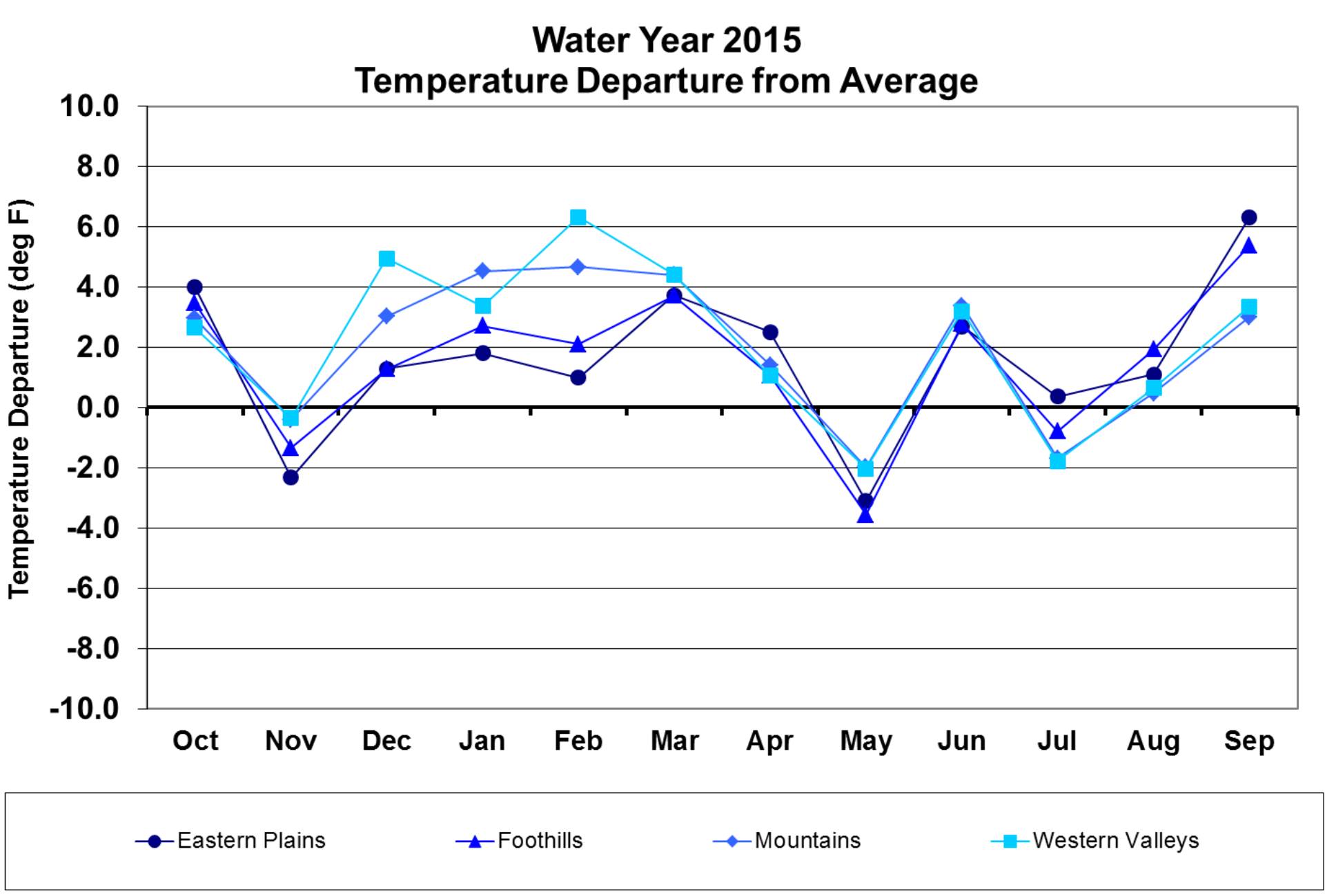
Climate Update

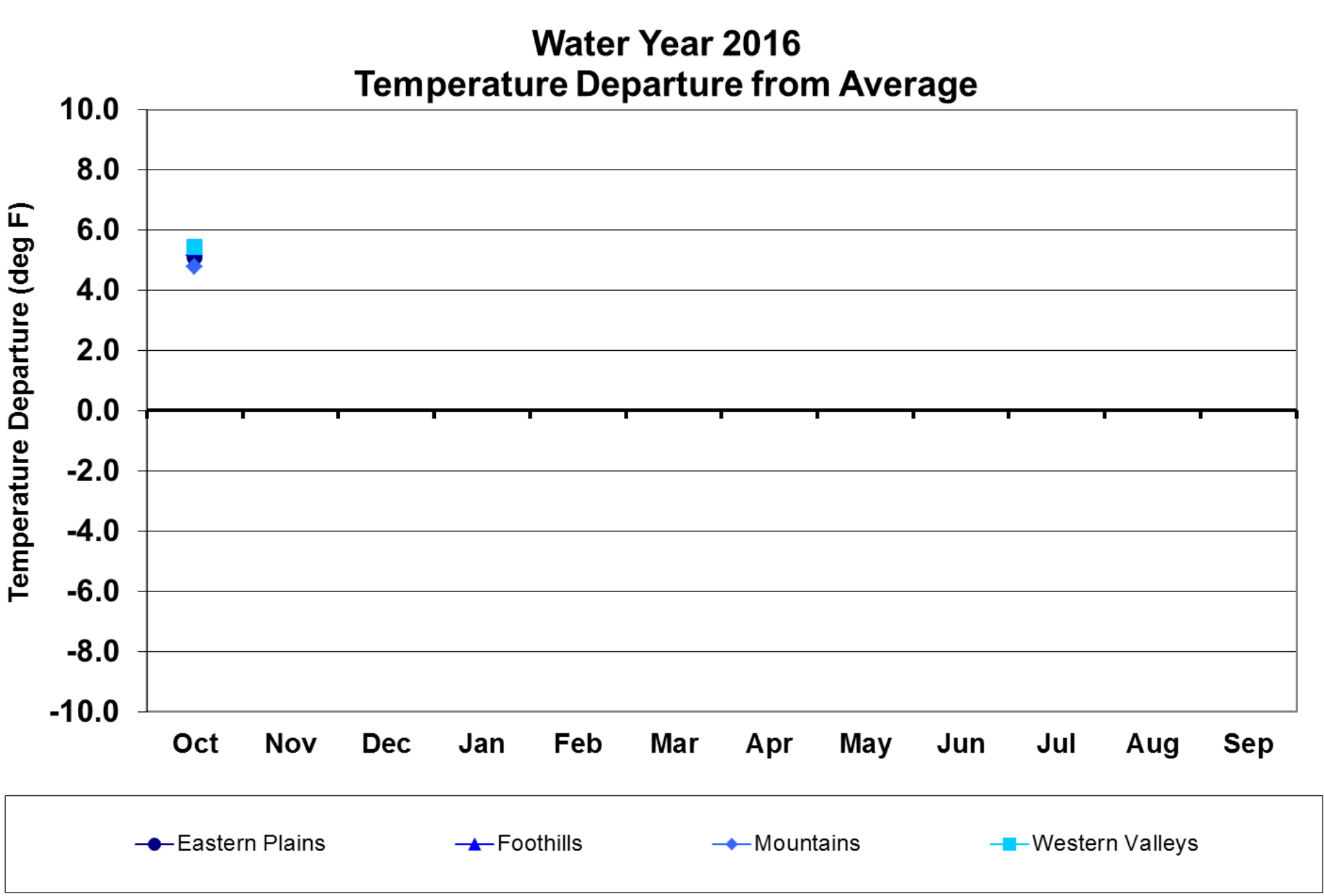
Nolan Doesken
Colorado Climate Center

Presented to
Water Availability Task Force
November 17, 2015
Denver, CO

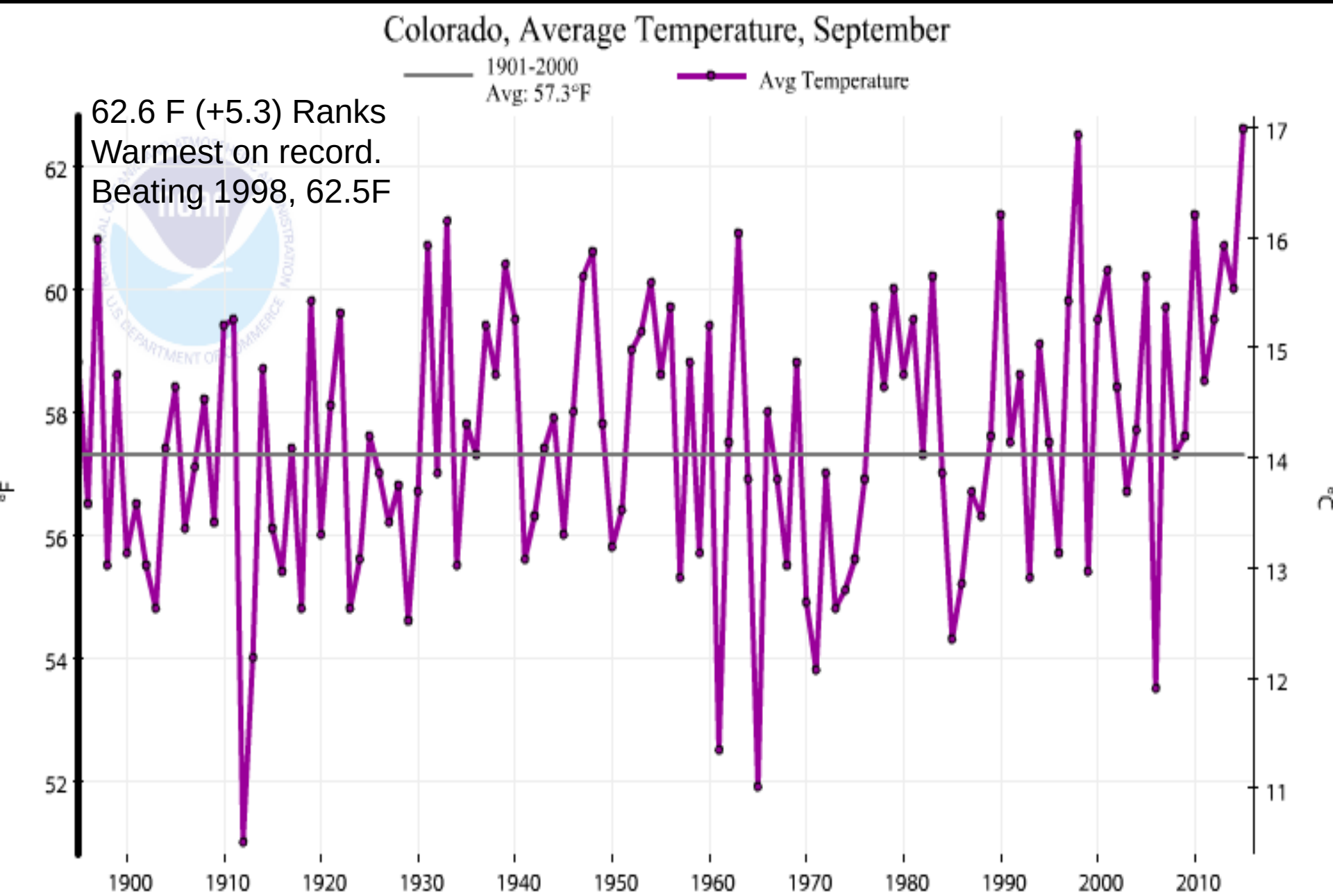
Water Year 2015 Temperature Departures



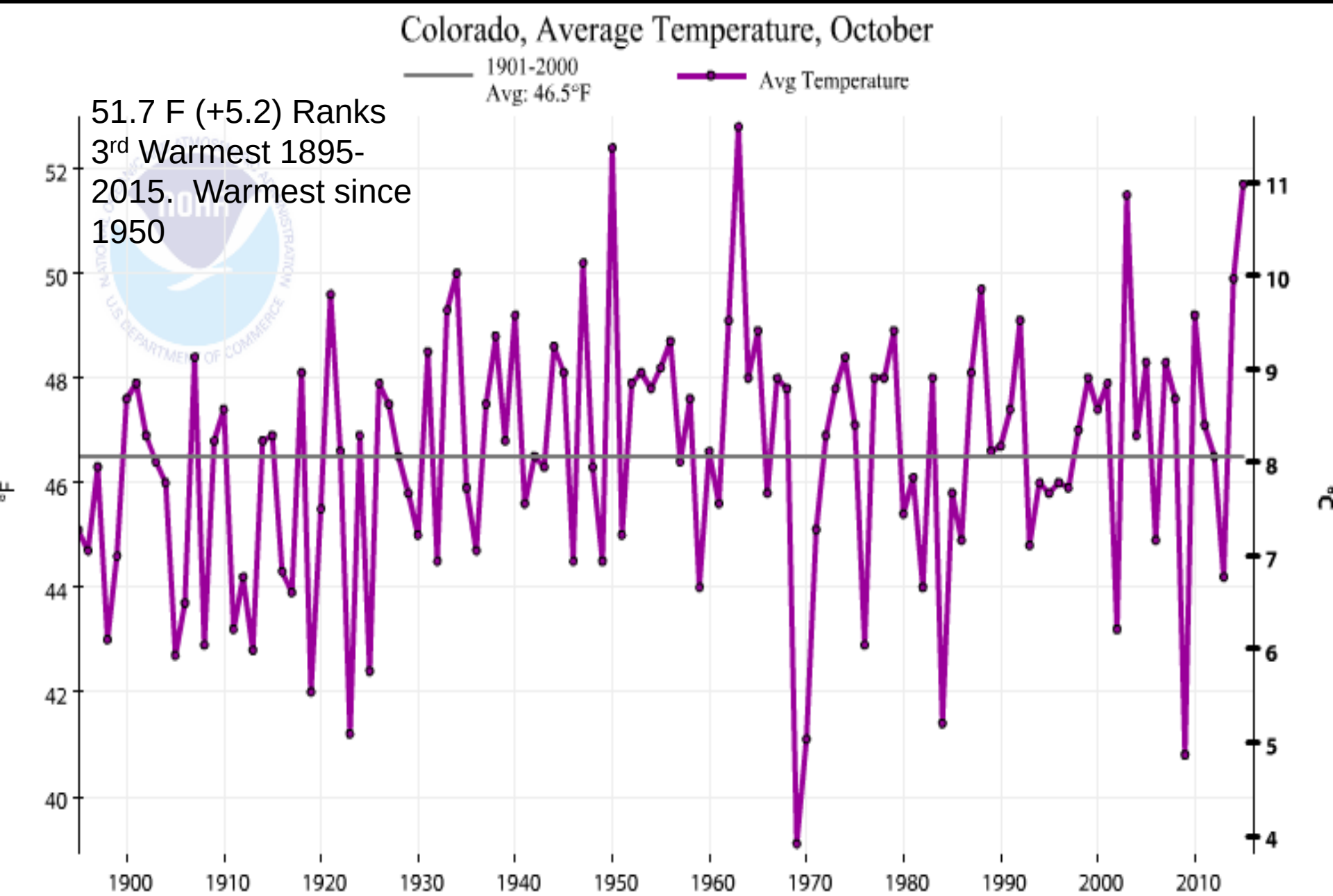
Water Year 2016 Temperature Departures



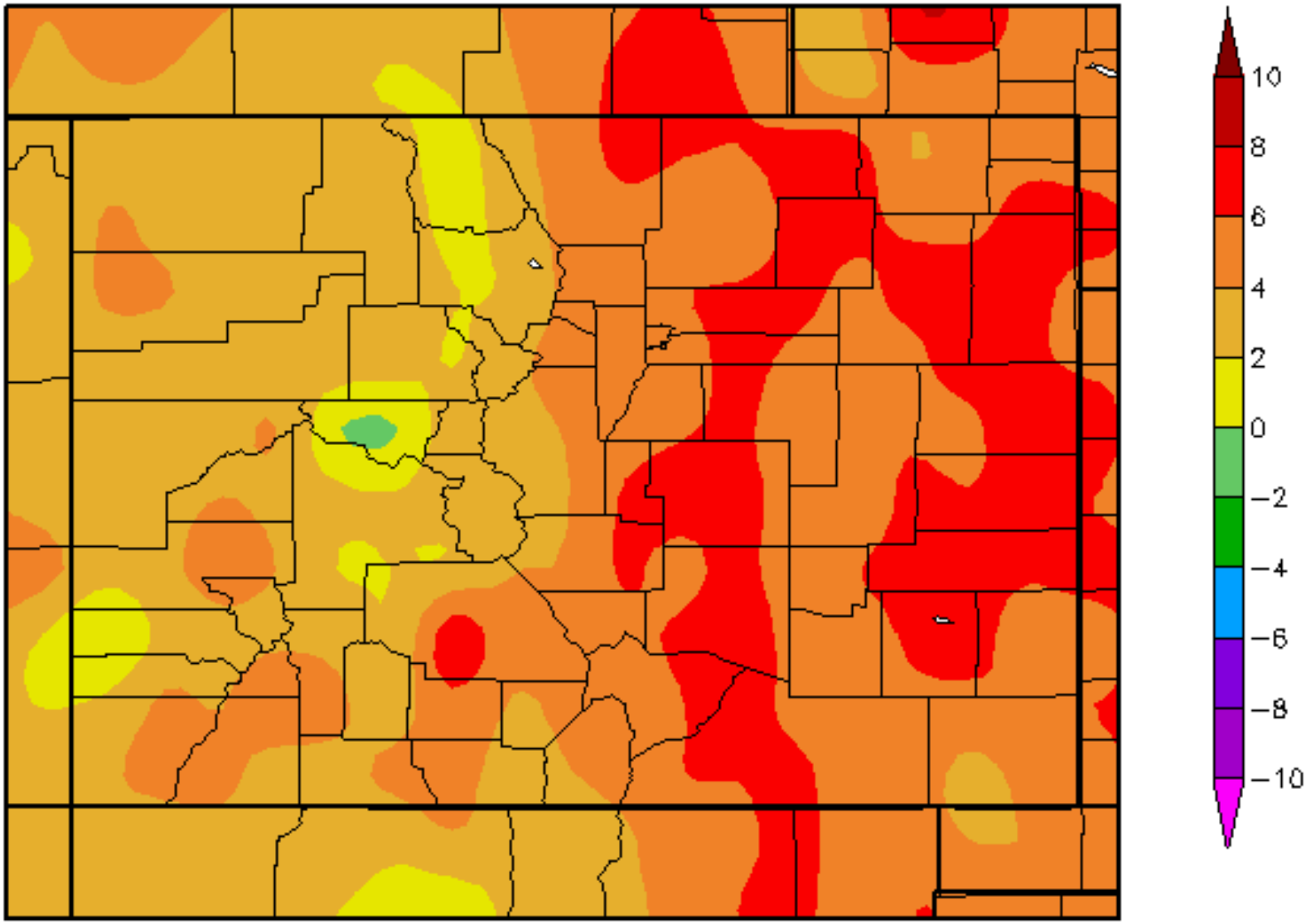
Sep 2015 Average Temperature History for Colorado (NCEI)



Oct 2015 Average Temperature History for Colorado (NCEI)



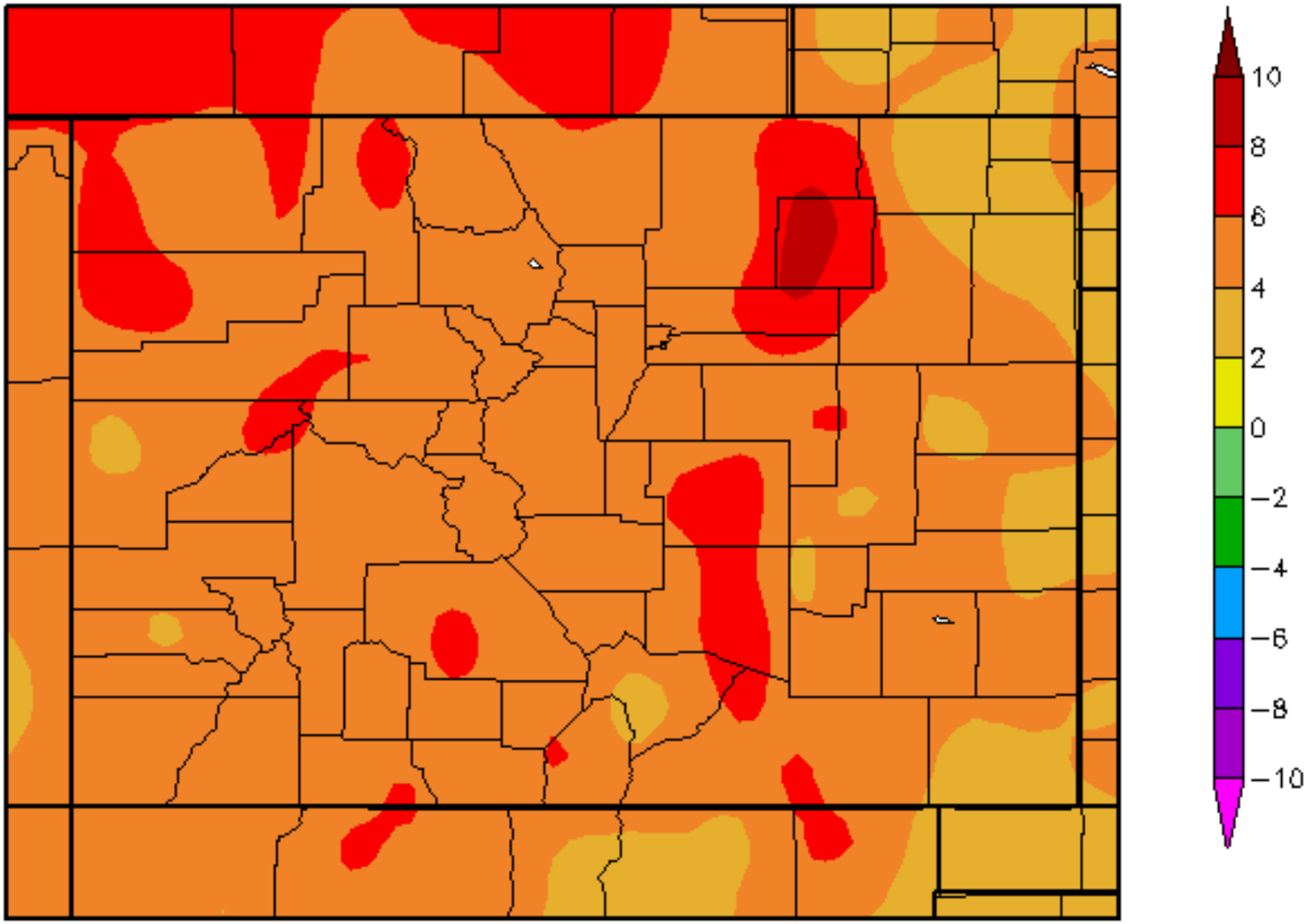
Departure from Normal Temperature (F)
9/1/2015 – 9/30/2015



Generated 10/11/2015 at HPRCC using provisional data.

Regional Climate Centers

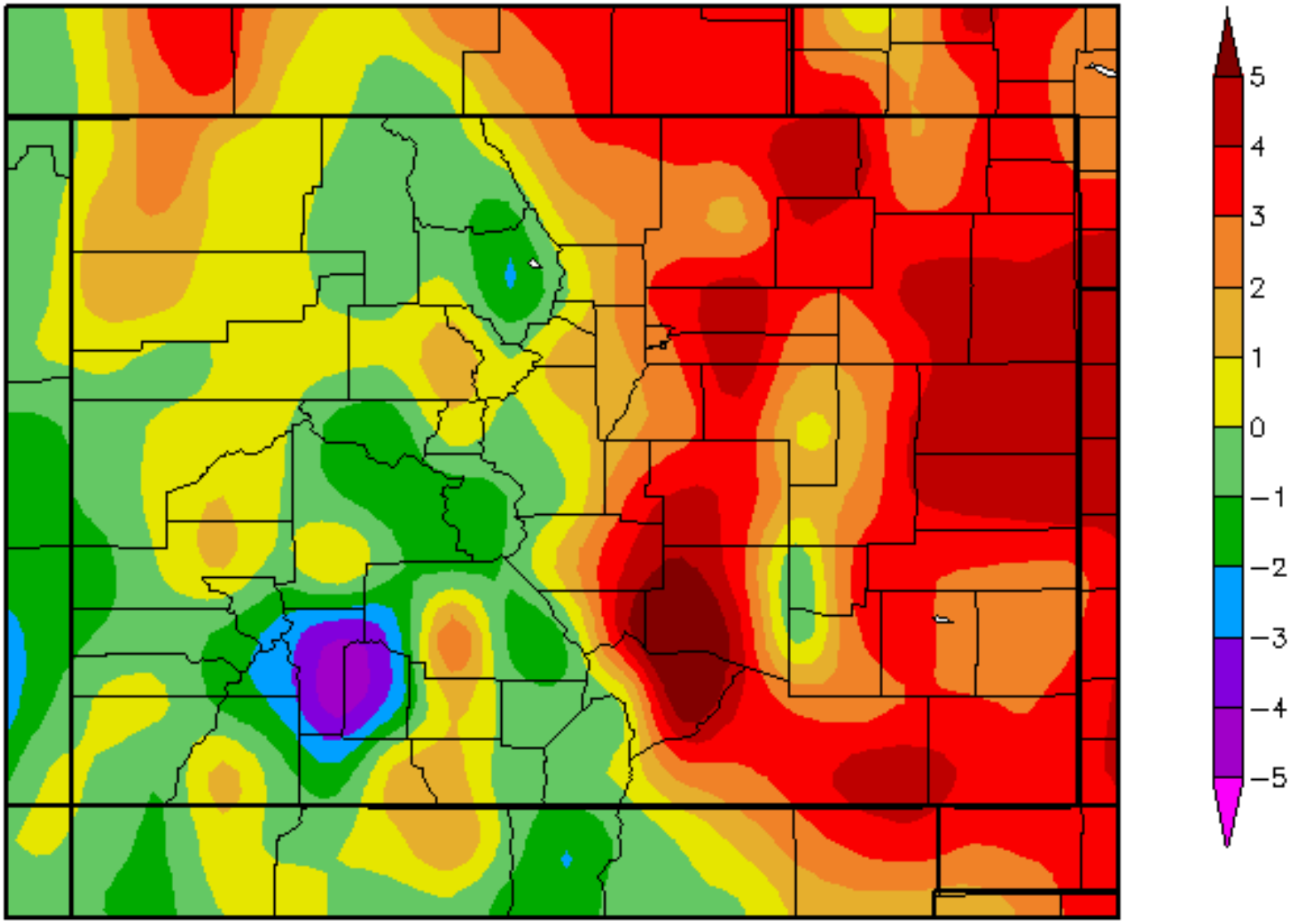
Departure from Normal Temperature (F)
10/1/2015 – 10/31/2015



Generated 11/11/2015 at HPRCC using provisional data.

Regional Climate Centers

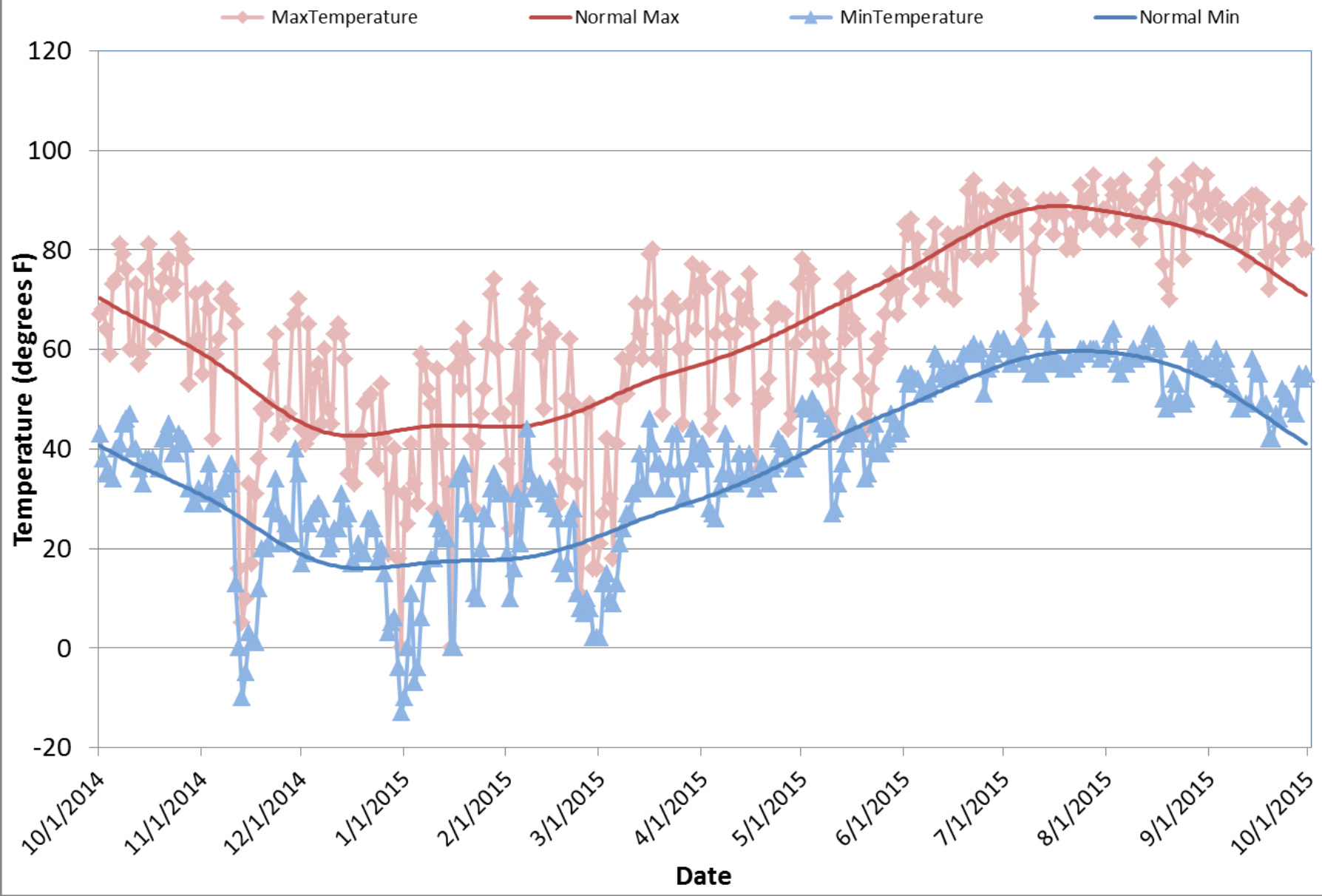
Departure from Normal Temperature (F)
11/1/2015 – 11/15/2015



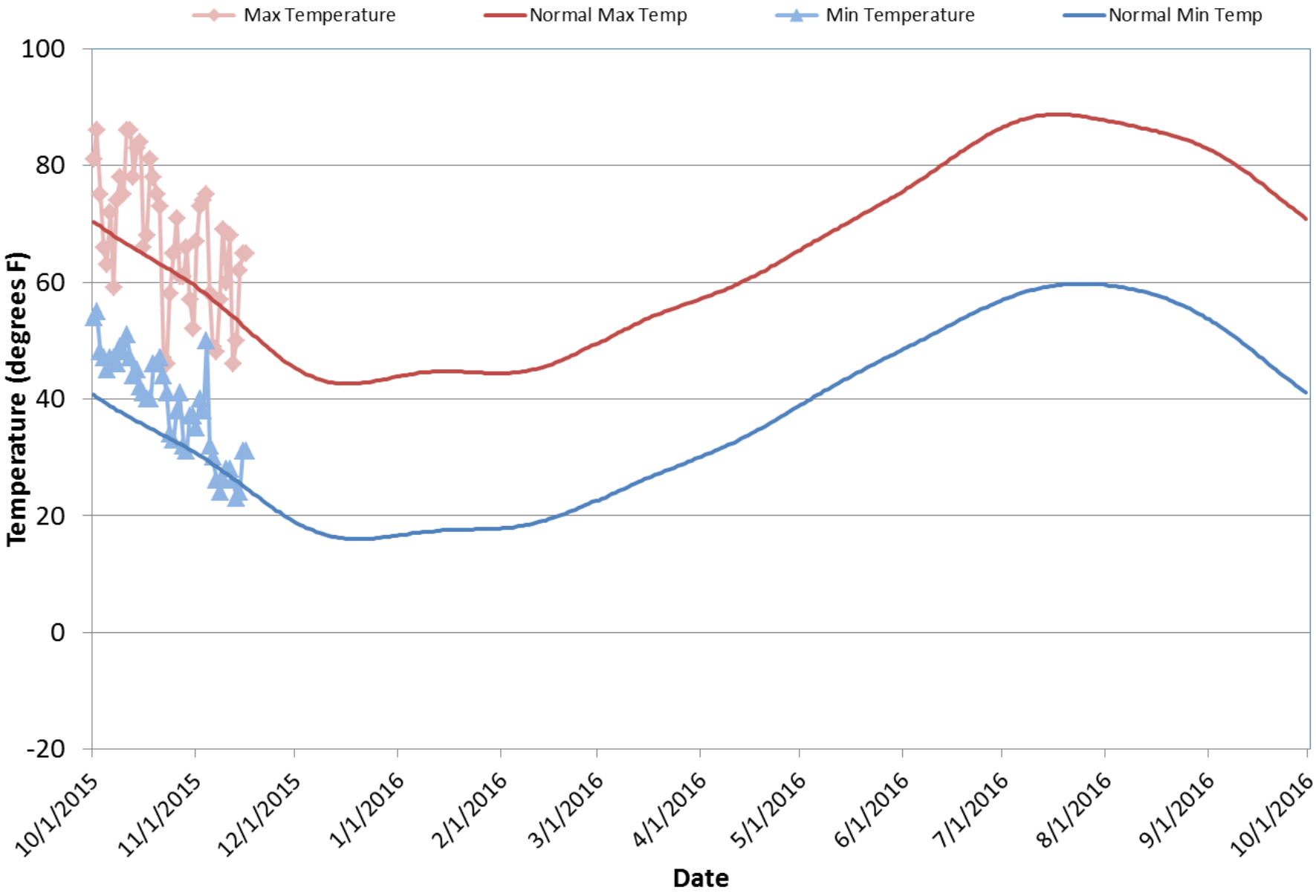
Generated 11/16/2015 at HPRCC using provisional data.

