



Climate Update

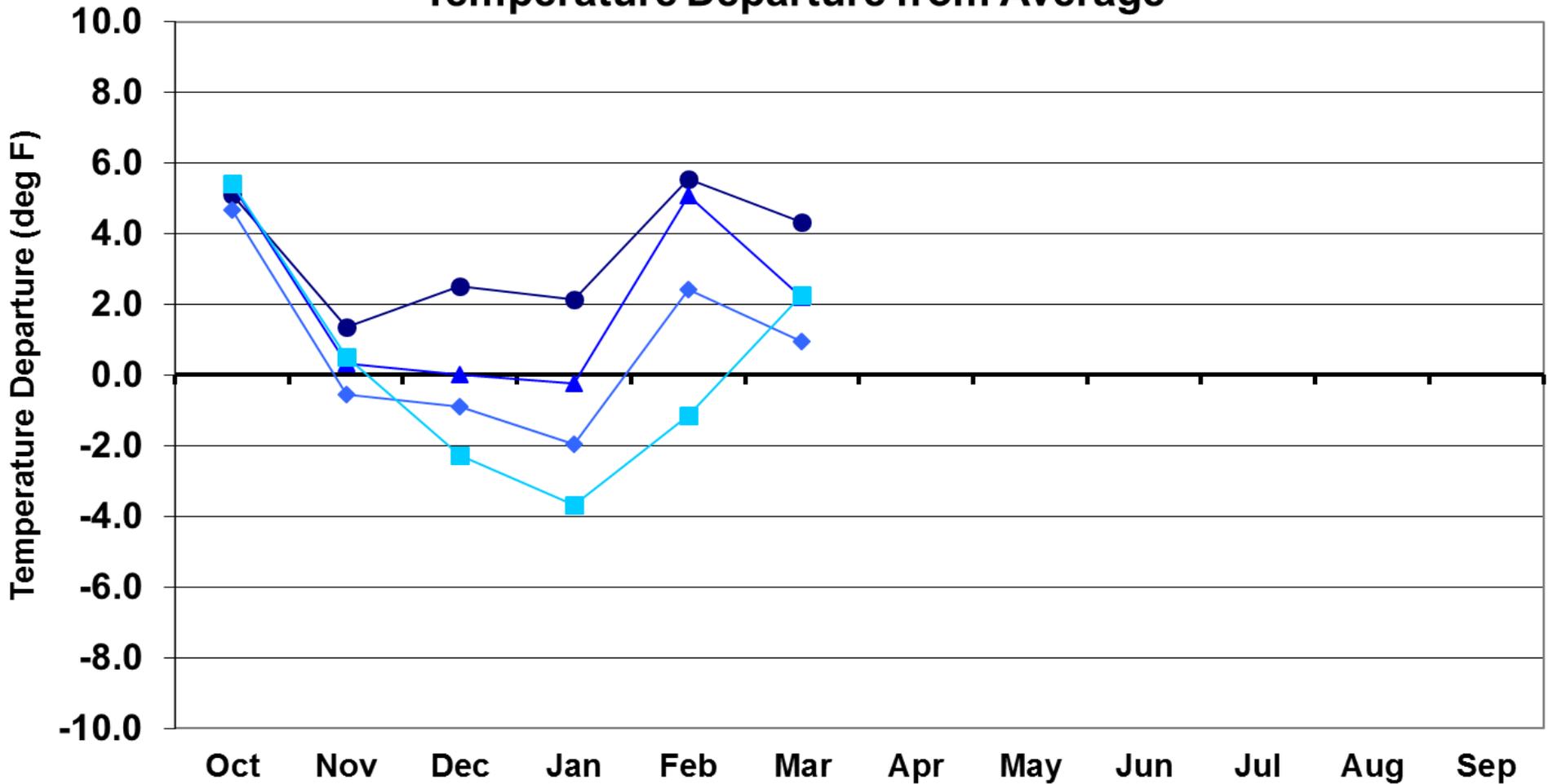


Nolan Doesken
Colorado Climate Center

Presented to
Water Availability Task Force
April 18, 2016
Denver, CO

Water Year 2016 Temperature Departures

Water Year 2016
Temperature Departure from Average



● Eastern Plains

▲ Foothills

◆ Mountains

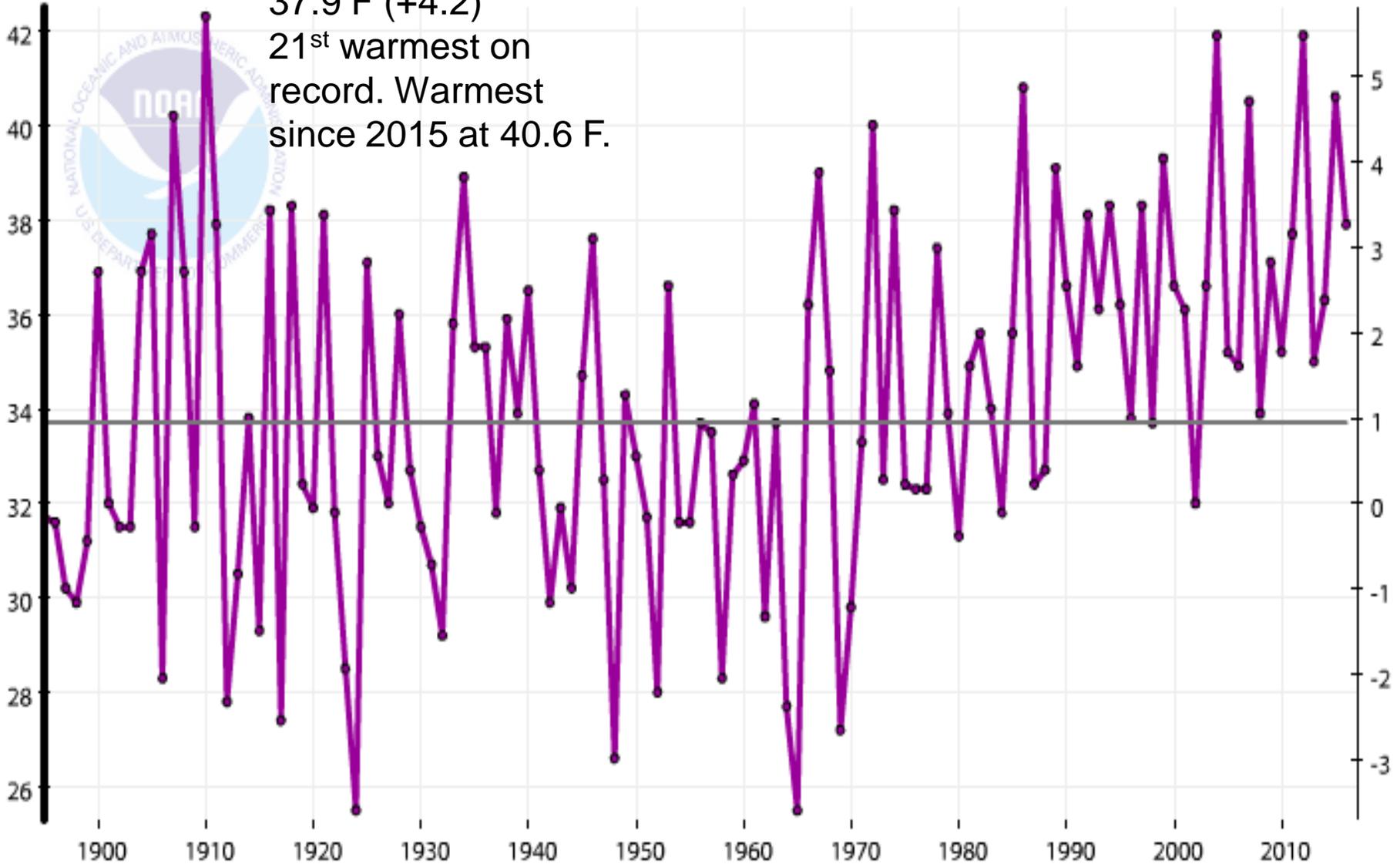
■ Western Valleys

March 2016 Average Temperature History for Colorado (NCEI)

Colorado, Average Temperature, March

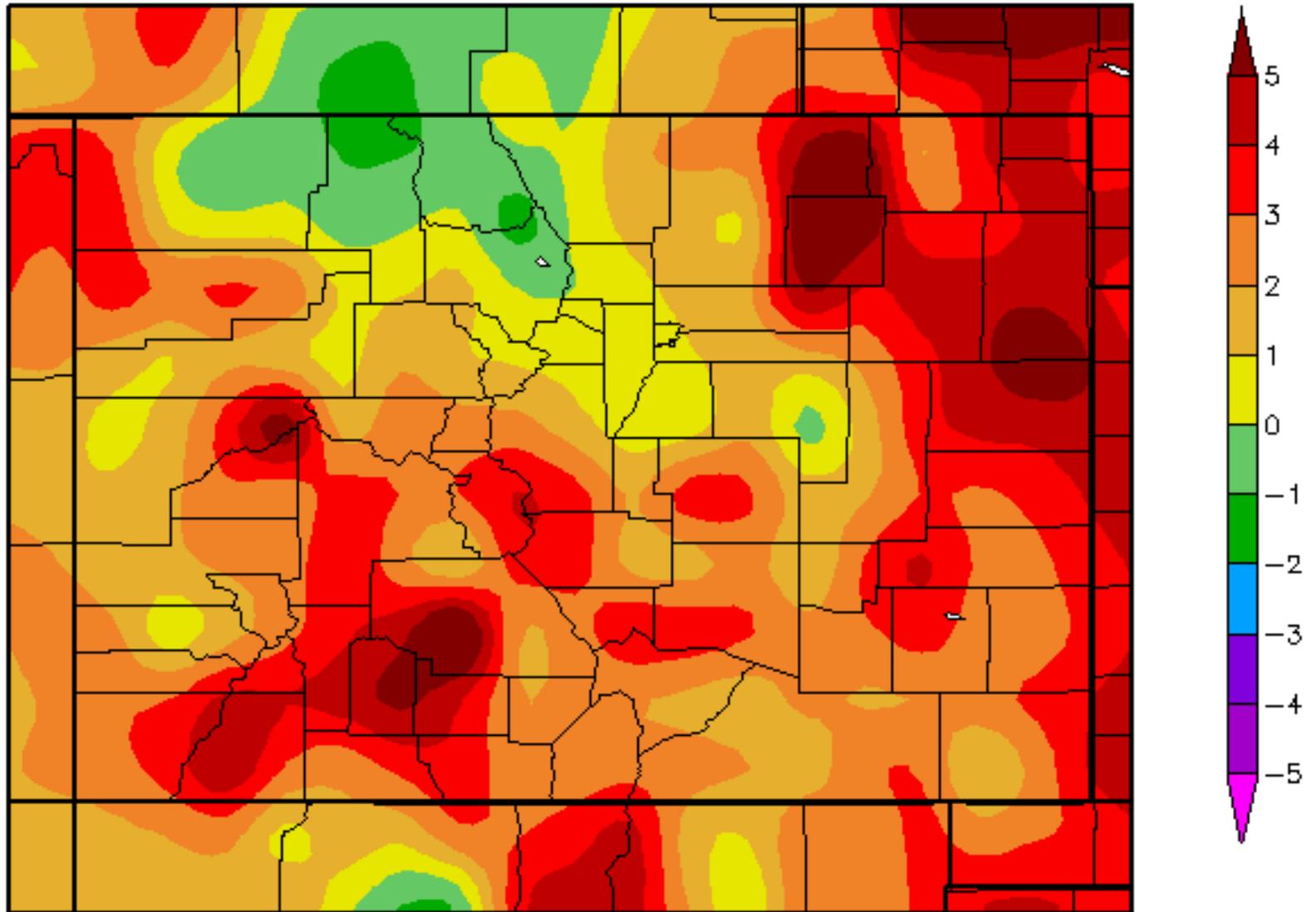
— 1901-2000 Avg: 33.7°F
—●— Avg Temperature

37.9 F (+4.2)
21st warmest on record. Warmest since 2015 at 40.6 F.



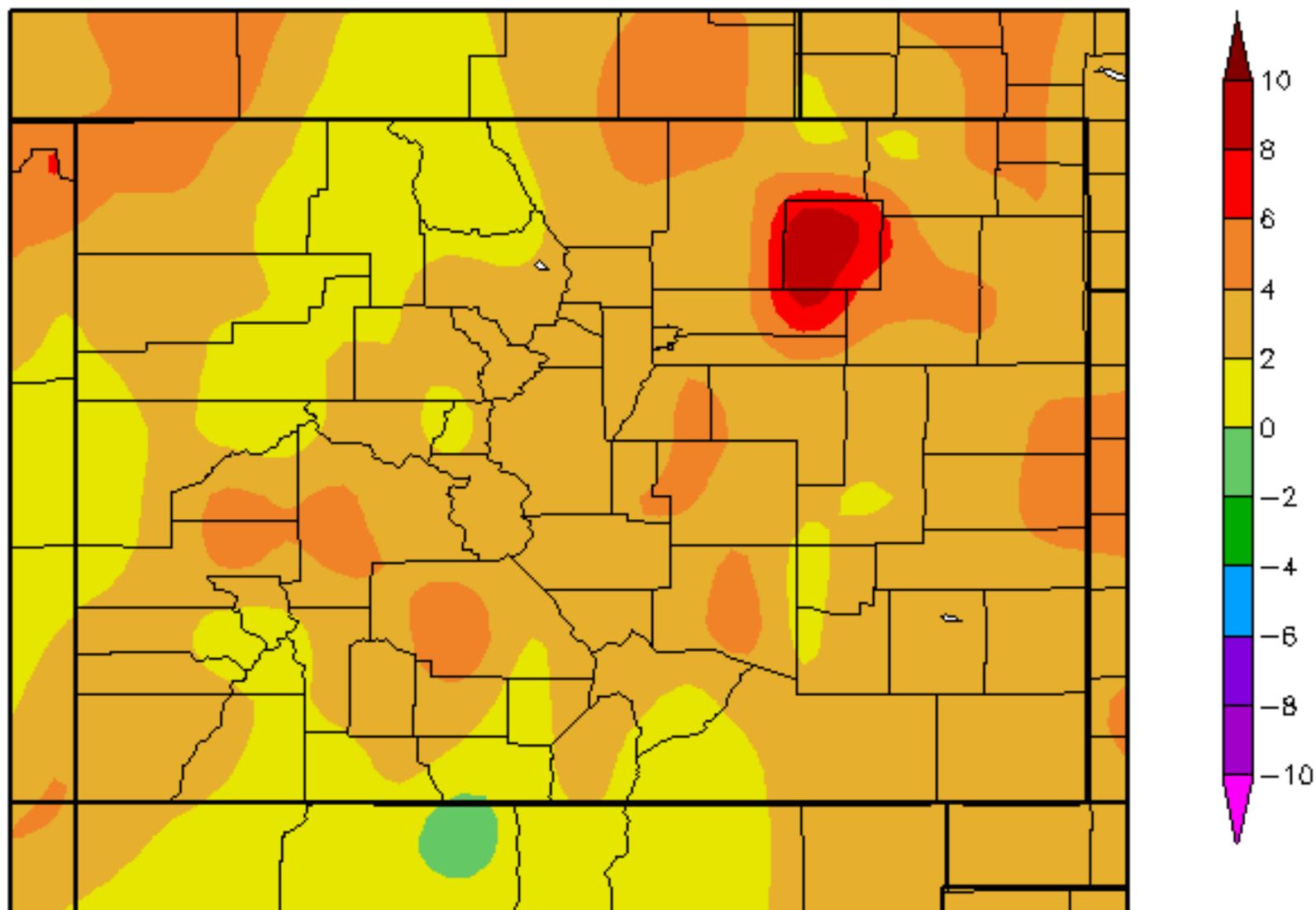
Departure from Normal Temperature (F)

3/1/2016 - 3/31/2016



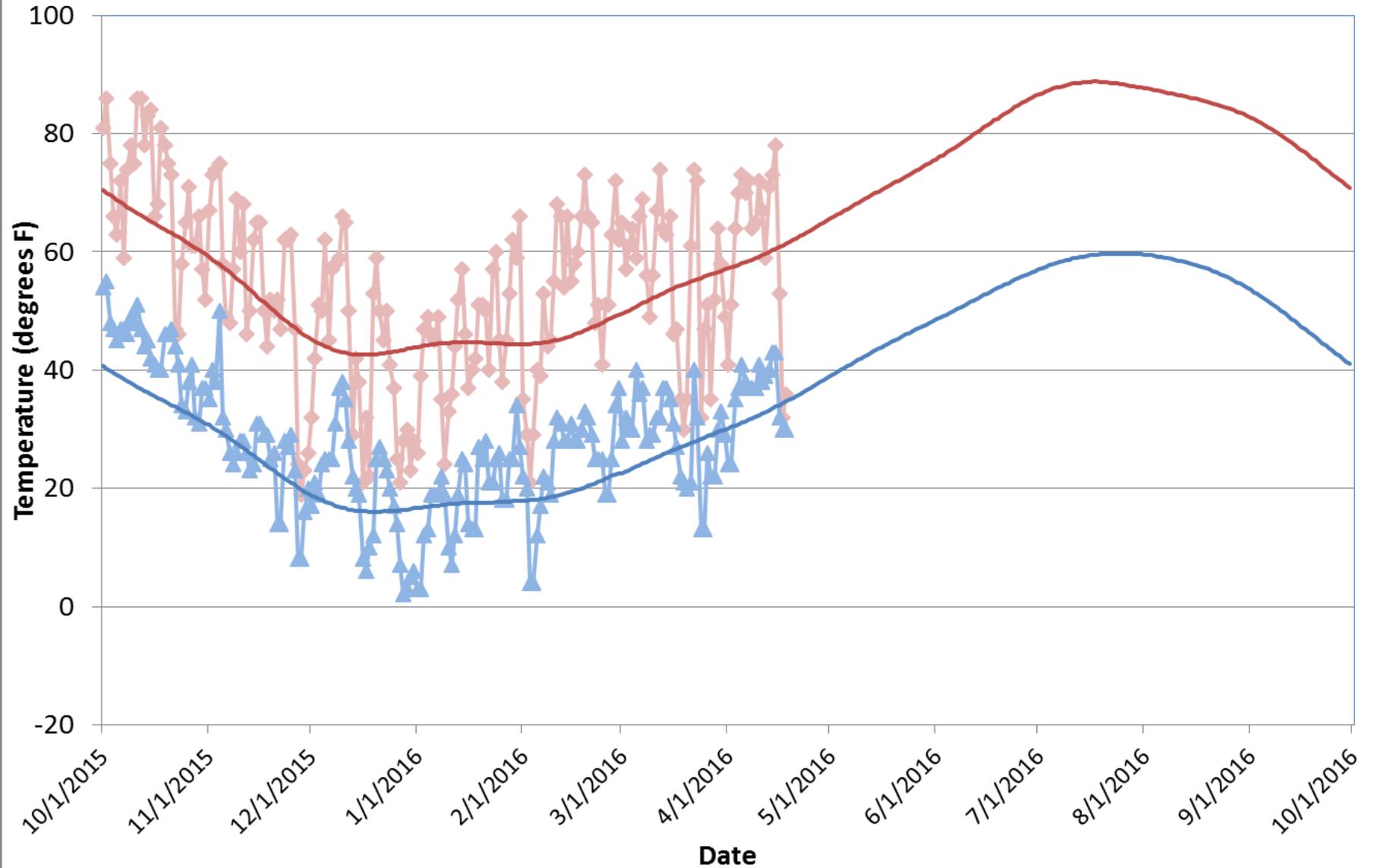
Departure from Normal Temperature (F)

4/1/2016 - 4/17/2016



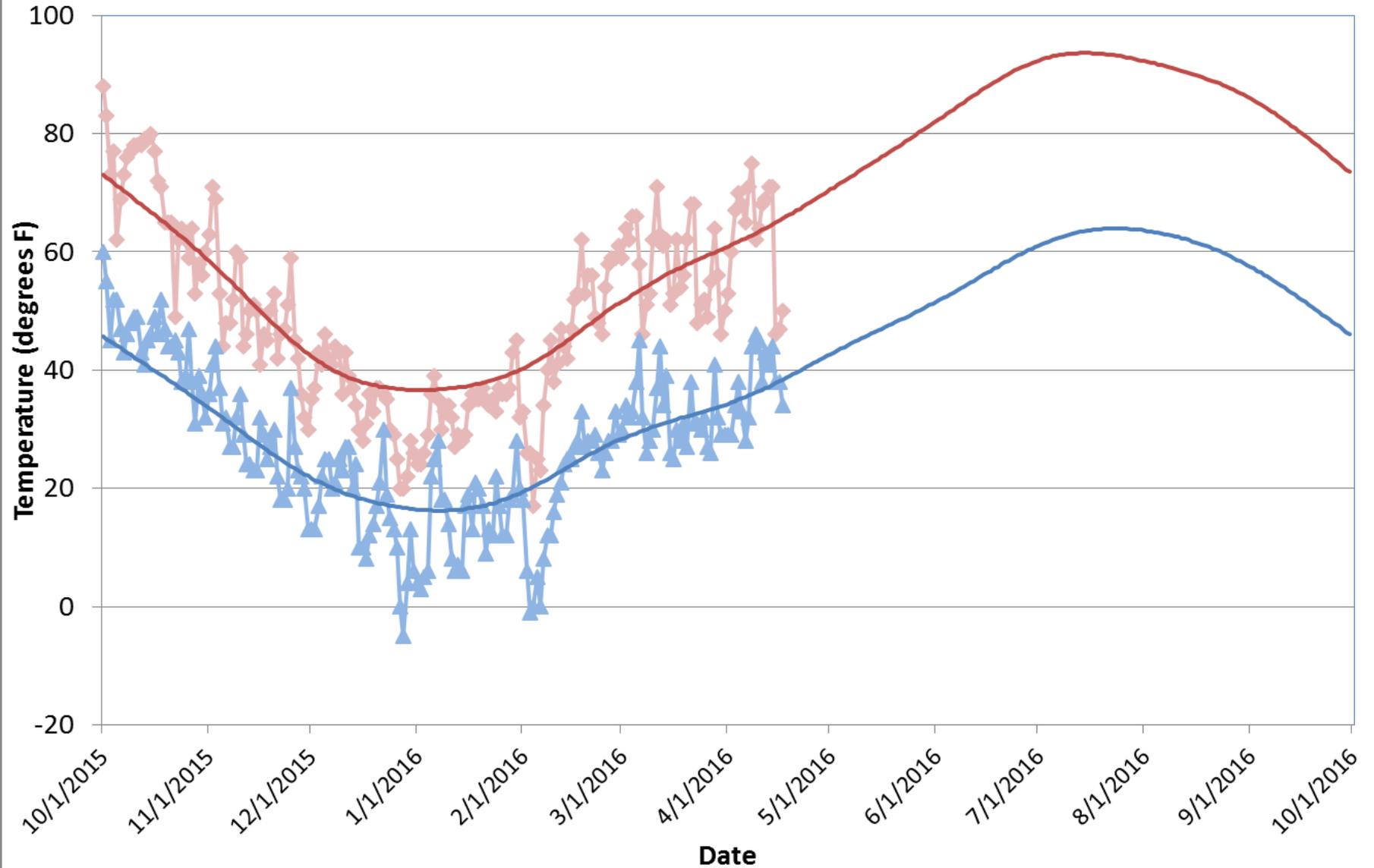
Denver-Stapleton Daily Max/Min Temperatures with Normals, Water Year 2016

Max Temperature Normal Max Temp Min Temperature Normal Min Temp

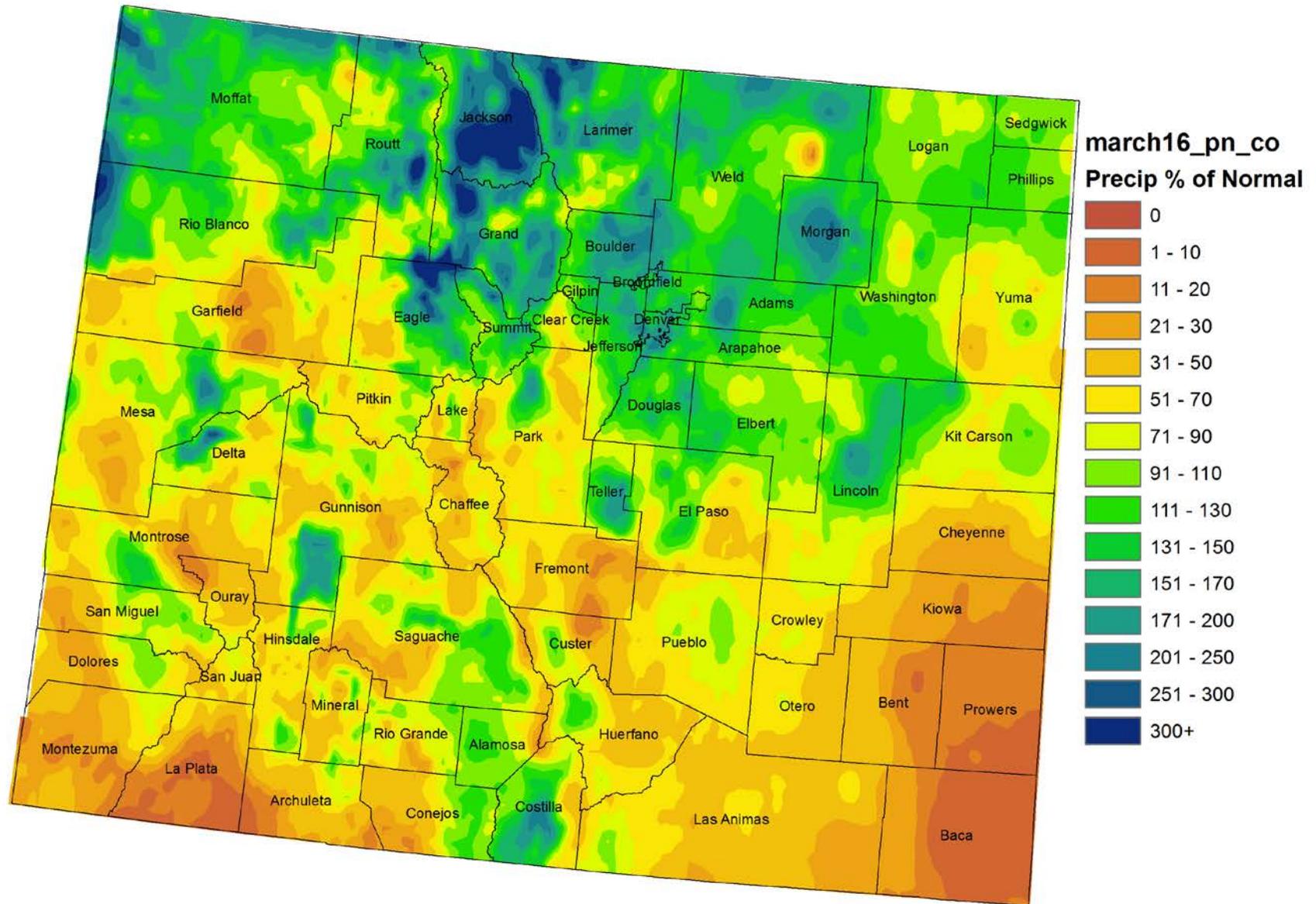


Grand Junction Daily Max/Min Temperature with Normals, WY 2016

Max Temperature Normal Max Temp Min Temperature Normal Min Temp



Colorado March 2016 Precipitation as a Percentage of Normal



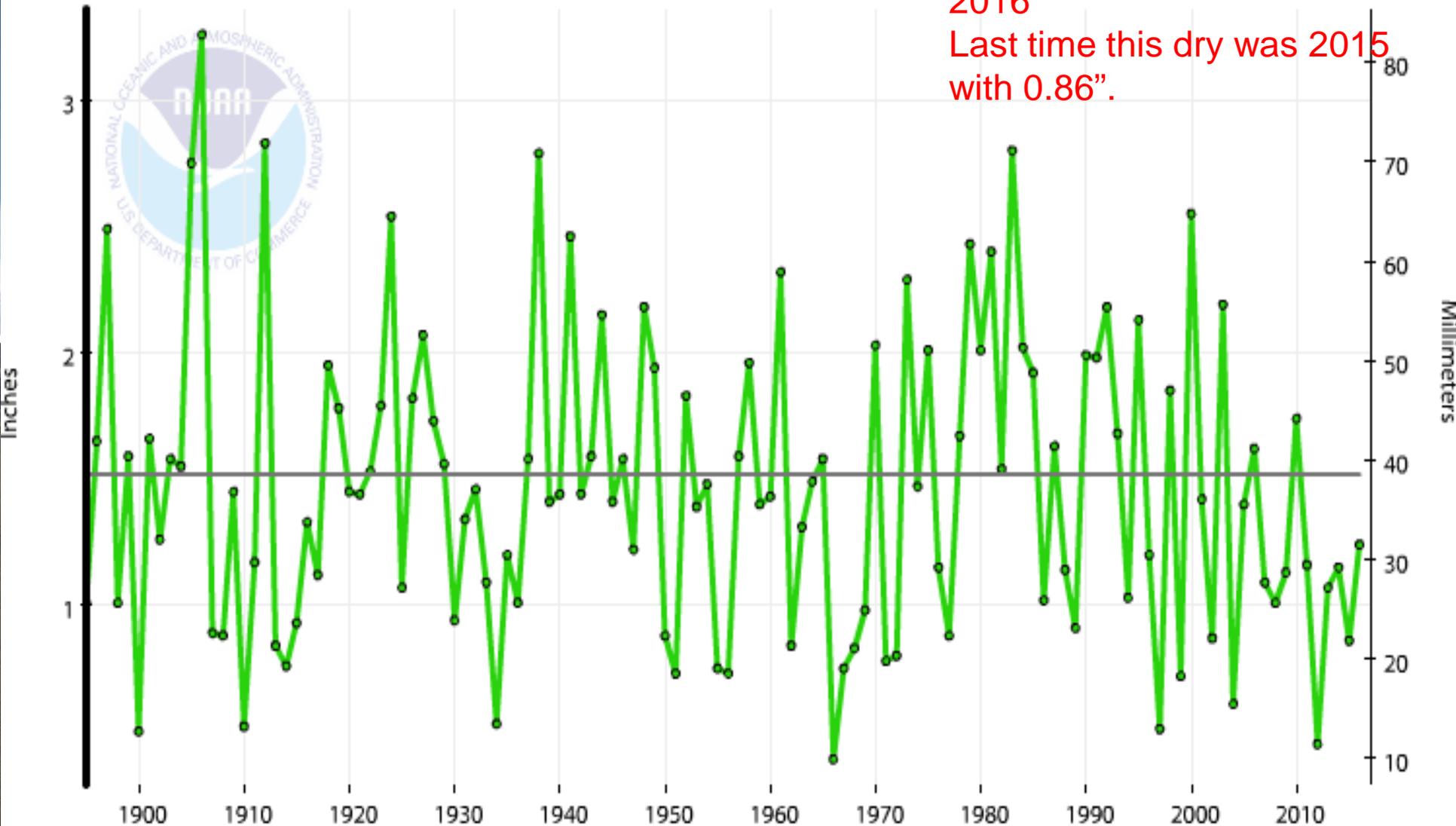
March 2016 Statewide Precipitation

Colorado, Precipitation, March 1.24" (-0.28")

