

Drought Update

November 23, 2004 WATF Meeting

*Nolan J. Doesken
Colorado Climate Center*

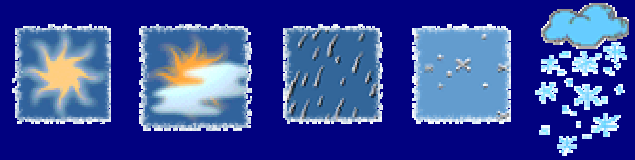
*presented at the Water Availability Task Force meeting,
DOW, Denver, November 23, 2004*

Prepared by Odie Bliss

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

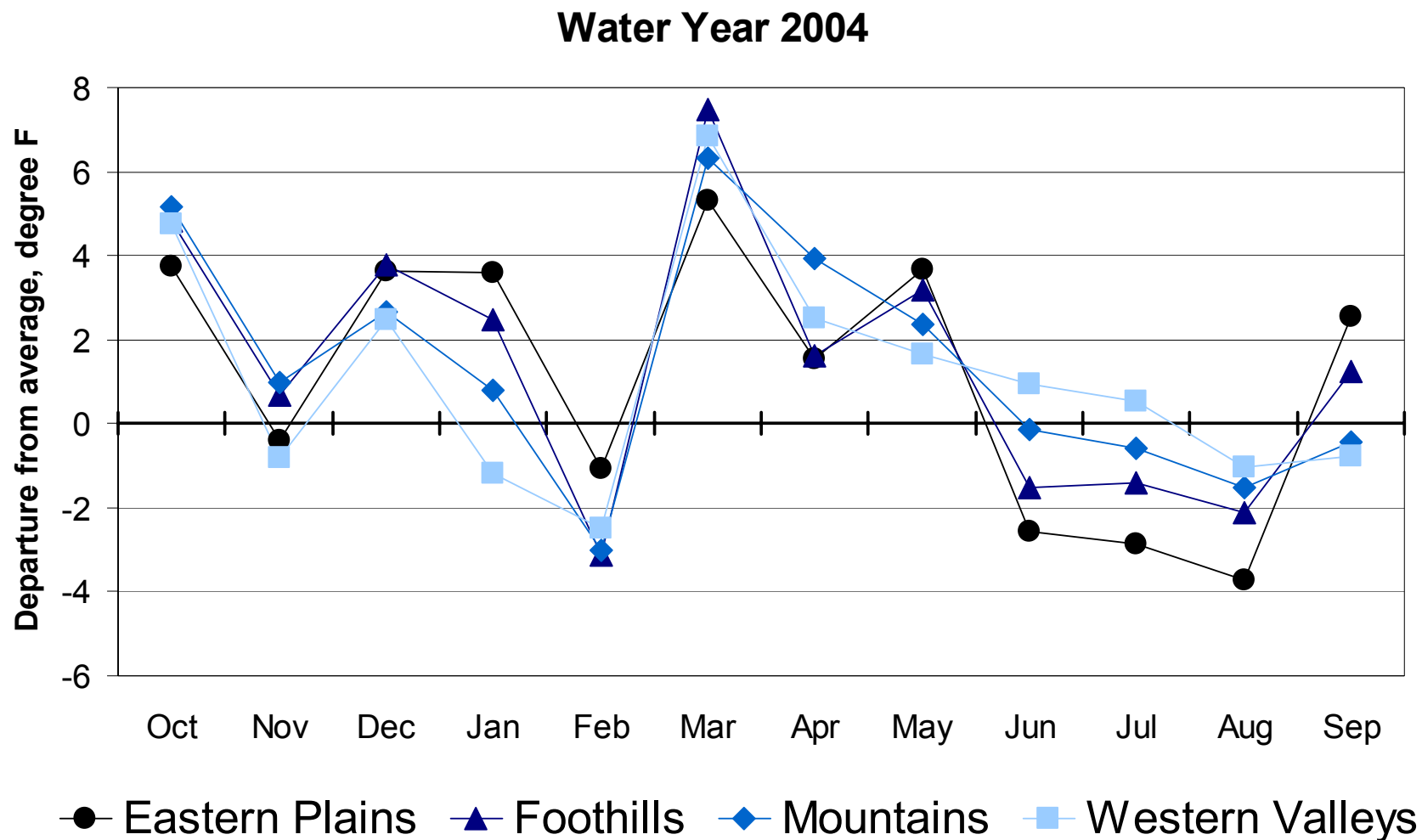


WY2004 Highlights

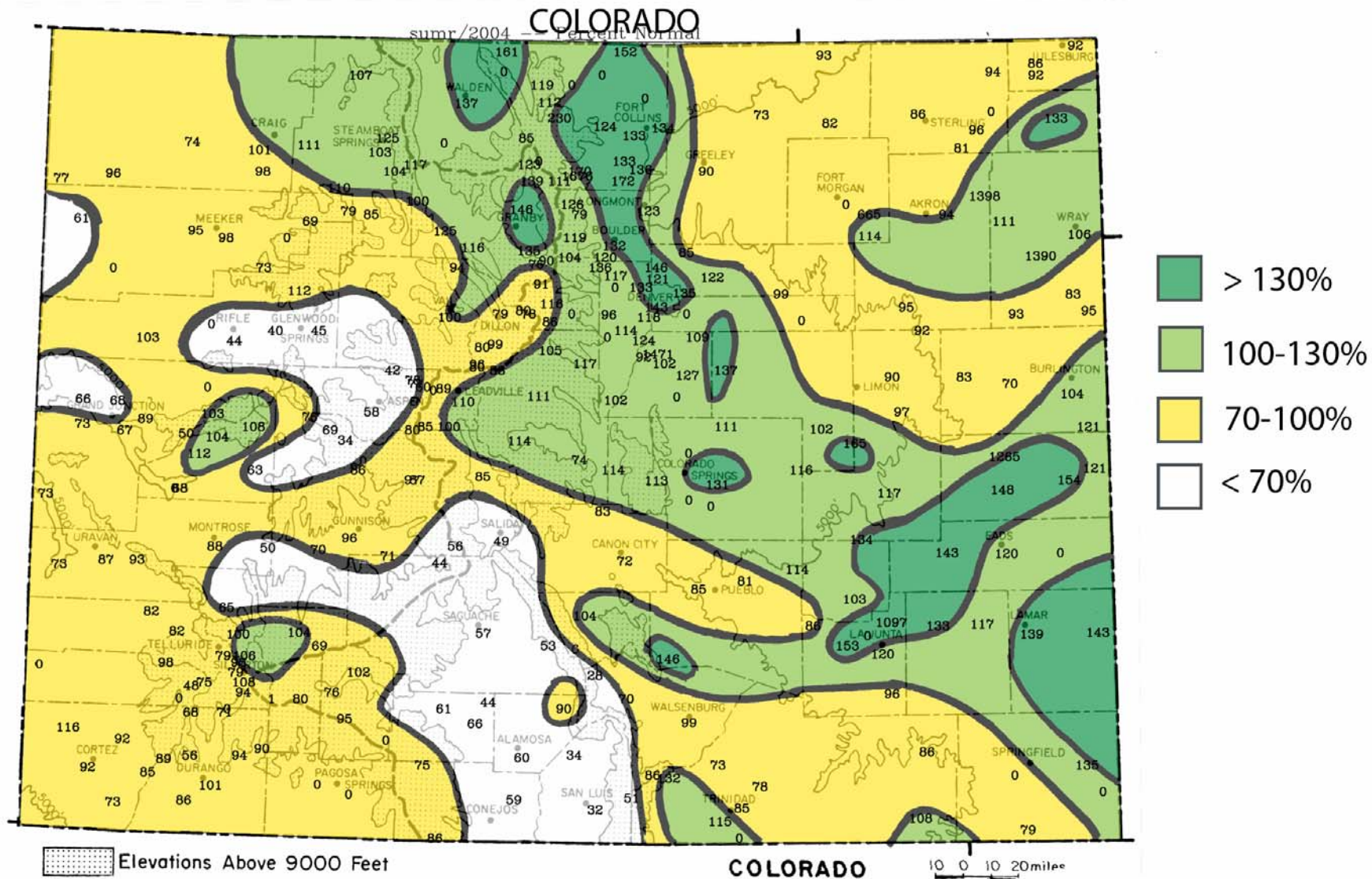


- *Record warmth in October*
- *Freezing drizzle storm for Halloween, cloudy*
- *Good early snows over SW Colorado*
- *Cold and snowcovered on the Western Slope midwinter*
- *Fairly dry and dull midwinter elsewhere*
- *A cold February*
- *Very warm and dry March*
- *Wet April -- Hurray!*
- *Oops, warm and dry again in May*
- *Cool and damp summer east of mountains*
- *Hot and dry to the west*
- *Moisture onslaught into Western Colorado in September*

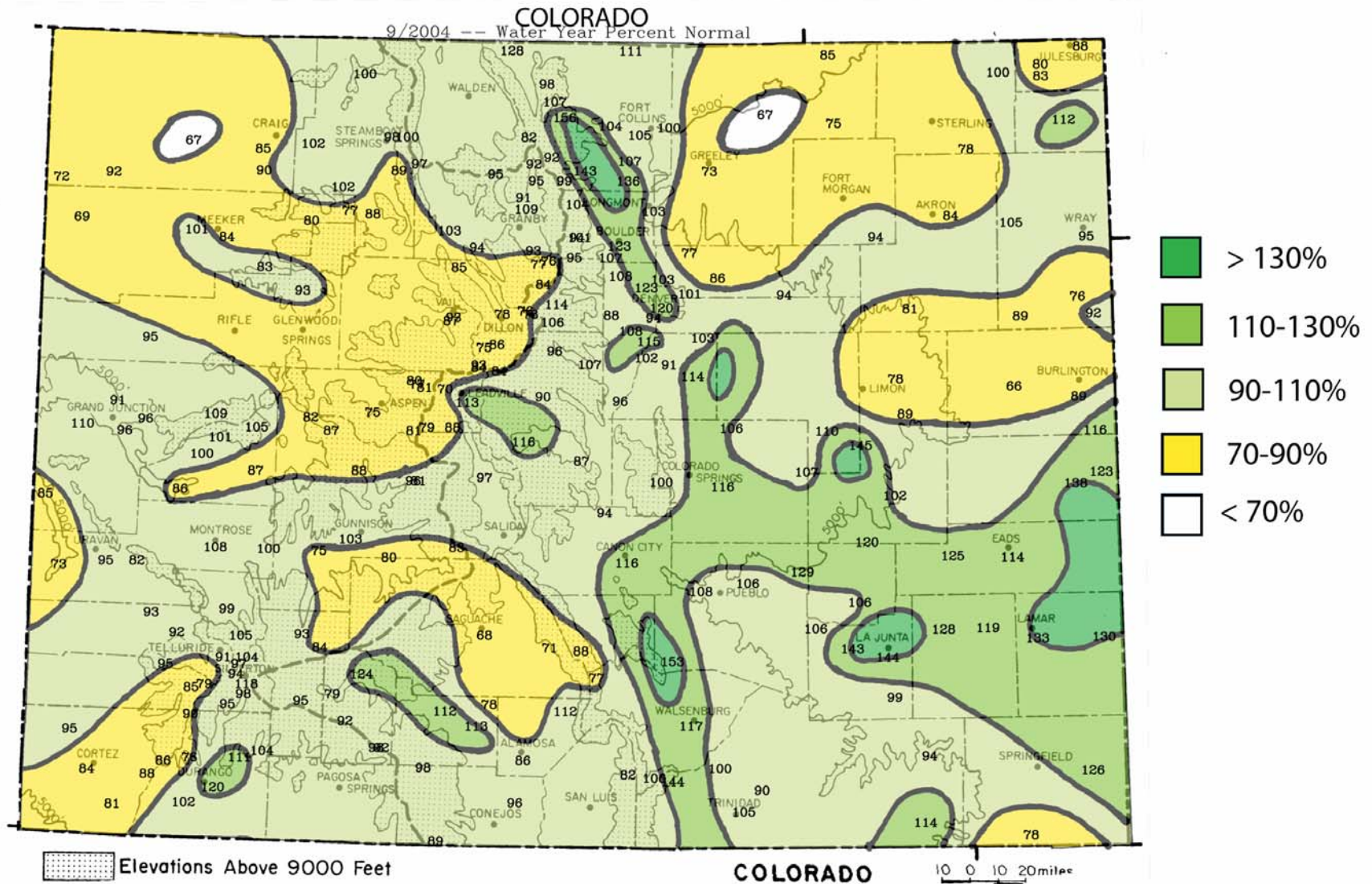
Water Year 2004 temperature departures from 1971-2000 average



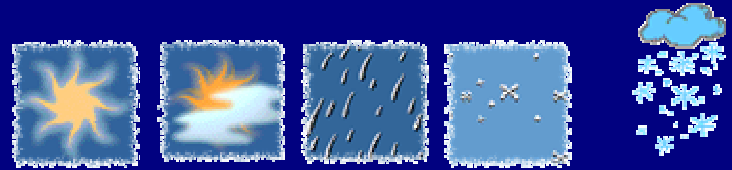
Summer 2004 (May-Sep) precipitation as a percent of the 1971-2000 average



Water Year 2004 precipitation as a percent of the 1971-2000 average



Summary



- *A mild winter again*
- *Another year with below average snowmelt runoff*
- *Generous growing season precipitation east of the mountains*
- *Coollest summer in a looong time*
- *Improvements in soil moisture*
- *Reservoirs hung in there*
- *Significant runoff from rains*



Selected Global Significant Events

October 2004



Click On A Shaded Area For More Information



Drought



Cold / Snow



Tropical Systems

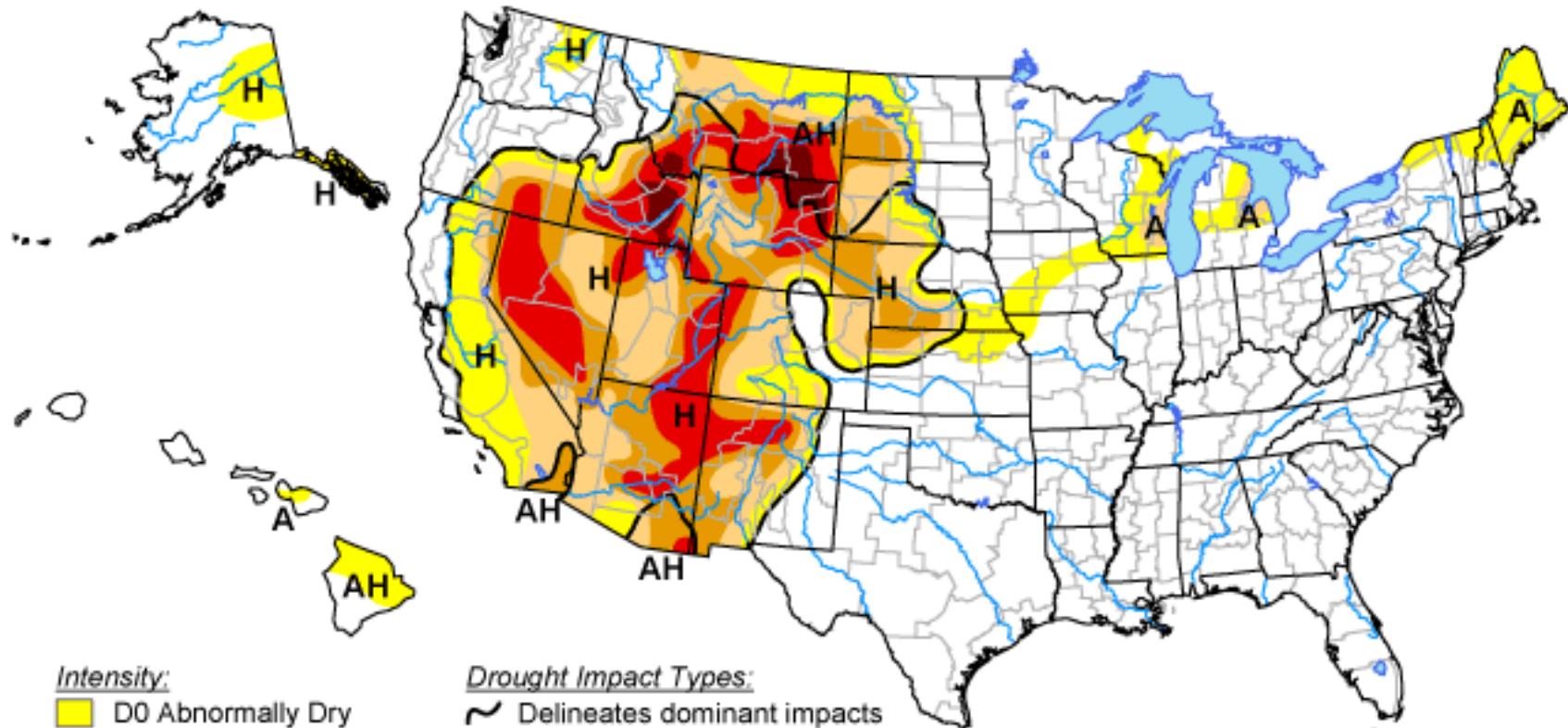


Storms






U.S. Drought Monitor

November 16, 2004


Valid 7 a.m. EST



Intensity:

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

Drought Impact Types:

-  Delineates dominant impacts
- A = Agricultural (crops, pastures, grasslands)
- H = Hydrological (water)
- (No type = Both impacts)