Regional Climate Centers

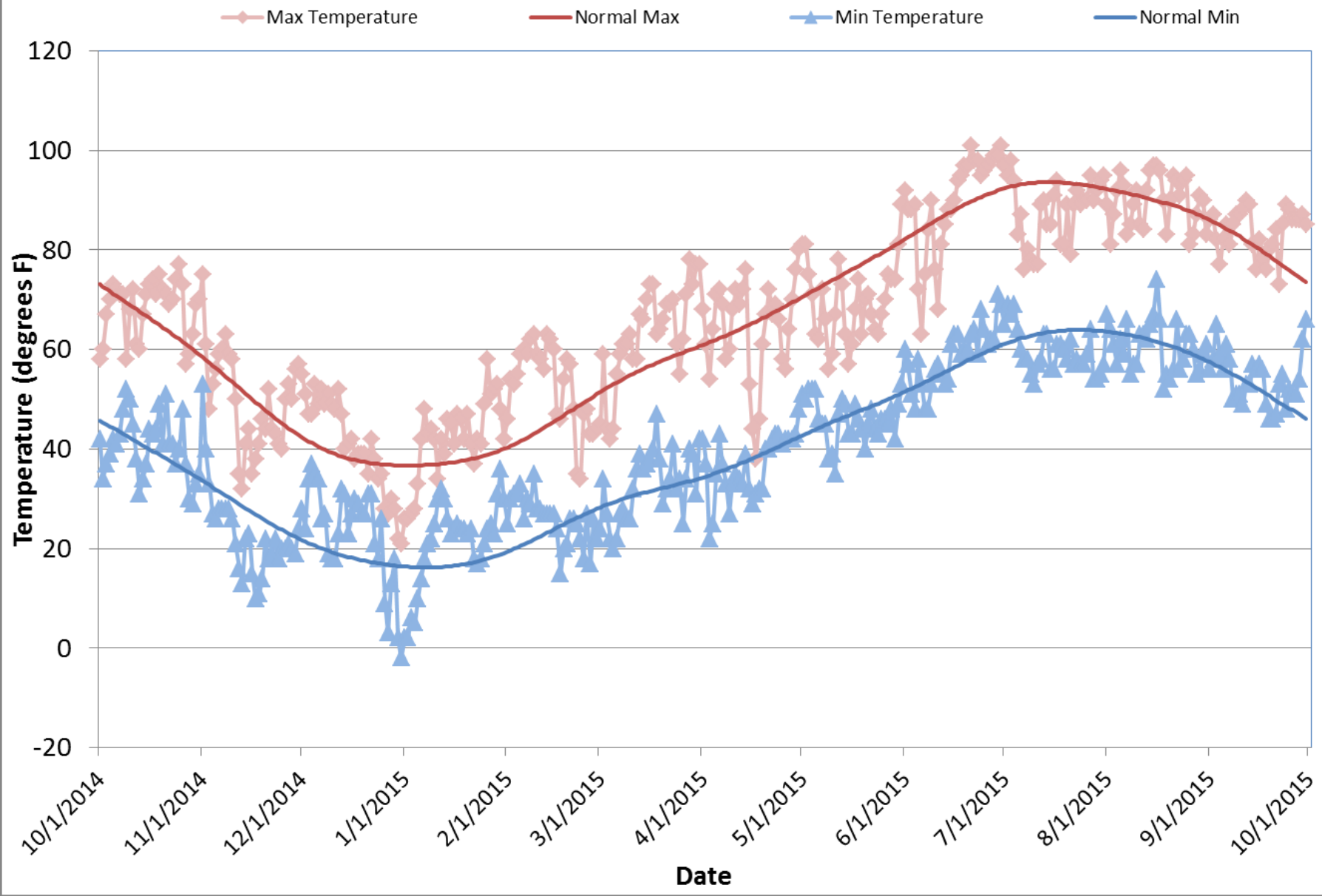
Denver-Stapleton Daily Max/Min Temperature with Normal for Water Year 2015



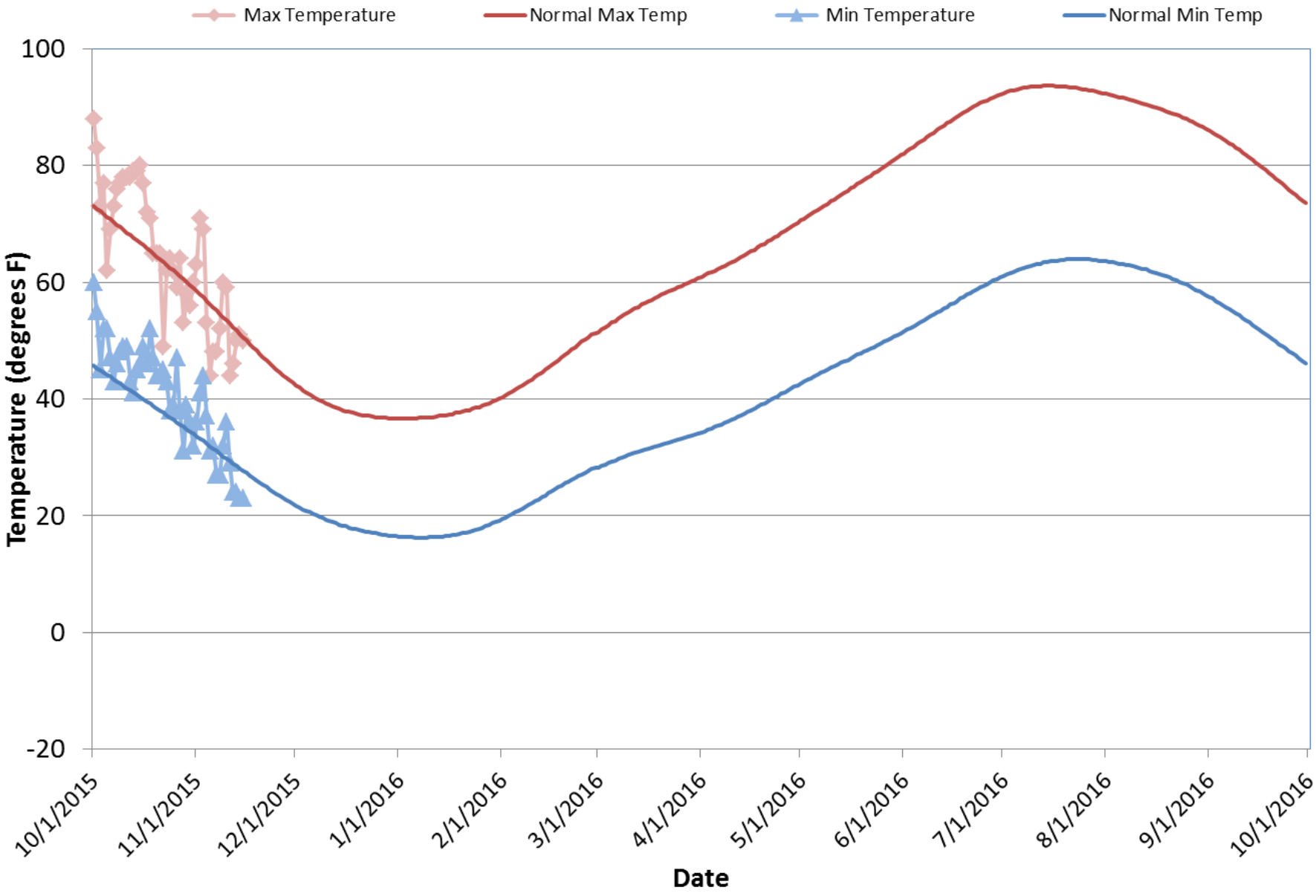
Denver-Stapleton Daily Max/Min Temperatures with Normals, Water Year 2016



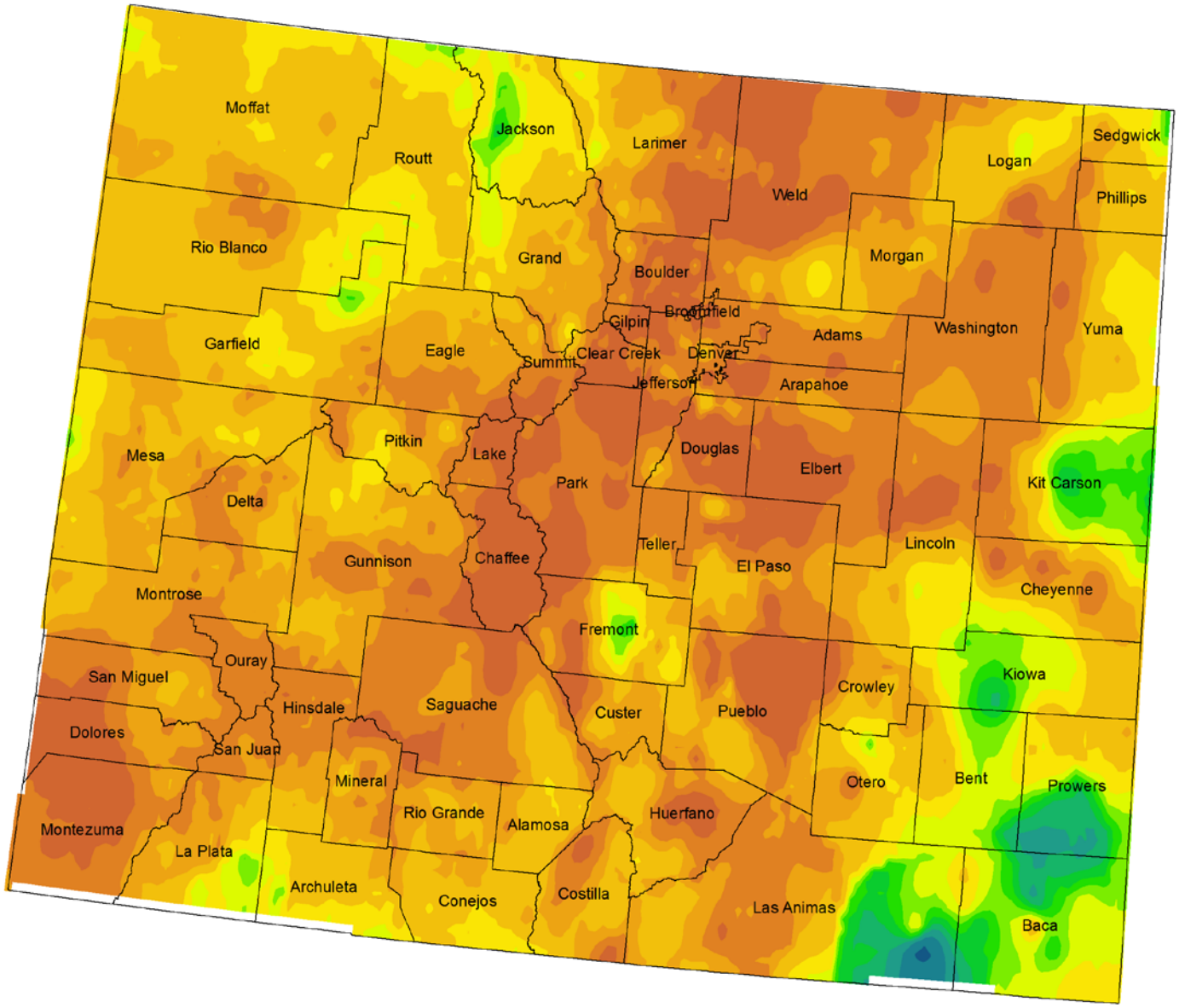
Grand Junction Daily Max/Min Temperature with Normals for Water Year 2015



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



Colorado September 2015 Precipitation as a Percentage of Normal

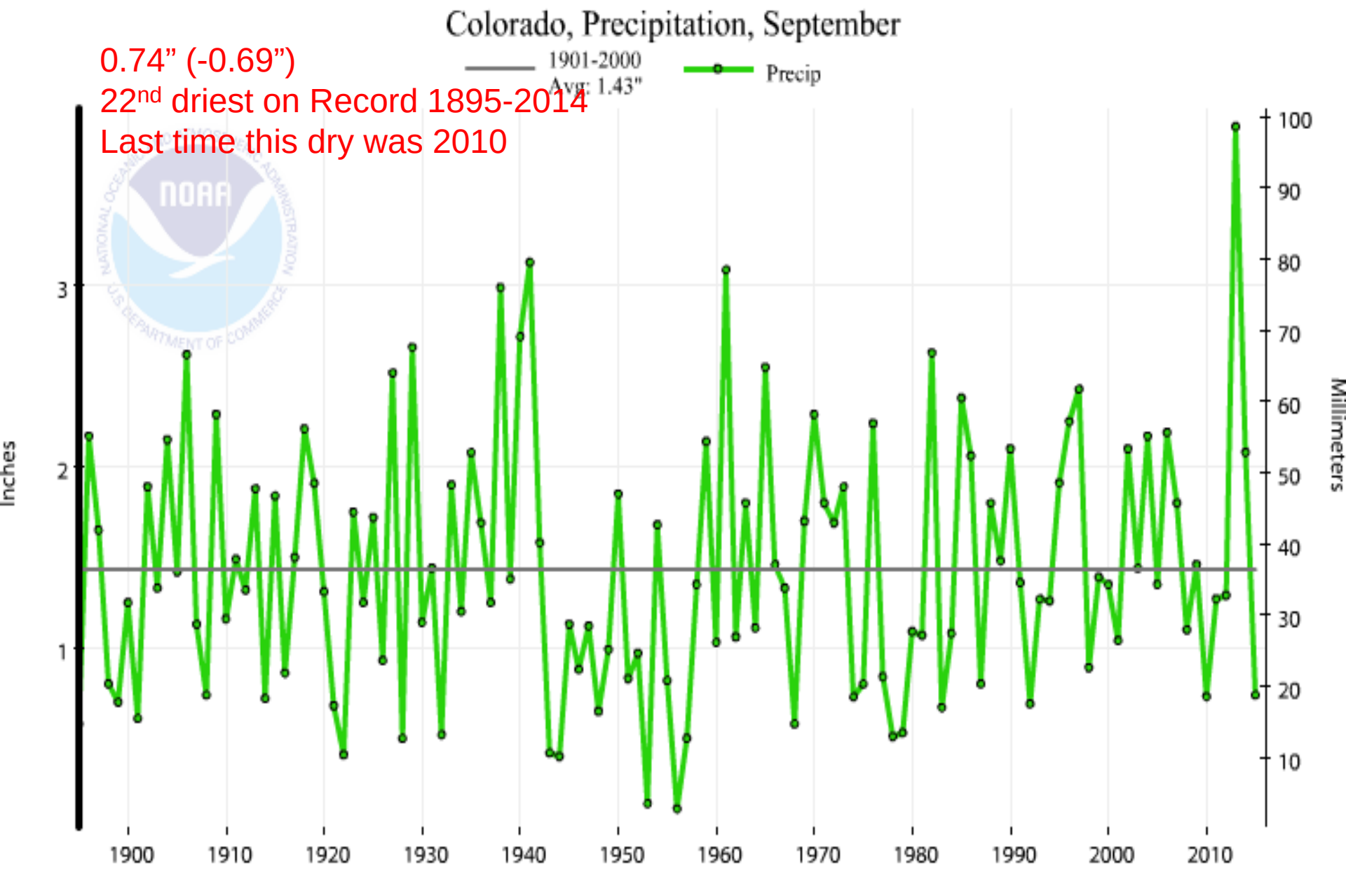


sep15_pn_co

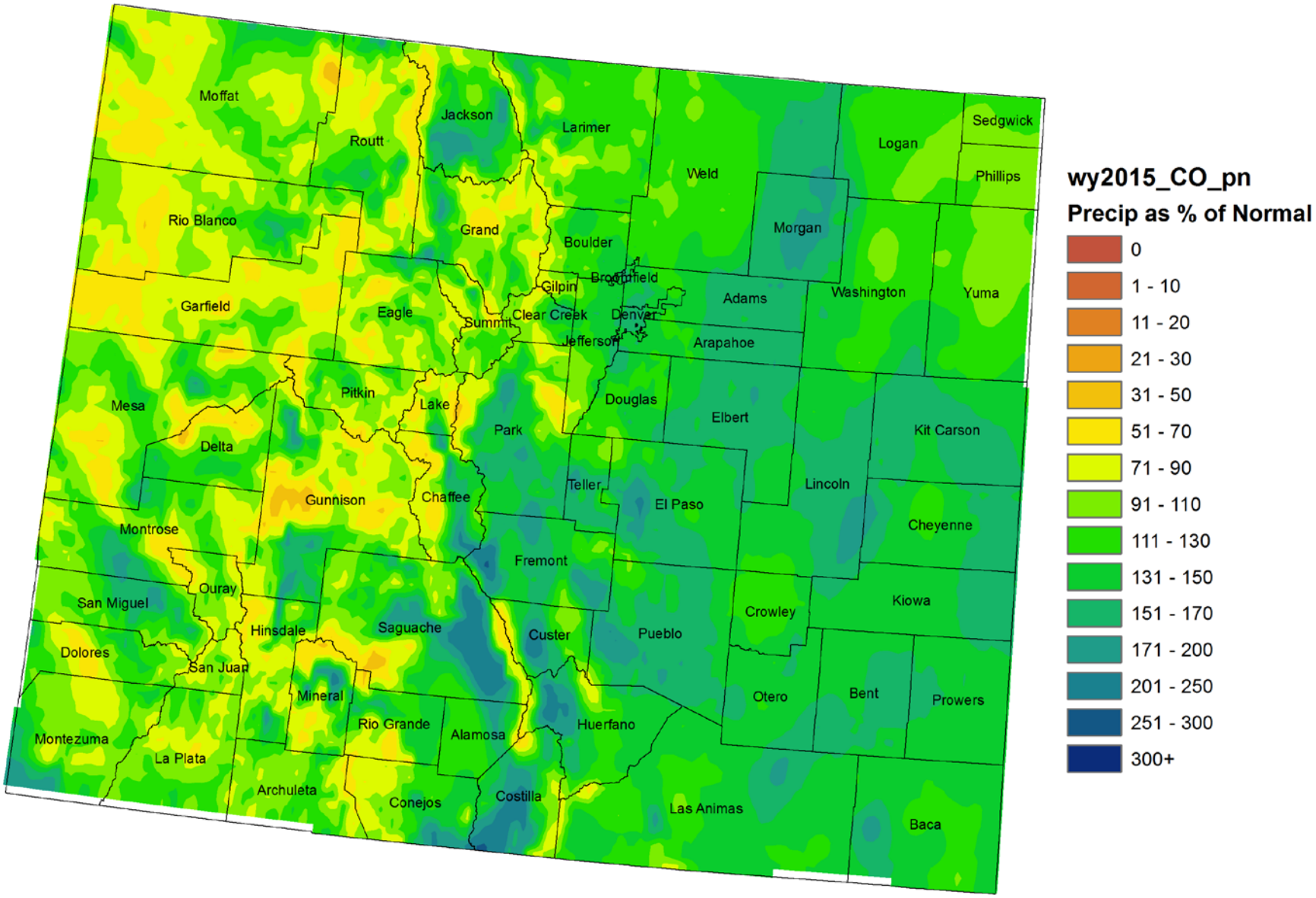
Precip % of Normal

- 0
- 1 - 10
- 11 - 20
- 21 - 30
- 31 - 50
- 51 - 70
- 71 - 90
- 91 - 110
- 111 - 130
- 131 - 150
- 151 - 170
- 171 - 200
- 201 - 250
- 251 - 300
- 300+

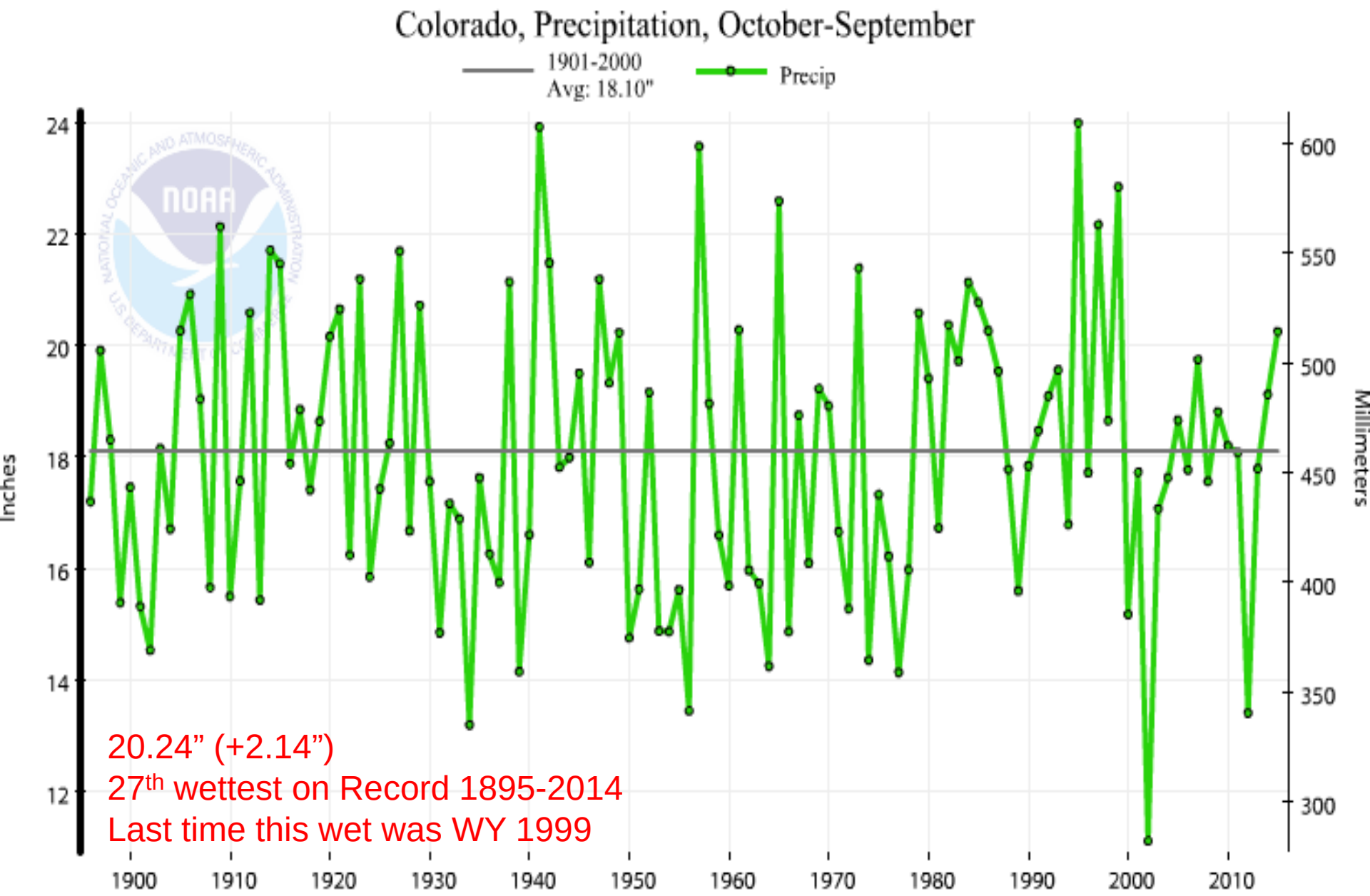
Sep 2015 Statewide Precipitation



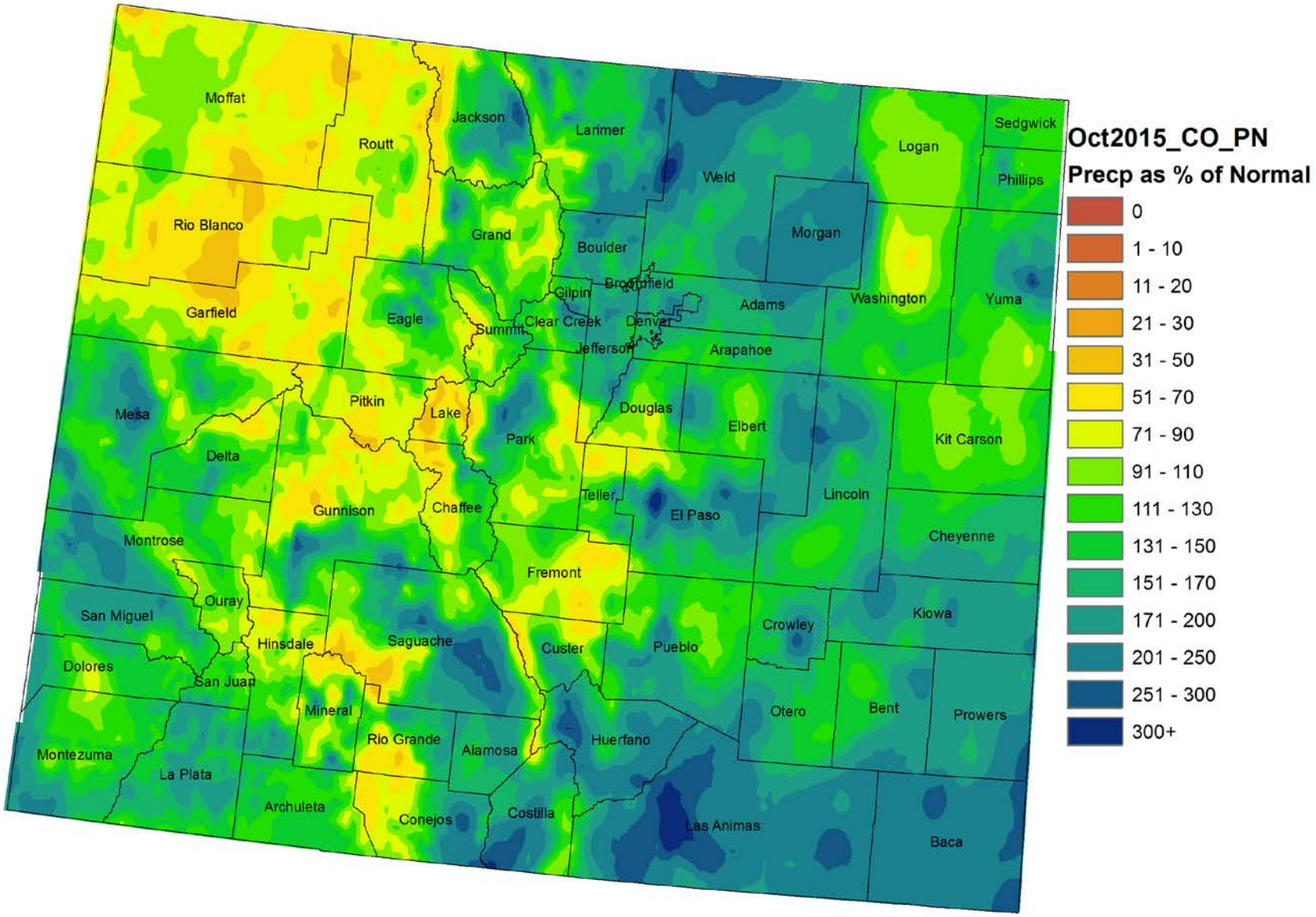
Colorado Water Year 2015 Precipitation as a Percentage of Normal



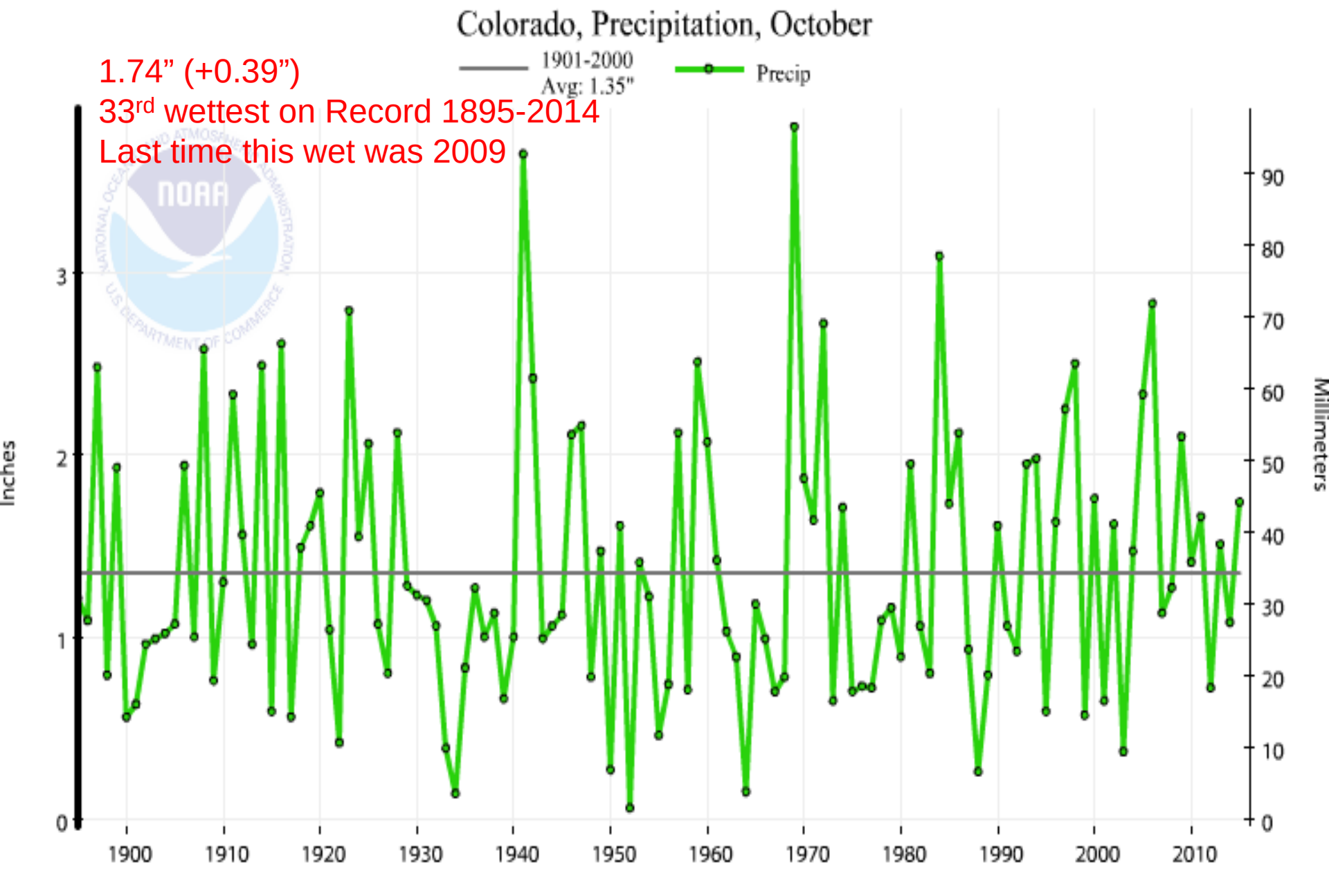
WY 2015 Statewide Precipitation



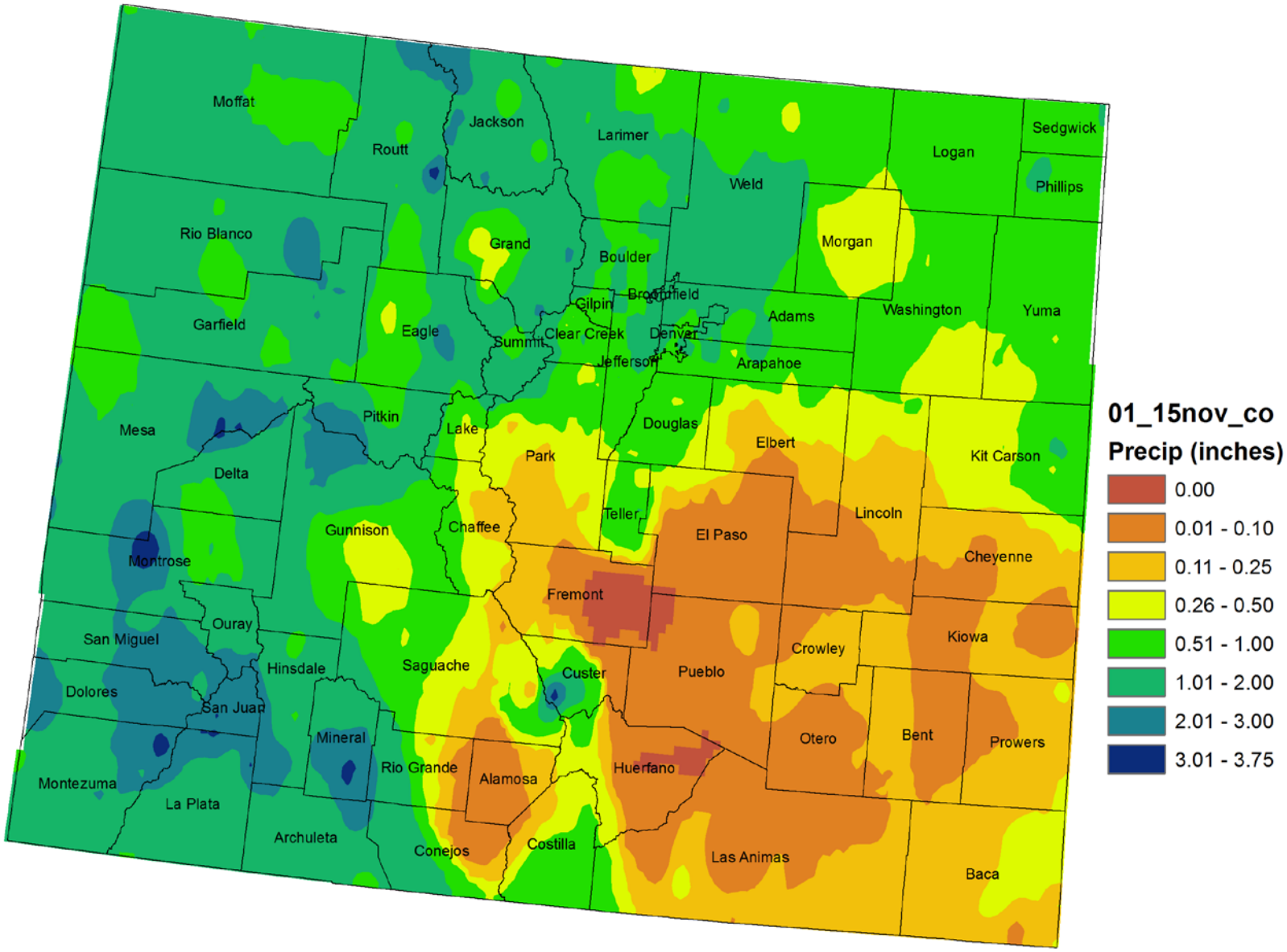
Colorado October 2015 Precipitation as a Percentage of Normal



