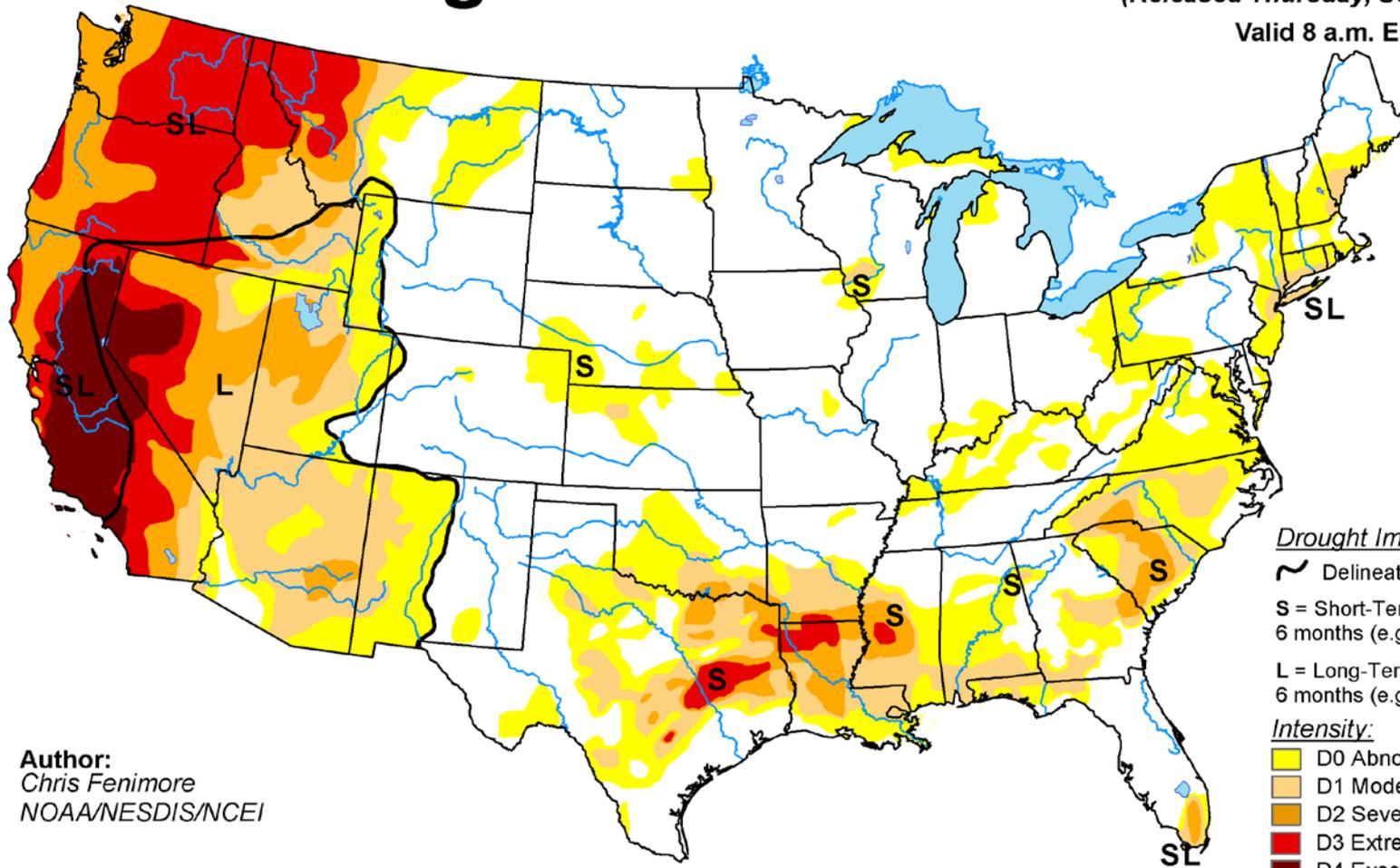


<http://droughtmonitor.unl.edu/>

# U.S. Drought Monitor

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

Valid 8 a.m. EDT



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

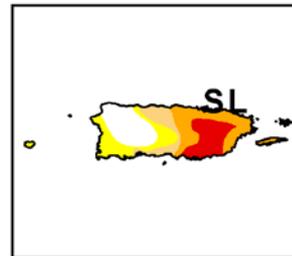
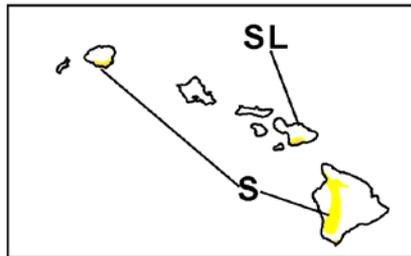
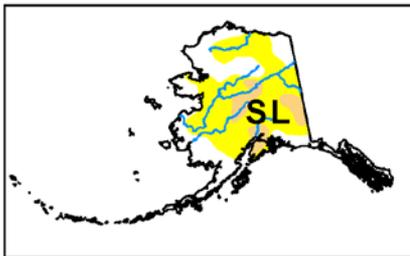
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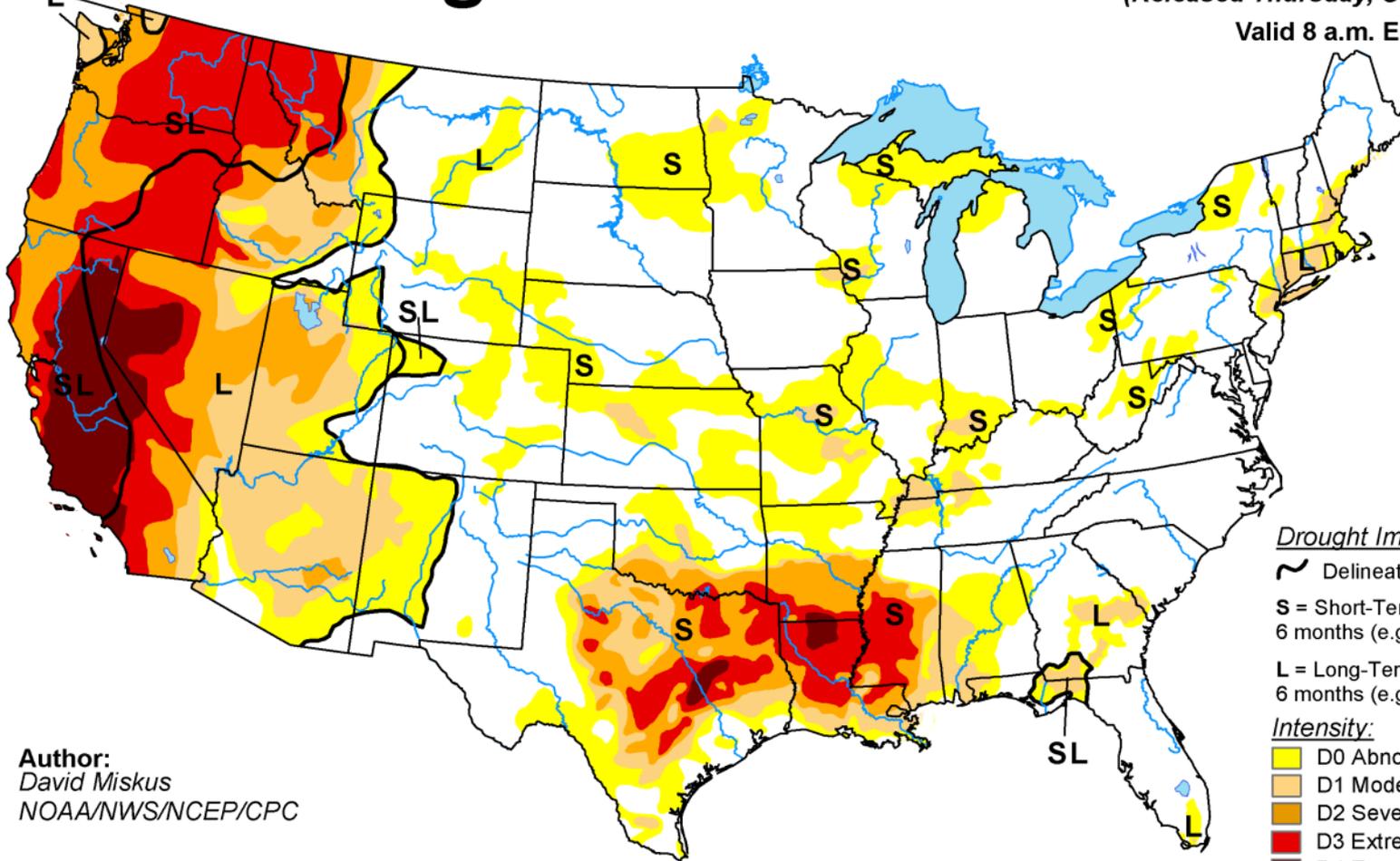


<http://droughtmonitor.unl.edu/>

# U.S. Drought Monitor

October 13, 2015  
(Released Thursday, Oct. 15, 2015)

