What Does It Take to Get Out of Drought?

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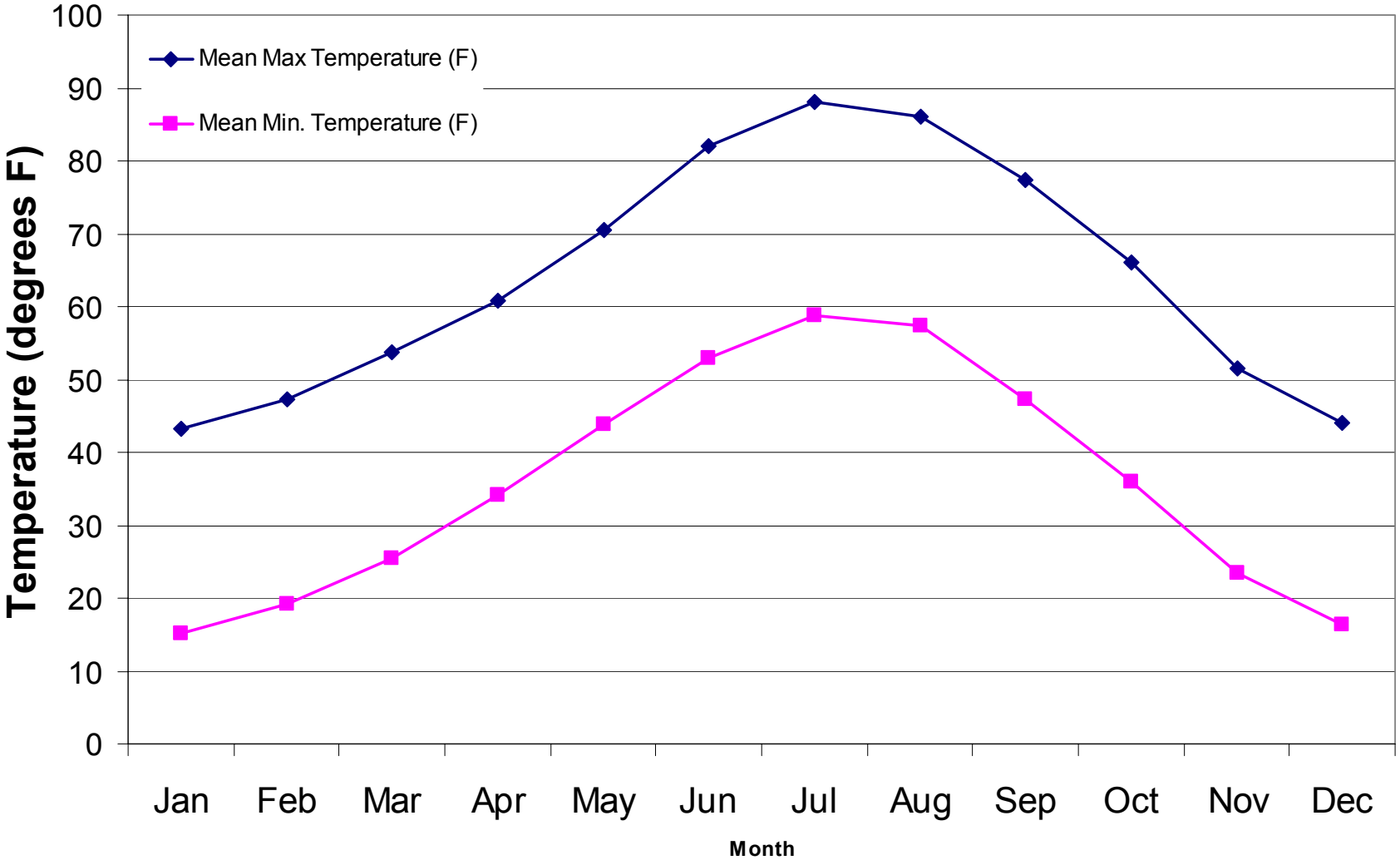
http://ccc.atmos.colostate.edu

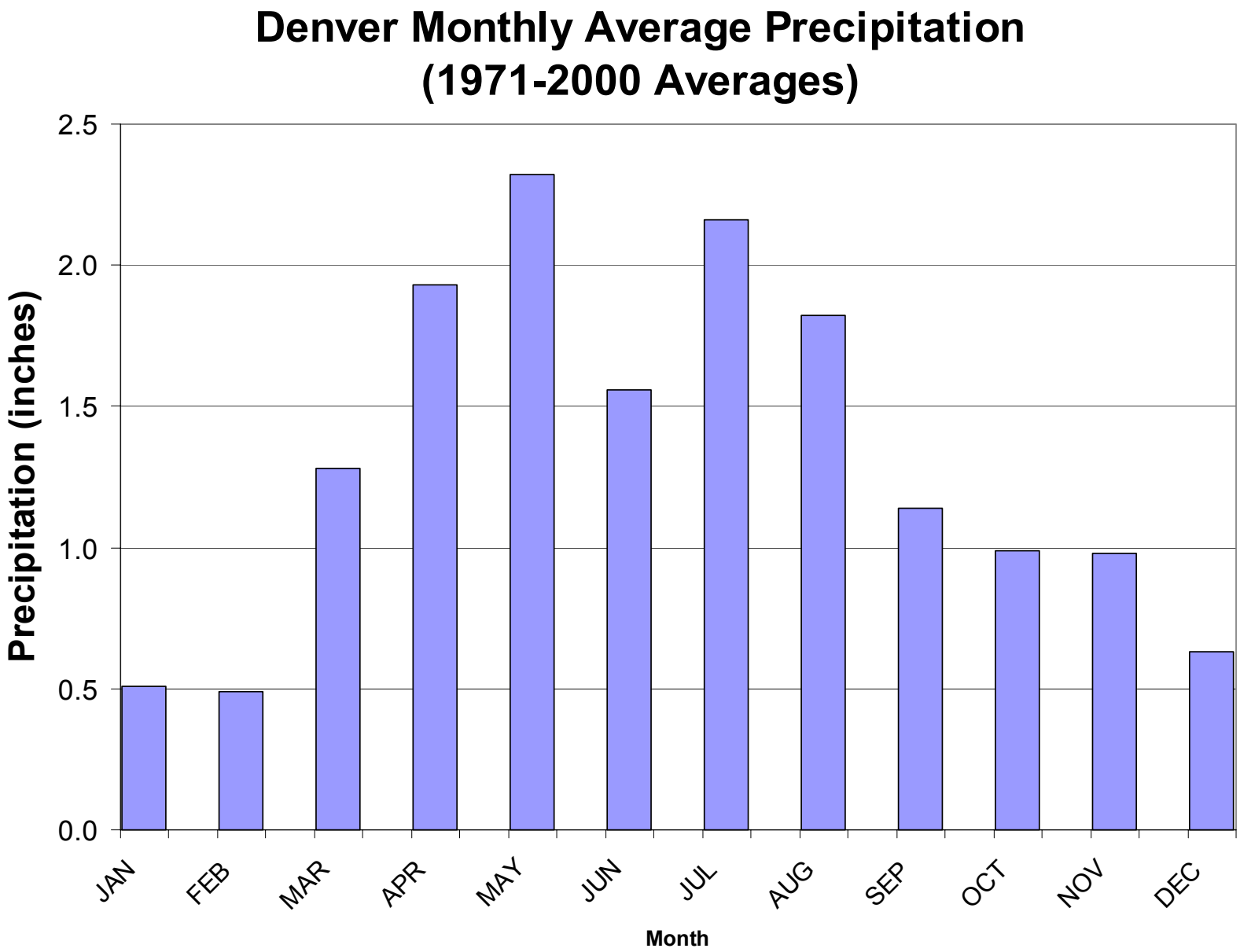
Presented at the Insects, Diseases and Drought Workshop, May 19, 2004, Centennial, Colorado

Prepared by Odie Bliss

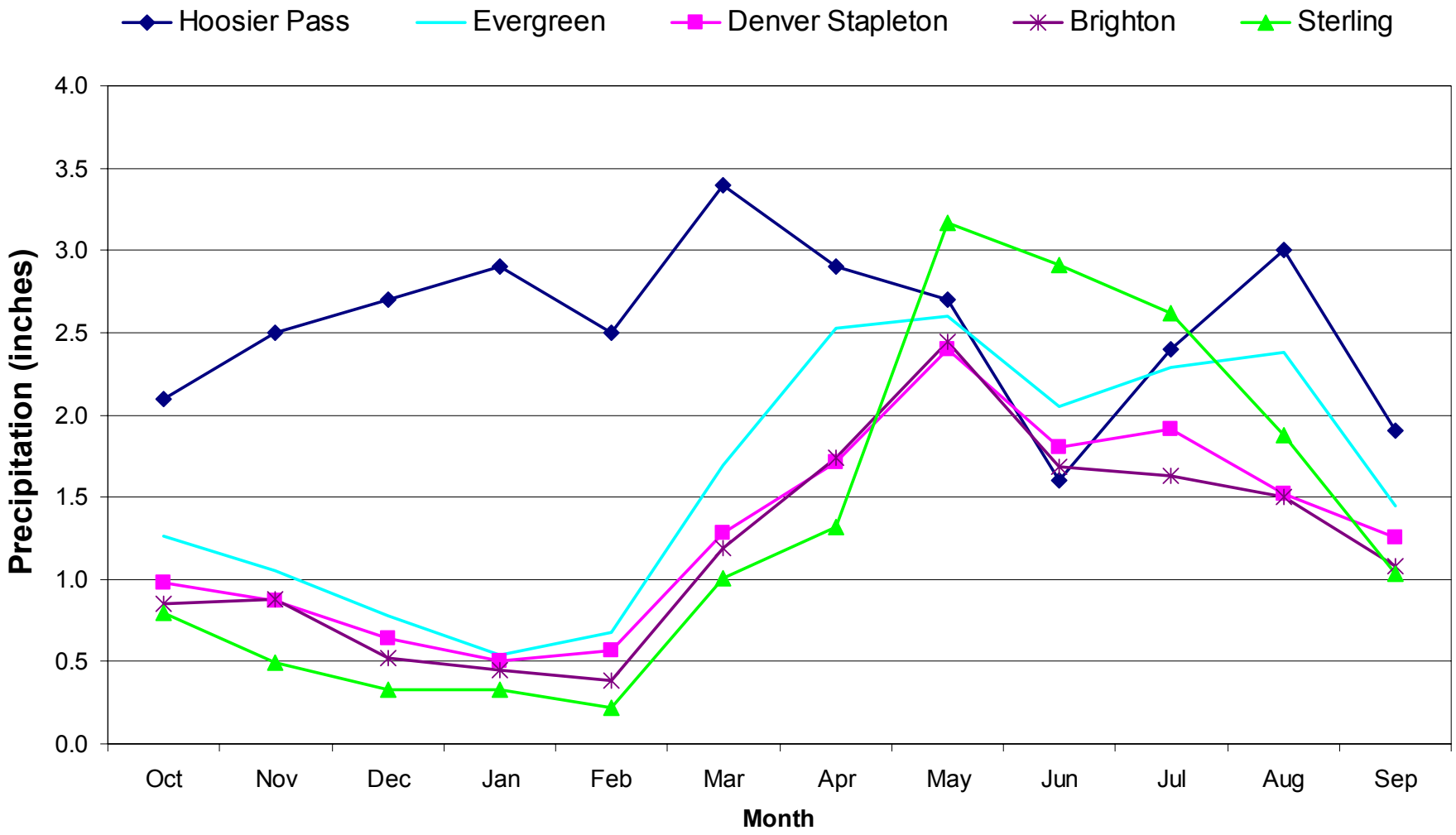
Denver Skyline

Denver Monthly Average Temperatures (1971-2000)



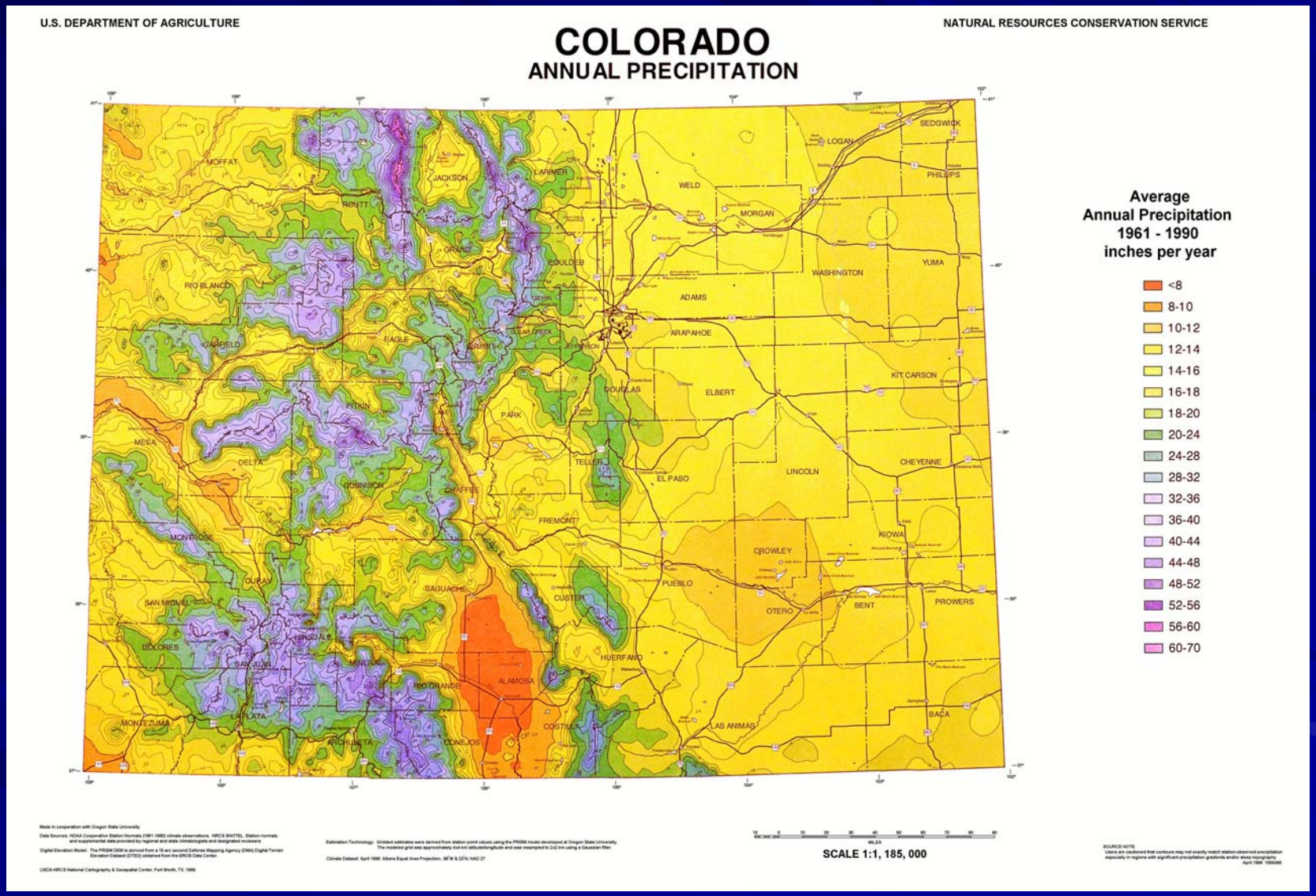

Denver Monthly Average Precipitation
(1971-2000 Averages)
Precipitation (inches)
2.5
2.0
1.5
1.0
0.5
0.0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Month

