



# Colorado CoCoRaHS

Because Every Drop Counts!

March 2014  
Volume 2, Issue 3

## WILL MARCH LIVE UP TO EXPECTATIONS?

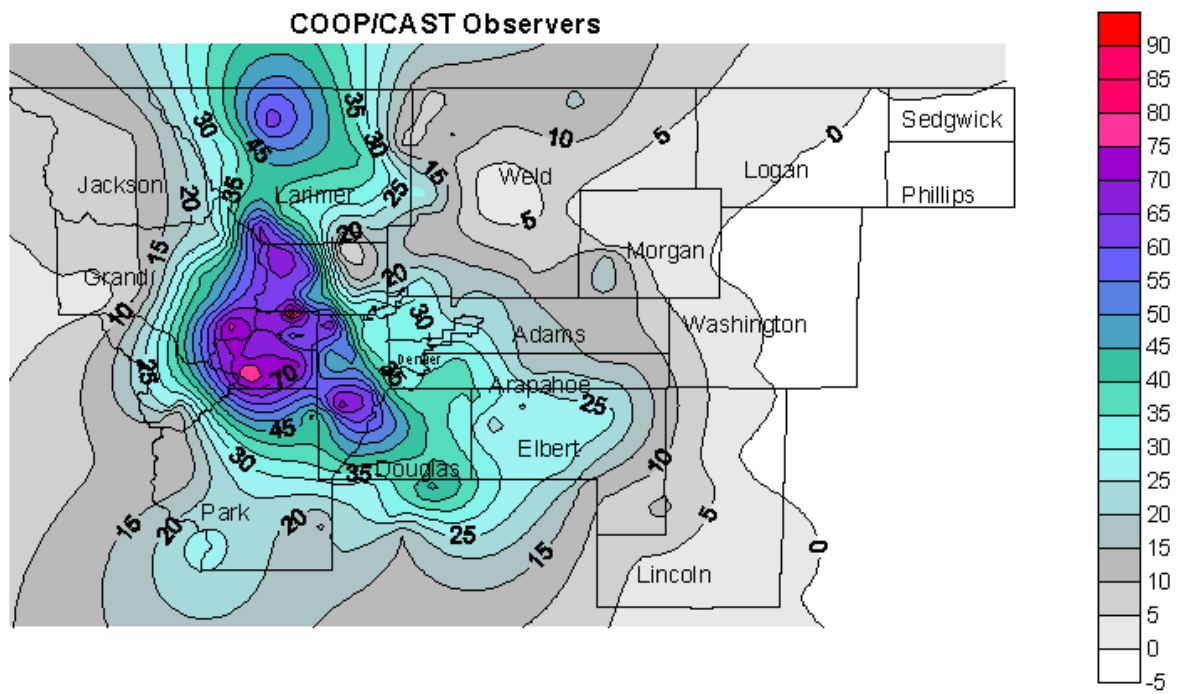
If you've lived in Colorado for any amount of time, you probably know that March can be a snowy month. In fact, for some cities including Denver, it's the snowiest of the year. Many other notable characteristics come with the month, including longer days, warmer temperatures, and the transition from winter to spring, seen with visible changes in vegetation and wildlife behavior.

## LOOK BACK TO MARCH 2003

Those who lived in Colorado during March 2003 will likely never forget the infamous

snowstorm that put a huge dent in a very bad drought over the north-central part of the state. Spring runoff that year helped fill reservoirs from mere puddles back to levels where recreation was once again possible. A bleak situation for municipal and agricultural water supplies also looked much better after the storm, which ranked as the top weather event to impact Colorado in the 2000-2010 decade, and has been described as not only a record breaker, but a back breaker. Three to eight feet of snow fell across a large area over a 3-day period. It was a very wet snow, bringing anywhere from 3 to 9 inches of water to the region.

