The Impacts of Weather

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Colorado Climate Center
Colorado State University

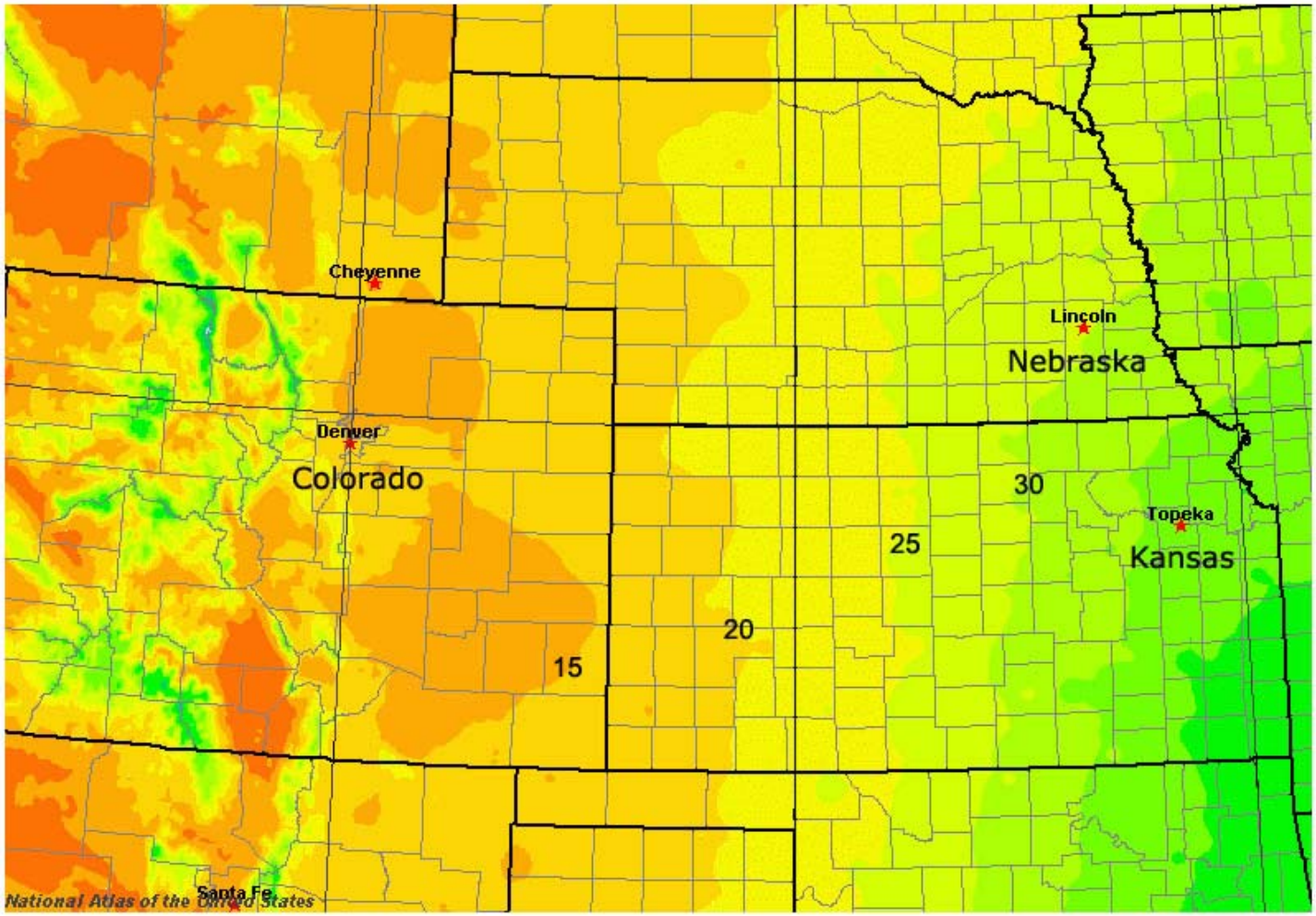
Presented at Ogallala Symposium, Wray, Colorado, February 23, 2004

Prepared by Odie Bliss

Ogallala Aquifer

COLORADO, KANSAS AND NEBRASKA

AVERAGE ANNUAL PRECIPITATION, 1961-1990

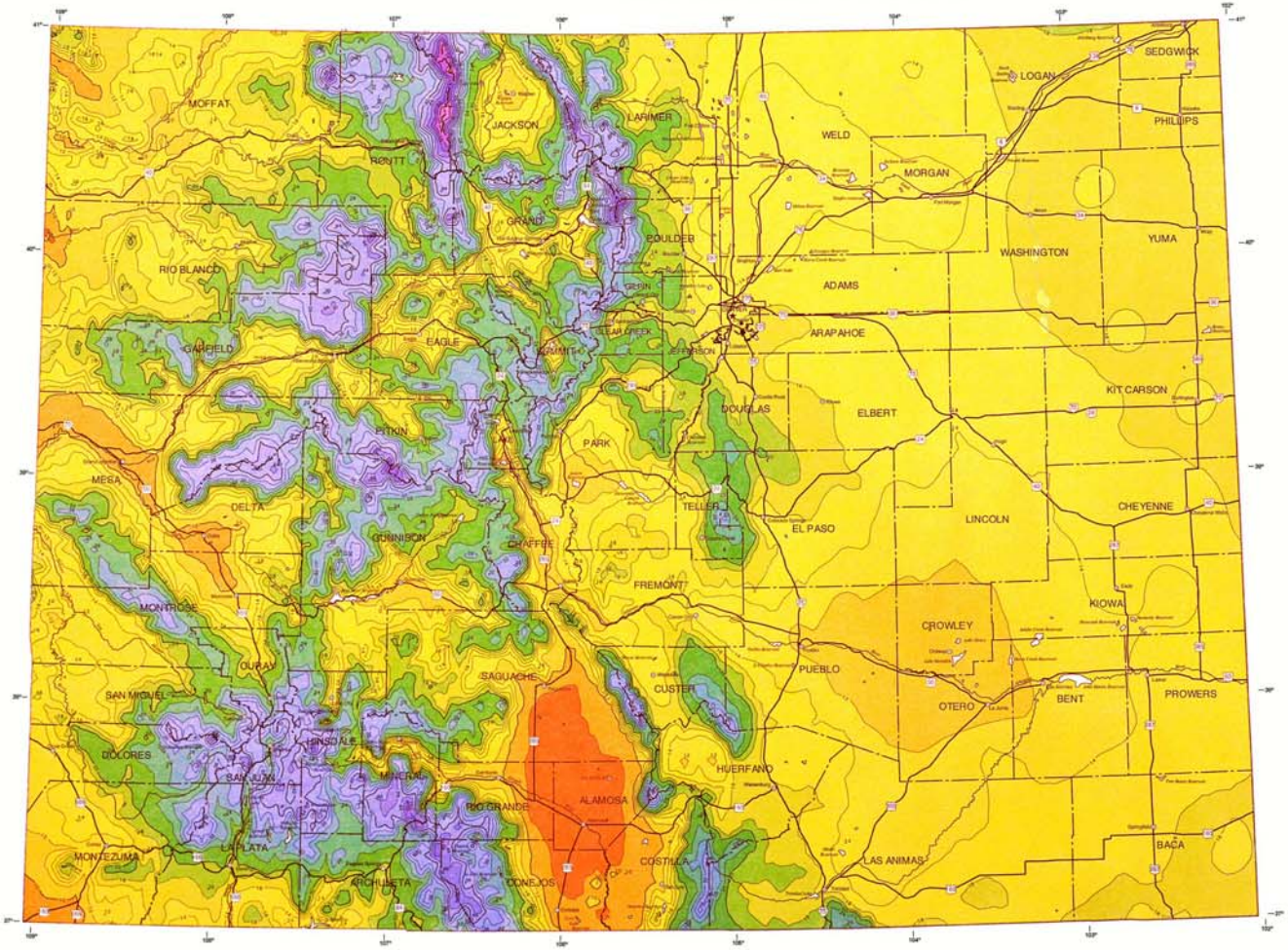


National Atlas of the United States, http://nationalatlas.gov

U.S. DEPARTMENT OF AGRICULTURE

NATURAL RESOURCES CONSERVATION SERVICE

COLORADO
ANNUAL PRECIPITATION



Average Annual Precipitation 1961 - 1990 inches per year

- <8
- 8-10
- 10-12
- 12-14
- 14-16
- 16-18
- 18-20
- 20-24
- 24-28
- 28-32
- 32-36
- 36-40
- 40-44
- 44-48
- 48-52
- 52-56
- 56-60
- 60-70

Made in cooperation with Oregon State University

Data Sources: NOAA Cooperative Station Normals (1961-1990) climate observations, NRCS SNOTEL Station normals, and supplemental data provided by regional and state climatologists and designated reviewers

Digital Elevation Model: The PRISM DEM is derived from a 15-arc second Defense Mapping Agency (DMA) Digital Terrain Elevation Dataset (DTED) obtained from the EROS Data Center.

USDA-NRCS National Cartography & Geospatial Center, Fort Worth, TX, 1998.

Estimation Technology: Gridded estimates were derived from station point values using the PRISM model developed at Oregon State University. The modeled grid was approximately 4x4 km latitude/longitude and was resampled to 2x2 km using a Gaussian filter.

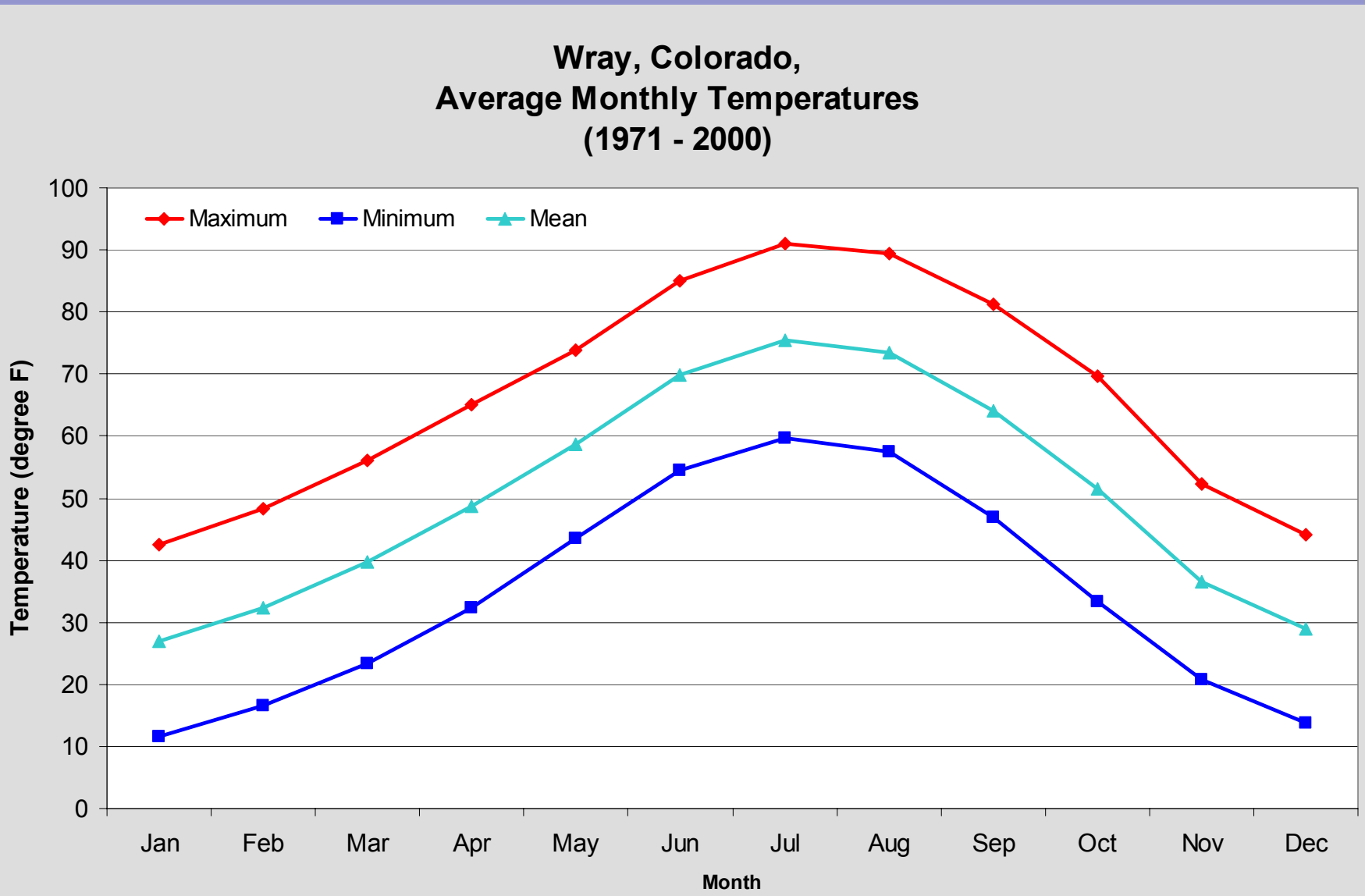
Climate Dataset: April 1998 Albers Equal Area Projection, 96° W & 23°N, NAD 27