Monthly Average Precipitation for Selected Sites in the South Platte Basin

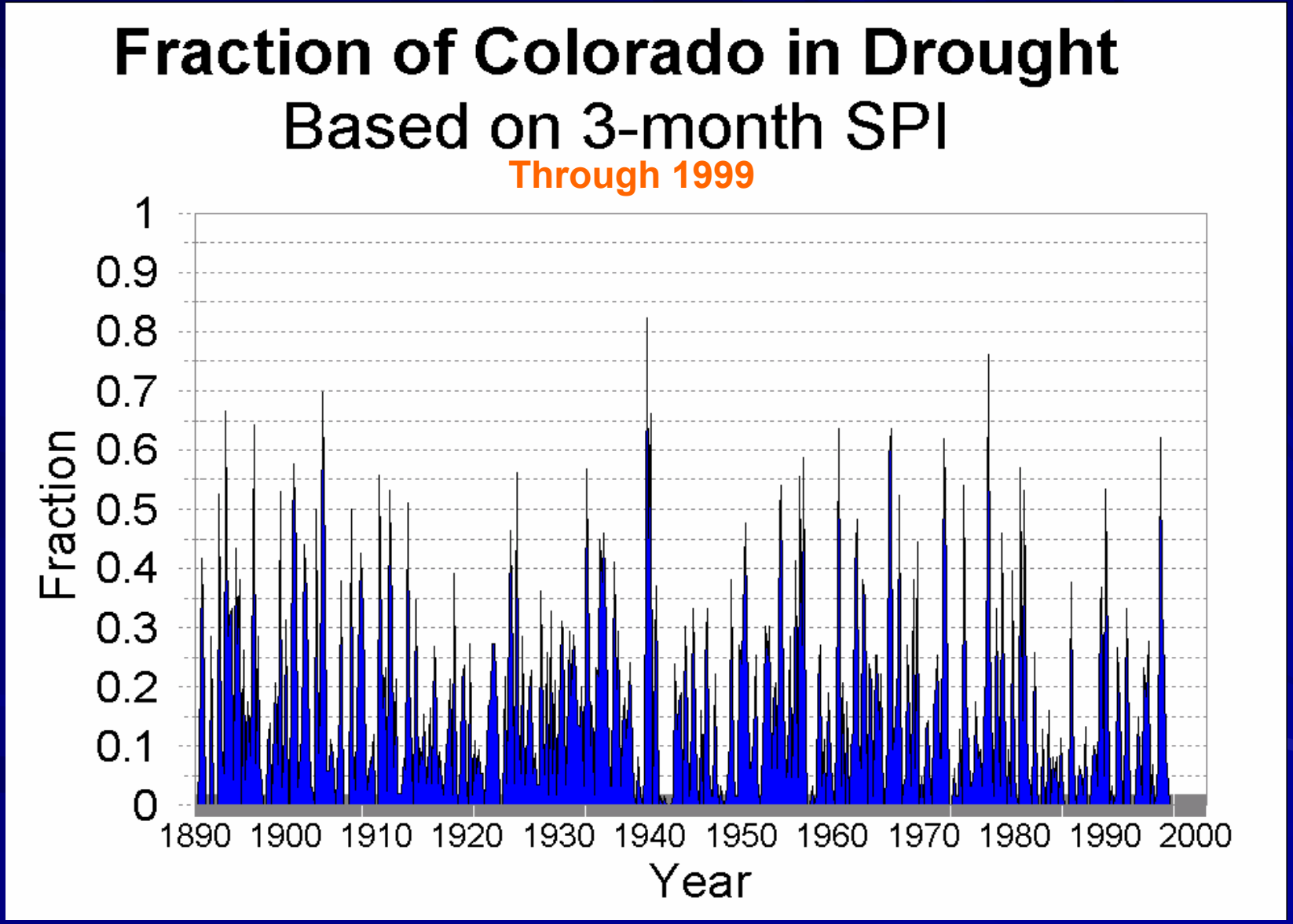


Long-Term Perspective

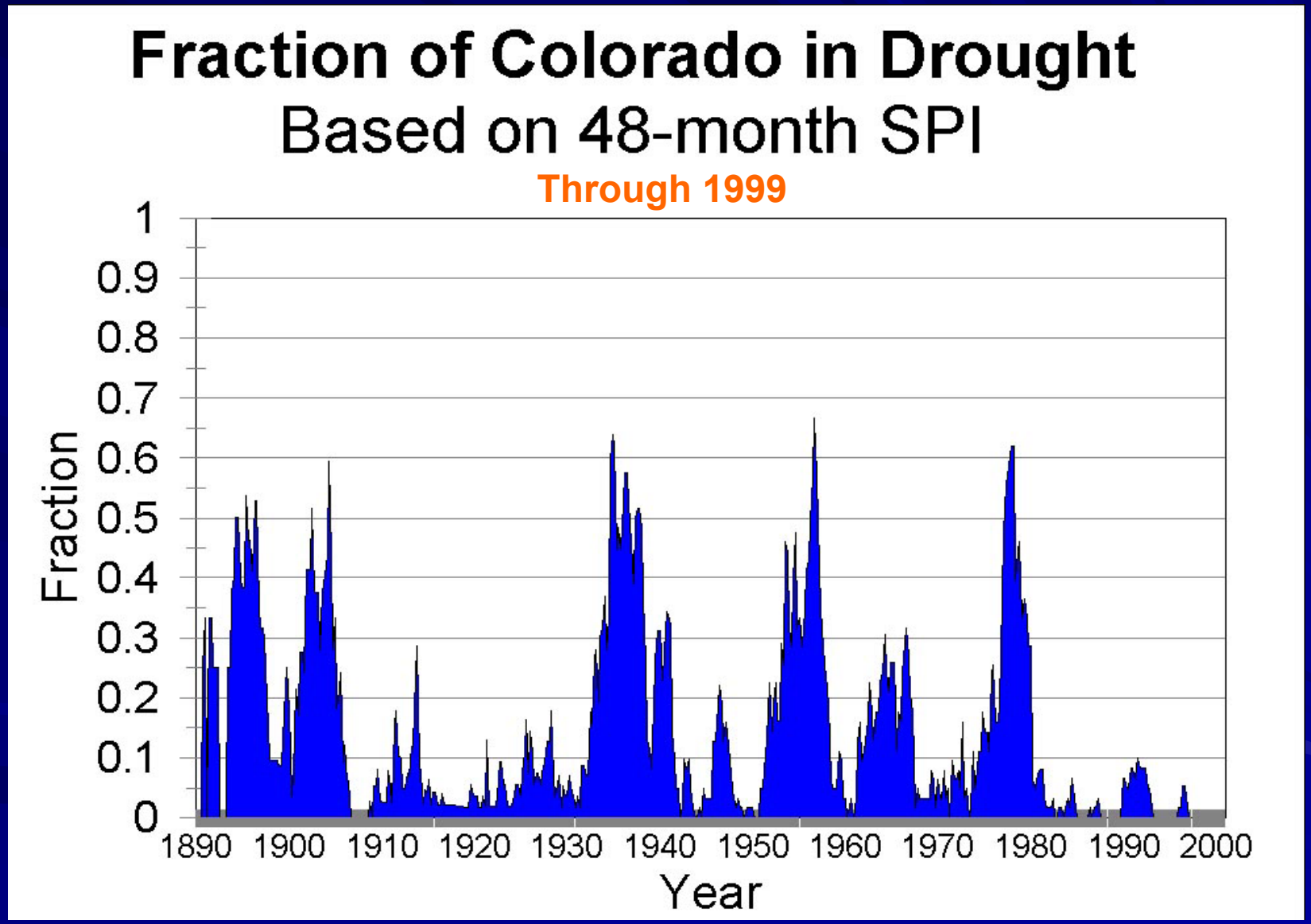
Colorado Average Precipitation



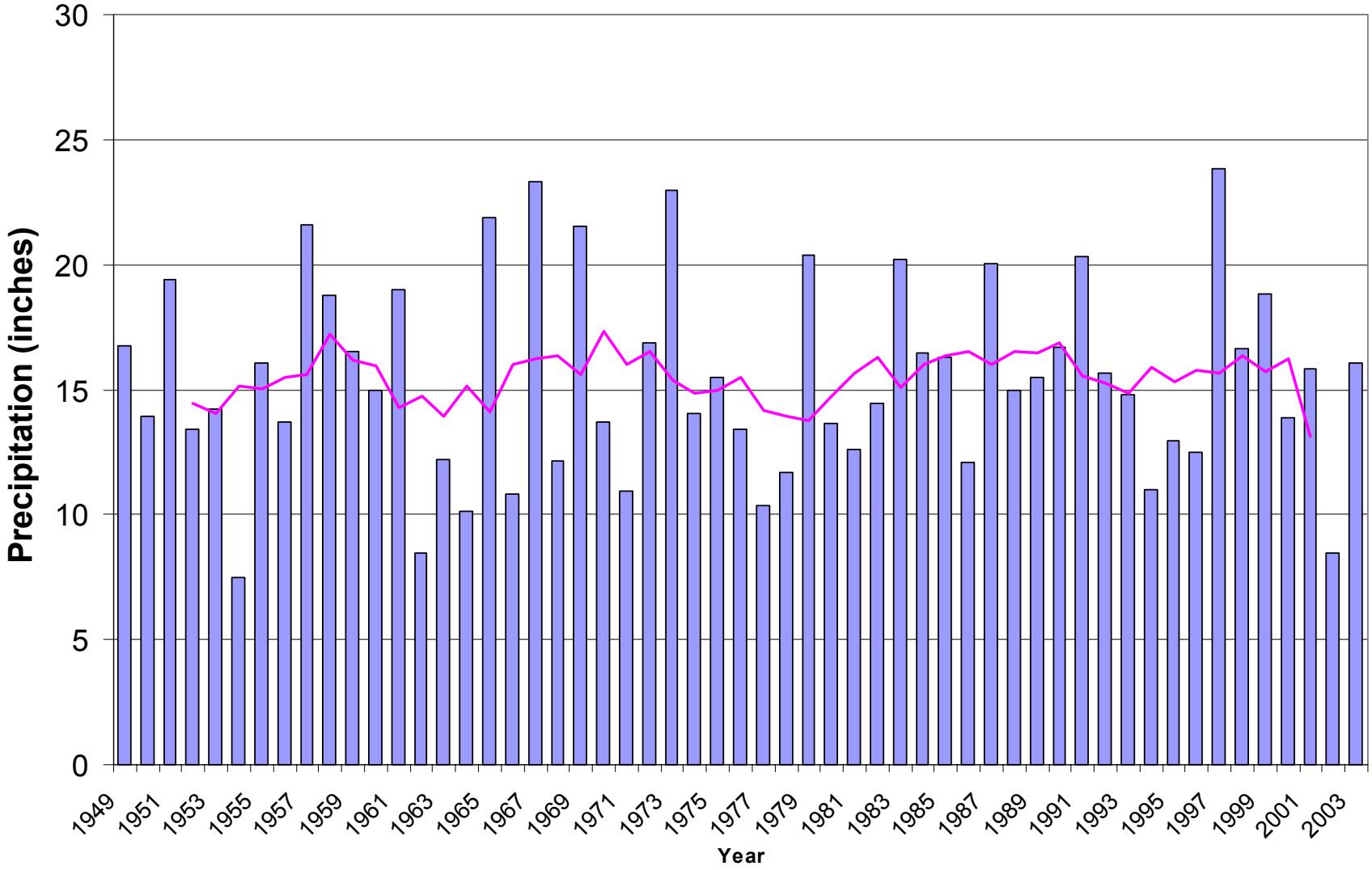
3-Month SPI


Fraction of Colorado in Drought
Based on 3-month SPI
Through 1999
Fraction
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1890
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
Year

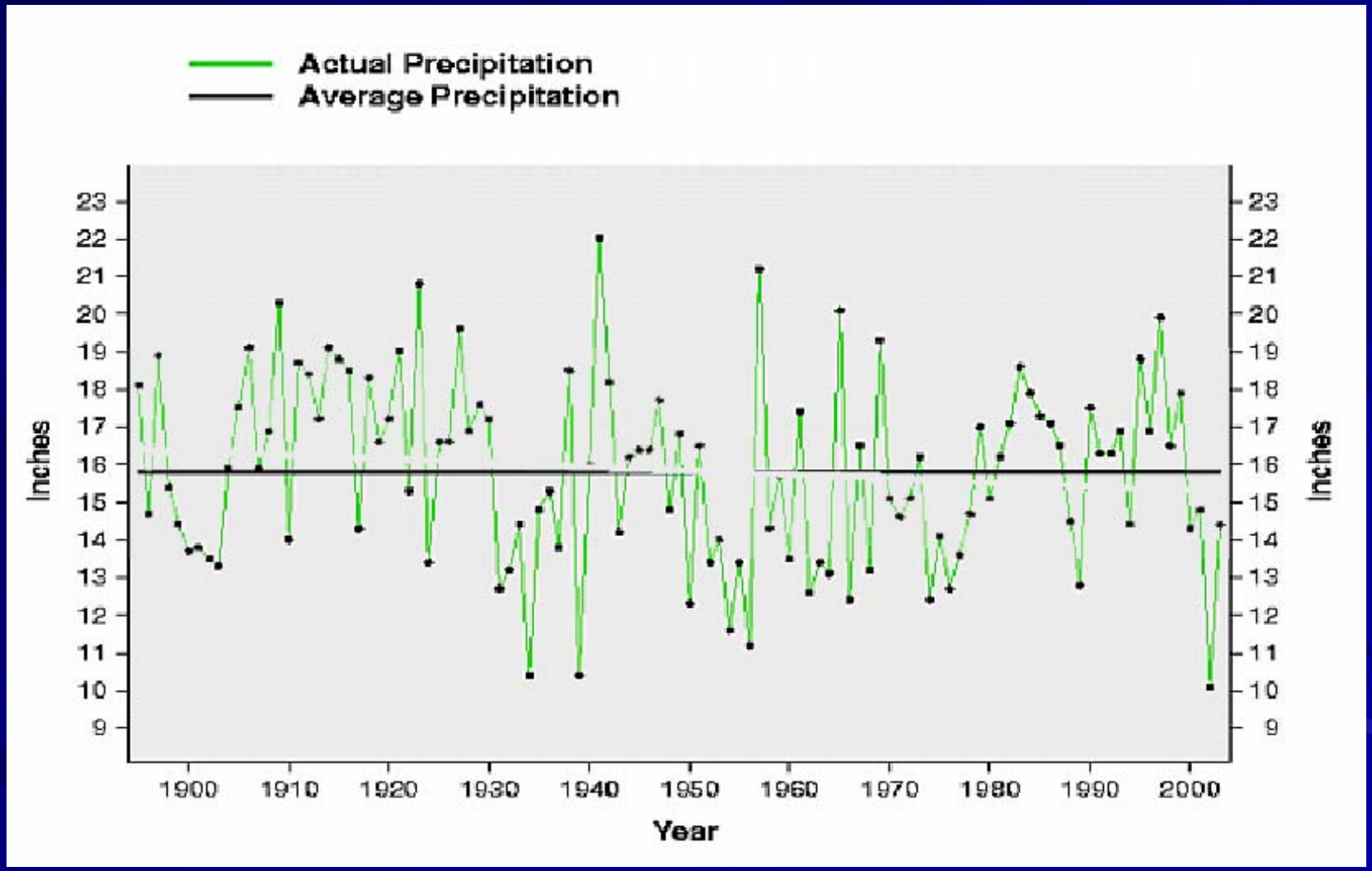
48-Month SPI


Fraction of Colorado in Drought
Based on 48-month SPI
Through 1999
Fraction
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1890
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
Year

Denver Stapleton Annual Precipitation (1949-2003)

