

A Review of the 2007 Water Year in Colorado

Nolan Doesken

Colorado Climate Center, CSU

Mike Gillespie

Snow Survey Division, USDA, NRCS



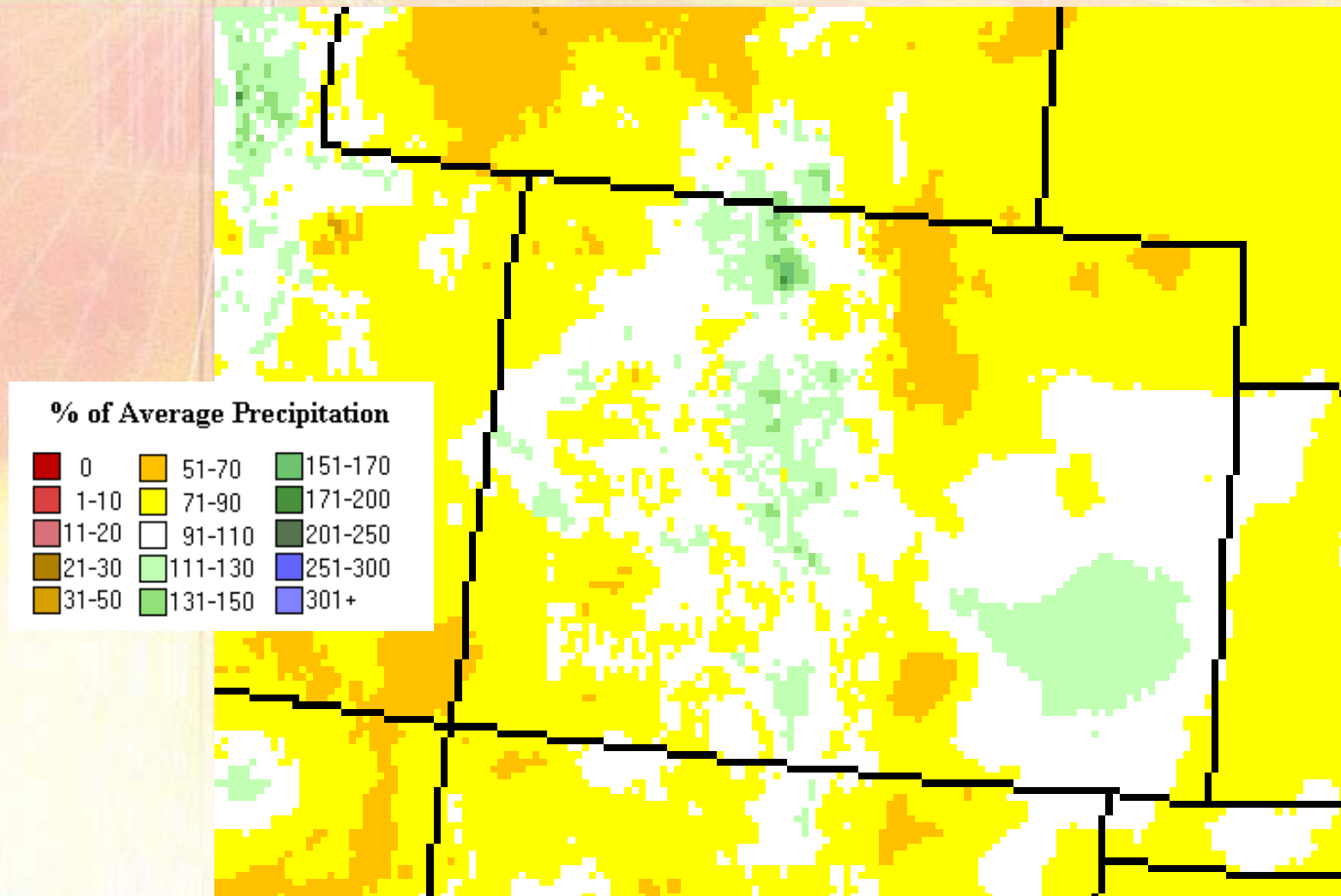
Presented at the 28th Annual AGU Hydrology Days, March 26, 2008, Colorado State University, Fort Collins, CO
(Prepared by Odie Bliss)



<http://ccc.atmos.colostate.edu>
<http://www.co.nrcs.usda.gov/snow/>

Where did it all start?

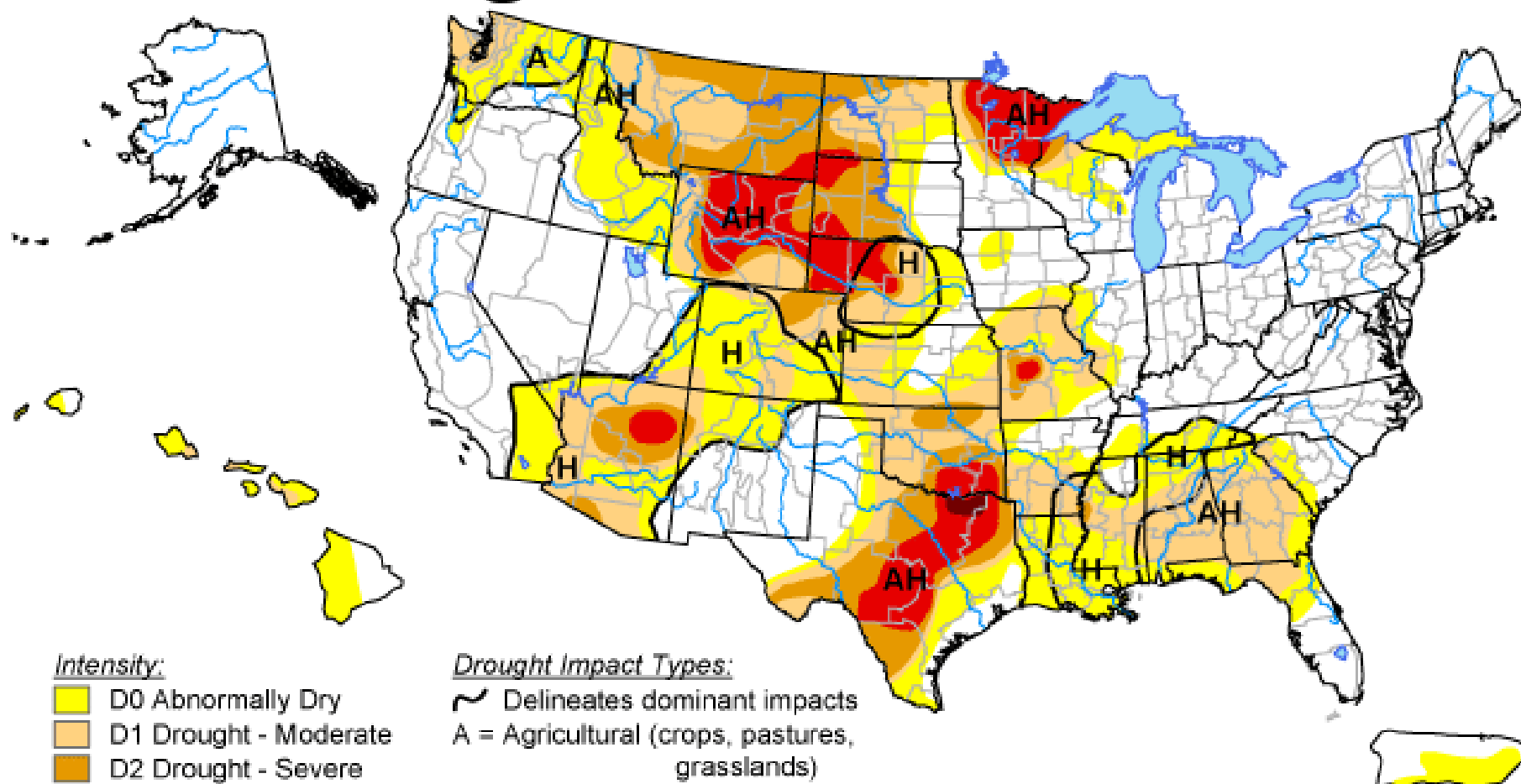
2006 Water Year Precipitation



U.S. Drought Monitor

October 3, 2006

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)

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



Released Thursday, October 5, 2006

Author: Rich Tinker, Climate Prediction Center, NOAA

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

Highlights of the 2007 Water Year in Colorado

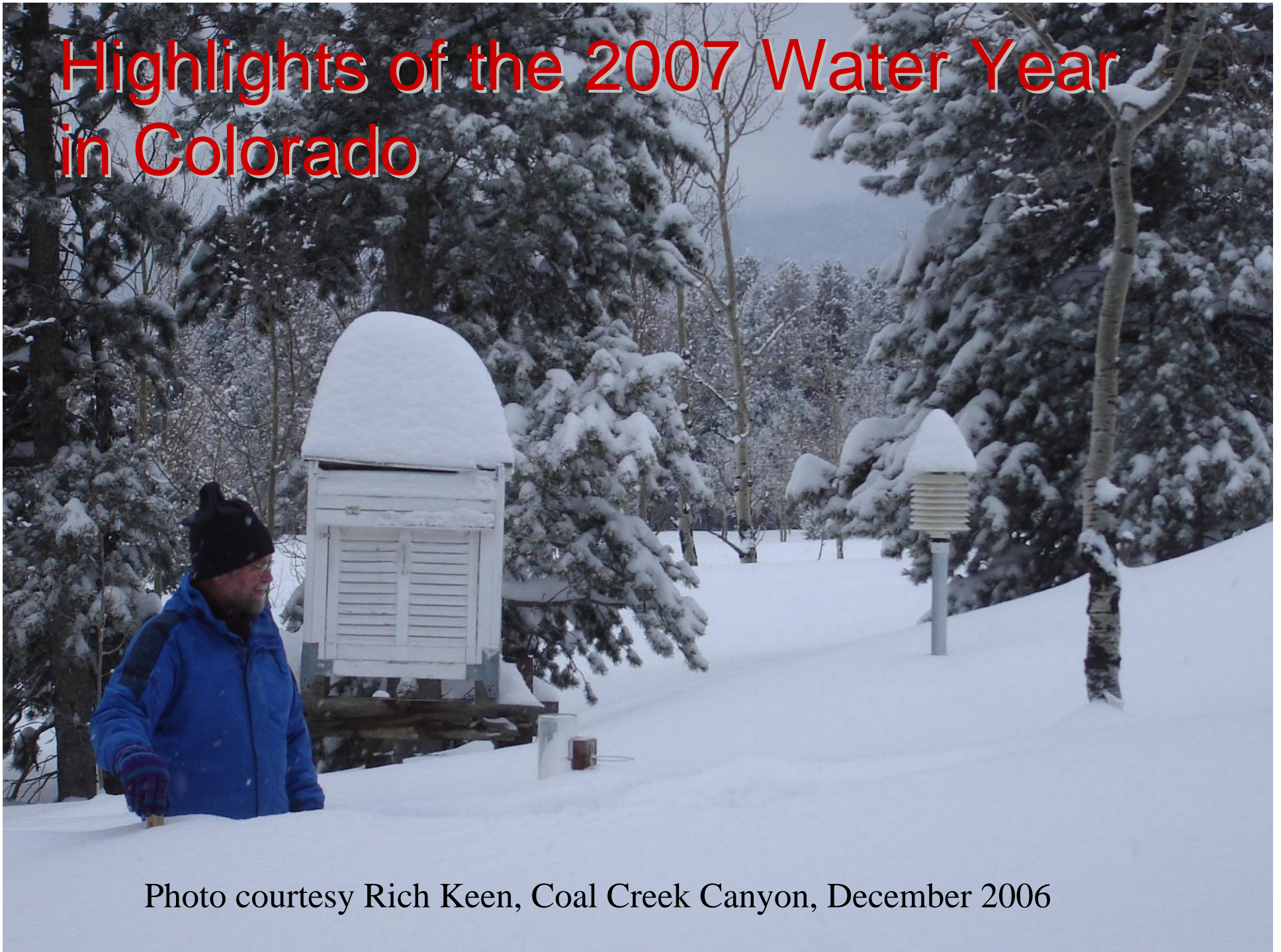


Photo courtesy Rich Keen, Coal Creek Canyon, December 2006

WY 2007 Summary

- Wet October 2006
- December 2006 Snowstorms
- Persisting snowcover and cold (Eastern Plains)
- Holly tornado March 28, 2007
- Early snowmelt and dry May 2007
- Hot summer with spotty storms
- September rains especially West Slope

Colorado Snowcover

As of January 7, 2007

Wyoming

Colorado

Nebraska

— Denver

Kansas

Arkansas River

http://rapidfire.sci.gsfc.nasa.gov/subsets/?AERONET_BSRN_BAO_Boulder

50 km

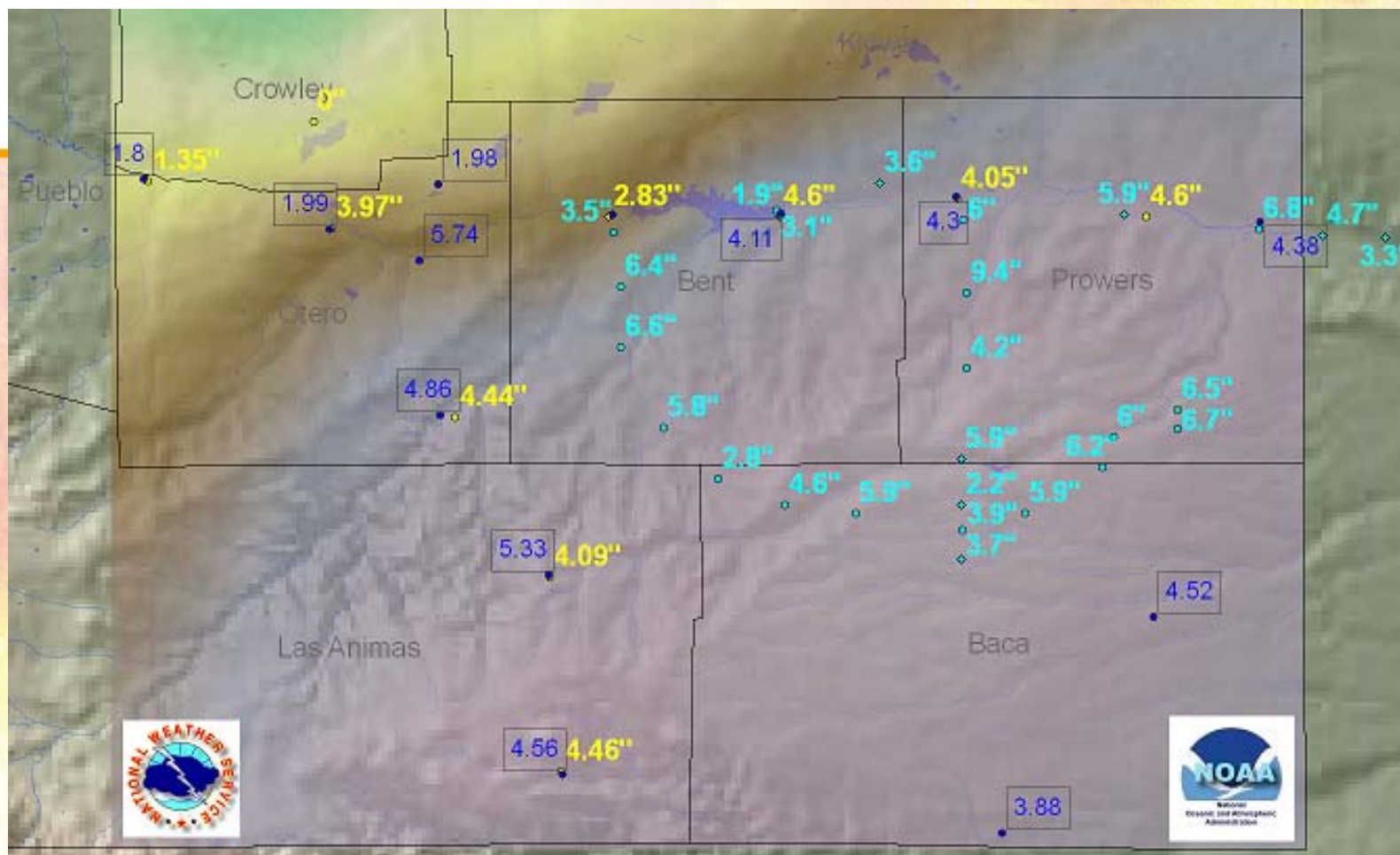


Colorado Snowcover

As of February 15, 2007

http://rapidfire.sci.gsfc.nasa.gov/subsets/?AERONET_BSRN_BAO_Boulder

Water in the Snowpack during early February and the Total Precipitation for the months of December and January



Yellow - water equivalent measured by coring/melting as reported by Cooperative Observers
 Light Blue - water equivalent measured by coring/weighing as reported by NWS employees
 Boxed - total precipitation for December and January as reported by Cooperative Observers



A Very Bad Day – Holly Tornado

March 28, 2007

Horace Tribune

**Enhanced Fujita
Scale (MPH)** Greeley County

EF0 = 65-85

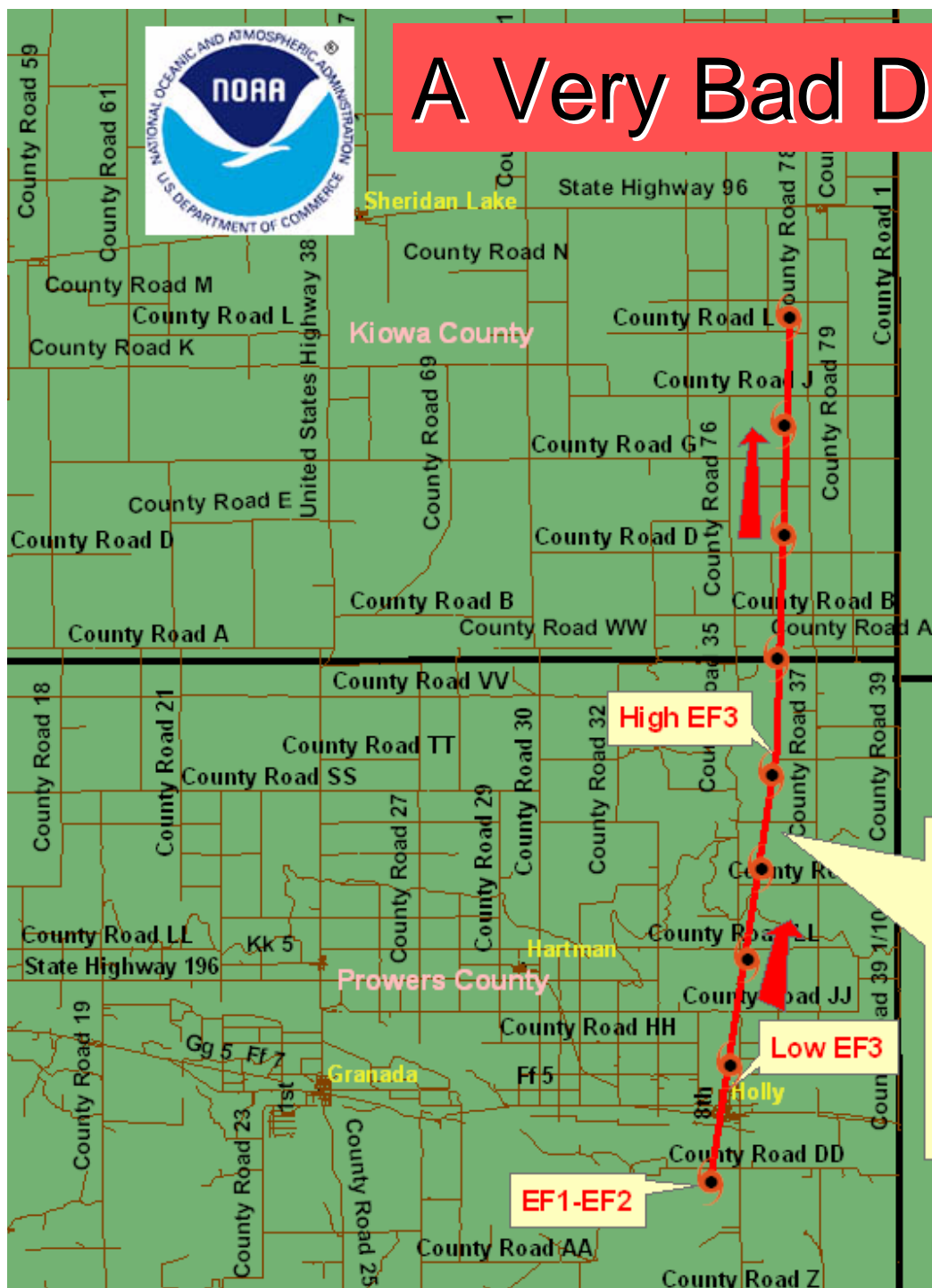
EF1 = 86-110

EF2 = 111-135

EF3 = 136-165

EF4 = 166-200

EF5 = >200



High EF3

Low EF3

EF1-EF2

The Holly Tornado was on the ground for an estimated 25-30 minutes covering an estimated distance of 28 miles. In Holly, the tornado reached a peak Enhanced Fujita Scale rating on the low end of the EF3 range. Over the lifetime of the storm, the tornado reached a peak intensity on the high end of the EF3 range about 12 miles north of Holly.

