



# Colorado CoCoRaHS

Because Every Drop Counts!

January 2015  
Volume 3, Issue 1

## HAPPY NEW YEAR!

Can you believe it is already 2015?

I'm sorry we didn't have a December newsletter – time just got away from me as I am sure it did for many of you.

As we move into 2015, the frequency of the Colorado newsletter is going to change from monthly to bi-monthly, but I'll still do my best to provide interesting content. Each newsletter will take the format of this one where the past two months are recapped for you.

As always, if you have any ideas for future content, please let me know!

My best to you and yours,

Chris Spears

## CALENDARS

The 2015 CoCoRaHS calendars are now on sale for \$7.50 each plus shipping.

All of the pictures are taken by fellow CoCoRaHS observers and are a great reminder for you not to forget to read your gauge.

If you like to keep paper records they make a great place to jot down your daily reports for future reference.

And who knows? The calendar might inspire a conversation between you and someone visiting your home or office that could lead to our newest volunteer! Here is the web address for you to order your copy today.

<http://www.weatheryourway.com/cocorahs/calendar2015coco.htm>





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## U.S. PRECIPITATION (% OF AVERAGE) – LOOKING BACK AT NOVEMBER 2014

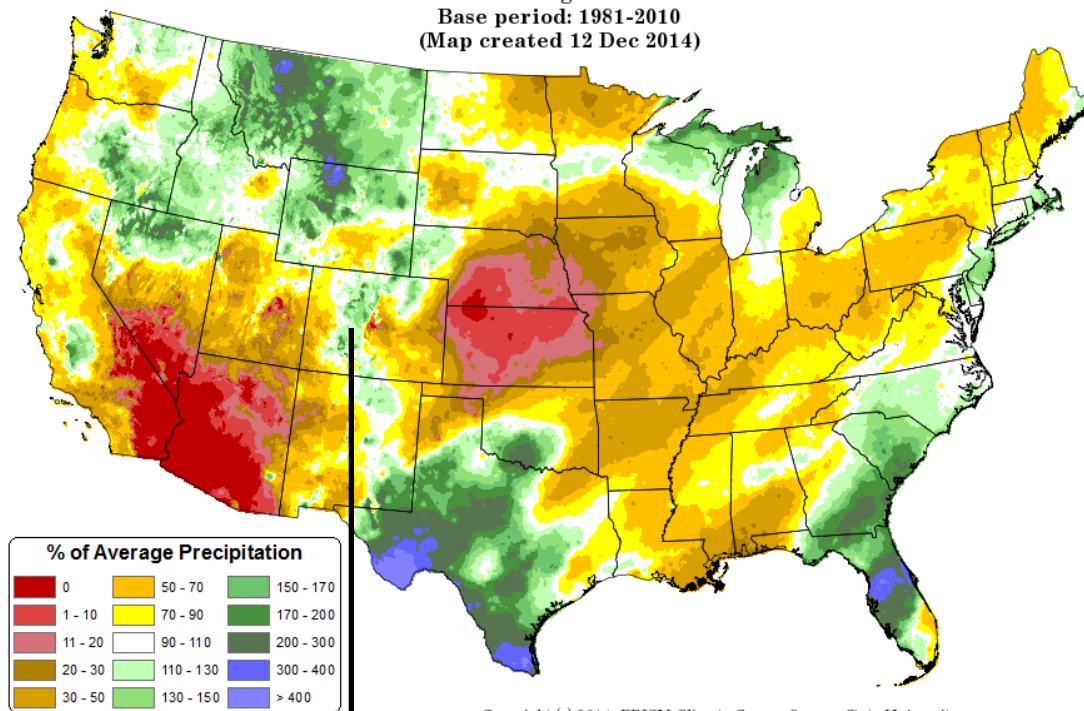
November was a pretty dry month across a large portion of the lower 48 states, with the exception of a few wet pockets in the northern Rockies, across Texas and the southeast coast. In Colorado many were dry but we did see several locations with at or slightly above average precipitation in the northern and central mountains and also across parts of the northeast plains.