MILES

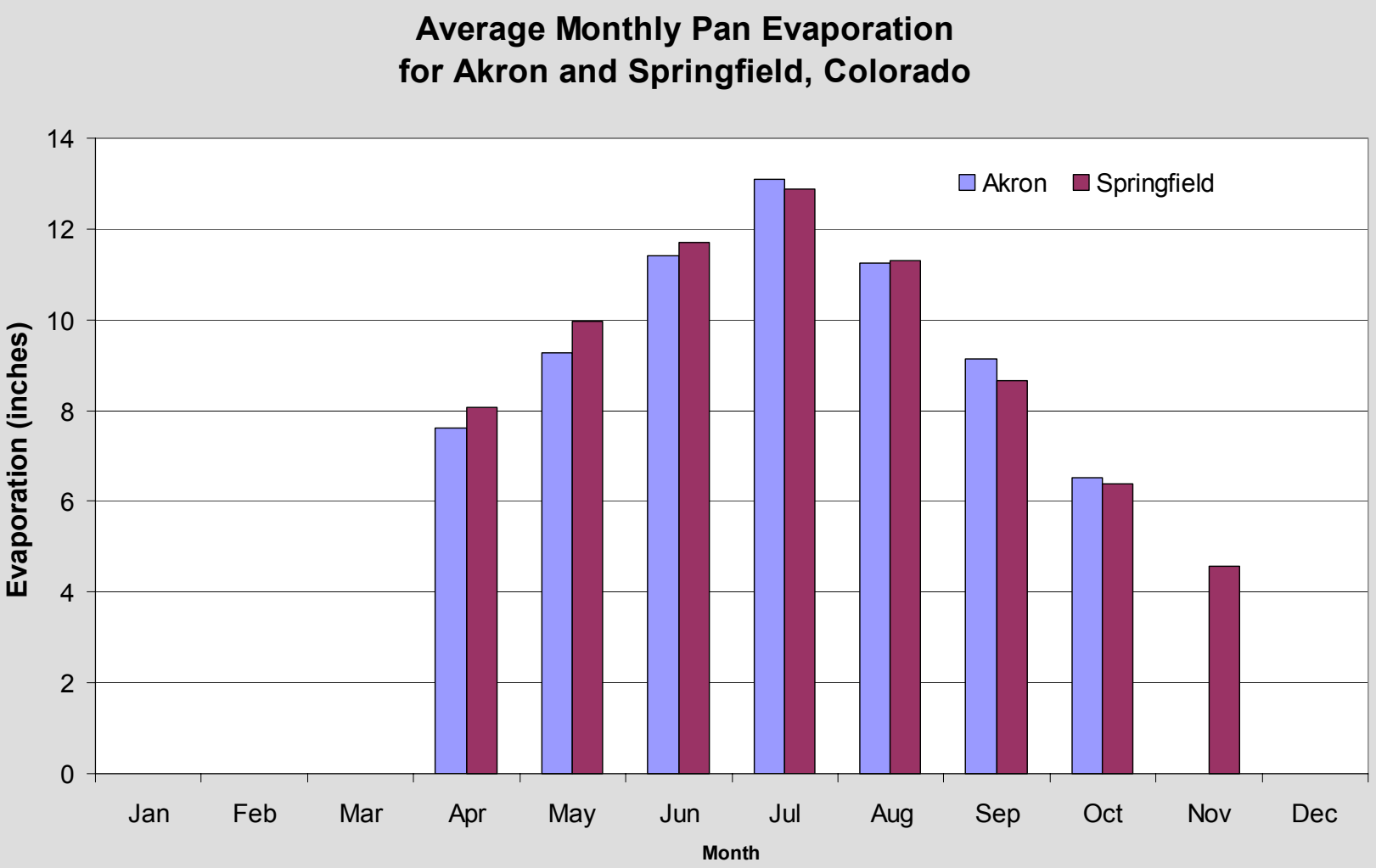
SCALE 1:1, 185, 000

SOURCE NOTE:
Users are cautioned that contours may not exactly match station-observed precipitation especially in regions with significant precipitation gradients and/or steep topography

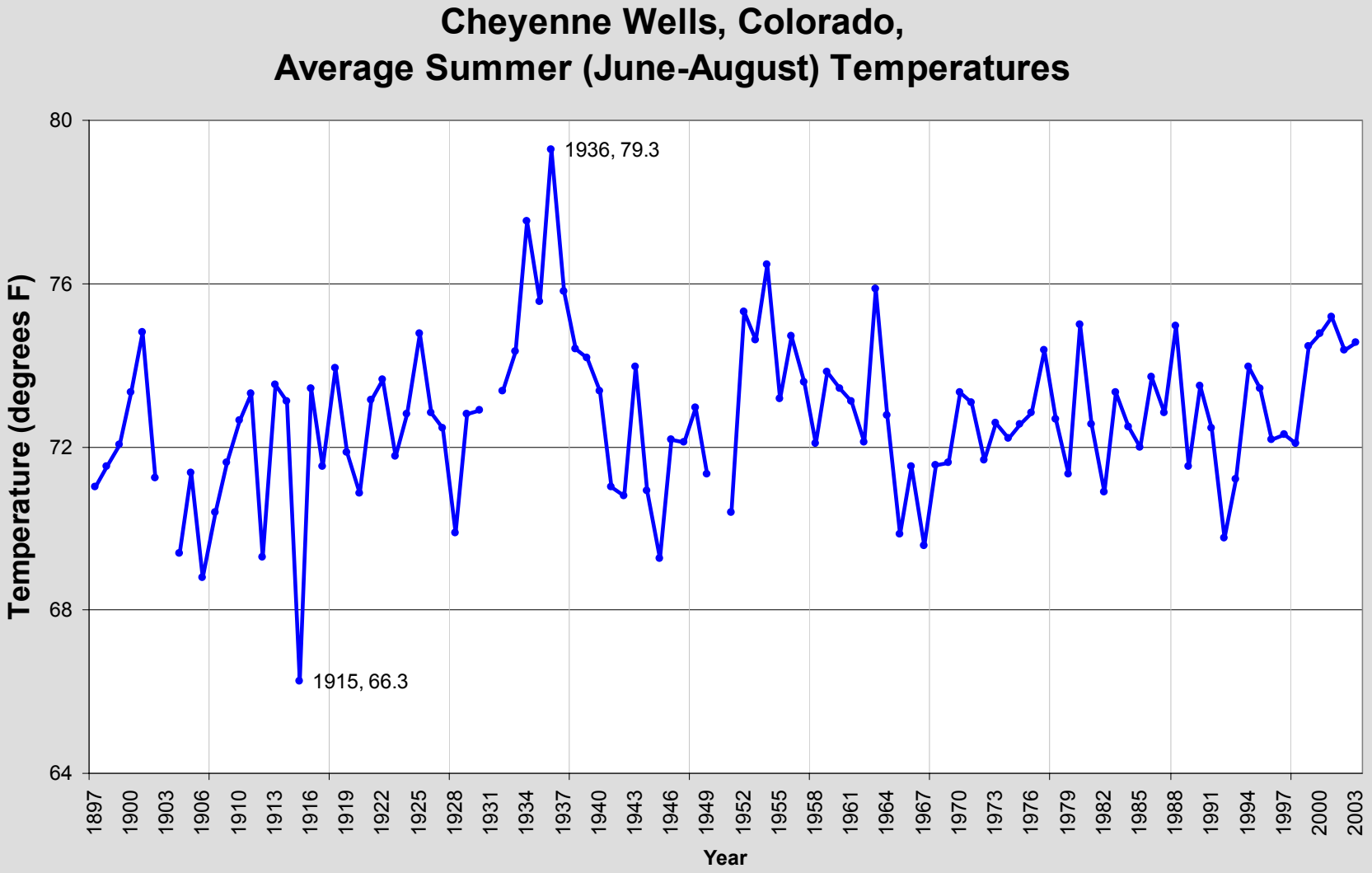
April 1998 1908498


Wray, Colorado,
Average Monthly Temperatures
(1971 - 2000)
Maximum
Minimum
Mean
Temperature (degree F)
100
90
80
70
60
50
40
30
20
10
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Month

