



Highlights of the 2006 Water Year in Colorado

Nolan Doesken, State Climatologist
Atmospheric Science Department
Colorado State University

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

Presented to 61st Annual Meeting of the Rocky Mountain
Hydrologic Research Center, held at NCAR, Boulder, CO,
November 3, 2006

Prepared by Odie Bliss





A quick review of climatic conditions leading up to the 2006 Water Year

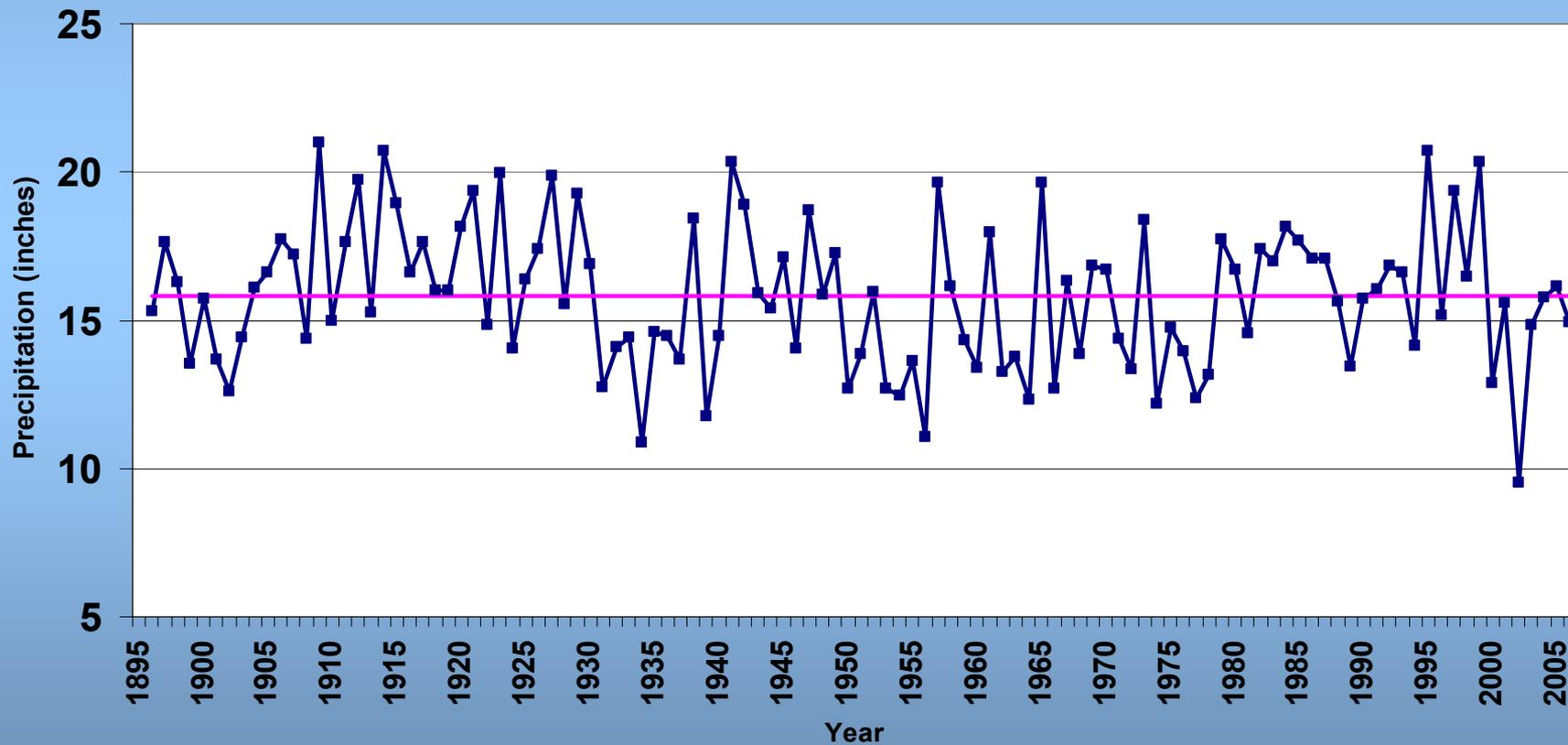


Photo by Lynn Kral, Loveland, January 2006



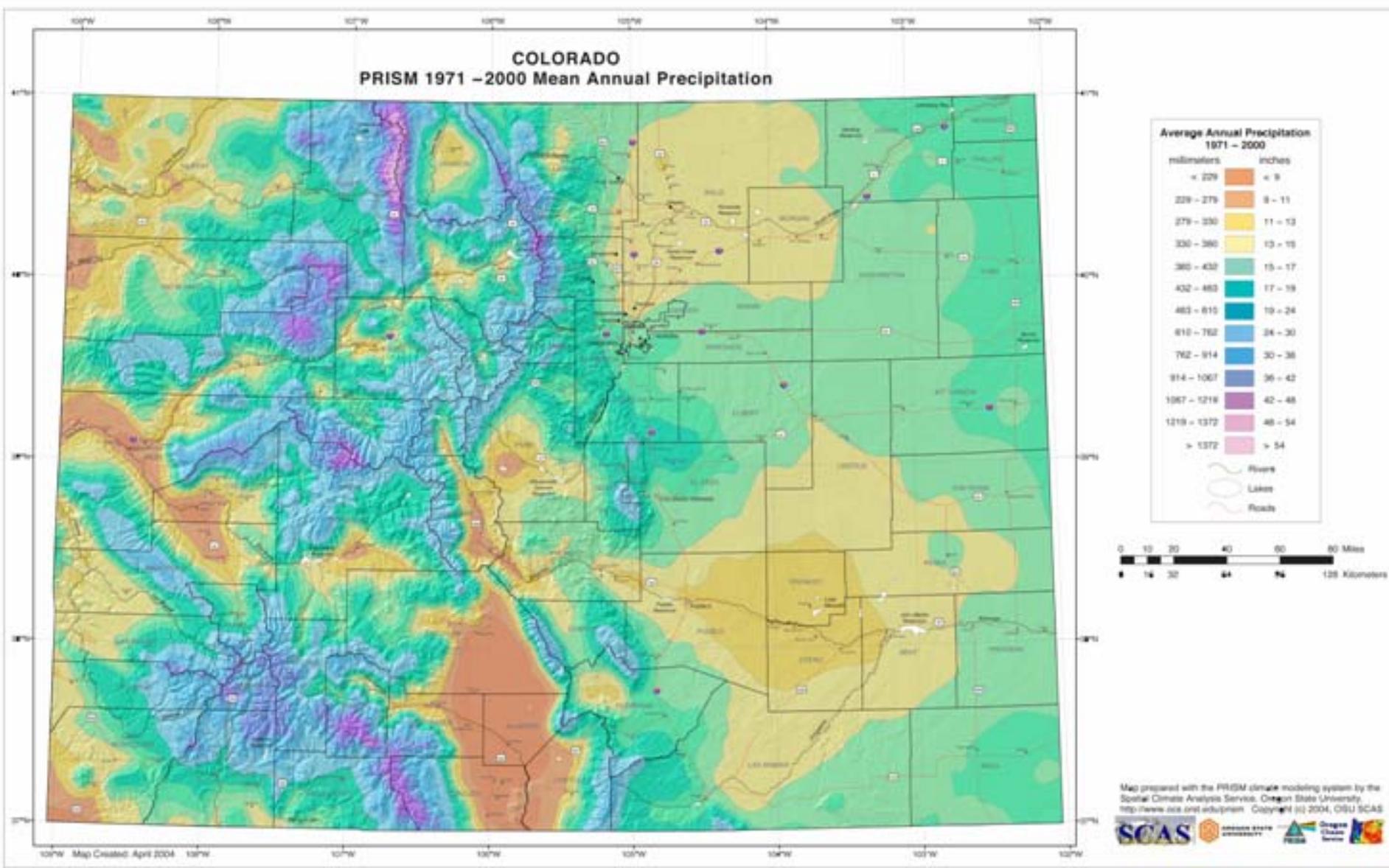
Colorado Precipitation in Historic Perspective

Colorado Statewide Water Year (Oct-Sep) Precipitation
from 1896 - 2006





Colorado Average Annual Precipitation

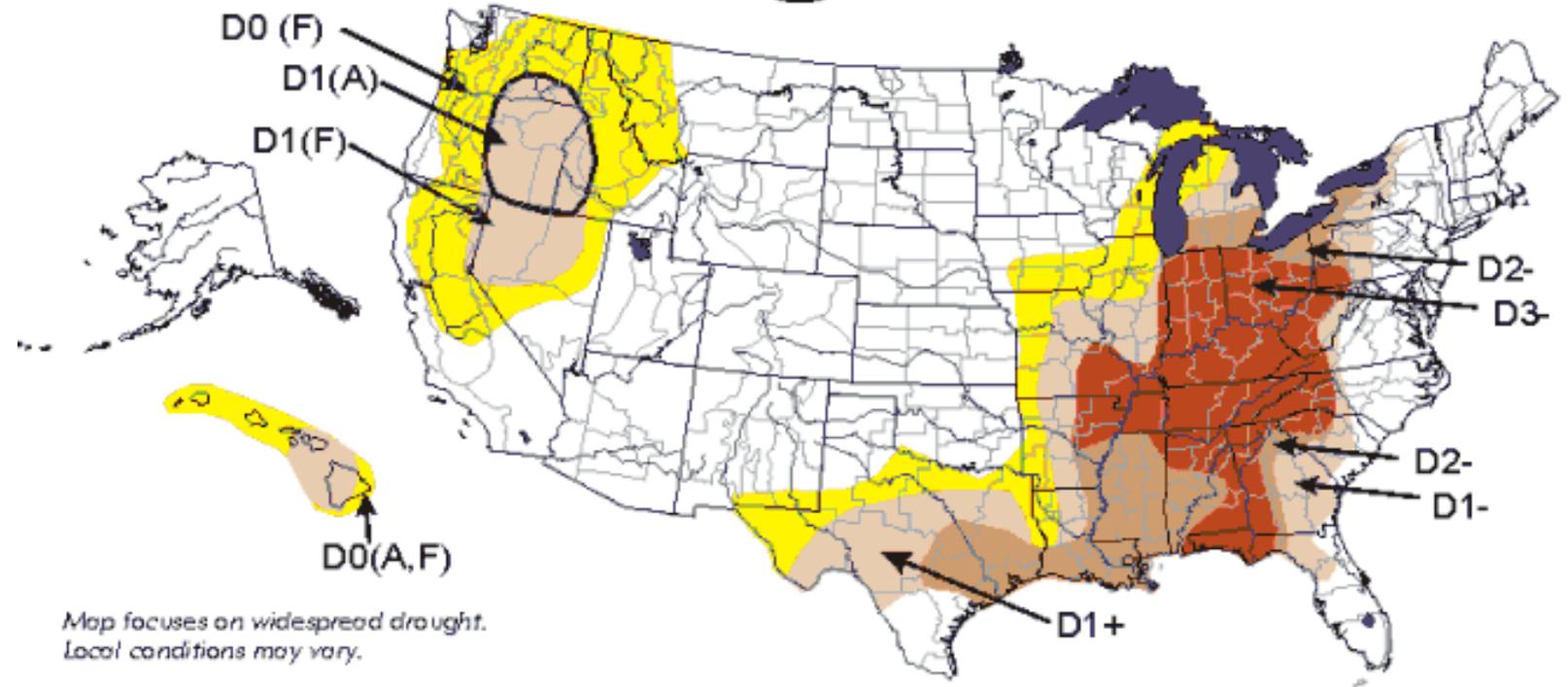




Sept 1999 Drought Monitor Map

September 28, 1999

U.S. Drought Monitor



Map focuses on widespread drought.
Local conditions may vary.

- D0 Watch
 - D1 Drought
 - D2 Drought-Severe
 - D3 Drought-Extreme
 - D4 Drought-Exceptional
 - Delineates Overlapping Areas
- Drought type: used only when impacts differ
- A = Agriculture
W = Water
F = Forest fire danger

Plus (+) = Forecast to intensify next two weeks
Minus (-) = Forecast to diminish next two weeks
No sign = No change in drought classification forecast



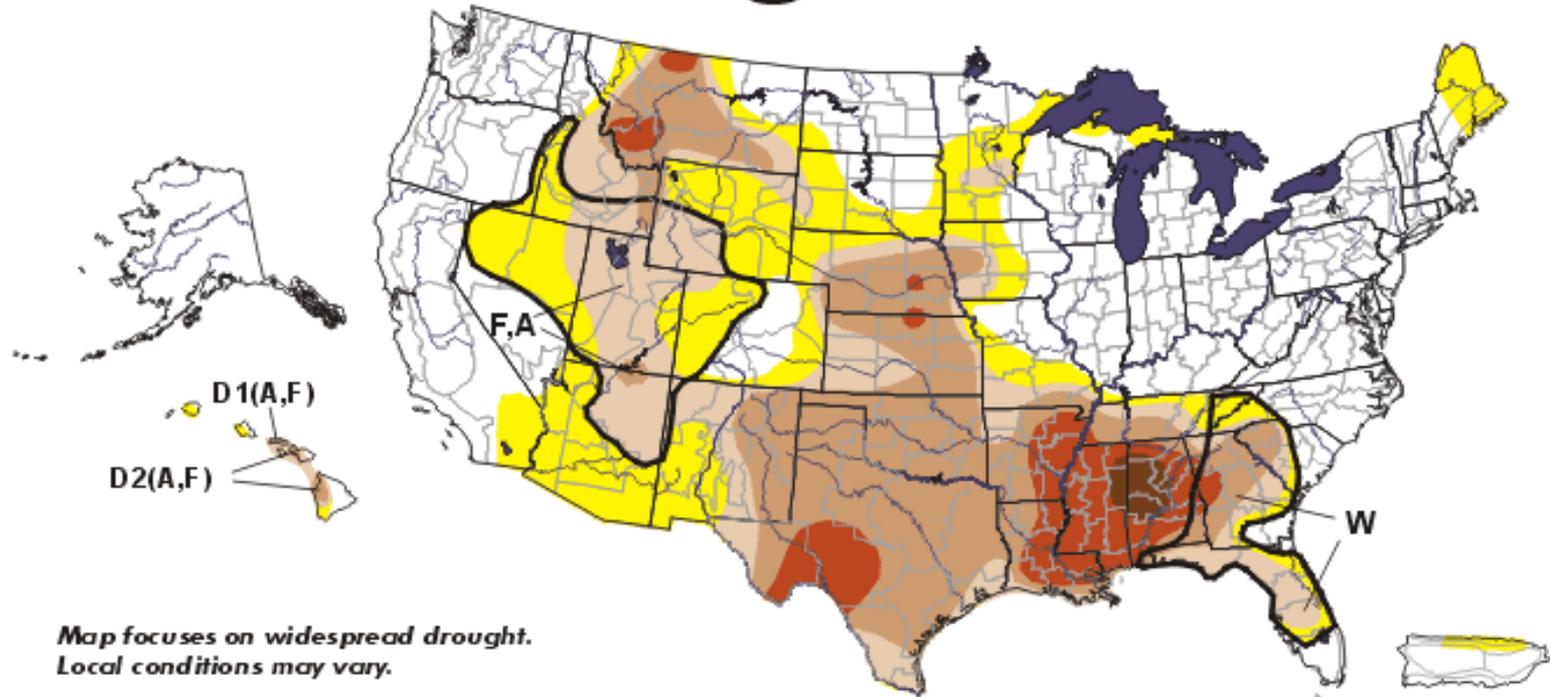
• Released Thursday, Sep 30, 1999 •



October 2000 Drought Monitor Map

October 3, 2000 Valid 8 a.m. EDT

U.S. Drought Monitor



*Map focuses on widespread drought.
Local conditions may vary.*

- | | |
|------------------------------|--|
| D0 Abnormally Dry | Drought type: used only
when impacts differ |
| D1 Drought-First Stage | |
| D2 Drought-Severe | |
| D3 Drought-Extreme | |
| D4 Drought-Exceptional | |
| Delineates Overlapping Areas | A = Agriculture |
| | W = Water |
| | F = Wildfire danger |



See accompanying texts summary for forecast statements
<http://ens.o.unl.edu/monitor/monitor.html>

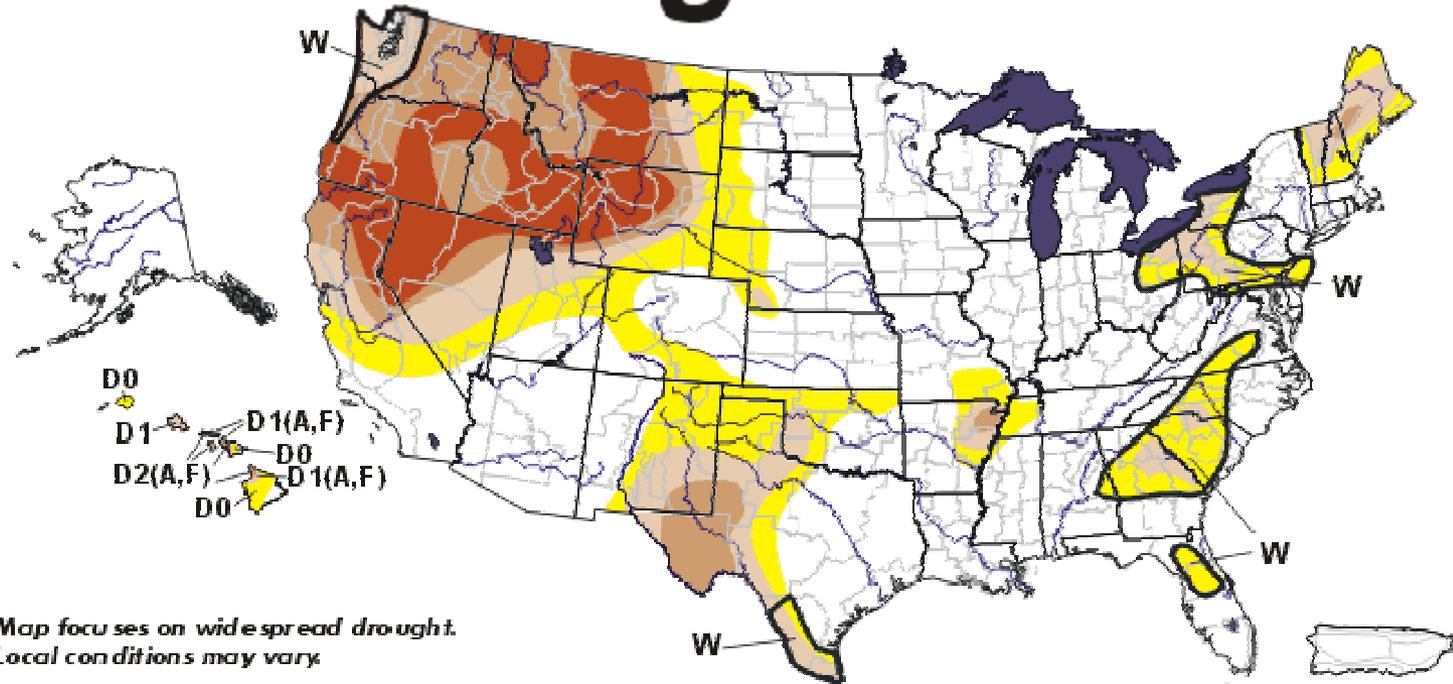
● Released Thursday, Oct. 5, 2000 ●



October 2001 Drought Monitor Map

October 2, 2001 Valid 8 a.m. EDT

U.S. Drought Monitor



Map focuses on widespread drought.
Local conditions may vary

- D0 Abn or mally Dry
- D1 Drought-Moderate
- D2 Drought-Severe
- D3 Drought-Extreme
- D4 Drought-Exceptional
- Delineates Overlapping Areas

Drought Impact Types:
 A = Agriculture
 W = Water (Hydrological)
 F = Fire danger (Wildfires)
 (No type = All 3 impacts)



See accompanying text summary for forecast statements
<http://ens.o.unl.edu/monitor/monitor.html>

• Released Thursday, October 4, 2001 •

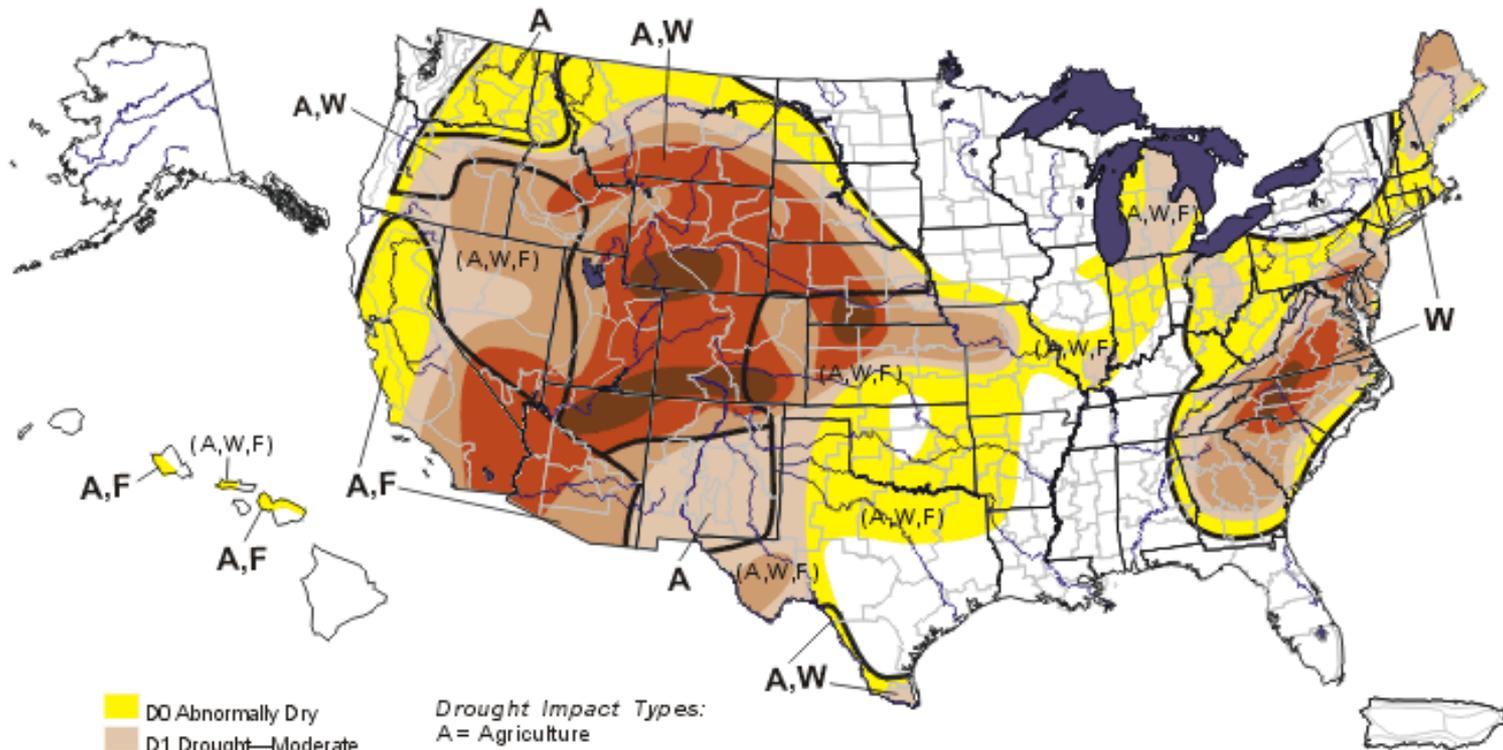
Author: Douglas Le Comte, NOAA/CPC



October 2002 Drought Monitor Map

U.S. Drought Monitor

October 1, 2002
Valid 8 a.m. EDT



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

Drought Impact Types:
 A = Agriculture
 W = Water (Hydrological)
 F = Fire danger (Wildfires)
 — Delineates dominant impacts
 (No type = All 3 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>



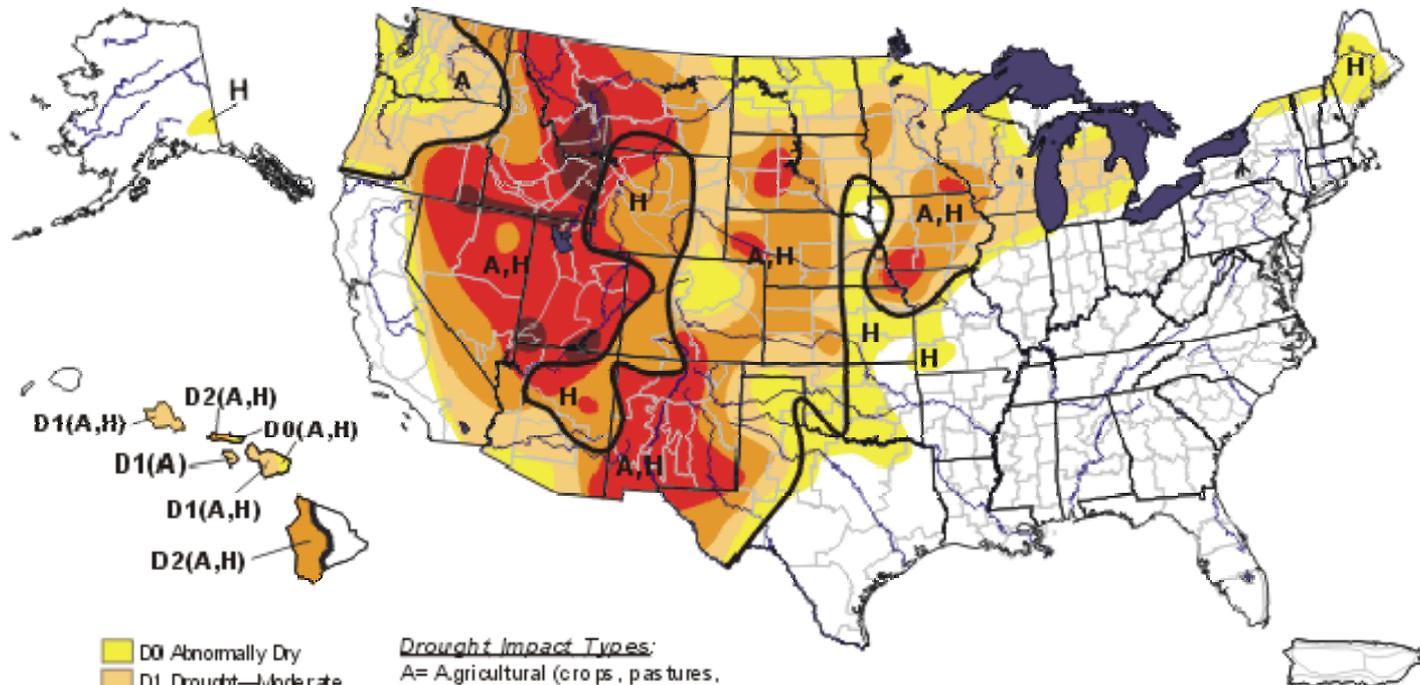
Released Thursday, October 3, 2002
 Author: Rich Tinker, CPC/INCEP/NWS/NOAA



September 2003 Drought Monitor Map

U.S. Drought Monitor

September 30, 2003
Valid 8 a.m. EDT



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

Drought Impact Types:
 A= Agricultural (crops, pastures, grasslands)
 H= Hydrological (water)
 No type = both impacts
 — Delineates dominant 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, October 2, 2003