### Total Precipitation Anomaly: November 2014

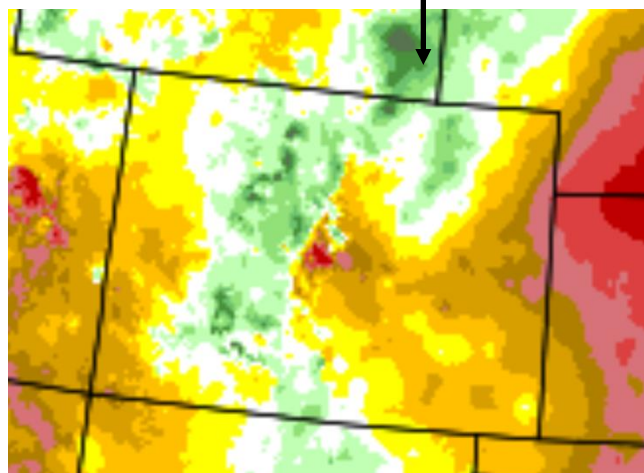
Period ending 30 Nov 2014

Base period: 1981-2010

(Map created 12 Dec 2014)



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	Nov. Precip (in.)	Departure From Average
Alamosa	0.34	-0.08
Aspen	1.32	-0.05
Co. Springs	0.26	-0.14
Denver	0.76	0.15
Durango	1.00	-0.68
Fort Collins	0.88	0.12
Grand Junction	0.39	-0.34
Lamar	0.15	-0.23
Pueblo	0.46	-0.01



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## U.S. TEMPERATURES (ANOMALY) – LOOKING BACK AT NOVEMBER 2014

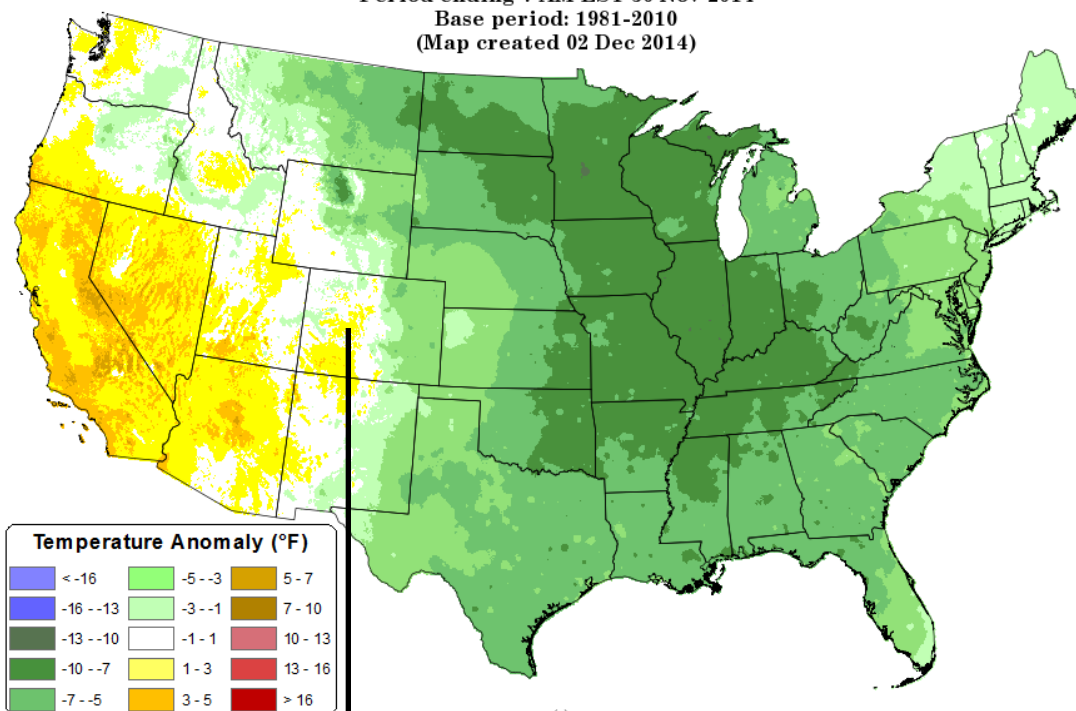
November 2014 was a fairly cold month across the lower 48 states, especially for locations along and east of the Rocky Mountains. The month started off with a bitter cold blast of arctic air that sent temperatures well below zero across eastern Colorado. Denver set a new record low of -13°F on the 12<sup>th</sup> and -14°F on the 13<sup>th</sup>. The high of 6°F on the 12<sup>th</sup> was a new record low max.

