The Catch

COCORAHS UPDATE—LOT'S OF WEATHER TO DISCUSS

FORT COLLINS, CO — Saturday, October 20, 2007

Dear CoCoRaHS participants, young and not so, and a big welcome to all of our new members!

Saturday greetings to all!

Applications to join CoCoRaHS continue streaming in. In just the past few weeks nearly 400 people have signed up to join CoCoRaHS from Florida alone. Alabama, in preparation for their launch date of November 1, have signed up 188 new rain gauge checkers. We can't quite keep up, but it's exciting.

A wild week for weather!

This has been a wild week. It started for us last Saturday. We were playing CoCoRaHS rain gauge and hail pad games with kids at the 4-H tent outside the Colorado State University football stadium before the game with Air Force (we lost -- 13th game in a row – drat!). A thunderstorm erupted directly overhead. Our demo rain gauge picked up over 0.75", mostly in 45 minutes -- and our "hail stone toss" competition was canceled due to hail (more excitement than during the actual football game). This would have been a great adventure were it not for the lightning bolts that were striking way too close.

A few CoCoRaHS volunteers have experiences with lightning. Some have been hit directly and are still here to share your stories. They have encouraged me to boldly warn others to take lightning seriously. Well, I had my chance on Saturday as we tried to decide if the best thing was to stay huddled under our aluminum-poled tent -- or if we should all run separately in all directions through torrents of rain and flowing water to find our cars several hundred yards away. Both choices seemed bad. The good news is that no one was hurt, but it was interesting to realize that the NCAA has an aggressive policy on what to do inside football stadiums when active lightning storms hit (the start of our game was postponed 45 minutes until lightning ended). But outside in the huge parking lots with only tents for cover is a different matter. If any of you are lightning safety experts, I would like to hear from you with advice on what we should have done. It's one

thing when a storm moves in and you have a few minutes to prepare and take cover, but what do you do when the storm forms right overhead without advance warning and you find yourself with no easy or dry options?

From Saturday afternoon to midnight Sunday night, we then enjoyed a soaking, cold rain with as much as 2-3" in parts of our county. Hurray!! For our part of the country, that's a big rain although it was limited to only a few counties in Colorado and SE Wyoming. Then came the snow with over 100 reports of snow from our higher elevation volunteers. The greatest one-day snow report was 10” near the Colorado-Wyoming border 20 miles WSW of Cheyenne, WY. After that, the big storm system took shape over the southern plains and swept into the Mississippi Valley and Great Lakes states. On Tuesday morning, one of our volunteers in Texas found their rain gauge full to the top with at least 11" of rain. (Remember, if you know you're having exceptional rain, please try to submit an "Intense Precipitation Report")

Over the next two days rains and local severe weather erupted over widespread areas of the central U.S. from northern Wisconsin down to the Gulf Coast. Over 2000 of us reported measurable precipitation Thursday AM, and many from eastern Kansas into Missouri, Illinois and Indiana reported over 2” of rain. Regrettably, severe weather claimed the lives of at least 6 people from this storm. On Thursday, torrential rains cut loose over southernmost Alabama and the western Panhandle of Florida. By Friday morning, over a dozen new CoCoRaHS observers in Florida had reported in excess of 8” of rain. Three observers exceeded 11” in the Gulf Breeze area. Here is the daily comment Friday AM from one of our Florida observers.

“rain continues today! Our wetlands have overflowed into our yard! We are completely underwater! The creek has risen enough to break through the sand and the creek is flowing rapidly into the Choctawhatchee Bay. Surfing alligators and turtles! 2 foot waves!”

We really appreciate your comments and remarks. It adds considerably to your numeric observations. Feel free to add remarks whenever you wish. Our only requirement is this -- TELL THE TRUTH!!

This brings us to an IMPORTANT REMINDER. Our gauges are quite accurate, easy to read and can be used for measuring both the rain and the water content of winter snow. As far as we can tell, these gauges are the best value for the dollar for all weather precipitation measurements. However, as large as they may seem, daily rainfall can and does exceed the 11.32” capacity of the gauge. This year alone, we have now had 6 occasions where rainfall has filled a CoCoRaHS gauge to the top. SO, if you are having one of these exceptional rains, go out during a break in the storm. Read the gauge, jot down the amount, and then empty the gauge to make room for more rain. Don’t risk your life, but do your best to make sure we can accurately report the total rainfall for the storm.

In a few states, all time record daily rainfall amounts have exceeded 20” – so be prepared.