Author: Candace Tankersley/Scott Stephens, NOAA/NCDC

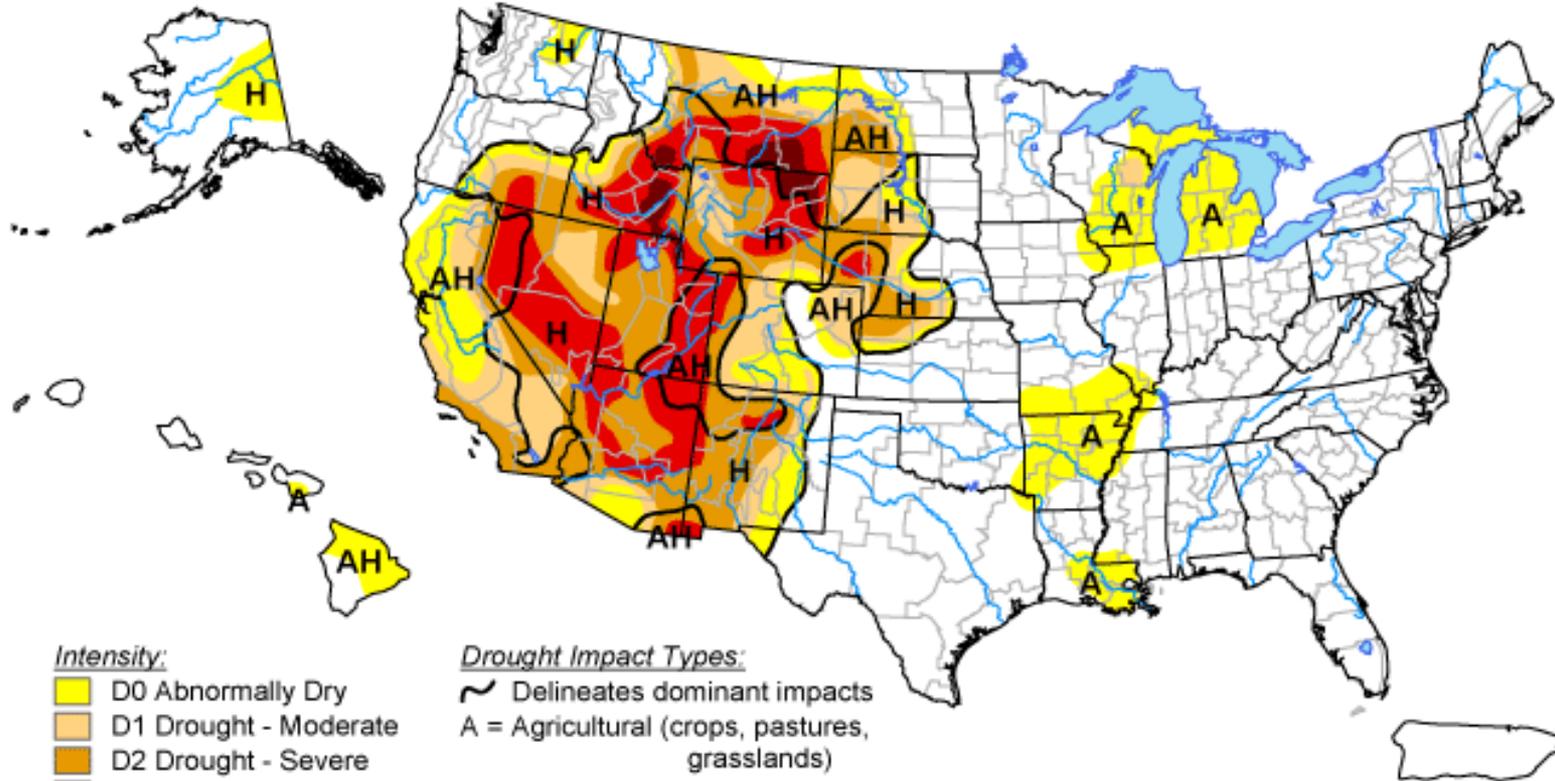


September 2004 Drought Monitor Map

U.S. Drought Monitor

September 28, 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)
- (No type = Both impacts)

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

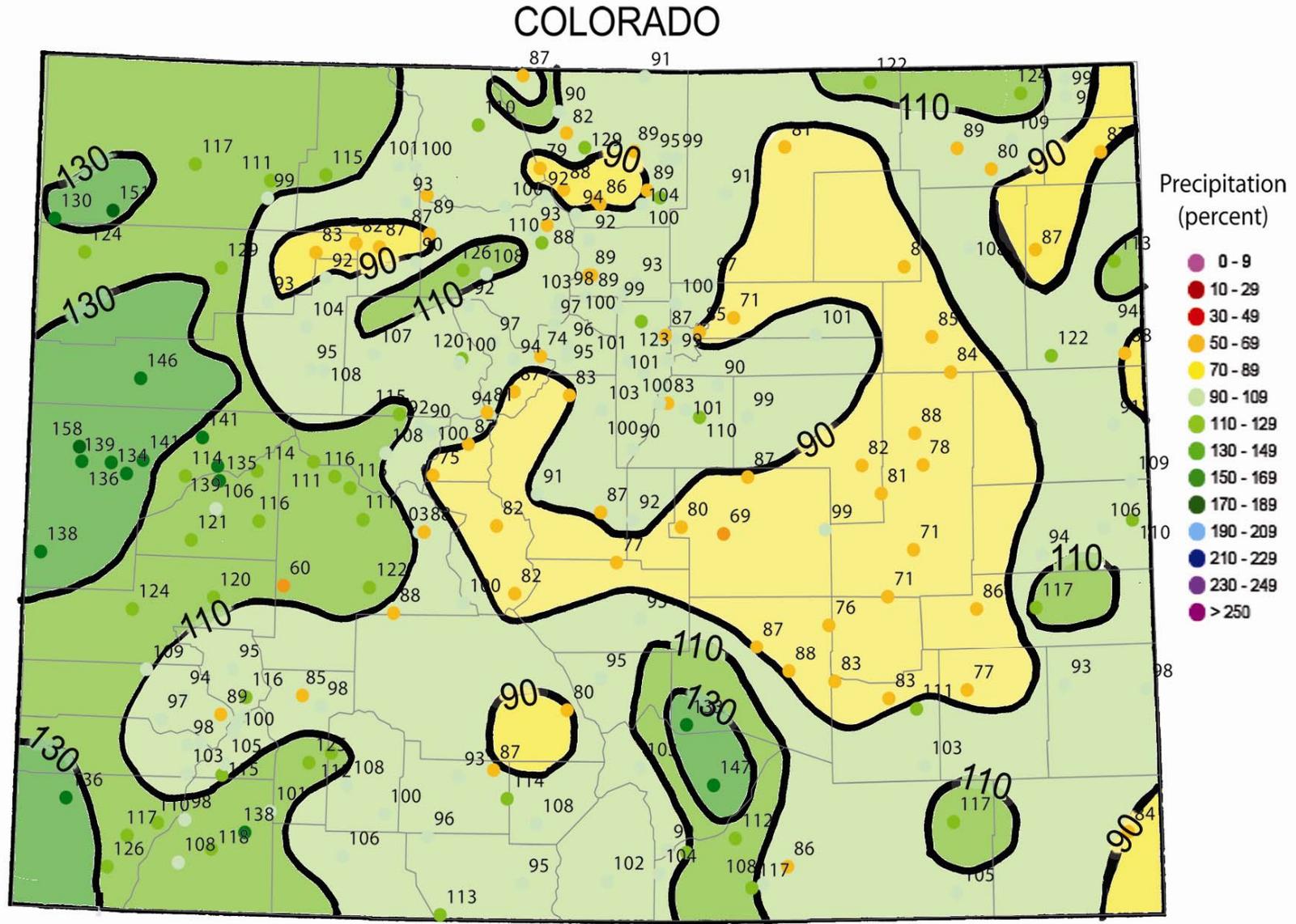


Released Thursday, September 30, 2004
Author: Brad Rippey, U.S. Department of Agriculture

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



2005 Water Year Precipitation



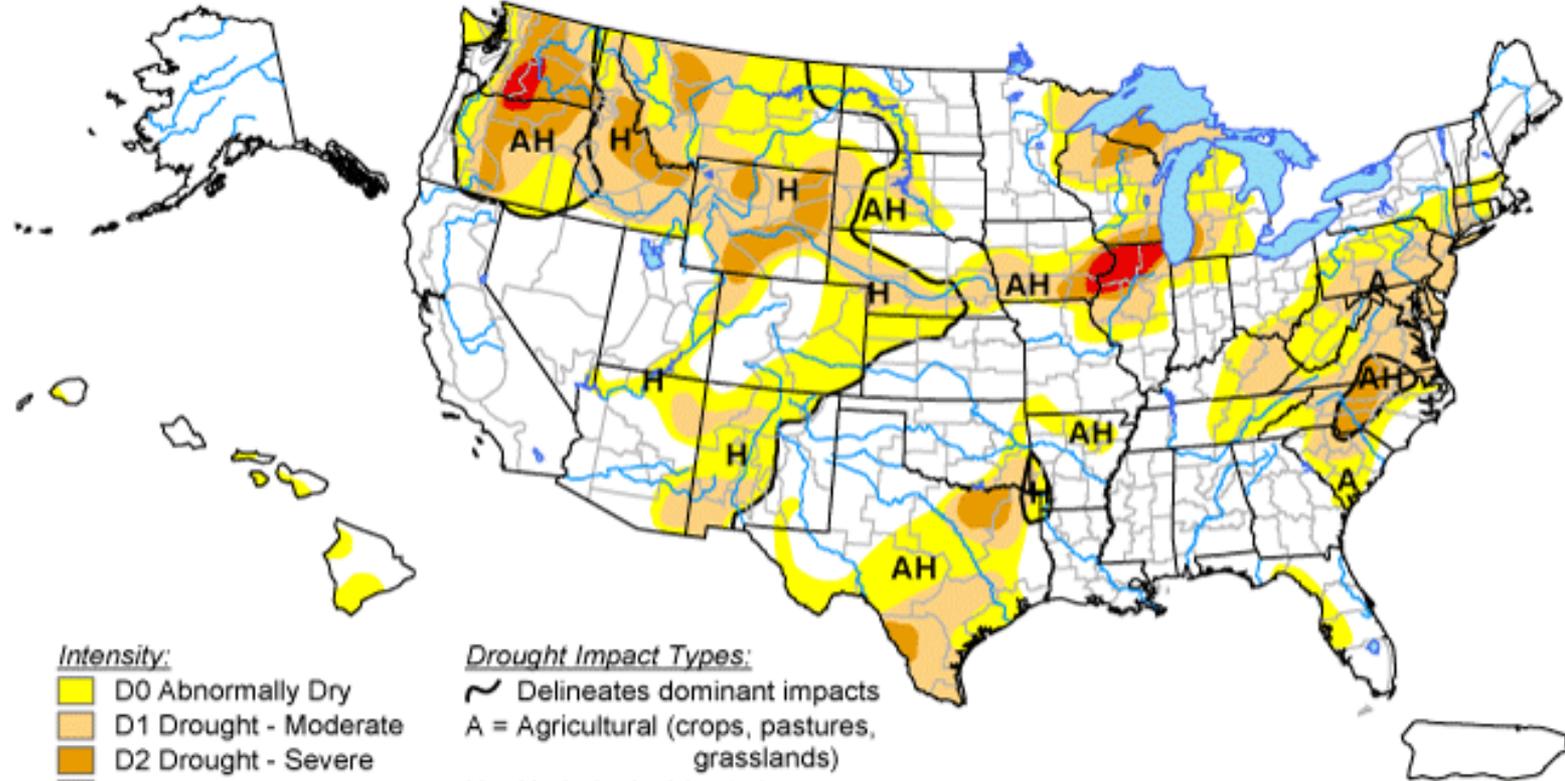
Water Year 2005 (Oct 04 - Sep 05) precipitation as a percent of the 1971-2000 average.



October 2005 Drought Monitor Map

U.S. Drought Monitor

October 4, 2005
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)
- (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, October 6, 2005

Author: RichTinker, CPC/NCEP/NWS/NOAA

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



What happened this past year?

WY2006 Highlights

- Soaking October storm – especially over Eastern Colorado
- Windy, dry winter over Foothills and Eastern Plains
- Frequent midwinter snows Northern Mountains
- Very warm and dry spring (tough on Agriculture)
- Early July soaking
- Wet summer over much of southern Colorado
- A chilly ending to another warm year

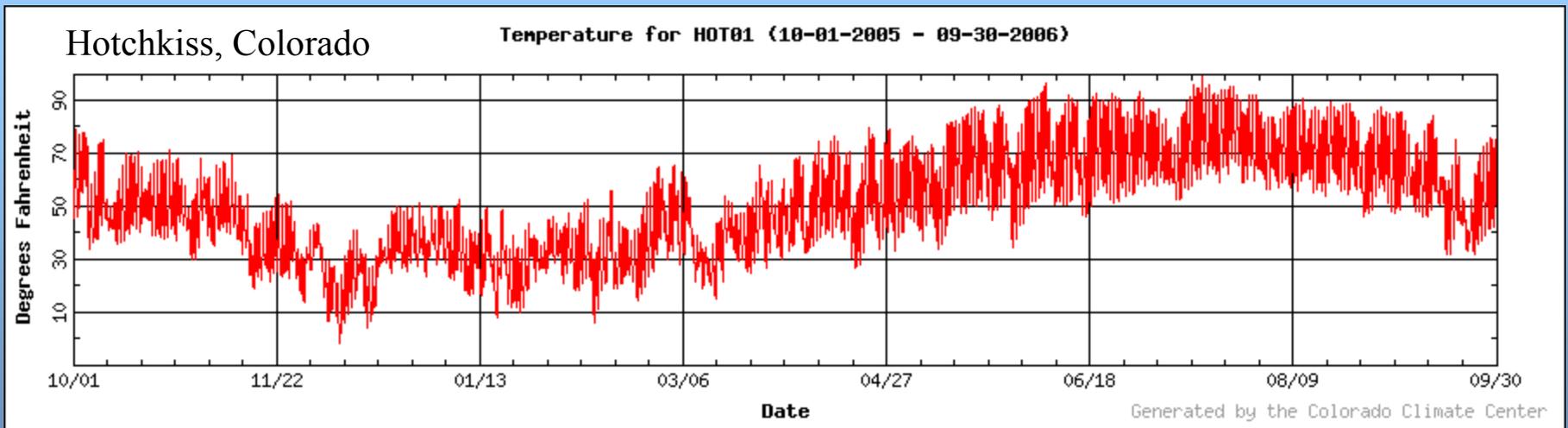
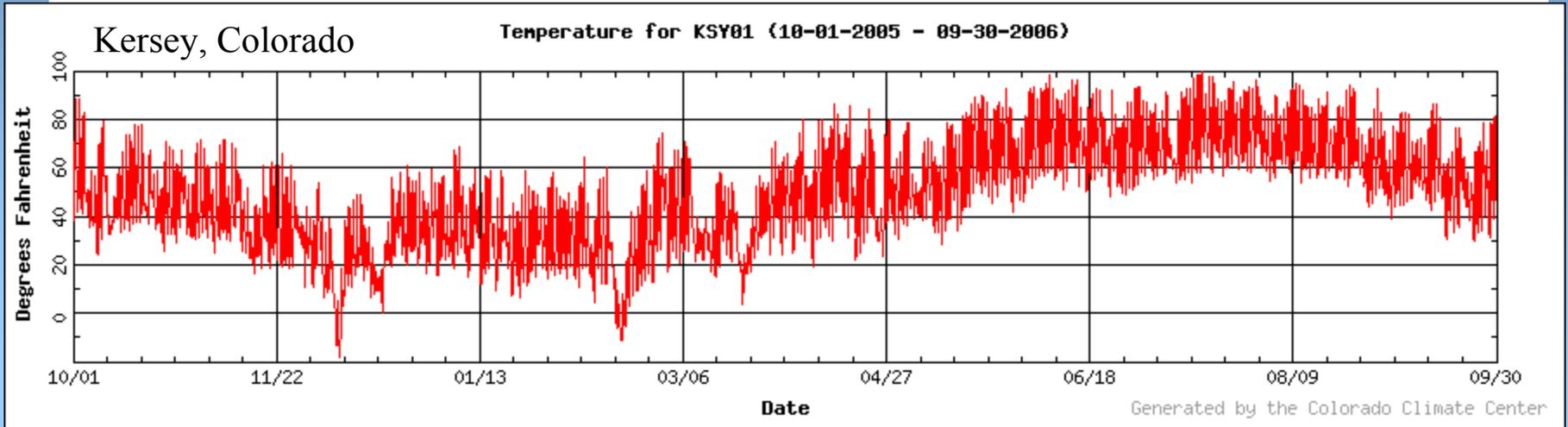
A closer look at the climate of the 2006 Water Year in Colorado



Photo by Wendy Ryan



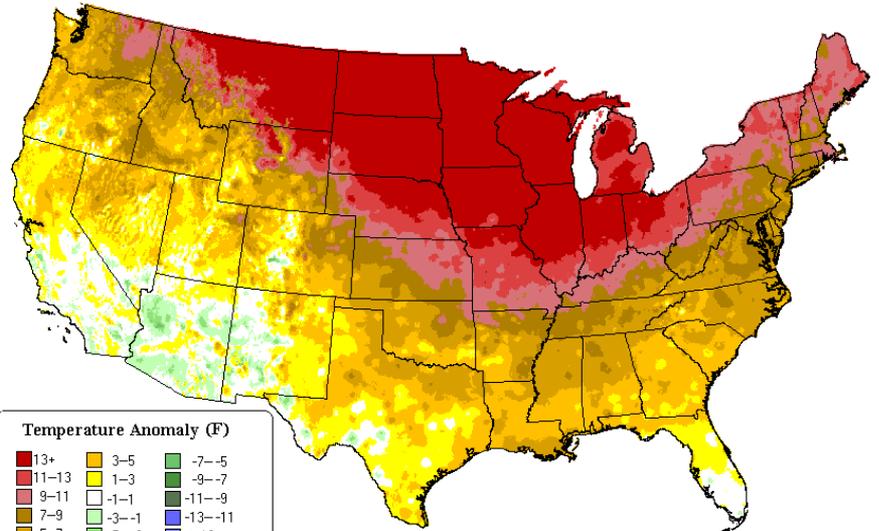
CoAgMet Temperatures





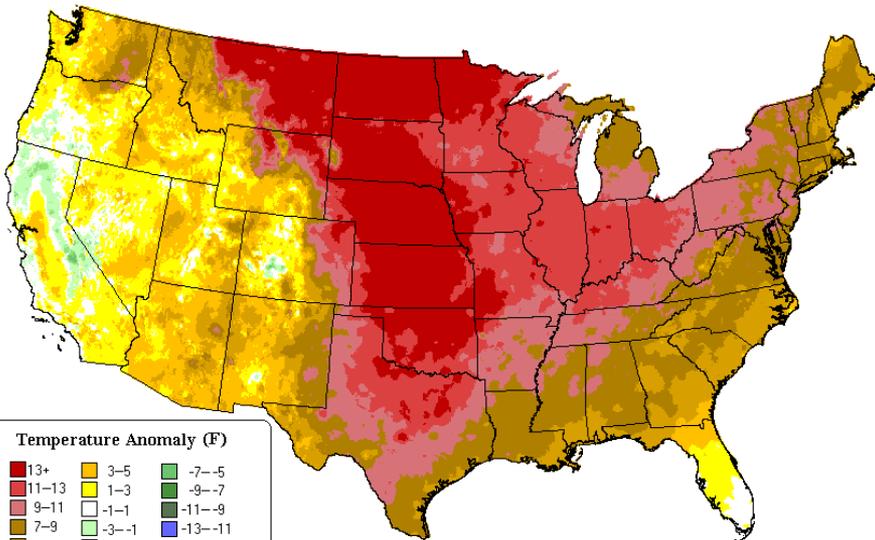
January 2006 departure from average (Prism)

Minimum Temperature Anomaly: Jan 2006
Final Data

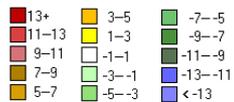


Copyright (c) 2006, Spatial Climate Analysis Service, Oregon State University
<http://www.ocs.oregonstate.edu/prism> - Map created Jul 12 2006

Maximum Temperature Anomaly: Jan 2006
Final Data

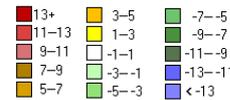


Temperature Anomaly (F)



Copyright (c) 2006, Spatial Climate Analysis Service, Oregon State University
<http://www.ocs.oregonstate.edu/prism> - Map created Jul 12 2006

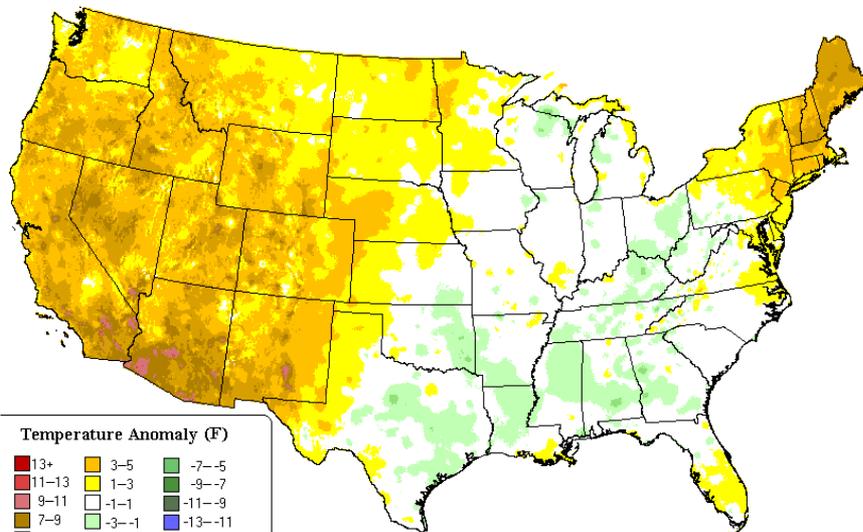
Temperature Anomaly (F)



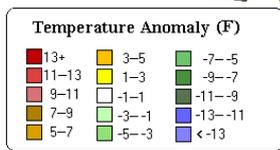


June 2006 departure from average (Prism)

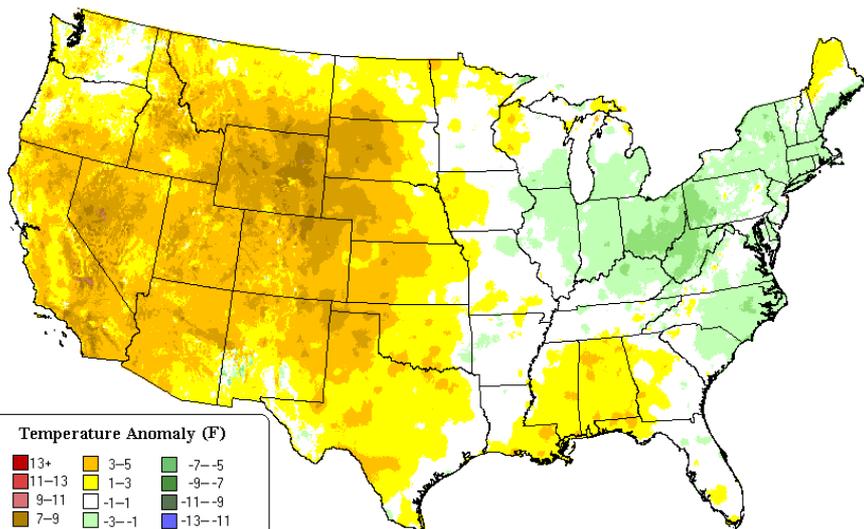
Minimum Temperature Anomaly: Jun 2006
Provisional Data



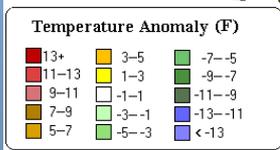
Copyright (c) 2006, PRISM Group, Oregon State University
<http://www.ocs.oregonstate.edu/prism> - Map created Oct 11 2006



Maximum Temperature Anomaly: Jun 2006
Provisional Data



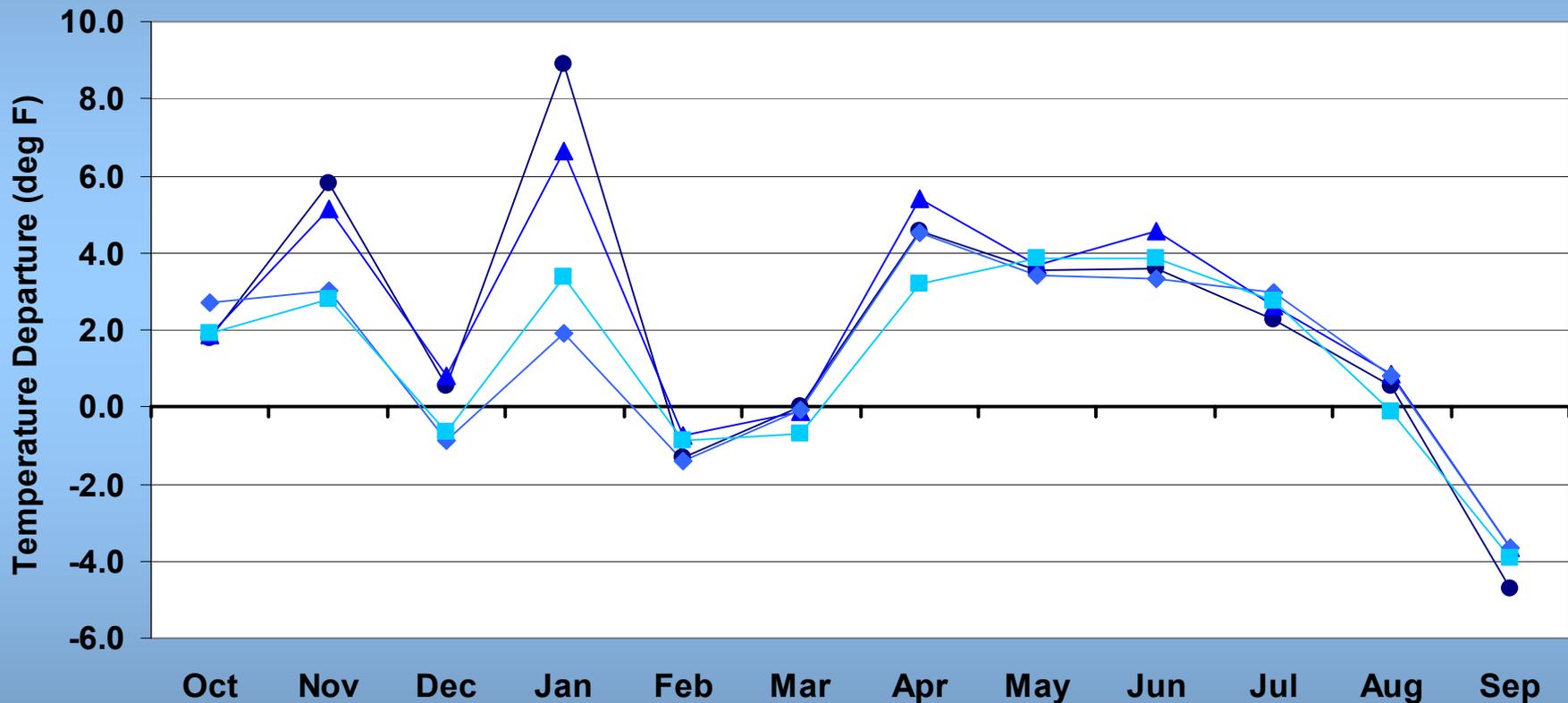
Copyright (c) 2006, PRISM Group, Oregon State University
<http://www.ocs.oregonstate.edu/prism> - Map created Oct 11 2006





