DROUGHT:

An update and status report

Nolan Doesken
Colorado Climate Center

Presented to: Colorado Conservation Tillage Association, Greeley, CO, February 1, 2006

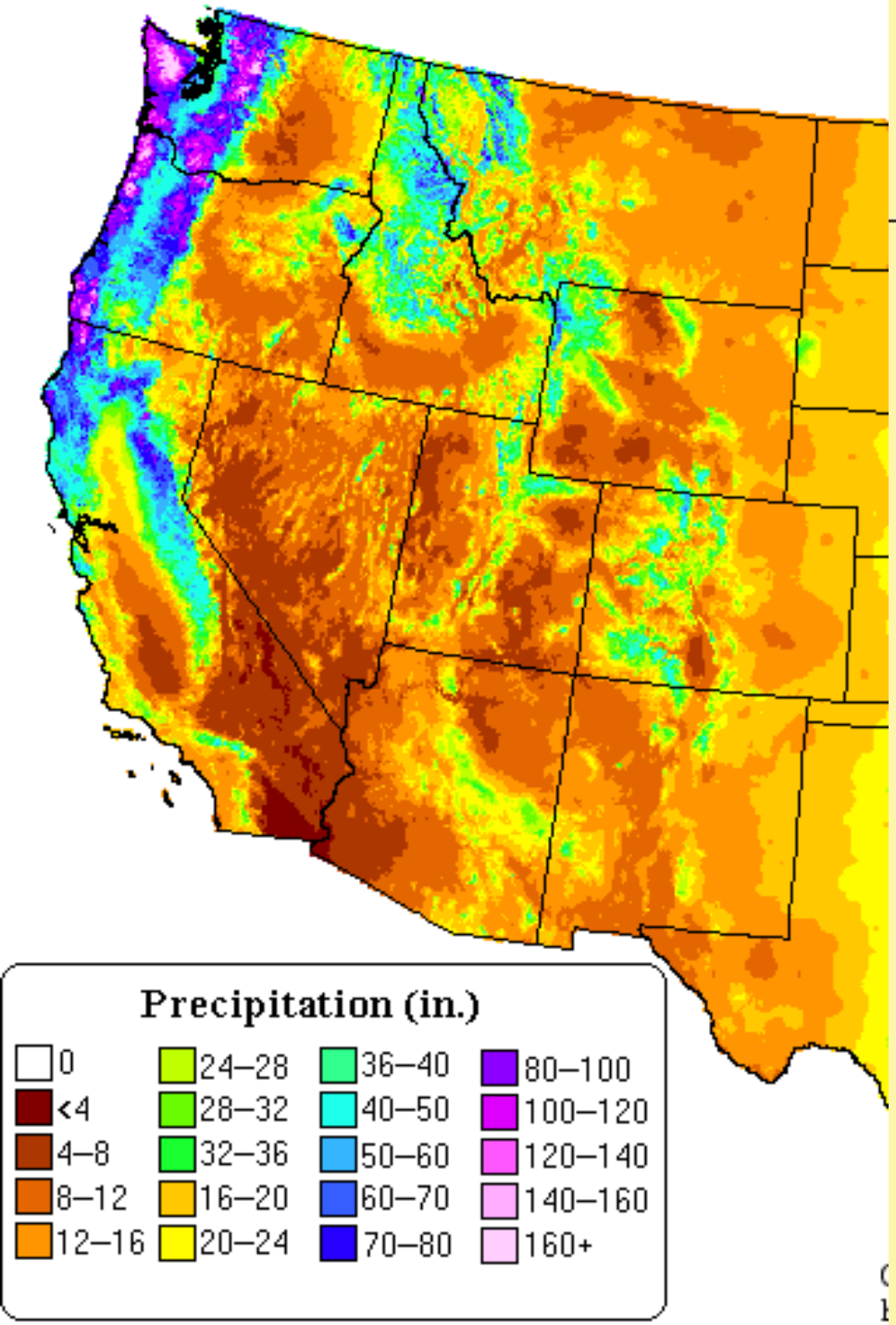
http://ccc.atmos.colostate.edu

Prepared by Odie Bliss

Colorado State University
Knowledge to Go Places

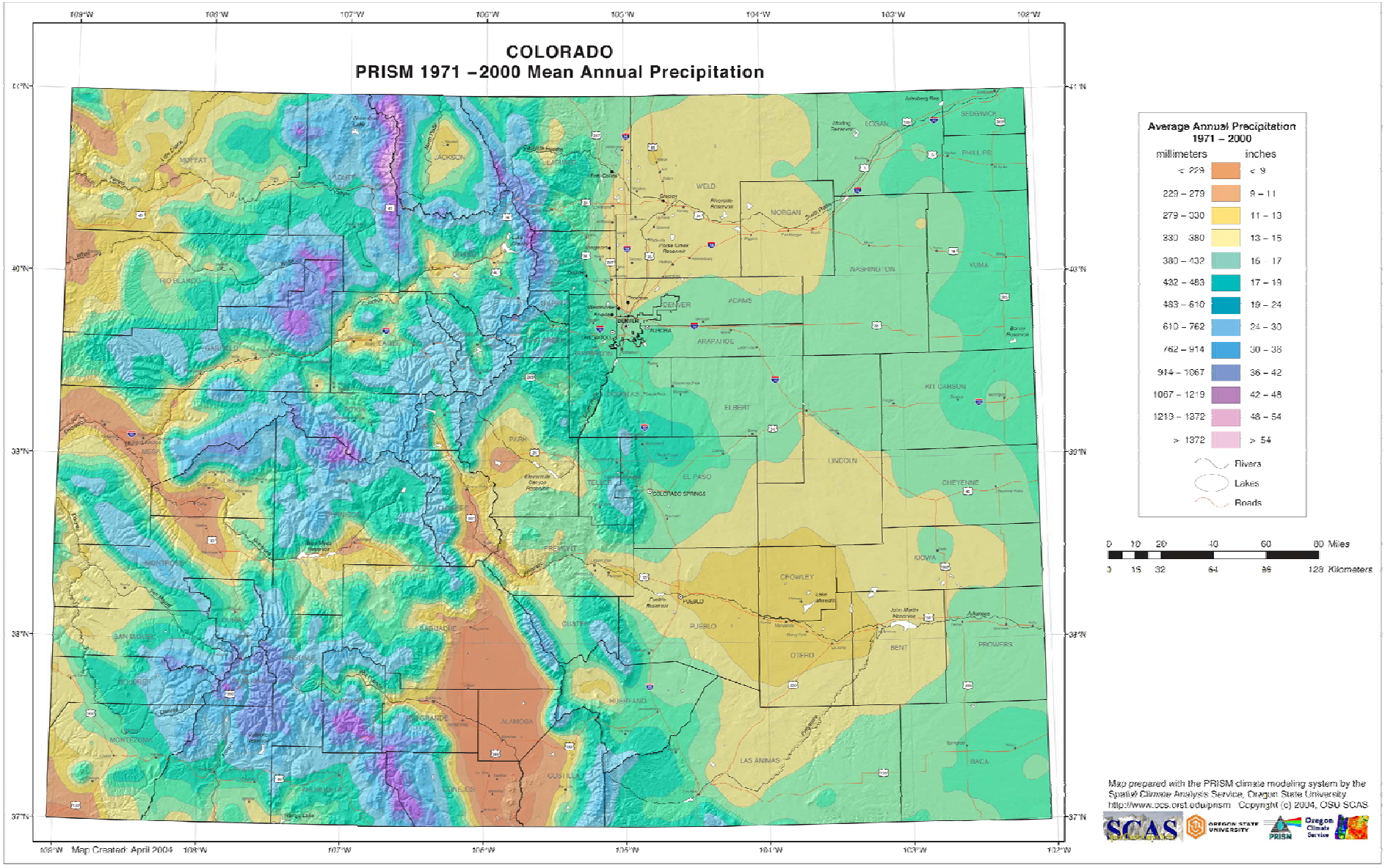
Let's Talk About Precipitation

Strasburg, Colo, Photo by Ian Wittmeyer



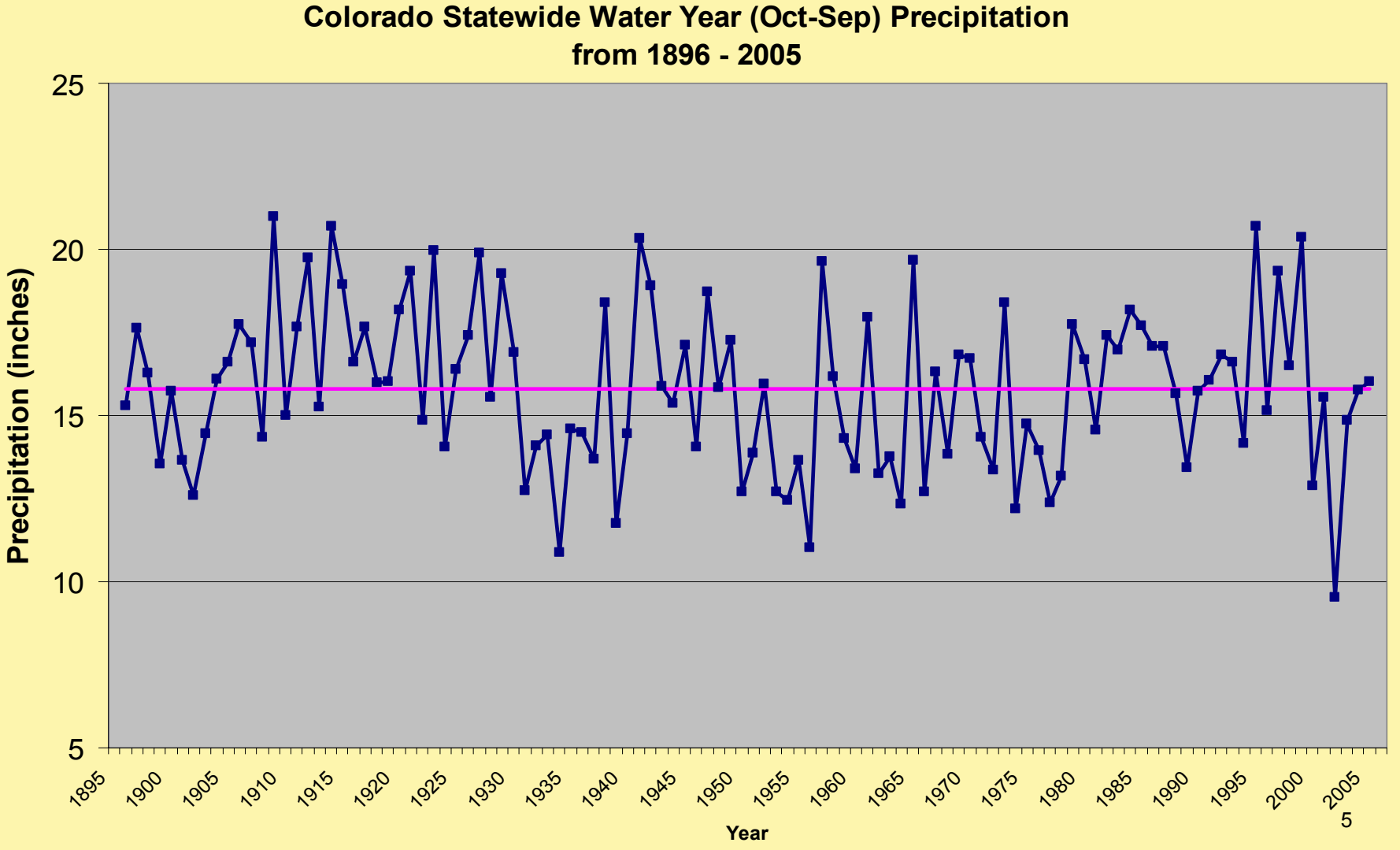
Precipitation: Annual Climatology (1971-2000)

Colorado Average Annual Precipitation



Have We Been Average?

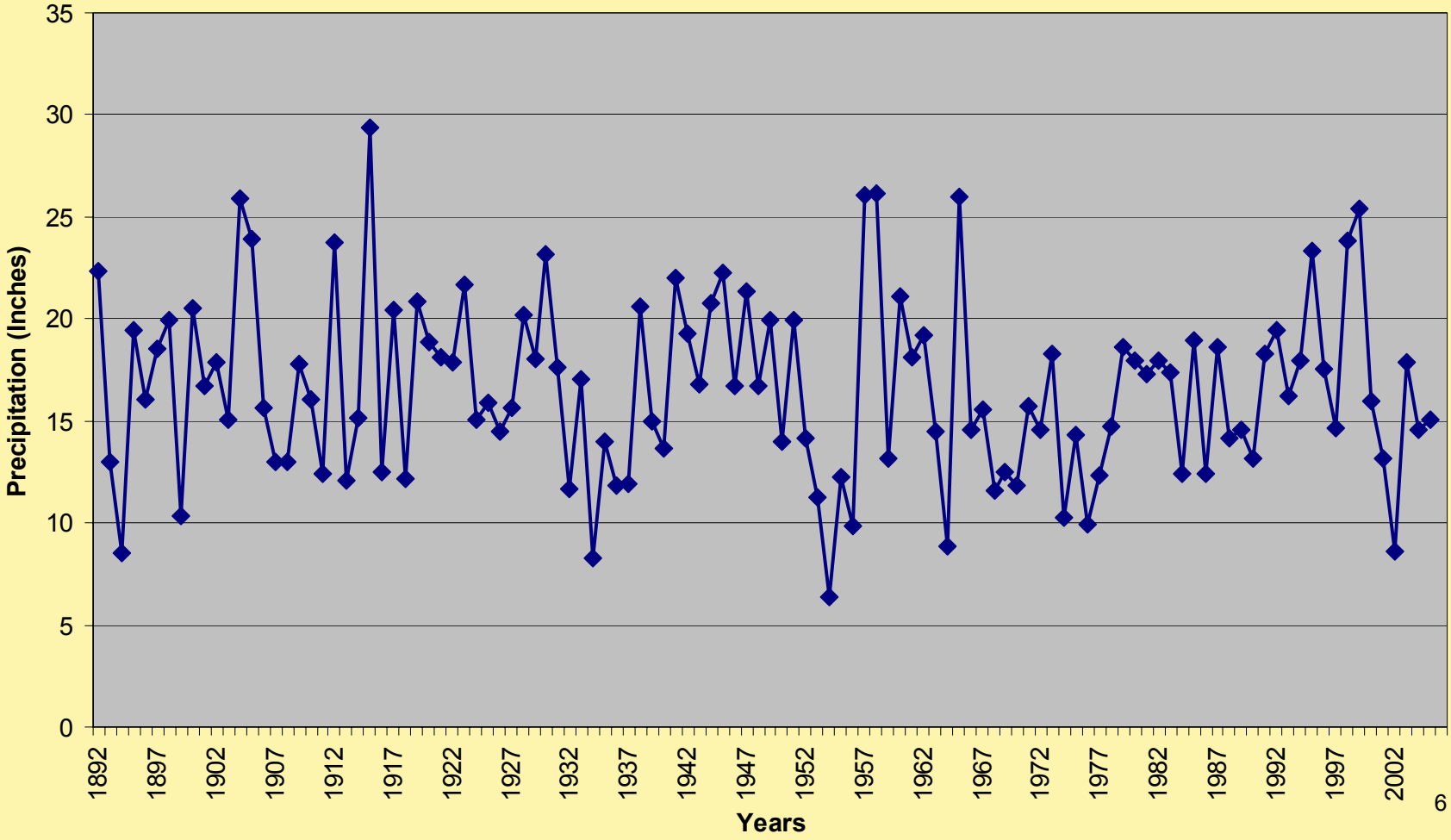
NO!



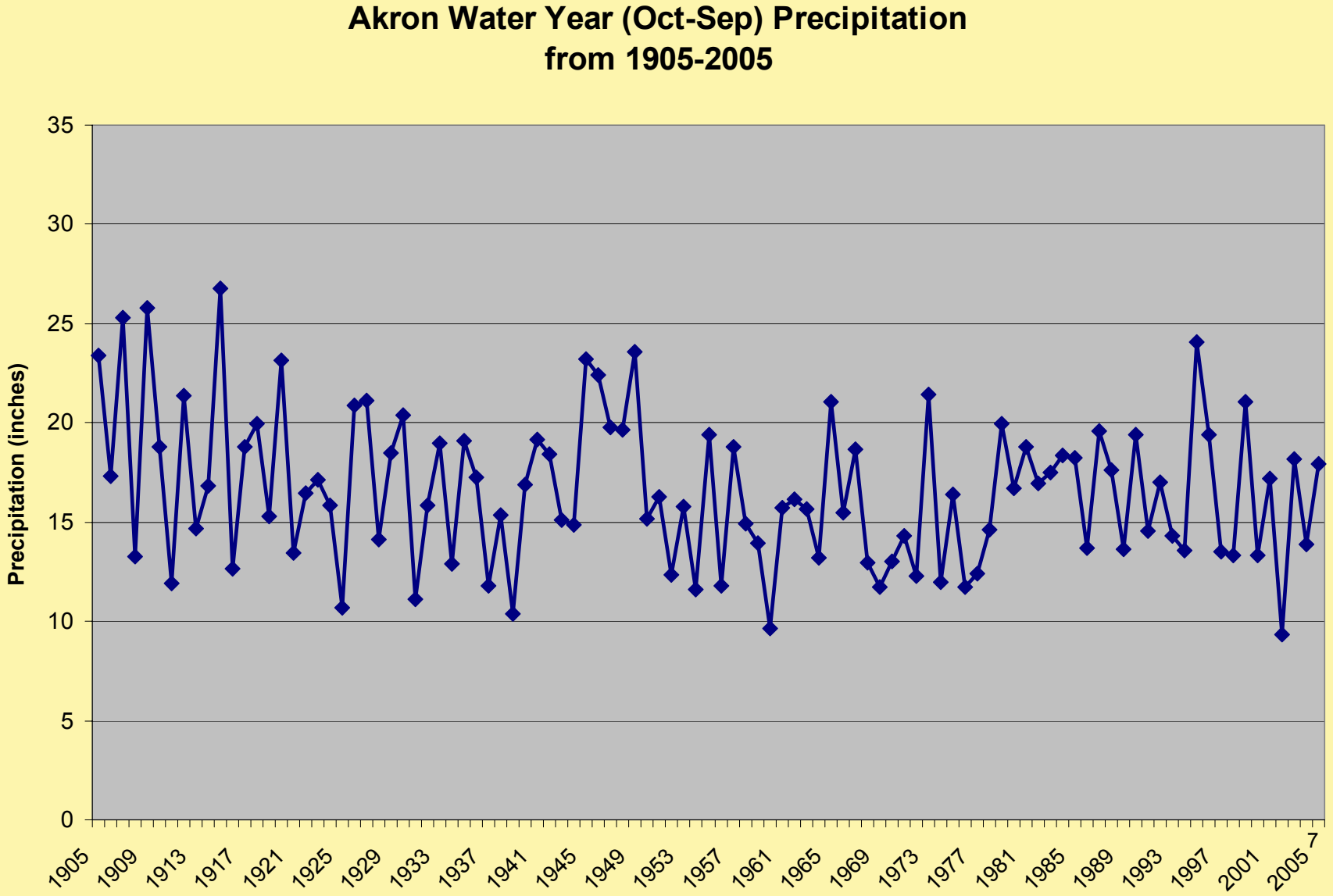
Burlington Water Year Precipitation

Burlington Water Year (Oct-Sep) Precipitation

for Years 1892-2005

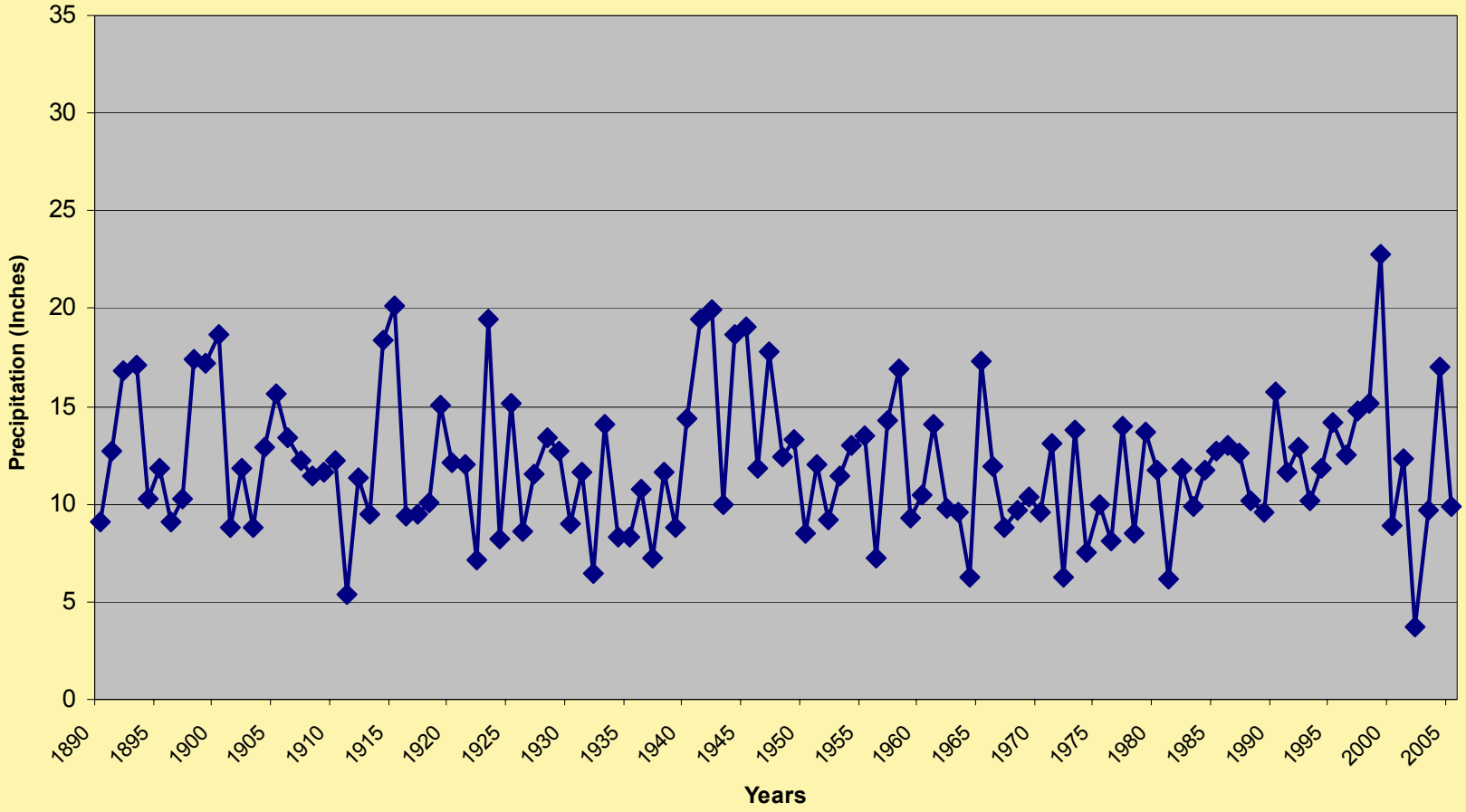


Akron Water Year Precipitation



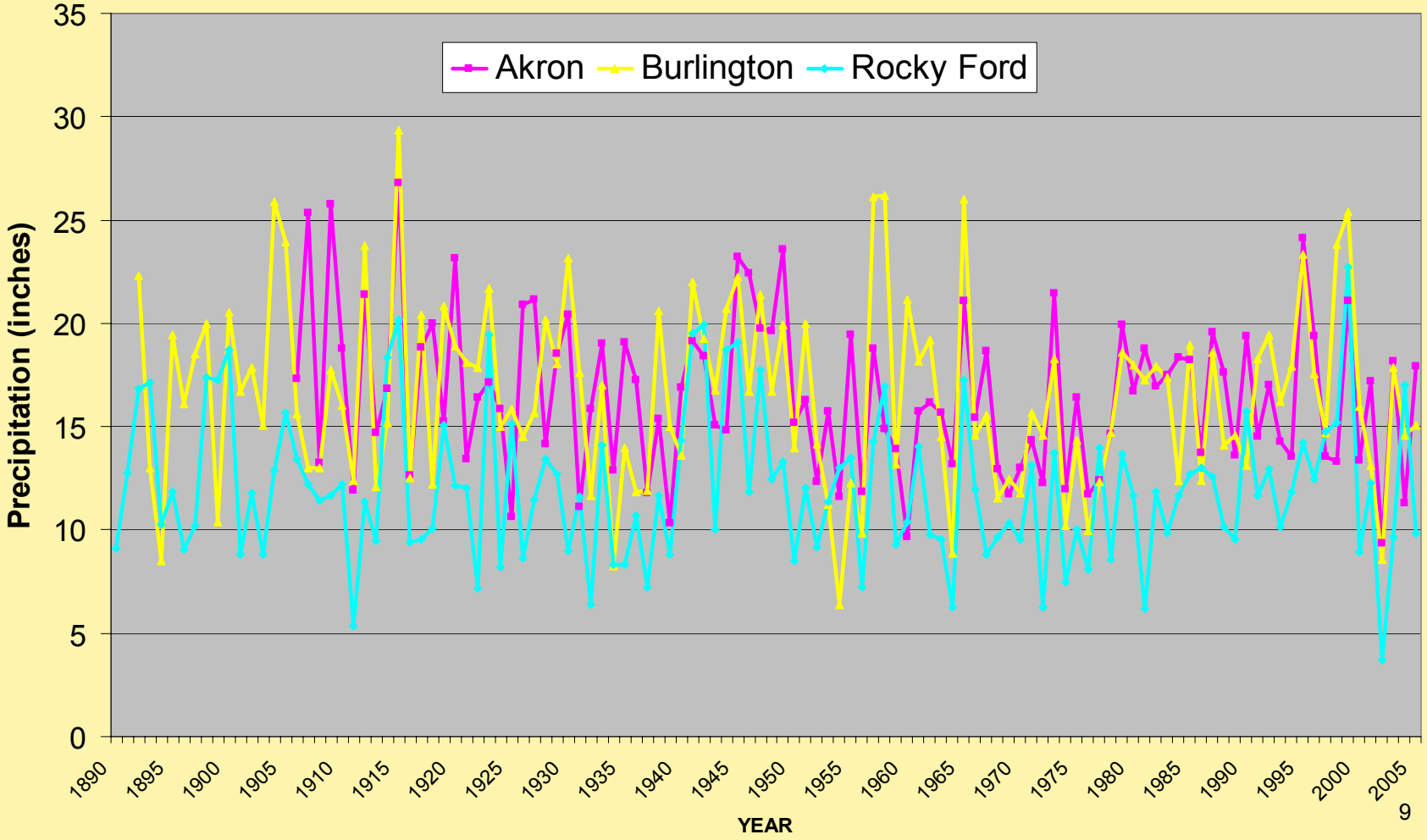
Rocky Ford Water Year Precipitation

Rocky Ford Water Year (Oct-Sep) Precipitation from 1890-2005



All 3 Sites Comparison

Water Year (Oct-Sep) Precipitation Comparison for Akron, Burlington, and Rocky Ford



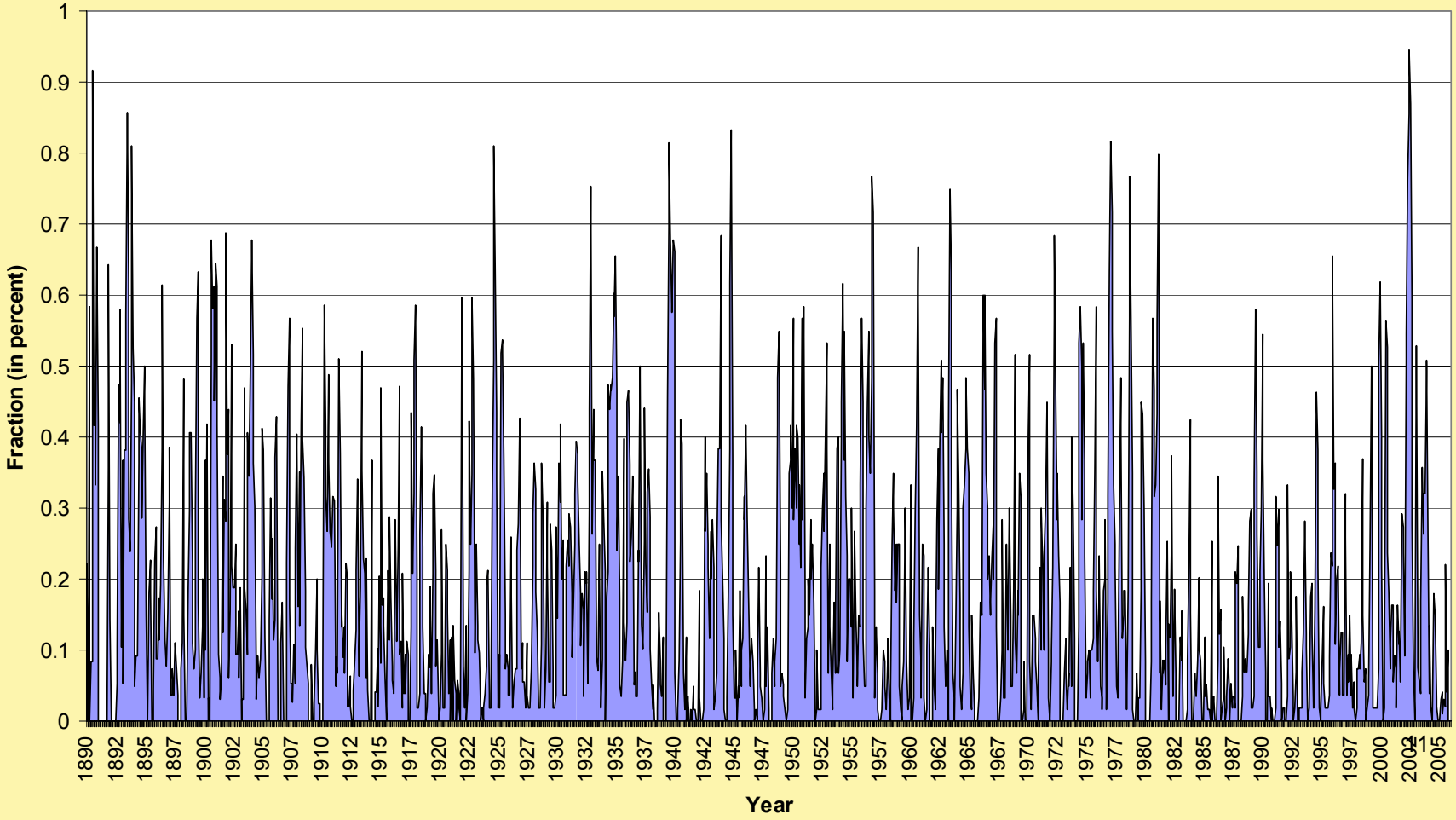
What's the Status of Drought Now??

