



# The Montana Meso

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## Welcome Message

Thank you for your interest and dedicated participation in the CoCoRaHS program and for taking the time to read through the latest edition of the Montana CoCoRaHS newsletter! Within this newsletter you will find information surrounding the latest weather and climate events across the region, tips for current and prospective observers, and a wide variety of additional content! This newsletter will continue to be issued seasonally under a collaborative effort among all of the Montana CoCoRaHS coordinators.

It is hoped that you find this newsletter both enjoyable and educational. If you have any questions, comments, or if you have a suggestion for future editions, please e-mail [Richard.Maliawco@noaa.gov](mailto:Richard.Maliawco@noaa.gov). Thank you again for your continuing commitment to be the best weather observers that you can be!

## CoCoRaHS: Why Join? How Do I Sign Up?

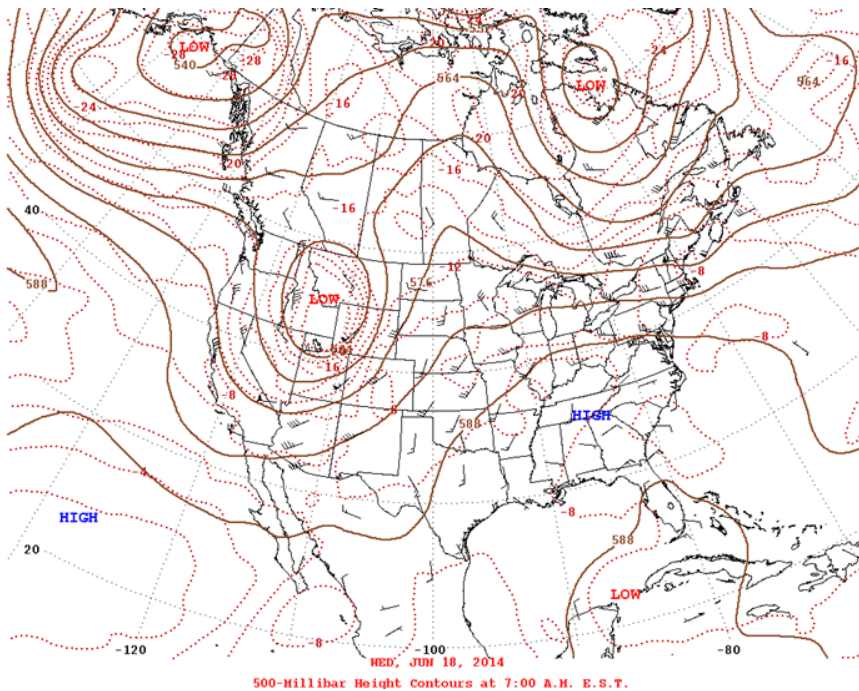
*By Richard Maliawco, NWS Glasgow, CoCoRaHS Coordinator*



CoCoRaHS observers help make an important difference in the lives of others. Daily observations are used for a number of purposes by many different users: meteorologists, emergency managers, city utilities, insurance adjusters, insect control, those with agricultural interests, those involved in the education sector, and practically countless others. Volunteering allows you to interact with others, make new acquaintances, affords you the opportunity to learn some exciting new things while you gain fun new experiences, and it allows you to participate in a number of trainings and other activities. Because your involvement matters so much, it is important to truly consider and take to heart all of the opportunities that are available with the CoCoRaHS program. Also think about all of the benefits your commitment brings to others. If you are already a CoCoRaHS observer, thank you for your diligence! If you are looking at becoming a new observer, or if you know someone who may have an interest, please check out the "About Us" section from the main CoCoRaHS page: <http://www.cocorahs.org/Content.aspx?page=aboutus>. You'll be able to learn all about the program & important sign-up information. Check it out today!