Water Year 2006 temperature departures from 1971-2000 average

Temperature Departures for Water Year 2006



● Eastern Plains ▲ Foothills ◆ Mountains ■ Western Valleys



WY2006 Snowpack Accumulation and Meltout



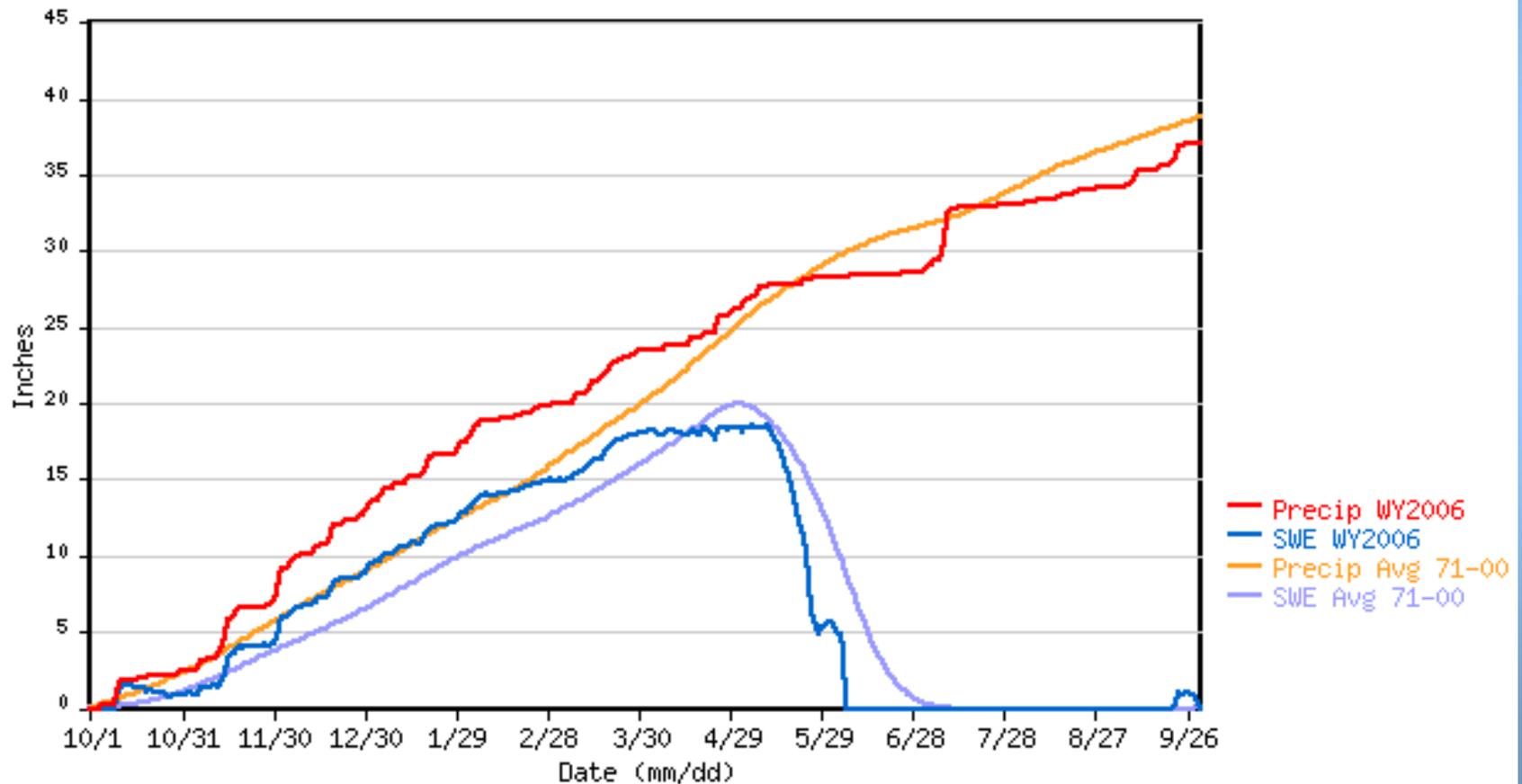
Photo courtesy NRCS



University Camp Snotel

UNIVERSITY CAMP SNOTEL for Water Year 2006

*** Provisional Data, Subject to Change ***

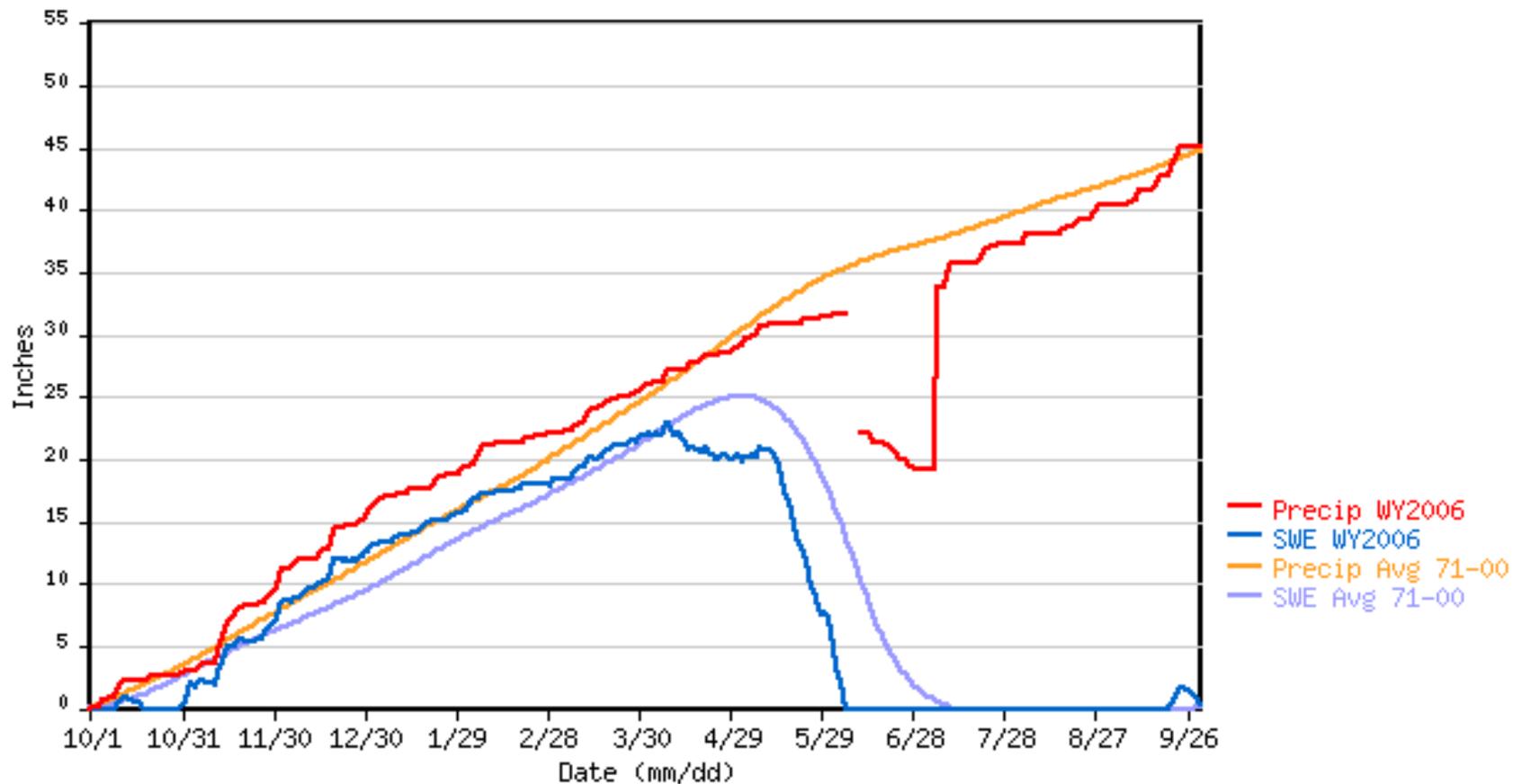




Joe Wright Reservoir Snotel

JOE WRIGHT SNOTEL for Water Year 2006

*** Provisional Data, Subject to Change ***

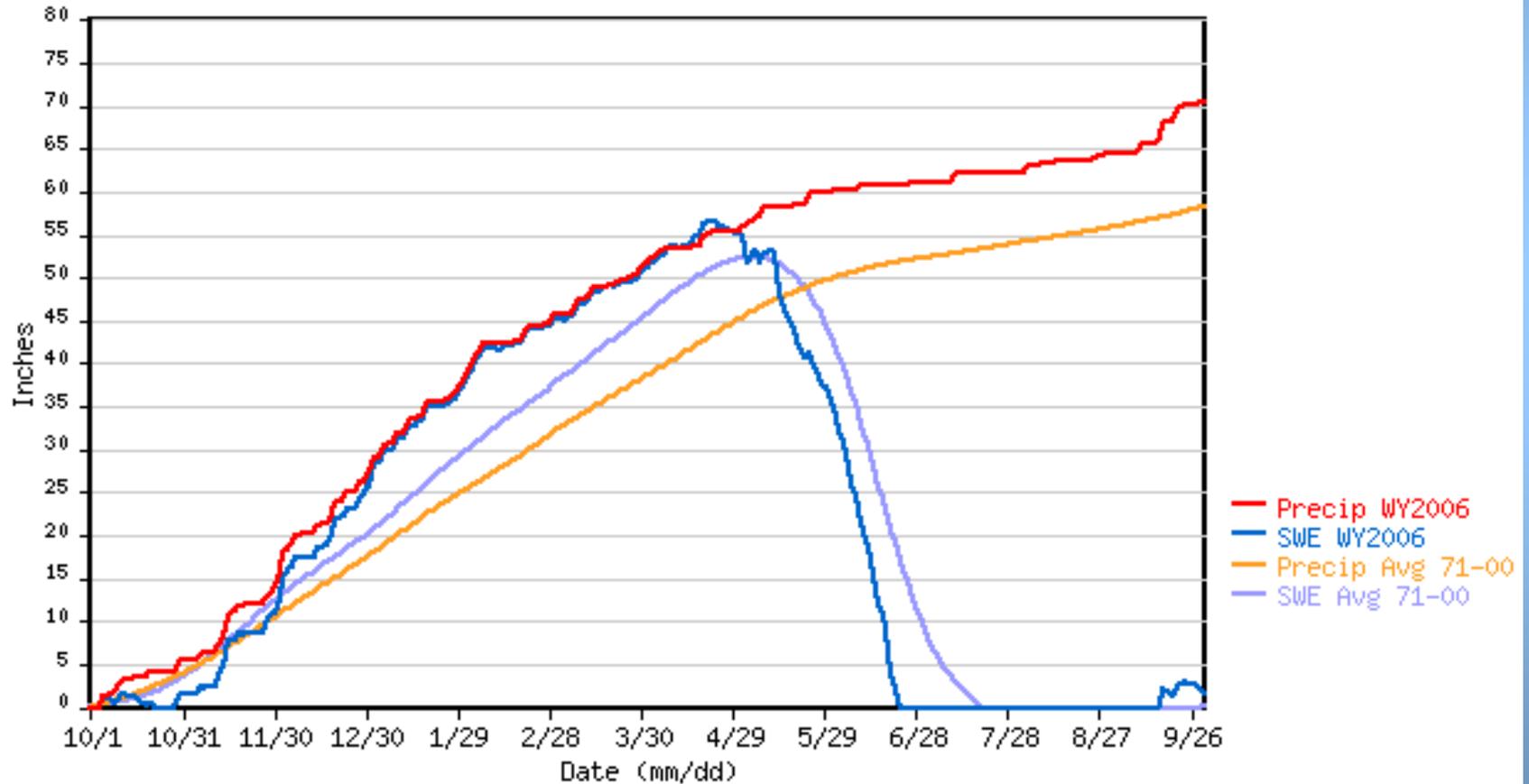




Tower Snotel

TOWER SNOTEL for Water Year 2006

*** Provisional Data, Subject to Change ***

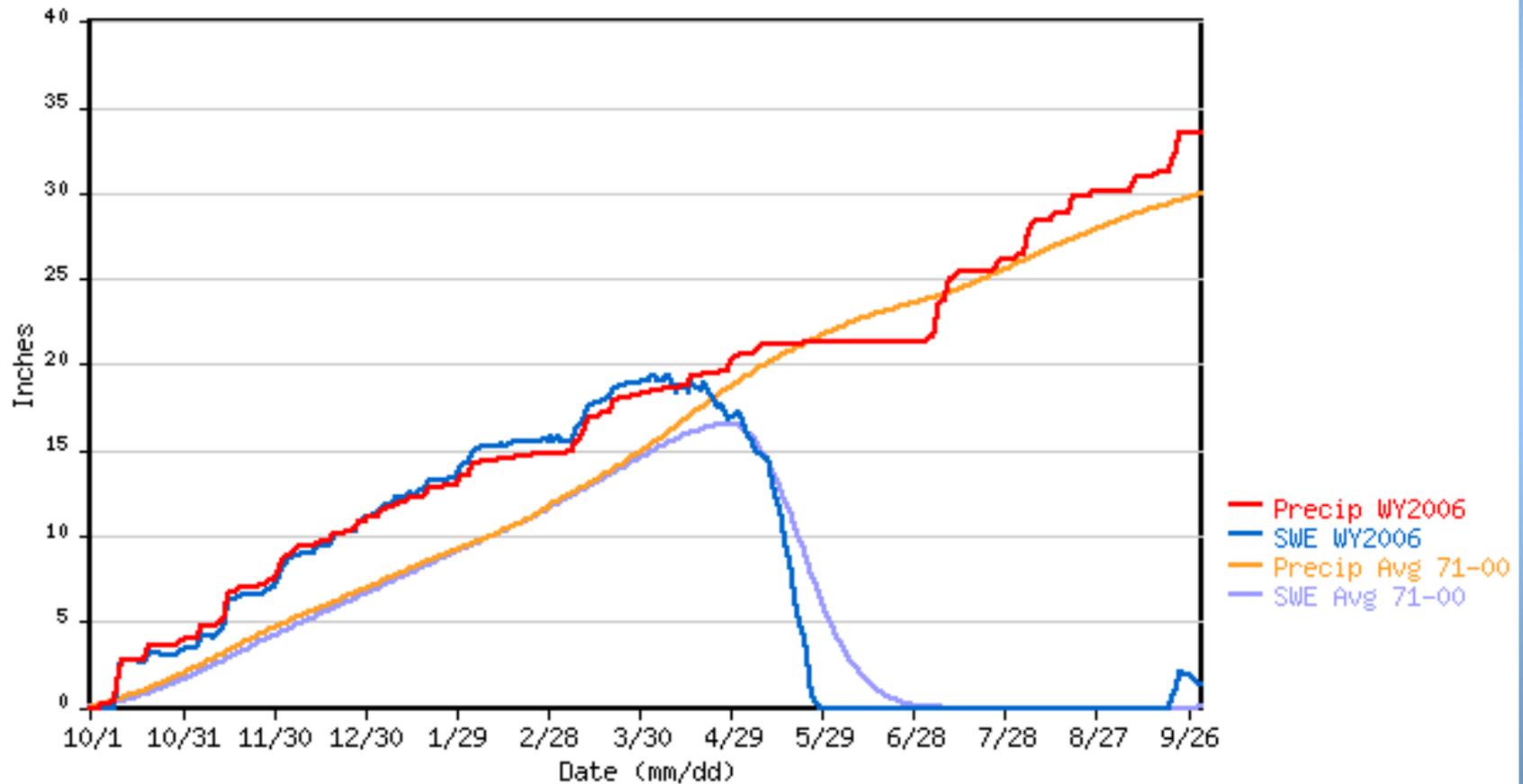




Hoosier Pass Snotel

HOOSIER PASS SNOTEL for Water Year 2006

*** Provisional Data, Subject to Change ***

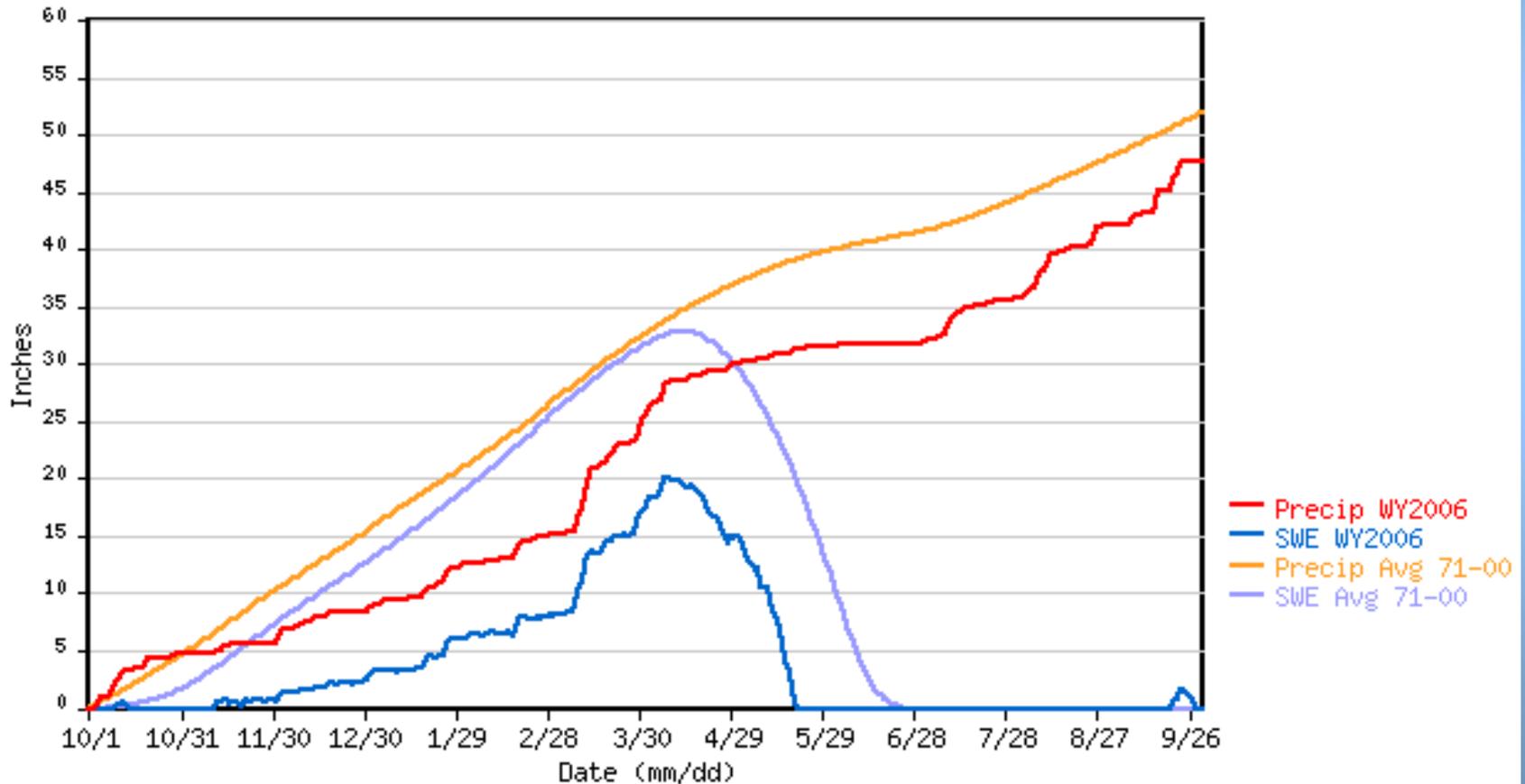




Upper San Juan Snotel

UPPER SAN JUAN SNOTEL for Water Year 2006

*** Provisional Data, Subject to Change ***

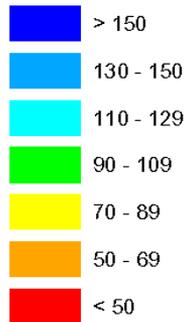




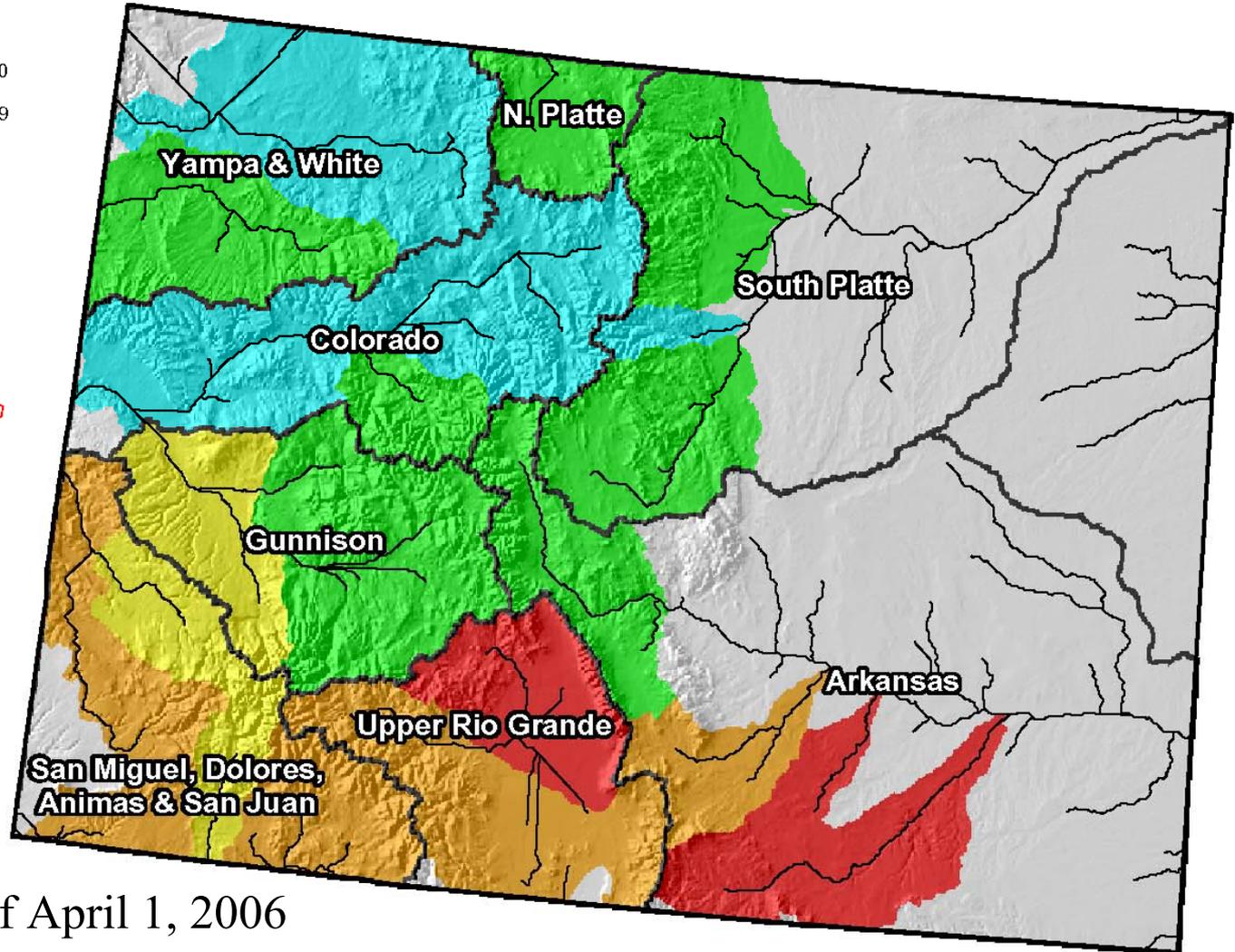
April 1 Snowpack

Colorado Snowpack Map

Percent of Average



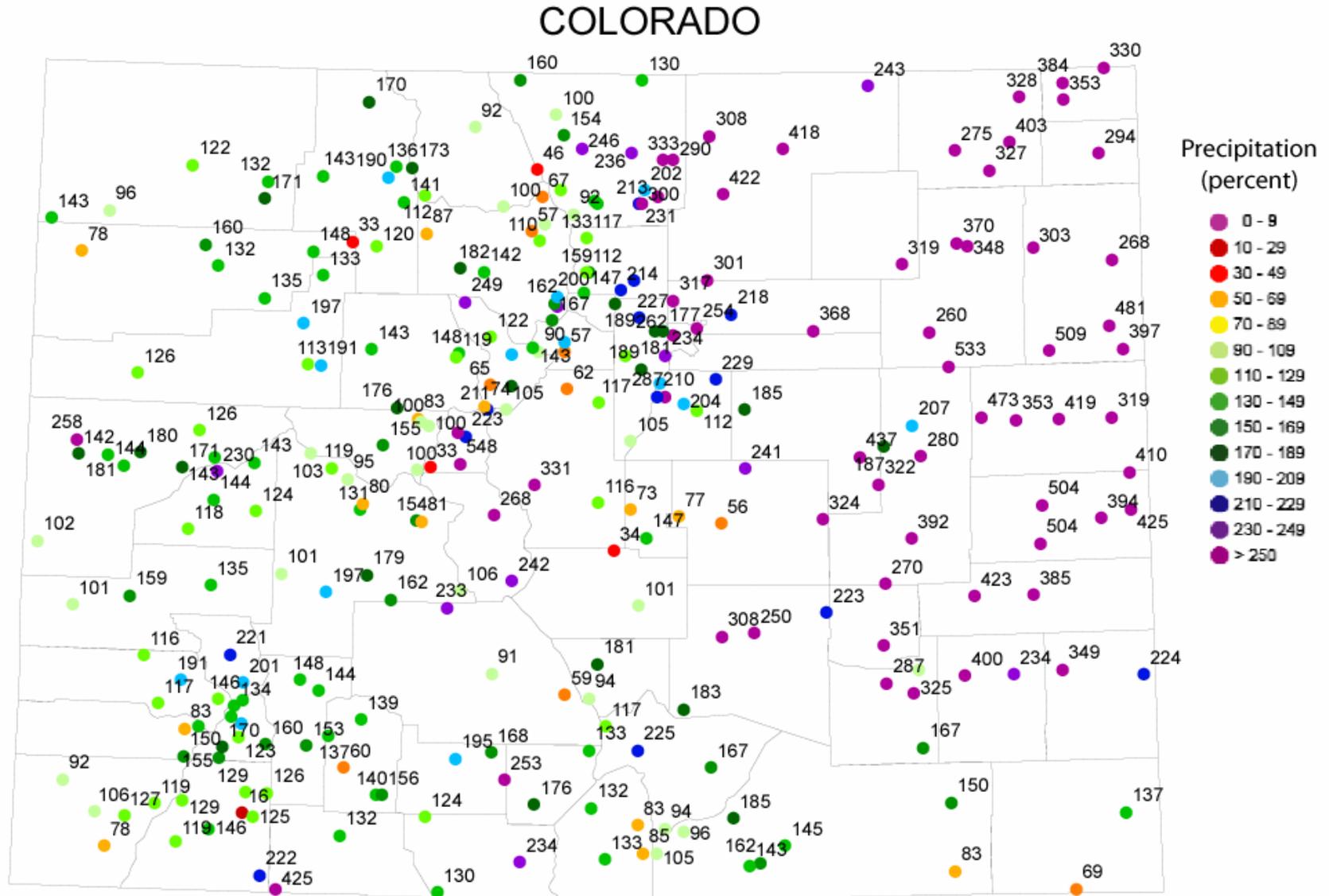
*Provisional Data
Subject to Revision*



Current as of April 1, 2006



Oct 2005 Precipitation percent normal

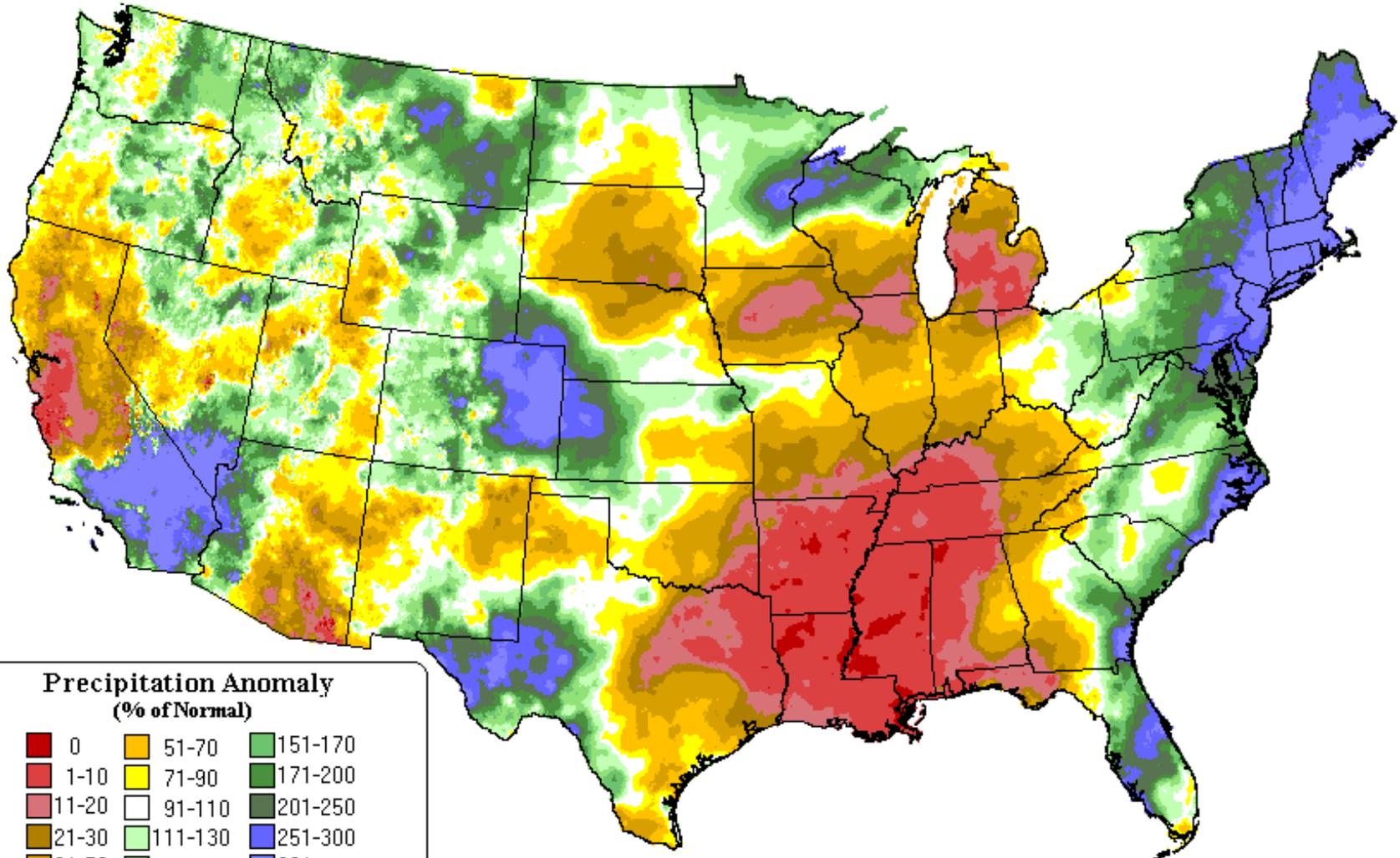


October 2005 precipitation as a percent of the 1971-2000 average.