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



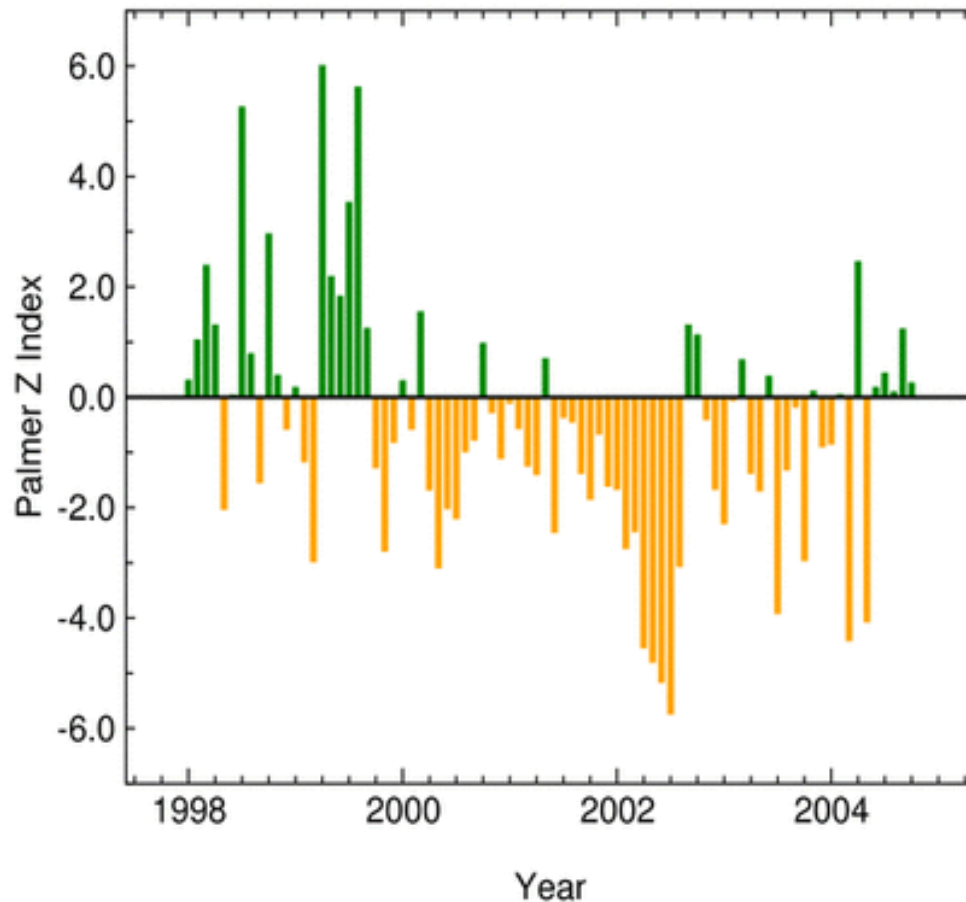
Released Thursday, November 18, 2004

Authors: Richard Heim/Candace Tankersley, NCDC/NESDIS/NOAA

<http://drought.unl.edu/dm>

Colorado Statewide Z Index*

January 1998 - October 2004



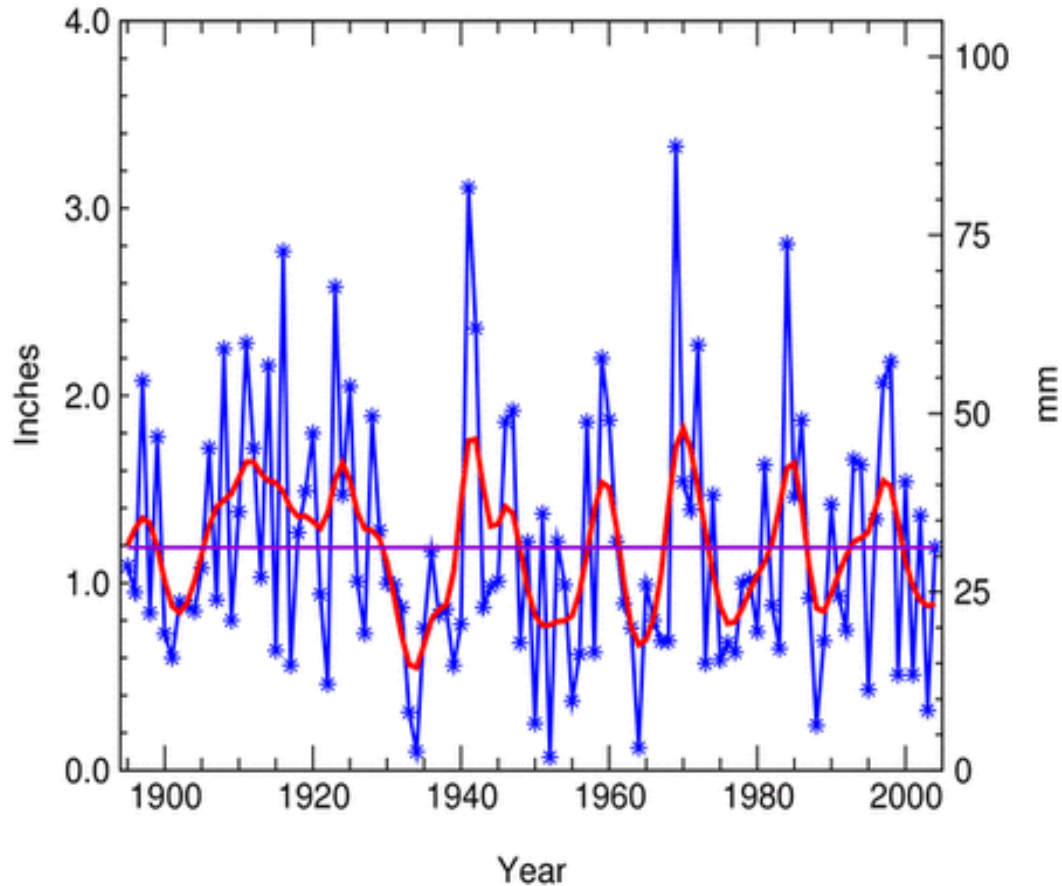
*Palmer Z Index
Short-Term Drought



National Climatic Data Center / NESDIS / NOAA

Colorado Statewide Precipitation

October, 1895 - 2004

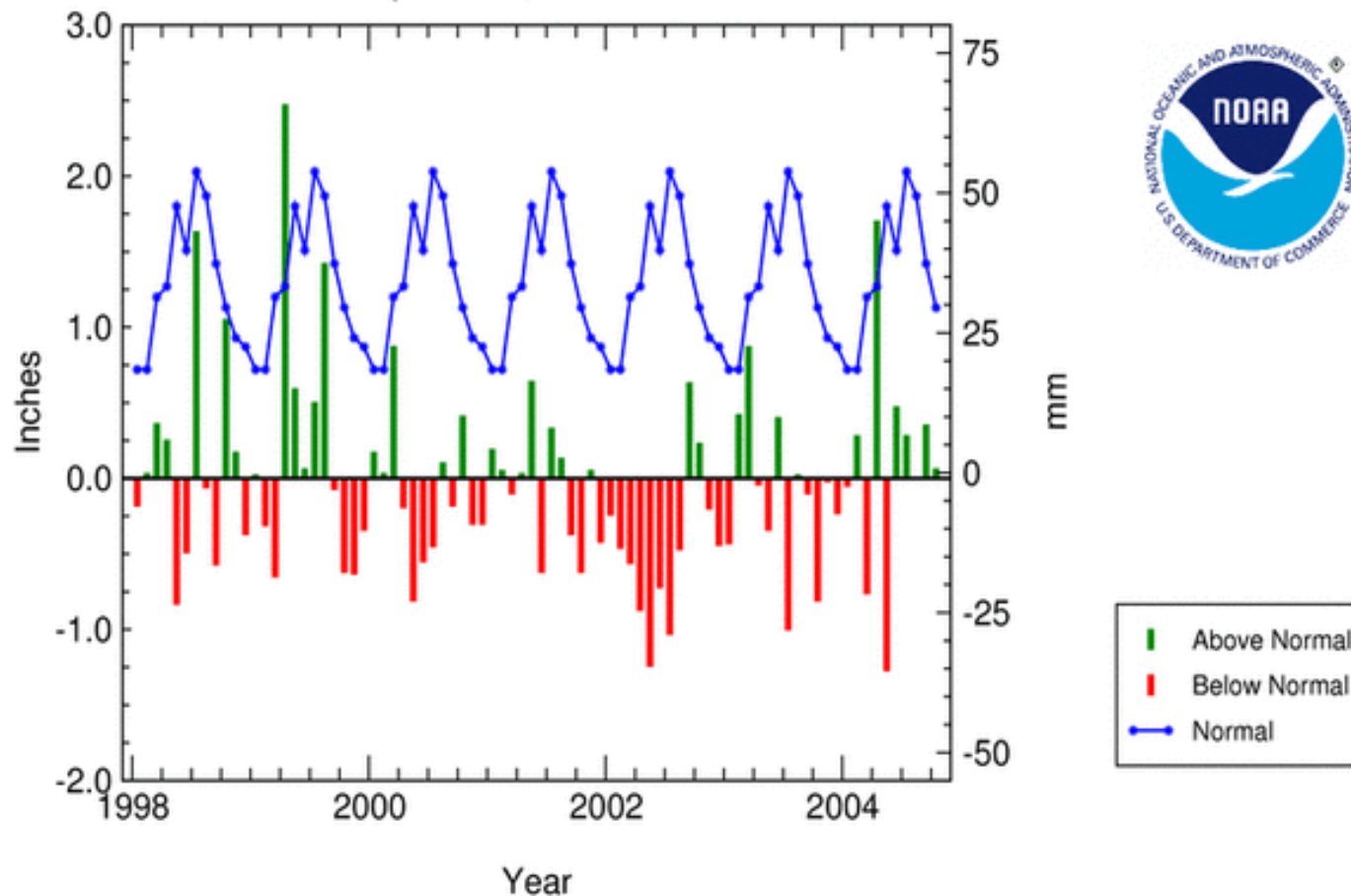


- * Yearly Values
- Filtered Values
- Long-Term Mean

National Climatic Data Center / NESDIS / NOAA

Colorado Statewide Precipitation

Normal & Departure, Jan 1998 - Oct 2004



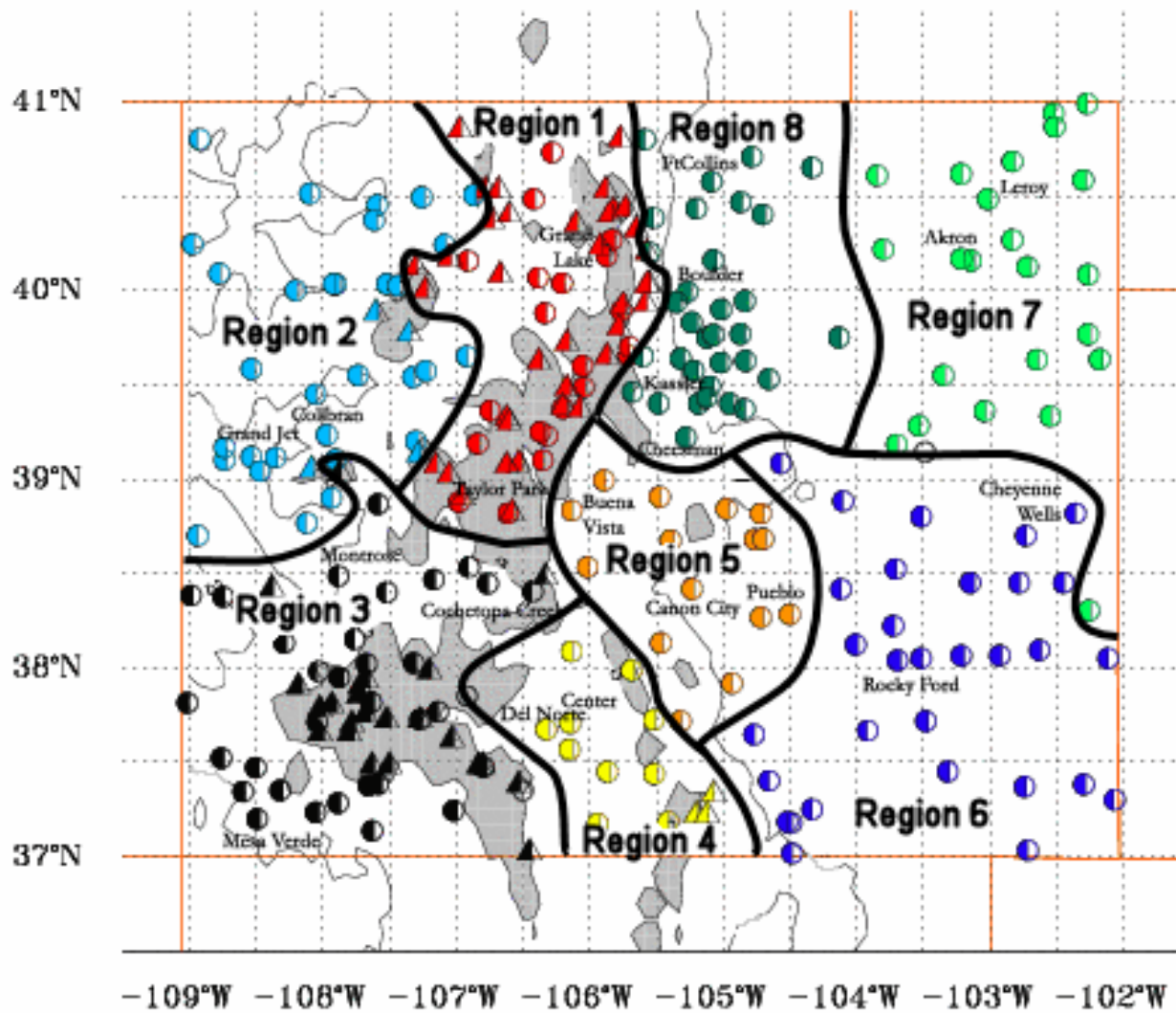
National Climatic Data Center / NESDIS / NOAA

**Statewide Precipitation Ranks
for Colorado , 2003-2004**

Period	Rank
Oct	<u>46th wettest</u> (<u>65th driest</u>)
Sep-Oct	<u>32nd wettest</u> (<u>78th driest</u>)
Aug-Oct	<u>40th wettest</u> (<u>71st driest</u>)
Jul-Oct	<u>38th wettest</u> (<u>73rd driest</u>)
Jun-Oct	<u>29th wettest</u> (<u>81st driest</u>)
May-Oct	<u>54th driest</u>
Apr-Oct	<u>30th wettest</u> (<u>81st driest</u>)
Mar-Oct	<u>43rd wettest</u> (<u>68th driest</u>)
Feb-Oct	<u>41st wettest</u> (<u>70th driest</u>)
Jan-Oct	<u>43rd wettest</u> (<u>68th driest</u>)
Dec-Oct	<u>45th wettest</u> (<u>65th driest</u>)
Nov-Oct	<u>46th wettest</u> (<u>64th driest</u>)

**Colorado
Precipitation
Ranking
1895-2004**

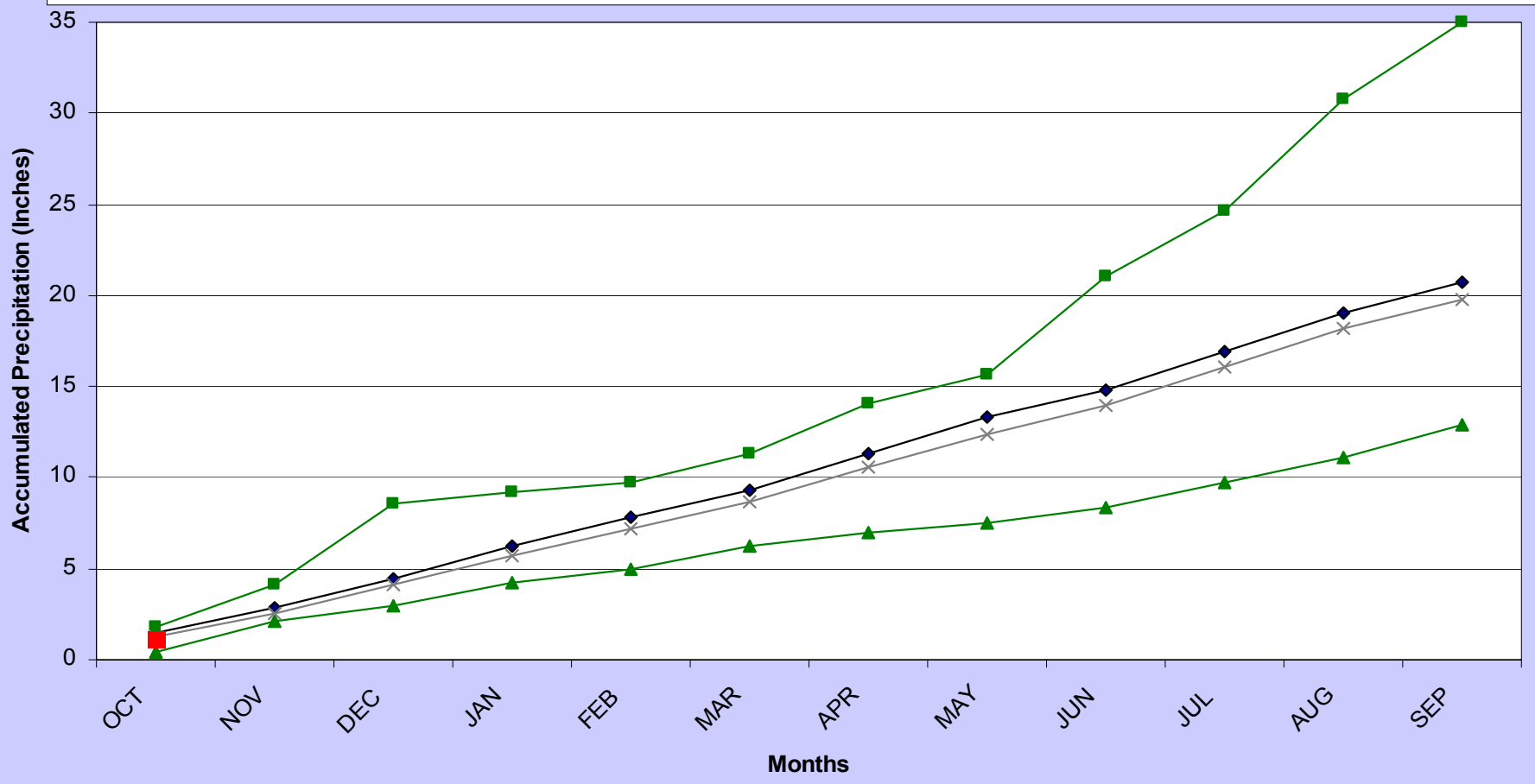
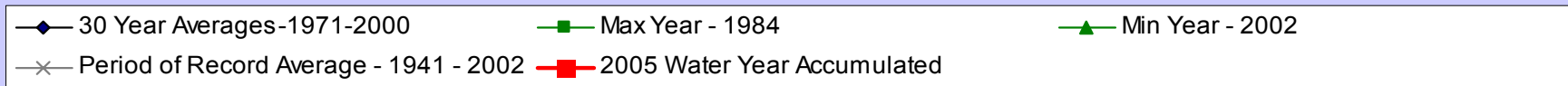
COLORADO



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

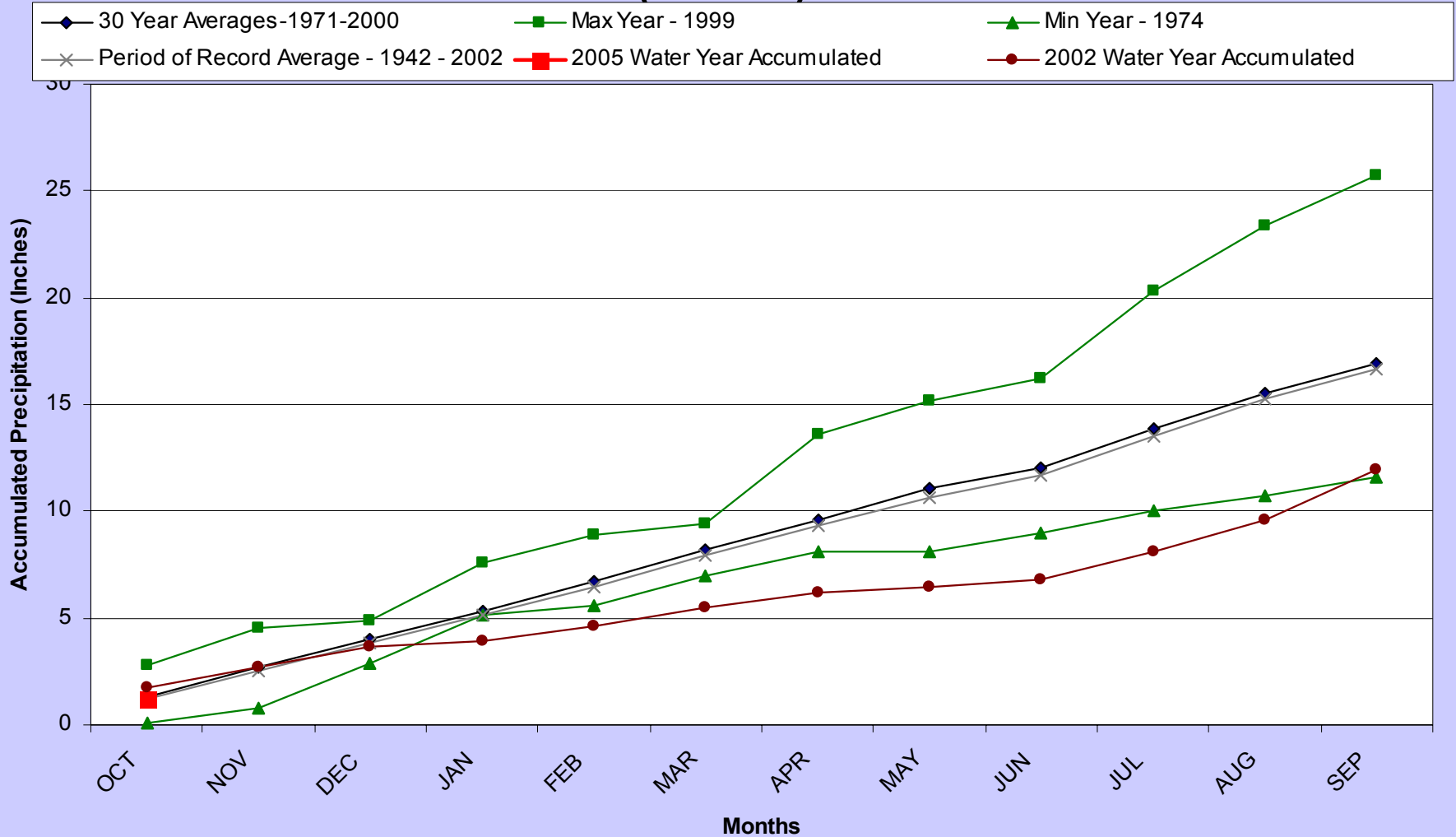
Division 1- Grand Lake 1NW

Grand Lake 1 NW 2005 Water Year (Oct '04)



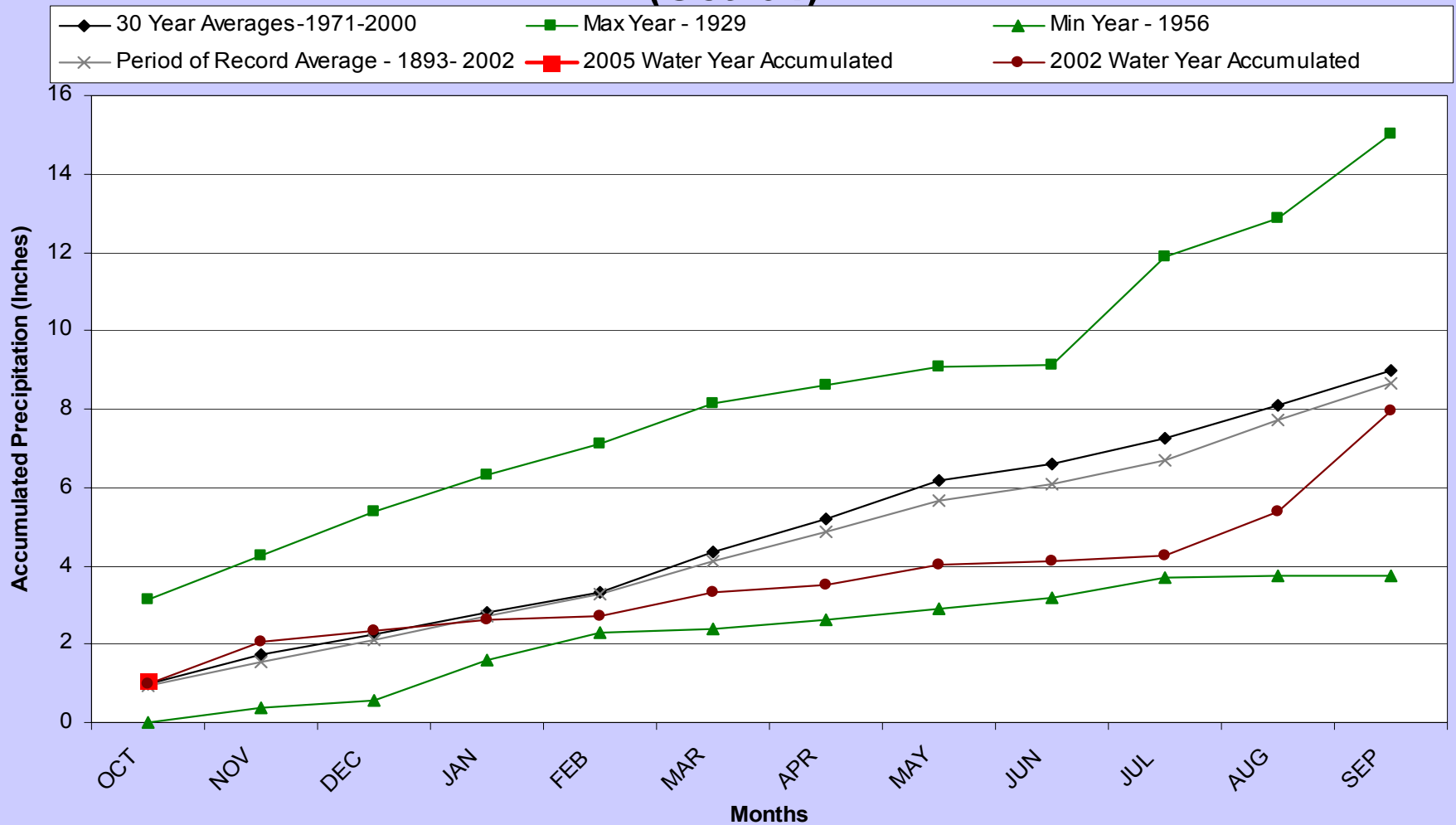
Division 1- Taylor Park

Taylor Park 2005 Water Year (Oct '04)



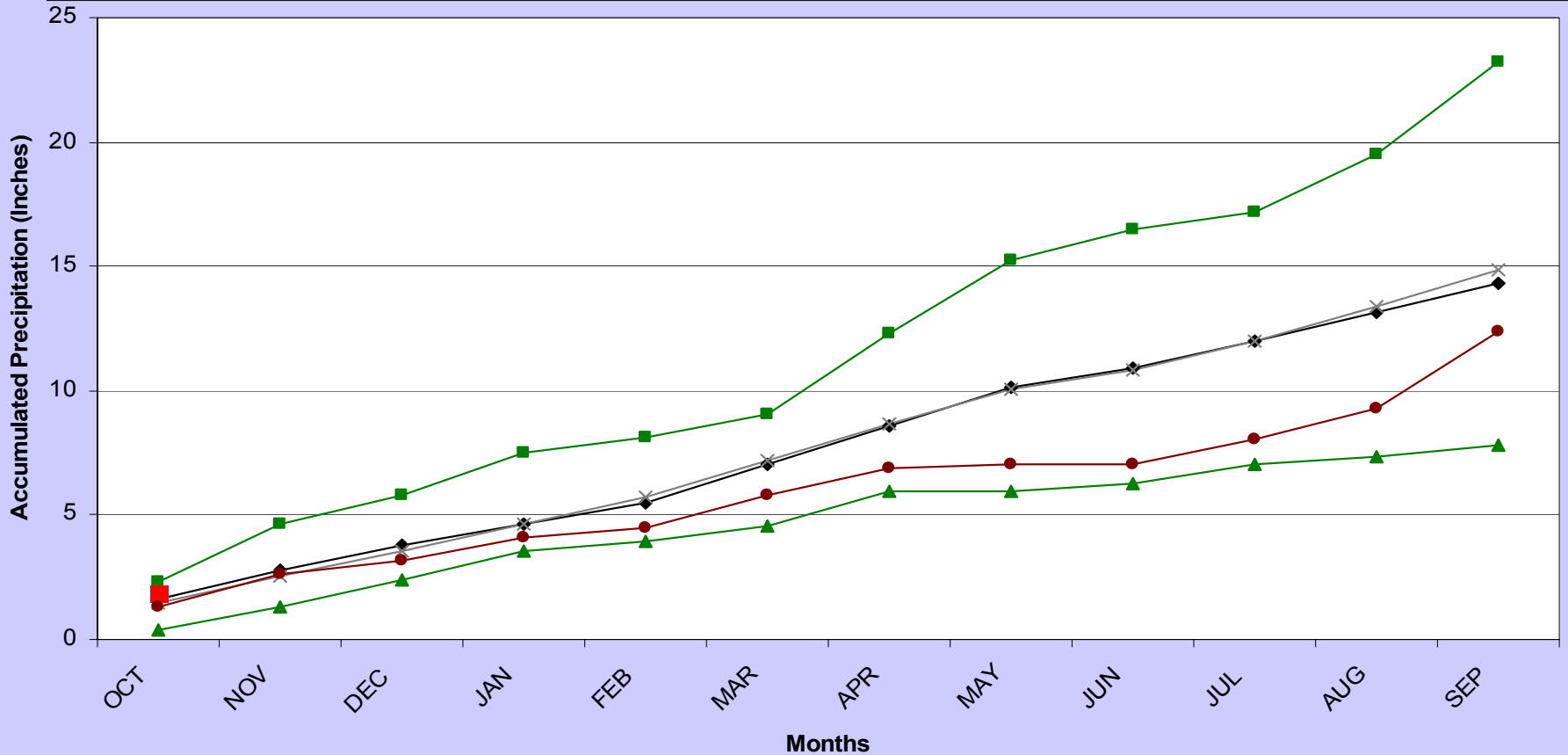
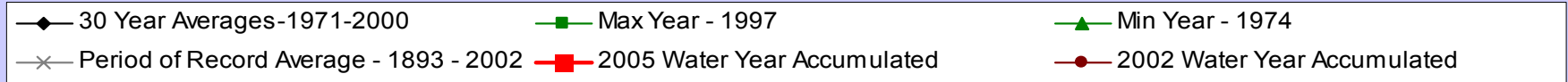
Division 2 – Grand Junction