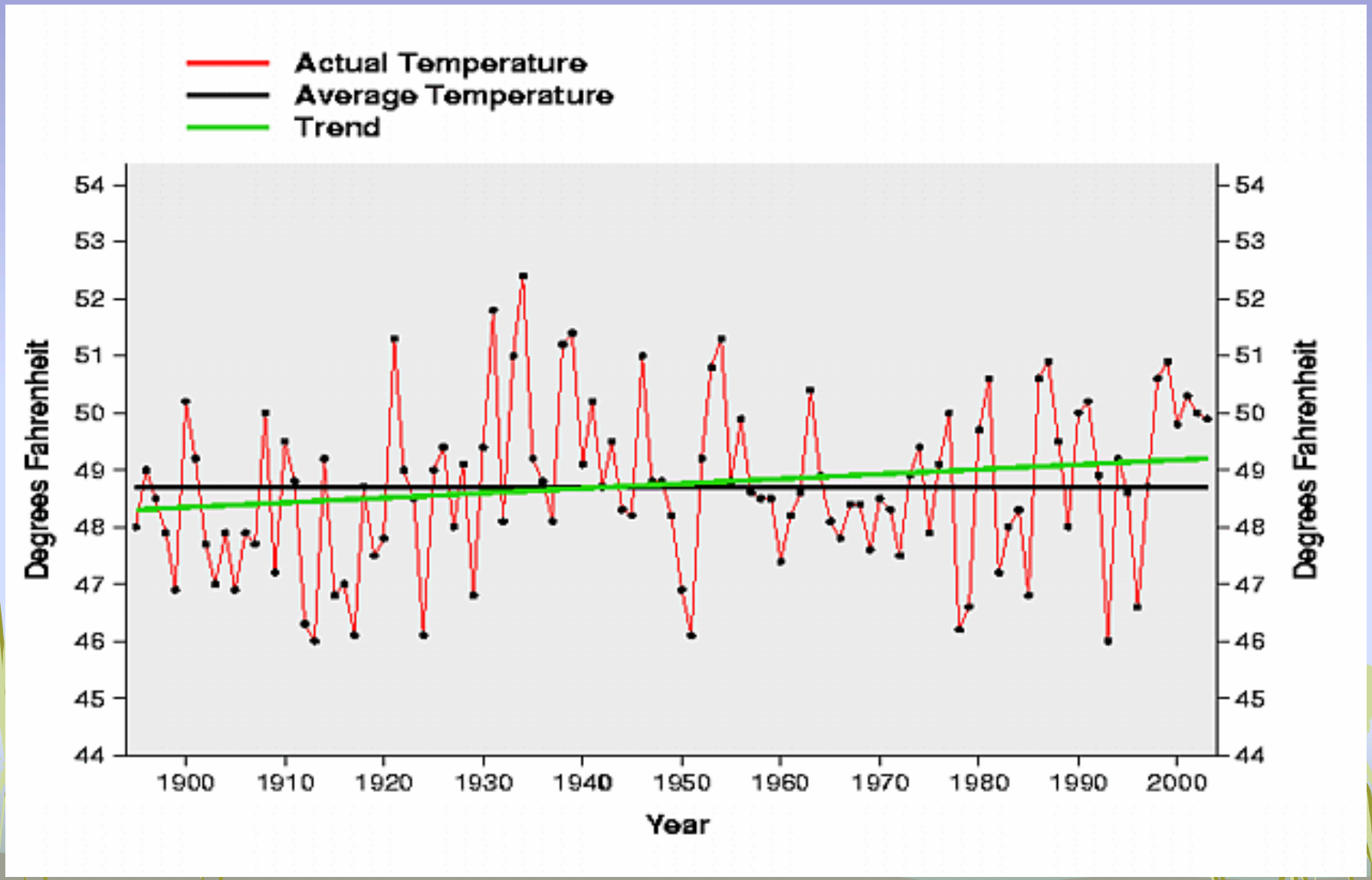
Monthly Pan Evaporation



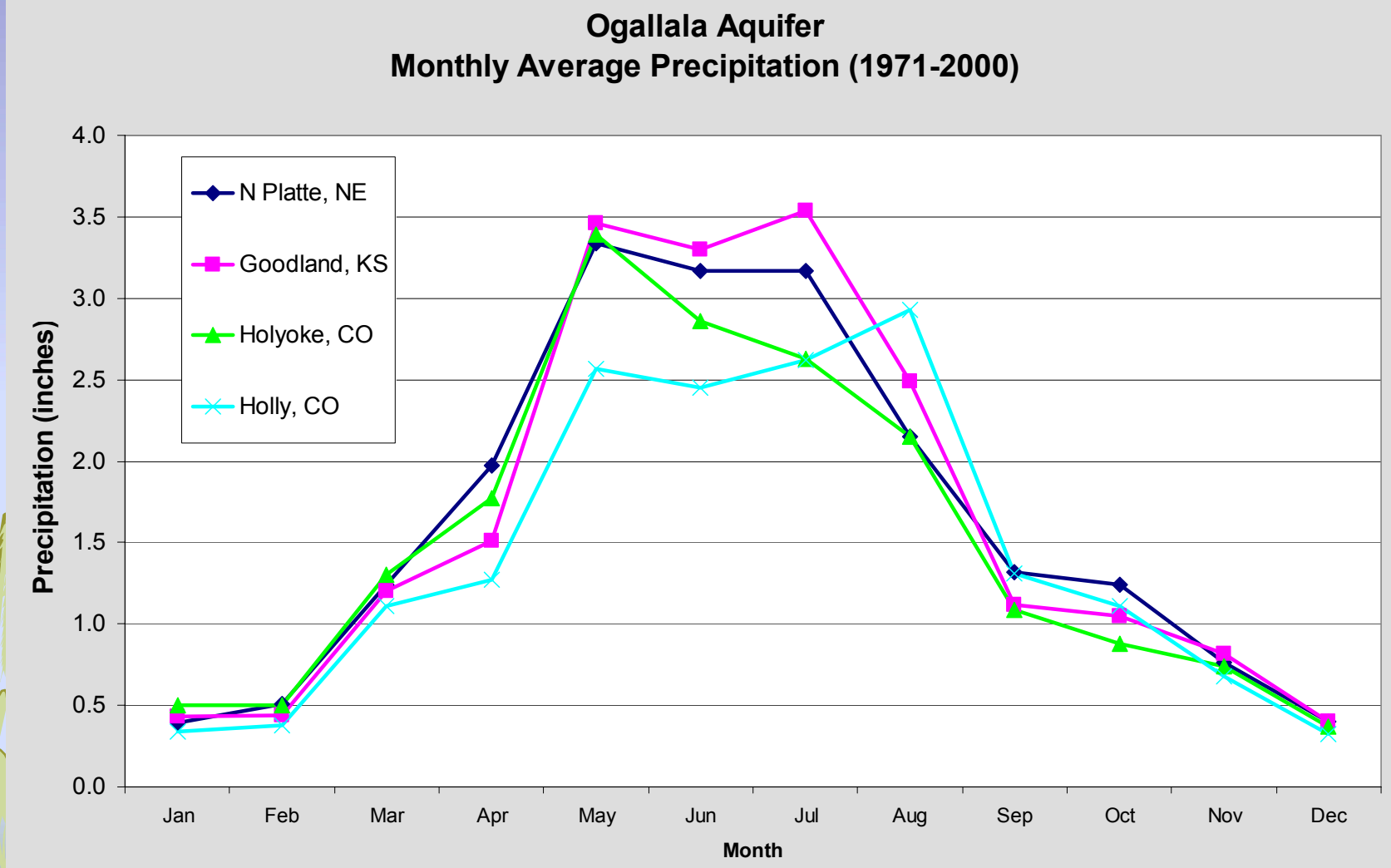
Average Summer (June-August) Temperatures



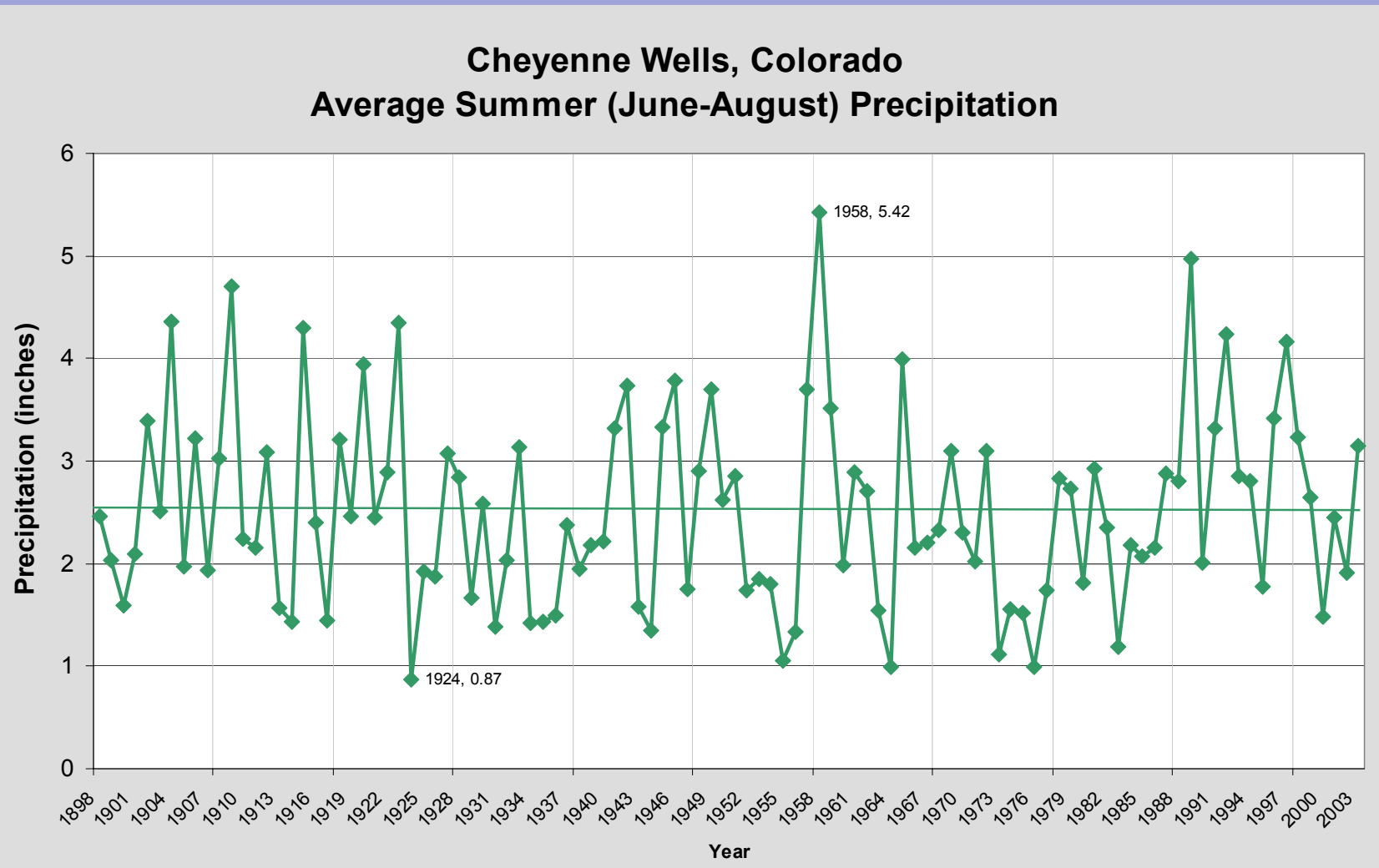
Nebraska Mean Annual Temperature (1895 – 2003)



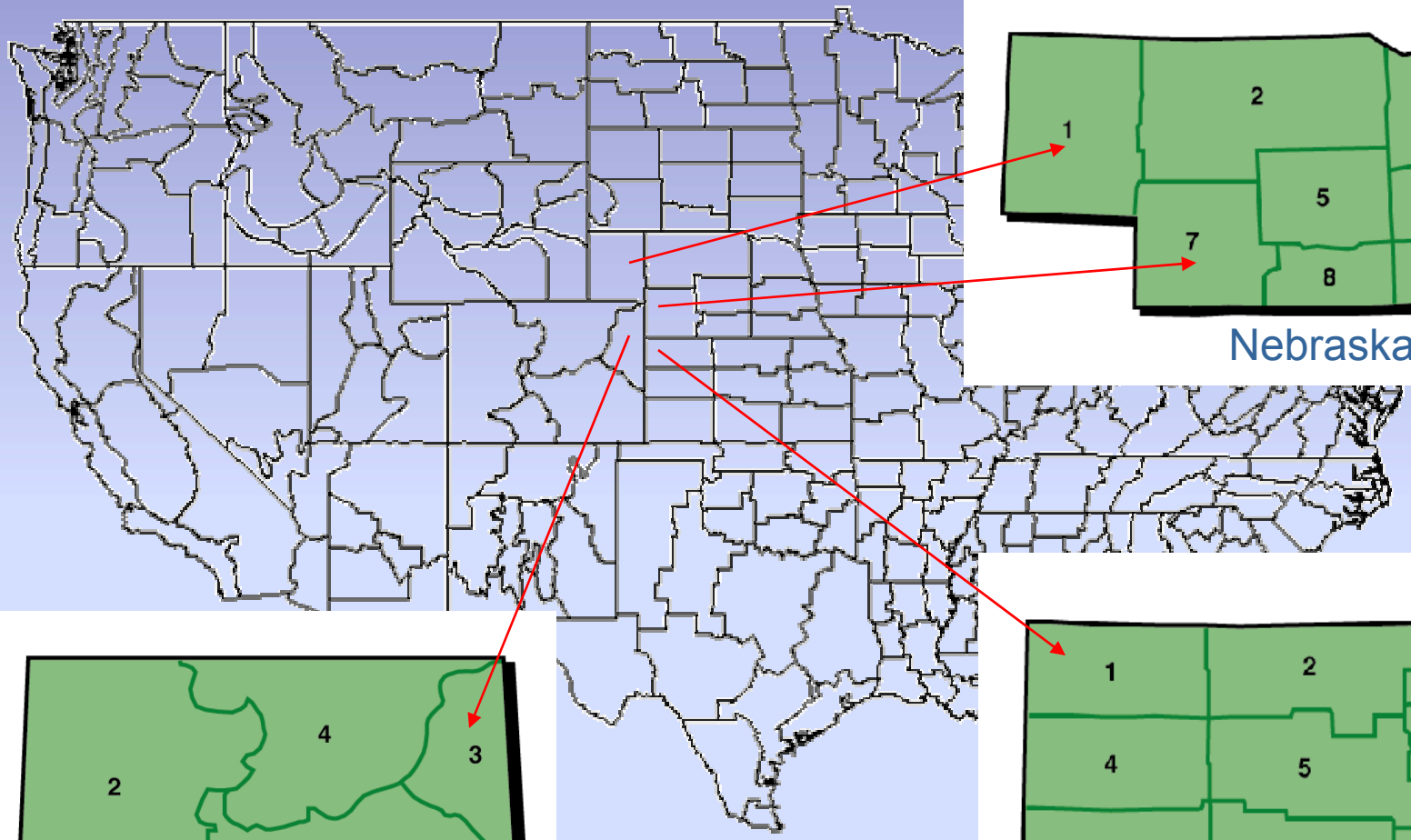
Monthly Average Precipitation for selected stations in the Ogallala Aquifer