3-Month SPI

Fraction of Colorado in Drought

Based on 3 month SPI

(1890 - 2005)

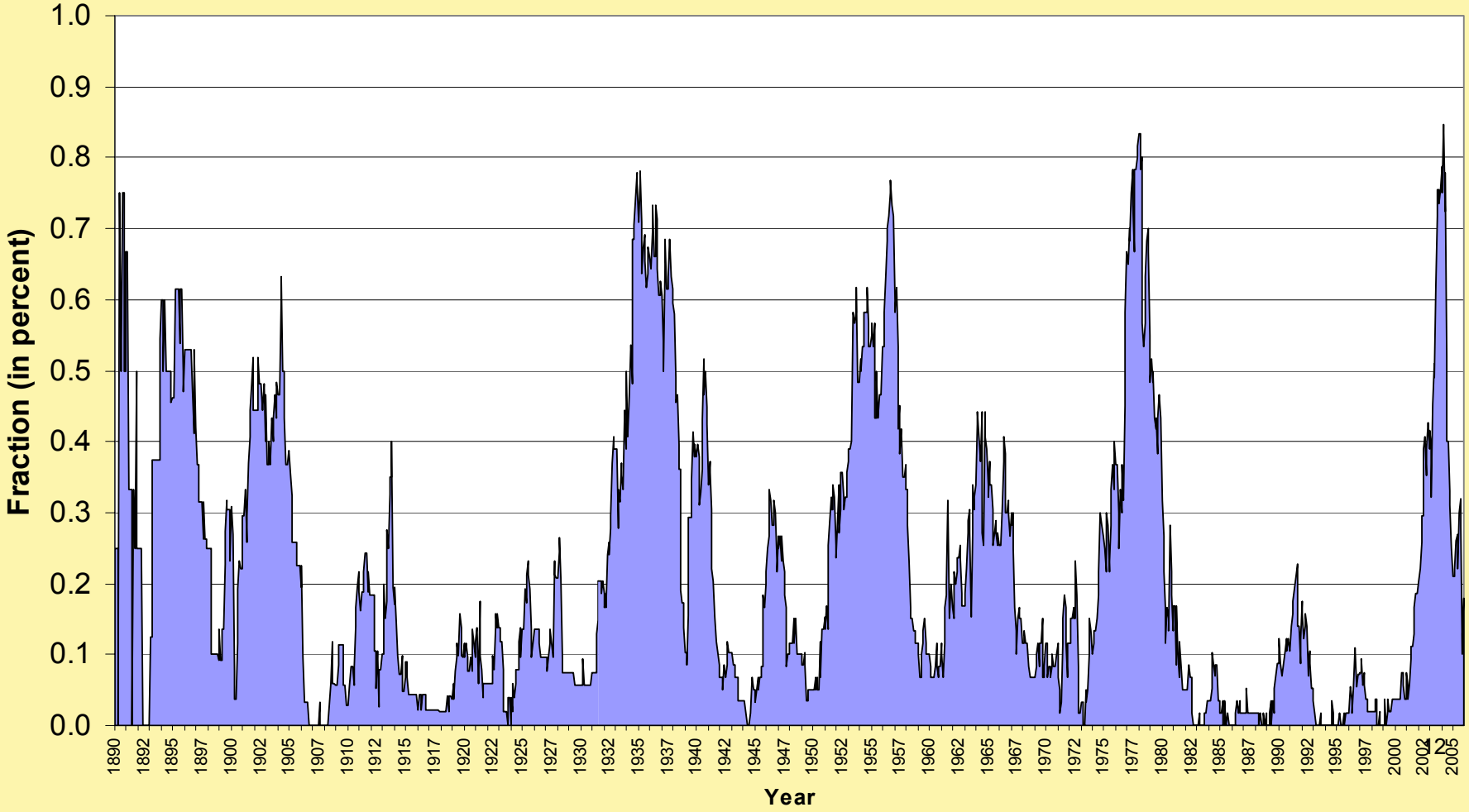


48-Month SPI

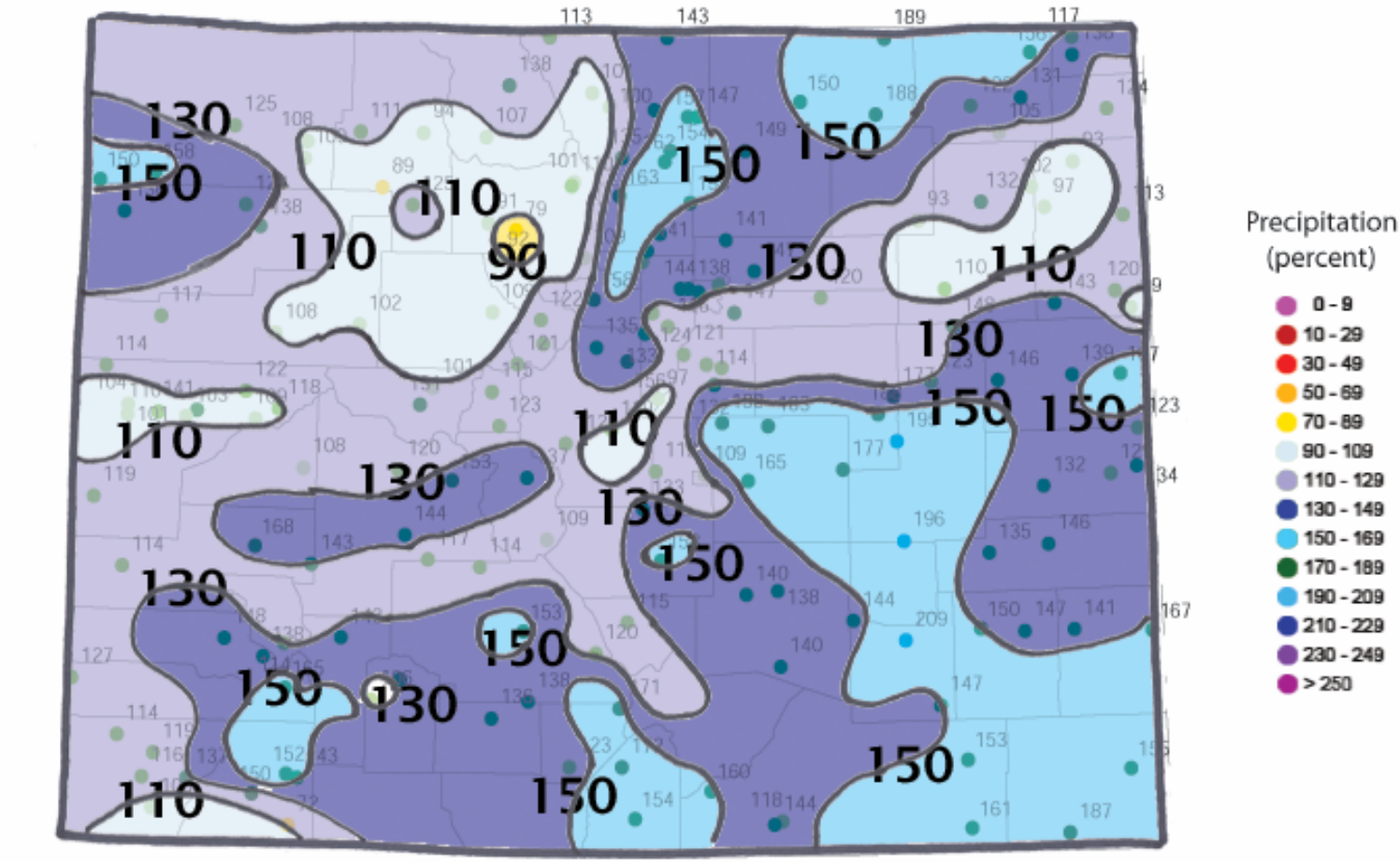
Fraction of Colorado in Drought

Based on 48 month SPI

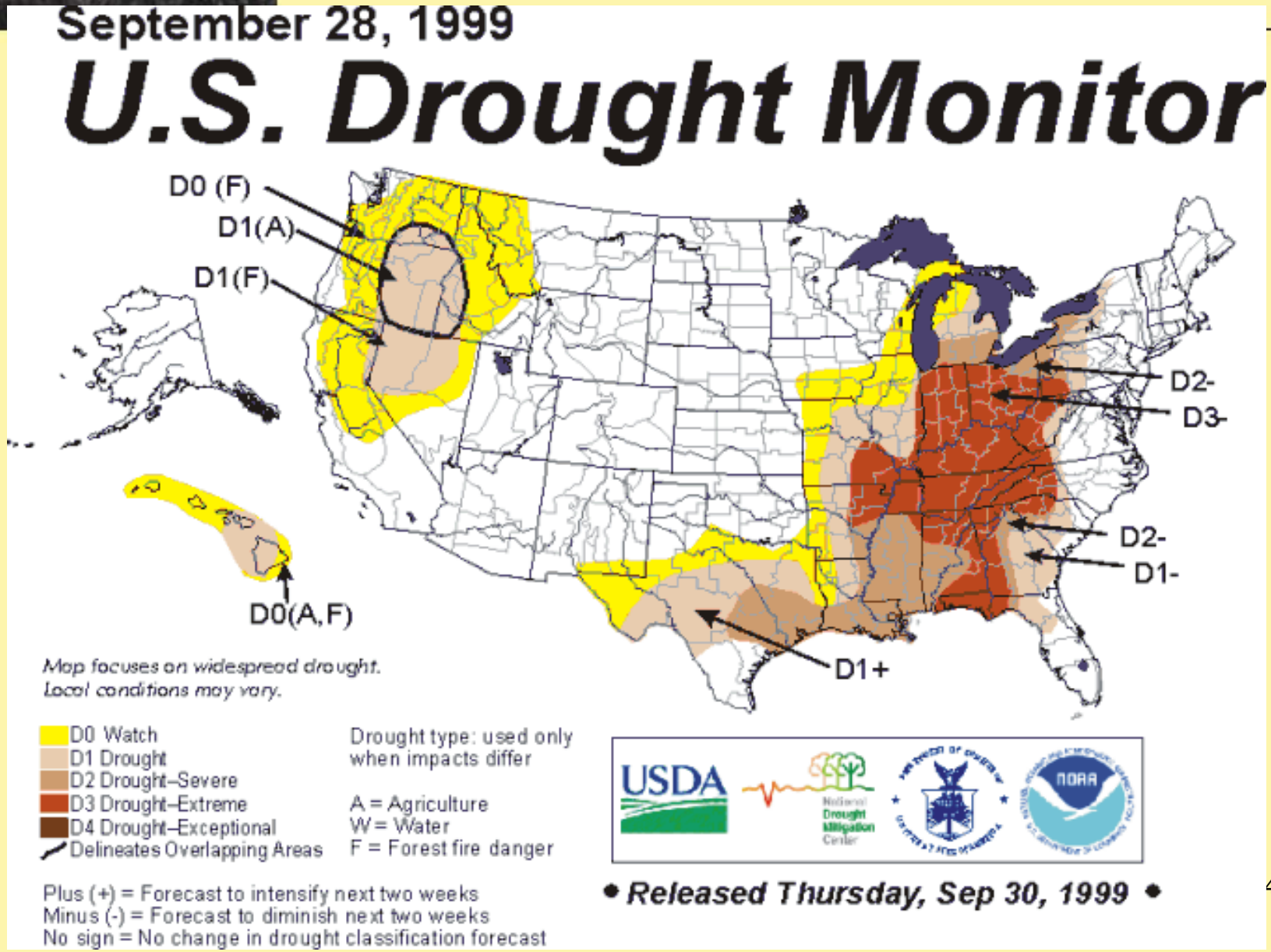
(1890 - 2005)



