



**Community Collaborative Rain, Hail and Snow
Network**

CoCoRaHS Webinar Training



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Outline

- I. What is CoCoRaHS?
- II. Brief History and main mission of the organization
- III. Who uses the data
- IV. Setting up the Rain Gauge and measuring precipitation (briefly talk about hail and snow).
- V. Reporting Observation
- VI. FAQ/Questions

What is CoCoRaHS?

CoCoRaHS is a grassroots,
non profit ...

...made up of volunteers of
all ages and backgrounds



...who take daily measurements of
precipitation right in their own backyards

Once trained,
our volunteer observers
collect data using low-cost
measurement tools ...



4-inch diameter
high capacity rain gauges



Aluminum foil-wrapped
Styrofoam hail pads



Training Slide Show
"Because every drop counts!"

Training is important to assure
accurate, high quality data

Things to know about...

Rain

- Overview
- Weather Radar
- Measuring Rain

Hail

- Overview
- Hail Facts
- Hail Figures
- CoCoRaHS & Hail
- Hail Pad Examples
- Measuring Hail

Snow

- Overview
- Measuring Snow

CoCoRaHS History



The network originated with the Colorado Climate Center at Colorado State University in 1998 thanks in part to the Fort Collins flood a year prior.

CoCoRaHS expanded with several years to all 50 States including Puerto Rico and the US Virgin Islands, plus Canada and the Bahamas.

North Carolina became part of the CoCoRaHS network in September 2007.



CoCoRaHS's main focus is to provide:

**Quality Precipitation Data
&
Educational Opportunities**

to help the public better
understand weather and climate



Why CoCoRaHS?