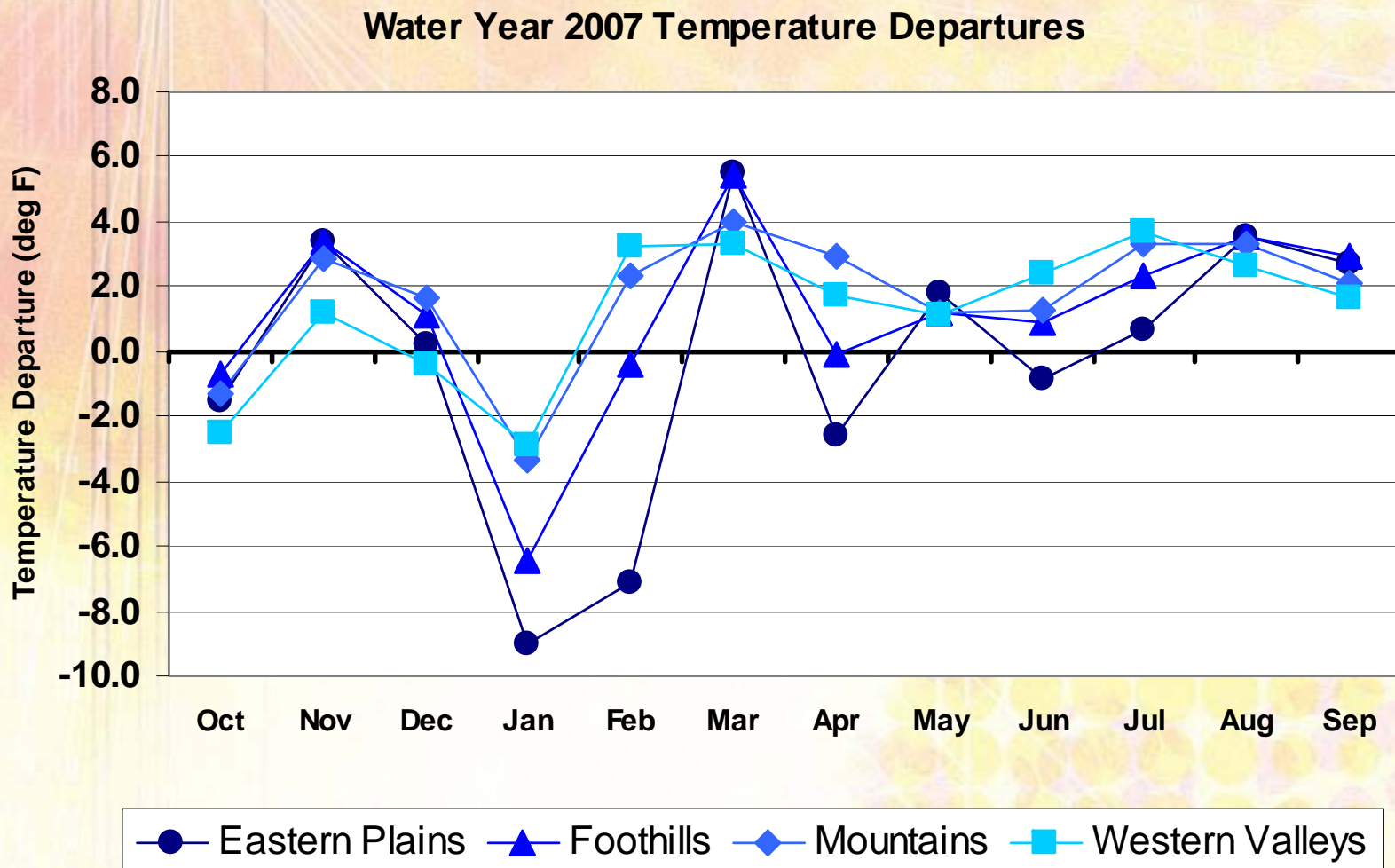
0 5 10 15 20 Miles

WY2007 Temperature Summary

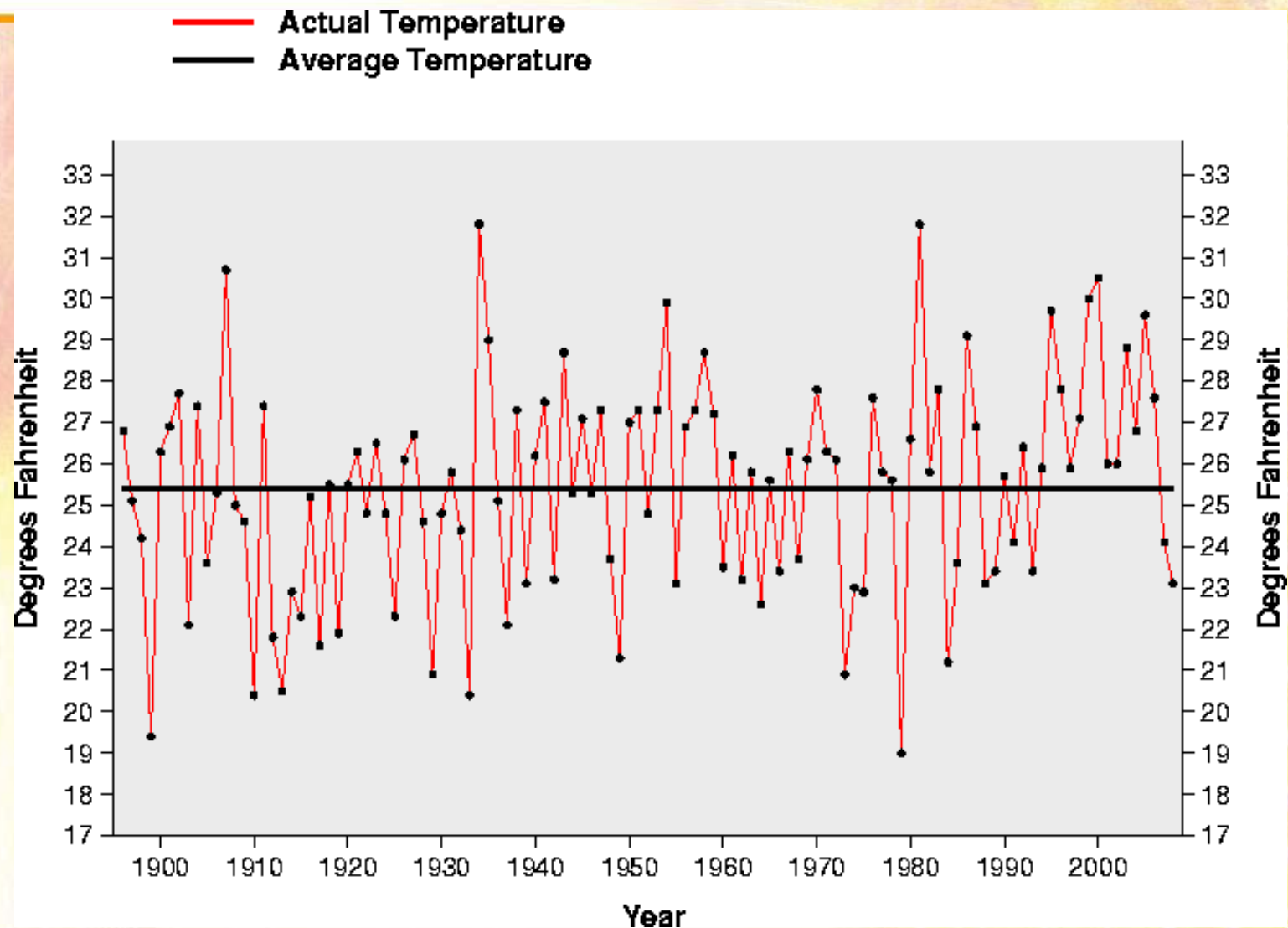


- Cold October 2006 across the state
- November/December above or near average
- January and February cold, especially Eastern Plains (near -10 deg F departure)
- March above average statewide
- April 2007 cold Eastern Plains, average Foothills, warmer Mountains and Western Valleys
- Near average all across the state for May
- Above average temperatures for June through September for most of the state

Water Year 2007 temperature departures from 1971-2000 average



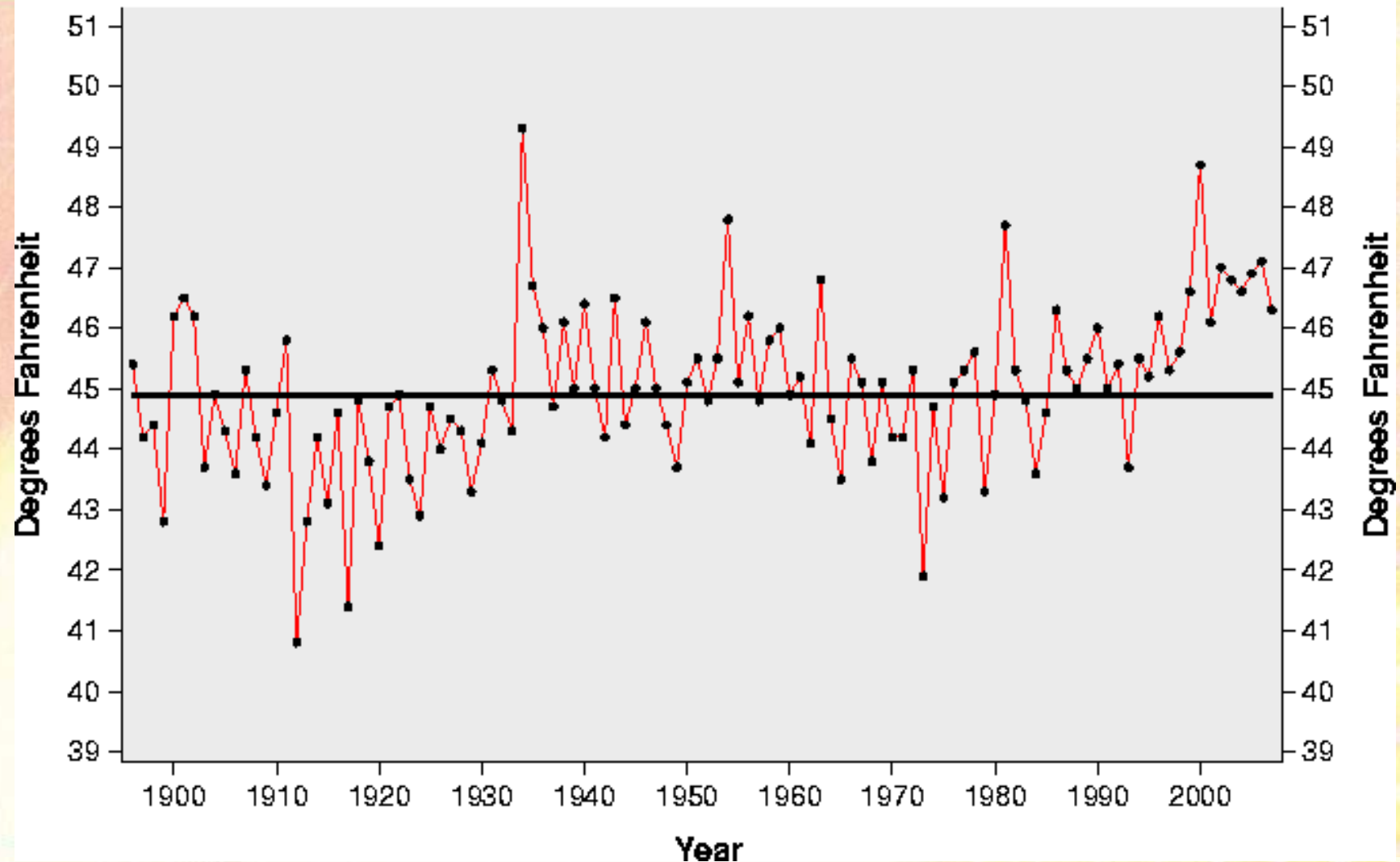
Water Year Winter (Dec – Feb) Statewide Temperature History



2007 Water Year Temperatures for Colorado

— Actual Temperature
— Average Temperature

Most recent 12-month period (Oct 2006 – Sep 2007)
(Period of record 1895 – 2007)