Valid 8 a.m. EDT



Author:  
David Miskus  
NOAA/NWS/NCEP/CPC

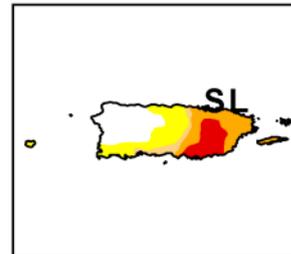
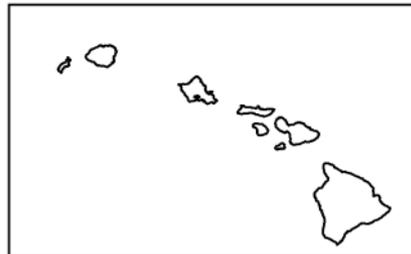
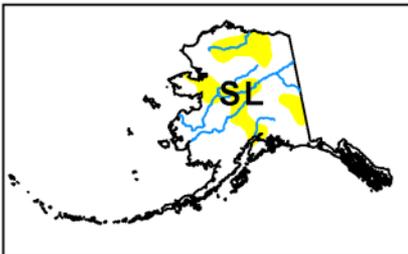
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The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

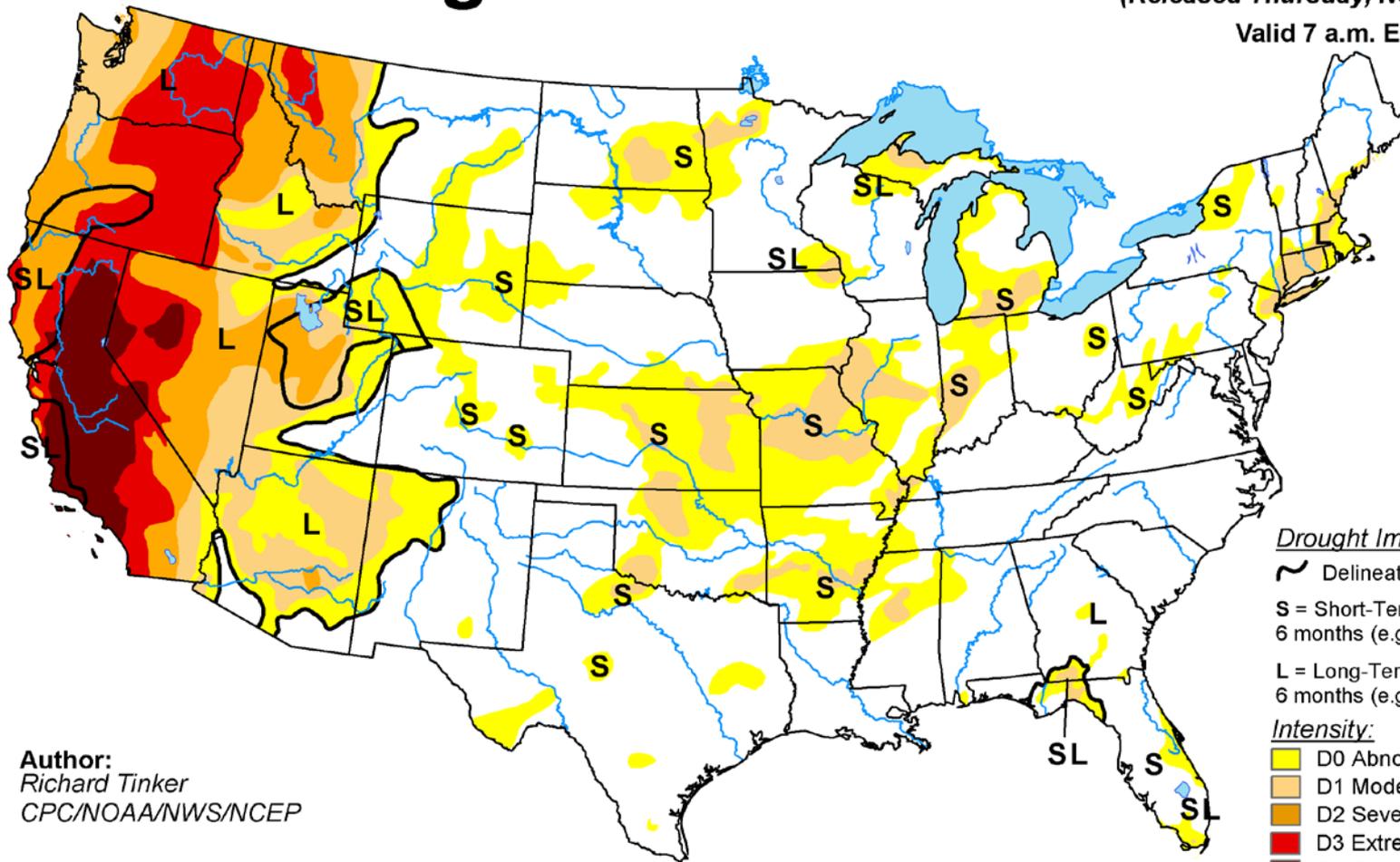


<http://droughtmonitor.unl.edu/>

# U.S. Drought Monitor

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

Valid 7 a.m. EST



Author:  
Richard Tinker  
CPC/NOAA/NWS/NCEP

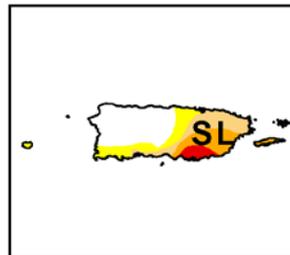
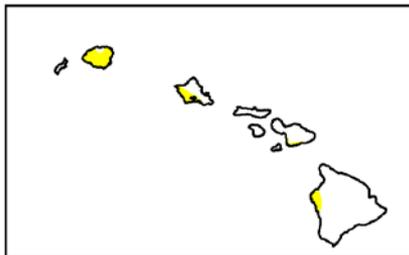
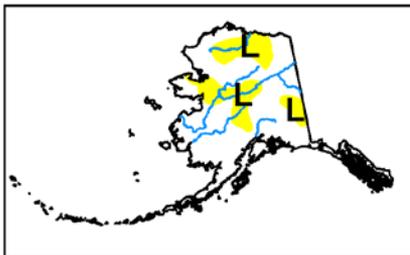
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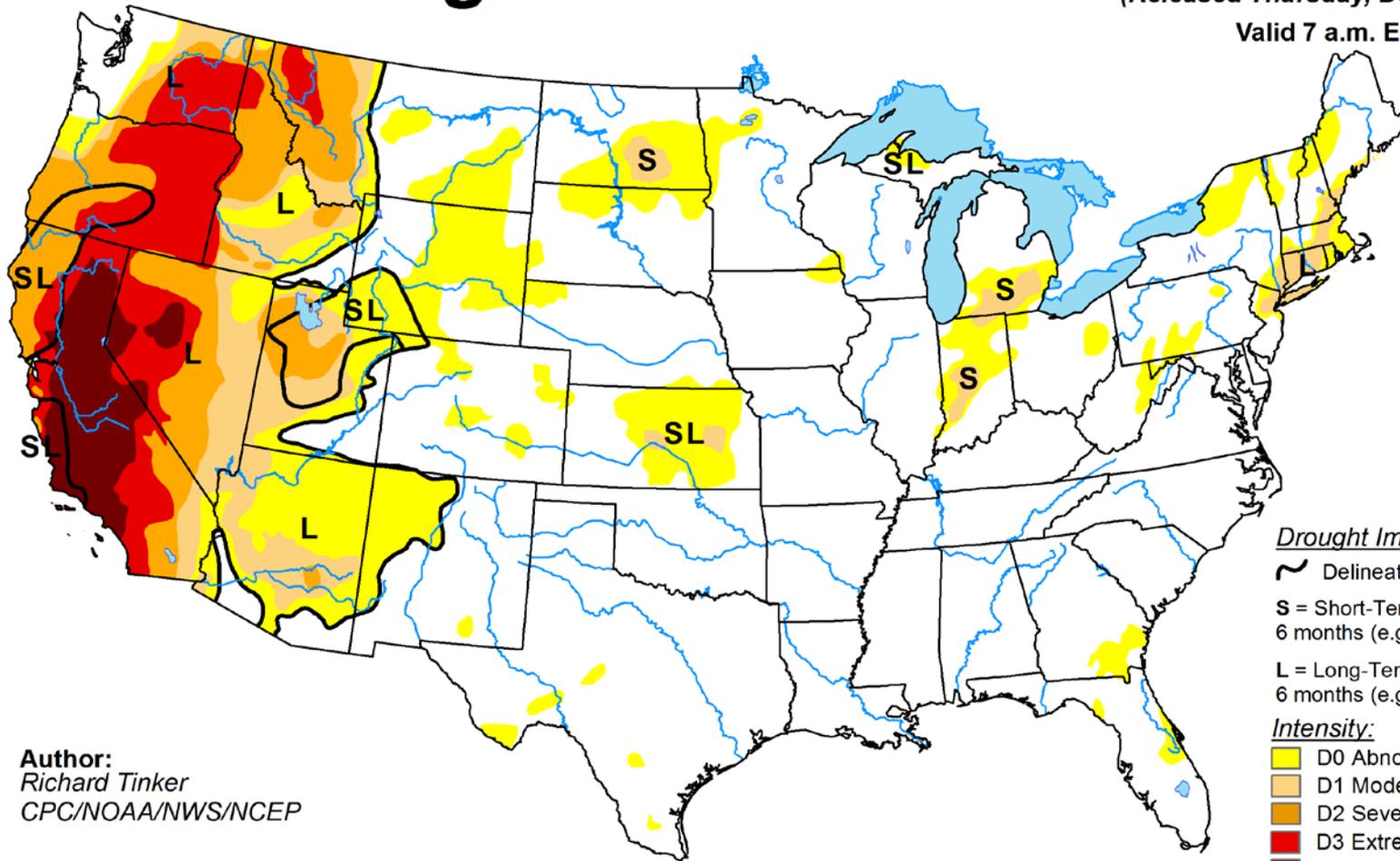