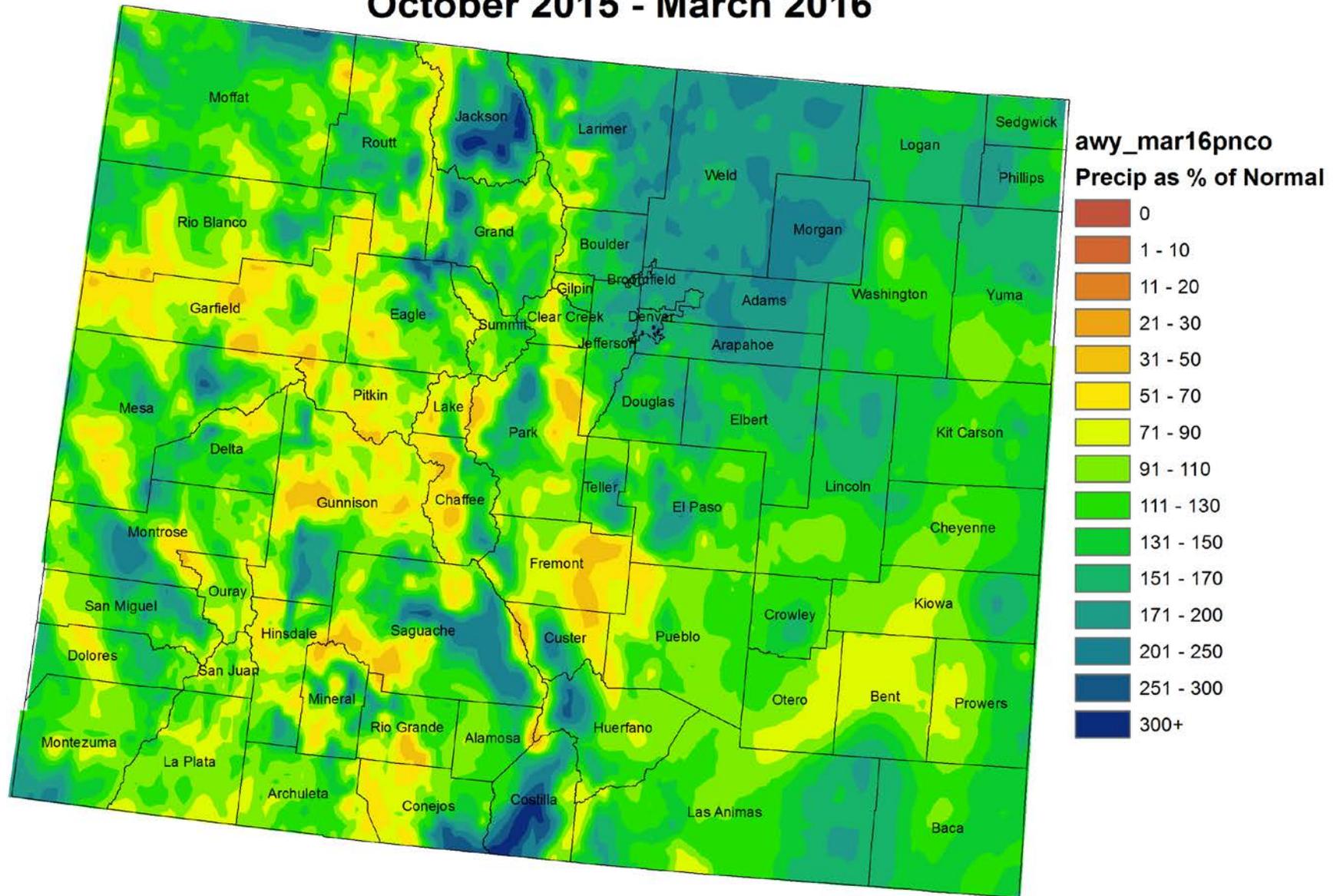
— 1901-2000 Avg: 1.52" ●— Precip

49th driest on Record 1895-2016

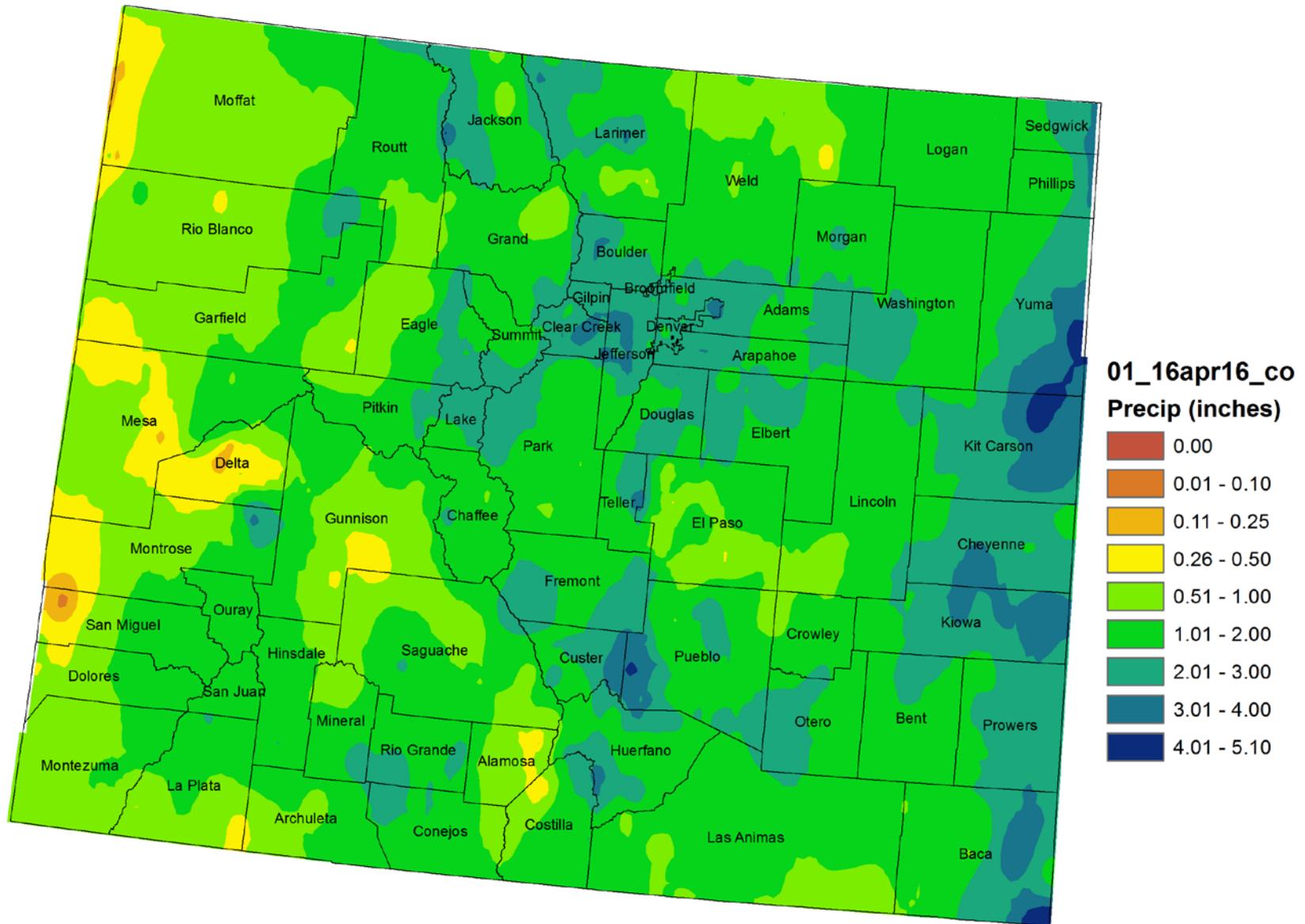
Last time this dry was 2015 with 0.86".



Colorado Water Year 2016 Precipitation as a Percentage of Normal October 2015 - March 2016

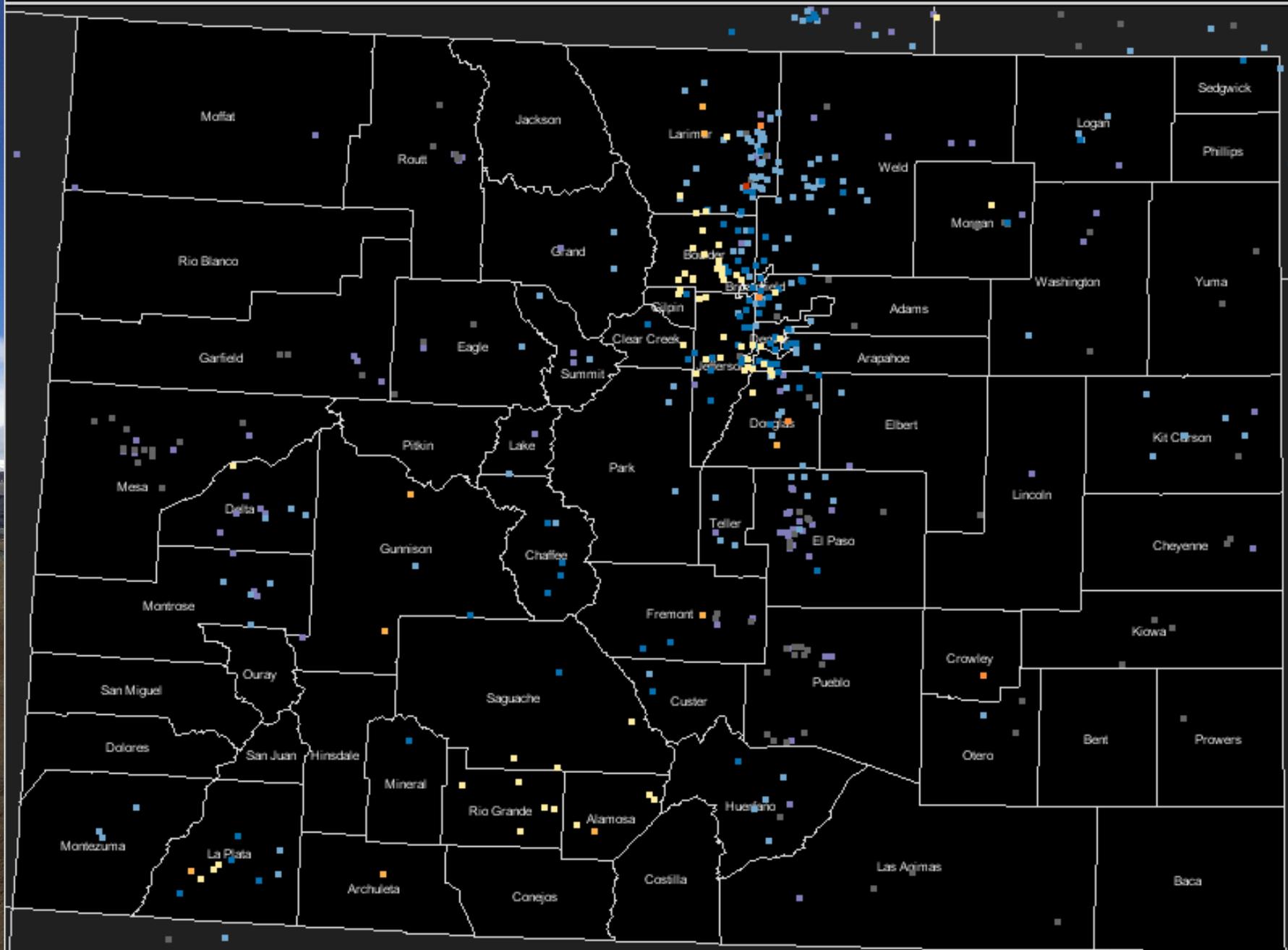
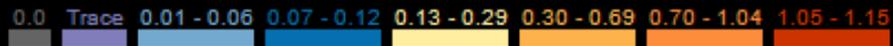