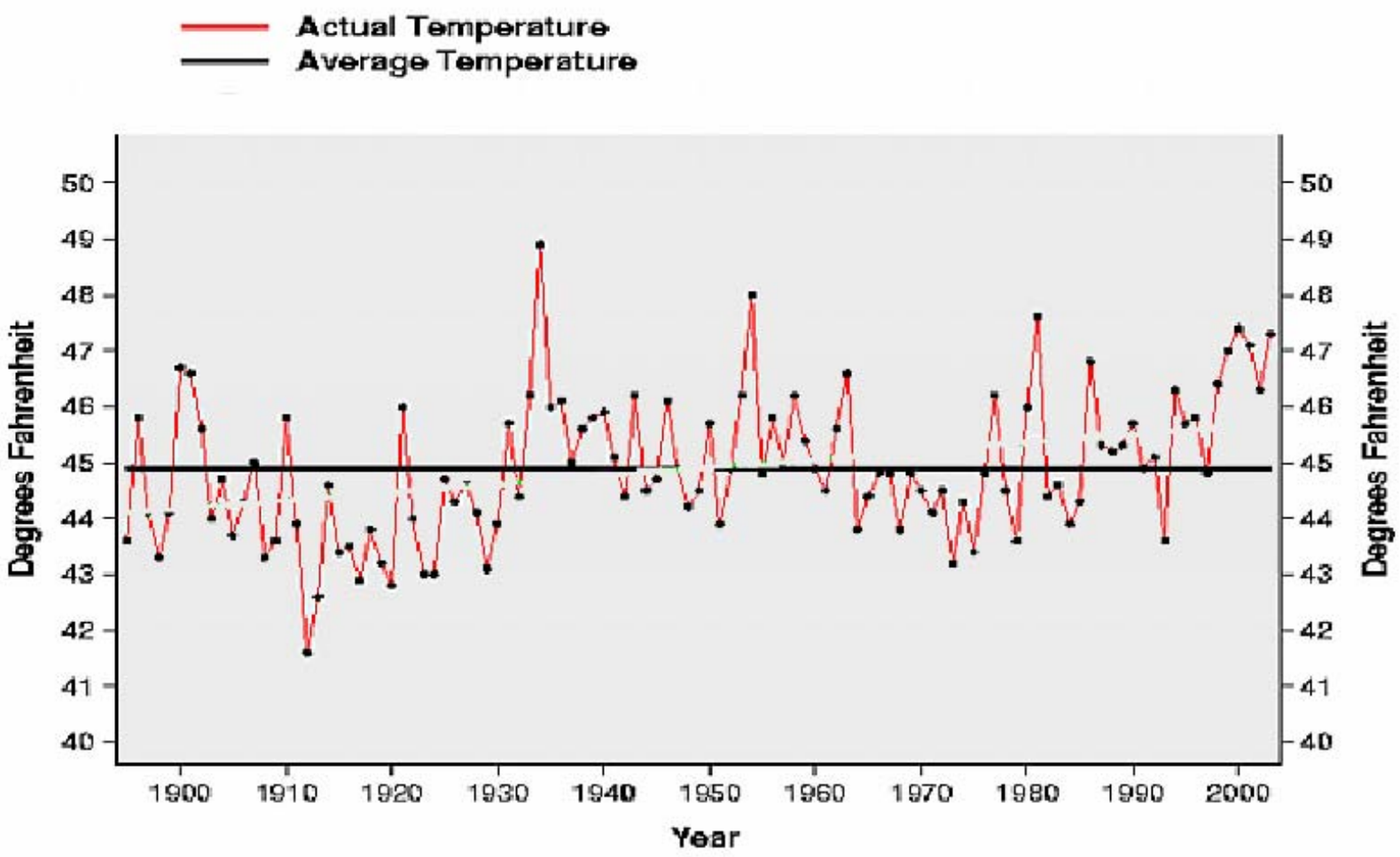


Statewide Annual Precipitation History



http://lwf.ncdc.noaa.gov/oa/climate/research/cag3/CO.html

Statewide Mean Annual Temperature History

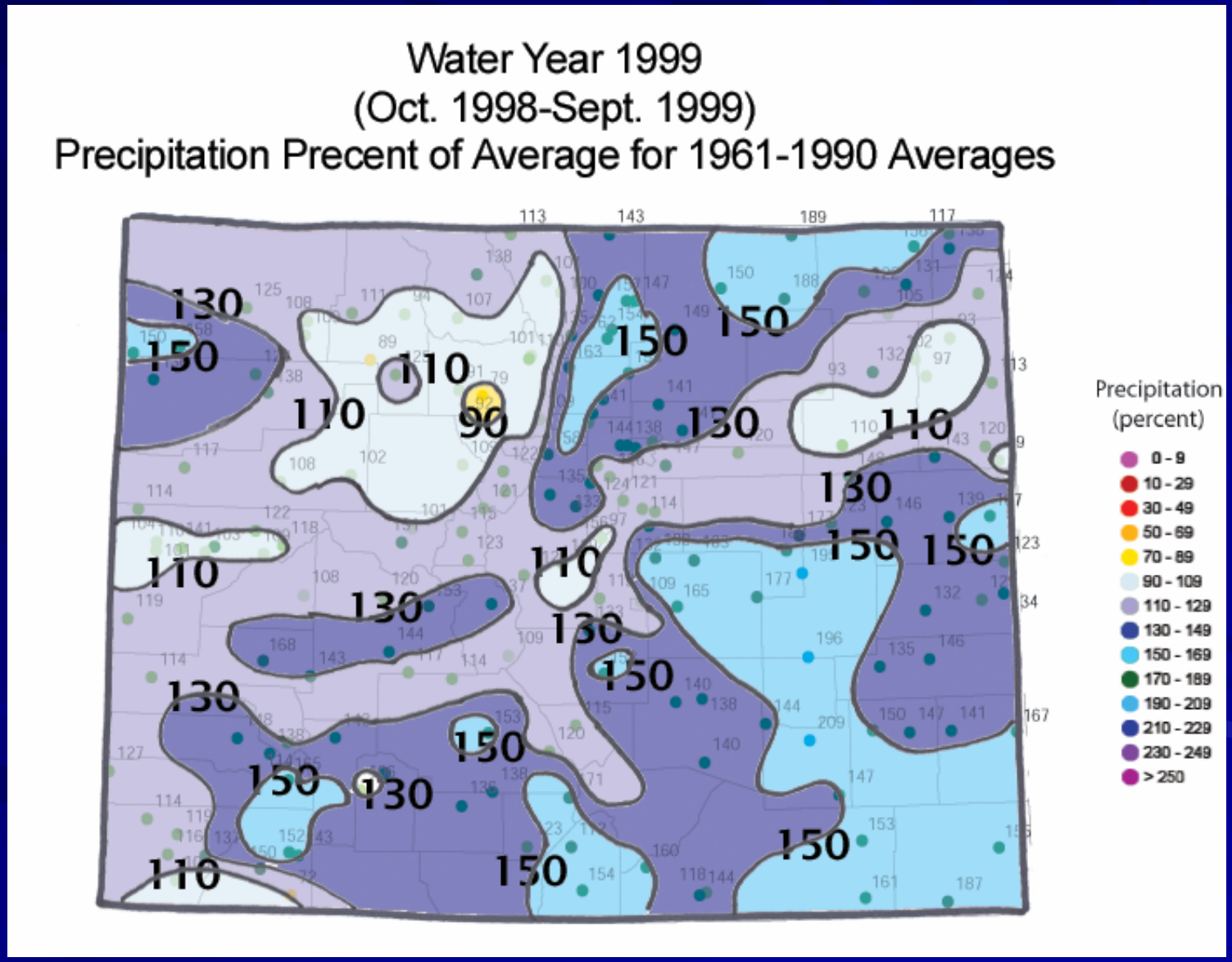


http://lwf.ncdc.noaa.gov/oa/climate/research/cag3/CO.html

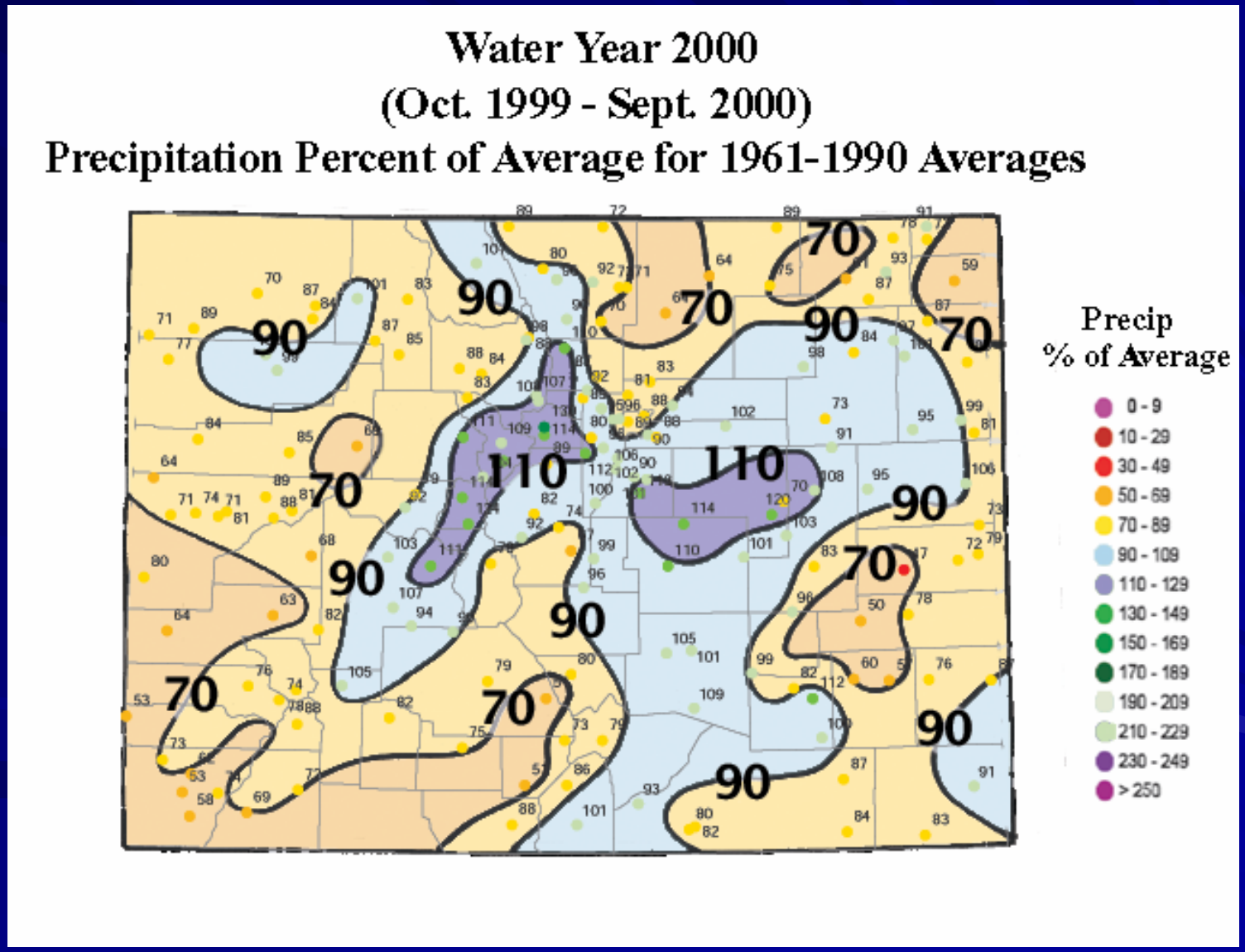
Recent Perspective

Photo: Barr Lake northeast of Denver, Colorado, October 2002
(Ken Dewey, High Plains Regional Climate Center)

