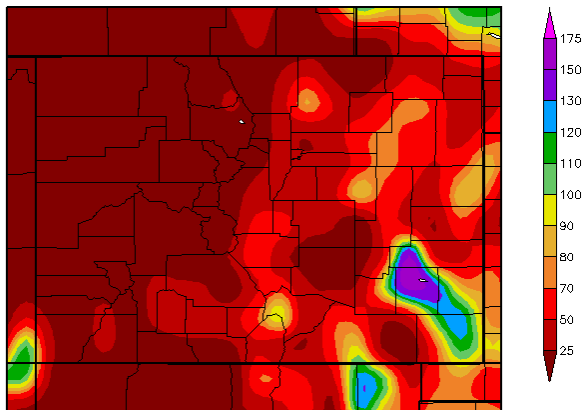


PRECIPITATION WELL BELOW NORMAL LAST MONTH

June was extremely dry across Colorado as high pressure dominated the weather pattern over the central Rockies. Most of the state saw less than 50 percent of its normal precipitation. The exception was a small pocket of southeast Colorado which did receive slightly above normal rainfall. The map below shows the percent of normal precipitation for June.

Percent of Normal Precipitation (%)
6/1/2013 – 6/30/2013



Generated 7/5/2013 at HPRCC using provisional data.

Regional Climate Centers

The driest locations were along the western slope, including Montrose, Glenwood Springs, Grand Junction, Steamboat Springs and Gunnison. Some of these areas didn't even see a tenth of an inch of rainfall.

Several CoCoRaHS stations went the entire month of June without any measurable precipitation. The following chart shows stations with reports on 25 or more days of the month and no moisture.

June 2013 - Colorado CoCoRaHS			
Station	Location	Precip	# Reports
CO-DL-26	Hotchkiss 7.1 WNW	0	30
CO-EG-29	Gypsum 1.9 SSW	0	30
CO-FM-2	Williamsburg .63 WNW	0	30
CO-GF-4	Glenwood Springs 1.4 S	0	30
CO-GF-28	Rifle 3.2 ENE	0	30
CO-LP-67	Ignacio 2.9 N	0	30
CO-ME-3	Grand Junction 8NNW	0	30
CO-ME-7	Fruita 4.5 NNE	0	30
CO-ME-69	Grand Junction 4.0 W	0	30
CO-ME-79	Grand Junction 3.9 WSW	0	30
CO-ME-94	Whitewater 4.2 SSE	0	30
CO-ME-101	Grand Junction 6.4 W	0	30
CO-MT-5	Montrose 1.2 ESE	0	30
CO-MT-13	Montrose 1.2 WSW	0	30
CO-MT-15	Montrose 2.9 ESE	0	30
CO-MT-31	Montrose 7.3 ENE	0	30
CO-MT-36	Montrose 1.6 E	0	30
CO-RG-10	Monte Vista 2.4 E	0	30
CO-RT-7	Steamboat Springs .14 NNE	0	30
CO-GF-33	Glenwood Springs 5.3 SSE	0	29
CO-ME-24	Mack 5 NW	0	29
CO-ME-81	Grand Junction 4.2 W	0	29
CO-RT-22	Clark 0.7 NW	0	29
CO-RT-42	Steamboat Springs 0.9 N	0	29
CO-GR-39	Granby 6.3 NNE	0	28
CO-LR-387	Bellvue 2.4 SSW	0	28
CO-MZ-31	Cortez 7.7 W	0	28
CO-AM-23	Alamosa 2.1 SSW	0	27
CO-AU-15	Pagosa Springs 6.2 WNW	0	27
CO-CS-11	Fort Garland 5.8 ESE	0	27
CO-JK-16	Cowdrey 16.5 WNW	0	27
CO-JK-25	Walden 2.6 SE	0	27
CO-PU-36	Pueblo West 3.6 WSW	0	27
CO-ME-91	Grand Junction 5.1 ESE	0	26
CO-ME-96	Grand Junction 5.0 WSW	0	26
CO-MT-6	Montrose 3.9 WNW	0	26
CO-MT-25	Olathe 3.2 NNE	0	26
CO-RB-15	Meeker 1.9 WSW	0	26
CO-ME-47	Grand Junction 2.4 W	0	25
CO-ME-102	Grand Junction 3.9 SSE	0	25
CO-MT-34	Montrose 5.6 SW	0	25



JUNE TEMPERATURES ABOVE NORMAL

If you thought it was warm last month across our state, you were right! Statewide temperatures ran up to 6 degrees above normal. Colorado Springs recorded its 6th warmest June on record with an average temperature of 70 degrees.

Many locations hit the century mark. Denver recorded its earliest 100 degree temperature ever on June 11. The previous record was June 14, 2006.