Colorado Water Month to Date Precipitation 1 - 16 April 2016

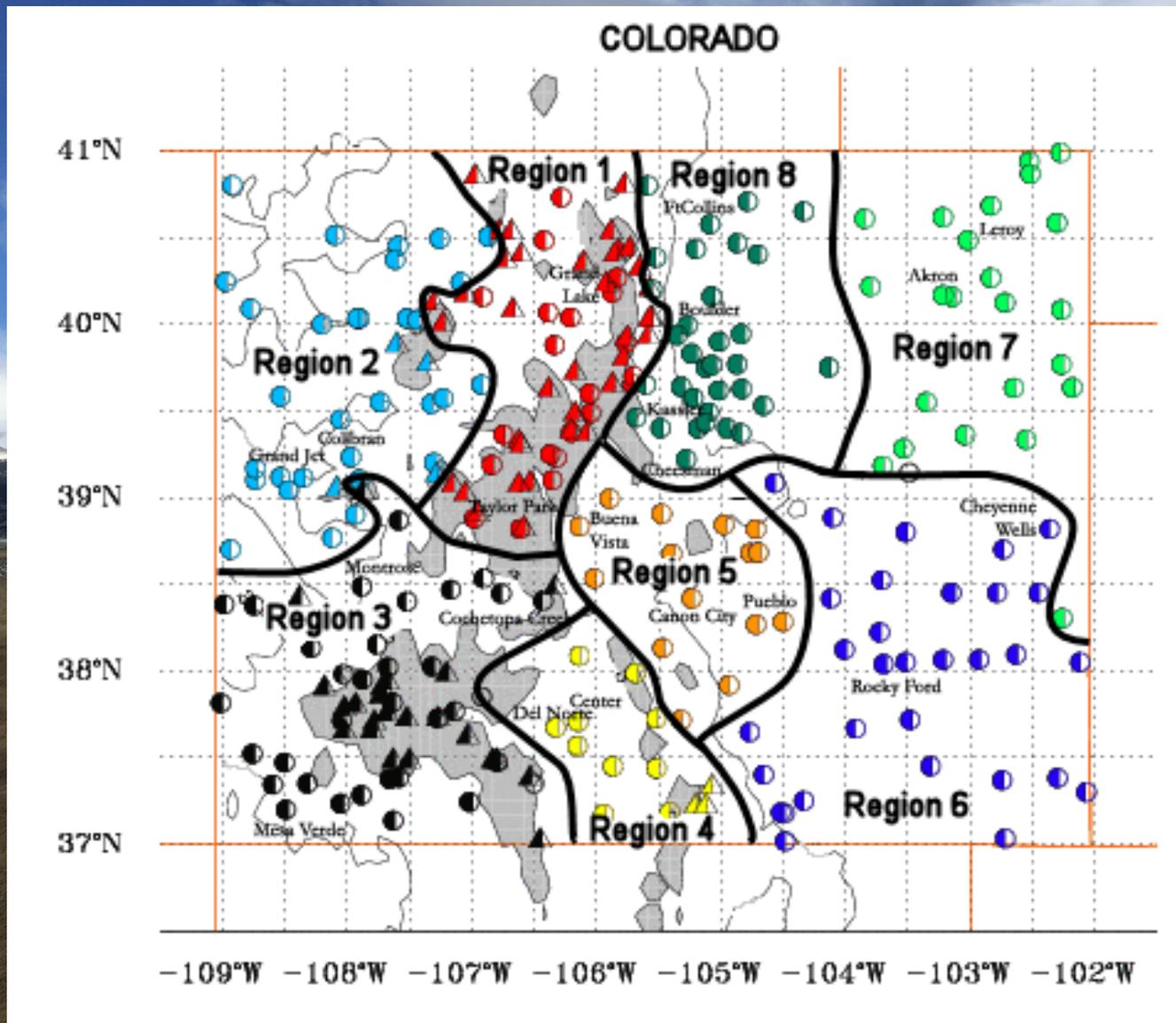


Daily Precipitation (inches x.xx), for the 24 hour period ending ~7:00 am

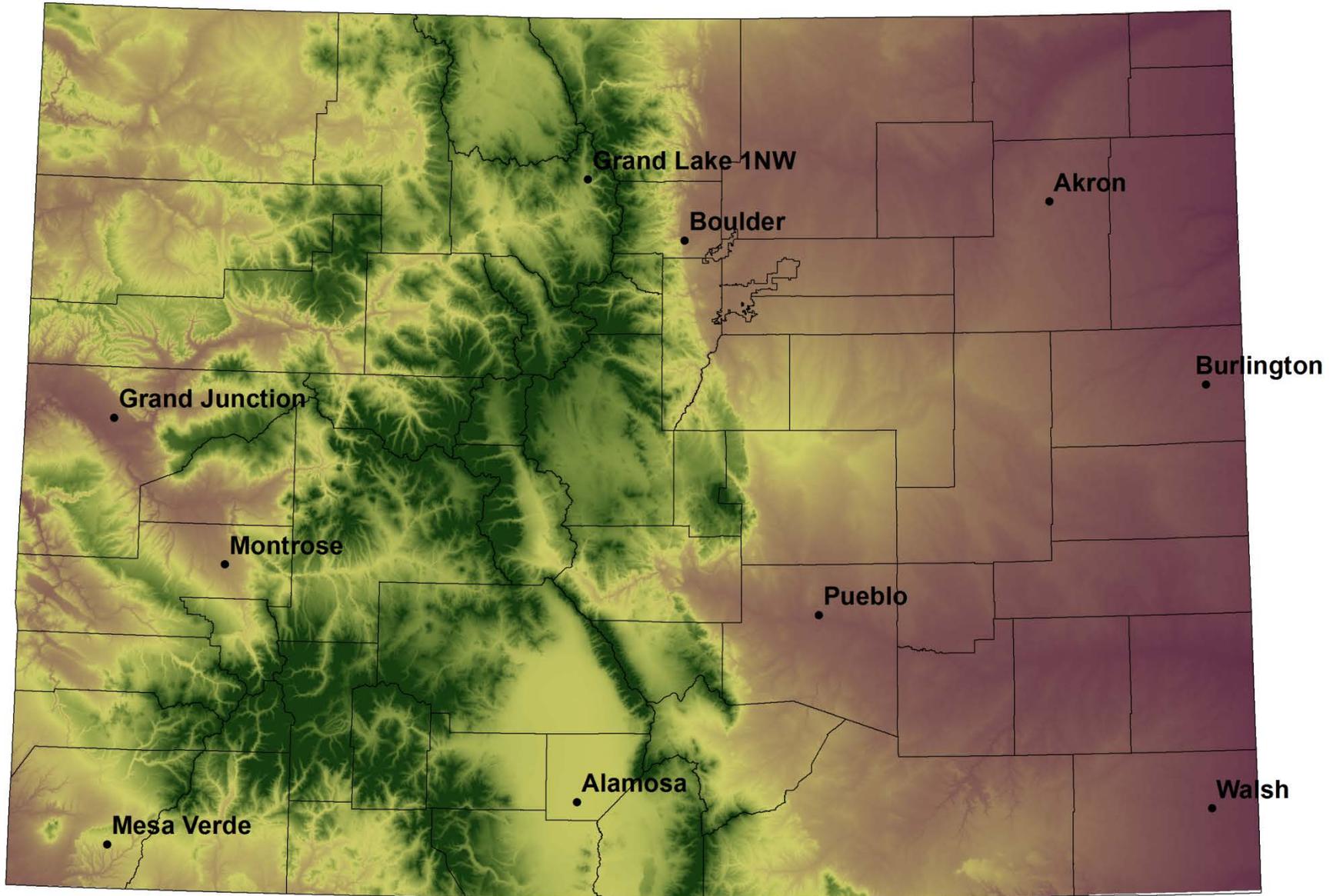
Colorado 4/18/2016



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

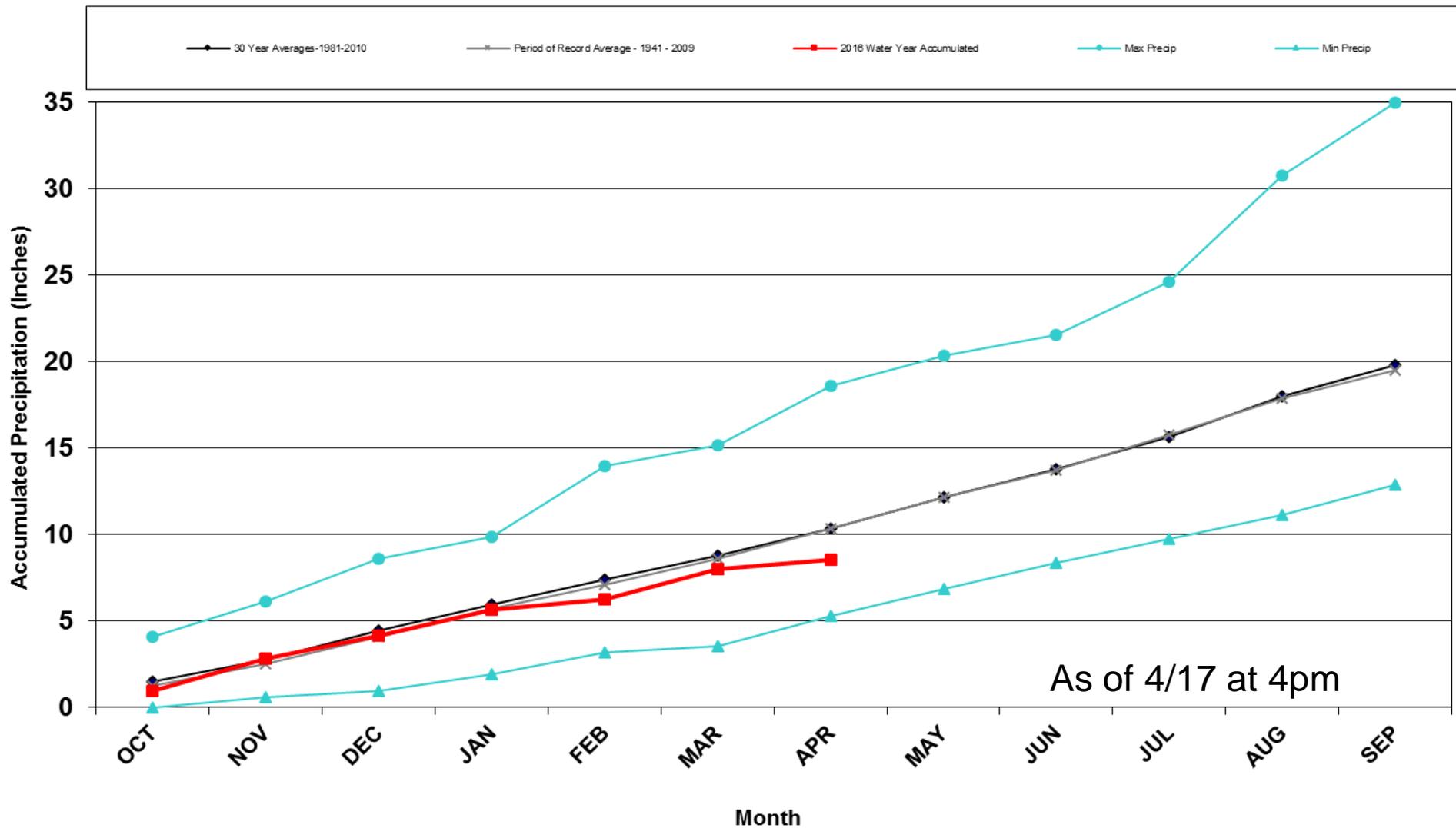


NWS Cooperative Stations for WATF



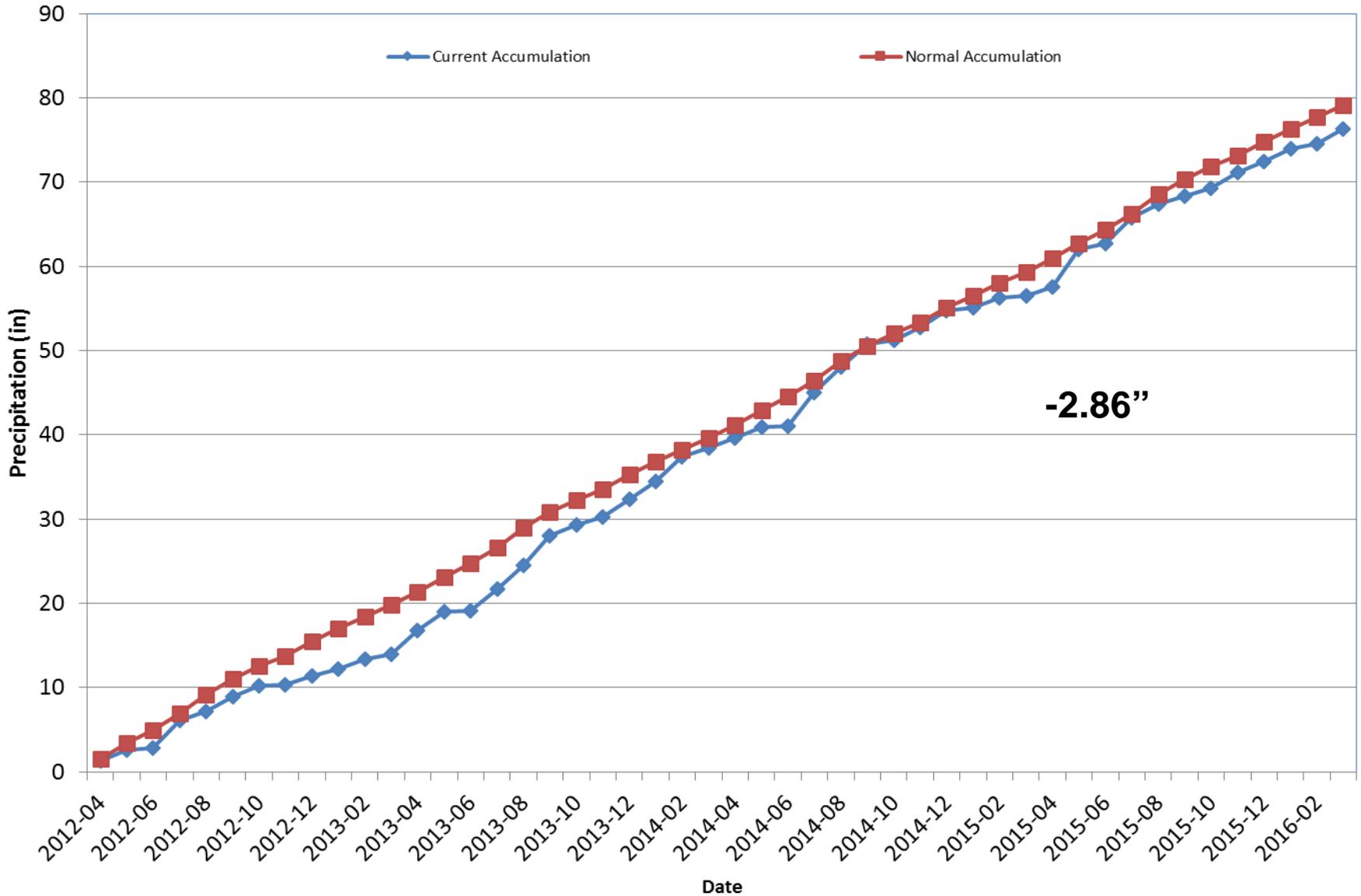
Division 1 – Grand Lake 1NW

Grand Lake 1 NW 2016 Water Year



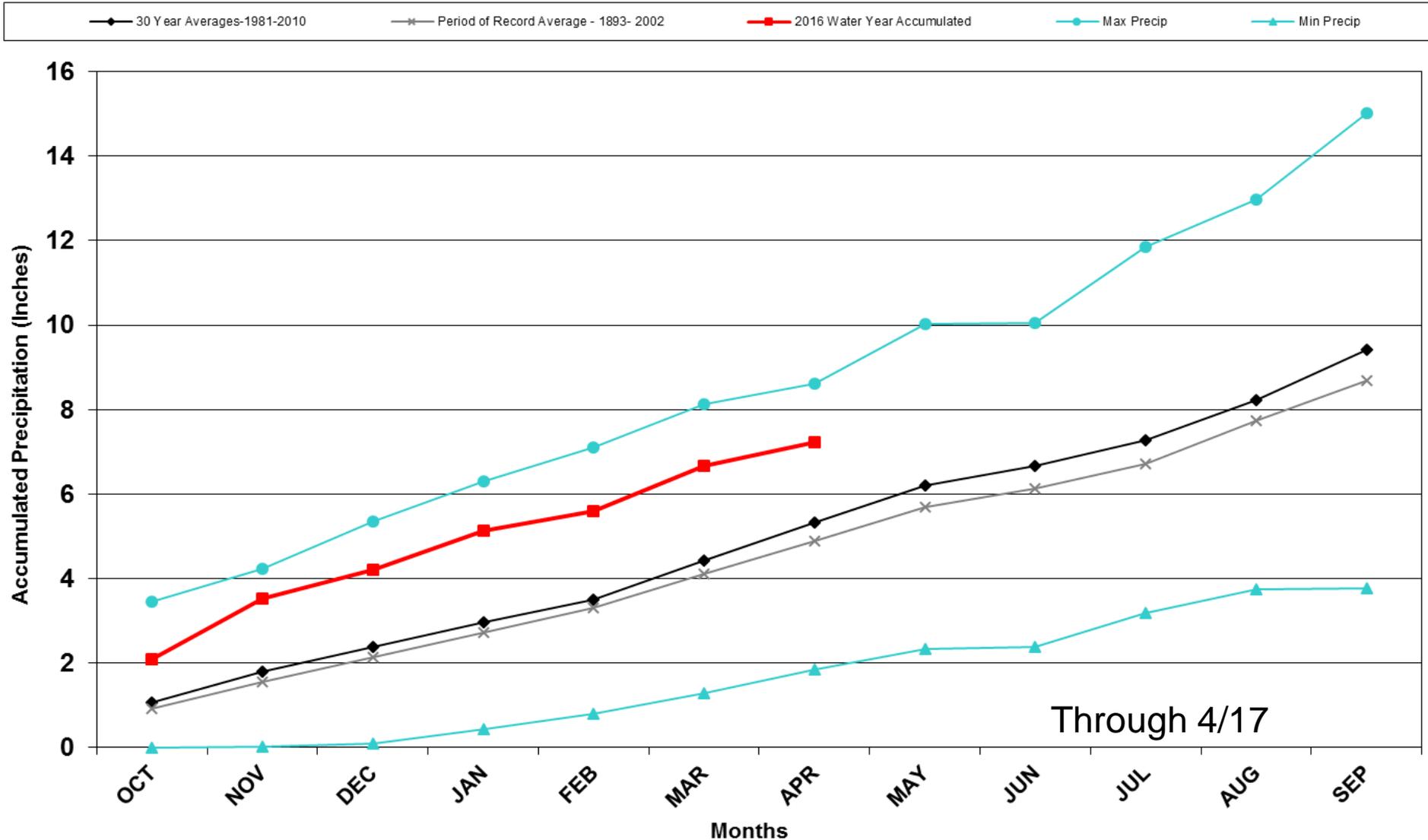
Division 1 – Grand Lake 1NW

Grand Lake 1NW Precipitation Accumulation



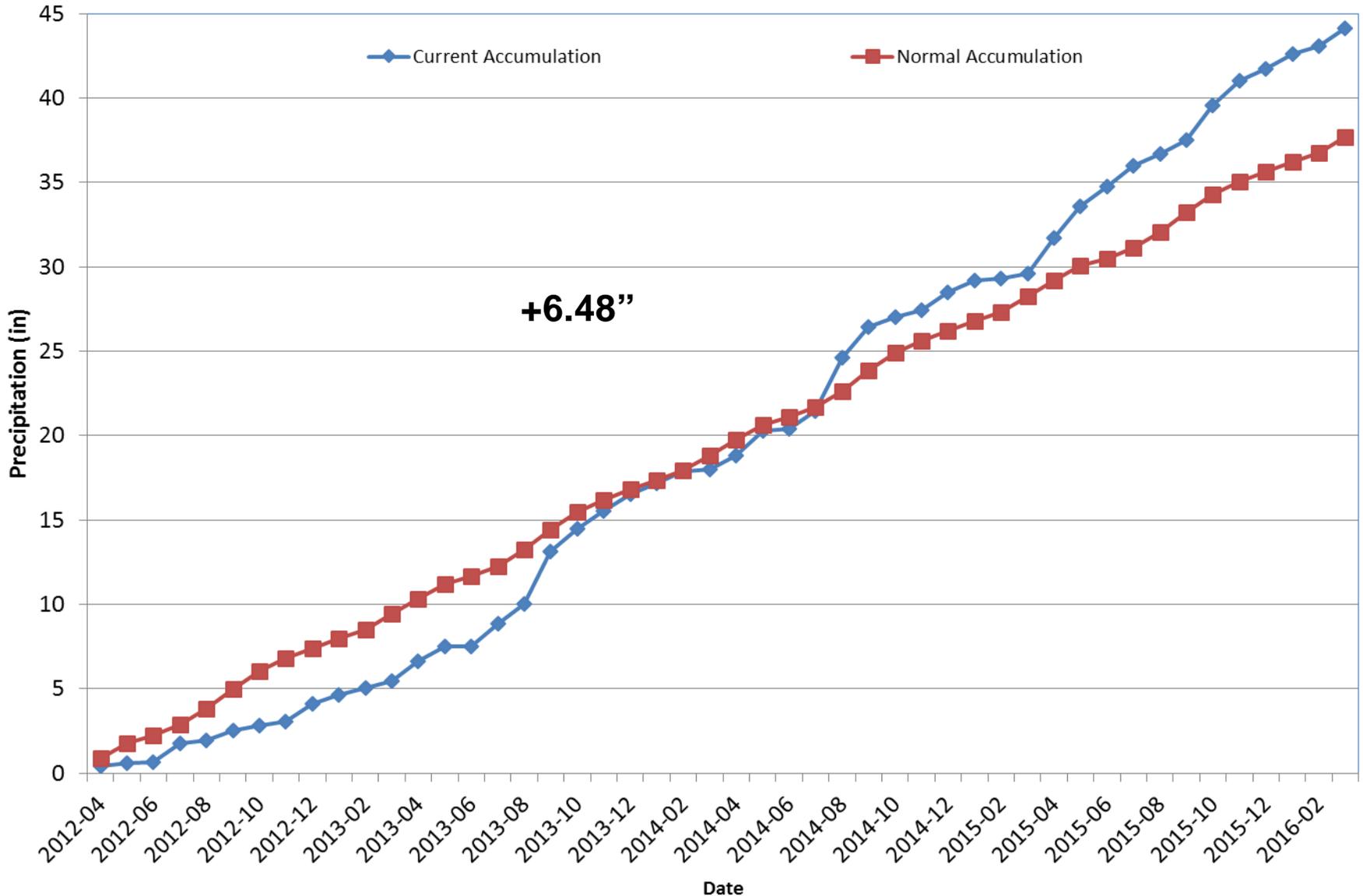
Division 2 – Grand Junction

Grand Junction WSFO 2016 Water Year



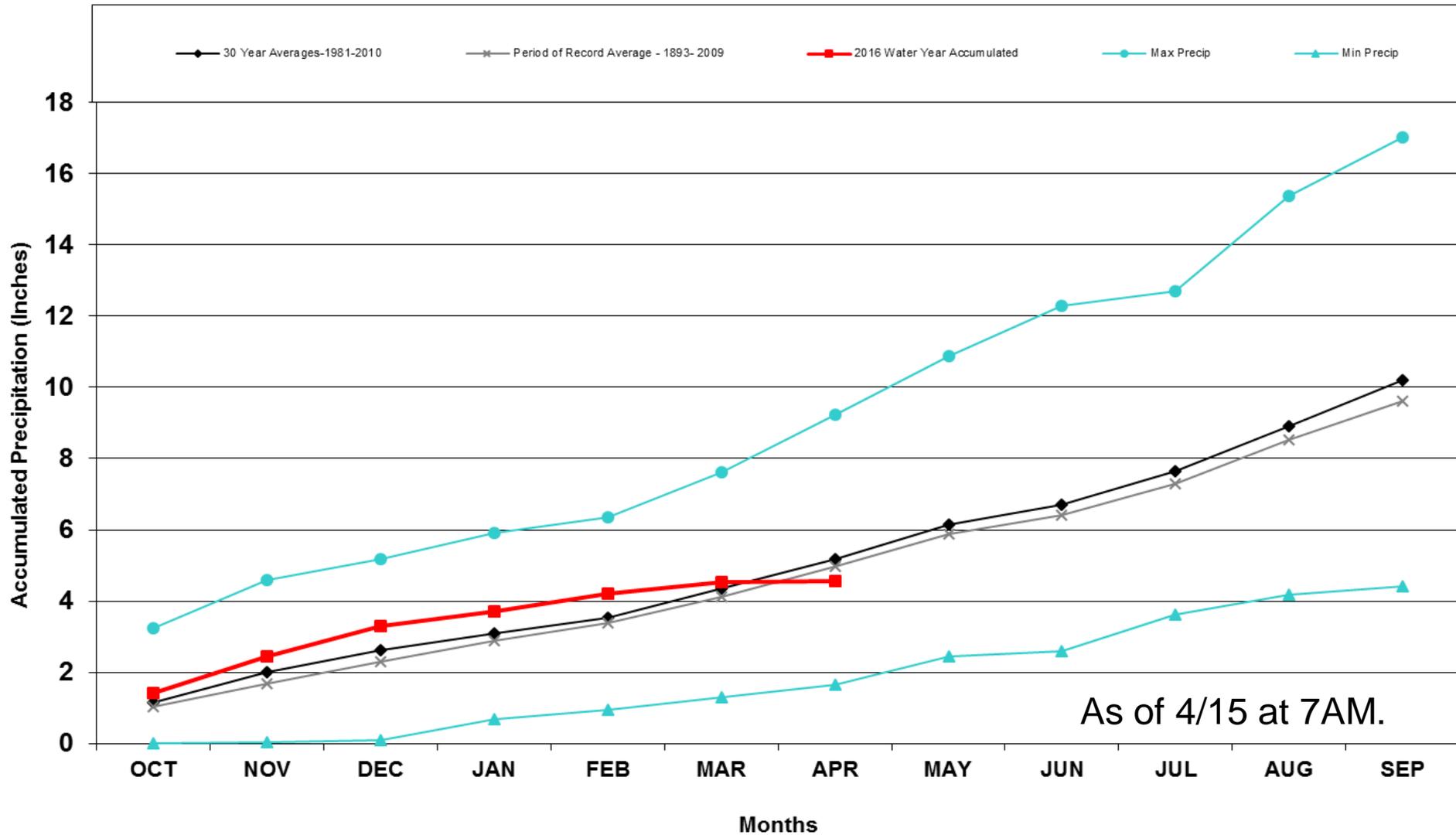
Division 2 – Grand Junction

Grand Junction Precipitation Accumulation



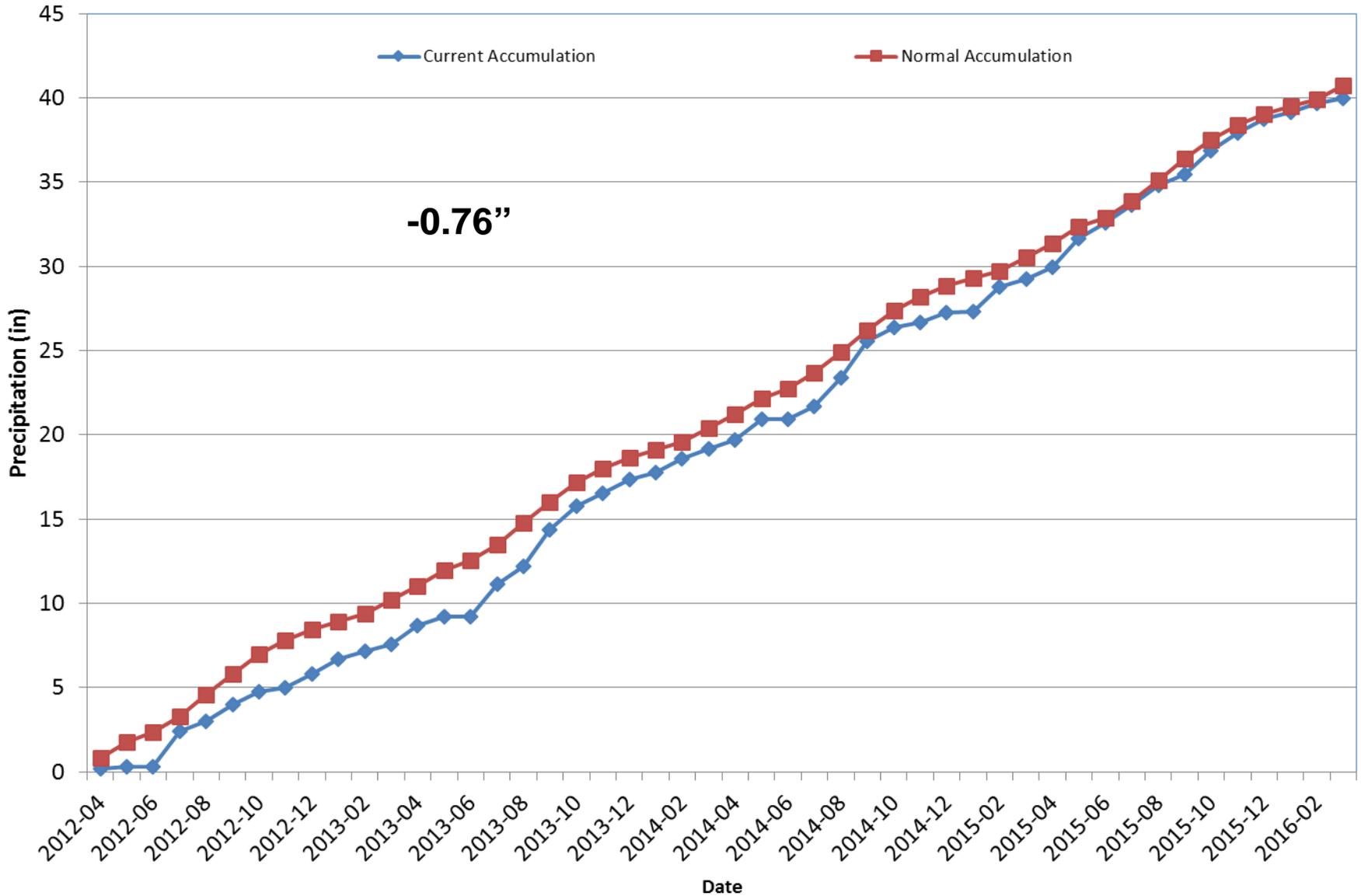
Division 3 – Montrose

Montrose #2 2016 Water Year



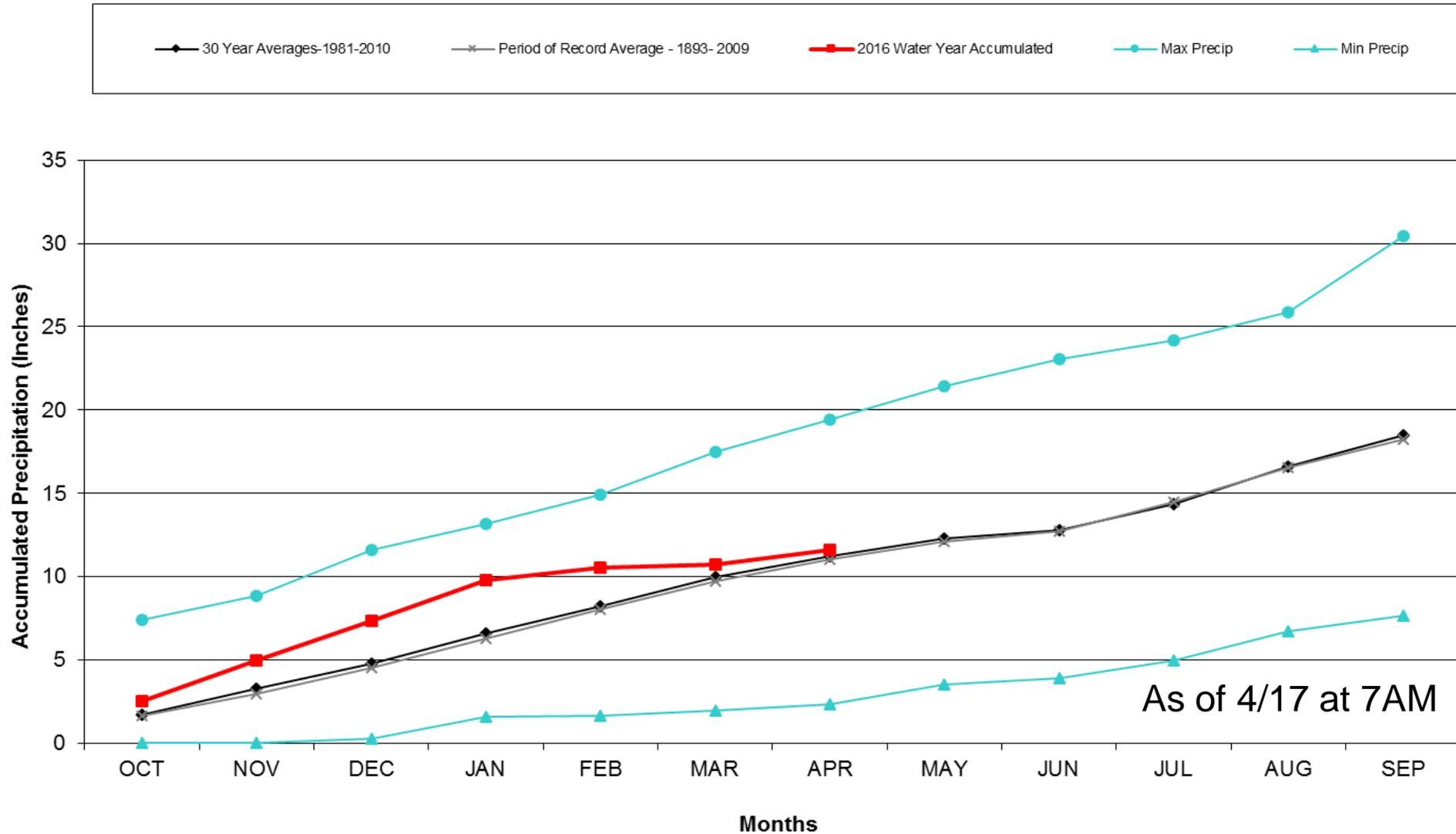
Division 3 – Montrose

Montrose #2 Precipitation Accumulation



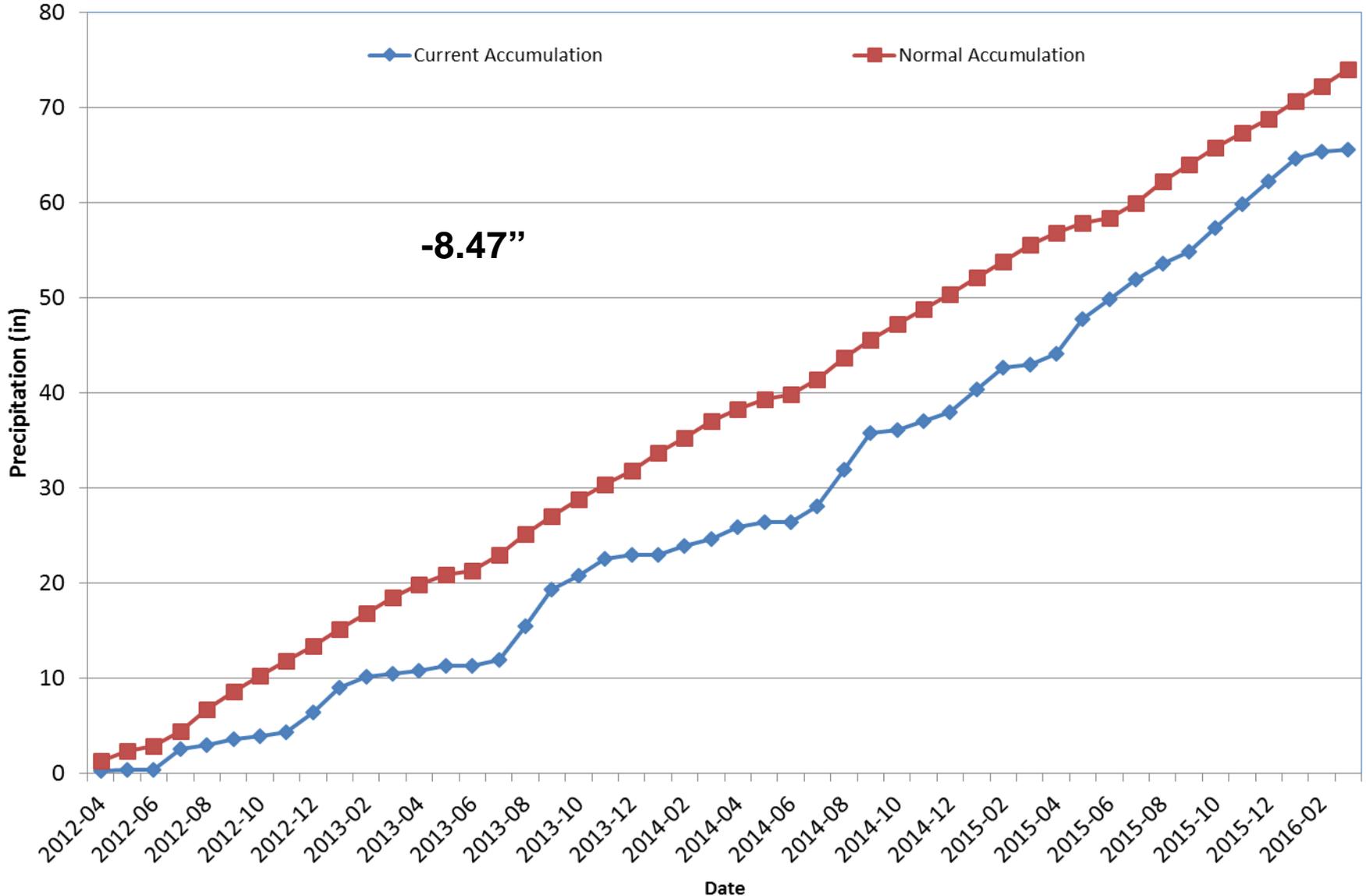
Division 3 – Mesa Verde NP

Mesa Verde NP 2016 Water Year



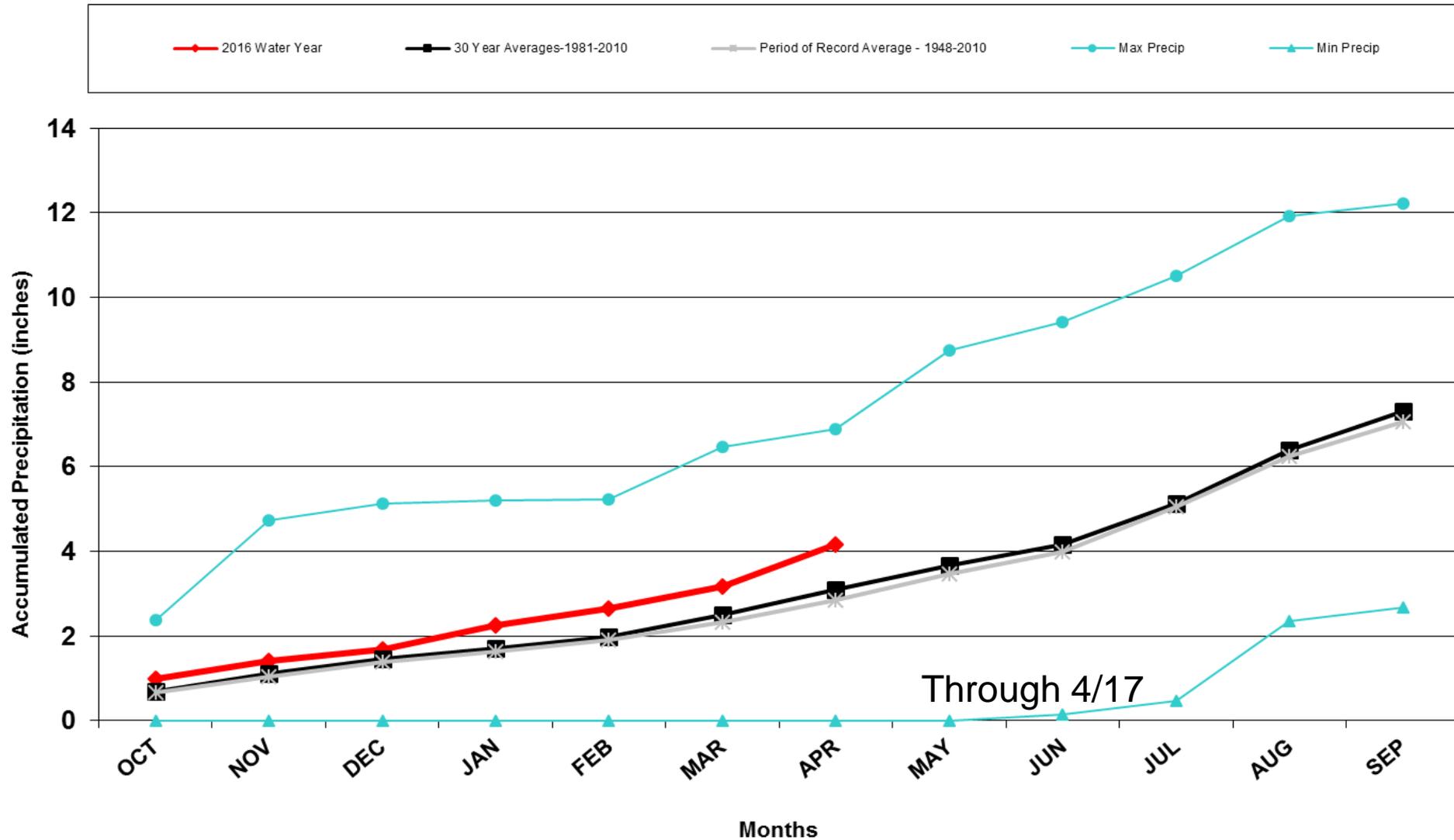
Division 3 – Mesa Verde NP

Mesa Verde NP Precipitation Accumulation



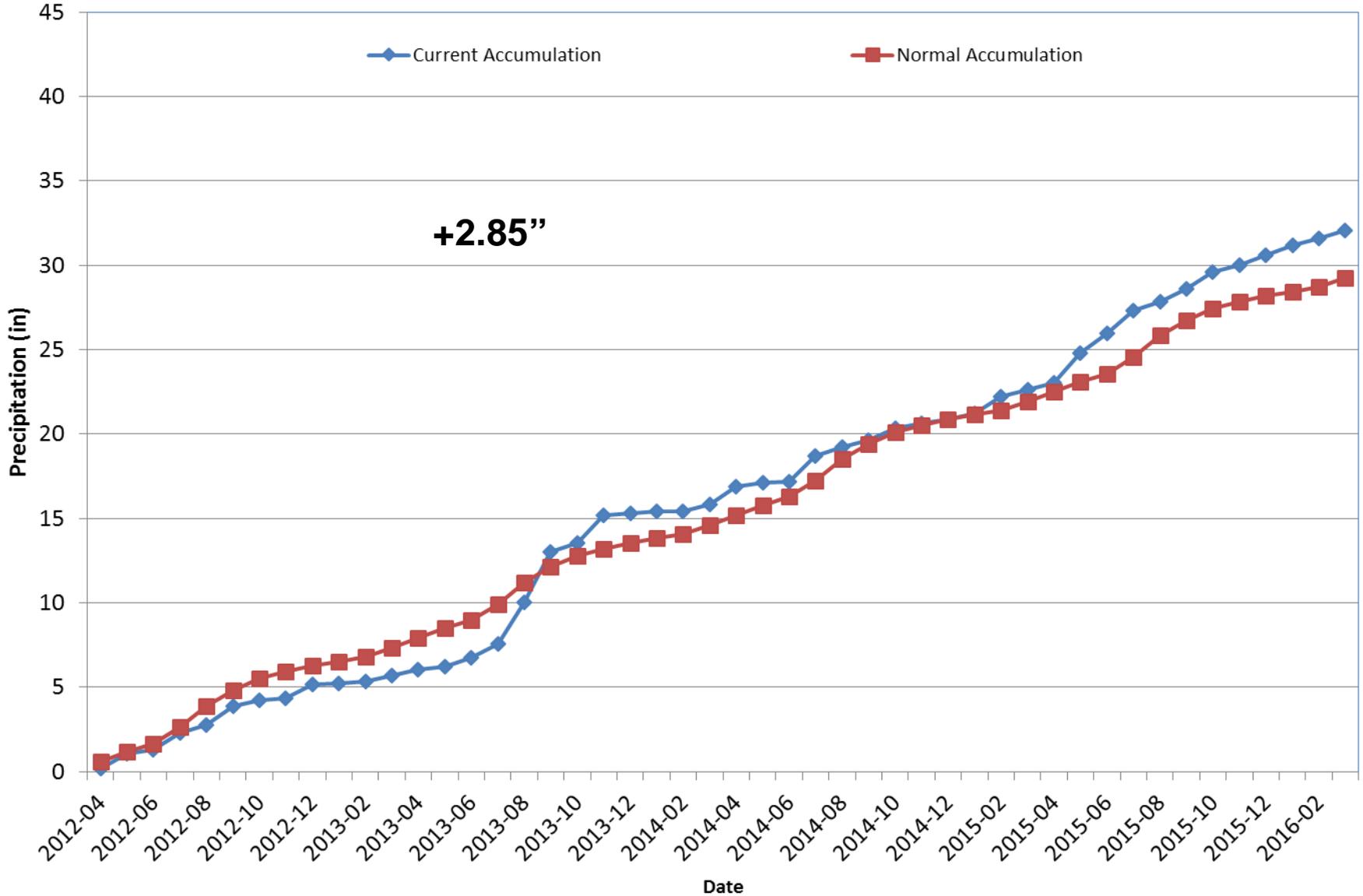
Division 4 – Alamosa

Alamosa WSO 2016 Water Year



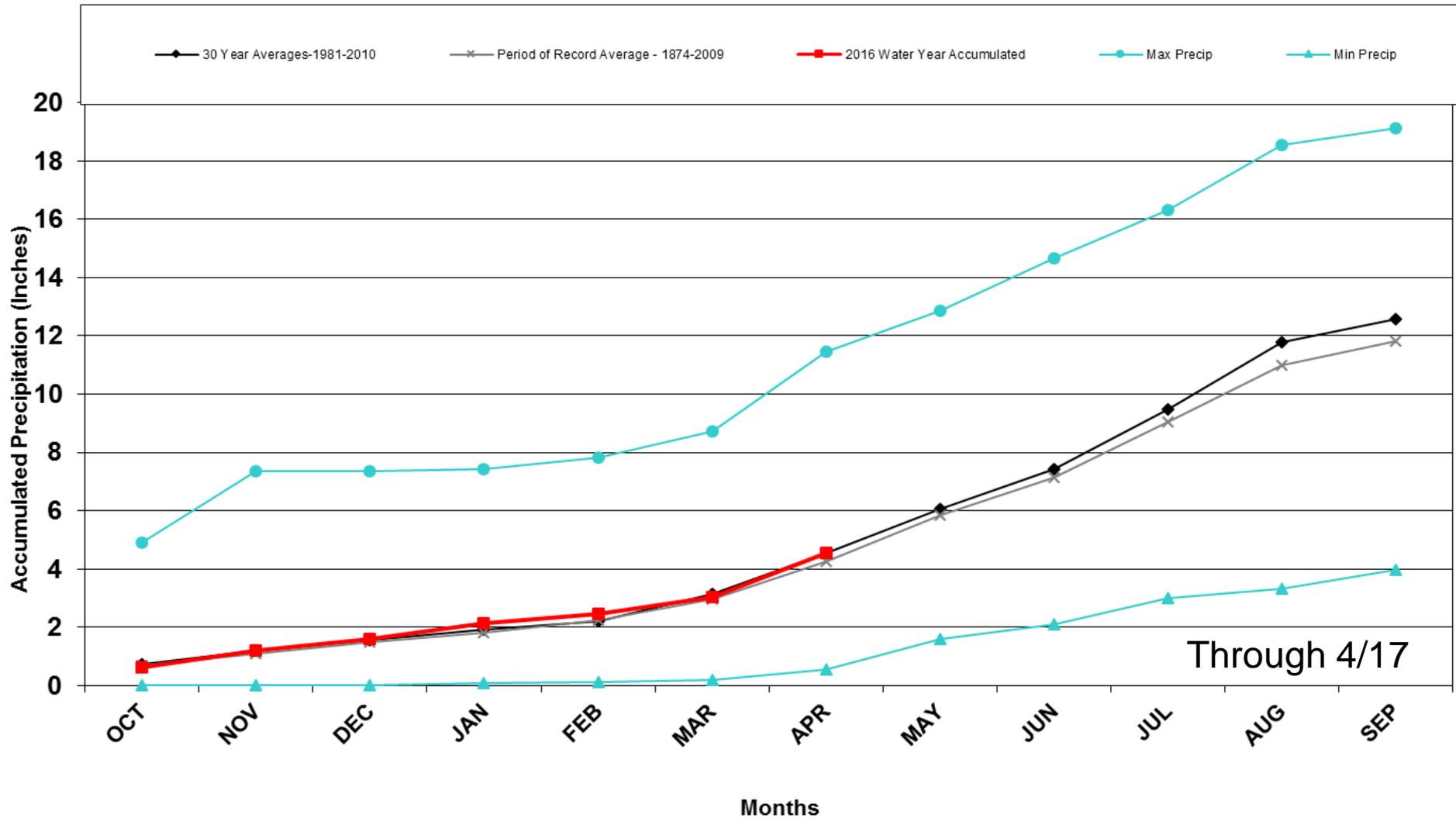
Division 4 – Alamosa

Alamosa WSO Precipitation Accumulation



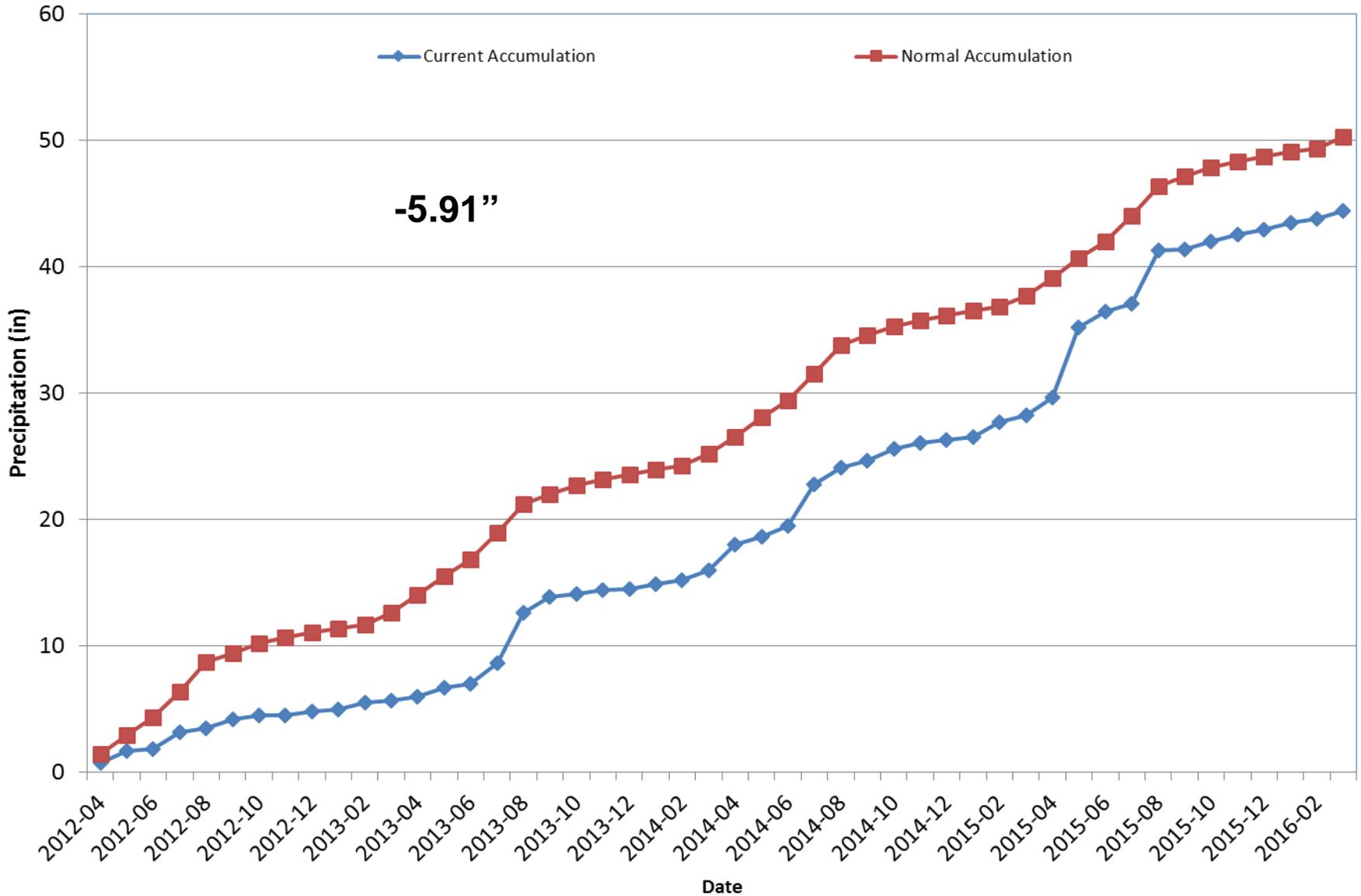
Division 5 – Pueblo

Pueblo WSO 2016 Water Year



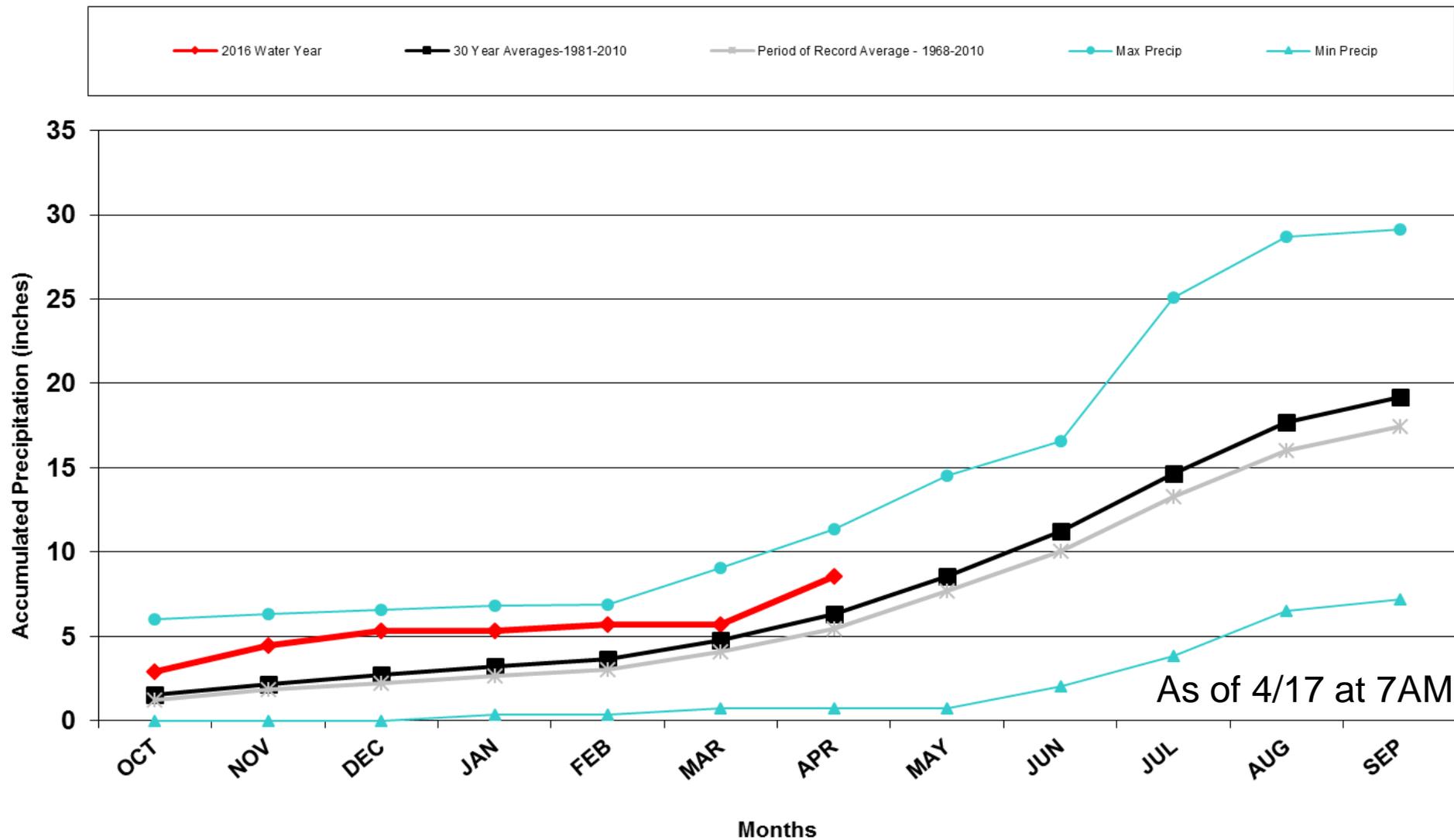
