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# The Catch



NOLAN DOESKEN'S MONTHLY COCORAHS E-MAIL MESSAGE

**CoCoRaHS -- Here Comes March!**

**Fort Collins, Colorado -- February 26, 2016**

Greetings CoCoRaHSians (CoCoRaisins for short),

This is my March news update. I'm sending this out a little early because Noah Newman, our CoCoRaHS education coordinator, who helps me format and send out the "Catch", will be gone until late March. He and his wife are headed out for a once-in-a-lifetime 3-week rafting trip through the Grand Canyon. I'll make sure he posts some pictures when he returns. On that note, several of the CoCoRaHS staff will be out of the office during March, and although we will monitor the site and our e-mails as best we can, we may not get back to you as quickly as we would like to - so please bear with us during the next few weeks.

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## **As the Days Grow Longer, The Storms Get Stronger (Old, but Useful Weather Folklore)**

While weather is quiet across the country today, that was not the case earlier this week and it won't be the case for most of the spring. Severe weather brought destruction to parts of the south including Louisiana, MS, FL and even southern VA. Parts of Michigan, Indiana and Illinois (including my home town of Royal in Champaign County) were blasted by a wildly blinding blizzard of wet snow on Wednesday. I wasn't there to experience it, but it brought back surprisingly vivid memories of a late February

snowstorm back in 1960 that set the table for what may still stand as the most brutal March in the recorded history of the Midwest and Ohio River Valley. One winter storm after another (like New England last year) brought snow and frigid temperatures. Those storms captured the full attention of a little second grader (me) who was inextricably hooked on meteorology from then on. It was also the only March where a pool-table-flat community enjoyed a month-long sledding hill (our neighboring village was named "Flatville" if you want to know just how flat it was) -- thanks to all the snow plowed to the south end of the church parking lot.

I doubt if spring 2016 will be as cold or severe, but don't be surprised if few memorable storms develop somewhere between the Pacific and Atlantic Oceans that will once again capture the imagination of more young children -- the children who will grow up to become our next generation of meteorologists and climatologists.

### **CoCoRaHS March Madness**

Don't forget to sign up a new volunteer or two for CoCoRaHS and help your state win the "CoCoRaHS Cup" for recruiting the most new rain gauge volunteers in March. Updates will be posted at the end of each week to see which states are winning. To find out more, click on the [March Madness banner](#) on the home page. You can also check out the "[Message of the Day](#)" throughout the month for periodic updates.

### **Hail and Stuff**

Two-inch diameter, clear, hard hail hit Brackettville, TX this week -- denting cars, cracking wind shields and busting up shingles. There's much more where that came from. Hail falls in most countries of the world, but the U.S. and Canada are particular hail prone. Starting in the South in late winter and then advancing northward in spring and summer, many of us will experience some hail before this year is over.

Our measurements provide valuable data to scientists, engineers and weather forecasters that simply are not available from other sources. Most electronic weather stations are unable to even detect hail. So if you experience hail at your home location, please use the [CoCoRaHS Hail report](#) to describe what you experience -- the size and range of sizes, the hardness, the color, the shape, the depth (if it hails so much that the ground is covered) and the damage. If it hails twice, report twice. Your report will immediately be forwarded to your local National Weather Service office. Also, remember to use the "[Significant Weather Report](#)" forms to document intense rain, heavy snow, dense fog, high winds, or other important weather. Please explore all of the types of reports you can submit - they are found in the left hand panel of your data entry form.

And one more thing. Many National Weather Service forecast offices are now conducting severe weather spotter training. If you haven't already attended, I highly recommend it. [Click here](#) to find out more about attending a 'Weather Spotter' training course with your local National Weather Service office.

### **Why We Do What We Do - The Way We Do It (Our Top Four FAQ's)**

We get a lot of questions about who we are, what we do and why and how we do it.

Here are some answers to some of the most frequently asked questions.

- First of all, our name -- What is CoCoRaHS?

Yes, its pronounced "KO-ko-rozz". It's an acronym that stands for the "Community, Collaborative Rain, Hail and Snow" network. Back when we started in 1998 it was the Colorado Collaborative Rain and Hail Study, but when we expanded to winter measurements in 1999 we changed the S from "Study" to "Snow" and when we expanded beyond Colorado in 2003 we changed from "Colorado" to "Community". Some people have called the name "cheezy" and a reviewer once, possibly accurately, called it a "barrier to participation." But it suggests we have a sense of humor, it implies teamwork, it rolls off the tongue well and sticks with us. So 18 years later we're still CoCoRaHS.

- Why do we use the clear plastic 4" diameter gauge?

Since the later 1800s, the standard gauge for measuring year-round precipitation was the old ["U.S. Weather Bureau" standard rain gauge \(SRG\)](#). It was made out of metal, was 8" in diameter, and stood two feet tall. It could be used with a funnel and inner cylinder in the warm season and just with its large, open outer cylinder in the winter to catch snow. The gauge that we use is a scale model of this traditional manual rain gauge -- approximately 4" in diameter, 12 inches tall. Years of side-by-side testing have shown that the smaller gauge, in almost all circumstances, compares very favorably (+/- 4%) with the SRG. The largest differences are observed during wind driven snow -- a situation when almost every conceivable rain gauge is deficient. Larger diameter gauges provide better overall sampling, but are too unwieldy.

Because it is light weight, easy to use, performs well for both rain and snow, and is relatively inexpensive, the National Weather Service has found the 4" diameter high capacity clear plastic gauge to be equivalent to it's official SRG. Therefore, when used in accordance with NWS guidelines, the data from these gauges can be used interchangeably with NWS official data.