1999 Water Year Precipitation

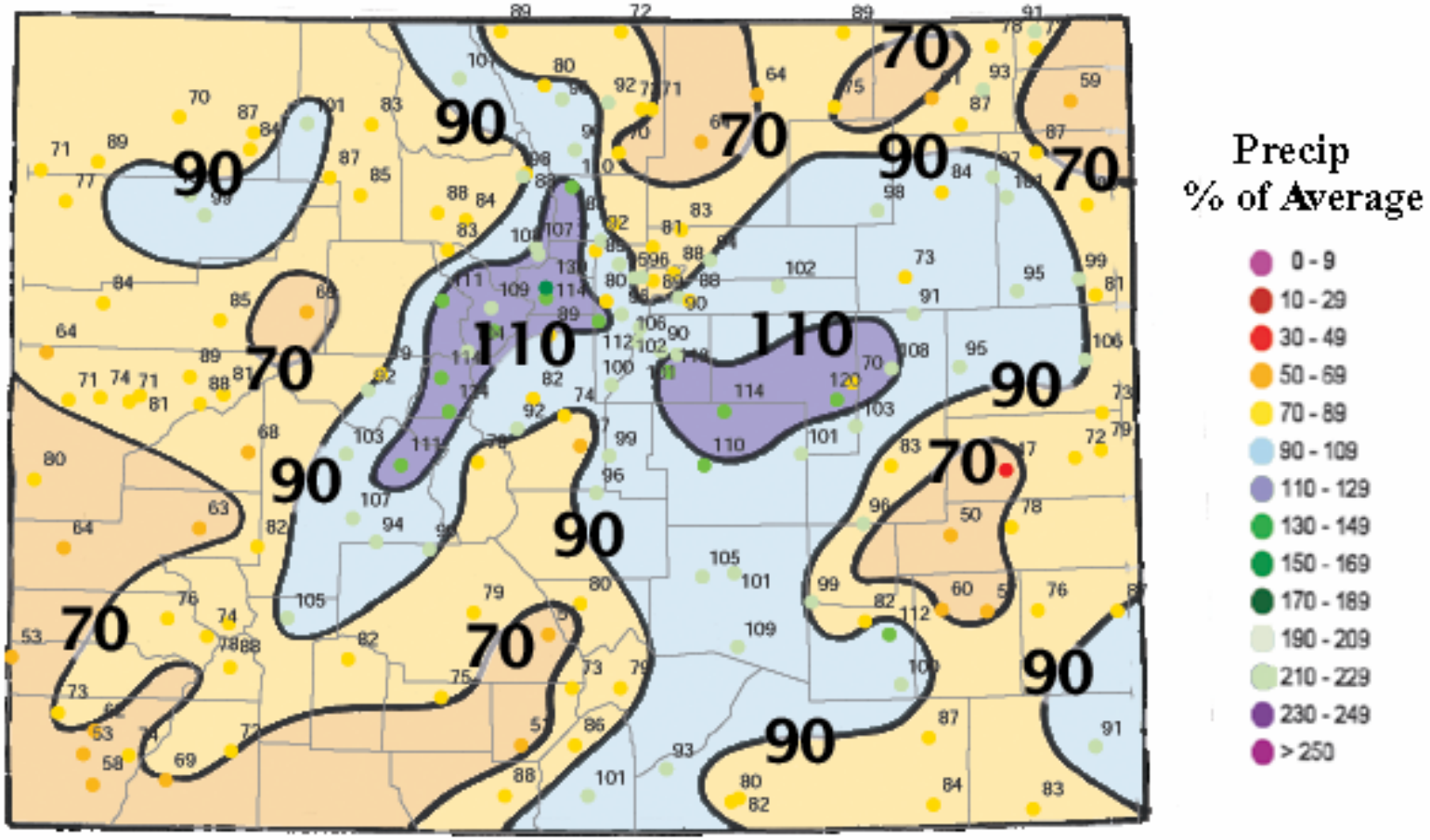


Sept 1999 Drought Monitor Map

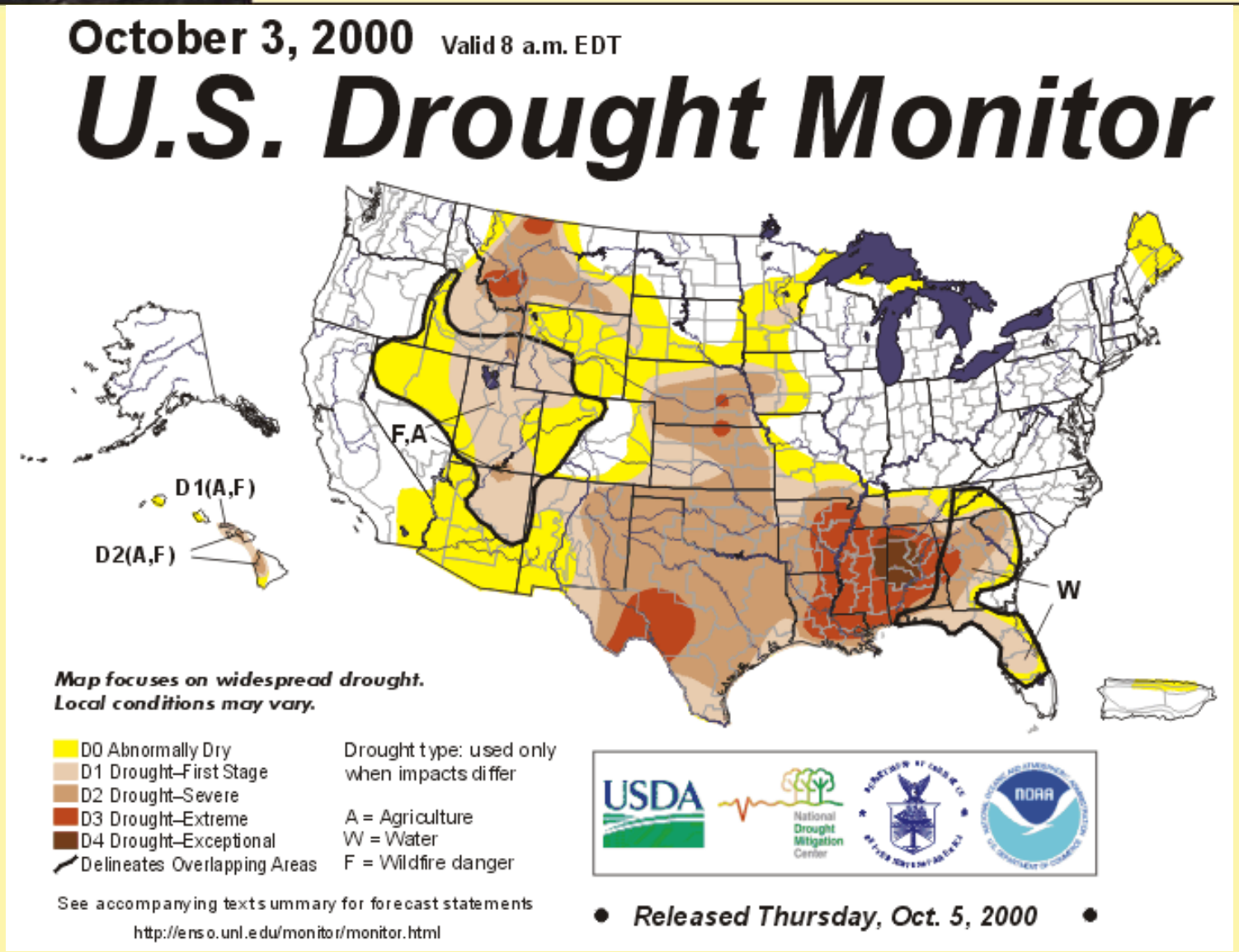


2000 Water Year Precipitation

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

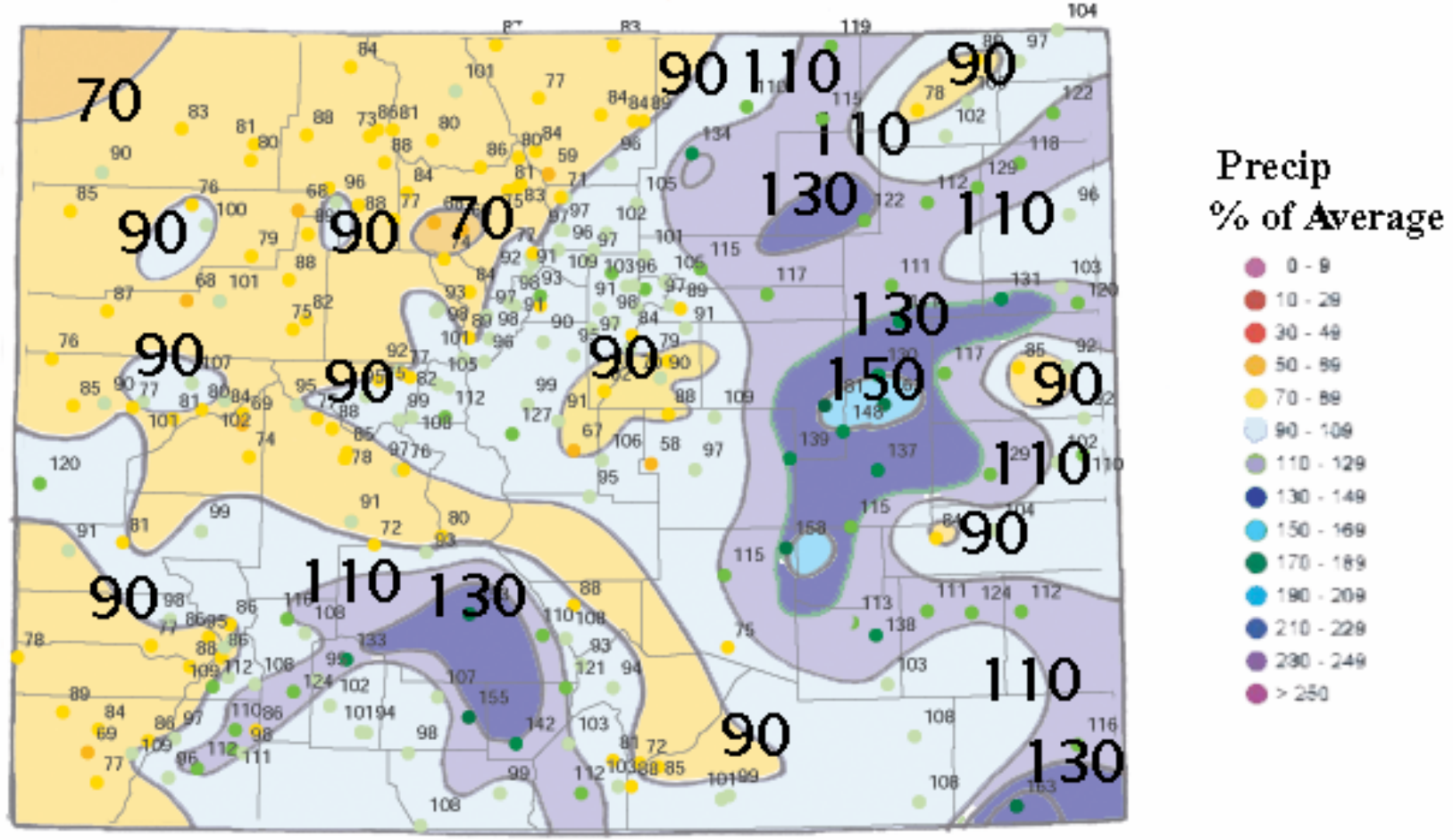


October 2000 Drought Monitor Map

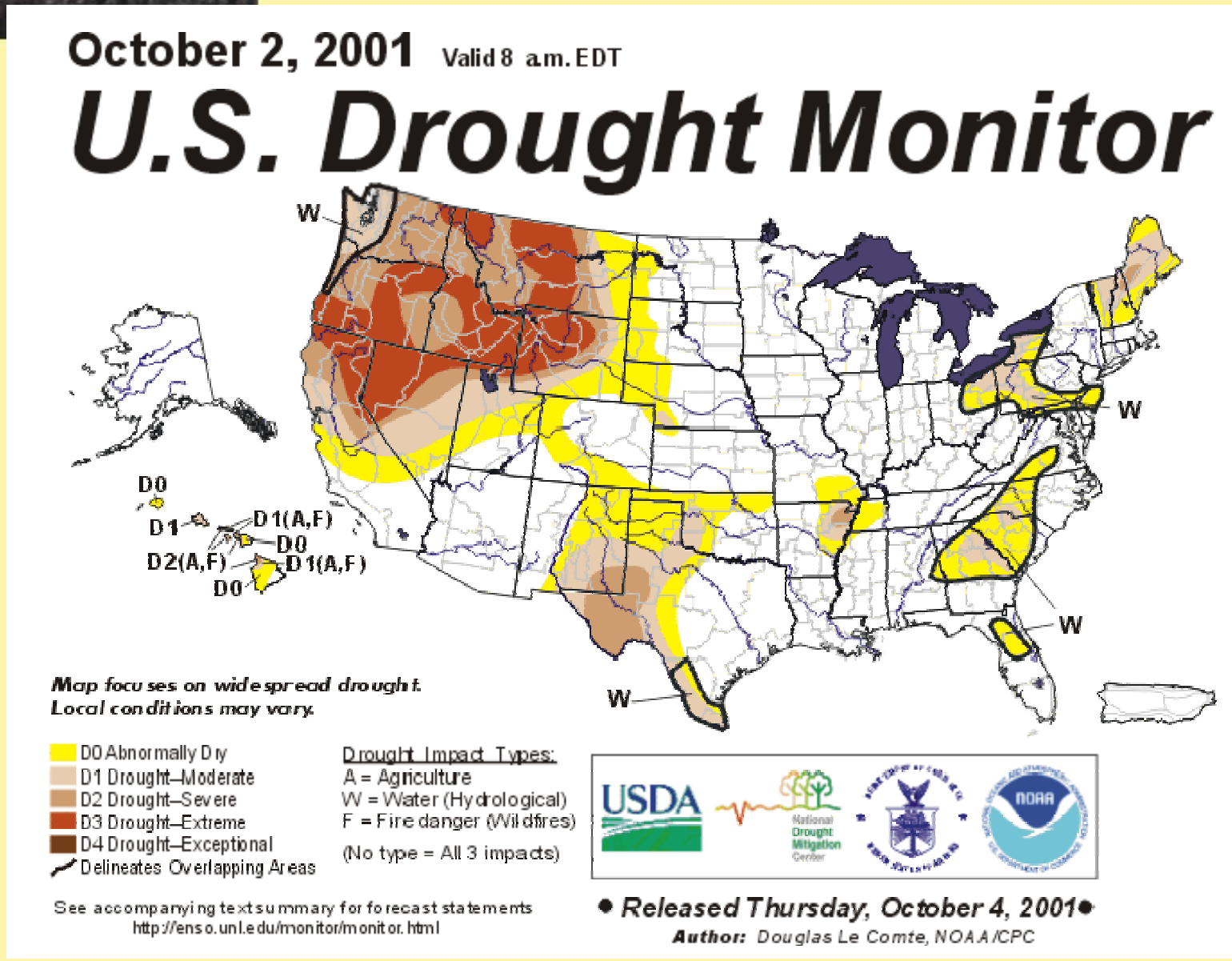


2001 Water Year Precipitation

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

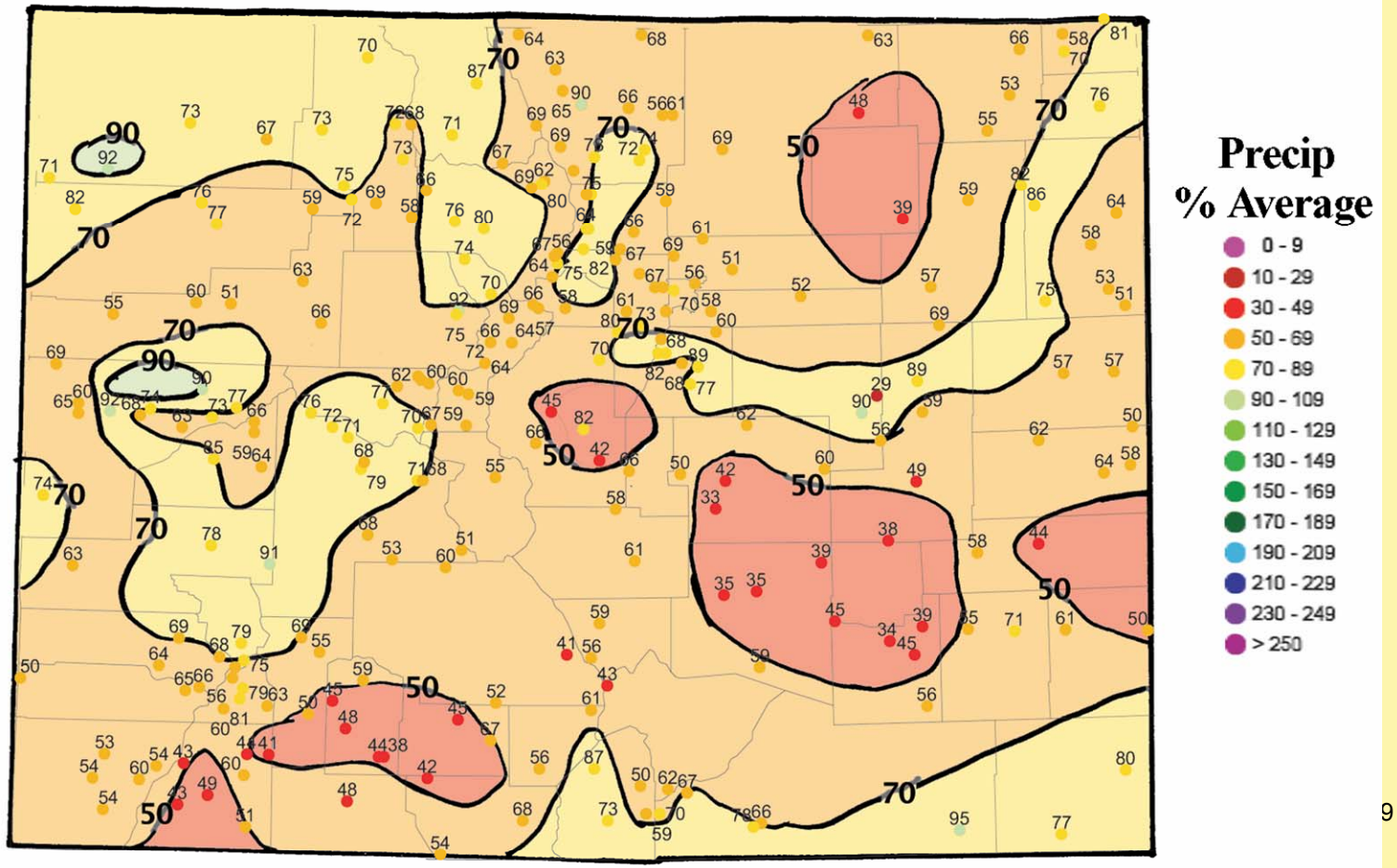


October 2001 Drought Monitor Map

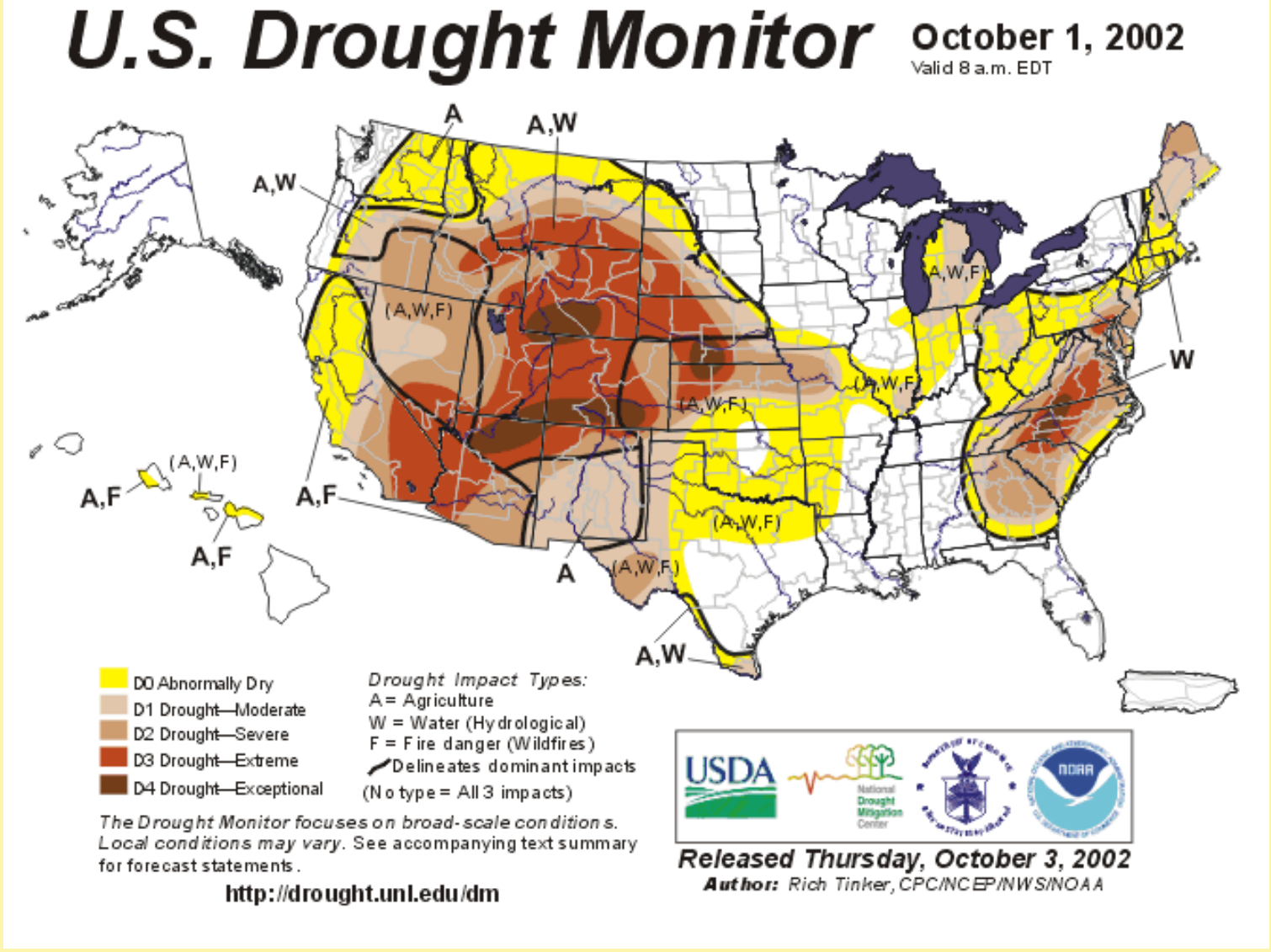


2002 Water Year Precipitation

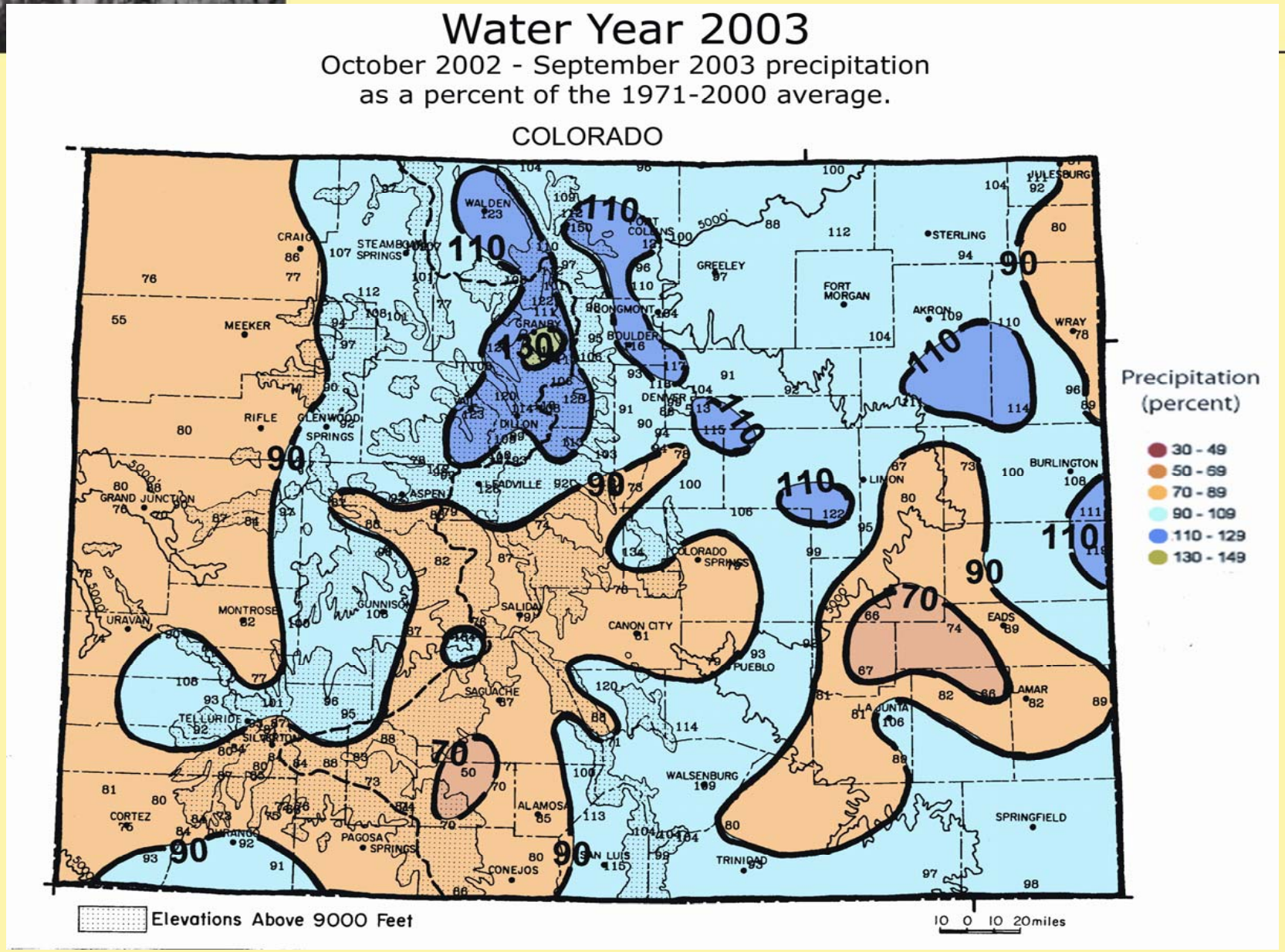
Water Year 2002
(Oct. 2001 - Sept. 2002)
Precipitation Percent of Average for 1961-1990 Averages



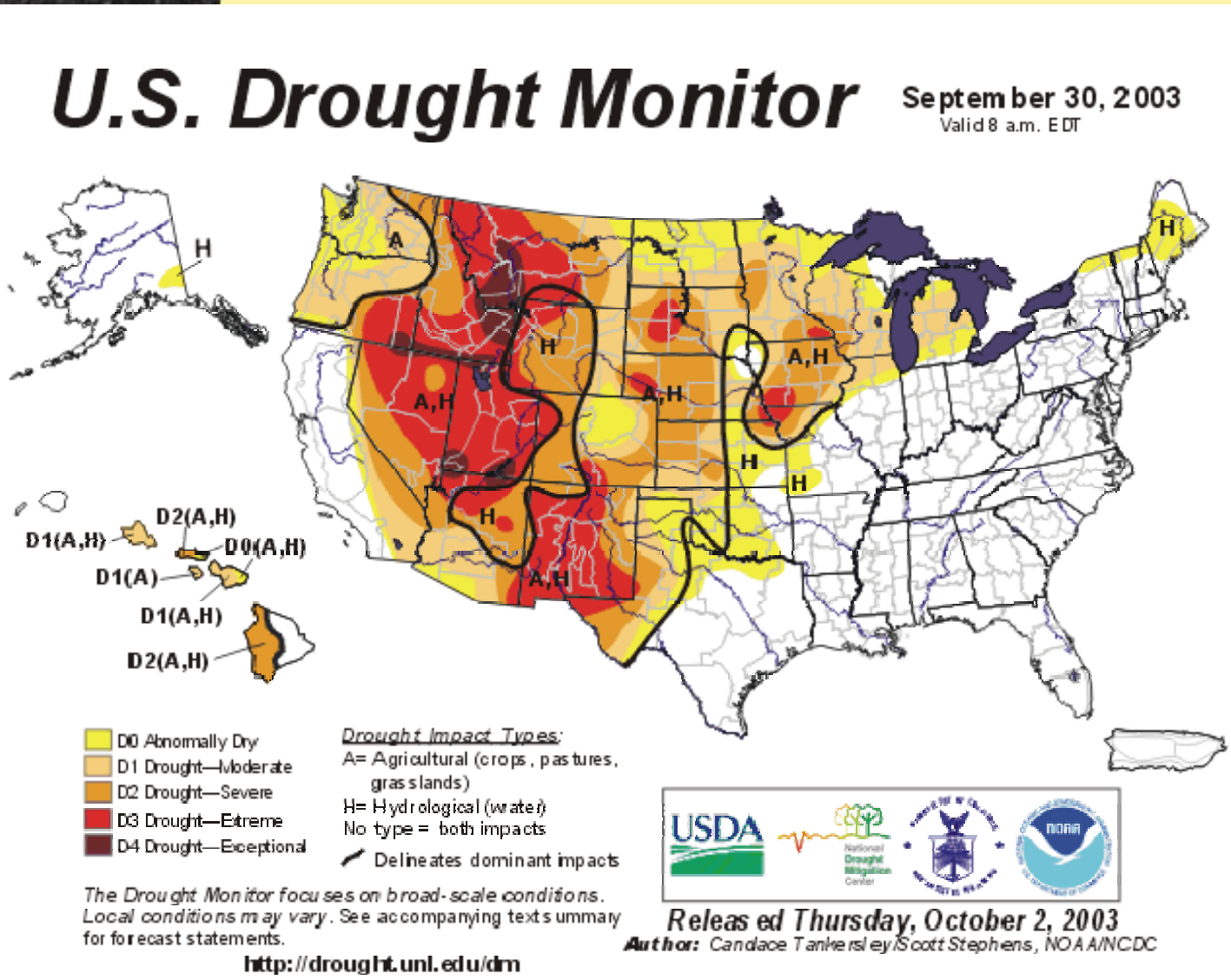
October 2002 Drought Monitor Map



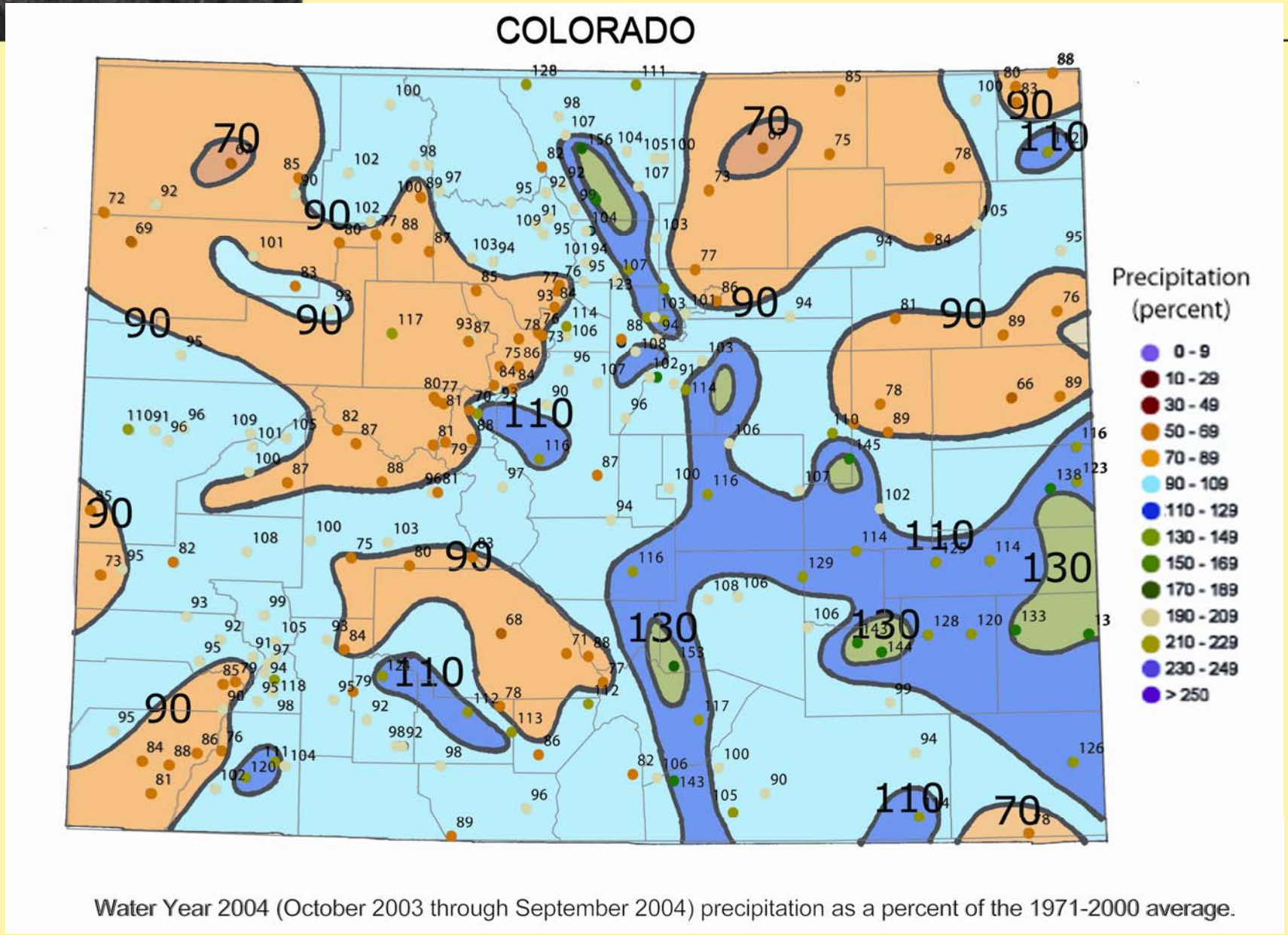
2003 Water Year Precipitation



September 2003 Drought Monitor Map

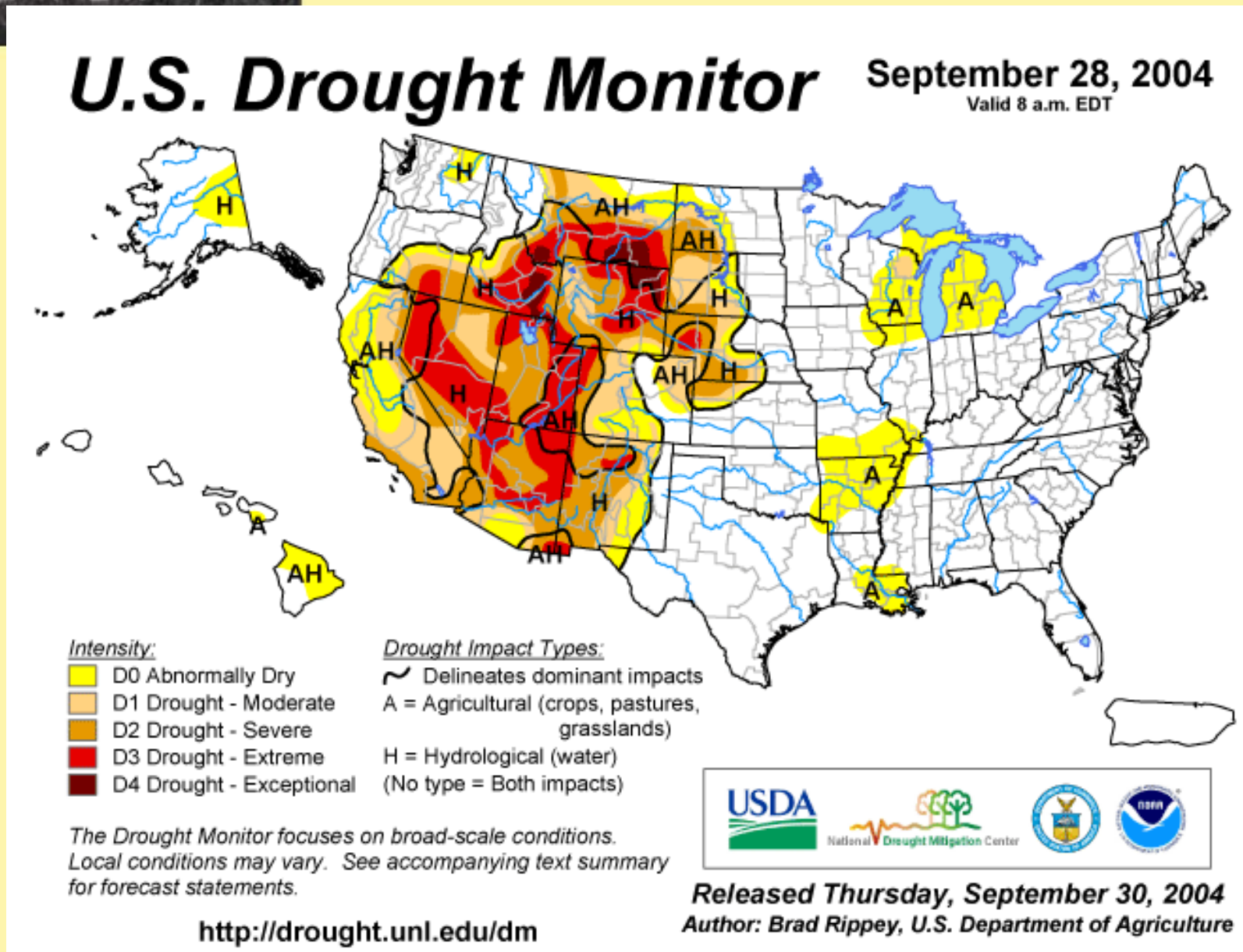


2004 Water Year Precipitation

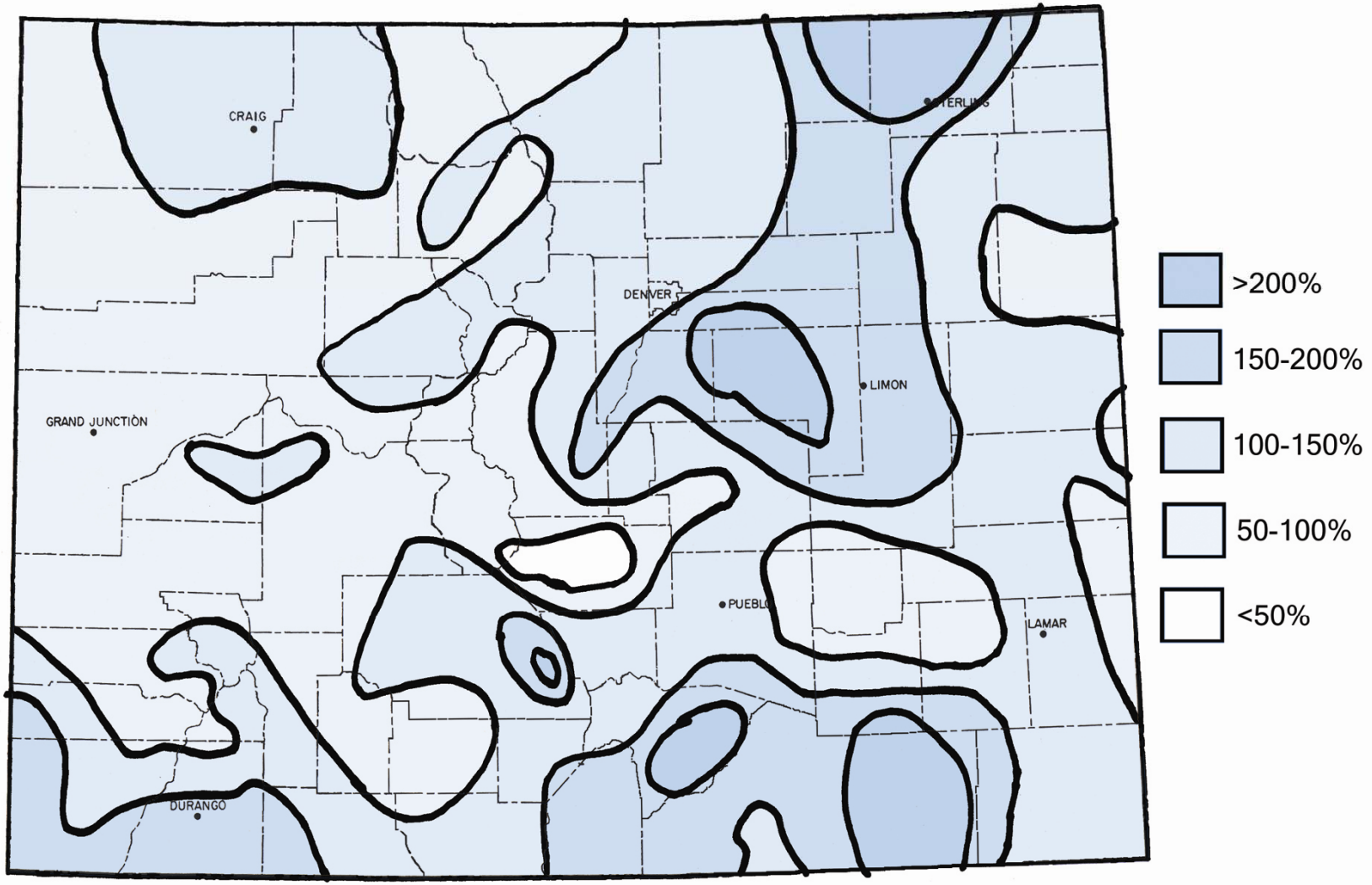


Water Year 2004 (October 2003 through September 2004) precipitation as a percent of the 1971-2000 average.