Interestingly, this huge storm crossing the country this week looked like it would bring significant drought relief to the Southeast. While it did bring widespread rains, the storms weakened as they crossed Tennessee into North Carolina. There was rain, but not drought-breaking rain. But hopefully this is the beginning of the anticipated fall weather changes that may open the door to more widespread rain.

Hail too

This week also brought reports of hail. One CoCoRaHS reporter in Boone County, Indiana had a storm that lasted just 2 minutes but brought stones between 1.5 and 1.75” diameter driven by wind which damaged cars and roofs.

Please remember to report hail – even if it is small and seemingly insignificant. You DO NOT have to use hail pads in order to be able to measure and report hail. Anytime you have hail of any size or amount, please use the “Hail” report on your “Enter My New Reports” menu to enter hail information. We are conducting hail research using these data. From a damage point of view, only the bigger storms are important, but from an overall hail climate research perspective, we hope you can report any hail that you experience.

Remember the BLOG

For those of us with time, Chris Spears is writing a great CoCoRaHS blog watching and reporting our changing weather every day.

Here is the link: http://cocorahs.blogspot.com/

Water Year reports!

Thanks so much to all of you who made the extra effort to review your daily reports and compile a summary for the 2007 Water Year (Oct 2006 - Sept 2007) of monthly totals of rain, snow and the number of days of measurable precipitation for the last year. I know the computer can do that heavy lifting, but it's a worthwhile exercise if you have time. It is especially helpful to us when you give your data the "once over" making sure that errors are found and corrected, and that entries that were forgotten were included. Now we can begin to compare place to place, year to year, and see the amazing variations in precipitation that we all deal with. I don't have the exact numbers in front of me, but the greatest CoCoRaHS water year precipitation totals were close to 80

inches in an area of Texas that was clobbered time after time this past year. One of the driest areas was also in Texas with less than 8" in a CoCoRaHS backyard east of El Paso. Within the immediate area of our city – Fort Collins, Colorado -- the annual precipitation varied from just over 12" up to 18".

Does anyone actually look at CoCoRaHS precipitation reports?

Almost every week we get questions from volunteers who are concerned that their efforts may be a waste of time. Let me assure you, your measurements and your reports of rain, hail and snow are used every day. Here are just a FEW EXAMPLES that we are aware of -- CoCoRaHS data are exported directly to the National Weather Service on a continuous basis and are being used to assist, support and verify weather forecasts, severe storm warnings, etc. in all participating states.

-- Data are used routinely in hydrologic modeling and stream flow prediction in many watersheds.

-- CoCoRaHS reports are being integrated into local, regional and national drought monitoring.

-- In various parts of the country, CoCoRaHS reports are being used by TV meteorologists and in local newspapers to help show the public how precipitation is varying across their local areas.

-- During the growing season, our data are used by agriculture to assess water supplies, soil moisture and potential crop yields and pests (all heavily dependent on precipitation).

-- Ranchers and the ranching industry here in the West use our rainfall reports to help assess range conditions and available forage.

-- Not surprisingly, insurance companies are looking at CoCoRaHS data to confirm and document hail damage and to check for possible insurance fraud.

-- City water utilities are looking at CoCoRaHS data to help evaluate water supplies and water consumption.

Depending on the time of year, there are many other uses of our observations:

-- Dozens of scientists from labs and universities in several states are utilizing our data in their work. For many years now, scientists working with remote sensing of storms (satellite, radar, etc.) have been accessing CoCoRaHS rain, hail and snow data to provide "ground truth" to calibrate and validate their observations and products.

-- We have worked with scientists studying the spread of the West Nile virus and other insect-borne diseases. Precipitation patterns play an important role in this process.

-- Storms affect bird migrations, insect populations, animal behavior water quality, non point source pollution, forest health, wild fire potential and so much more.

Climate versus weather

Remember, I am not a weather forecaster. I am a climatologist. Once the day is over and the storm has past, you may think that your reports are lost and forgotten. In fact, as time goes on your data take on a whole new value -- it becomes a part of history. For example, the 2007 Water Year summaries that many of you helped with allow us to map seasonal and annual precipitation totals over broad areas. Since CoCoRaHS began here in Colorado several years ago, we now have many reporting sites in each of our cities instead of the traditional one official station per city which is what the National Weather Service has normally been able to provide. With the help of having many observation points, we can study the local nature of climate variability. Here in Fort Collins we have learned that over 9 years, the annual precipitation has systematically varied across town by several inches. That's a lot considering our average is only about 15 inches per year. We have found systematic and repeatable precipitation patterns over every city in and near the Rocky Mountains. We might have guessed that without CoCoRaHS, but now we can show it and support it with proof.