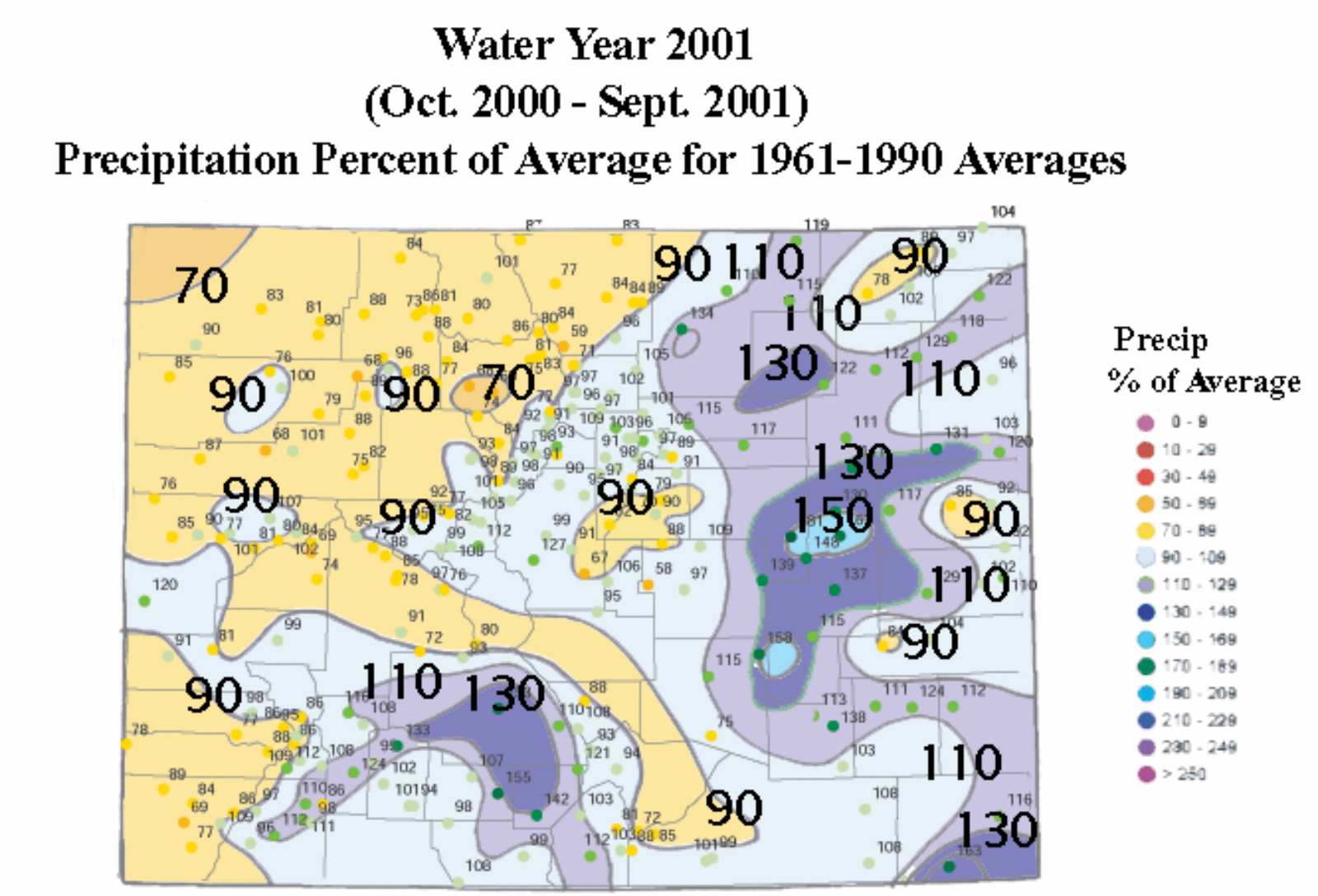
1999 Water Year Precipitation



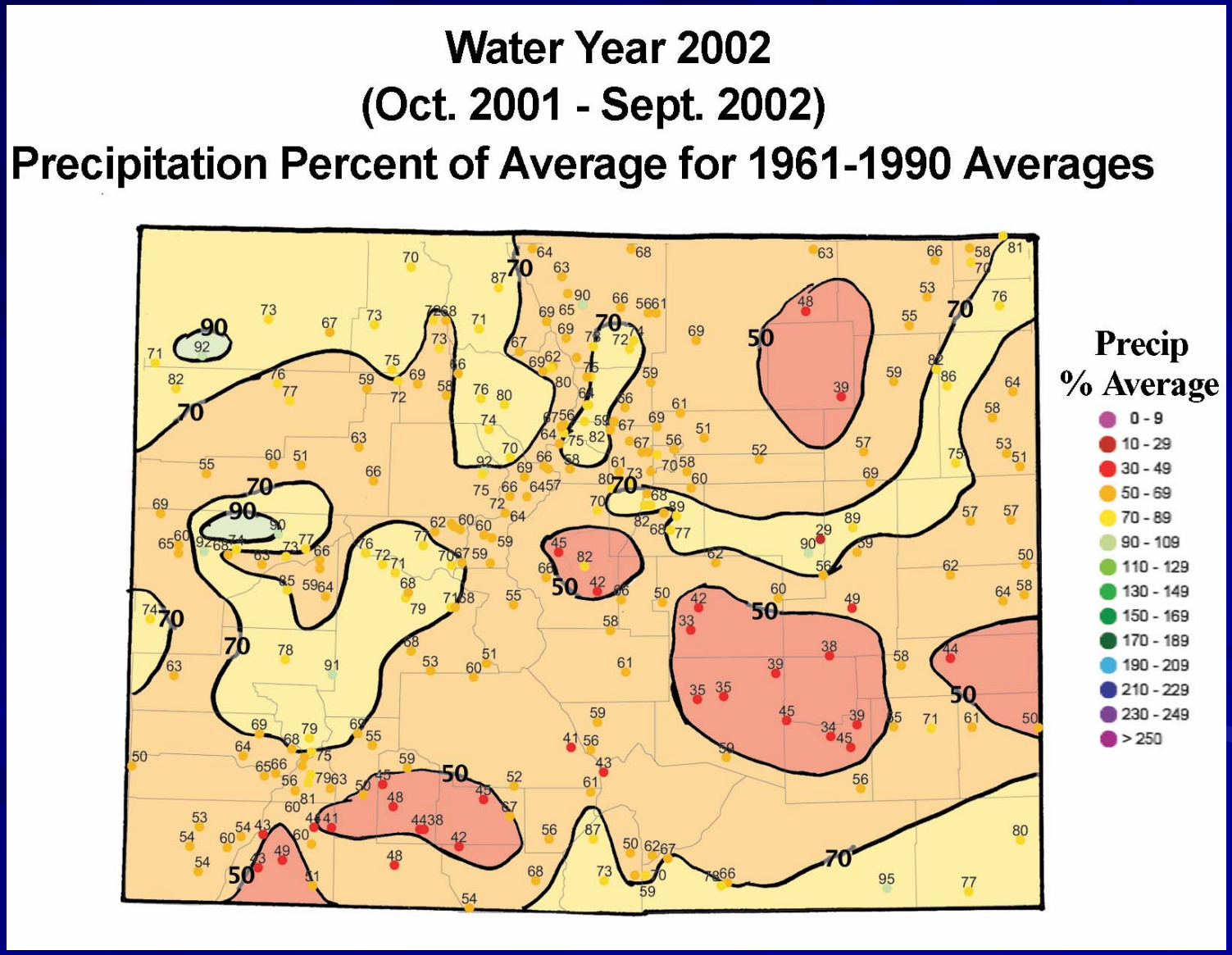
2000 Water Year Precipitation



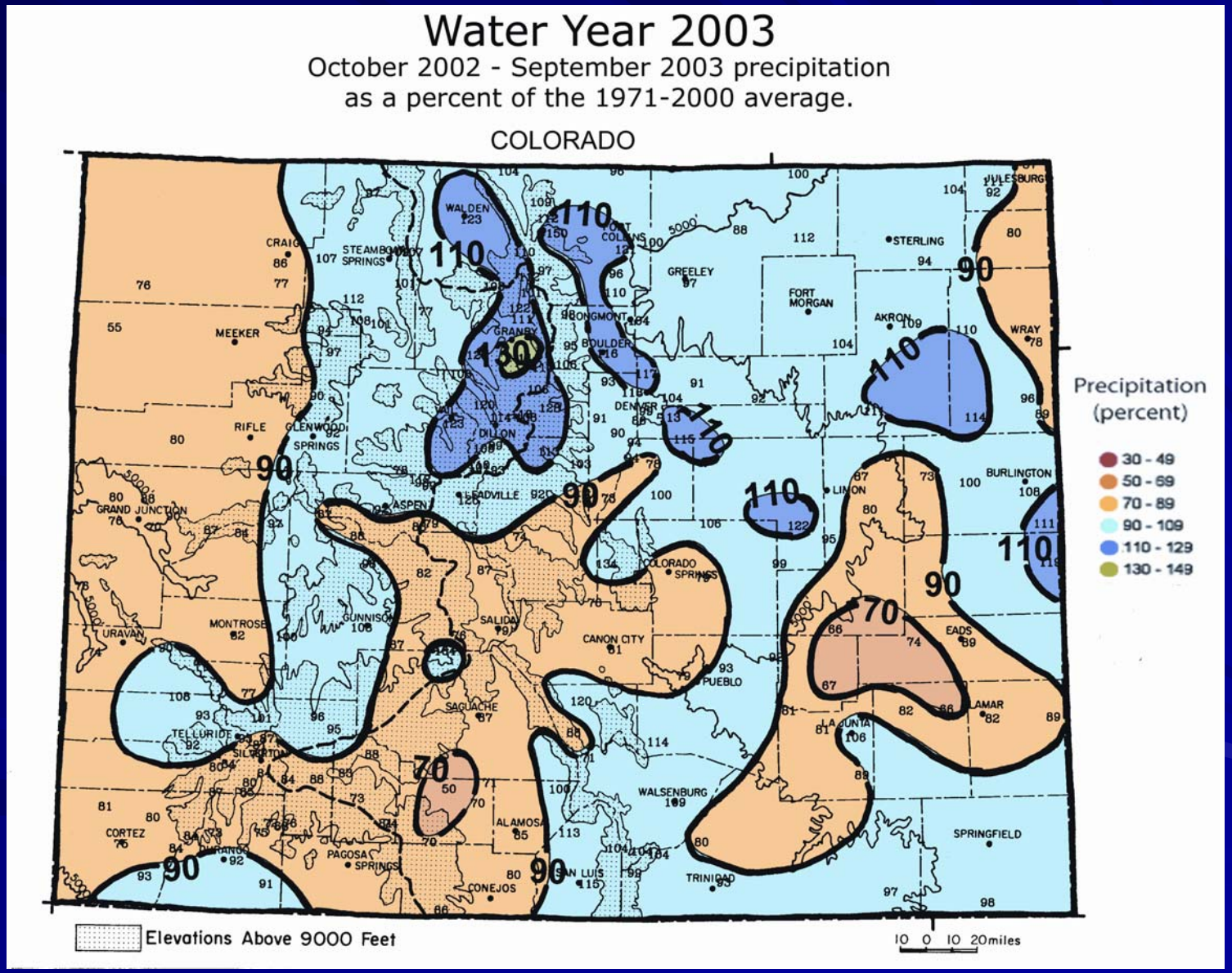
2001 Water Year Precipitation



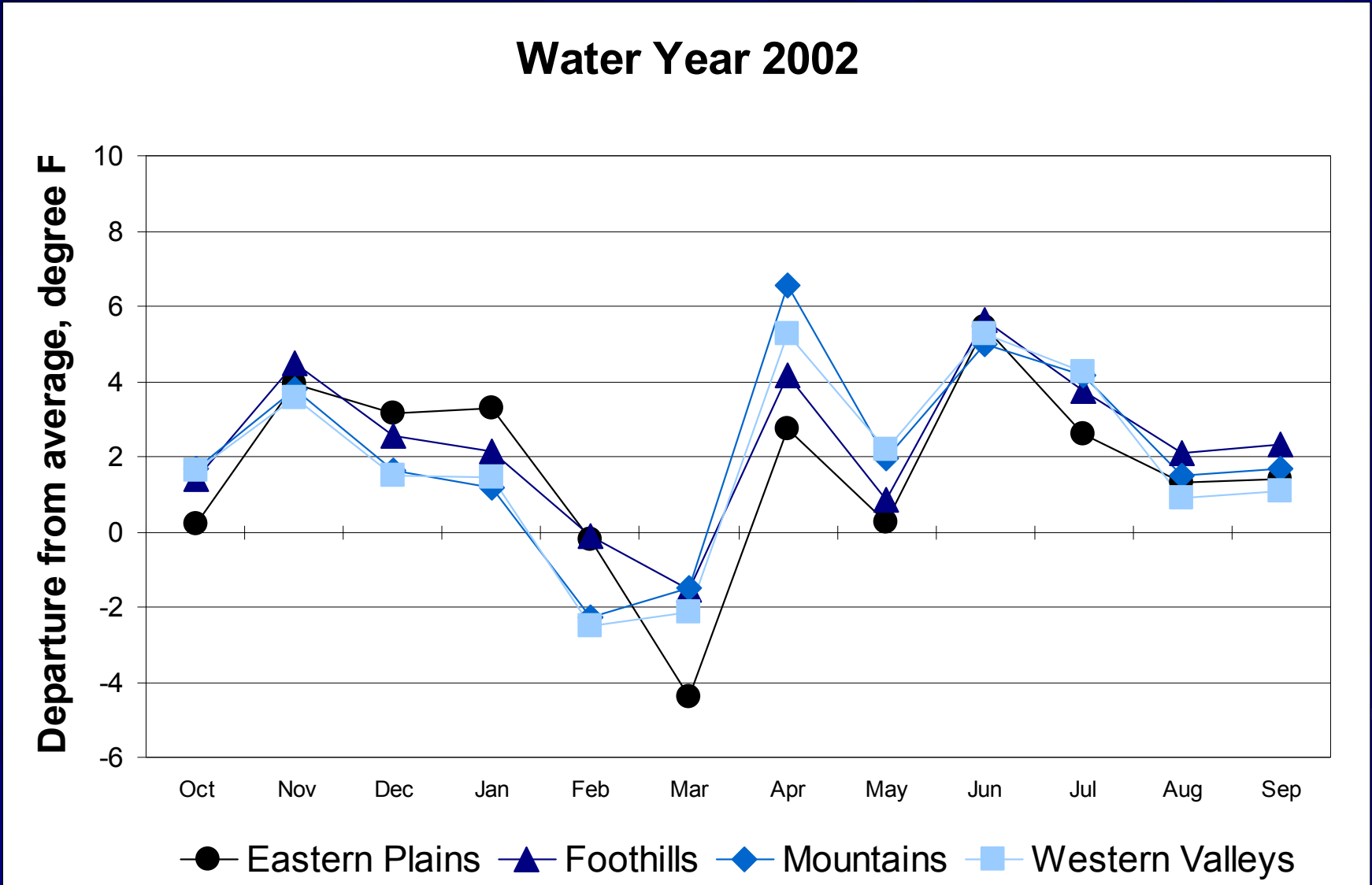
2002 Water Year Precipitation



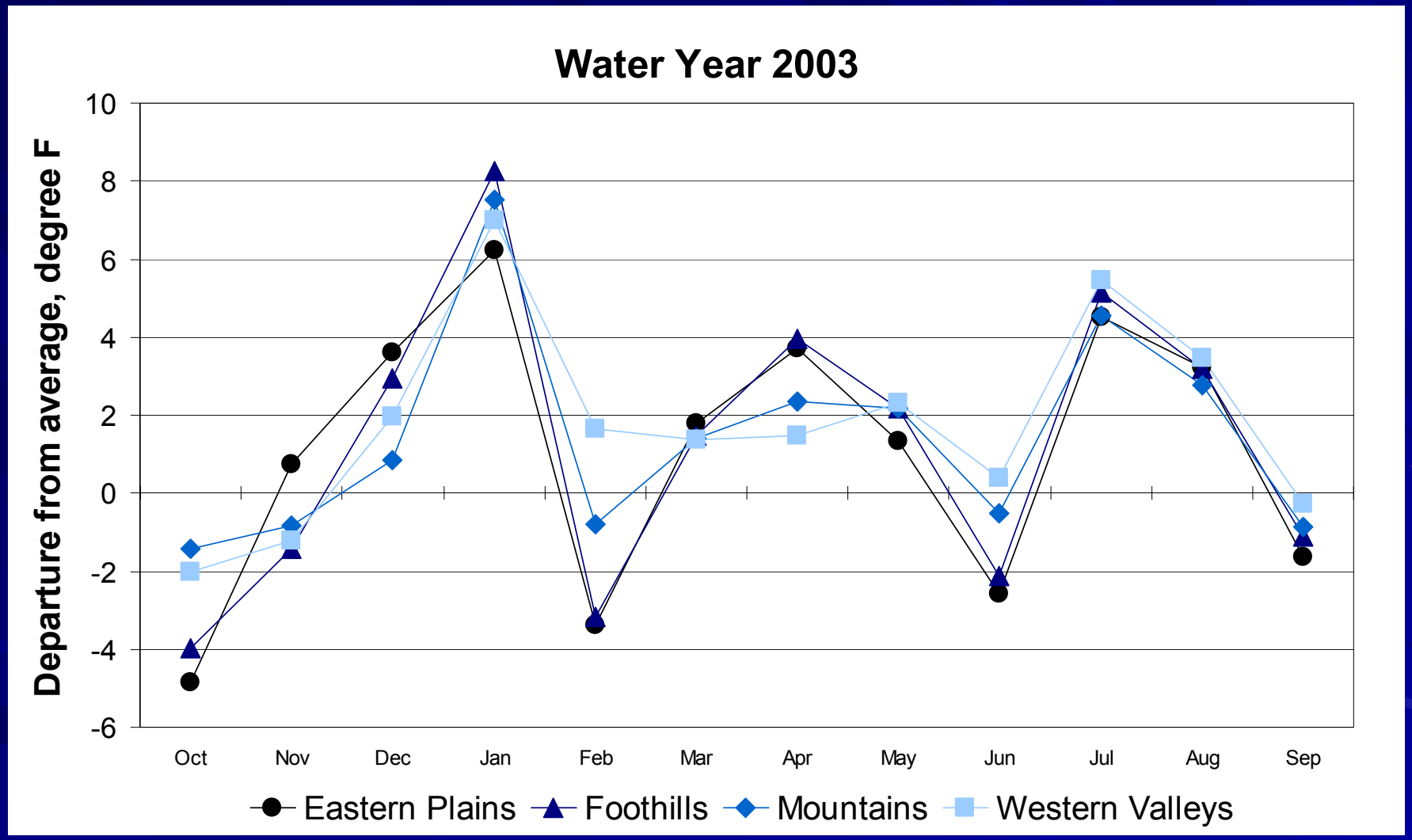
2003 Water Year Precipitation



WY2002 Temperature Departures



WY2003 Temperature Departures



Where We Stand Now

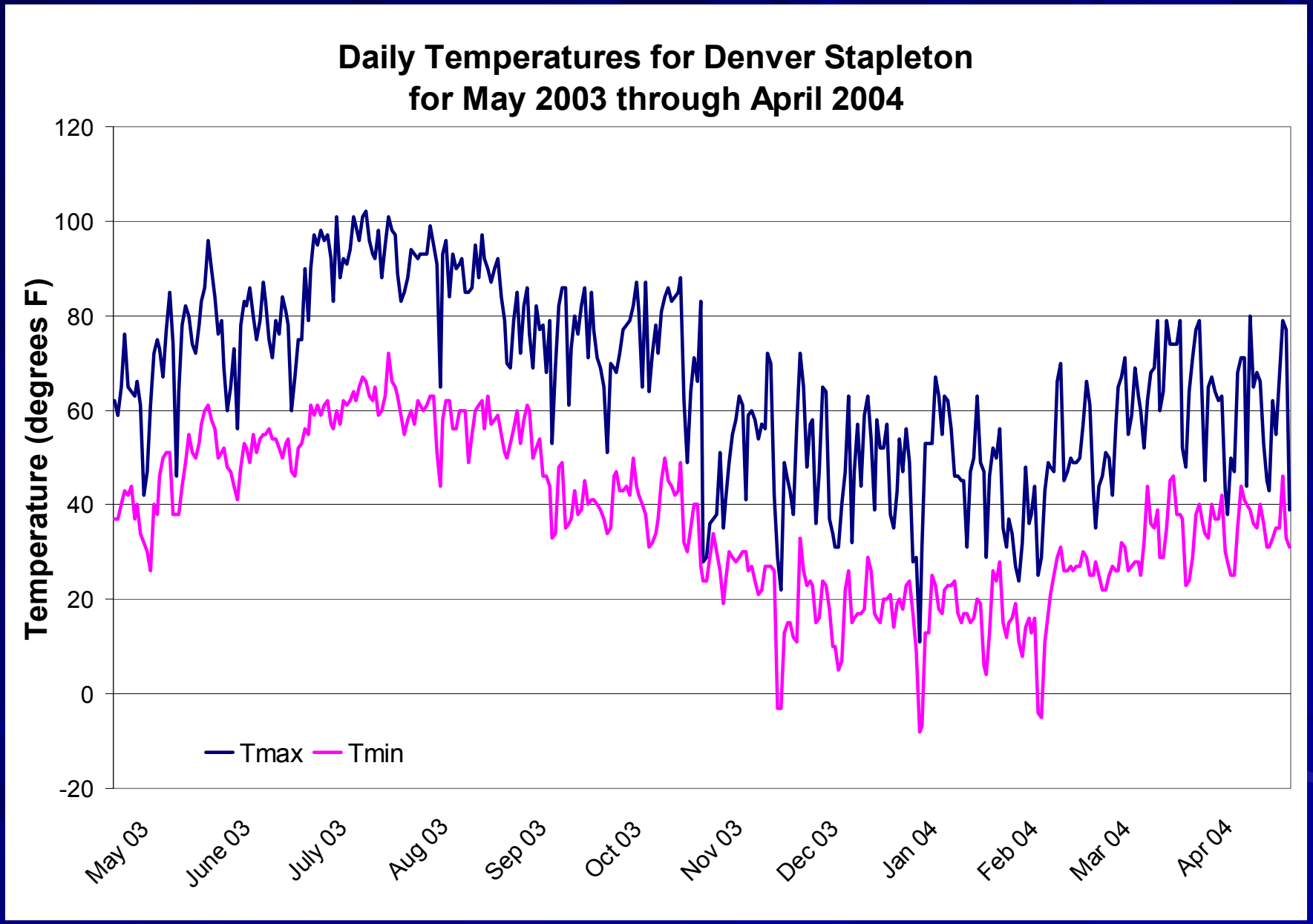
Denver Water Department

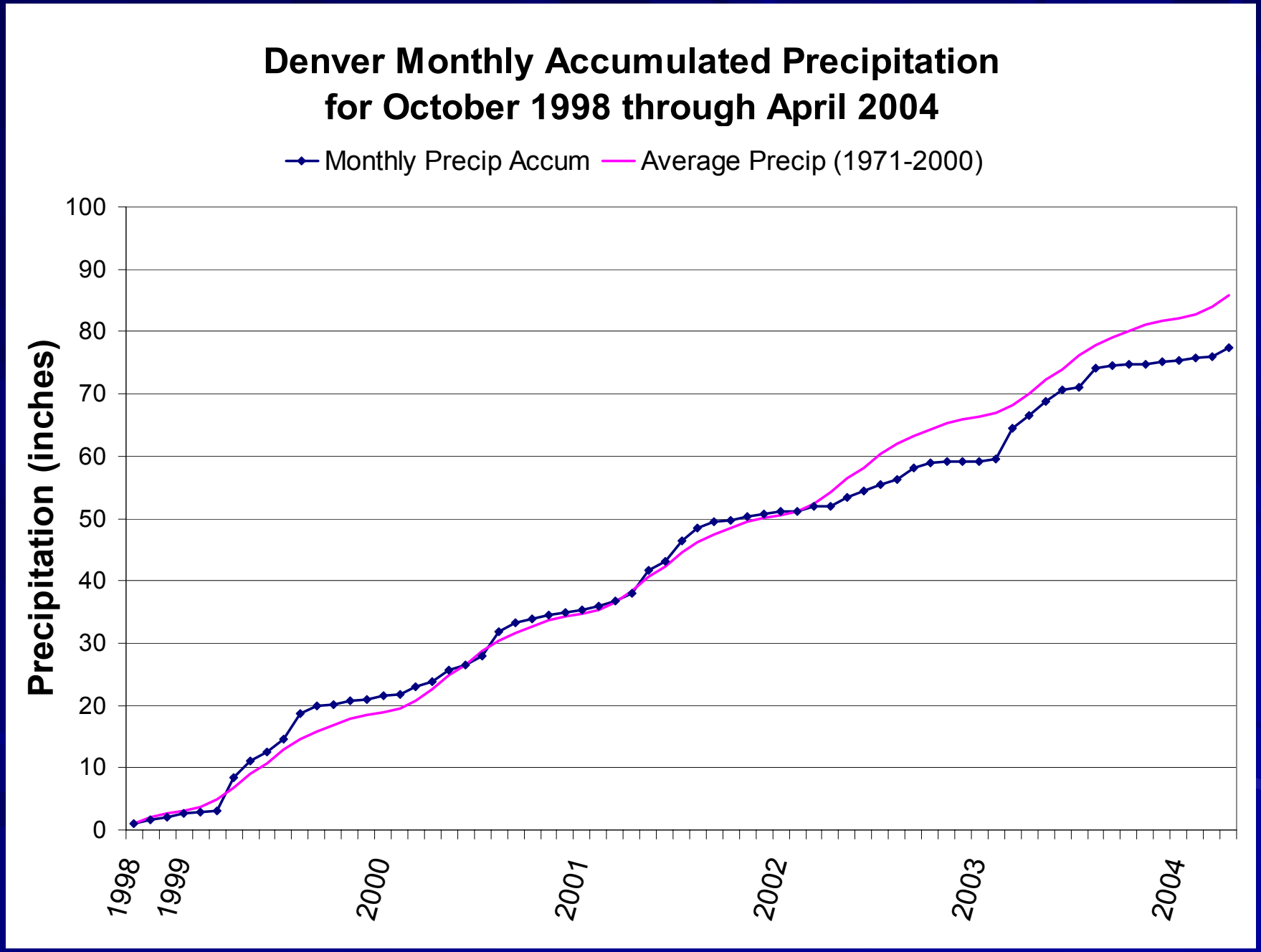
SPRING/SUMMER WATERING SCHEDULE
(Effective May 1, 2004)
Watering Schedule