September 2004 Drought Monitor Map

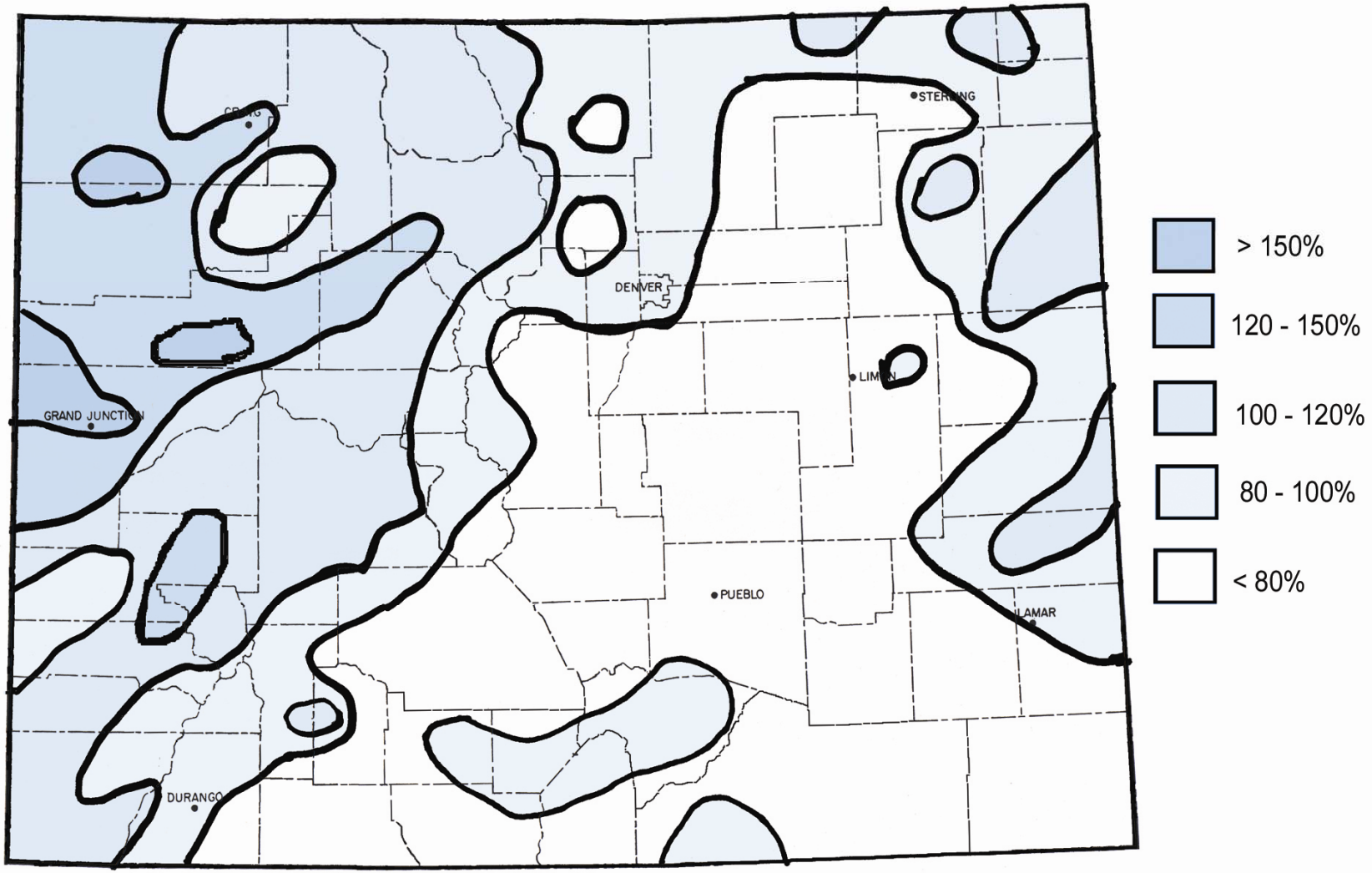


Winter (Oct 2004 – April 2005) 2005 Precipitation Percent of Average



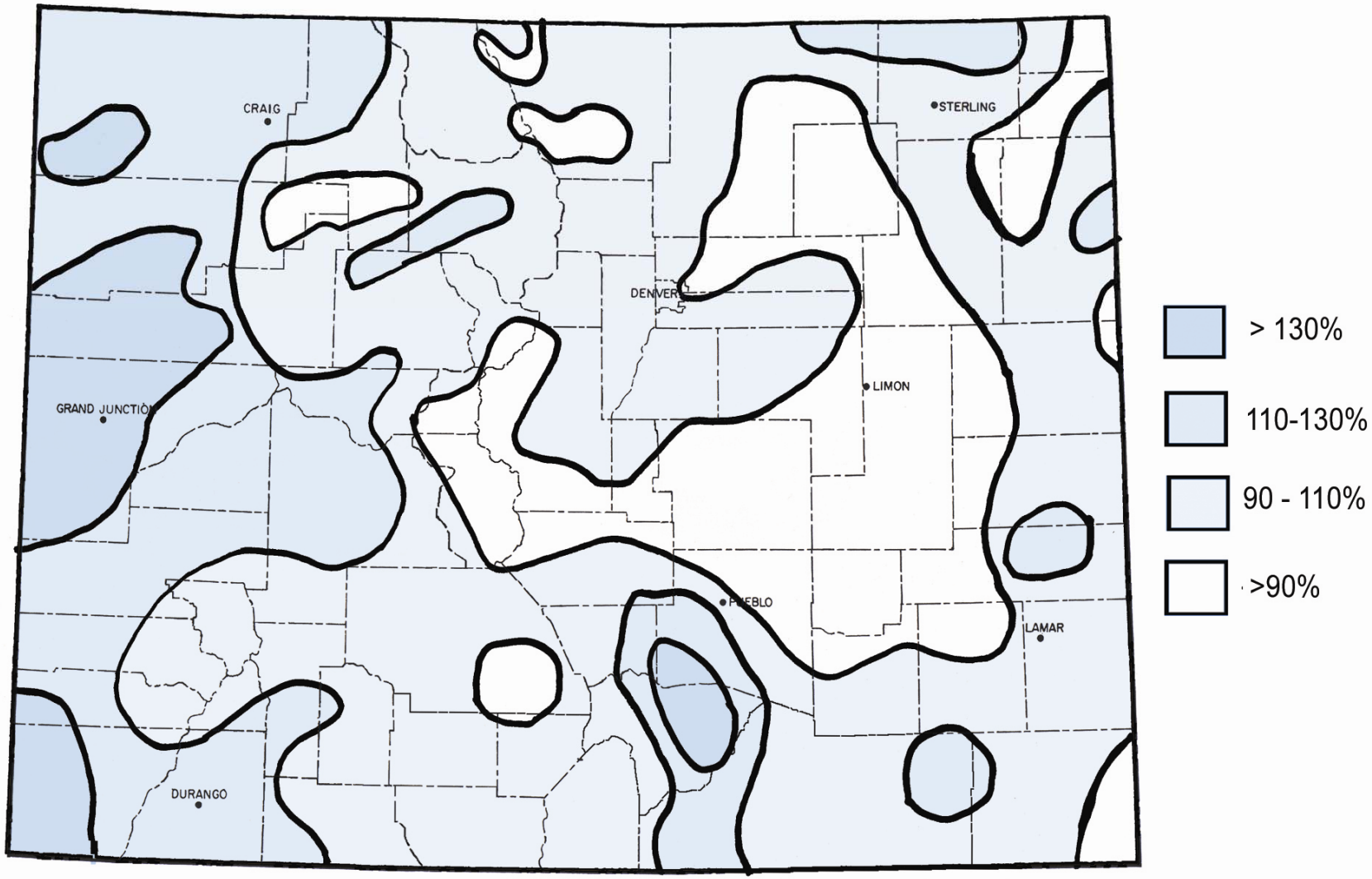
Winter 2005 (Oct 04 - April 05) precipitation as a percent of the 1971-2000 average.

Summer (May – Sep) 2005 precipitation as percent of average



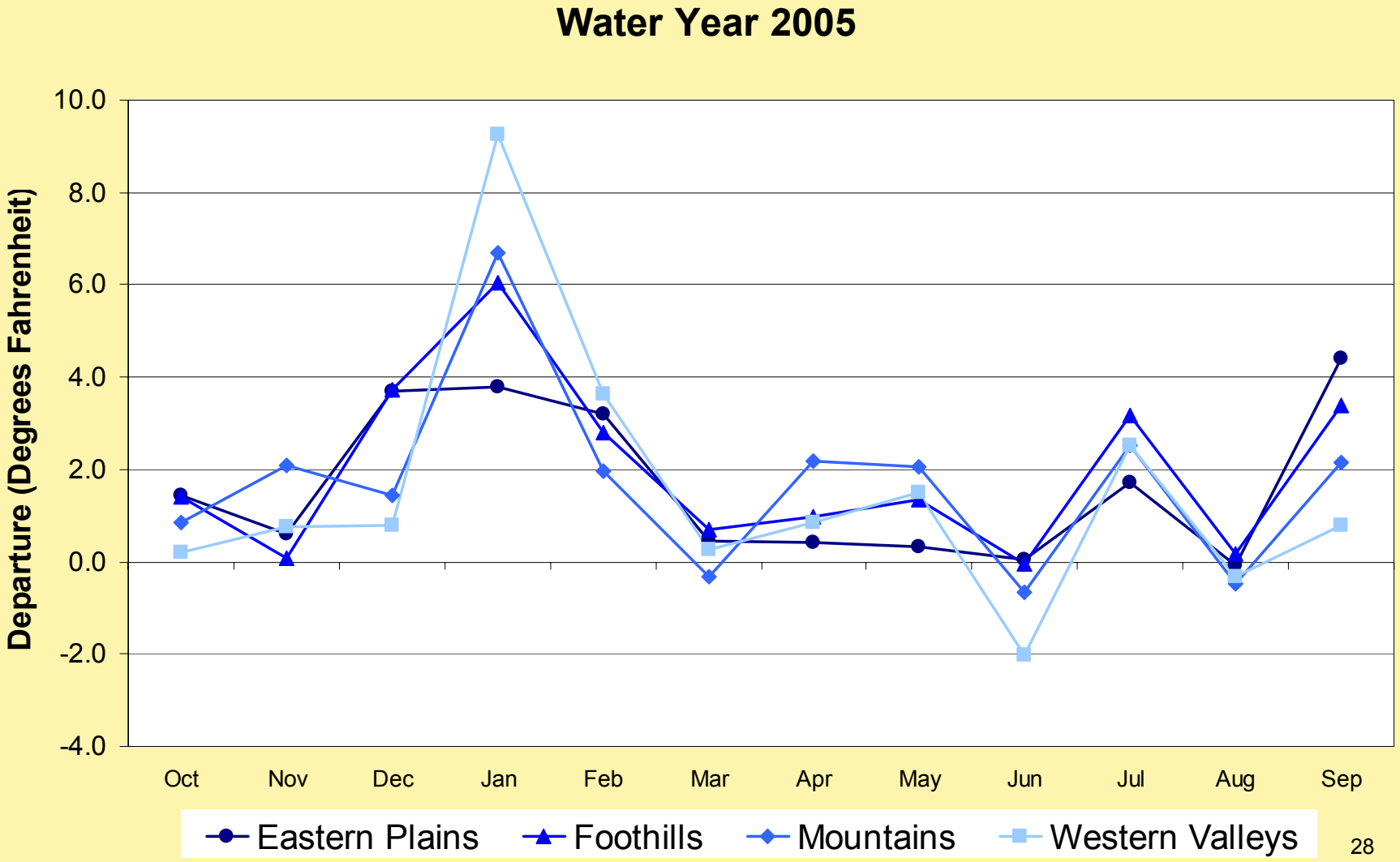
Summer (May - September) 2005 precipitation as a percent of the 1971-2000 average.

2005 Water Year Precipitation as Percent of Average



Water Year 2005 (Oct 04 - Sept. 05) precipitation as a percent of the 1971-2000 average.

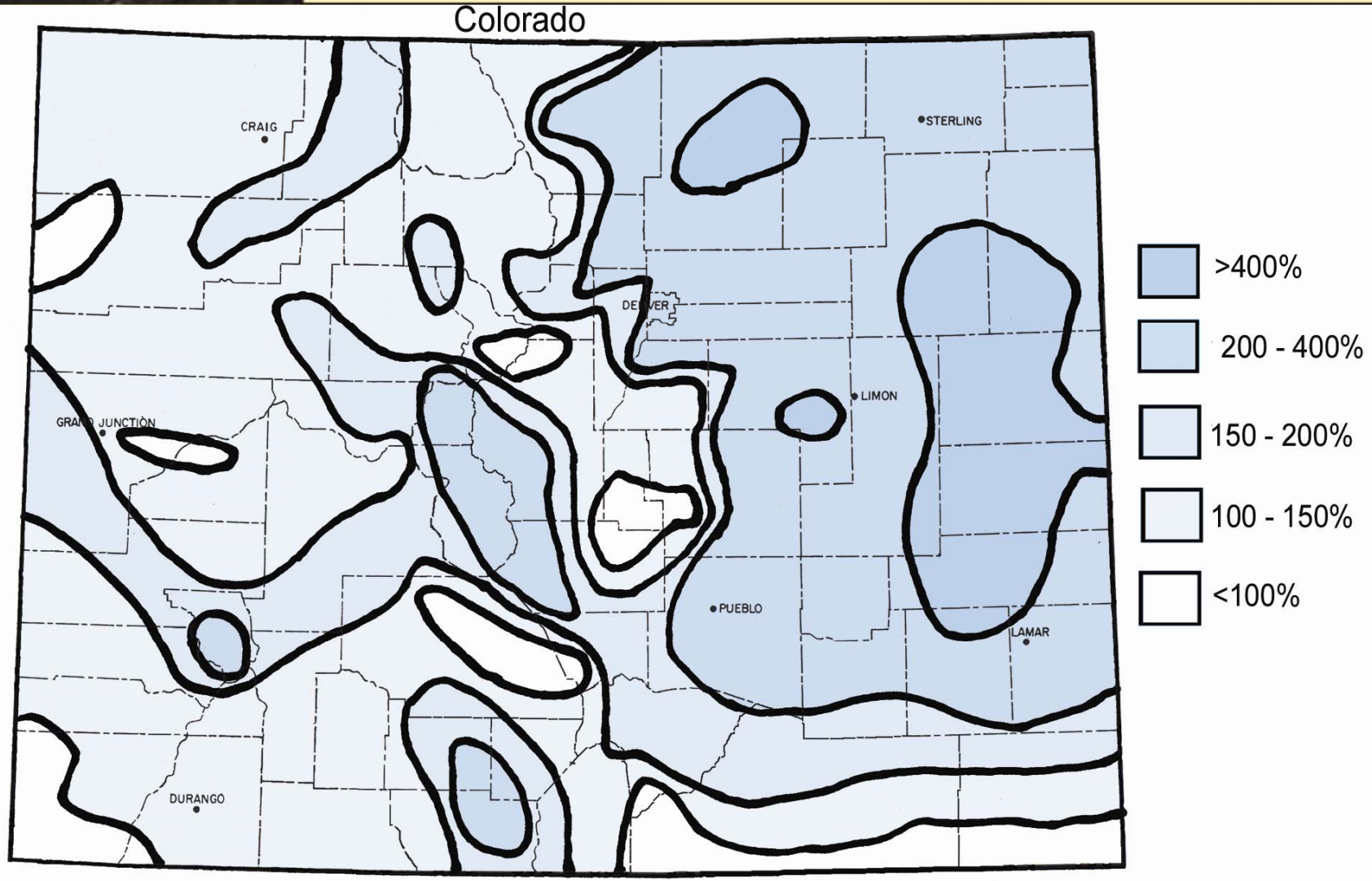
Water Year 2005 temperature departures from 1971-2000 average



WY2005 Highlights

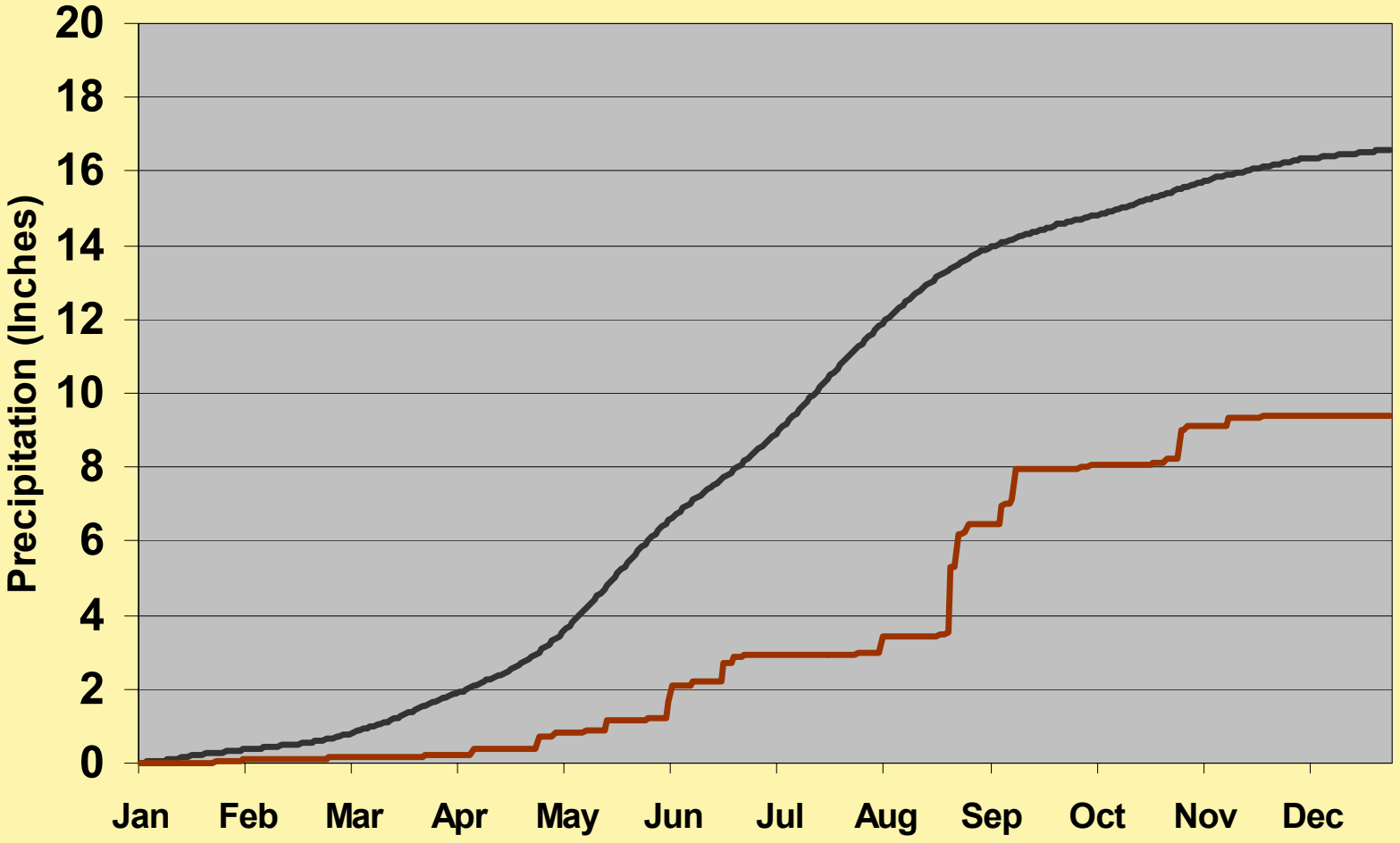
- Snow blitz across southern Rockies.
- Near-average snowpack in the South Platte basin.
- Mild winter (12th in a row).
- Beneficial April and early June precipitation.
- A hot and dry July.
- Below average growing season precipitation.
- A saving Denver-metro rain August 3-5th.
- Overall – Above average temperature, near to slightly below average precipitation.
- October 2005 – Great moisture on the Plains!

Oct 2005 map of precipitation as percent of average

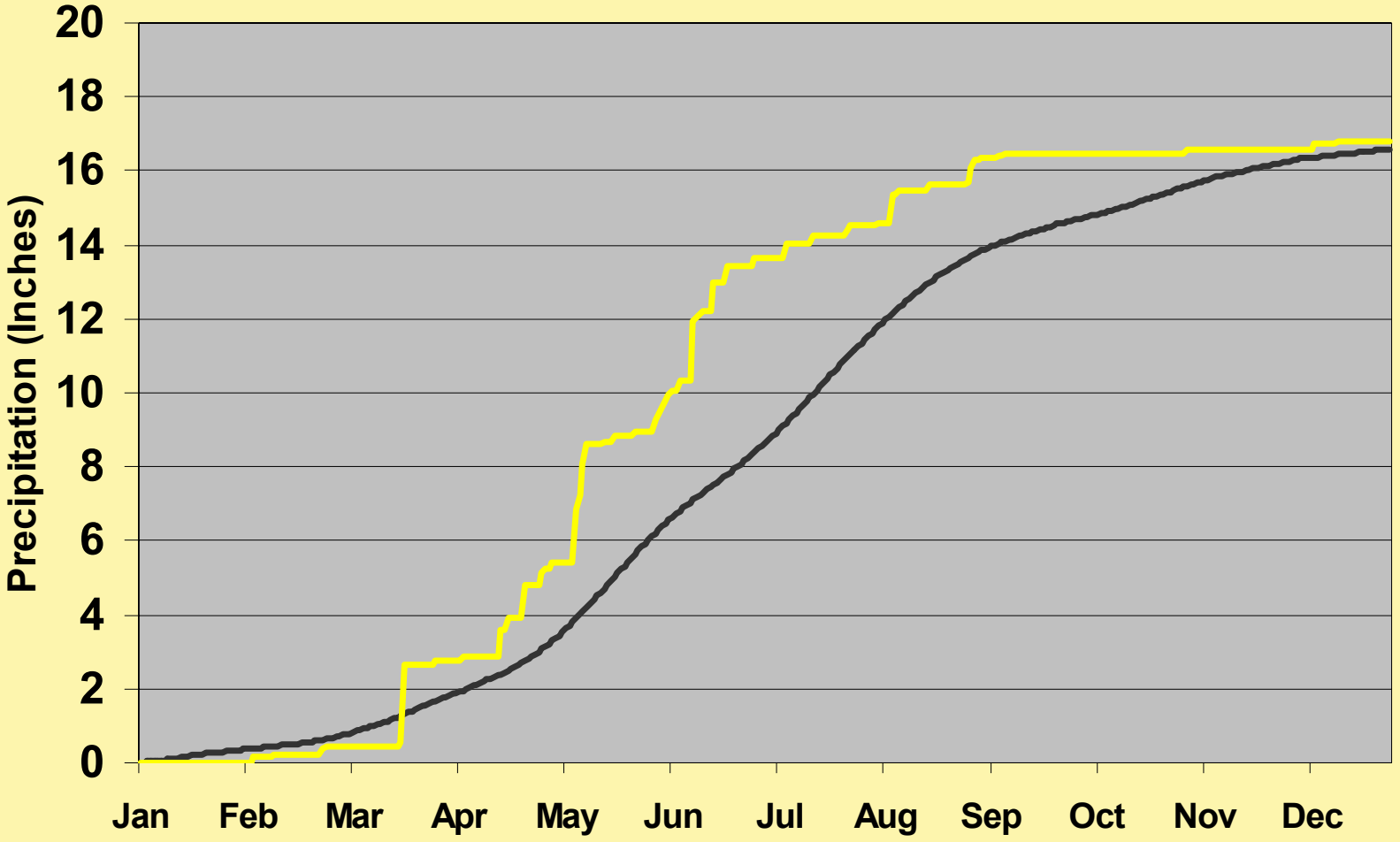


October 2005 precipitation as a percent of the 1971 - 2000 average.