Division 5 – Pueblo

Pueblo Memorial AP Precipitation Accumulation



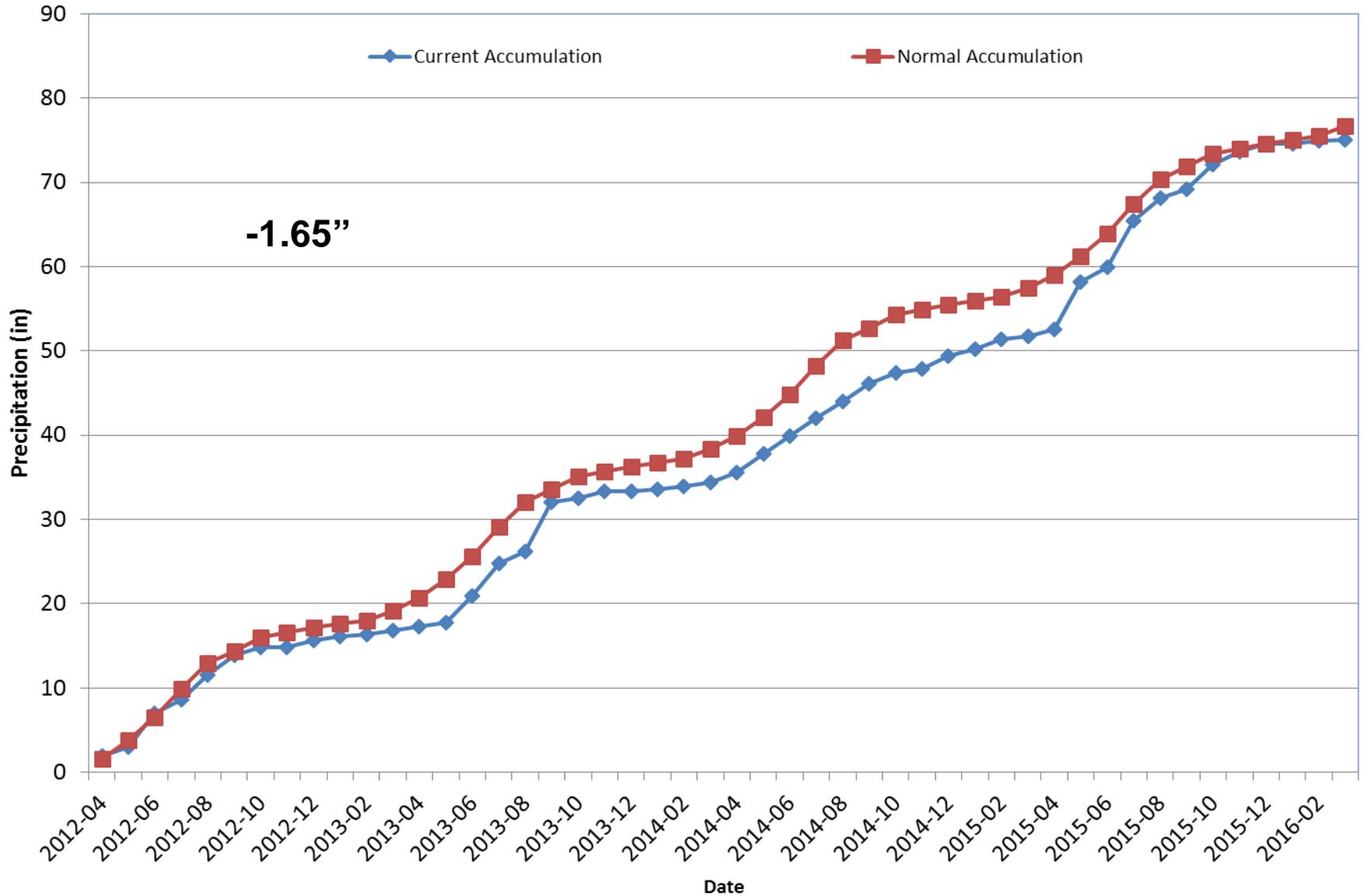
Division 6 - Walsh

Walsh 2016 Water Year



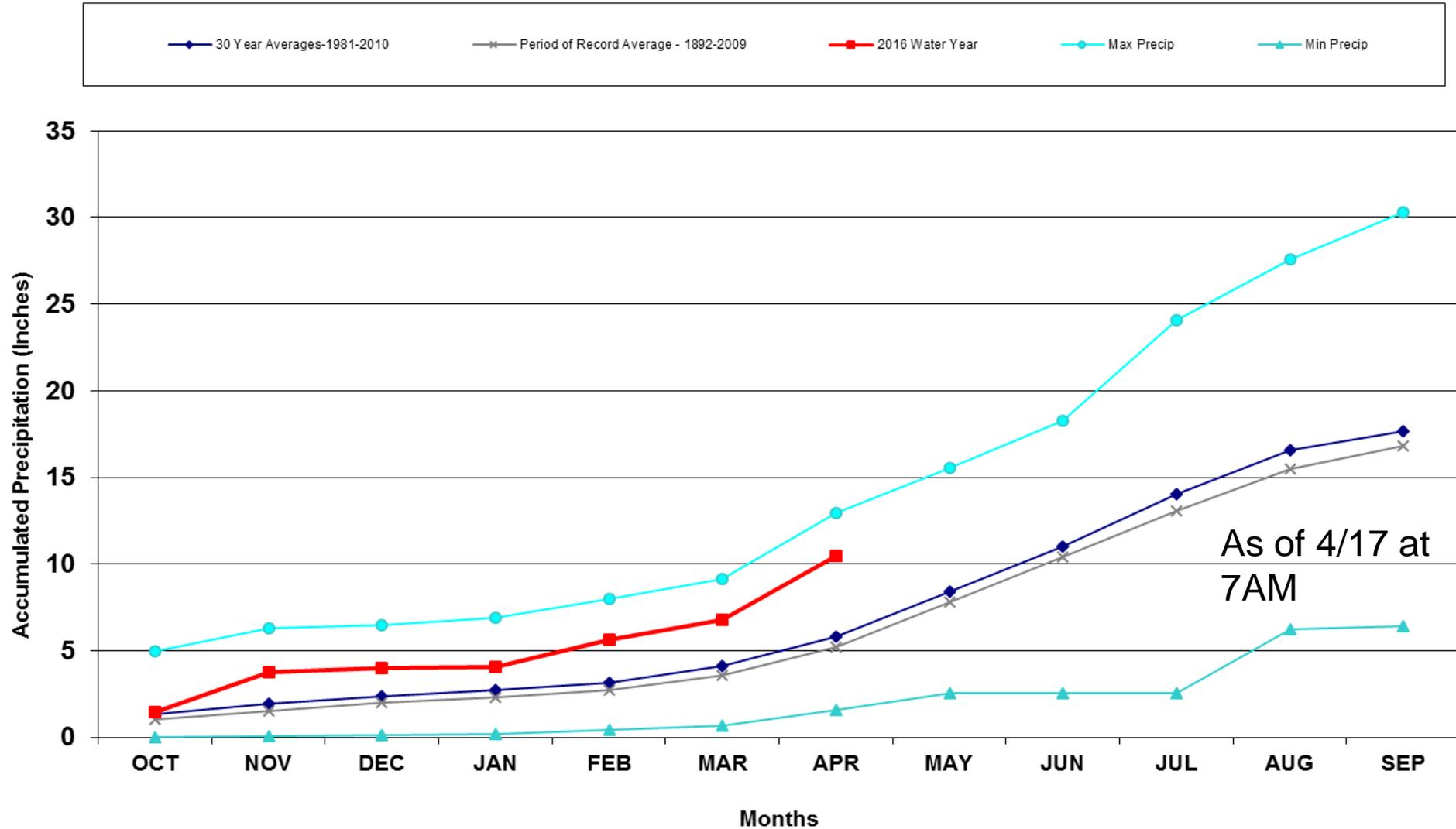
Division 6 - Walsh

Walsh 1W Precipitation Accumulation



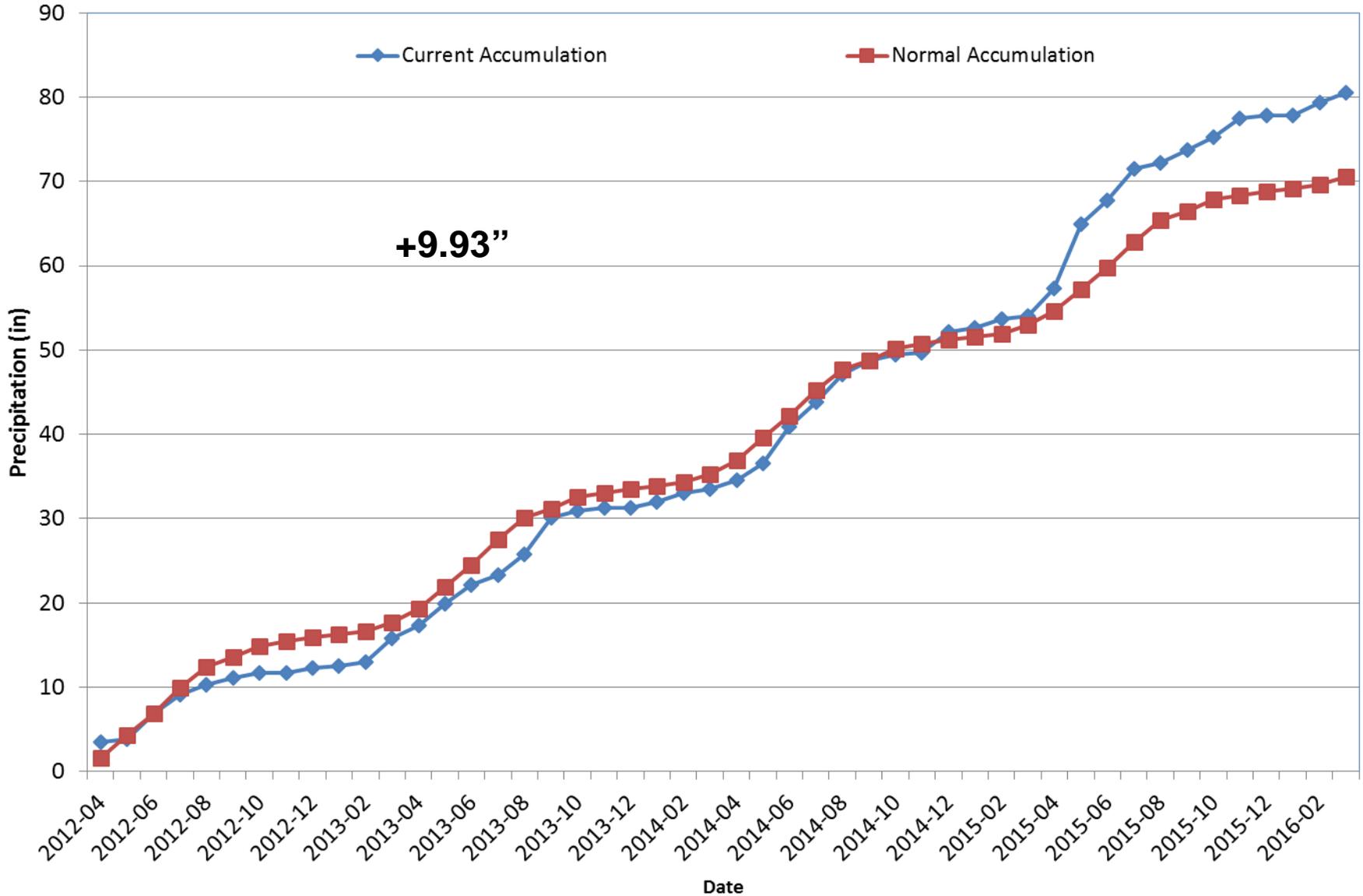
Division 6 - Burlington

Burlington 2016 Water Year



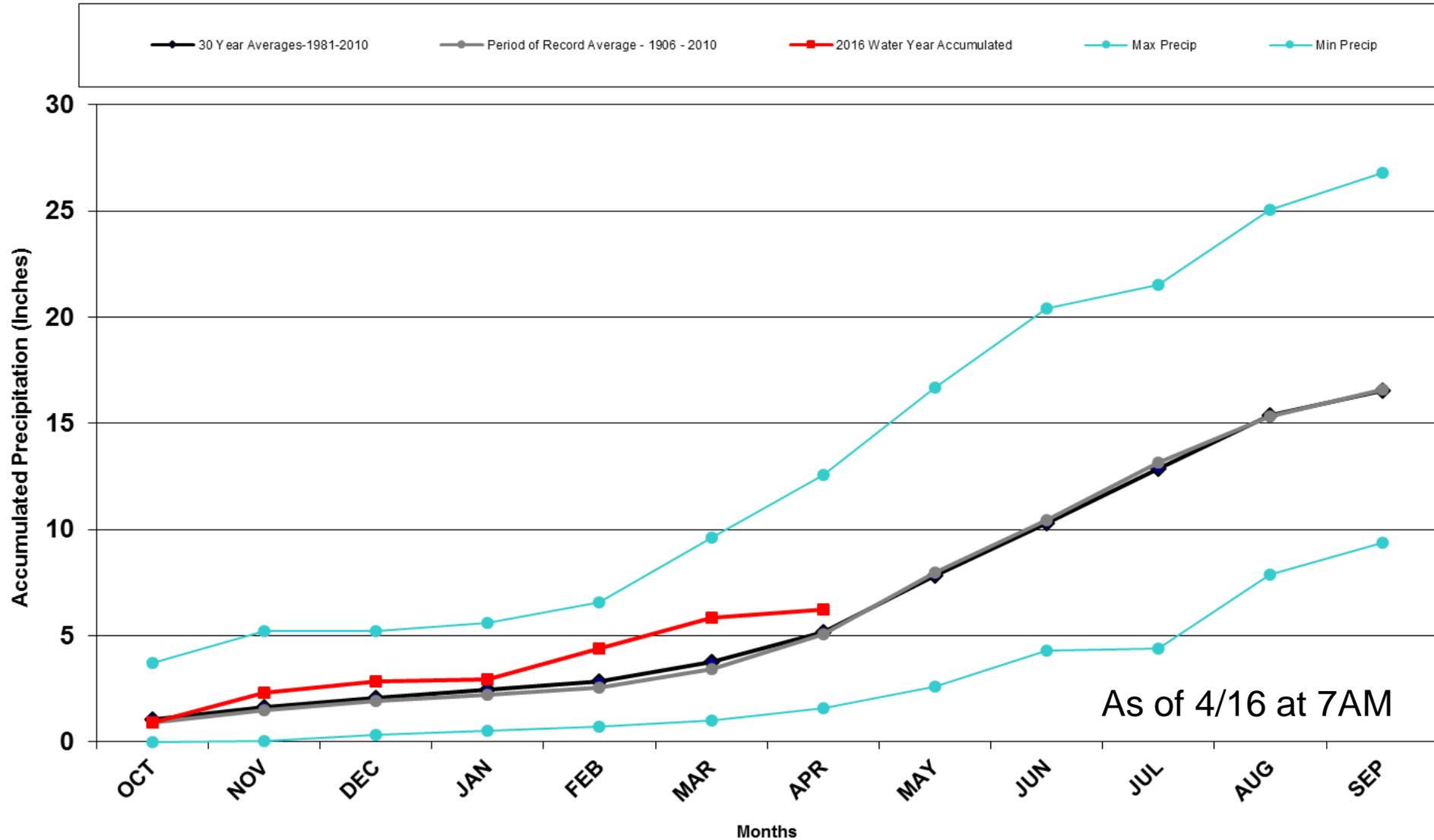
Division 6 - Burlington

Burlington, CO Precipitation Accumulation



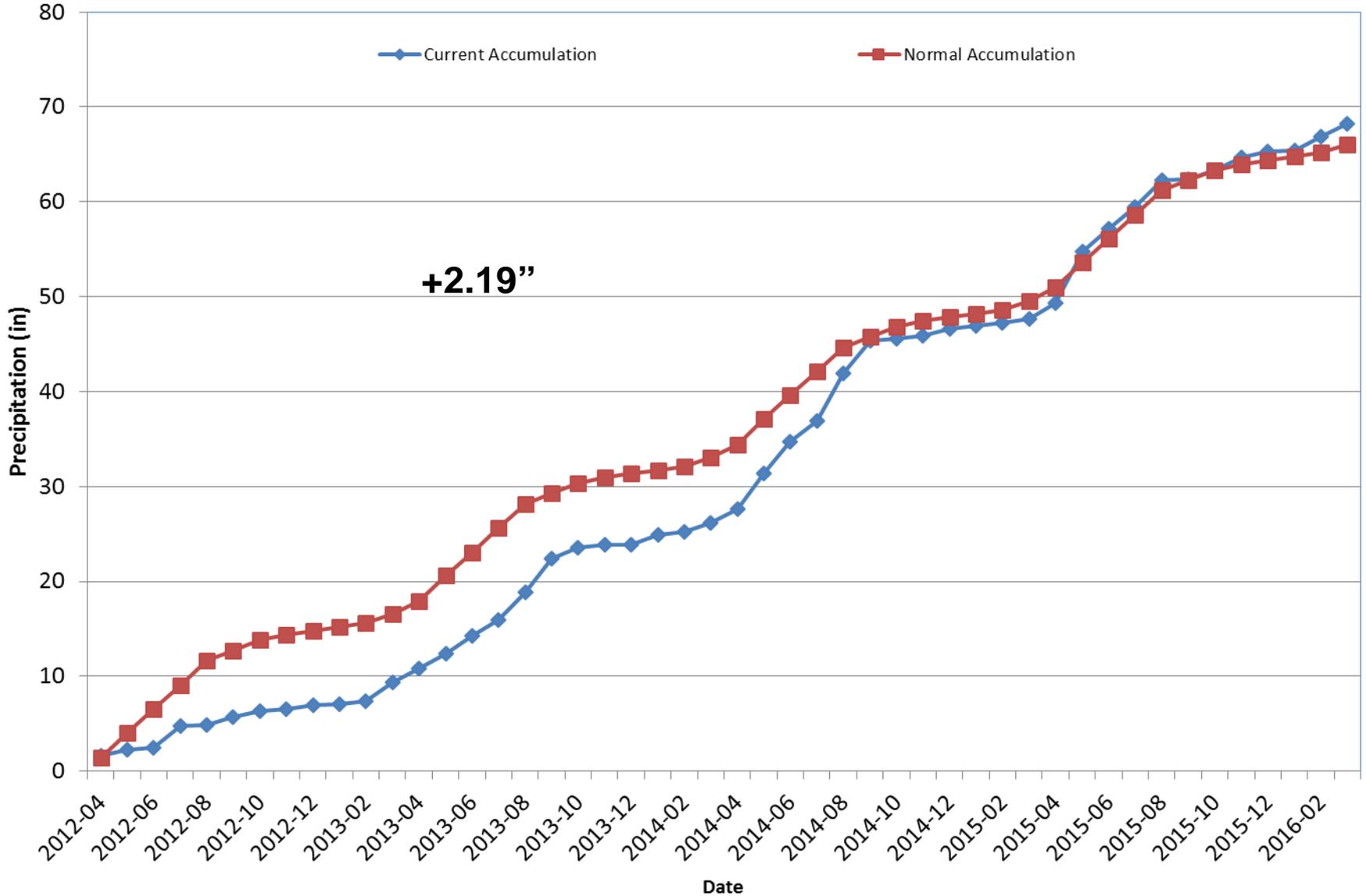
Division 7 – Akron

Akron 4E 2016 Water Year



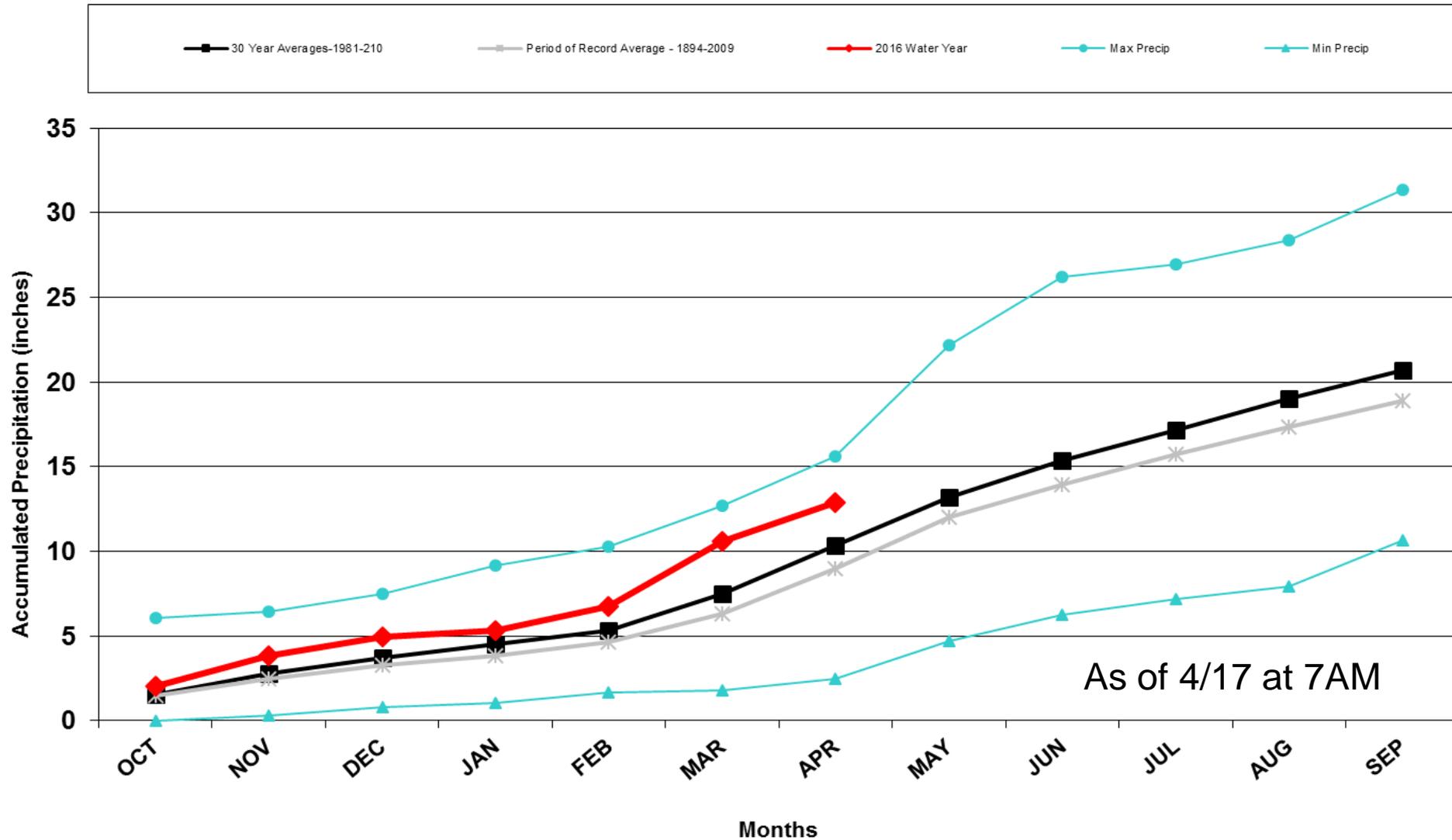
Division 7 – Akron

Akron 4E Precipitation Accumulation



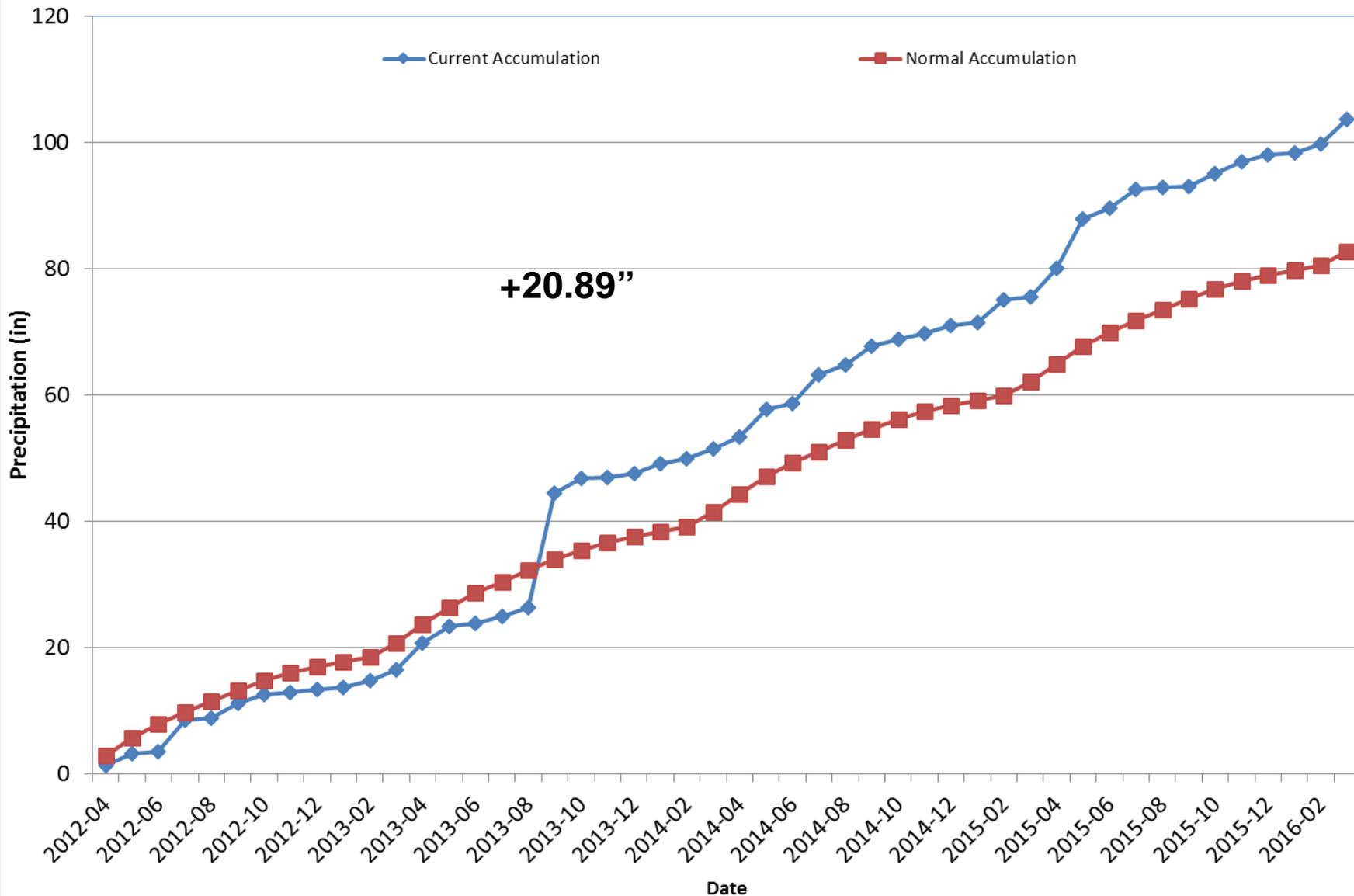
Division 8 - Boulder

Boulder 2016 Water Year

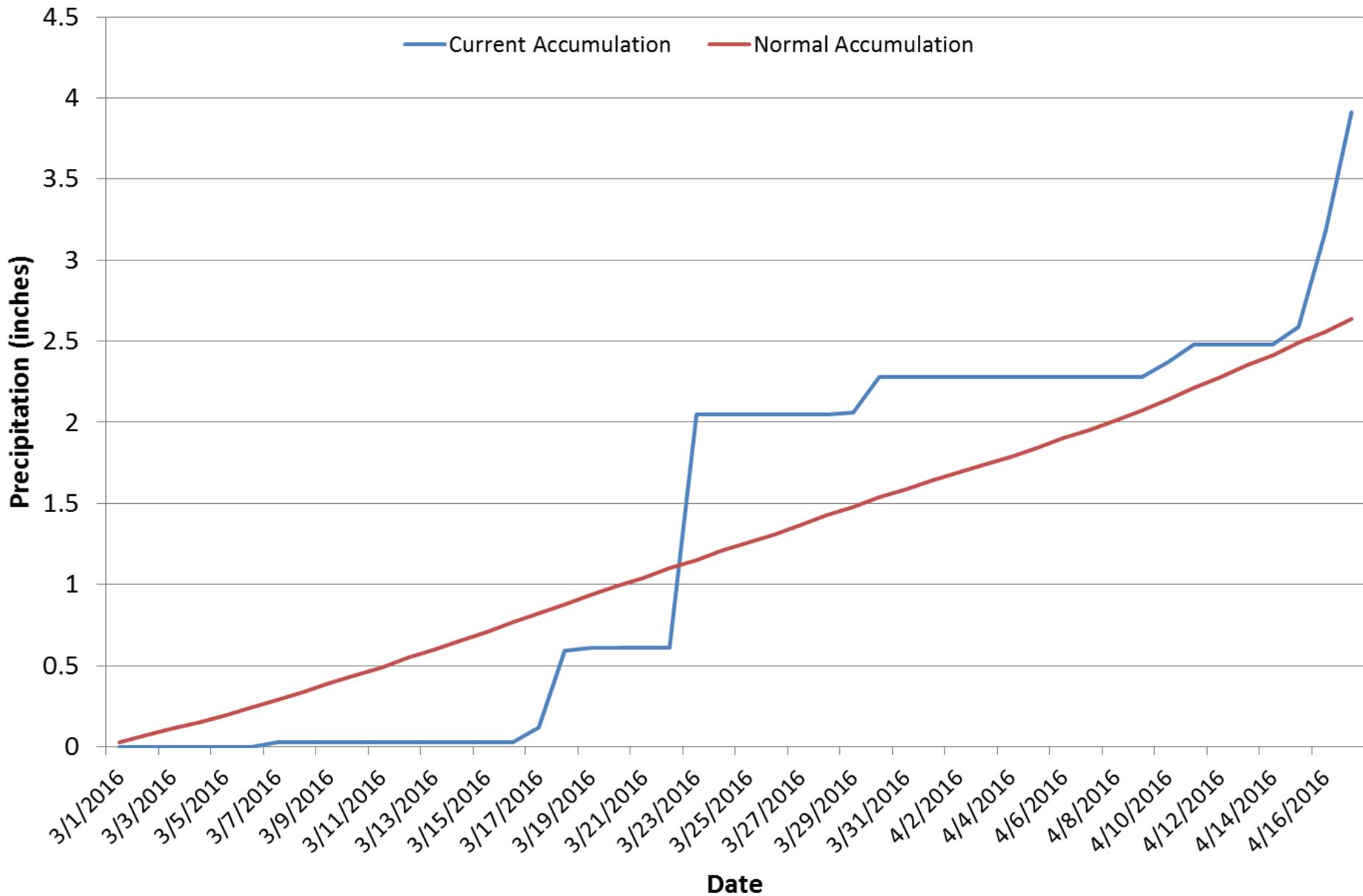


Division 8 - Boulder

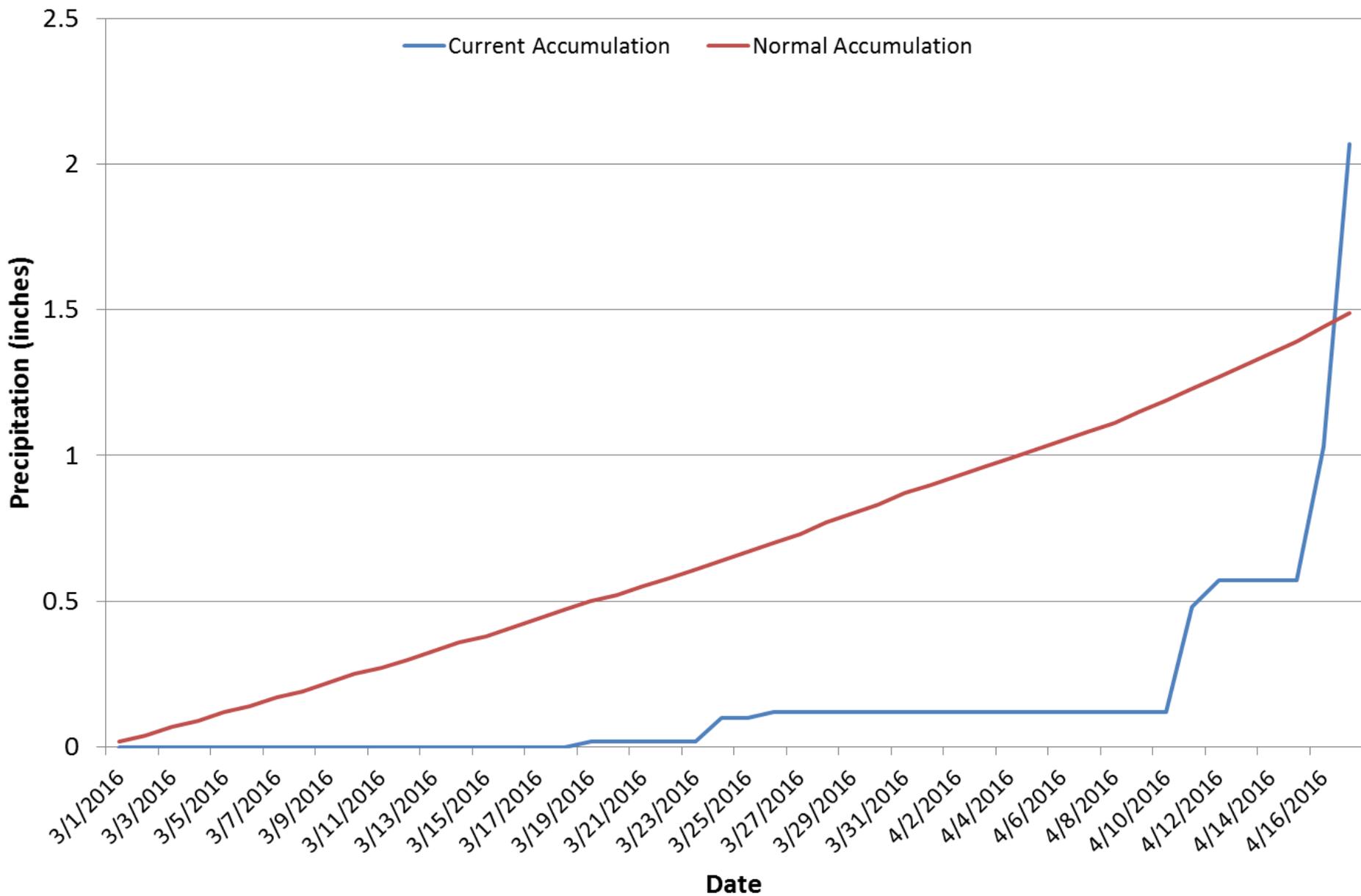
Boulder Precipitation Accumulation



Fort Collins Accumulated Precipitation

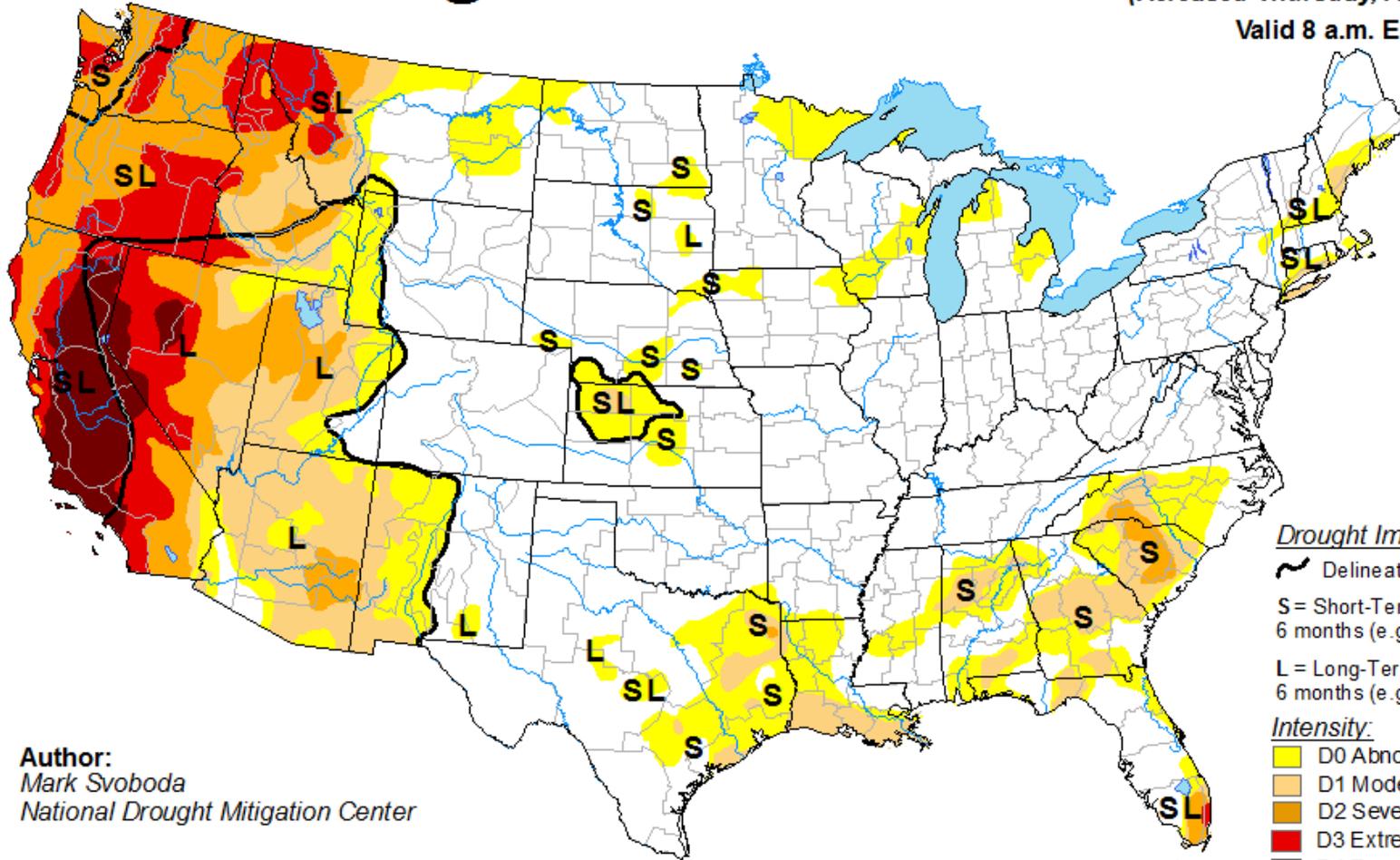


Lamar Accumulated Precipitation



U.S. Drought Monitor

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

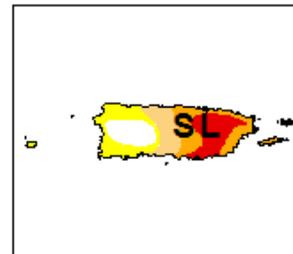
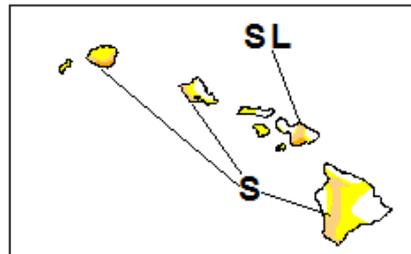
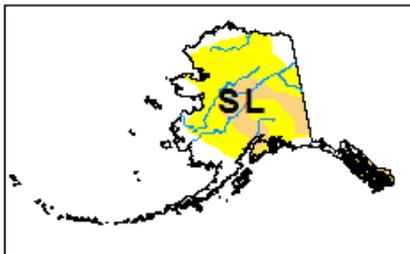


Author:
 Mark Svoboda
 National Drought Mitigation Center

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
 Orange: D2 Severe Drought
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 Dark Red: D4 Exceptional Drought

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

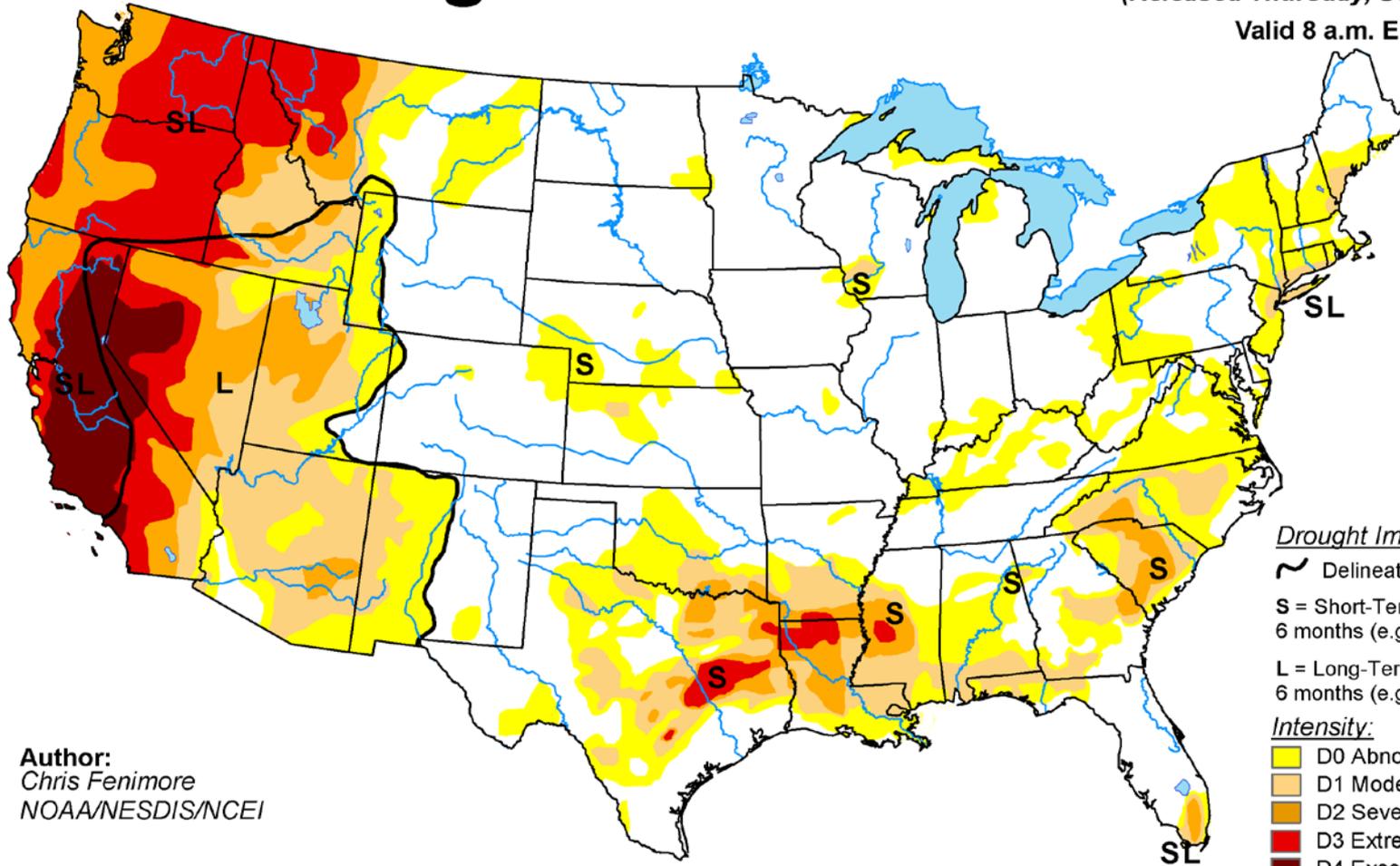


<http://droughtmonitor.unl.edu/>