October 2005 precipitation as percent of average (Prism)

Precipitation Anomaly: Oct 2005 Final Data



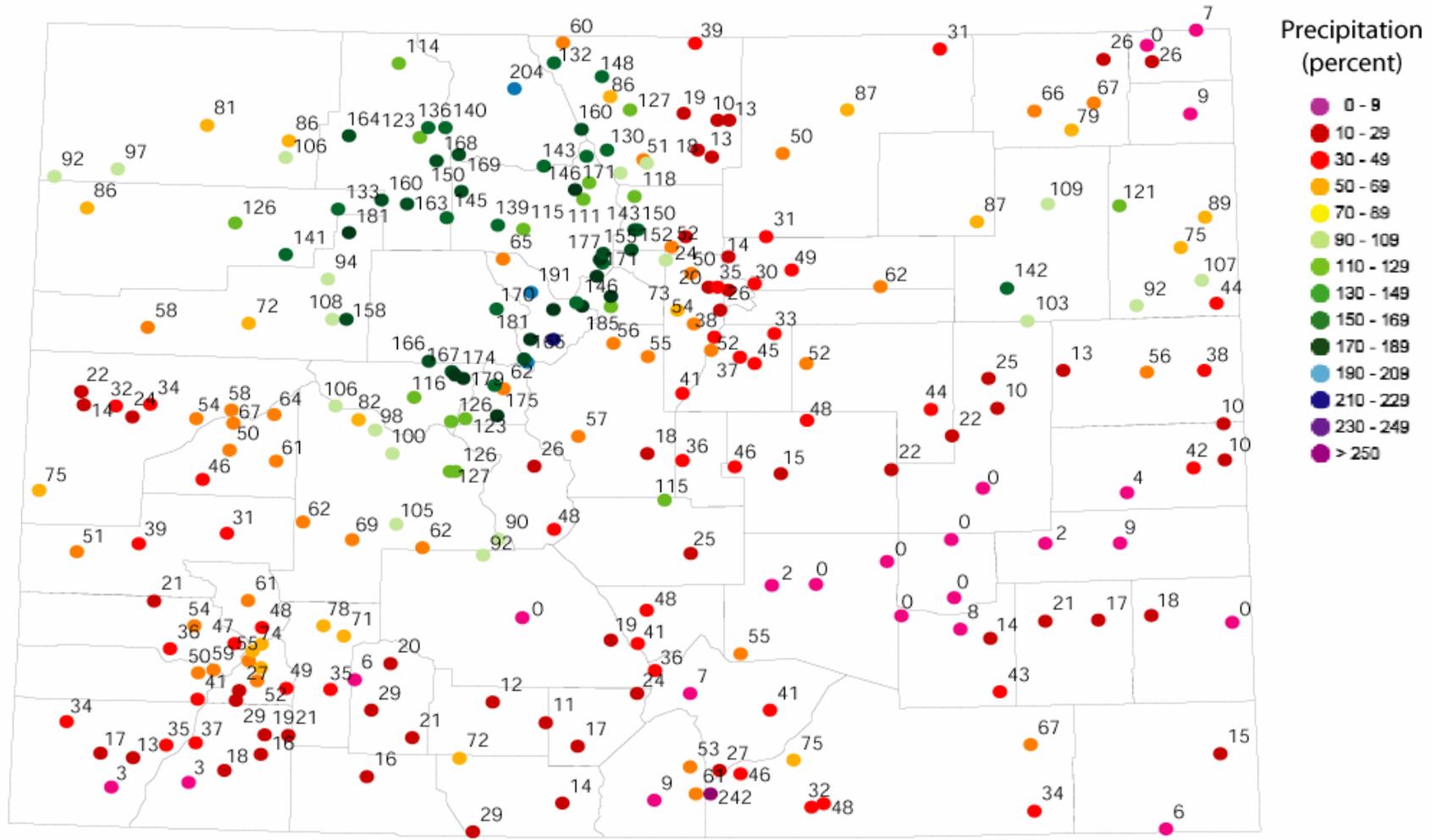
Precipitation Anomaly (% of Normal)

0	51-70	151-170
1-10	71-90	171-200
11-20	91-110	201-250
21-30	111-130	251-300
31-50	131-150	301+



Nov 2005 Precipitation percent normal

COLORADO

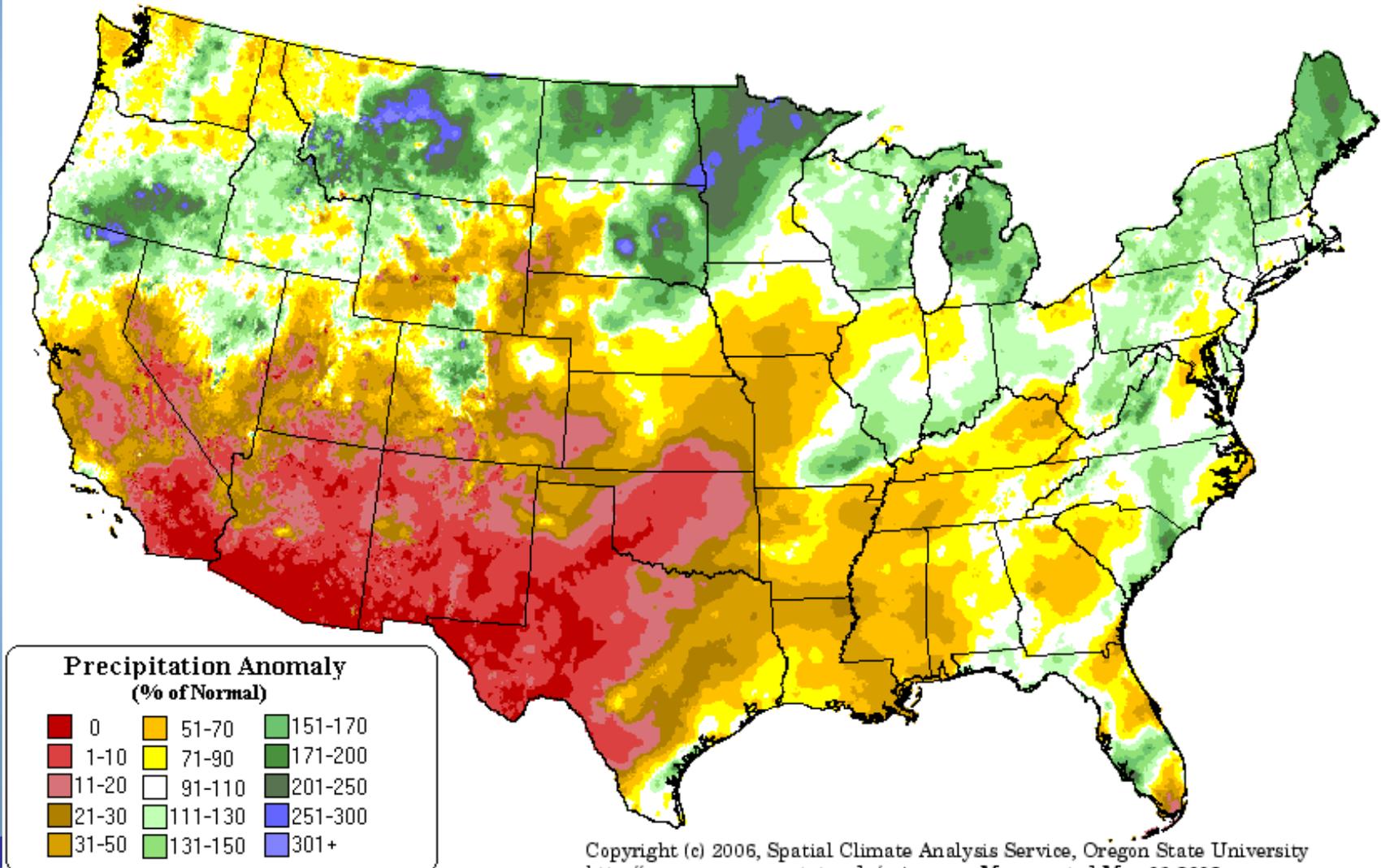


November 2005 precipitation as a percent of the 1971-2000 average.



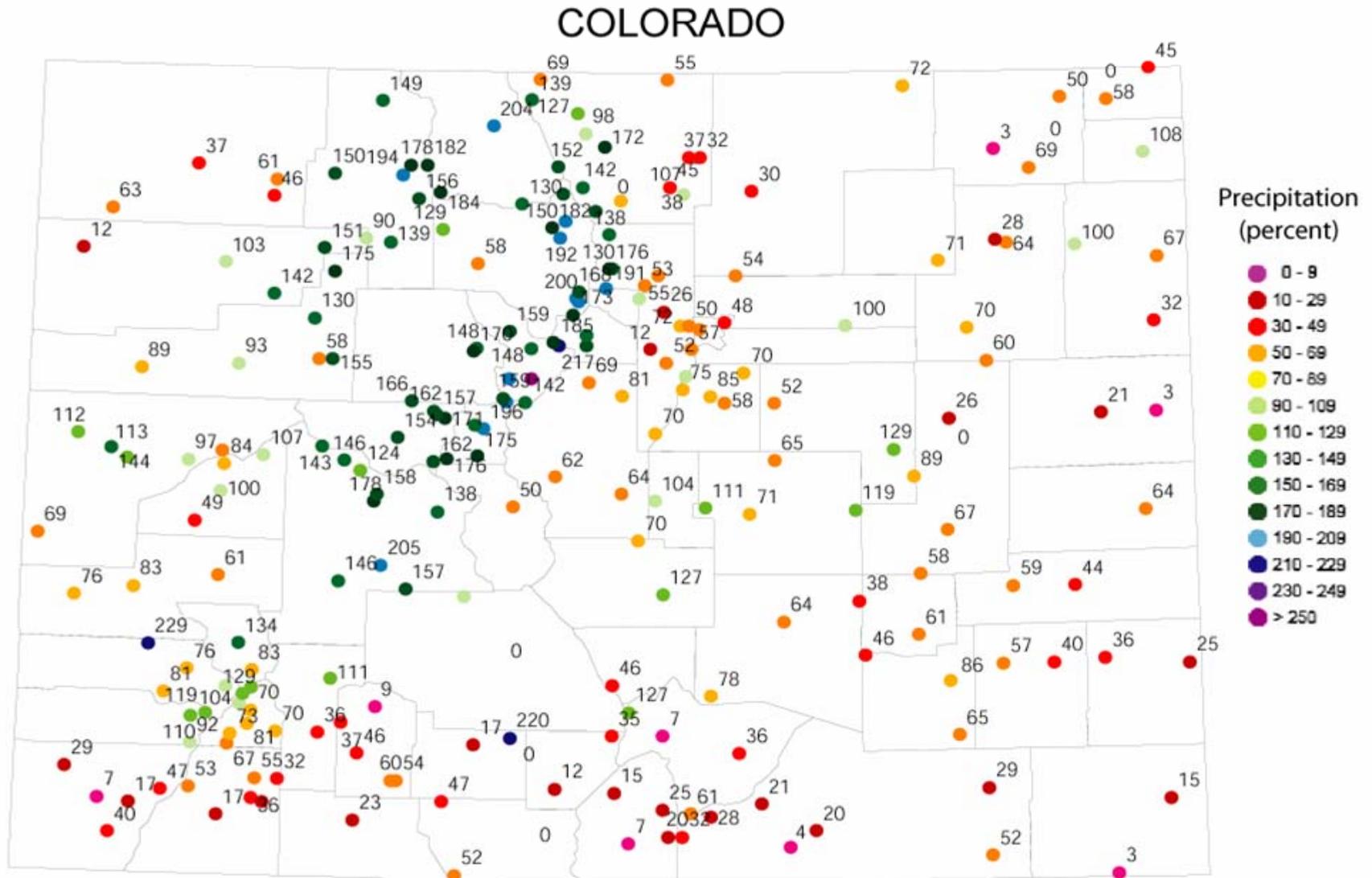
November 2005 precipitation as percent of average (Prism)

Precipitation Anomaly: Nov 2005 Final Data





Dec 2005 Precipitation percent normal

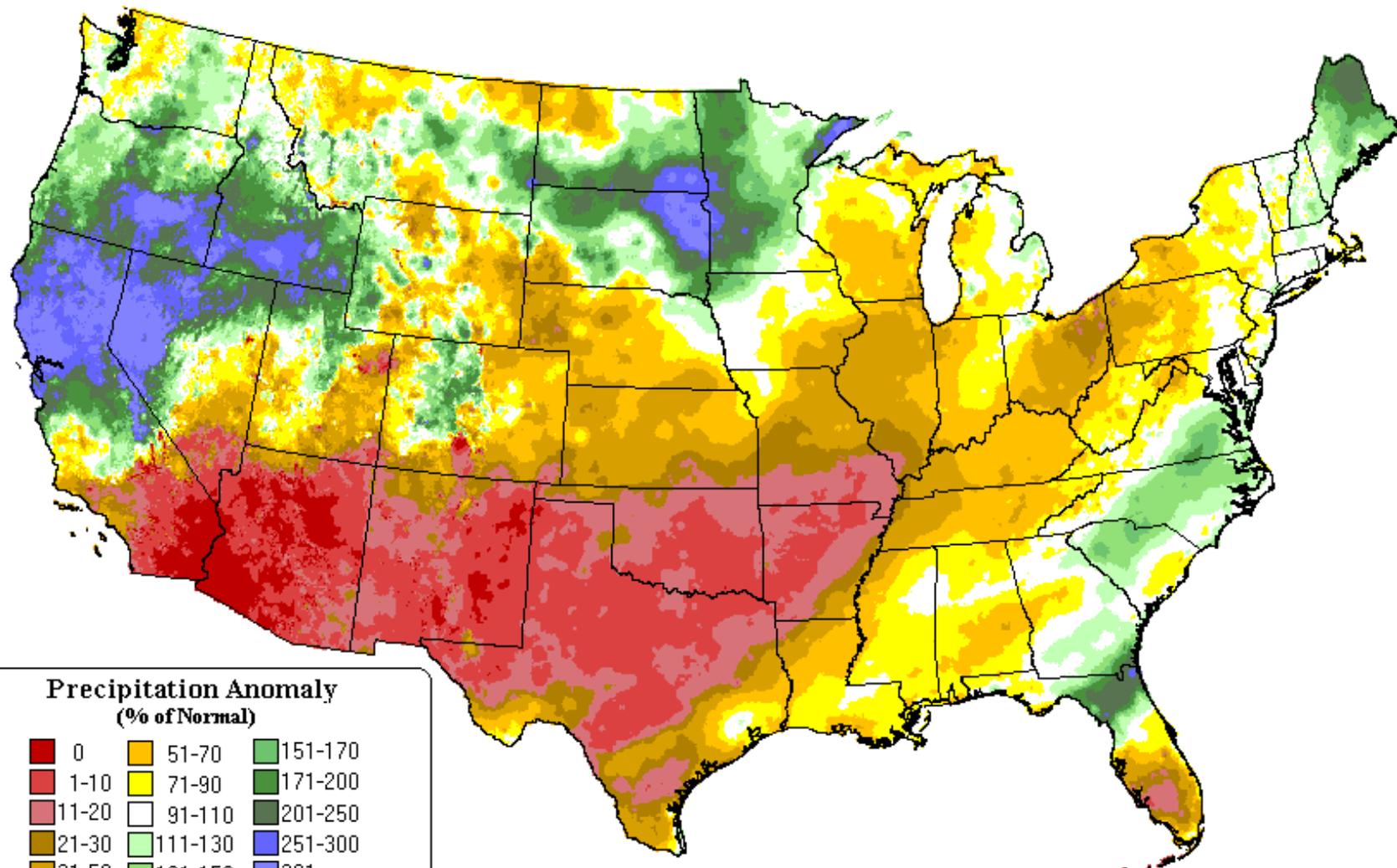


December 2005 precipitation as a percent of the 1971-2000 average.



December 2005 precipitation as a percent of average (Prism)

Precipitation Anomaly: Dec 2005 Final Data

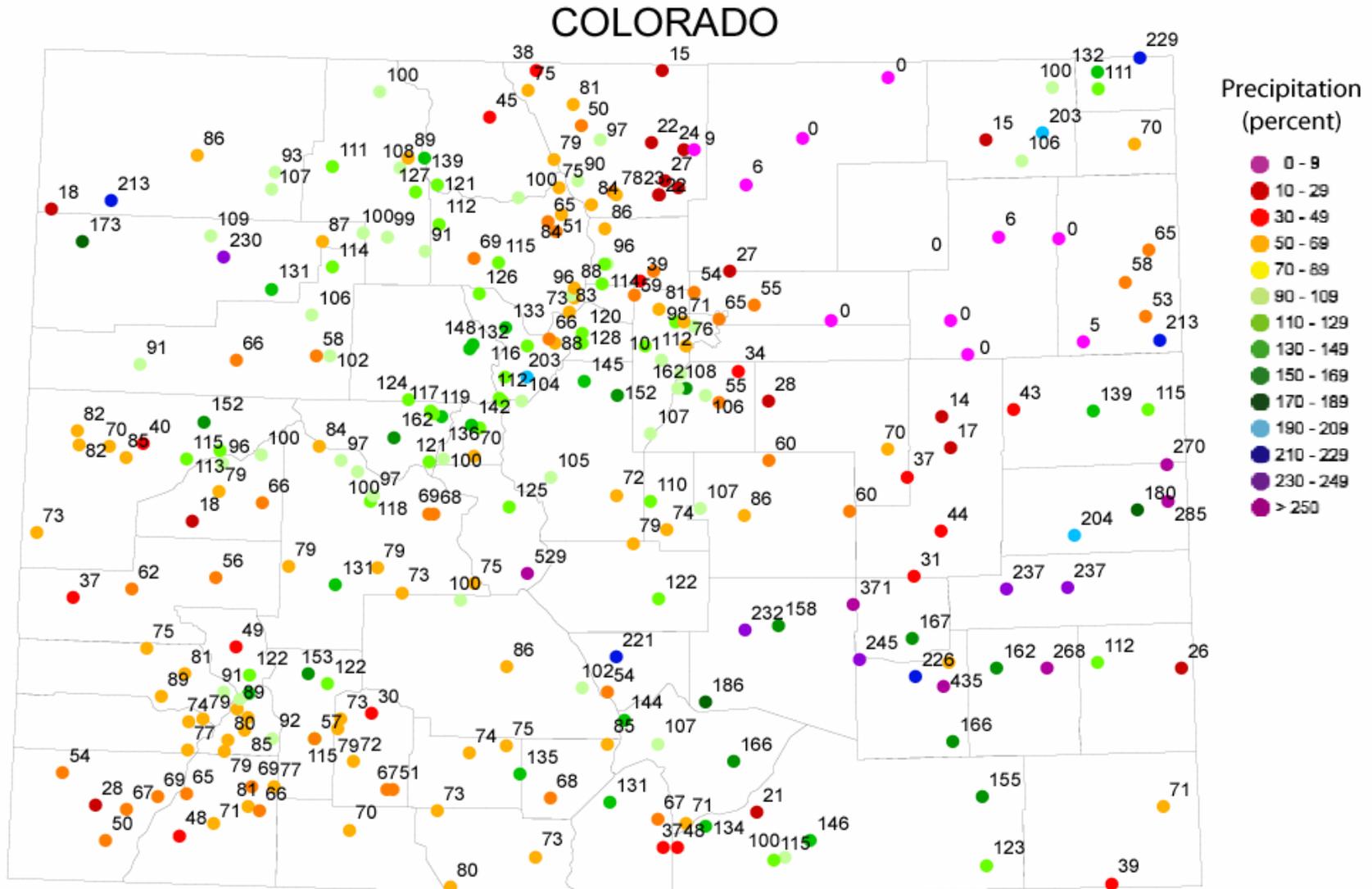


Precipitation Anomaly (% of Normal)

0	51-70	151-170
1-10	71-90	171-200
11-20	91-110	201-250
21-30	111-130	251-300
31-50	131-150	301+



Jan 2006 Precipitation percent normal

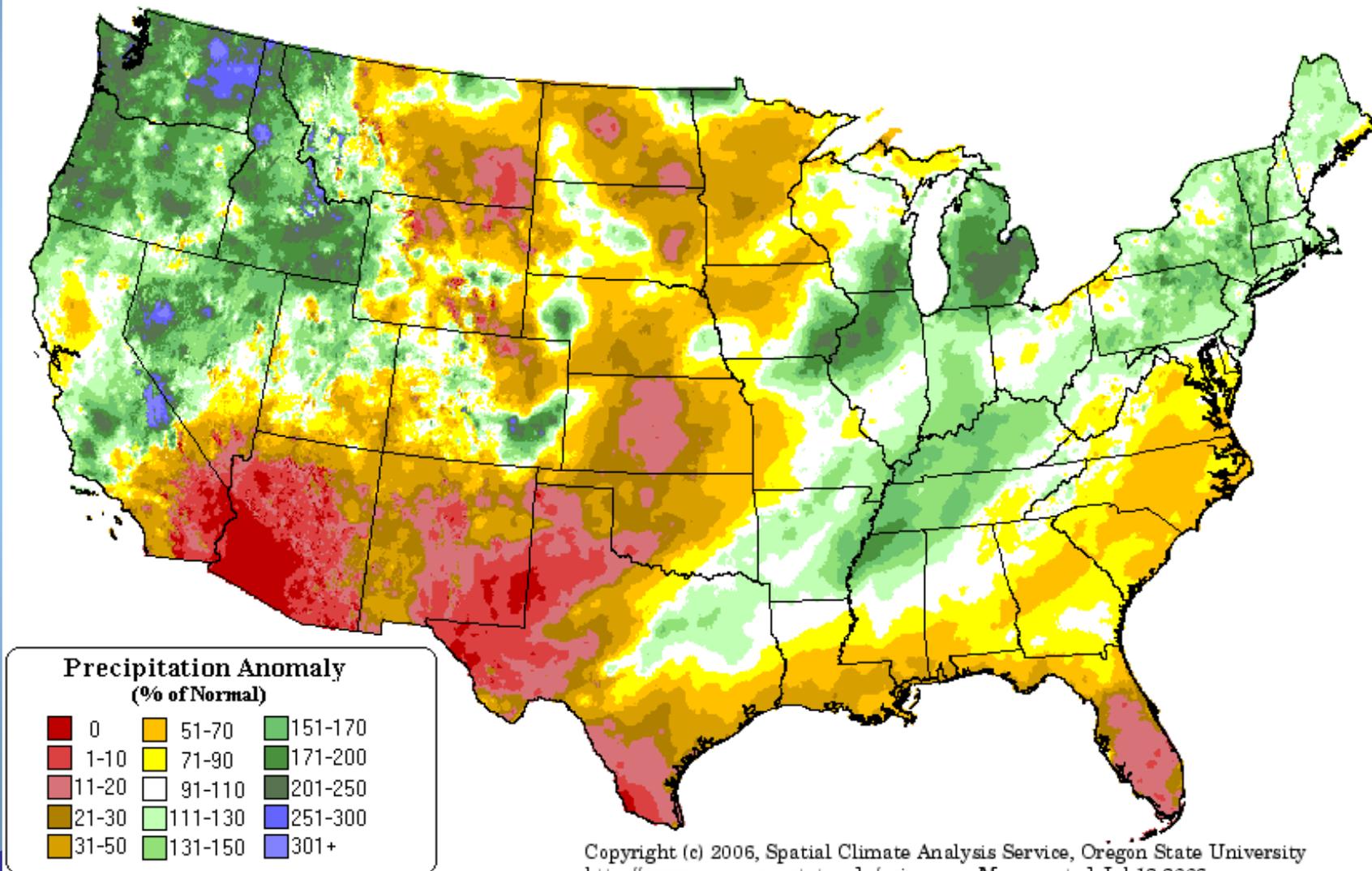


January 2006 precipitation as a percent of the 1971-2000 average.