Grand Junction WSFO 2005 Water Year (Oct '04)



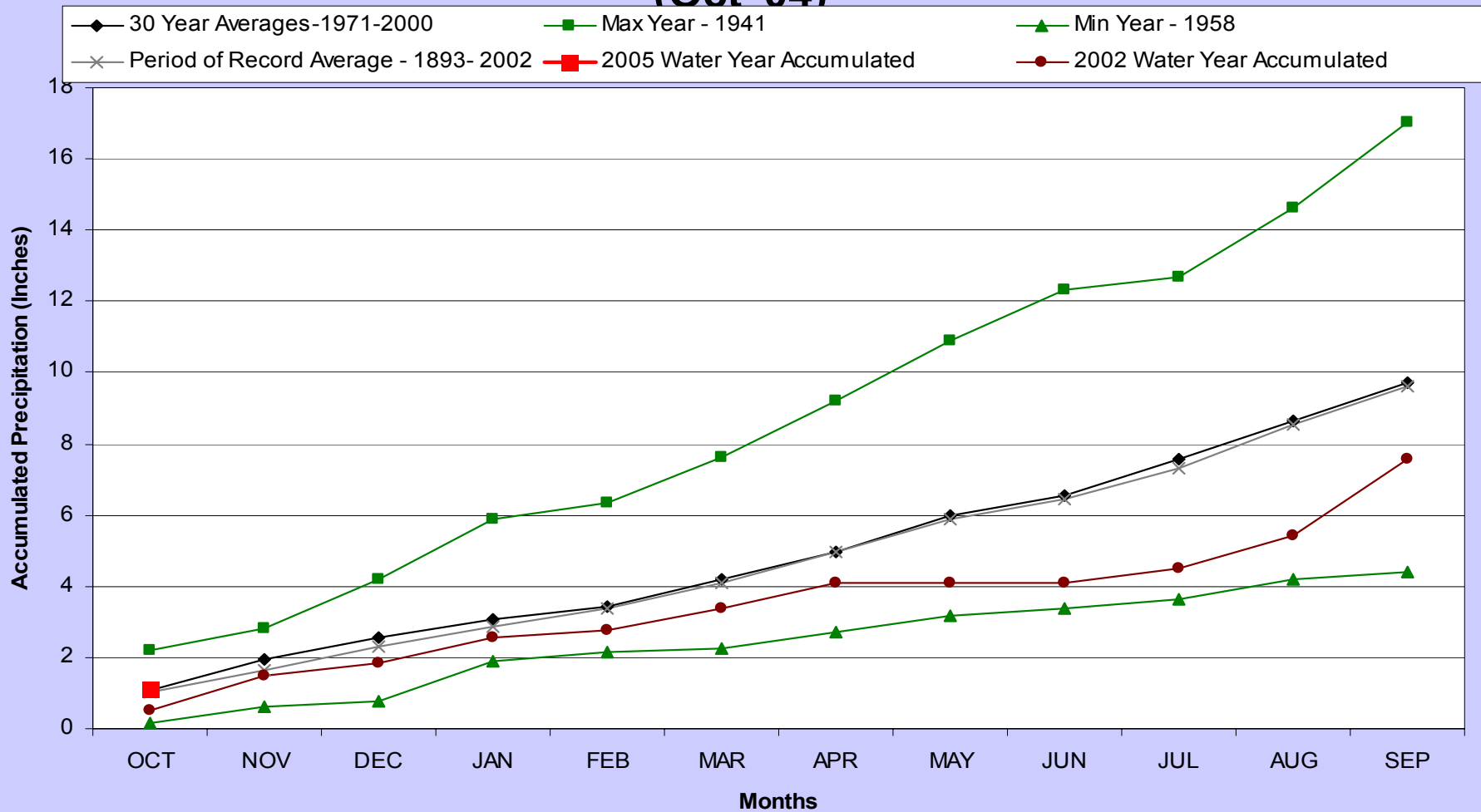
Division 2 – Collbran

Collbran 2SW 2005 Water Year (Oct '04)



Division 3 - Montrose

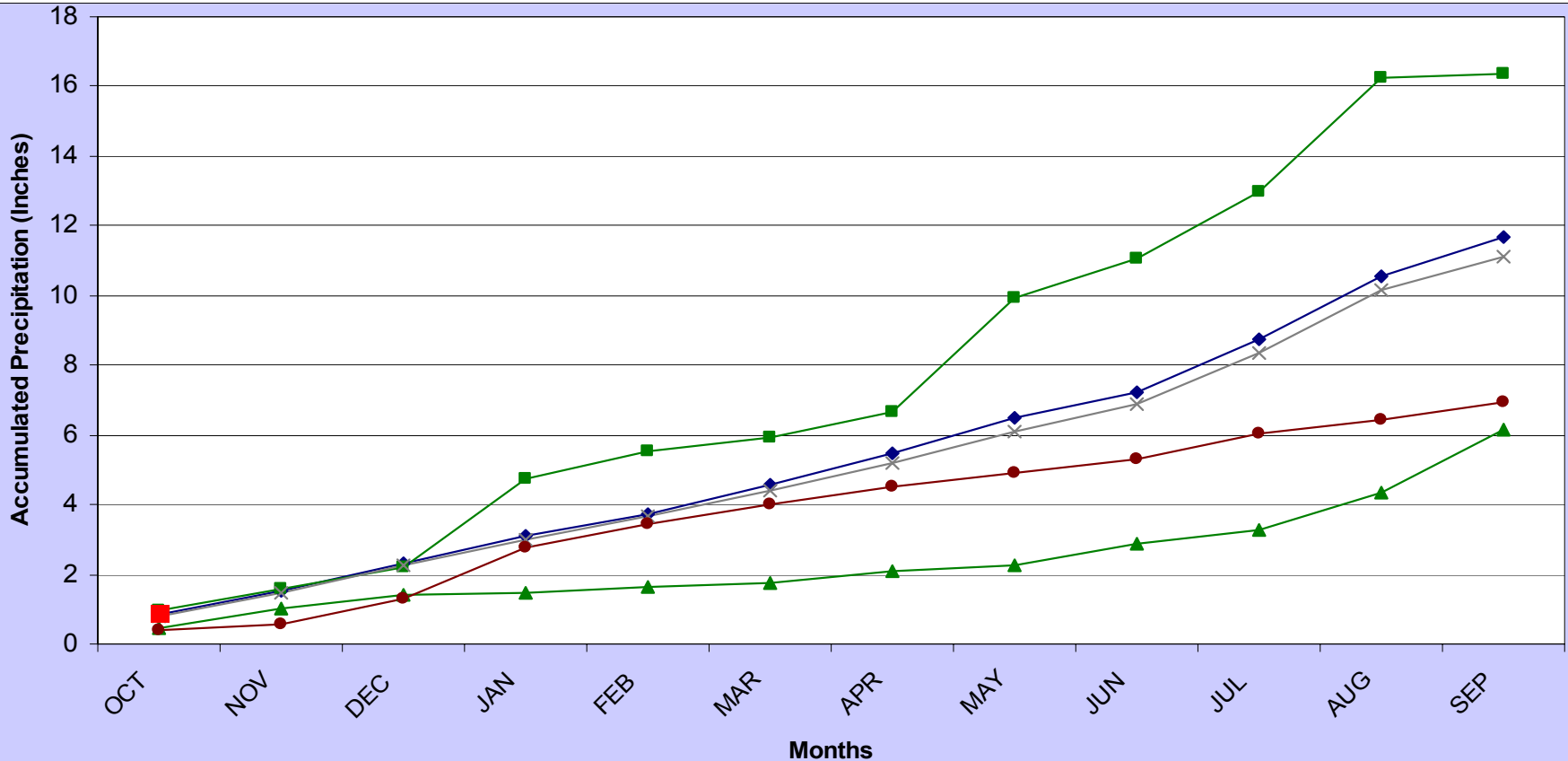
Montrose #2 2005 Water Year (Oct '04)



Division 3 – Cochetopa Creek

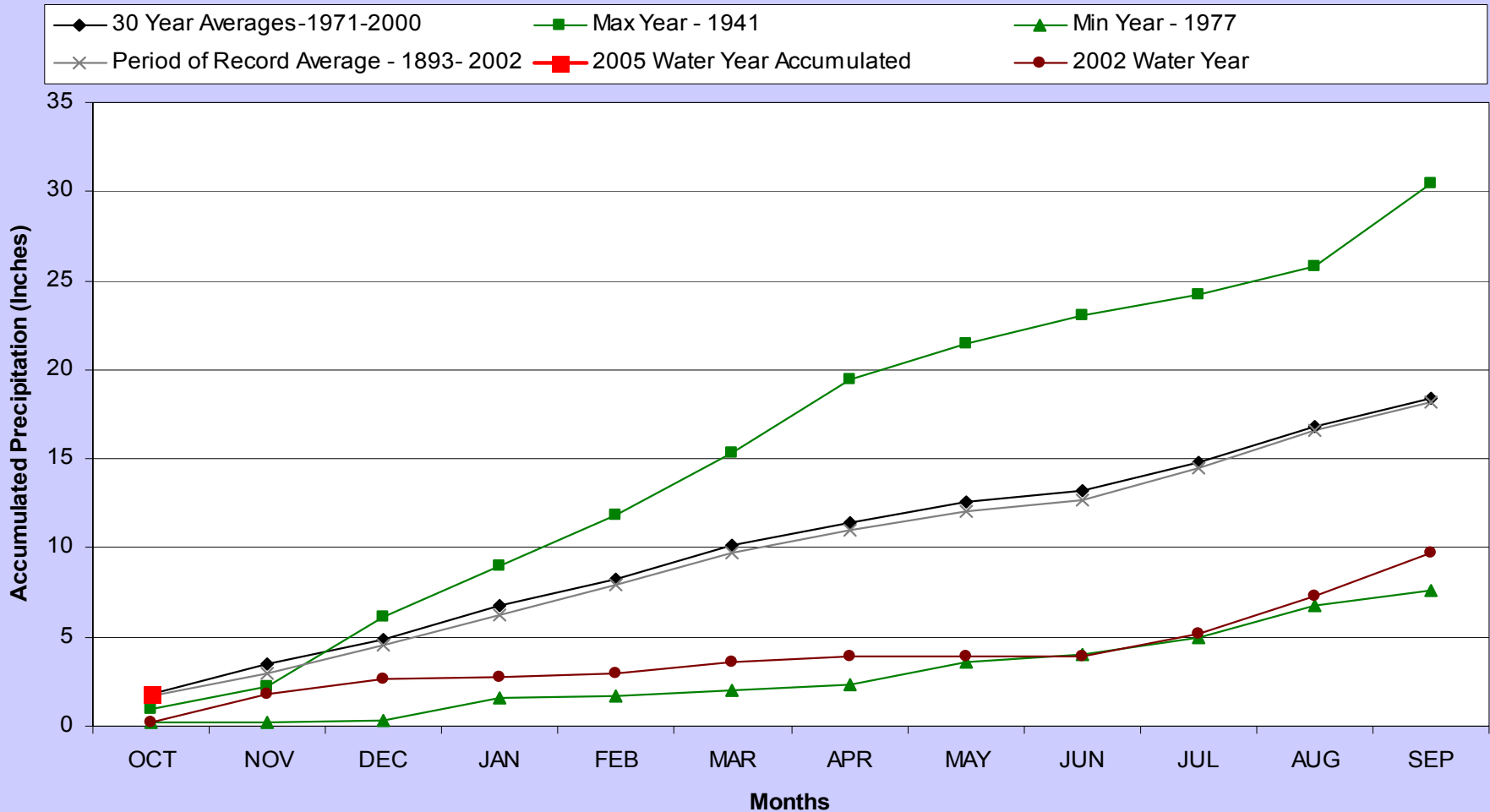
Cochetopa Creek 2005 Water Year (Oct '04)

◆ 30 Year Averages-1971-2000 ■ Max Year - 1957 ▲ Min Year - 2002
× Period of Record Average - 1949 - 2002 ■ 2005 Water Year ● 2nd Min Year - 1950



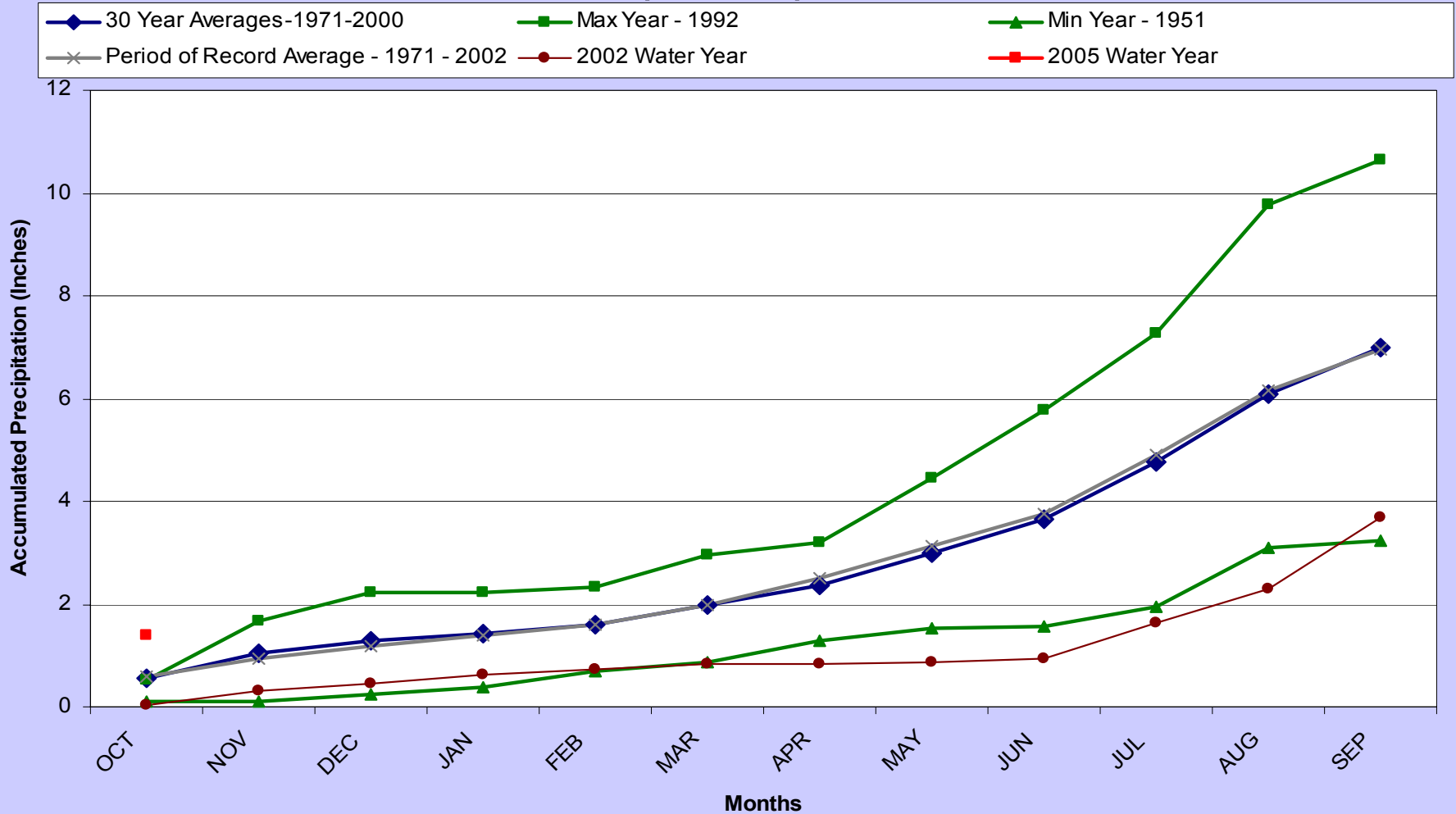
Division 3 -- Mesa Verde

Mesa Verde NP 2005 Water Year (Oct '04)



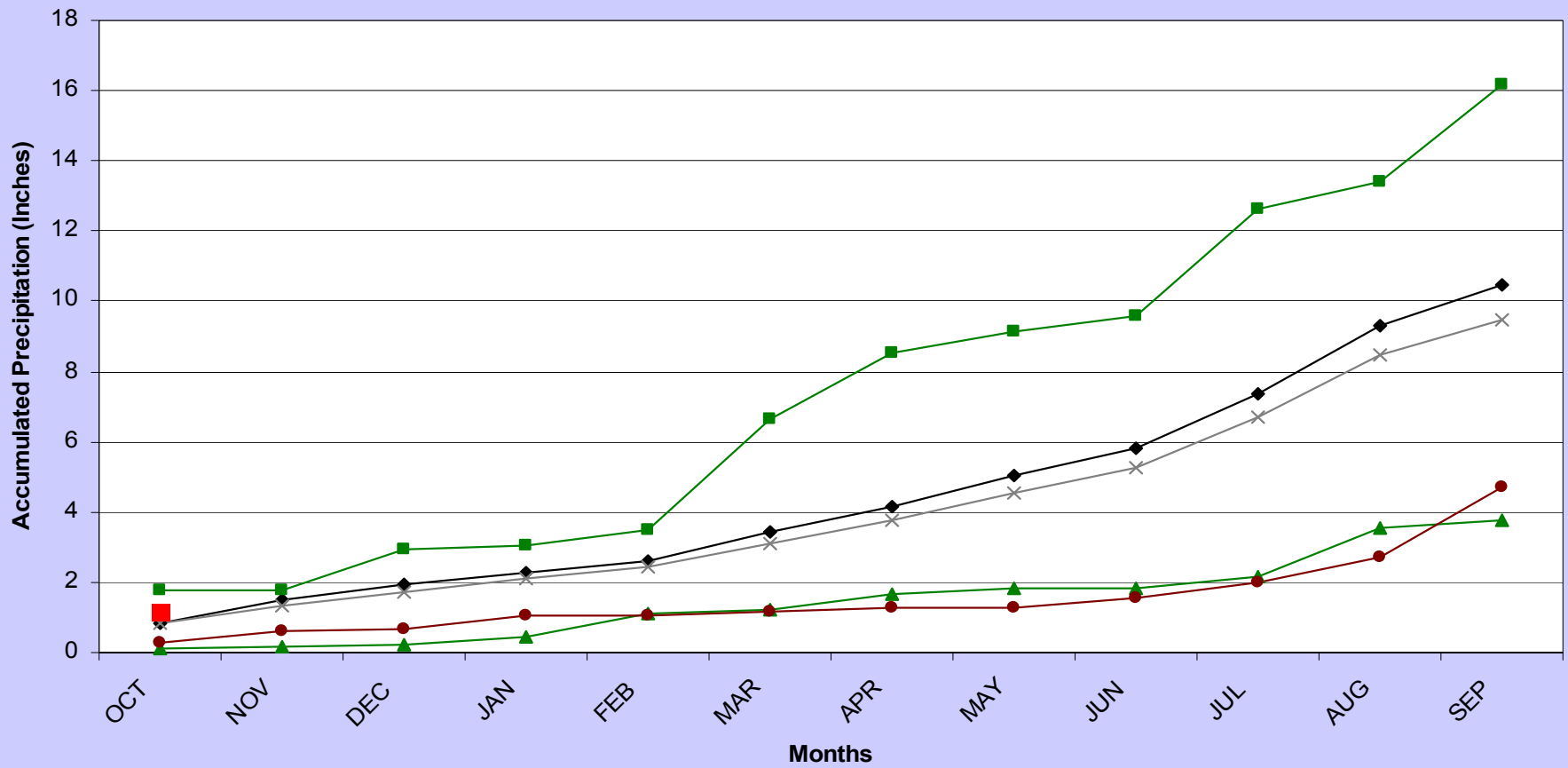
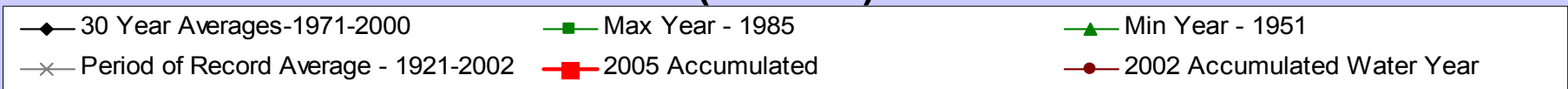
Division 4 - Center

Center 4SSW 2005 Water Year (Oct '04)