U.S. Drought Monitor

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

Valid 8 a.m. EDT



Author:
Chris Fenimore
NOAA/NESDIS/NCEI

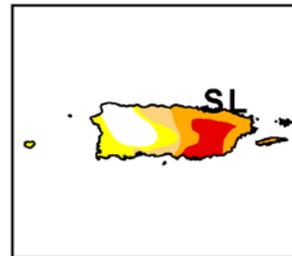
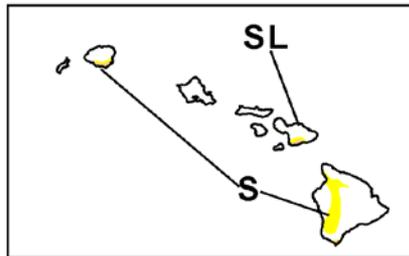
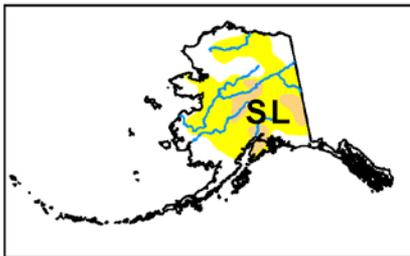
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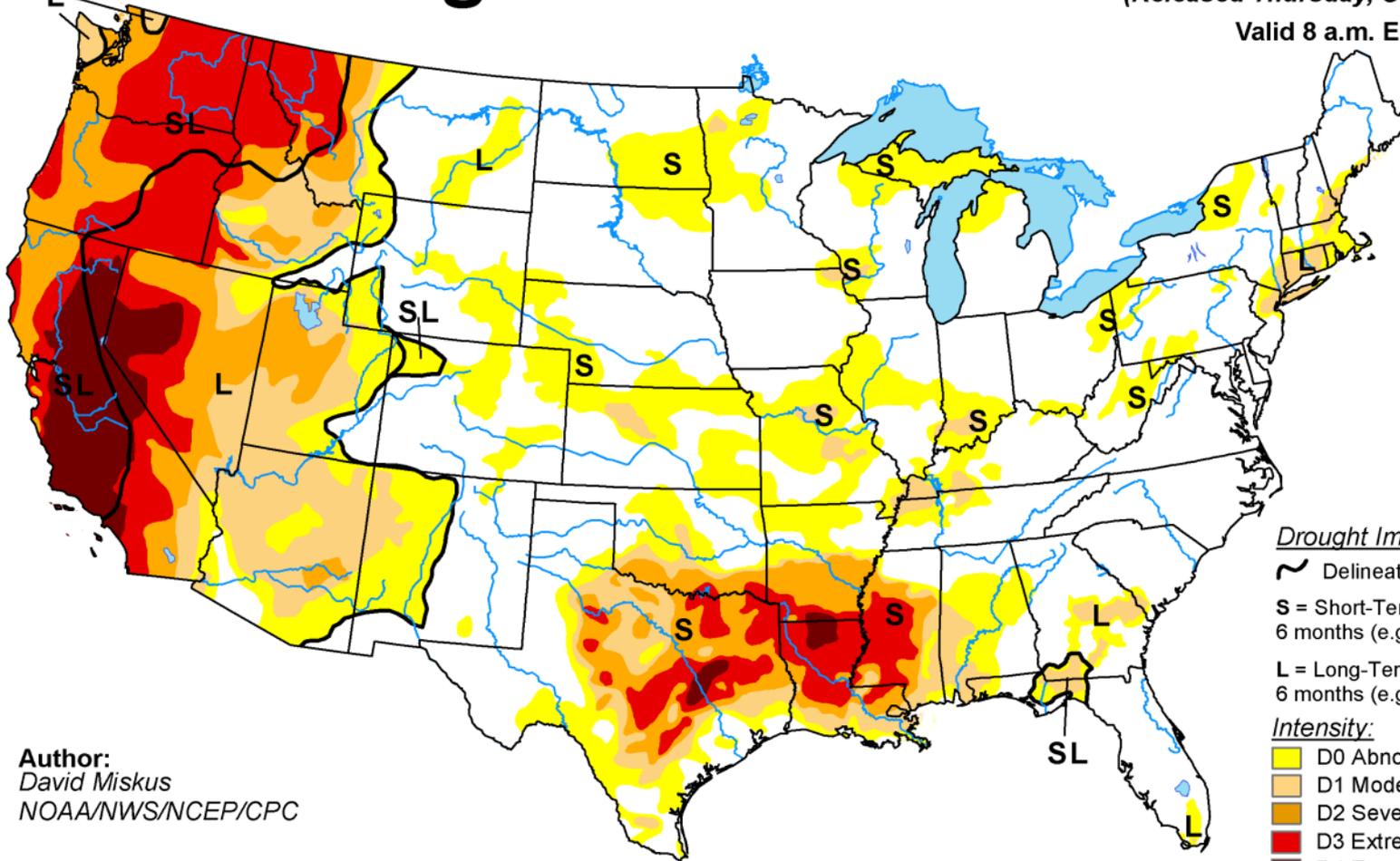


<http://droughtmonitor.unl.edu/>

U.S. Drought Monitor

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

Valid 8 a.m. EDT



Author:
David Miskus
NOAA/NWS/NCEP/CPC

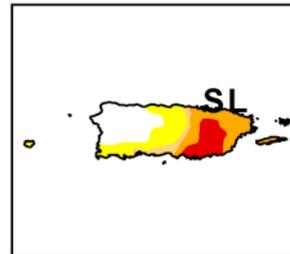
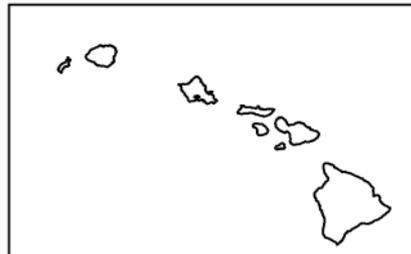
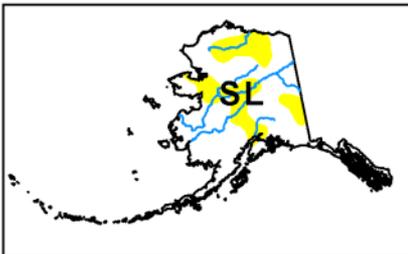
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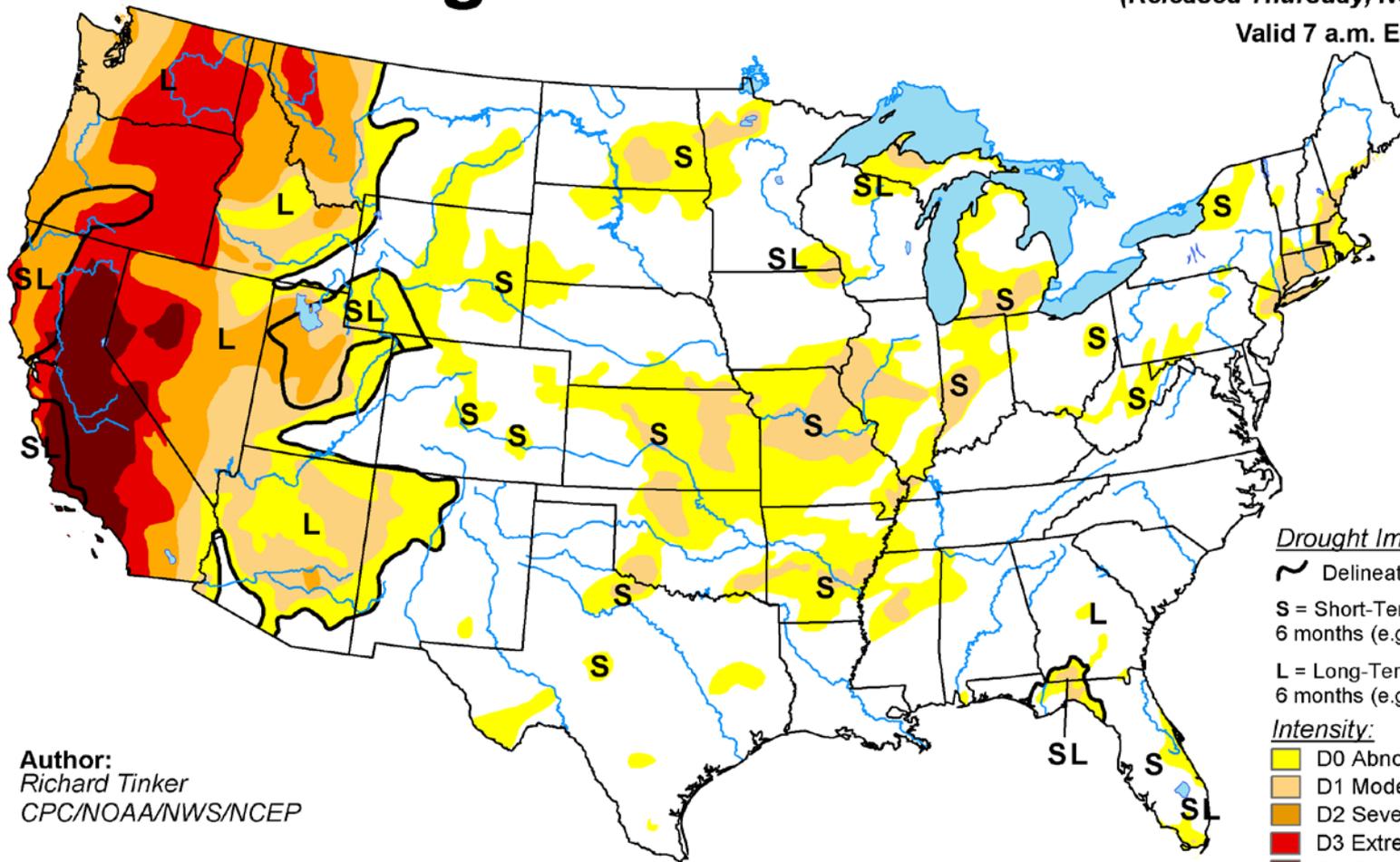


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U.S. Drought Monitor

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

Valid 7 a.m. EST



Author:
Richard Tinker
CPC/NOAA/NWS/NCEP

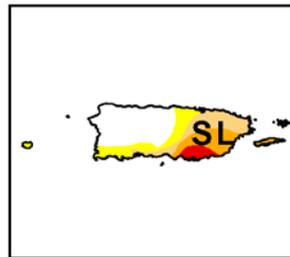
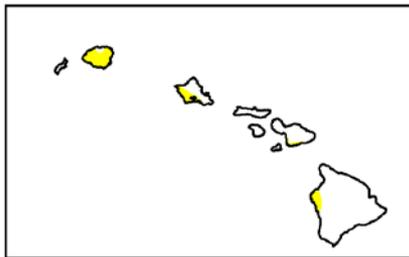
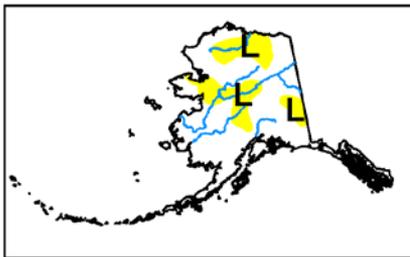
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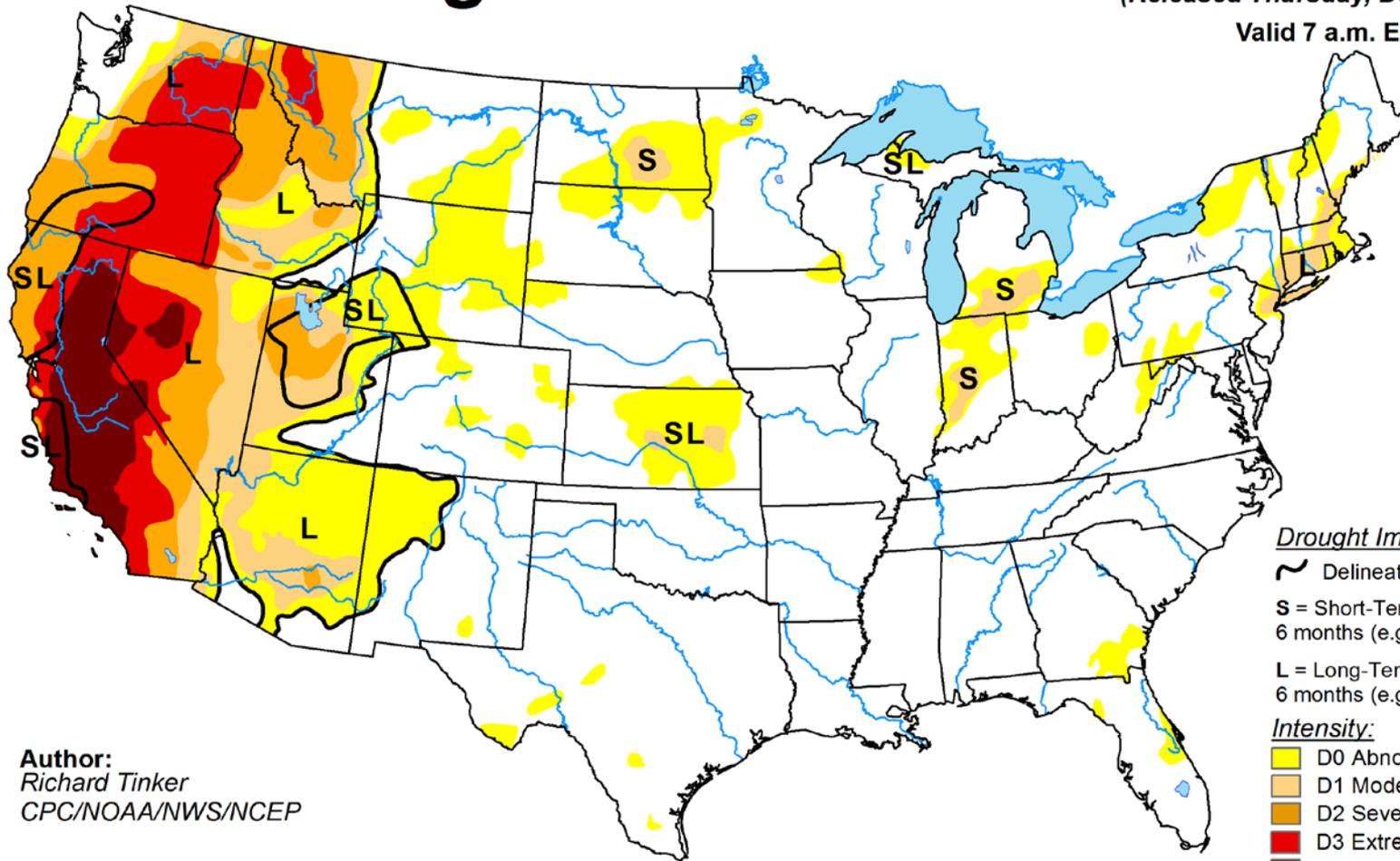


<http://droughtmonitor.unl.edu/>

U.S. Drought Monitor

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

Valid 7 a.m. EST



Author:
Richard Tinker
CPC/NOAA/NWS/NCEP

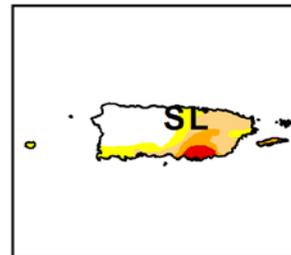
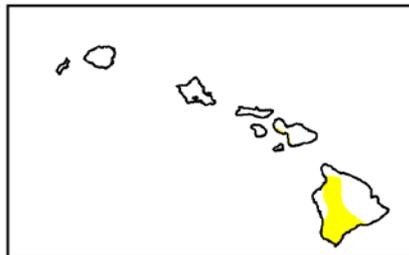
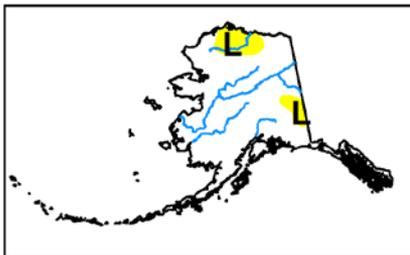
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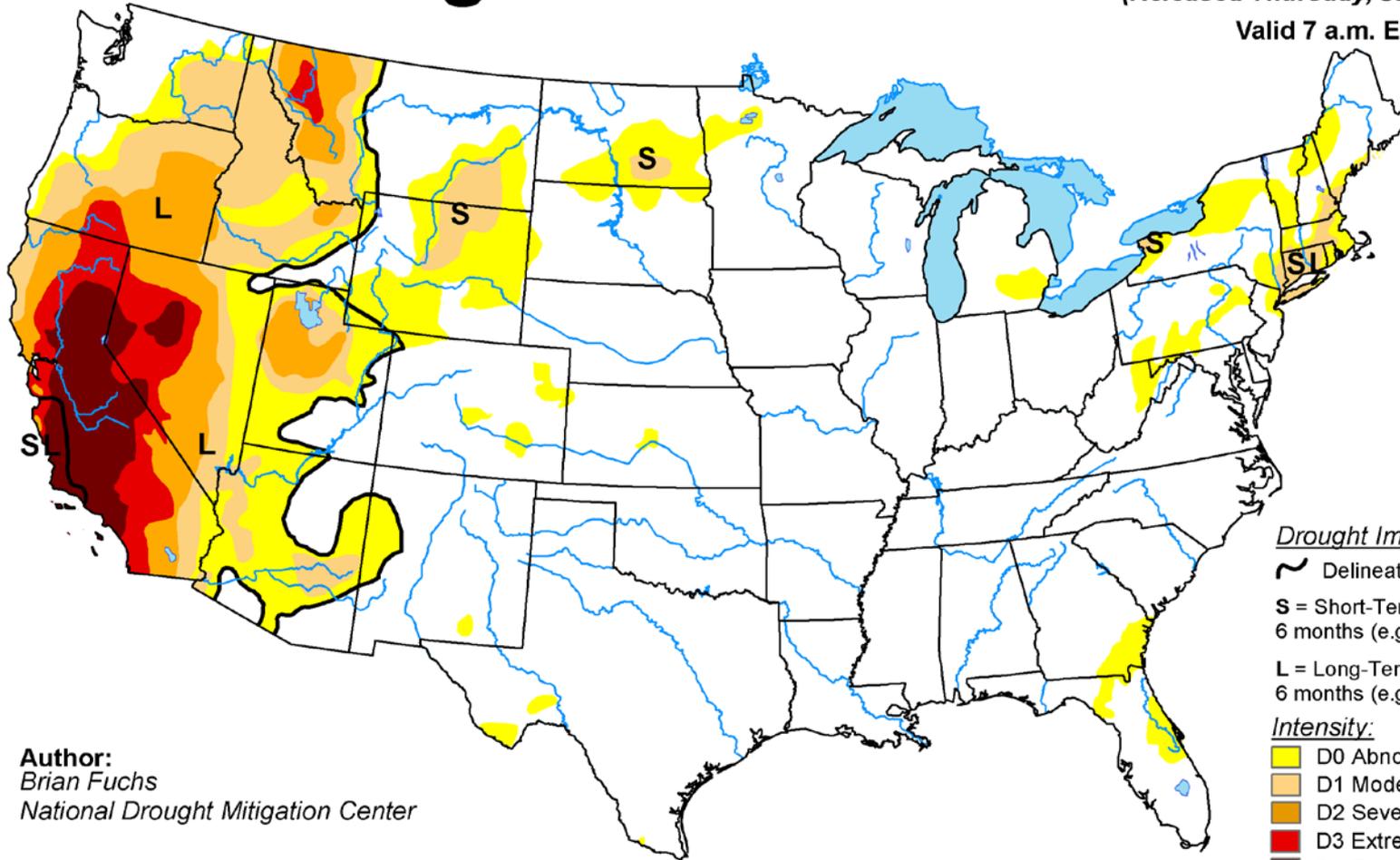