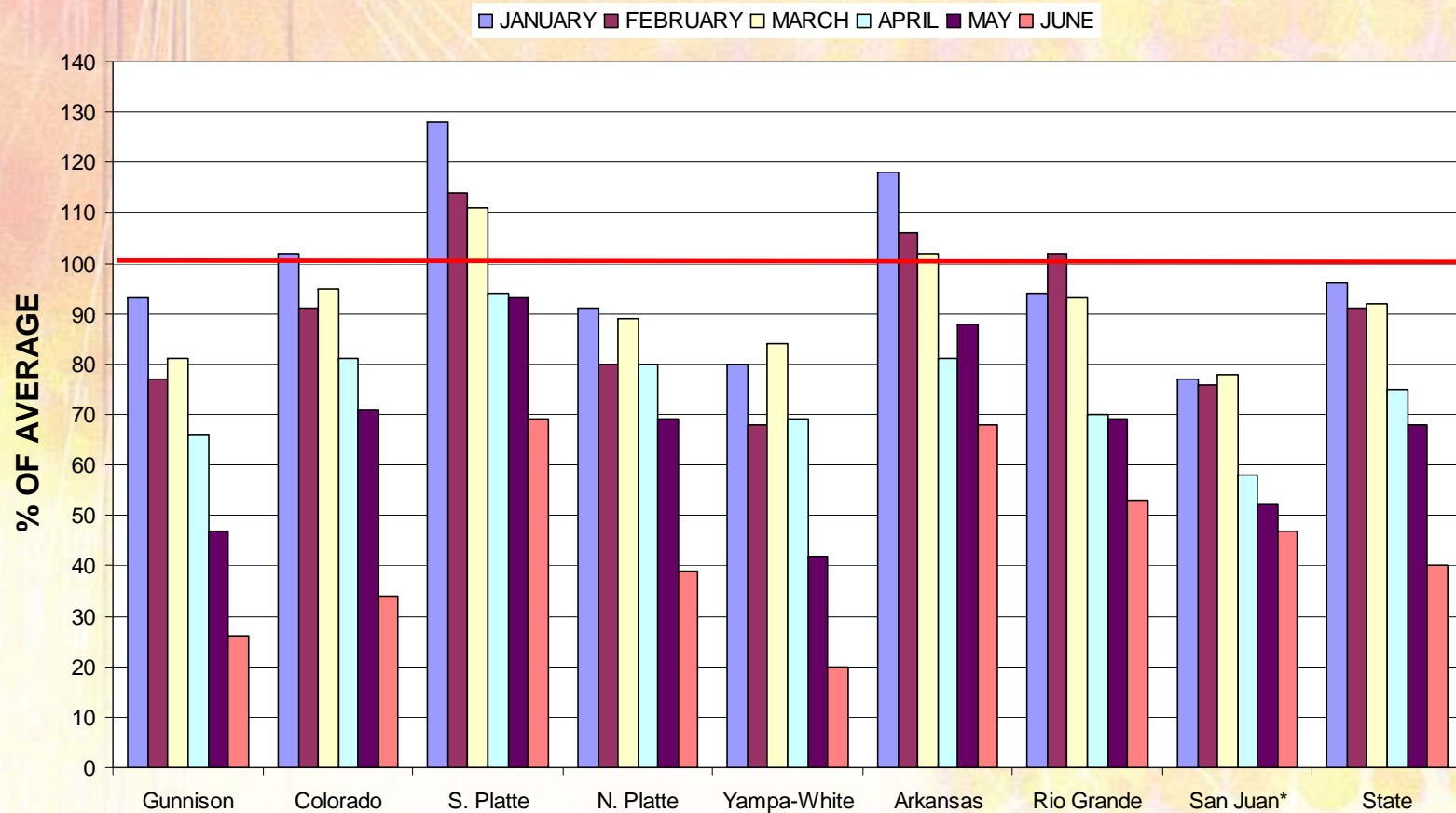


Colorado Snowpack for 2007 – Good Start, Early Finish

COLORADO SNOWPACK

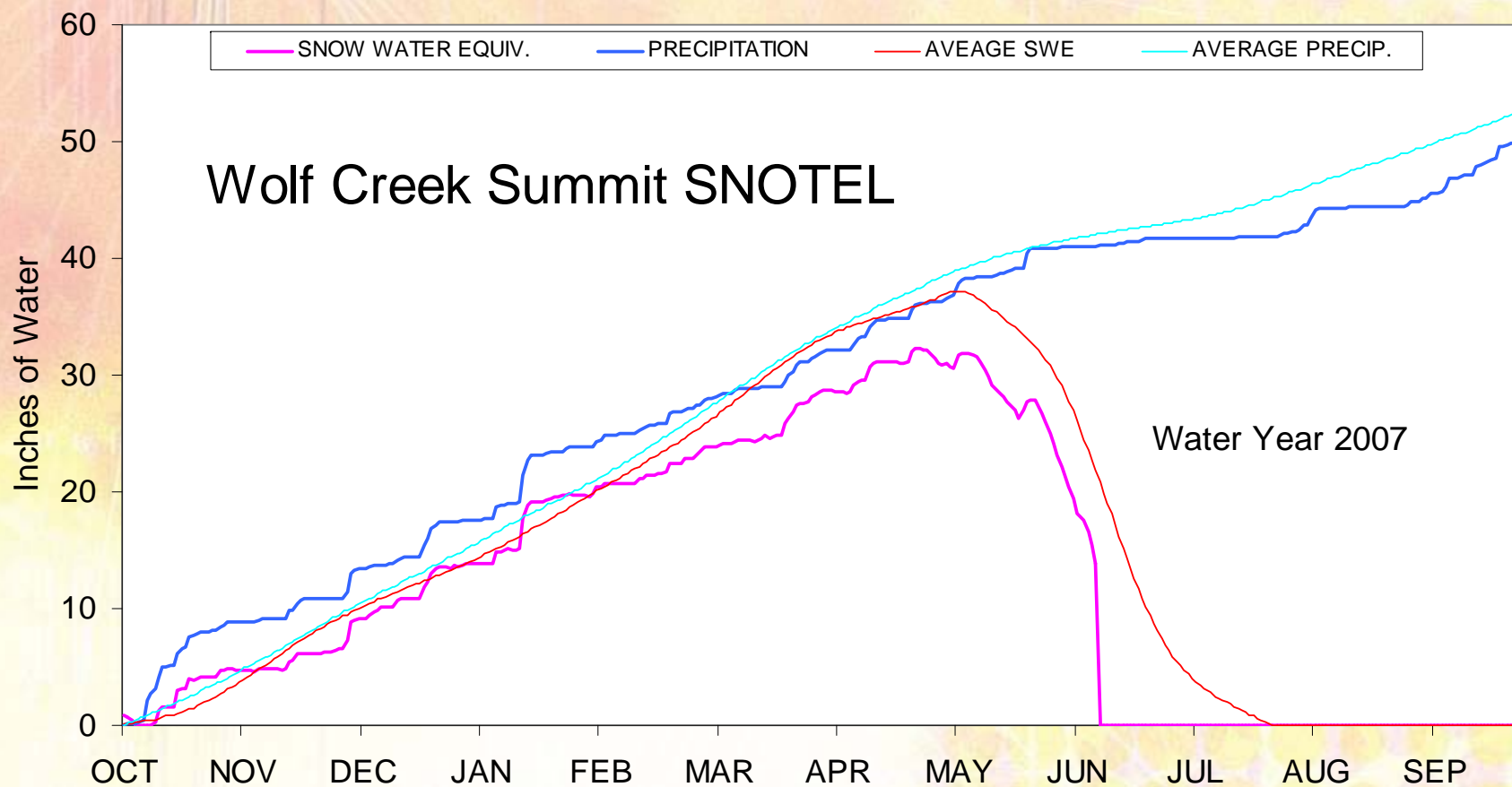
Summary for 2007

USDA Natural Resources Conservation Service

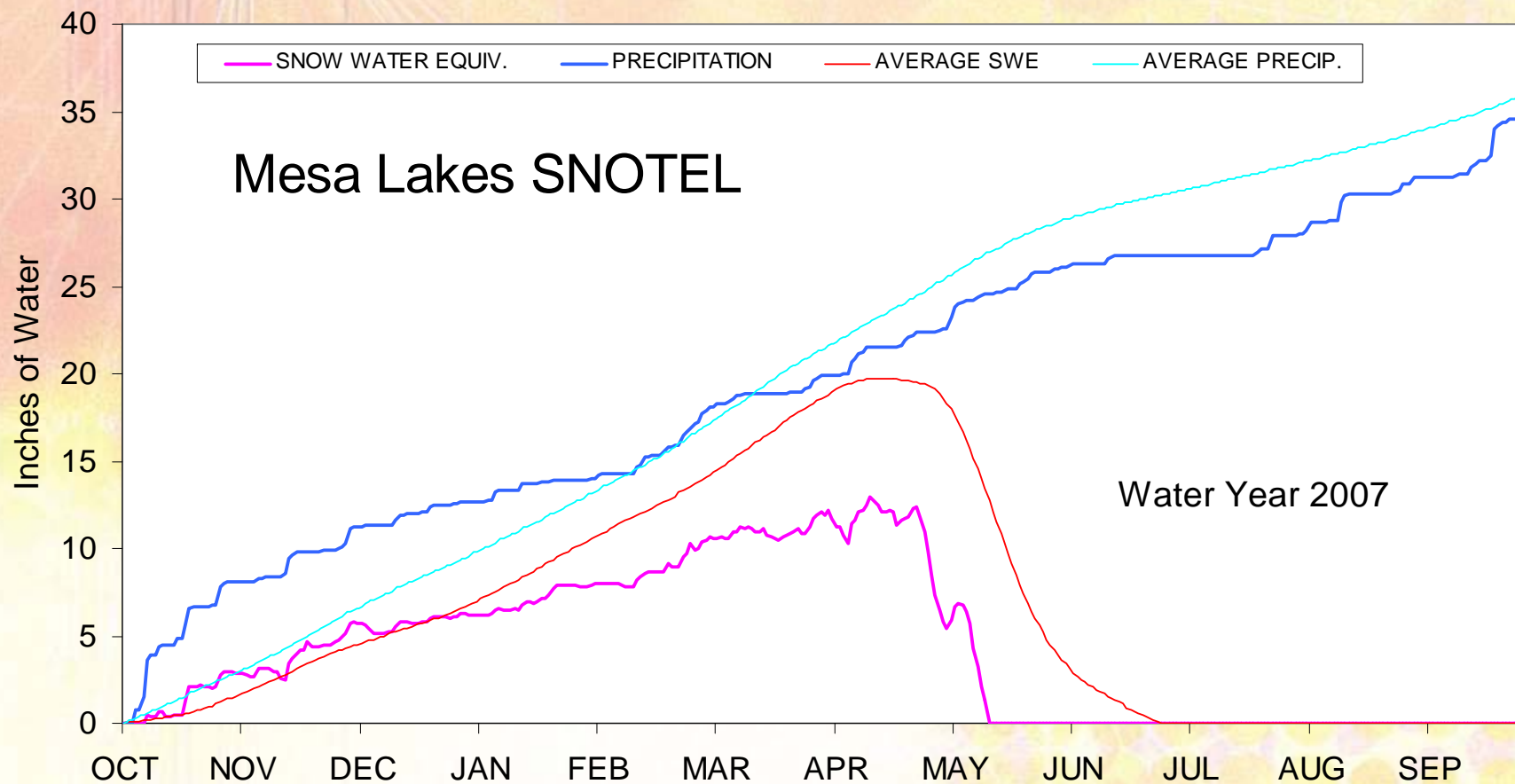


*Includes Animas, Dolores, San Miguel Basins

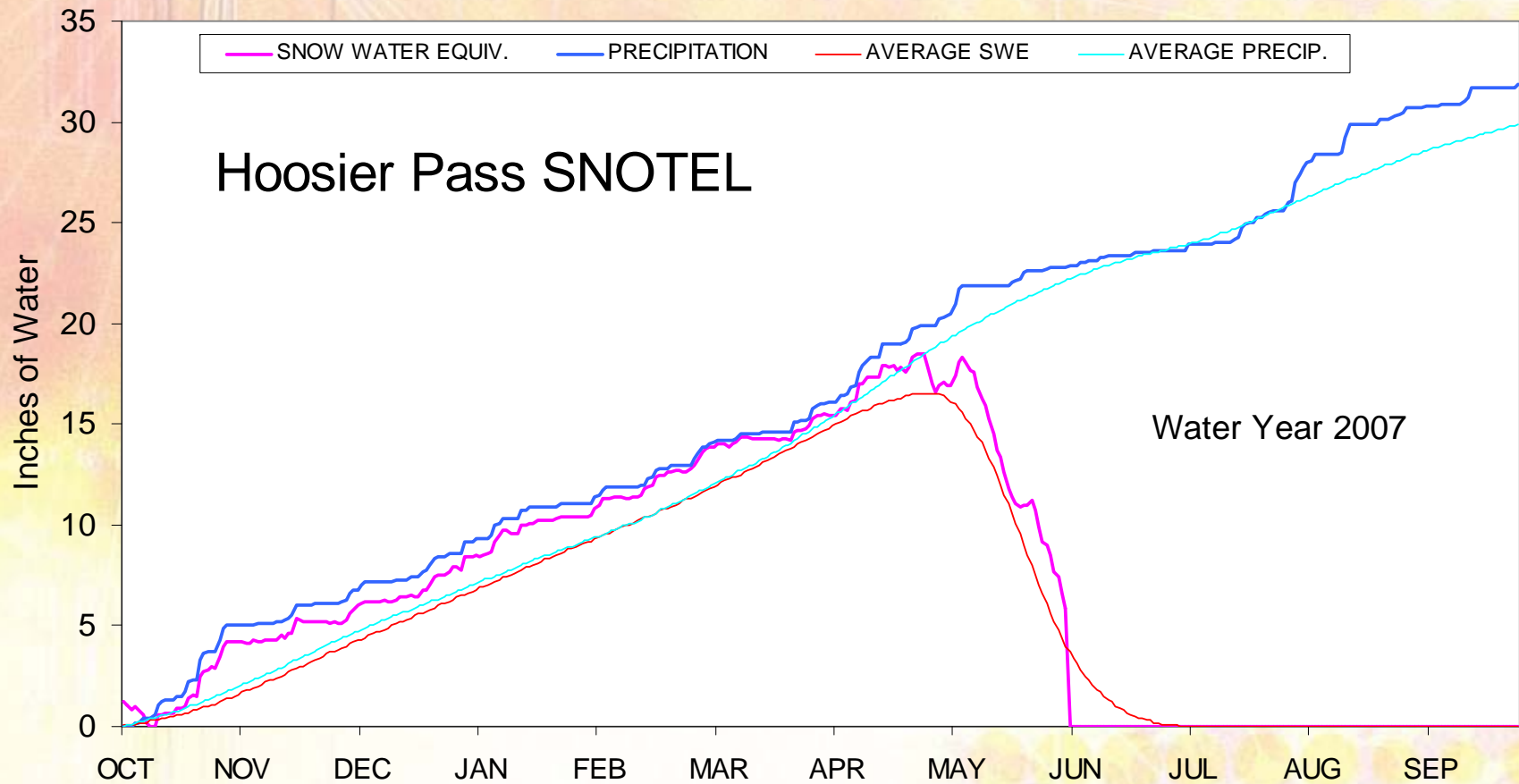
Wolf Creek Summit Snotel



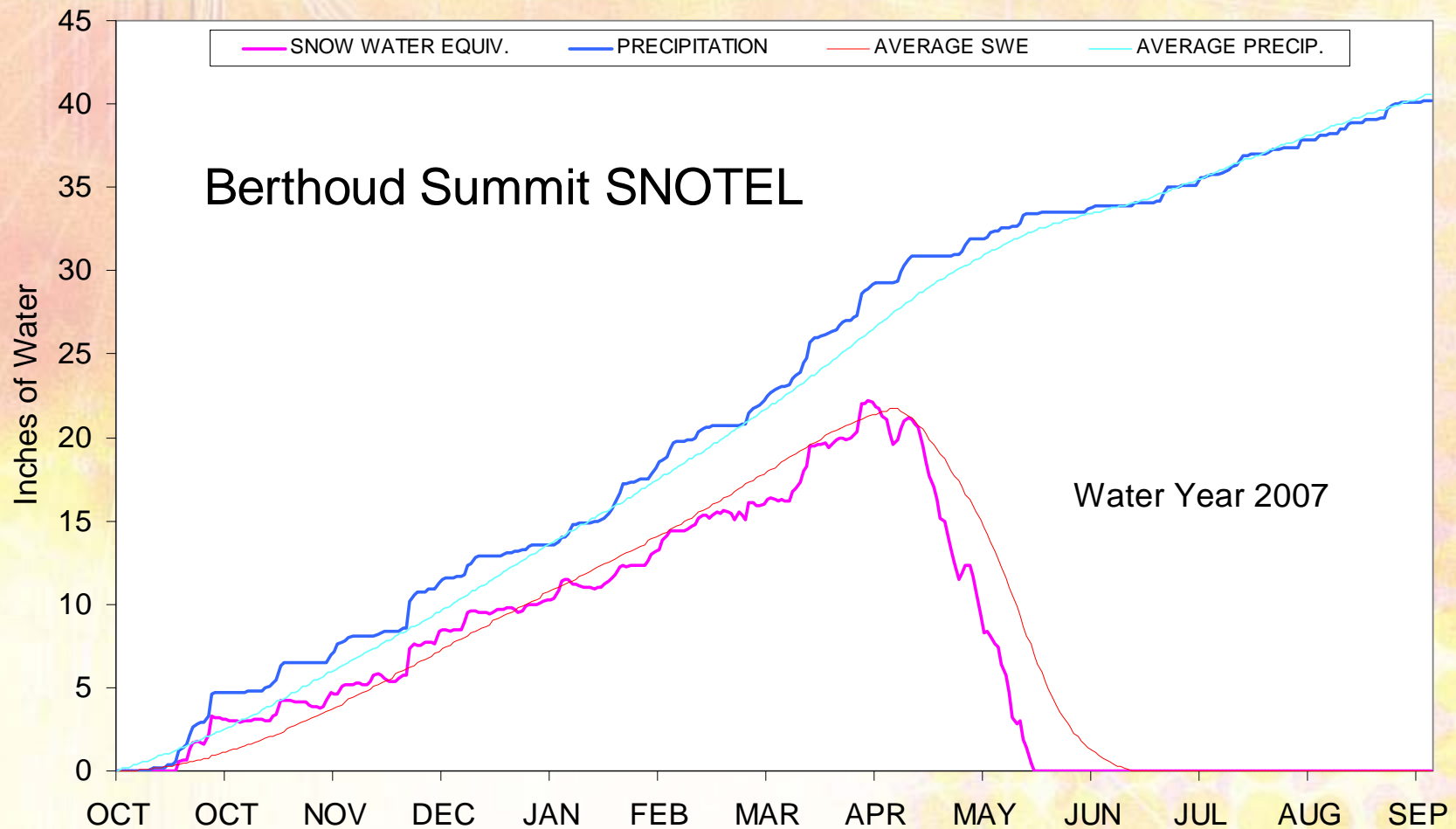
Mesa Lakes Snotel



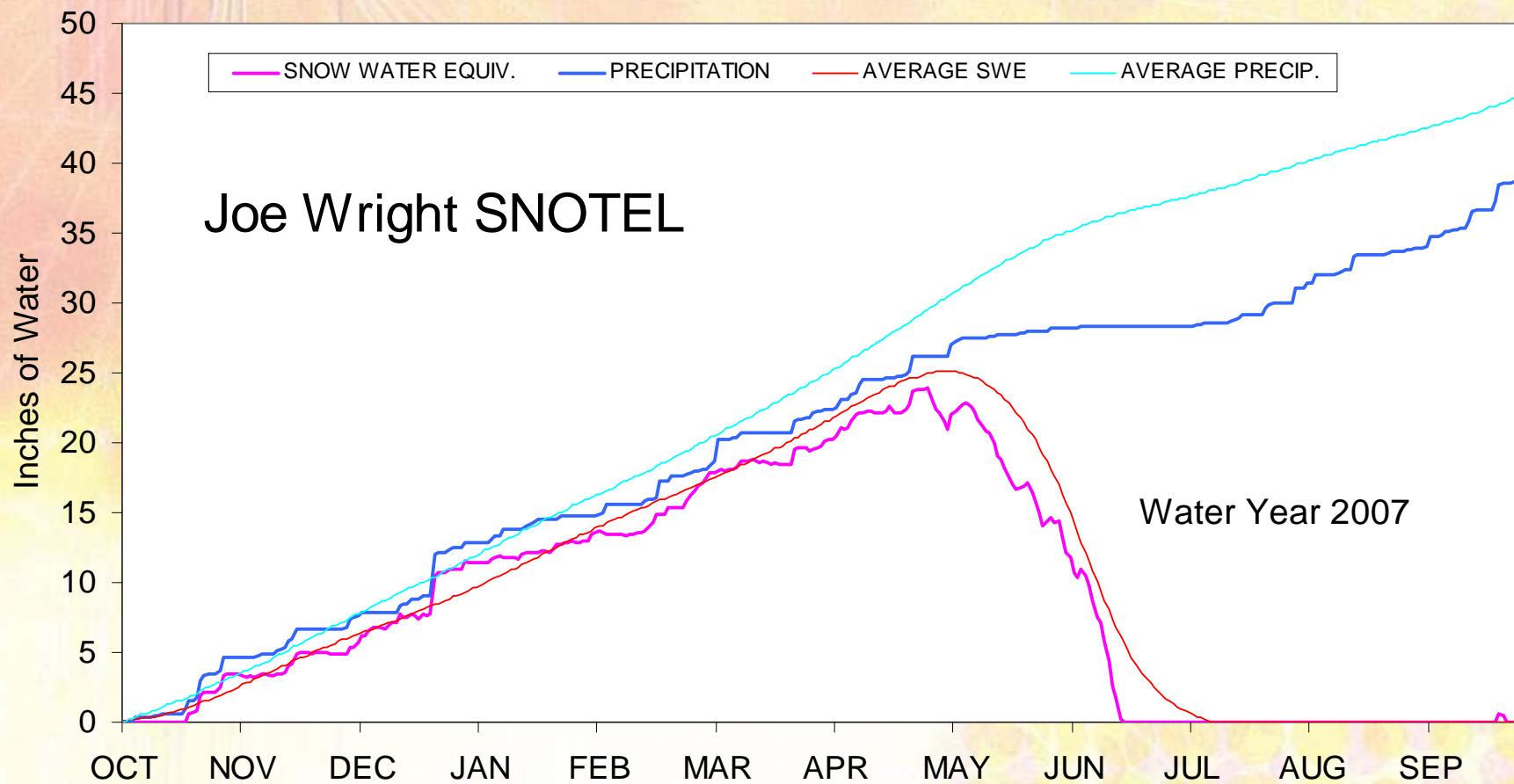
Hoosier Pass Snotel



Berthoud Summit Snotel



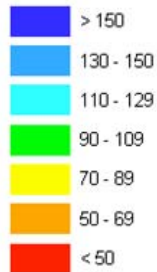
Joe Wright Snotel



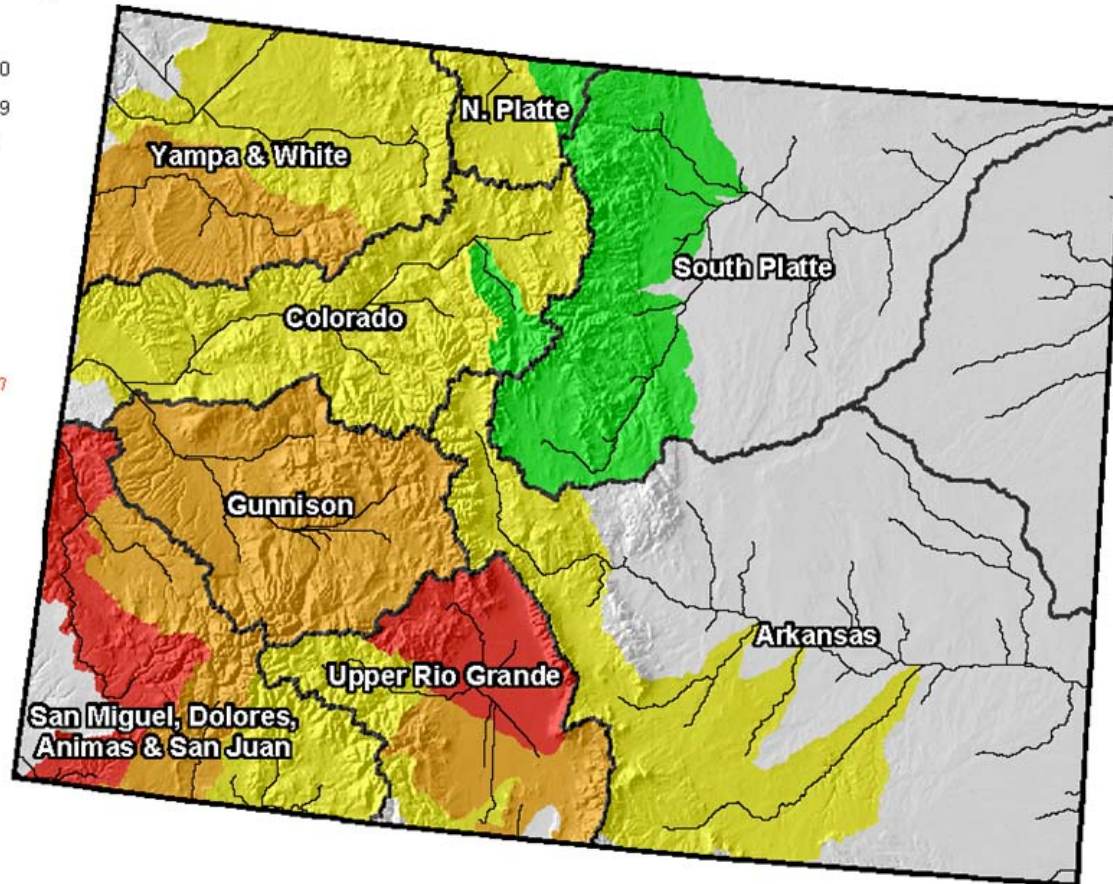