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Even Address Single-Family Residence	**NO Watering** See exceptions below	- Home Owners Assoc - Apartments - Businesses - Government	**Odd Address** Single-Family Residence	**Even Address** Single-Family Residence	- Home Owners Assoc - Apartments - Businesses - Government	**Odd Address** Single-Family Residence

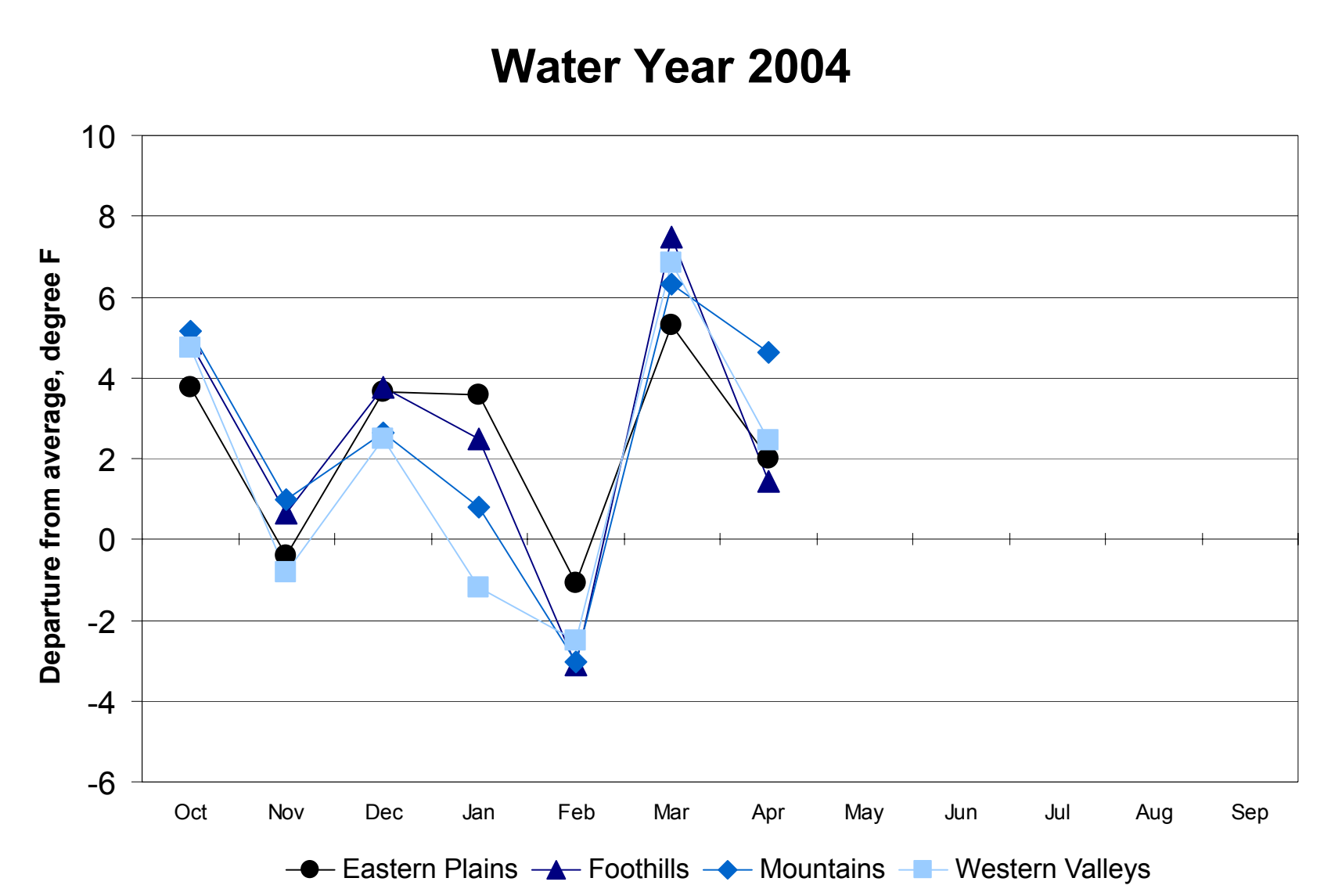
2004 Spring/Summer Water Use Rules

http://www.denverwater.org/drought/droughtframe.html

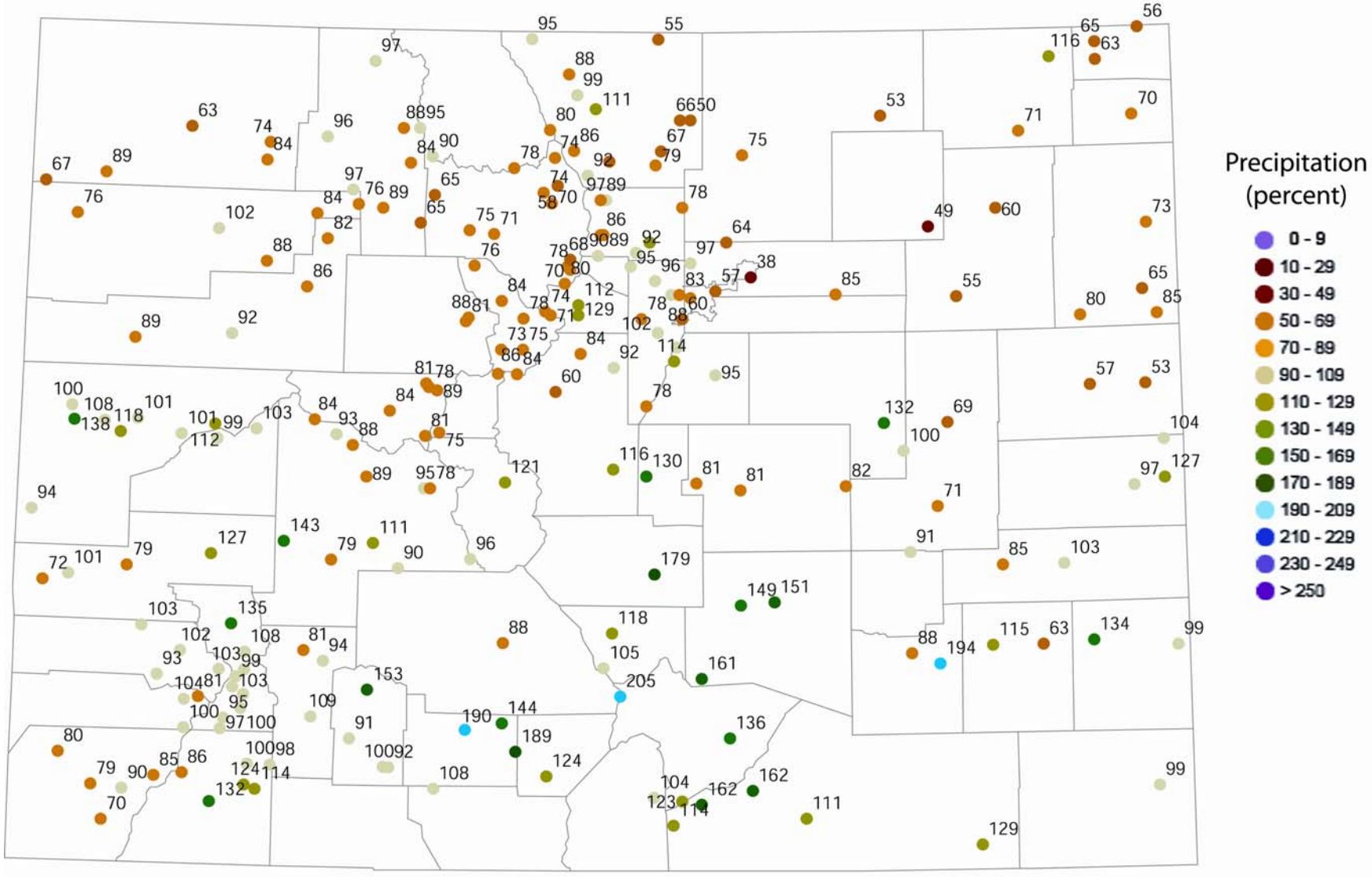

Daily Temperatures for Denver Stapleton
for May 2003 through April 2004
Temperature (degrees F)
120
100
80
60
40
20
0
-20
Tmax
Tmin
May 03
June 03
July 03
Aug 03
Sep 03
Oct 03
Nov 03
Dec 03
Jan 04
Feb 04
Mar 04
Apr 04


Denver Monthly Accumulated Precipitation
for October 1998 through April 2004
Monthly Precip Accum
Average Precip (1971-2000)
Precipitation (inches)
100
90
80
70
60
50
40
30
20
10
0
1998
1999
2000
2001
2002
2003
2004

WY2004 Temperature Departures

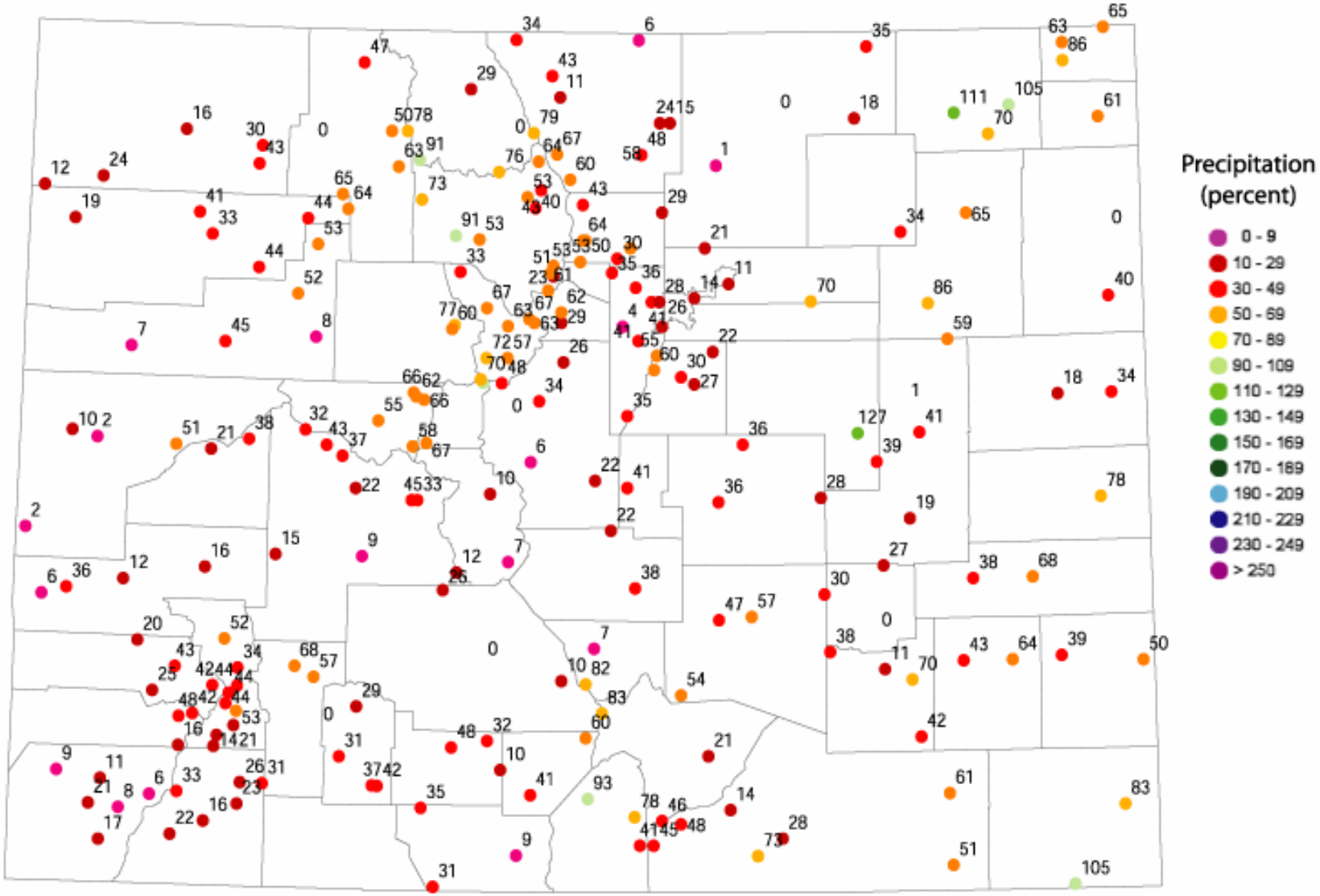


COLORADO



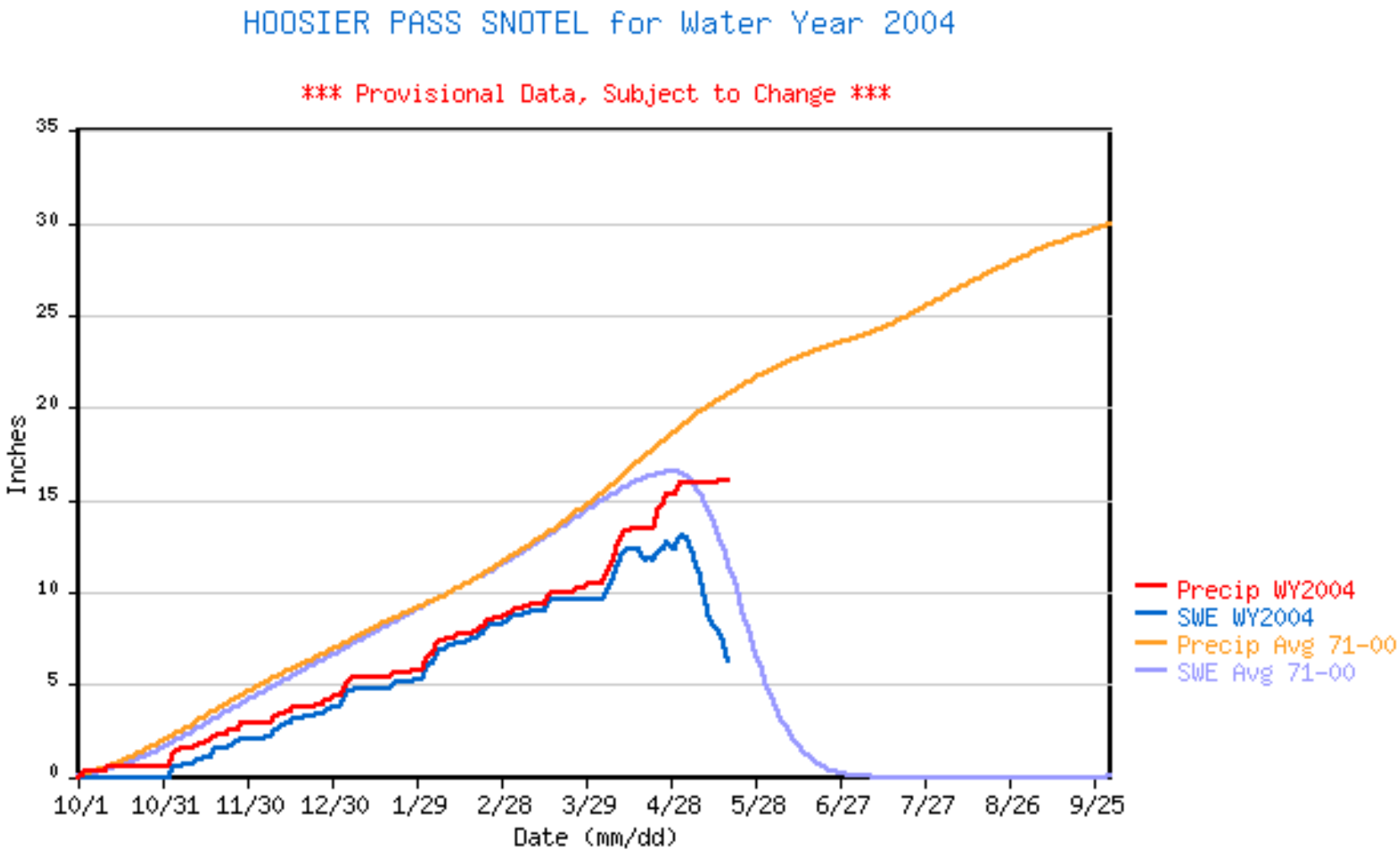
Water Year 2004 (October 2003 through April 2004) precipitation as a percent of the 1971-2000 average.