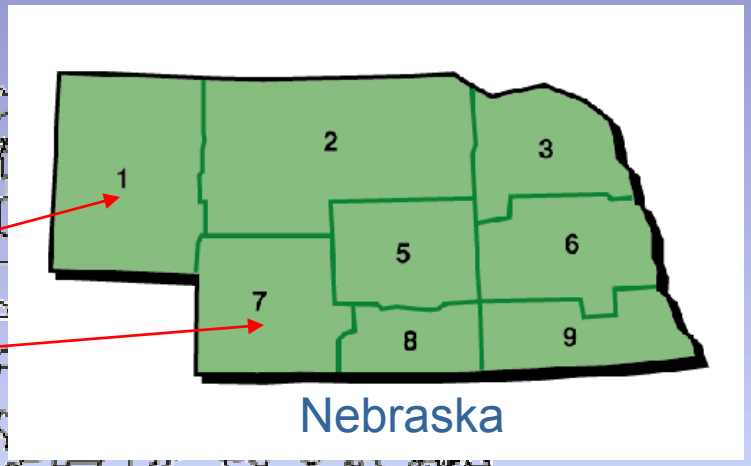


Average Summer (June-August) Precipitation

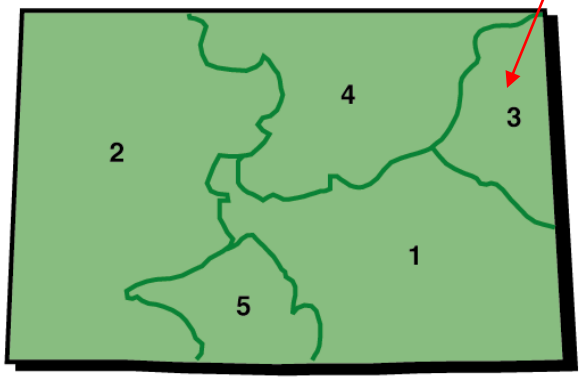


Climate Divisions

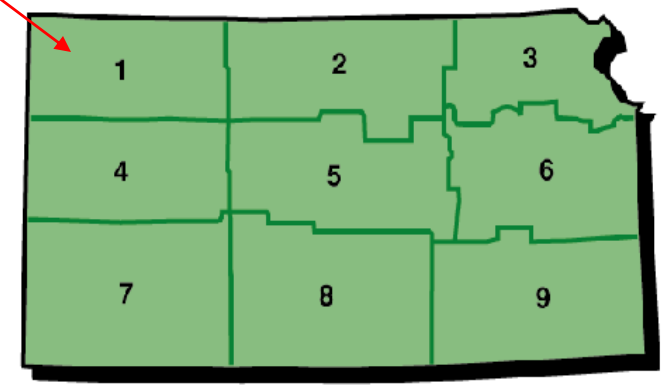




Nebraska

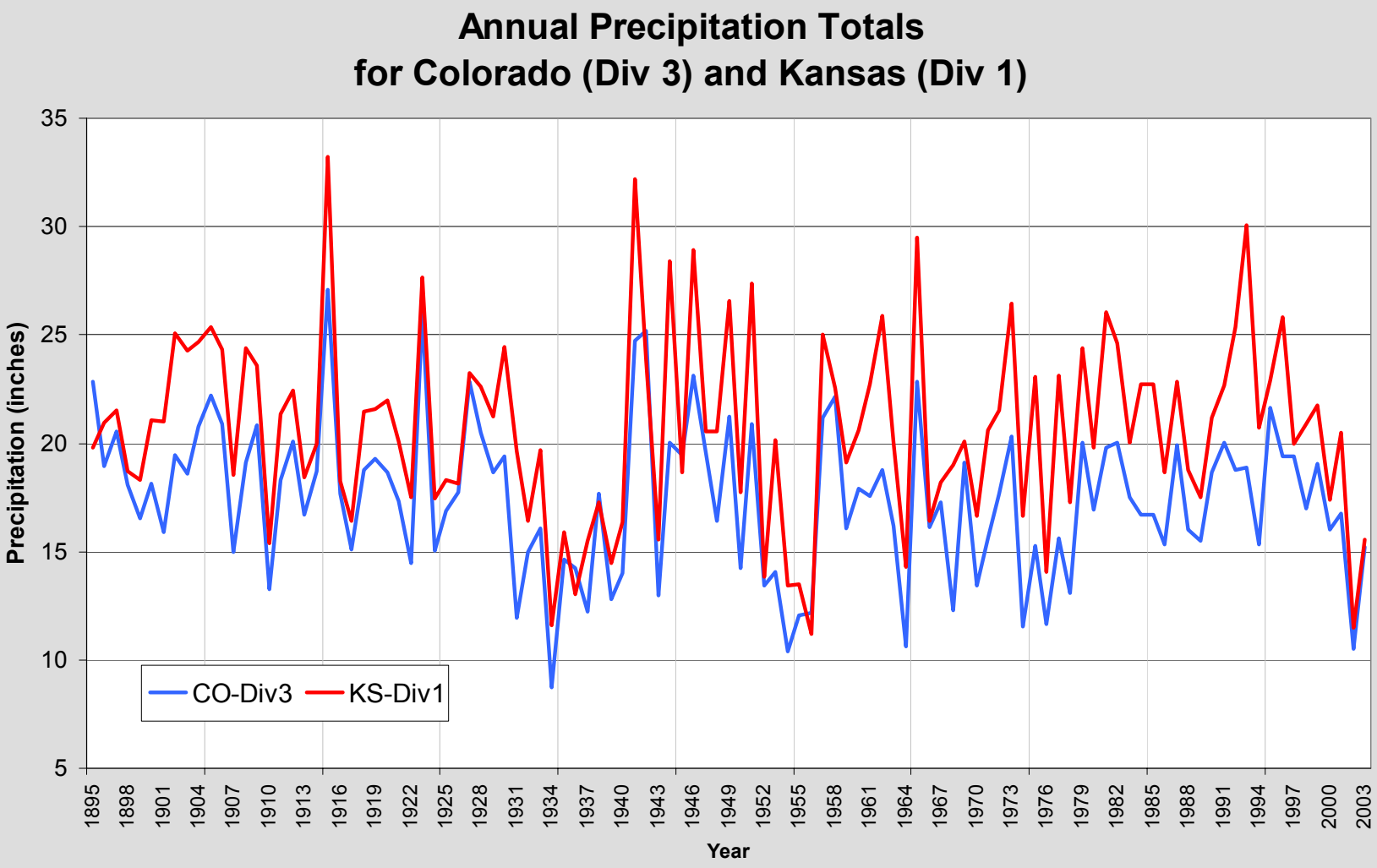


Colorado

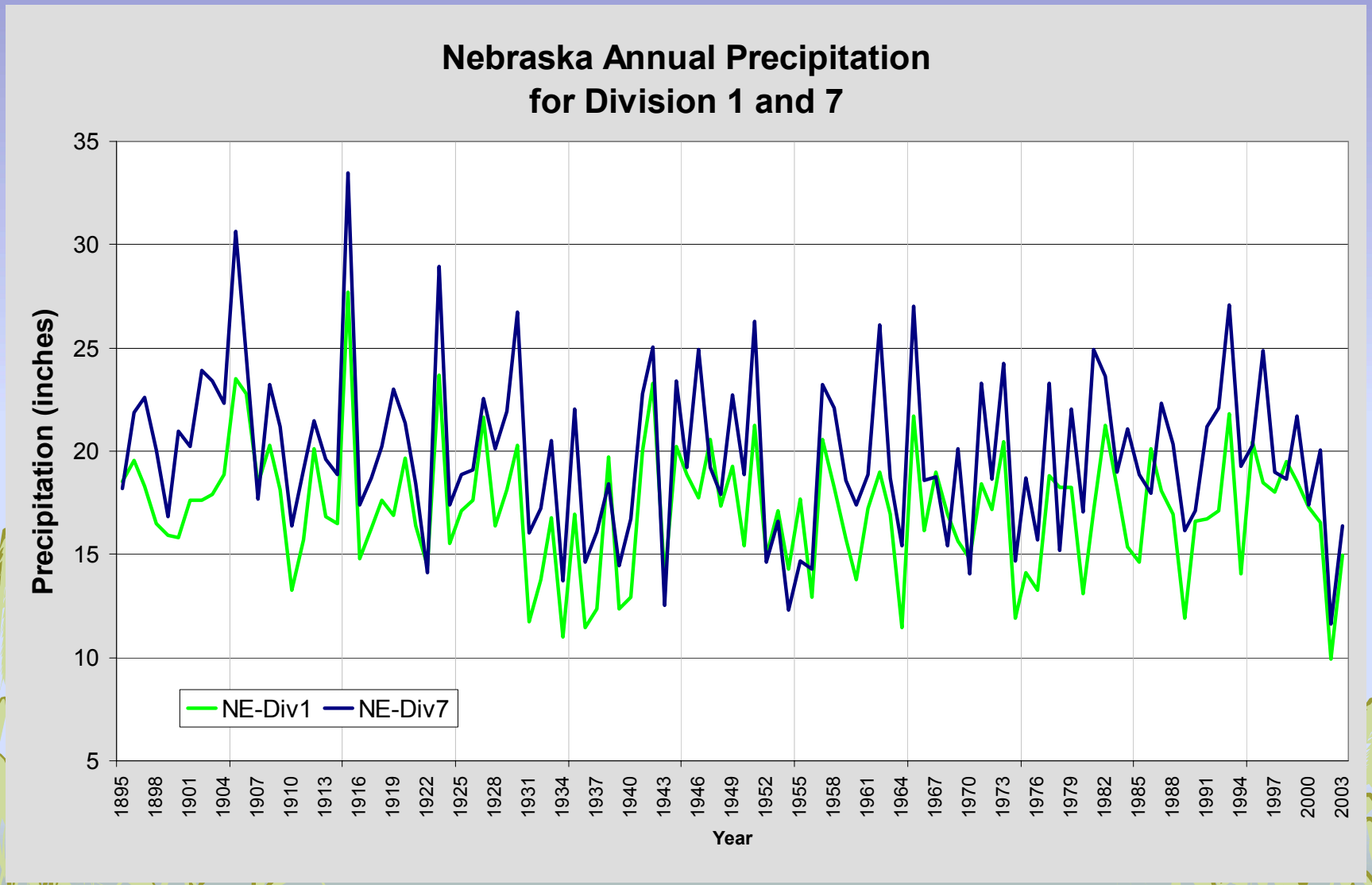


Kansas

Annual Precipitation Totals by Division

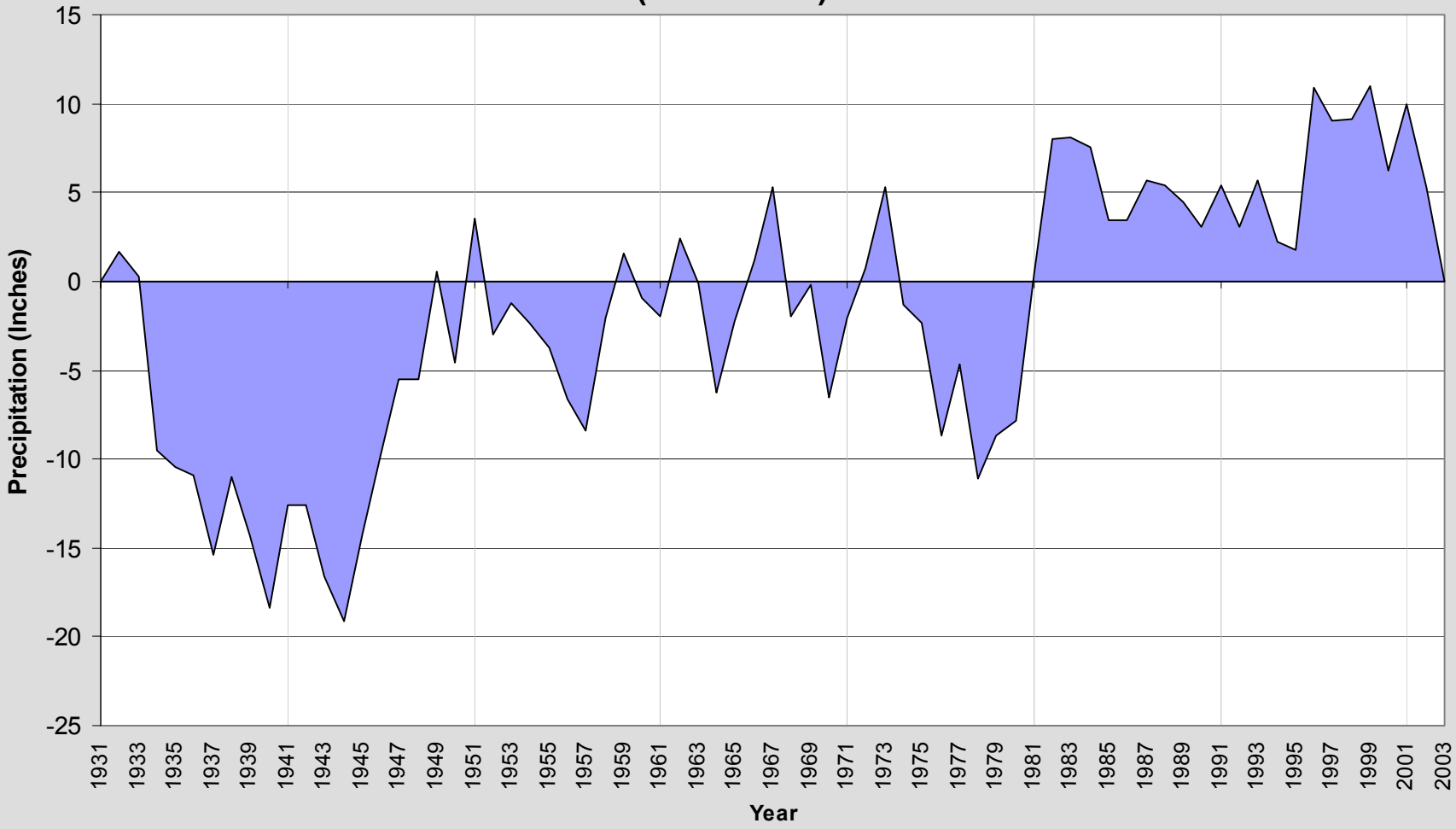


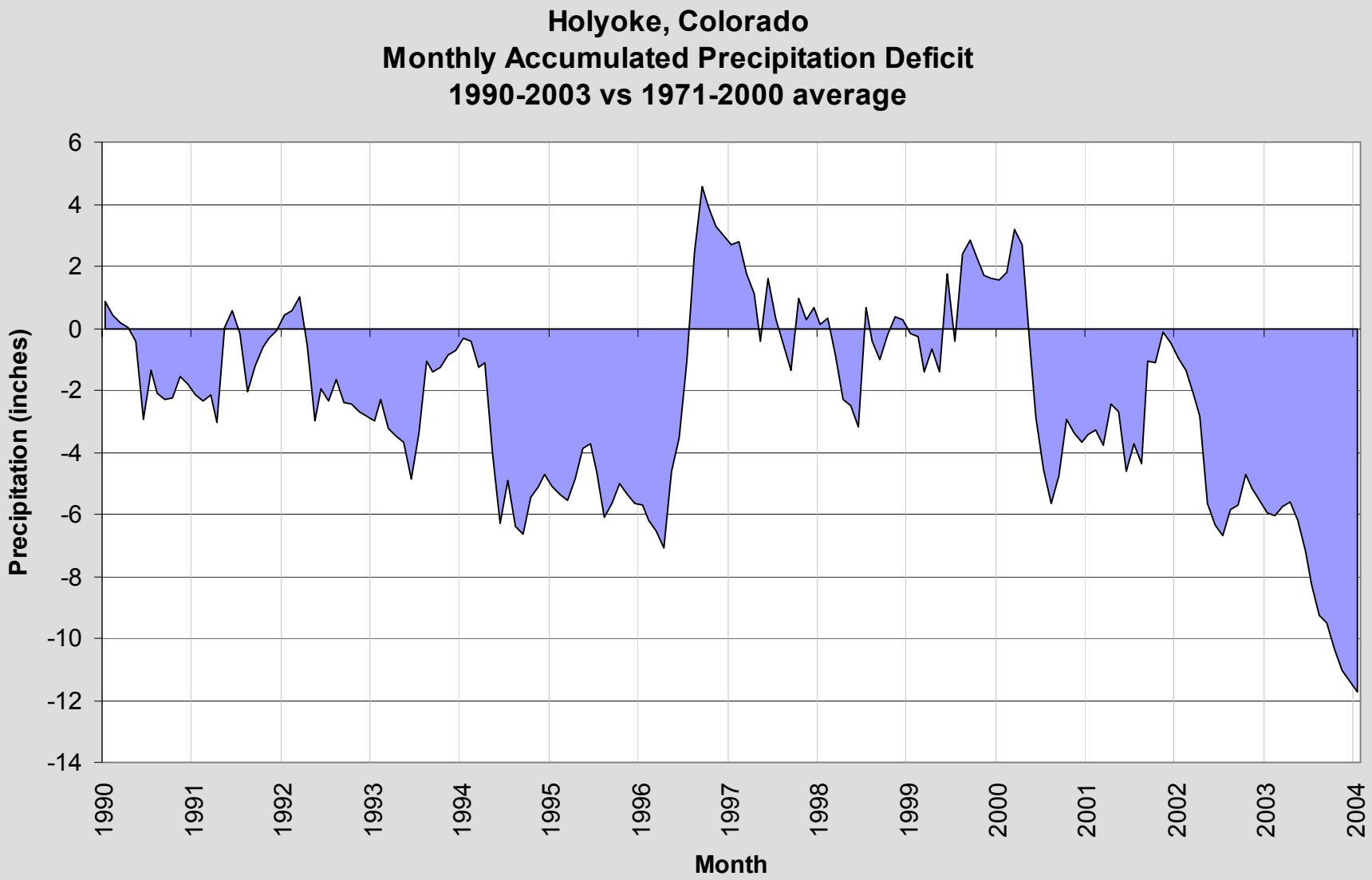
Annual Precipitation Totals by Division



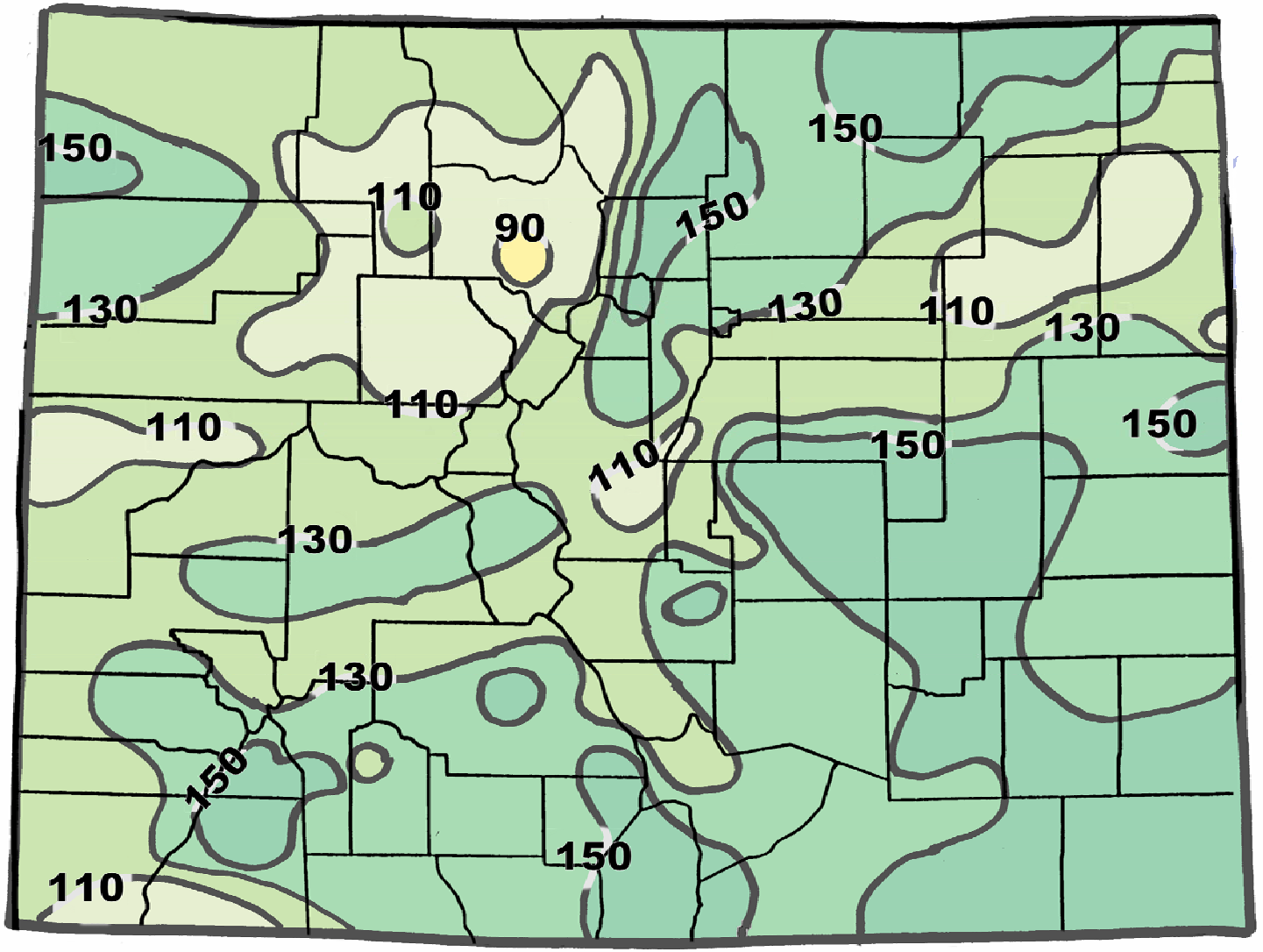
Holyoke, Colorado