### Daily Mean Temperature Anomaly: November 2014

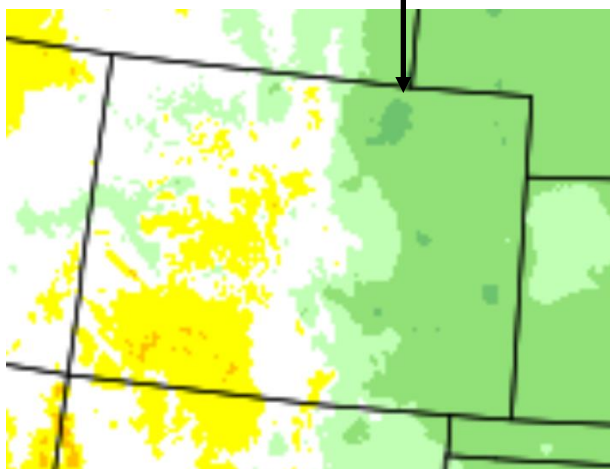
Period ending 7 AM EST 30 Nov 2014

Base period: 1981-2010

(Map created 02 Dec 2014)



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	Nov. Mean Temp. (°F)	Anomaly
Alamosa	31.9	2.4
Aspen	30.1	0.8
Co. Springs	36.2	-1.9
Denver	36.2	-2.1
Durango	36.8	1.3
Fort Collins	35.9	-2.8
Grand Junction	36.2	-2.8
Lamar	36.9	-3.1
Pueblo	36.9	-2.4



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## U.S. PRECIPITATION (% OF AVERAGE) – LOOKING BACK AT DECEMBER 2014

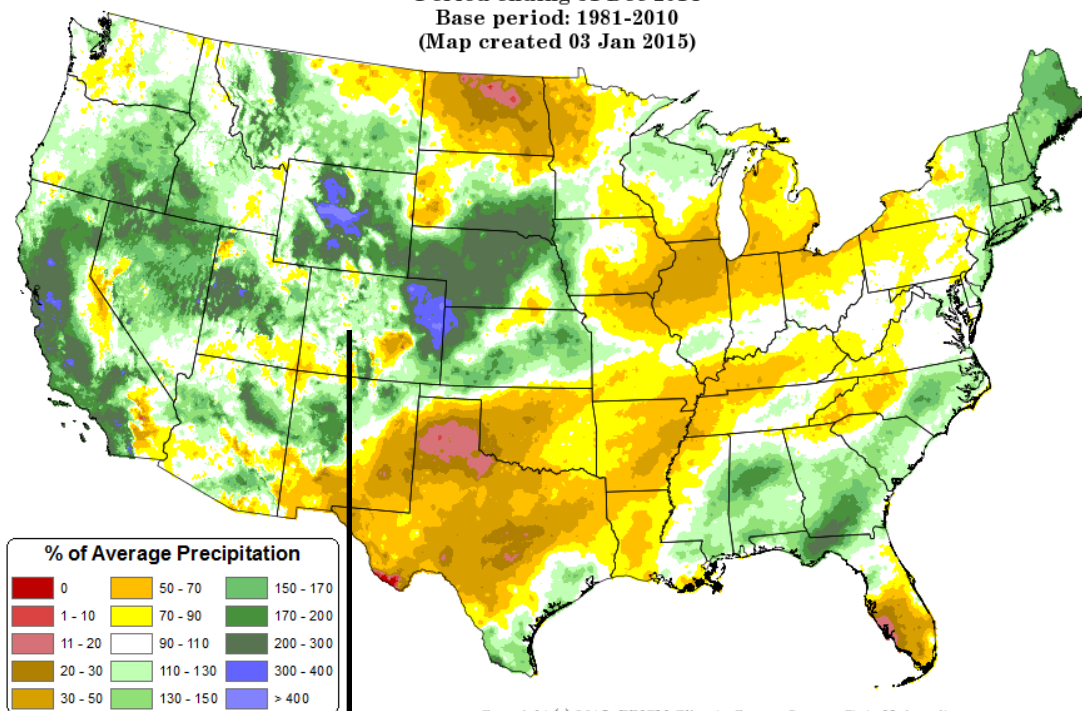
Weather patterns took a major shift in December, bringing much needed moisture into the western United States – especially across California. Colorado also had a fairly wet month with the exception of some southern counties. The snow machine really cranked up during the last half of the month, especially in northeast Colorado. It was dry from Texas into the Great Lakes.