<http://droughtmonitor.unl.edu/>

# U.S. Drought Monitor

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

Valid 7 a.m. EST



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

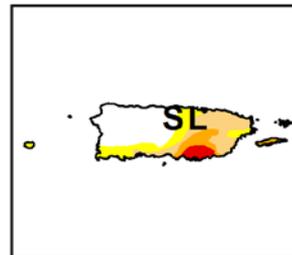
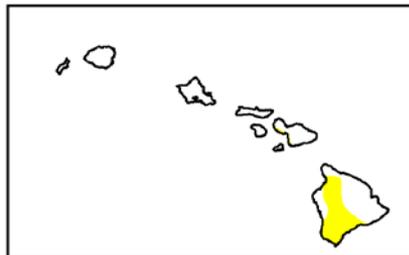
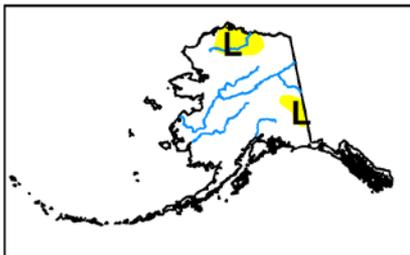
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The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

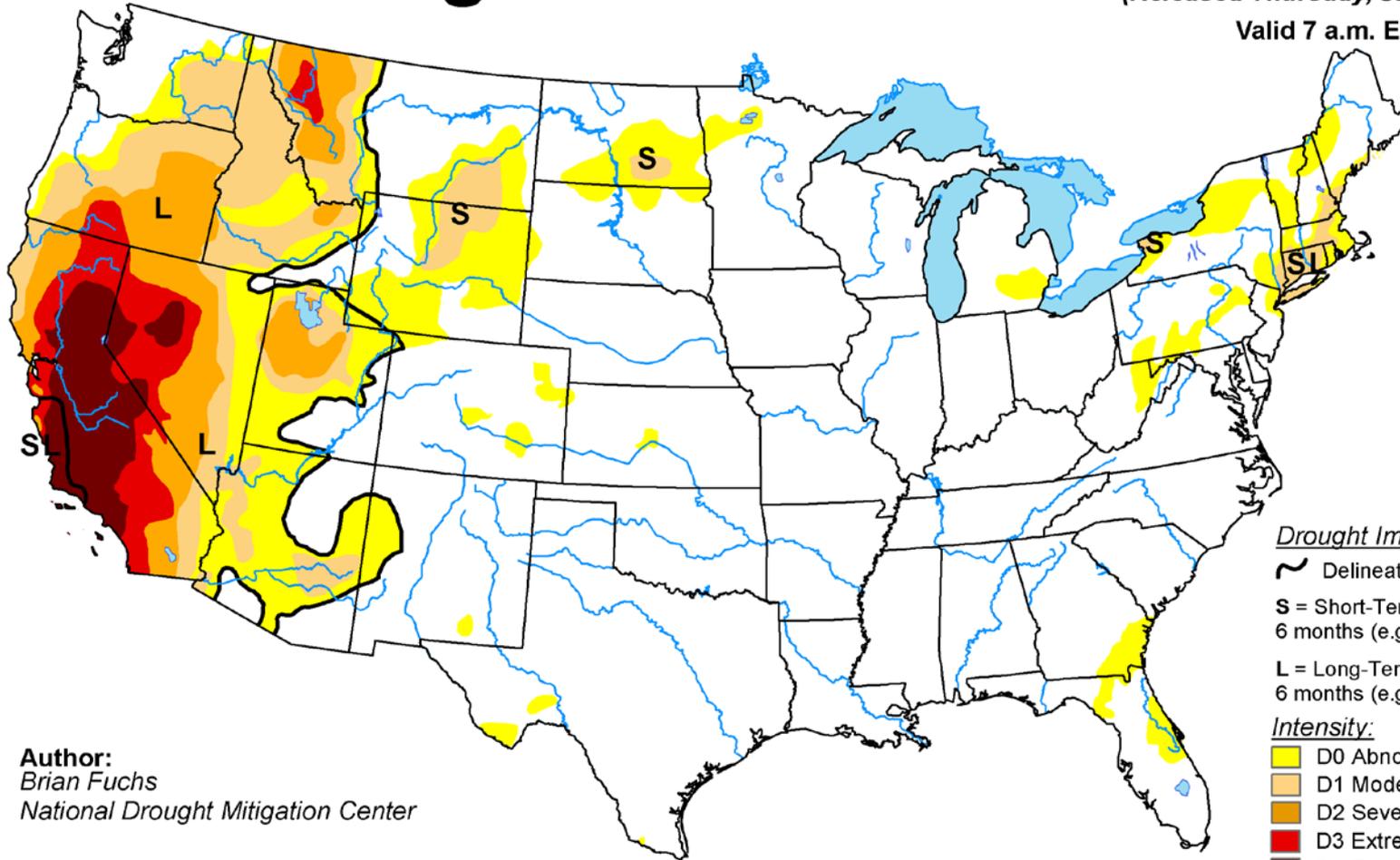


<http://droughtmonitor.unl.edu/>

# U.S. Drought Monitor

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

Valid 7 a.m. EST



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

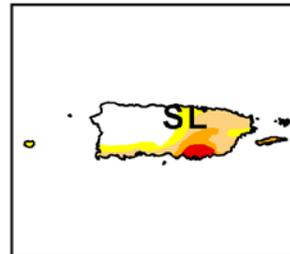
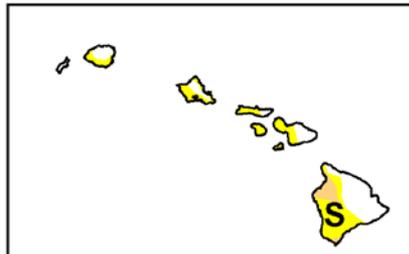
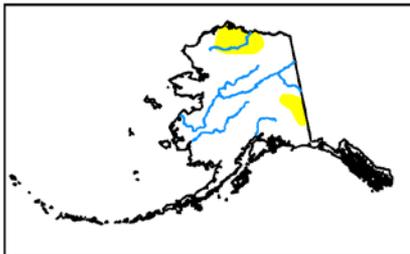
### Drought Impact Types:

- ~ 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

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

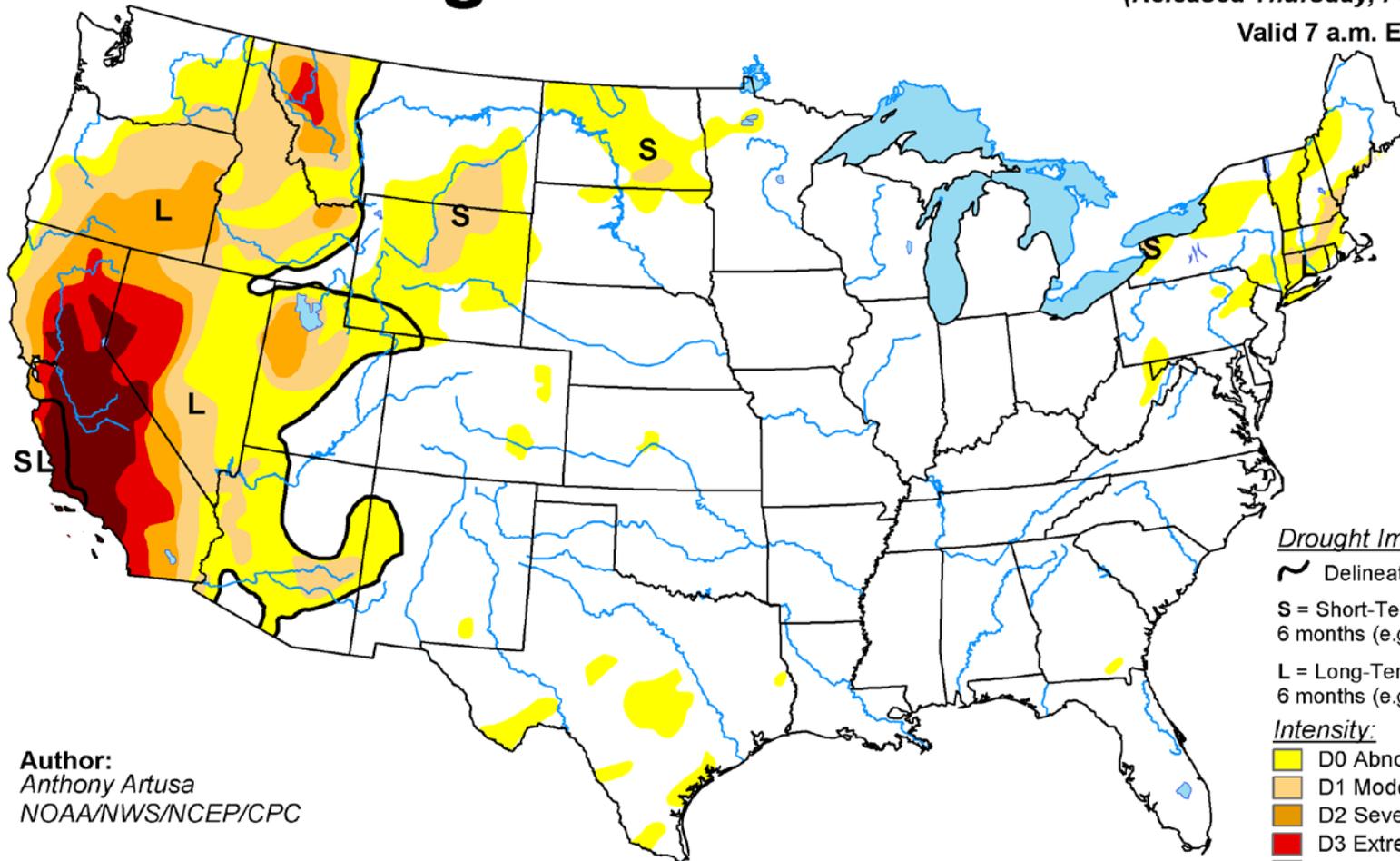


<http://droughtmonitor.unl.edu/>

# U.S. Drought Monitor

February 9, 2016  
(Released Thursday, Feb. 11, 2016)