<http://droughtmonitor.unl.edu/>

U.S. Drought Monitor

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

Valid 7 a.m. EST



Author:
Brian Fuchs
National Drought Mitigation Center

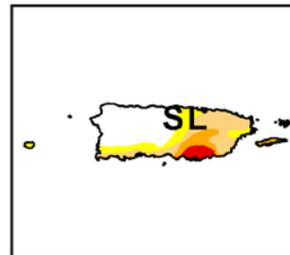
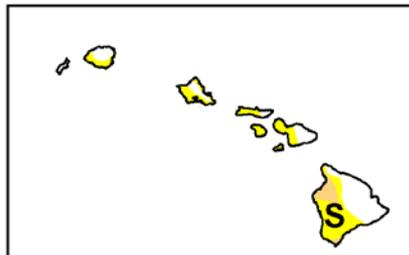
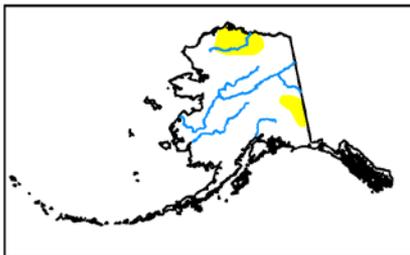
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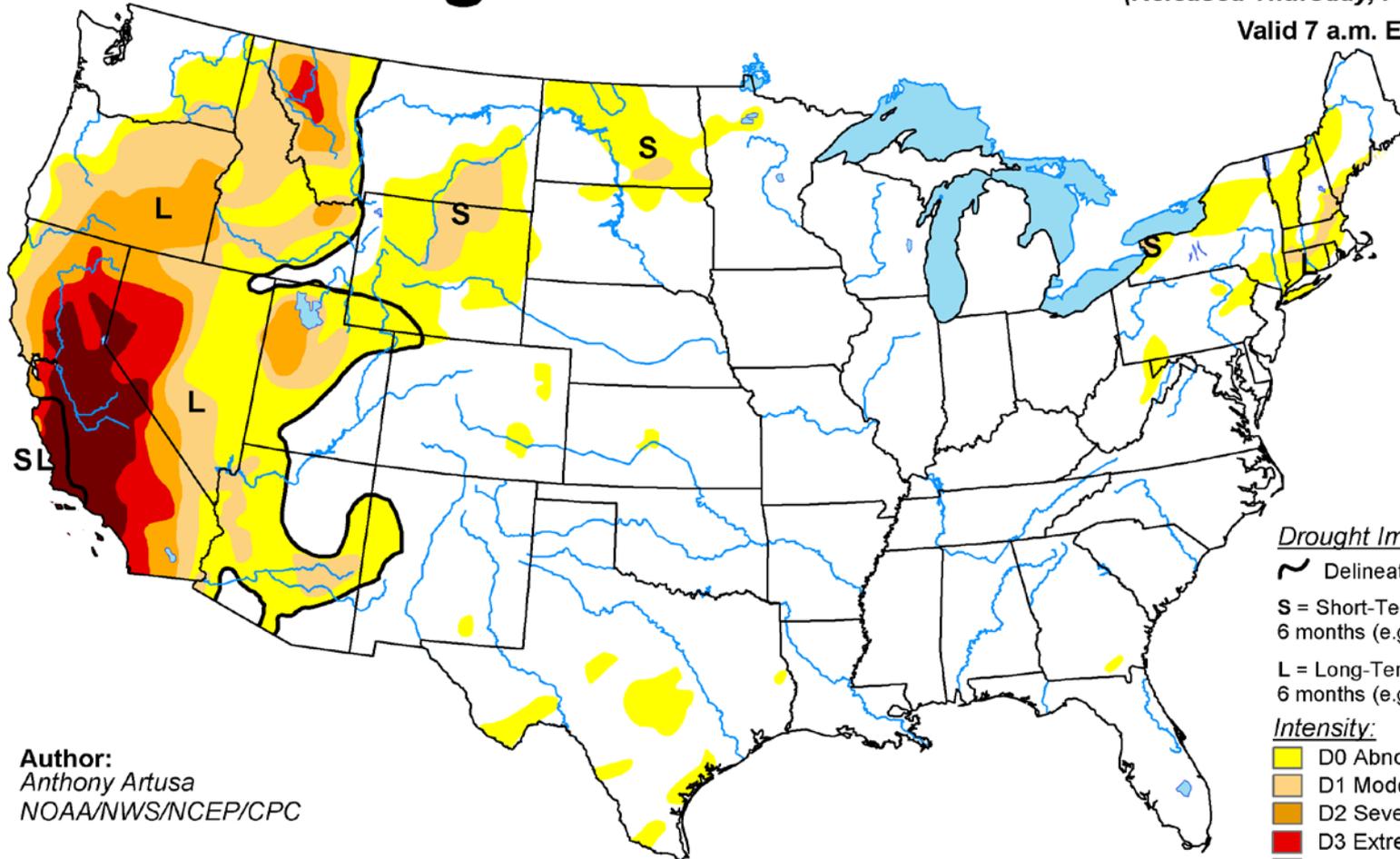


<http://droughtmonitor.unl.edu/>

U.S. Drought Monitor

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

Valid 7 a.m. EST



Author:
Anthony Artusa
NOAA/NWS/NCEP/CPC

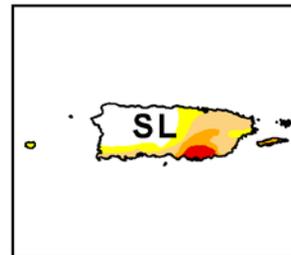
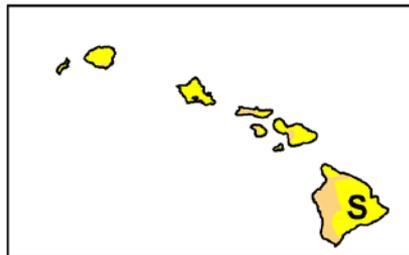
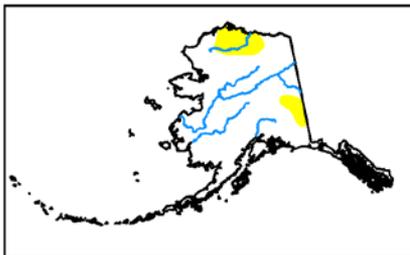
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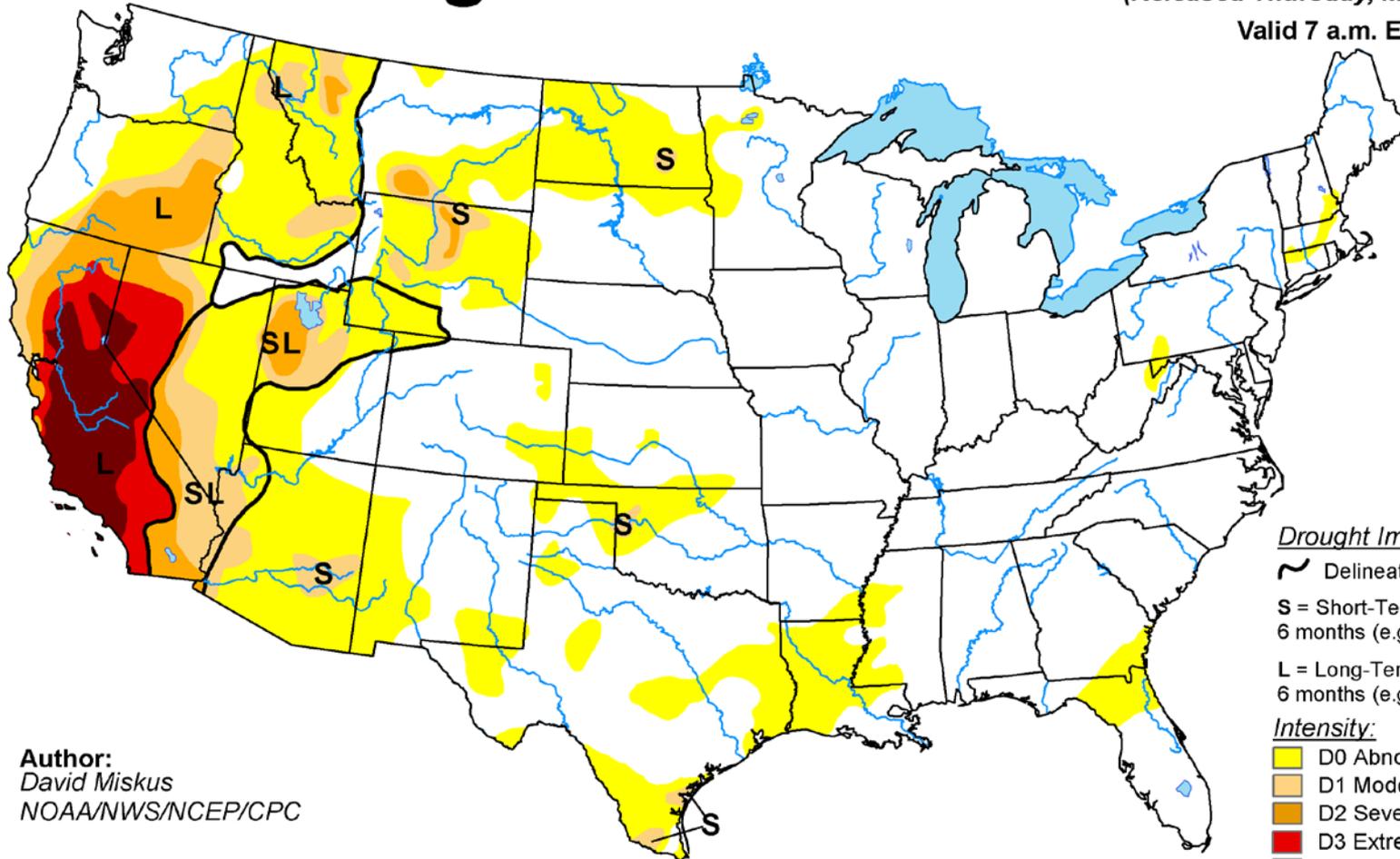
<http://droughtmonitor.unl.edu/>

U.S. Drought Monitor

March 8, 2016

(Released Thursday, Mar. 10, 2016)

Valid 7 a.m. EST



Author:
David Miskus
NOAA/NWS/NCEP/CPC

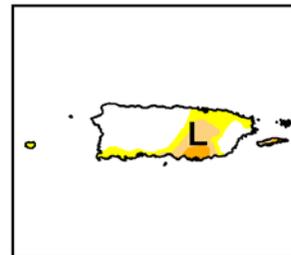
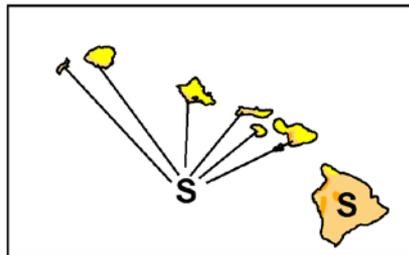
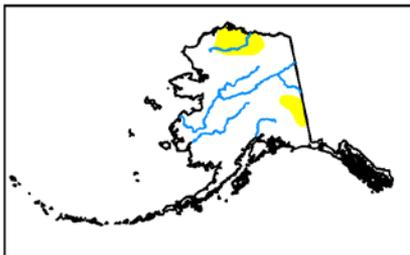
Drought Impact Types:

- ~ 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:

- 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.



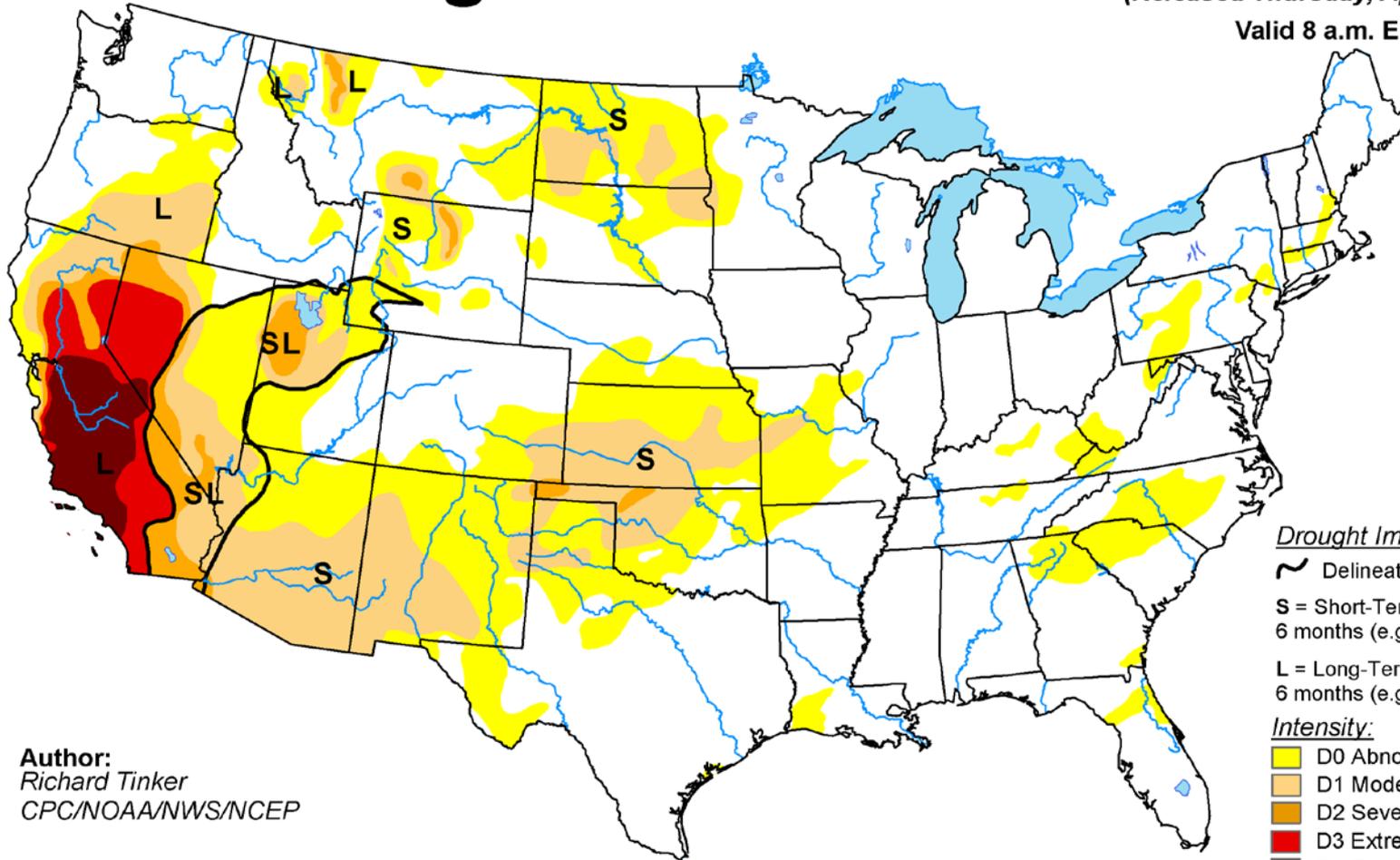
<http://droughtmonitor.unl.edu/>

U.S. Drought Monitor

April 12, 2016

(Released Thursday, Apr. 14, 2016)

Valid 8 a.m. EDT



Author:
Richard Tinker
CPC/NOAA/NWS/NCEP

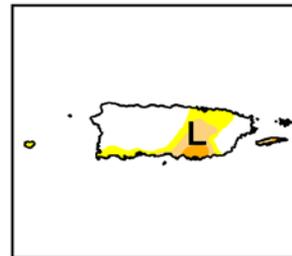
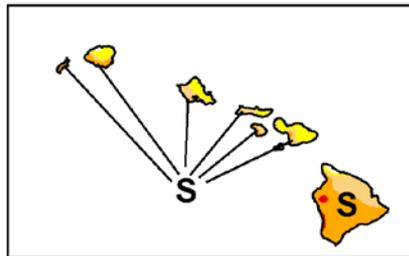
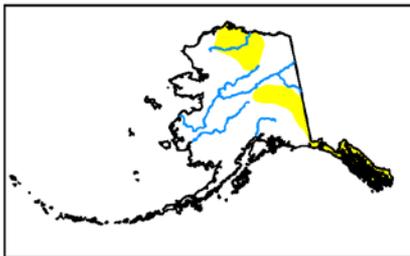
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<http://droughtmonitor.unl.edu/>

U.S. Drought Monitor

Colorado

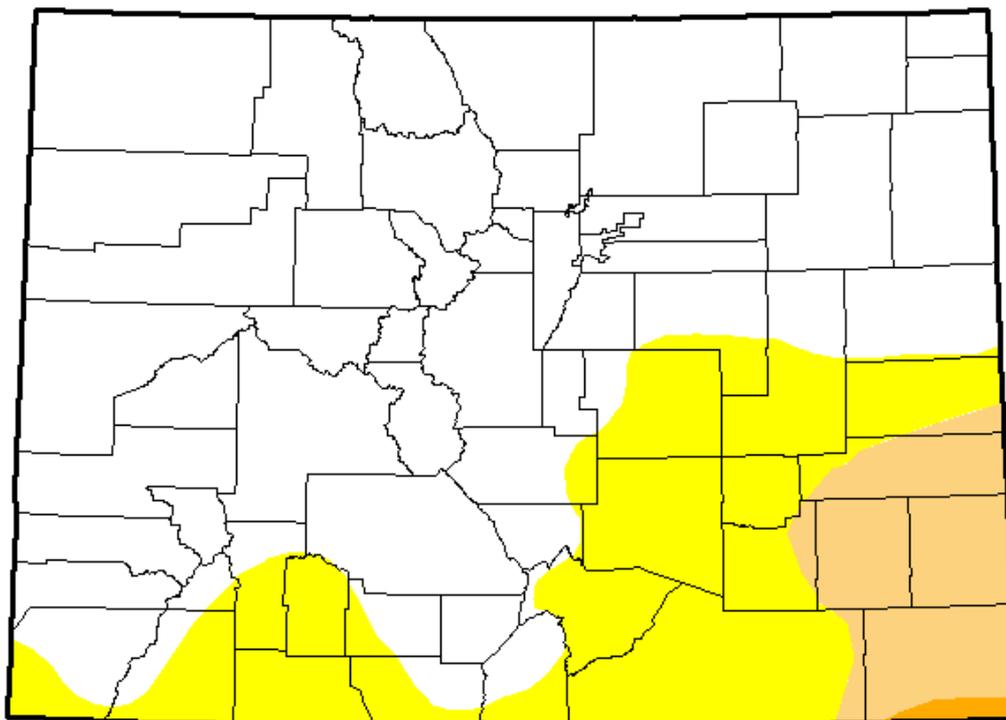
April 12, 2016

(Released Thursday, Apr. 14, 2016)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	70.41	29.59	7.75	0.35	0.00	0.00
Last Week <i>4/5/2016</i>	71.01	28.99	7.36	0.00	0.00	0.00
3 Months Ago <i>1/12/2016</i>	89.98	10.02	0.00	0.00	0.00	0.00
Start of Calendar Year <i>12/29/2015</i>	90.02	9.98	0.00	0.00	0.00	0.00
Start of Water Year <i>9/29/2015</i>	71.49	28.51	0.00	0.00	0.00	0.00
One Year Ago <i>4/14/2015</i>	25.49	74.51	51.74	39.75	0.00	0.00



Intensity:



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

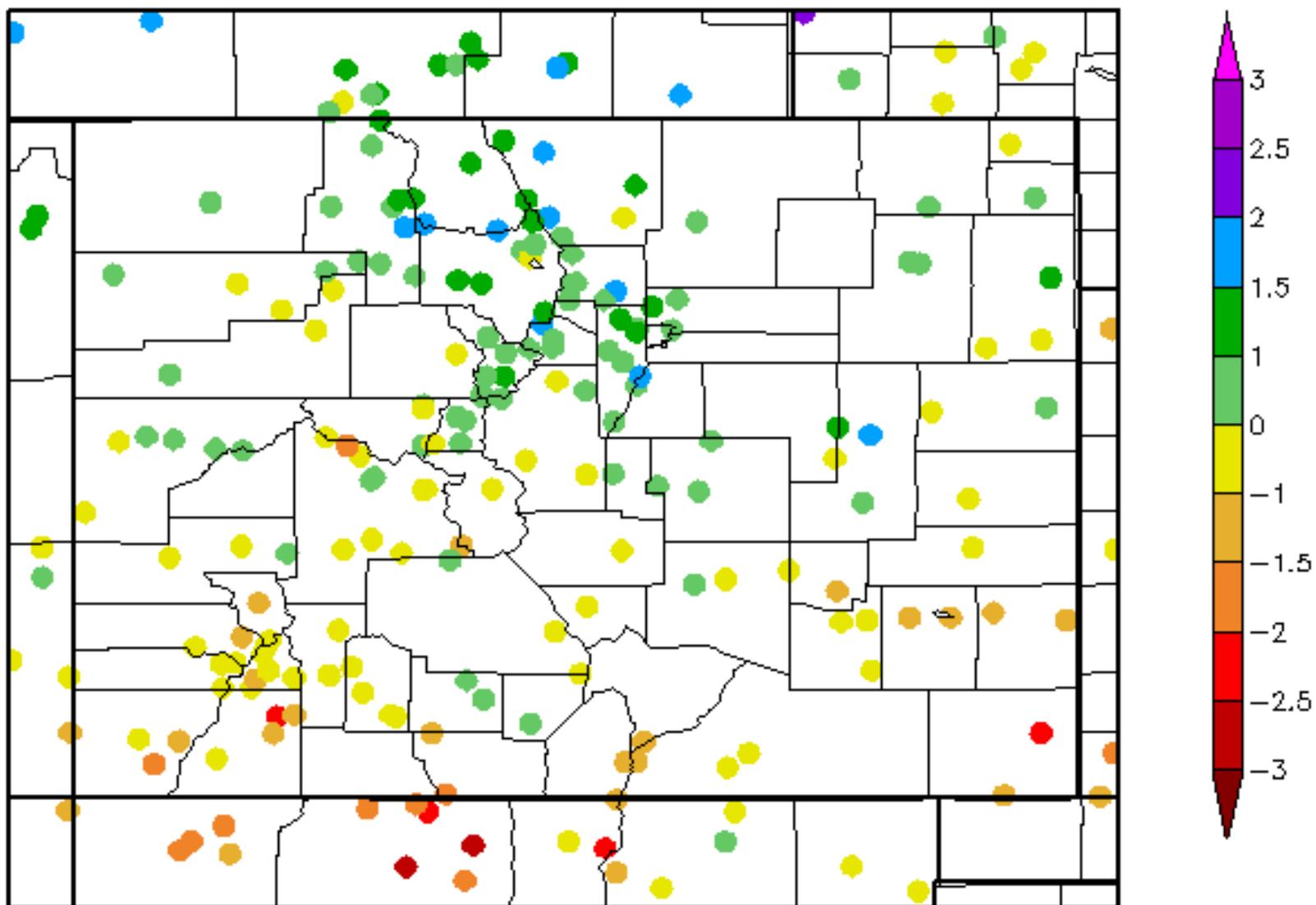
Author:

Richard Tinker
CPC/NOAA/NWS/NCEP



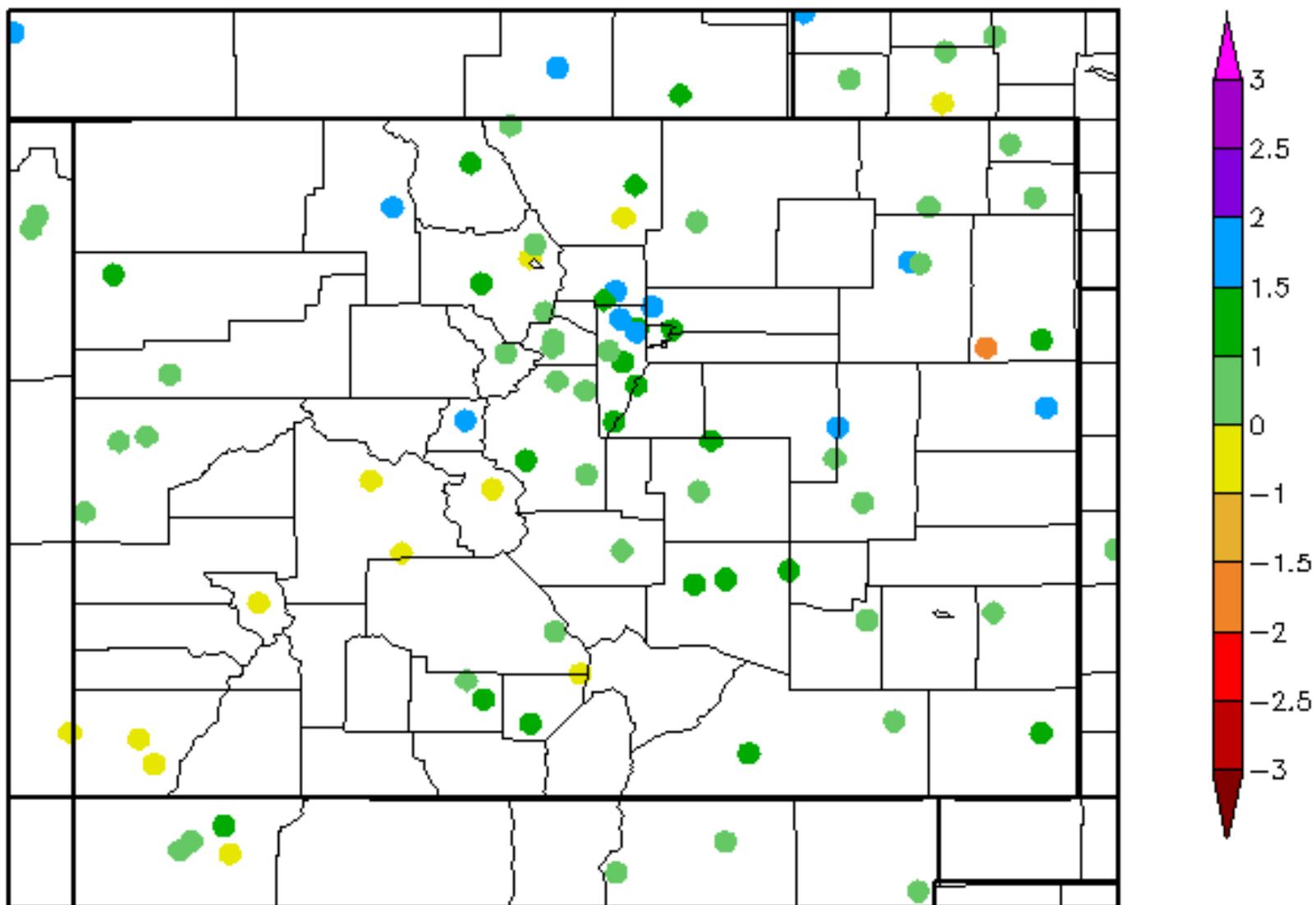
Monthly SPI

3/1/2016 - 3/31/2016



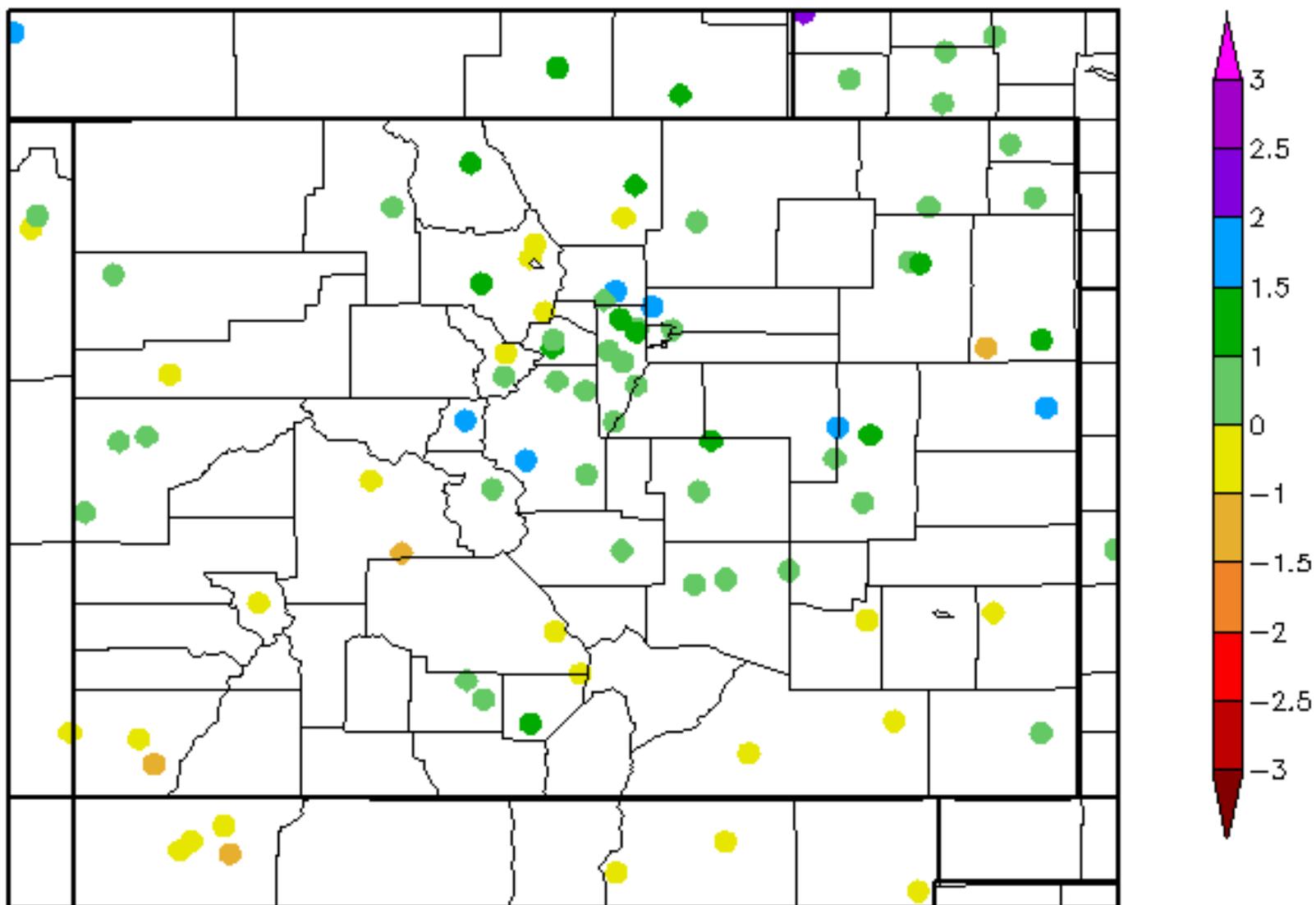
30 Day SPI

3/19/2016 - 4/17/2016



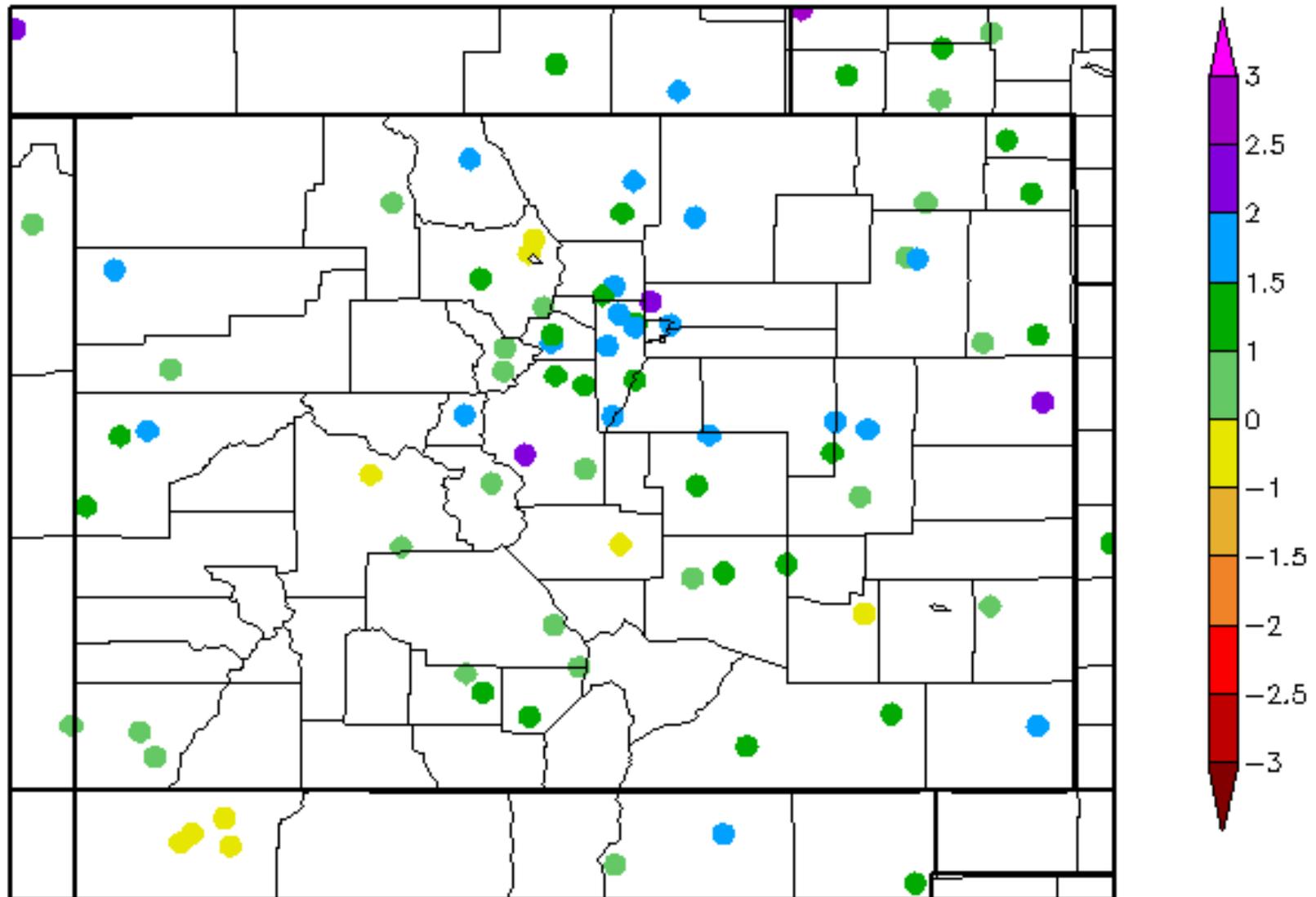
90 Day SPI

1/19/2016 - 4/17/2016



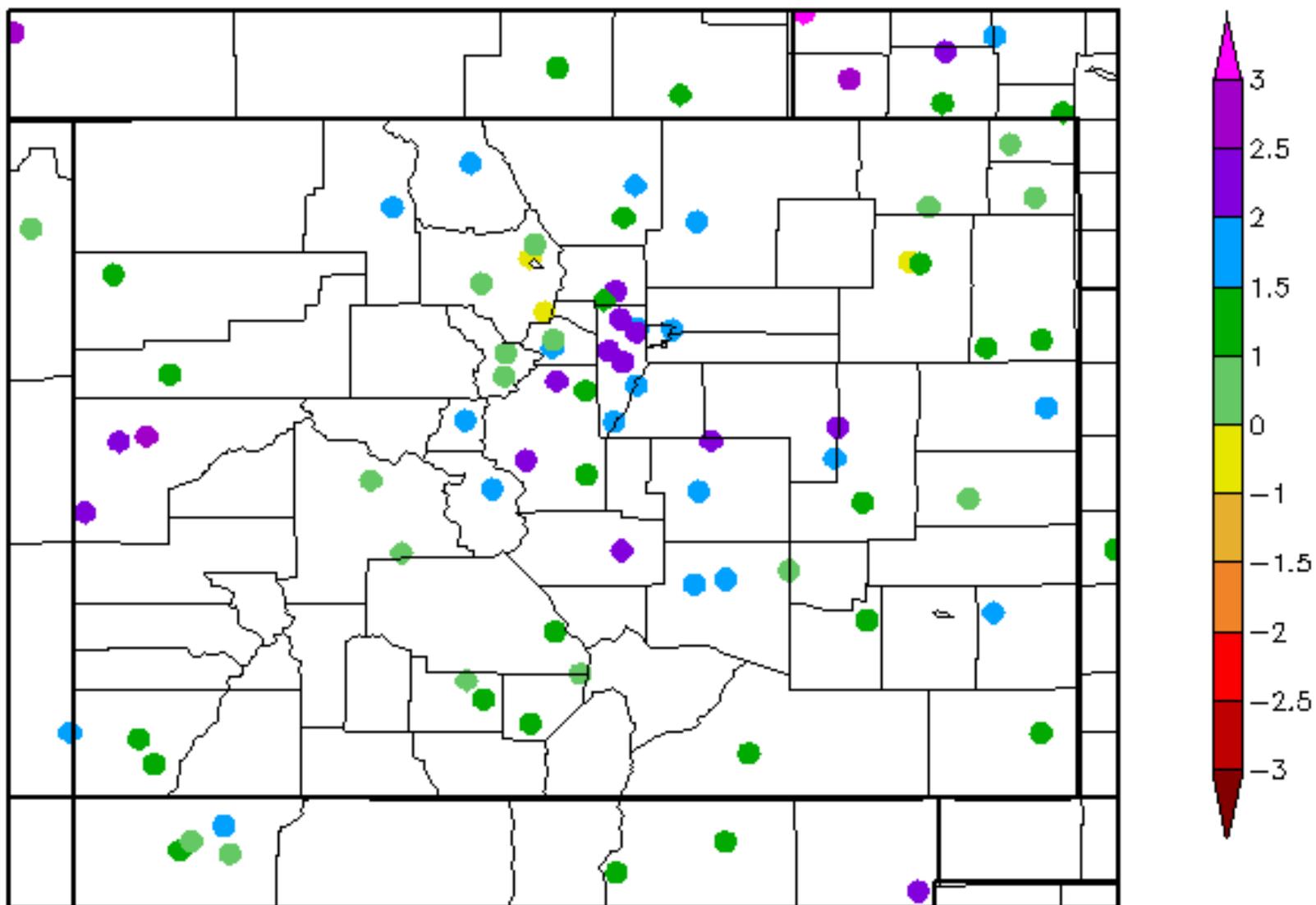
6 Month SPI

10/18/2015 - 4/17/2016



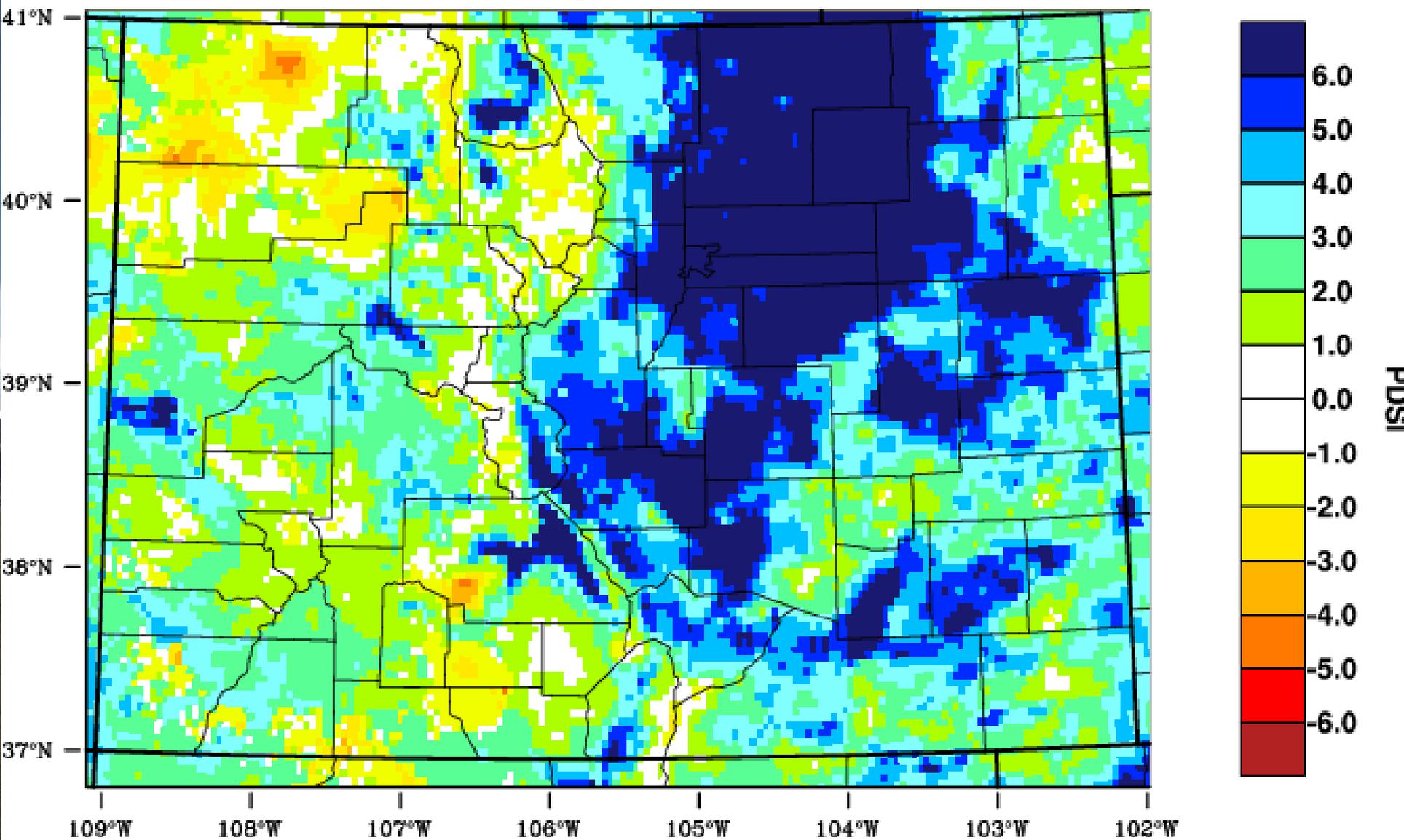
12 Month SPI

4/18/2015 - 4/17/2016



Colorado - PDSI

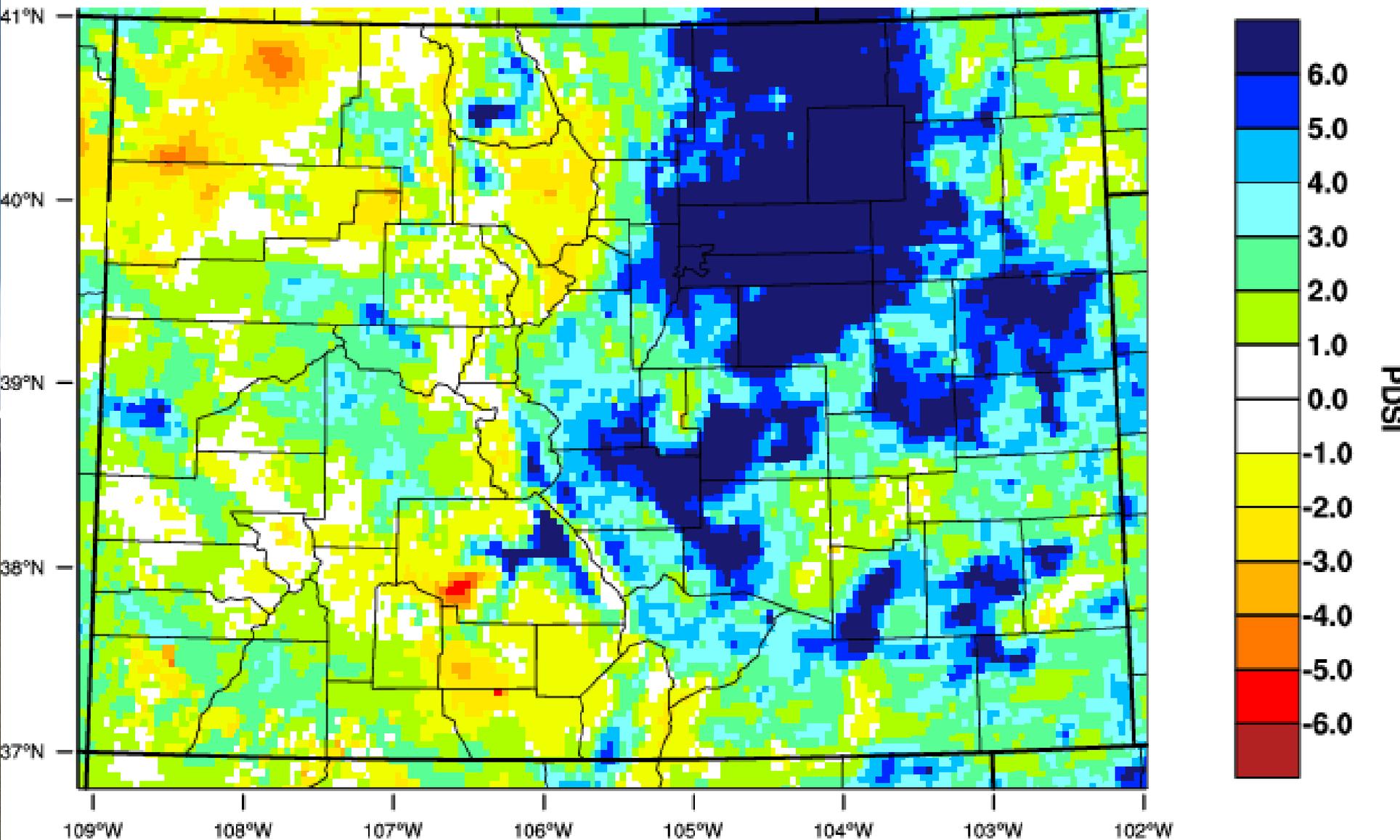
August 2015



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

Colorado - PDSI

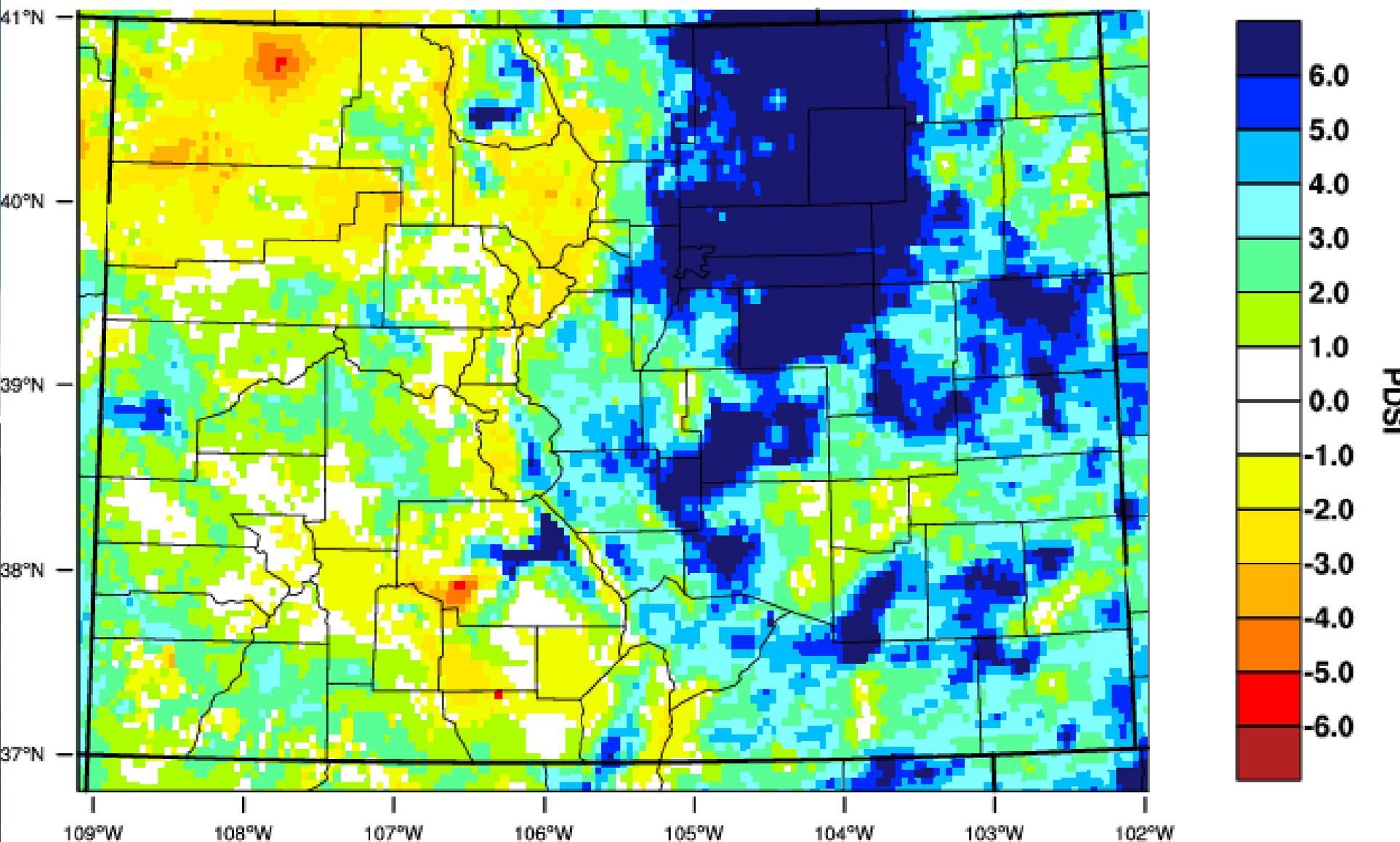
September 2015



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

Colorado - PDSI

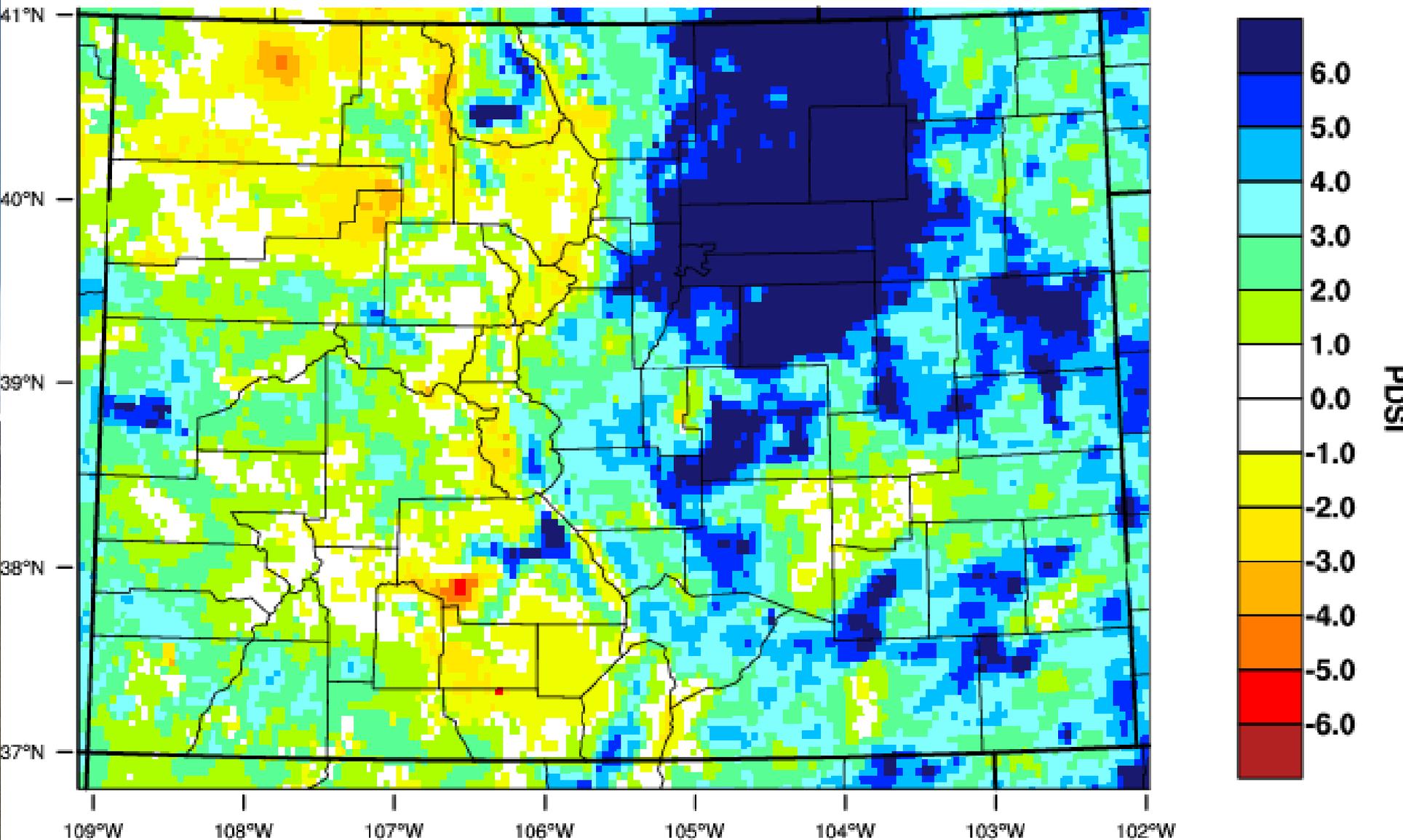
October 2015



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

Colorado - PDSI

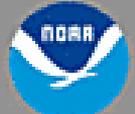
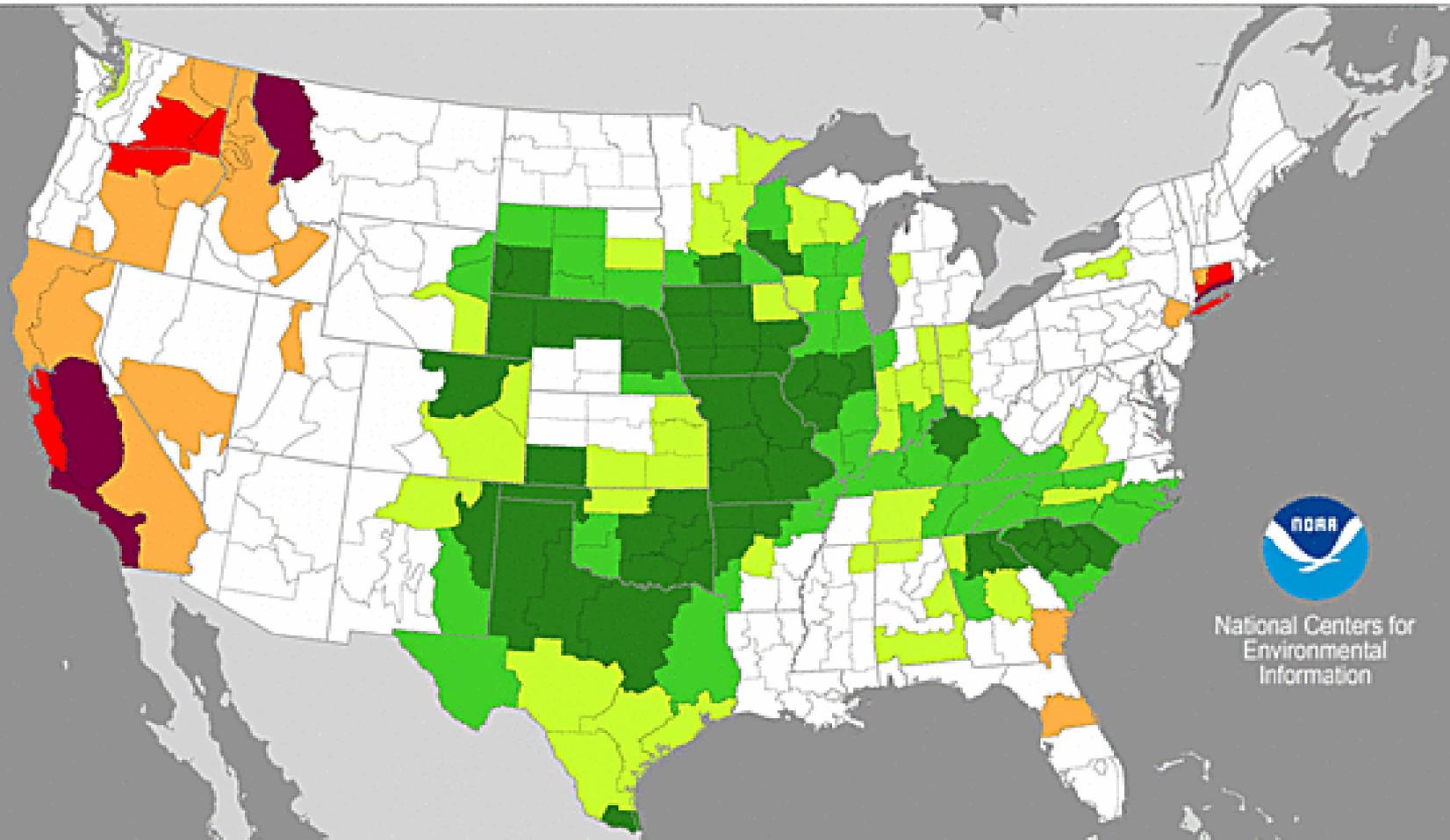
November 2015