We are extremely interested in studying the characteristics of extreme storms. How often do they happen? How large an area do these storms cover? How do stream flow and flood levels respond to the rainfall? Can we use "space" to replace "time" when investigating the recurrence interval for extreme storms? (What I mean by this is if we have 100 rain gauges for a few years instead of one or two gauge for 100 years, can we learn similar information about the frequency of local extreme events?) This is very important information for civil engineers, structural engineers, architects, building contractors, hydrologists, flood plain managers, etc.

If we are able to sustain CoCoRaHS for many years, then a whole new set of uses become possible. There is always interest in how our climate varies over time. We have networks of weather stations nationwide to help track this, like our Fort Collins Weather Station that I am responsible for (a National Weather Service Cooperative Program Historical Climate Network station with 119 years of uninterrupted data). But these stations are relatively few and far apart. Whatever CoCoRaHS can do to help fill the gaps between existing official stations allows us to do a better job of assessing climate variability and potential climate change.

A very special event!

Speaking of the National Weather Service Cooperative Network, a few weeks ago I had the humbling experience of being invited to help honor Mr. Layton Munson of Sedgwick, Colorado (extreme northeastern Colorado) for 60 years of service to the National Weather Service as a volunteer weather observer and also an amateur radio operator. He was already taking official observations for

the old U.S. Weather Bureau before I was born, and he just kept going. Mr. Munson was our first volunteer in Colorado's history to reach the 60 years of service mark. There are currently 13 active NWS Cooperative stations in the U.S. where observers have been reporting for 60 years are longer. As I recall, the record is around 75 years. For climatologists like me, long term data are invaluable for tracking the climate of our nation.

One of the really big surprises for me at the ceremony for Layton was that our CoCoRaHS volunteer coordinator for western Montana (Trent Smith) attended the event. That's a long trip. It turns out that Trent grew up in Sedgwick and was back in town visiting family. Trent, it was great to see you there!

The U.S. has a long and colorful history of citizen weather observing dating back to even before the American Revolution. We follow such notables as Ben Franklin and Thomas Jefferson in this curious hobby. In a future letter, I want to tell you more about the history of weather observing in our country.

Snow is coming soon! Review the instructions

As I finish this note, it is a gorgeous day outside – blue sky and temperatures already close to 70 degrees. But the forecast for tonight and tomorrow – SNOW!

This is a great time to review the instructions for measuring snow. It's just not as simple as rain. Remember, we want to record:
1) The water content of the snow (entered in the same way as rain)
2) The new accumulation of snow (prior to melting and setting) that fell in the past 24-hours
3) The total depth of snow remaining on the ground at the 7 AM observation time.
4) The water content of a core sample of new snow (optional but useful measure, since windblown snow does not readily collect in our 4" diameter gauges).
5) The total Snow Water Equivalent (SWE) which is the total water content of any snow and ice on the ground at the 7 AM observation time (also an optional reading but very useful especially for engineering applications requiring the weight of snow on roofs and hydrologic applications that predict future runoff, water supplies and potential flooding from melting snow).

Also, keep in mind that when snow and subfreezing temperatures are anticipated, you need to bring the funnel and inner tube of your gauge indoors.

Training materials are available on our website. We have a training presentation that you can click on from our homepage (see the right hand column -- www.cocorahs.org – not recommended for a low-speed connection). We also have narrative instructions and a snow measurement training video available.

http://www.cocorahs.org/Content.aspx?page=snow

This is also the time of year in the colder parts of the country when you should decide if you will stick with CoCoRaHS through the winter or take a break. We're not as young as we used to be, and there is no reason to risk breaking a wrist or hip to go out and measure that stinking snow. Or then again, this might be a good time to train your younger family members and nearby neighbors so they can help in the cold of winter. Then our records can be more complete.

Forgot to get started?

We have nearly 3,000 CoCoRaHS applicants who have never gotten around to taking their first observation. If this sounds like you, then why not get started today. The data you may collect and provide will be important to us, to weather forecasters, but also to many in your state and community. Furthermore, you might learn something. If the $22 cost of a new rain gauge is a barrier, then please contact your state or regional coordinator. We have been seeking donations and support so that some complimentary gauges are available in many states.

Thanks again!

That's way enough CoCoRaHS for one day. Thanks for all your help and your commitment to this volunteer project. Have a great weekend.

Sincerely,

Nolan Doesken
Colorado State University