# June Storm Affects Glacier Park & Rocky Mtn. Front

By Megan VanDenHeuvel, NWS Great Falls, CoCoRaHS Coordinator

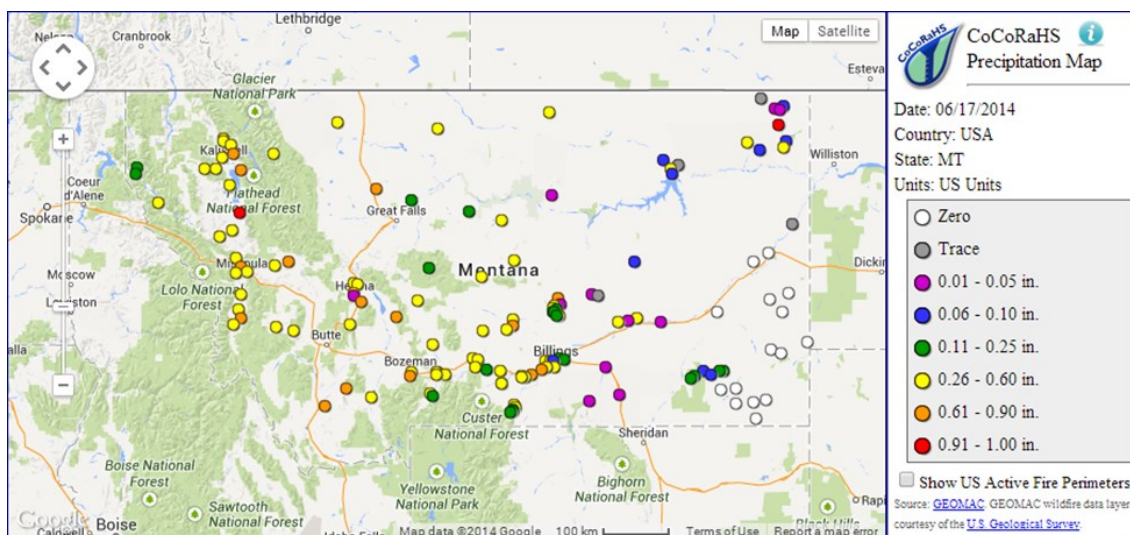


On June 16 – 19, 2014 a widespread, heavy rain and mountain snow event occurred along the Rocky Mountain Front and Glacier National Park area. Total three-day rainfall amounts in lower elevations ranged from 3 to 6 inches with isolated amounts up to 7 inches on the International border. While precipitation was primarily rain, heavy snow also occurred above elevations of 6000 feet and a period of mixed rain and snow occurred between 5000 and 6000 feet. This heavy snow especially impacted the higher elevations of Glacier National Park where 1 to 2 feet of snow fell. Plowing efforts along Going-to-the-Sun Road were halted due to the heavy rain, snow and strong winds and flooding occurred at Saint Mary campgrounds.

The weather system that was responsible for this event was a potent upper-level low pressure system that deepened as it moved into the Northern Rockies with ample moisture from the Pacific as well as the Gulf of

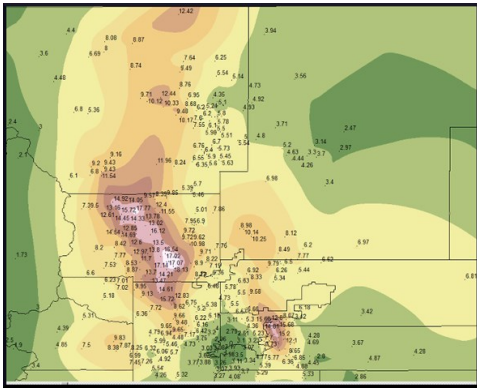


Mexico. Additionally, a cool, Canadian airmass wrapping into the low allowed for heavy snow above elevations of 6000 feet, though snow was reported as low as 5000 feet. Below is a CoCoRaHS map of all the reports received across Montana on June 17, 2014.