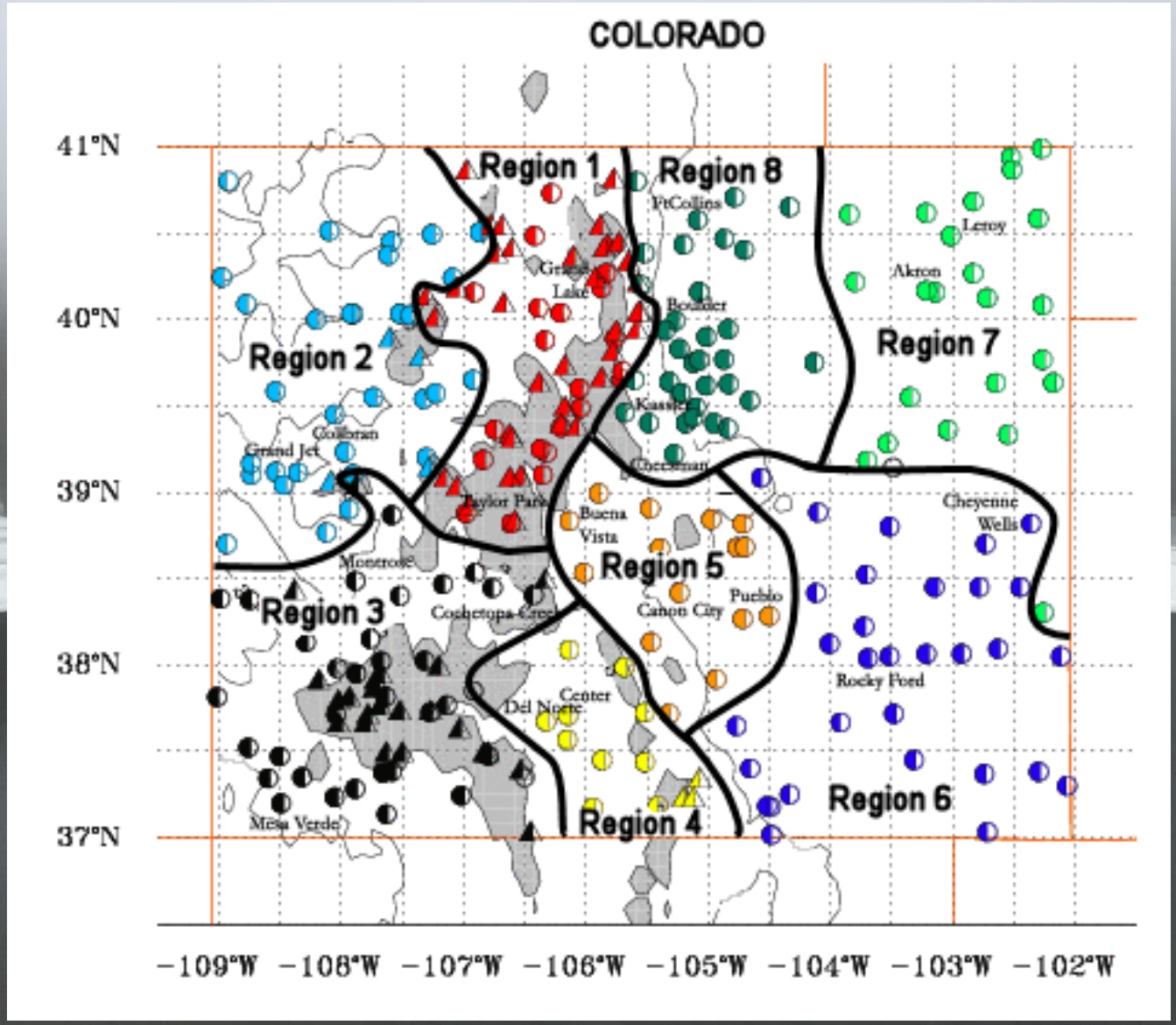
Oct 2015 Statewide Precipitation



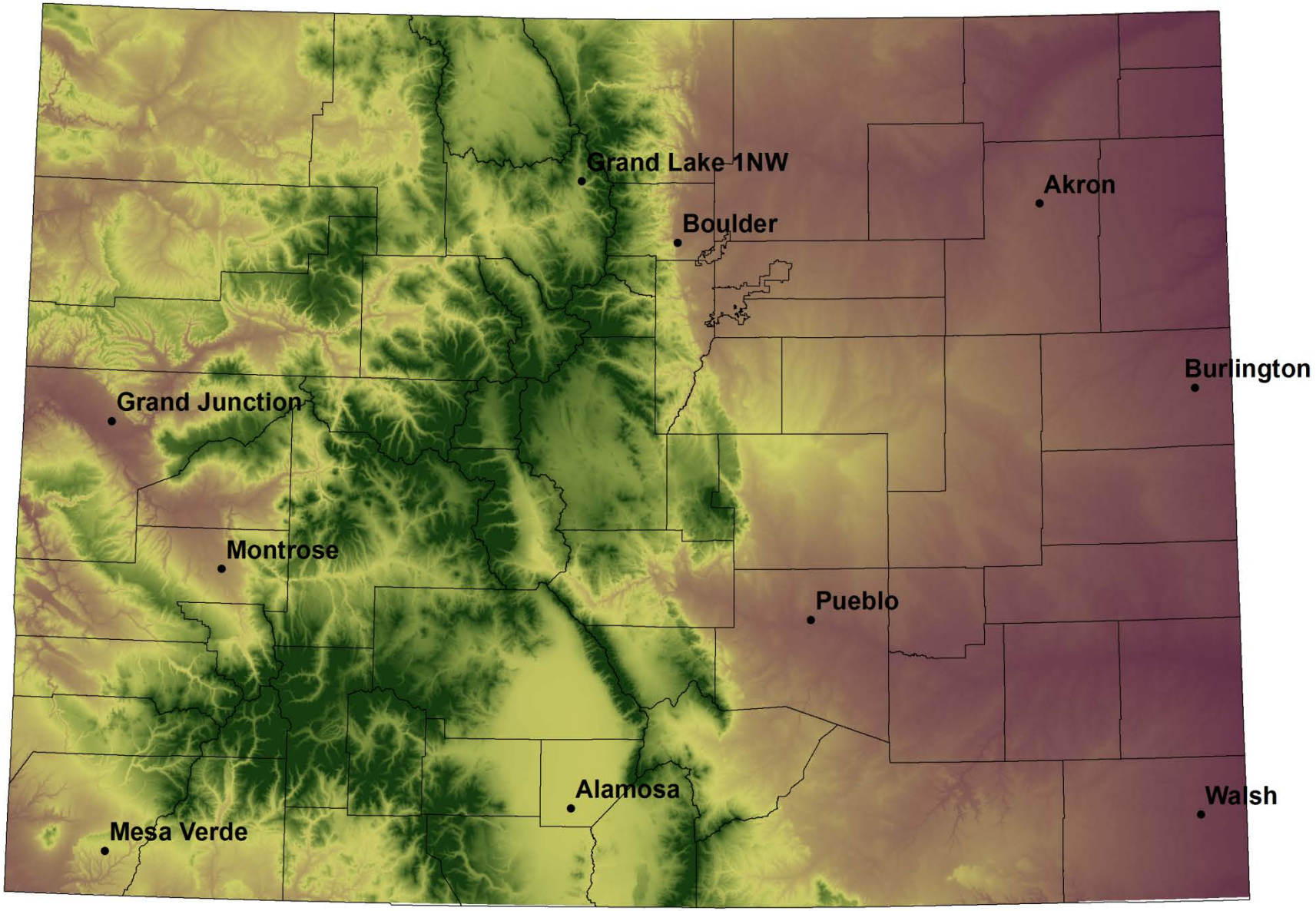
Colorado Month to Date Precipitation
1 - 15 November 2015



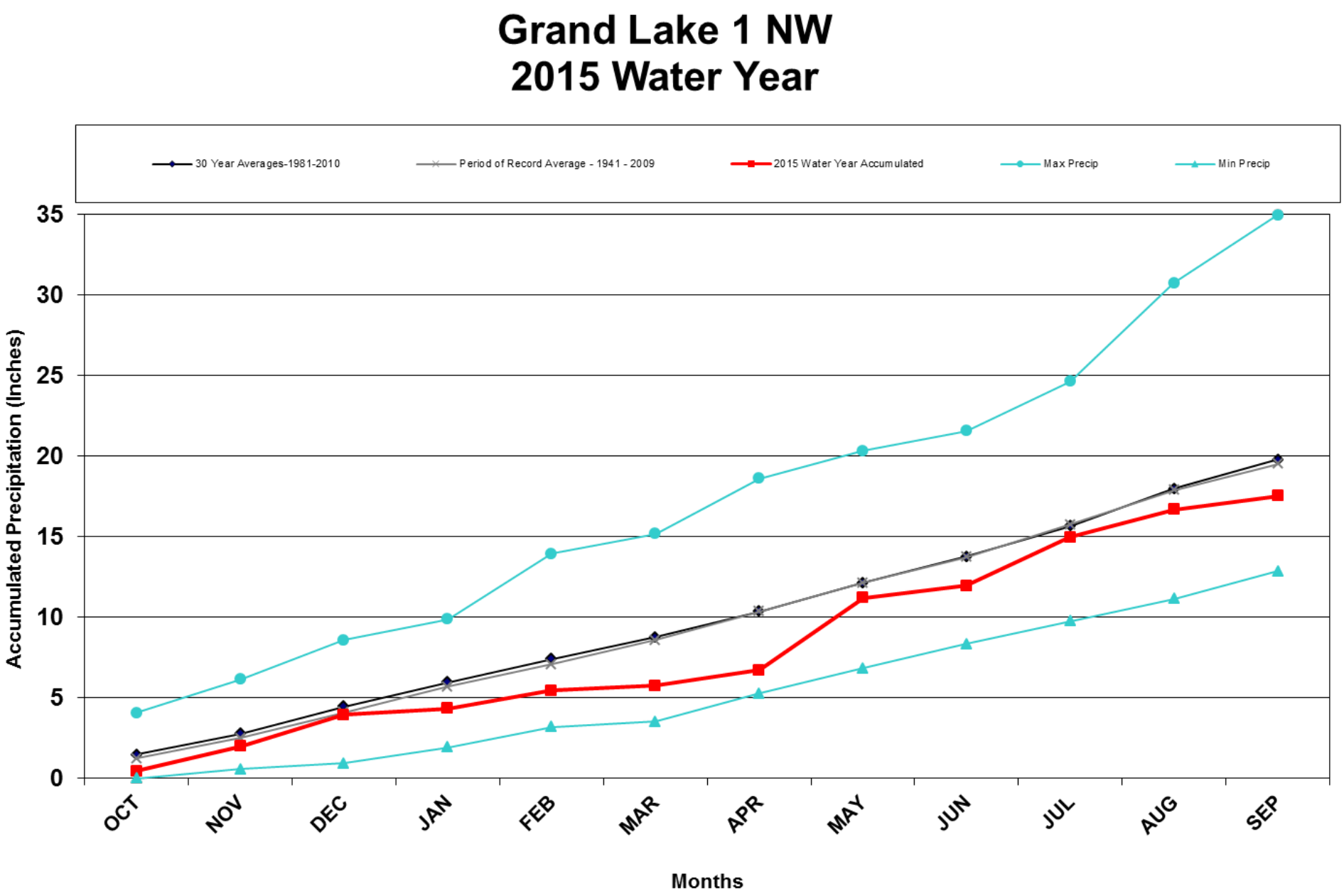
Climate divisions defined by Dr. Klaus Wolter of NOAA's Climate Diagnostic Center in Boulder, CO