One of the hottest locations in the state was Lamar with 11 days topping out at 100 degrees or higher.

June 2013 - 100 Degree Days			
	# Days	Highest	Date(s)
Lamar	11	111	11th
La Junta	9	109	11th
Springfield	7	107	27th
Rocky Ford	7	104	10th, 11th, 27th
Pueblo	5	104	11th, 27th
Burlington	3	107	11th
Grand Junction	3	103	28th
Cortez	2	101	27th
Akron	2	104	11th
Greeley	1	100	11th
Denver	1	100	11th
Rifle	1	100	28th

The hottest temperature ever recorded in Colorado was 114°F at Las Animas on July 1, 1933, and at Sedgwick on July 11, 1954.

DROUGHT CONDITIONS IN SOUTHEAST COLORADO

Devastation from the exceptional drought conditions can be seen from a simple drive along Highway 287, especially between Lamar and Springfield. I snapped these photos on June 21. (Photos courtesy of Chris Spears)



The area looks more like a desert and makes you feel as if you are driving along a highway in northeast Arizona. Every now and then you will see a patch of green where a farmer has been able to irrigate a small piece of land, but for the most part, large tracts of fields are gone and turned into a fine, sand-like topsoil.



As I drove south out of Limon, it was amazing how fast conditions changed, especially in Kiowa County and points south. The process of recovery from this drought will take years. Let's hope more consistent precipitation returns to the region soon.

SUMMER MONSOON IS HERE

What exactly is a monsoon? Interestingly enough, it has nothing to do with rain. It is simply a seasonal shift in the wind pattern. We often associate it with rain, however, because the wind shift often transports moisture to the region which results in increased chances for precipitation.

The North American Monsoon, sometimes also known as the Mexican Monsoon, is a very important part of Colorado's climate. This weather pattern brings higher humidity to the state and helps to spark almost daily afternoon showers and thunderstorms. These storms are often slow moving and can produce generous rainfall. There are some hazards associated with the monsoon, including the risk for flash flooding and deadly cloud-to-ground lightning.

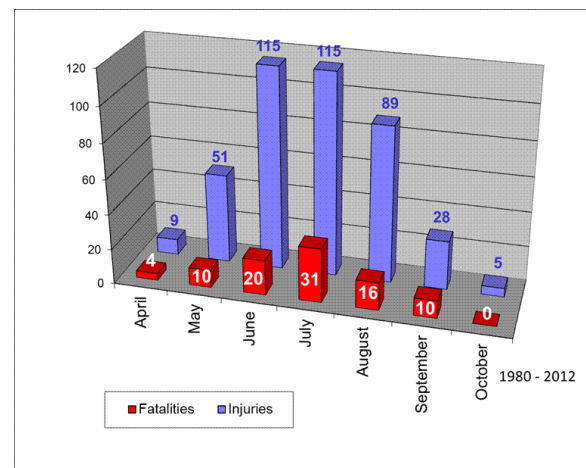
LIGHTNING STRIKES ACROSS COLORADO

The National Weather Service office in Pueblo operates the Colorado Lightning Resource Page which can be found at the internet address below.

<http://www.crh.noaa.gov/pub/?n=ltg.php>

There you will find all kinds of lighting statistics for Colorado, including detailed information by county.

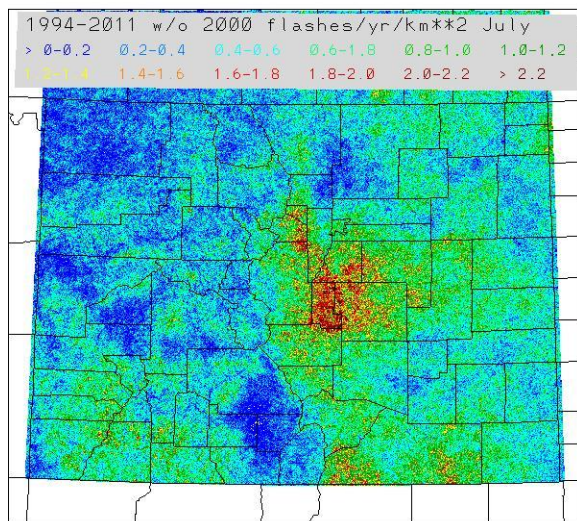
The following graph produced by the NWS office in Pueblo shows that July is the most deadly month for lightning fatalities in Colorado since 1980. It is tied with June for the month with the highest number of lightning injuries.



Lightning strikes occur statewide, but are most common in the foothills west and south of Denver, in the Pikes Peak region west of Colorado Springs, and over the Palmer Divide south of Denver.