# Colorado Floods of September 11-17, 2013

By Trent Smith, NWS Missoula, CoCoRaHS Coordinator



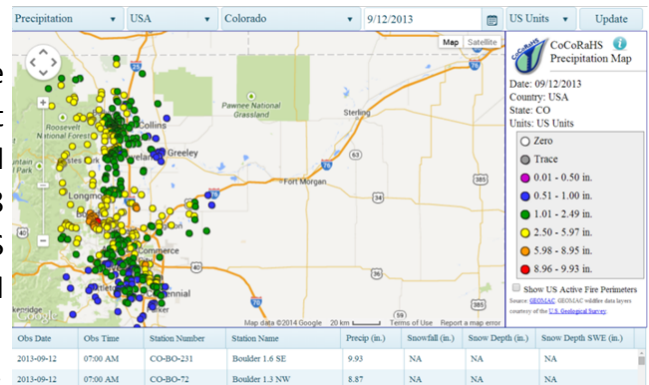
**Precipitation Totals along the northern Front Range of Colorado**

On September 9, 2013 rain began falling and did not stop for 8 days, which caused the largest flooding events in Colorado's history. The weather elements lined up to produce rain amounts that have been classified as a 1000 year event. You read that right, a 1000 year rain event. Many CoCoRaHS observers were impacted by the flooding, and yet remained dedicated to their daily measurements. CoCoRaHS observations were a huge assistance to the meteorologists and hydrologists of the National Weather Service.

On September 9<sup>th</sup>, a low pressure system became fairly stationary over the Great Basin of the southwest United States. This low pulled in plumes of moisture from the Gulf of Mexico and the Pacific Ocean while an easterly surface flow over Colorado caused upslope along the Front Range of the Rockies. As several pulses of moisture moved across the region, intense rainfall occurred, particularly on September 11-12<sup>th</sup>. The mountains around Boulder, Colorado received the majority of the rainfall from this event. In fact, Boulder itself received over 9 inches of rain in a 24-hour period on September 12<sup>th</sup>, which nearly doubled the previous record.

The weather forecast models struggled with the intensity and placement of this historic event. The highest projected rainfall amounts from forecast models ranged from 3 to 5 inches, while actual amounts totaled over 18 inches by September 17<sup>th</sup>. The role that CoCoRaHS observations played was crucial so that forecasters could adjust the forecast as the scenario evolved.

The flooding became widespread and extensive as many roadways leading into the mountains along the Front Range became inundated and unpassable. A few mountain towns were isolated for several days and people had to be evacuated by helicopter. The wave of water that came out of the mountains drained into the South Platte River which caused flooding all the way into Nebraska.



**CoCoRaHS observations from September 12, 2013**



**Flooded road in Colorado captured by Earth Vision Trust**

Again, I would like to thank our CoCoRaHS observers for your dedication to the program. The information you provide is invaluable and is being utilized every day. To read more about the Colorado Floods of September 11-17, 2013 go to: [http://www.nws.noaa.gov/om/assessments/pdfs/14colorado\\_floods.pdf](http://www.nws.noaa.gov/om/assessments/pdfs/14colorado_floods.pdf)

## Hail and Significant Weather Reports

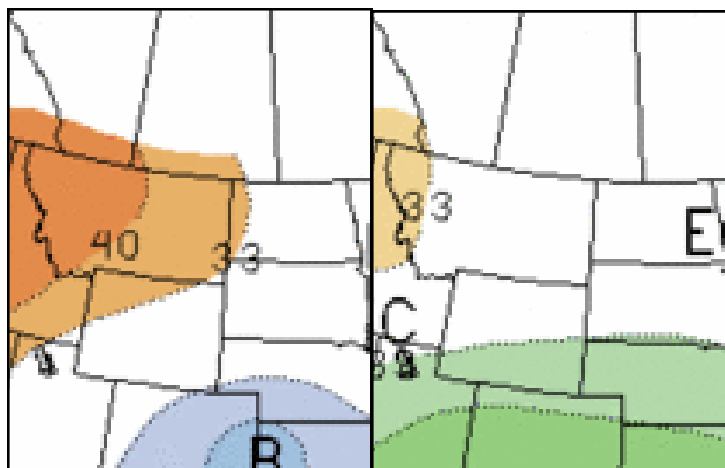
*By Vickie Stephenson, NWS Billings, CoCoRaHS Coordinator*