Valid 7 a.m. EST



**Author:**  
Anthony Artusa  
NOAA/NWS/NCEP/CPC

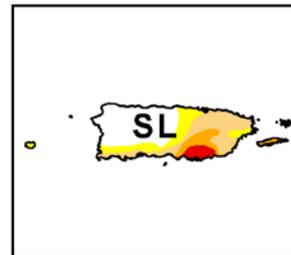
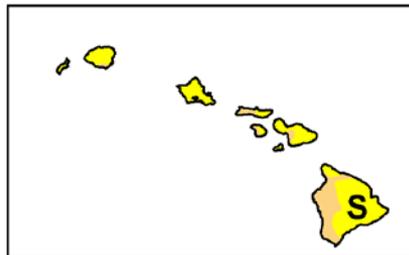
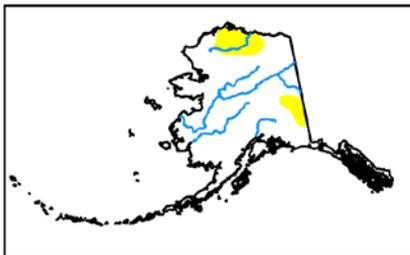
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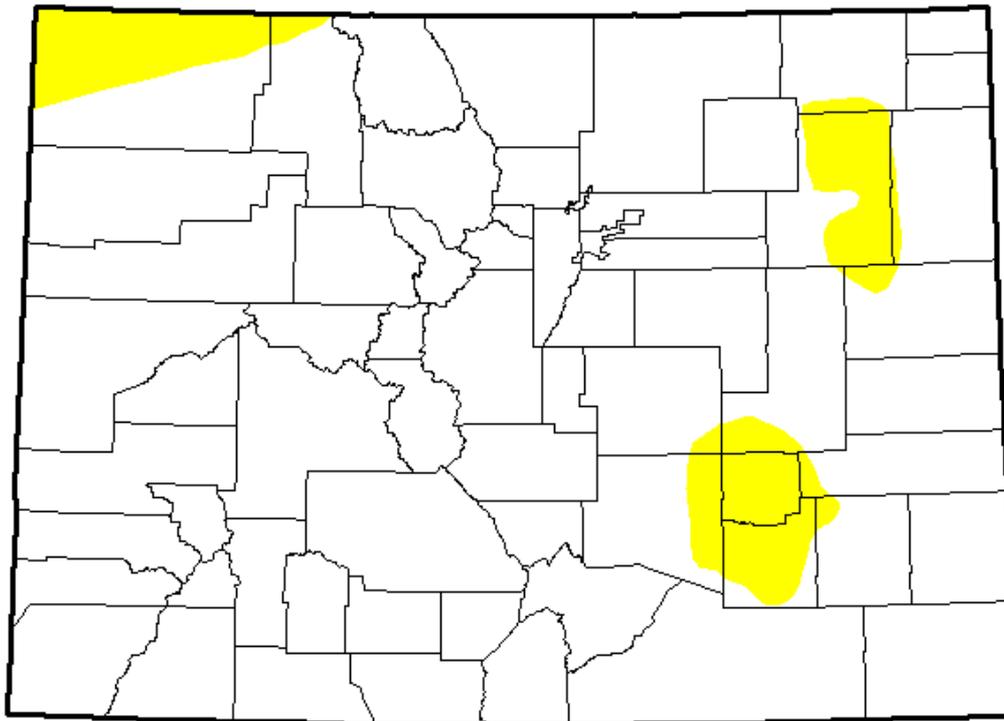


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# U.S. Drought Monitor

## Colorado

**February 9, 2016**  
 (Released Thursday, Feb. 11, 2016)  
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*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	92.65	7.35	0.00	0.00	0.00	0.00
<b>Last Week</b> <i>2/2/2016</i>	89.95	10.05	0.00	0.00	0.00	0.00
<b>3 Months Ago</b> <i>11/10/2015</i>	79.91	20.09	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>2/10/2015</i>	36.97	63.03	21.43	12.20	0.00	0.00

Intensity:

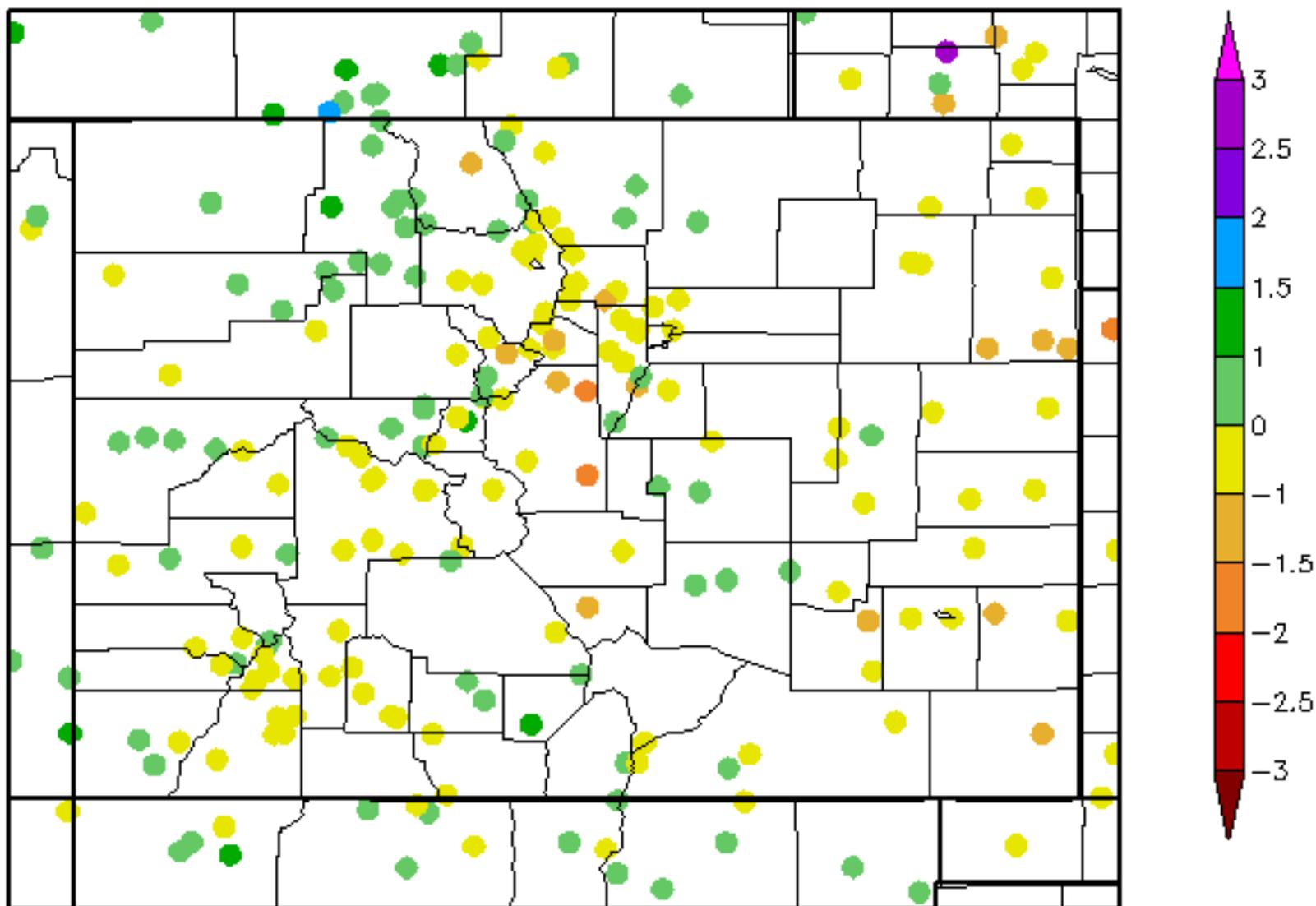
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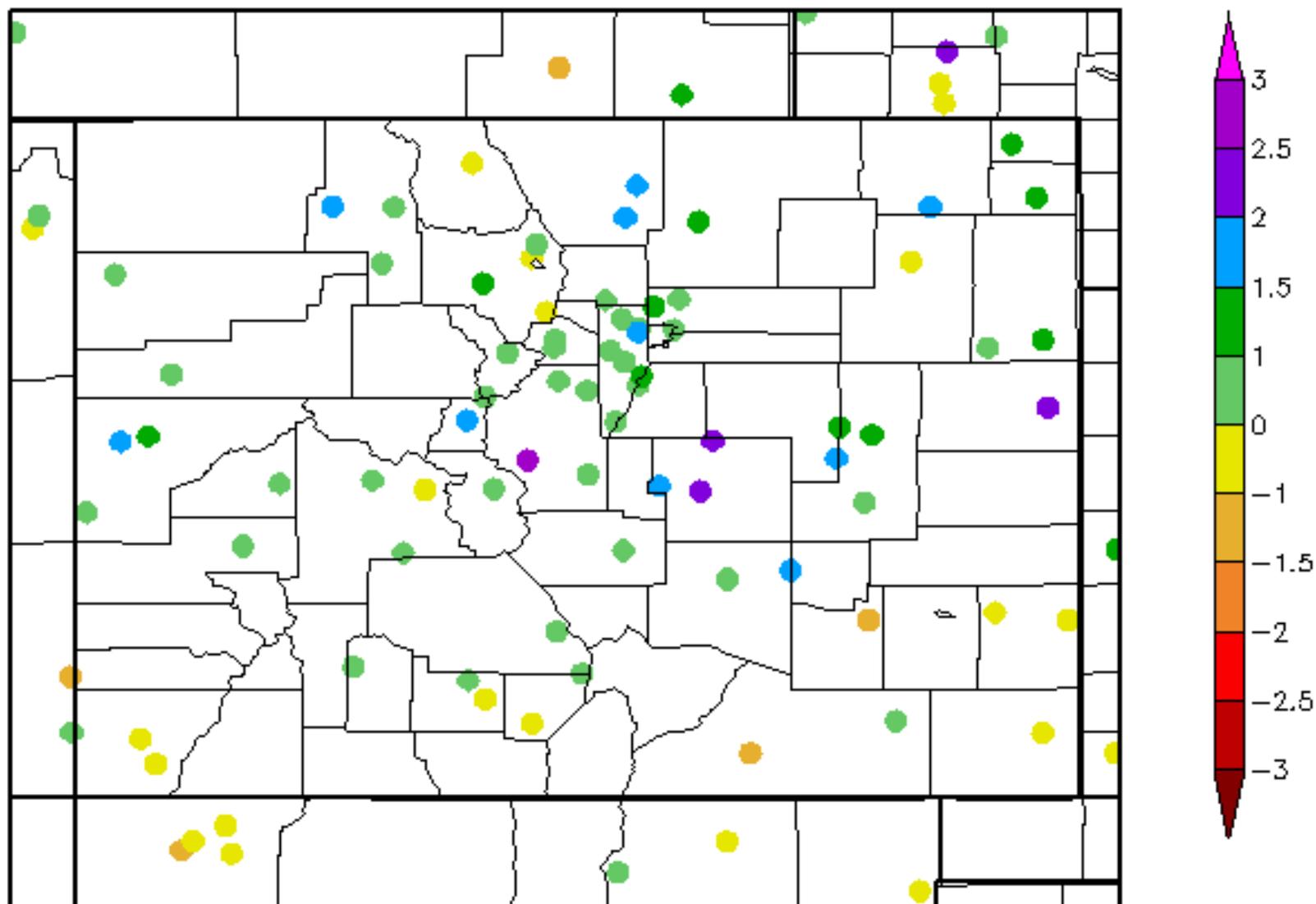