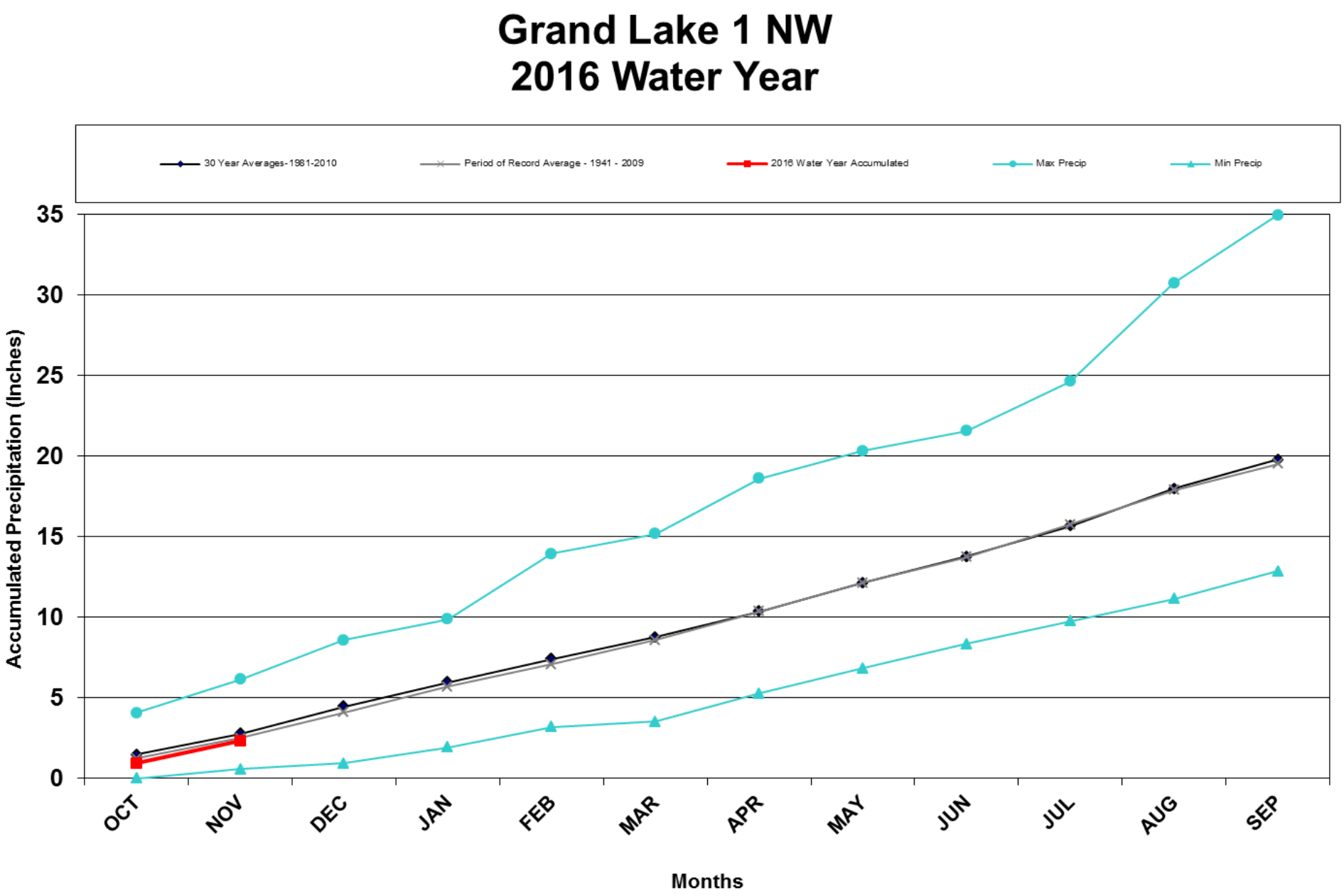
NWS Cooperative Stations for WATF



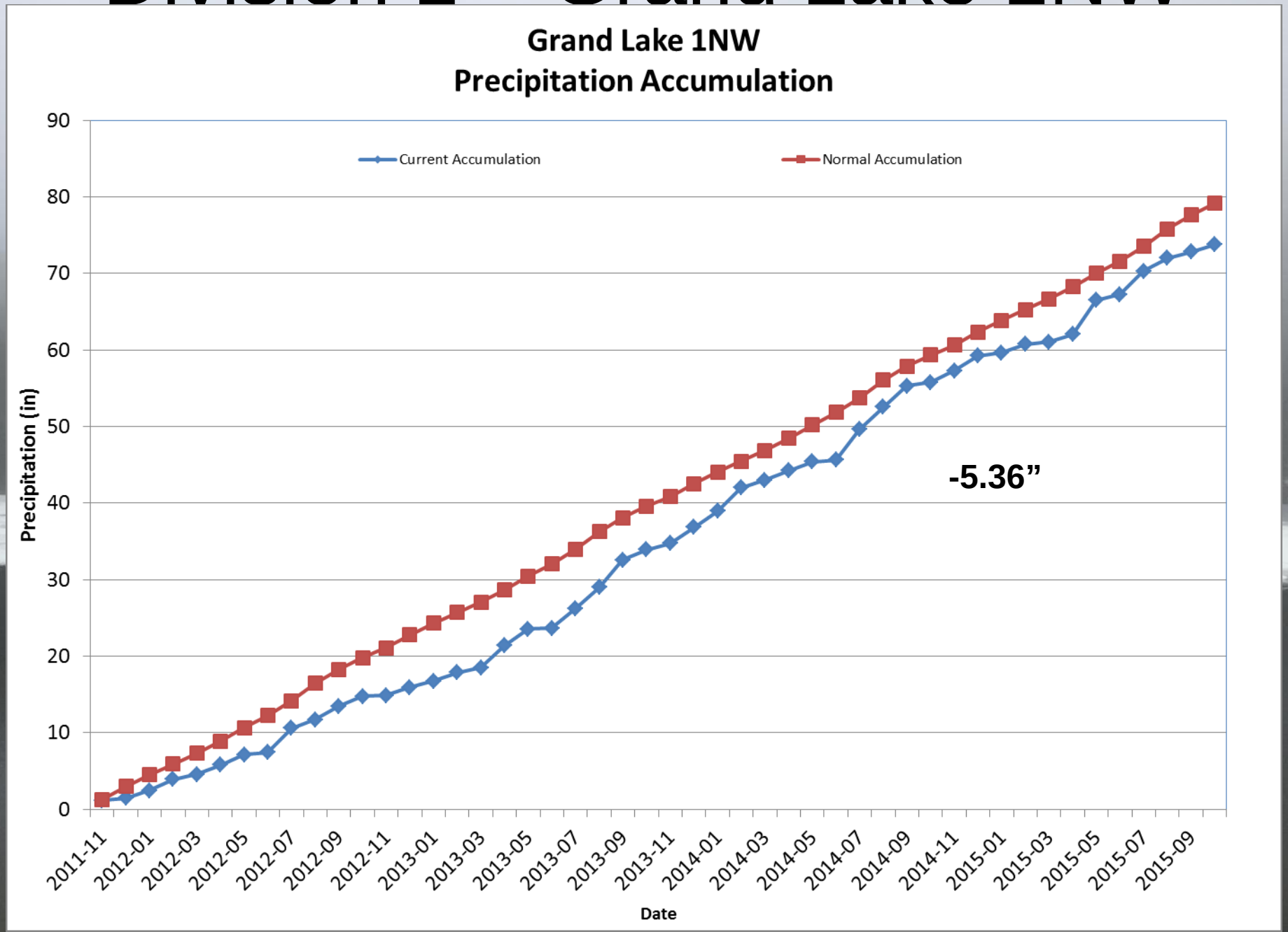
Division 1 – Grand Lake 1NW



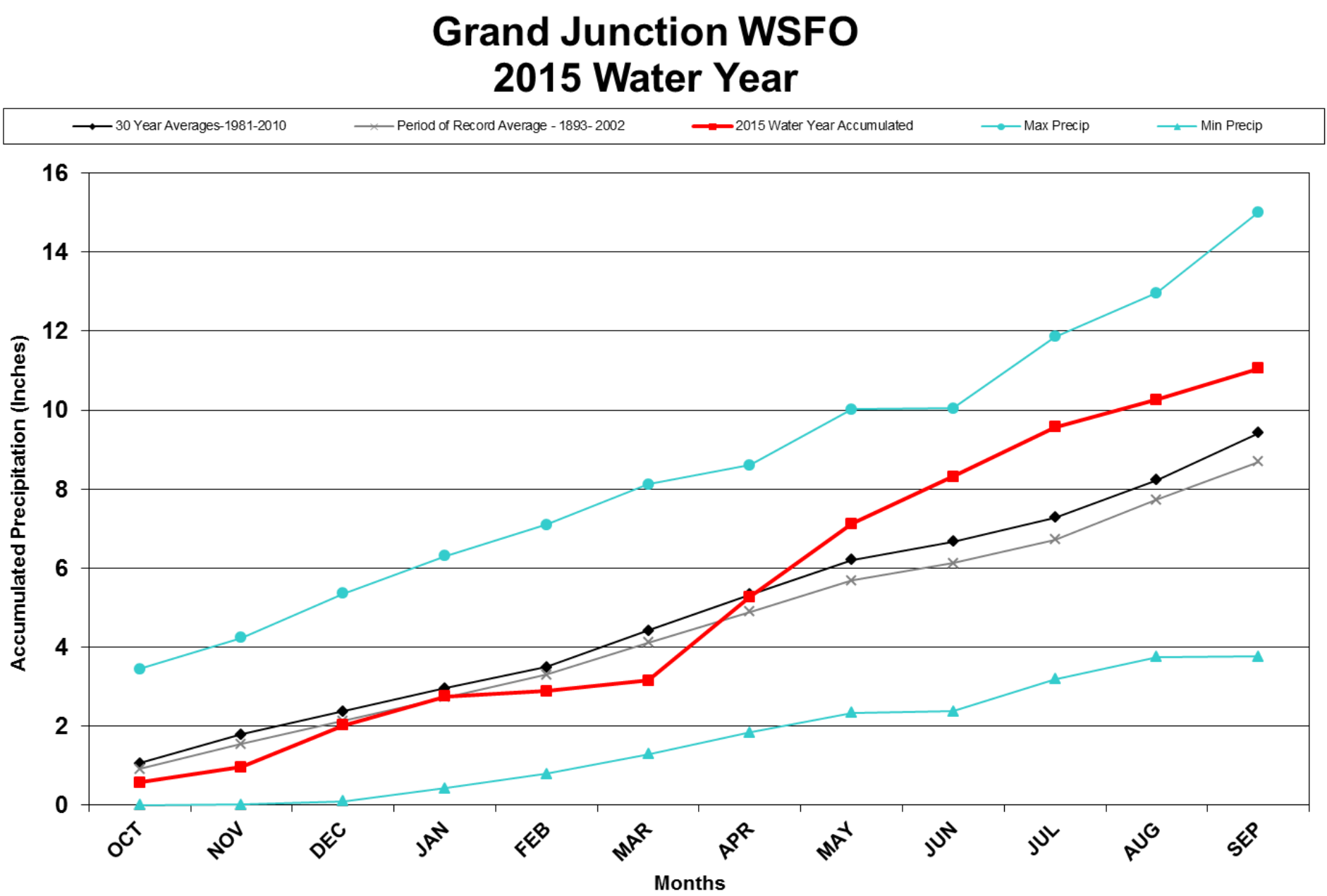
Division 1 – Grand Lake 1NW



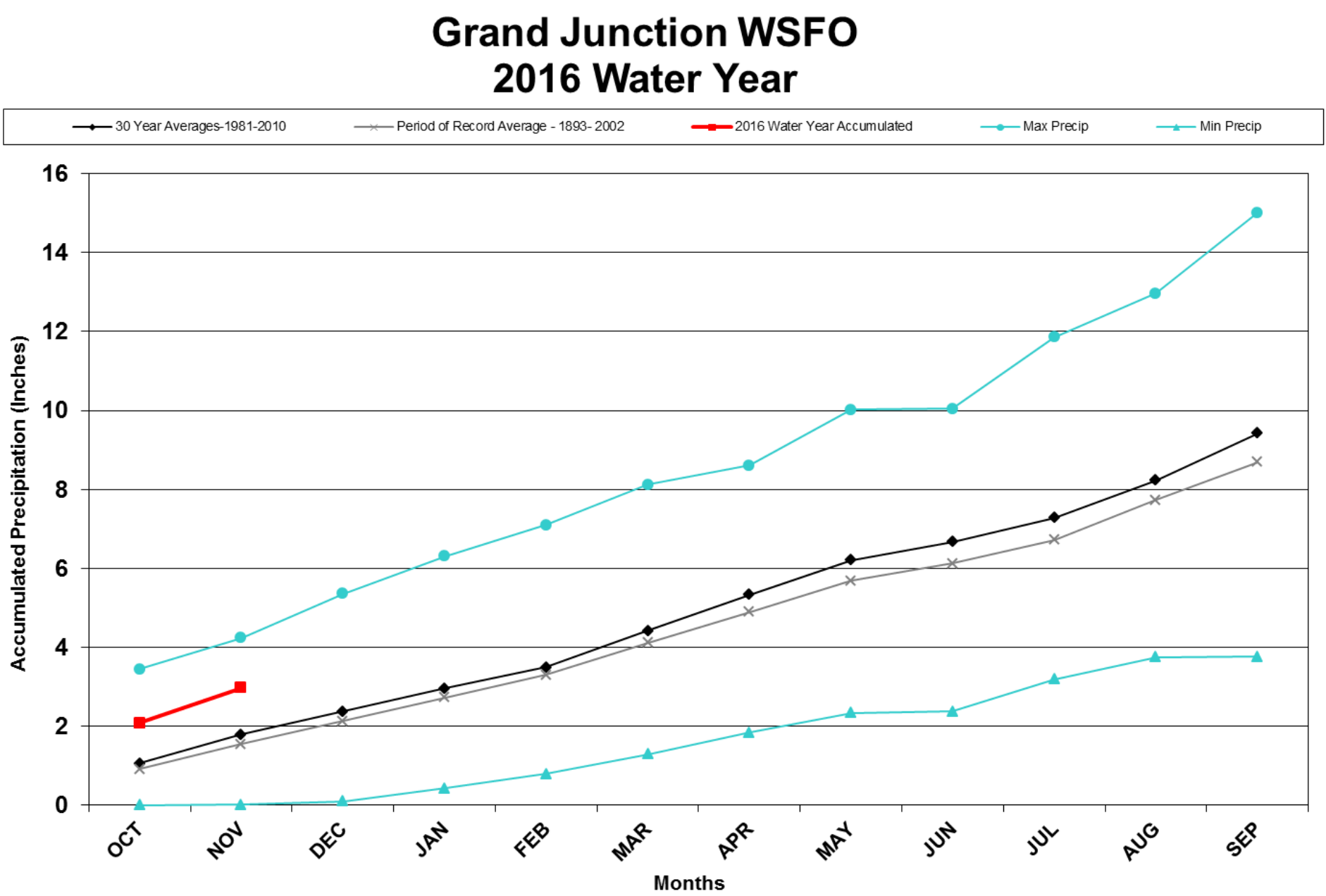
Division 1 – Grand Lake 1NW



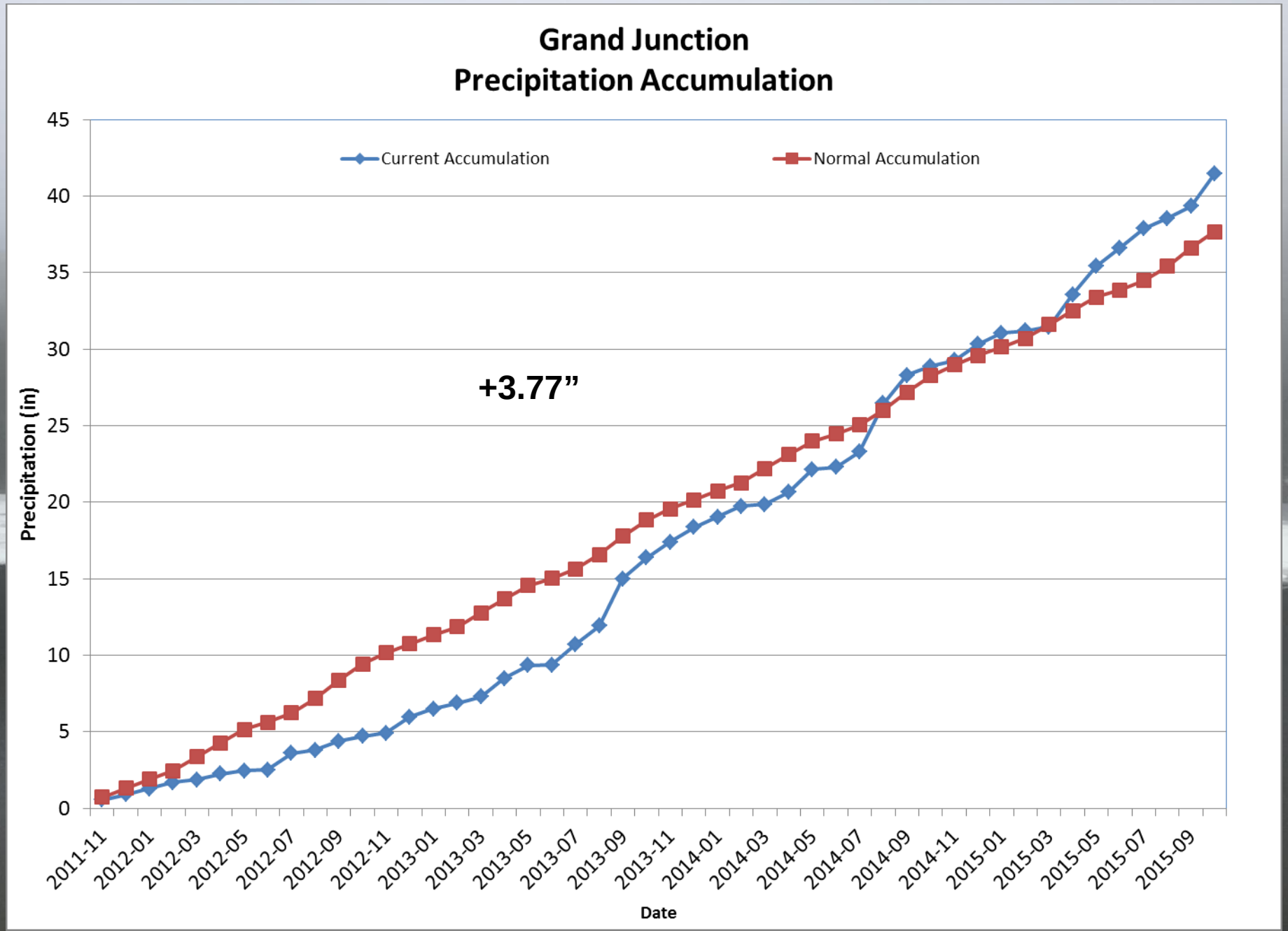
Division 2 – Grand Junction



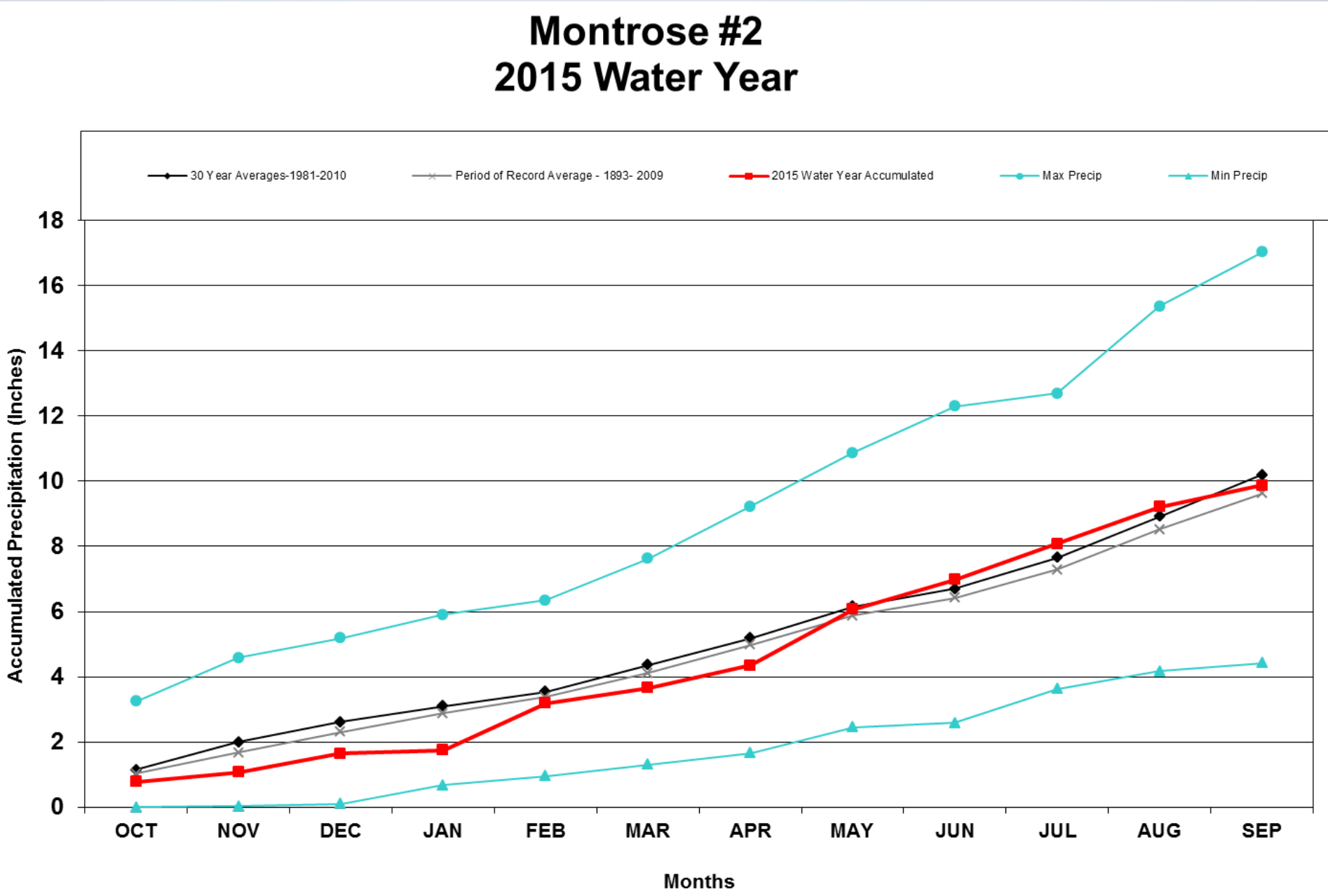
Division 2 – Grand Junction



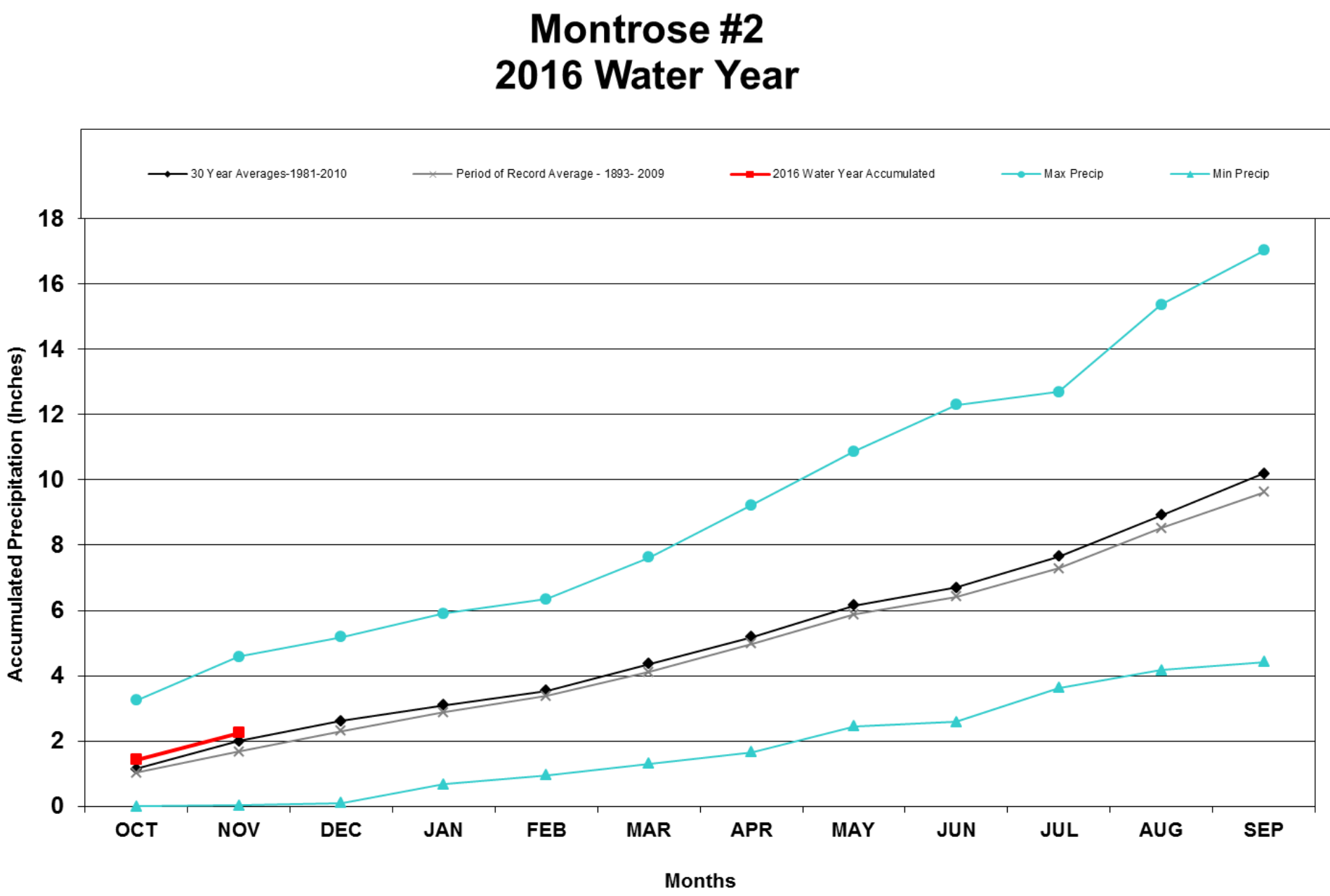
Division 2 – Grand Junction



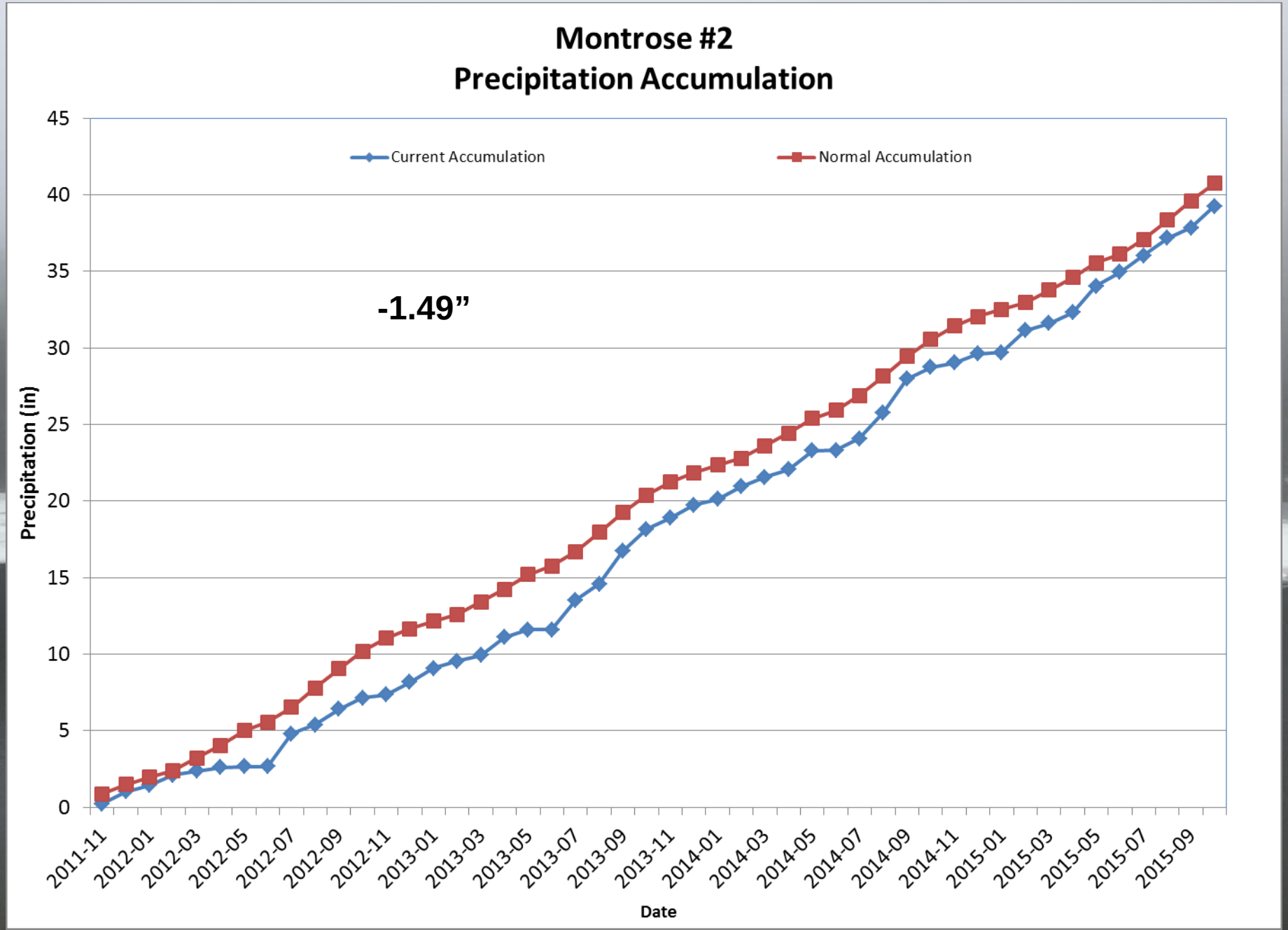
Division 3 – Montrose



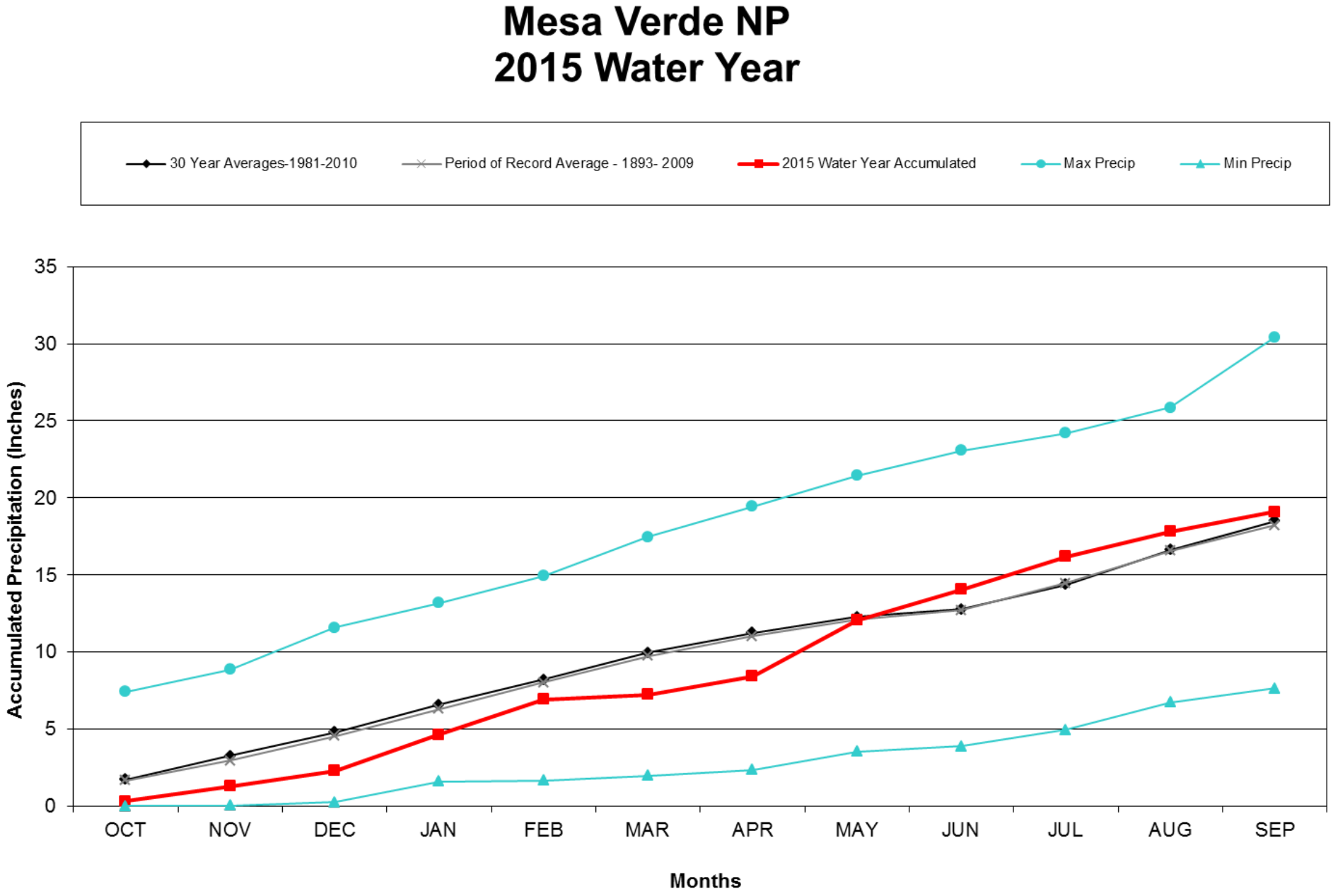
Division 3 – Montrose



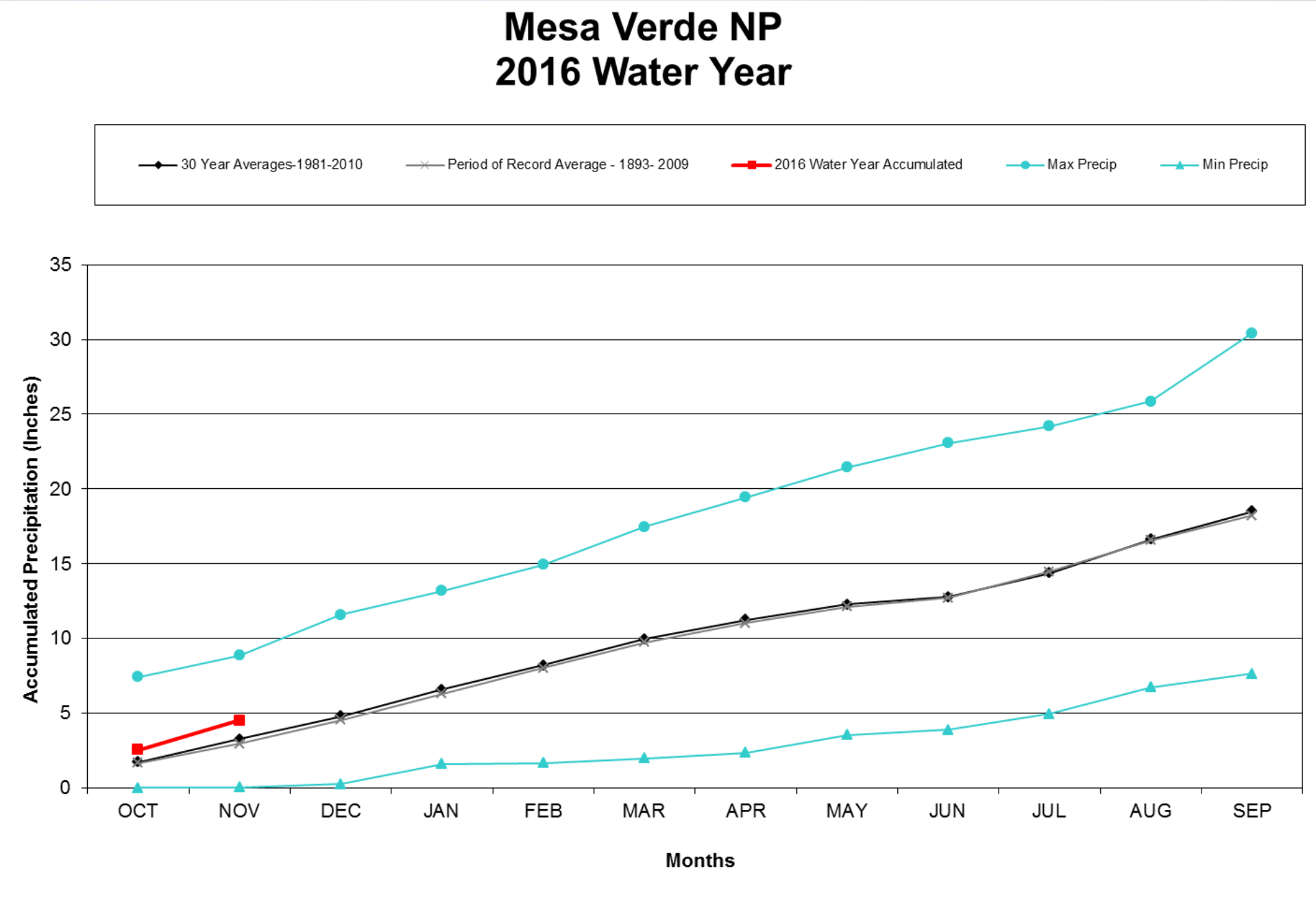
Division 3 – Montrose



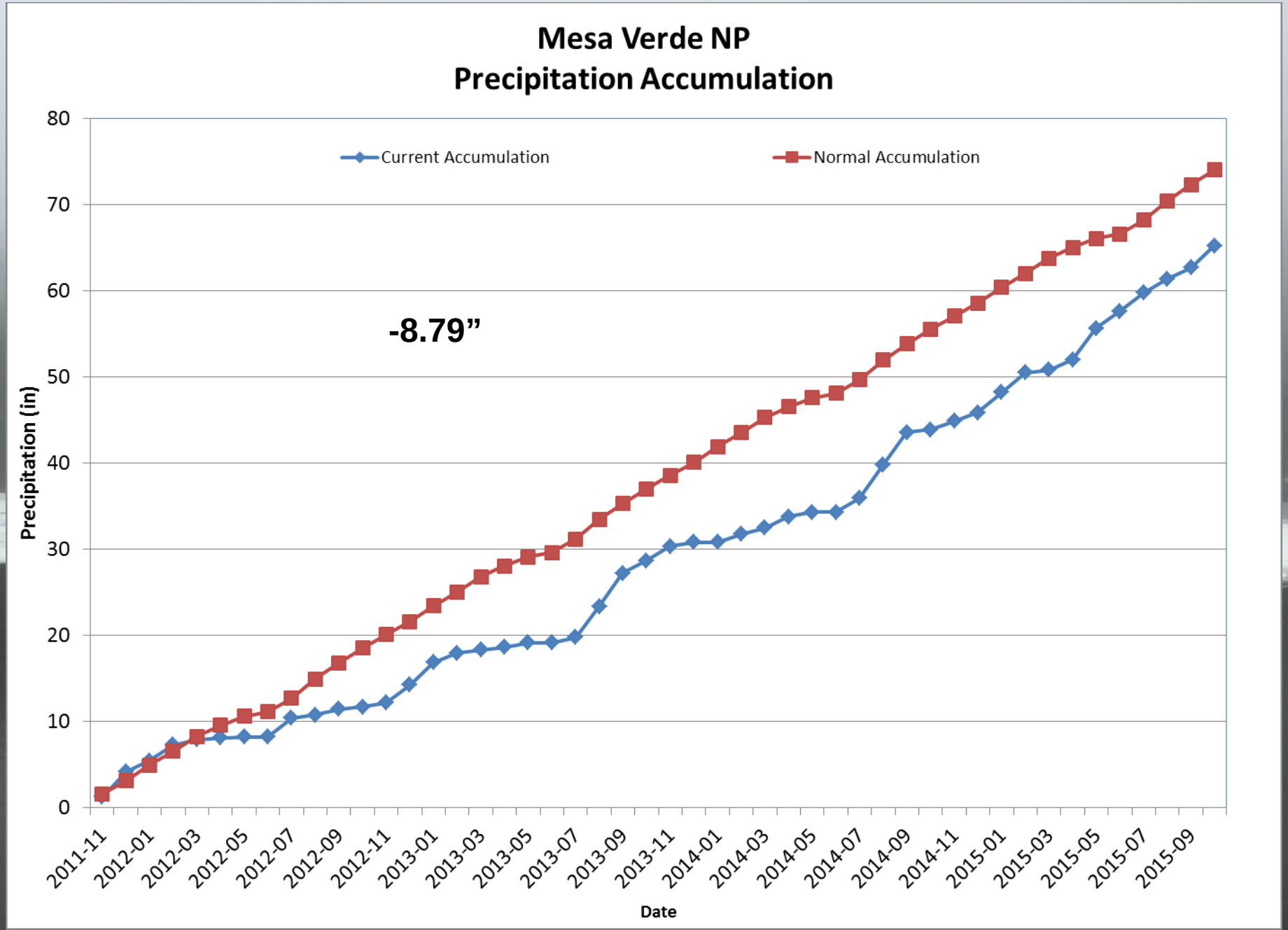
Division 3 – Mesa Verde NP



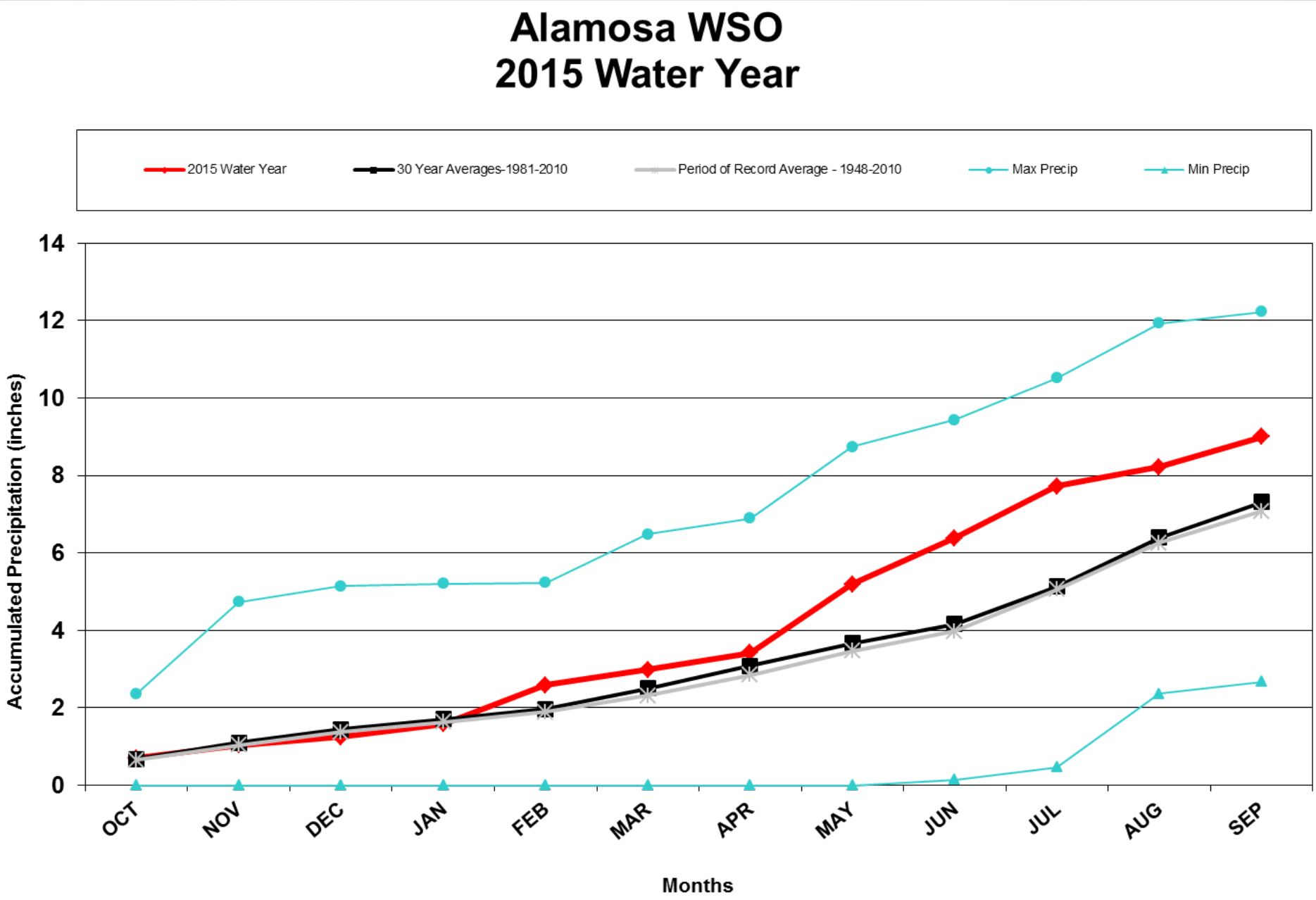