Most CoCoRaHS volunteers have never sent in a "Significant Weather Report." But someday it might be the most important thing you could do. Your daily 24-hour reports are awesome and valuable, but if you really want to make somebody's day at your local National Weather Service Office, then if you're having a bad storm, send in a "Significant Weather Report". Each report is automatically directed to the appropriate National Weather Service office and sounds an alarm for our forecasters. Information is vital to our forecasters to do their jobs, and our observers are the vital link to our forecasters in reporting their current weather conditions. Reports of heavy rain, heavy snow, hail, high winds, or other conditions help our forecasters make critical assessments and often times help with the decision to issue severe weather warnings. You'll still need to send in your regular daily report the next day, but if you can, do us here at the Weather Service a favor and send in special reports when you can. This summary was modified from an original piece in Nolan Doesken's "The Catch" from 06 June 2014: [http://cms.cocorahs.org/Media/Docs/TheCatch\\_2014-06-06.pdf](http://cms.cocorahs.org/Media/Docs/TheCatch_2014-06-06.pdf).

## Climate Prediction Center Three Month Outlook

*By Richard Maliawco, NWS Glasgow, CoCoRaHS Coordinator*

The Climate Prediction Center released its three month outlook for temperature and precipitation on 21 August 2014 for the months of September, October, and November. The outlook provides insightful information on what the weather will offer relative to climate averages for the remainder of the summer as well as the first part of autumn. Having said that, much of Montana looks to have increased chances for above average temperatures during the outlook period. Much the entire state of Montana is painted with equal chances for above or below average precipitation. There is a higher chance for below average precipitation across the far western portion of the state. Increased confidence does exist on above average precipitation amounts south of Montana through much of the state of Wyoming. Those with interests may want to pay attention to updated outlooks to see if this area shifts further to the north to include portions of Montana. As always, the latest CPC outlook is always available here: <http://www.cpc.ncep.noaa.gov/>.



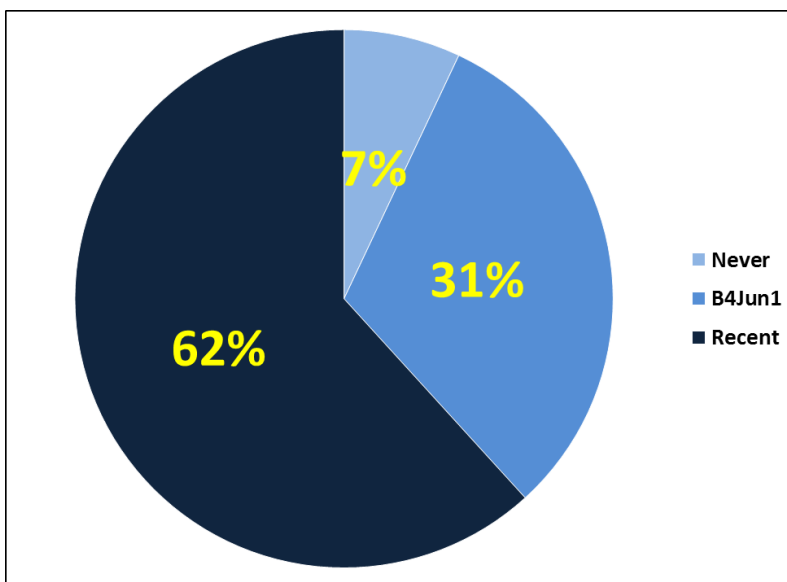
The above cropped image is from the Climate Prediction Center and is a three month outlook for September-November 2014.. The three month temperature outlook (left) depicts where above average temperatures (orange shades), below average temperatures (blue shades) are more likely. Areas with equal chances for above or below average temperatures are also shown. The precipitation outlook (right) shows locations where above average precipitation (green shades) are more likely. Areas with equal chances for above or below average precipitation are also shown.