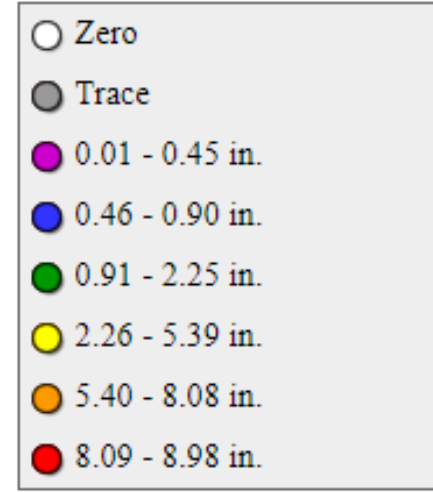


Precipitation is important
and highly variable

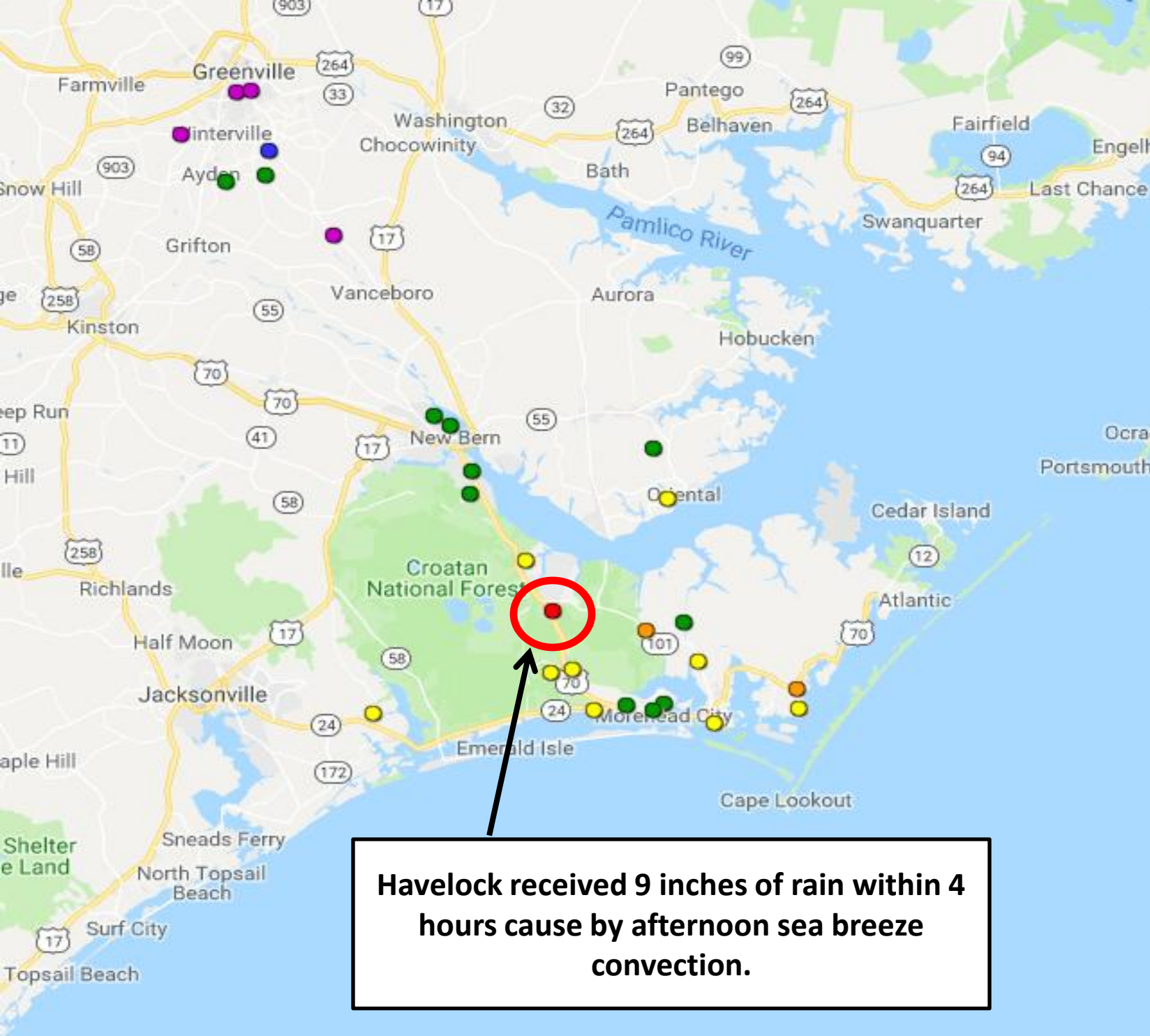


Data sources are few and
rain gauges are far apart

Date: 08/13/2009
 Country: USA
 State: NC
 Units: US Units



☐ Show US Active Fire Perimeters
 Source: [GEOMAC](#) GEOMAC wildfire data layers
 courtesy of the [U.S. Geological Survey](#).



Havelock received 9 inches of rain within 4 hours cause by afternoon sea breeze convection.

Who uses CoCoRaHS data?

National Weather Service
Other Meteorologists
Hydrologists
Emergency Managers
City Utilities

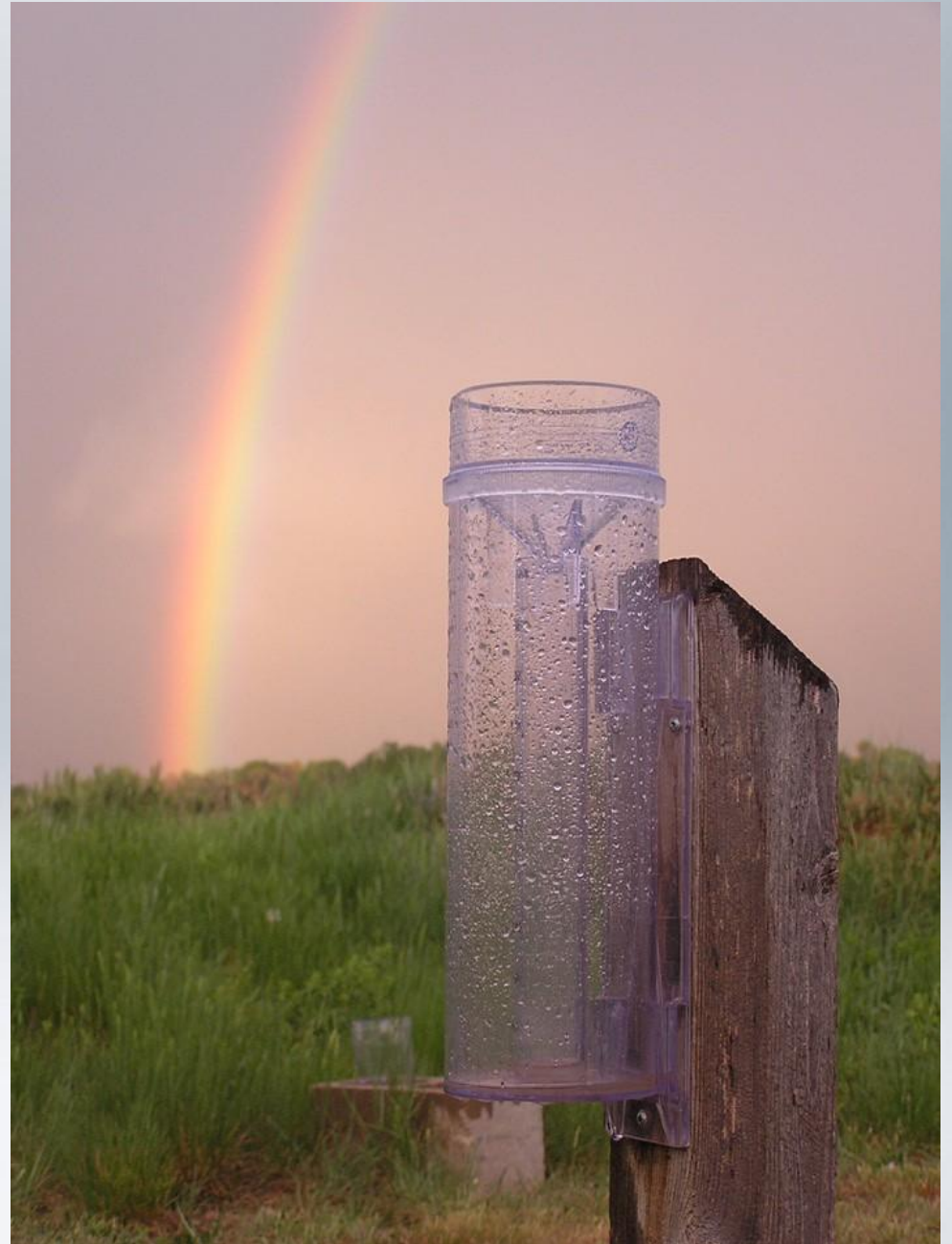
- Water supply
- Water conservation
- Storm water

