A Review of the 2009 Water Year in Colorado

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Presented at 30th Annual CSU Hydrology Days
Fort Collins, Colorado
22 March 2010
U.S. Drought Status at beginning of 2009 Water Year

Drought Monitor  September 30, 2008

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought – Extreme
- D4 Drought - Exceptional
Highlights of the 2009 Water Year in Colorado
MEI and SST

2009 -- El Nino emerges during the summer
Additional Highlights of WY 2009

- No major floods, No major extremes
- Above average temperatures in Winter
- Below average temperature in Summer
- December, April, May and June brought good moisture to Mountains and Western Slope.
- Near normal snowpack began quick meltout in May, followed by cool, wet June which created a second peak in streamflow late June/early July
- October, February, April, June, July, August and September brought good moisture to Eastern Plains.
- Abnormally dry conditions shifted from SE to SW Colorado during the year
A closer look at the climate of the 2009 Water Year in Colorado
Water Year 2009 Temperature Departures From 1971-2000 Average

Temperature Departure (deg F)

- Eastern Plains
- Foothills
- Mountains
- Western Valleys
2009 WY Temperatures at selected stations east and west

Kersey, Colorado

Temperature for KSY01 (09-30-2008 - 10-01-2009)

Hotchkiss, Colorado

Temperature for FRT02 (09-30-2008 - 10-01-2009)
Month by Month Precipitation for 2009 Water Year

Statewide maps showing precipitation as a percent of 1971-2000 averages
October 2008 Precipitation as Percent of Normal
November 2008 Precipitation as Percent of Normal

Legend:
- nov_08_pn
- <50
- 50-100
- 100-150
- 150-200
- >200
December 2008 Precipitation as Percent of Normal
January 2009 Precipitation as Percent of Normal
February 2009 Precipitation as Percent of Normal

Legend
- feb_09_pn
- <50
- 50-100
- 100-150
- 150-200
- >200
March 2009 Precipitation as Percent of Normal
U.S. Drought Monitor March 31, 2009

- D4 Drought - Exceptional
- D3 Drought – Extreme
- D2 Drought - Severe
- D1 Drought - Moderate
- D0 Abnormally Dry
June 2009 Precipitation as Percent of Normal
July 2009 Precipitation as Percent of Normal
August 2009 Precipitation as Percent of Normal
September 2009 Precipitation as Percent of Normal
Water Year 2009 Precipitation as Percent of Normal
(Oct 08 - Sept 09)
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

http://drought.unl.edu/dm
Colorado Precipitation in Historic Perspective

Most recent 12-month period (Oct 2008 – Sept 2009)
(Period of Record 1895-2009)
WY2009 Snowpack Accumulation and Meltout
Joe Wright Reservoir Snotel

**JOE WRIGHT SNOTEL** as of 10/06/2009

*** Provisional Data, Subject to Change ***
Berthoud Summit SNOTEL

Water Year 2009
Wolf Creek Summit SNOTEL

Water Year 2009
Progression of COLORADO Water Year 2009
Snowpack -- by basin

USDA Natural Resources Conservation Service

*Includes Animas, Dolores, San Miguel Basins
APRIL 1 SNOWPACK
COLORADO STATEWIDE

Graph showing the percent of average snowpack for each year from 1968 to 2008.
Streamflow
2009 Water Year Hydrograph compared to average

Cache La Poudre River at Mouth of Canyon

Discharge, (1000 CFS)

- Mean Discharge
- 2009 Discharge
2009 Water Year Hydrograph compared to average

Colorado River near Dotsero, CO

- Blue line: 2009 Discharge
- Green line: Mean Discharge

Discharge (1000 CFS)

Months: OCT, NOV, DEC, JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP

Discharge values range from 0 to 12,000 (1000 CFS).
2009 Water Year Hydrograph compared to average

Animas River at Durango, CO

Discharge, (1000 CFS)

2009 Discharge
Mean Discharge
2009 Water Year Streamflow volumes for selected rivers compared to average.
Streamflow elsewhere

- Colo. R. at Stateline
- Arkansas nr Grenada
- South Platte at Julesburg
- North Platte nr Northgate
- Dolores nr Bedrock
- San Juan nr Carracas
- Animas nr Cedar Hill, NM
- Rio Grande nr Cerro, NM
- Yampa nr Maybell
- White nr Rangely

2009 Volume
Average Volume
Pan Evaporation

Fort Collins, CO Pan Evaporation Compared to Normal

- 2009 Evaporation

Pan Evaporation (in)

Month

May, June, July, Aug, September
And How are Colorado’s Reservoirs Doing?
Reservoir storage compared to averages – by basin

*includes the Animas and Dolores basins
Reservoir Storage Levels

Colorado Statewide Reservoir Levels on October 1st for Years 1997-2009
CoAgMet: Colorado Agricultural Meteorological Network  -- Quick Update

ccc.atmos.colostate.edu/~coagmet
CoAgMet Network
-- currently downsizing and fund raising
Welcome to the Colorado Climate Trends Website

Climate Trends of Colorado

Welcome! The climate of Colorado is a valued natural resource affecting our lives and livelihoods. By nature, climate is variable. No two years are ever exactly alike. Instrumental observations of our climate dating back to the late 1800s give a sense of our average climate, typical variations, extremes and long-term trends. (For a description of historic weather observations in Colorado, click here). Tracking temperatures and precipitation through history reveal seasonal patterns, cold and warm periods, and episodes of drought and abundant water.

Today there is great interest in climate change. If our state is warming, these data will show it. This Website lets you view, graph and download historic temperature and precipitation data for selected weather stations in Colorado having the longest and most consistent historical data. Historic consistency is critical for accurately assessing climate trends. There have been hundreds of weather stations operated in Colorado since the 1890s, but very few have data that are complete and consistent. Even the best stations selected for this site are imperfect.

For each station shown here, a description of the history of the station is

National Weather Service Co-op Program

Weather observations in Colorado using thermometers and rain gauges date back to the late 1800s. Some of the earliest weather stations were established in the largest cities during the 1870s by the U.S. Signal Service. In the 1880s Colorado formed a "State Weather Service" and began setting up more basic weather stations in smaller towns and rural areas. By 1890, the first nationwide civilian weather service was formed within the U.S. Department of Agriculture. State networks, such as Colorado's were combined to form a single nationwide volunteer weather observing network. This same network continues today managed by the National Weather Service. What began as a few dozen stations in the
Sedgwick 5S Precipitation History

Total Annual Precipitation
Sedgwick 5S • Station 57515

Source: Colorado Climate Center, Fort Collins, Colorado
And How About CoCoRaHS?

Community Collaborative Rain, Hail and Snow network

- Hundreds of new observers, especially from other states
- All 50 states on board!
We are always looking for new rain gauge volunteers. Are you available??

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 “Presentations”