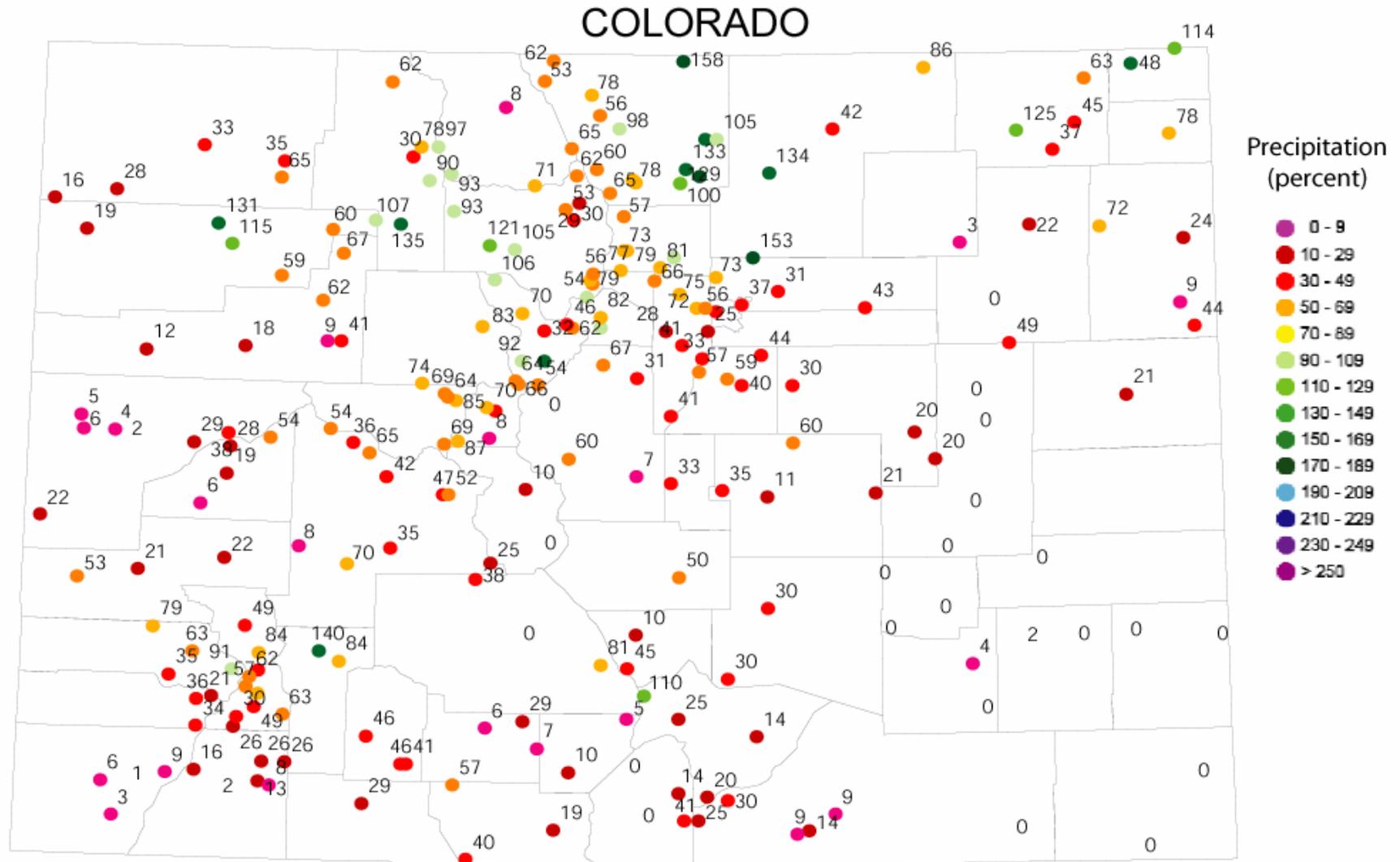
January 2006 precipitation as a percent of average (Prism)

Precipitation Anomaly: Jan 2006 Final Data





Feb 2006 Precipitation percent normal

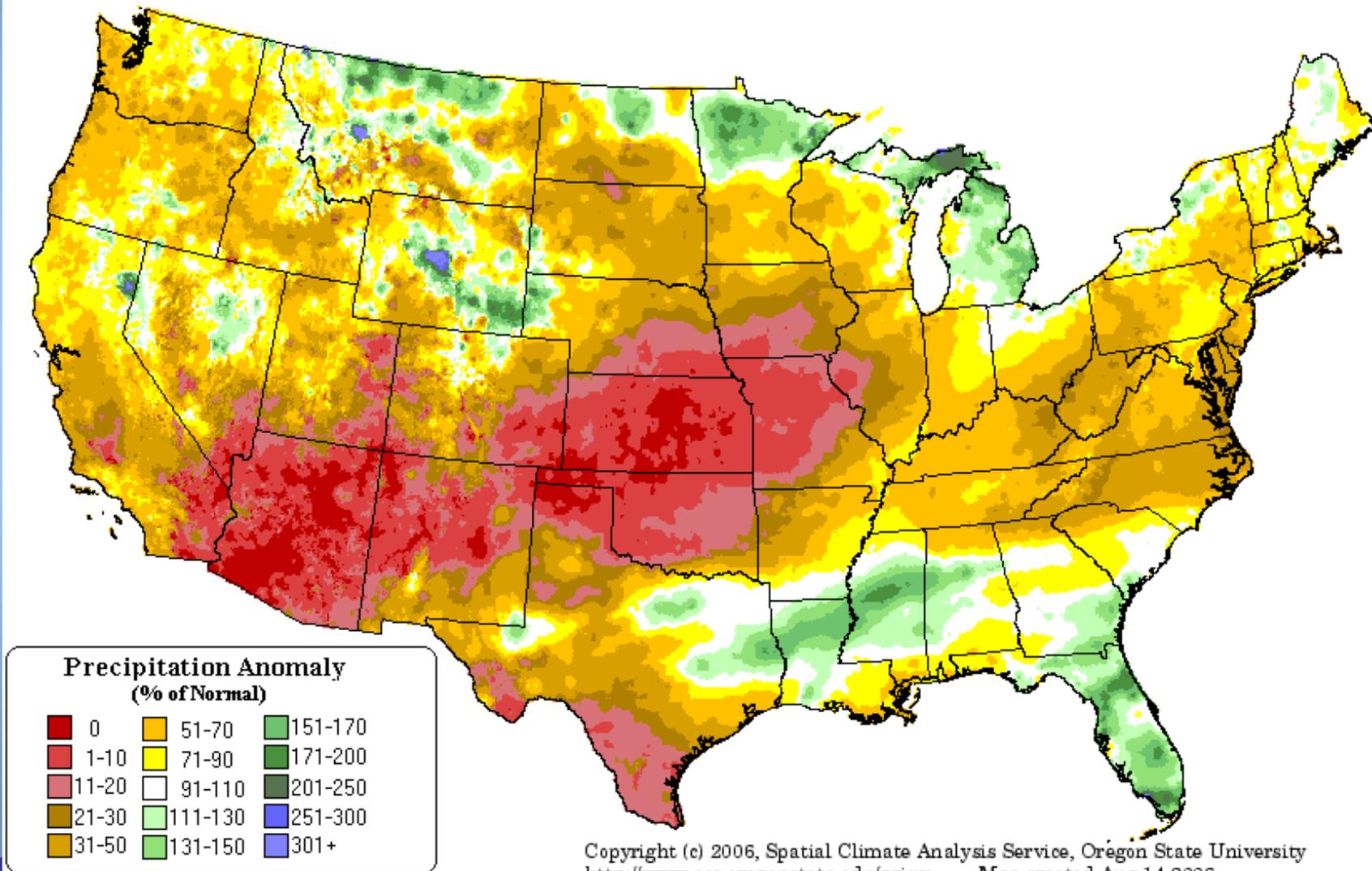


February 2006 precipitation as a percent of the 1971-2000 average.



February 2006 precipitation as a percent of average (Prism)

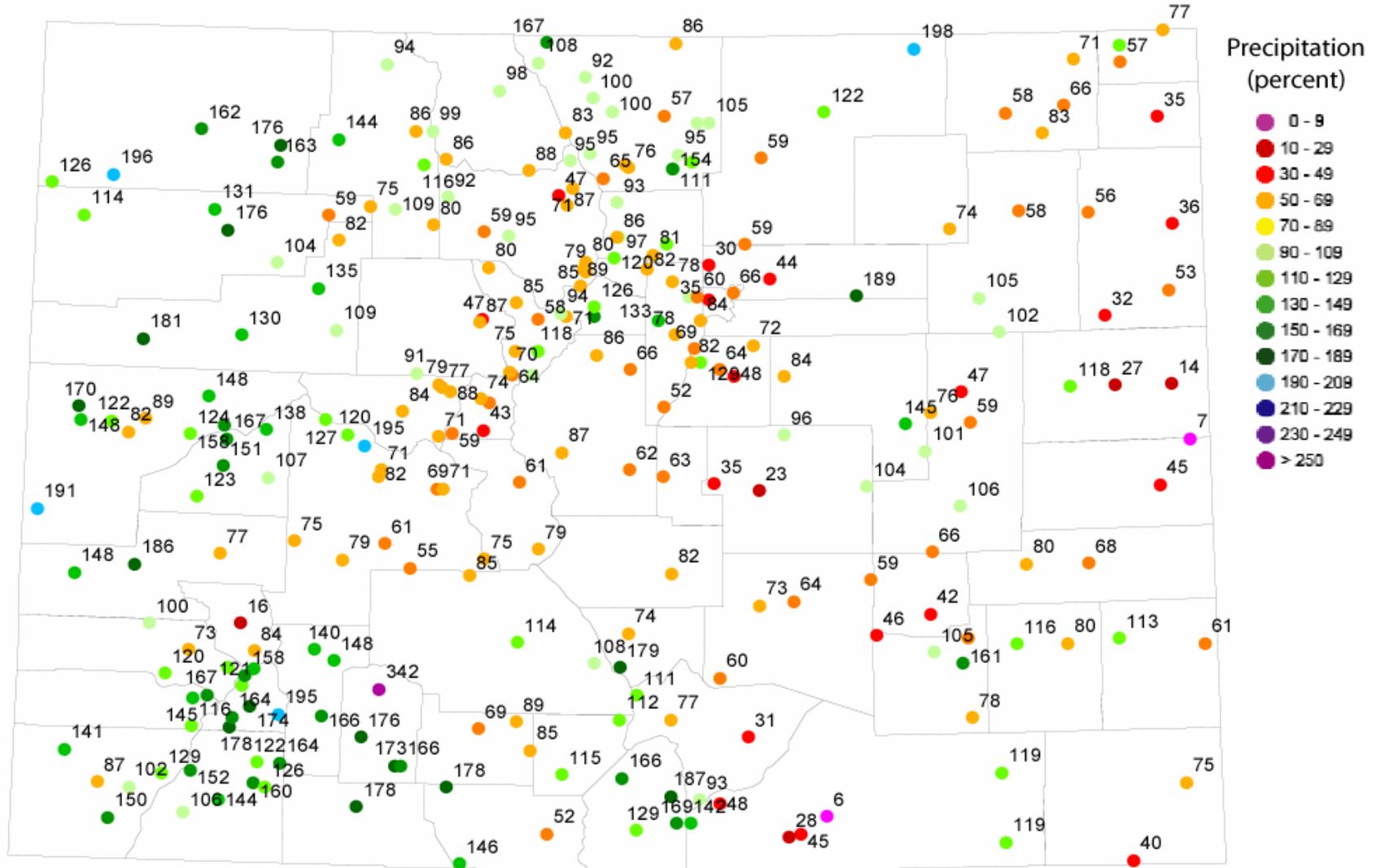
Precipitation Anomaly: Feb 2006 Final Data





Mar 2006 Precipitation percent normal

COLORADO

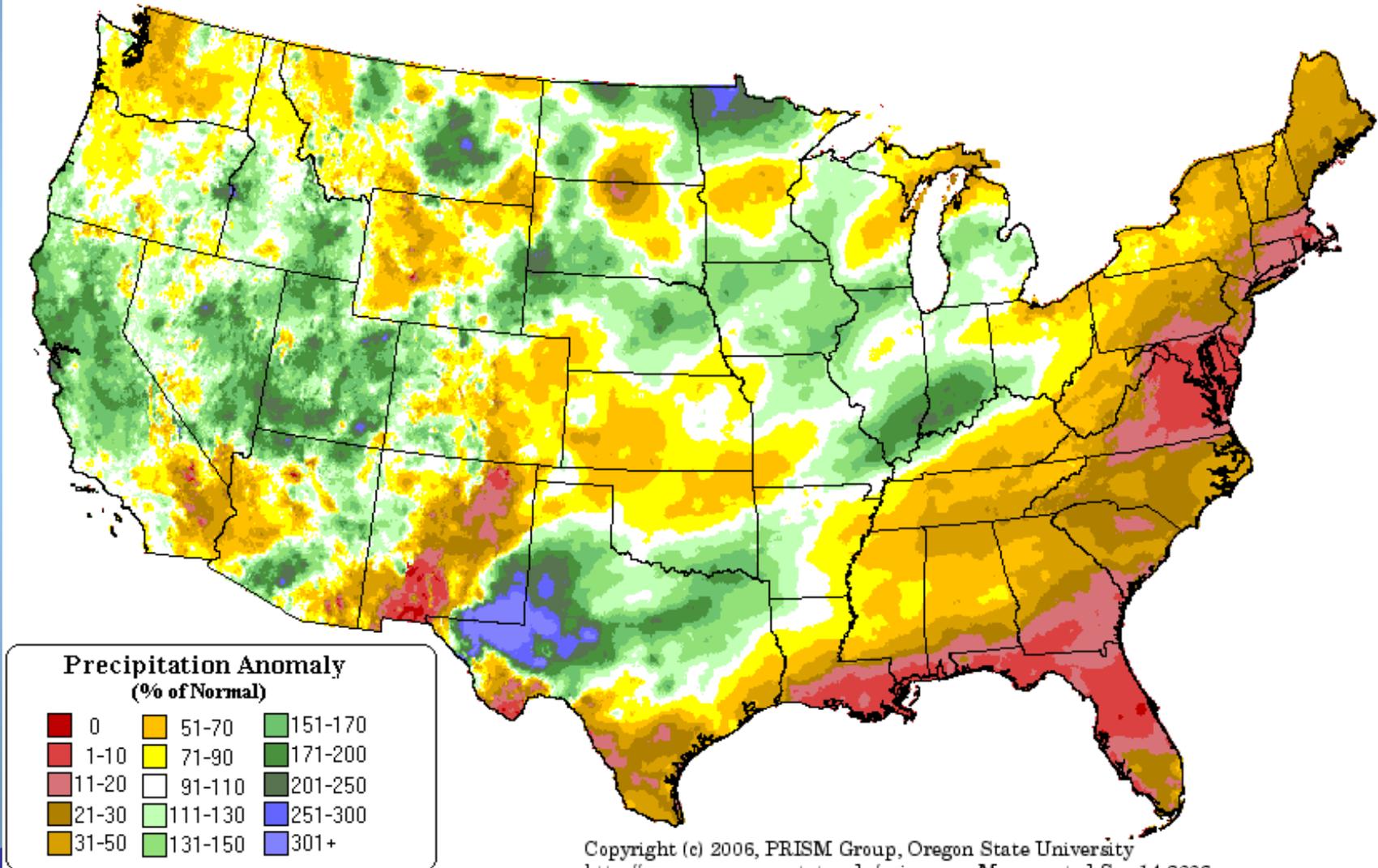


March 2006 precipitation as a percent of the 1971-2000 average.



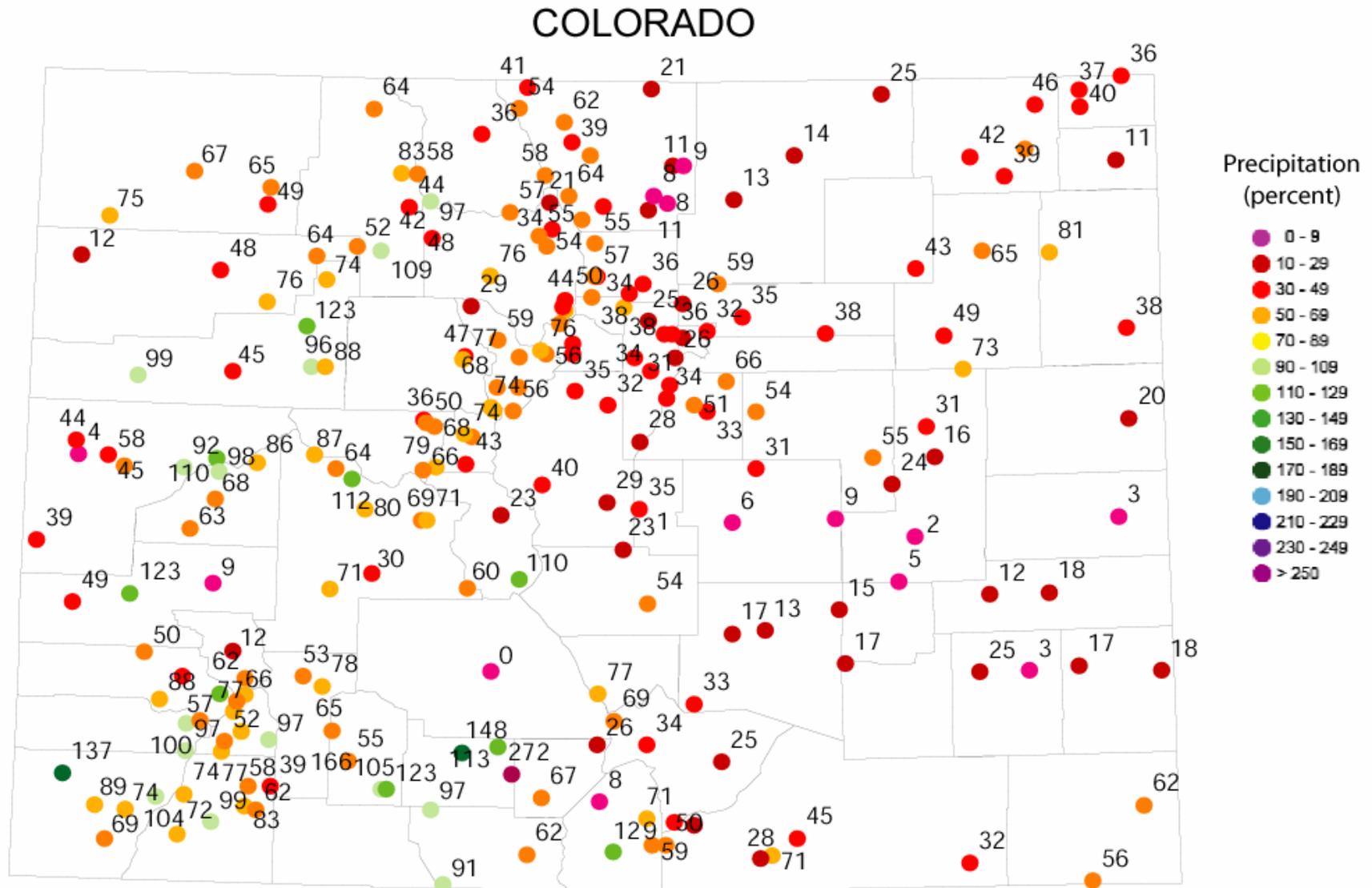
March 2006 precipitation as a percent of average (Prism)

Precipitation Anomaly: Mar 2006 Final Data





Apr 2006 Precipitation percent normal

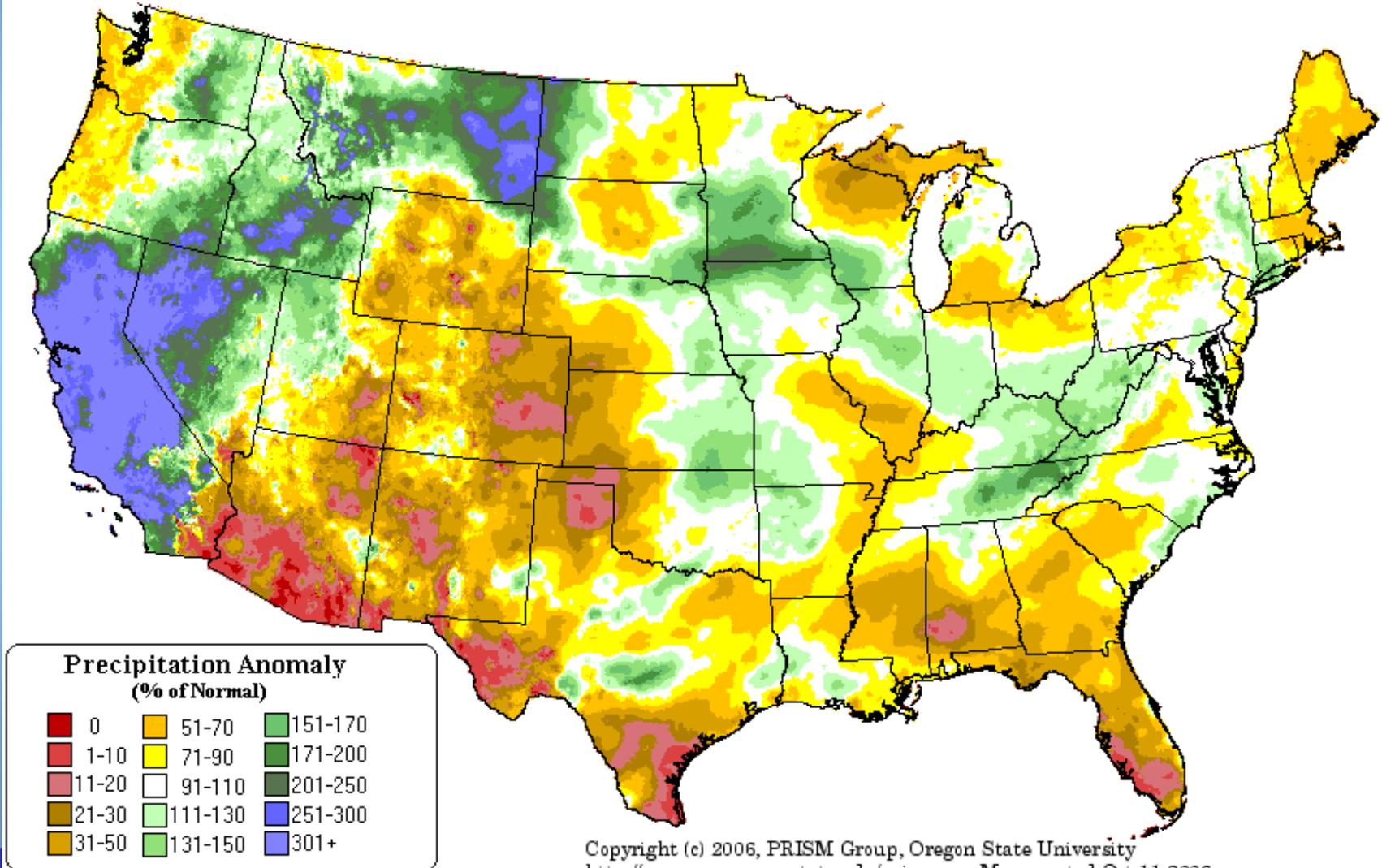


April 2006 precipitation as a percent of the 1971-2000 average.



April 2006 precipitation as a percent of average (Prism)

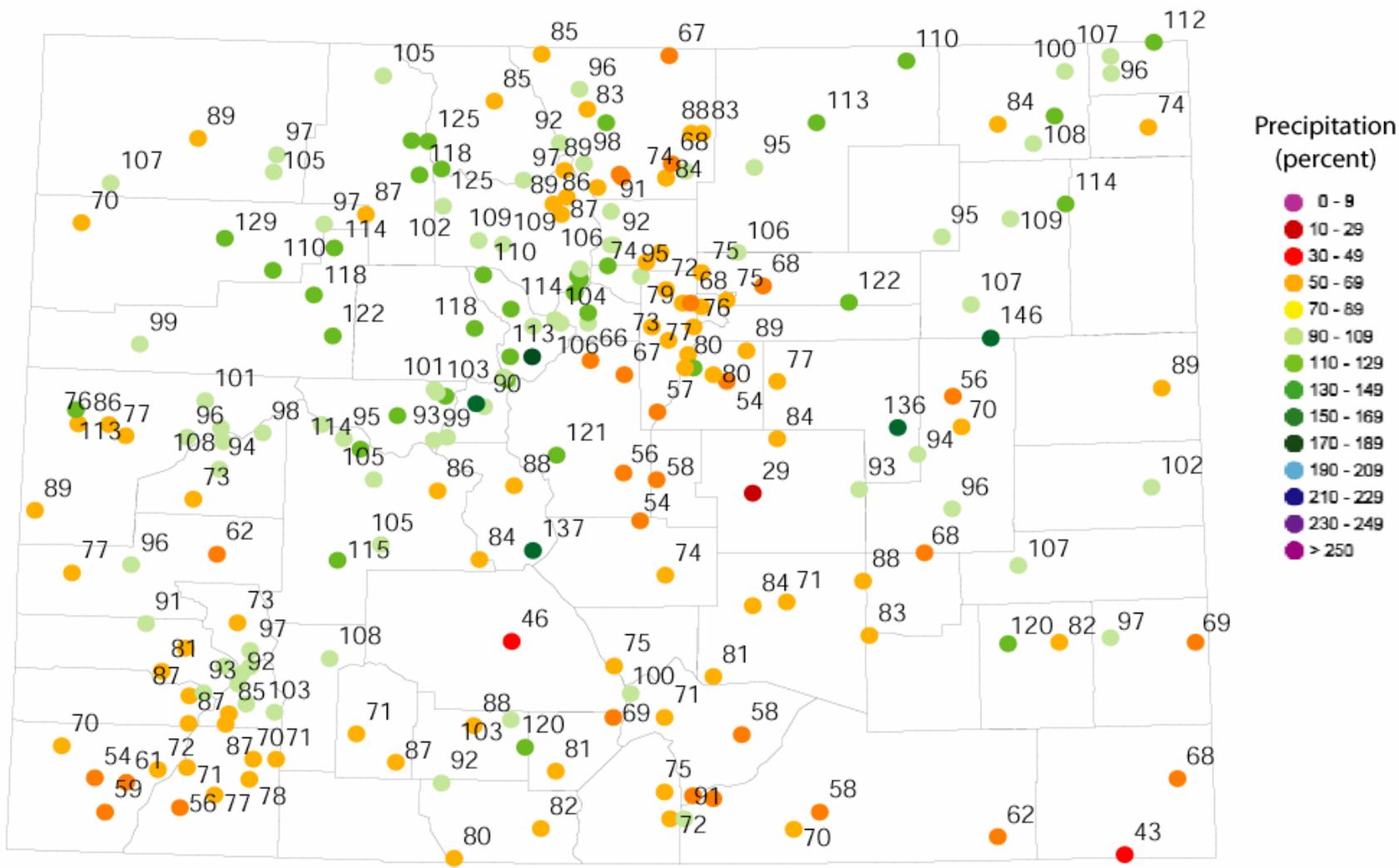
Precipitation Anomaly: Apr 2006 Final Data





Winter (Oct 2005 - April 2006) precipitation as percent of average

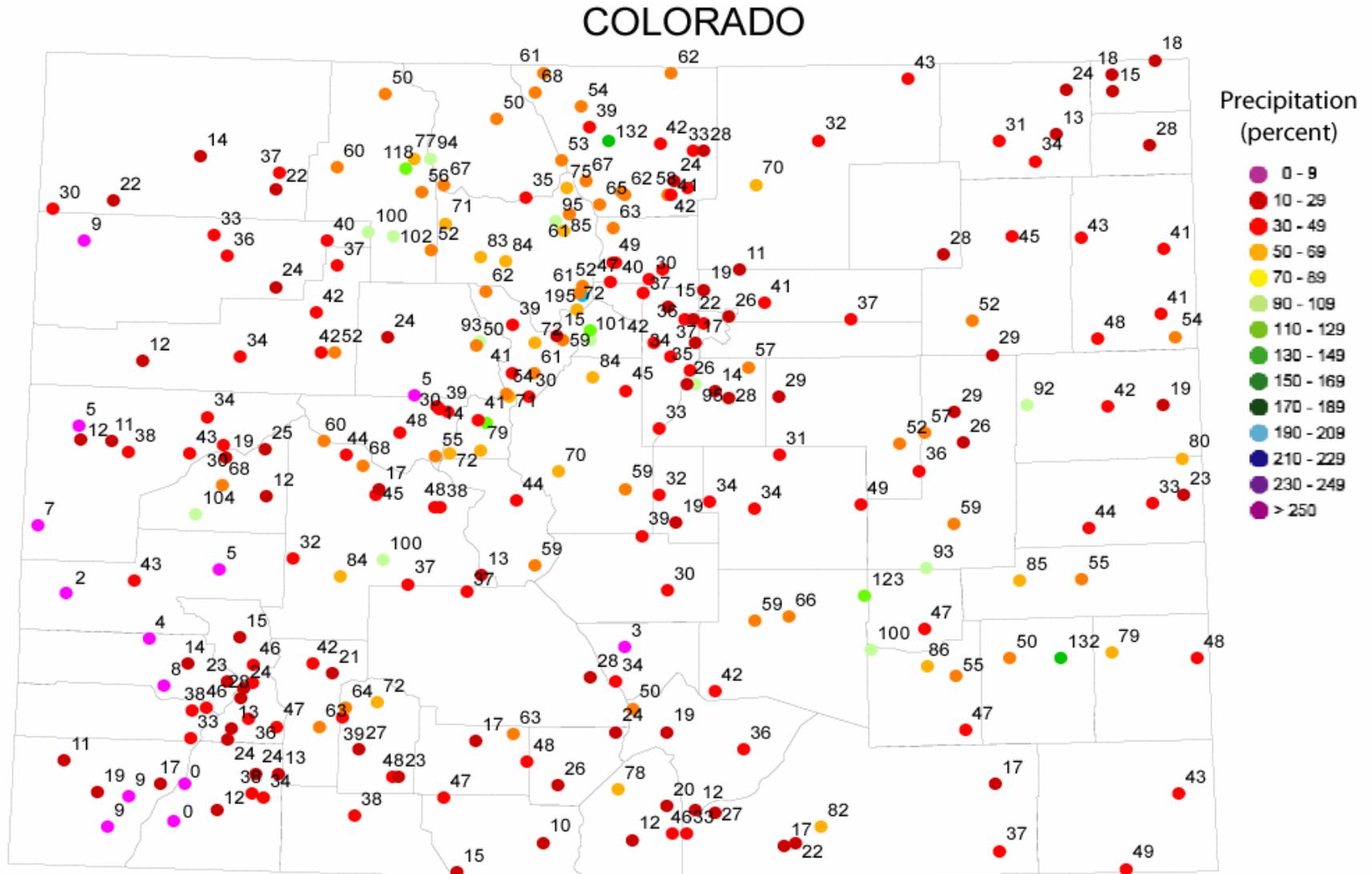
COLORADO



Water Year 2006 (October 2005 through April 2006) precipitation as a percent of the 1971-2000 average.