COLORADO

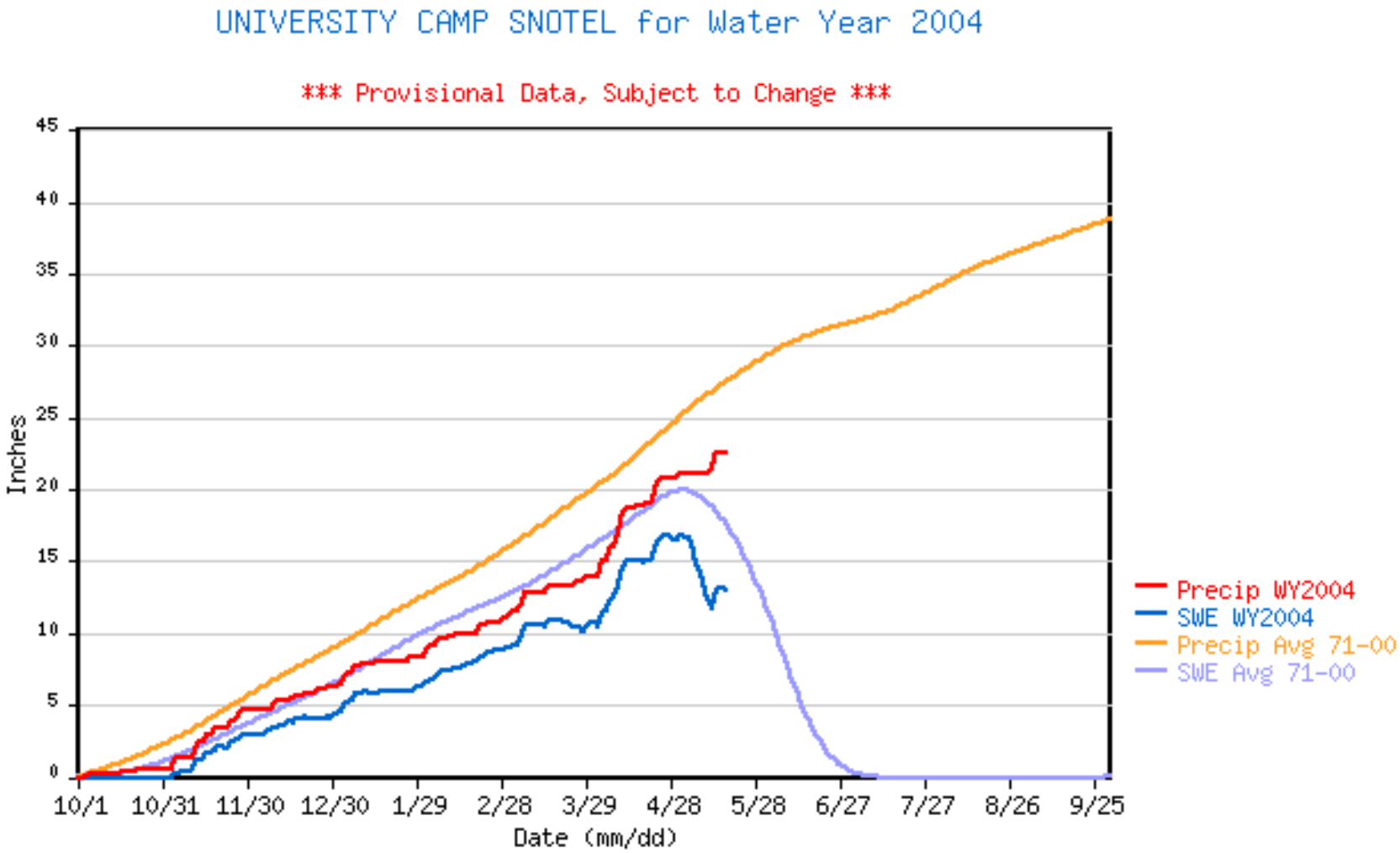


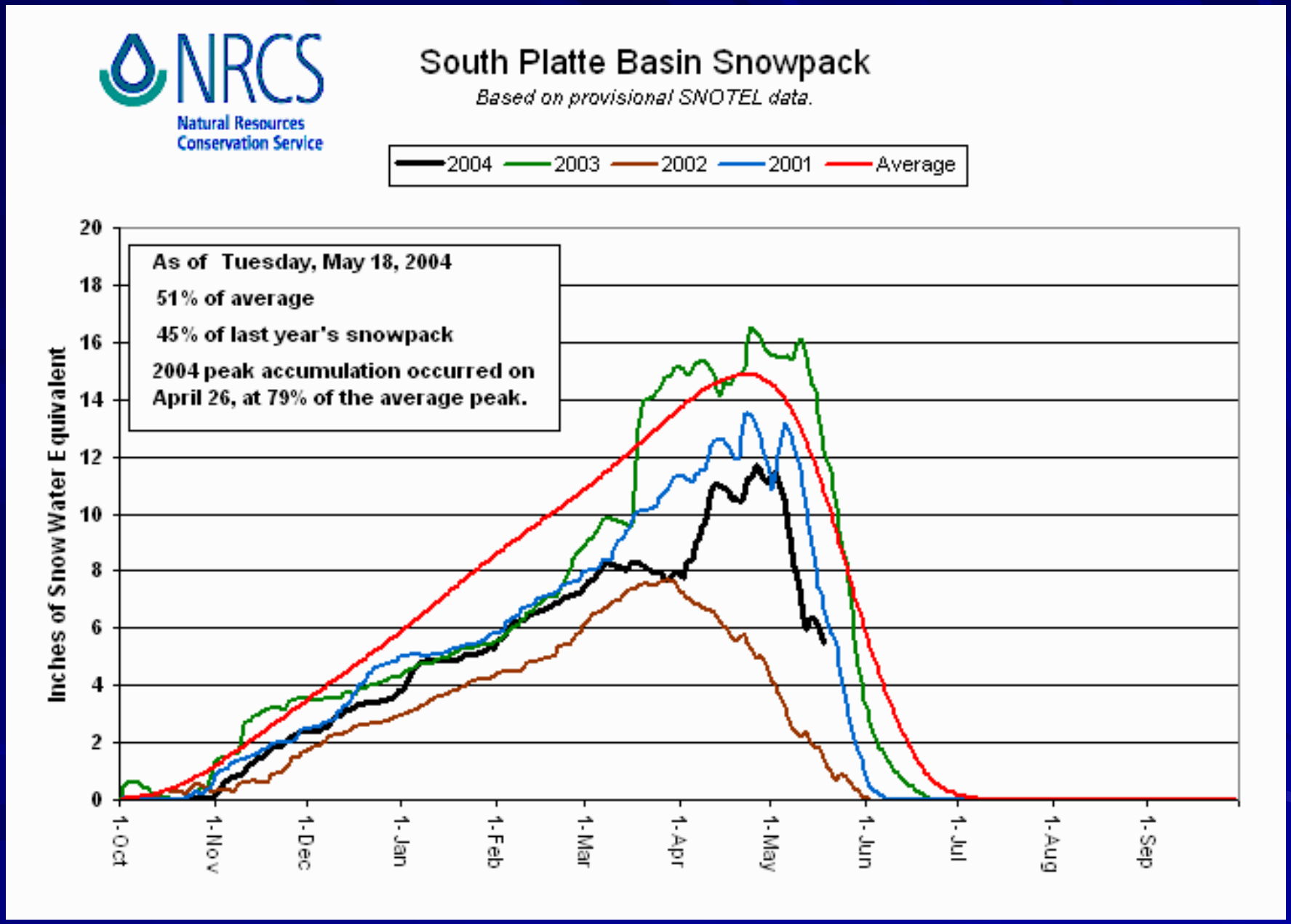
March 2004 precipitation as a percent of the 1971-2000 average.

Hoosier Pass



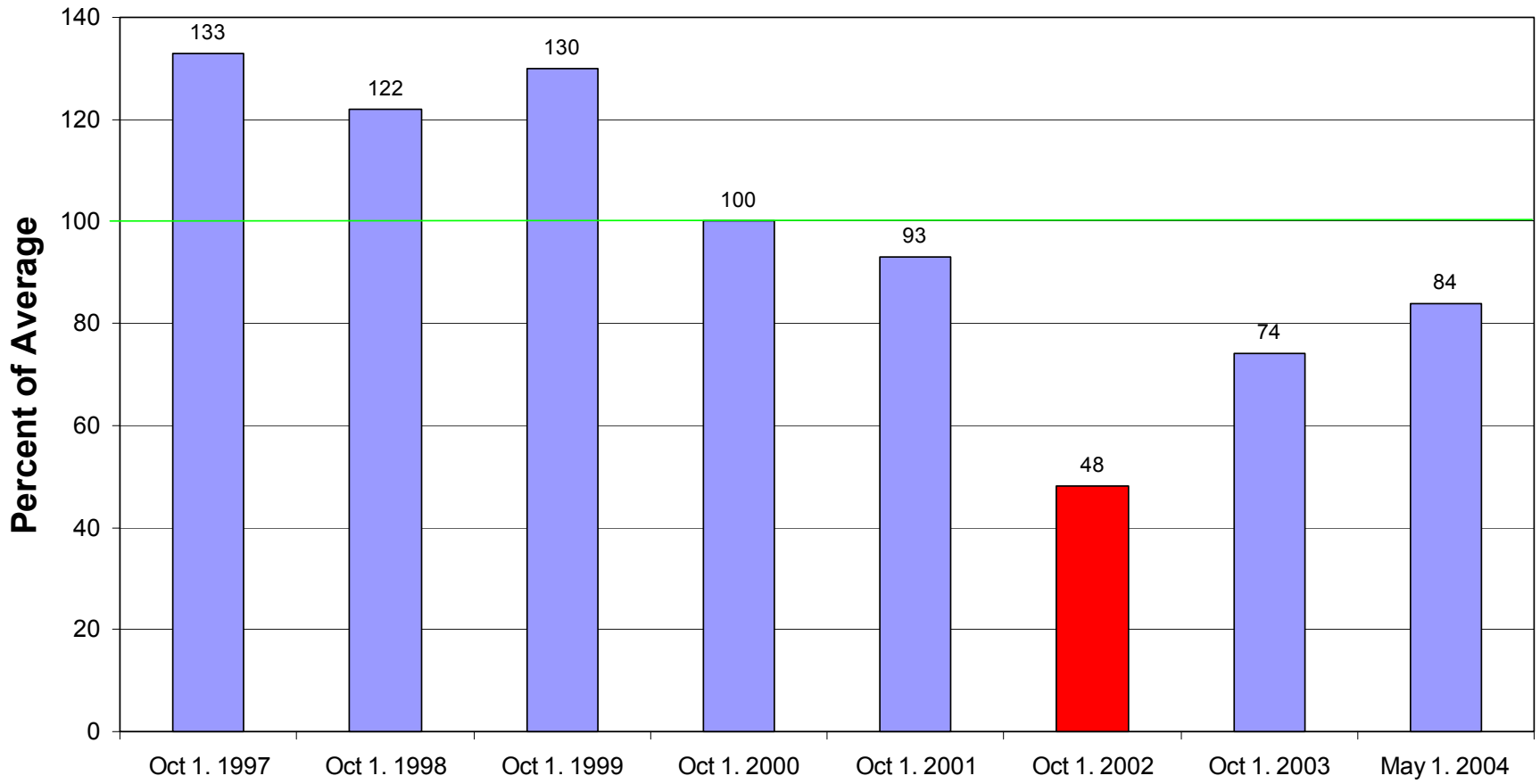
University Camp





http://www.co.nrcs.usda.gov/snow/data/basins.html

Reservoir Levels



What Comes Next?

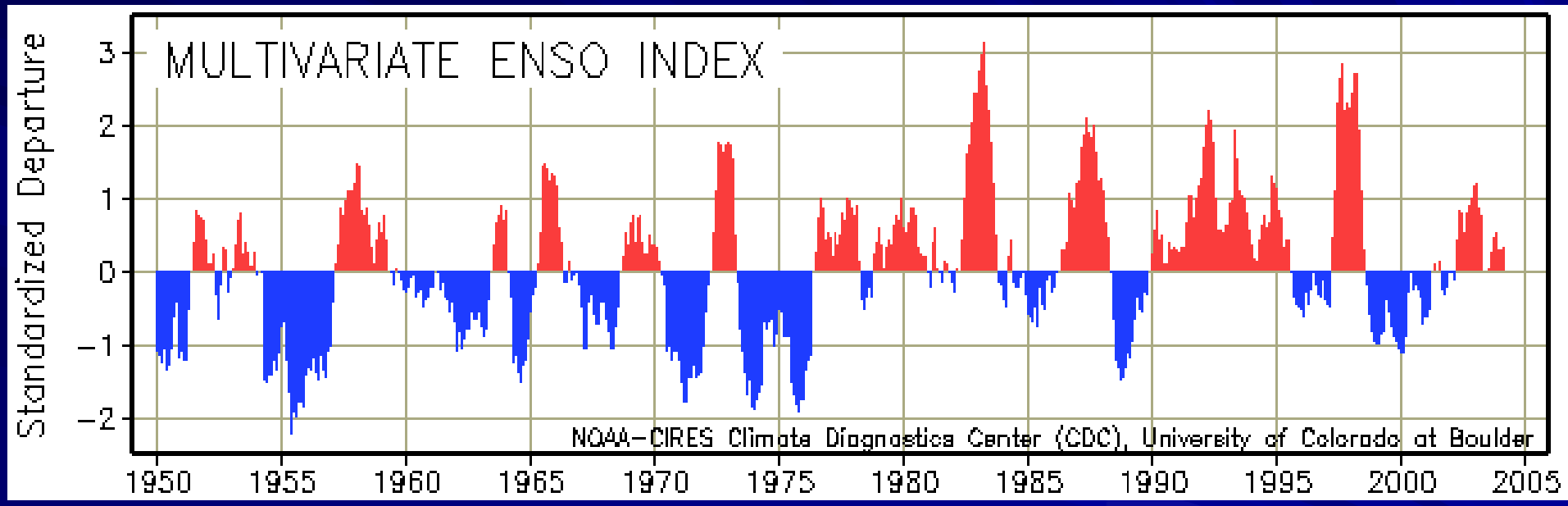
Positive Indicators

- Late winter snows
- Cool spring
- Multi-day precipitation
- Wet Snow
- Low intensity rainfall
- Light winds
- High humidity
- Abundant cloud cover

Negative Indicators

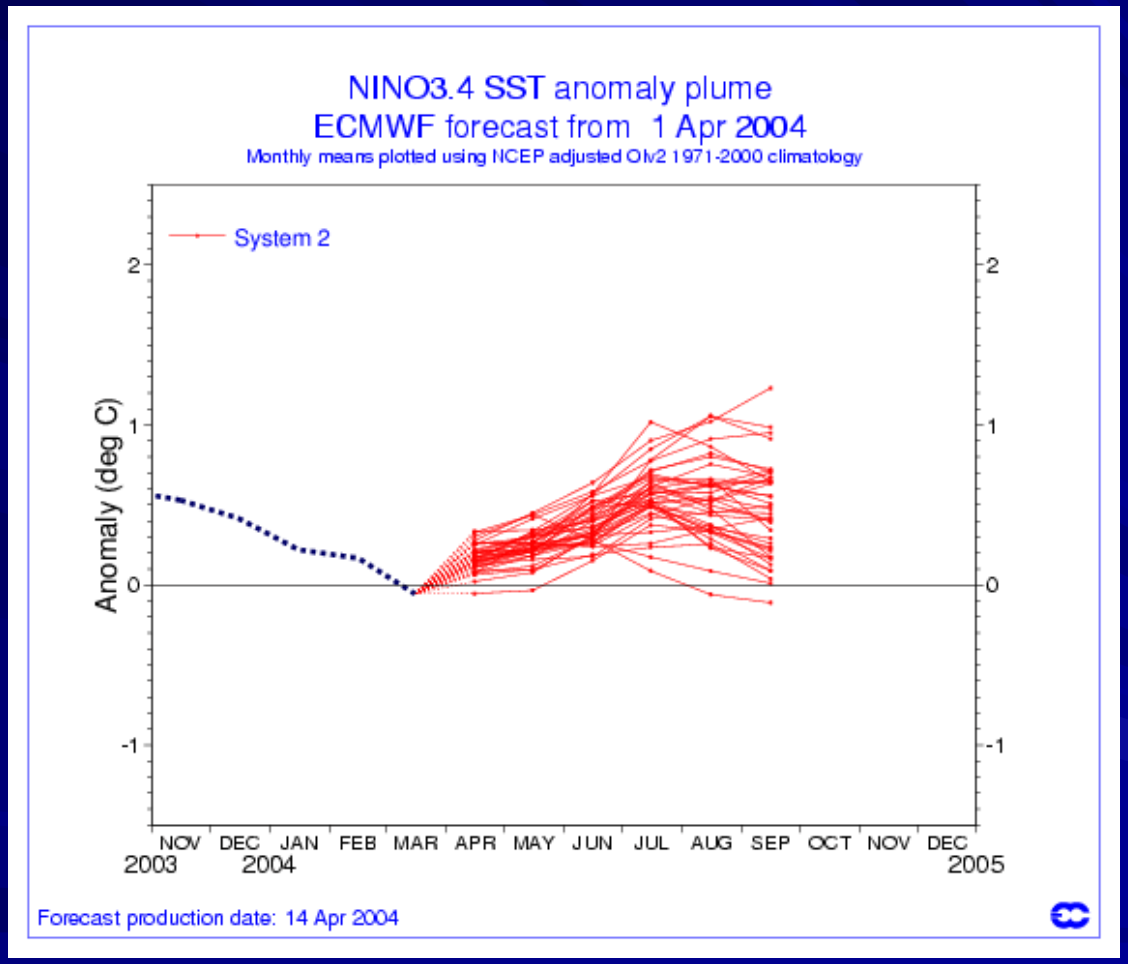
- Little late winter snow
- Missed opportunities
- Warm spring
- Brief, sporadic precipitation
- High intensity rainfall
- Frequent, strong winds
- Low humidity
- Abundant sunshine