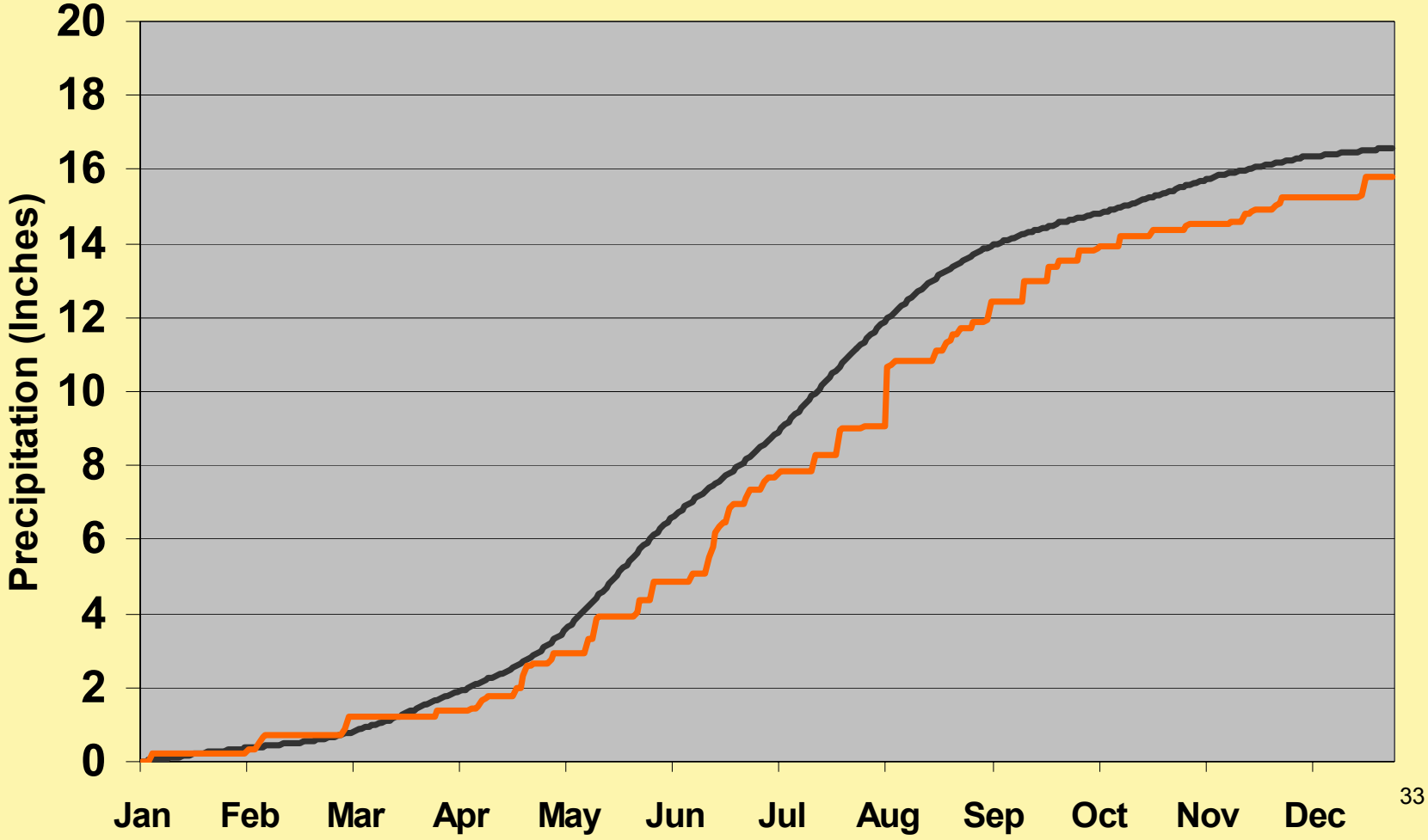
2002 Akron Daily Accumulated Precipitation



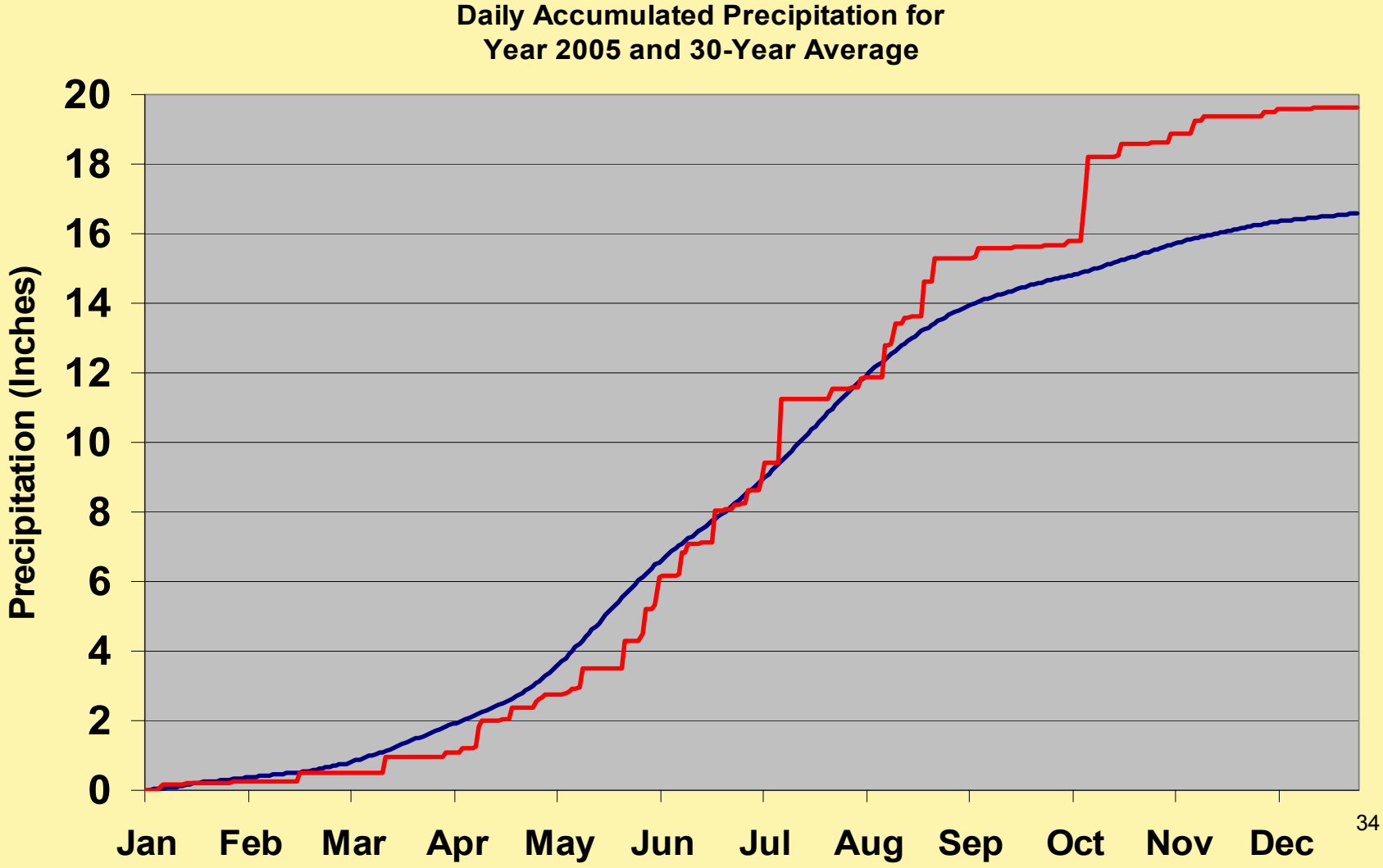
Akron 2003 daily precipitation compared to daily average



Akron 2004 daily precipitation compared to daily average



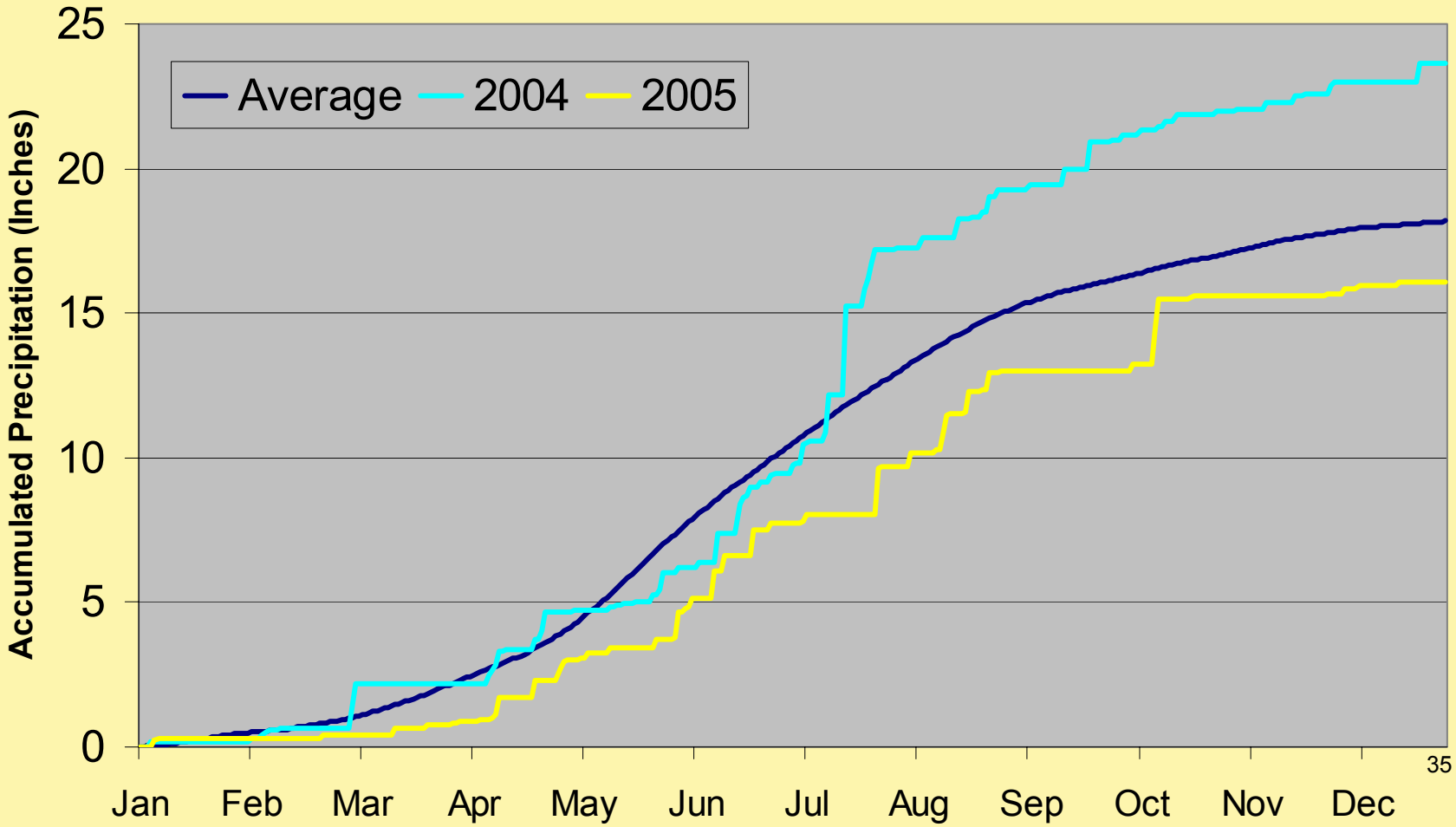
Akron 2005 daily precipitation compared to daily average



Holyoke, 2004 & 2005 daily accumulated precipitation compared to daily average

Holyoke

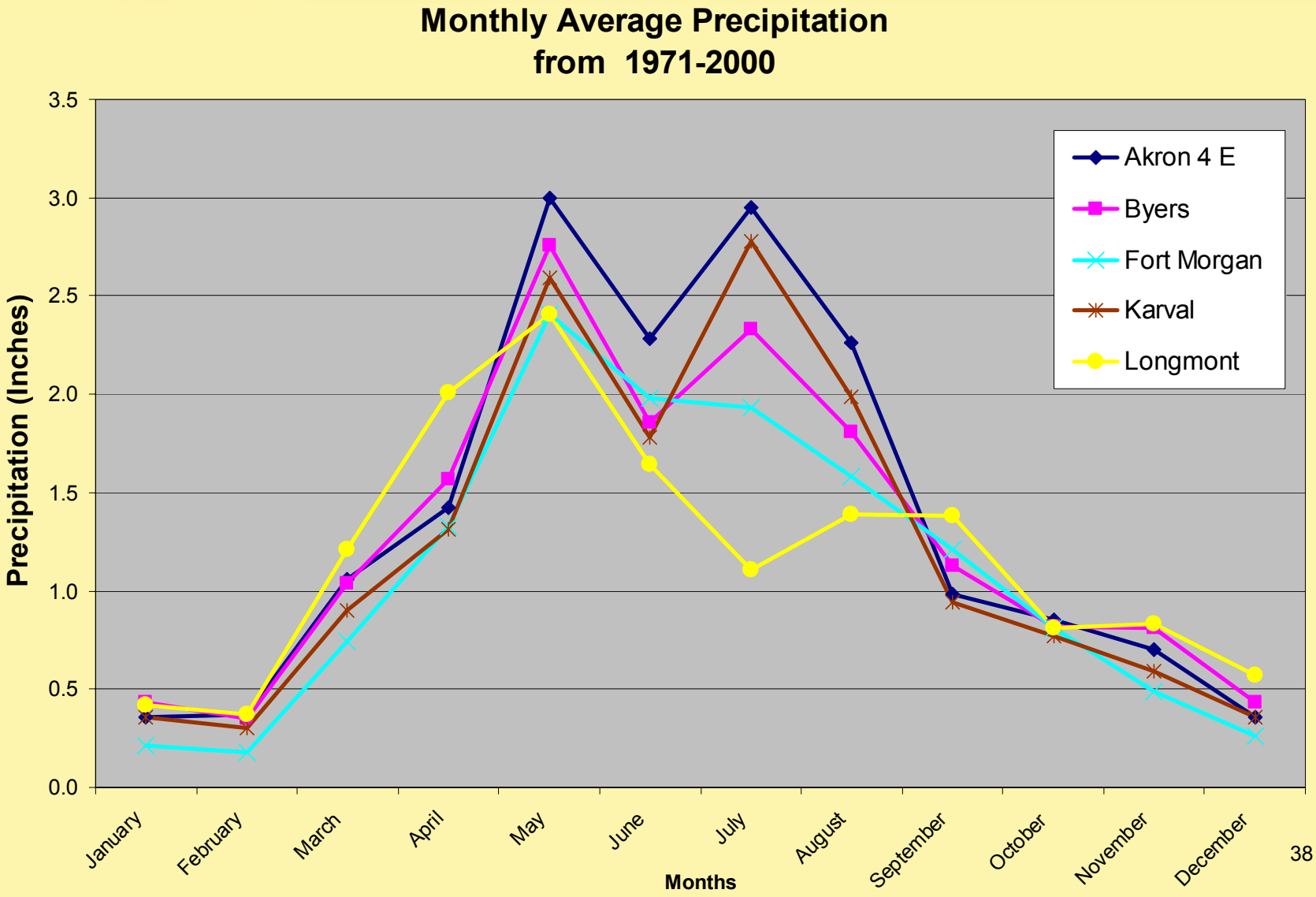
Daily Accumulated Precipitation for 2004, 2005 and 30-year average



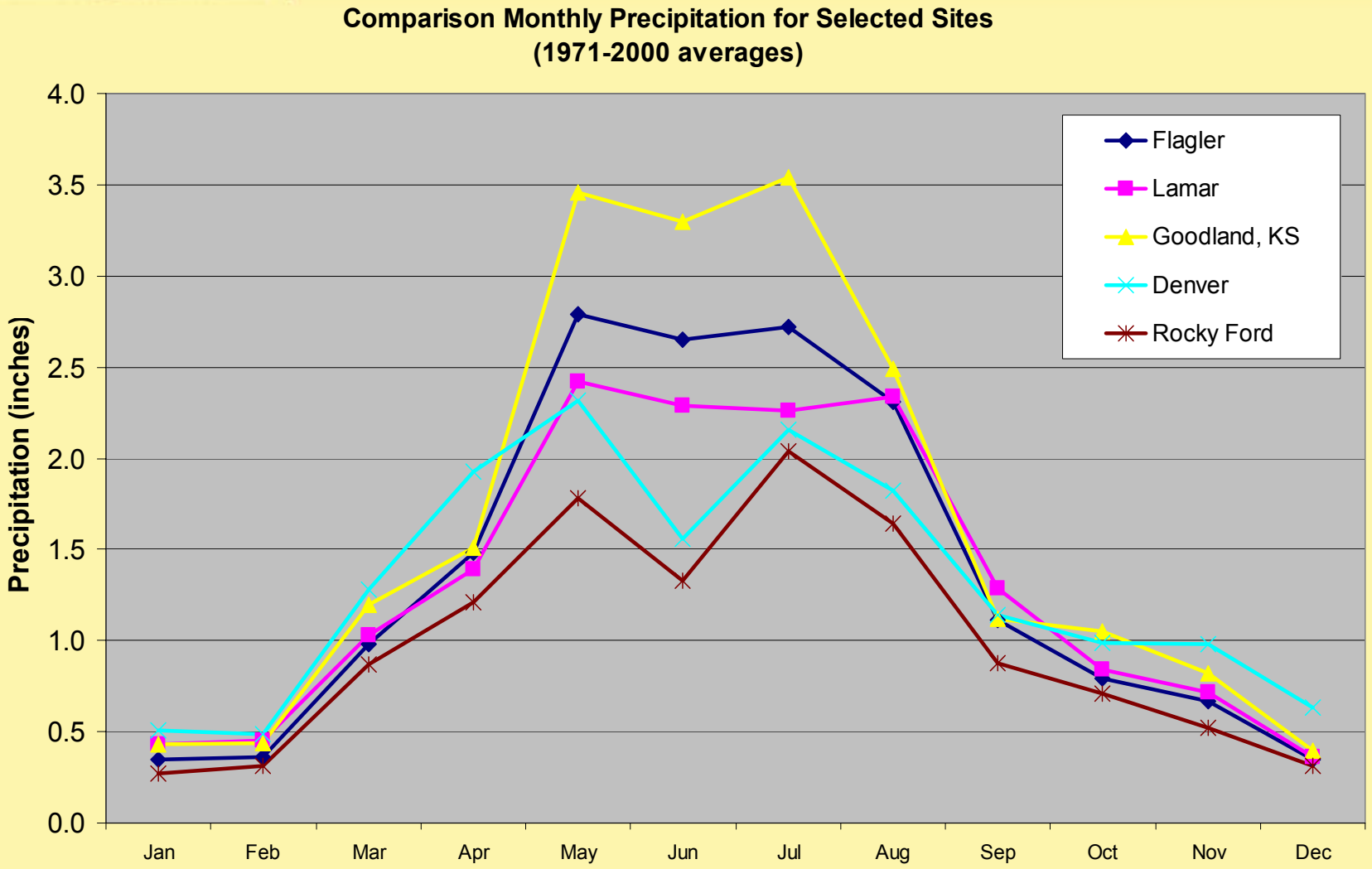
What Comes Next?


To predict the future,
take a another look at
the past.

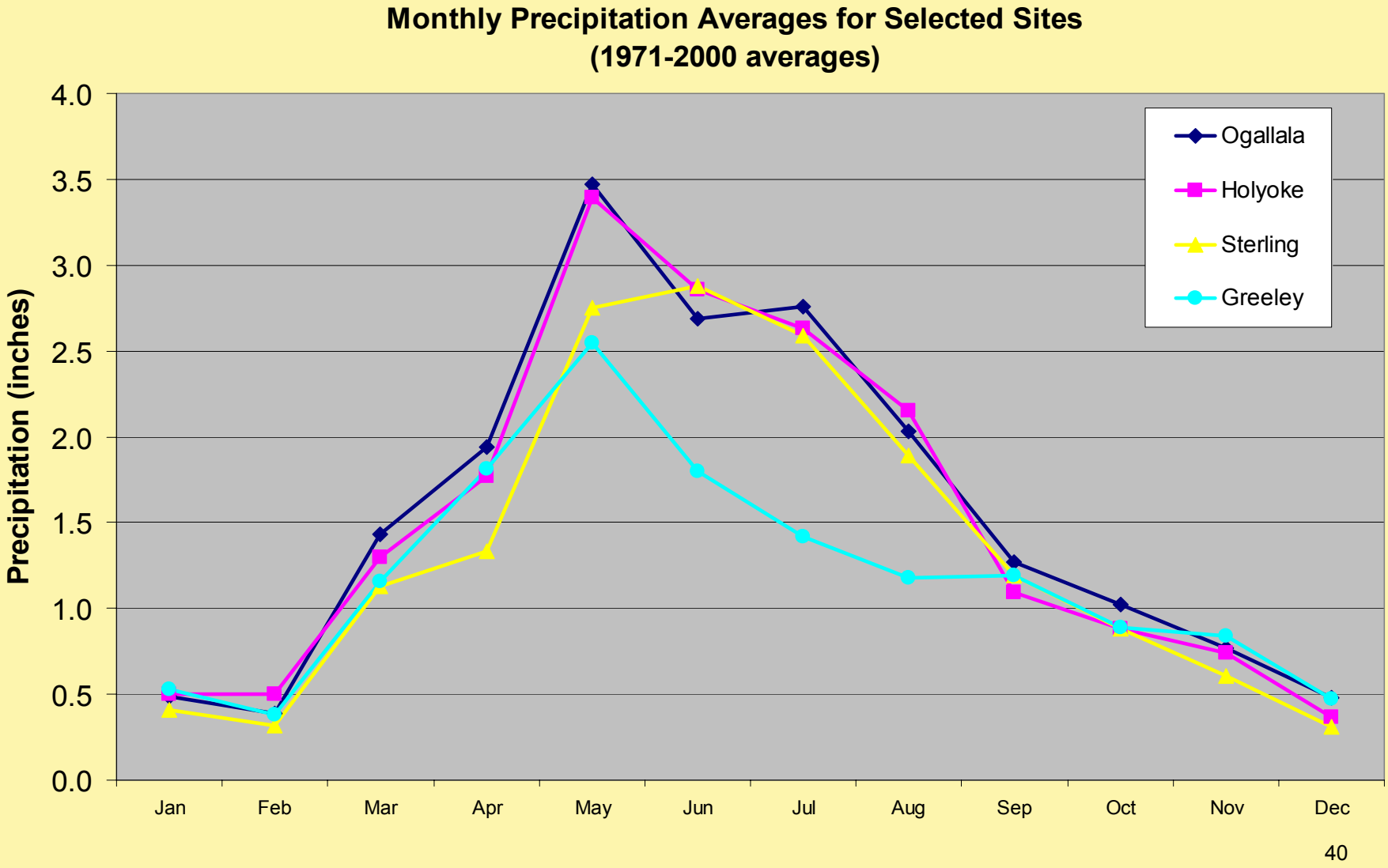
Precipitation Averages for Selected Sites



Precipitation Averages for Selected Sites



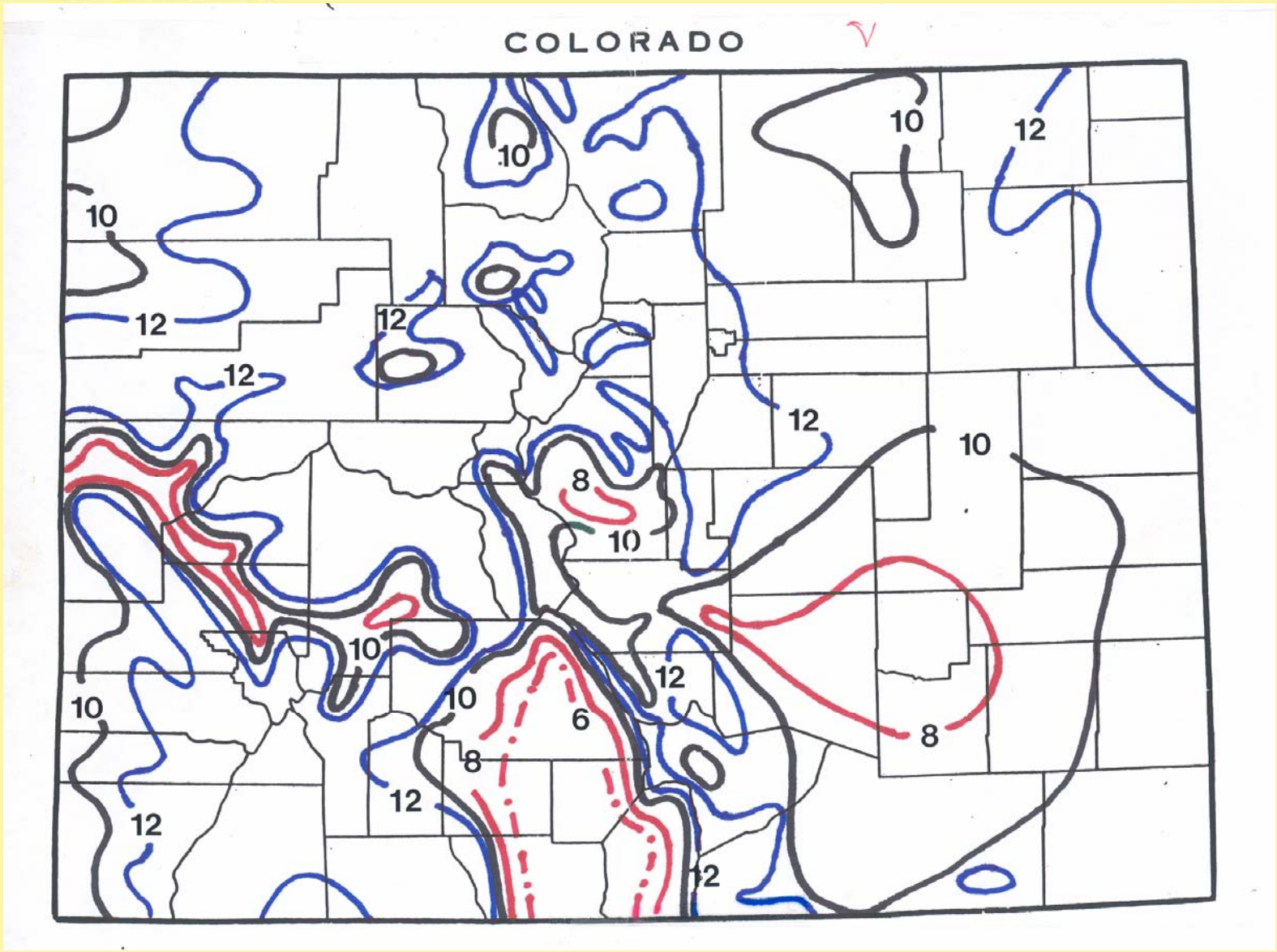
Precipitation Averages for Selected Sites



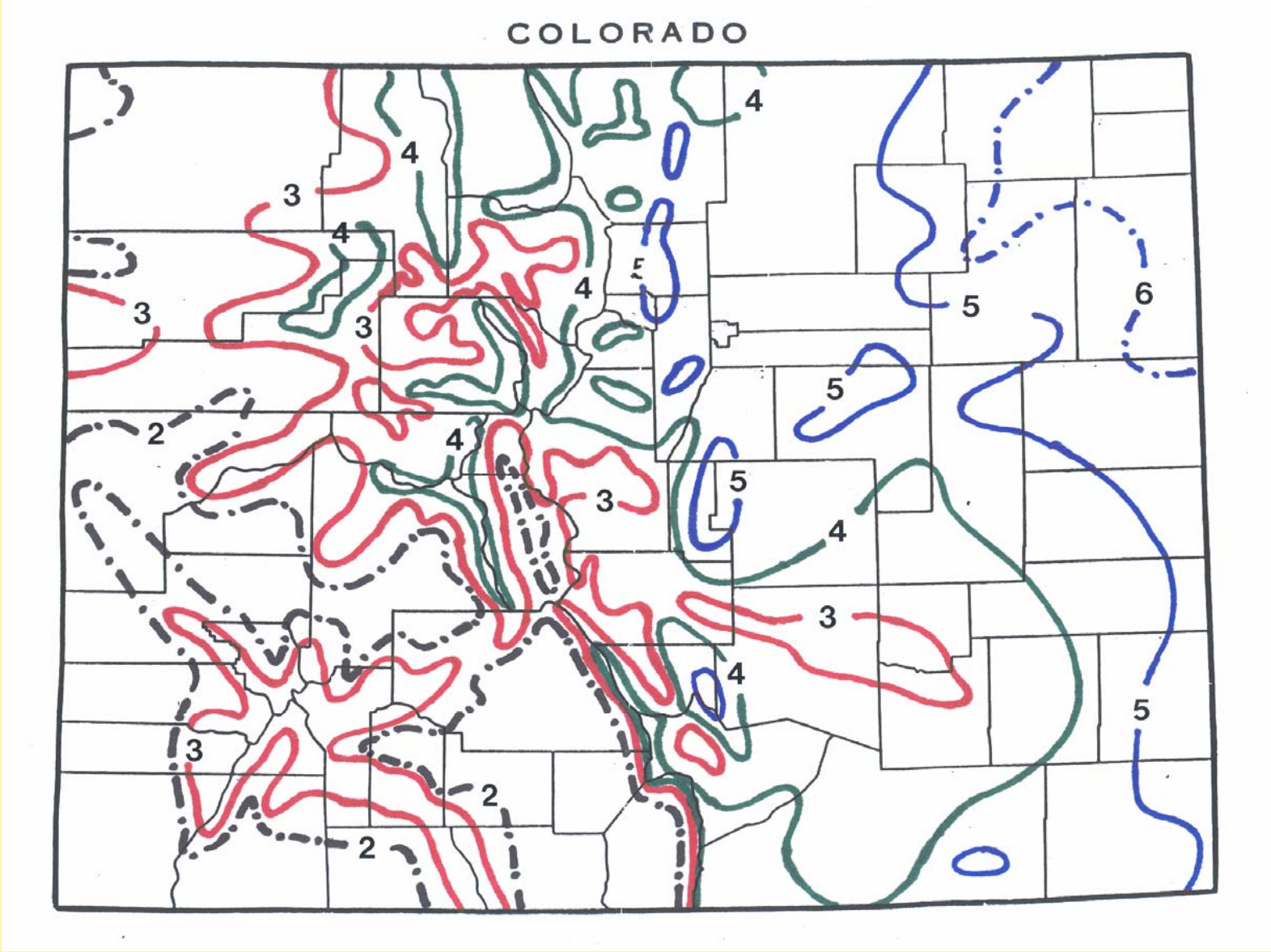
Precipitation

- A few storms contribute a large fraction of annual precipitation while many small events contribute a small fraction.