The following map may be a little difficult to see, but it shows the most common places for cloud-to-ground lightning strikes in Colorado during the month of July. Be sure to visit the Colorado Lightning Resource Page to see a bigger version of this image.

The warmer colors (red, yellow and orange) show the highest frequency of flashes between 1994-2011.



JULY IS PEAK TIME FOR FLASH FLOODS

Deadly flash floods from heavy rain can happen anytime from April through September, but they are more common during the summer months. Historically, late July and early August tend to be a peak time for flood events. This is largely due to the fact that moisture is often ample with the peak of the monsoon season in effect, and climatologically, winds over Colorado tend to be lightest during the mid-summer when the jet

stream is far to the north over Canada. Those two factors combine to create slow-moving thunderstorms that are capable of producing several inches of rain. Some notable July events include...

- 7/9/1953 – Heavy rain over downtown and east-central Denver (3.90” at Lowry Air Force Base in 7 hours).
- 7/29 to 8/2/1956 – Heavy rain over 5 days produced flooding from metro Denver to Fort Morgan with some areas seeing up to 11” of rain.
- 7/20 to 7/25/1965 – Days of heavy rain caused flooding along the Clear Creek and Plum Creek drainage areas with severe damage in Georgetown, Golden and to the Cheyenne Mountain Zoo near Colorado Springs. At least 3 people lost their lives.
- 7/31 to 8/1/1976 – Heavy rain between Estes Park and Ft. Collins produced the massive Big Thompson Canyon flood that killed at least 139 people and caused over \$30 million in damage.
- 7/9/1996 – A flood in Pueblo caused severe damage to intersections along I-25.
- 7/12/1996 – A flood on the Buffalo Creek burn scar in southern Jefferson County claimed two lives.



- 7/28/1997 – a highly localized flash flood event in Ft. Collins claimed 5 lives and washed out many areas along Spring Creek, including a trailer park. Several buildings on the CSU campus were damaged by the flood waters. This event is what brought CoCoRaHS to fruition.
- 7/25/1998 – flooding in the South Platte drainage area caused damage both in the foothills and across metro Denver. Cars were washed off roads between Idaho Springs and Central City and basements were flooded. In Aurora, the Highline Canal was breached and there was flooding on both I-25 and I-70.
- 7/30/1998 – More flooding hit metro Denver between Castle Rock and Parker and along I-25 near the Logan Street Bridge. The Golden Gate Casino in Central City was damaged after a river of mud, trees and debris flowed down Main Street. Flooding was also reported around the Buffalo Creek burn scar in southern Jefferson County. Heavy rain caused flooding south of Denver in Security, Manitou Springs and Calhan. A mudslide blocked Highway 24 near Manitou Springs.
- 7/31/1998 – Heavy rain and hail washed out roads northeast of Westcliffe in Custer County.

FUN JUNE FACTS FROM AROUND COLORADO DURING JUNE

*As of 10 am on 7-8-13

- 1,101 stations in Colorado filed at least one daily report
- 802 stations reported for at least half of the month
- 345 stations filed a report everyday during June (+24% increase over May)
- June's Wettest Station in Colorado: CO-BO-135 (Boulder 5.4 ESE) with 3.90 inches of precipitation
- June's Driest Station in Colorado: there were numerous stations that reported nothing for the entire month
- 71 stations filed a multi-day accumulation report
- There was no measurable snow reported during June by CoCoRaHS observers, but at least one mountain observer reported a flurry on June 1.

Top 10 June Precipitation Totals

Station	Name	Precip	# Reports
CO-BO-135	Boulder 5.4 ESE	3.9	19
CO-MR-63	LDR 9.6 N	3.66	26
CO-LN-45	Karval 4.9 WSW	3.56	30
CO-WA-67	Anton 5.8 SE	3.45	28
CO-BA-27	Stonington 8.6 SE	3.3	20
CO-WA-23	Messex 3.8 WNW	3.04	30
CO-AD-174	Bennett 14.1 N	2.77	12
CO-HF-14	Walsenburg 8.7 W	2.74	30
CO-LR-393	FCL 5.6 E	2.73	30
CO-BA-22	Walsh 5.4 SSW	2.62	6



SIGNIFICANT WEATHER REPORTS

There were 22 “Significant Weather Reports” submitted during June across Colorado. Some of the heaviest include receiving almost an inch of rain in just 10 minutes near Fort Collins!