Multivariate ENSO Index (MEI)



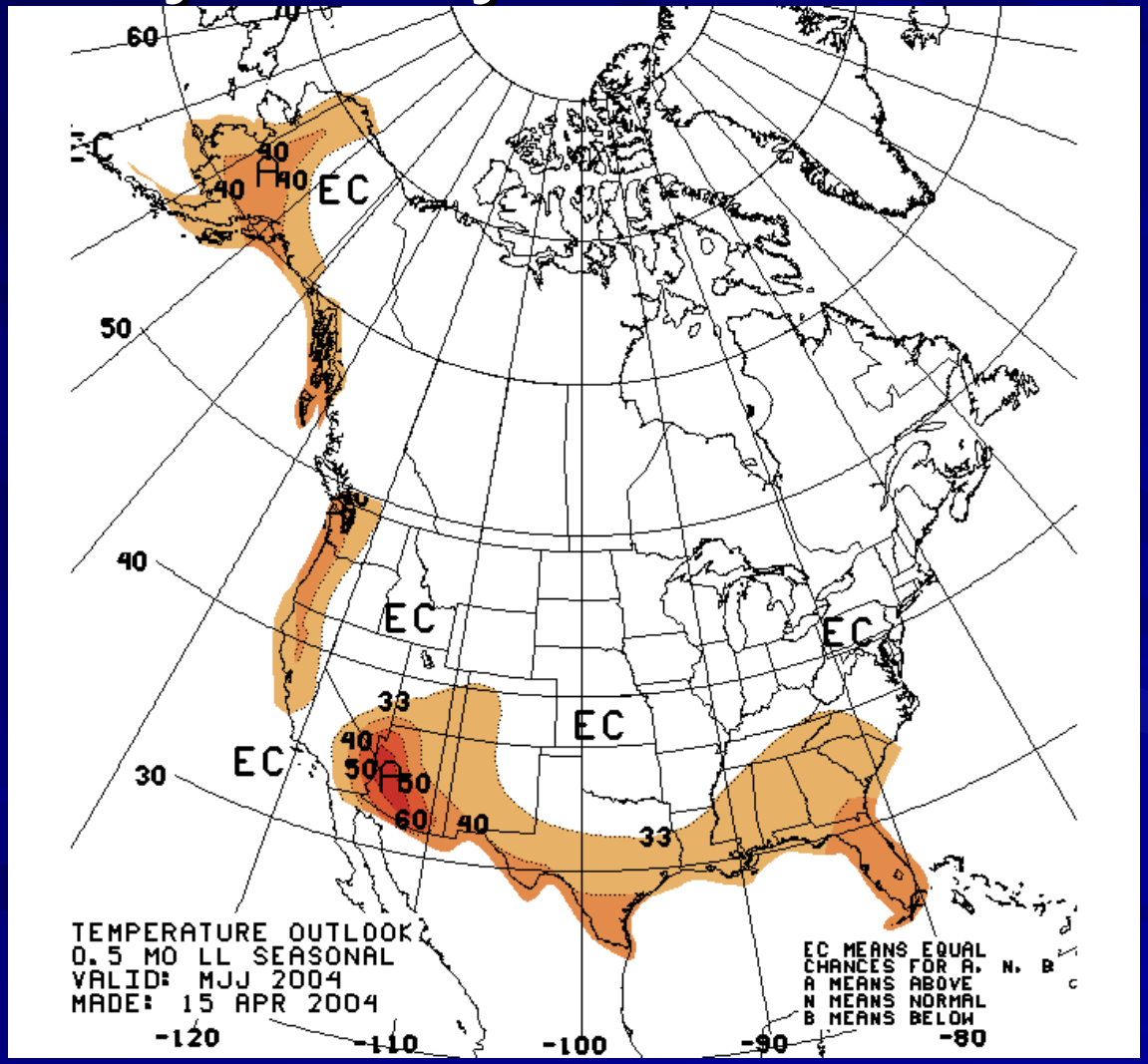
http://www.cdc.noaa.gov/people/klaus.wolter/MEI/

El Nino Forecast



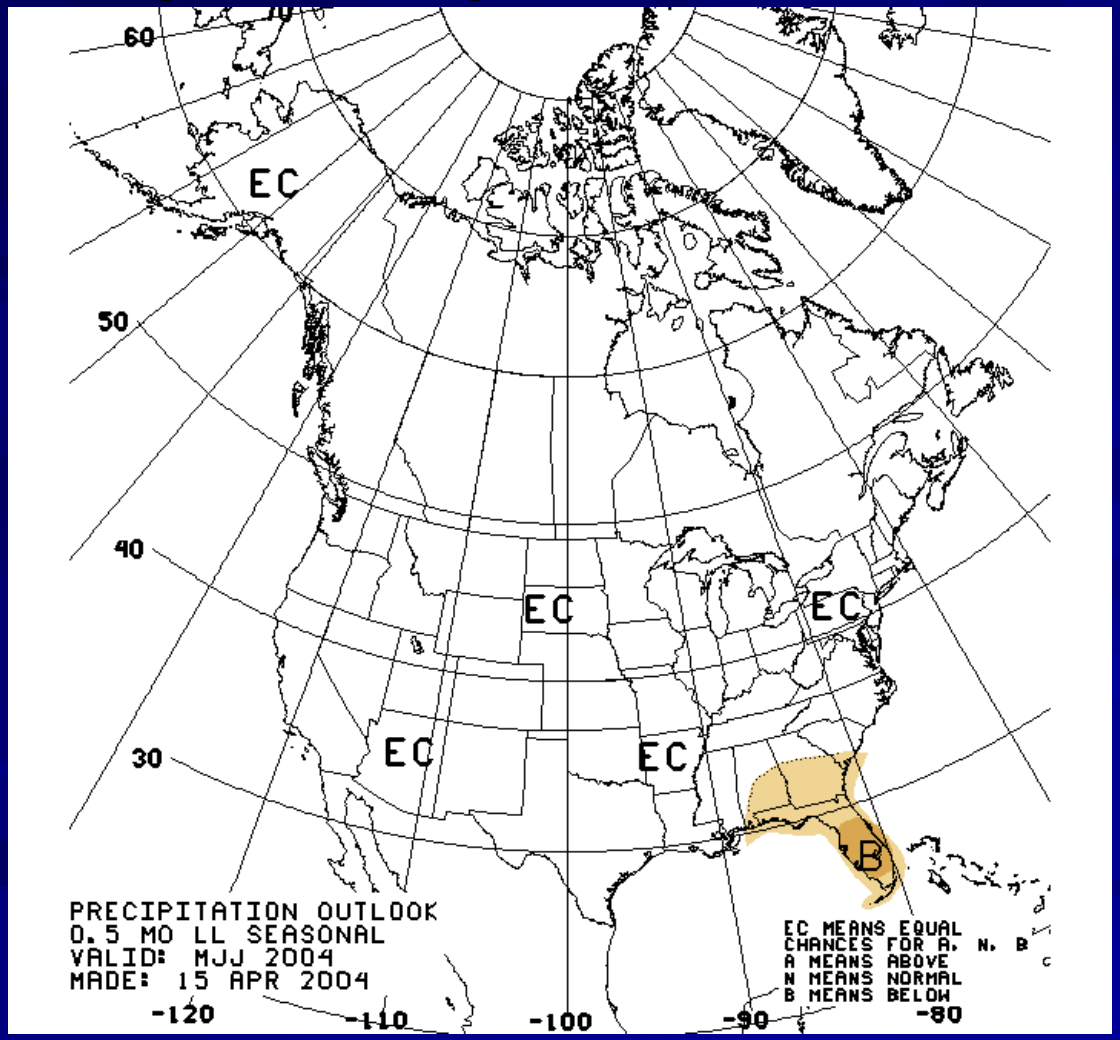
http://www.cdc.noaa.gov/people/klaus.wolter/SWcasts/

Temperature
May – July 2004



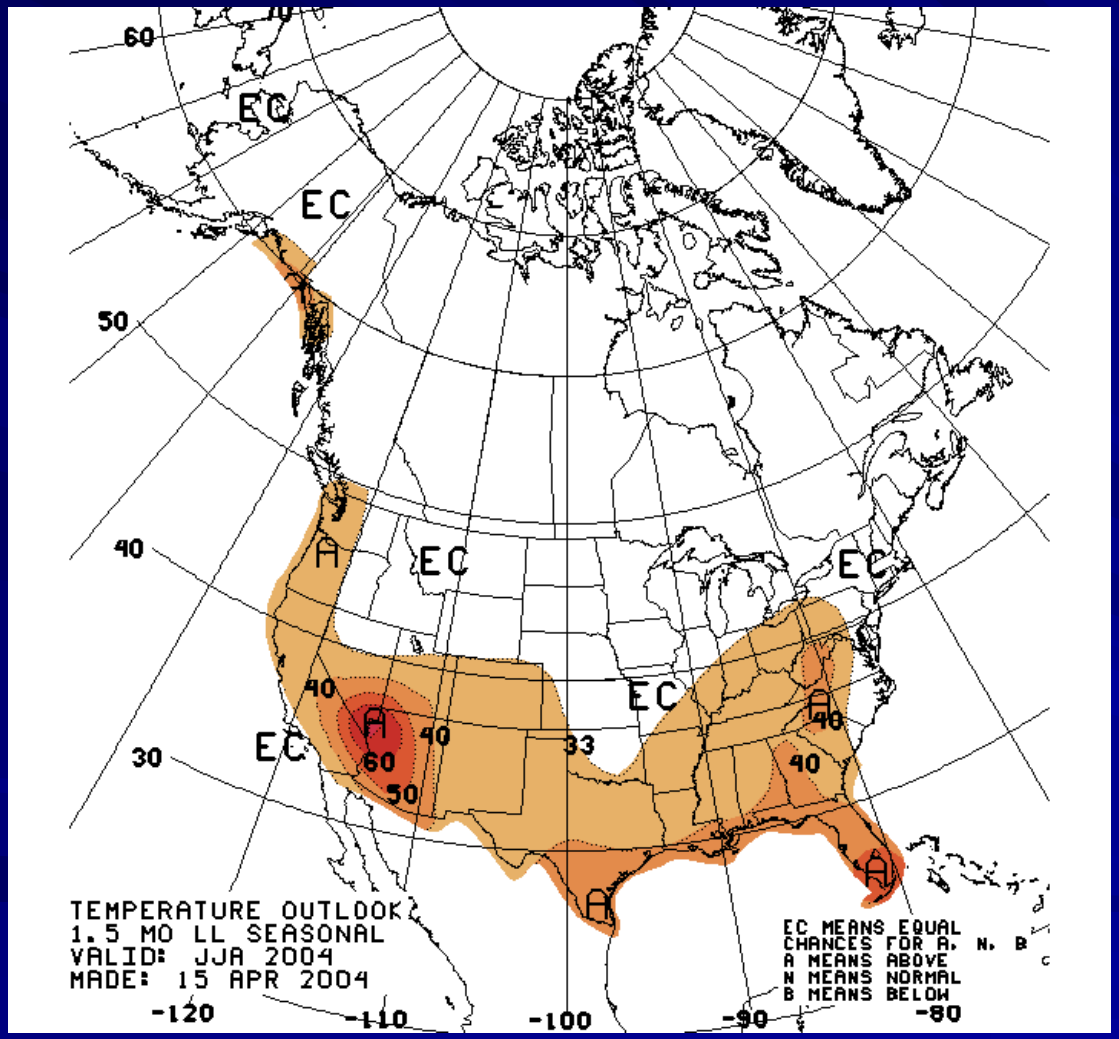
From the Colorado Prediction Center
http://www.cpc.ncep.noaa.gov/products/predictions/multi_season/13_seasonal_outlooks/color/churchill.html

Precipitation
May – July 2004



From the Colorado Prediction Center
http://www.cpc.ncep.noaa.gov/products/predictions/multi_season/13_seasonal_outlooks/color/churchill.html

Temperature
June – August 2004



From the Colorado Prediction Center
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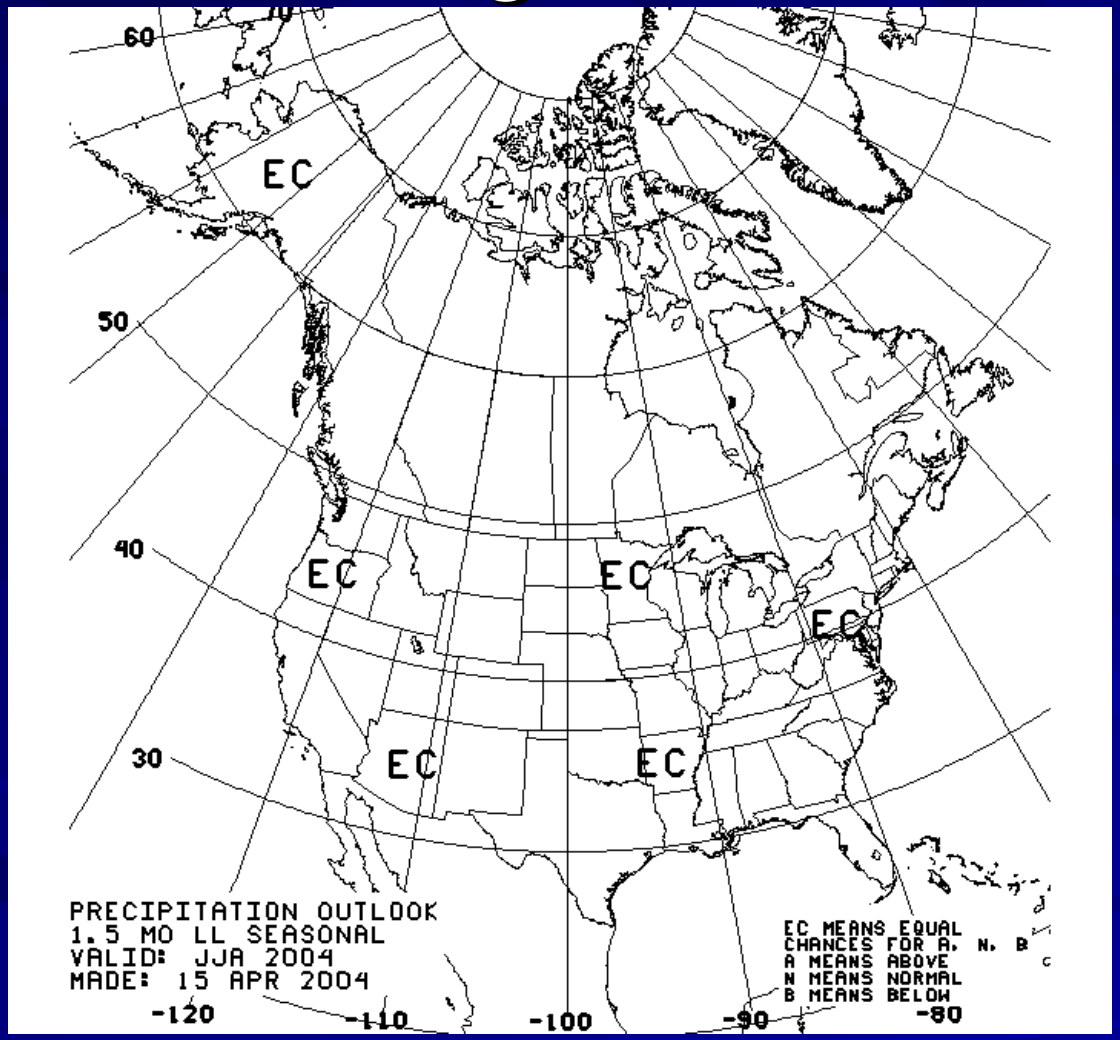
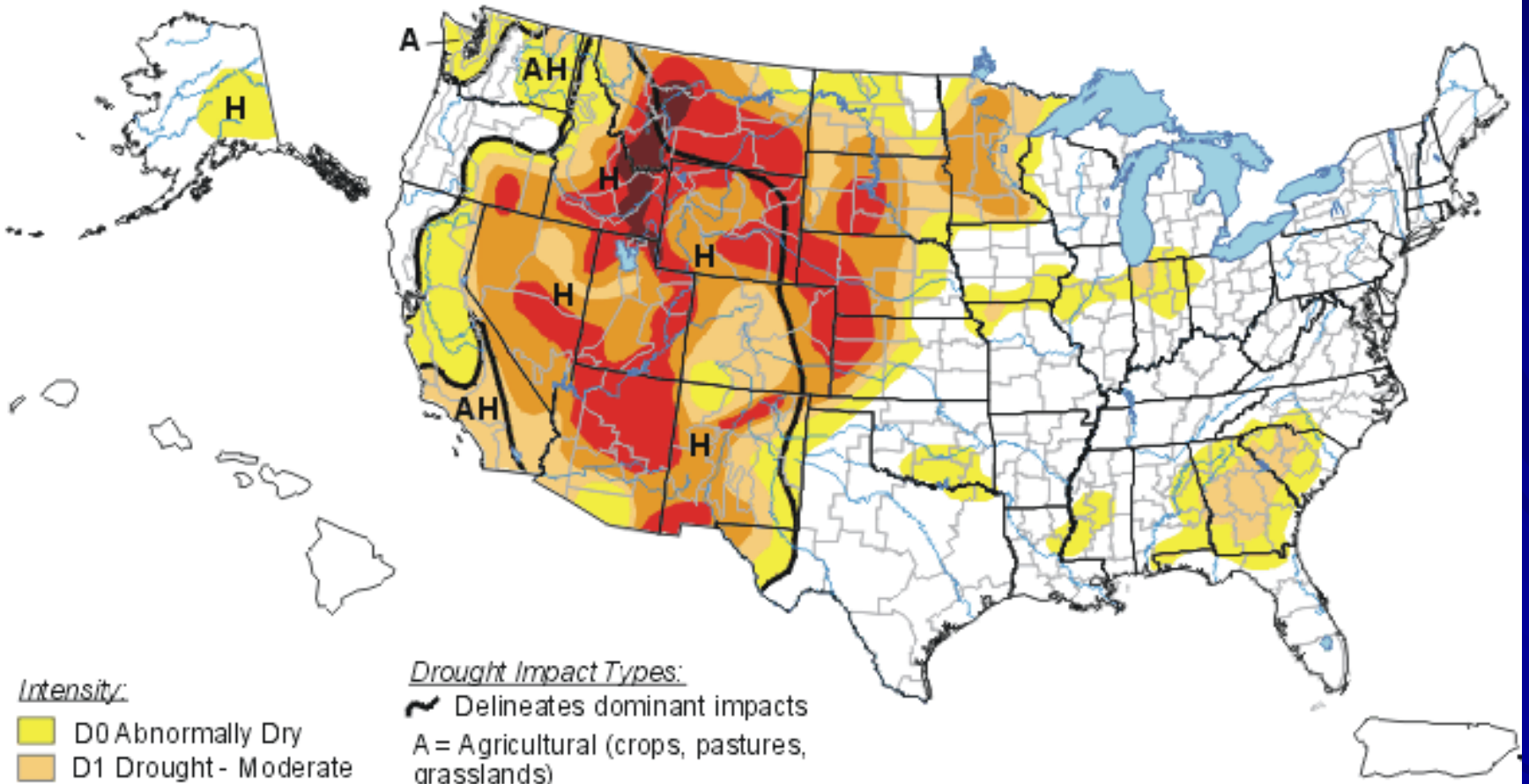
Precipitation
June – August 2004