Yearly Accumulated Precipitation Deficit (1931-2003)




Holyoke, Colorado
Monthly Accumulated Precipitation Deficit
1990-2003 vs 1971-2000 average
Precipitation (inches)
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
Month

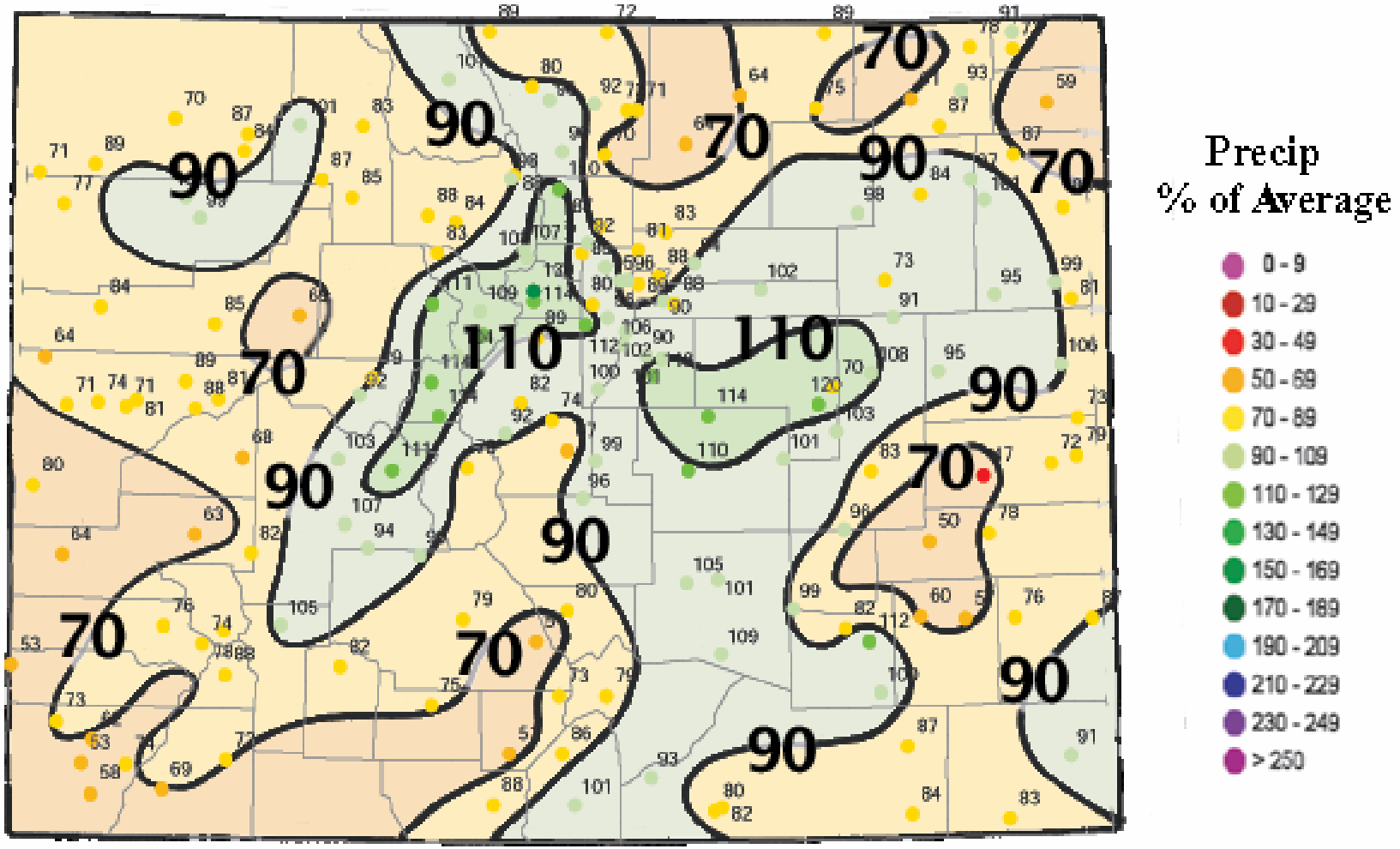
Water Year 1999
(October 1998 - September 1999)
Precipitation as a percent of average



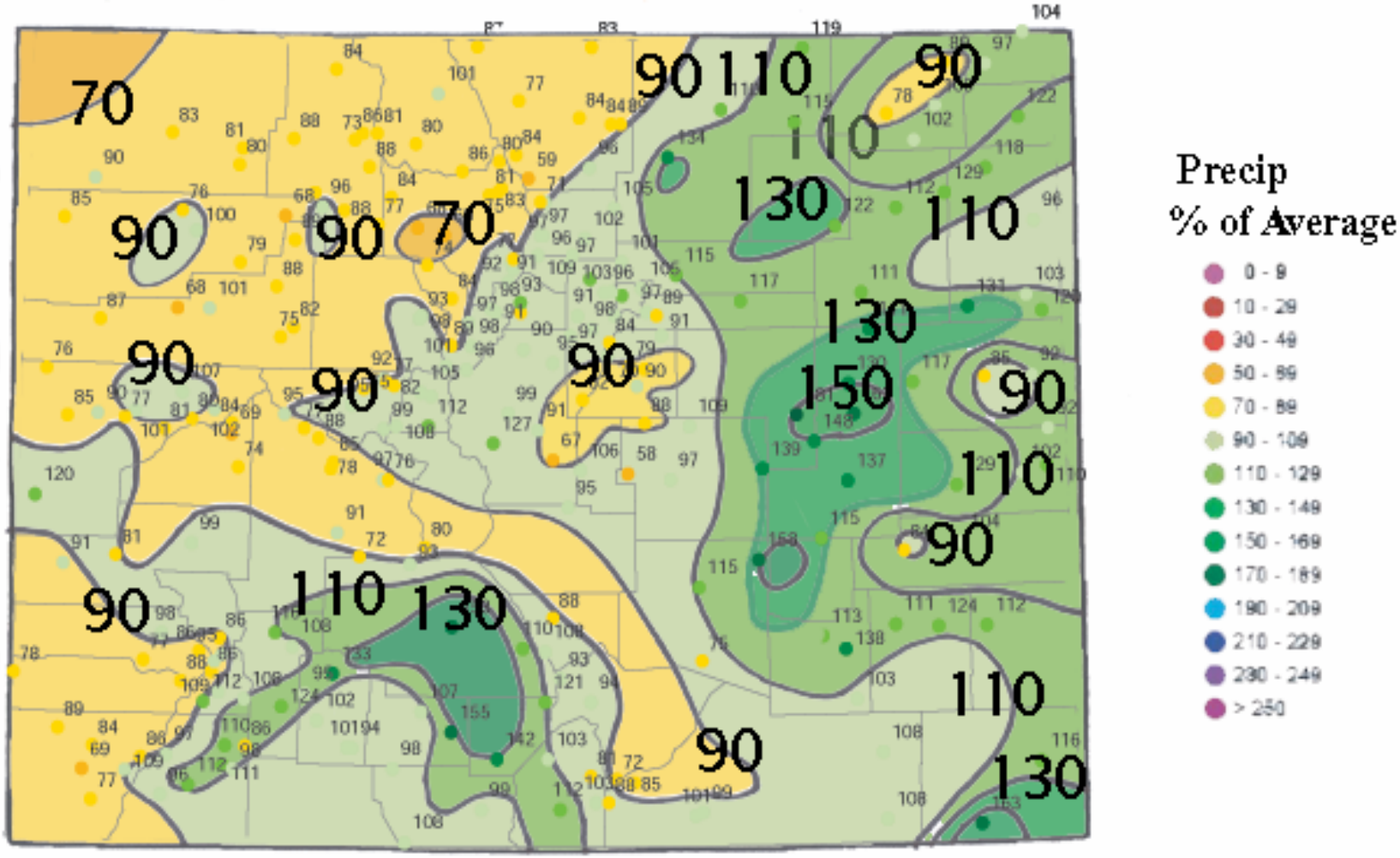
Precip
% of Average

- 0 - 9
- 10 - 29
- 30 - 49
- 50 - 69
- 70 - 89
- 90 - 109
- 110 - 129
- 130 - 149
- 150 - 169
- 170 - 189
- 190 - 209
- 210 - 229
- 230 - 249
- > 250