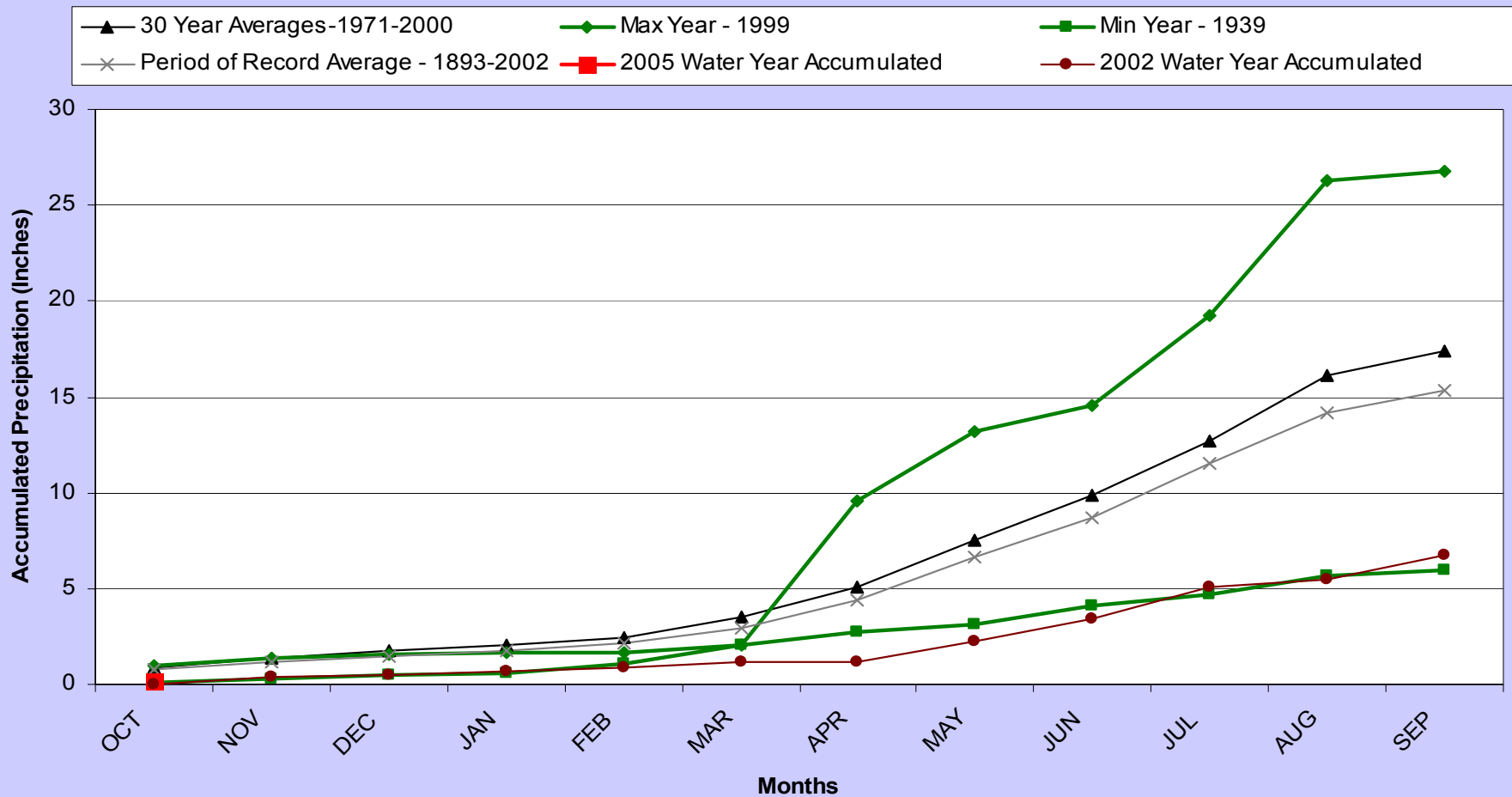
Division 4 – Del Norte

Del Norte 2005 Water Year (Oct '04)



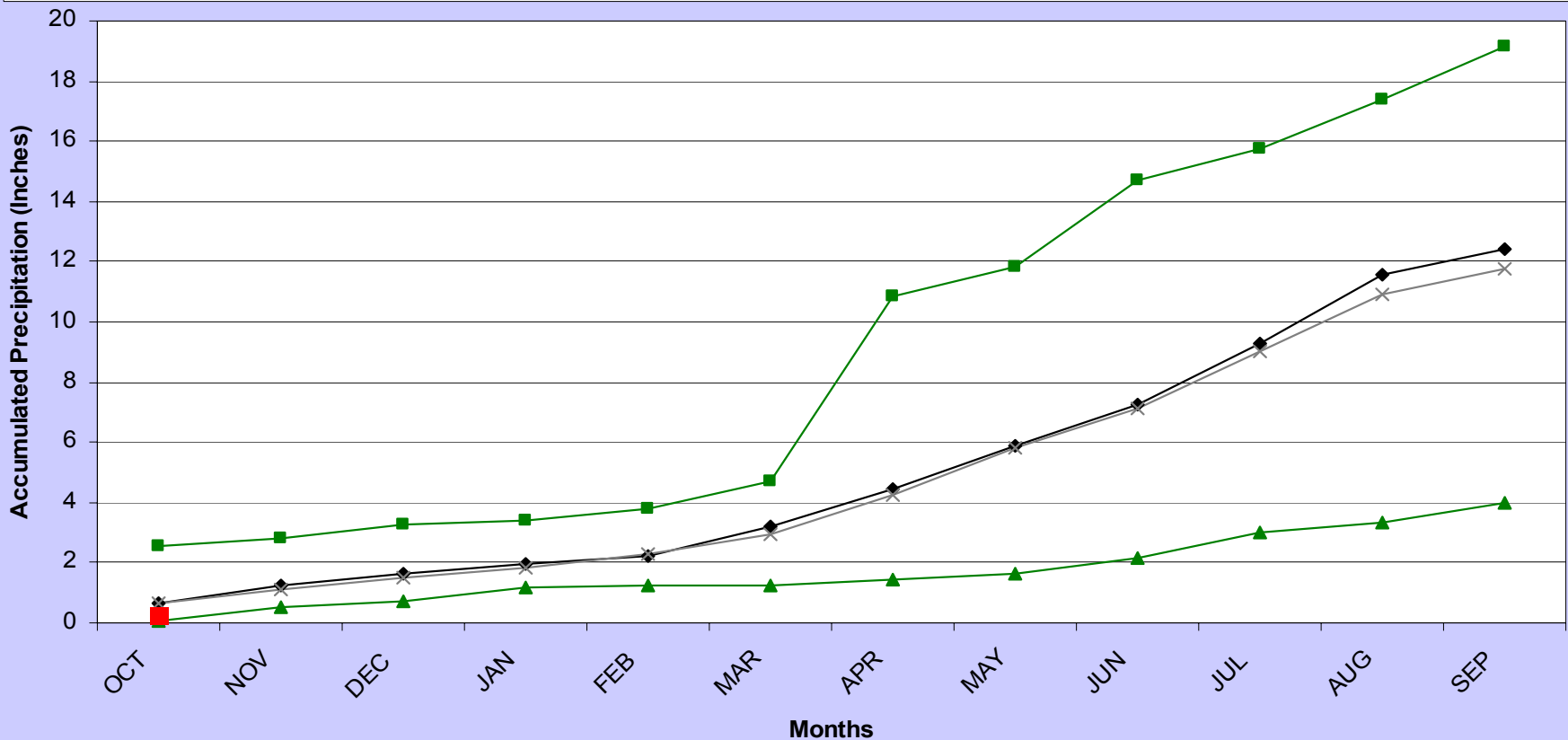
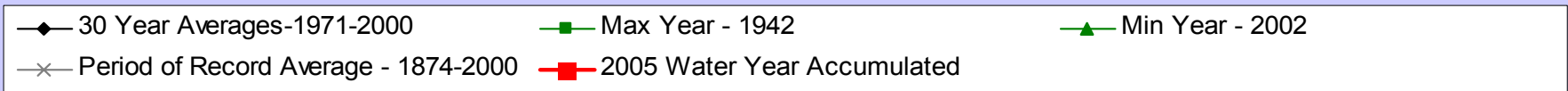
Division 5 – Colorado Springs

Colorado Springs 2005 Water Year (Oct '04)



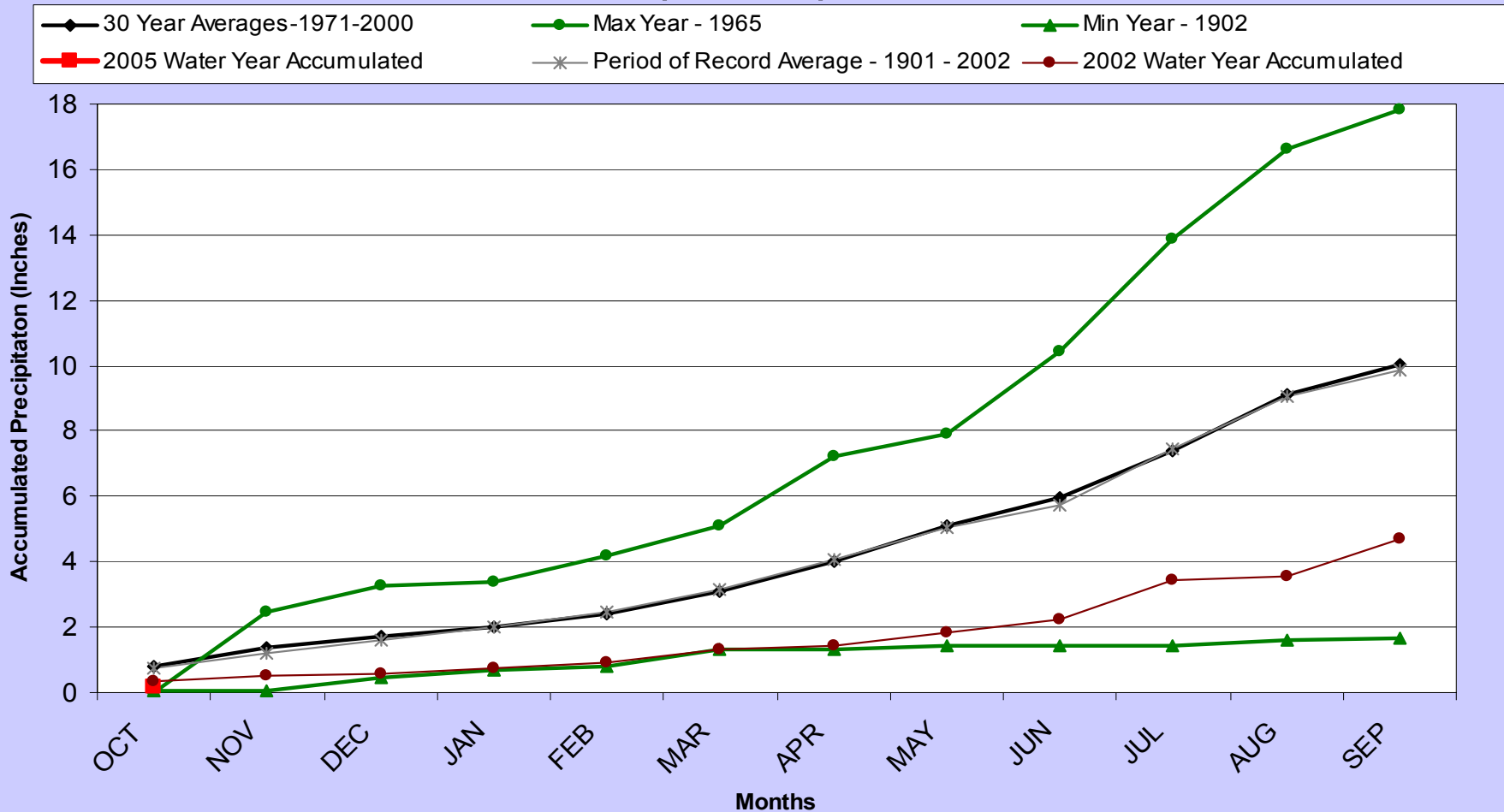
Division 5 - Pueblo

Pueblo WSO 2005 Water Year (Oct '04)



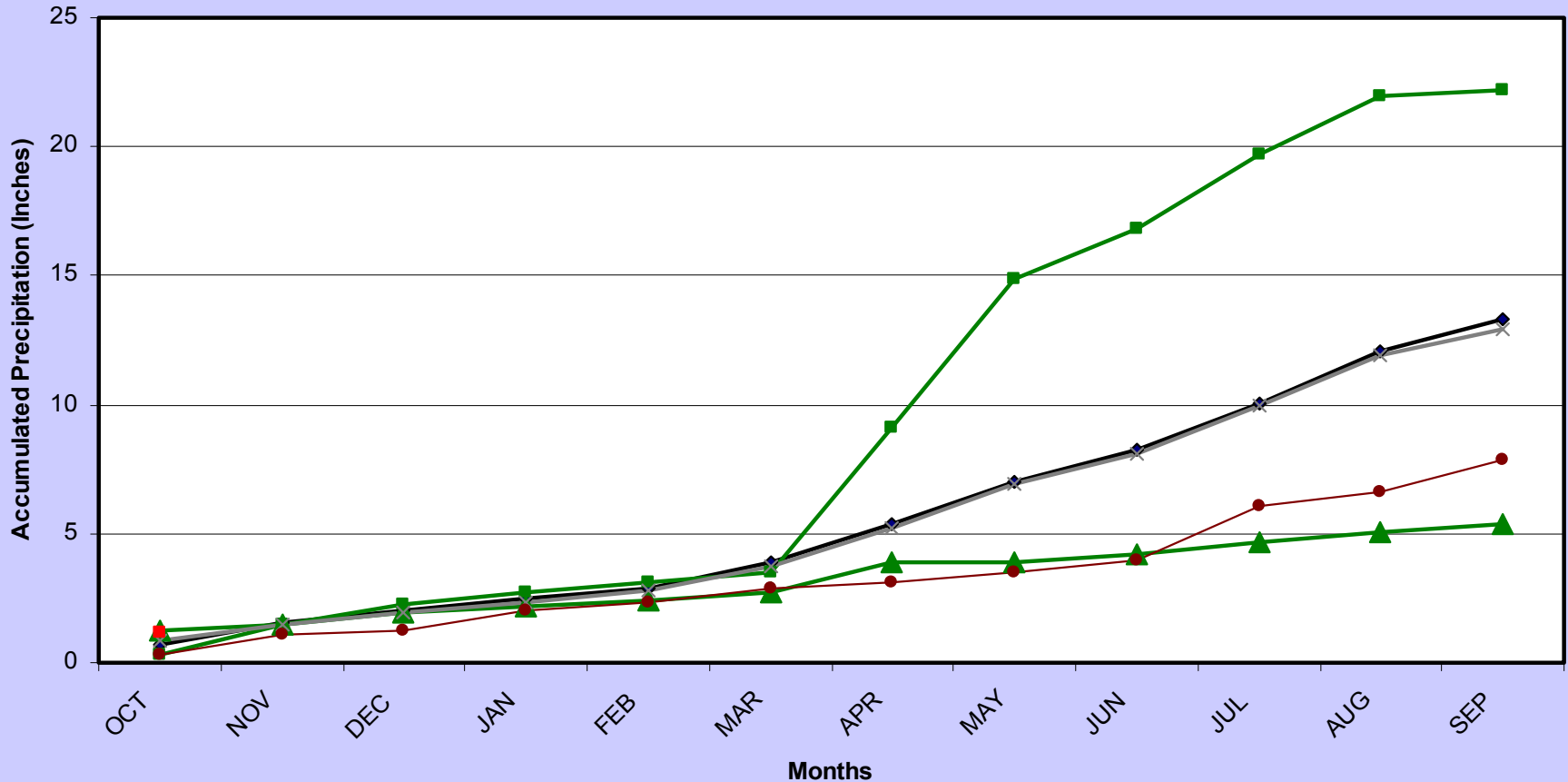
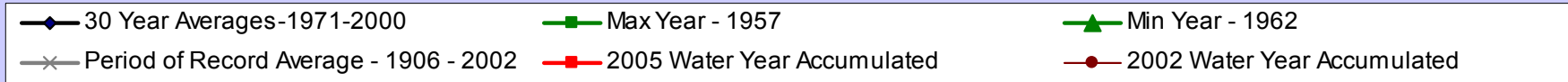
Division 5 – Buena Vista

Buena Vista 2005 Water Year (Oct '04)



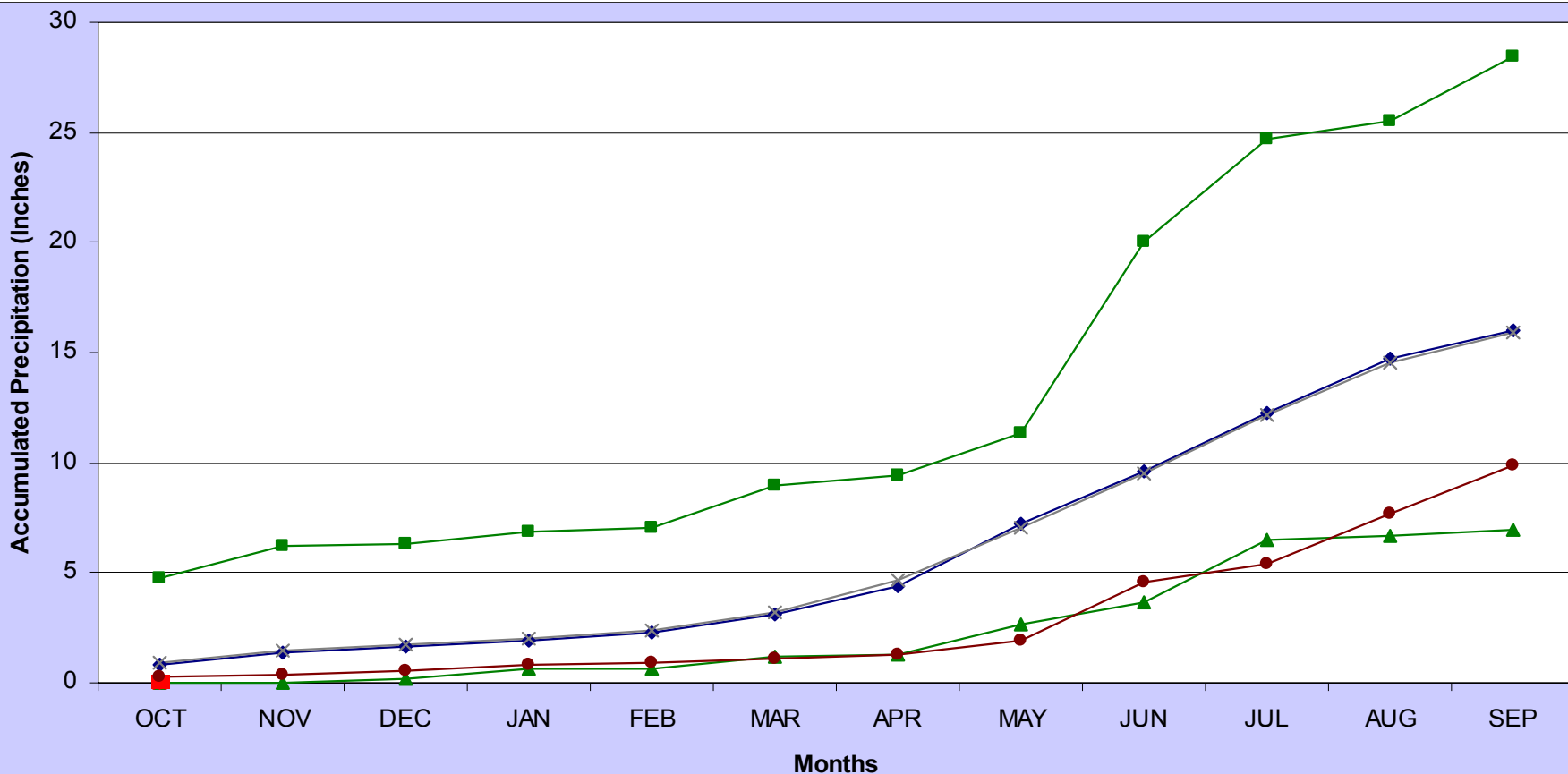
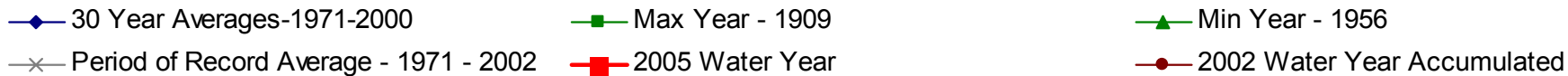
Division 5 – Canon City

Canon City 2005 Water Year (Oct '04)



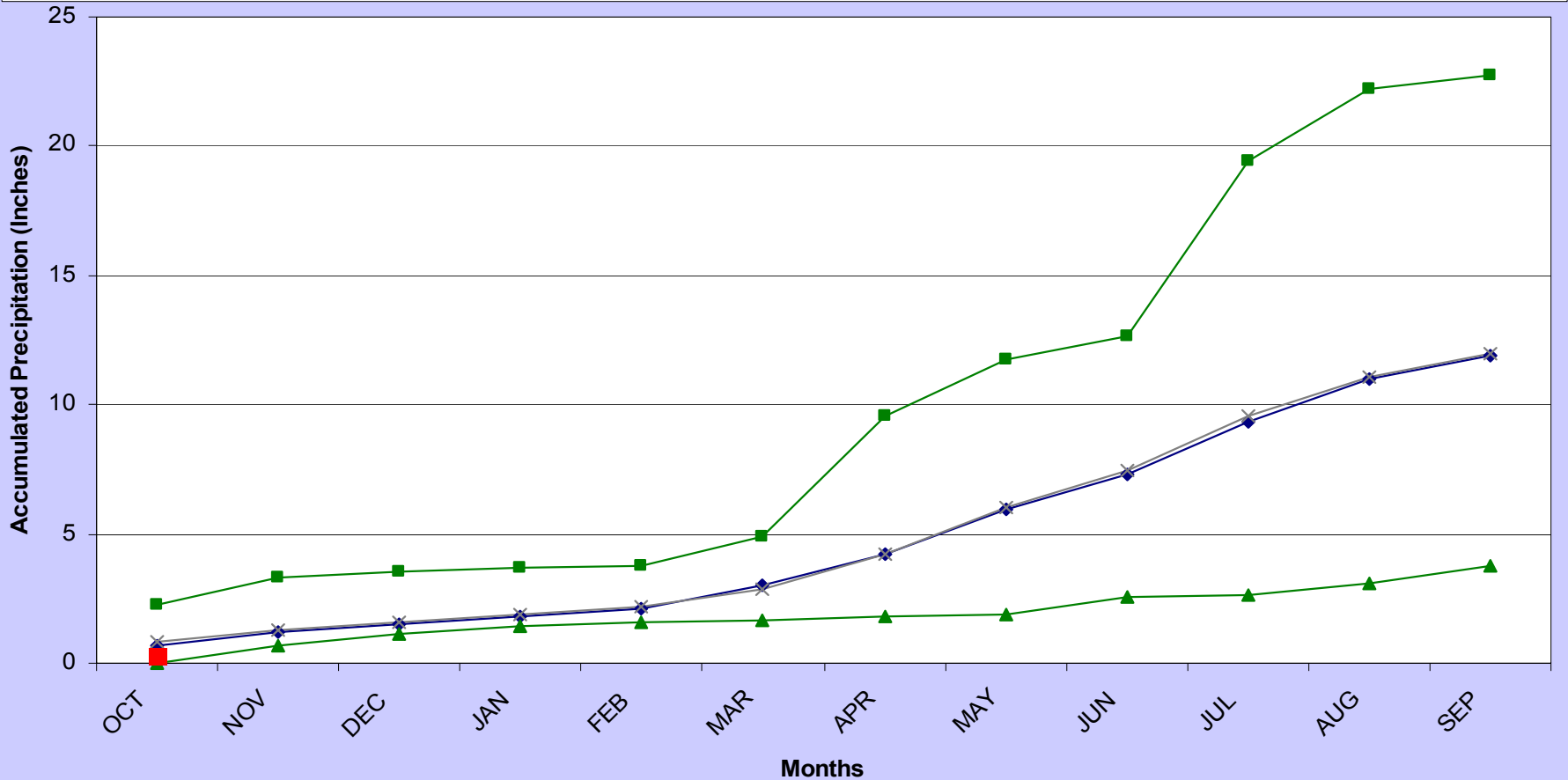
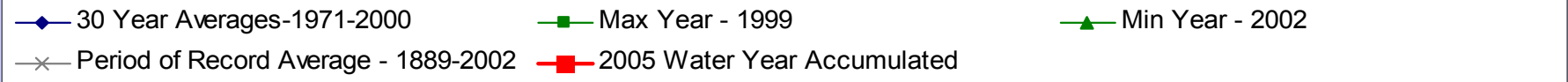
Division 6 – Cheyenne Wells