Division 3 – Mesa Verde NP



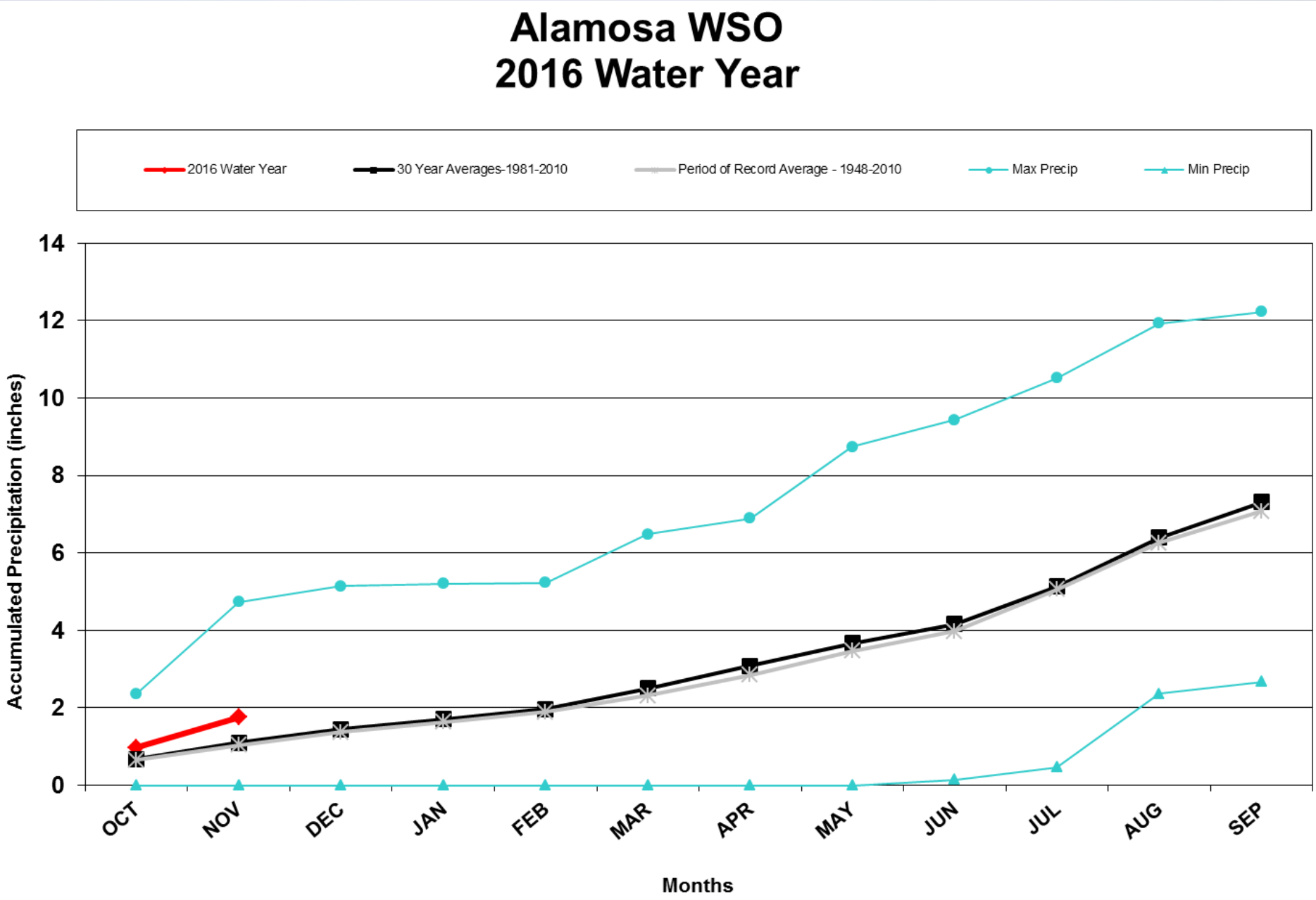
Division 3 – Mesa Verde NP



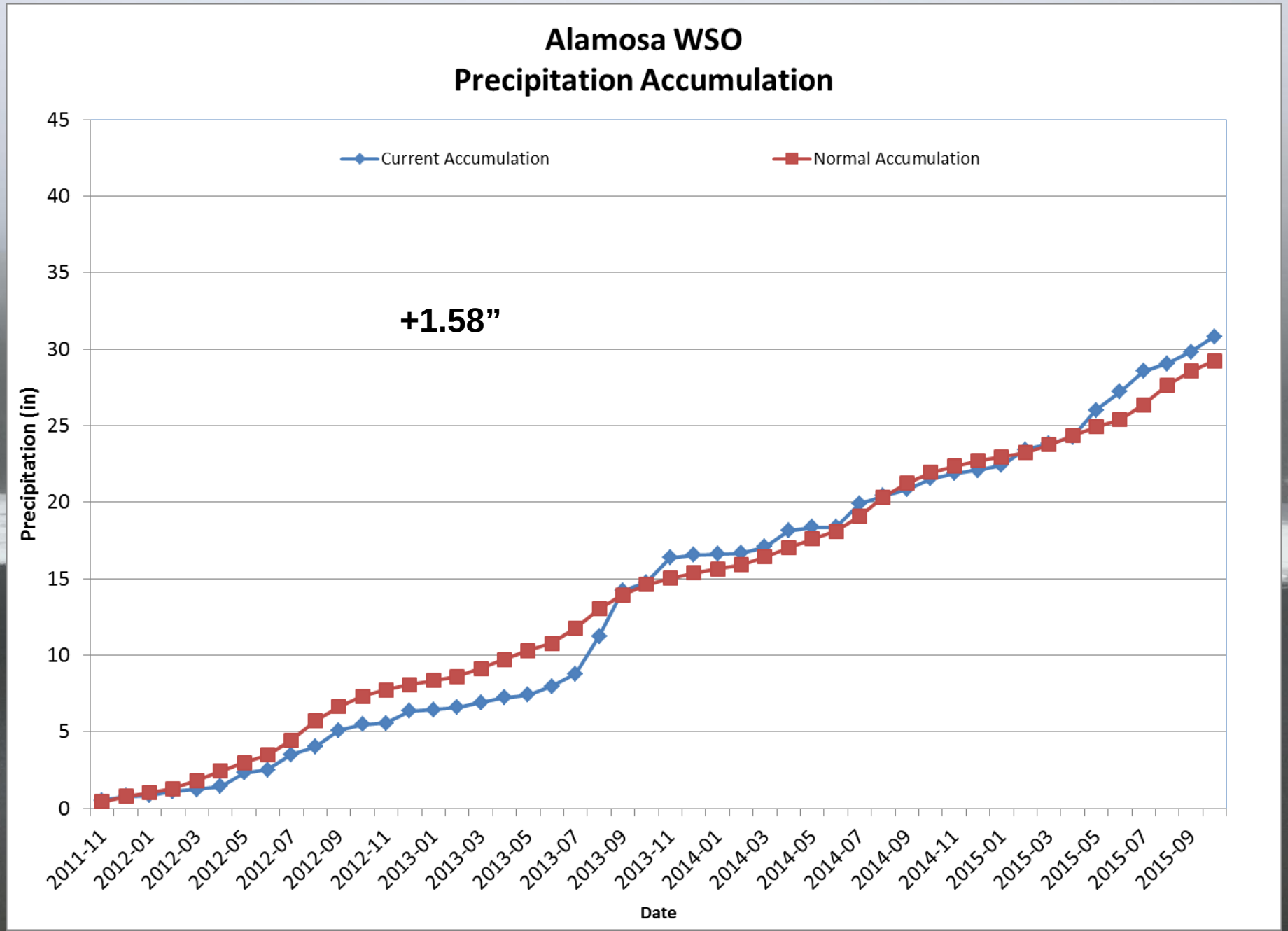
Division 4 – Alamosa



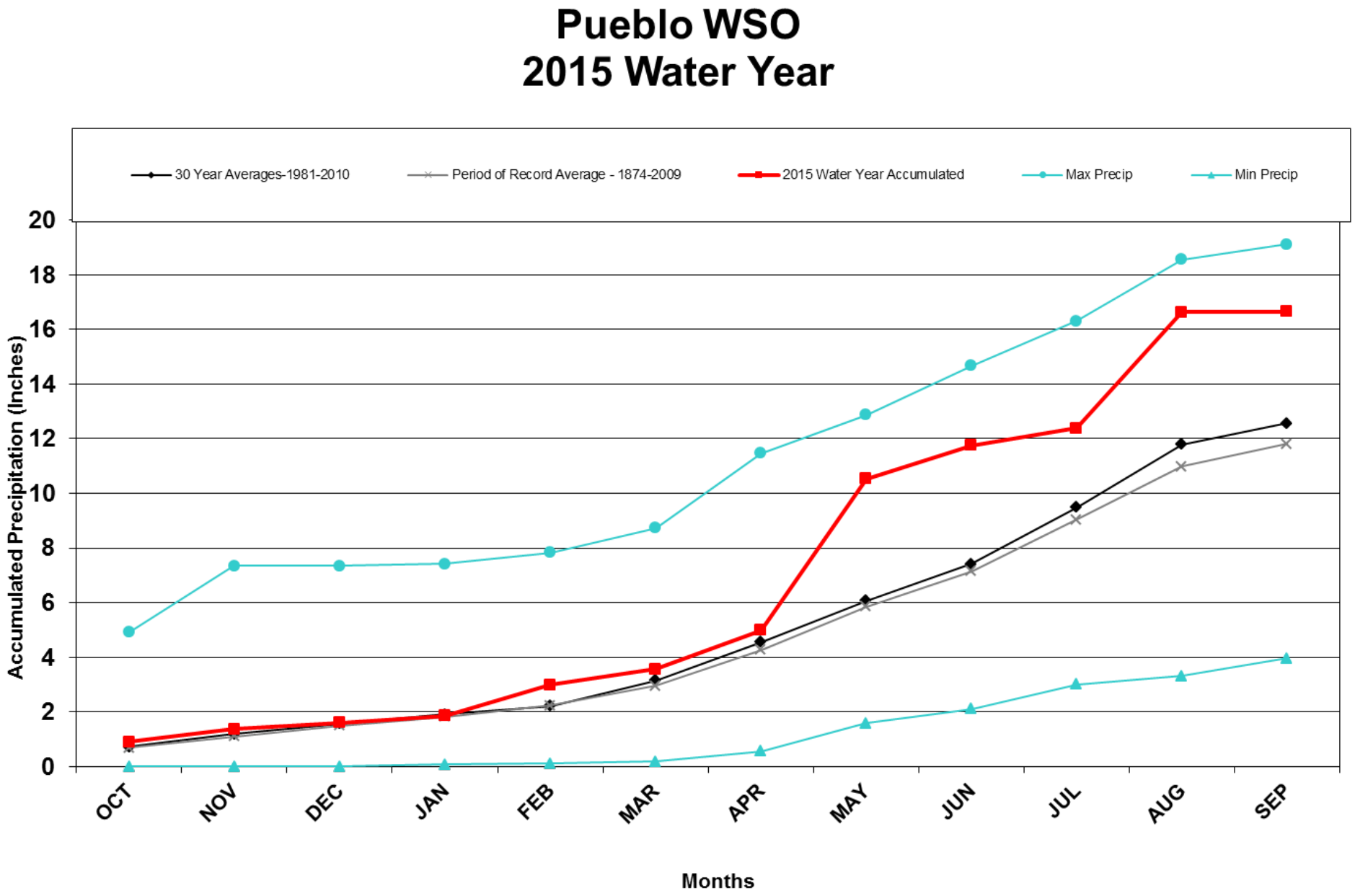
Division 4 – Alamosa



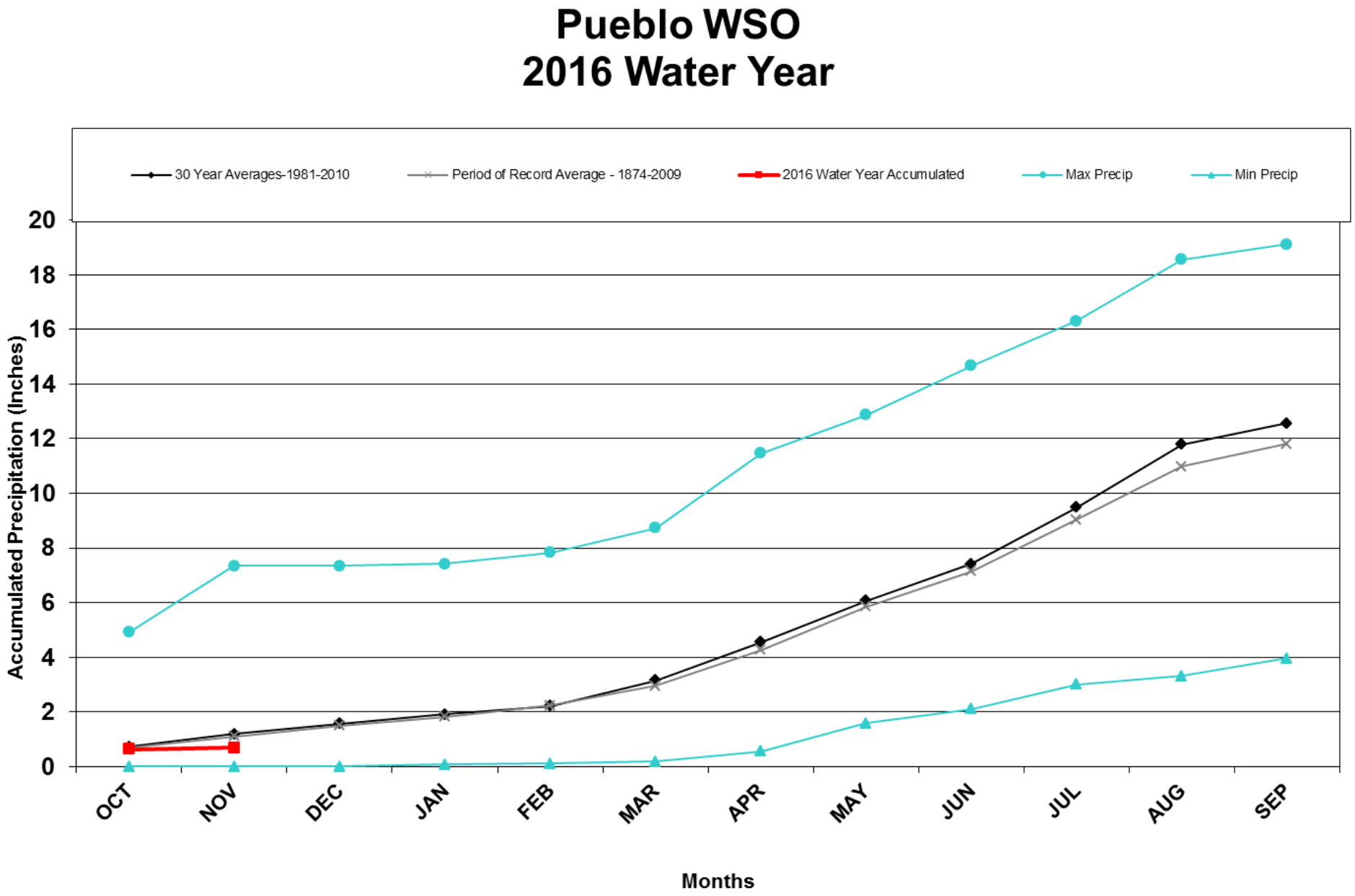
Division 4 – Alamosa



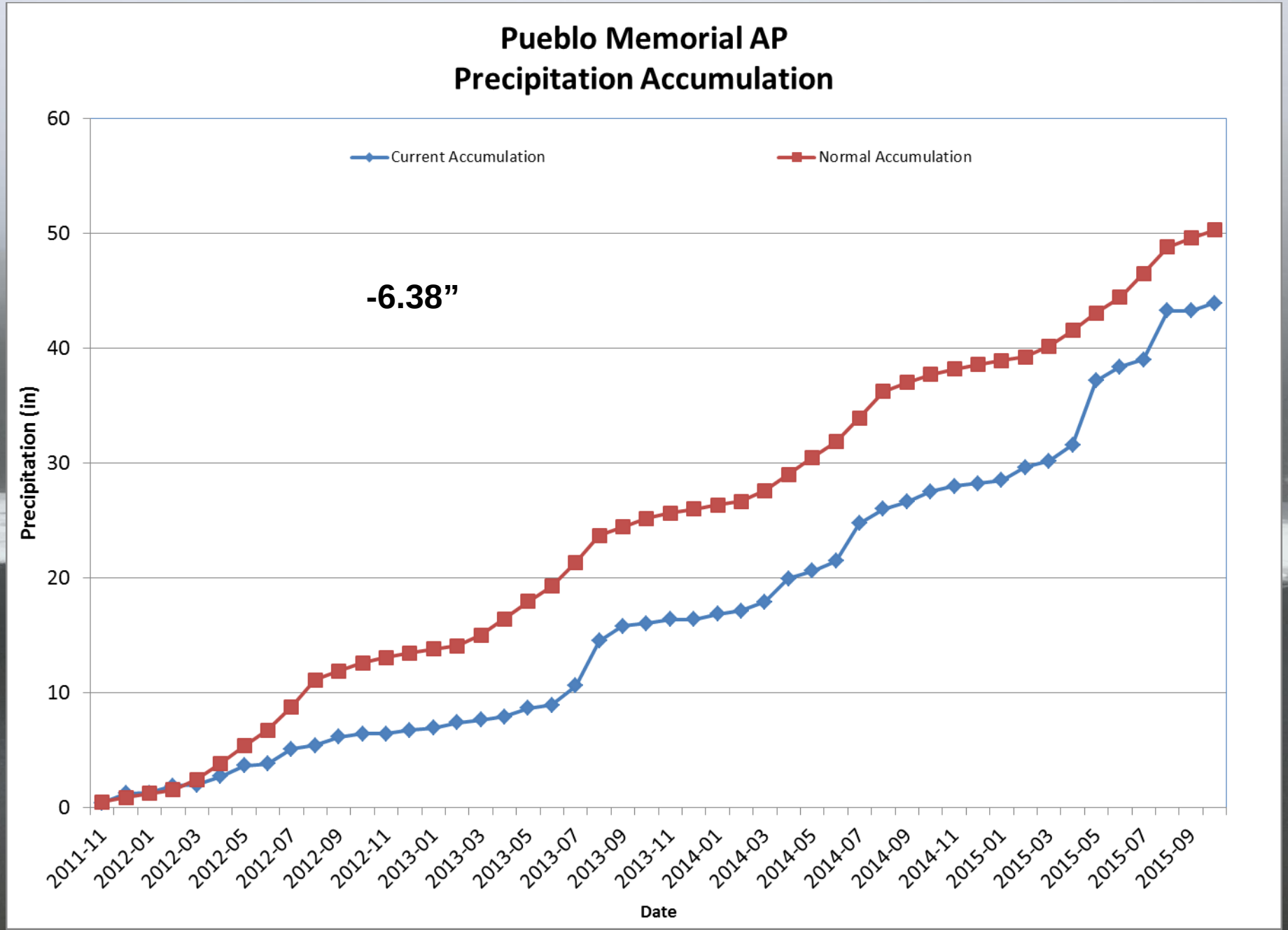
Division 5 – Pueblo



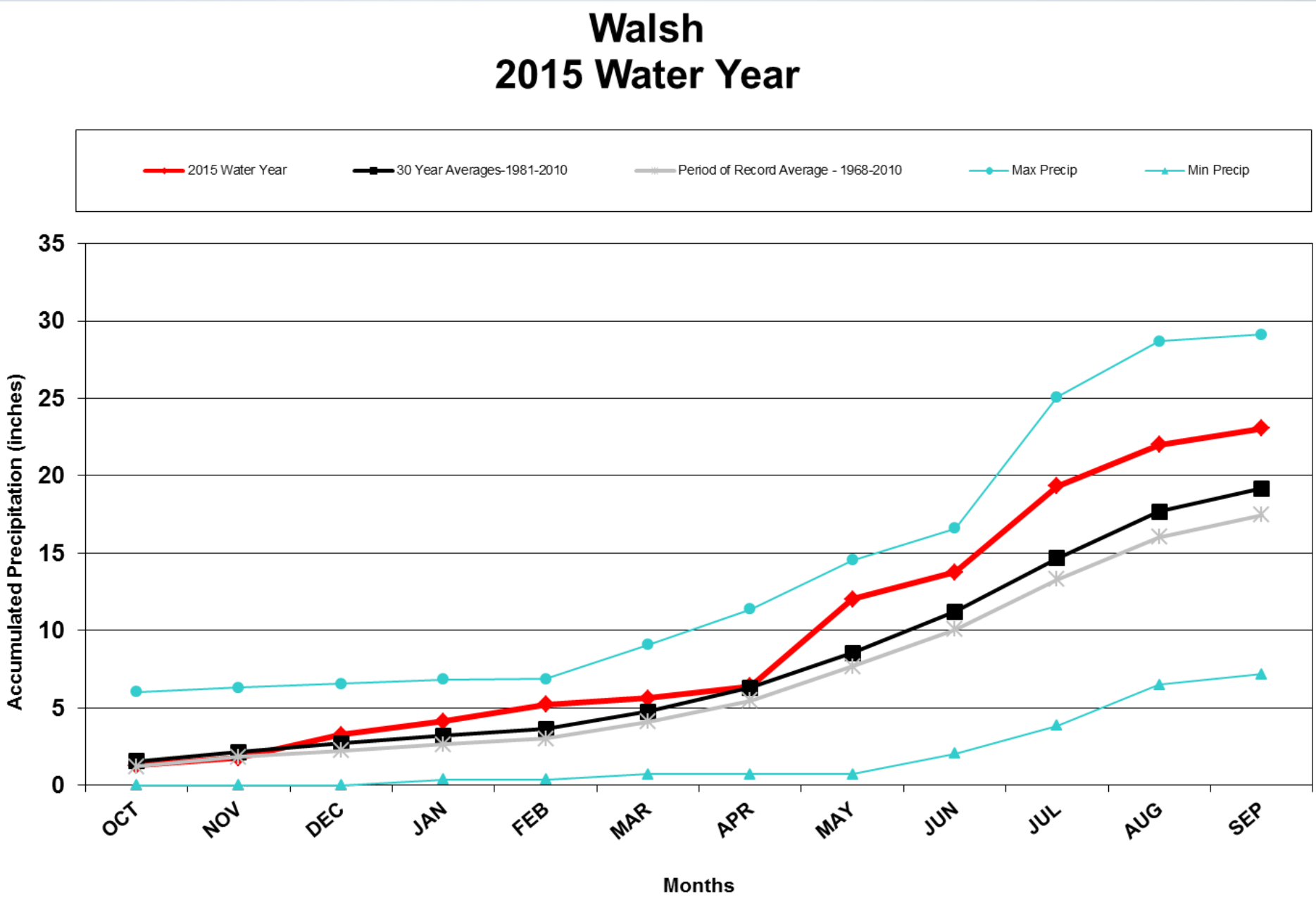
Division 5 – Pueblo



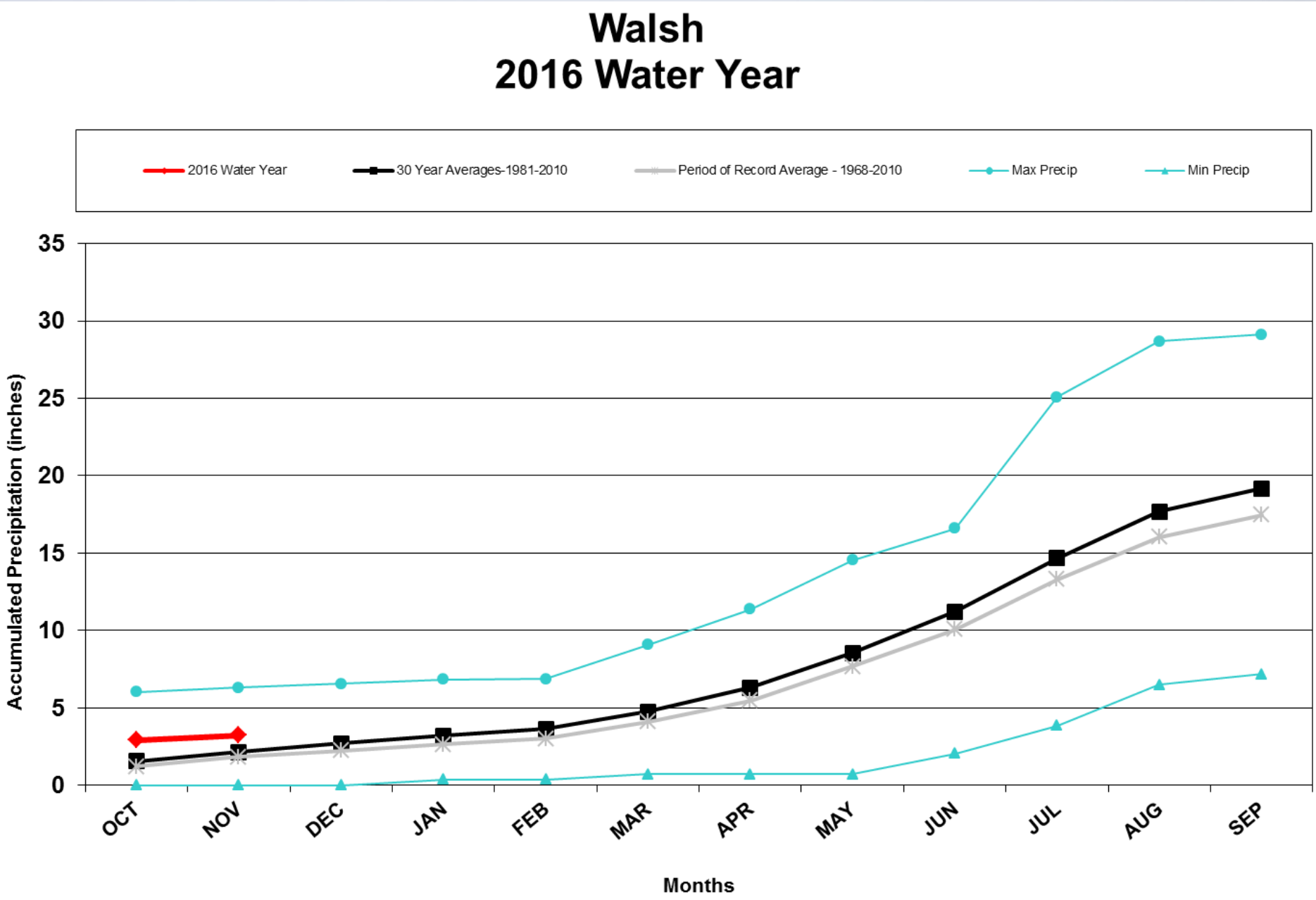
Division 5 – Pueblo



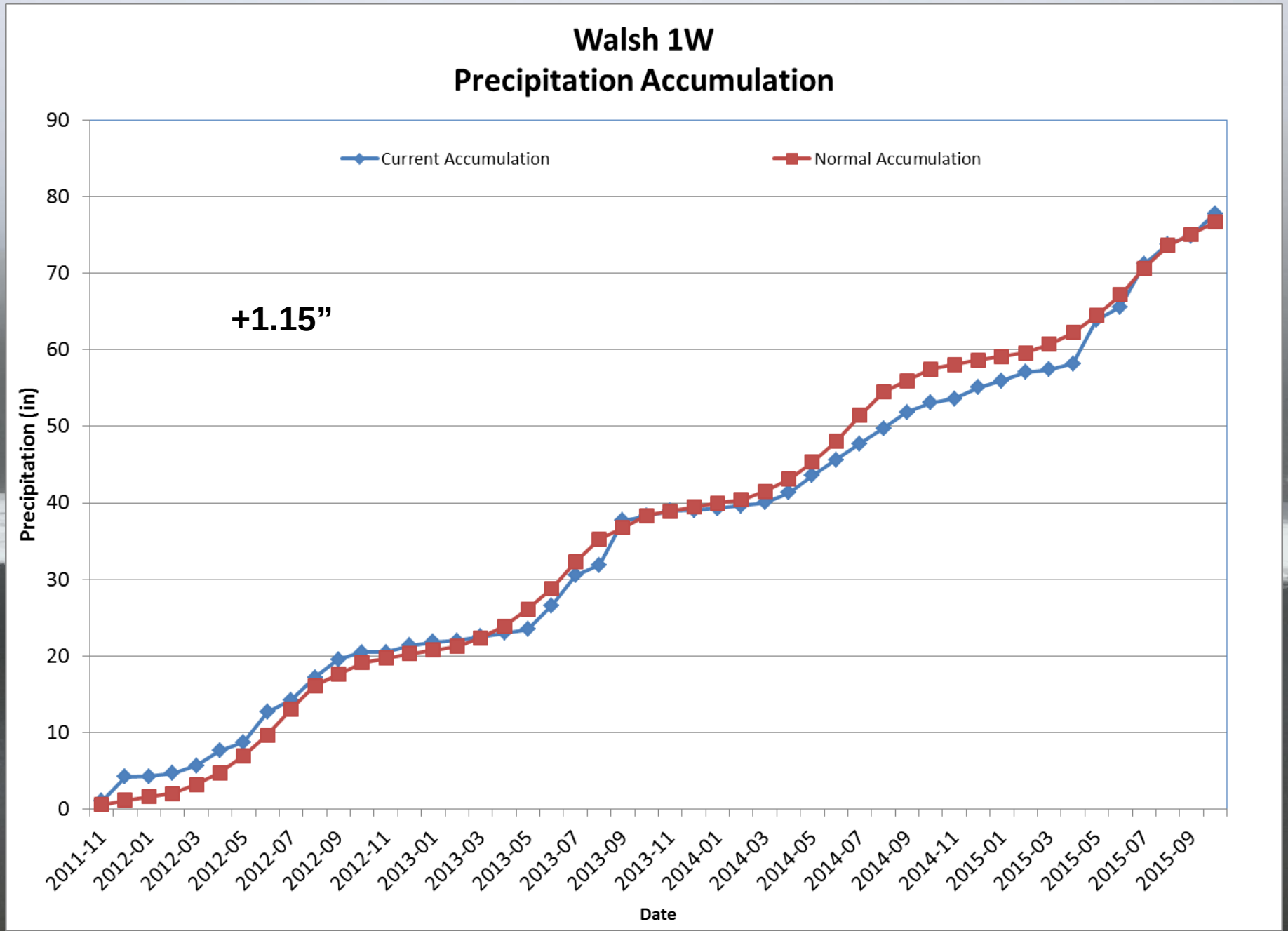
Division 6 - Walsh



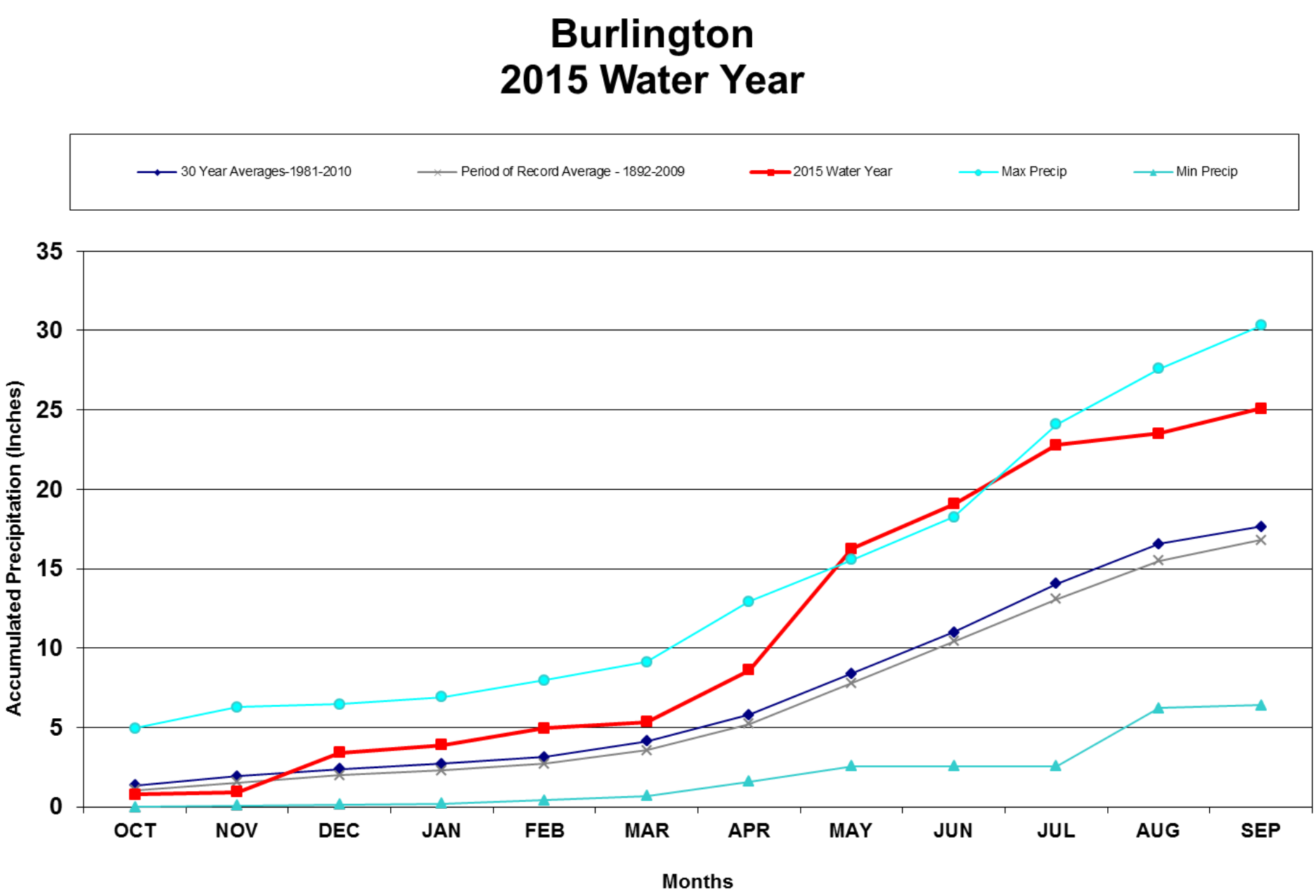
Division 6 - Walsh



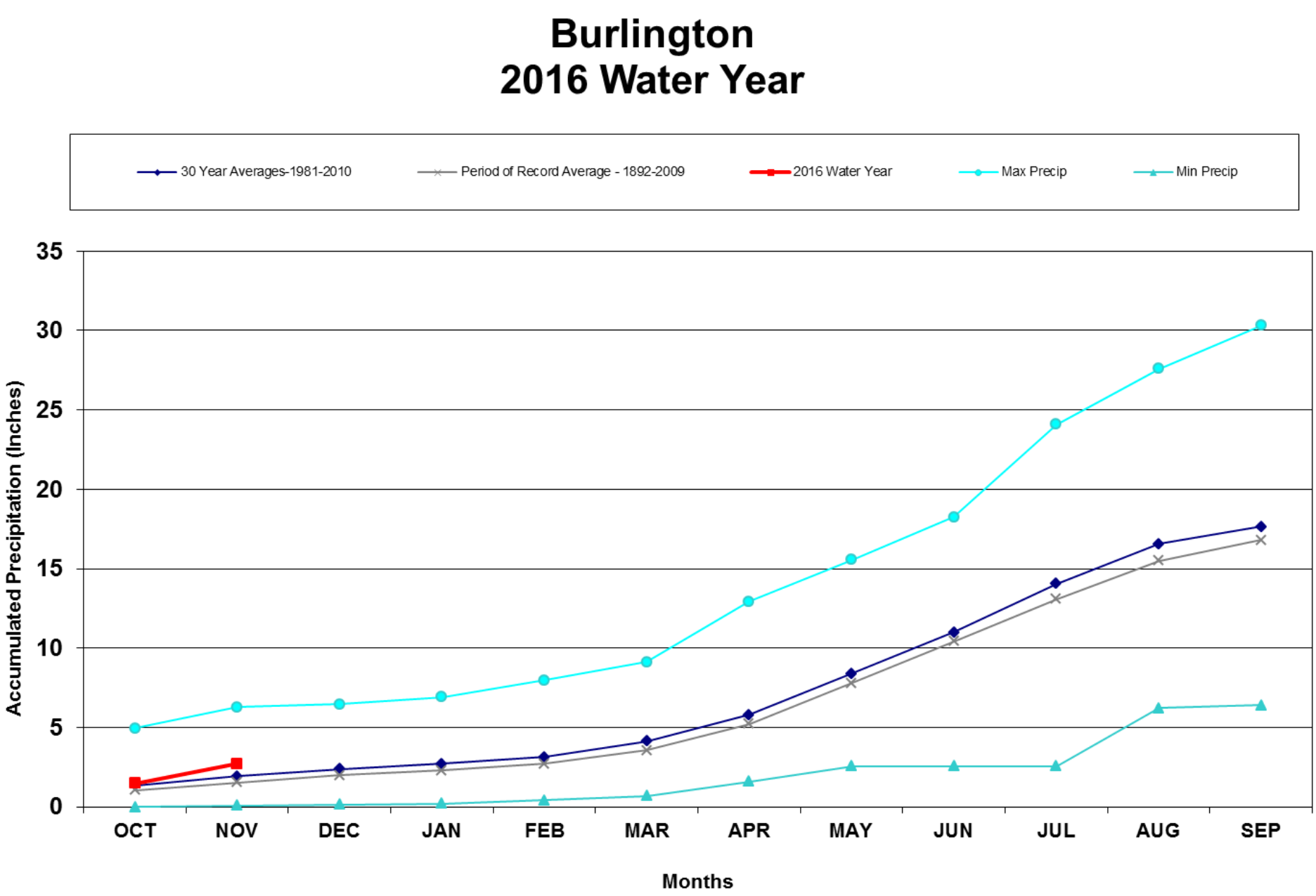
Division 6 - Walsh



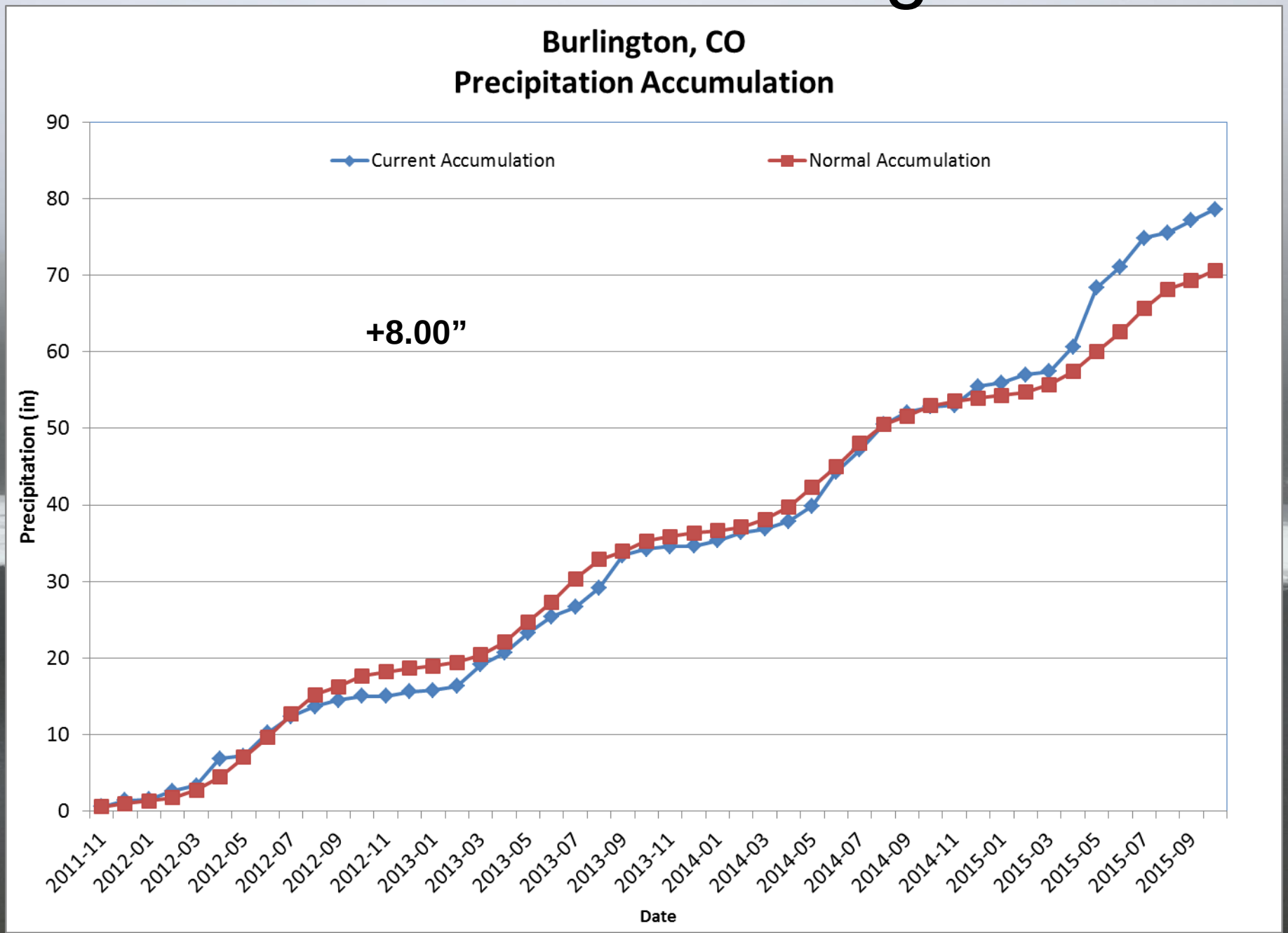
Division 6 - Burlington



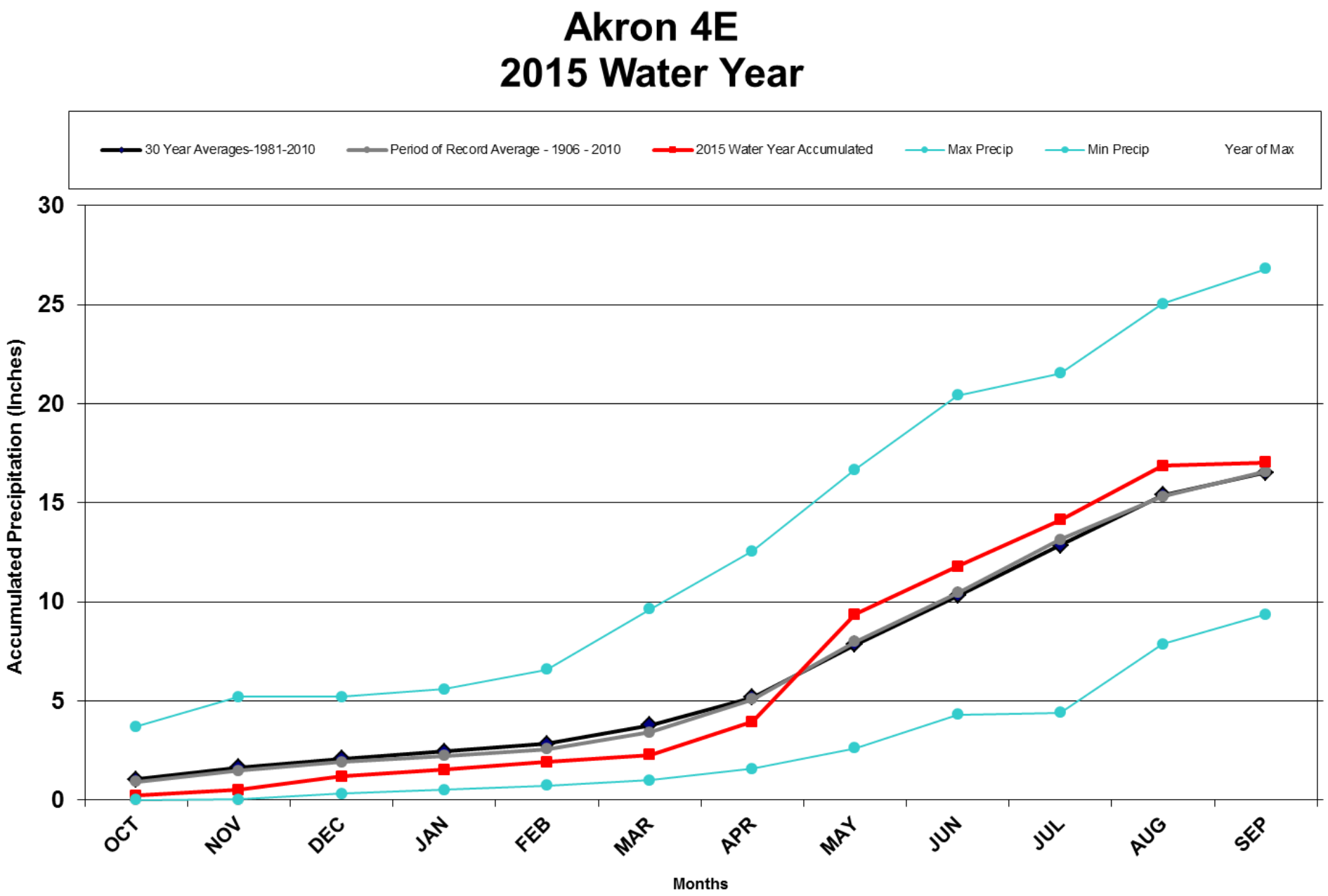
Division 6 - Burlington