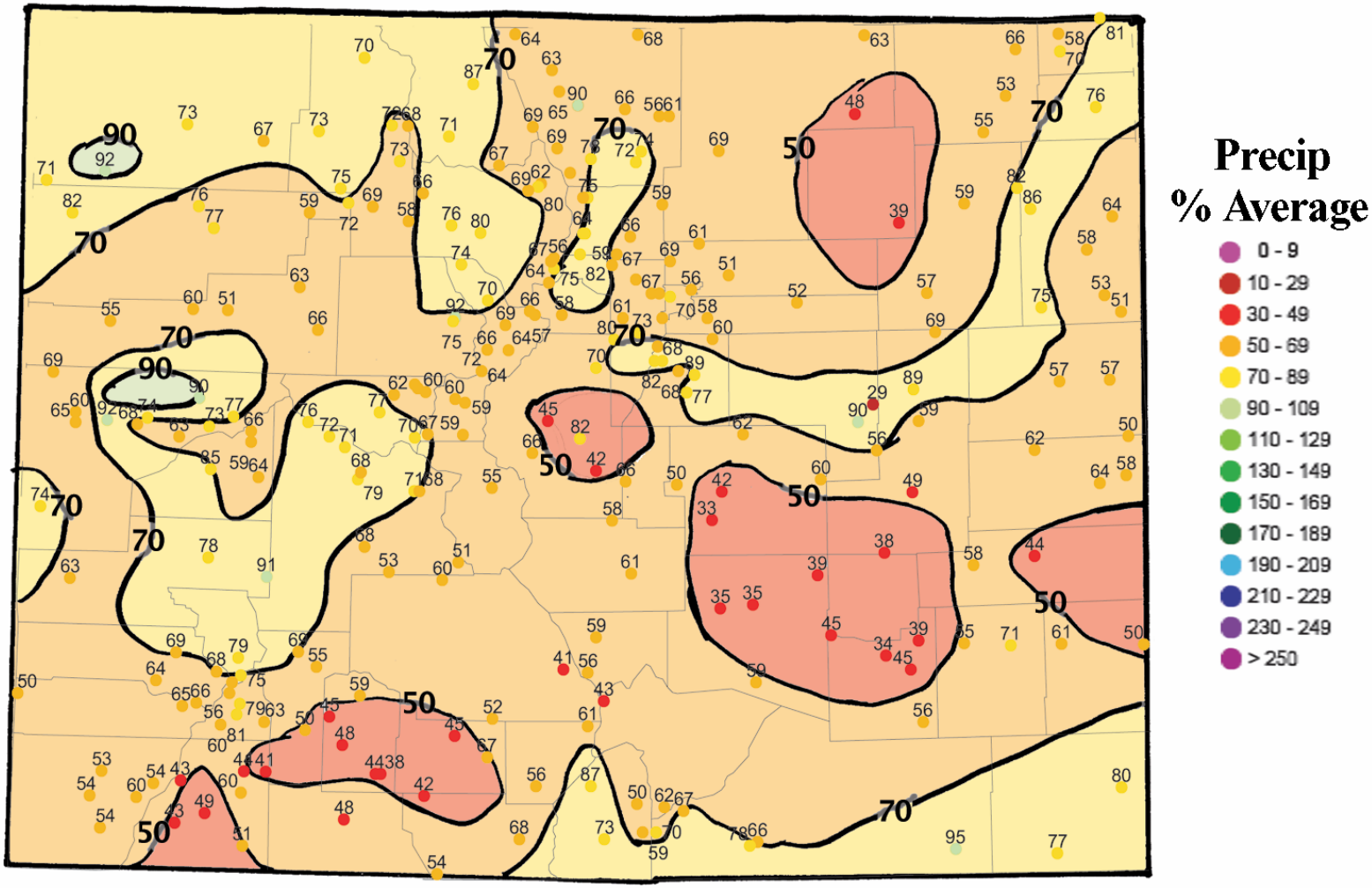
Water Year 2000
(Oct. 1999 - Sept. 2000)
Precipitation Percent of Average for 1961-1990 Averages



Water Year 2001
(Oct. 2000 - Sept. 2001)
Precipitation Percent of Average for 1961-1990 Averages

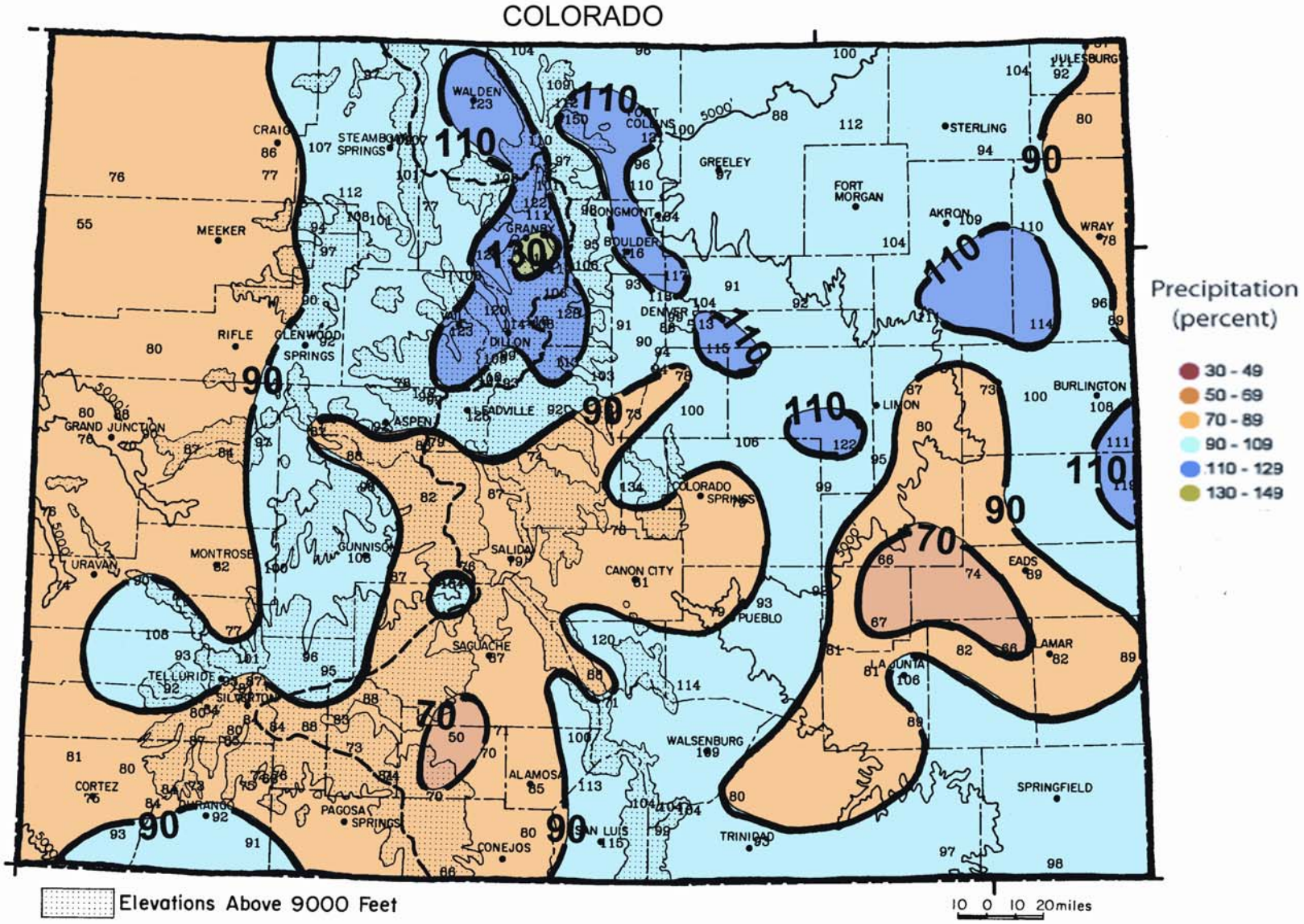


Water Year 2002
(Oct. 2001 - Sept. 2002)
Precipitation Percent of Average for 1961-1990 Averages

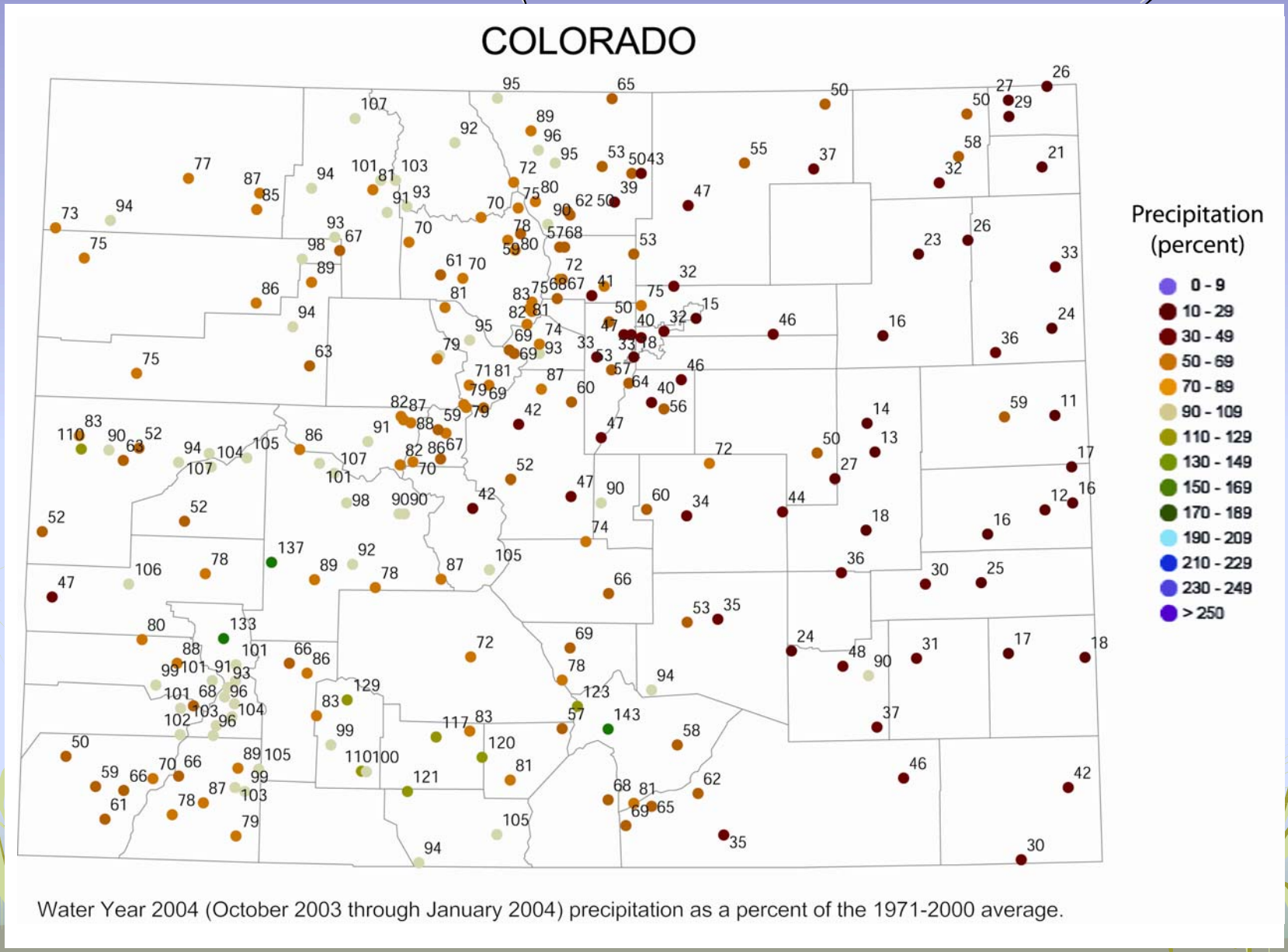


Water Year 2003

October 2002 - September 2003 precipitation
as a percent of the 1971-2000 average.