### Total Precipitation Anomaly: December 2014

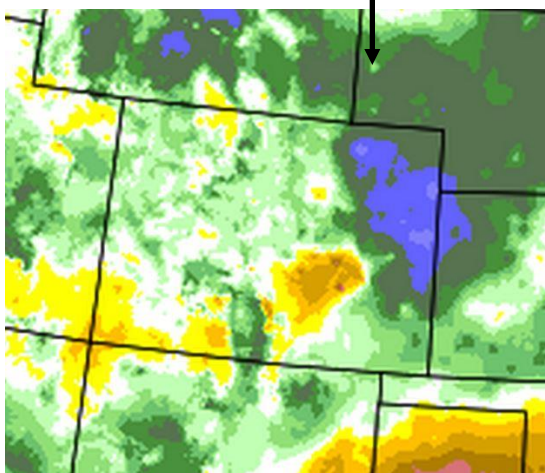
Period ending 31 Dec 2014

Base period: 1981-2010

(Map created 03 Jan 2015)



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	Dec. Precip (in.)	Departure From Average
Alamosa	0.21	-0.13
Aspen	1.82	0.72
Co. Springs	0.16	-0.17
Denver	0.59	0.25
Durango	0.70	-0.41
Fort Collins	0.64	0.14
Grand Junction	1.06	0.49
Lamar	0.38	-0.01
Pueblo	0.24	-0.13





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## U.S. TEMPERATURES (ANOMALY) – LOOKING BACK AT DECEMBER 2014

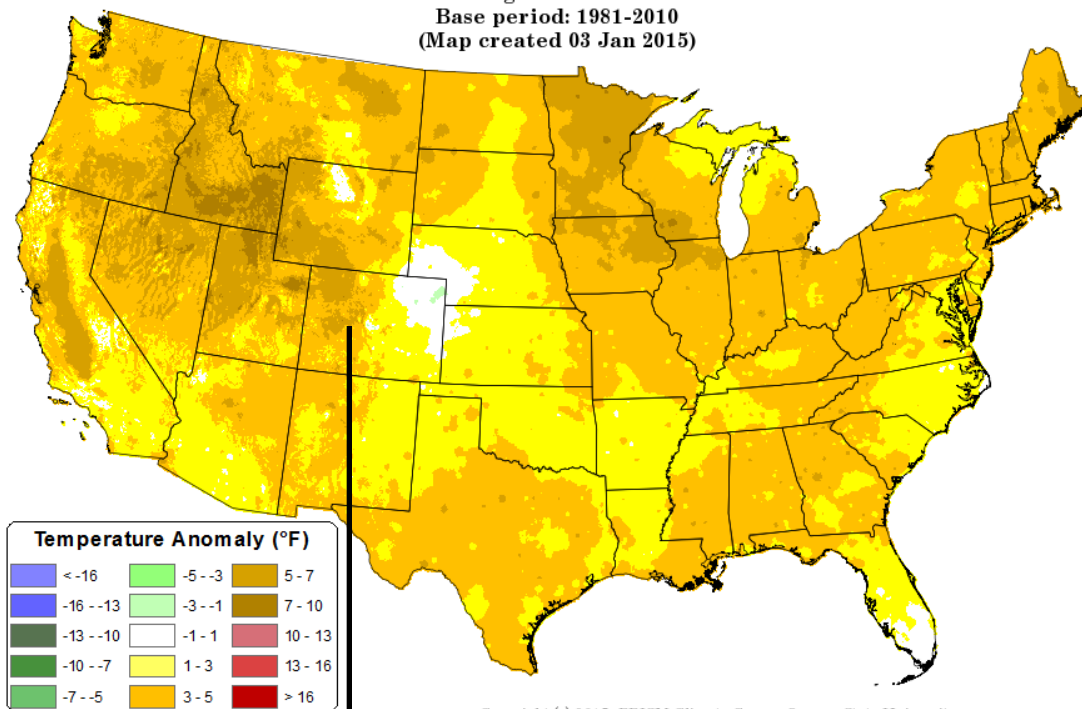
Most of the lower 48 states were warmer than normal during the month of December although it didn't necessarily feel like it. In Colorado, the first two weeks were quiet with above normal temperatures, but then things changed before Christmas. And while the pattern turned more active and snowy, it was never bitterly cold until the very last few days of the month.