April 1 Snowpack

Colorado Snowpack Map

Percent of Average



*Provisional Data
Subject to Revision*

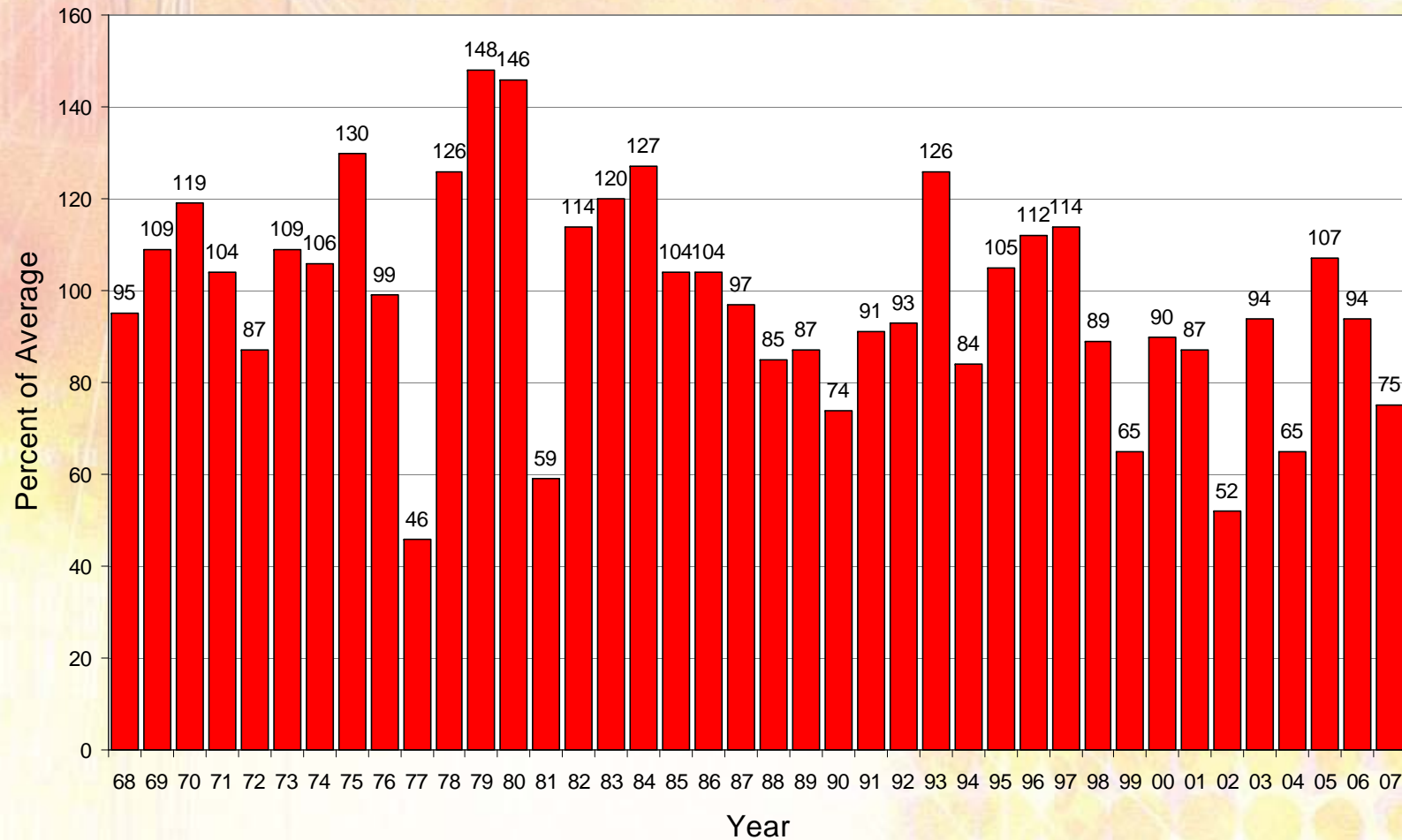


Current as of April 1, 2007

http://www.co.nrcs.usda.gov/snow/snow/state/current/monthly/maps_graphs/getsnomap.html

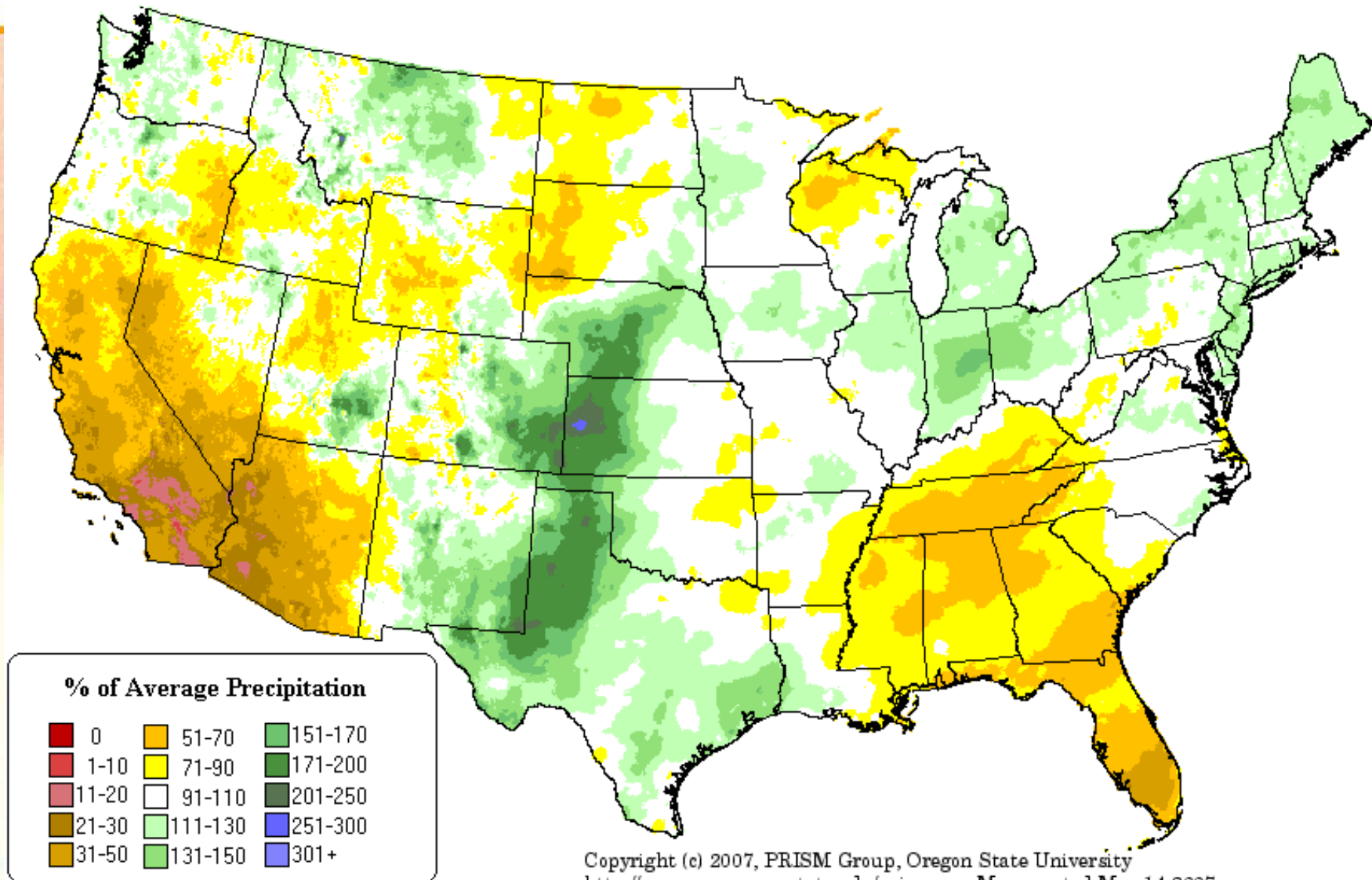
April 1 Snowpack History

APRIL 1 SNOWPACK
COLORADO STATEWIDE



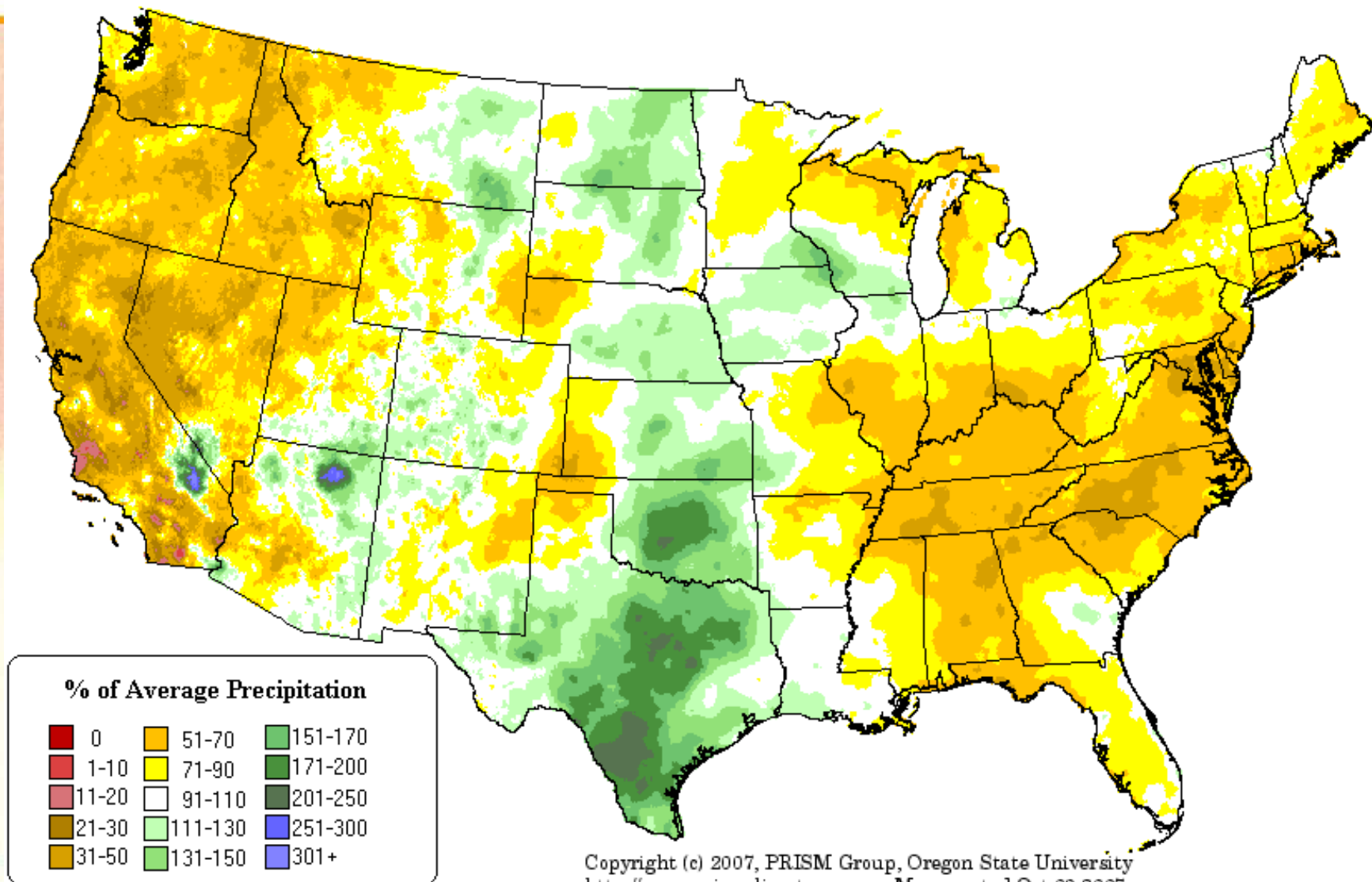
Winter (Oct 2006 – Apr 2007) % of Average

7-month Percent of Average Precipitation: Apr 2007
Provisional Data



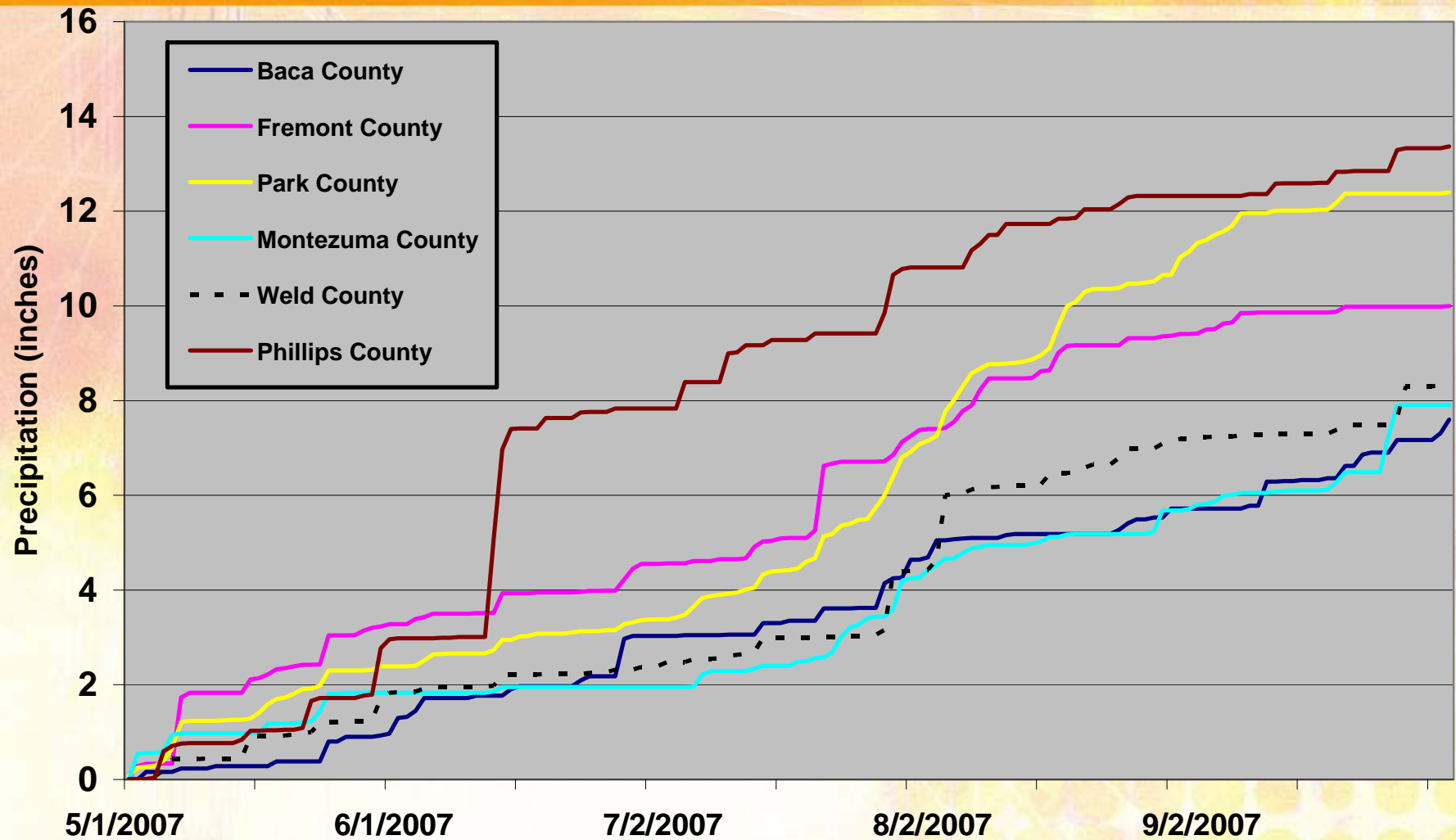
Summer 2007 (May–Sep) precipitation as a percent of average (Prism)