# Monthly SPI 1/1/2016 - 1/31/2016



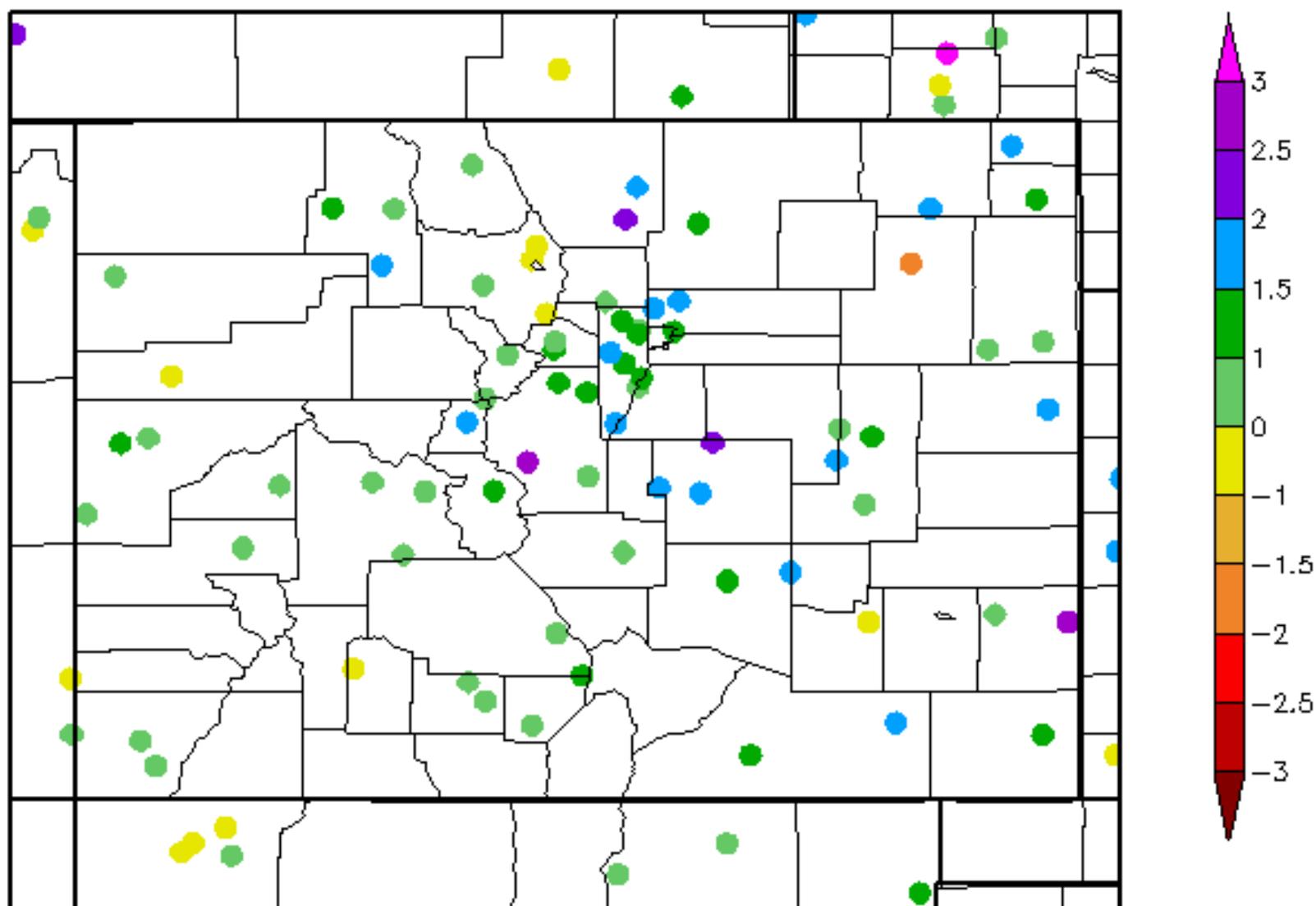
# 30 Day SPI

1/17/2016 - 2/15/2016



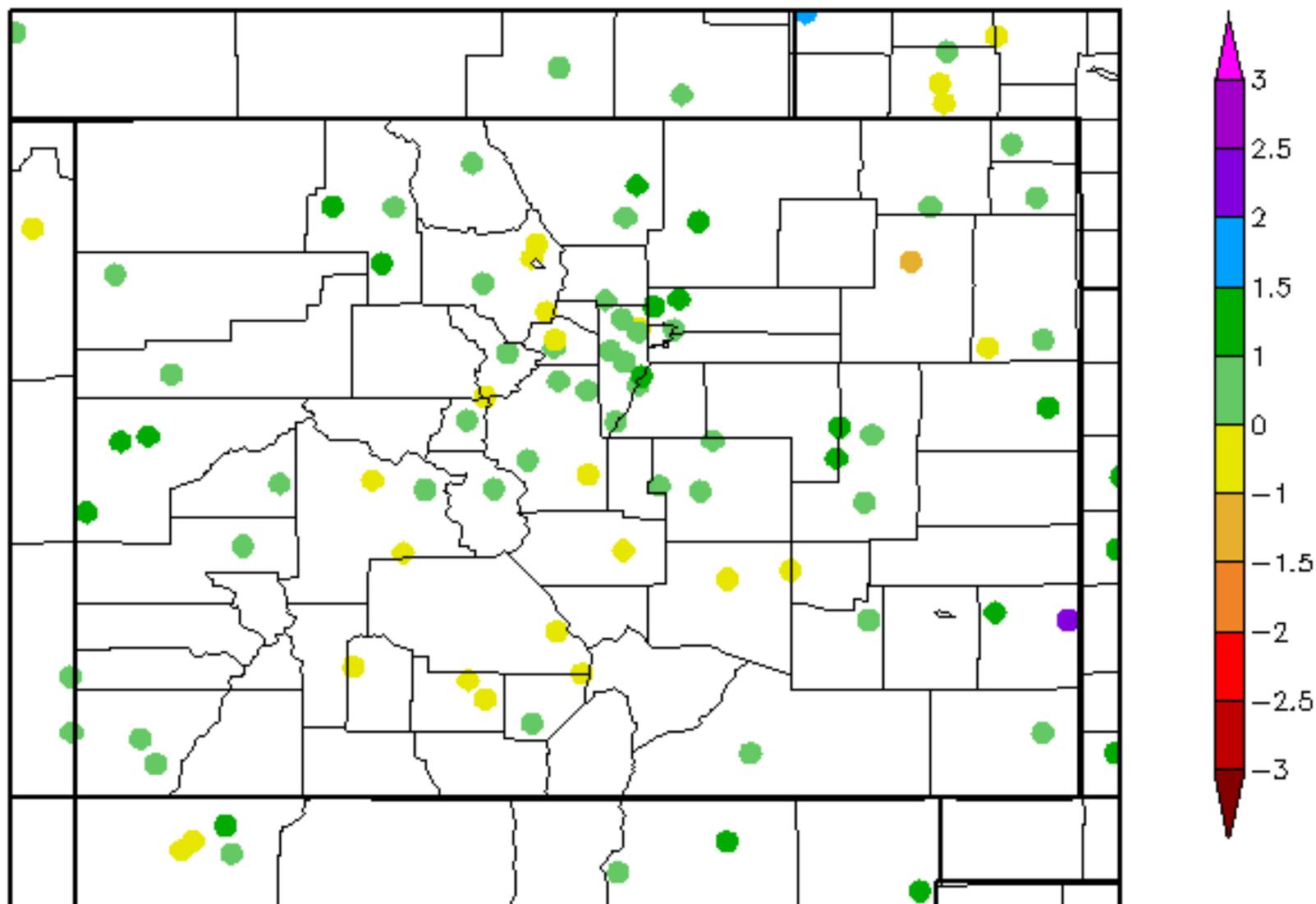
# 90 Day SPI

11/18/2015 - 2/15/2016



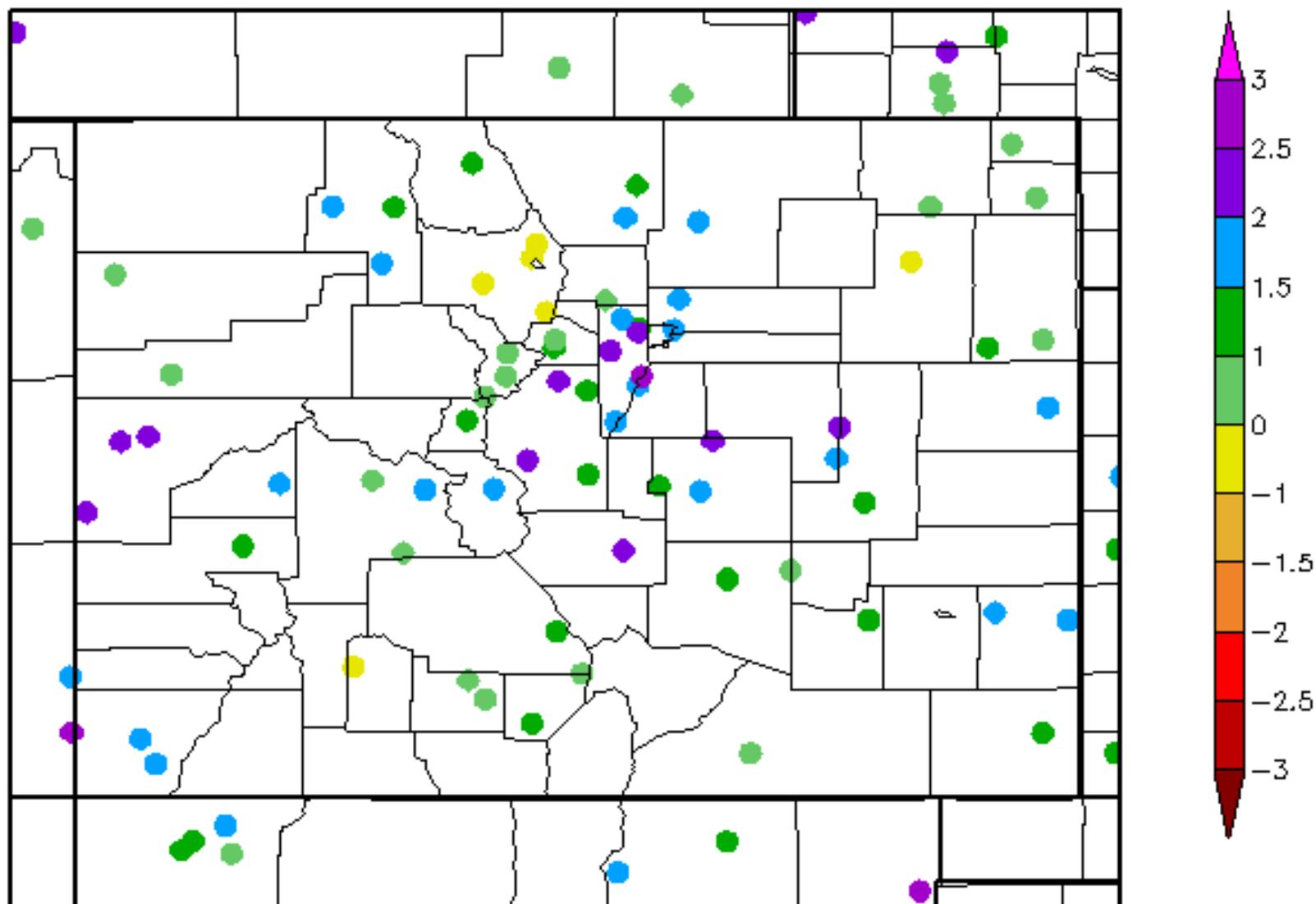
# 6 Month SPI

8/16/2015 - 2/15/2016



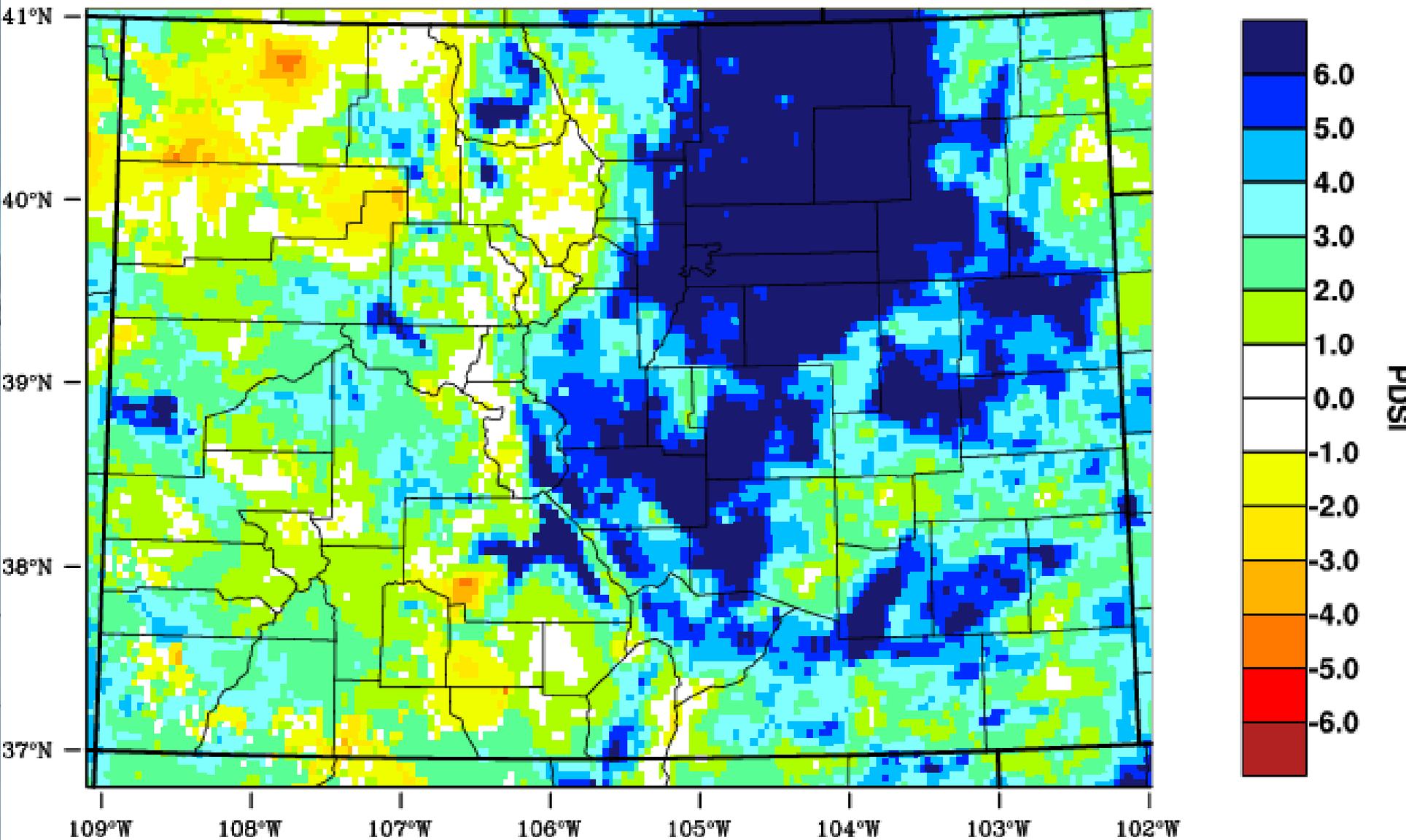
# 12 Month SPI

2/16/2015 - 2/15/2016