Cheyenne Wells 2005 Water Year (Oct '04)



Division 6 – Rocky Ford

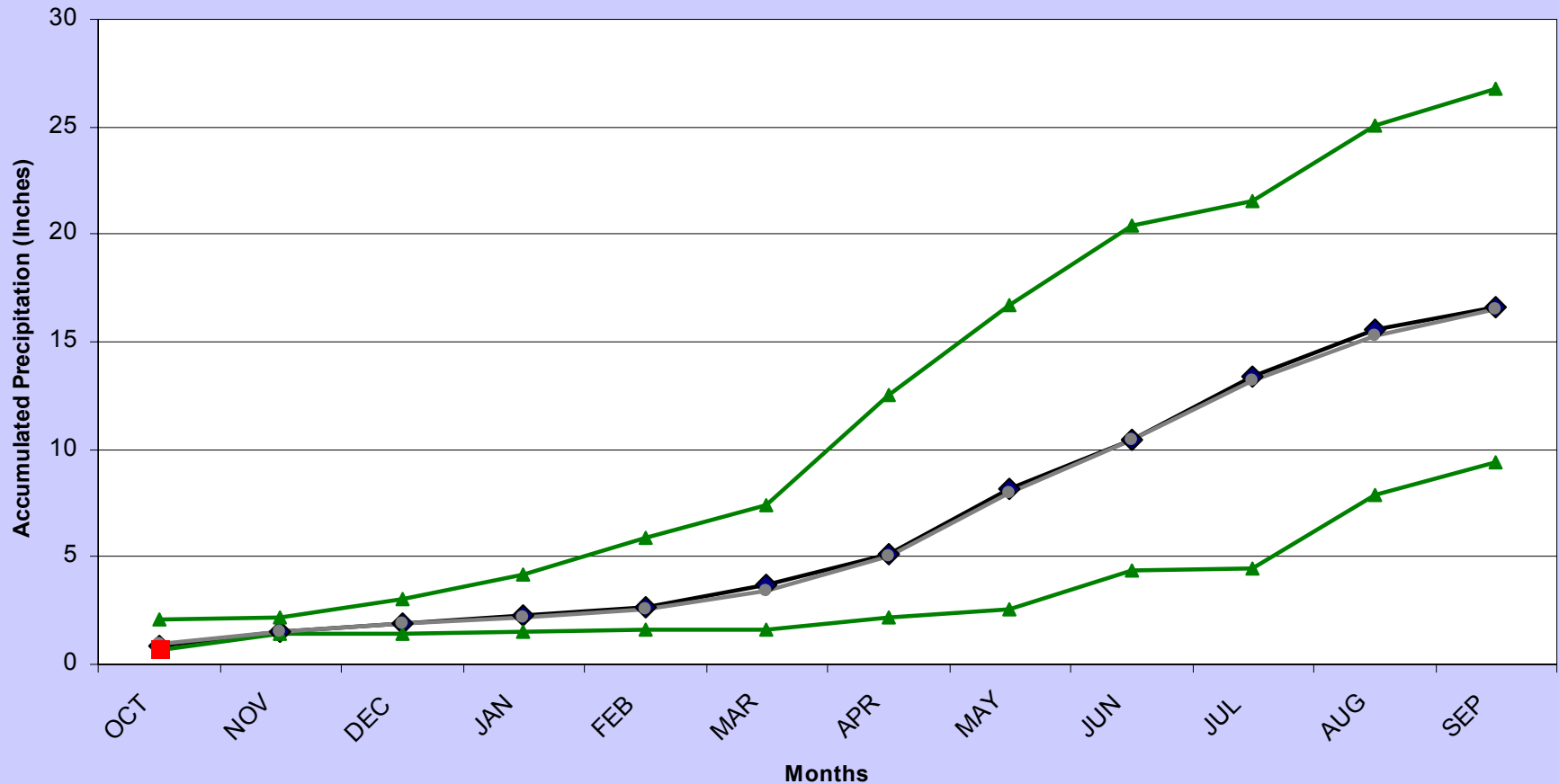
Rocky Ford 2005 Water Year (Oct '04)



Division 7 – Akron

Akron 4E 2005 Water Year (Oct '04)

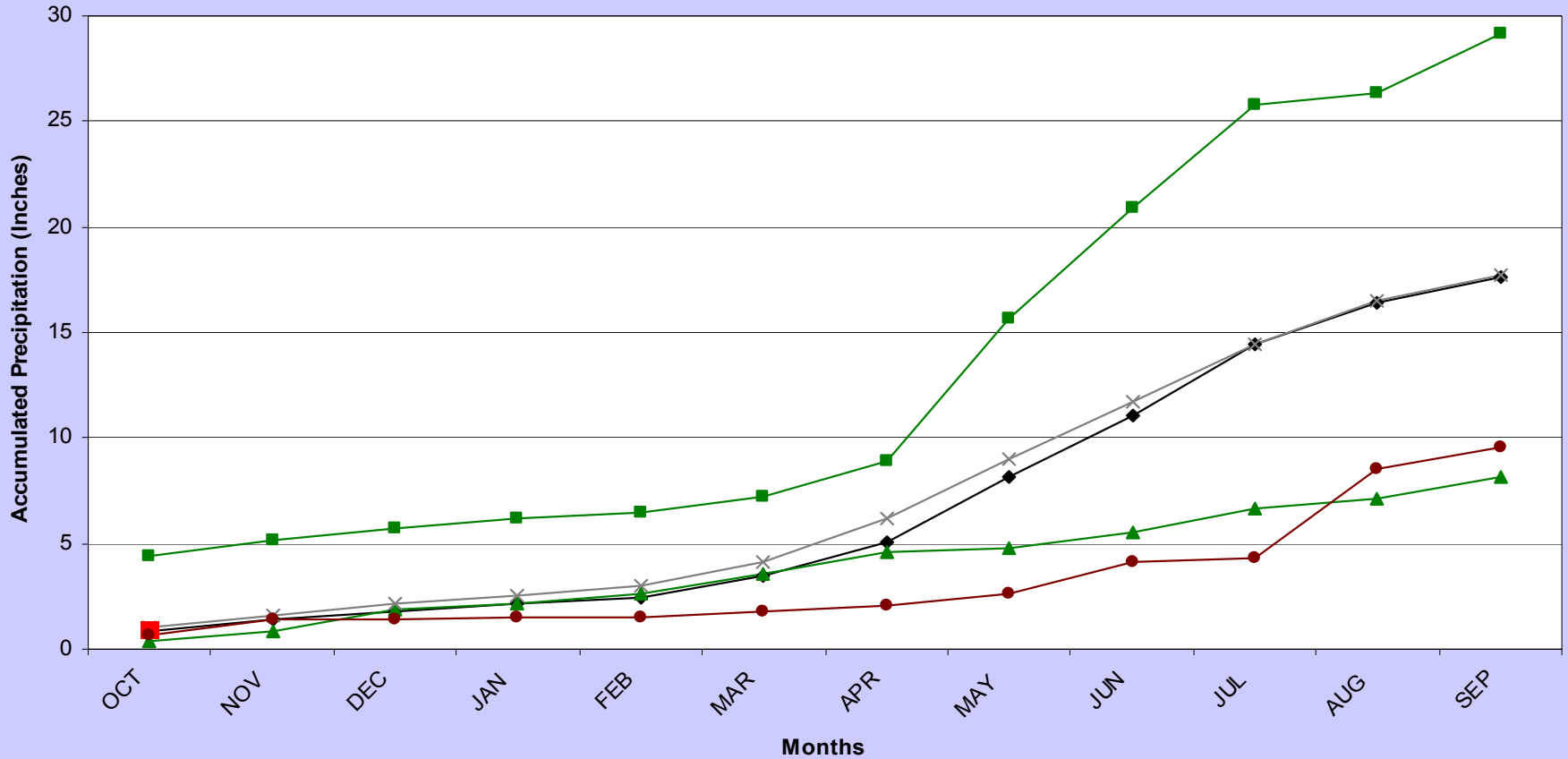
◆ 30 Year Averages-1971-2000 ▲ Max Year - 1915 ▲ Min Year - 2002
● Period of Record Average - 1906 - 2002 ■ 2005 Water Year Accumulated



Division 7 - Leroy

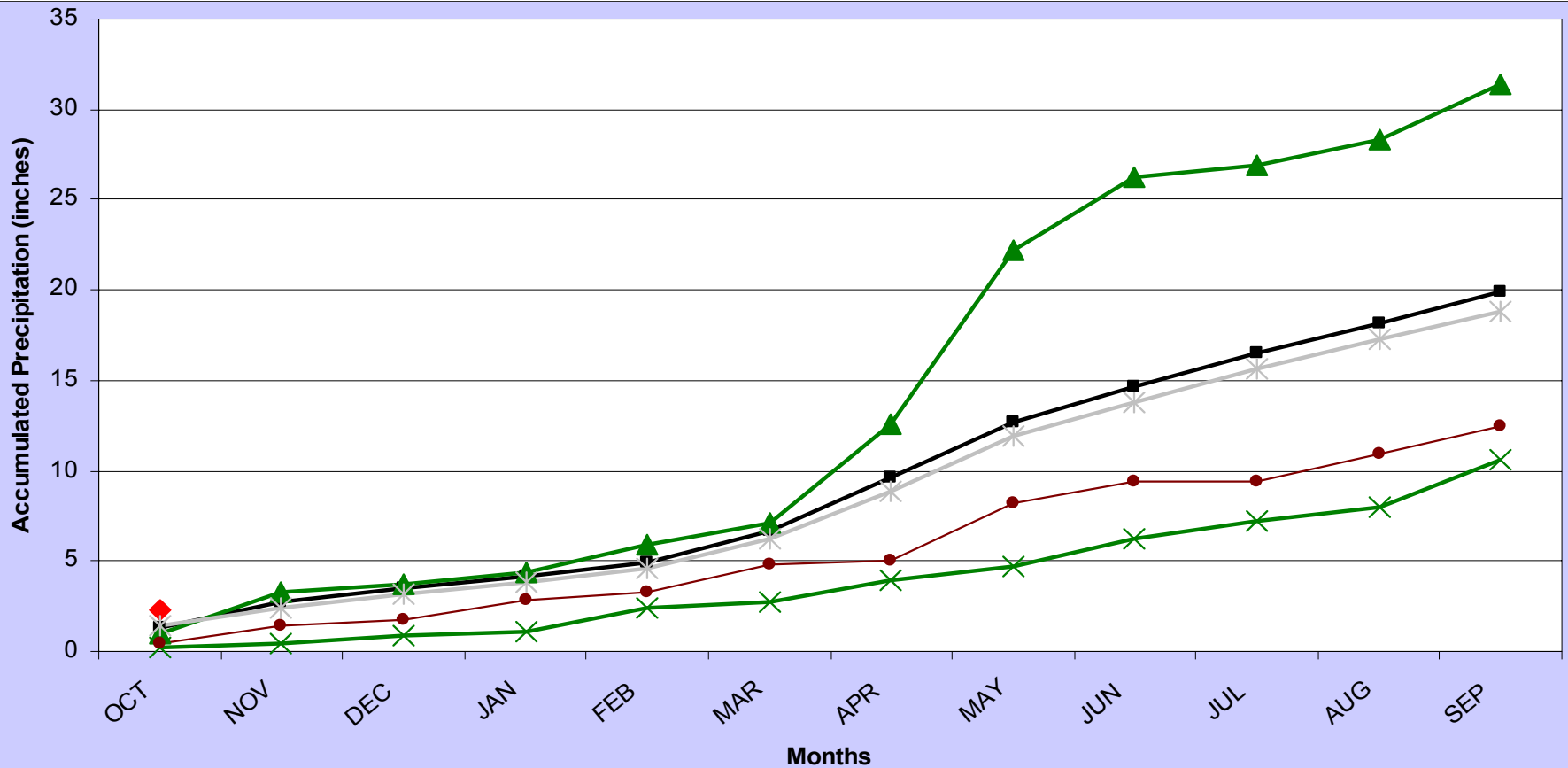
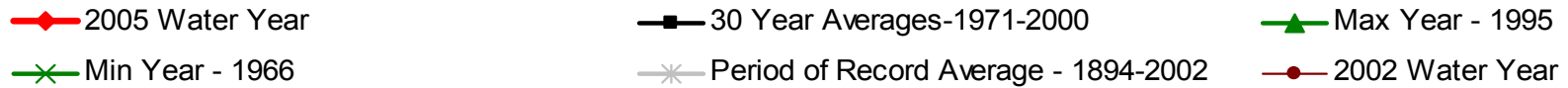
Leroy 5SW 2005 Water Year (Oct '04)

◆ 30 Year Averages-1971-2000 ■ Max Year - 1995 ▲ Min Year - 1894
× Period of Record Average - 1890-2002 ■ 200 Water Year Accumulated ● 2002 Water Year Accumulated



Division 8 – Boulder

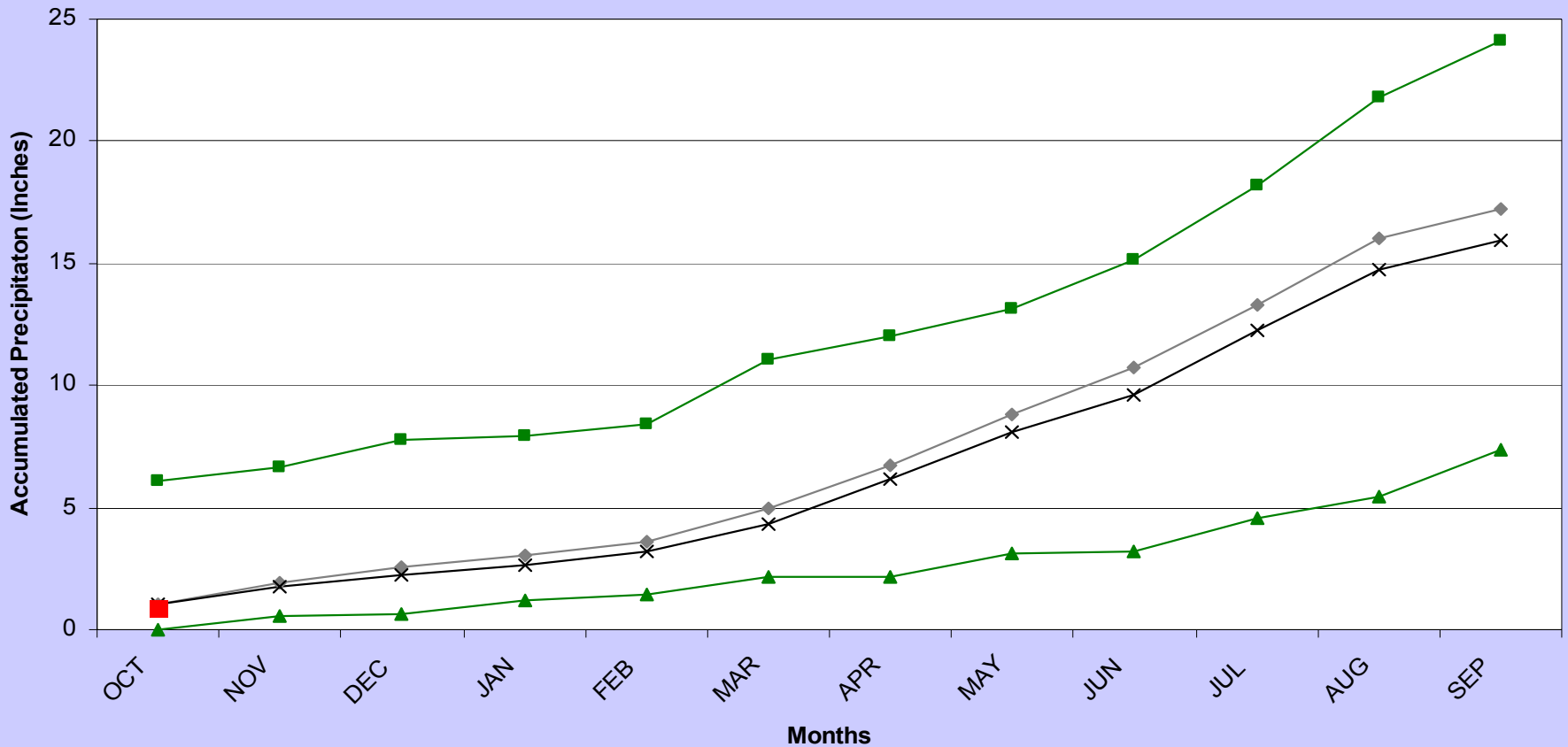
Boulder 2005 Water Year (Oct '04)



Division 8 – Cheesman

Cheesman 2005 Water Year (Oct '04)

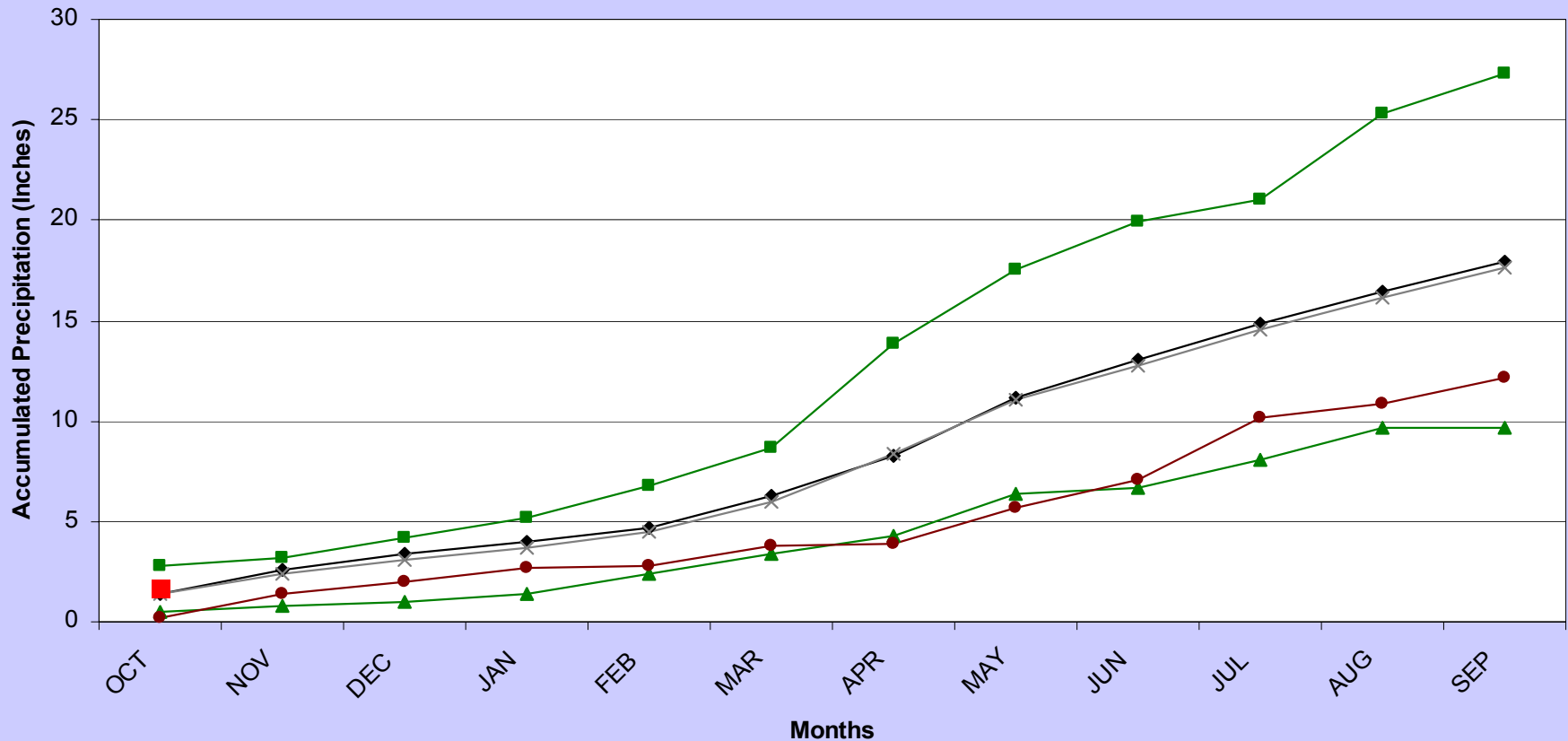
◆ 30 Year Averages-1971-2000 ■ Max Year - 1970 ▲ Min Year - 2002
× Period of Record Average - 1904 - 2002 ■ 2005 Water Year



Division 8 – Kassler

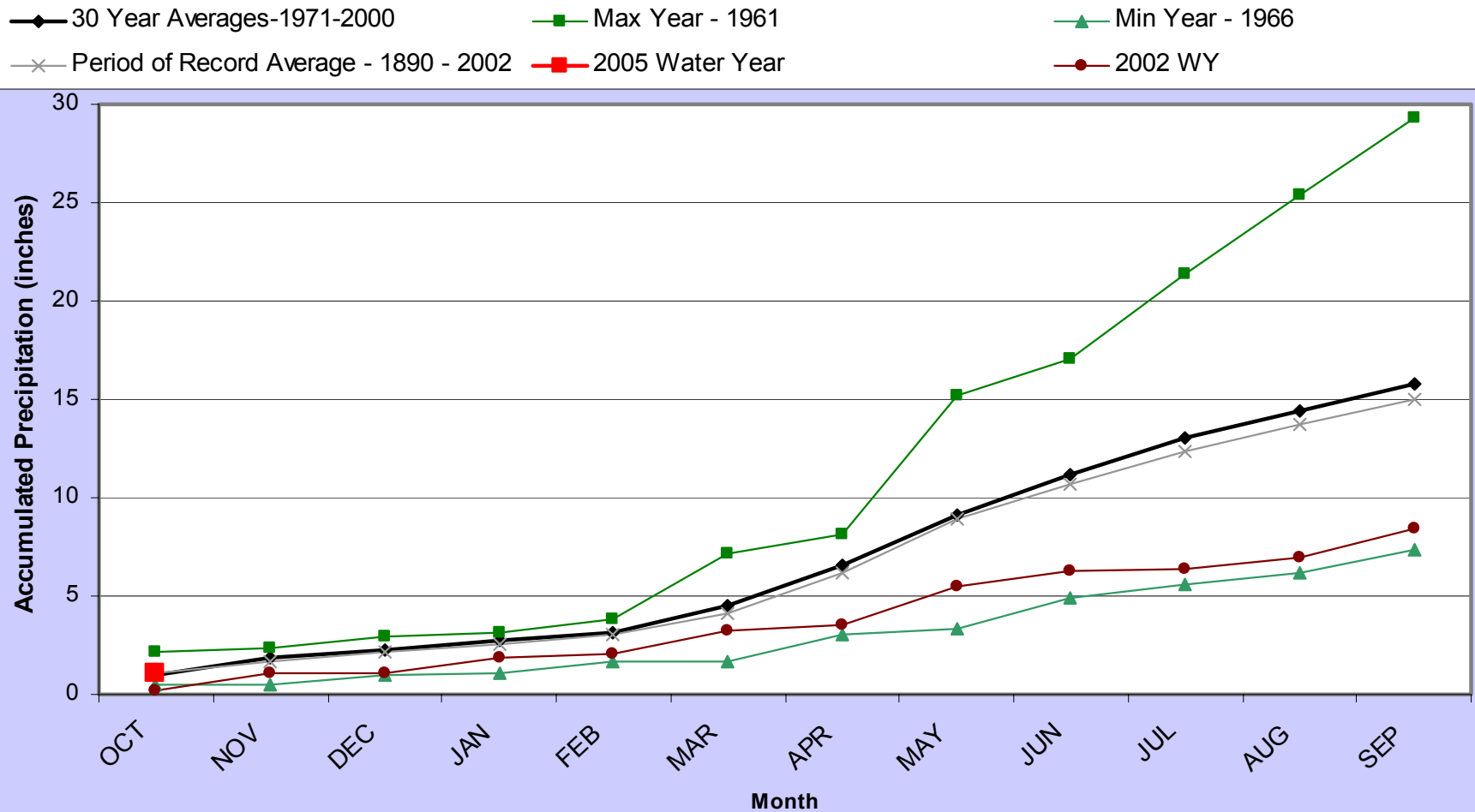
Kassler 2005 Water Year (Oct '04)