May 2006 Precipitation percent normal

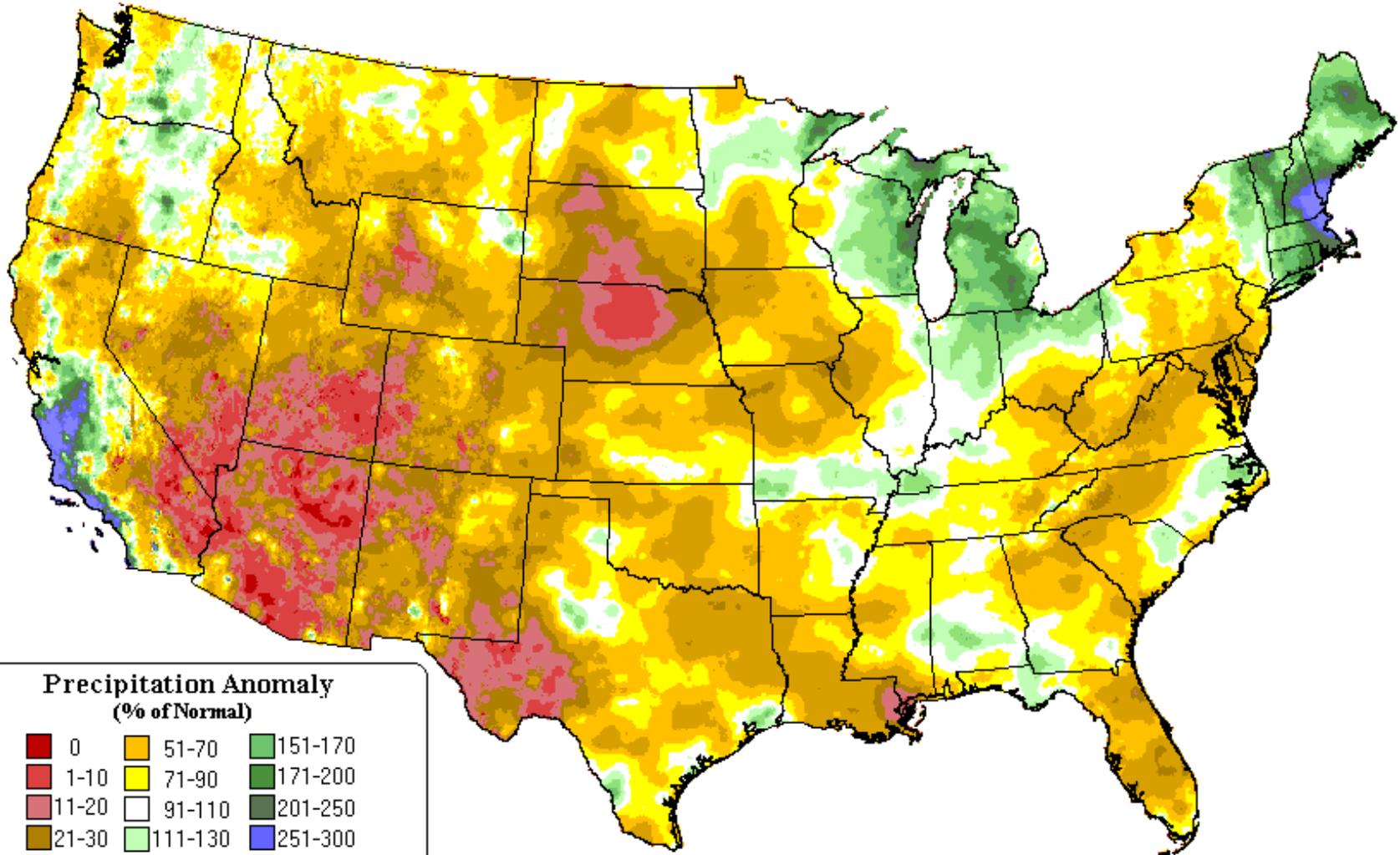


May 2006 precipitation as a percent of the 1971-2000 average.



May 2006 precipitation as a percent of average (Prism)

Precipitation Anomaly: May 2006 Preliminary Data

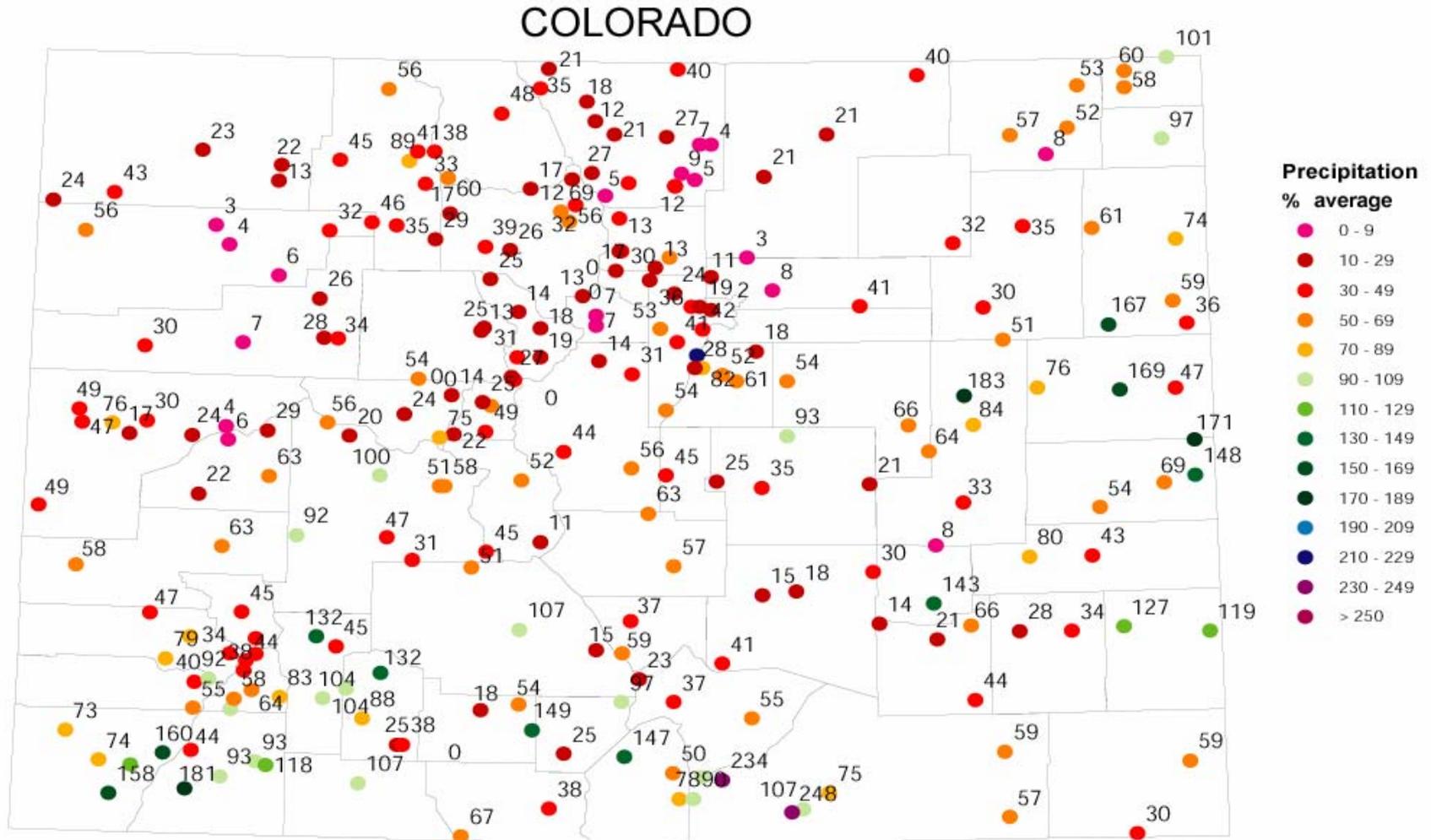


Precipitation Anomaly (% of Normal)

0	51-70	151-170
1-10	71-90	171-200
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21-30	111-130	251-300
31-50	131-150	301+



Jun 2006 Precipitation percent normal

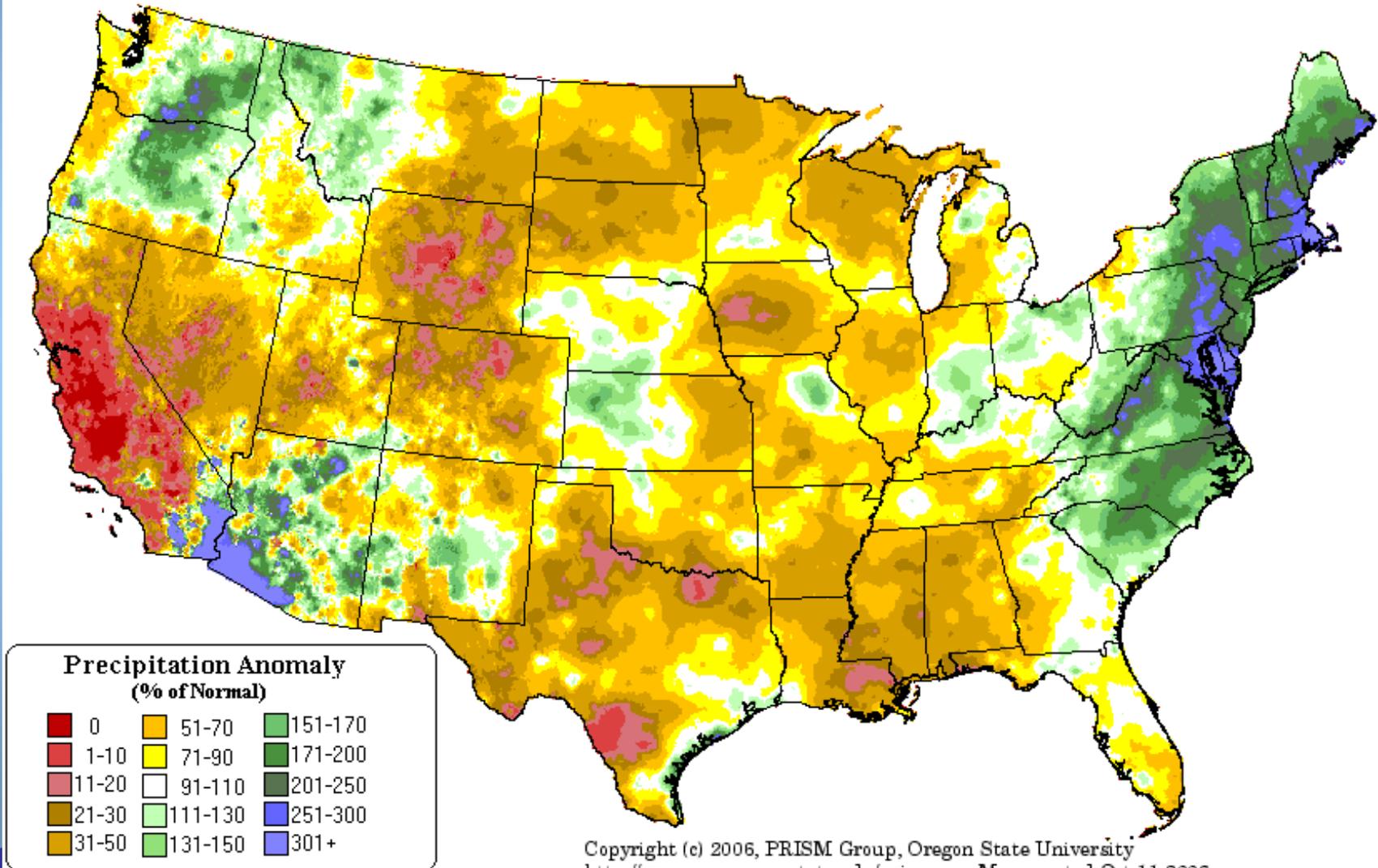


June 2006 precipitation as a percent of the 1971-2000 average.



June 2006 precipitation as a percent of average (Prism)

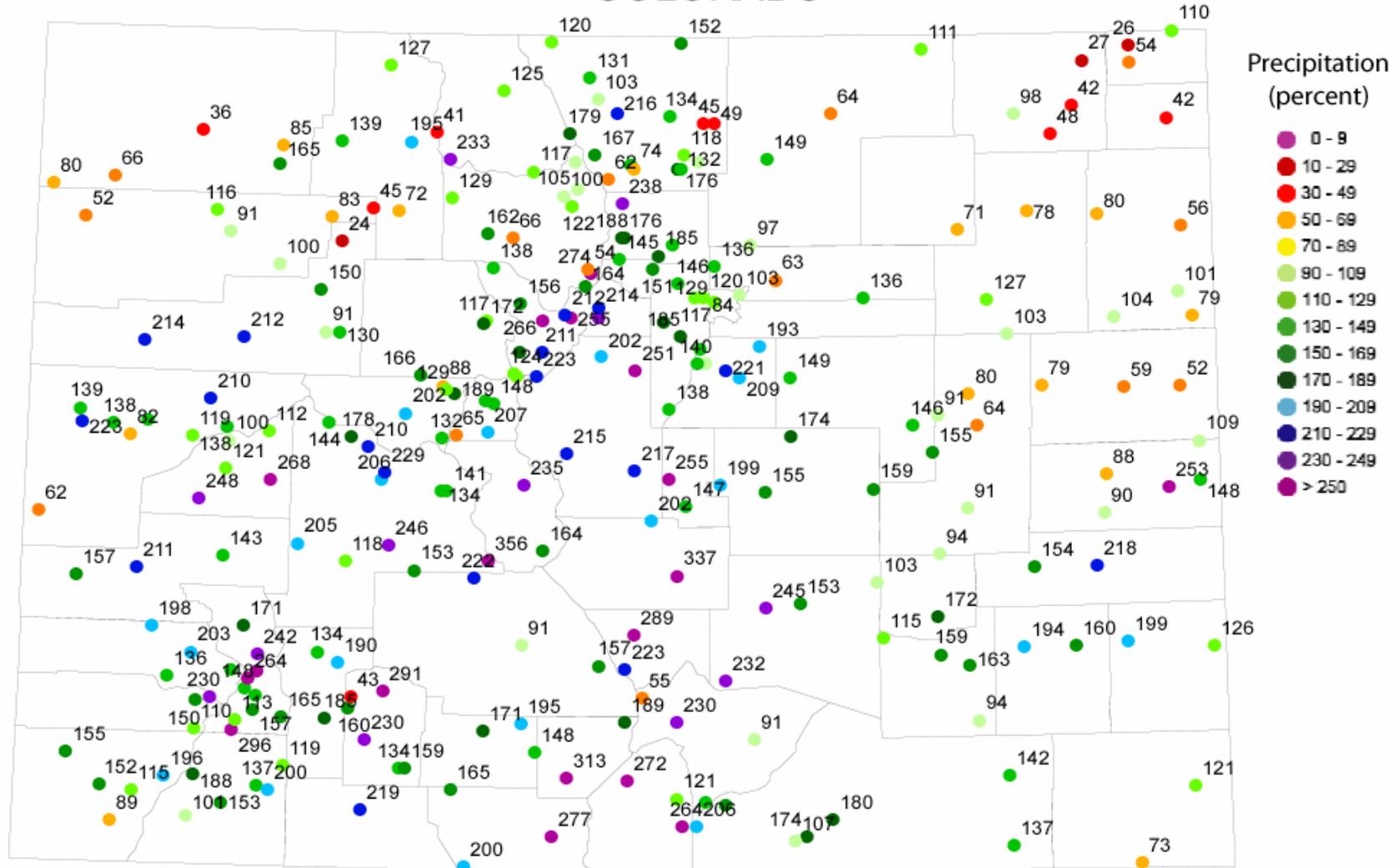
Precipitation Anomaly: Jun 2006 Provisional Data





Jul 2006 Precipitation percent normal

COLORADO

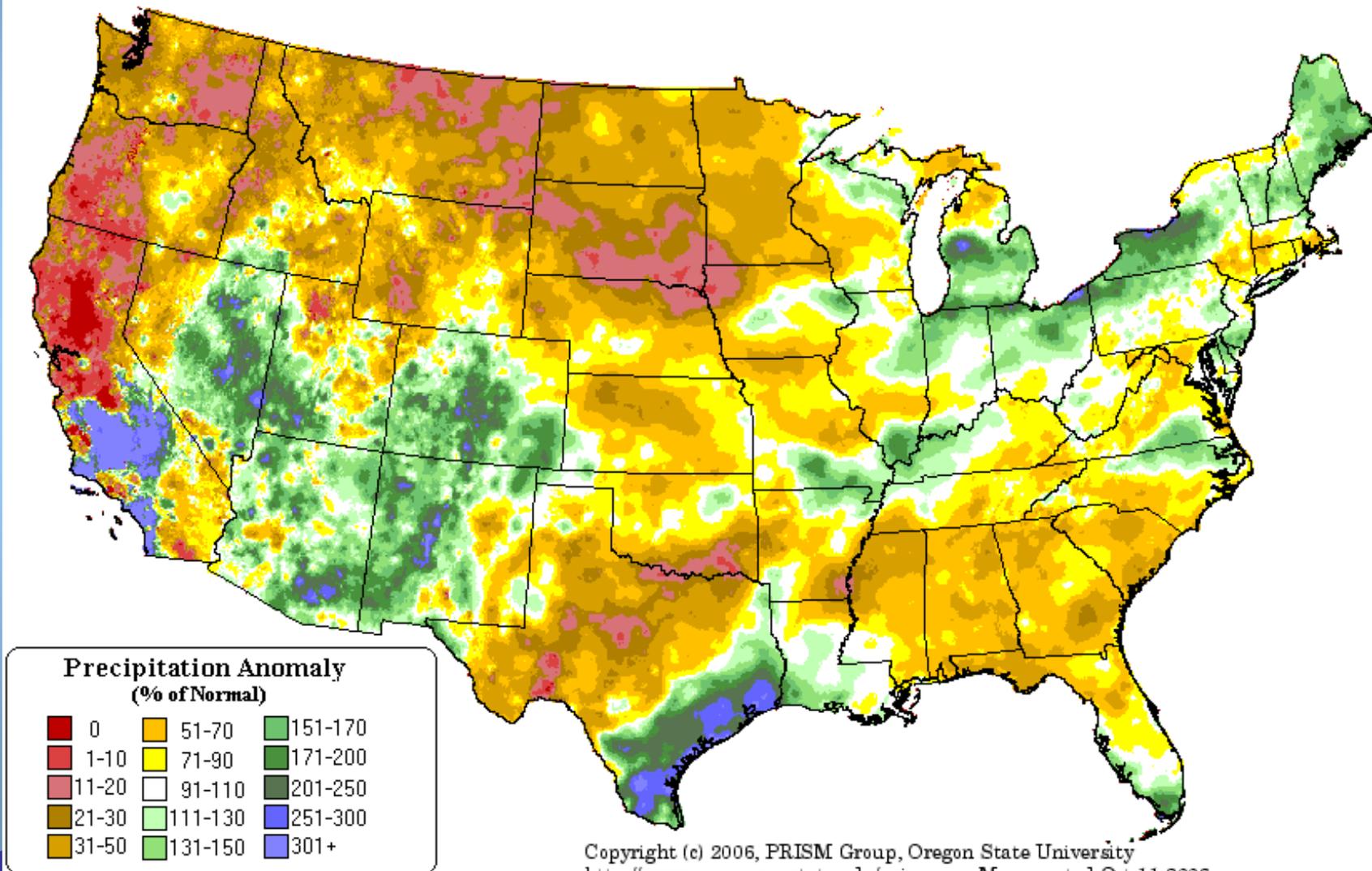


July 2006 precipitation as a percent of the 1971-2000 average.



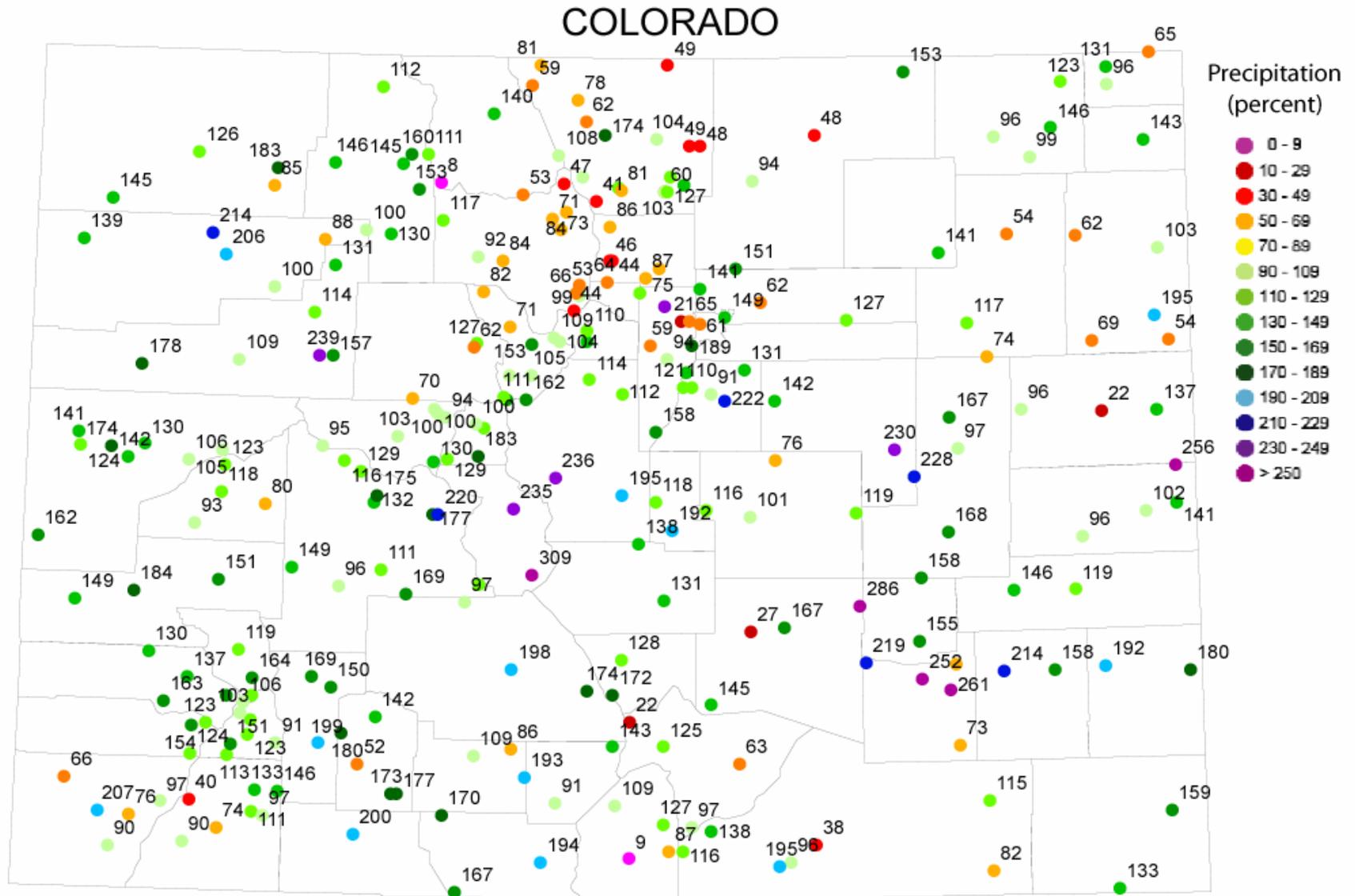
July 2006 precipitation as a percent of average (Prism)

Precipitation Anomaly: Jul 2006 Provisional Data





Aug 2006 Precipitation percent normal

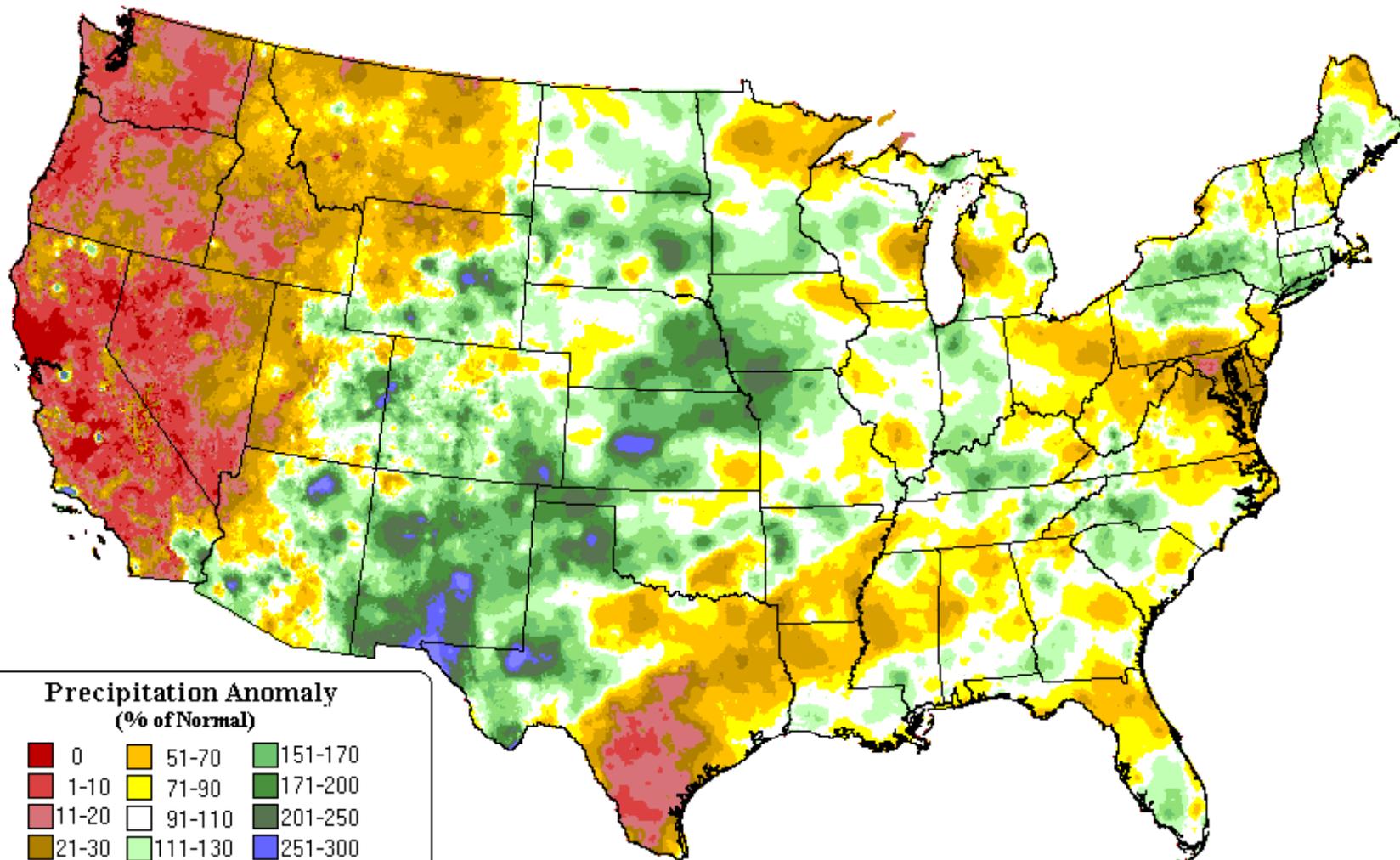


August 2006 precipitation as a percent of the 1971-2000 average.



