Drought in Colorado: Past, Present, Future

Nolan Doesken
Colorado Climate Center
Atmospheric Science Department
Colorado State University

http://ccc.colostate.edu
Colorado Average Annual Precipitation Map

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
- 52-60
- 60-70

Scale 1:1,85,000
South Platte Average Precipitation

Monthly Average Precipitation for Selected Sites in the South Platte Basin

- Hoosier Pass
- Denver Stapleton
- Sterling
Fraction of Colorado in Drought
Based on 3-month SPI
Through 1999
Fraction of Colorado in Drought Based on 48-month SPI
(Through 1999)
Water Year 2000
Precipitation Percent of Average for 1961-1990 Averages

Precip % of Average
Water Year 2001
(Oct. 2000 - Sept. 2001)
Precipitation Percent of Average for 1961-1990 Averages
Upper San Juan Snotel
Water Year 2002

06M03S    -UPPER SAN JUAN SNOTEL for Water Year 2002

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

NWCC: http://www.wcc.nrcs.usda.gov/cgi-bin/site-wygraph-multi.pl?state=CO
May 2002 precipitation as a percent of the 1961-1990 average.
Negative Indicators

- Little late winter snow
- Missed opportunities
- Warm spring
- Brief, sporadic precipitation
- High intensity rainfall
- Frequent, strong winds
- Low humidity
- Abundant sunshine
July 2002 precipitation as a percent of the 1961-1990 average.
U.S. Drought Monitor July 23, 2002
Valid 8 a.m. EDT

Drought Impact Types:
A = Agriculture
W = Water (Hydrological)
F = Fire danger (Wildfires)

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, July 25, 2002
Author: Brad Rippey, USDA
Hayman Fire
Largest in Recent History
Water Year 2002
Precipitation Percent of Average for 1961-1990 Averages
Cache la Poudre River Undepleted Flow (Preliminary)

Data from Northern Colorado Water Conservancy District
2002 Water Year Temperature Departures from Average

Water Year 2002

Departure from average, degree F

-6 -4 -2 0 2 4 6 8

Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep

- Eastern Plains  - Foothills  - Mountains  - Western Valleys
2003 – Shaky Road to Recovery

06M03S  -UPPER SAN JUAN SNOTEL for Water Year 2003

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

Graph showing precipitation and snow water equivalent (SWE) data for the water year 2003, with dates from October 1 to September 26.
Field Closed
Due to Drought
Conditions
until September 03'

Thank you,
[Signature]
Director of Facilities & Operations
Roof collapsed under the March 17-19, 2003 Snowstorm

Photo taken by John Fischbach, City of Fort Collins.
Water Year 2003
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

http://drought.unl.edu/dm
Current Upper San Juan Snotel for Water Year 2004

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

Graph showing precipitation and snow water equivalent (SWE) data for the Water Year 2004, with dates from 10/1 to 9/25.
El Nino History

MULTIVARIATE ENSO INDEX

Valid through January 8, 2004

From http://www.cdc.noaa.gov/~kew/MEI/
Temperature
March – May 2004

From the Colorado Prediction Center
Precipitation
March – May 2004

From the Colorado Prediction Center
Temperature
June – August 2004

From the Colorado Prediction Center
Precipitation
June – August 2004

From the Colorado Prediction Center
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](http://ccc.atmos.colostate.edu)
  click on “Drought”
  then click on “Presentations”