## March 17-20, 2003 Snowfall Totals



Lake Dillon, Colorado August, 2002

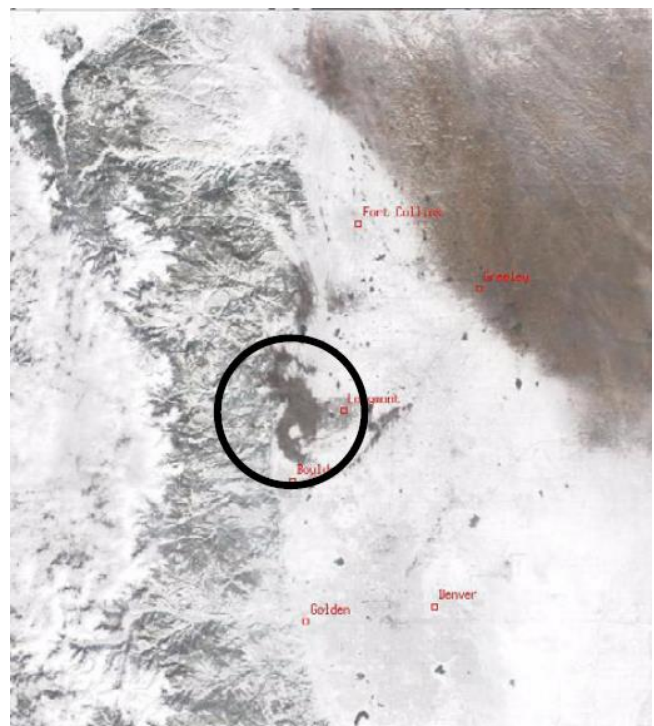


R. Anthes

A very empty Lake Dillon prior to being rapidly filled after snow melted from the 2003 March blizzard. (Courtesy: NCAR Digital Images)

### NOT EVERYONE WAS BURIED AFTER MARCH 2003 SNOWSTORM

While much of the I-25 urban corridor between Colorado Springs and Cheyenne was buried under feet of snow, there was one location wondering what all the hype was about; the small town of Lyons, Colorado.



MODIS visible satellite image used in the Poulos et al. research paper, published after the March 2003 event. Brown represents little to no snow cover on the ground or wind-swept mountain peaks.

During the March 2003 storm, if you got in your car and drove in any direction from the town of Lyons (circled in black on the image above) snow amounts rapidly increased from just a few inches to a few feet. It turns

Blizzard Aftermath in Boulder, Colorado



©UCAR

A car buried in Boulder after the March 2003 blizzard. Some locations in the foothills west of Boulder reported over 80 inches of snow. (Courtesy: NCAR Digital Images)



out, there was a very small scale weather pattern impacting the area that nobody realized at the time.

During the storm, the prevailing wind pattern blew from the north, parallel to the foothills west of Interstate 25. It created what we call in meteorology, a barrier jet, which is like a small-scale jet stream, or enhancement of upper level winds. It turns out that wind pattern actually created a highly localized downslope wind for the Lyons area as the flow came down the slopes of some higher terrain north of town.

When a wind blows down a slope, it compresses the atmosphere and warms it up. In this case, it was just enough to make a critical difference in temperature, which affected the type of precipitation that fell. While most of the Front Range saw an extended period of heavy snow, Lyons saw periods of rain, a rain-snow mix, and occasionally all snow.

Wind was just one feature that helped create a nearly “perfect storm” for the Front Range. The other was a direct transport of moisture from the Gulf of Mexico, which combined with moisture already associated with the storm, from the Pacific Ocean.

### **BENEFIT OF COCORAHHS**

This case study is a great example of why an organization like CoCoRaHS can prove invaluable when it comes to discovering and studying highly localized climate patterns. It’s also a great argument for why we like to have one or more rain gauge per square mile

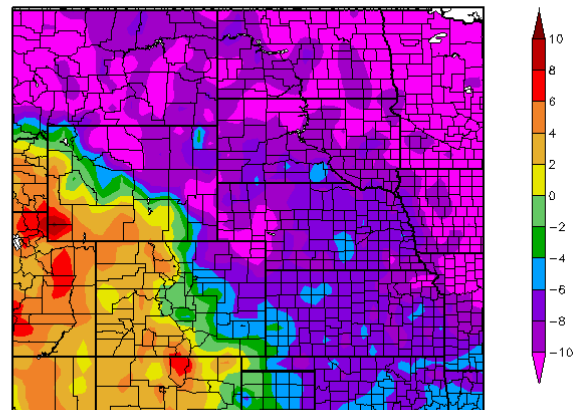
where possible; to catch those small-scale details of our weather and climate.

### **FEBRUARY TEMPS SPLIT IN COLO.**

The mountains played an important role in whether you were above or below average for temperatures last month. Colorado sat right on the edge of a huge arctic air mass that parked itself over the upper Midwest all month long, and as a result, locations along and east of the Continental Divide were at or below average, as cold air kept trying to back in from the north and northeast. It comes as no surprise that the coldest temperatures during February were in the extreme northeast counties.

Cold air is heavy and dense, and therefore sinks close to the ground. Since that cold air just couldn’t make it up and over the mountains when it would back into the state from the north and east, western Colorado stayed warmer during the month. For this reason, there were many days when people along the Front Range who wanted to escape the cold just had to head a few miles west for higher ground and warmer temperatures.