### Daily Mean Temperature Anomaly: December 2014

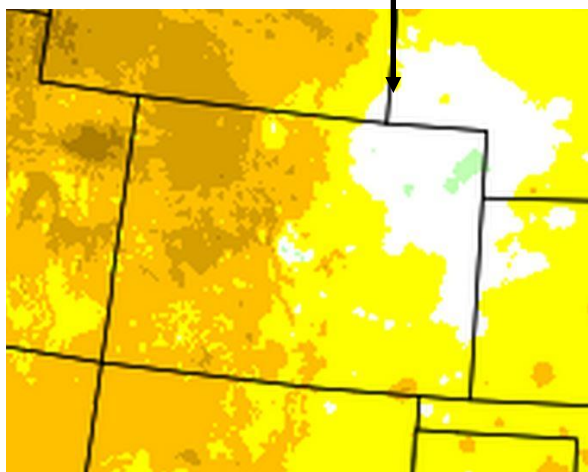
Period ending 7 AM EST 31 Dec 2014

Base period: 1981-2010

(Map created 03 Jan 2015)



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	Dec. Mean Temp. (°F)	Anomaly
Alamosa	22.9	5.0
Aspen	24.5	4.6
Co. Springs	32.2	2.4
Denver	32.1	2.1
Durango	29.8	3.4
Fort Collins	31.7	1.5
Grand Junction	32.8	4.2
Lamar	32.1	2.4
Pueblo	31.1	1.0



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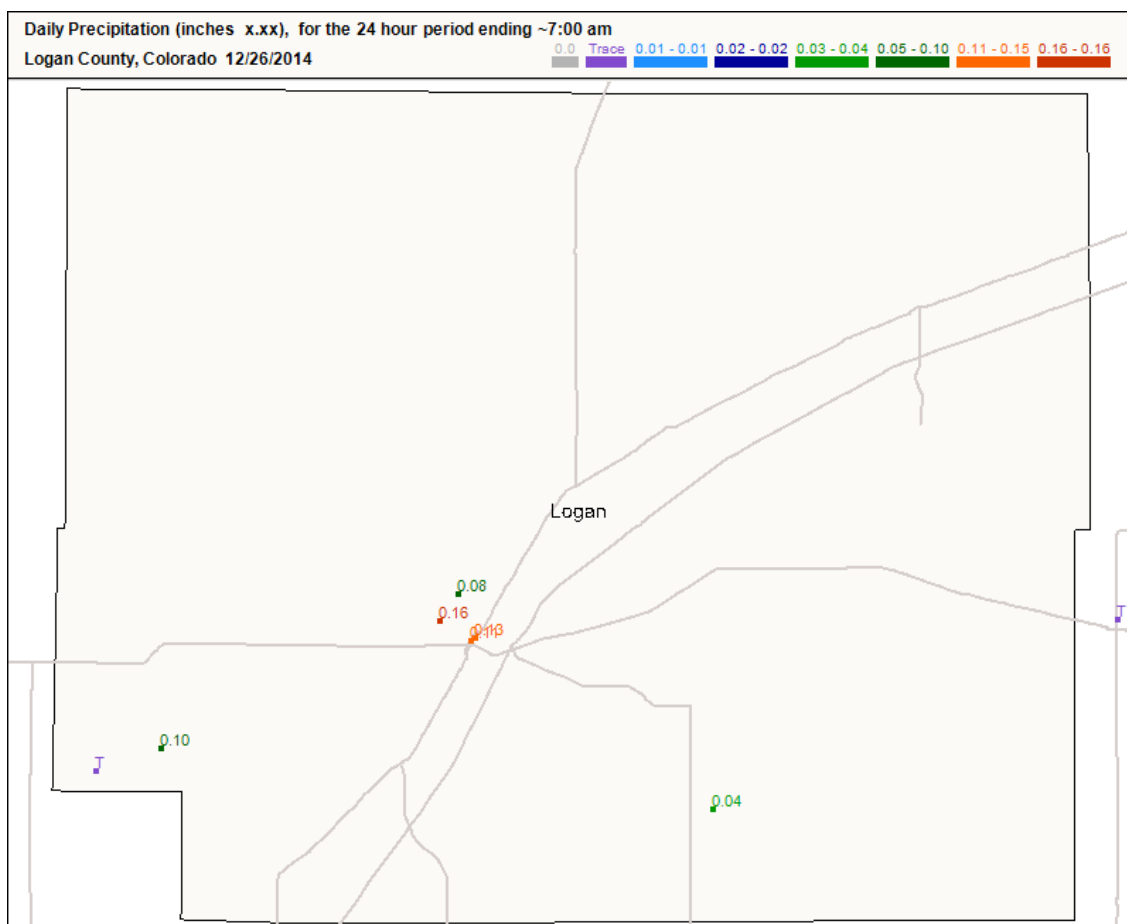
## FEATURED COUNTY – LOGAN