5-month Percent of Average Precipitation: Sep 2007 Provisional Data



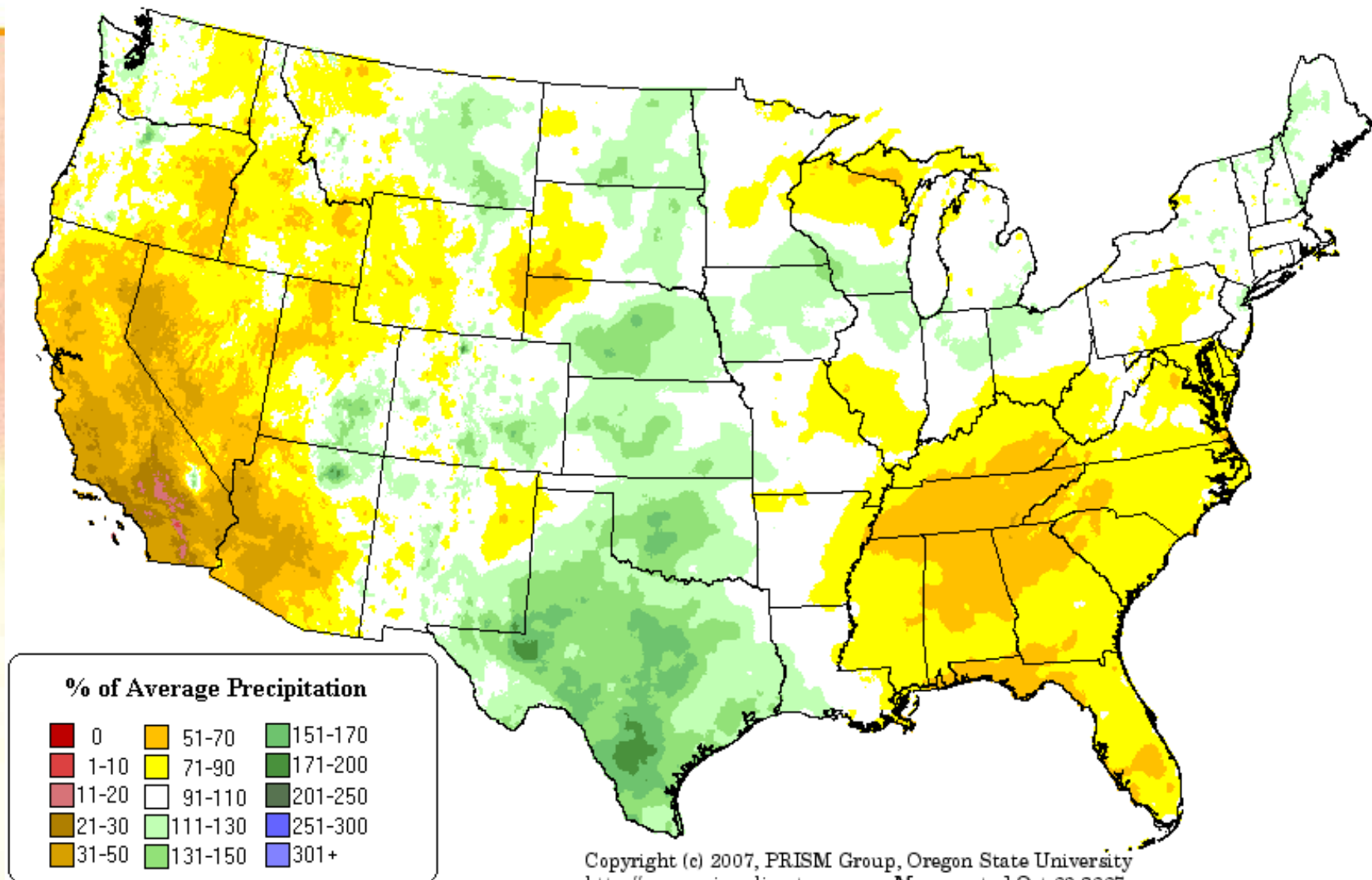
Daily Precipitation Accumulation Summer 2007 (May-September) for Community Collaborative Rain, Hail and Snow Network (CoCoRaHS)

CoCoRAHS Accumulated Precipitation for Summer (May-Sep) by County



Water Year 2007 precipitation as a percent of average (Prism)

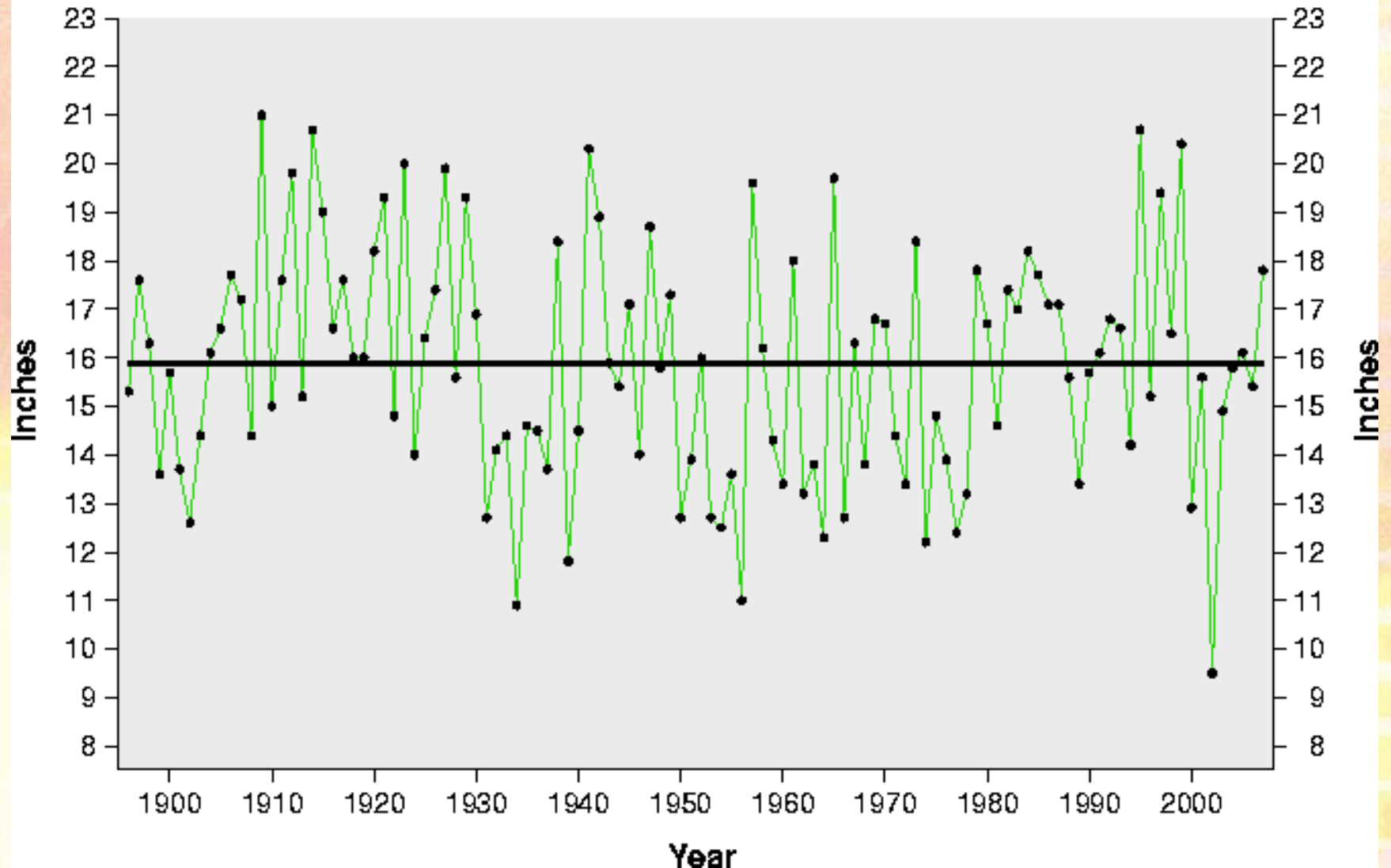
12-month Percent of Average Precipitation: Sep 2007 Provisional Data



Colorado Precipitation in Historic Perspective

— Actual Precipitation
— Average Precipitation

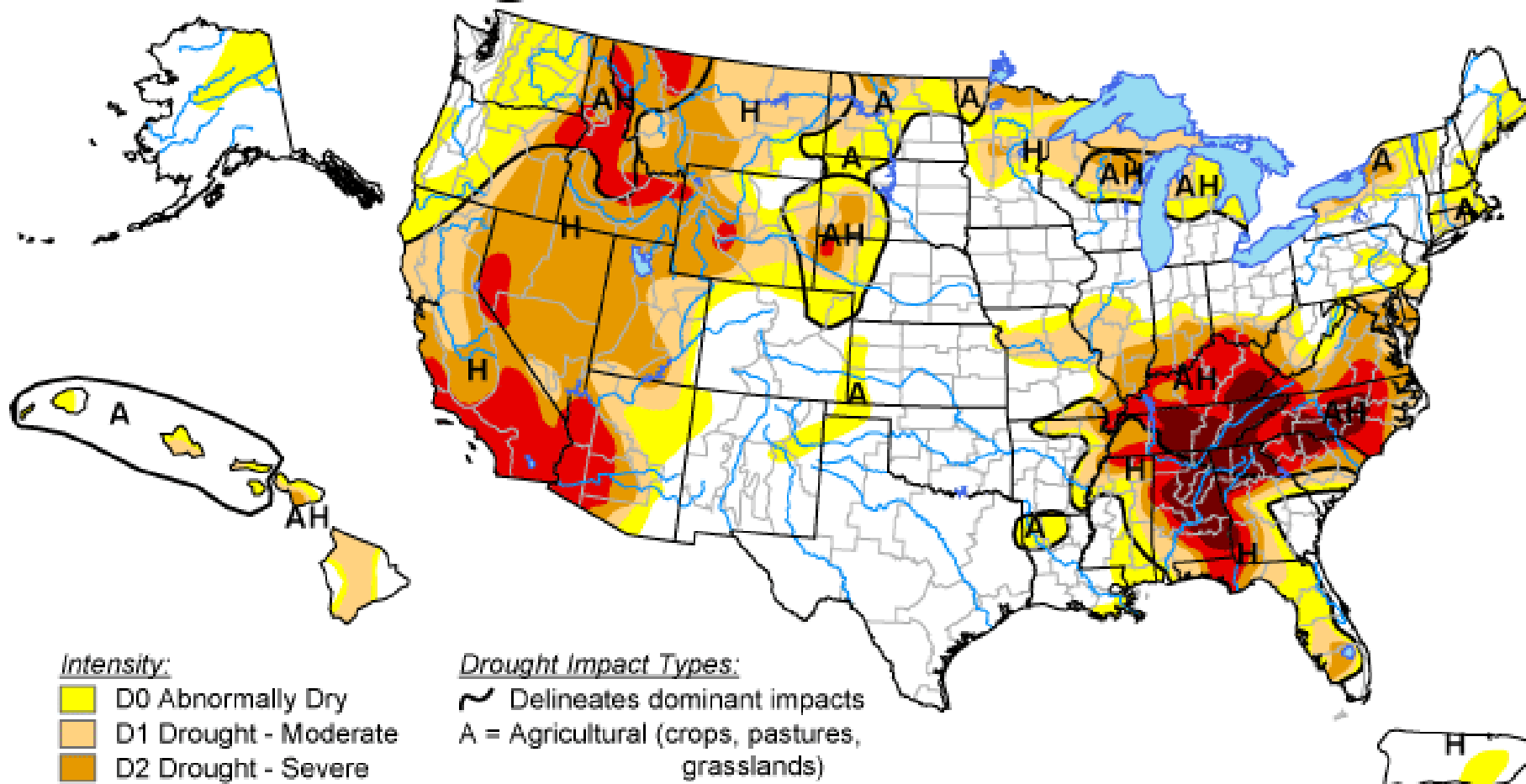
Most recent 12-month period (Oct 2006 – Sep 2007)
(Period of record 1895 – 2007)



U.S. Drought Monitor

October 2, 2007

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)