# Colorado - PDSI

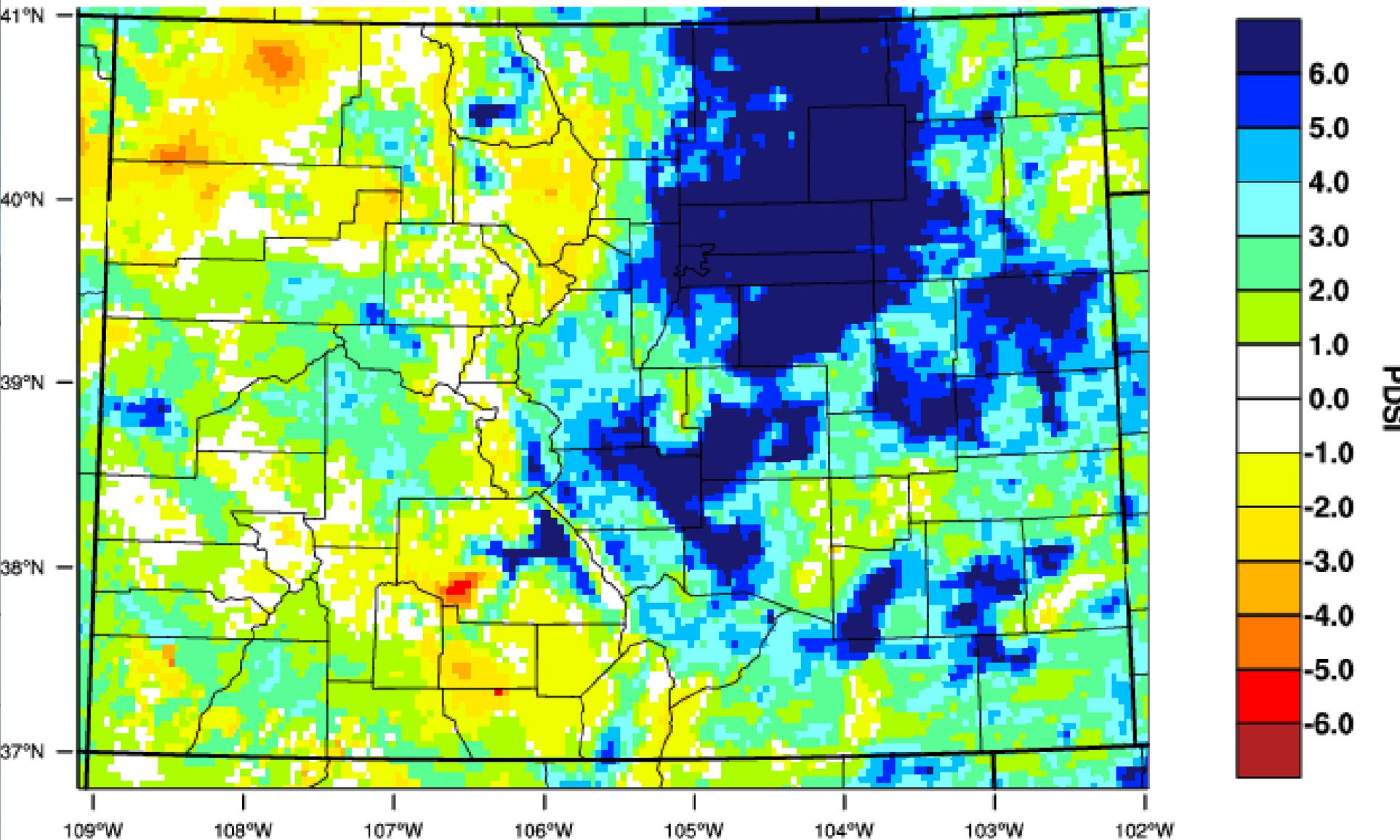
August 2015



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

# Colorado - PDSI

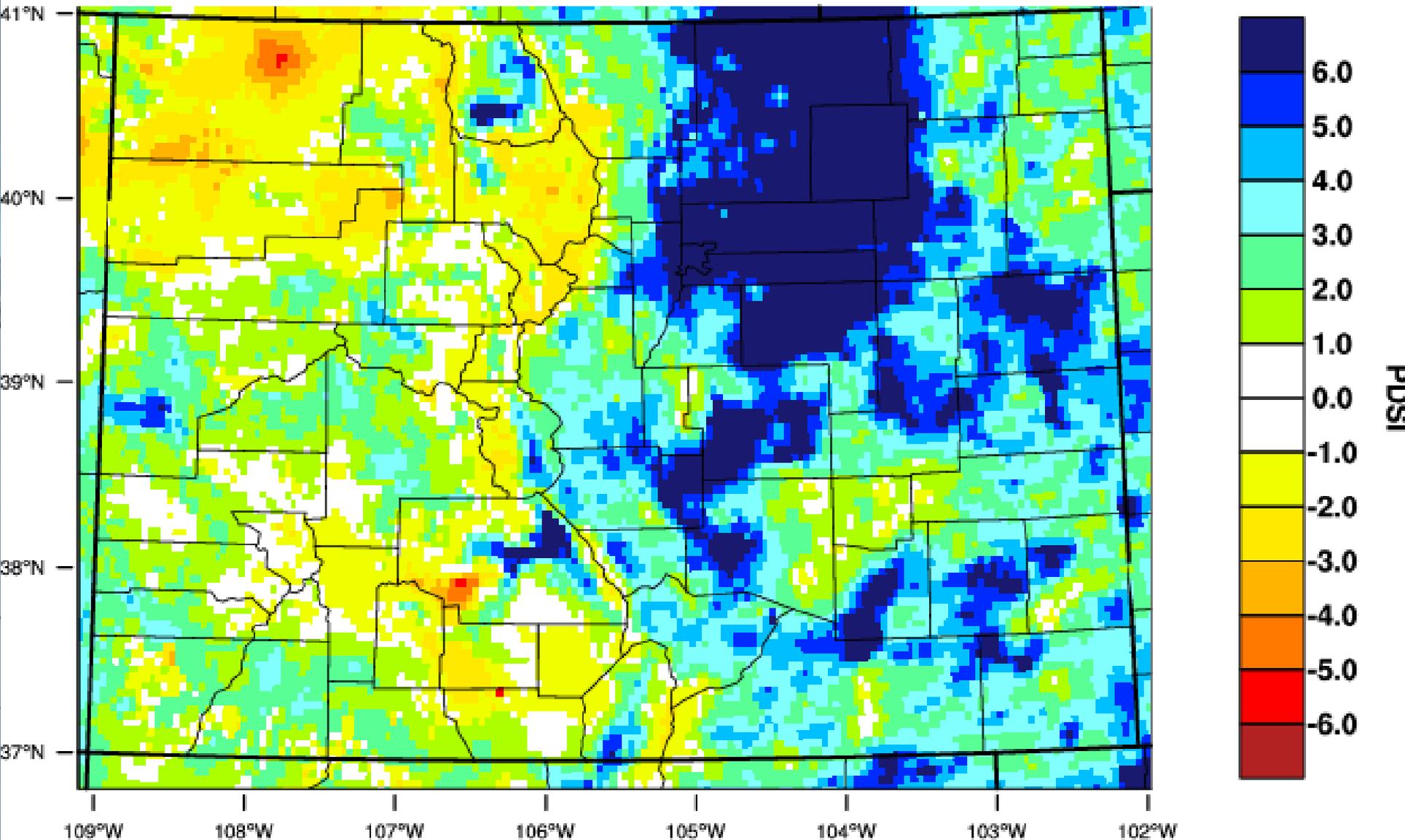
September 2015



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

# Colorado - PDSI

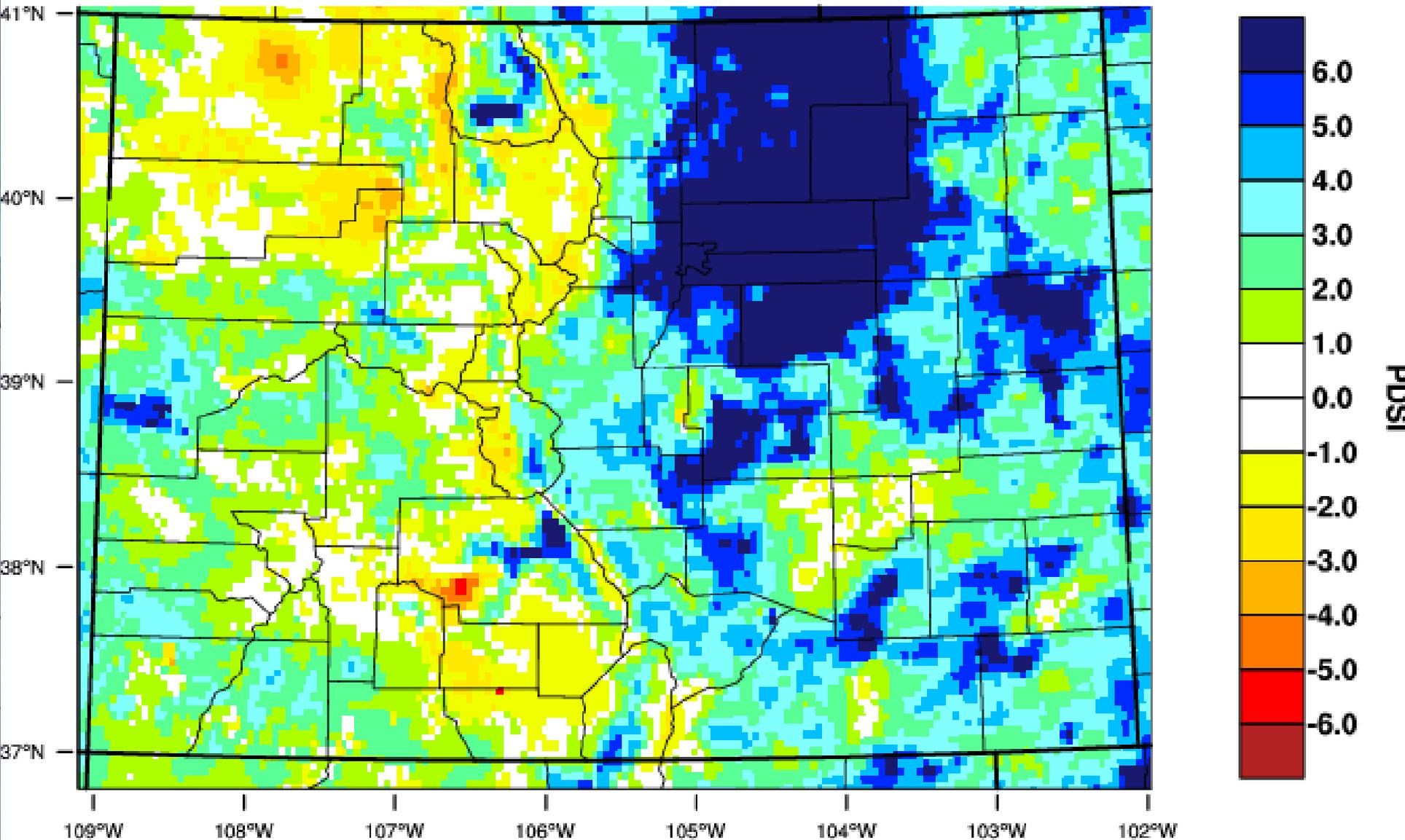
October 2015



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

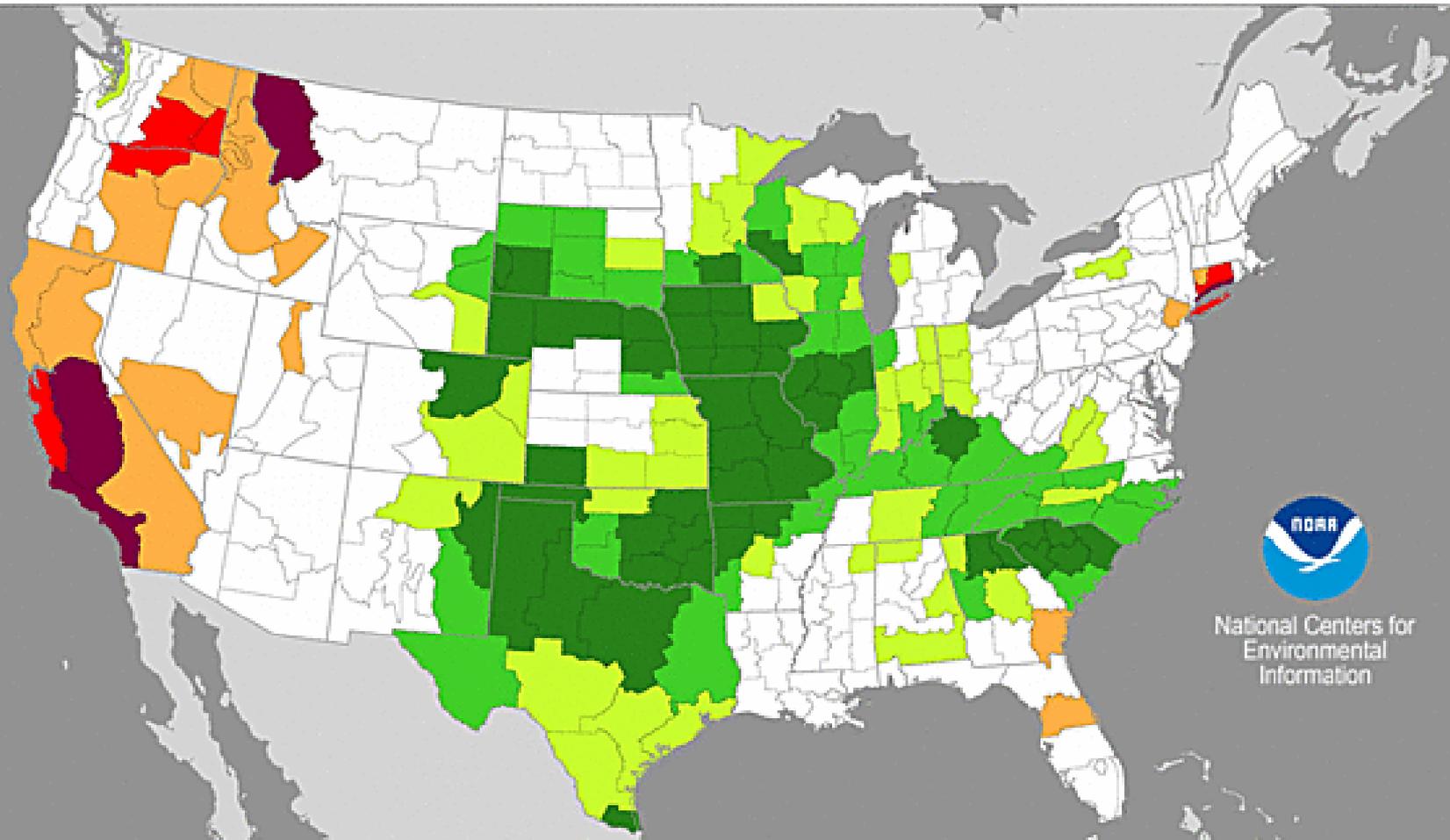