Logan County is in the northeast corner of Colorado on the border with Nebraska. Interstate 76 and the South Platte River cut a southwest to northeast path through the heart of the county. As of 2010, the latest census numbers show the county was just shy of 23,000 residents.

Logan County is highly agricultural and can see some pretty wicked weather, ranging from ferocious winter winds that bring bitter cold and blowing snow, to hot summer days with strong to severe thunderstorms. Sometimes the area can see very localized heavy rains during the summer as thunderstorms moving east of the Front Range encounter warmer and more humid air. Such was the case during the summer of 2014.

The largest town and the seat of Logan County is Sterling. Other communities in the area include Atwood, Crook, Fleming, Illif, Merino, Padroni, Peetz and Proctor.

If you know someone in Logan County who might enjoy being part of CoCoRaHS, encourage them to sign up as a volunteer.





### NOVEMBER FUN FACTS FROM AROUND COLORADO

- 1,165 stations filed at least one daily report
- 819 stations reported at least half of the month
- 388 stations filed a report every day
- Wettest station: CO-GN-18 (Crested Butte 6.2 N) with 4.26" of precipitation
- Driest station that reported all 30 days: CO-KC-80 (Burlington 8.4 NNE) with 0.00" of precipitation
- 65 stations filed a multi-day accumulation report
- 788 stations reported snow during November, with the most being 62.5" at CO-GN-18 (Crested Butte 6.2 N) The second highest total was 53.4" at CO-SU-40 (Breckenridge 3.3 SE).

### DECEMBER FUN FACTS FROM AROUND COLORADO

- 1,056 stations filed at least one daily report
- 787 stations reported at least half of the month
- 356 stations filed a report every day
- Wettest station: CO-GF-67 (Glenwood Springs 7.0 NW) with 3.53" of precipitation
- Driest station that reported all 31 days: CO-EP-29 (Yoder 4.2 SE) with 0.04" of precipitation
- 82 stations filed a multi-day accumulation report
- 843 stations reported snow during December, with the most being 49.5" at CO-GN-18 (Crested Butte 6.2 N) The second highest total was 44.9" at CO-SU-6 (Silverthorne 2.1 WSW).



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## **EARLY SEASON COLD BLAST HITS PORTIONS OF COLORADO**

Some of the coldest November air seen in several decades invaded much of eastern Colorado on Nov. 10, 2014 - sending temperatures well below zero in the foothills and on the eastern plains and leaving behind a fresh blanket of snow.