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

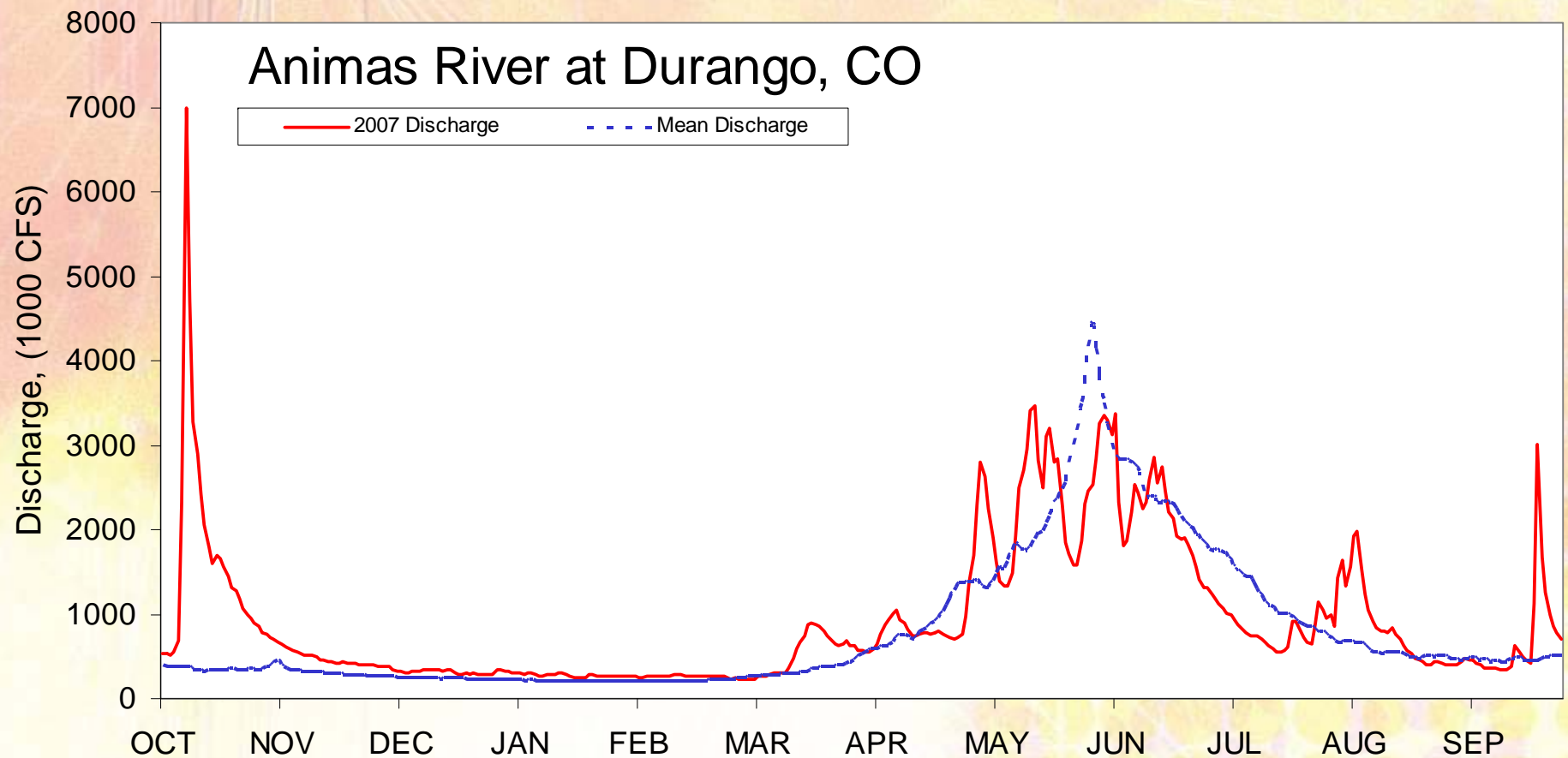
<http://drought.unl.edu/dm>



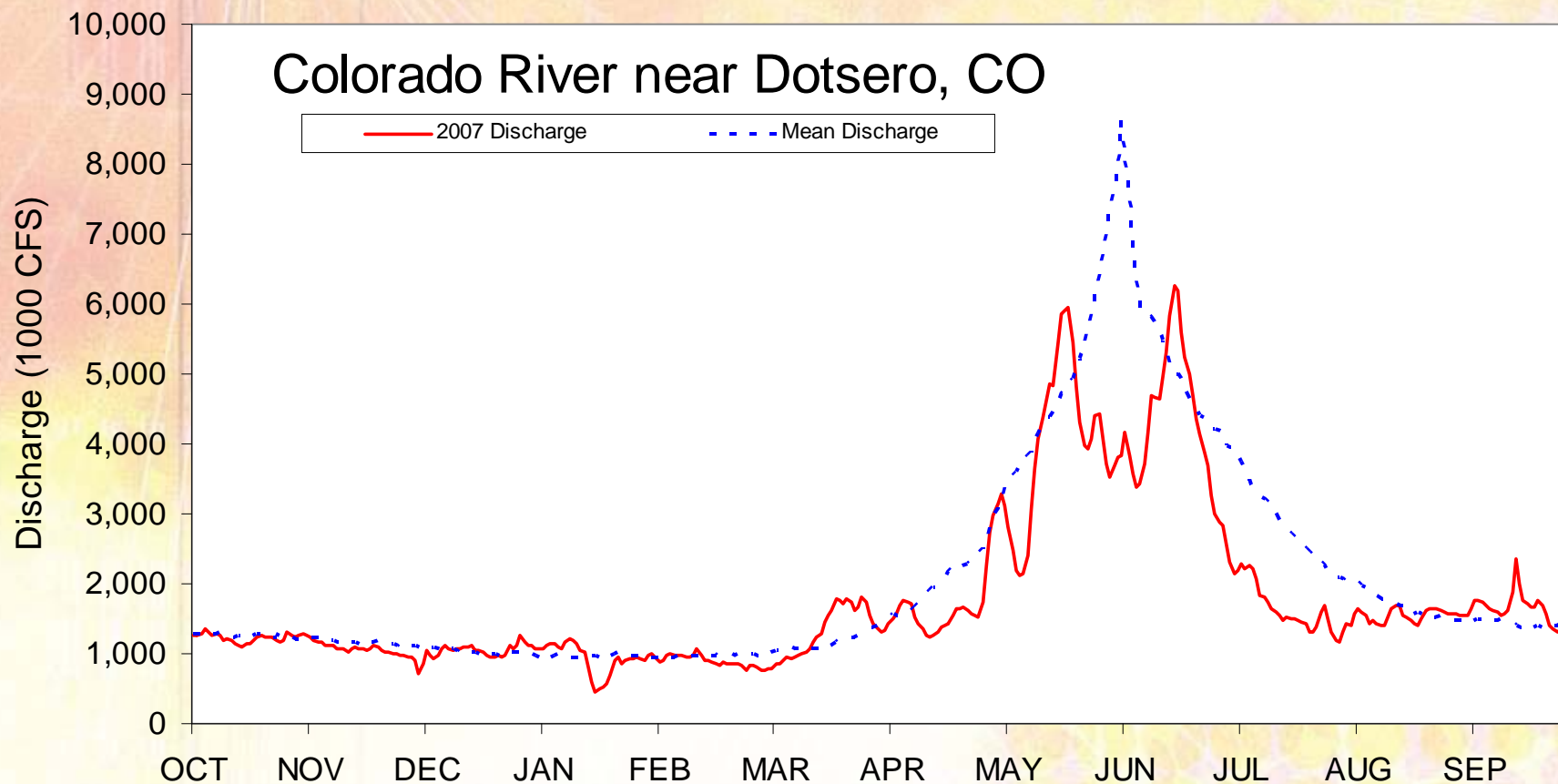
Released Thursday, October 4, 2007

Author: Jay Lawrimore/Liz Love-Brotak, NOAA/NESDIS/NCDC

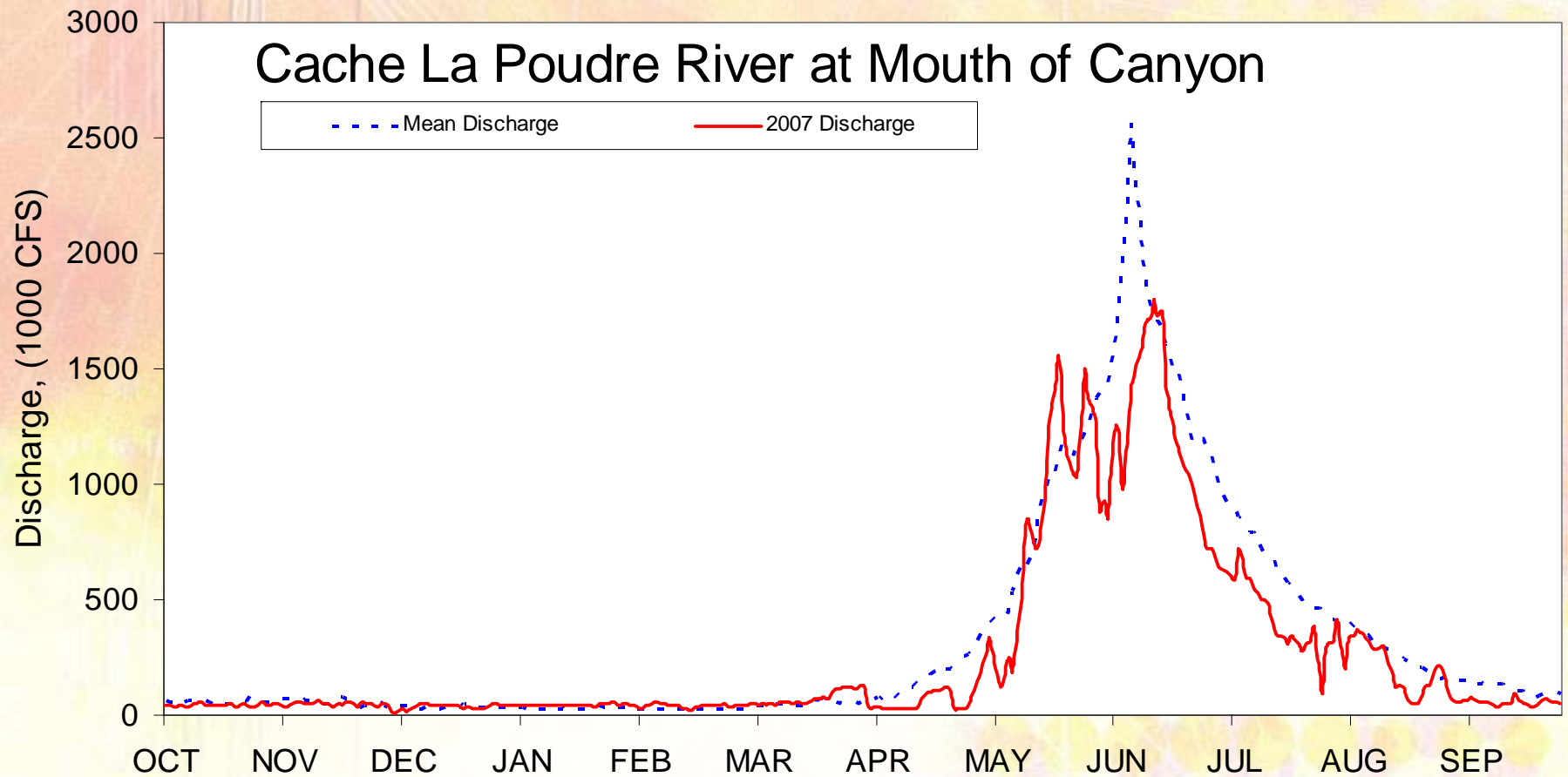
Animas River Streamflow



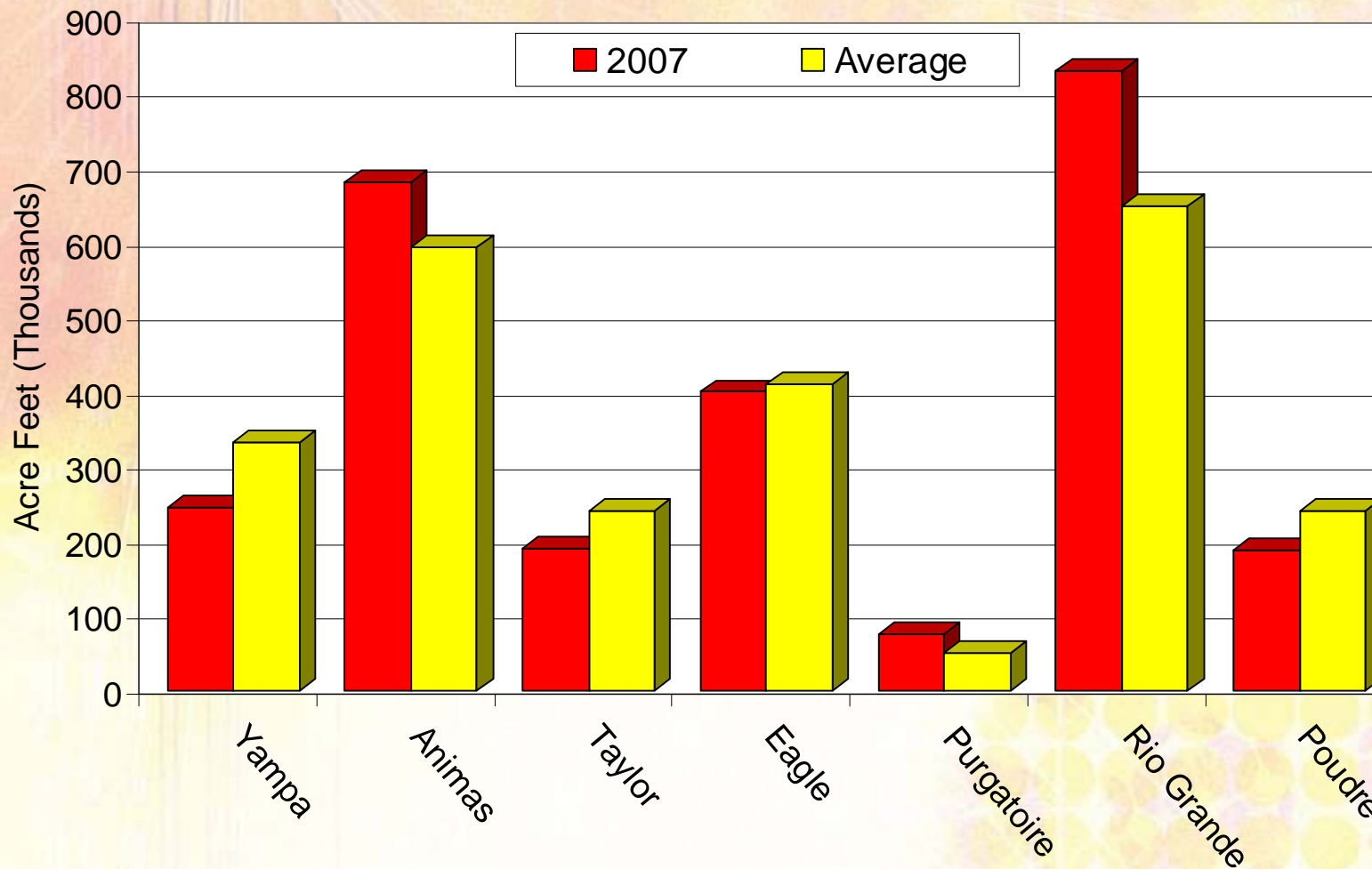
Colorado River Streamflow



Cache La Poudre River Streamflow



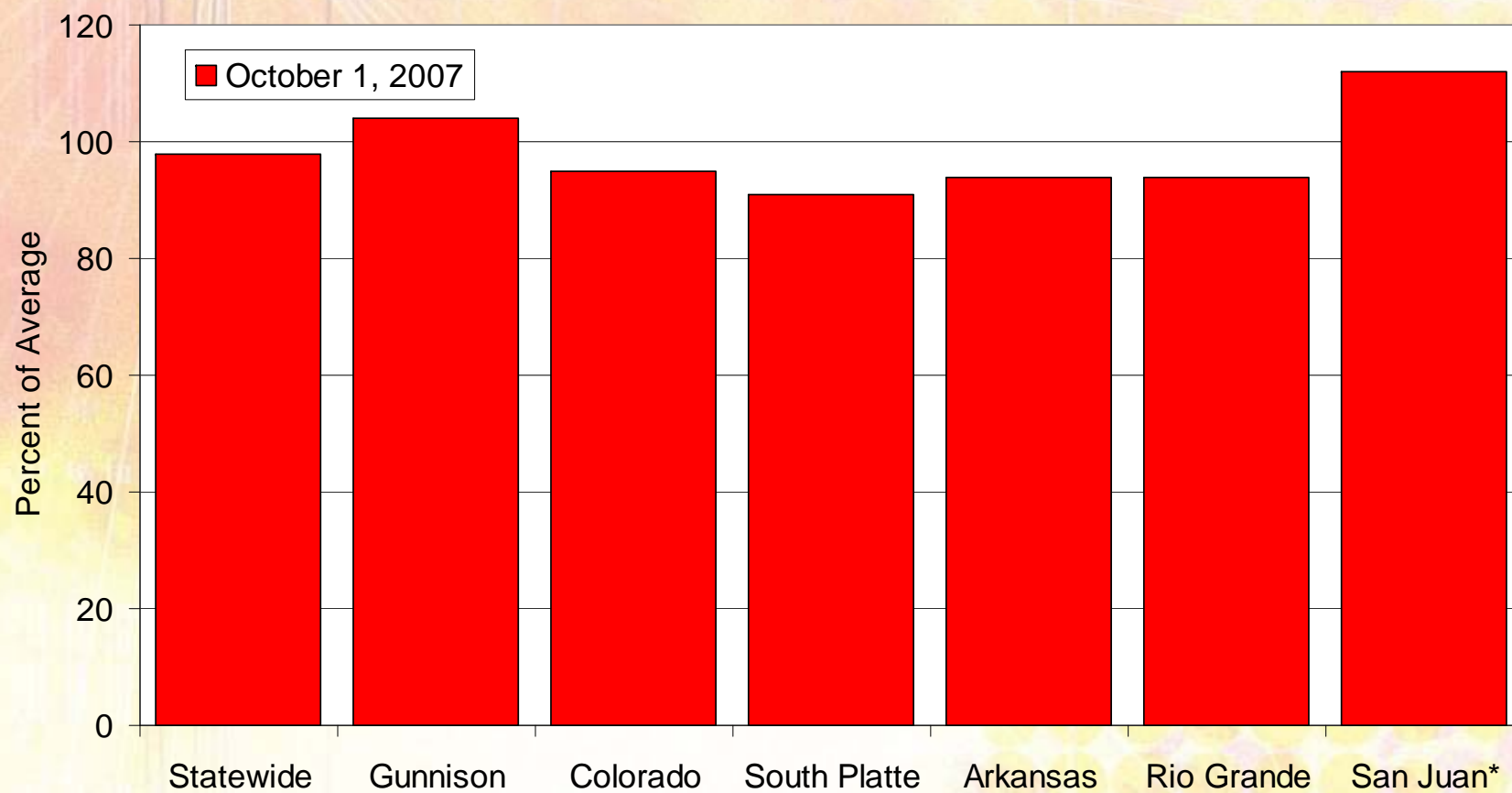
Streamflow vs. Average



2007 Reservoir Storage Summary

- Reservoir storage improved across the state even with lack of snowpack and runoff
- Volumes tracked above average for most of the year in Gunnison, Colorado and San Juan/Animas/Dolores and San Miguel basins
- Storage statewide declined to 98% of average on September 30

Reservoir Storage by Basin, Oct 1, 2007



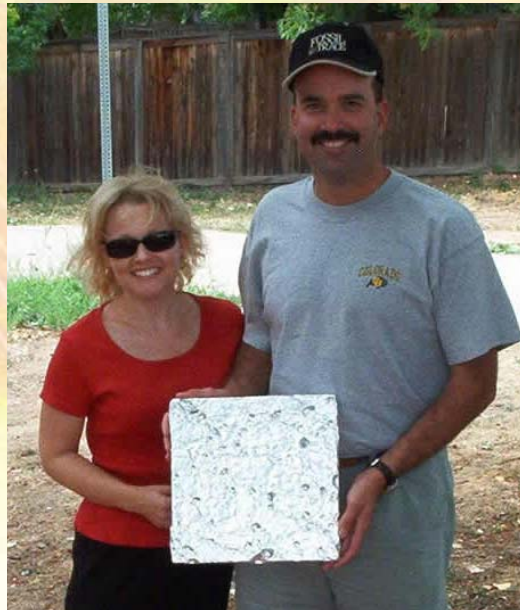
*includes the Animas and Dolores basins

Colorado Reservoir Storage Levels

**Colorado Statewide Reservoir Levels on October 1st
for Years 1997- 2007**



CoCoRaHS – Community Collaborative Rain Hail and Snow: We're looking for more volunteers!



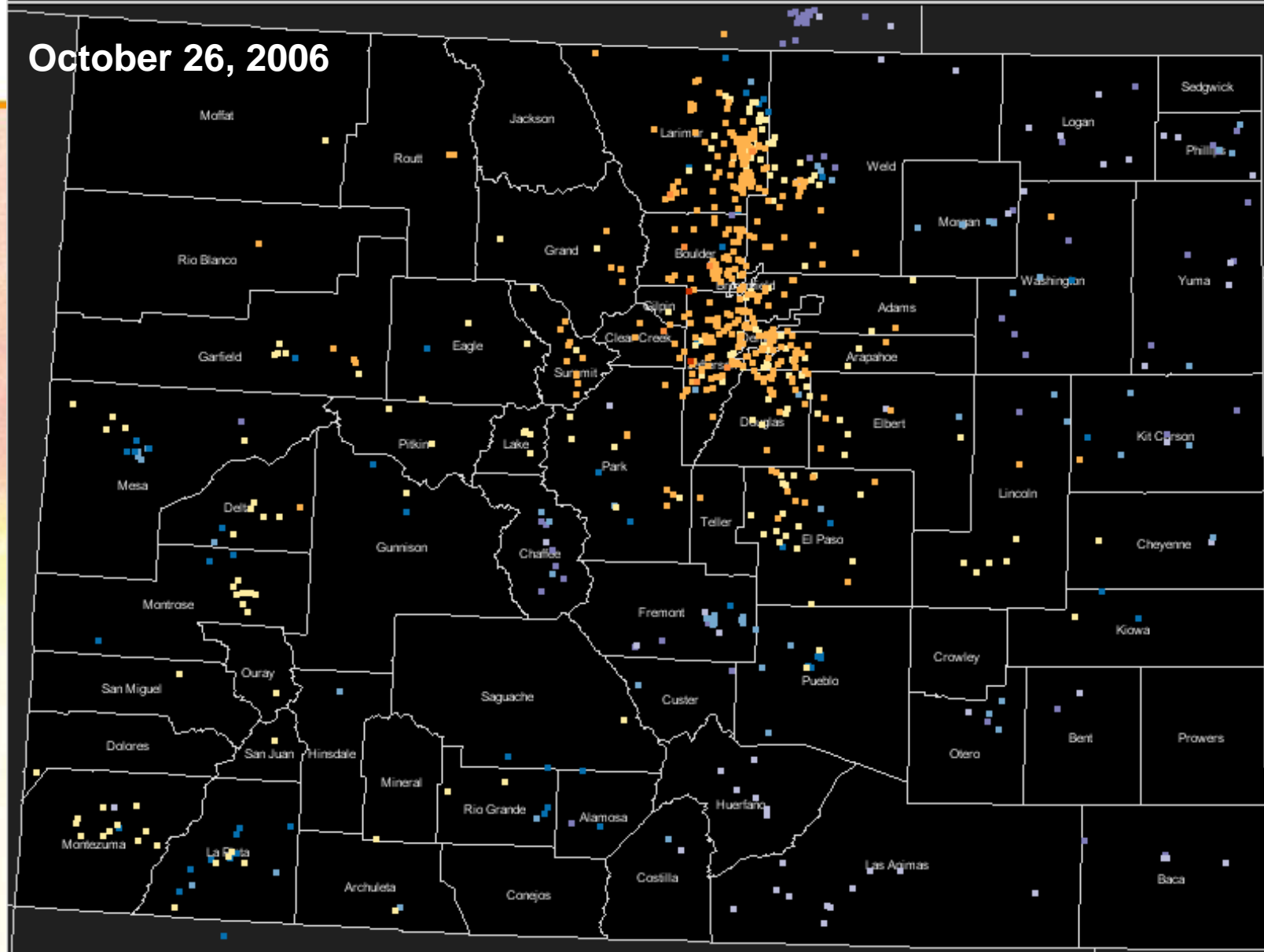
CoCo RaHS Daily Highlights 2007 Water Year