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

Palmer Drought Severity Index

December, 2015

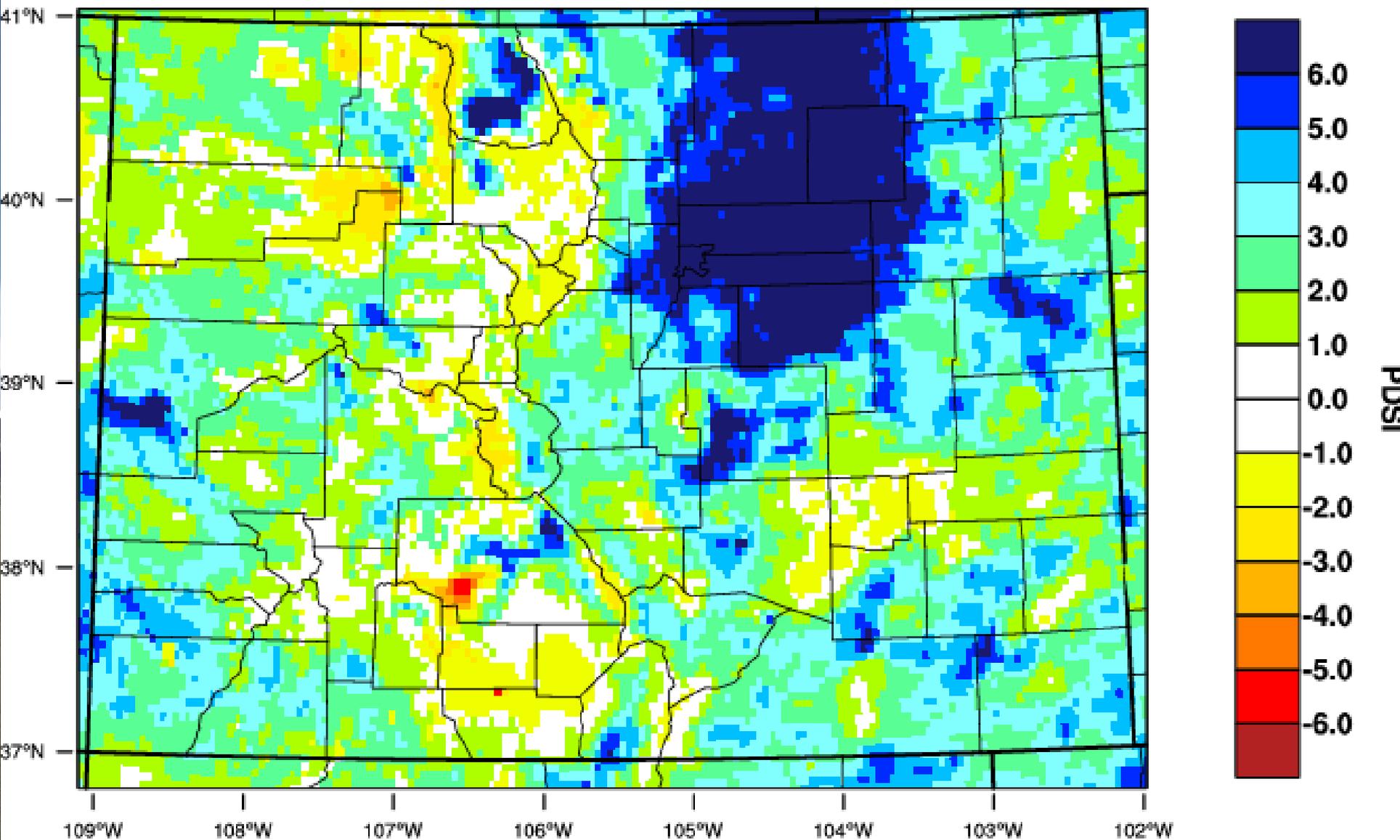


National Centers for Environmental Information

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

Colorado - PDSI

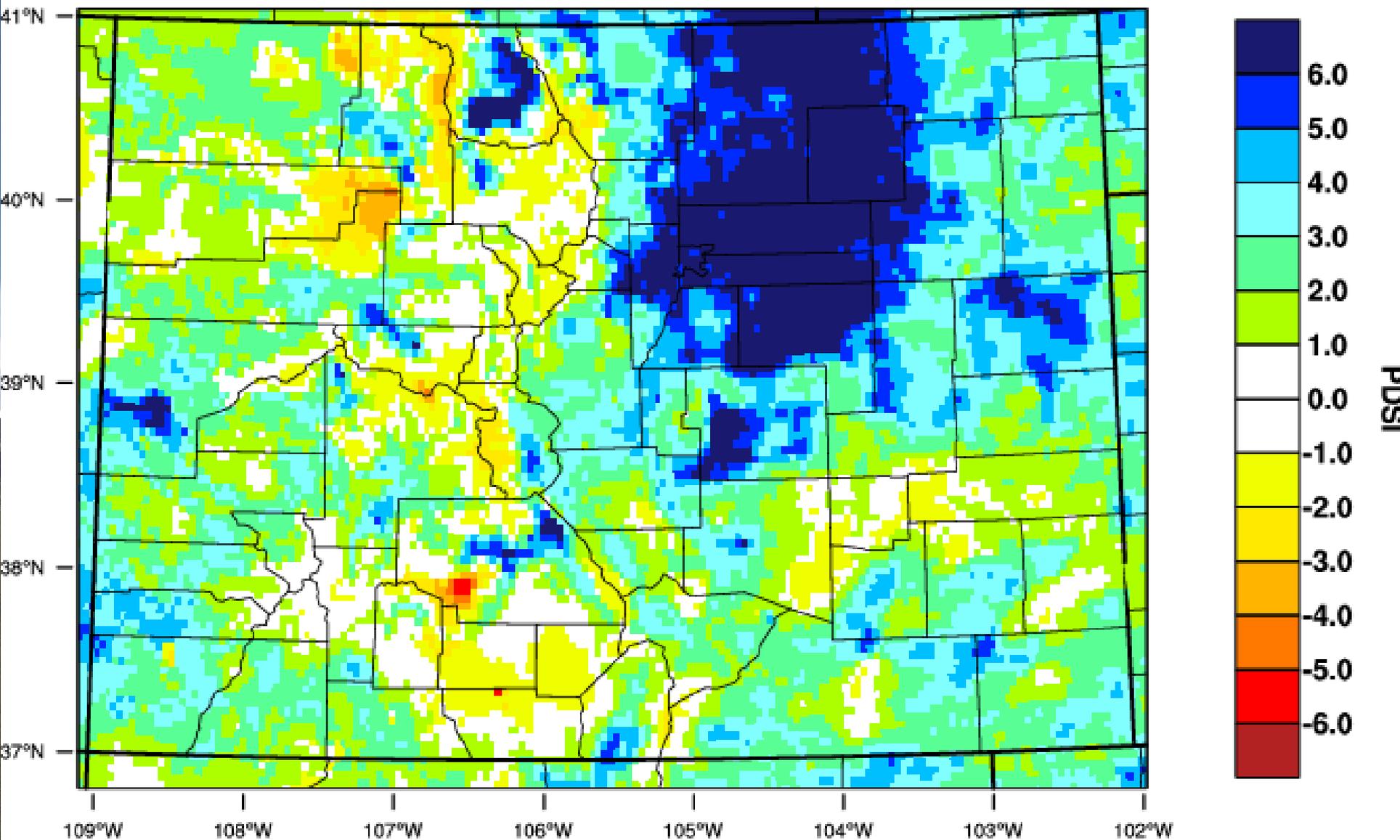
January 2016



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

Colorado - PDSI

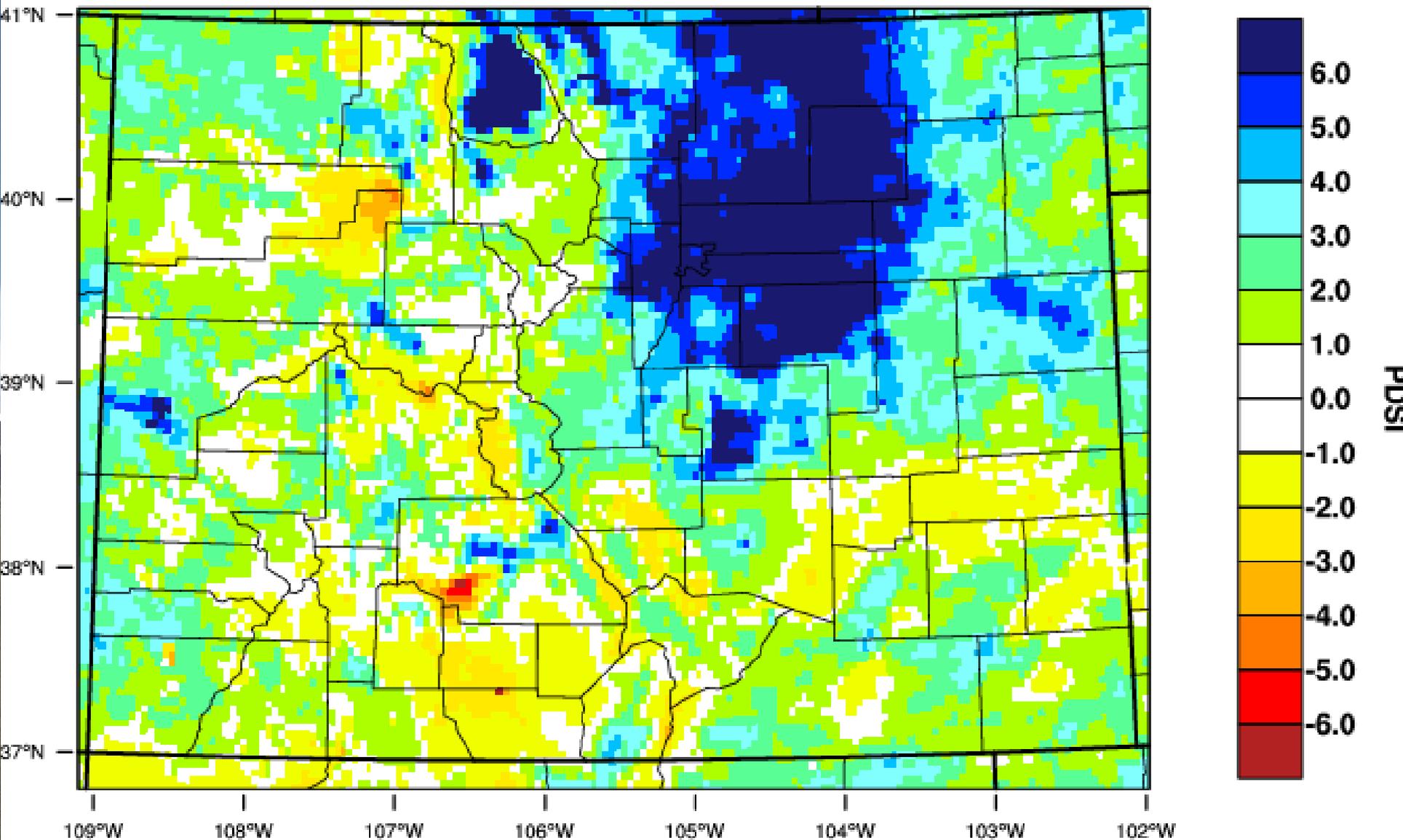
February 2016



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

Colorado - PDSI

March 2016



WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 11 APR 2016

**Thinking ahead to “flood season”
Now’s the time**

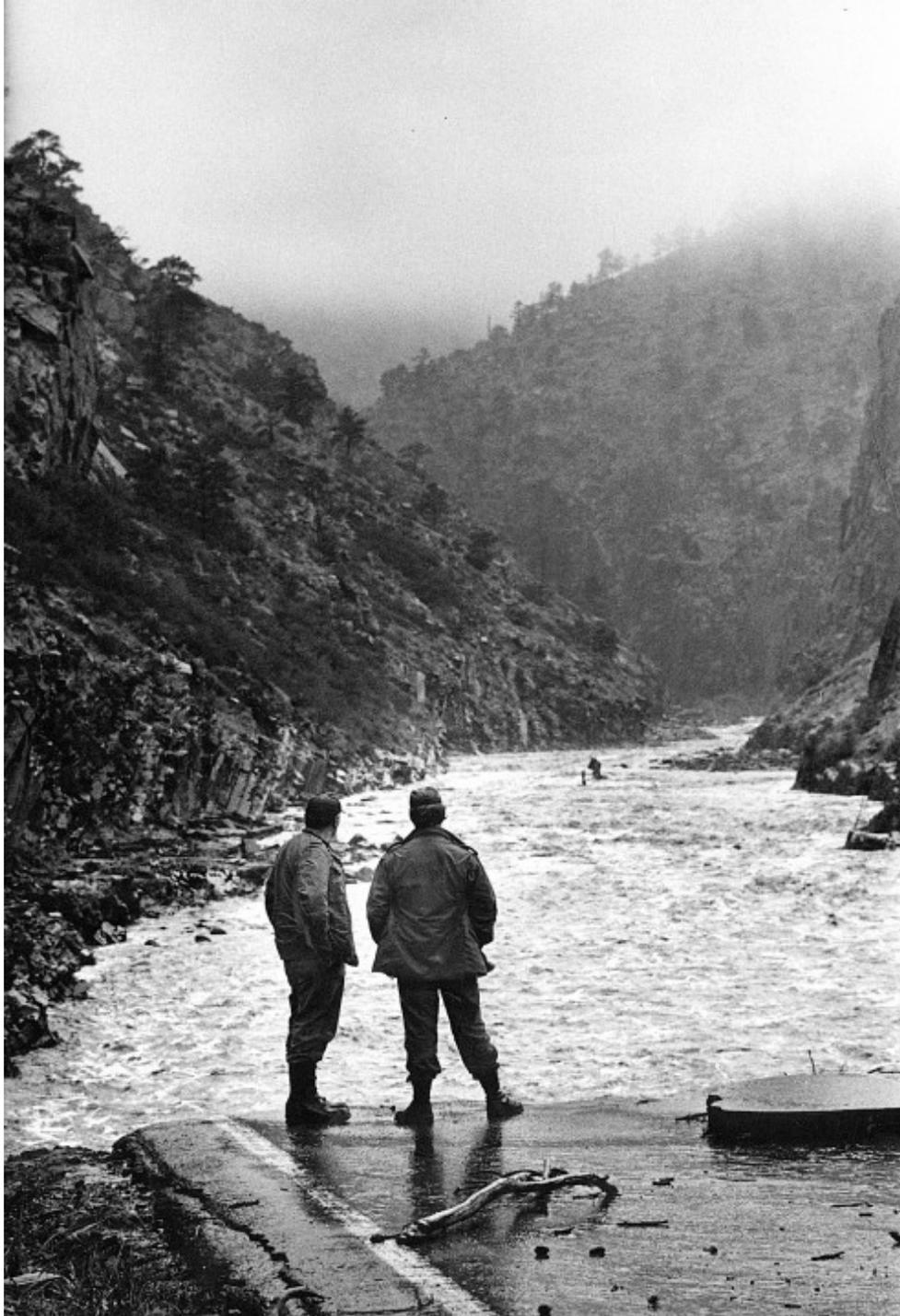


Floods Happen

Sometimes close to home

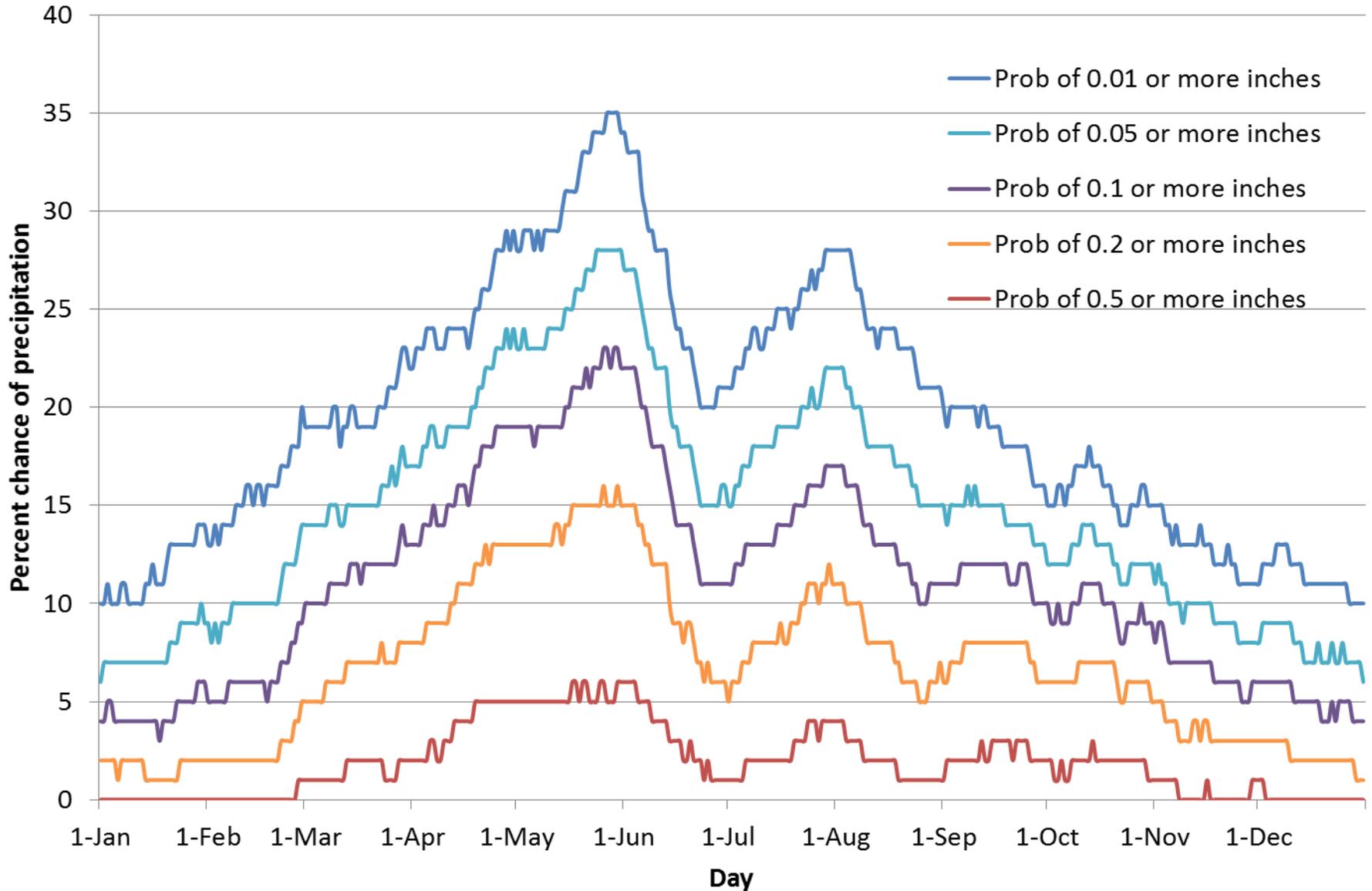


Fort Collins, July 1997
Credit: coloradoan.com



Credit: Denver Post

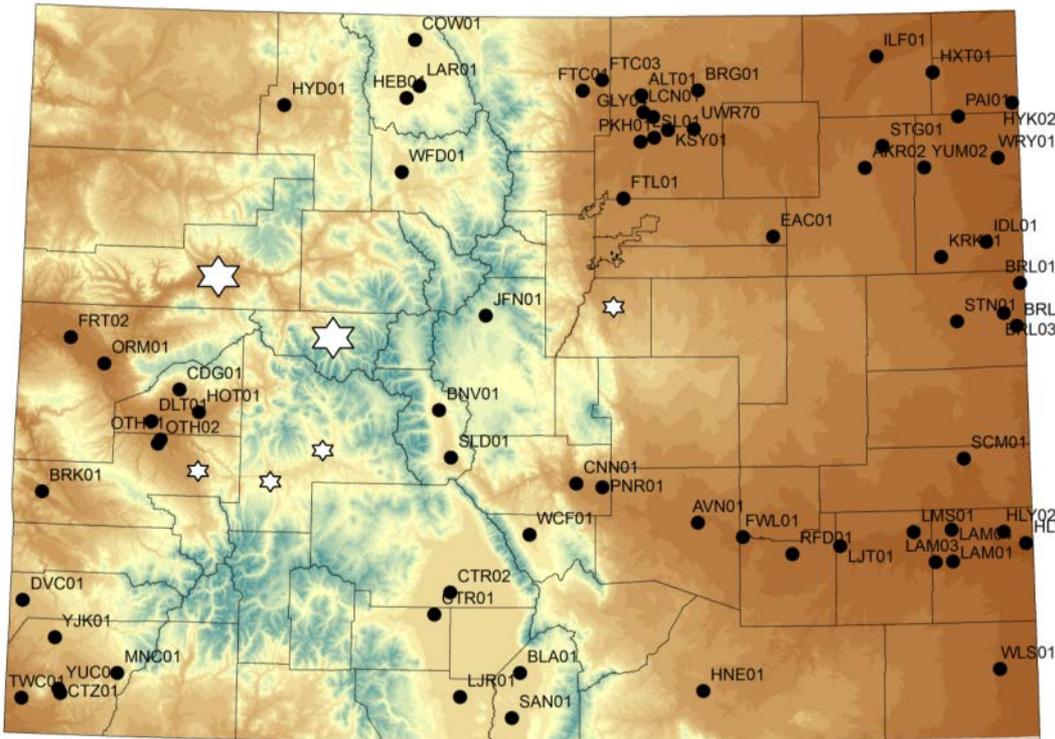
Percent Chance of Precipitation each Day



A Few Words about CoAgMet

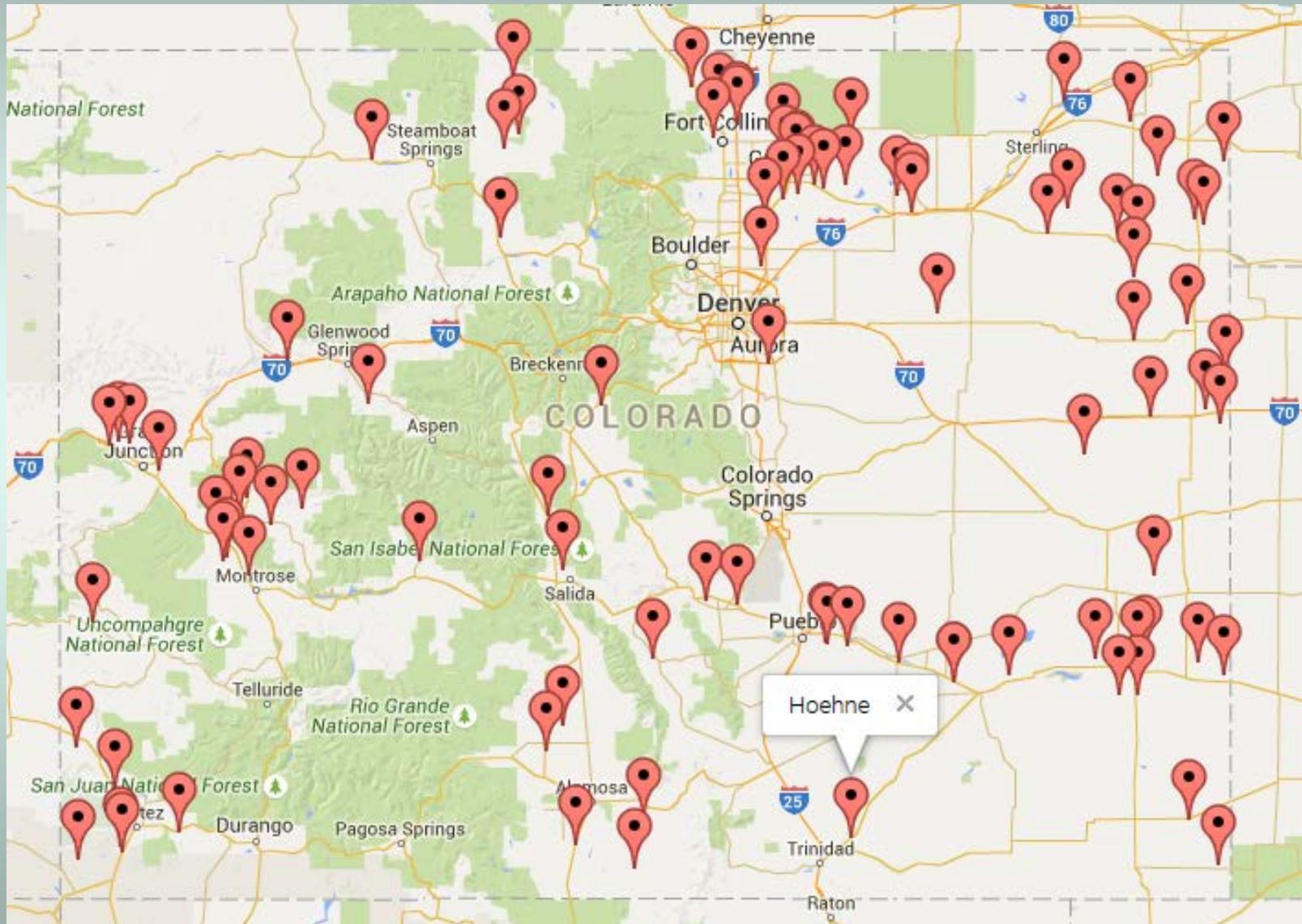
CSU's Colorado Agricultural Meteorological Network "CoAgMet"

Current and Future Stations
as of March 2015



THANKS!! to those of
You who help support
CoAgMet

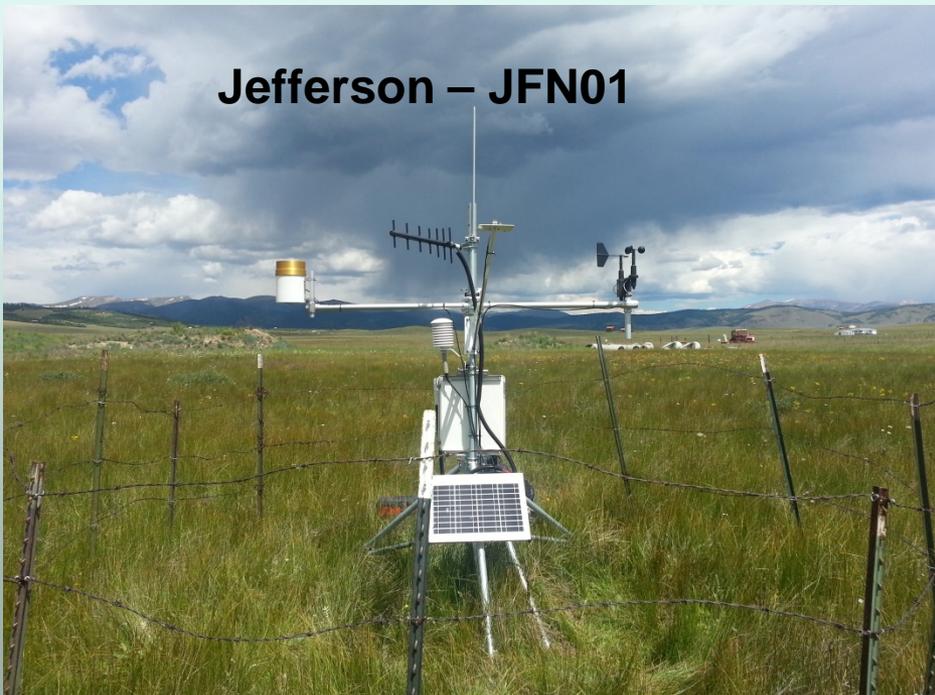
2015 Map of CoAgMet Stations



CoAgMet – a great source of data for ag applications and decision support



Walsh – WLS01



Jefferson – JFN01



La Salle – LSL01

Site Photos – Year to Year Comparison

Holly (HLY01) – Looking towards the West



7/19/2010

Site Photos

4 Cardinal Directions + Ground photo

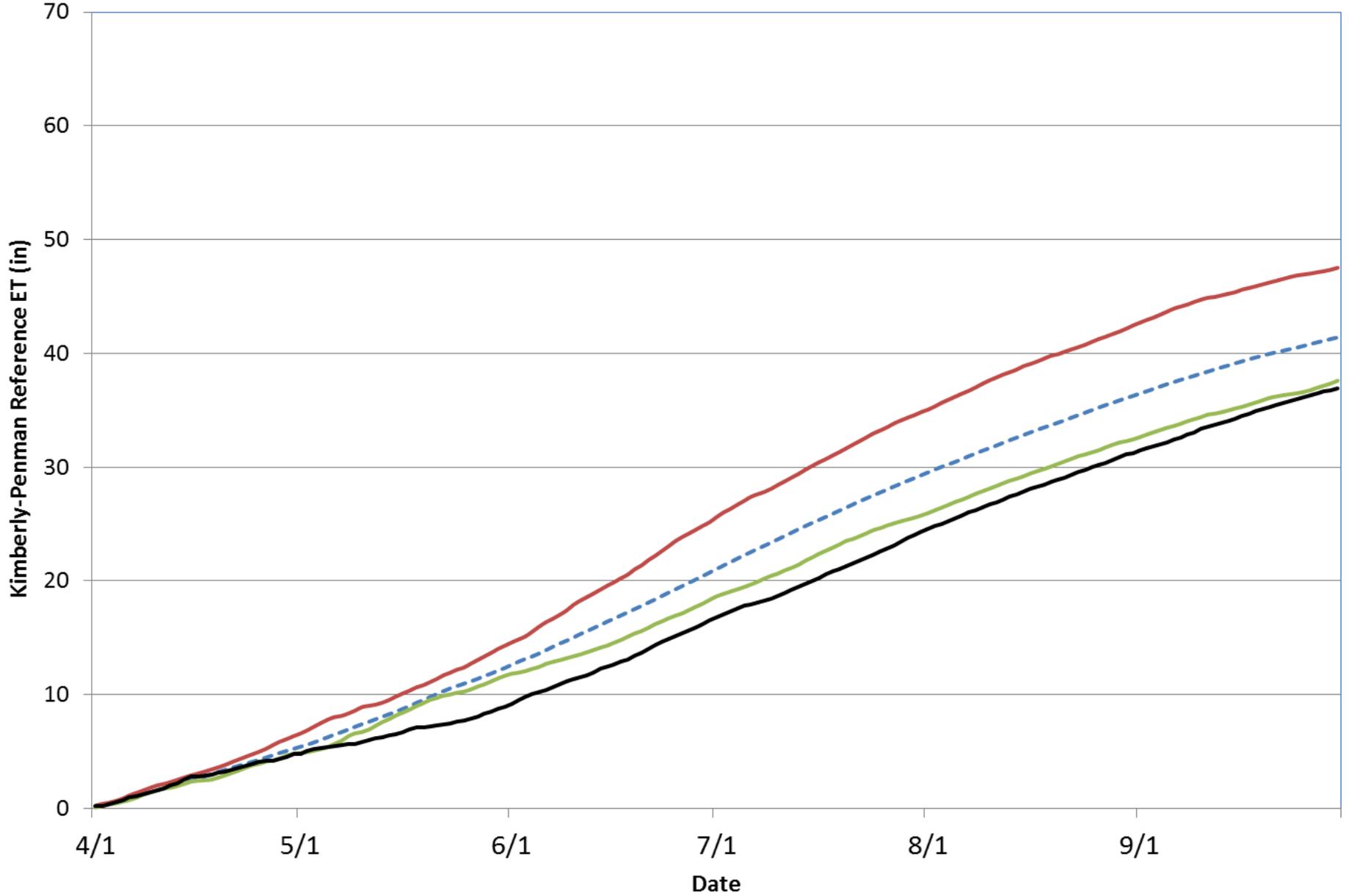


Evapotranspiration

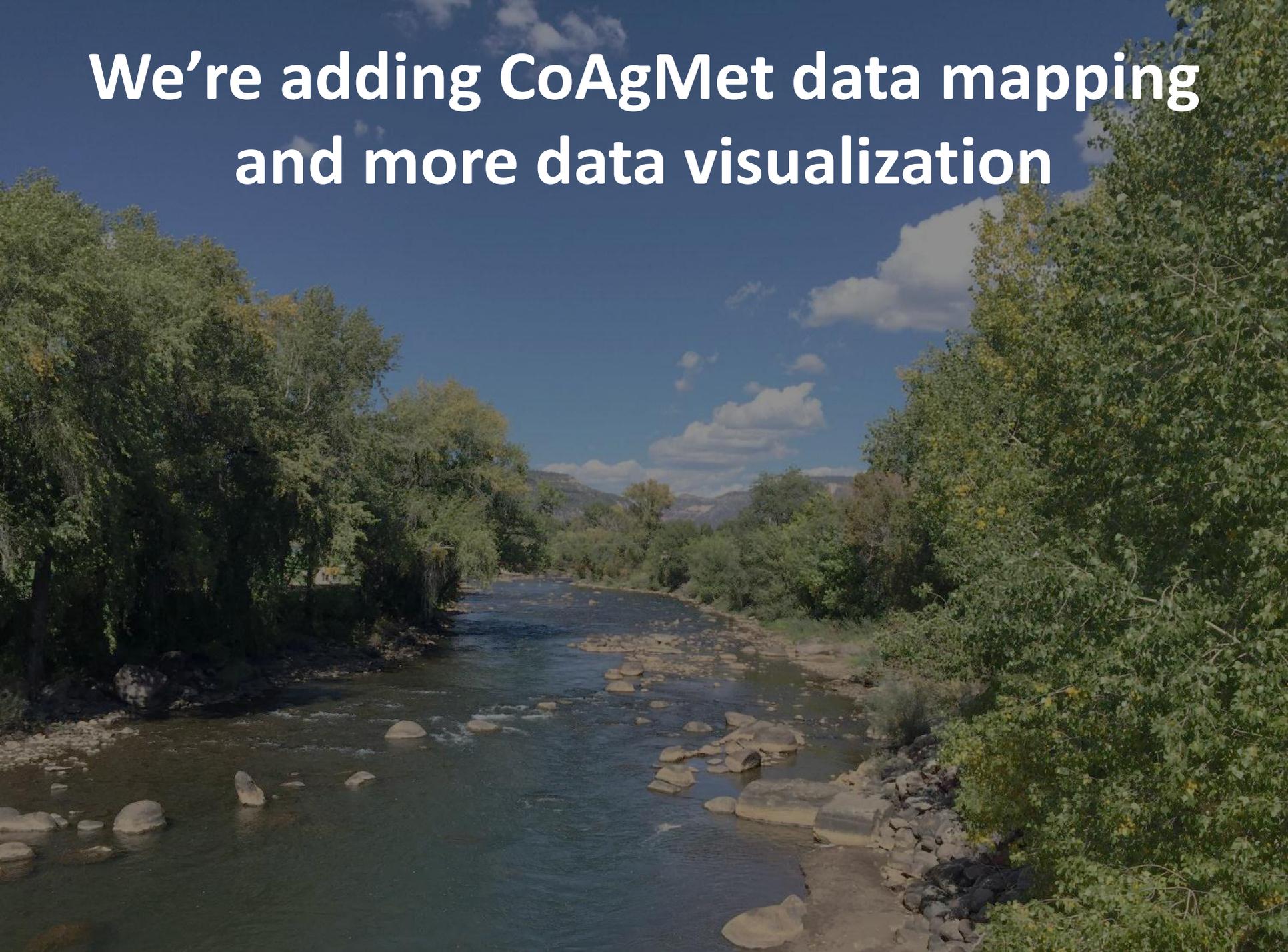


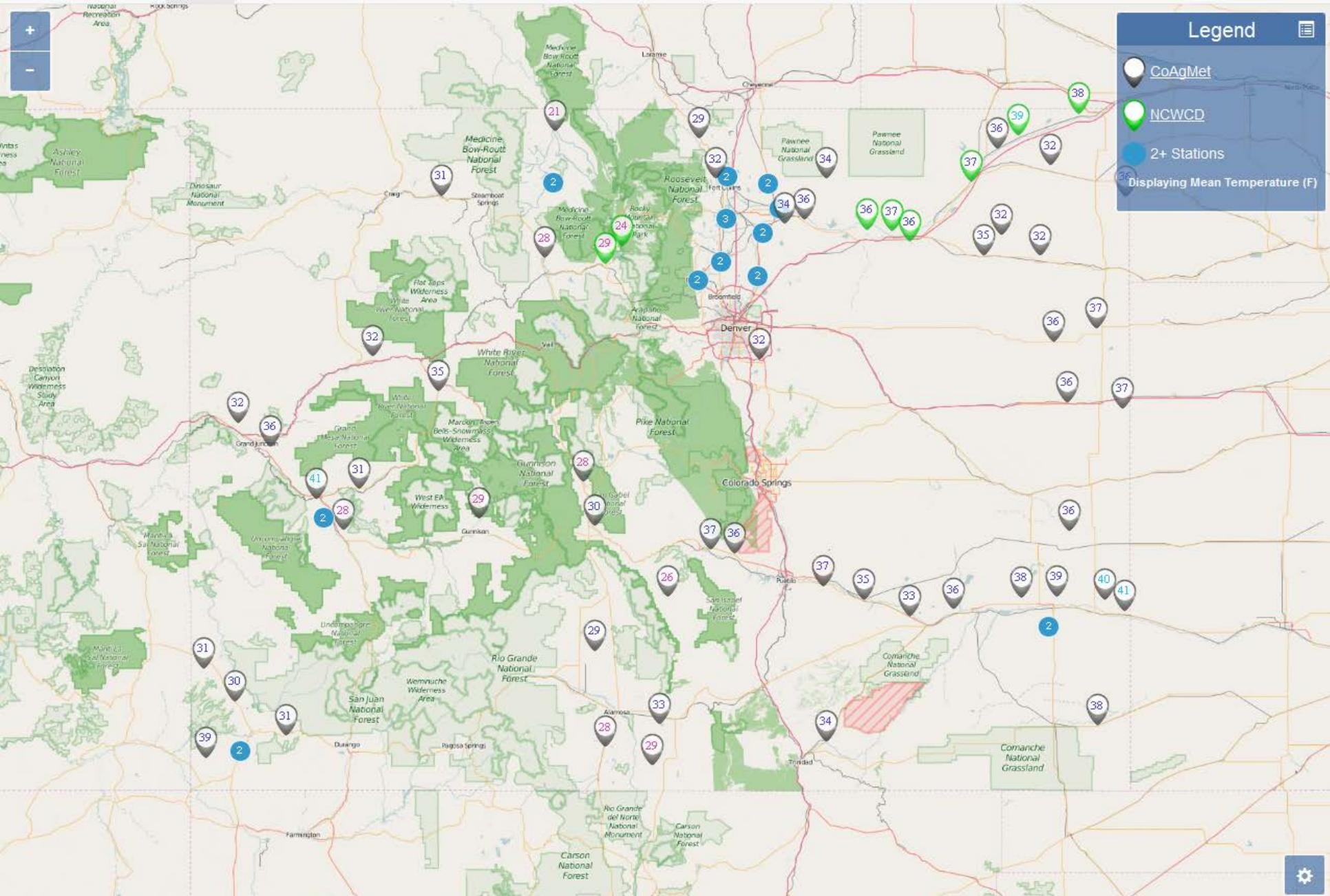
Lucerne Kimberly-Penman Reference ET (1992 - 2015)

--- Average — 2012 — 2009 — 2015



**We're adding CoAgMet data mapping
and more data visualization**





Colorado Climate Center

Data and Power Point Presentations available for downloading

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