Is the gauge perfect? Of course not. It requires occasional cleaning, the plastic gradually degrades in bright sunlight, and it will crack if allowed to freeze with water left in it or if struck by large, hard hail. There is also some evidence that there may be some imperfections in the molds. But overall, it's a darn good gauge.

- Why do we still use an "old fashioned" gauge that requires someone to go out and read it instead of encouraging or requiring the use of electronic rain gauges that measure automatically and don't require emptying?

With each passing year, more people are asking this question and it's getting harder to talk people into reading a manual rain gauge. The reason we stick with our requirements are clear, and they are proven time after time. The fact is that it is extremely difficult to measure precipitation accurately over the full range of meteorological conditions -- light rain, heavy rain, hot temperatures, cold temperature, strong winds, light winds, rain, drizzle, hail and snow. Years of testing have shown that the manual gauges provide the

most consistent measurements that most closely represent "ground truth" over the widest range of conditions. Furthermore, the observer can add useful interpretation to the results based on visual clues (such as the obvious under-catch that many observers noted in the Midwest blizzard earlier this week).

The most common and inexpensive technology used in electronic gauges are "tipping buckets". These gauges of various designs have been in use since the 1800s. Comparisons with standard manual rain gauges have shown these gauges compare favorably in light long-duration rainfall events, but with intense rain, hot temperatures or winter forms of precipitation, differences can be large and cumulative. Tipping bucket gauges repeatedly report less precipitation than manual gauges from just a few percent to 10-30% less.

Don't get me wrong -- I love the many advantages of automated gauges. We use them at many of our weather stations. But for climatologically consistent data, we stick with the CoCoRaHS gauge and the NWS Standard Rain Gauge.

We know that a few of you are using tipping bucket gauges for CoCoRaHS -- or for backup. Several of you have and continue to provide data comparisons between your CoCoRaHS gauge and your electronic gauge. This has been a huge help and has confirmed that most tipping bucket gauges report lower monthly and annual precipitation totals than the adjacent manual gauge. If you have no other option than to use an electronic gauge, then please let us know so it's documented in our files.

- [Why do we recommend 7 AM for our daily observations?](#)

Perhaps in an ideal world, we would all be wide awake and on our toes at 11:59 PM so we could all take "calendar day" observations. That would be great for record keeping, but it's not practical for normal living. For a whole set of reasons the 6 AM to 8 AM window works the best for most of our schedules with 7 AM the single best choice. For much of the country, rainfall is most frequent in the afternoon and evening and less likely in the AM. 7 AM also aligns fairly well with the National Weather Service hydrologic preference of 1200 Z (Greenwich Mean time) for 24-hour precipitation reporting.

Our daily rainfall maps are best and most useful when we all measure and report close to the same time. But we are a volunteer network, after all -- so we allow flexibility. Some report earlier, some later. The more flexible we are the more volunteers we can accommodate -- but the result is some random-looking discrepancies on our daily precipitation maps - and a huge challenge for our QC team who continuously monitor our data.

### **ETgages - Anyone Interested?**

Did you know, you can help measure the second largest component of the water cycle-- evapotranspiration. Back in 2012 we introduced the ETgage into CoCoRaHS. With the help of grant funding, we were able to deploy at least one gauge in most every state. We had close to 150 ET observers last year. The gauges are pricey (about \$200) but the data are awesome. You'll need to have a fairly open landscape with no irrigation

sprinklers where the ETgauge would be installed. If this sounds like fun and is feasible for you, please let me know. [Click here to learn more](#) about the instrument and view the training guide, or check out some water balance graphs from some current observers by [clicking here](#).

### **Soil Moisture Too?**

Rainfall is where the water comes from. Evaporation is where much of the water goes. But if you are a plant, what you care about is how much water is in the soil where your roots are. For two years we've been testing simple (well, simplish :) ) methods for measuring the amount of moisture in soil. We're finally ready to begin testing our methods in more places. If you're interested in helping, and you have an area that is representative (in terms of soil type, slope, vegetation etc.) that doesn't receive irrigation water, you might be a good candidate. It will require an area where you can dig a few shallow holes in the ground every few weeks. If this sounds like scientific exploration -- or just curious fun, let me know. We should be ready to get started sometime in May.

### **Farm Story**

Tomorrow we have to trailer one of our horses to the Vet to get some x-rays. She (the horse -- Rosie) doesn't complain but she's been chronically lame now for quite awhile. The vet is optimistic we can get her healed.

We're now in one of those infrequent sweet spots. The mud season is over for the time being, but it hasn't dried out enough yet to be dusty. Most of the frost is out of the ground now (and that allowed the water to soak in which ended the mud). Now we're starting to get antsy to get into the garden, but experience says "wait". There are parts of the country where March means spring, but around here March means more winter interrupted occasionally by short, windy periods that feel more like summer. So, we'll wait.

The long-range spring forecast is still calling for wet weather associated with the last gasp of this 2015-2016 El Nino before it fades away. I hope that works out here in Colorado, and especially for California. When you only average 15" of precipitation like we do, every inch is precious. Go March!

### **Thanks**

Thanks for being a part of CoCoRaHS. If you haven't gotten your rain gauge set up yet, March is a great time. Enjoy spring, but be ready for anything. It's usually a wild ride, so stay safe.

Sincerely,

Nolan Doesken and the CoCoRaHS team  
NOAA's Weather Ready Nation Ambassador Program  
Colorado State University

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