Daily Precipitation (inches x.xx), for the 24 hour period ending ~7:00 am

Colorado 10/26/2006

0.0 Trace 0.01 - 0.12 0.12 - 0.23 0.23 - 0.59 0.59 - 1.40 1.40 - 2.11 2.11 - 2.34

October 26, 2006

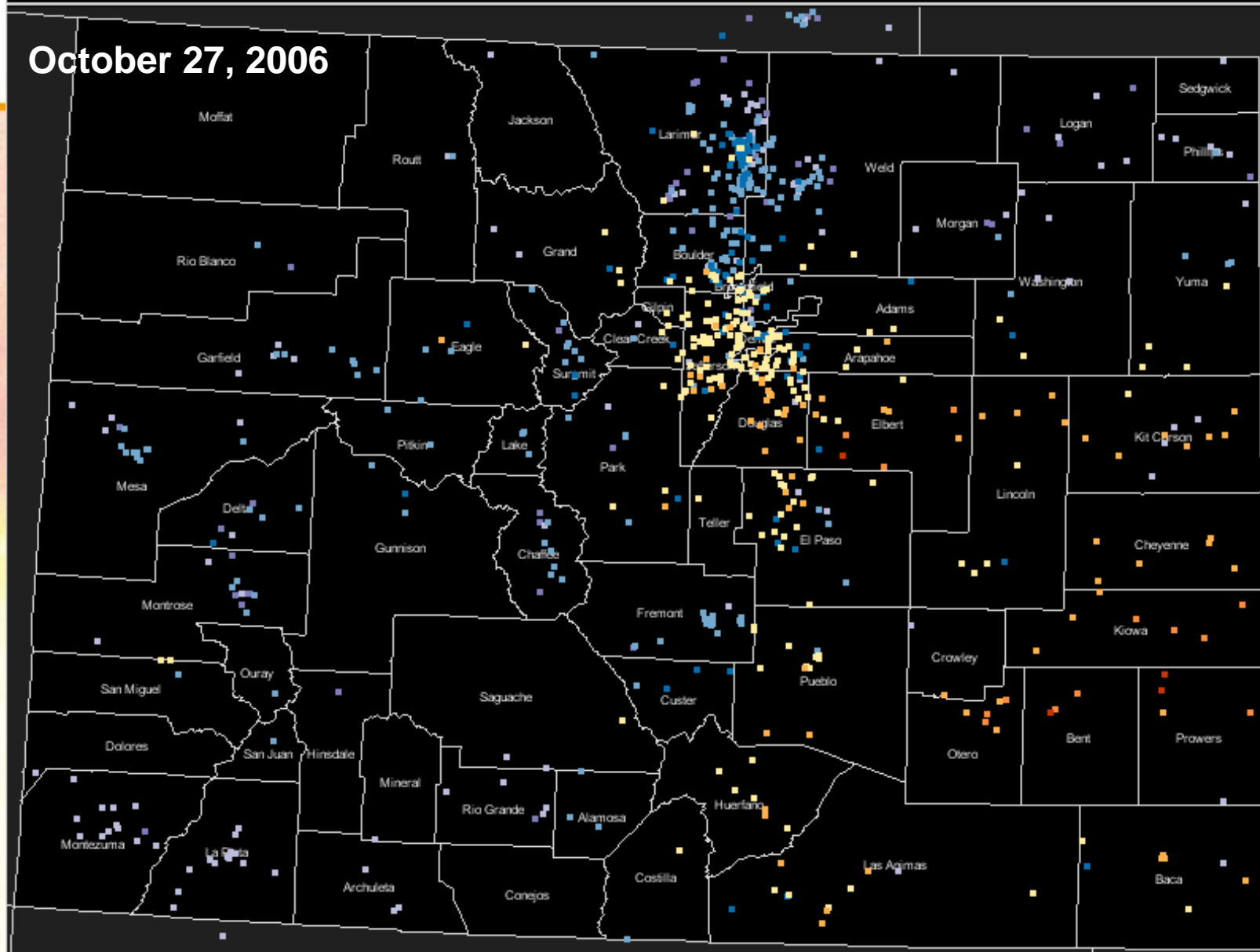


Daily Precipitation (inches x.xx), for the 24 hour period ending ~7:00 am

Colorado 10/27/2006

0.0 Trace 0.01 - 0.17 0.17 - 0.34 0.34 - 0.86 0.86 - 2.05 2.05 - 3.08 3.08 - 3.42

October 27, 2006

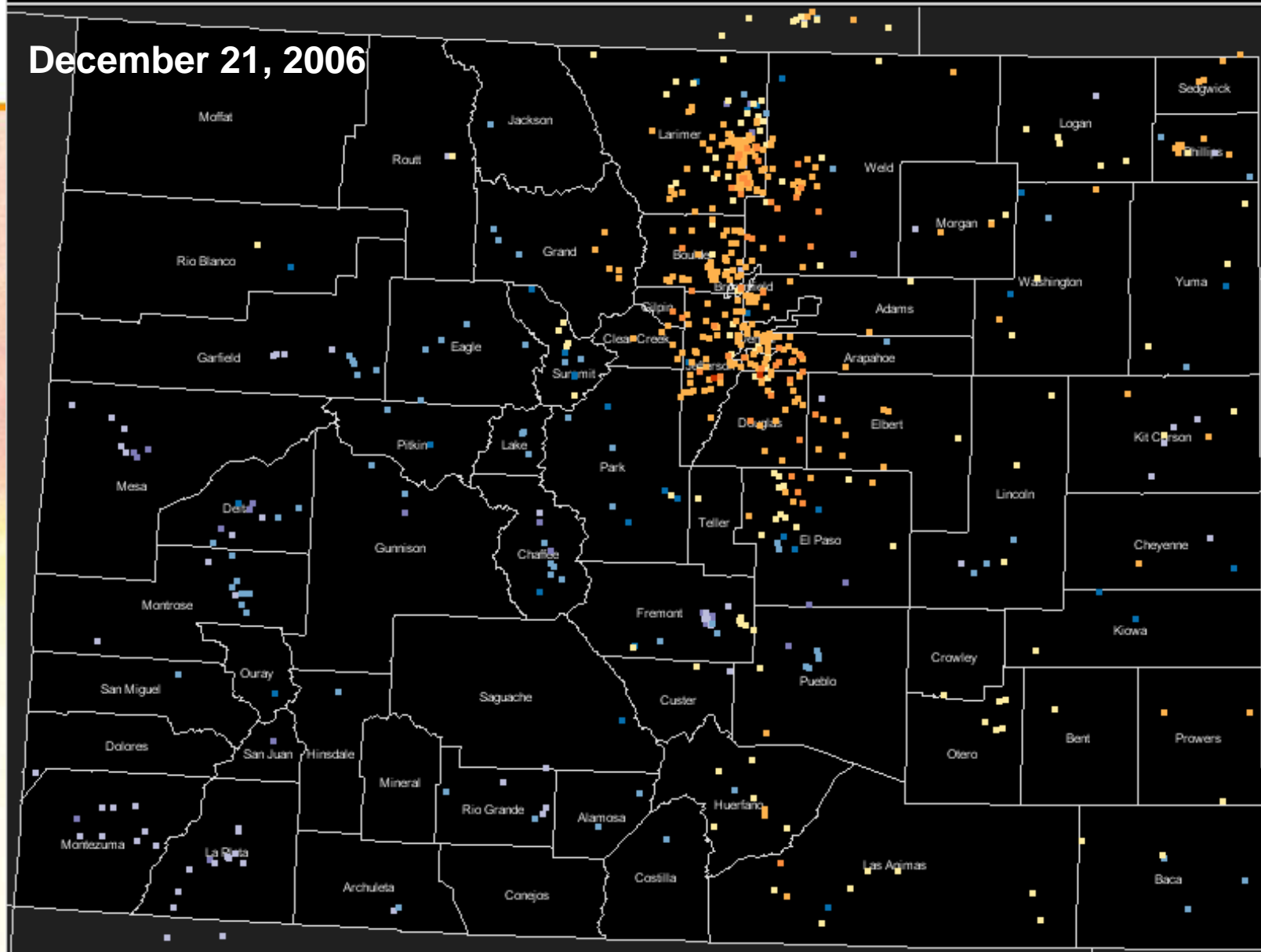


Daily Precipitation (inches x.xx), for the 24 hour period ending ~7:00 am

Colorado 12/21/2006

0.0 Trace 0.01 - 0.19 0.19 - 0.38 0.38 - 0.96 0.96 - 2.29 2.29 - 3.44 3.44 - 3.82

December 21, 2006

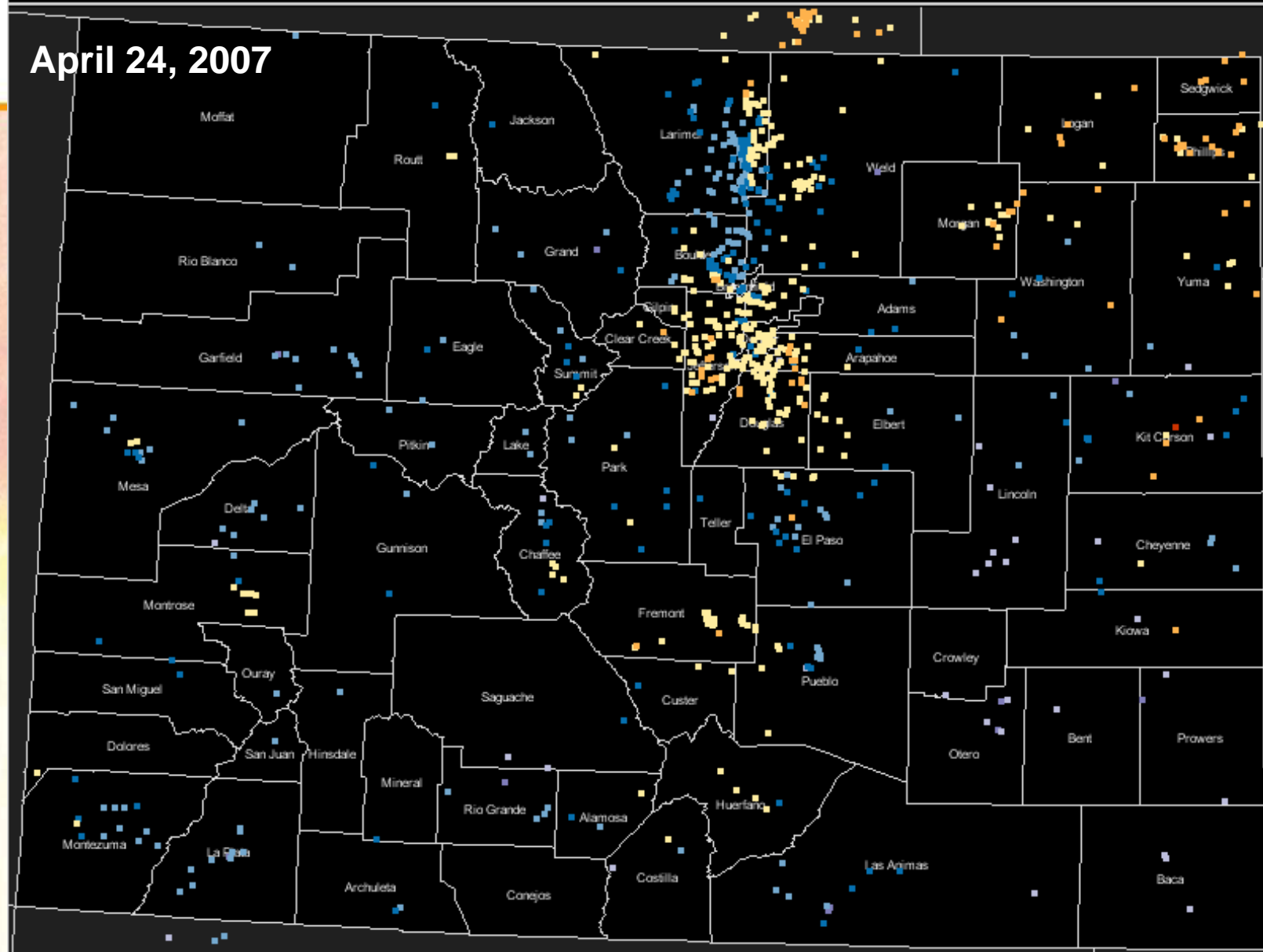


Daily Precipitation (inches x.xx), for the 24 hour period ending ~7:00 am

Colorado 4/24/2007

0.0 Trace 0.01 - 0.21 0.21 - 0.41 0.41 - 1.03 1.03 - 2.46 2.46 - 3.69 3.69 - 4.10

April 24, 2007

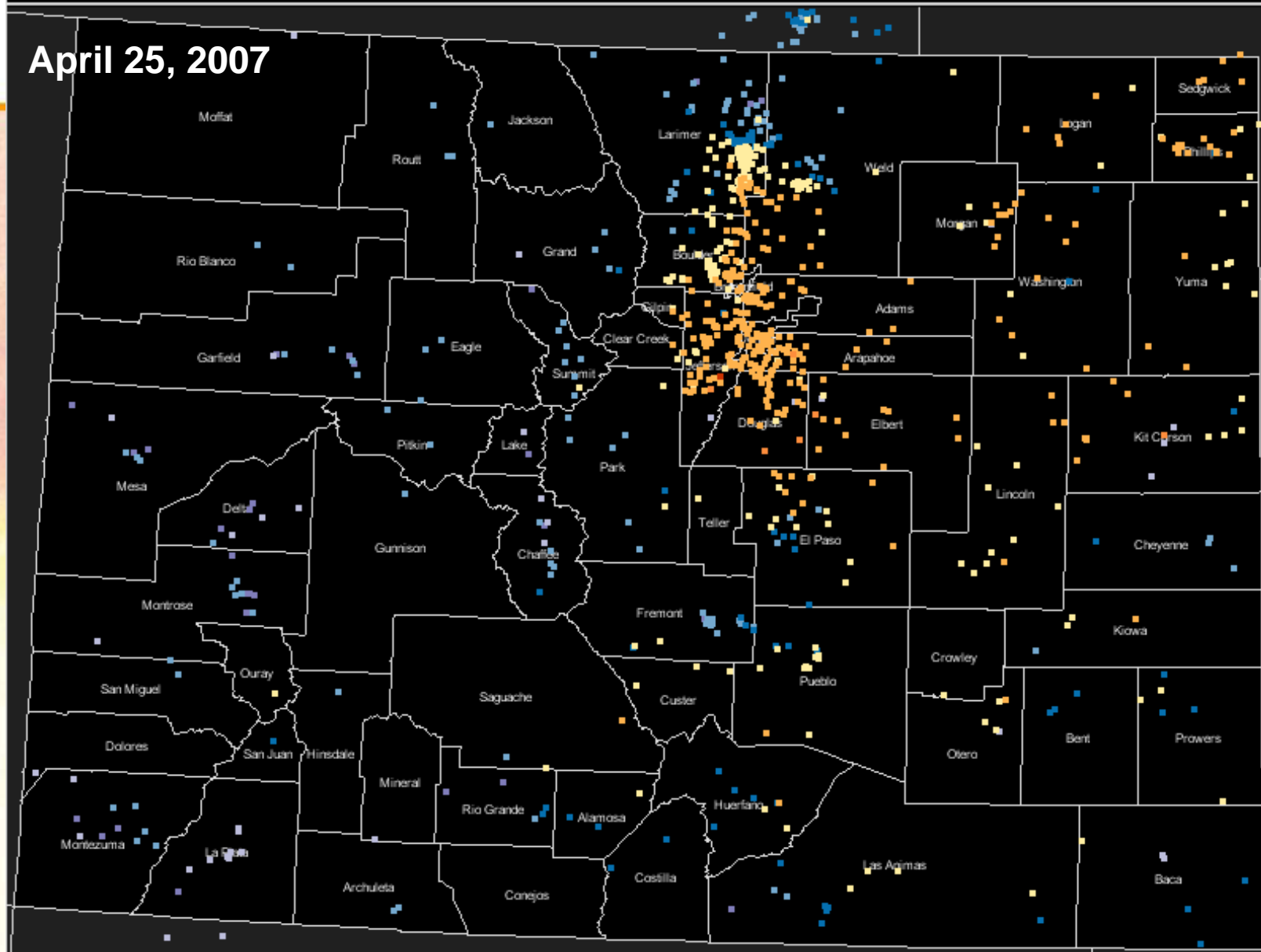


Daily Precipitation (inches x.xx), for the 24 hour period ending ~7:00 am

Colorado 4/25/2007

0.0 Trace 0.01 - 0.22 0.22 - 0.44 0.44 - 1.11 1.11 - 2.66 2.66 - 3.99 3.99 - 4.43

April 25, 2007

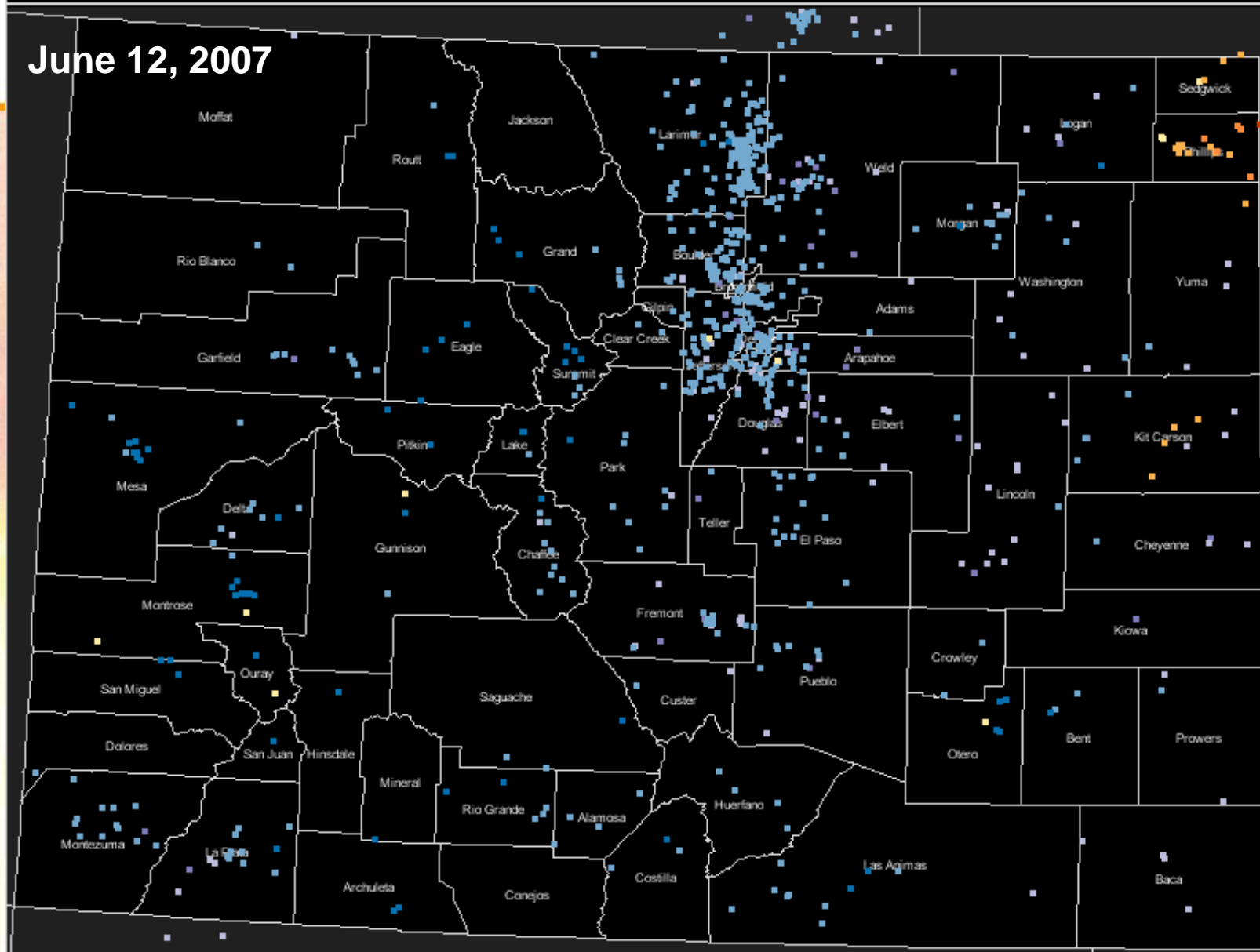


Daily Precipitation (inches x.xx), for the 24 hour period ending ~7:00 am

Colorado 6/12/2007

0.0 Trace 0.01 - 0.20 0.20 - 0.39 0.39 - 0.98 0.98 - 2.34 2.34 - 3.51 3.51 - 3.90

June 12, 2007

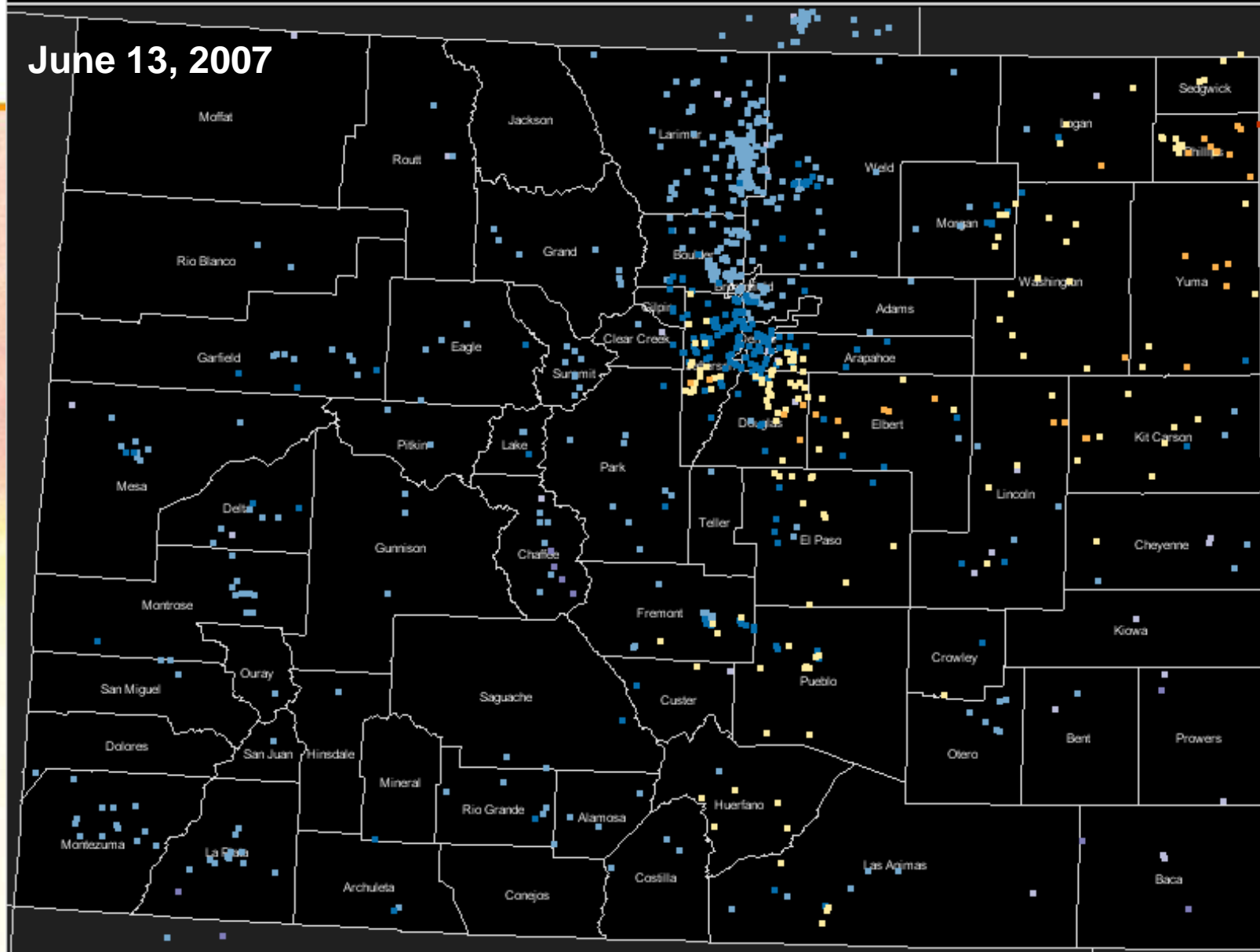