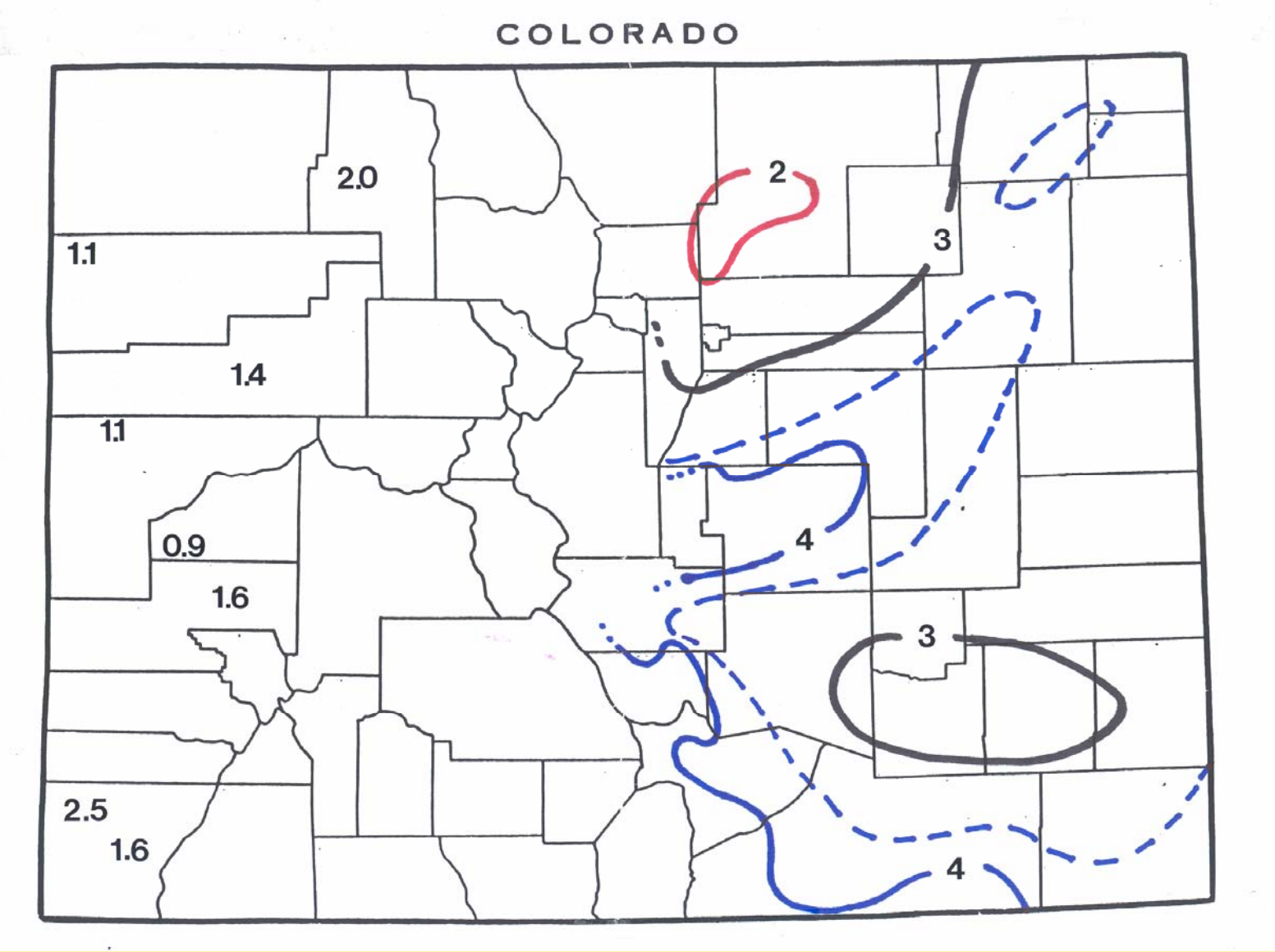
Average Wheat-Season Precipitation
September – June (Inches)
(Based on 1961-90 observed data)



Average May-June Precipitation (Inches) (Based on 1961-90 observed data)



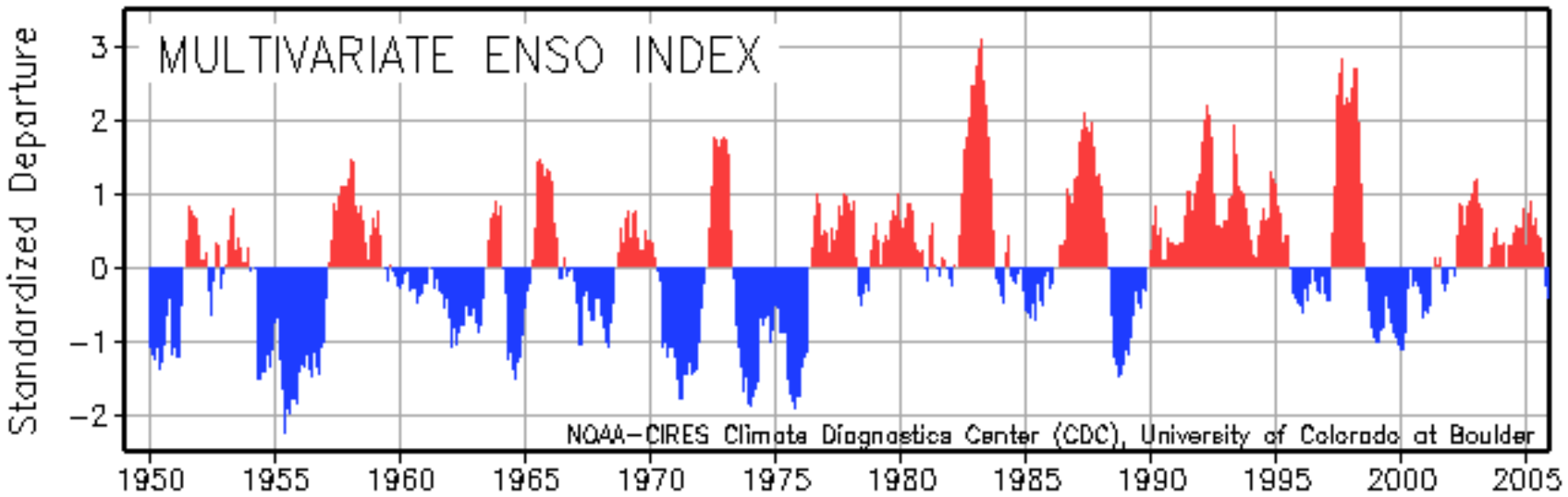
Average Precipitation (Inches)
For the Period 15 July – 25 August
(Based on 1961-1990 observed data)



Drought or Flood?

Which Will It Be?

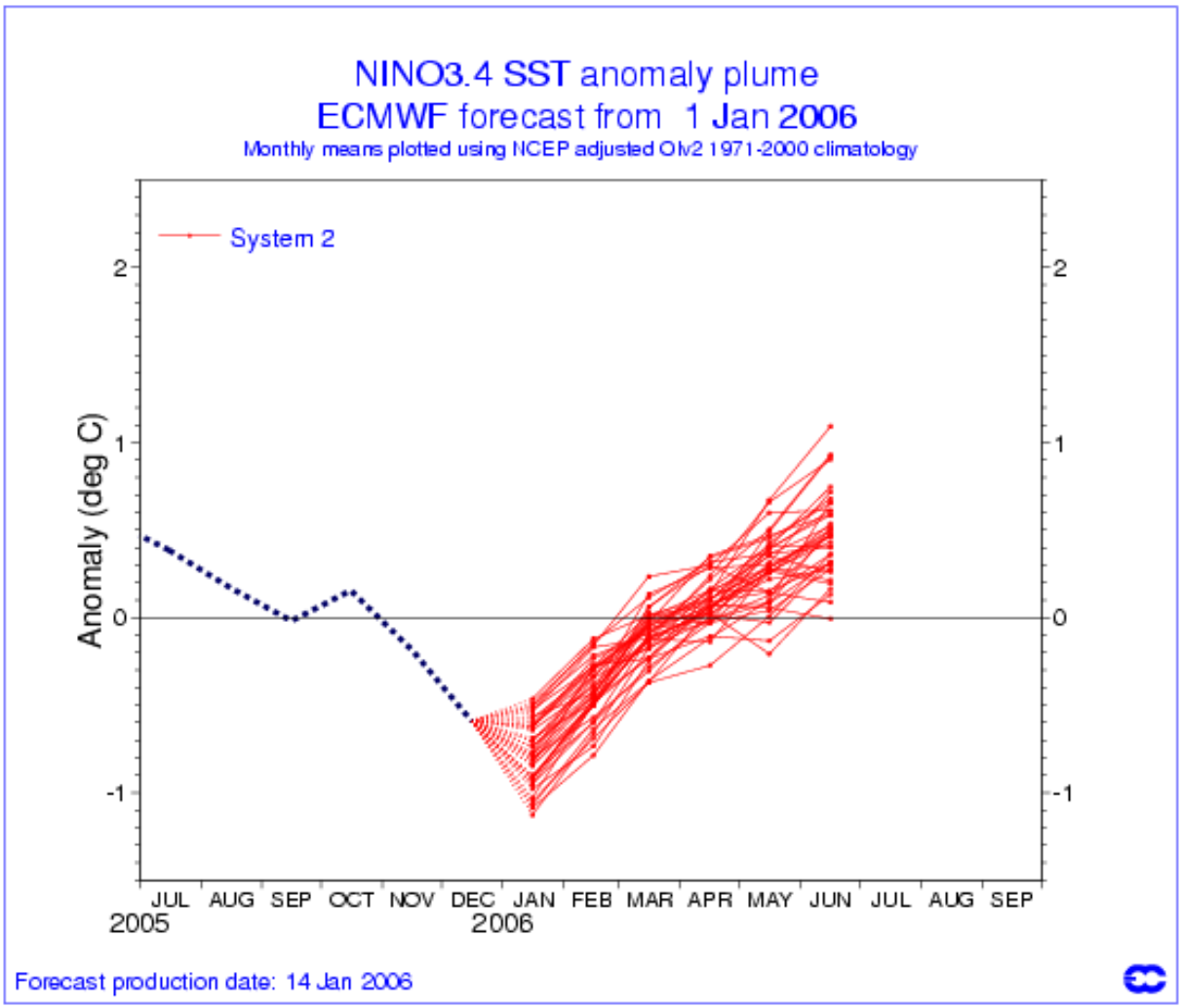
Multivariate ENSO Index (MEI)



Last update: January 10, 2006

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

El Nino Forecast



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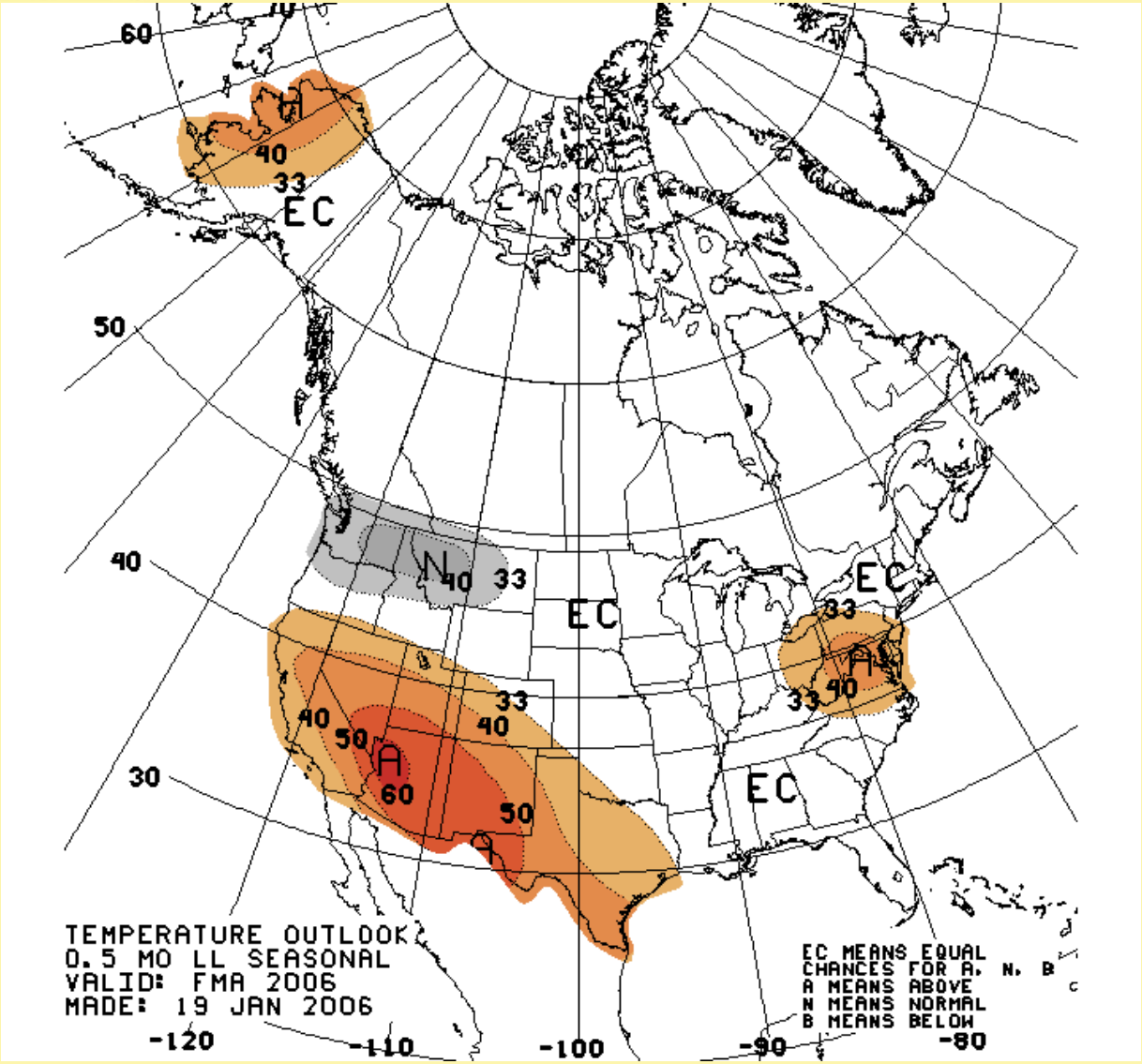
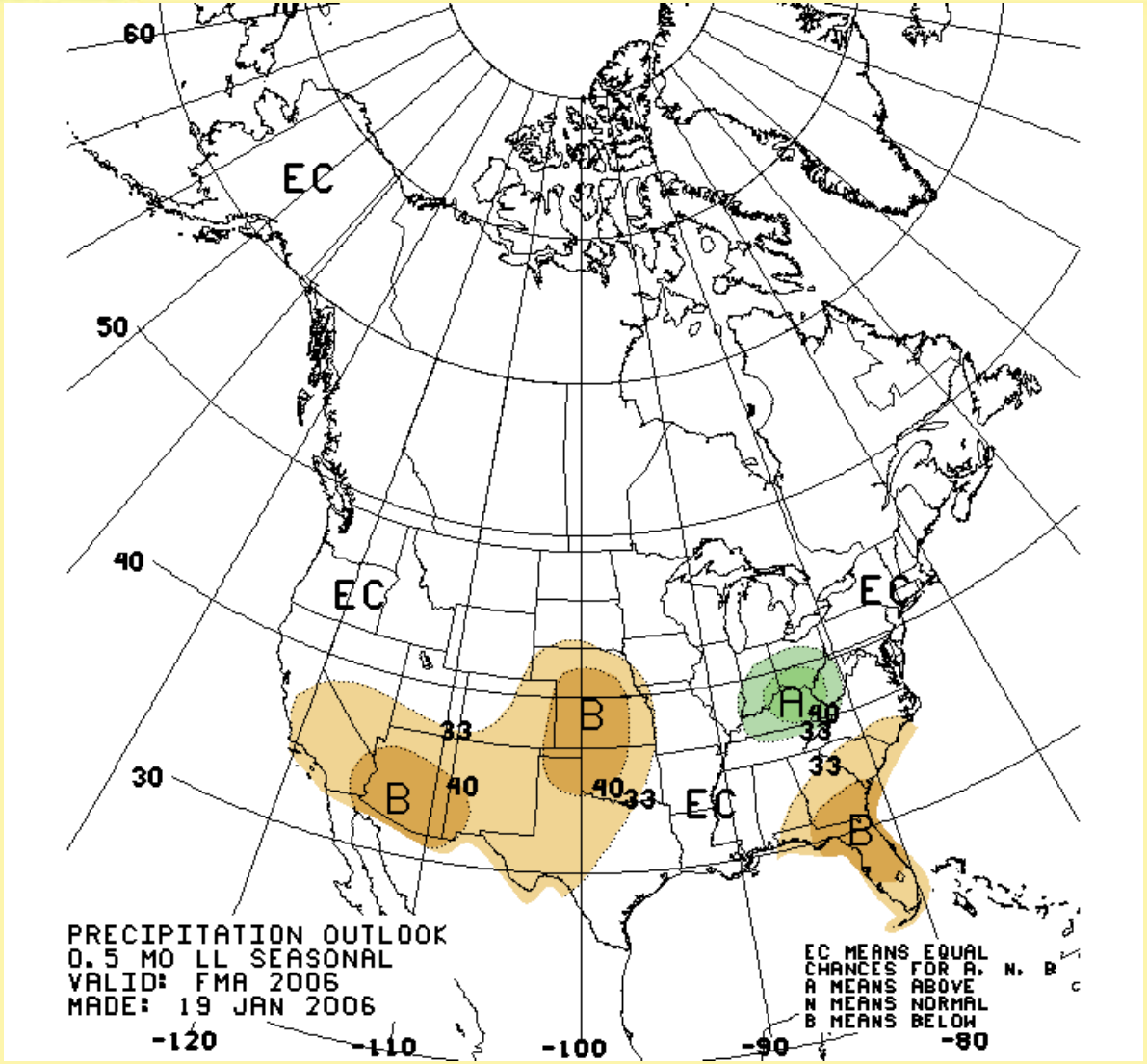
Temperature
Feb-Apr 2006



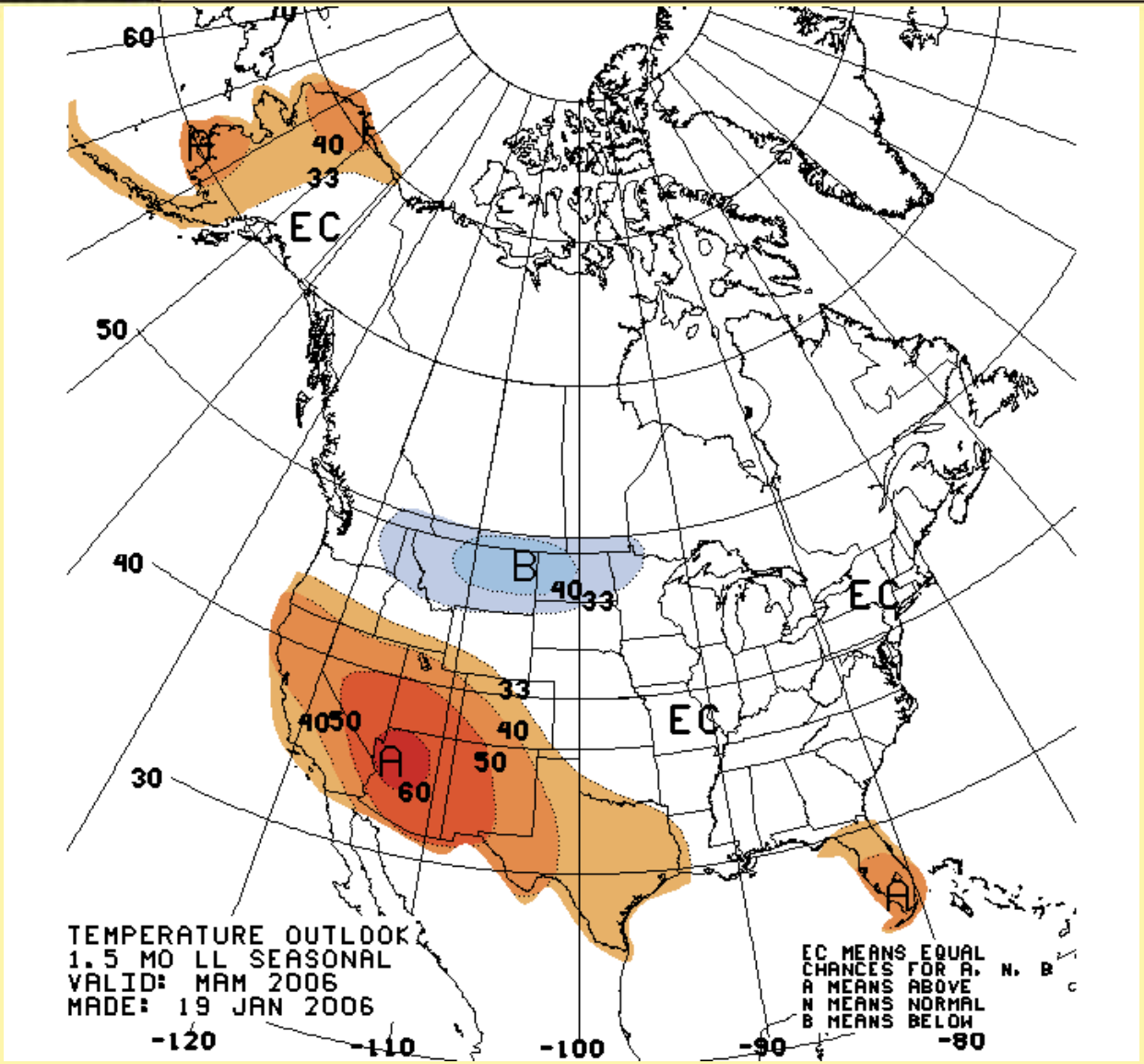
http://www.cpc.ncep.noaa.gov/products/predictions/multi_season/13_seasonal_outlooks/color/churchill.html

Precipitation Feb-Apr 2006



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

Temperature
Mar-May 2006



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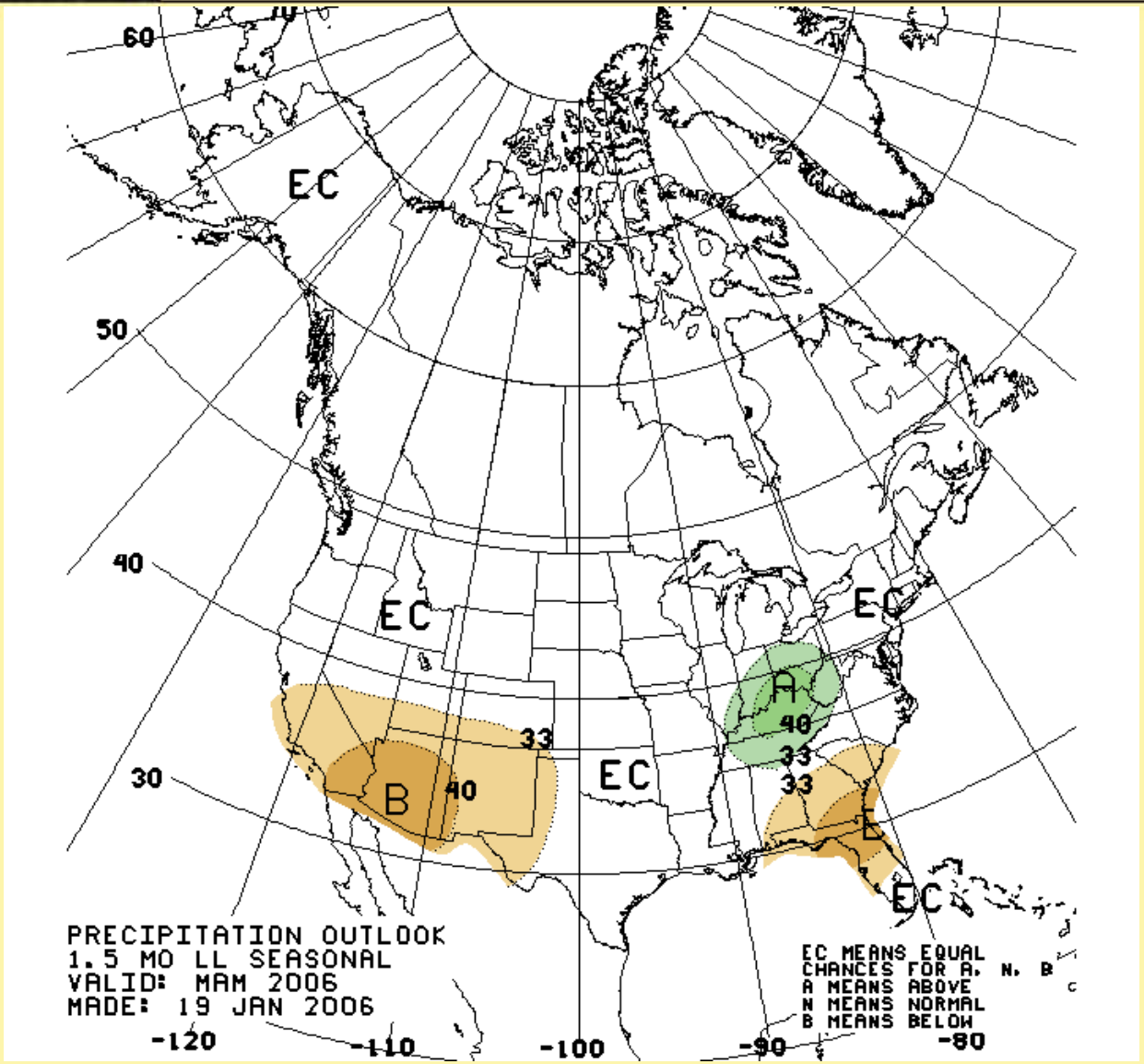
Precipitation Mar-May 2006