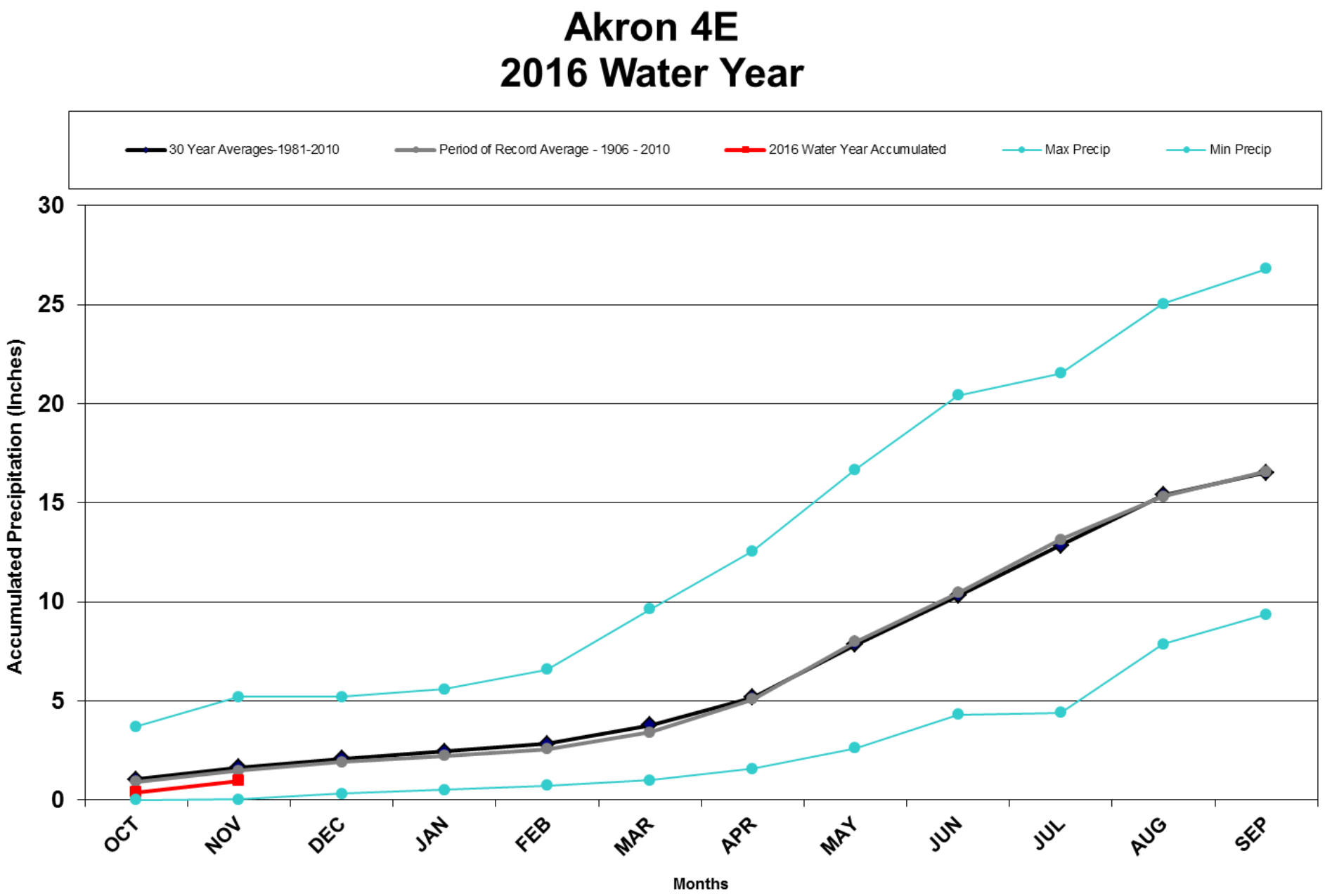
Division 6 - Burlington



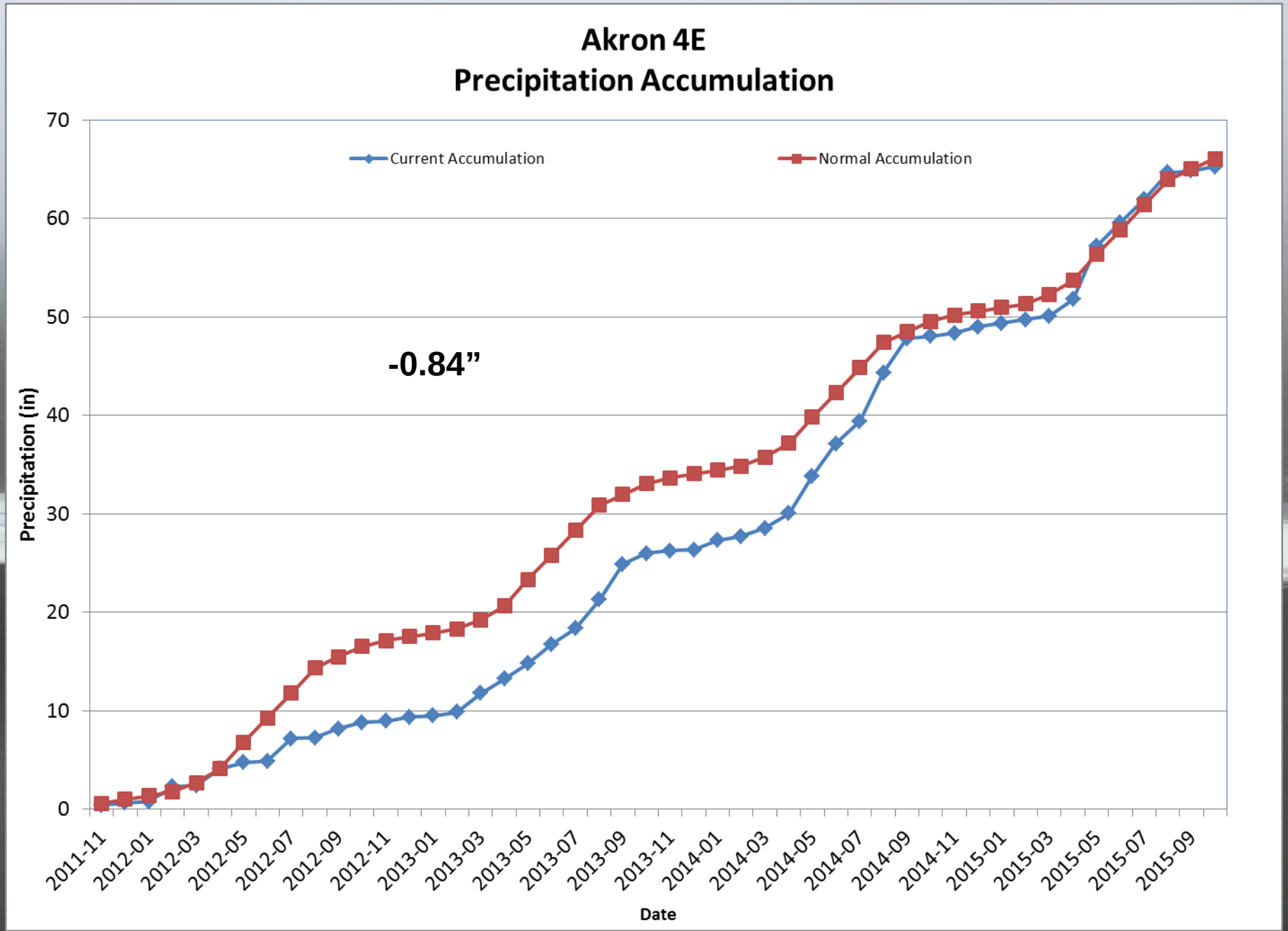
Division 7 – Akron



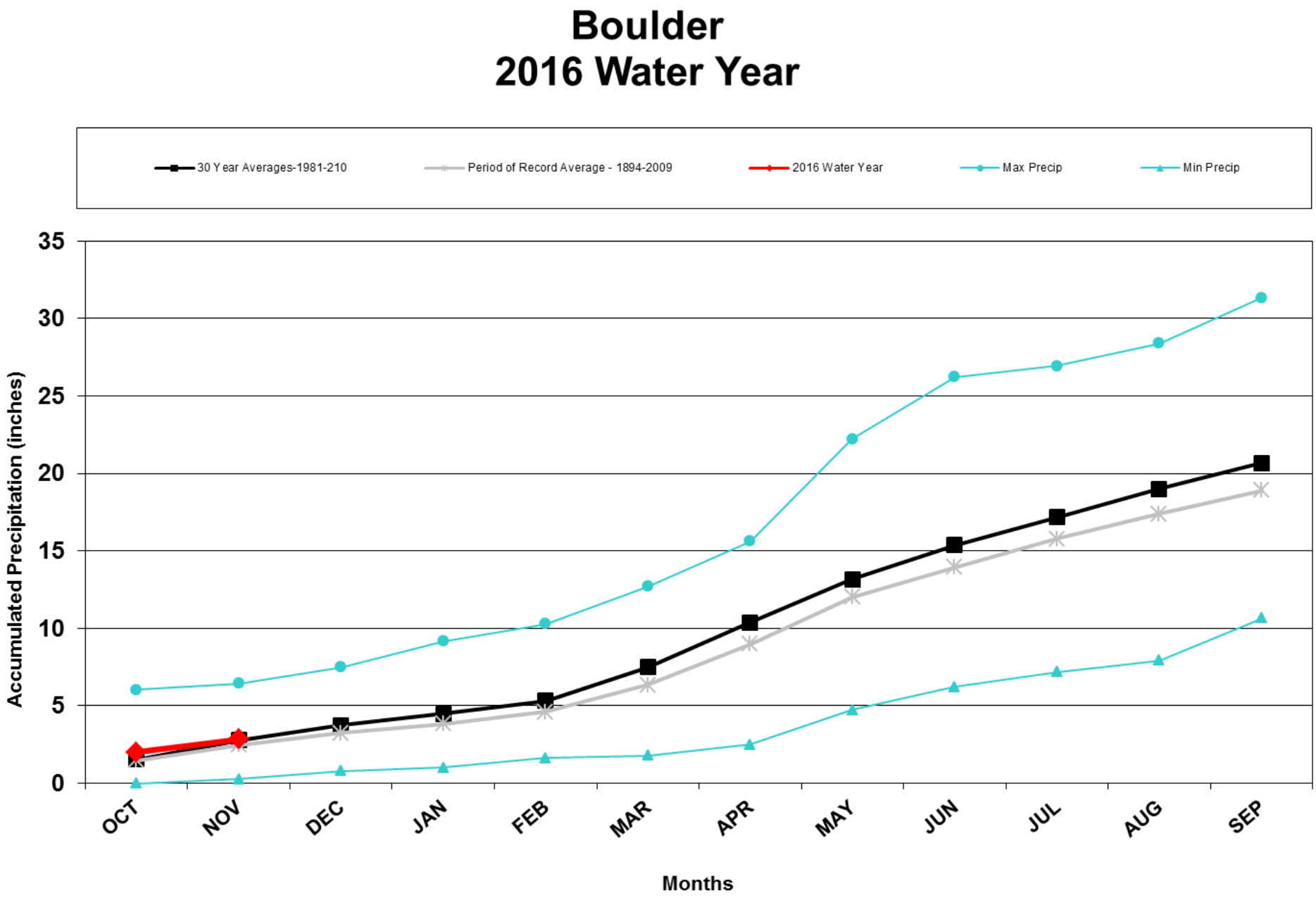
Division 7 – Akron



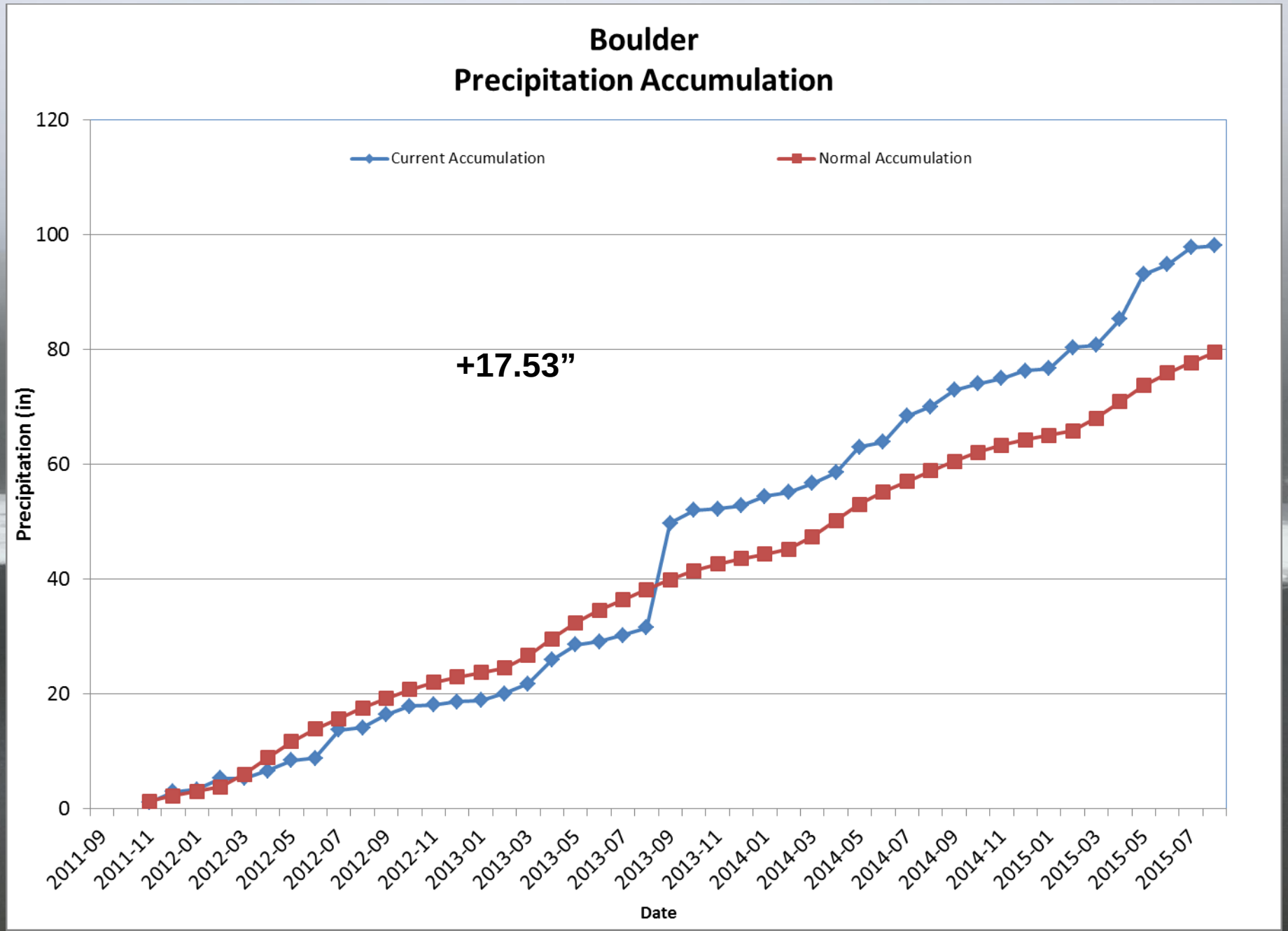
Division 7 – Akron



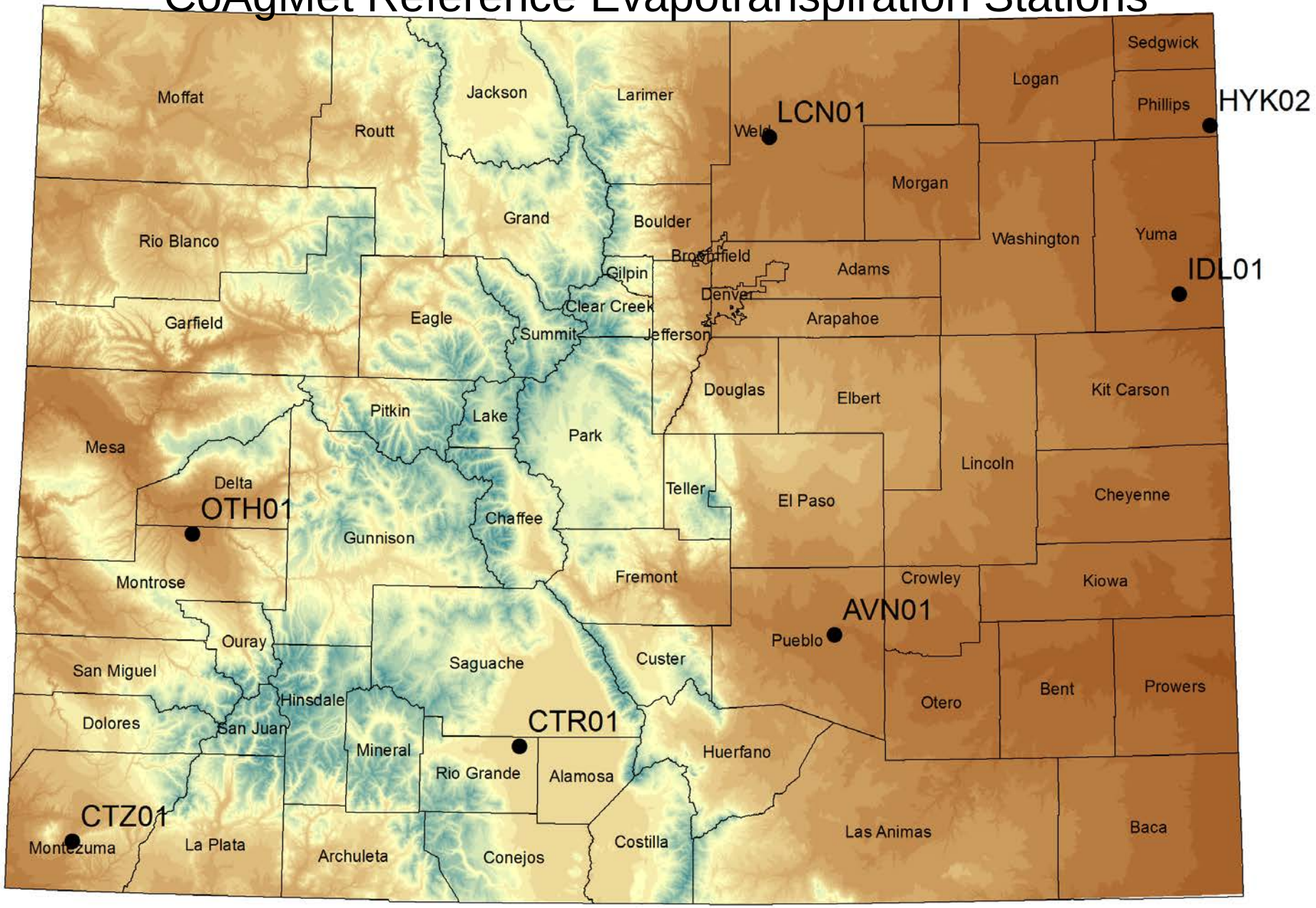
Division 8 - Boulder

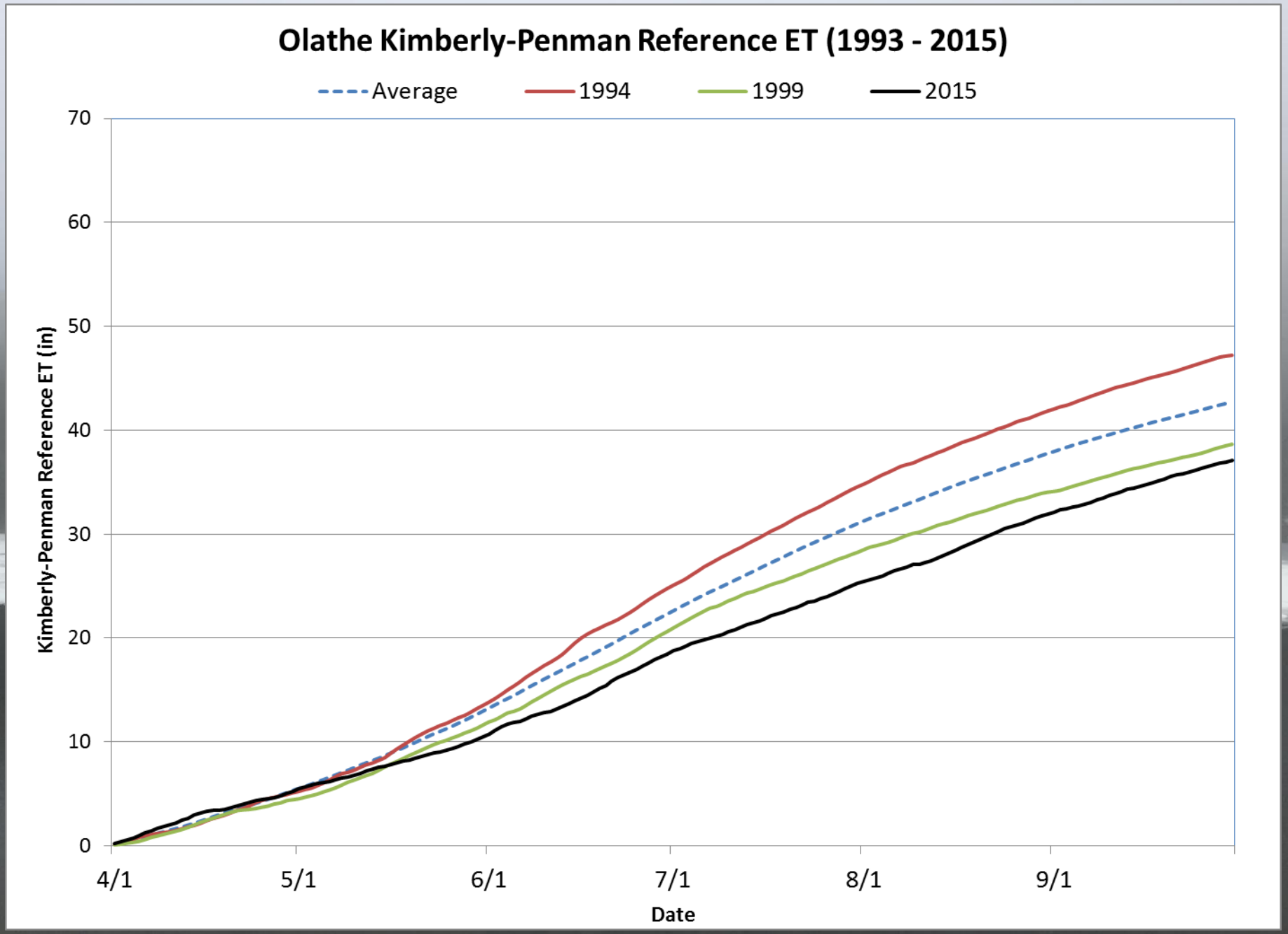


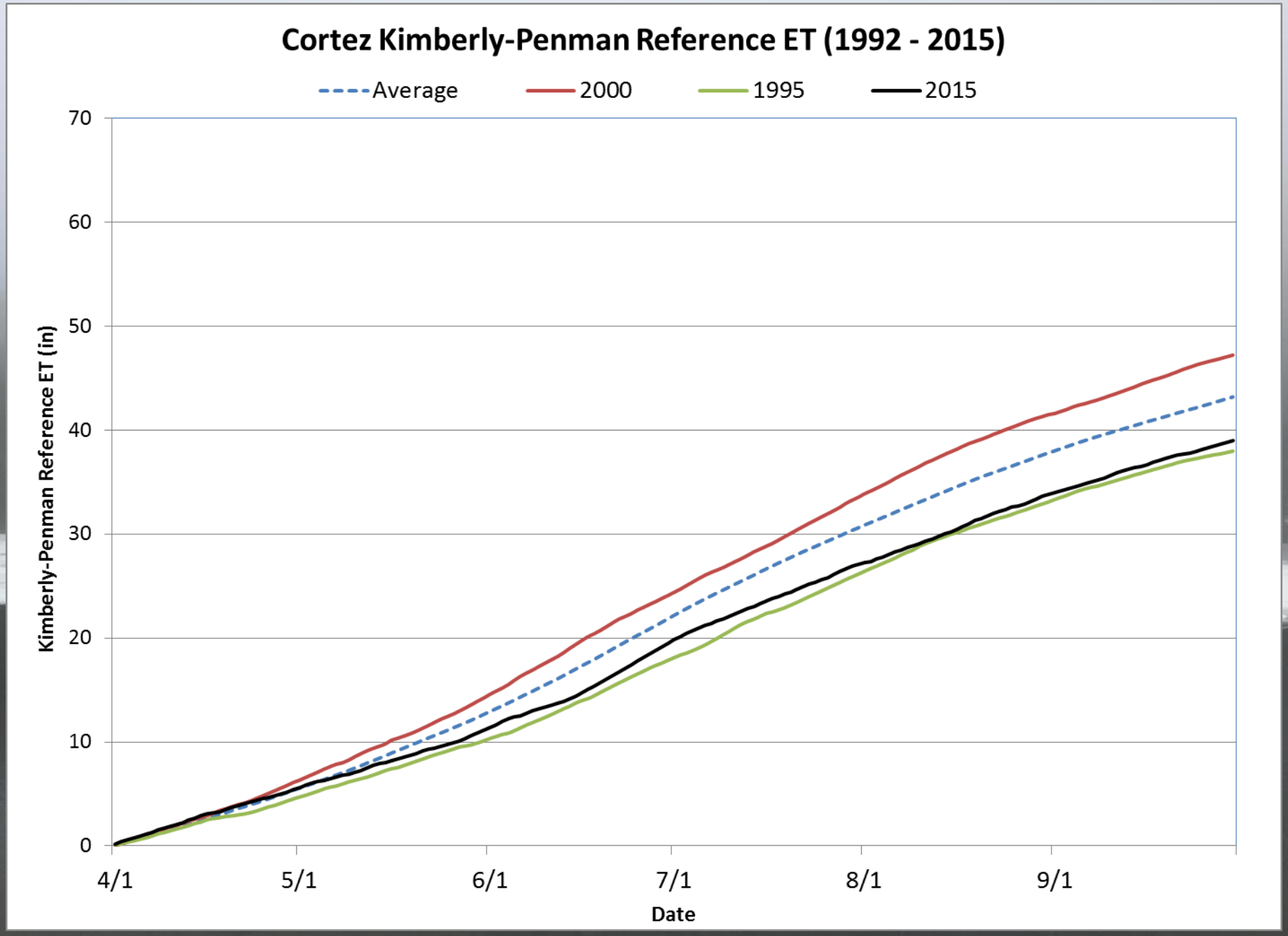
Division 8 - Boulder

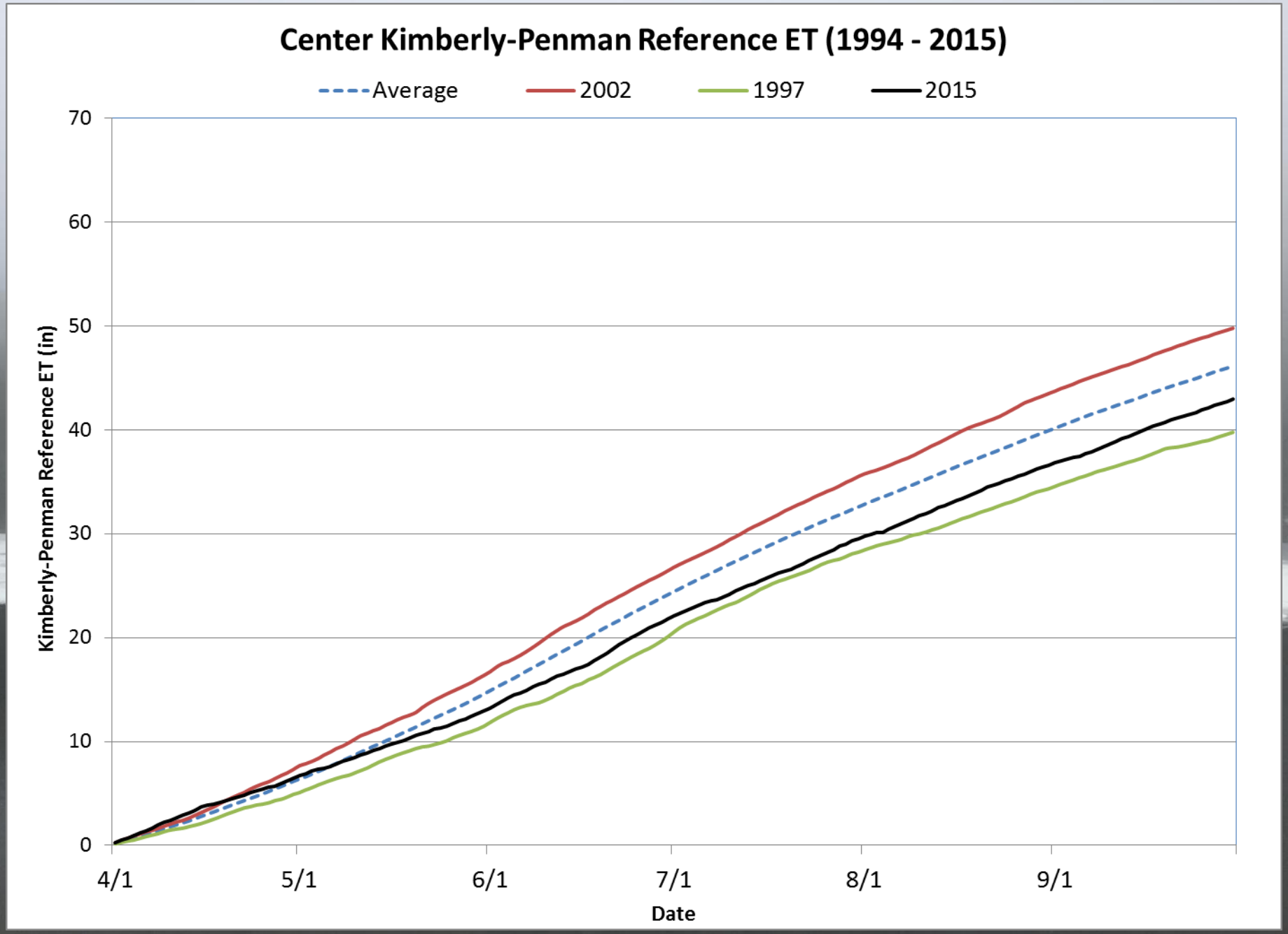


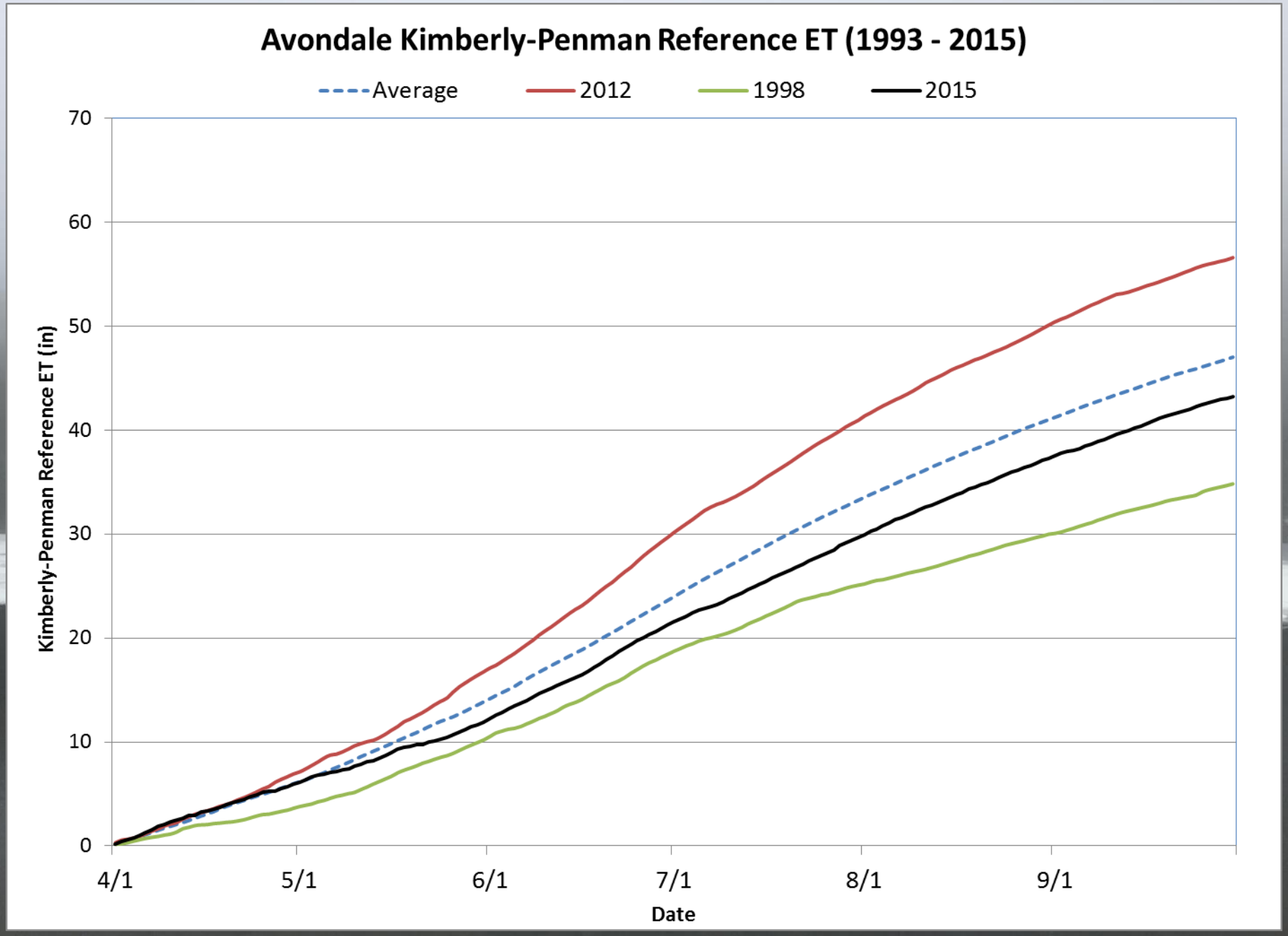
CoAgMet Reference Evapotranspiration Stations

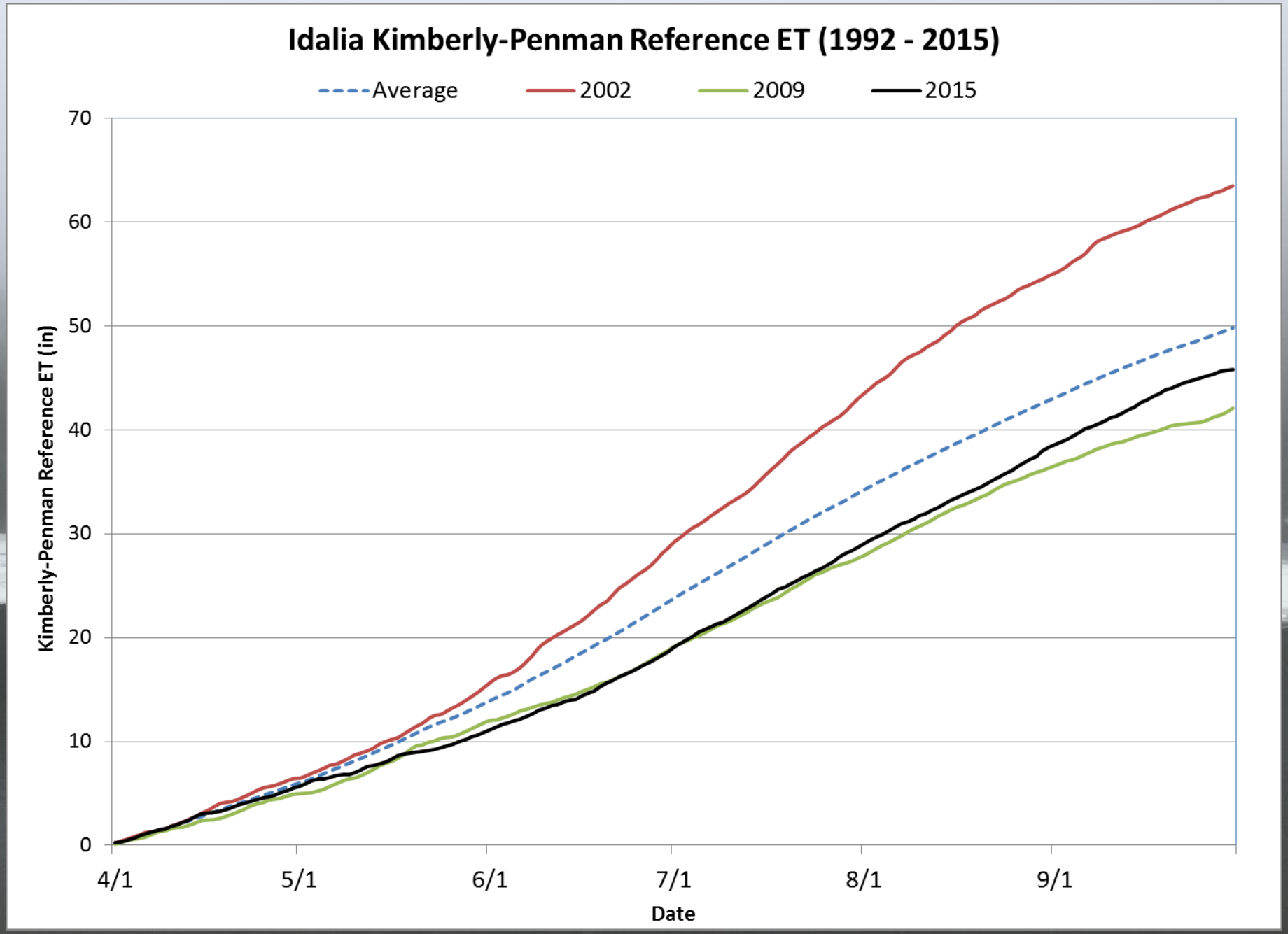


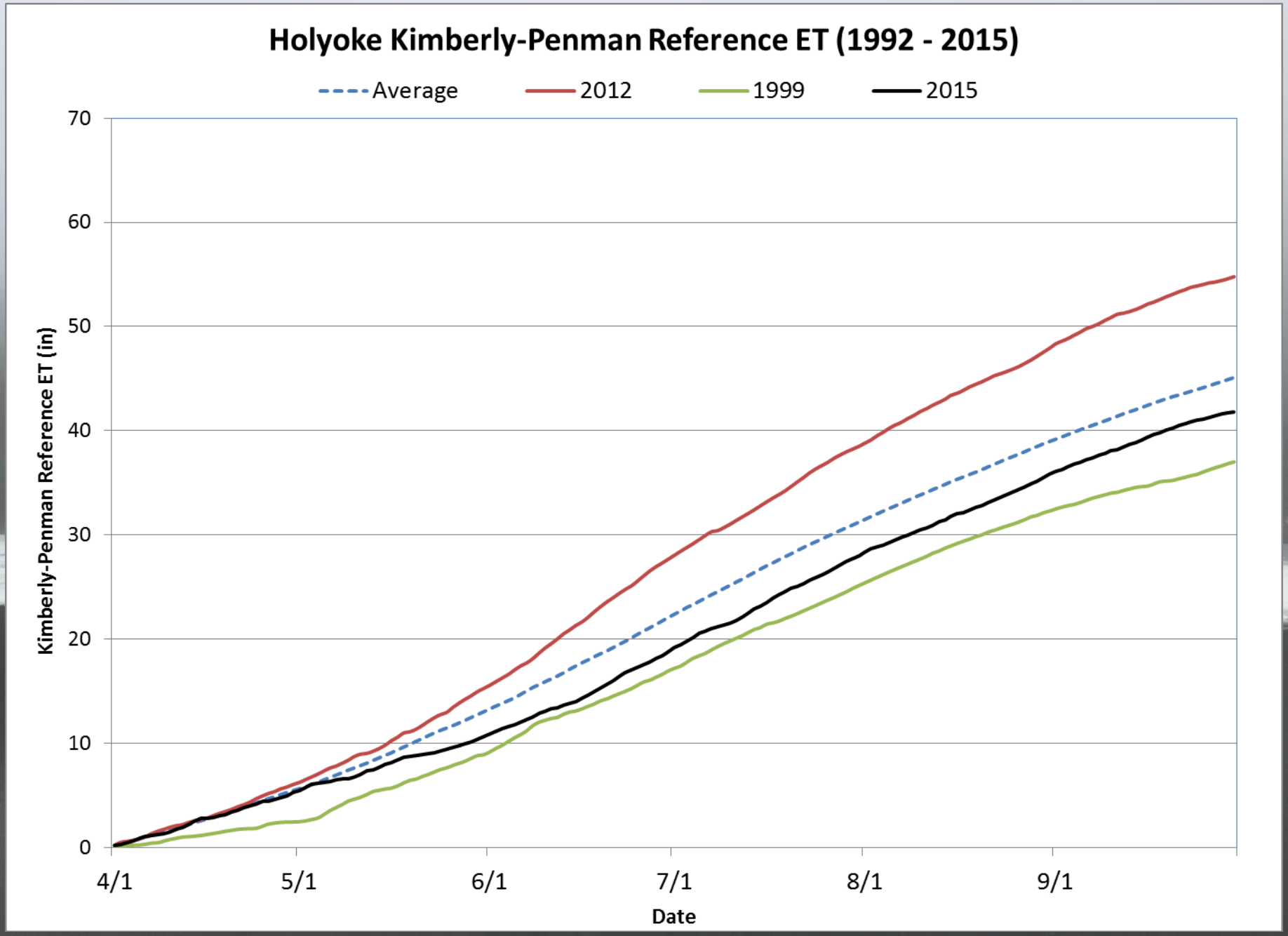

Olathe Kimberly-Penman Reference ET (1993 - 2015)
Average
1994
1999
2015
70
60
50
40
30
20
10
0
Kimberly-Penman Reference ET (in)
4/1
5/1
6/1
7/1
8/1
9/1
Date

