A look at Colorado’s climate across time and space scales

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Our Mission

The Colorado Climate Center at CSU provides valuable weather and climate expertise to the residents of the state through its threefold program of:

1) *Climate Monitoring* (data acquisition, analysis, and archiving),

2) *Climate Research*

3) *Climate Services* (providing data, analysis, climate education and outreach)
When studying the atmosphere, we often refer to “scales” of motion...

earth.nullschool.net links:

- Global 250 mb
- Zoom
- Same zoom but surface

(Note: this isn’t actually how fast the air is flowing! But a nice visualization nonetheless)
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Entire year 2017

October-December 2017

70% increase in area from November to January in Colorado.

99.4% of the state now in at least D0

22% in D2 (severe)
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http://scacis.rcc-acis.org/
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Think of this as the pressure at jet-stream level, difference between 2017 and the long-term average.

Persistent upper-level high pressure over the southwest (sinking motion); jet stream weaker and deflected northward.
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https://www.esrl.noaa.gov/psd/data/composites/day/
ENSO (El Niño / Southern Oscillation)

- One of the biggest drivers of seasonal climate over North America is ENSO, the periodic variation of ocean temperatures in the Pacific Ocean

- This year, we are in **La Niña** conditions: cool ocean near South America, warm in the western Pacific

- La Niña conditions expected to continue through the winter, then returning to neutral in the spring

- But...
  - ENSO influences on Colorado aren’t as consistent as they are to our north and south
  - ENSO is only one driver of our winter conditions...and they’ve only partially explained our conditions this winter
Water year precipitation thus far

http://climate.colostate.edu/~drought/
By late February and early March, the Great Basin high pressure ridge regains its strength, returning the West Coast and Intermountain West to a drier and warmer weather regime. The wildfire danger may increase again across southern California under these conditions. Meanwhile, the Arctic and Polar Jet Streams begin their northward migration, causing temperatures to moderate across the country. Meanwhile, the southeast U.S. usually stays stormy and abnormally wet as the region remains under the influence of a very moist subtropical flow.

For north central and northeast Colorado, the northward shift of the Polar Jet Stream (i.e., storm track) causes a reduction in high country snowfall. However, the occasional passage of a weather disturbance moved along by strong northwest flow aloft can still contribute to the late season snowpack in the northern mountains. East of the mountains, conditions usually turn warmer and drier, enhanced by warming and drying effects of gusty Chinook winds periodically downsloping off the Front Range.
Upper Colorado River basin

Upper Rio Grande River basin

From NRCS
But these are large-scale factors...in horticulture, it’s often the (very) small scales that matter most!
You have the “mildest” climate of anywhere in Colorado here on the Western Slope...but the influences of the mesa and mountains and valleys are evident.
Fruita CoAgMet Temperature Data, last winter

Air Temp.

Soil Temp.

1 November 2016 to 31 March 2017
Winter minimum temperature extremes

While averages are going up a bit, the extremes seem to be staying plenty cold
Lowest Min Temperature – Dec through Feb – GRAND JUNCTION WALKER FIELD, CO

Use navigation tools above and below chart to change displayed range

Zoom: 1 yr, 10 yrs, 30 yrs, All

From 1900 To 2017

Temperature (degrees F)


-20
-10
0
10
20

Powered by ACIS
Lowest Min Temperature – Dec through Feb – PALISADE, CO

Use navigation tools above and below chart to change displayed range

Temperature (degrees F)

From 1912 To 2017

Yearly temperature fluctuations from 1912 to 2017 for PALISADE, CO, showing the lowest minimum temperatures during December through February.
And for even smaller-scale differences...
The CCC (led by Peter Goble) has deployed thermometers in many areas of Montezuma County to explore microclimates favorable for wine grapes.
Average of 10 Coldest Winter Days

West end of McElmo Canyon is promising and needs more data and analysis
See Peter Goble’s poster this afternoon!
CoAgMET

- 75 stations
- 10 proposed for west slope
- 44 5-minute stations
- interactive mapping through eERAMS
- Includes
  - time series charts
  - site photos

coagmet.colostate.edu
Growing season summaries at long-term stations: Olathe (2017)

http://climate.colostate.edu/2017ET/et_summary_oth_anom.html
new website features at climate.colostate.edu

- Data Access
- Climate Maps (coming soon)
- Climate Normals
- Climate Extremes
- Tools
Greetings,

Please join us tomorrow morning, **Tuesday, January 16th at 10:00AM MST** for our monthly "Climate, Water and Drought Assessment" Webinar.

To register go to the Colorado Climate Center website at: [http://climate.colostate.edu/webinar_registration.html](http://climate.colostate.edu/webinar_registration.html).

A toll-free 800 number is provided for calling-in. Our webinars are brief (usually less than 30 minutes) and provide updated information assessing climate, water and drought for the Intermountain West.

Intermountain West Drought Early Warning System Webinars are being brought to you by the Colorado Climate Center at Colorado State University with support from the National Integrated Drought Information System (NIDIS). For more information on NIDIS please visit: [https://www.drought.gov/drought/what-nidis](https://www.drought.gov/drought/what-nidis)

Sincerely,

The Colorado Climate Center Team

We lead monthly webinars on the drought situation in the intermountain west (might become every 2 weeks if drought worsens)

Register at [http://climate.colostate.edu/webinar_regISTRATION.html](http://climate.colostate.edu/webinar_registration.html)

See graphics at [http://climate.colostate.edu/~drought/](http://climate.colostate.edu/~drought/)
And finally, the all-important question: “Do you have a rain gauge?”
If you are interested in weather and the variations in precipitation, please join the Community Collaborative Rain, Hail and Snow Network

http://www.cocorahs.org

or see me today
Thank you for the opportunity to be here!

http://climate.colostate.edu/

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