# Colorado - PDSI

November 2015



# Palmer Drought Severity Index

December, 2015

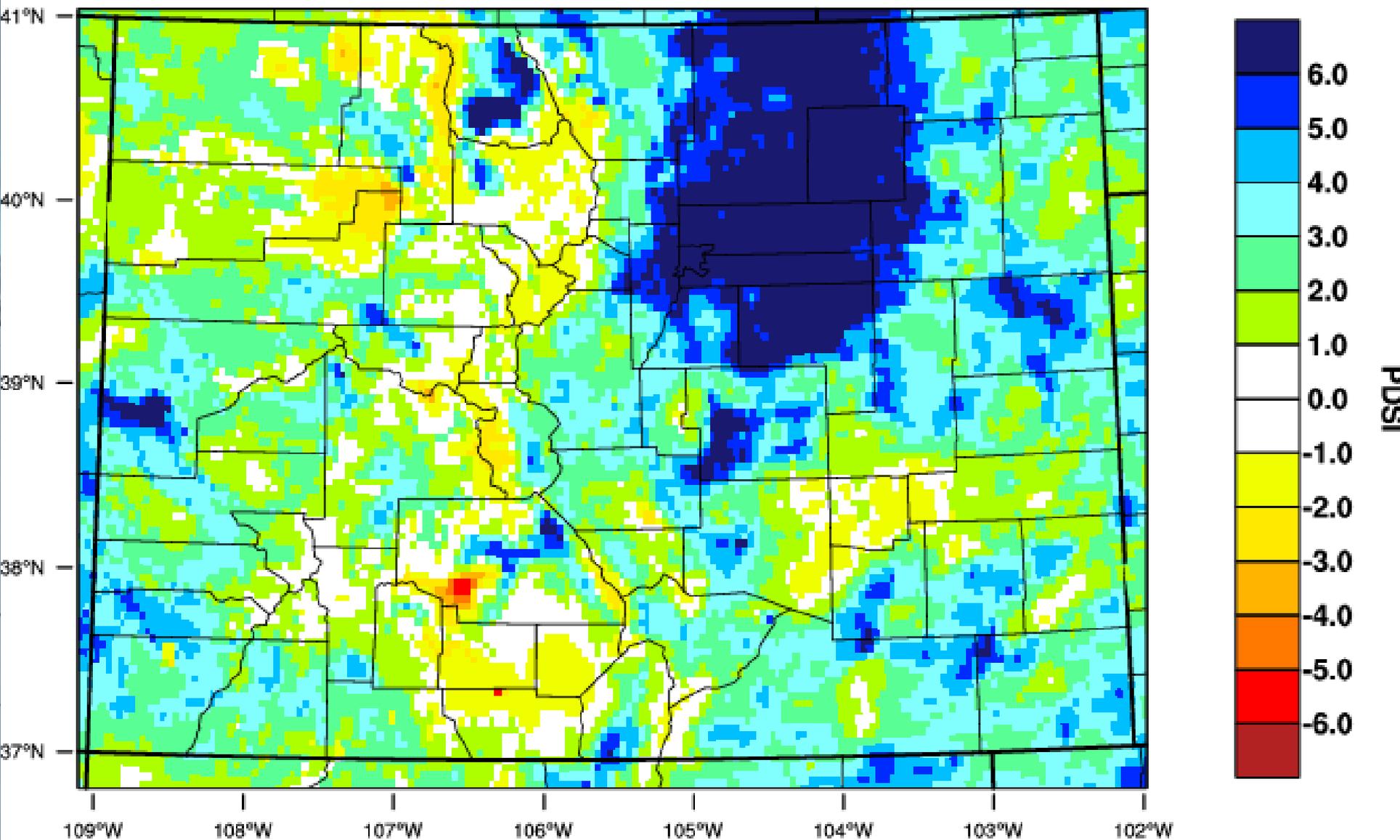


National Centers for Environmental Information

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

# Colorado - PDSI

January 2016



WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 16 FEB 2016

# Any Concerns?

- We're in a "lull" -- that's not unusual, so don't panic.
- The next 4 months are springtime "show time"
- 3-4 spring storms will make the difference between good year and not, especially for the Arkansas and S. Platte
- "indicators" suggest a warm summer ahead.

# Colorado Climate Center

Data and Power Point Presentations available for downloading

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