Date	Time	Station	Name	Duration	New Precip	Total Precip	Flooding
6/30/2013	2:30 PM	CO-TL-16	Cripple Creek 5.1 NW	10	0.45	NA	Unusual
6/30/2013	3:19 PM	CO-EP-237	Falcon 2.3 NNE	60	0.16	0.16	
6/28/2013	7:45 PM	CO-LR-636	Fort Collins 2.8 NE	60	0.77	NA	Minor
6/28/2013	7:45 PM	CO-LR-903	Fort Collins 2.7 SSE	45	0.76	NA	Minor
6/28/2013	7:48 PM	CO-LR-844	Loveland 1.4 WSW	75	1.5	NA	
6/28/2013	7:50 PM	CO-LR-769	Fort Collins 0.7 SSW	30	0.63	0.63	No
6/28/2013	8:00 PM	CO-LR-632	Fort Collins 4.8 SE	15	0.95	NA	Unusual
6/28/2013	8:00 PM	CO-LR-816	Fort Collins 4.5 SSE	30	0.69	0.69	Minor
6/28/2013	8:07 PM	CO-LR-4	Bellvue 5.9 W	28	0.54	0.55	Unusual
6/28/2013	8:10 PM	CO-LR-290	FCL 4.0 SE	10	0.85	NA	
6/28/2013	8:10 PM	CO-LR-393	FCL 5.6 E	20	1.5	1.5	Unusual
6/28/2013	8:15 PM	CO-LR-40	Loveland 1.5 N	21	0.89	NA	Unusual
6/28/2013	8:22 PM	CO-LR-623	Fort Collins 6.1 SW	33	0.6	0.6	
6/28/2013	8:30 PM	CO-LR-885	Fort Collins 3.7 S	17	0.9	NA	Minor
6/28/2013	10:05 PM	CO-BO-4	Boulder 2.9 S	20	0.57	NA	No
6/18/2013	11:50 AM	CO-LA-33	Aguilar 7.2 WSW	25	0.95	0.95	
6/14/2013	5:00 PM	CO-LN-51	Limon 0.3 W	25	0.8	0.8	Minor

Remember, if you can safely make an observation and file a Significant Weather Report, the information goes in real-time to the National Weather Service and can help them verify radar, which in turn, could determine if a warning is needed for a particular area.

Filing a Significant Weather Report does not take the place of your daily precipitation report, it is simply just a snapshot or real-time report of what is happening at your location. You do not have to empty your gauge to file this report.

We welcome any feedback or ideas you may have for future newsletters!

If you are on Facebook or Twitter, don't forget to follow [CoCoRaHS](#) and the [Colorado Climate Center](#)!

Colorado Weather Trivia

Question: What is the largest hail ever documented in Colorado?

Answer: 4.5” – recorded 20 times since 1970

SELECTED OBSERVER COMMENTS FROM JUNE

“Wish I could report something besides a big old goose egg.”

“Unusually chilly this morning at 42 deg F. Clouds building especially toward the mountains. However, away from the mountains it is very clear. No wind.”

“A brief snow flurry after 7:00 am”



JUNE'S "OBSERVER SPOTLIGHT"

This month's observer spotlight features Tom Claeys from Jefferson County. His primary CoCoRaHS station is CO-JF-72 near Broomfield, but he also helps two relatives file reports for their gauges. Tom filed his first report on July 1, 2002, and since then, has measured over 161" of precipitation and 620" of snow!

Why did you join CoCoRaHS?

I attended my first Mike Nelson weather workshop back in 2002-ish at 9NEWS in Denver, where Nolan Doesken and Chris Spears introduced CoCoRaHS to the attendees, their goal being to get more observers to sign up. As I have always had a more-than-casual interest in meteorology and collecting weather data, which had included tracking wind, rain, sunrise/sunset times, daily temperatures, etc., I thought that finally this would be the perfect place where I can put my data so it can be of use to someone. CoCoRaHS also was a perfect addition to my other meteorologically-dependent interests, like golf, windsurfing, and even watching lake levels. I now have three stations that I report from, and I also carry a gauge in my car for when I am out and about.

What have you learned from measuring precipitation?

I quickly learned how precipitation quantities vary even within very short distances, such as across the street. I also learned how surprisingly how much I enjoy a brand new rain gauge every other year or

so. On a related tangent, I have learned to love attending the various weather/climate workshops that CoCoRaHS was either directly or indirectly involved. I have often used the Total Snow maps in the winter to help determine where might be the best place to travel to help feed my golf habit, when my local courses aren't golfable for awhile (Eaton, CO has been traveled to the most so far, in case you're wondering).

Has being a CoCoRaHS observer made you more aware of climate?

Yes absolutely. Especially from watching CoCoRaHS maps grow over the years from just Colorado to across the entire nation, it becomes easier to see patterns. So I think



CoCoRaHS is meeting its goal to make people's lives better by having this detailed information available.

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Colorado CoCoRaHS

July 2013
Volume 1, Issue 3



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