## CoCoRaHS Observers: Overview of MT Participation

*By Richard Maliawco, NWS Glasgow, CoCoRaHS Coordinator*

CoCoRaHS observer participation is crucial to routine operations that take place within National Weather Service Weather Forecast Offices (WFO). When observers report daily (including their “zeros”) the NWS can use that information for a multitude of purposes. It is just as important to know that it didn’t rain as it is to know when and how much precipitation fell when it did rain. These reports not only help to answer questions our customers may have when looking for precipitation amounts around the area, but also assist with climate data maintenance, and during severe weather operations CoCoRaHS reports can even help out with warning decision making. Educators, insurance adjusters, those with agricultural interests, and many others find these observations useful as well. During training, observers are highly encouraged to report daily. However, when looking at the numbers on a statewide scale it becomes clear that many observers do not participate as regularly as would be ideal. Observers may have a difficult time reporting each and every day due to busy schedules, personal life events, loss of interest with time, and a multitude of other reasons. It is up to CoCoRaHS coordinators, at least in part, to perform continuous outreach initiatives in order to maintain enthusiasm and optimize participation of CoCoRaHS observers. Data was collected from the national CoCoRaHS webpage pertaining to the number of observers at the statewide level in Montana as of 02 July 2014. The frequency that observers have reported since becoming observers was determined as well as the frequency of those who had never reported, who have submitted their last report before 01 June 2014, as well as those who have reported recently (since before 01 June 2014 but before the date that the data were collected). These data were also broken down by county ([http://www.wrh.noaa.gov/ggw/pdf/CoCoRaHS\\_Participation.pdf](http://www.wrh.noaa.gov/ggw/pdf/CoCoRaHS_Participation.pdf)).

At the statewide level, there were a total of 285 observers in the database who were listed as reporting or not closed as of 02 July 2014. These are the observers that are in other words considered “active.” Of these, 265 have reported since signing up; however, 20 have never reported. There were 176 that have reported since 01 June 2014 through 02 July 2014. A total of 89 observers haven’t reported since before 01 June. This means that of all active observers who have actually reported since signing up, nearly 34% haven’t done so in over a month. The numbers are even more discouraging when including those that have never reported since signing up. That’s because out of 285 observers, roughly 38% either haven’t reported since before 01 June or have never reported at all. This speaks to the need to conduct further outreach initiatives to maintain enthusiasm and participation among CoCoRaHS observers. Reminding them of their importance and relevance to NWS operations can be a part of that initiative.



The pie chart shows that out of 285 MT CoCoRaHS observers listed as “reporting” as of 02 July 2014 on the national CoCoRaHS page the actual percentage who have never reported (Never), the percentage who haven’t reported since before 01 June 2014 (B4Jun1), and the percentage who have reported since 01 June 2014 through 02 July 2014 (Recent).

# Weather vs. Climate

By Richard Maliawco, NWS Glasgow, CoCoRaHS Coordinator



Image courtesy of: <http://www.cocorahs.org/>

A common area of confusion surrounds the differences between weather and climate. Weather more often deals with day to day variation whereas climate involves long term averages as well as extremes. The average high temperature for July 1 at your hometown would be an example of climate. Other examples of climate would be to refer to the highest temperature on record at your hometown or the lowest rainfall on record for the month of July. In contrast, when discussing what the high temperature was this afternoon at your house, that is an example of weather. If you measured an inch of rainfall in your gauge this morning, that would also be an example of weather.

There is a video on YouTube which is part of a CoCoRaHS educational series and it does a very decent job illustrating the differences between weather and climate. The differences are explained in an easy to understand way and it can be viewed here:

<https://www.youtube.com/watch?v=VHgyOa70Q7Y&list=PLFF1F628305FBCE41&index=42>. It is a short clip and will only take a little over 5 minutes to watch the whole thing.

What's more, you will find access to many other educational CoCoRaHS videos that may capture your interest as well!



## Visit Us Online:

<http://www.weather.gov/billings>

<http://www.weather.gov/glasgow>

<http://www.weather.gov/greatfalls>

<http://www.weather.gov/missoula>

## National Weather Service Mission Statement:

The National Weather Service (NWS) provides weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters and ocean areas, for the protection of life and property and the enhancement of the national economy. NWS data and products form a national information database and infrastructure which can be used by other governmental agencies, the private sector, the public, and the global community.



## Visit Us Online:

<http://www.cocorahs.org>

## CoCoRaHS Mission Statement:

CoCoRaHS is a unique, non-profit, community-based network of volunteers of all ages and backgrounds working together to measure and map precipitation (rain, hail and snow). By using low-cost measurement tools, stressing training and education, and utilizing an interactive Web-site, our aim is to provide the highest quality data for natural resource, education and research applications.