

# 10,000 and Counting



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## What is CoCoRaHS?

By: Anna Louks

CoCoRaHS stands for the Community Collaborative Rain, Hail & Snow Network. It was founded in 1998 by the Colorado Climate Center at Colorado State University after a severe flood affected Fort Collins the prior year.

It is a network of volunteers of varying ages from across Minnesota and the United States who collect precipitation data. These data are then used by several organizations, such as the National Weather Service, state

climatology offices, meteorologists, hydrologists, etc., across the country to create maps and other educational tools necessary for the understanding of local and national climate.

To the right: A 4-inch diameter rain gauge used to collect rainfall. The large diameter allows a representative amount to filter into the rain gauge allowing the observer to record an accurate total for each event.



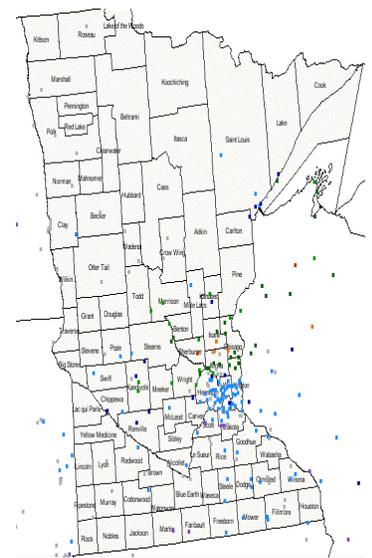
## Minnesota's Volunteer Network

The CoCoRaHS network of volunteer observers is essential to gathering representative data of precipitation in the state of Minnesota, as well as across the country. Minnesota's network consists of 465 active CoCoRaHS observers, of which 306 were added in the past year!

There is no formal training necessary to be an observer, just an interest in the weather and recording the information collected.

When an observation is taken, the information can be submitted directly to the CoCoRaHS website or are called in to the office. The information is then directly available for maps and, if intense precipitation is reported, the information can be sent directly to the National Weather Service office for Meteorologists to use if warnings or watches need to take effect.

Right: A map of Minnesota's CoCoRaHS



## New Dual-Polarization Radars to be installed

The National Weather Service is excited to announce the installation of Dual-Polarization, or Dual-Pol, Radar to several of its sites this fall. Five radar sites will initially be upgraded with this technology. They include, Chicago, IL; Phoenix, AZ; Morehead City, NC; Wichita, KS; and Fort Polk, LA.

As shown in the picture to the far left, conventional radar submits radio waves in pulses, orientated horizontally. When there is an obstruction in the way such as a cloud, rain, or hail, the wave will bounce off it and return to the radar receiver. Clouds, rain, and hail are not the only obstructions that will return a radar signal, however. Buildings, ground clutter, wind farms, even bugs can send a "false return" to the receiver. This is normally disregarded by most radar users, but can be misleading at times. As shown in the bottom picture to the left, most all

radar stations in the Midwest and eastward are showing a false return. The only location of true precipitation is in the far northeast.

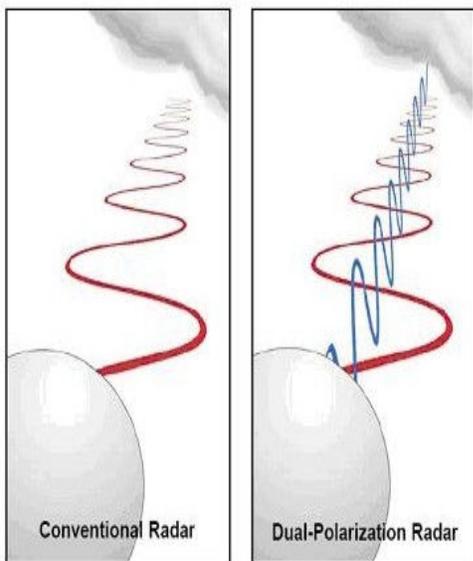
The way to combat false returns is with Dual-Pol Radar. Along with sending pulses of horizontally oriented waves, it will also send vertically oriented radio waves intermittently to collect data on both properties of the obstruction. This will not only help rule out the false returns as discussed earlier, but will also help in the detection of mixed precipitation (rain and snow), and the difference between rain and hail using three new base products. The first of these is Differential Reflectivity or ZDR; this will show the presence of hail cores and updrafts within a system. Second is Specific Differential Phase or KDP, this will differentiate between several large raindrops and numerous small raindrops, thus aiding the

user to distinguish a heavy (former) or light (latter) rainfall. Third is the Correlation Coefficient or CC; this will be able to show a melting layer (a layer within the storm that allows snowfall to melt completely or partially), presence of large hail, and distinguish biological targets.

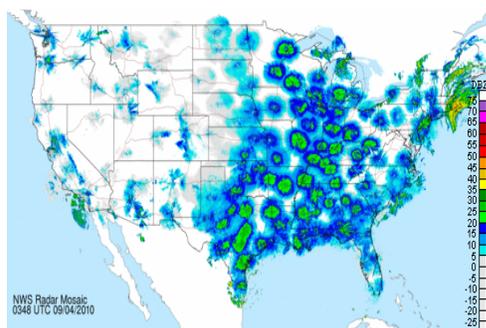
Along with these new products will also be eight new precipitation products that will greatly enhance radar estimated precipitation amounts which will be welcomed by all users.