◆ 30 Year Averages-1971-2000 ■ Max Year - 1915 ▲ Min Year - 1956
× Period of Record Average - 1899 - 2002 ■ 2005 Water Year Accumulated ● 2002 Water Year Accumulated

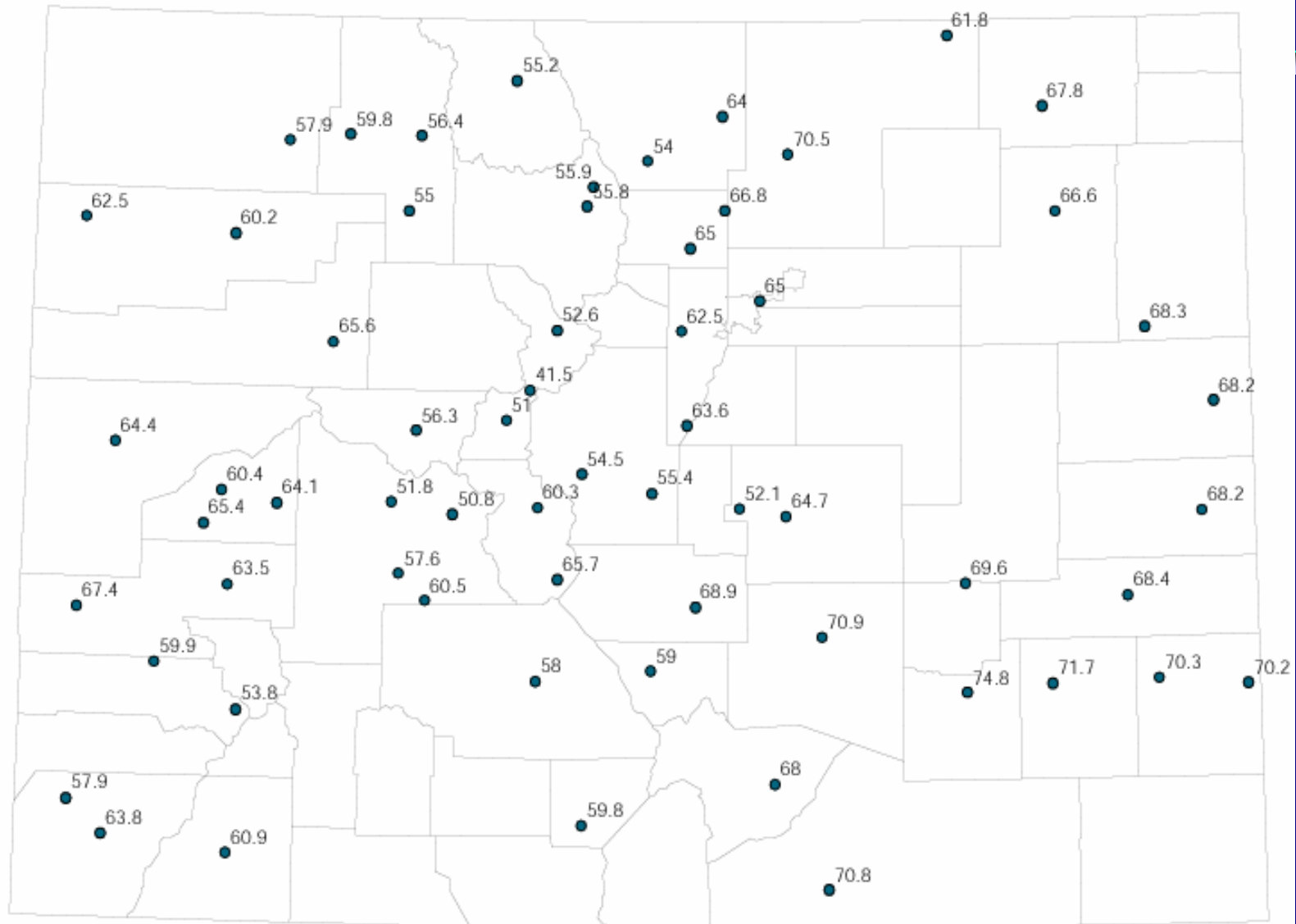


Division 8 – Fort Collins

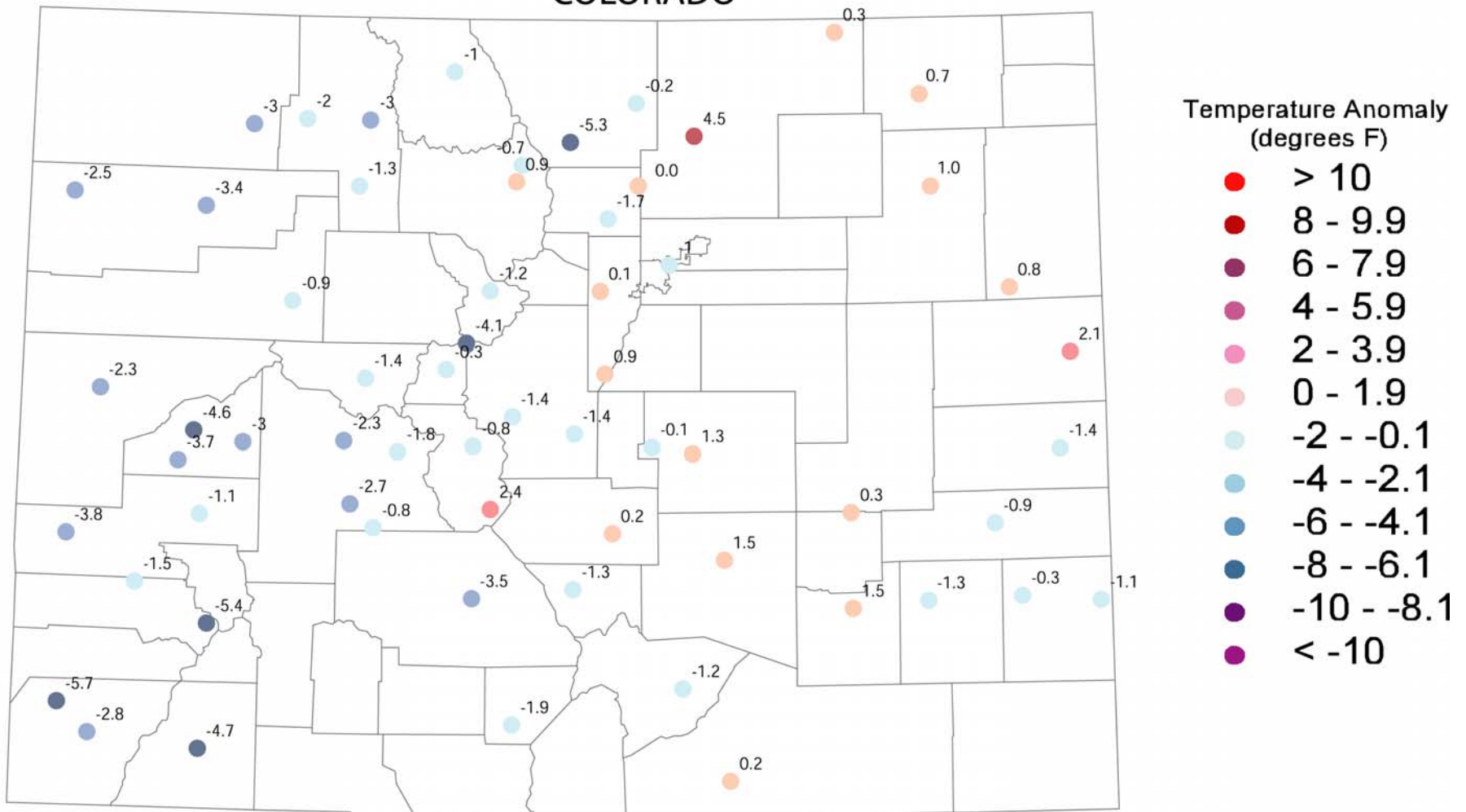
Fort Collins 2005 Water Year (Oct '04)



30-Year Average October Maximum Temperatures

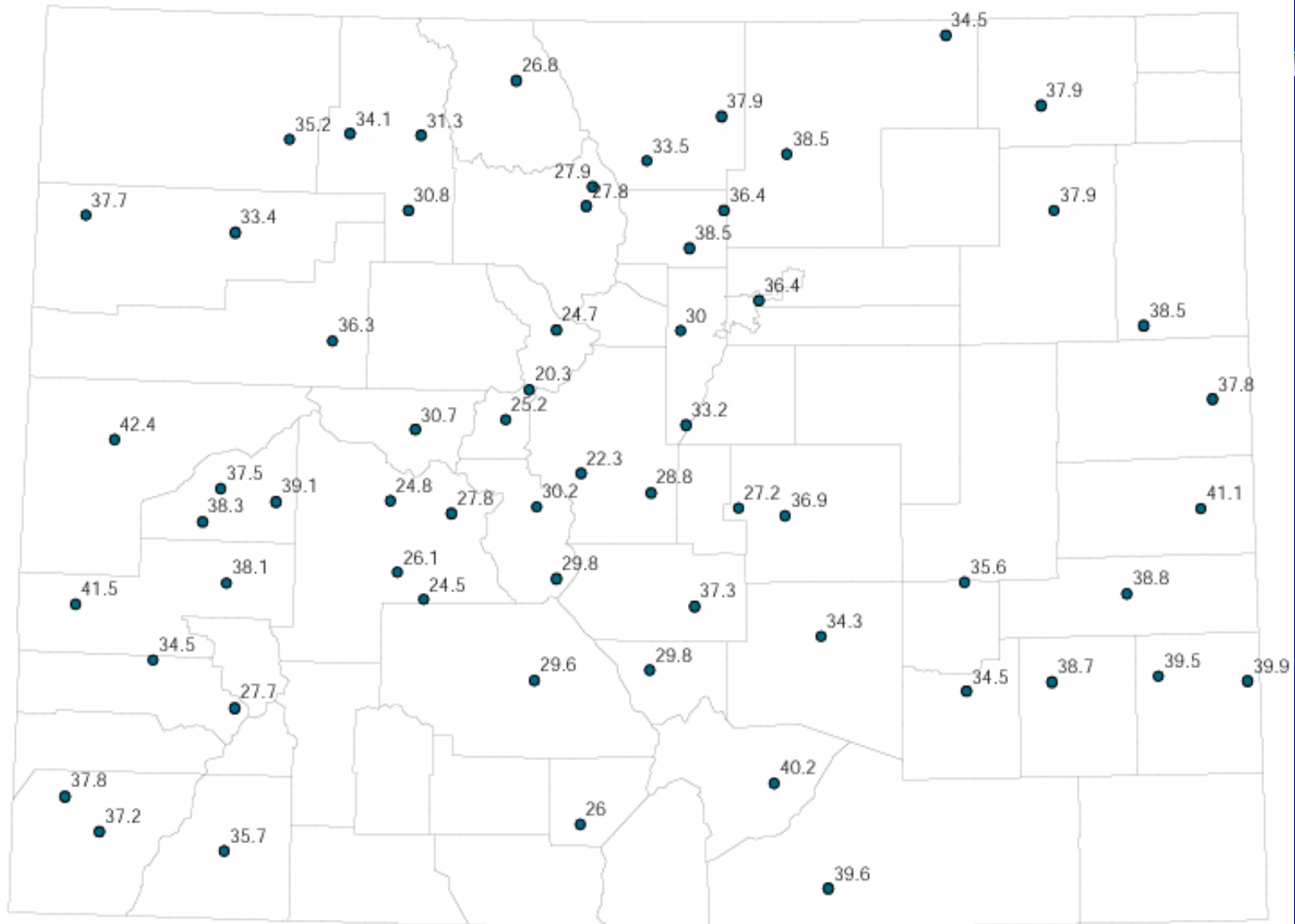


COLORADO

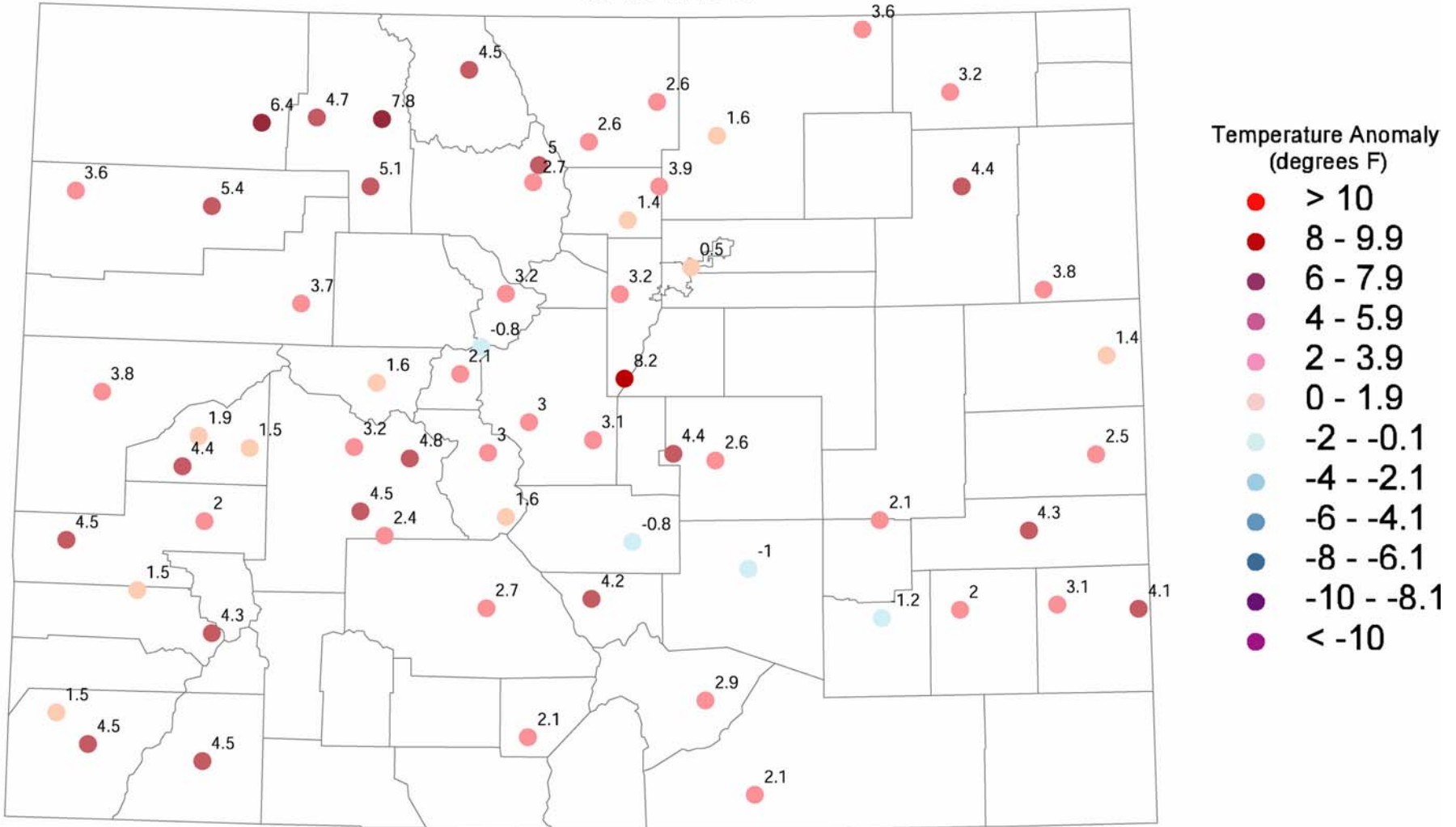


October 2004 average maximum temperature departures from the 1971-2000 averages.

30-Year Average October Minimum Temperatures

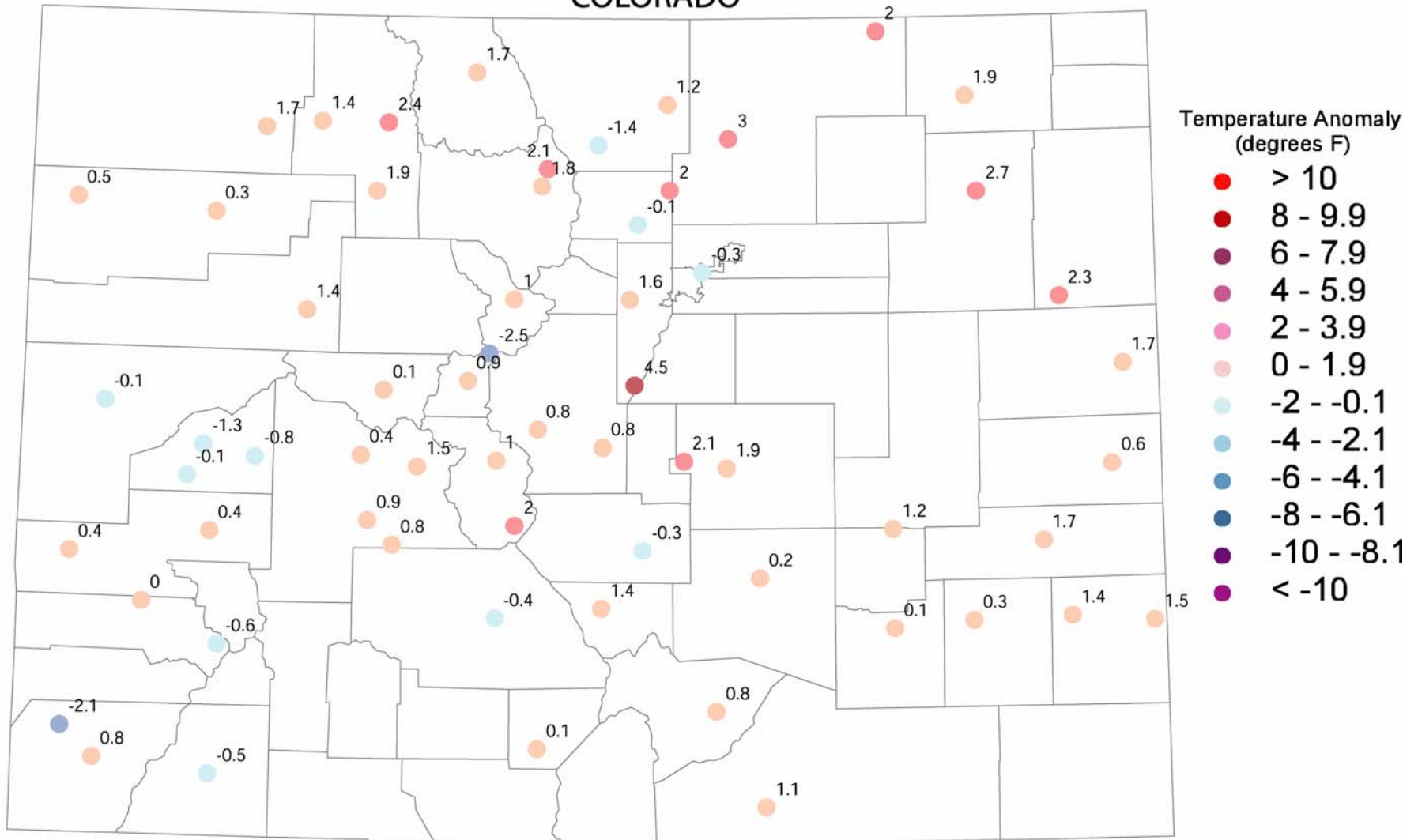


COLORADO



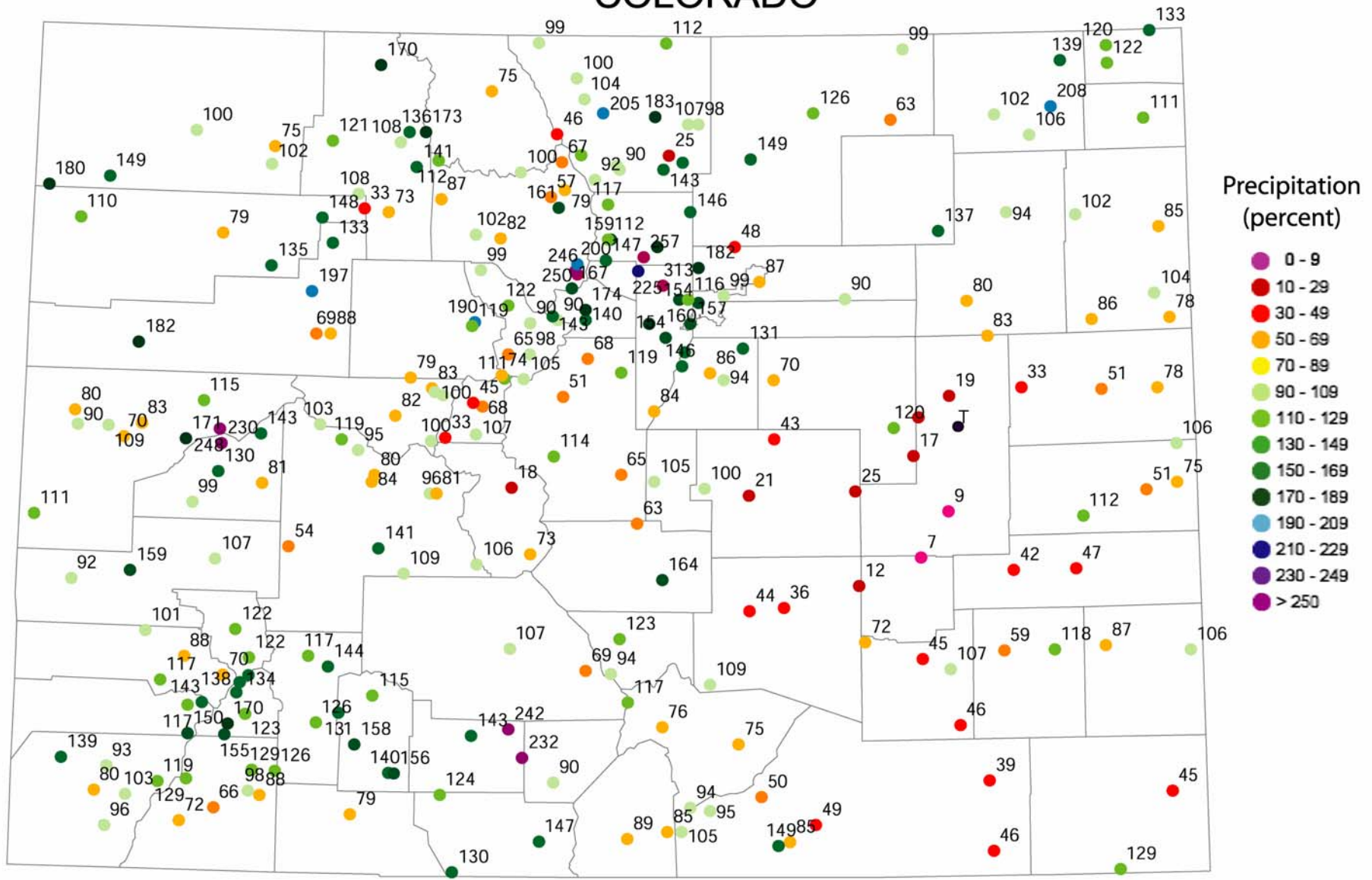
October 2004 average minimum temperature departures from the 1971-2000 averages.