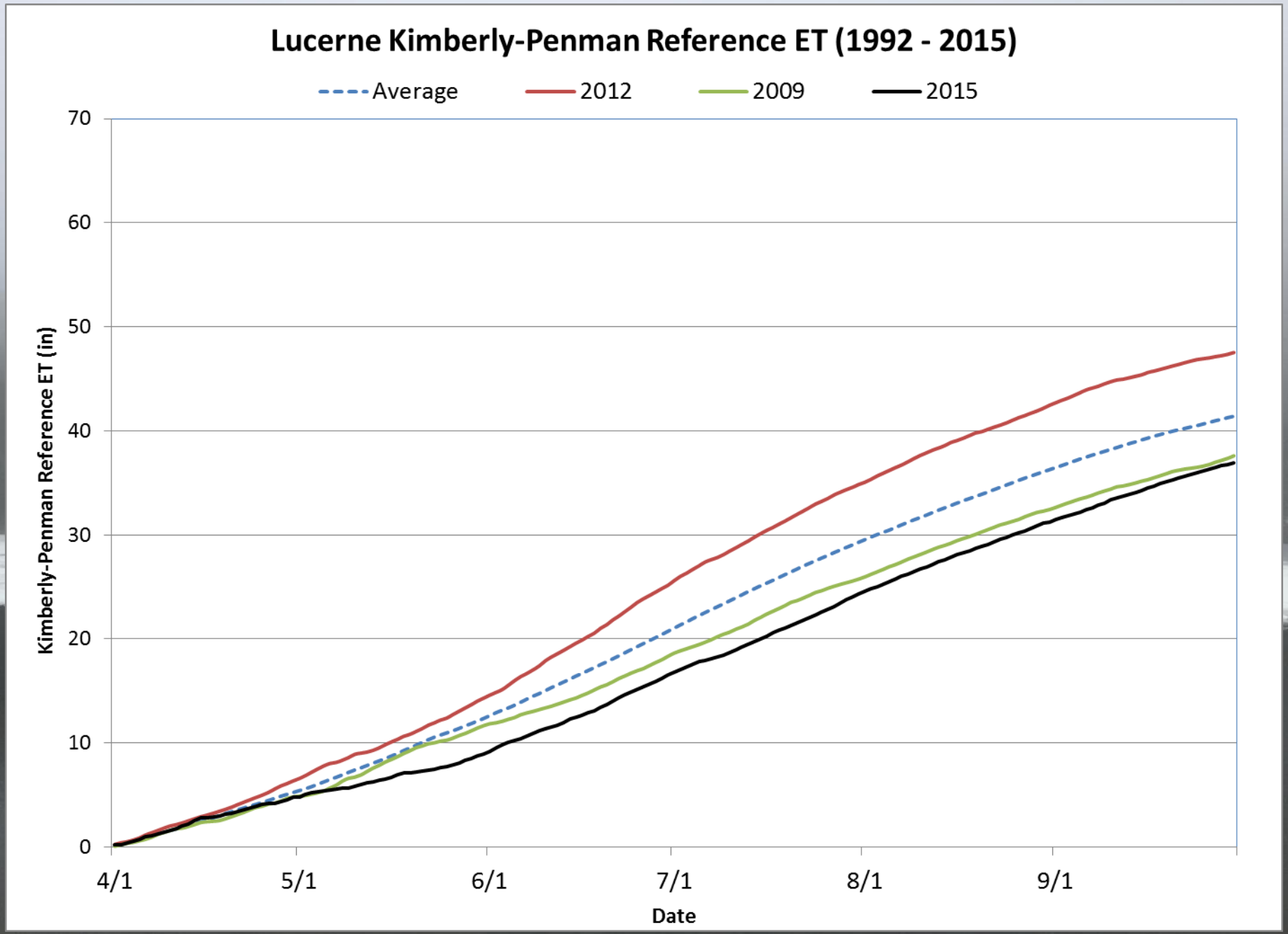

Cortez Kimberly-Penman Reference ET (1992 - 2015)
Average
2000
1995
2015
70
60
50
40
30
20
10
0
Kimberly-Penman Reference ET (in)
4/1
5/1
6/1
7/1
8/1
9/1
Date


Center Kimberly-Penman Reference ET (1994 - 2015)
Average
2002
1997
2015
70
60
50
40
30
20
10
0
Kimberly-Penman Reference ET (in)
4/1
5/1
6/1
7/1
8/1
9/1
Date


Avondale Kimberly-Penman Reference ET (1993 - 2015)
Average
2012
1998
2015
70
60
50
40
30
20
10
0
Kimberly-Penman Reference ET (in)
4/1
5/1
6/1
7/1
8/1
9/1
Date


Idalia Kimberly-Penman Reference ET (1992 - 2015)
Average
2002
2009
2015
Kimberly-Penman Reference ET (in)
70
60
50
40
30
20
10
0
4/1
5/1
6/1
7/1
8/1
9/1
Date


Holyoke Kimberly-Penman Reference ET (1992 - 2015)
Average
2012
1999
2015
70
60
50
40
30
20
10
0
Kimberly-Penman Reference ET (in)
4/1
5/1
6/1
7/1
8/1
9/1
Date

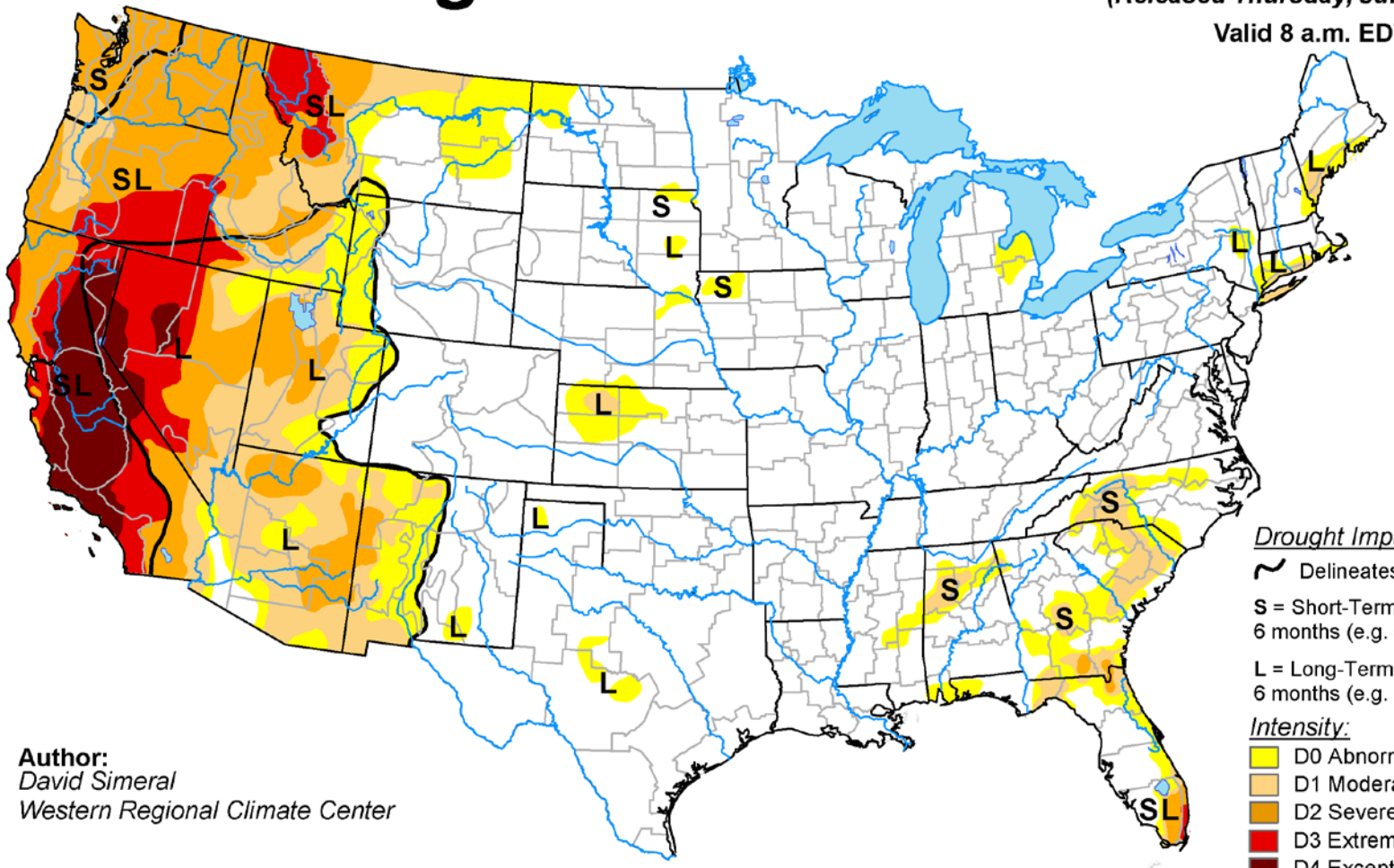

Lucerne Kimberly-Penman Reference ET (1992 - 2015)
Average
2012
2009
2015
70
60
50
40
30
20
10
0
Kimberly-Penman Reference ET (in)
4/1
5/1
6/1
7/1
8/1
9/1
Date

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

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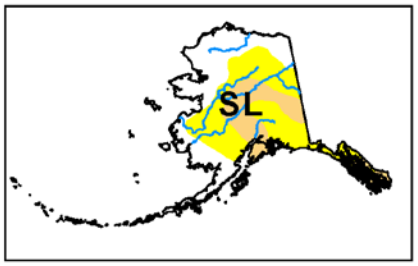
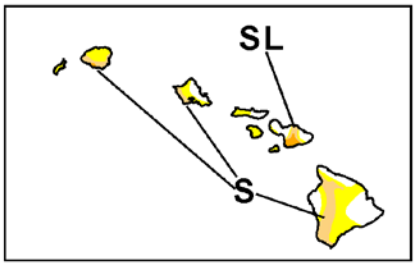
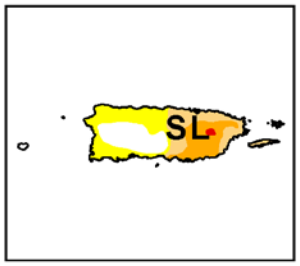






USDA National Drought Mitigation Center

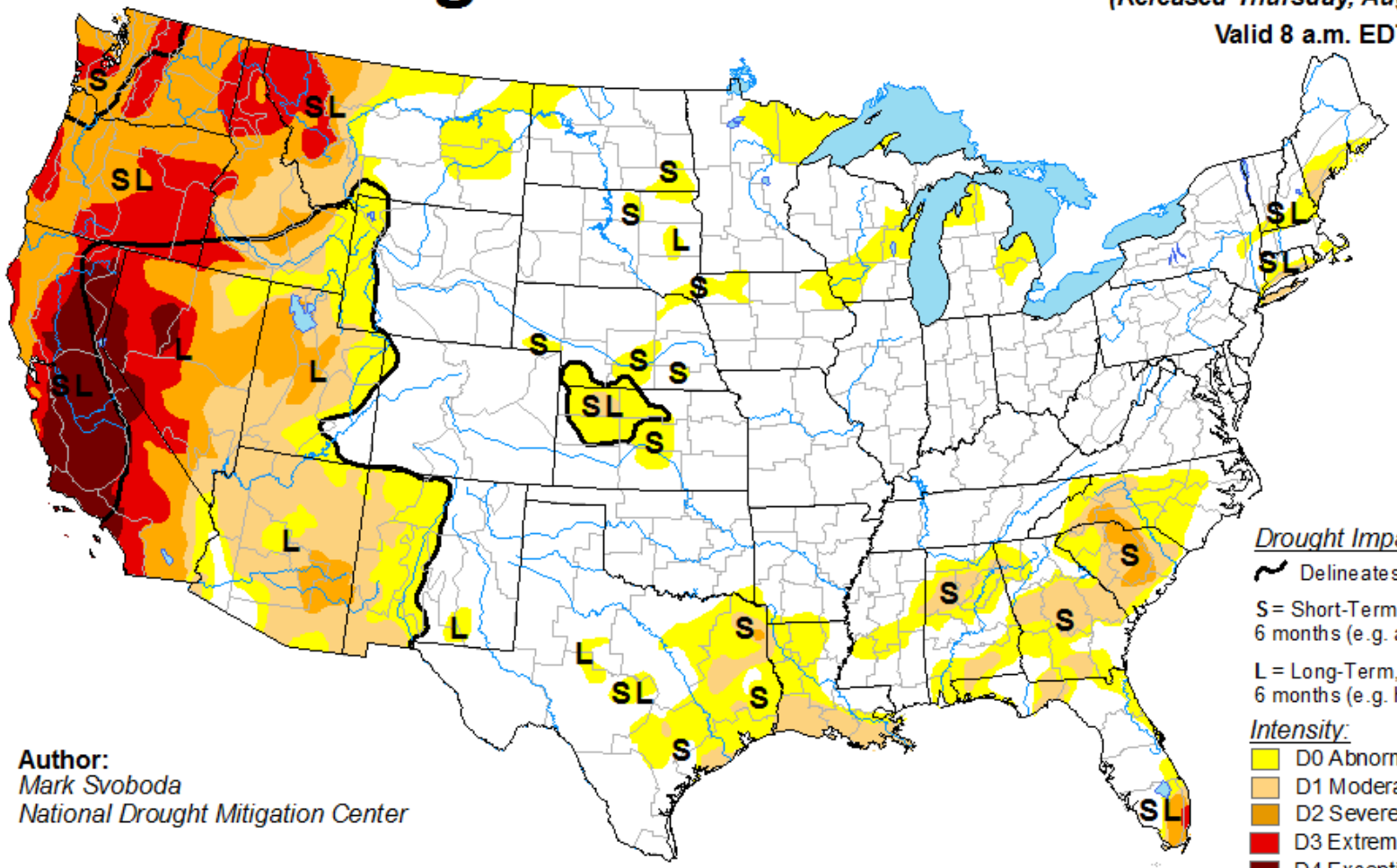
http://droughtmonitor.unl.edu/

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

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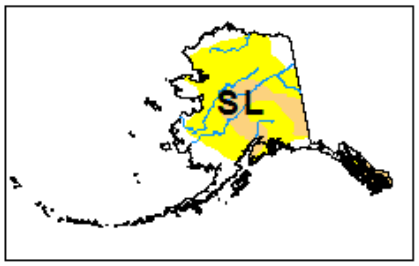
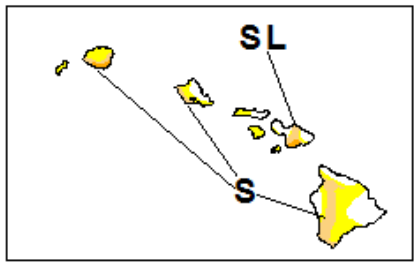
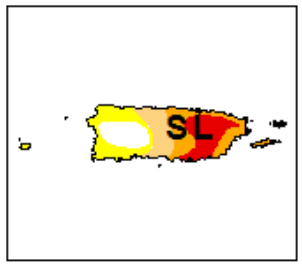






USDA National Drought Mitigation Center

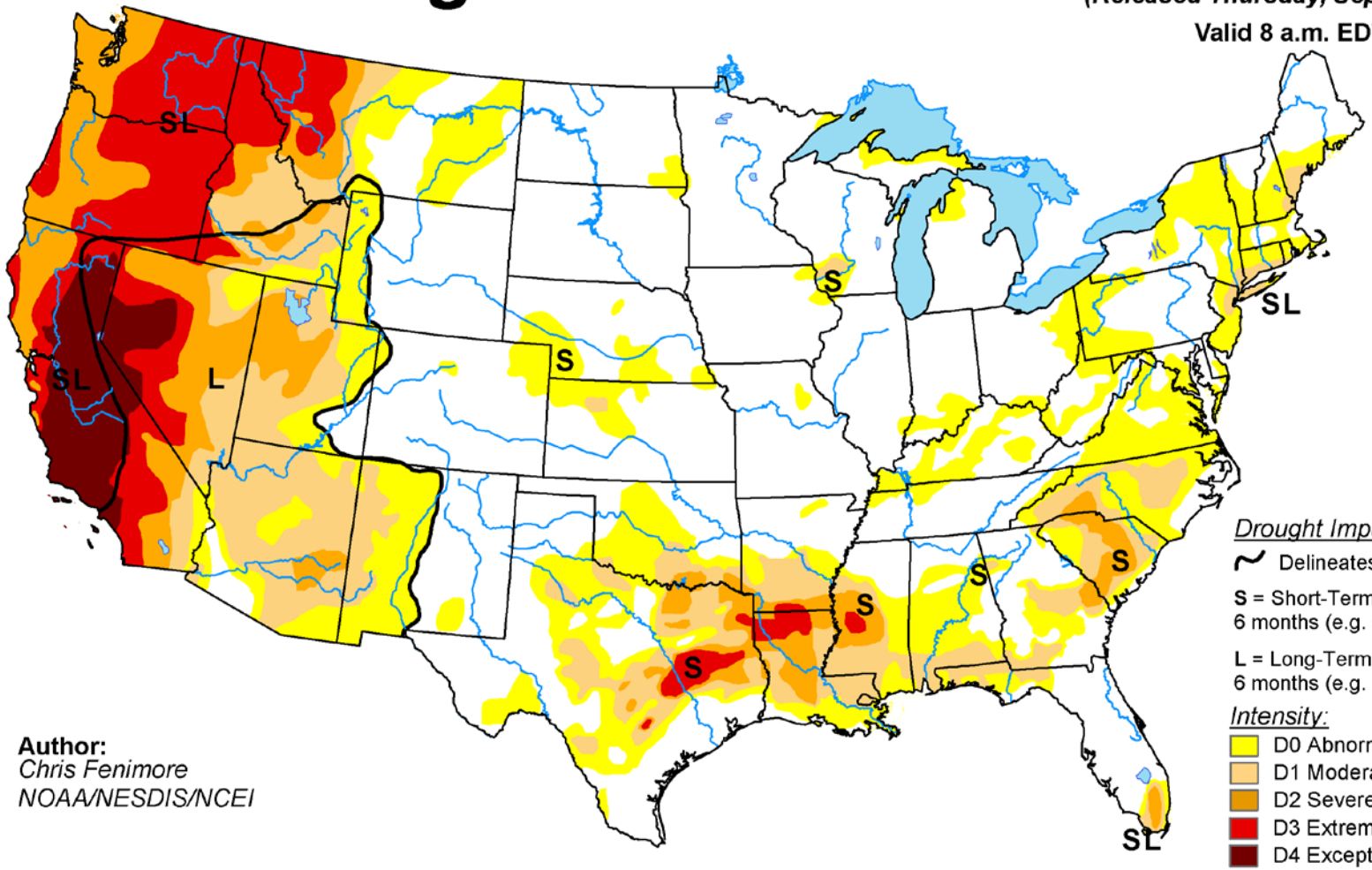
http://droughtmonitor.unl.edu/

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

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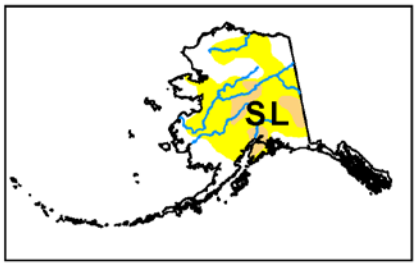
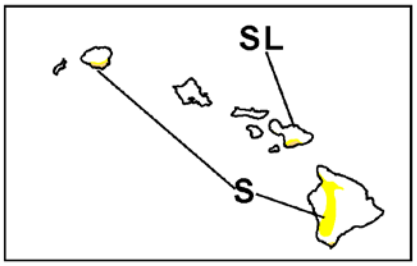
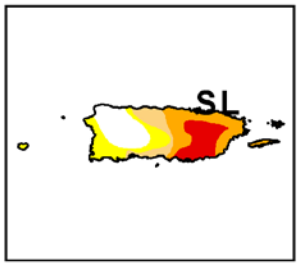






USDA National Drought Mitigation Center

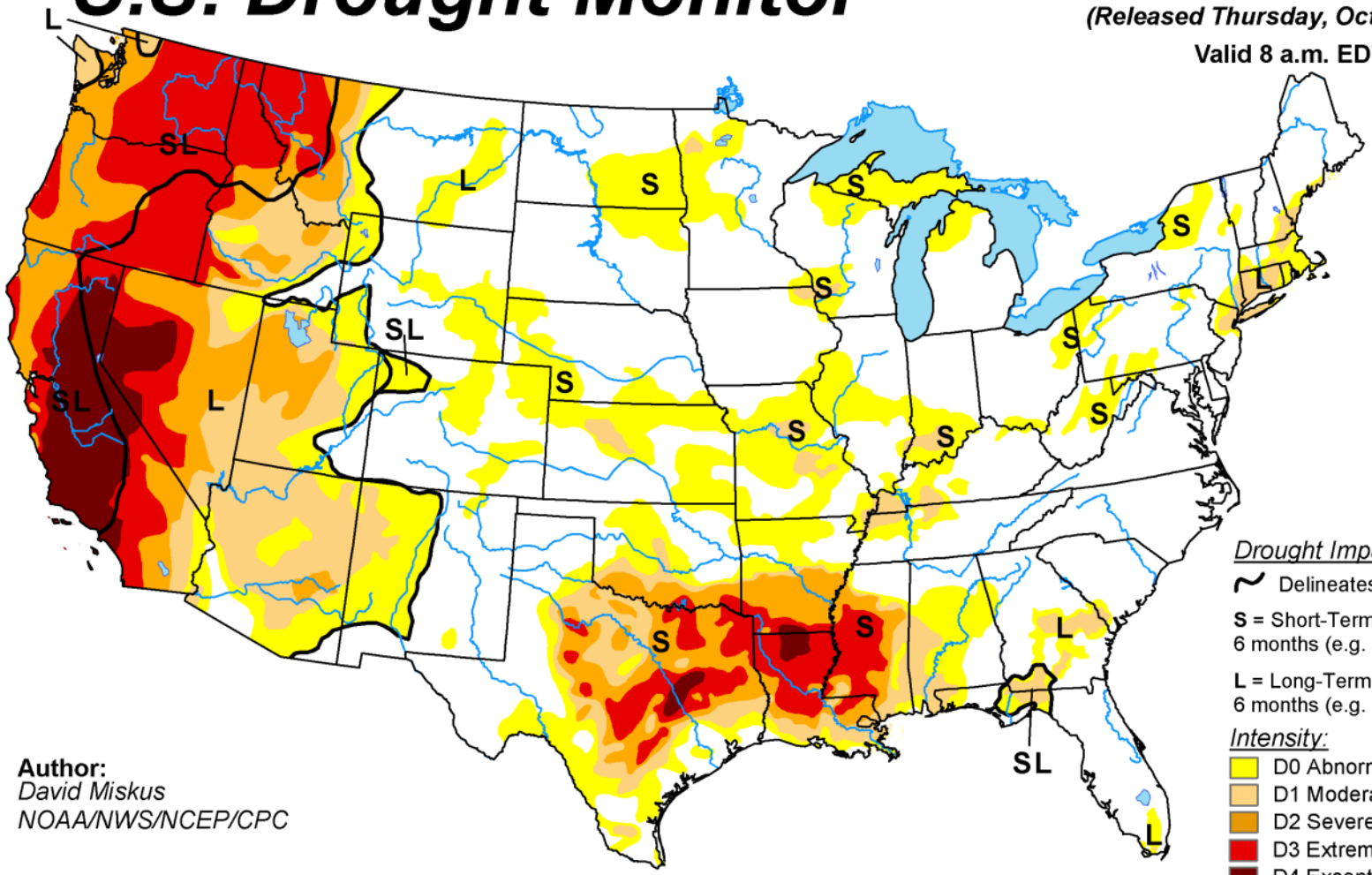
http://droughtmonitor.unl.edu/

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:

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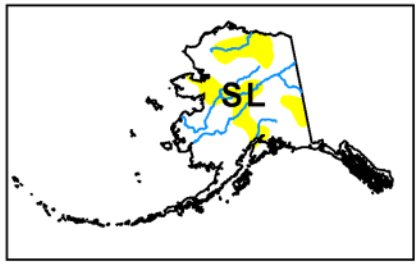
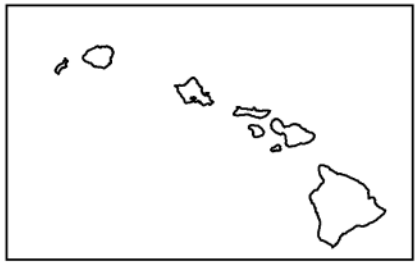
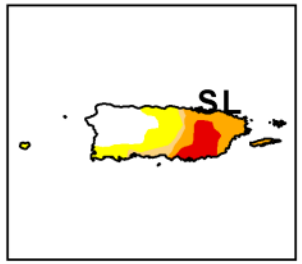






USDA National Drought Mitigation Center

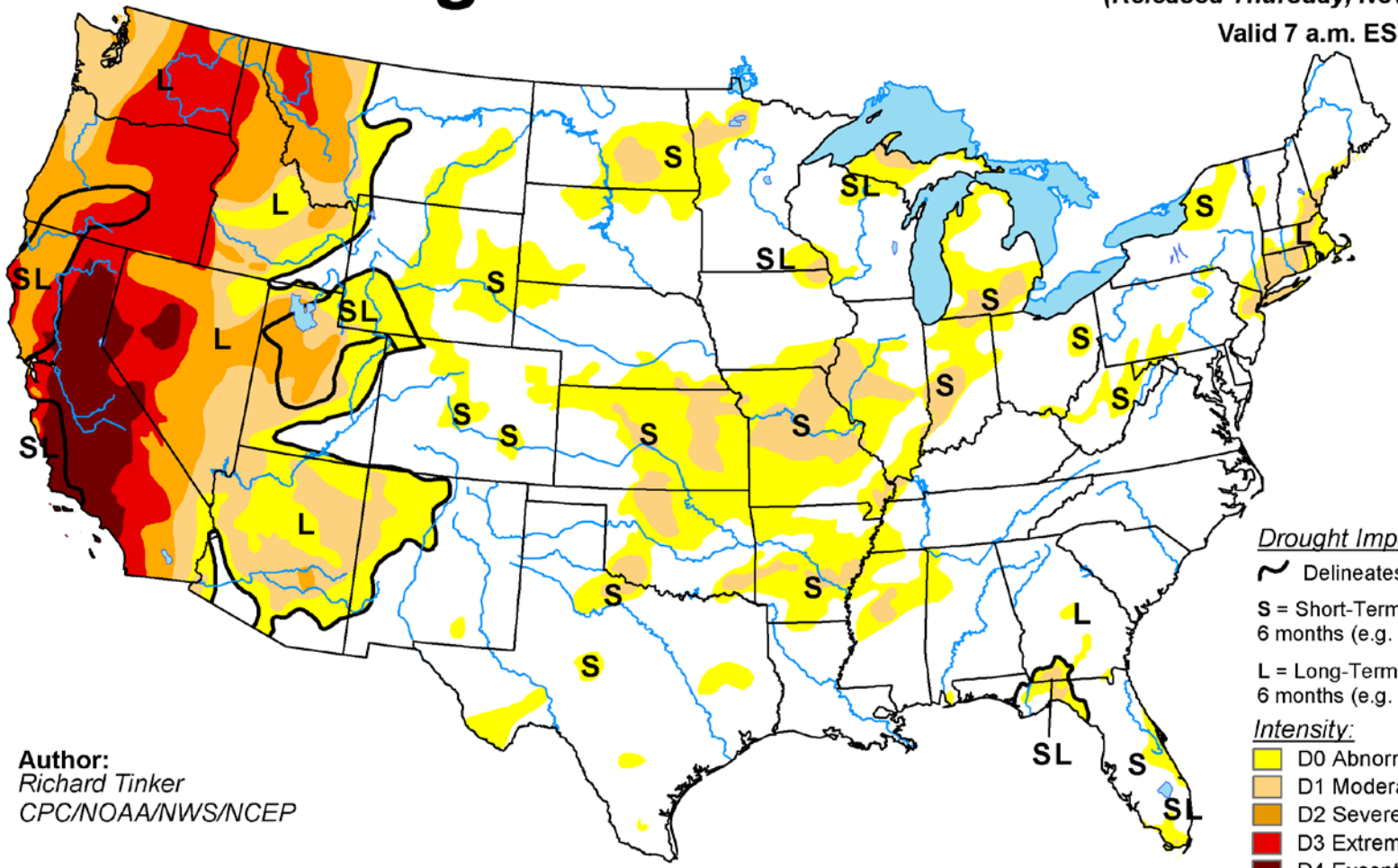
http://droughtmonitor.unl.edu/

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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~ Delineates dominant impacts

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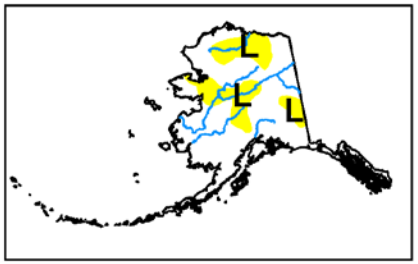
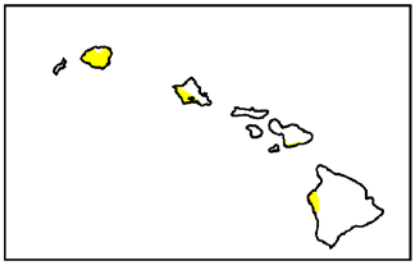
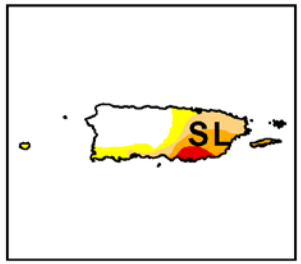


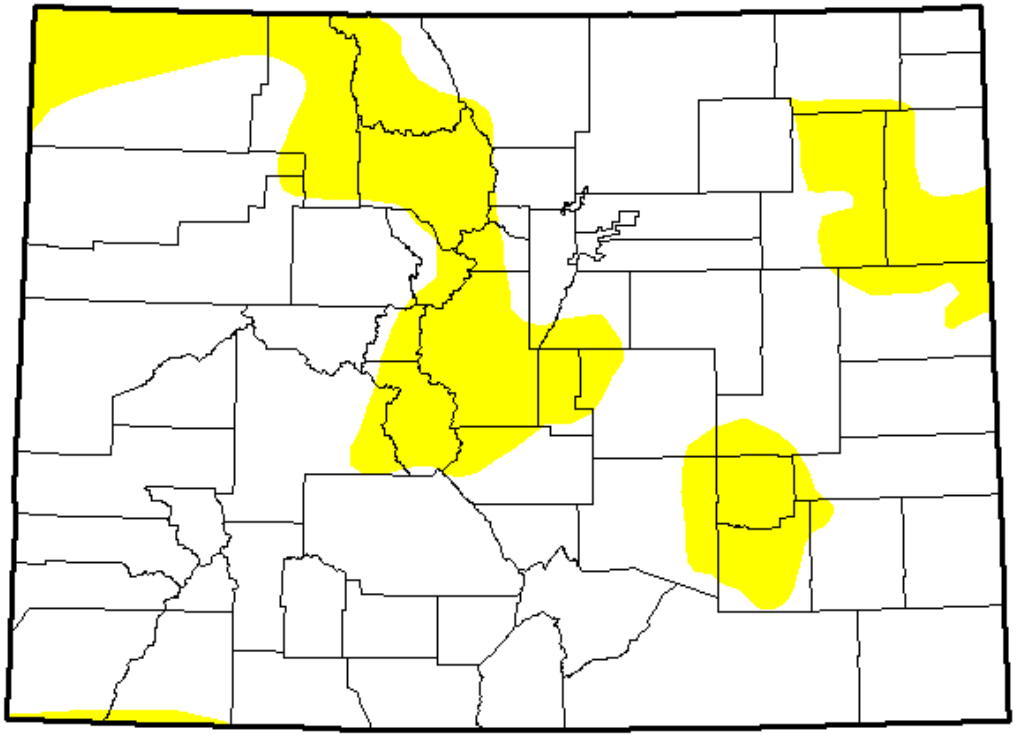




USDA National Drought Mitigation Center

http://droughtmonitor.unl.edu/

U.S. Drought Monitor
Colorado



November 10, 2015

(Released Thursday, Nov. 12, 2015)

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	79.91	20.09	0.00	0.00	0.00	0.00
Last Week 11/3/2015	71.27	28.73	0.00	0.00	0.00	0.00
3 Months Ago 8/11/2015	97.96	2.04	0.00	0.00	0.00	0.00
Start of Calendar Year 12/30/2014	69.87	30.13	21.26	12.26	0.00	0.00
Start of Water Year 9/29/2015	71.49	28.51	0.00	0.00	0.00	0.00
One Year Ago 11/11/2014	70.00	30.00	21.26	12.26	0.00	0.00

Intensity:

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- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
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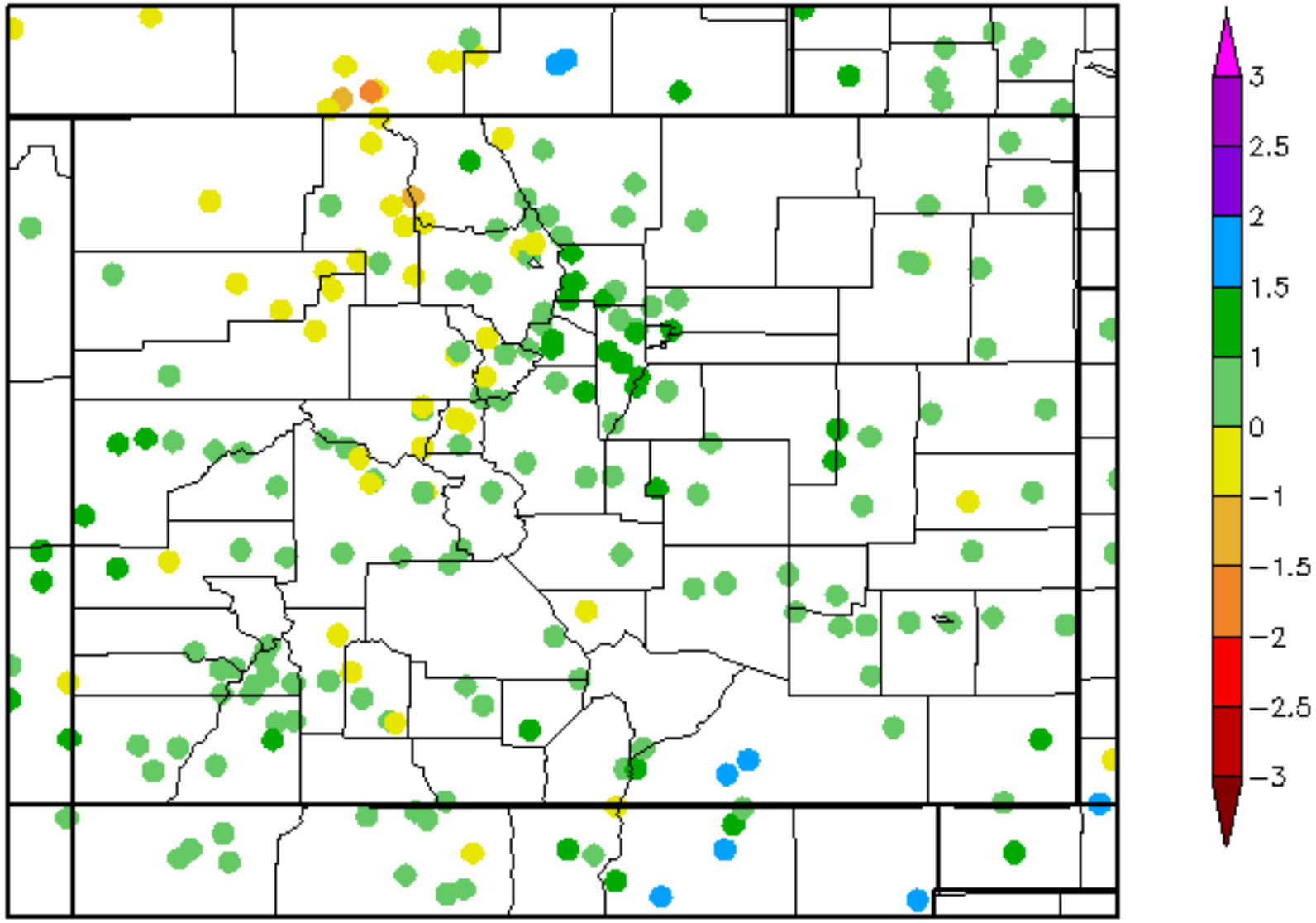
Author:
Richard Tinker
CPC/NOAA/NWS/NCEP

http://droughtmonitor.unl.edu/

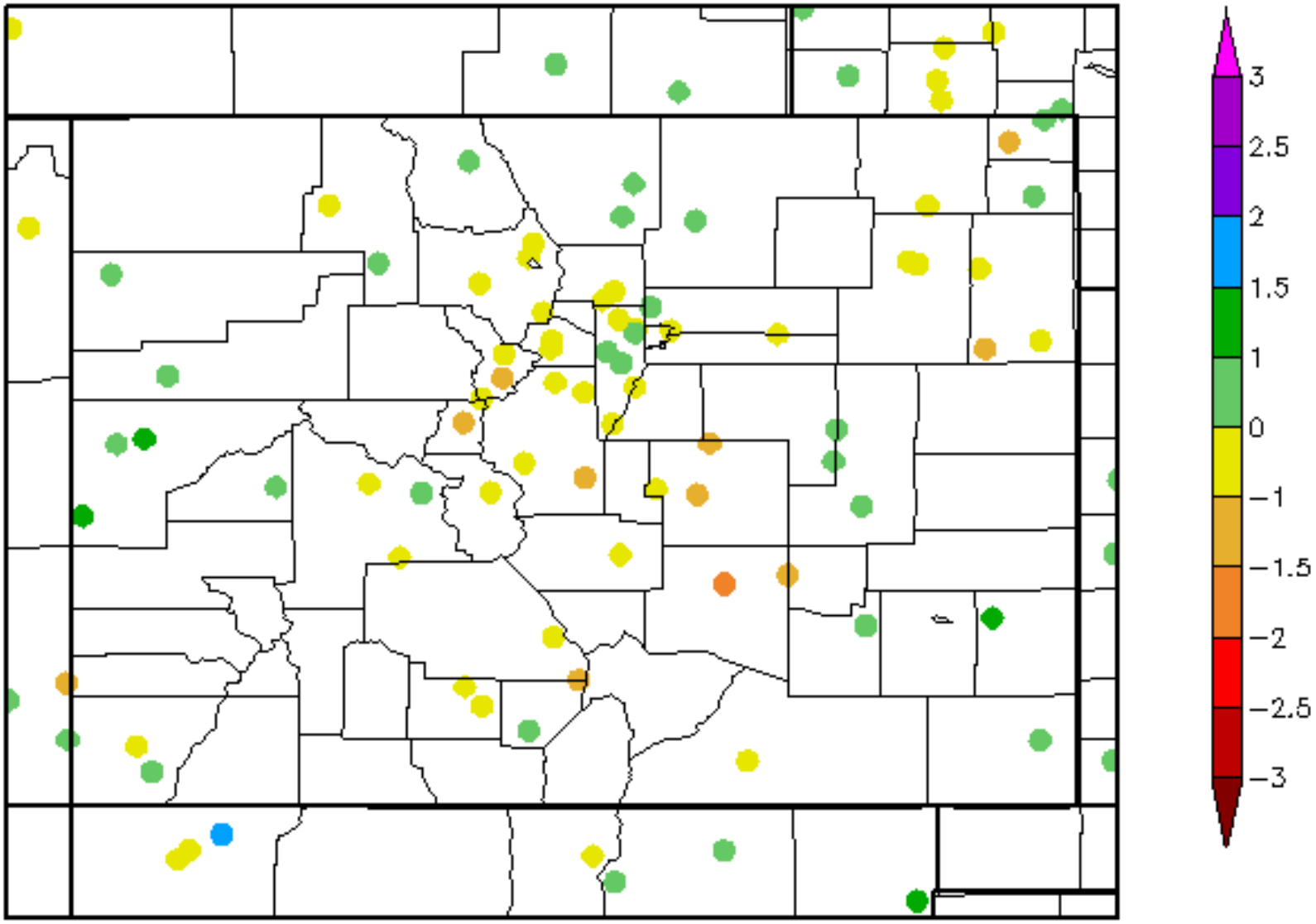
Monthly SPI
10/1/2015 – 10/31/2015



Generated 11/11/2015 at HPRCC using provisional data.

Regional Climate Centers

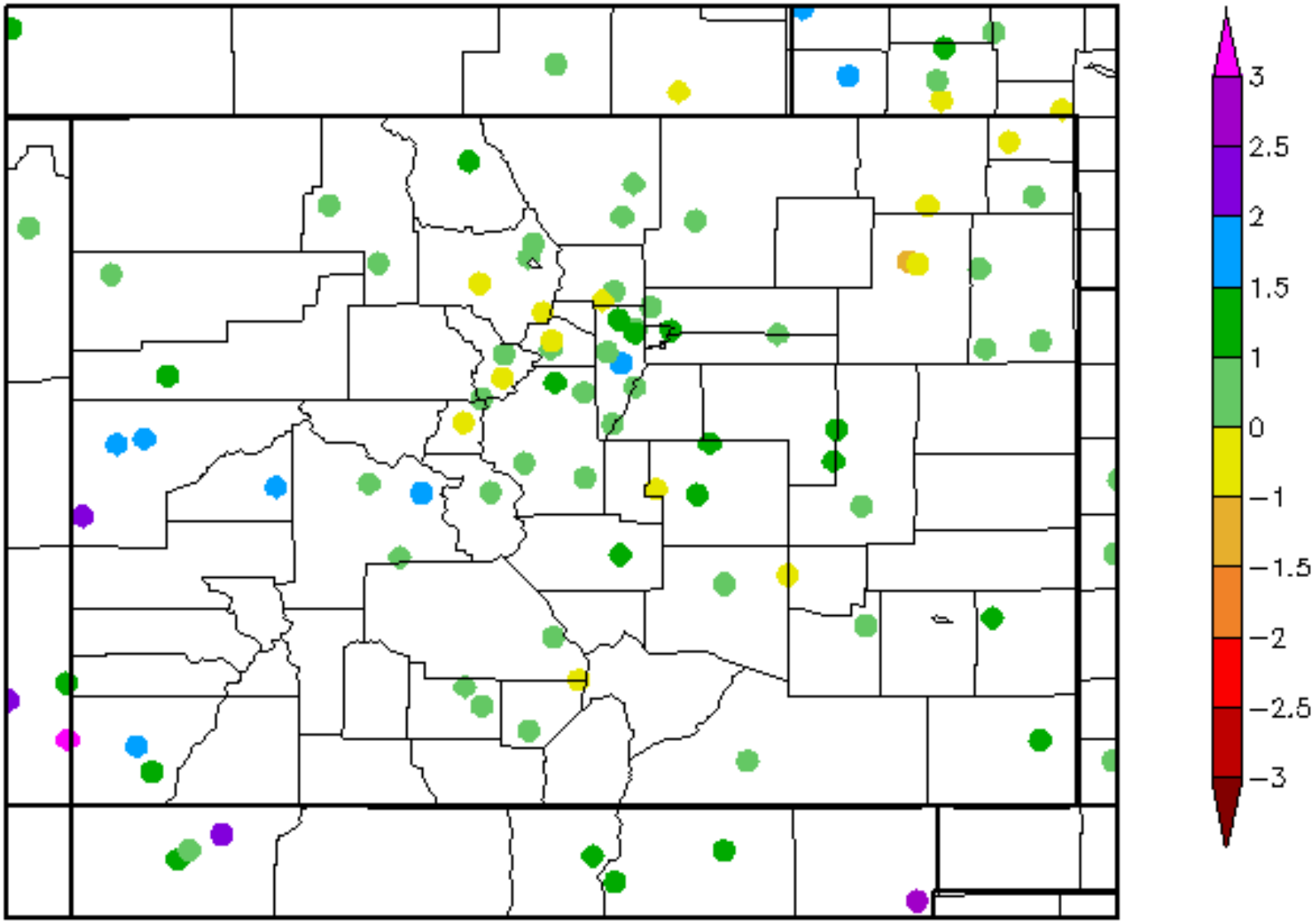
90 Day SPI
8/18/2015 – 11/15/2015



Generated 11/16/2015 at HPRCC using provisional data.

Regional Climate Centers

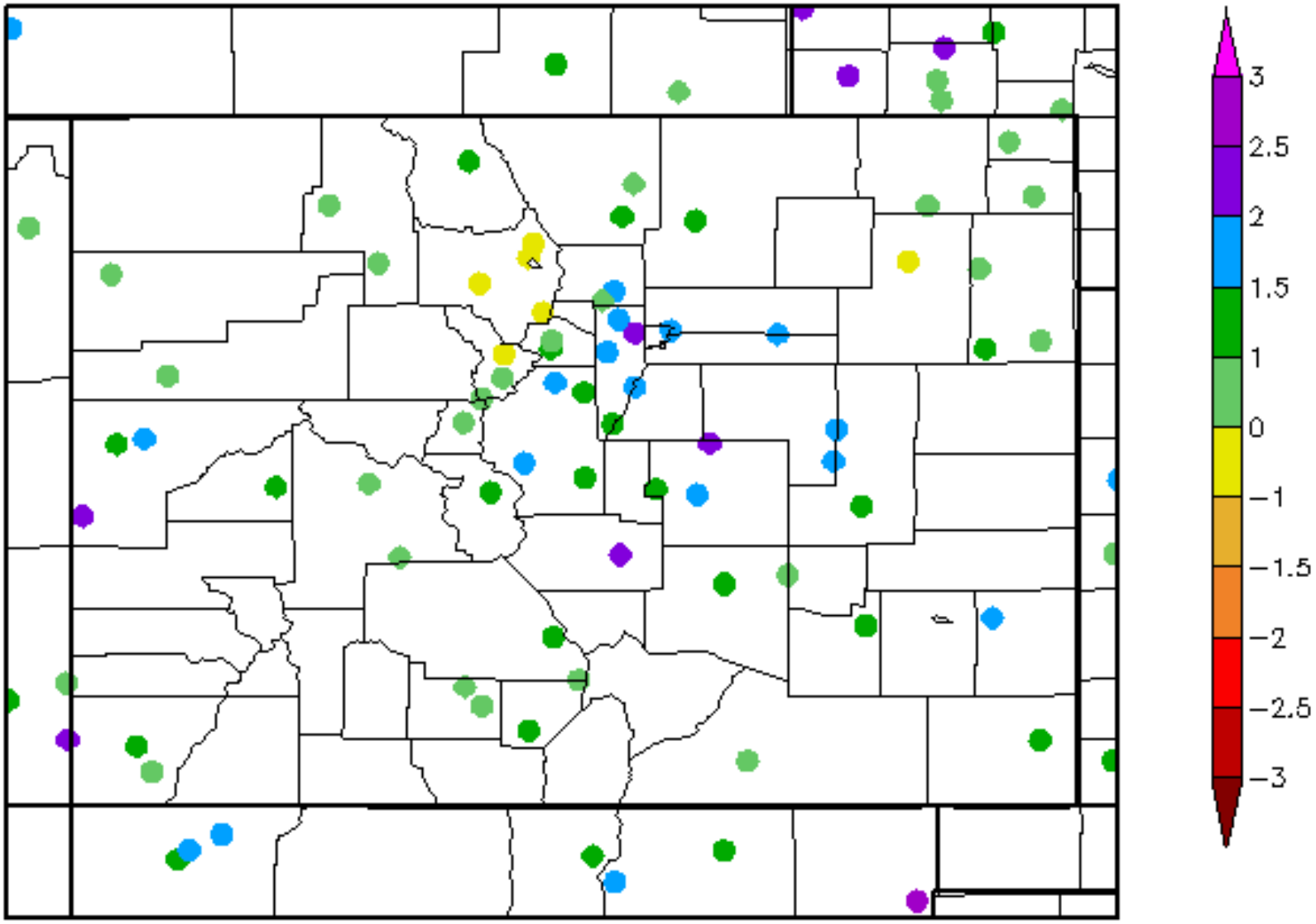
6 Month SPI
5/16/2015 – 11/15/2015



Generated 11/16/2015 at HPRCC using provisional data.

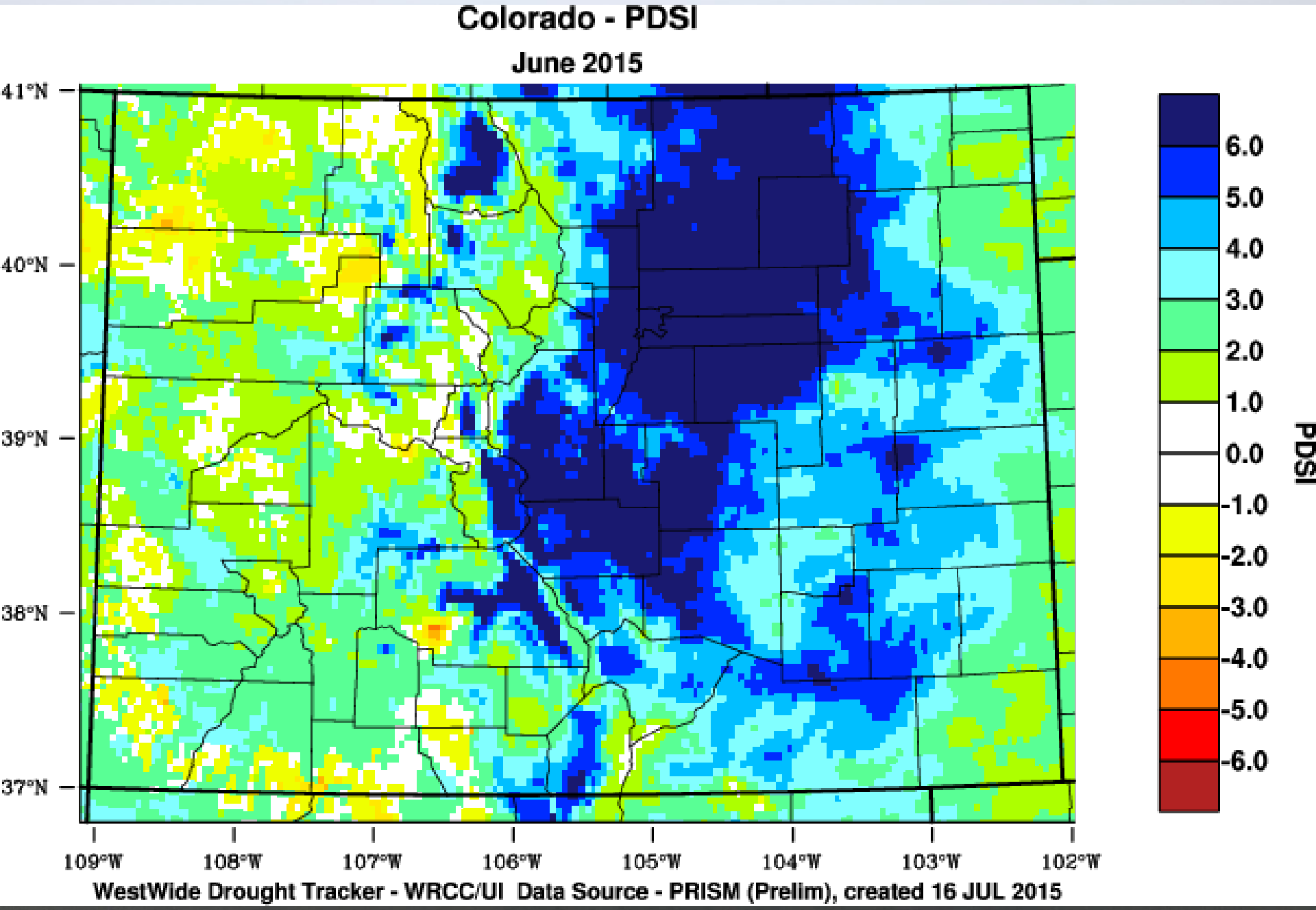
Regional Climate Centers

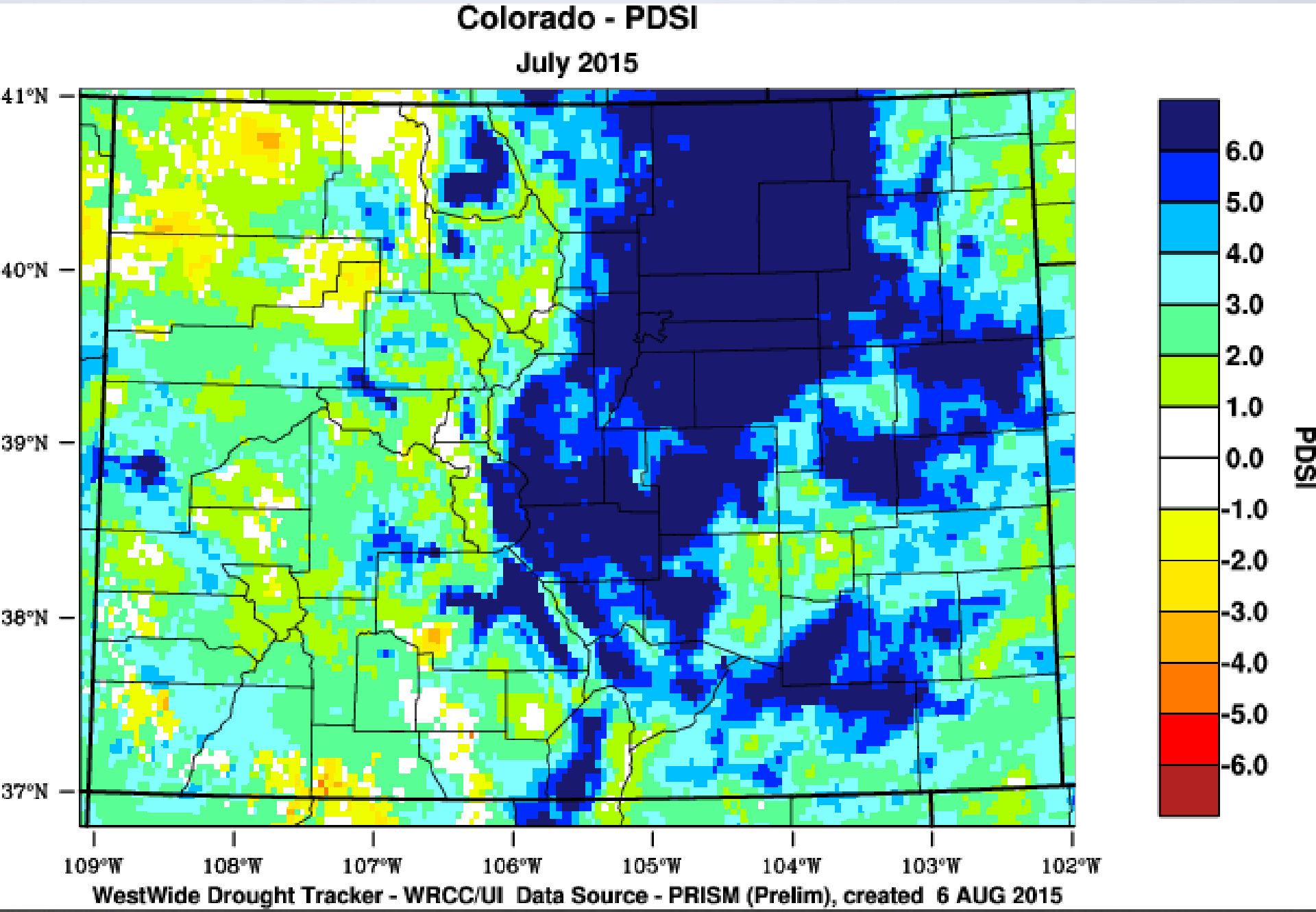
12 Month SPI
11/16/2014 – 11/15/2015

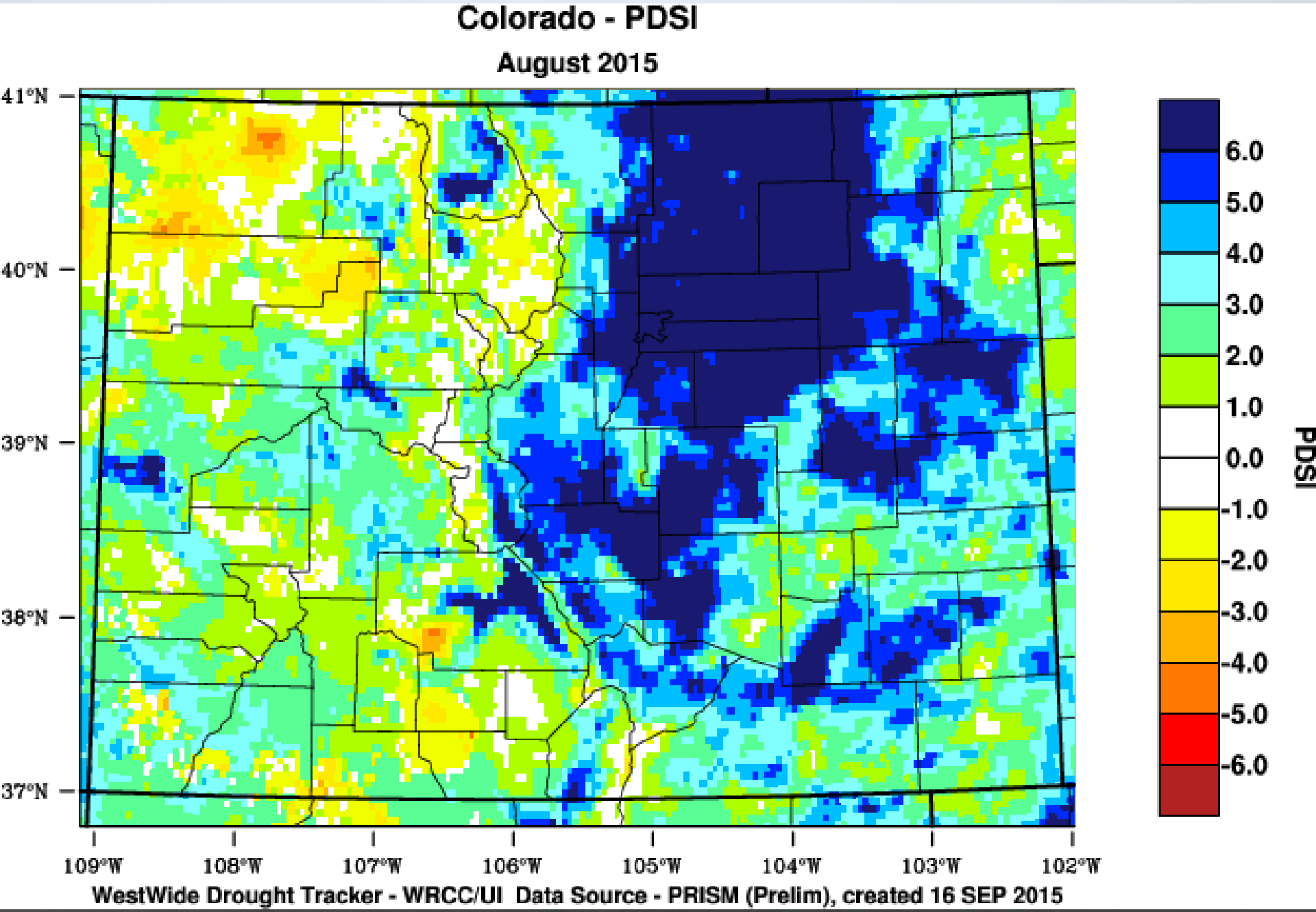


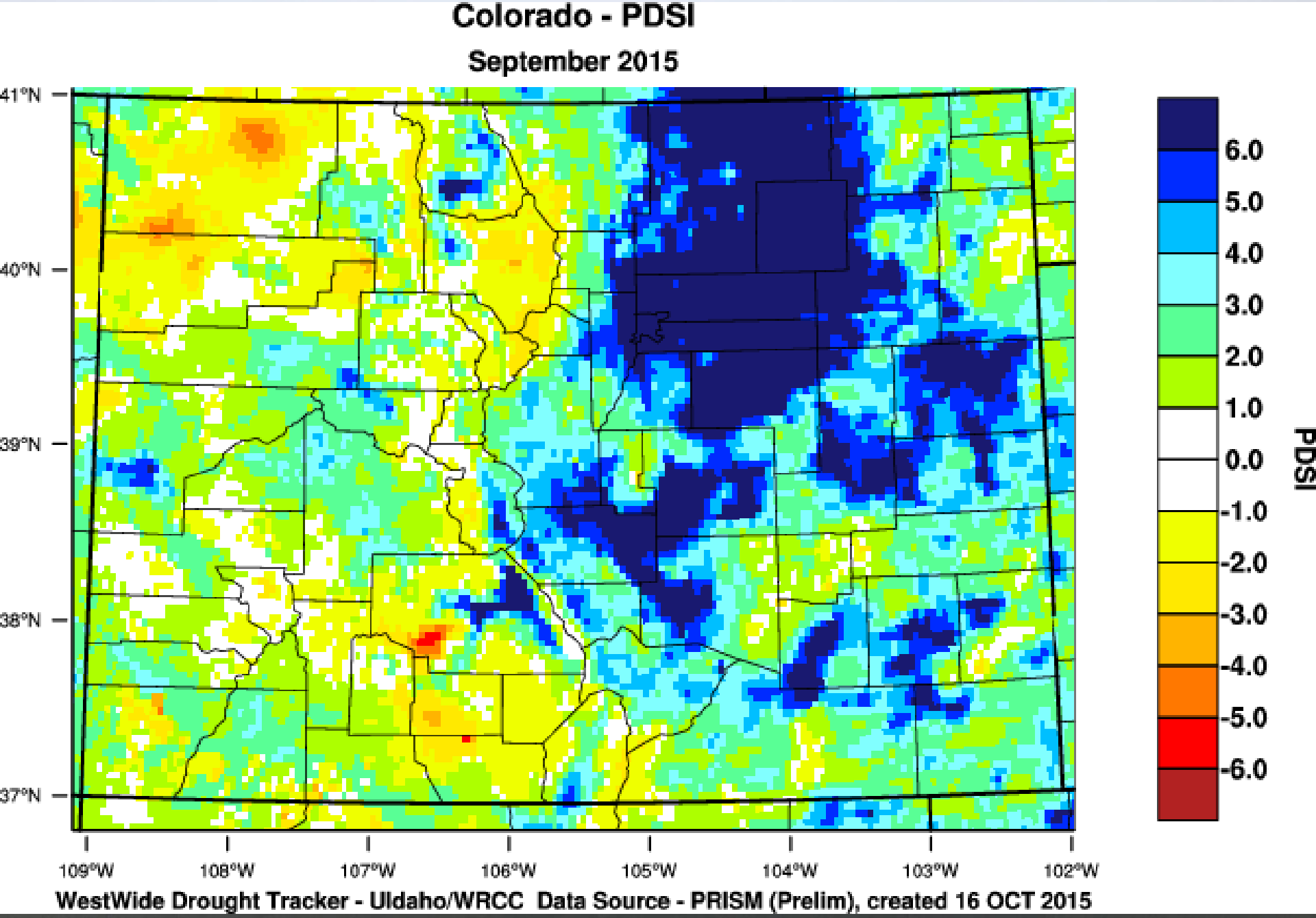
Generated 11/16/2015 at HPRCC using provisional data.

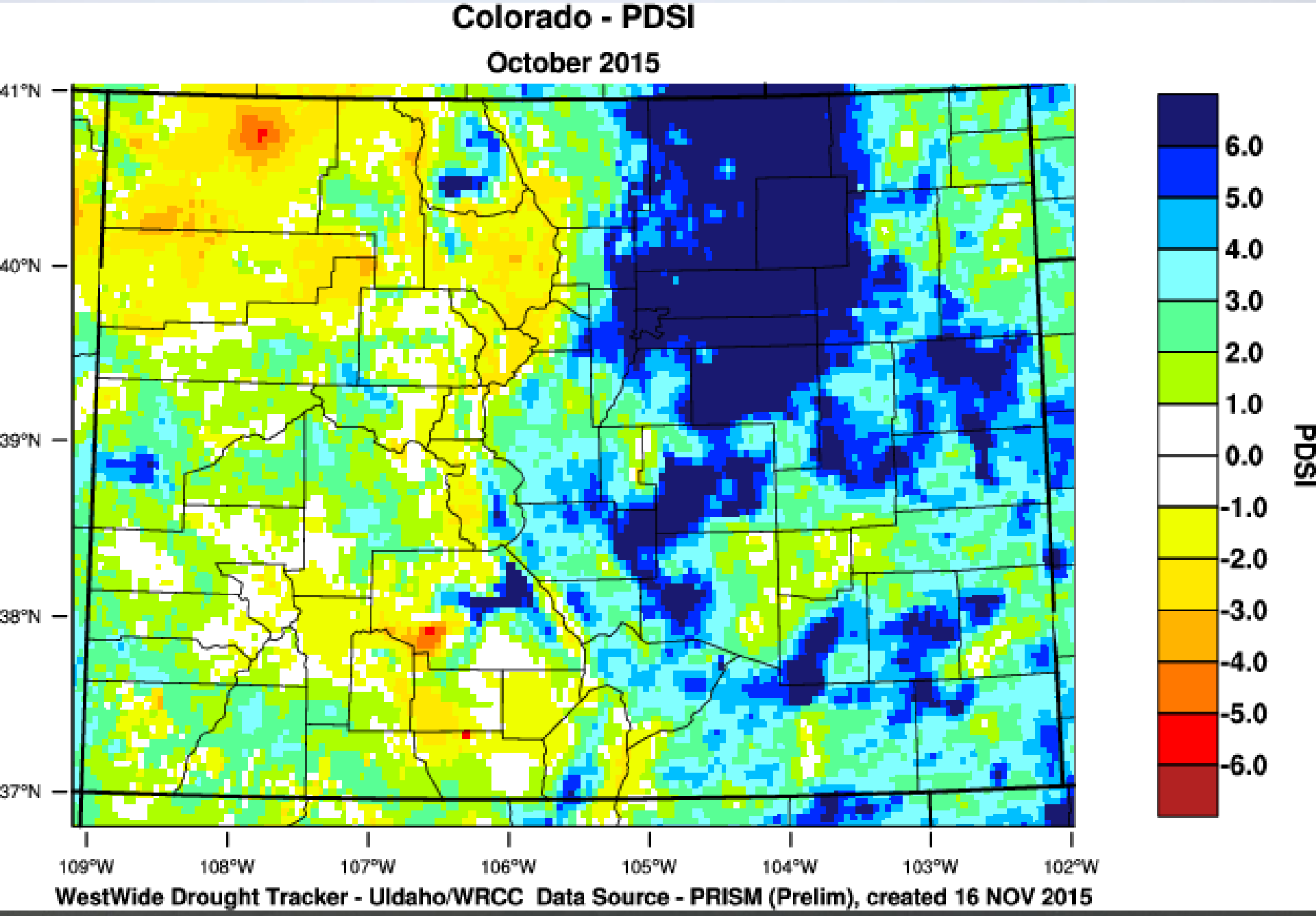
Regional Climate Centers


Colorado - PDSI
June 2015
41°N
40°N
39°N
38°N
37°N
109°W
108°W
107°W
106°W
105°W
104°W
103°W
102°W
6.0
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
-6.0
PDSI
WestWide Drought Tracker - WRCC/UI Data Source - PRISM (Prelim), created 16 JUL 2015


Colorado - PDSI
July 2015
41°N
40°N
39°N
38°N
37°N
109°W
108°W
107°W
106°W
105°W
104°W
103°W
102°W
6.0
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
-6.0
PDSI
WestWide Drought Tracker - WRCC/UI Data Source - PRISM (Prelim), created 6 AUG 2015


Colorado - PDSI
August 2015
41°N
40°N
39°N
38°N
37°N
109°W
108°W
107°W
106°W
105°W
104°W
103°W
102°W
6.0
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
-6.0
PDSI
WestWide Drought Tracker - WRCC/UI Data Source - PRISM (Prelim), created 16 SEP 2015


Colorado - PDSI
September 2015
41°N
40°N
39°N
38°N
37°N
109°W
108°W
107°W
106°W
105°W
104°W
103°W
102°W
6.0
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
-6.0
PDSI
WestWide Drought Tracker - Uldaho/WRCC Data Source - PRISM (Prelim), created 16 OCT 2015


Colorado - PDSI
October 2015
41°N
40°N
39°N
38°N
37°N
109°W
108°W
107°W
106°W
105°W
104°W
103°W
102°W
6.0
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
-6.0
PDSI
WestWide Drought Tracker - UIdaho/WRCC Data Source - PRISM (Prelim), created 16 NOV 2015

Colorado Climate Center

Data and Power Point Presentations available for downloading

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

COLORADO CLIMATE CENTER

Colorado State University
Knowledge to Go Places