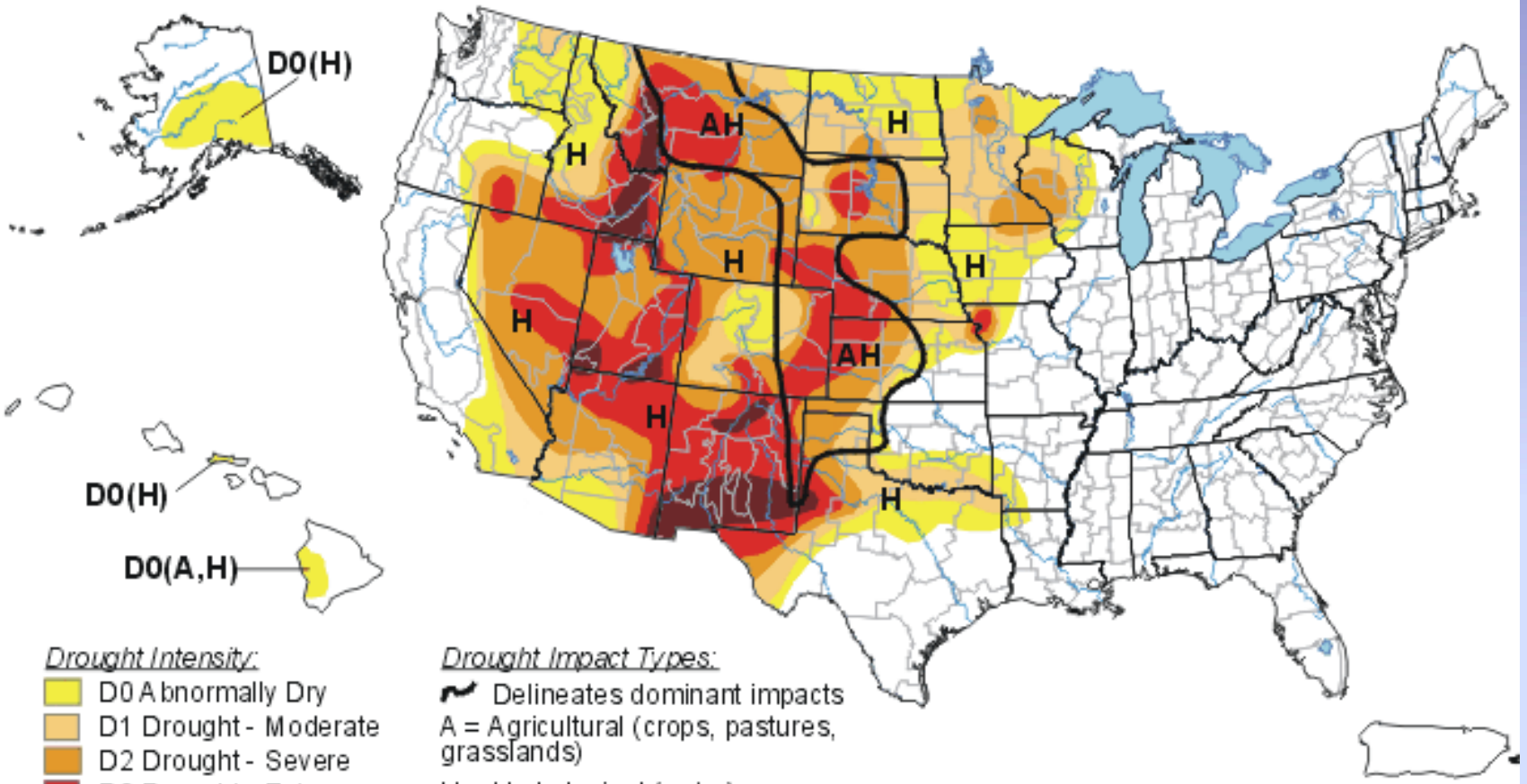
Water Year 2004 (Oct 2003 - Jan 2004)



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

U.S. Drought Monitor

February 17, 2004
Valid 7 a.m. EST



Drought 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)

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

USDA National Drought Mitigation Center

Released Thursday, February 19, 2004

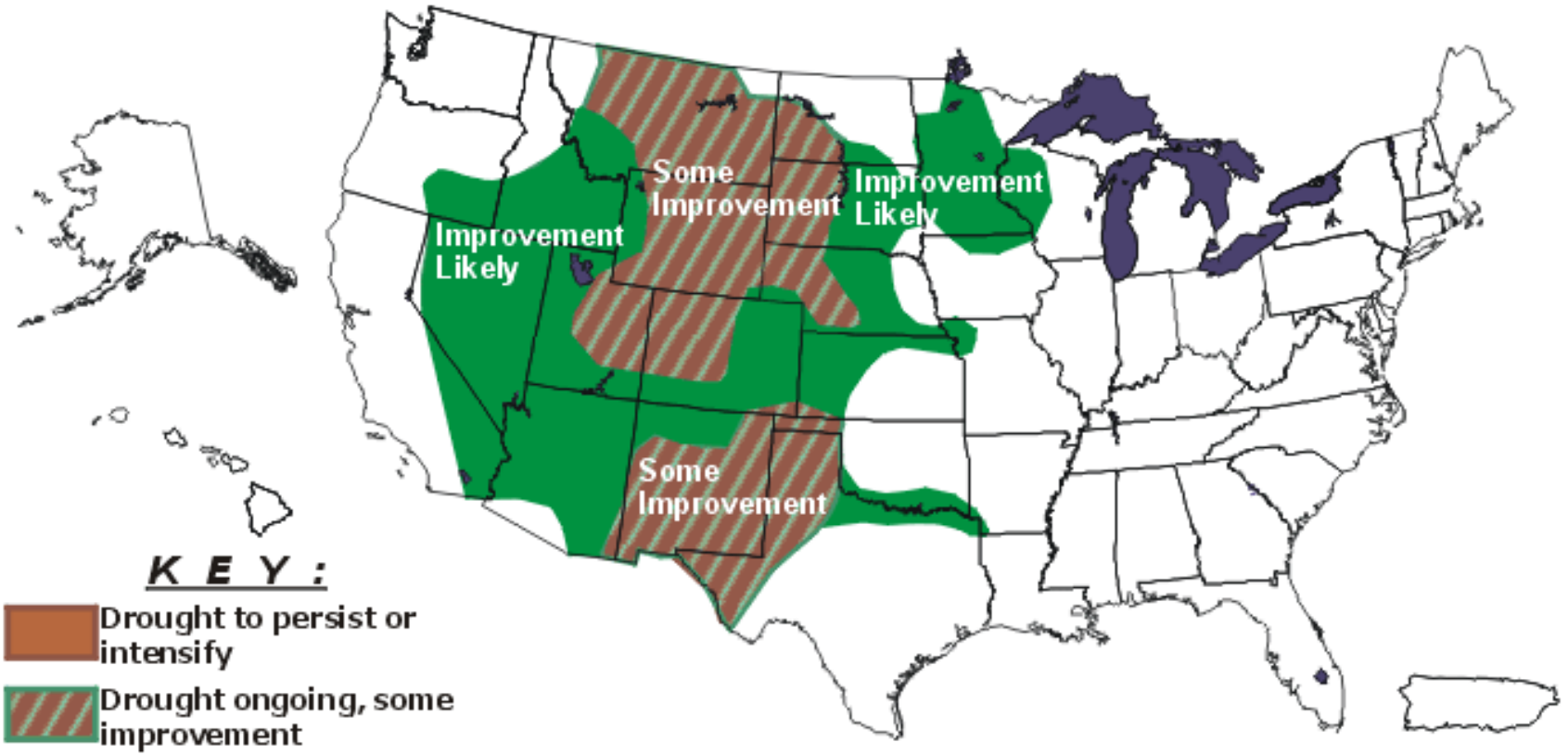
Author: Michael Hayes, NDMC

http://drought.unl.edu/dm

U. S. Seasonal Drought Outlook

Through May 2004

Released February 19, 2004

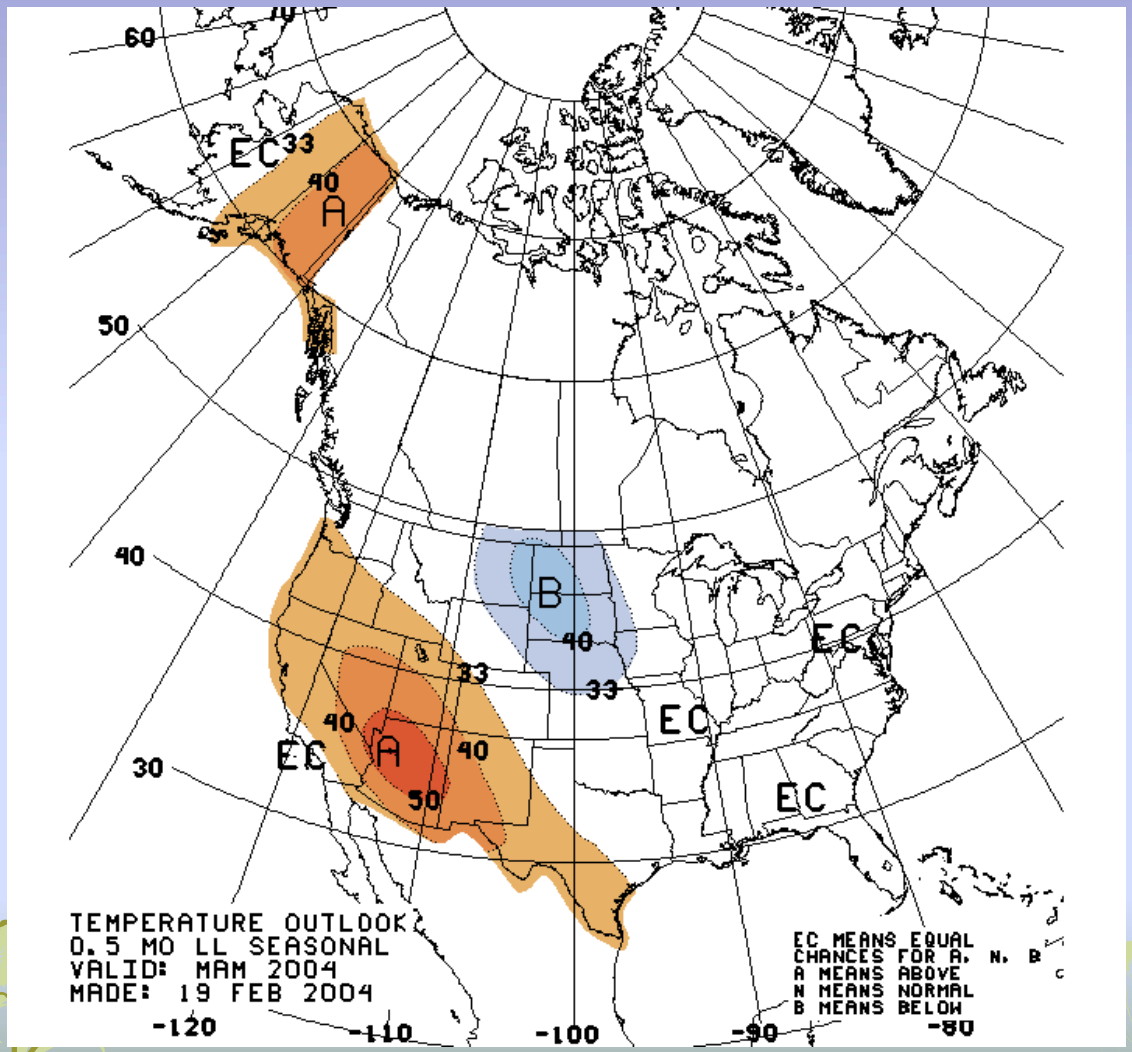


K E Y :

- Drought to persist or intensify
- Drought ongoing, some improvement
- Drought likely to improve, impacts ease
- Drought development likely

Depicts general, large-scale trends based on subjectively derived probabilities guided by numerous indicators, including short and long-range statistical and dynamical forecasts. Short-term events -- such as individual storms -- cannot be accurately forecast more than a few days in advance, so use caution if using this outlook for applications -- such as crops -- that can be affected by such events. "Ongoing" drought areas are schematically approximated from the Drought Monitor (D1 to D4). For weekly drought updates, see the latest Drought Monitor map and text.

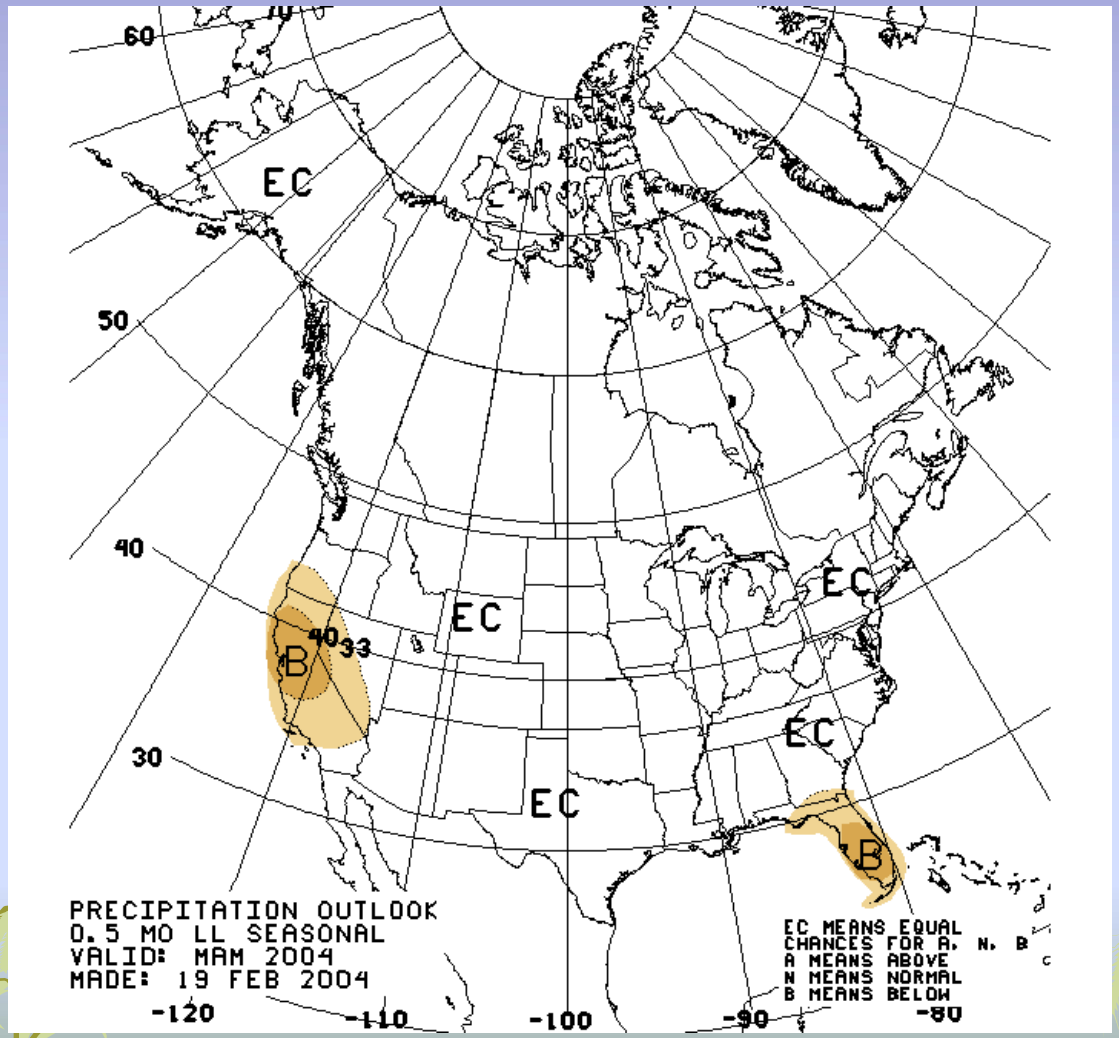
Temperature
March – May 2004



From the Colorado Prediction Center

http://www.cpc.ncep.noaa.gov/products/predictions/multi_season/13_seasonal_outlooks/color/churchill.html