COLORADO



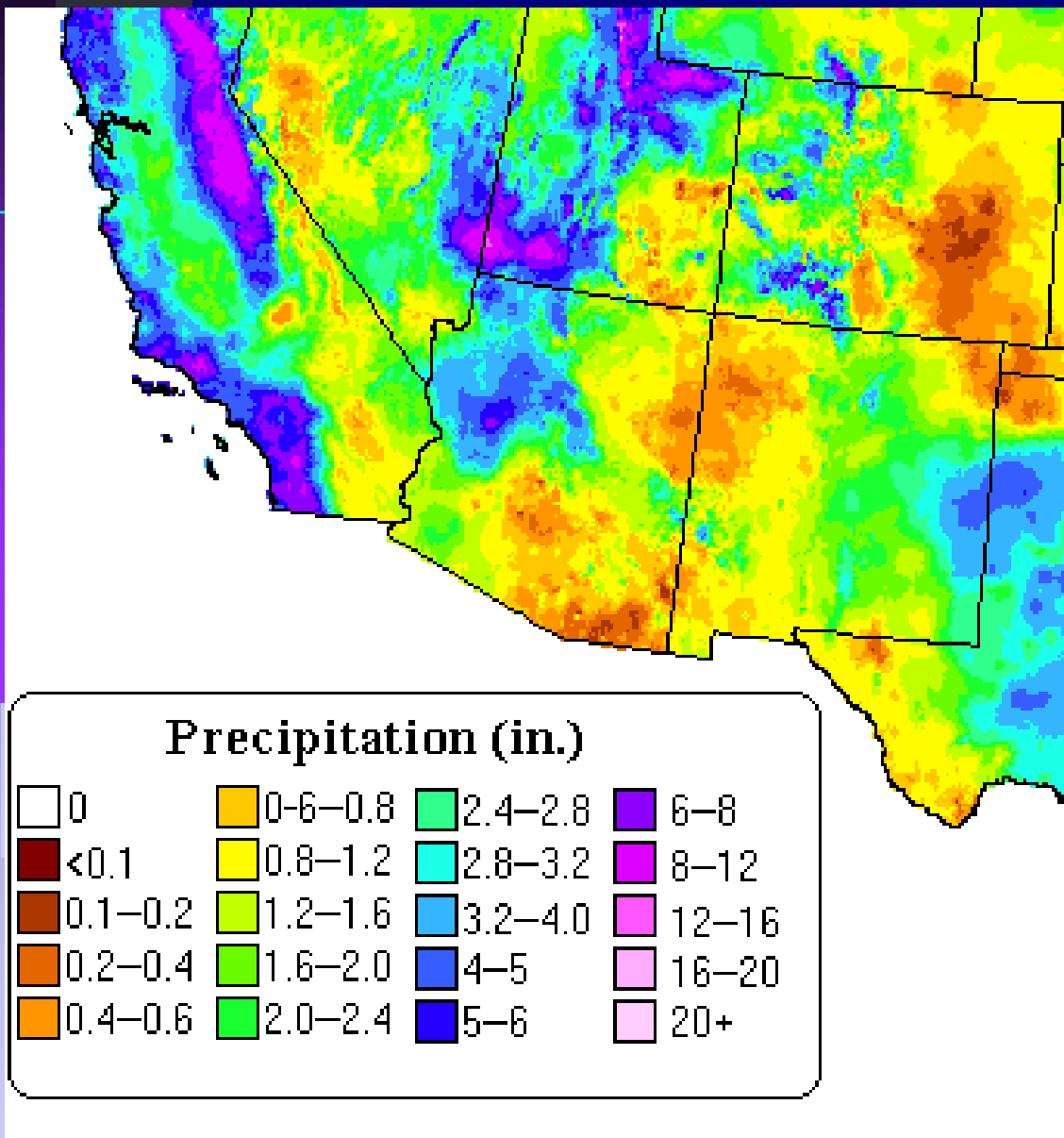
October 2004 average temperature departures from the 1971-2000 average.

COLORADO



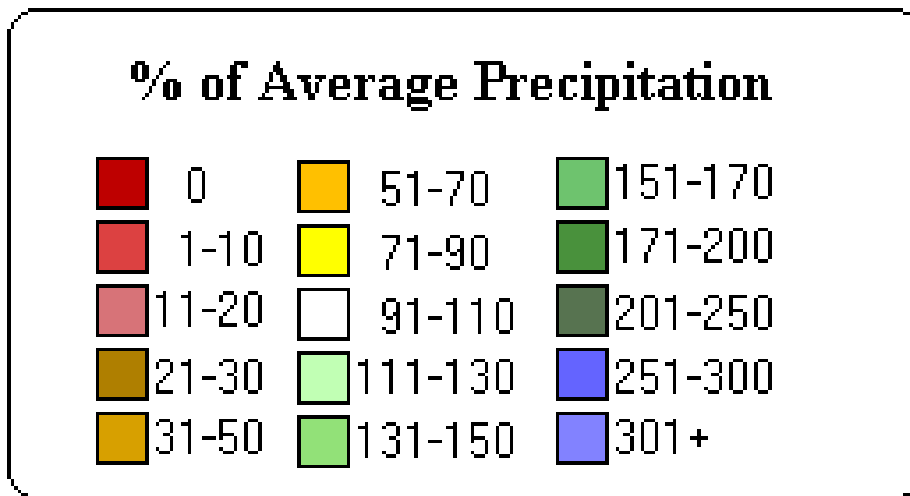
October 2004 precipitation as a percent of the 1971-2000 average.

*Precipitation:
October 2004*



Courtesy of Oregon Climate Service, <http://www.ocs.orst.edu/prism>

*1-month
Percent of
Average
Precipitation –
October 2004*

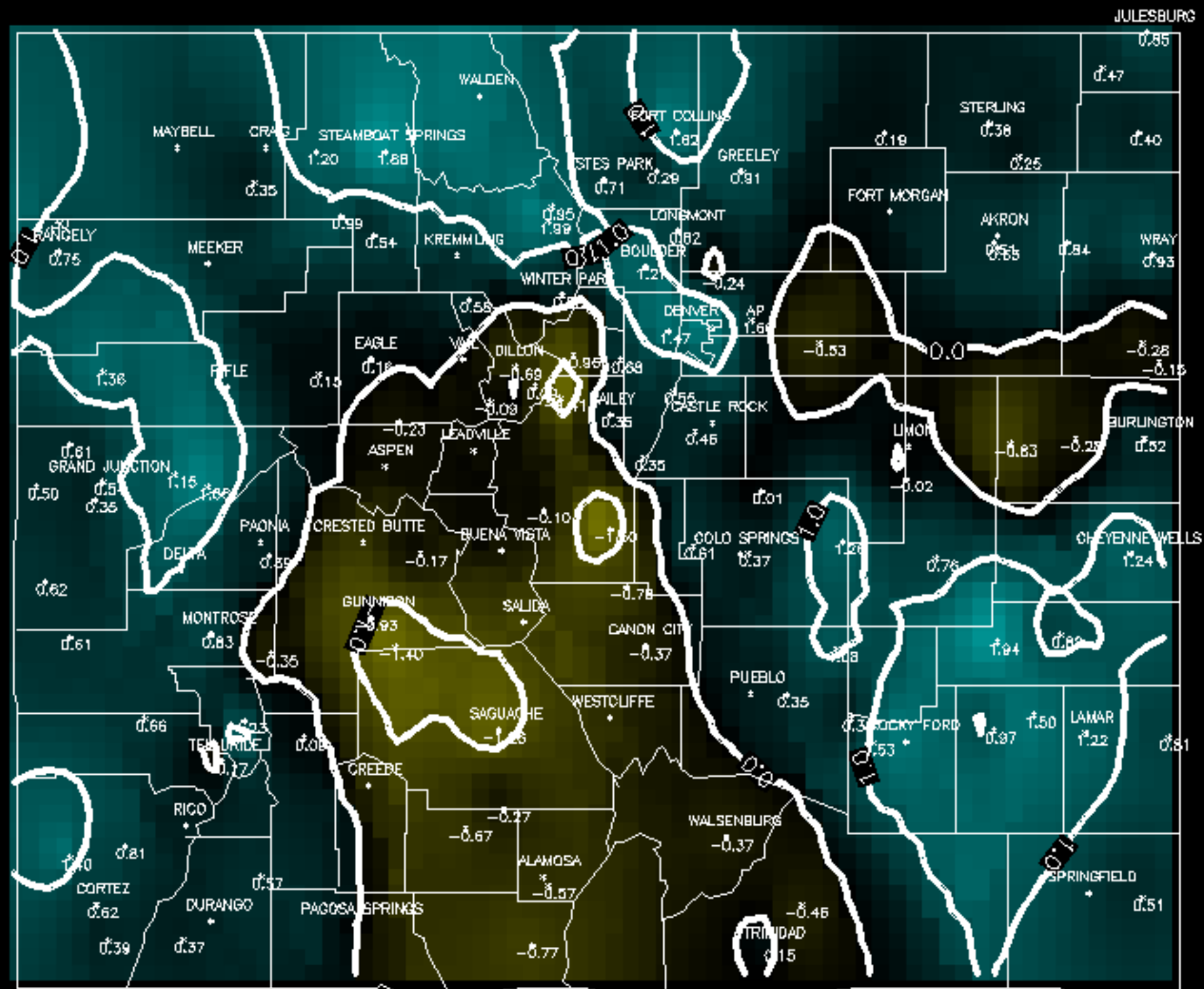


Courtesy of Oregon Climate Service, <http://www.ocs.orst.edu/prism>

3 Month SPI

Colorado

10/2004 3 mon. SPI



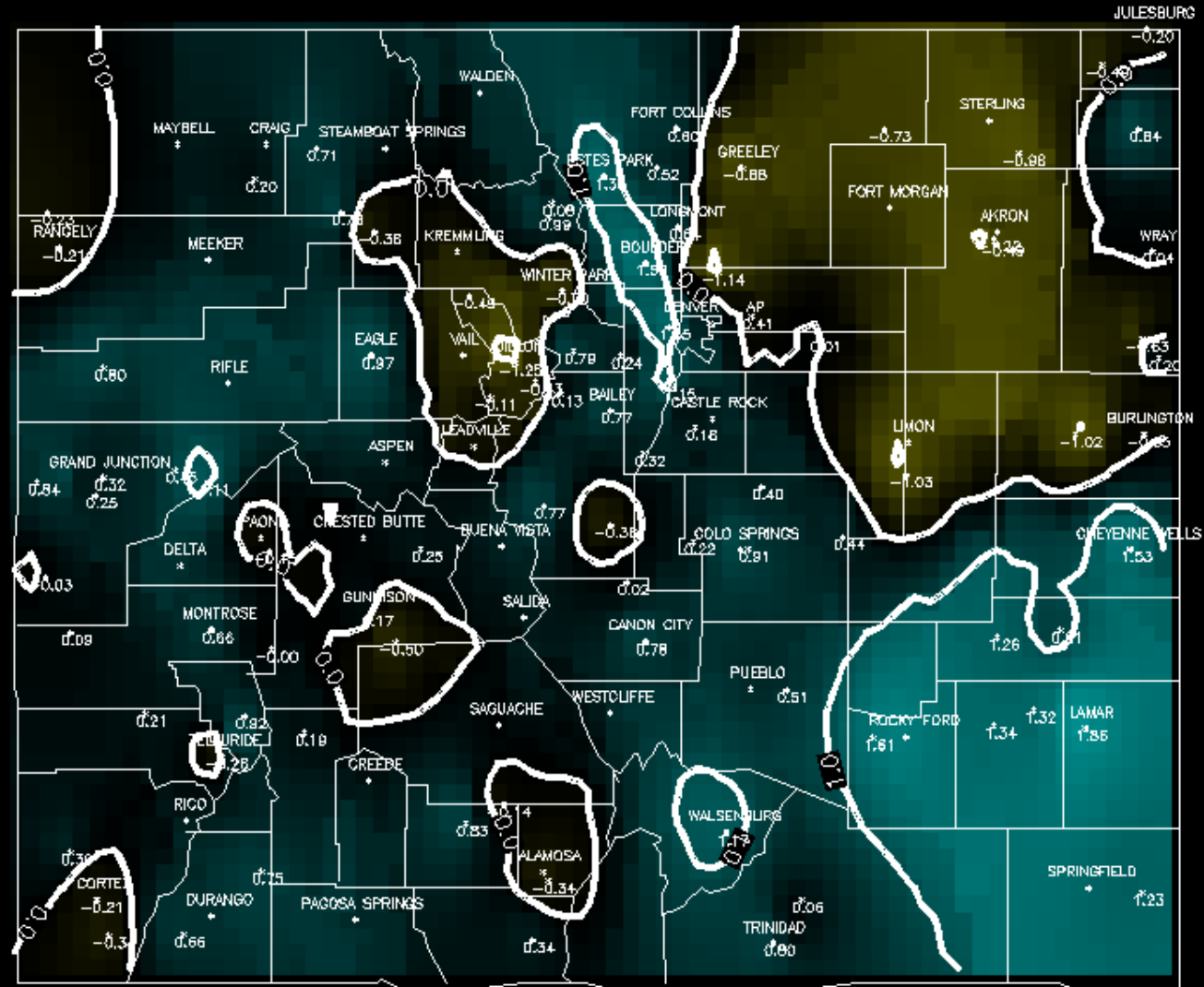
100 % < 2.0	2 % < -1.0
80 % < 1.0	0 % < -2.0
27 % < 0.0	0 % < -3.0

Produced by:
Colorado Climate Center
Fort Collins, CO

12 Month SPI

Colorado

10/2004 12 mon. SPI



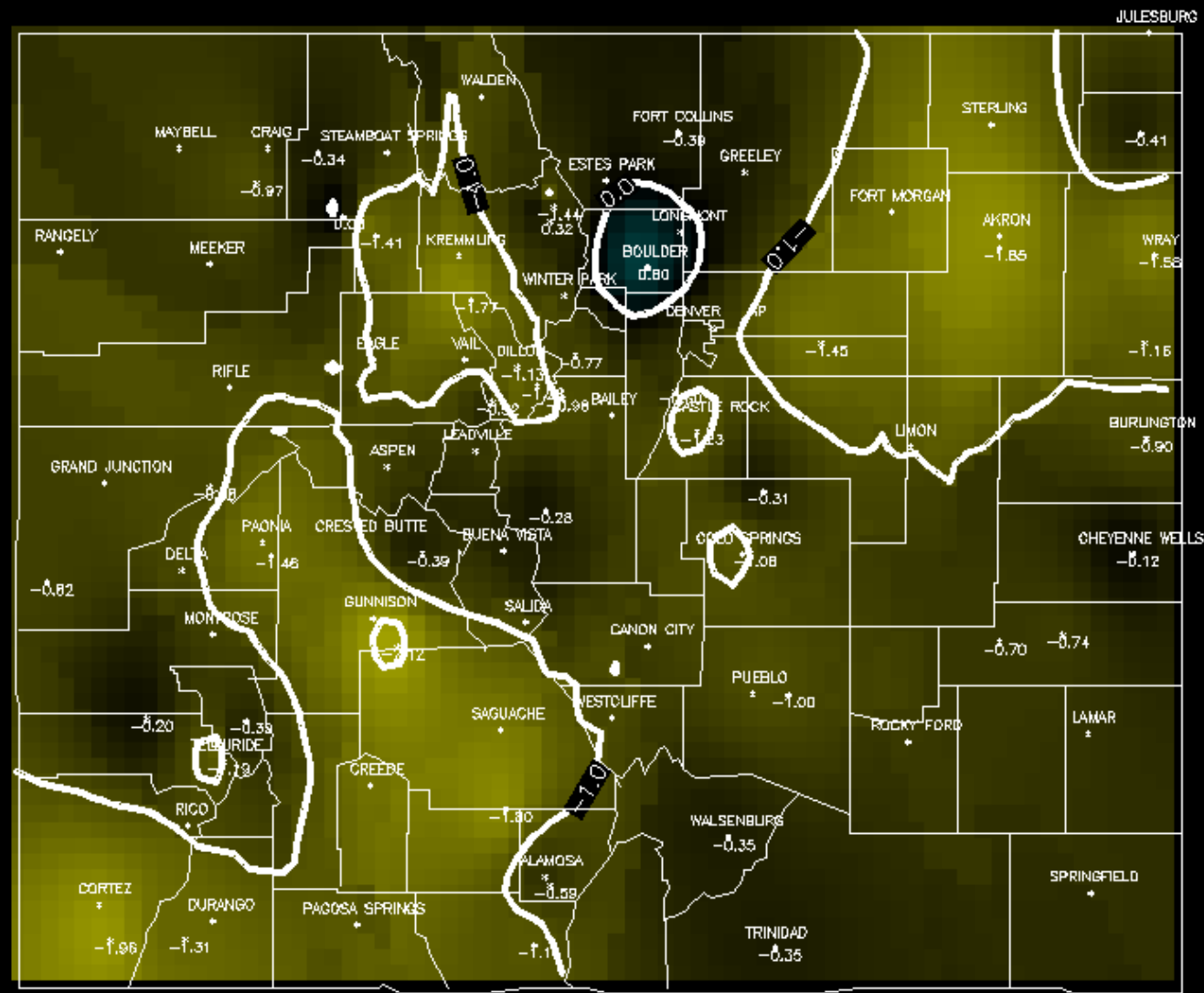
100 % << 2.0
88 % << 1.0
28 % << 0.0
0.0 % << -1.0
0.2 % << -2.0
0.0 % << -3.0

Produced by:
Colorado Climate Center
Fort Collins, CO

48 Month SPI

Colorado

10/2004 48 mon. SPI

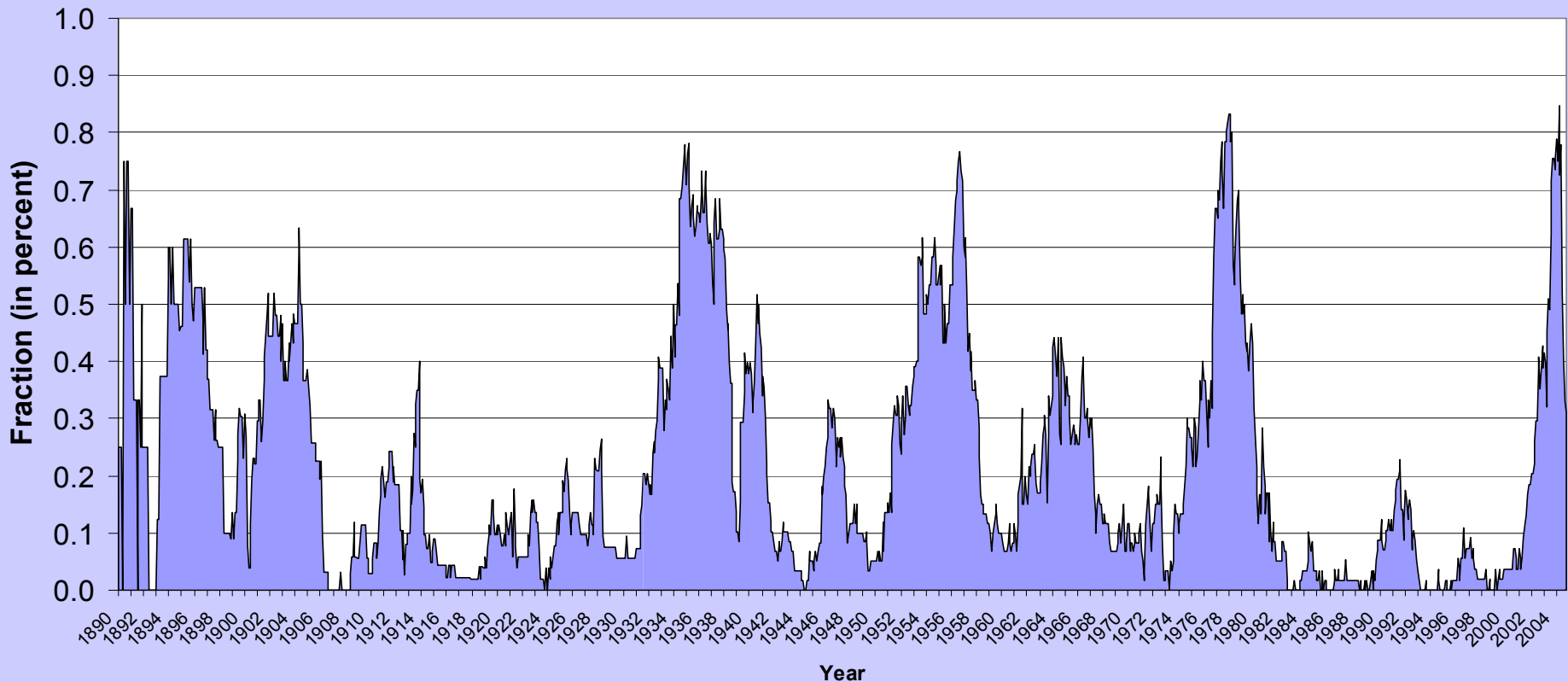


Fraction of Colorado in Drought

Fraction of Colorado in Drought

Based on 48 month SPI

(1890 - Oct 2004)



Calibration period is 1961-2000. Data values produced by John Kleist.