August 2006 precipitation as a percent of average (Prism)

Precipitation Anomaly: Aug 2006 Provisional Data

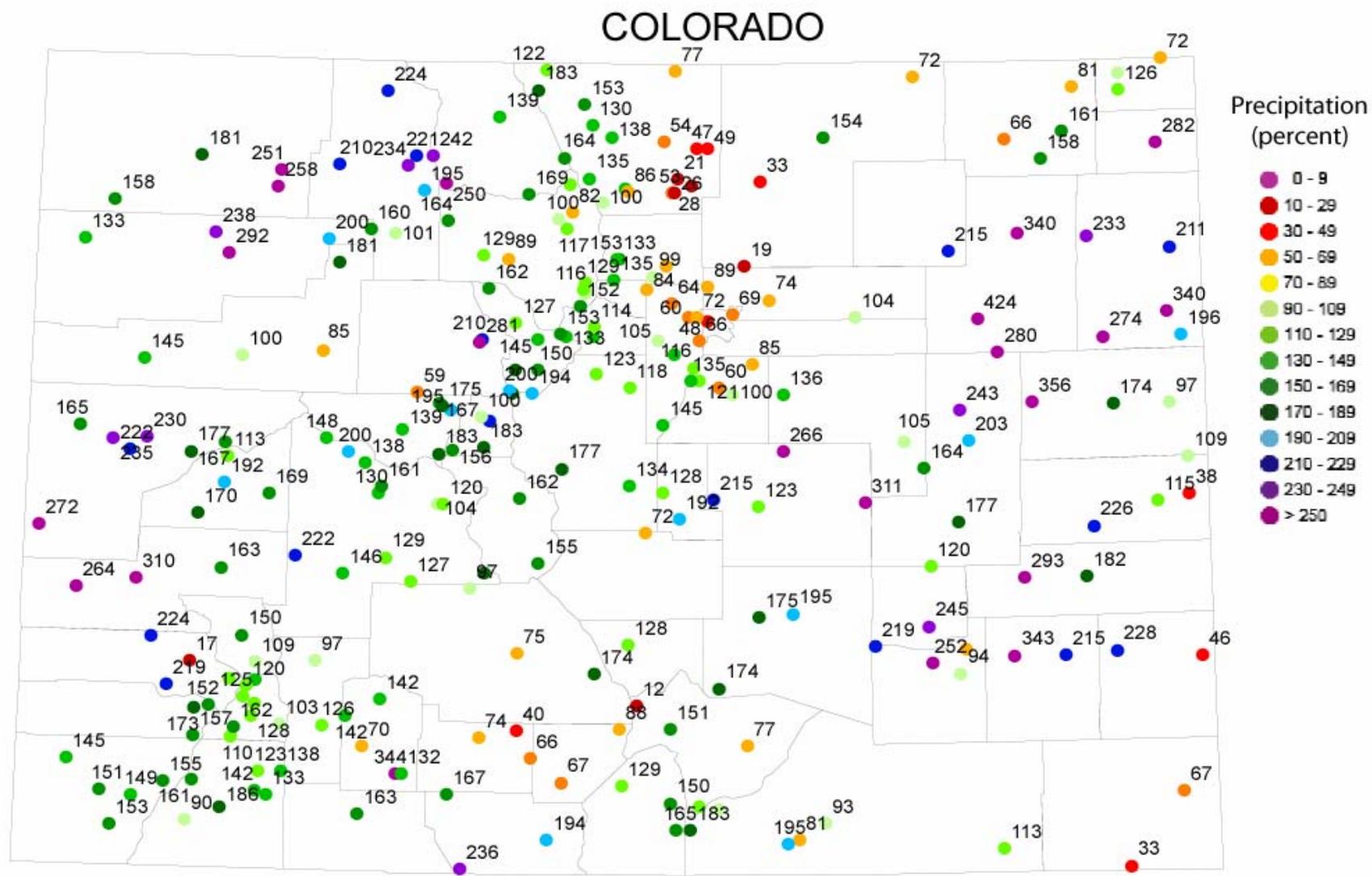


Precipitation Anomaly (% of Normal)

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Sep 2006 Precipitation percent normal

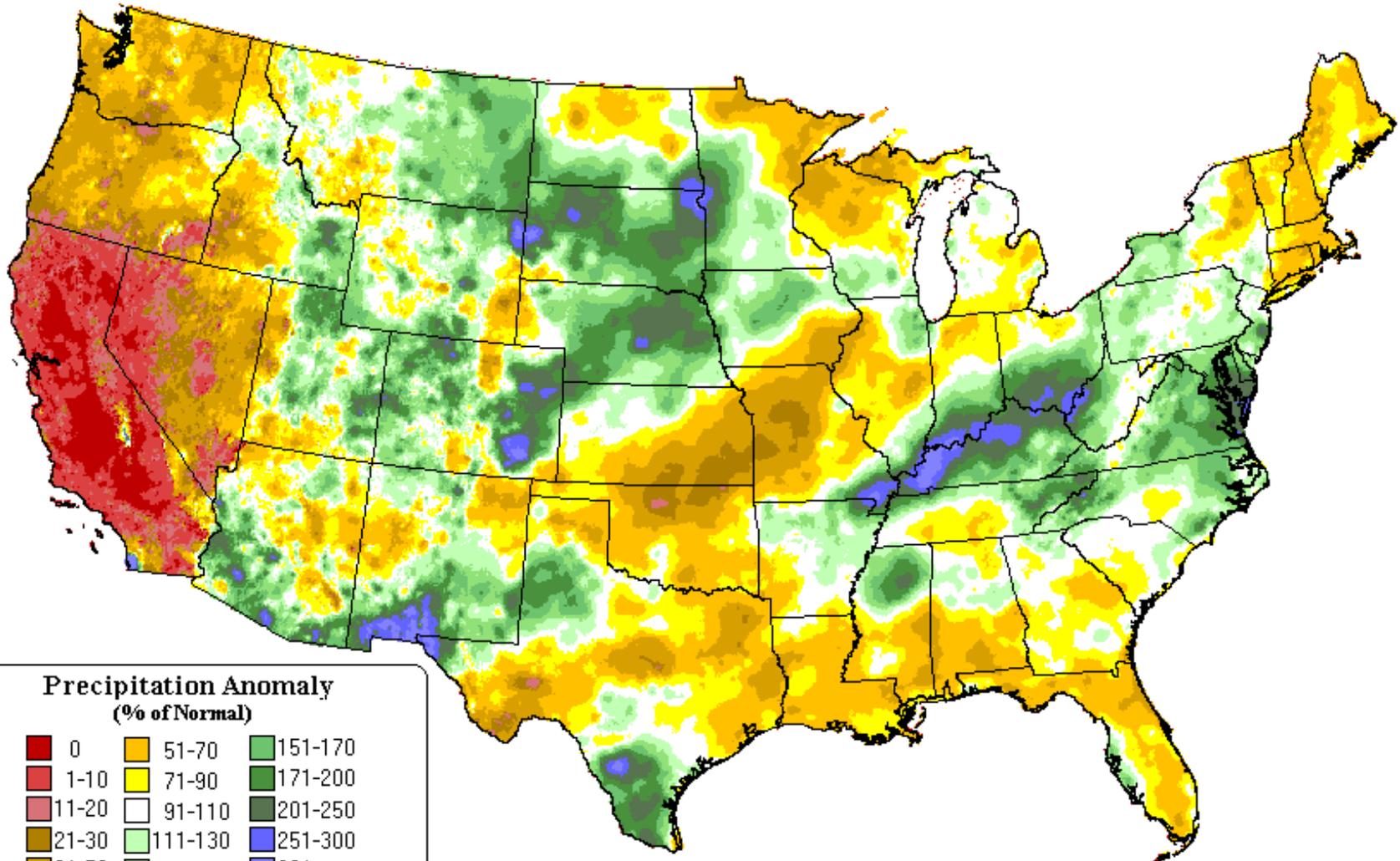


September 2006 precipitation as a percent of the 1971-2000 average.



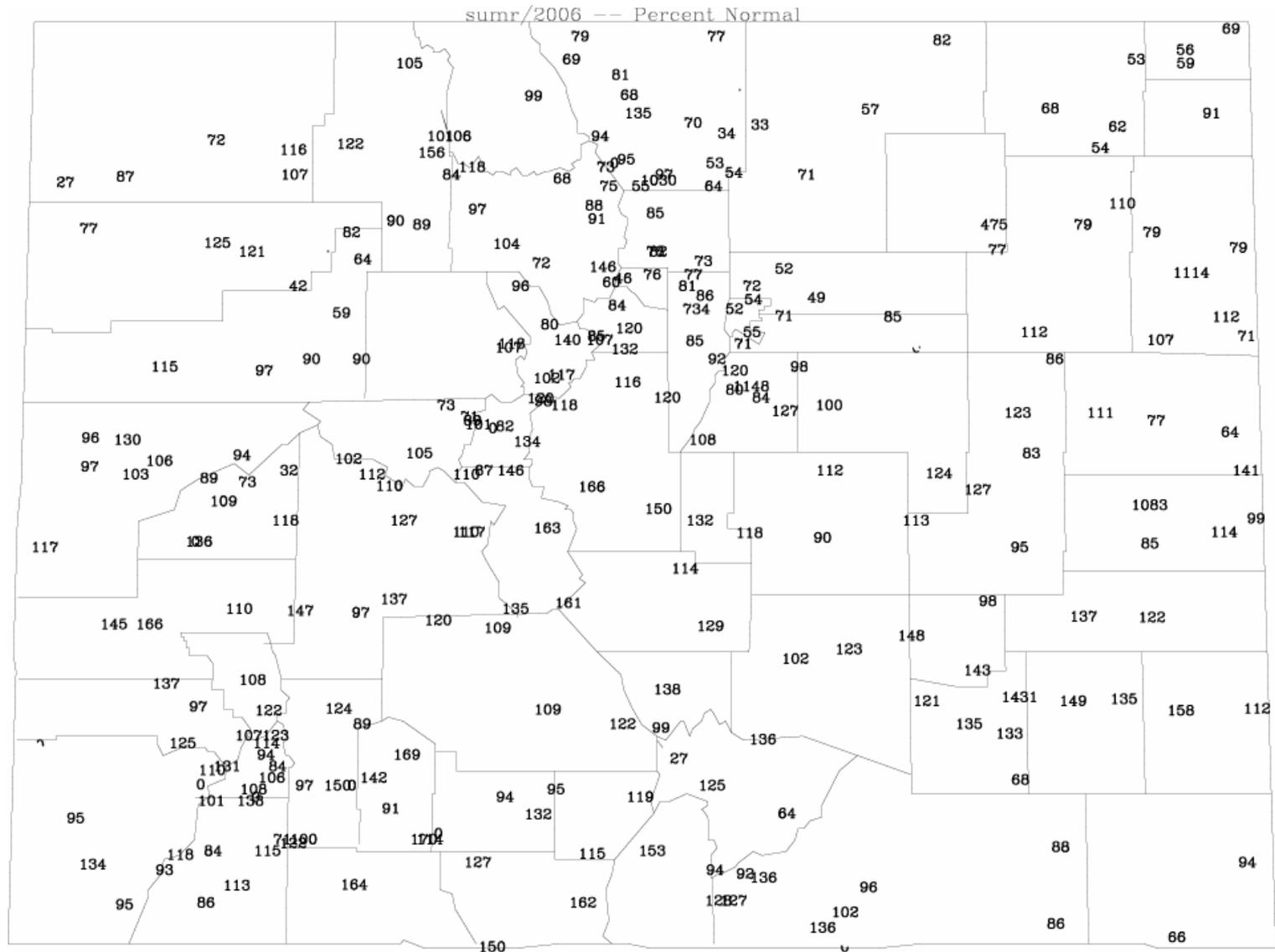
September 2006 precipitation as a percent of average (Prism)

Precipitation Anomaly: Sep 2006 Provisional Data





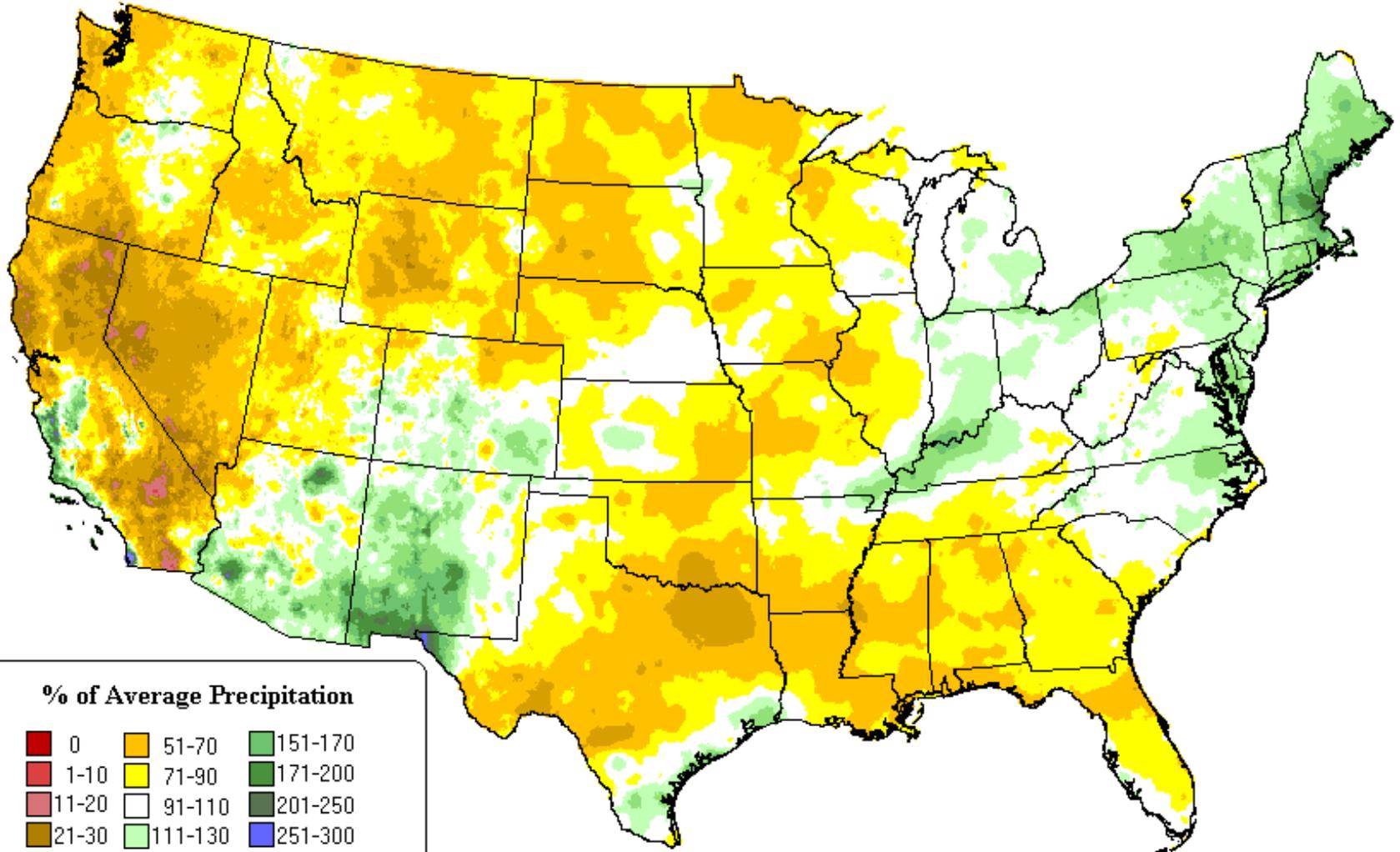
Summer 2006 (May–Sep) precipitation as a percent of the 1971-2000 average





Summer 2006 (May–Sep) precipitation as a percent of average (Prism)

5-month Percent of Average Precipitation: Sep 2006 Provisional Data



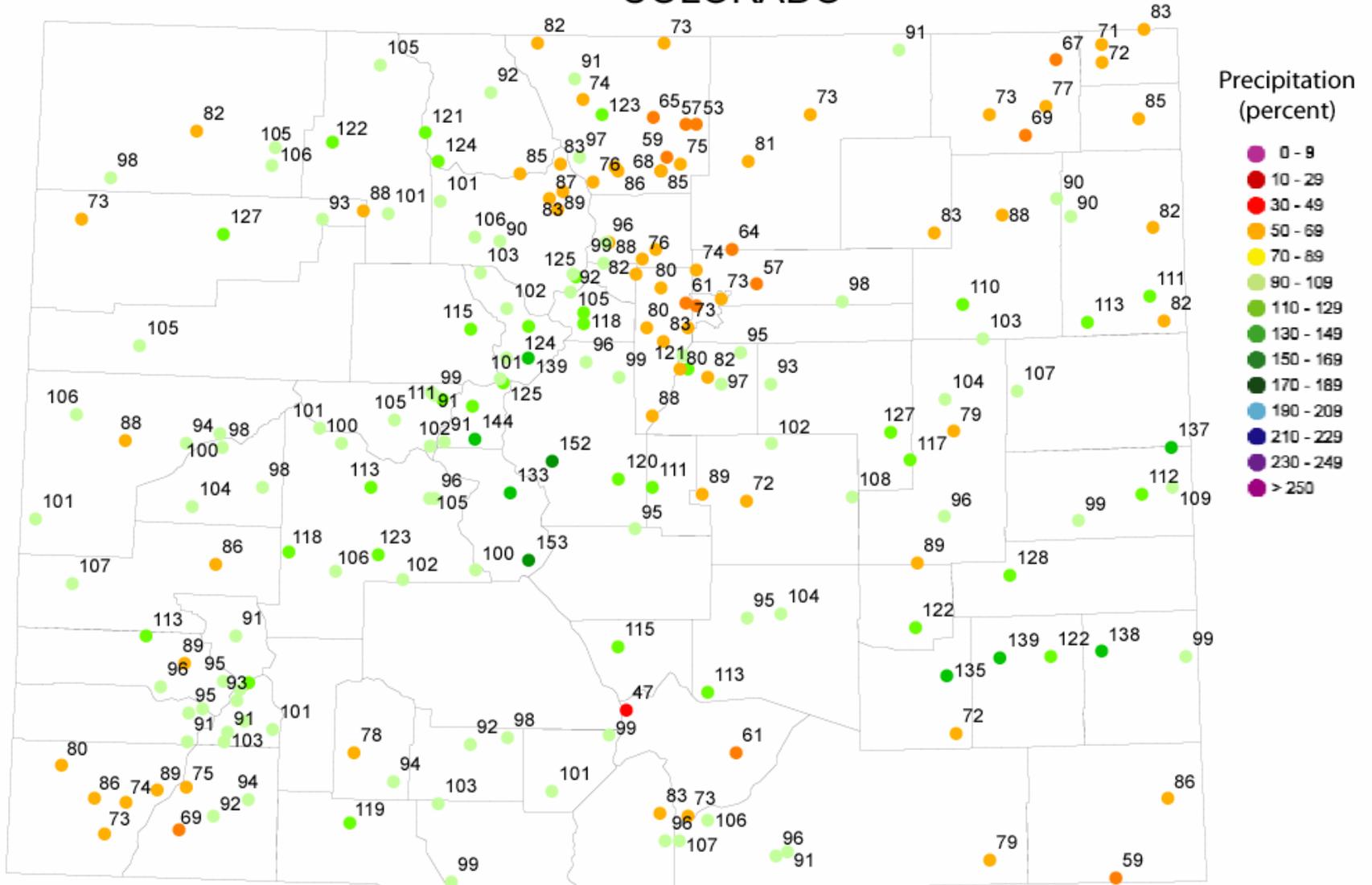
% of Average Precipitation

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Water Year 2006 precipitation as a percent of the 1971-2000 average

COLORADO

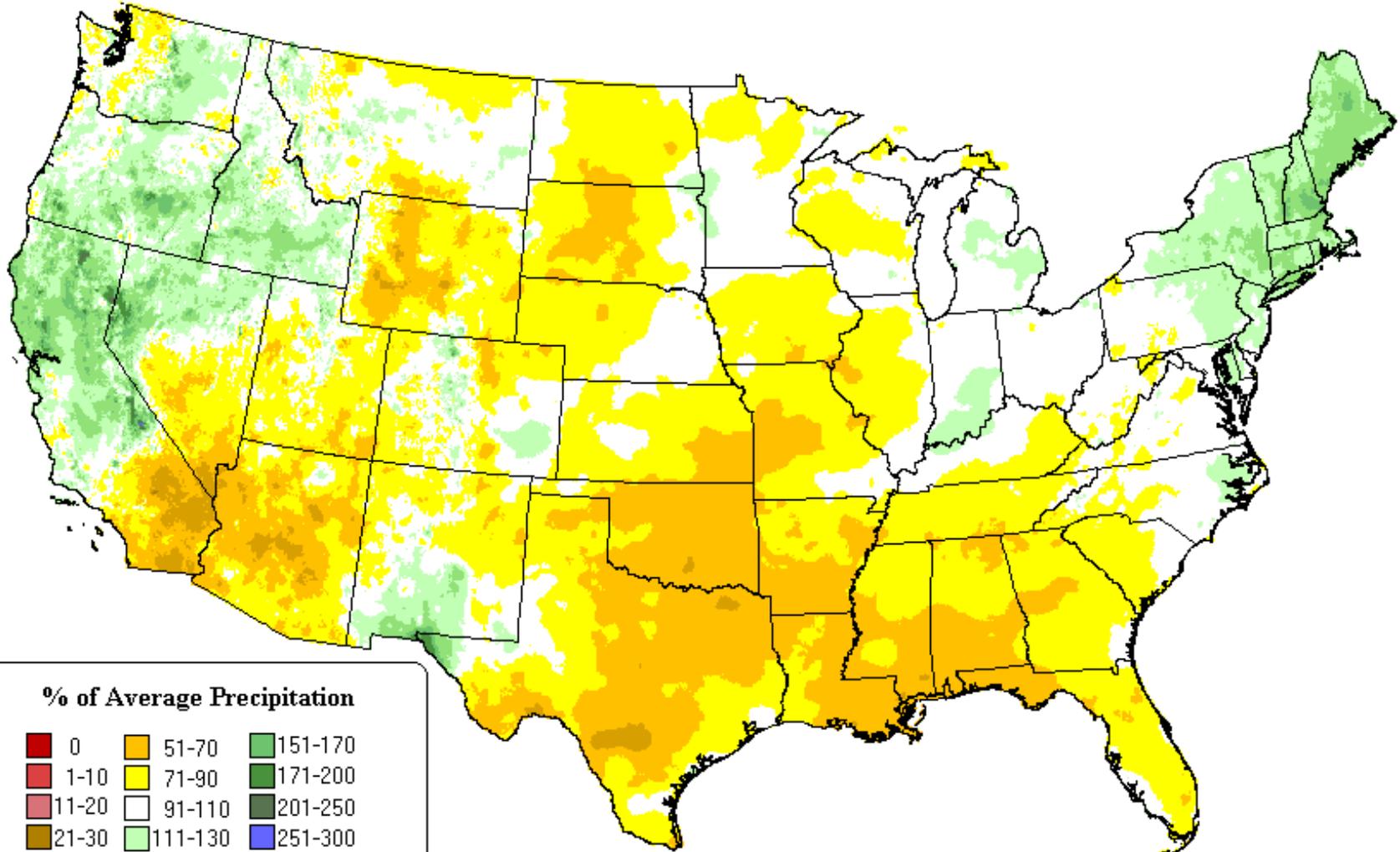


Water Year 2006 (October 2005 through September 2006) precipitation as a percent of the 1971-2000 average.



Water Year 2006 precipitation as a percent of average (Prism)

12-month Percent of Average Precipitation: Sep 2006
Provisional Data



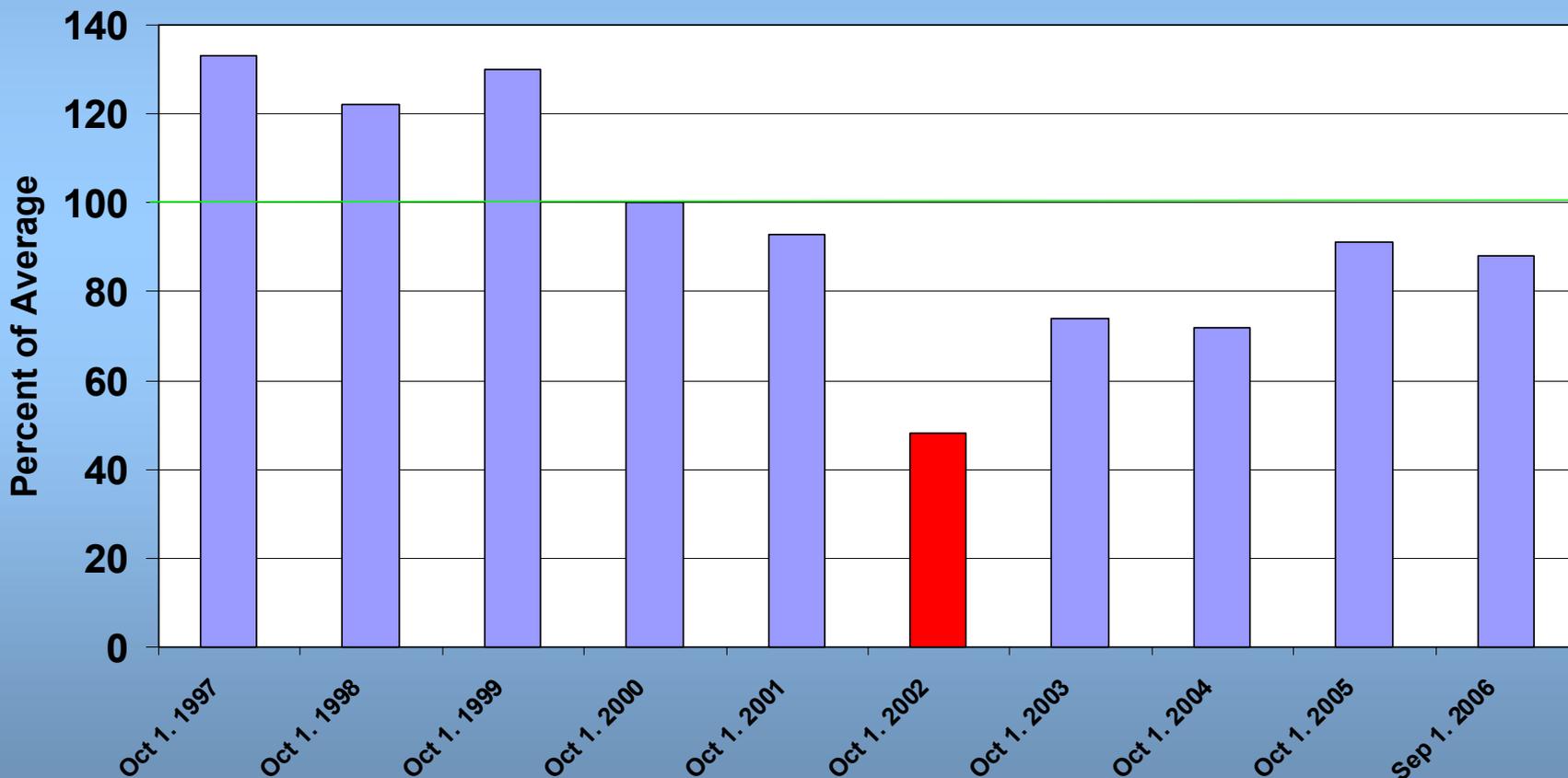
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31-50	131-150	301+



Reservoir Storage Levels

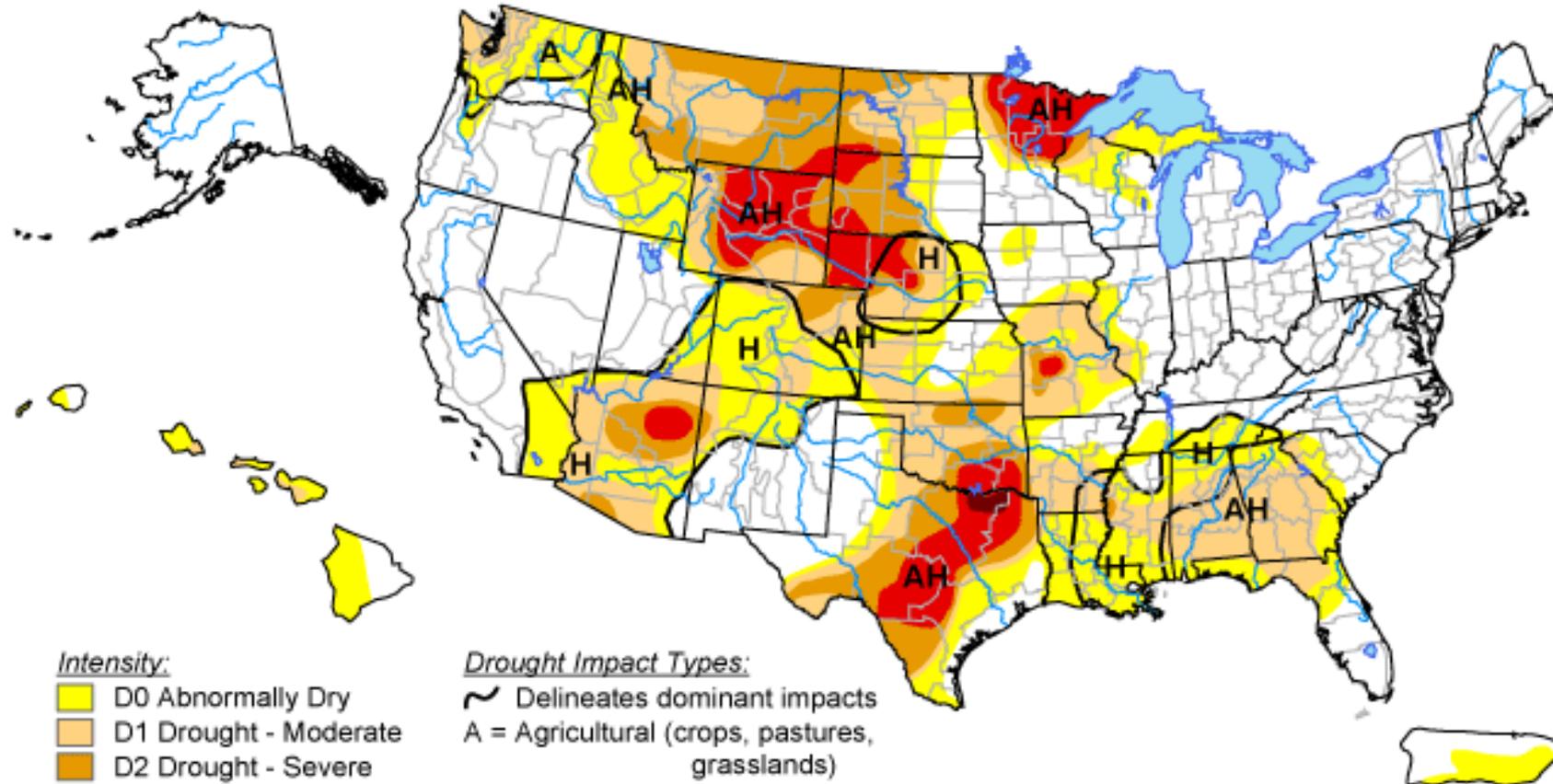
**Colorado Statewide Reservoir Levels on October 1st
for Years 1997- 2005 and Sept 1, 2006**



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.