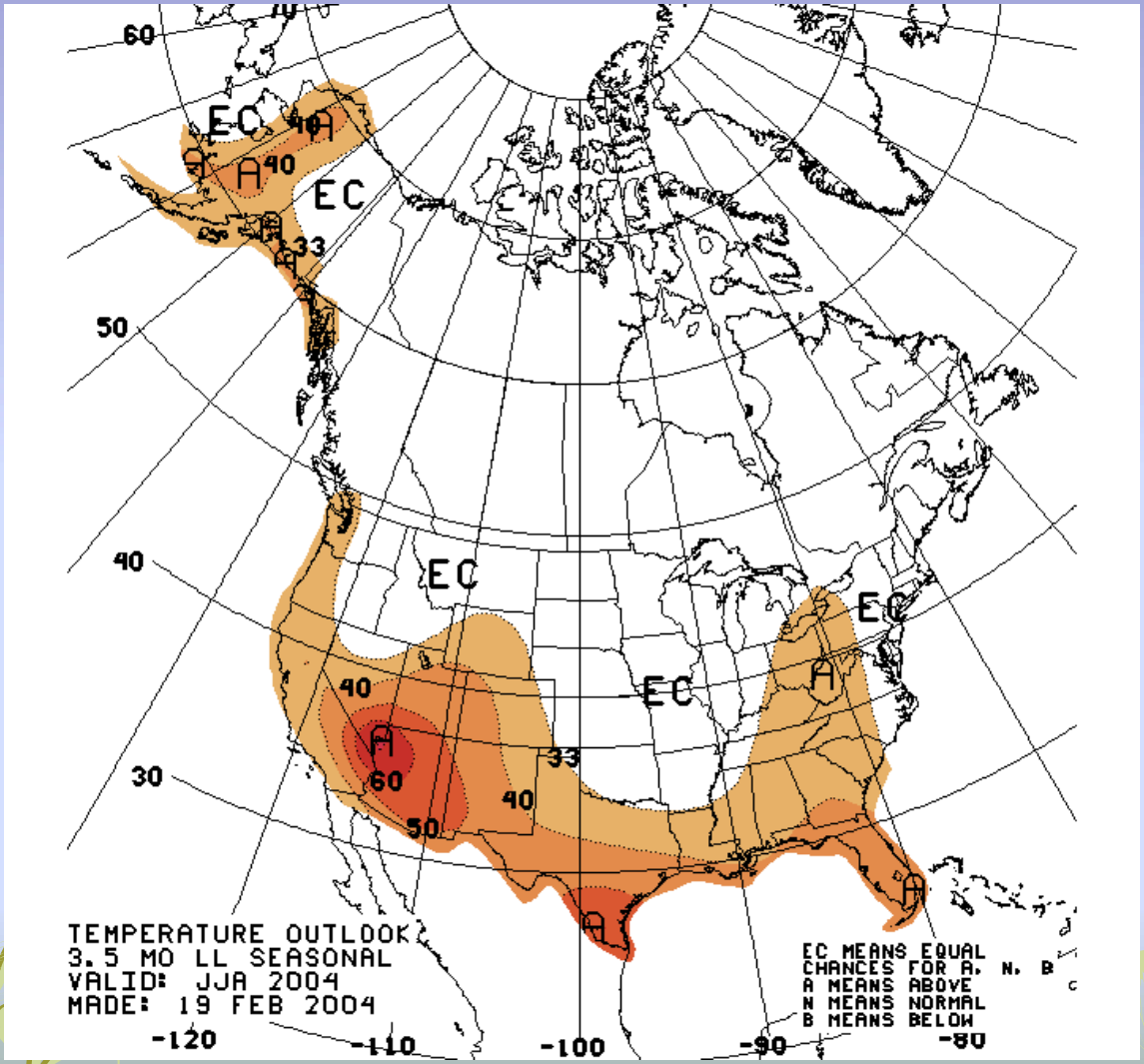
Precipitation
March – May 2004



From the Colorado Prediction Center

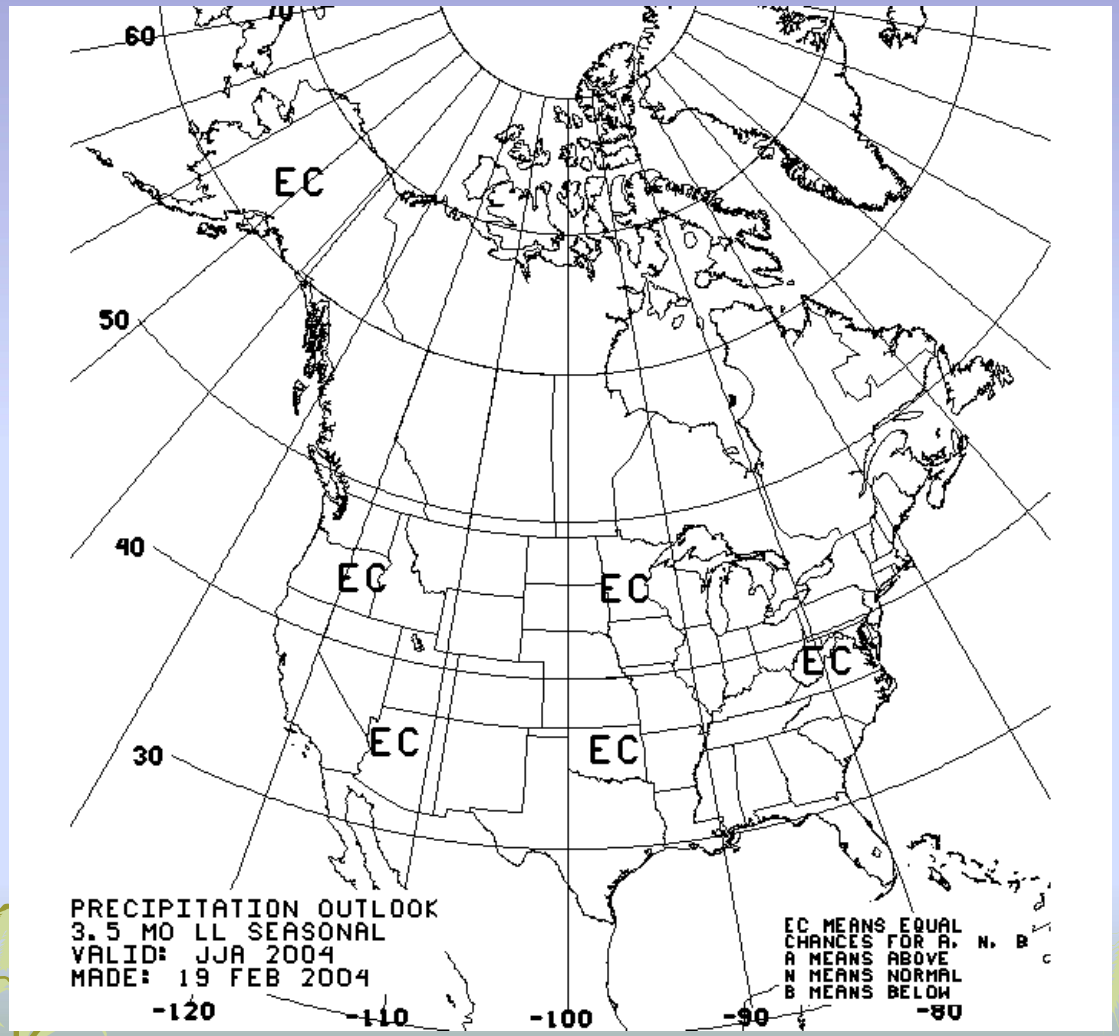
http://www.cpc.ncep.noaa.gov/products/predictions/multi_season/13_seasonal_outlooks/color/churchill.html

Temperature
June – August 2004



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

Precipitation
June – August 2004



From the Colorado Prediction Center

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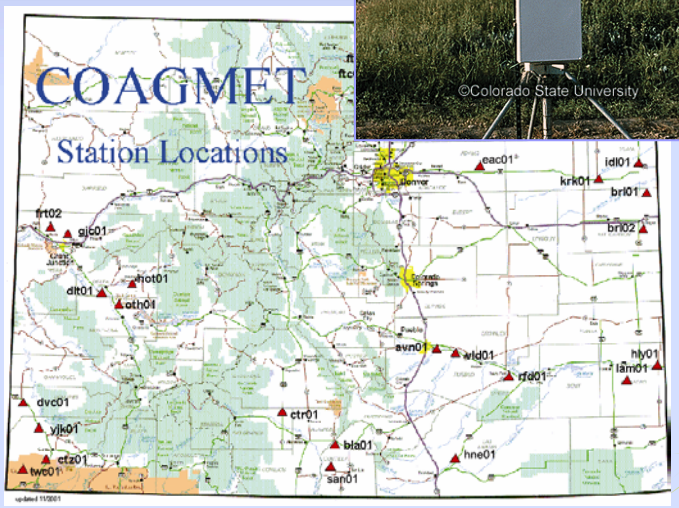
CoAgMet
Weather Data for Agriculture

- *Automated weather stations with daily and hourly readings of:*
  - *Temperature*
  - *Humidity*
  - *Wind*
  - *Precipitation*
  - *Solar energy*
  - *Evapotranspiration*



http://www.coagmet.com

CoCo RaHS

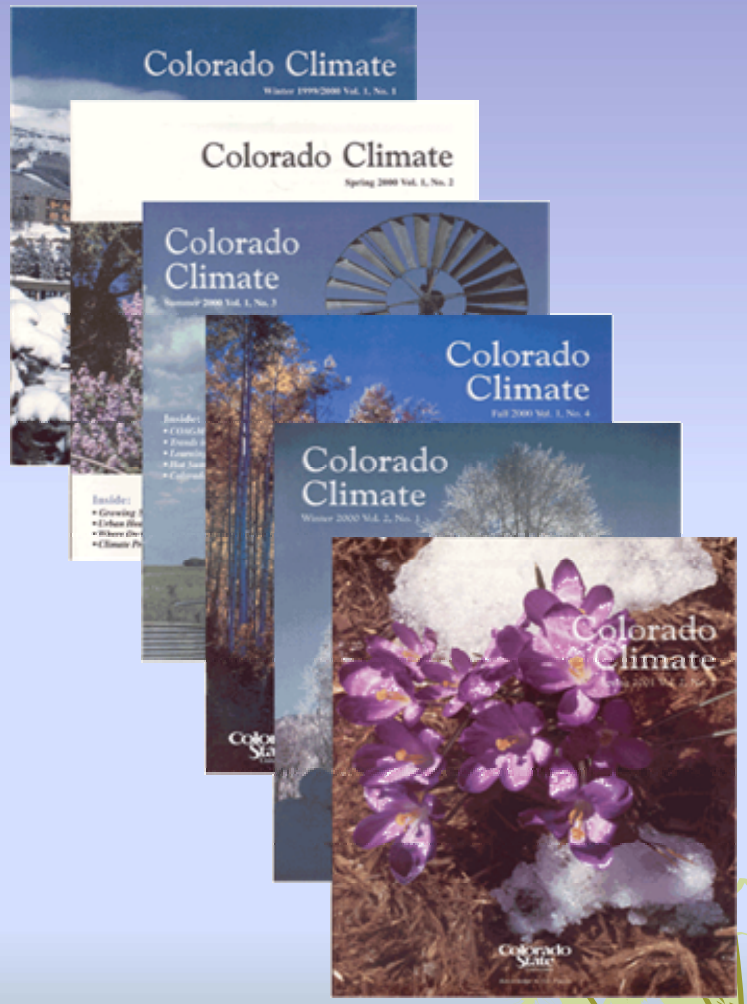
Community Collaborative
Rain and Hail Study

YOU CAN HELP!

http://www.cocorahs.org

Colorado Climate Magazine

- *Good bedtime reading about the climate of Colorado -- recent and historic*
- *$15/year subscription pays printing and mailing costs*



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"