Departure from Normal Temperature (F)  
2/1/2014 – 2/28/2014

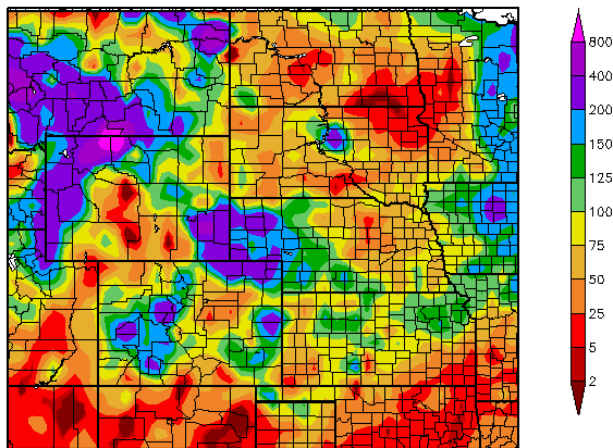




### FEBRUARY PRECIP VARIED STATEWIDE

February brought several pockets of higher than normal precipitation to Colorado, especially for the mountains, which received several days of heavy snow due to the jet stream. It stayed in a prime position to bring a series of storms packed full of moisture, straight from the Pacific Ocean. Sometimes this type of weather pattern is called the Pineapple Express, when the plume of moisture can be seen on a satellite picture flowing from Hawaii all the way to the west coast. All that moisture helped boost statewide snowpack to levels above normal in 6 of the 8 main river basins.

Percent of Normal Precipitation (%)  
2/1/2014 - 2/28/2014



Generated 3/2/2014 at HPRDC using provisional data.

Regional Climate Centers

Pockets of wetter-than-normal precipitation in east and northeast Colorado were due to the influence of numerous cold fronts moving in as cold air over the Upper Midwest kept trying to back into the state.

### FEBRUARY FUN FACTS FROM AROUND COLORADO

\*As of 9 pm, 3/9/2014

- 1,020 stations filed at least one daily report
- 776 stations reported at least half of the month
- 356 stations filed a report every day
- Wettest station: CO-JK-23 (Walden 16.3 WSW) with 8.85" of precipitation and 90.3" of snow
- Driest station that reported all 28 days: CO-EP-29 (Yoder 4.2 SE) with 0.04" of precipitation and 2.5" of snow
- 62 stations filed a multi-day accumulation report
- 856 stations reported measurable snow (greater than a Trace) during December with the most being 101" at station CO-GN-18 (Crested Butte 6.2 N)

February 2014 Snow		
Station	Name	Snow (in.)
CO-GN-18	Crested Butte 6.2 N	101.0
CO-JK-23	Walden 16.3 WSW	90.3
CO-SU-6	Silverthorne 2.1 WSW	62.4
CO-SU-40	Breckenridge 3.3 SE	43.1
CO-SA-35	Sargents 0.3 NE	43.0
CO-SU-61	Silverthorne 2.8 SSW	40.4
CO-GR-3	Kremmling 10.9 NW	40.3
CO-EG-19	Vail 2.6 E	38.4
CO-LP-66	Rockwood 6.7 N	38.1
CO-GR-39	Granby 6.3 NNE	37.7





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## OBSERVER SPOTLIGHT & DEDICATION

This month we have a very special entry for this section. We dedicate the March 2014 Colorado newsletter to the memory of long-time CoCoRaHS observer, Joe Boland.



**Joe Boland, CoCoRaHS Station CO-JF-40 (Golden 0.7 NW).**

Joe first signed up for CoCoRaHS back in April of 2002. I had the pleasure of meeting him at a training class a few years later.

He was a retired engineer and a man of many interests, including weather, astronomy and gardening.

Joe was an extremely dedicated CoCoRaHS observer. He filed his first report on May 2, 2002, reporting 0.10" of precipitation with a trace of snow. With very few exceptions, he

filed daily reports through February 4, 2014, the day he passed away. Now that is what I call being committed to something one loves!

Joe's wife tells me she was in awe of the time he would spend melting snow and measuring every last drop of moisture. She says he was honored to be part of such an important program and loved watching it grow nationally.

Over the course of Joe's nearly 12 years with CoCoRaHS, he filed over 4,000 daily reports and measured 230.95" of precipitation and 1,056.3" of snow.

Joe Boland, we're thankful for your tireless dedication and the enthusiasm you showed our organization. Your reports on our daily maps are greatly missed.

## IMPRESSIVE CoCoRaHS SNOW TOTALS

Colorado Snow Totals		
Data Jul. 1, 2013 through Feb. 28, 2014		
Station	Name	Snow (in.)
CO-GN-18	Crested Butte 6.2 N	304.0
CO-JK-23	Walden 16.3 WSW	241.0
CO-SU-6	Silverthorne 2.1 WSW	236.5
CO-RT-43	Steamboat Springs 1.9 E	219.1
CO-GR-3	Kremmling 10.9 NW	182.4
CO-RT-25	Steamboat Springs 1 SE	176.3
CO-RT-44	Oak Creek 1.7 WNW	166.9
CO-SU-40	Breckenridge 3.3 SE	162.3
CO-GF-56	Glenwood Springs 7.8 ESE	157.6
CO-RT-16	Steamboat Springs 1.1 E	155.1