Part of what caused the arctic blast was a powerful area of low pressure off the coast of Alaska. The low pressure was the remains of Super Typhoon Nuri which developed around Halloween in the western Pacific Ocean. At its peak, Nuri was the second most intense tropical cyclone measured on the planet in 2014.

As Nuri weakened and moved to the northeast, it met up with the jet stream winds over the Bering Sea and rapidly intensified into a major storm system that brought hurricane-force winds to coastal Alaska. A floating buoy measured the barometric pressure on the east side of the storm at 929.8 mb, which was lower than what was measured in Hurricane Sandy.

The intense storm system created a sharp trough of low pressure in the jet stream which reached all the way up to the Arctic Circle. The flow of wind brought a cold pool of air straight out of the North Pole, sliding south along the east side of the Rockies and into the heart of the lower 48 states.

Locations in western Colorado escaped the cold outbreak because the air mass was shallow, settling in along the eastern slopes

of the Rockies. Because cold air is heavy and dense, it often can't make it up and over the mountains to spill west of the Continental Divide.

So while places like Denver and the Front Range was shivering at or below zero, locations higher up including Aspen and Vail were in the 30s and lower 40s.

## **WIDESPREAD FREEZING DRIZZLE EVENT**

On Jan. 8, 2015 - a widespread freezing drizzle event hit Denver and much of the Front Range I-25 Urban Corridor, turning roads, sidewalks and decks into a sheet of ice.

The freezing drizzle received a lot of attention on social media, especially from Coloradans with roots in the southern United States where icing events are much more common.

So what caused the freezing drizzle and is it rare in Colorado?

While freezing drizzle doesn't happen often, it can be expected once or twice every winter or two. But a long duration and widespread freezing drizzle event is fairly rare in Colorado. My experience with freezing rain or drizzle comes from the traditional setup which is called overrunning, common in the eastern and southern United States but not in Colorado. This is where cold subfreezing air near the ground penetrates southward but may then be "overrun" by warmer air from the Gulf or Atlantic lifted by the wedge of cold air. Rain





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falling from this warm layer above arrives at the ground and freezes on contact.

In Colorado, it's a much more complicated scenario because many times the temperature of the air during the winter season, both at and above the ground, is below freezing. So that begs the question of how do you get freezing drizzle and not snow. The answer lies in the very complicated subject of cloud physics.

A cloud, which is made up of thousands of tiny liquid water droplets, has a temperature threshold where those water droplets begin to turn into tiny particles of ice. (that temperature is right around  $-10^{\circ}\text{C}$  or colder) This is important because the formation of these ice crystals serve as the building blocks for snowflakes to form.

In the case of the recent freezing drizzle event, there was a shallow layer of moisture in place with temperatures at or slightly warmer than the threshold for ice formation, which allowed most of the water droplets to remain in the liquid state, even with temperatures below freezing. In meteorology, this is called supercooled water. Because temperatures were flirting with the  $-10^{\circ}\text{C}$  threshold, some snow was mixed in with the freezing drizzle.

More times than not, in Colorado, the profile of temperature and moisture in the atmosphere sets us up for either a brief rain to snow or all snow. It's not every day you get the right setup to see several hours of freezing drizzle. In some cases like around Fort Collins, there were periods of freezing

drizzle that lasted a few days with the recent event.

## **LAKE GRANBY HAS LATEST FREEZE ON RECORD**

Colorado's second largest body of water is typically frozen over by early winter and becomes a popular destination for ice fishing. But something unusual happened this cold season - the lake wasn't declared fully frozen over until Dec. 31. Lake Granby sits over 8,000 feet above sea level about two hours west of Denver.

One reason attributed to the late ice over is the mild weather experienced in late fall. Another reason that likely contributed to the latest freeze on record is Lake Granby is currently experiencing unusually high water levels for so late in the season. The lake was only 2.5 feet from being full as of early January. Cool temperatures this past summer and generous precipitation since Sept. 2013 has kept many lakes and reservoirs in northern Colorado higher than normal, including the Colorado-Big Thompson system (which includes Lake Granby) managed by The Northern Colorado Water Conservation District.



Open pockets of water still remained on Lake Granby just before New Year's Day. Picture is courtesy of Rob McClure, Photographer at CBS4 in Denver.