The timing of each site upgrade will coincide with climatologically inactive periods for that area. Minneapolis radar is scheduled to be upgraded in October 2012, shortly after Duluth. The process takes about two weeks during which radar data will not be available from the site until completion.

*Photos: courtesy of the National Weather Service.*



*"Eight new precipitation products that will greatly enhance radar estimated precipitation amounts."*



## Your Local National Weather Service Office

Did you know that Minnesota is covered by six different National Weather Service (NWS) Offices? In northwest Minnesota, the Fargo/Grand Forks office covers eighteen counties in Northwest Minnesota. The Duluth office covers ten counties in northeast

Minnesota. Chanhassen has a large area and covers forty two counties in central and southern Minnesota, including the Twin Cities Metro. La Crosse covers seven counties in southeast Minnesota. Sioux Falls has eight counties in its responsibility and finally

Aberdeen has two counties in west central Minnesota. For a map of the NWS responsibility see:

[http://www.crh.noaa.gov/images/mpx/nwsmn\\_wi\\_responsibility.gif](http://www.crh.noaa.gov/images/mpx/nwsmn_wi_responsibility.gif)

## Meet a CoCoRaHS Observer

By: Kevin Kraujalis

Jerry Sundberg has been with CoCoRaHS for nearly a year and a half. Jerry and his wife, Laura, built their home in Lakewood Township of Duluth in 1968. Mr. Sundberg is a retired employee of Mesabi Railroad in Proctor. Jerry and Laura are avid gardeners with a variety of roses growing on their property. Their vegetable garden specializes in garlic and onions. The Sundbergs are members of the Hortus Garden Club in Duluth. They host garden

tours including four hundred visitors this past summer from the Duluth Flower Society and other organizations. During the Christmas season, Jerry has a 70,000 outdoor light display choreographed with Christmas music.

Mr. Sundberg has been taking weather observations at his location since 1972. He has logged detailed weather records since 1977. Jerry's favorite thing about northern

Minnesota weather is the variability in weather conditions over a short period of time. He dislikes the occasional early spring blizzards that wreak havoc with his gardening preparation. Some of his most memorable weather moments include local flooding in the summer of 1991 when many roads were washed out in his area. He also remembers a harsh cold snap in the winter of 1996.



Jerry Sundberg  
Courtesy Kevin Kraujalis

## Getting Ready for Winter

By: Pete Boulay

It's hard to believe that fall is here. Some observers will put their gauges away for the winter and others will keep measuring all year long.

Here are some handy tips to keep your CoCoRaHS gauge in great working order for years to come. If you are not planning on keeping your gauge out in the winter, the end of October is a good time to bring in your rain gage. If you leave it outside in the winter, the inner cylinder will crack when water

freezes inside of it. You certainly can measure wintertime precipitation. Simply leave the outer cylinder outside to catch the wintertime precipitation. You can bring the outer cylinder inside so the snow and ice can melt, then pour the liquid into the inner cylinder.

You can also measure some warm water with the inner cylinder and pour it into the outer cylinder to speed the process. Do not pour hot water into the outer cylinder, the rapid temperature change may

cause the cylinder to crack.

If you can afford to purchase a second gage, it can be handy to "swap" outer cylinders in the winter. This way you can bring one inside to melt what fell inside and put an empty gage on the post ready for the next event. This is especially useful for ongoing events and you won't miss any snowflakes flitting down through the air. Thank You to all observers for a wonderful warm weather season!

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*"Observing winter time precipitation can be fun, but you don't want to leave your funnel and inner cylinder outside when it freezes."*

## 2011 Weather Headlines



*This photo taken by Cass County Sheriff Department shows the devastation caused by overland flooding on County Hwy 22 in early April.*

January was relatively quiet for snow fall when compared to December when the Twin Cities recorded their highest accumulation of 33.4 inches. This broke the old record set in 1969 of 33.2 inches of snow fall.

The biggest headlines for January-March were the amount of liquid involved in each snowfall, which was cause for concern for spring flooding in the Red River, Minnesota River, and the Mississippi River Valleys. As April came around, the temperatures fluctuated from mild high temperatures in the 50's and 60's to high temperatures in the 30's a week later. These fluctuations were caused by strong low pressure systems that developed on the lee side of the Rocky Mountains. They brought with them surges

of moisture and warmth from the Gulf and mixed with cold, dry Canadian air creating severe storms, some with tornadoes, from Mississippi all the way to the far northeast of the country, and blizzard conditions and heavy snowfall from Nebraska and points north through the Upper Mississippi Valley states.

Of course as warm temperatures came, the snow melted and that meant citizens in any river valley were on high alert. Note the picture to the left of Cass County Highway 22 where severe overland flooding is depicted in all directions.

In May, an EF-1 tornado went through North Minneapolis creating excessive damage to the neighborhoods there. Also, records were set all across Minnesota when

extremely warm temperatures and high dew points caused heat indexes above 100F for a large portion of our state. However, the record was broken at the Moorhead Airport on July 19 at 7 and 9pm at an incredible 88 degrees F! Several severe storms also rolled through parts of the state causing damage from winds following the I-94 corridor from Alexandria to the Twin Cities.

As is usually the case in Minnesota, there have been reports from every spectrum of inconvenient weather from snow depth totals and prolonged cold temperatures to nearly tropical heat so far this year. But this is why we love Minnesota, a taste of every extreme.