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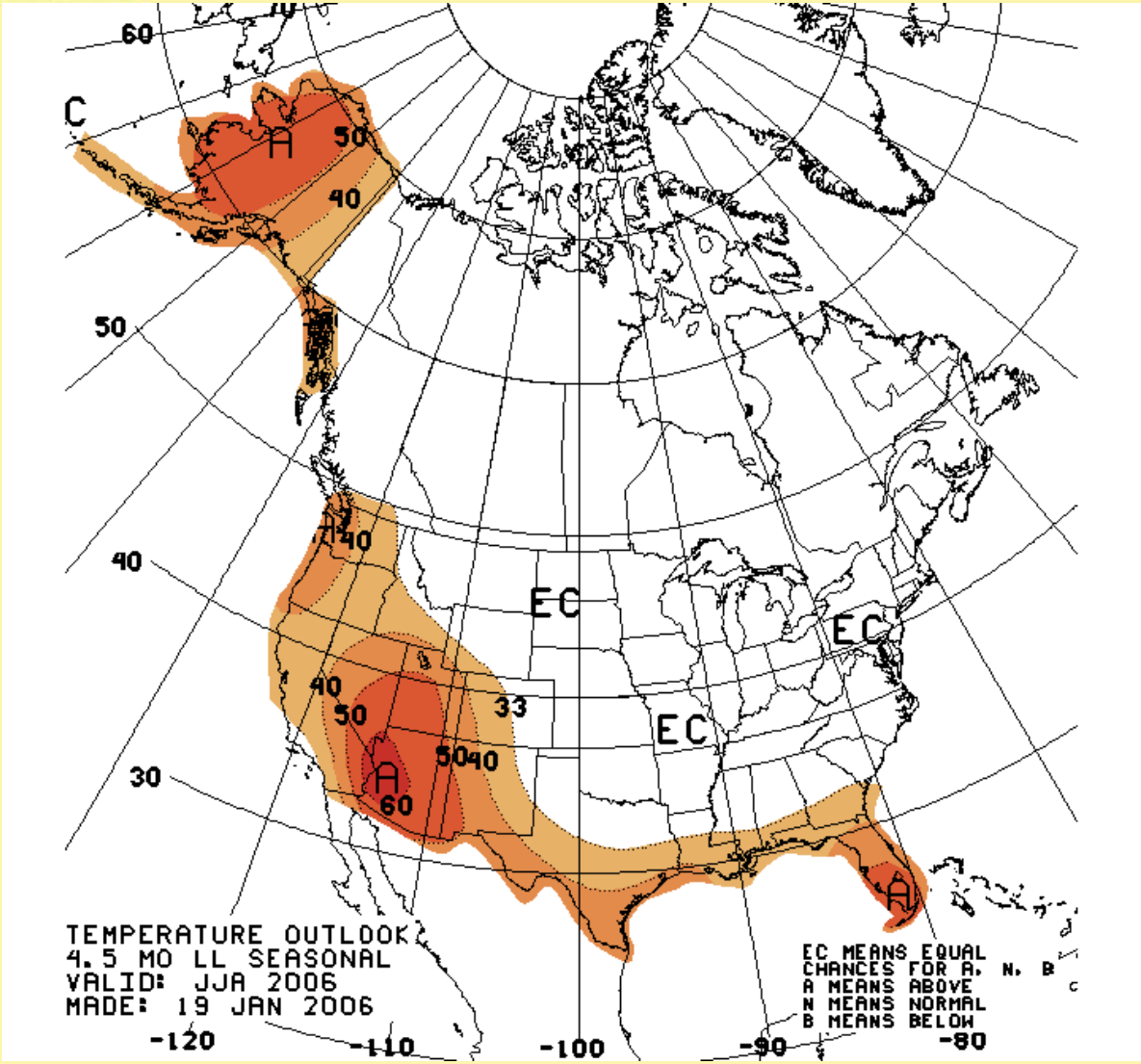
Temperature Jun-Aug 2006



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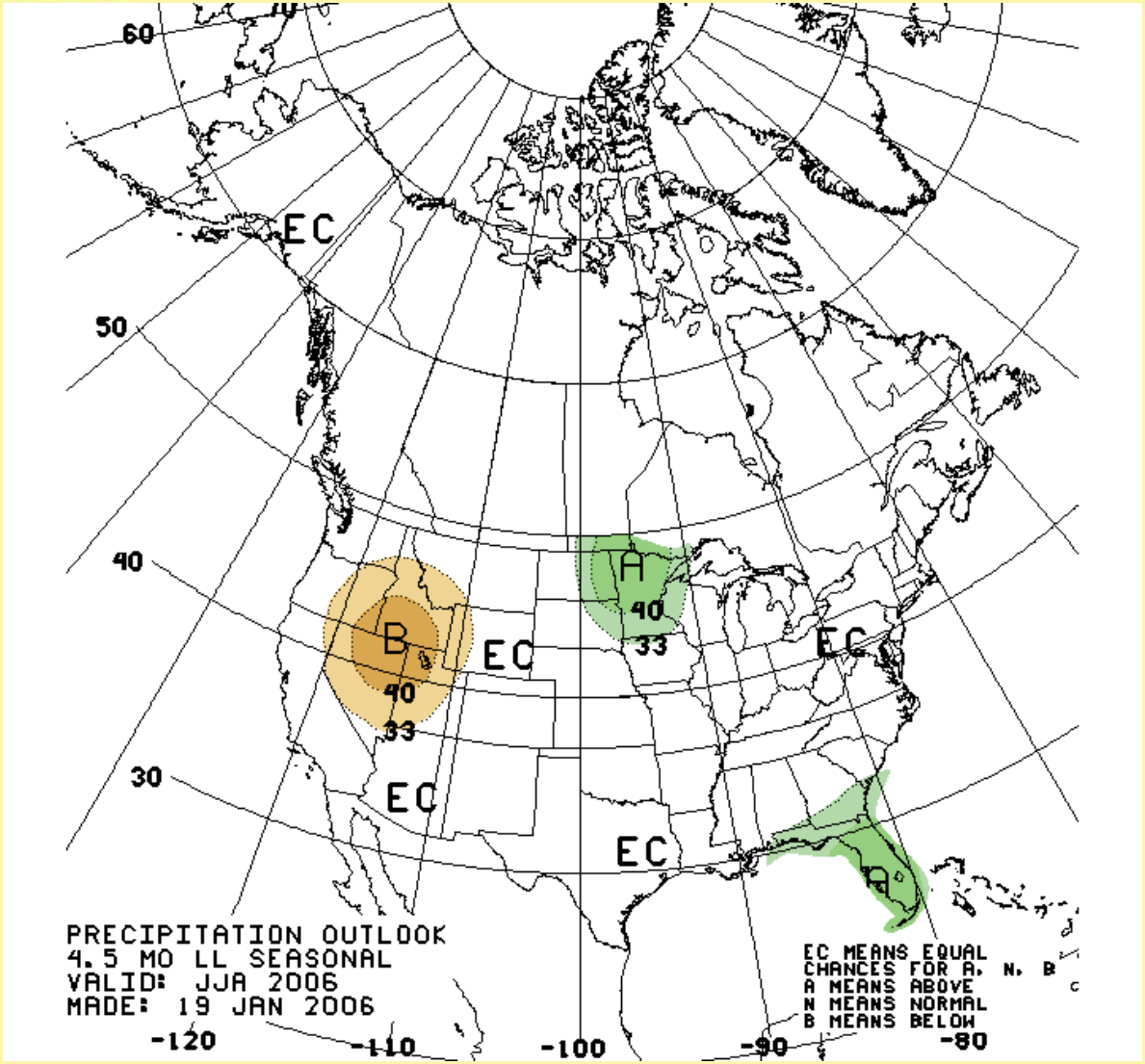
Precipitation Jun-Aug 2006



From the Colorado Prediction Center

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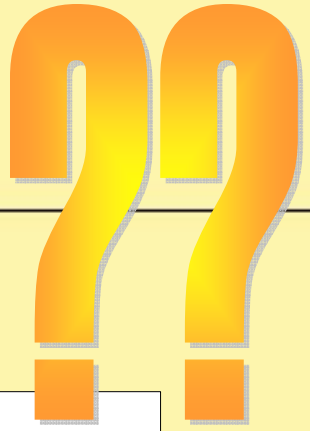
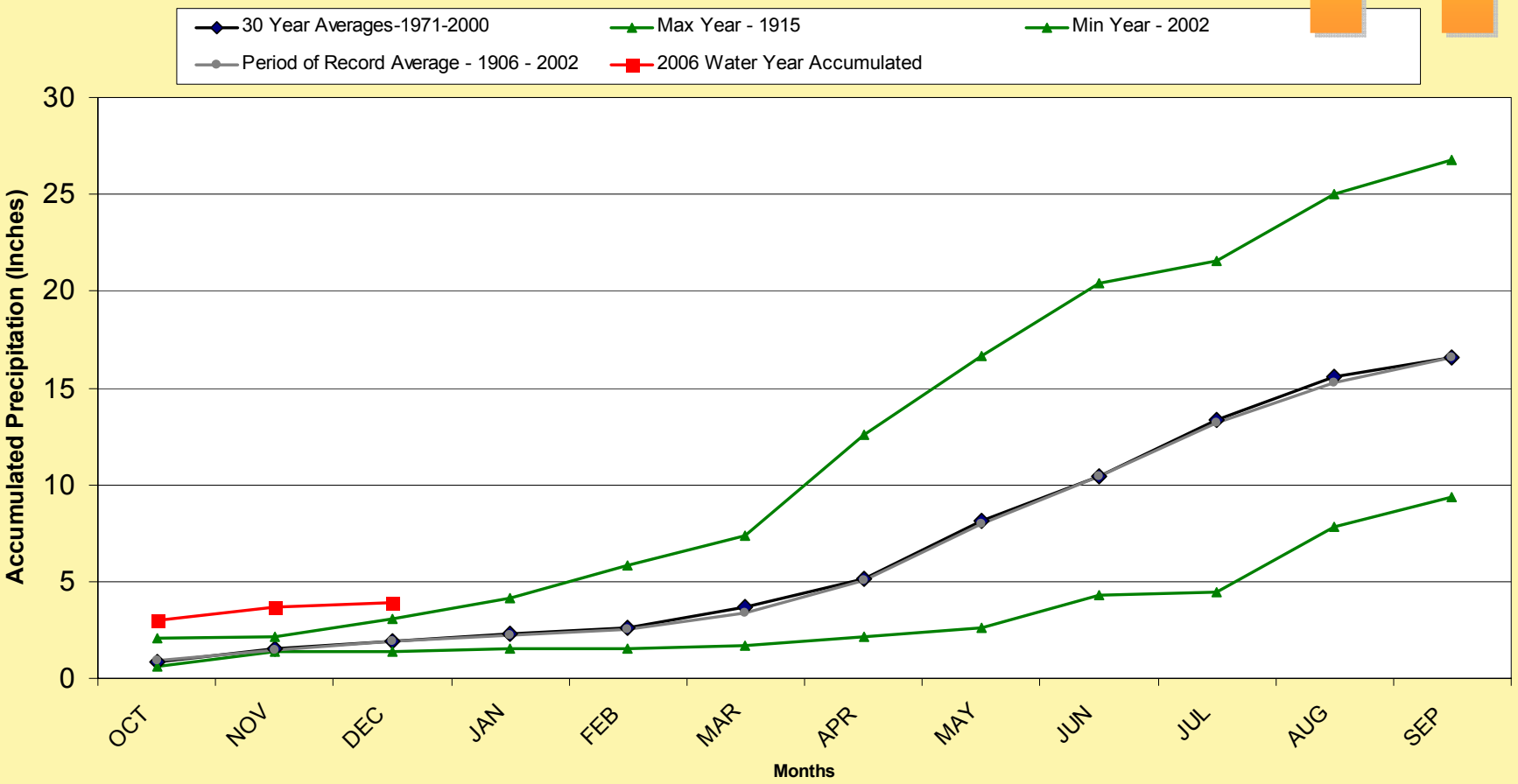
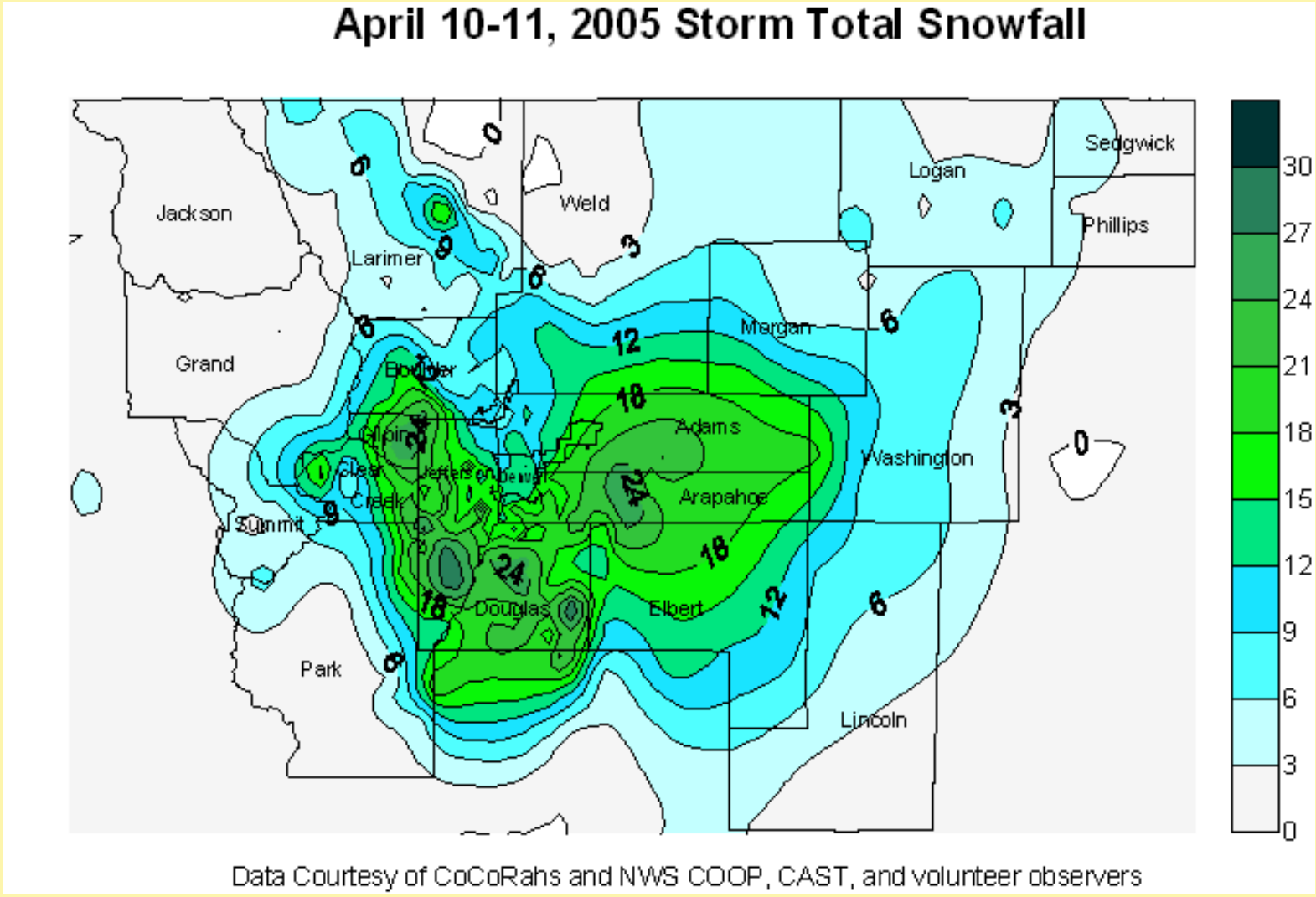
Our Path For 2006



Akron 4E
2006 Water Year

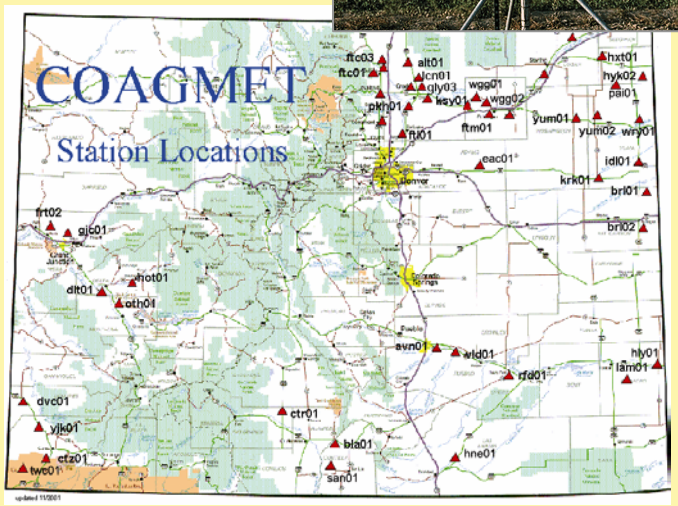


If we can't predict it, at least we can track it!



CoAgMet
Weather Data for Agriculture

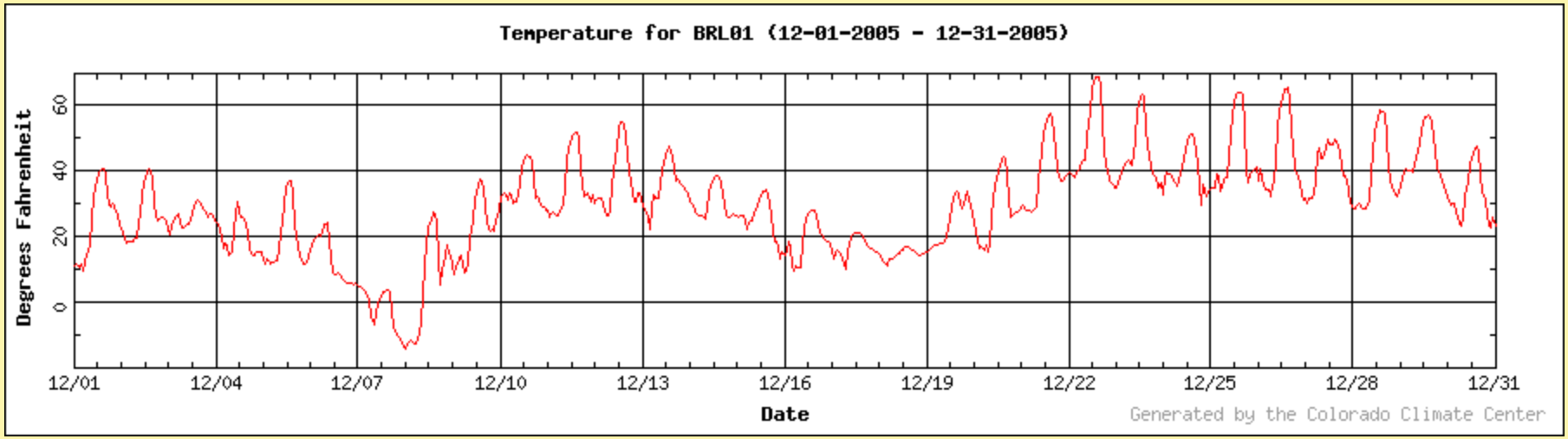
- *Automated weather stations with daily and hourly readings of:*
  - *Temperature*
  - *Humidity*
  - *Wind*
  - *Precipitation*
  - *Solar Energy*
  - *Evapotranspiration*



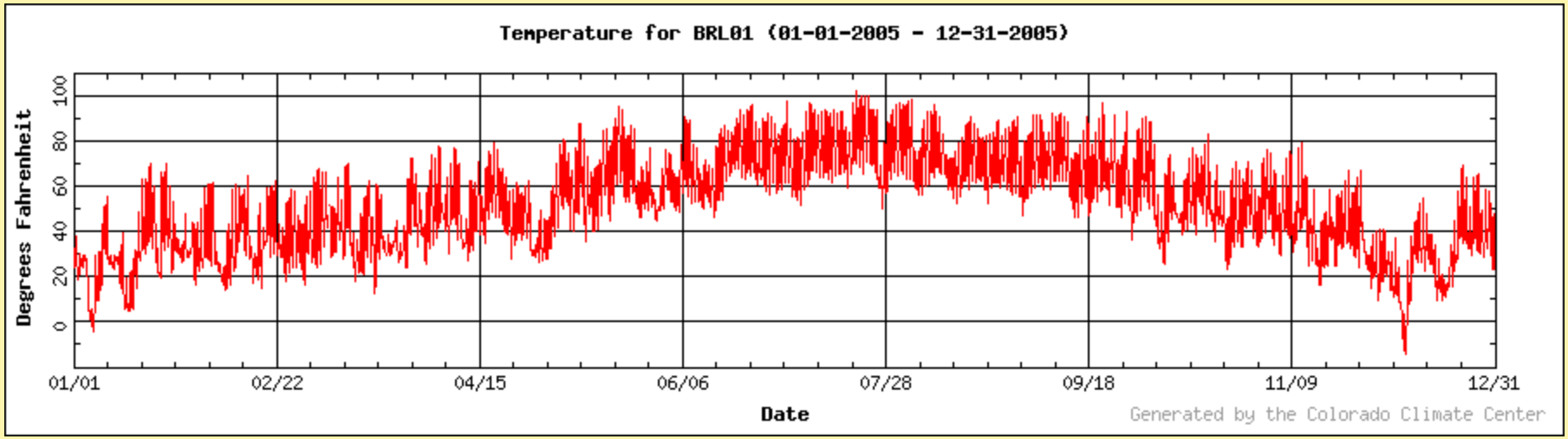
http://www.coagmet.com

Temperature 2005 CoAgMet graph

Burlington, Dec 1-31, 2005

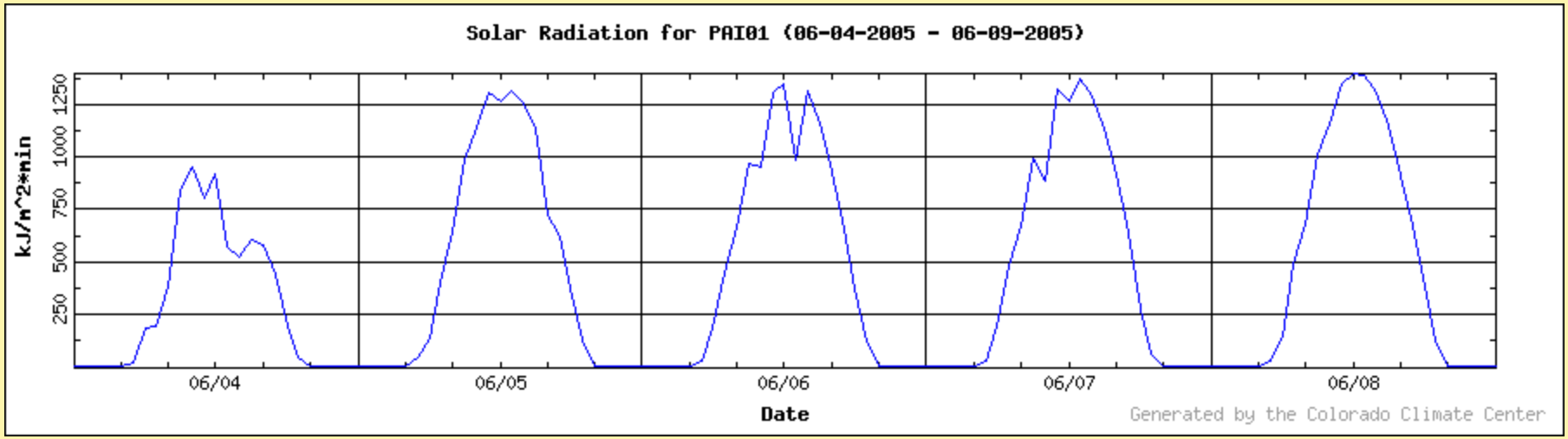


Burlington, Jan–Dec 2005

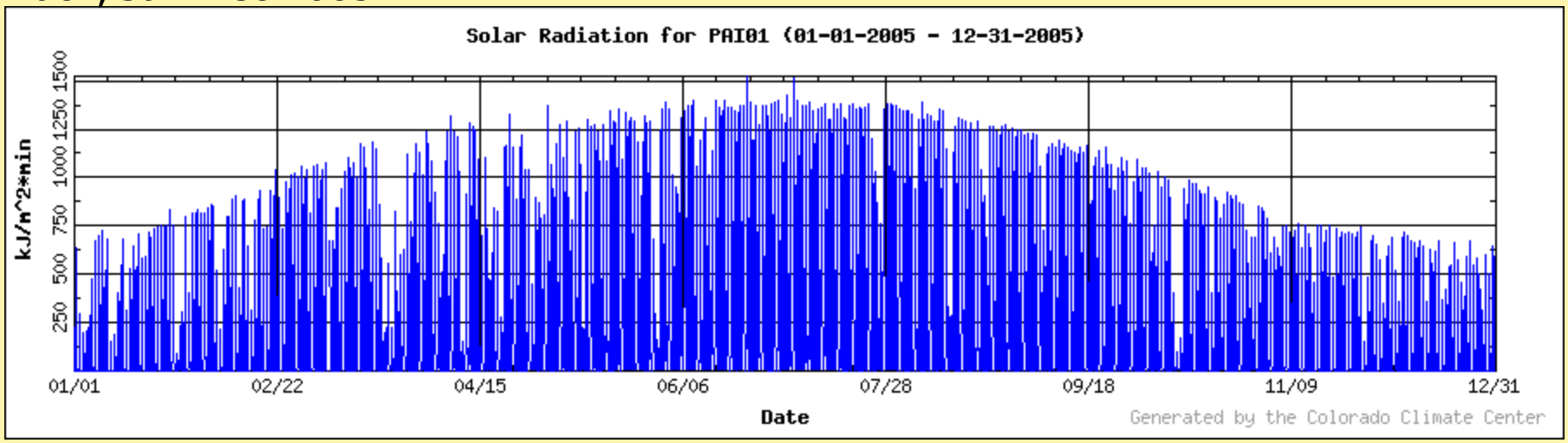


Solar Energy

Paoli, June 4 – 8, 2005

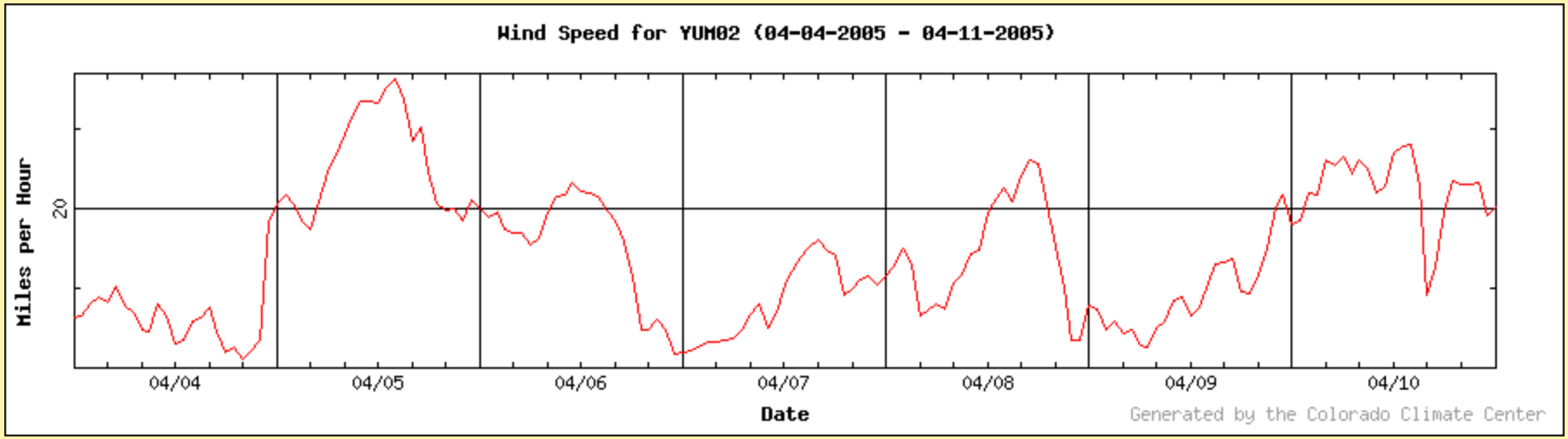


Paoli, Jan-Dec 2005

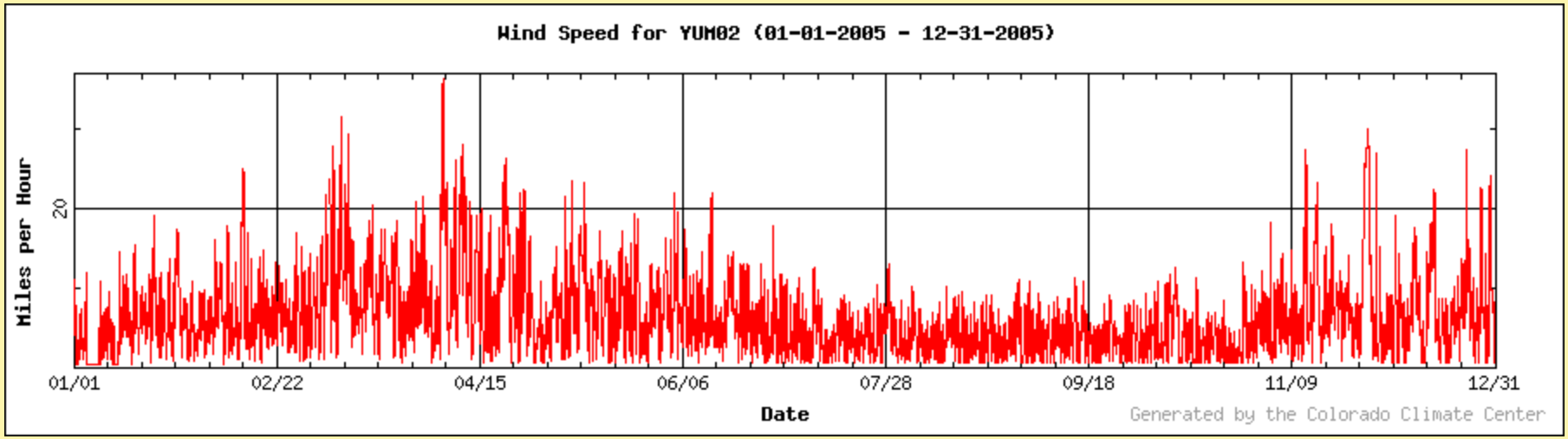


Wind Speed

Yuma, April 4-11, 2005



Yuma, Jan-Dec 2005



And you can help too!