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



Released Thursday, October 5, 2006

Author: Rich Tinker, Climate Prediction Center, NOAA



Summary

- Soaking October storm – especially over Eastern Colorado
- Windy, dry winter over Foothills and Eastern Plains
- Frequent midwinter snows Northern Mountains
- Very warm and dry spring (tough on Agriculture)
- Early July soaking
- Wet summer over much of southern Colorado
- A chilly ending to another warm year

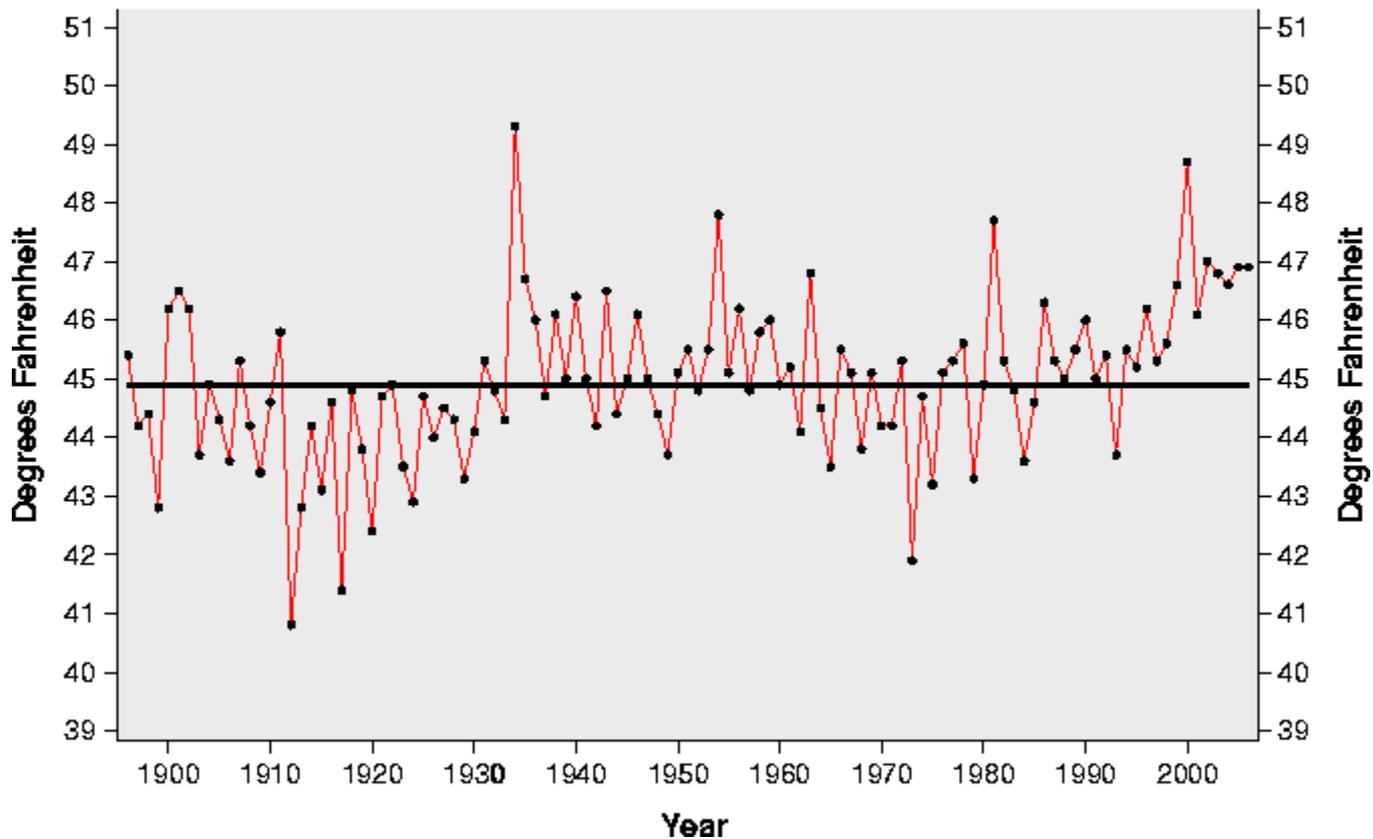
But,

- Some cold and windy winter weather, but still warmer than average for many areas for 13th winter in a row



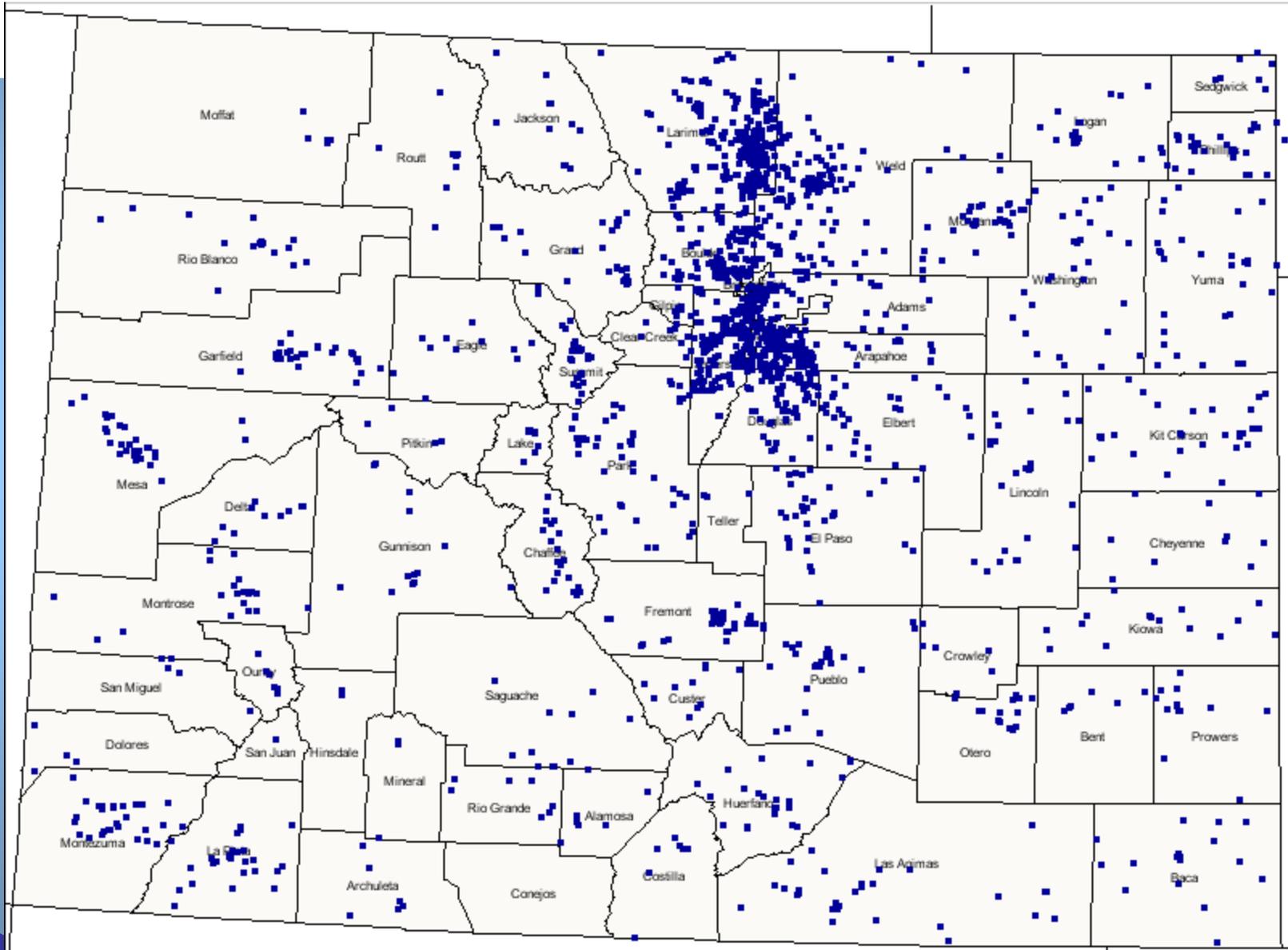
Overall, 2006 Water Year warmer than average again

— **Actual Temperature** Colorado (Oct-Sep) Average Temperatures
— **Average Temperature** From 1896-2006



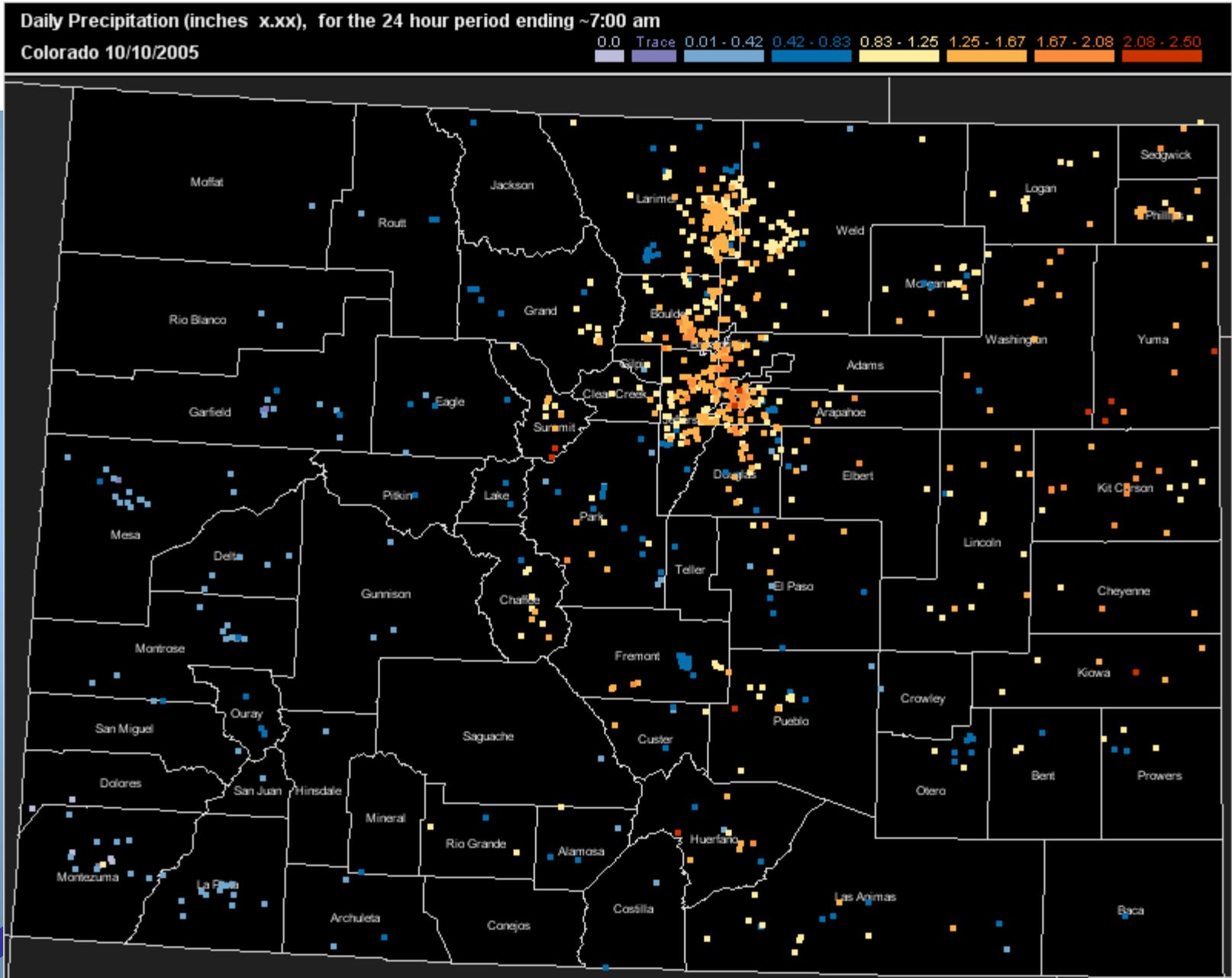


Active CoCoRaHS stations in Colorado





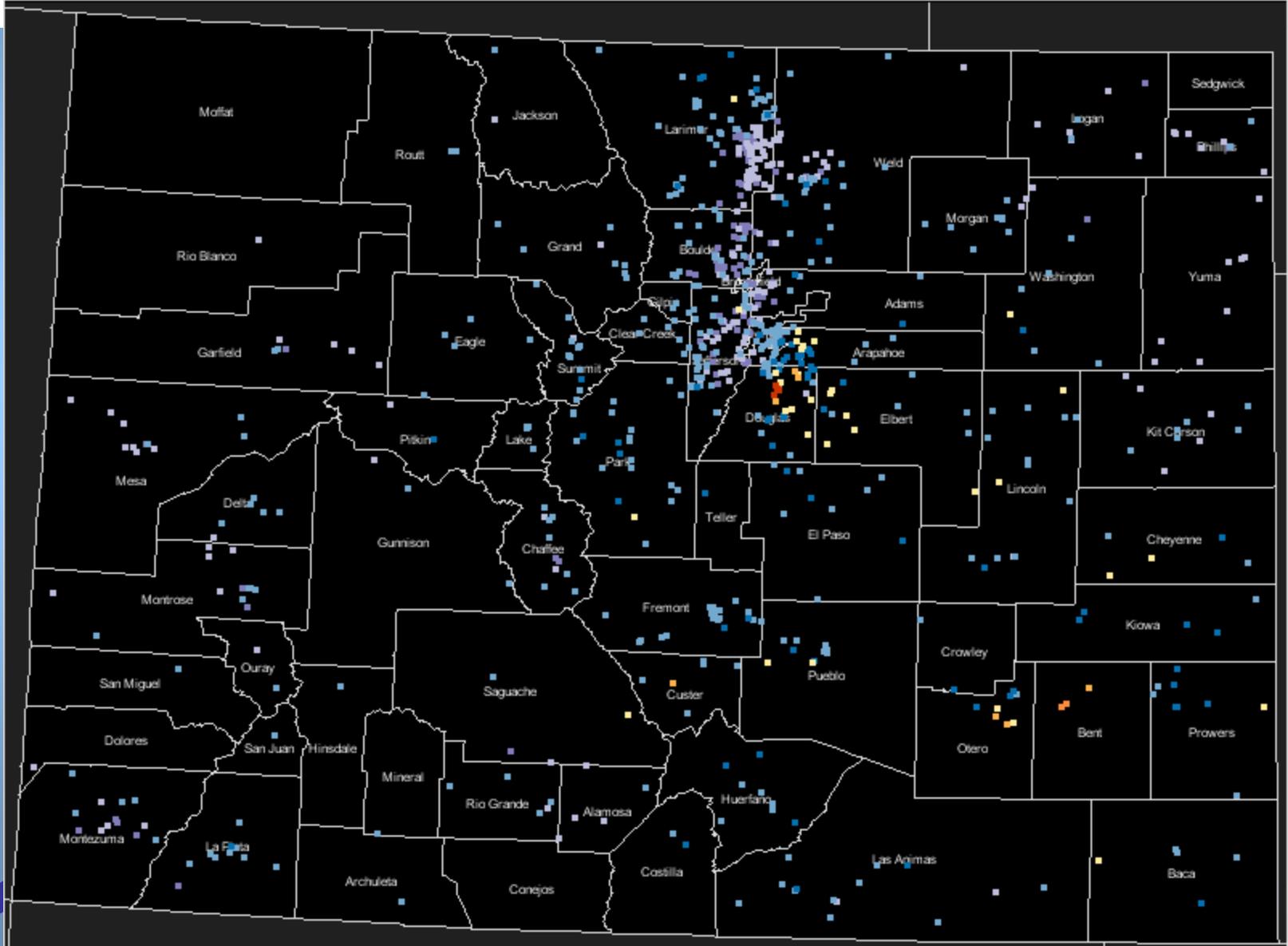
CoCoRaHS Precipitation map for Oct 10, 2005





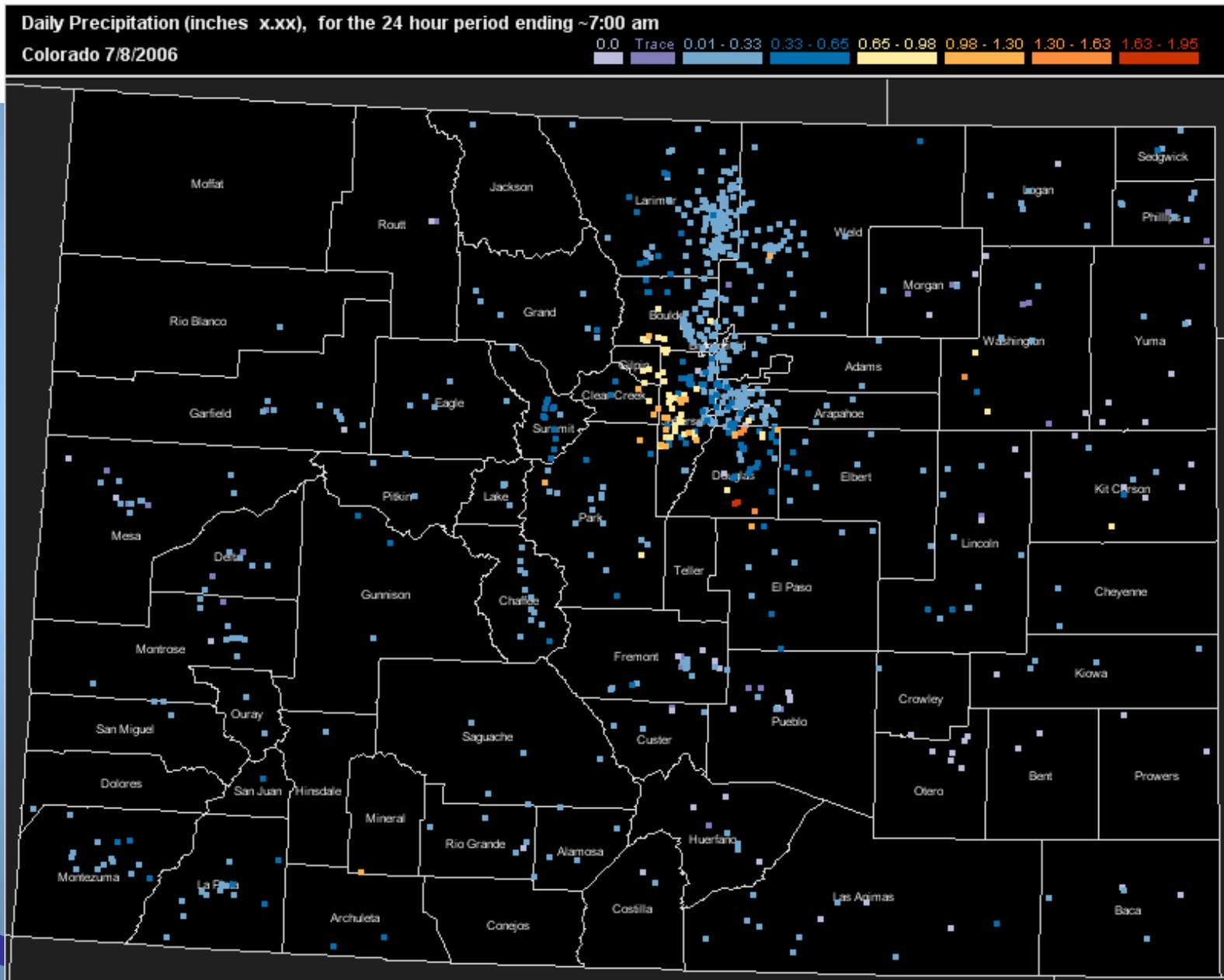
CoCoRaH Precipitation map for July 4, 2006

Daily Precipitation (inches x.xx), for the 24 hour period ending ~7:00 am
Colorado 7/4/2006



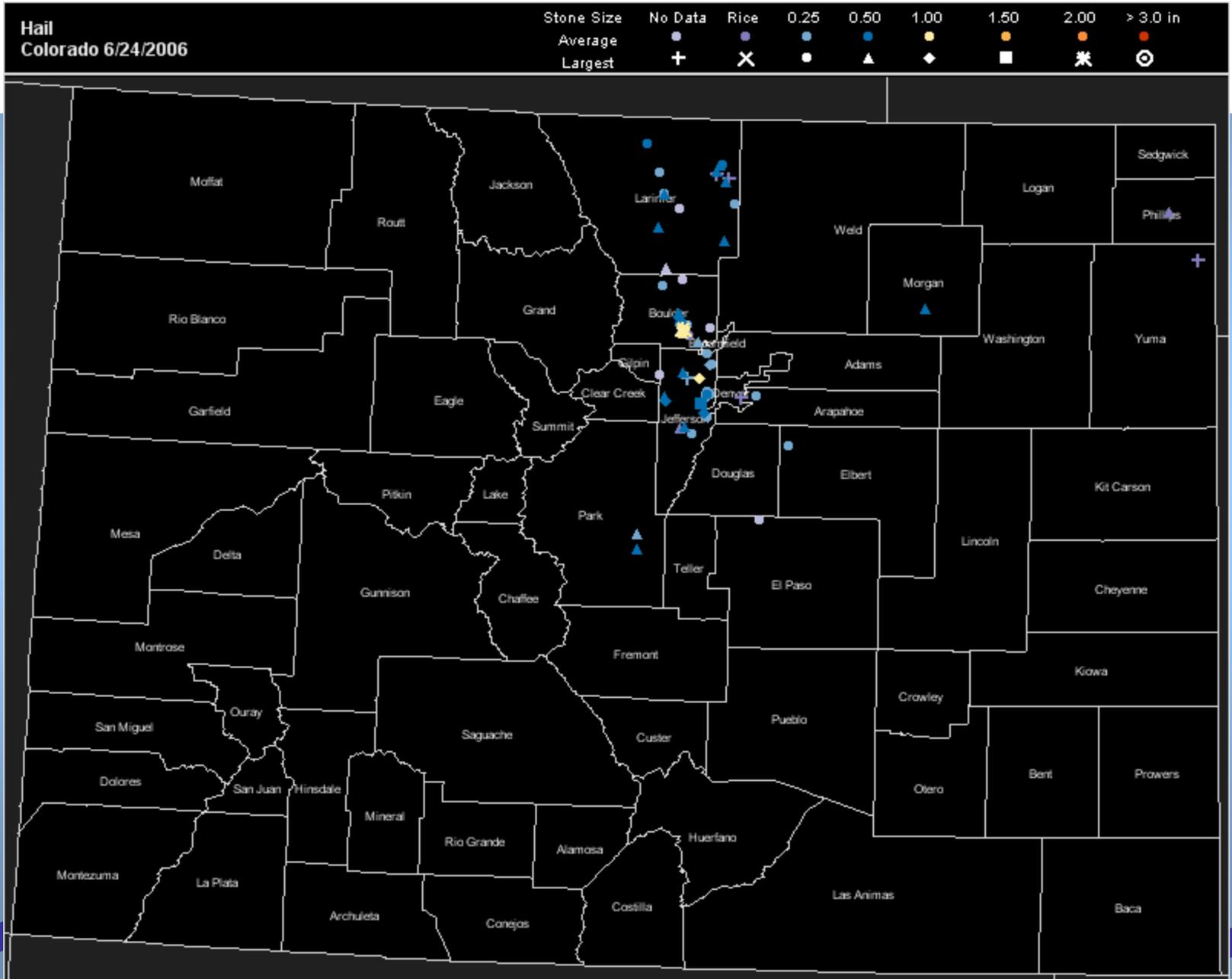


CoCoRaH Precipitation map for July 8, 2006





CoCoRaHS Hail map for June 24, 2006

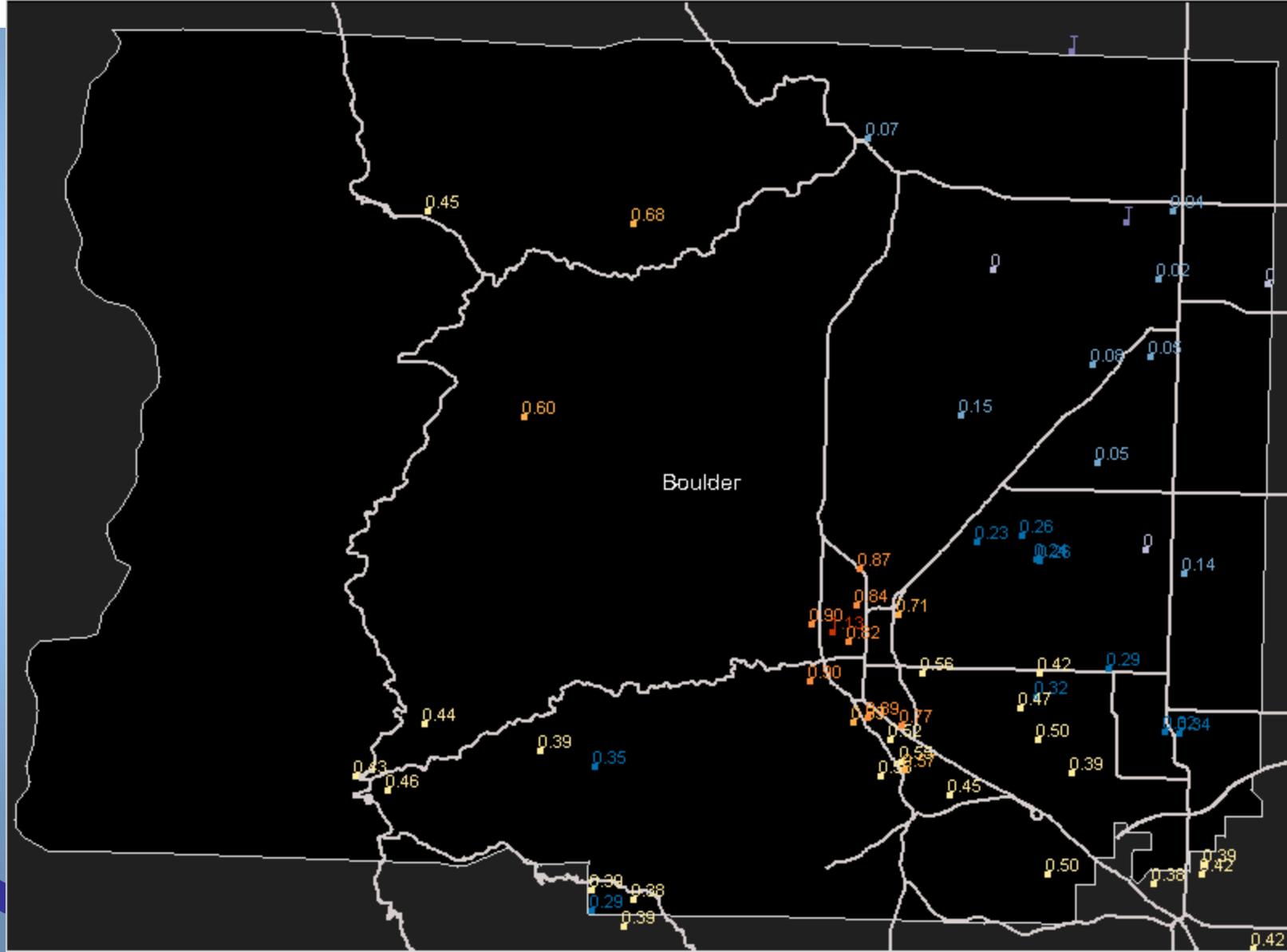




CoCoRAHS Precipitation map for October 21, 2006

Daily Precipitation (inches x.xx), for the 24 hour period ending ~7:00 am
Boulder County, Colorado 10/21/2006

0.0	Trace	0.01 - 0.19	0.19 - 0.38	0.38 - 0.56	0.56 - 0.75	0.75 - 0.94	0.94 - 1.13
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For More Information, Visit the CoCoRaHS Web Site



<http://www.cocorahs.org>



Support for this project provided by
NSF Informal Science Education Program,
NOAA Environmental Literacy Program
and
many local charter sponsors.



Colorado Climate Center

Data and Power Point Presentations available for downloading

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

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