Projected Conditions at 0.2 Probability Level

12 Month SPI at 6 months

Colorado

10/2004 12 mon. SPI - Projected 6 mon. at P=0.20



100% < 2.0
 100% < 1.0
 78% < 0.0

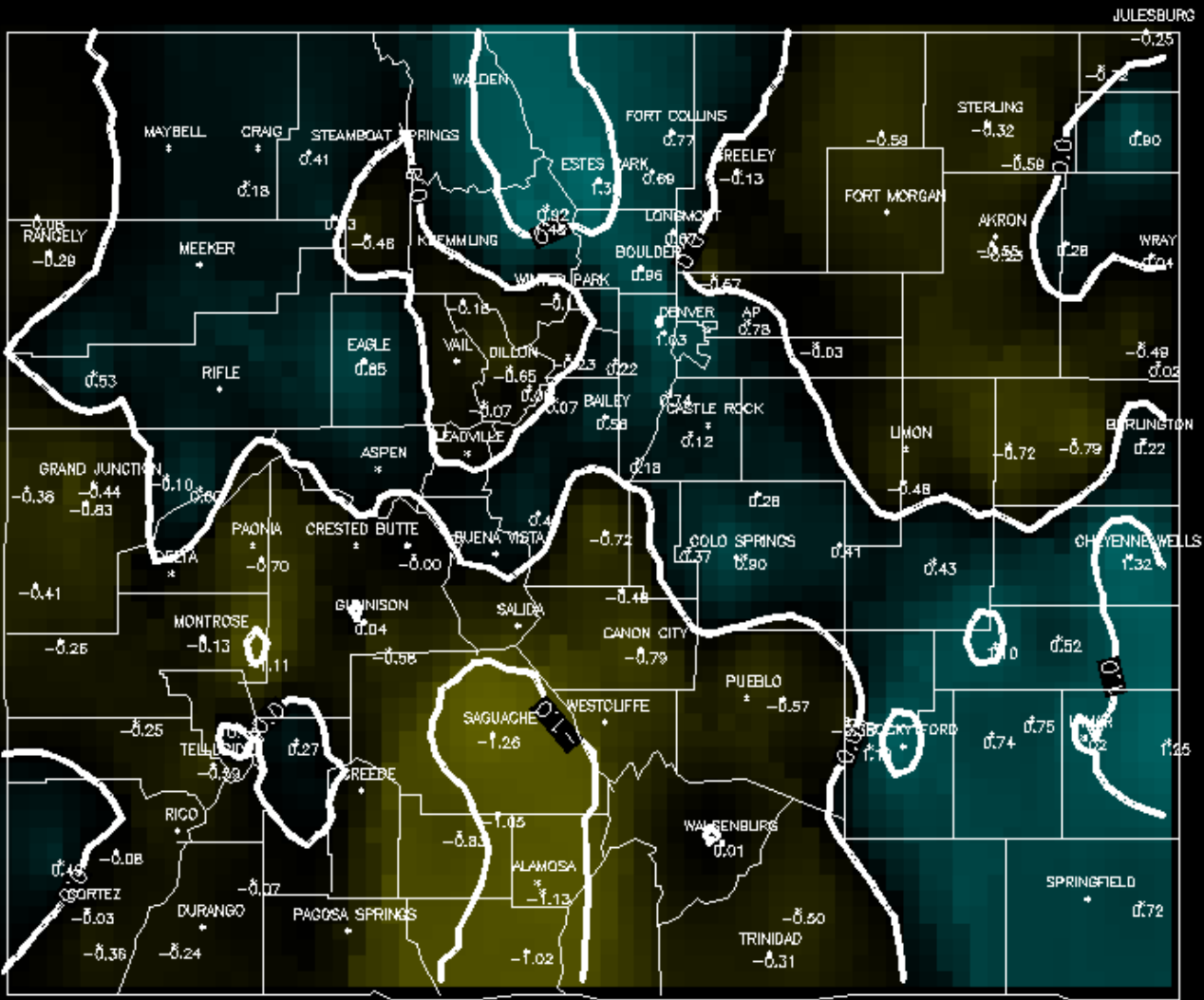
12% < -1.0
 0% < -2.0
 0% < -3.0

Produced by:
 Colorado Climate Center
 Fort Collins, CO

Projected Conditions at 0.5 Probability Level 12 Month SPI at 6 months

Colorado

10/2004 12 mon. SPI - Projected 6 mon. at P=0.50



100 % << 2.0	3/3	<<< -1.0
96 % << 1.0	3/3	<<< -2.0
54 % << 0.0	3/3	<<< -3.0

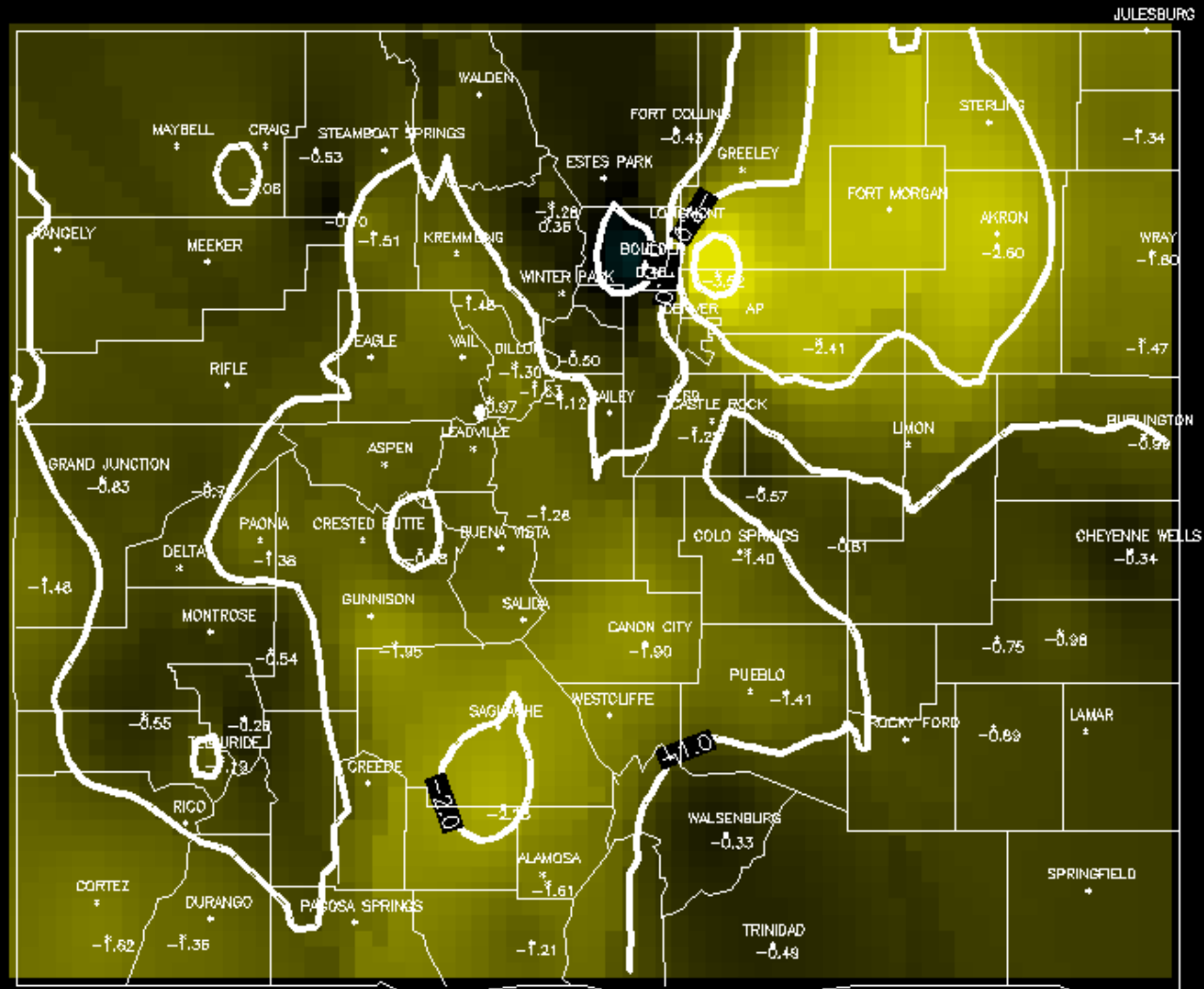
Produced by:
Colorado Climate Center
Fort Collins, CO

Projected Conditions at 0.2 Probability Level

48 Month SPI at 12 months

Colorado

10/2004 48 mon. SPI – Projected 12 mon. at P=0.20



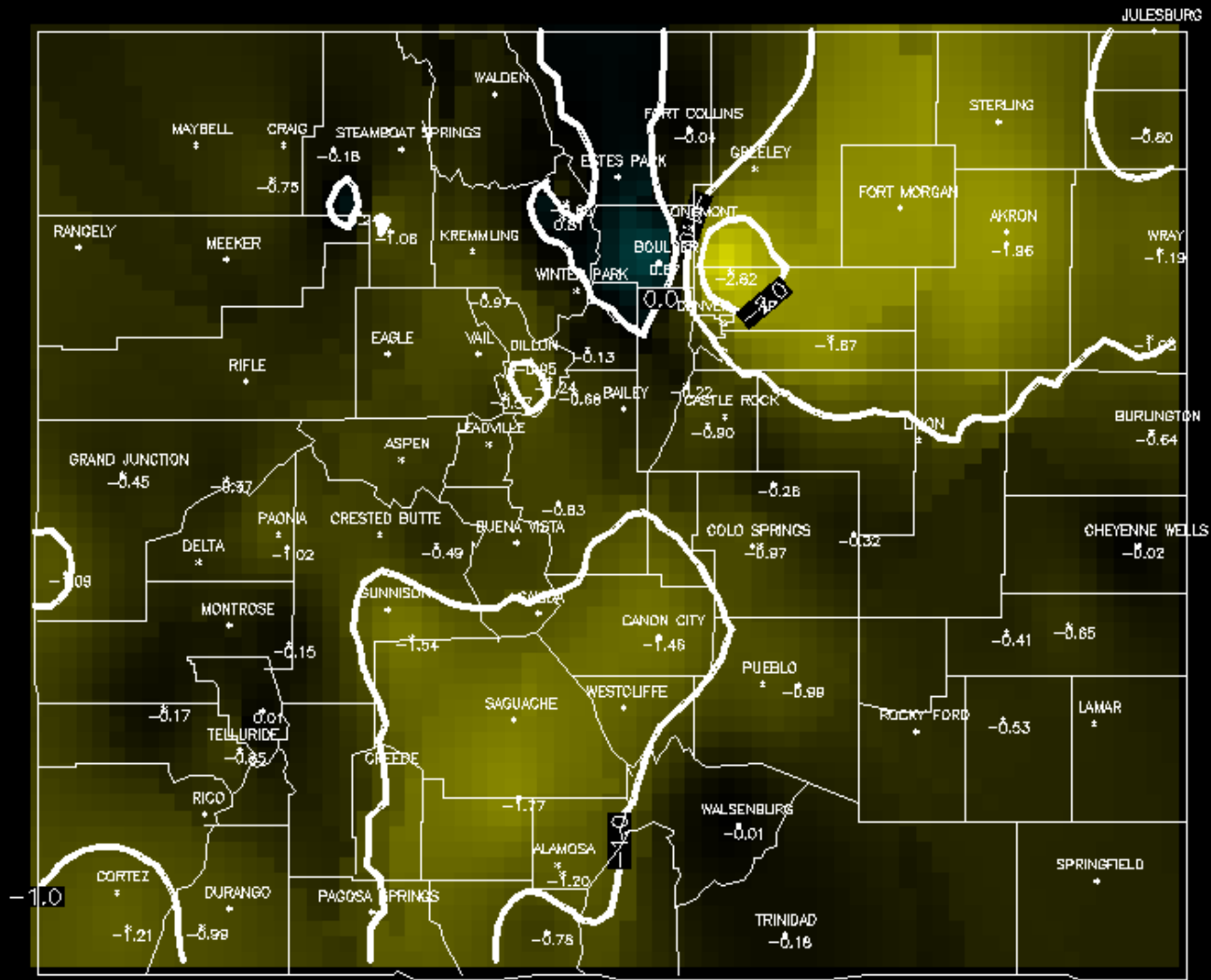
Produced by:
Colorado Climate Center
Fort Collins, CO

Projected Conditions at 0.5 Probability Level

48 Month SPI at 12 months

Colorado

10/2004 48 mon. SPI – Projected 12 mon. at P=0.50



100 % < 2.0	25 % < -1.0
100 % < 1.0	1 % < -2.0
97 % < 0.0	0 % < -3.0

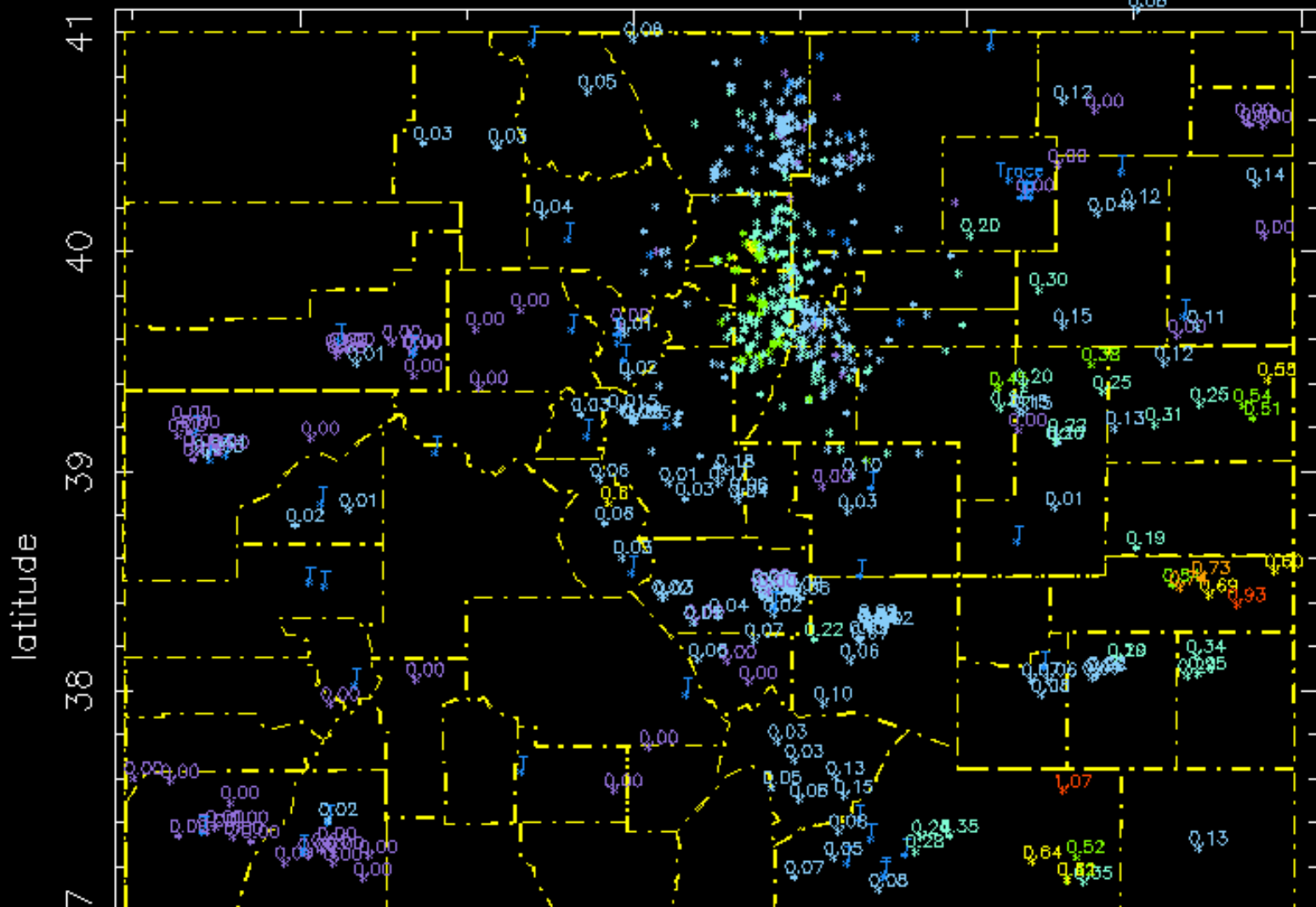
Produced by:
Colorado Climate Center
Fort Collins, CO

How About CoCoRaHS?



**Community Collaborative
Rain and Hail Study**

©2001 JOYCE M. TURLEY
DIXON COVE DESIGN



latitude

41
40
39
38
37
36

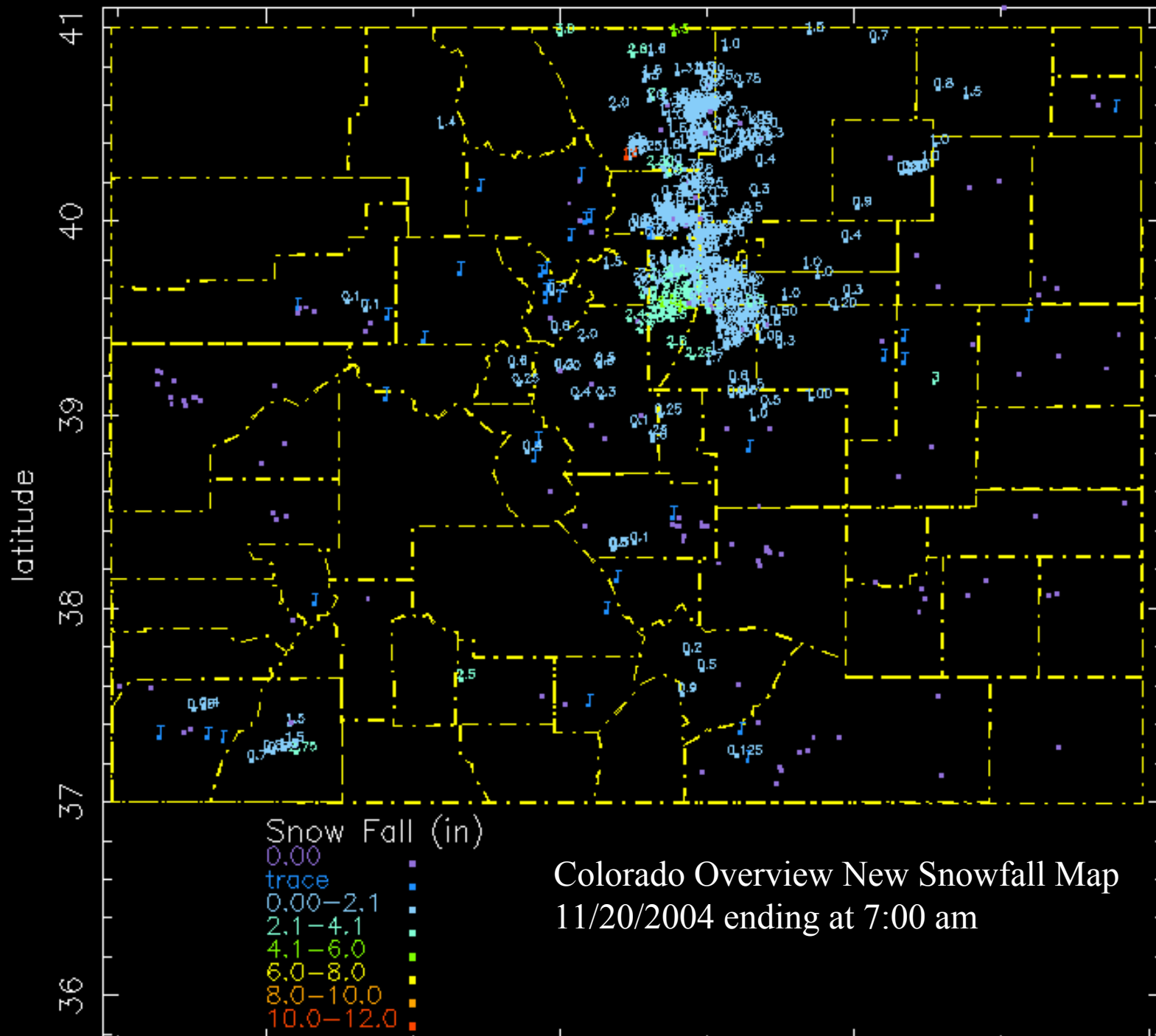
map key

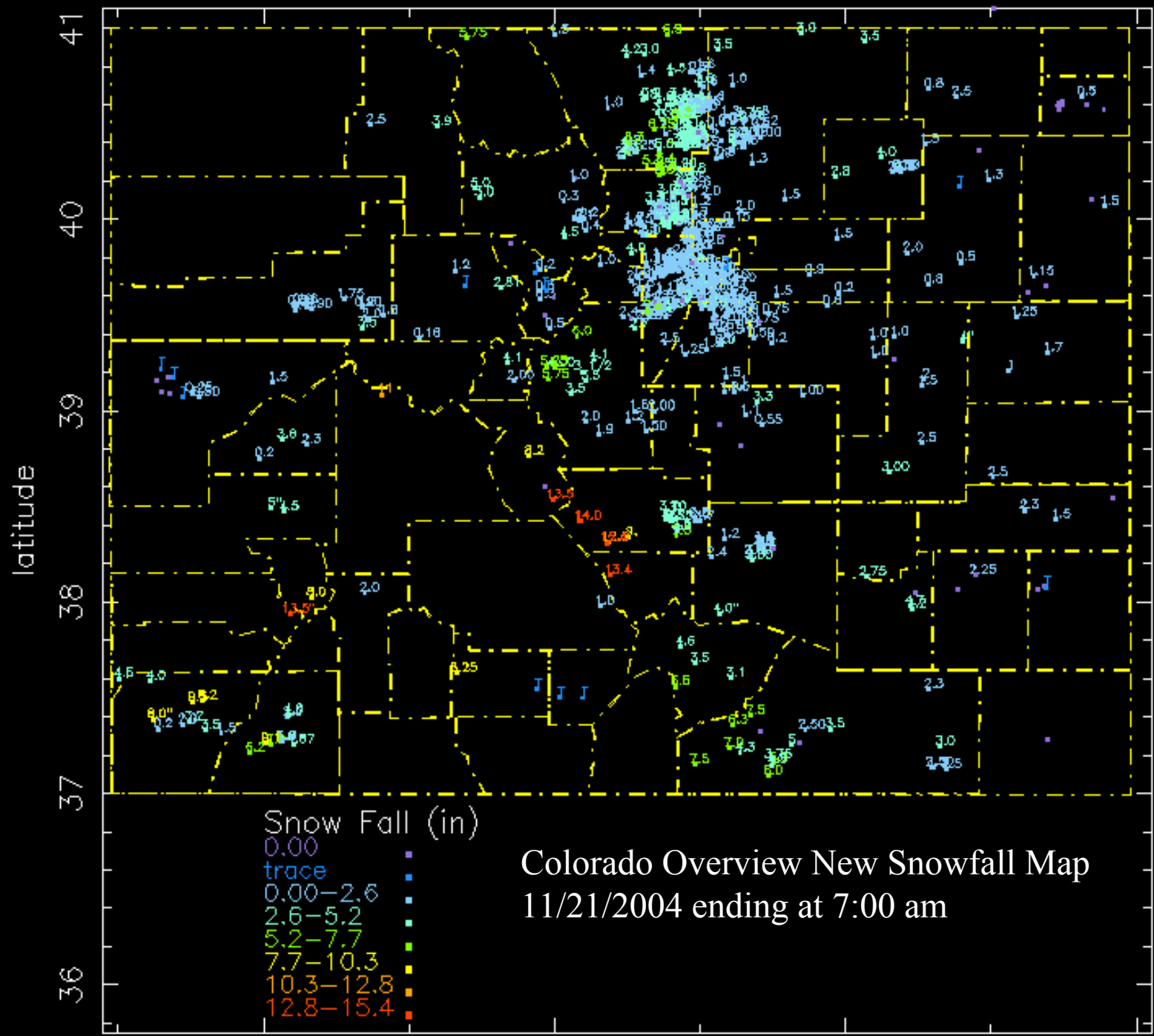
0.00	■
trace	■
0.00-0.18	■
0.18-0.36	■
0.36-0.54	■
0.54-0.72	■
0.72-0.89	■
0.89-1.07	■

Colorado Overview Precipitation

11/11/04 for the 24-hour ending at 7 am

mean	0.159
standard deviation	0.157
skewness (unitless)	1.362





Colorado Overview New Snowfall Map
 11/21/2004 ending at 7:00 am

*For more information visit the
CoCo RaHS Web site*

<http://www.cocorahs.org>



Support for this project provided by
Informal Science Education Program,
National Science Foundation
and
many local charter sponsors.

Colorado Climate Center

Colorado State University

*Data and Power Point Presentations available
for downloading*

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

- *click on “Drought”*
- *then click on “Presentations”*