Daily Precipitation (inches x.xx), for the 24 hour period ending ~7:00 am

Colorado 6/13/2007

0.0 Trace 0.01 - 0.32 0.32 - 0.64 0.64 - 1.60 1.60 - 3.84 3.84 - 5.76 5.76 - 6.40

June 13, 2007

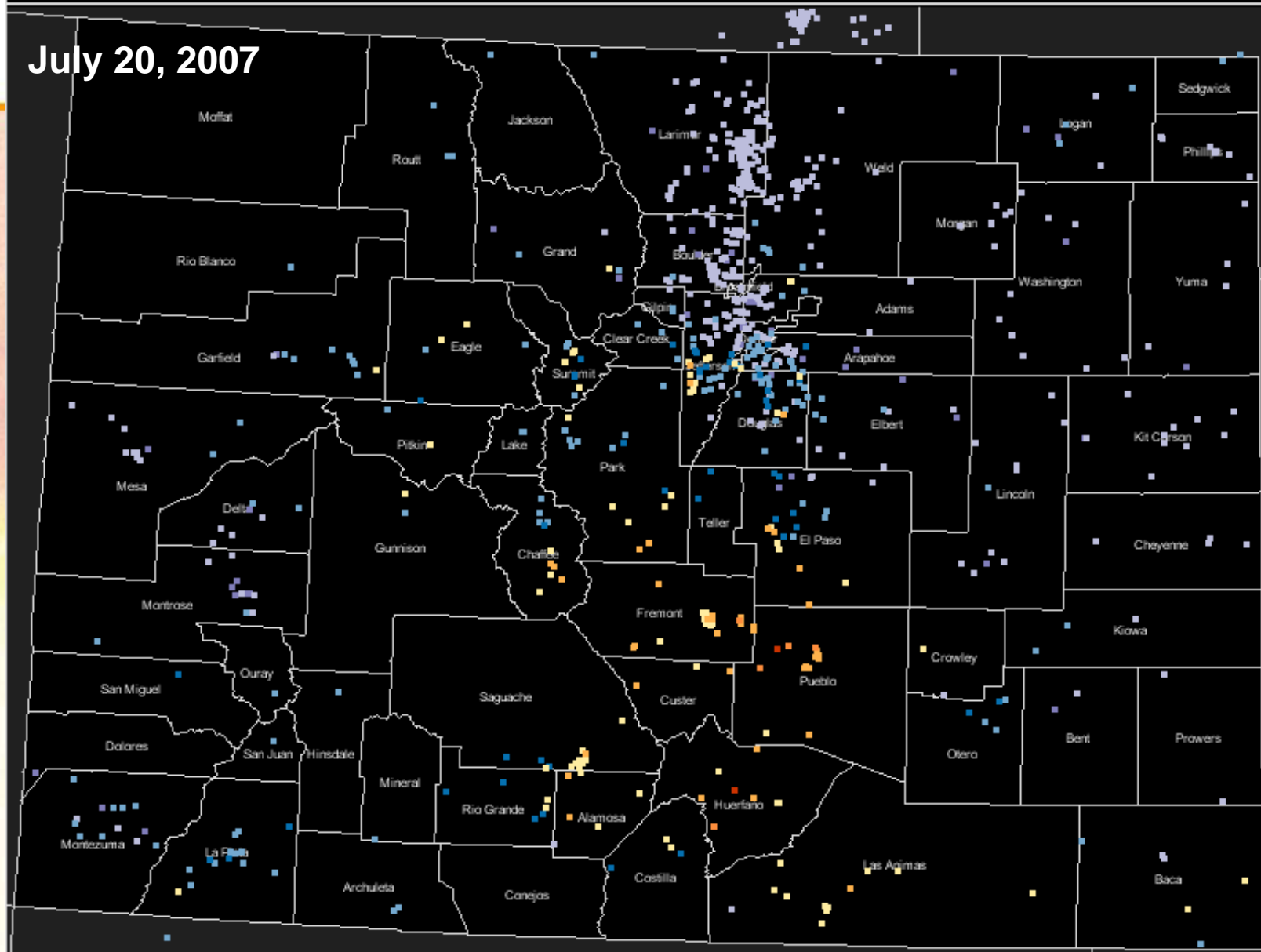


Daily Precipitation (inches x.xx), for the 24 hour period ending ~7:00 am

Colorado 7/20/2007

0.0 Trace 0.01 - 0.21 0.21 - 0.41 0.41 - 1.03 1.03 - 2.47 2.47 - 3.71 3.71 - 4.12

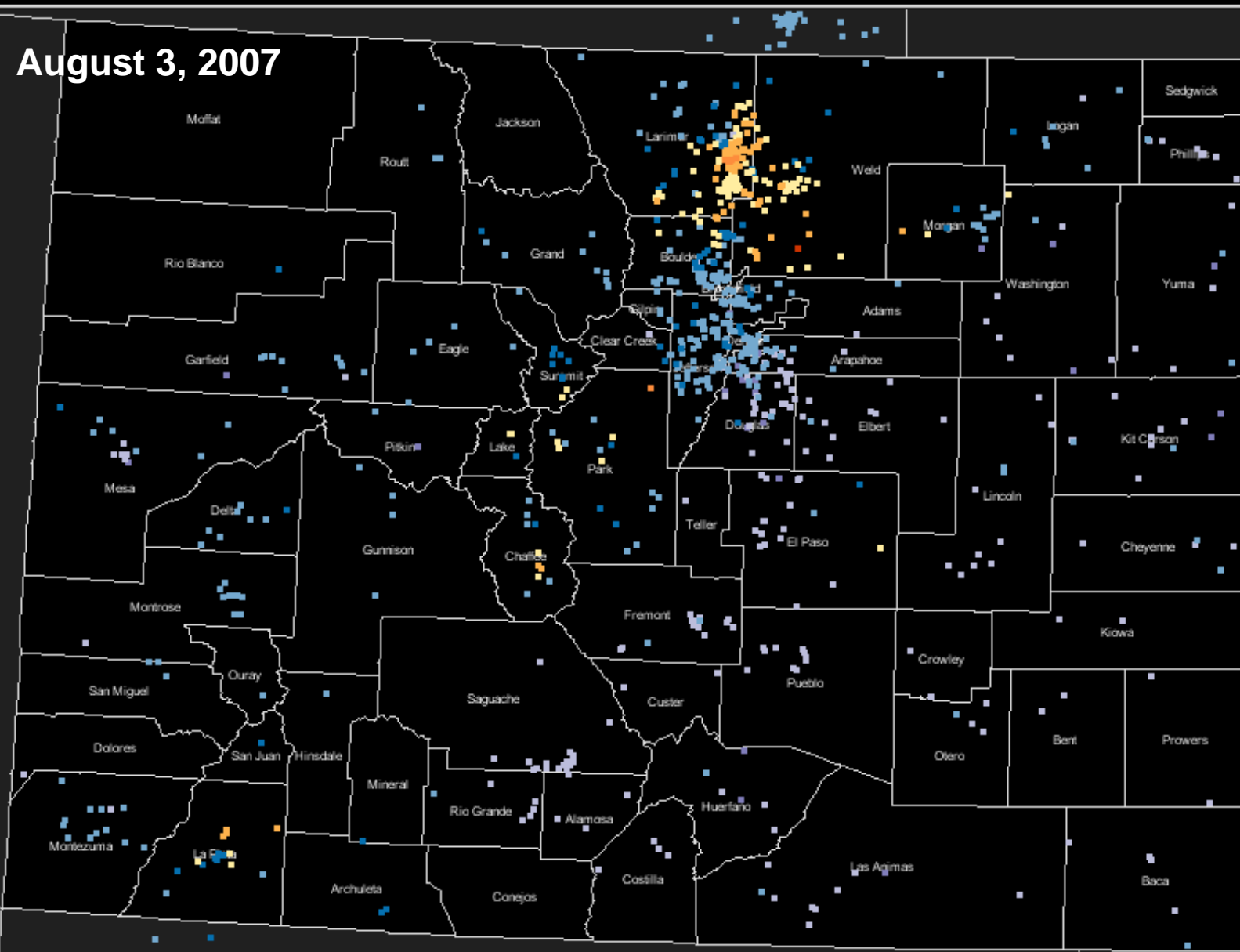
July 20, 2007



Daily Precipitation (inches x.xx), for the 24 hour period ending ~7:00 am

Colorado 8/3/2007

0.0 Trace 0.01 - 0.32 0.32 - 0.64 0.64 - 1.59 1.59 - 3.82 3.82 - 5.73 5.73 - 6.37

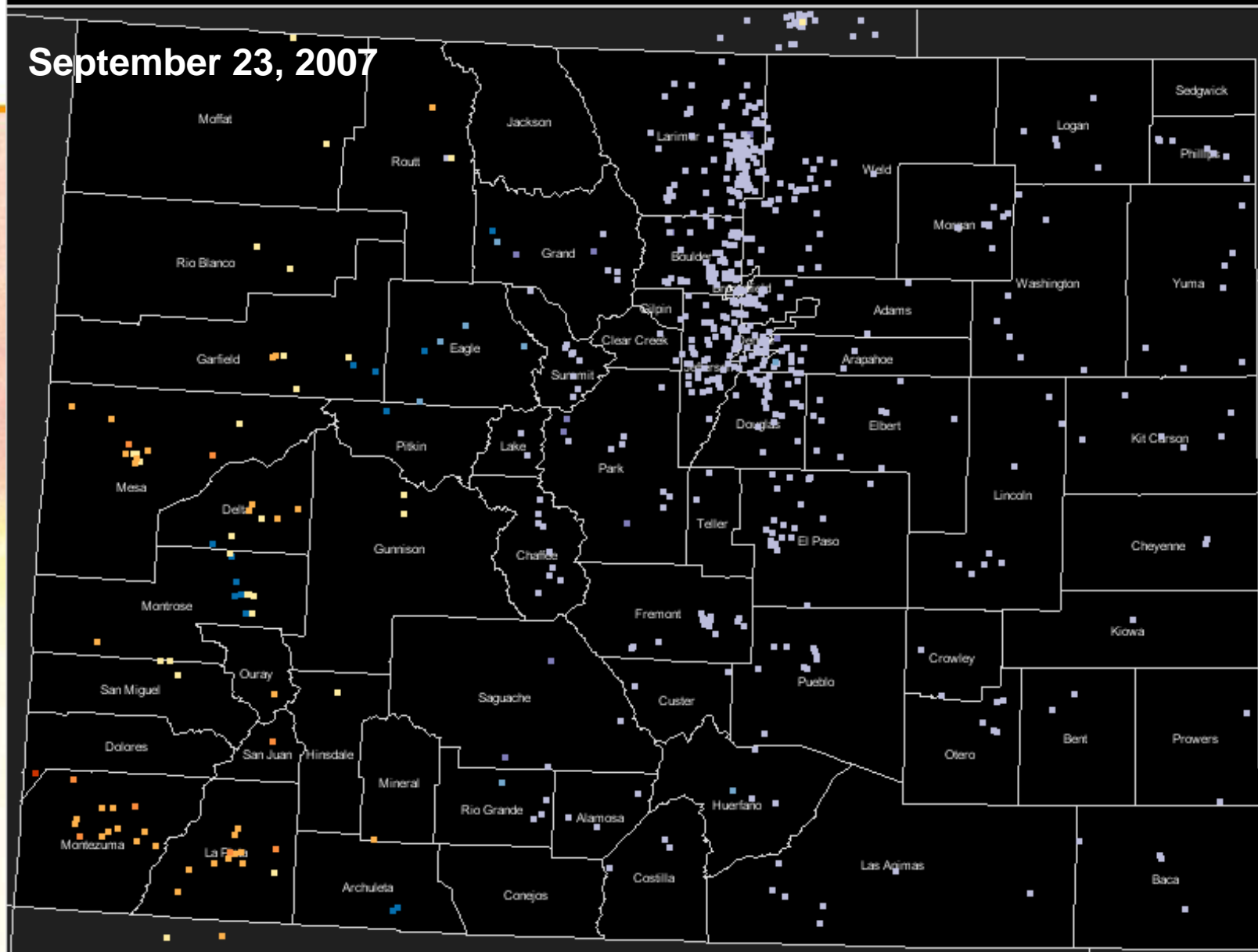


Daily Precipitation (inches x.xx), for the 24 hour period ending ~7:00 am

Colorado 9/23/2007

0.0 Trace 0.01 - 0.08 0.08 - 0.16 0.16 - 0.39 0.39 - 0.93 0.93 - 1.40 1.40 - 1.55

September 23, 2007

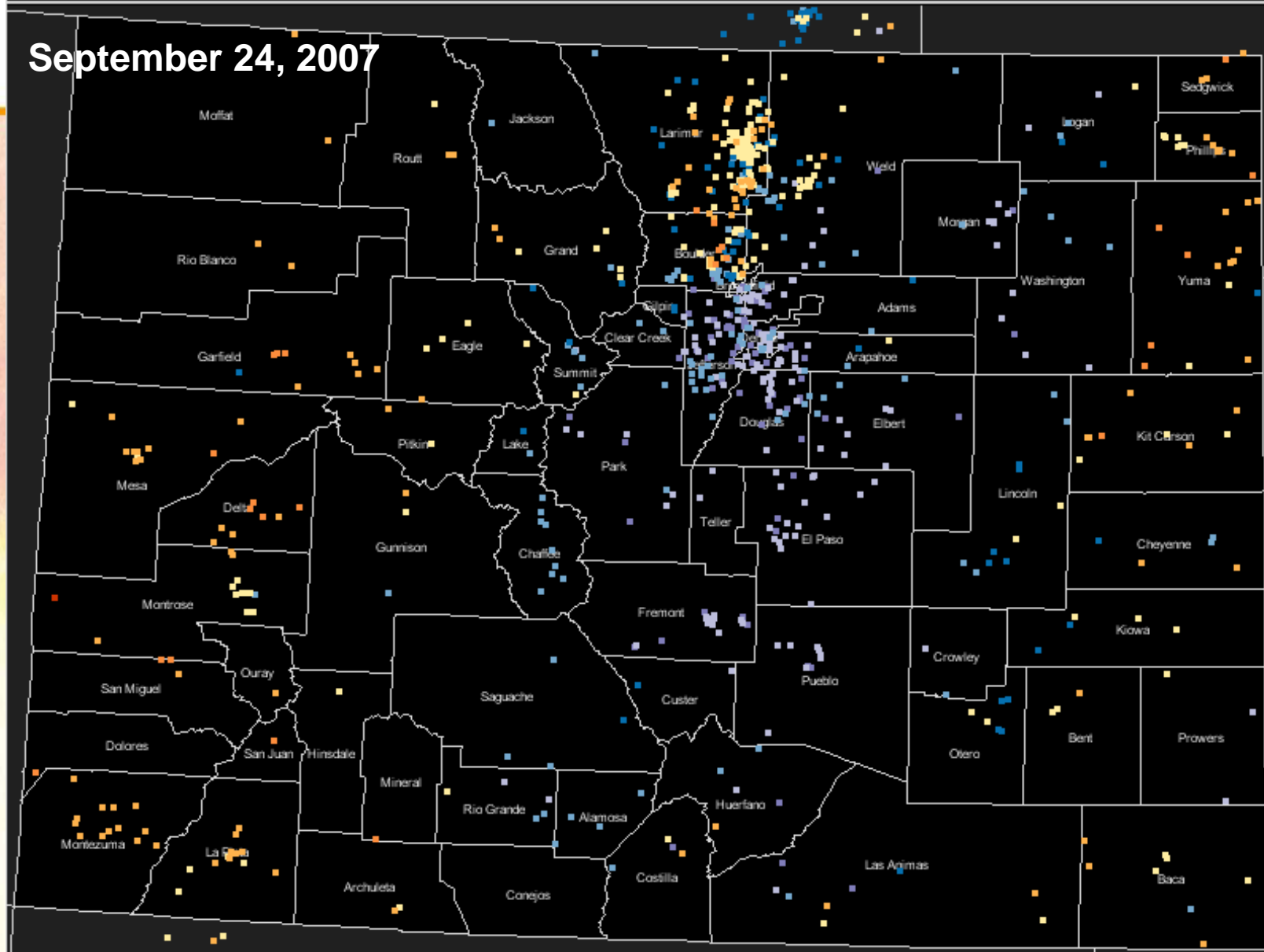


Daily Precipitation (inches x.xx), for the 24 hour period ending ~7:00 am

Colorado 9/24/2007

0.0 Trace 0.01 - 0.07 0.07 - 0.14 0.14 - 0.36 0.36 - 0.86 0.86 - 1.29 1.29 - 1.43

September 24, 2007



Natural Resources Conservation Service

Snow Survey Office

- Access to snowpack, precipitation, reservoir data and streamflow forecast information available at:
<http://www.co.nrcs.usda.gov/snow/index.html>



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”