From the Colorado Prediction Center
http://www.cpc.ncep.noaa.gov/products/predictions/multi_season/13_seasonal_outlooks/color/churchill.html

U.S. Drought Monitor

May 11, 2004
Valid 8 a.m. EDT



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)
A,H = Agricultural and Hydrological
(No type = Both impacts)

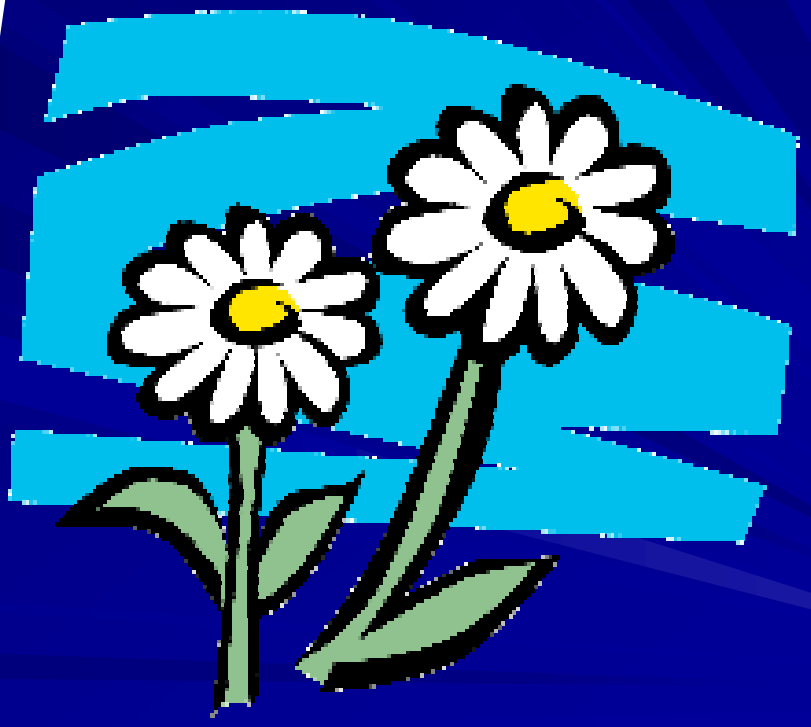
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

http://drought.unl.edu/dm

Released Thursday, May 13, 2004

Author: David Miskus, JAWF/CPC/NOAA

What Can We Do About It?



CoCo RaHS

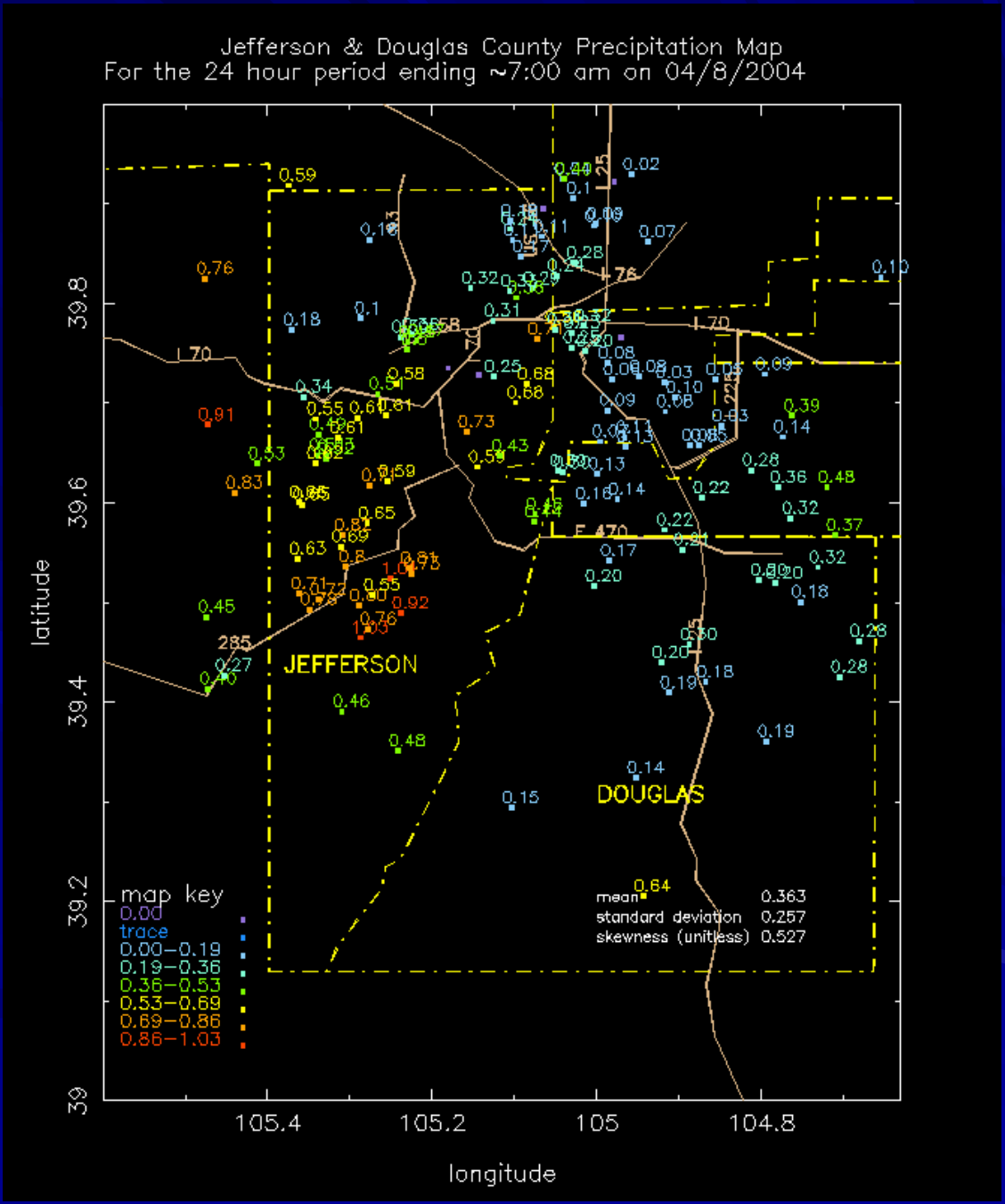
Community Collaborative
Rain and Hail Study

YOU CAN HELP!

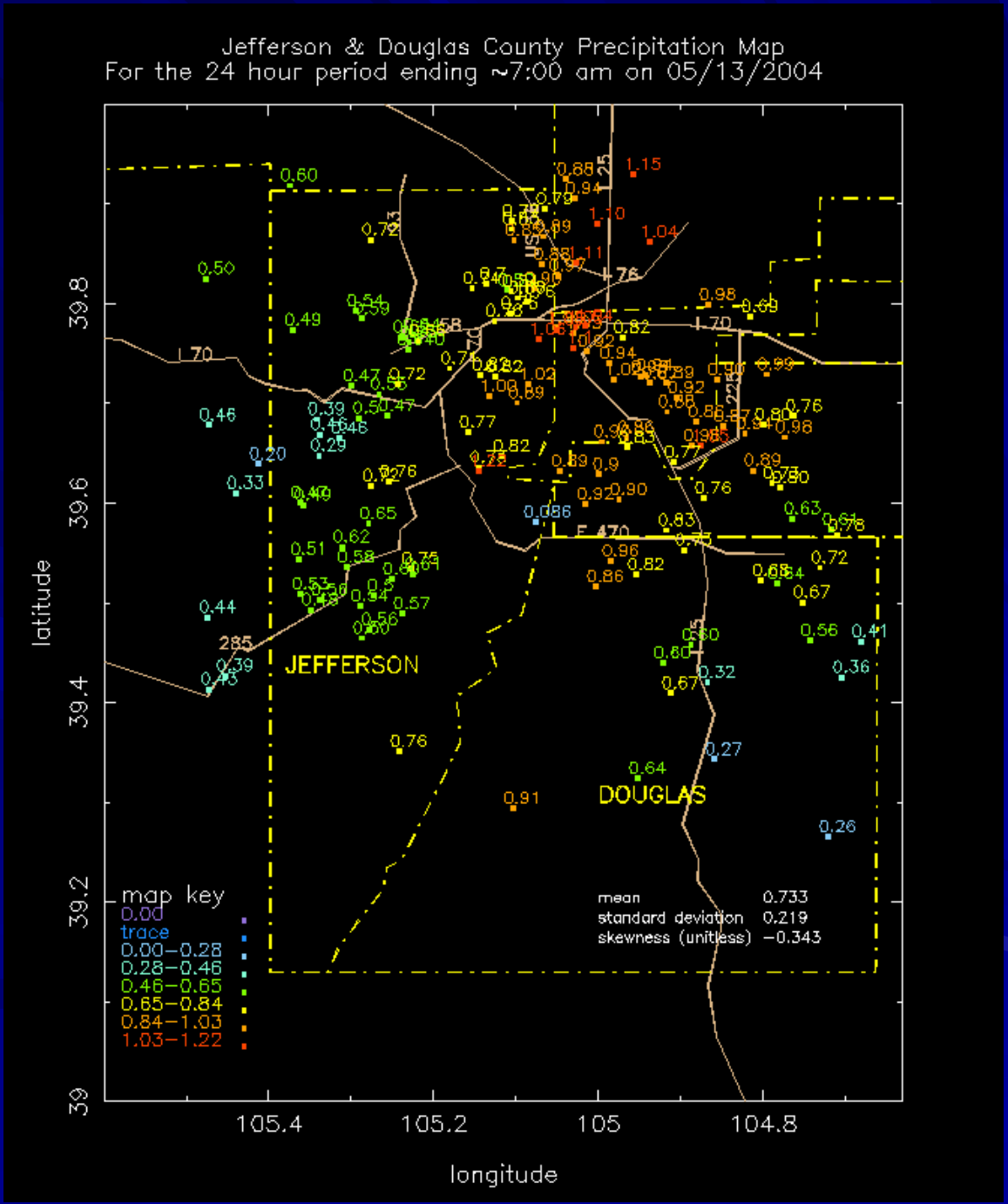
http://www.cocorahs.org

Funding provided by

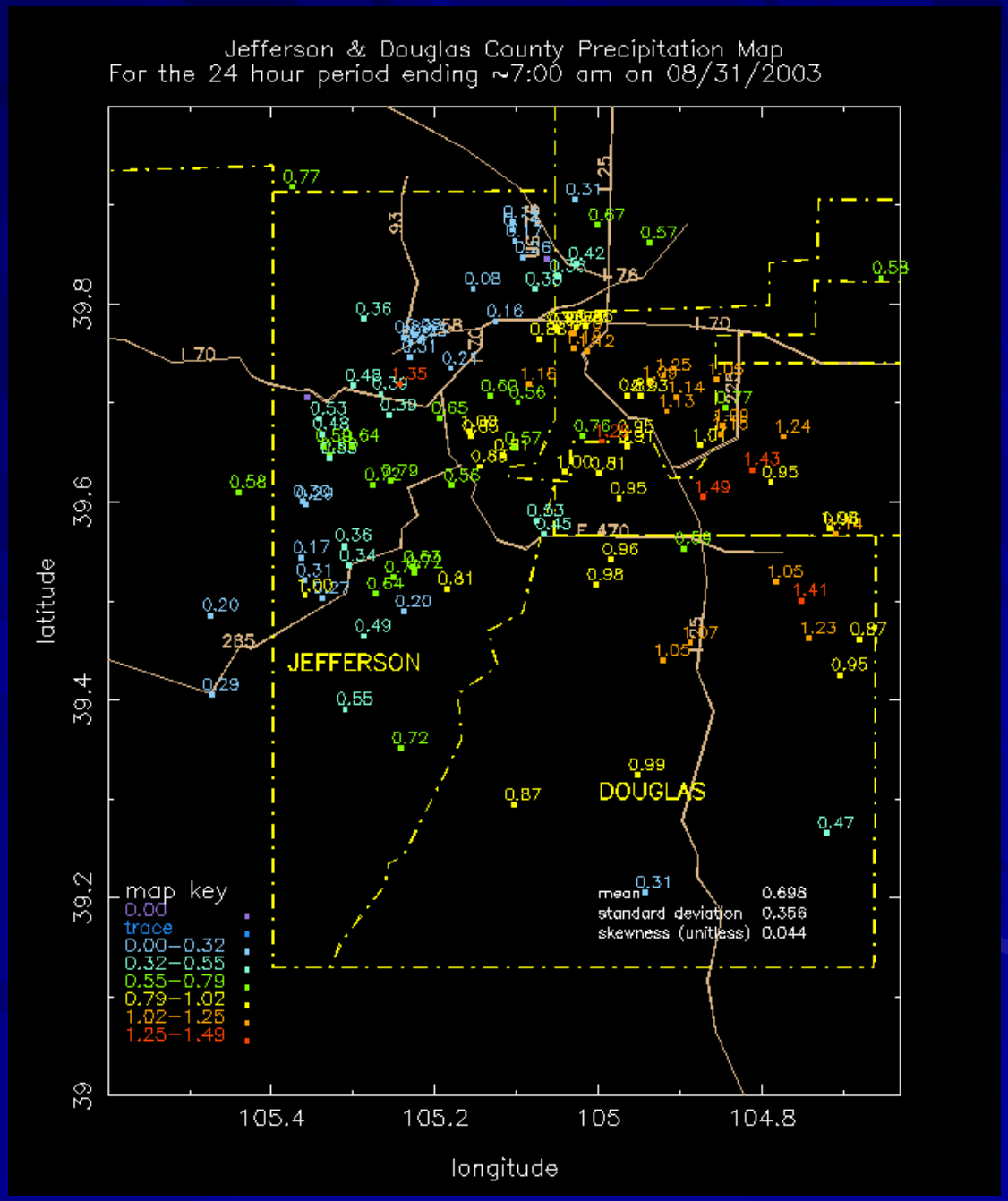
CoCo RaHS Precipitation Map for April 8, 2004



CoCo RaHS Precipitation Map for May 13, 2004



CoCo RaHS Precipitation Map for August 31, 2003



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"