CoCoRaHS

Community Collaborative Rain, Hail, and Snow Network

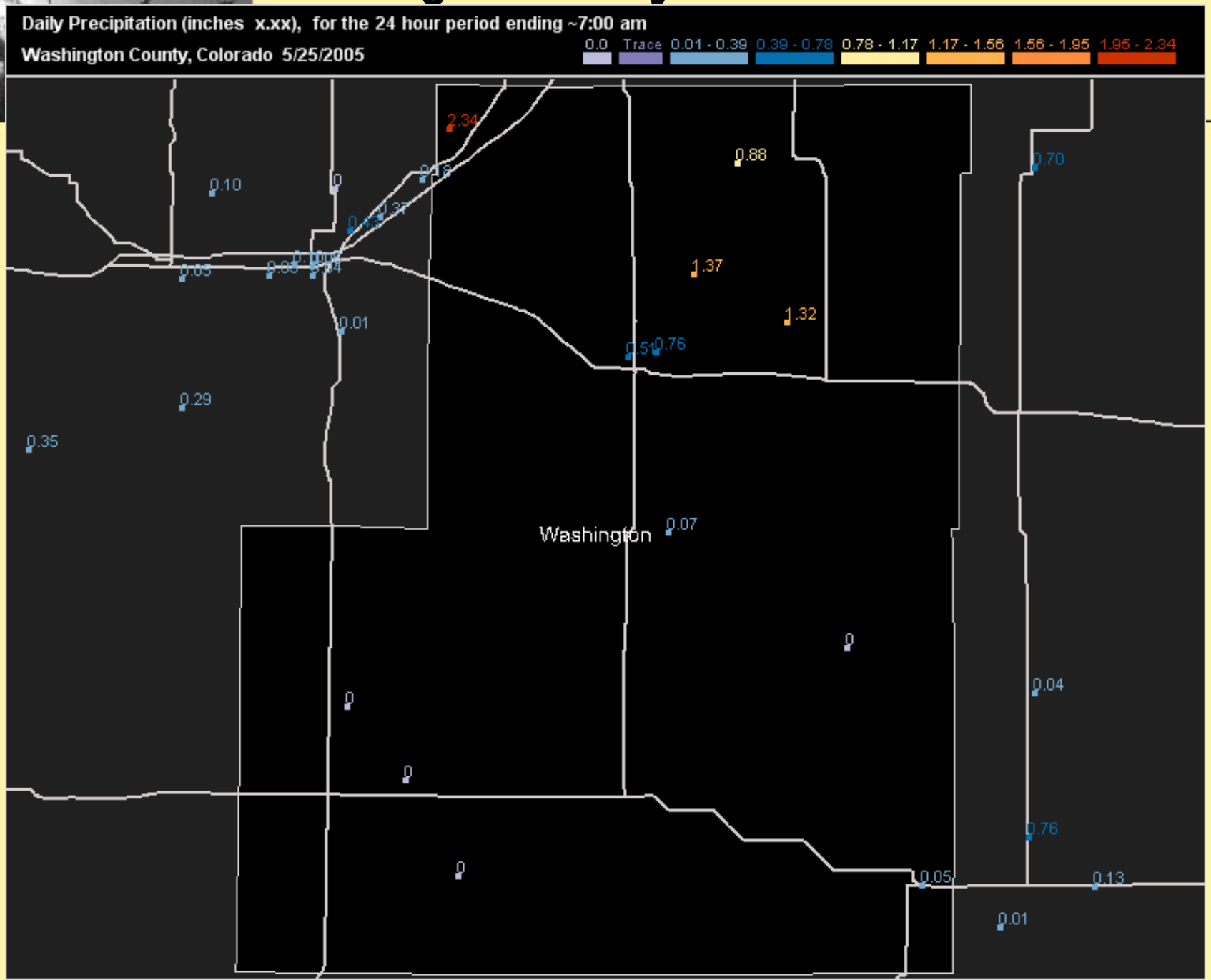



http://www.cocorahs.org

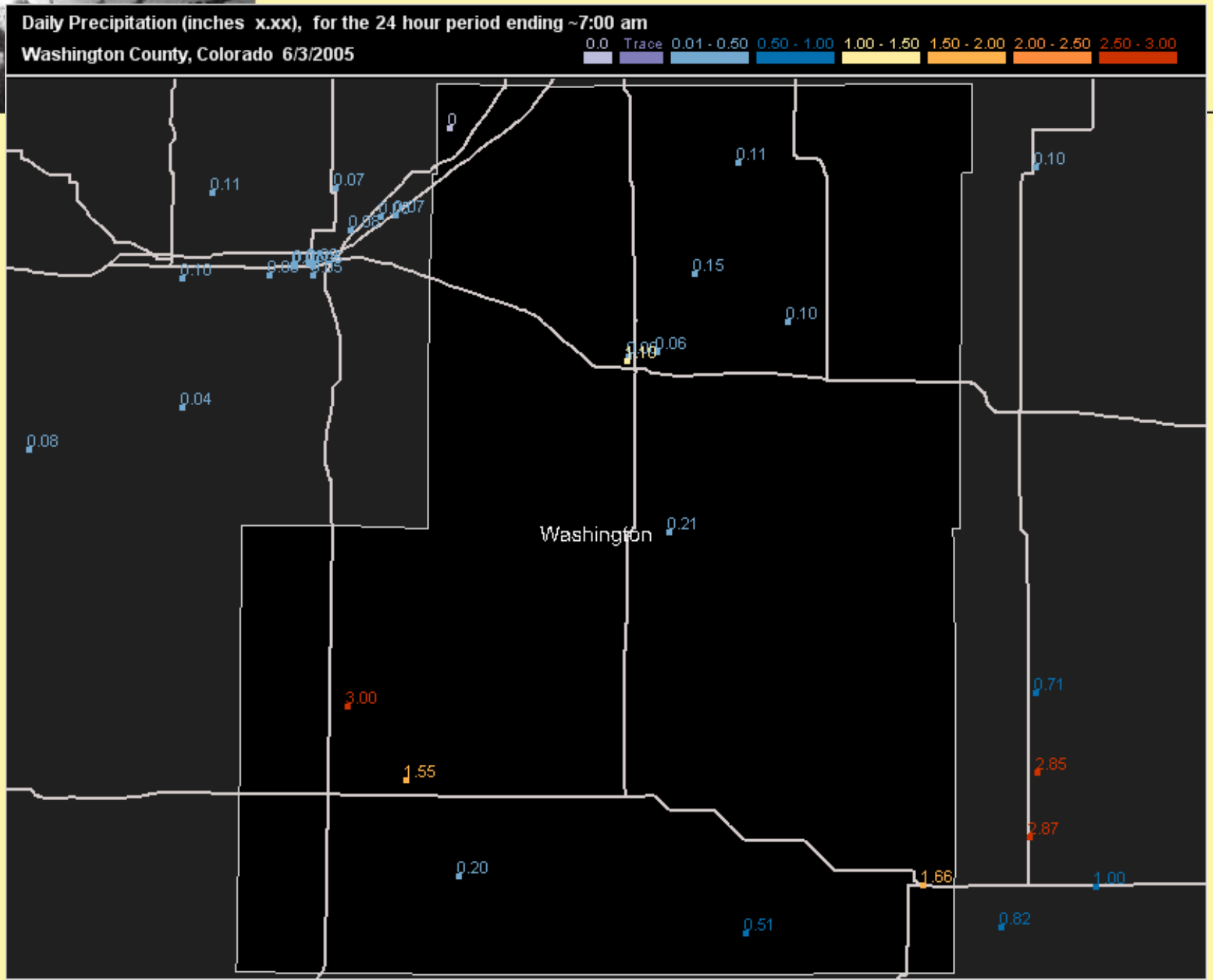
- Over 1,000 volunteers participate in rain, hail and snow measurements.
- More accurate maps, verifies forecasting, radar research, crop damage, drought/flooding, educational purposes.

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

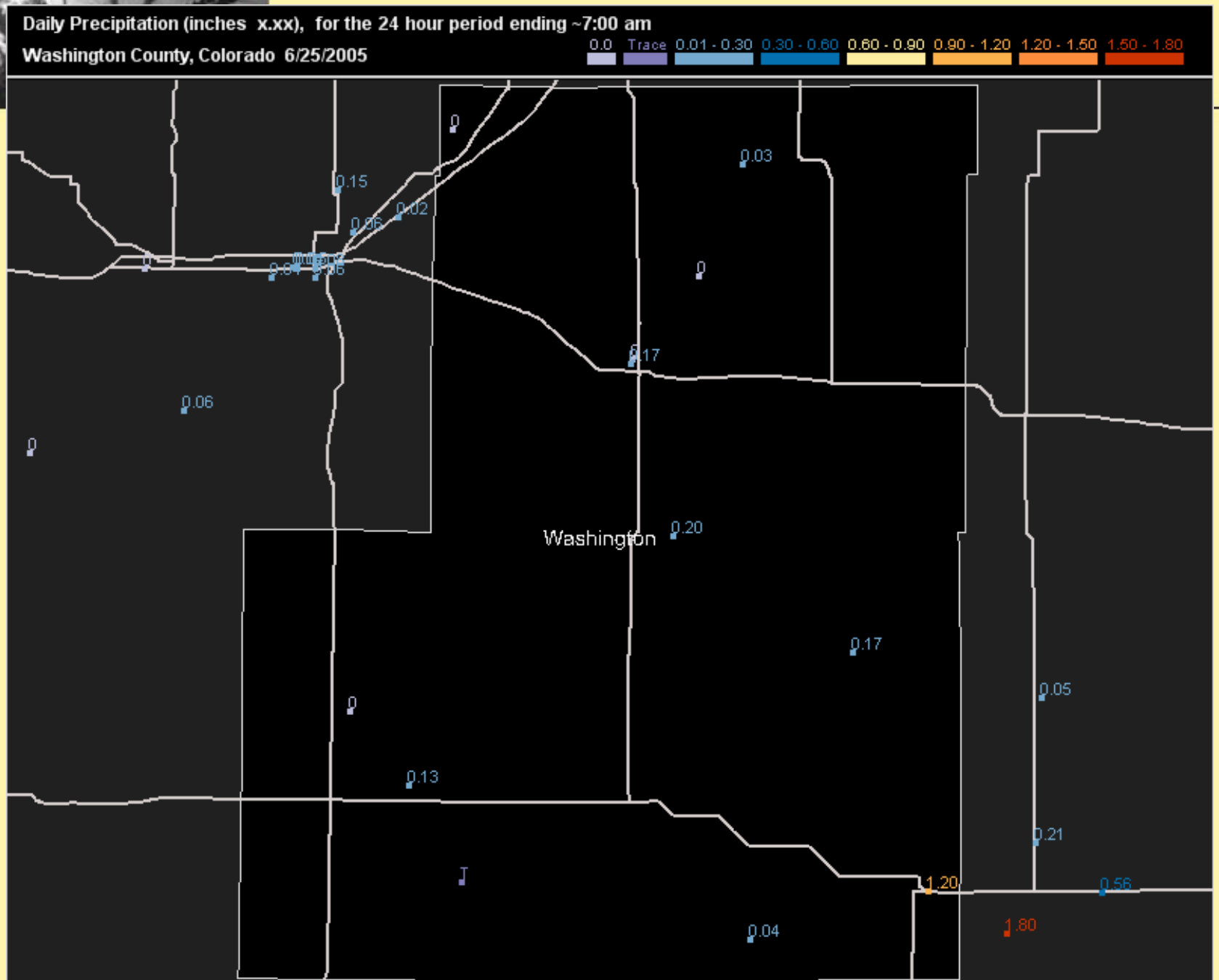
Washington County 5/25/05



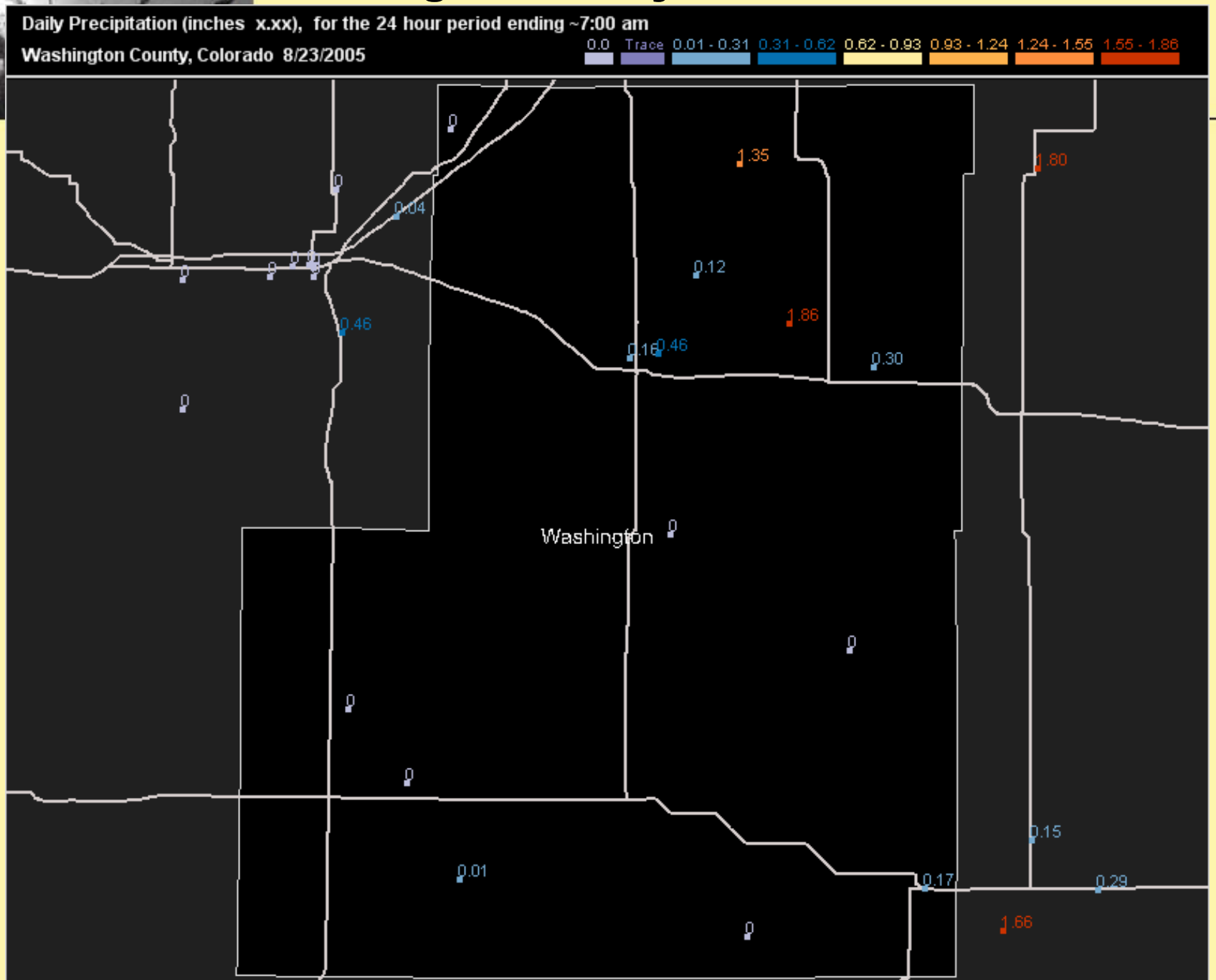
Washington County 6/3/05



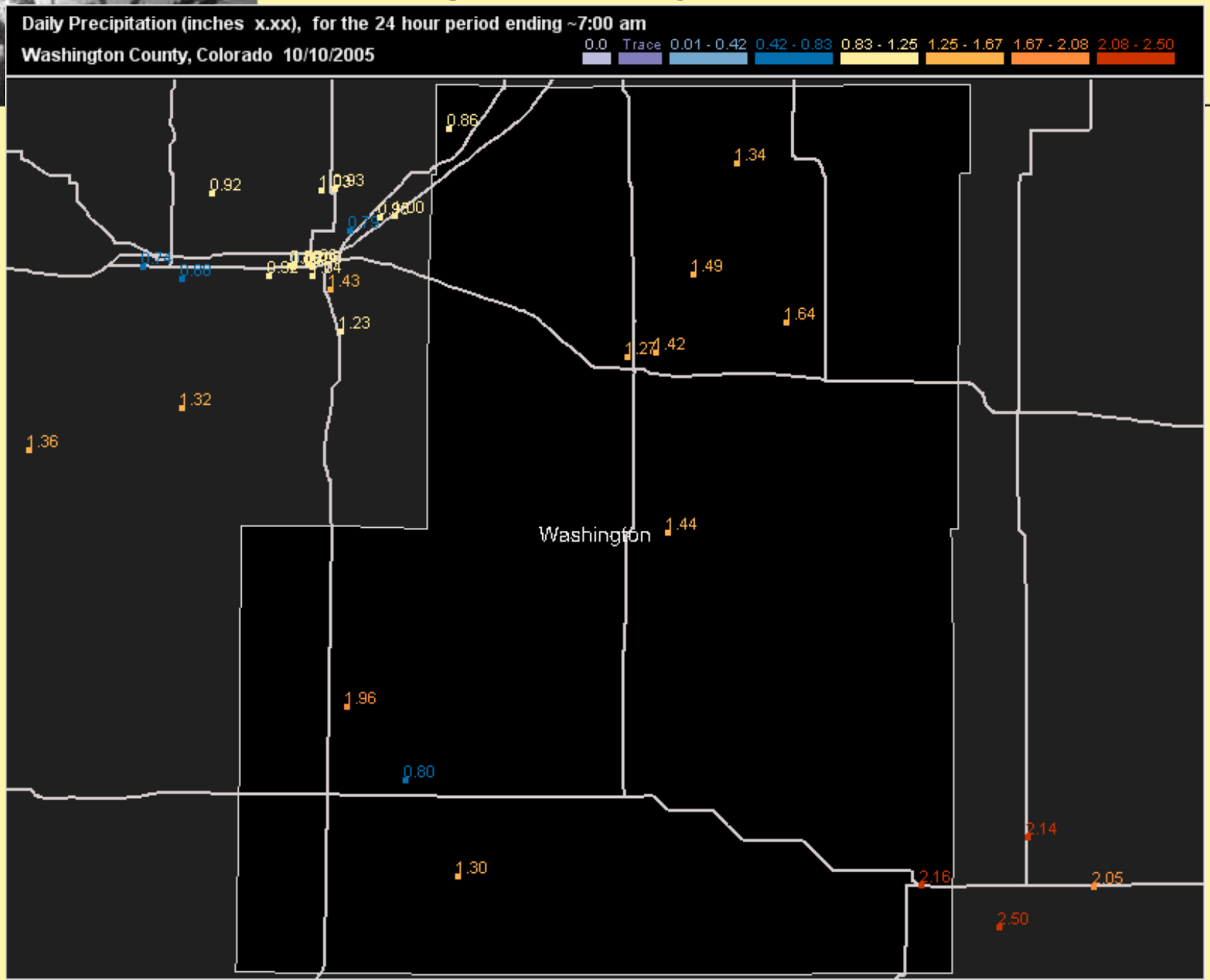
Washington County 6/25/05



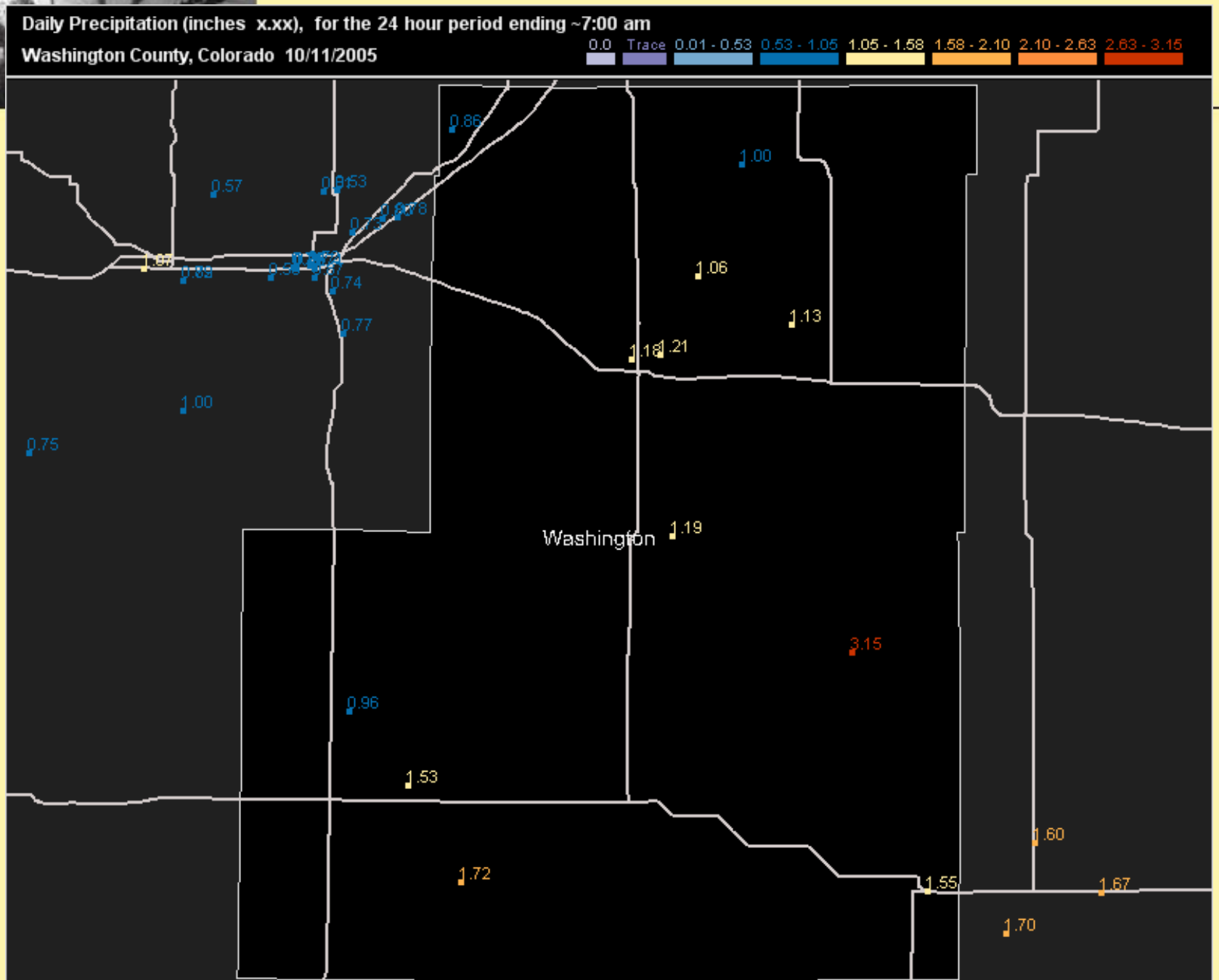
Washington County 8/23/05



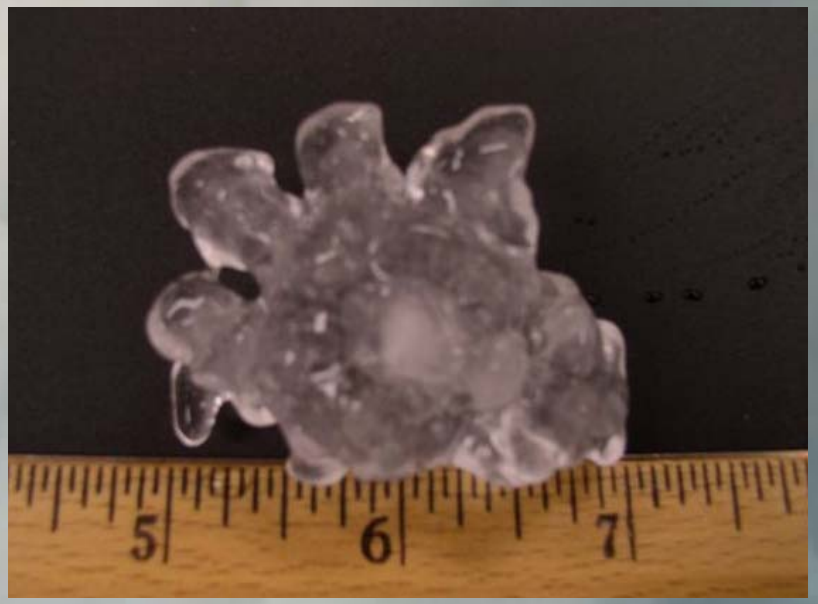
Washington County 10/10/05



Washington County 10/11/05



Clear Hail Stones



Photos courtesy of CoCoRaHS observer.

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"

Colorado Climate Center

Colorado State University
Knowledge to Go Places