Insurance adjusters
USDA—Crop production
Engineers
Scientists studying storms
Mosquito control
Farm Service Agency
Ranchers and Farmers
Outdoor & Recreation



Section I

Setting up your rain gauge and measuring precipitation



Placement of your gauge

*“Location is the
key to good data”*



Places **not** to place your gauge



The #1, all time worst place to put your rain gauge is to leave it in the box!

Using your gauge to hold up your gutter downspout is not a wise choice either!

Although convenient, the deck is still too close to the house



Avoid placing it under trees or any structure

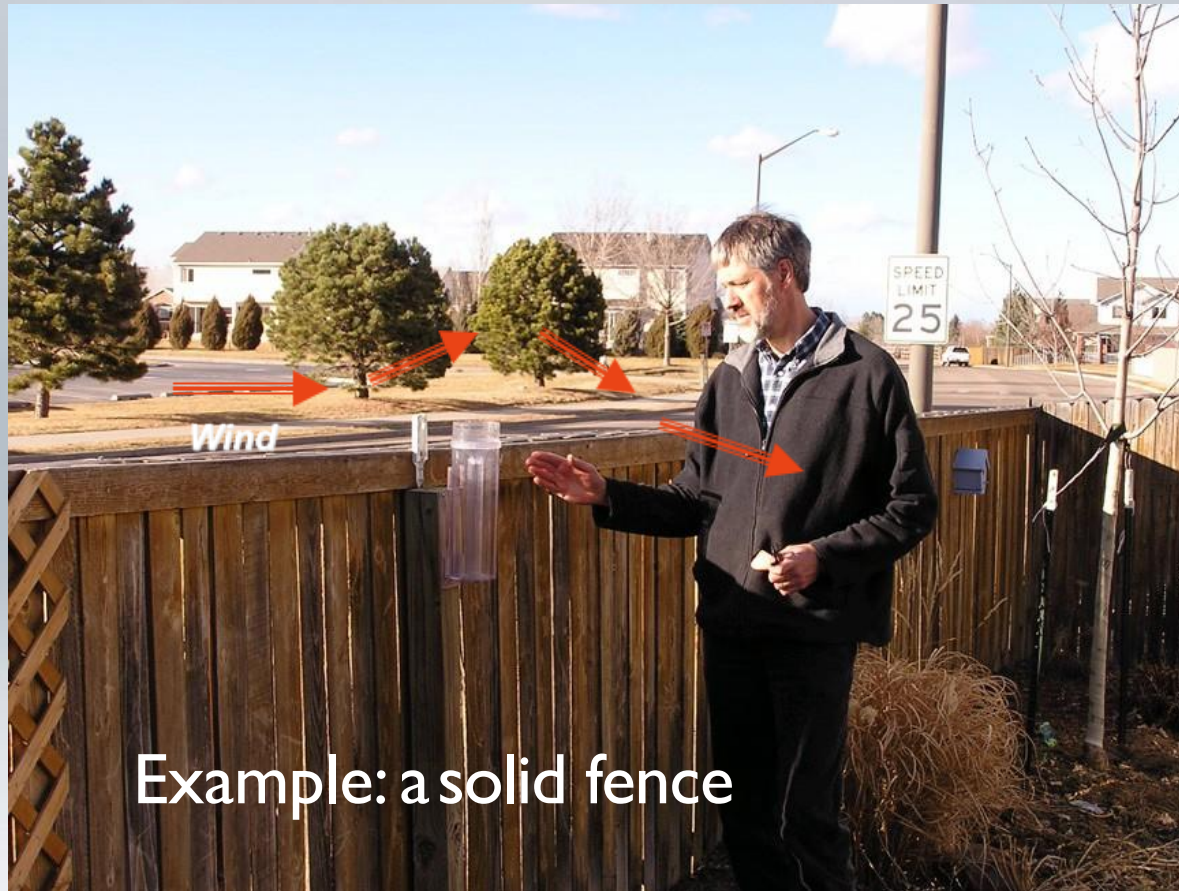


Animals (dogs, birds . . .)



Sprinklers both big and small

Avoid anything that would artificially increase or decrease your catch gauge



Example: a solid fence

This can cause updrafting during strong winds, which may reduce your gauge catch.

Ideal placements for your gauge

residential



rural



urban

Distance from Obstacles

In open areas strive to be twice as far from obstacles as they are high.

In developed areas strive to be as far from obstacles as they are high.

Distance between Trees

Ideally, place your gauge equidistant from the nearest trees



Height above the ground

In open areas place the gauge top approx. 2 feet off the ground



In developed areas place the gauge top approx. 5 feet off the ground



Level and Bevel

Make sure that your gauge is level



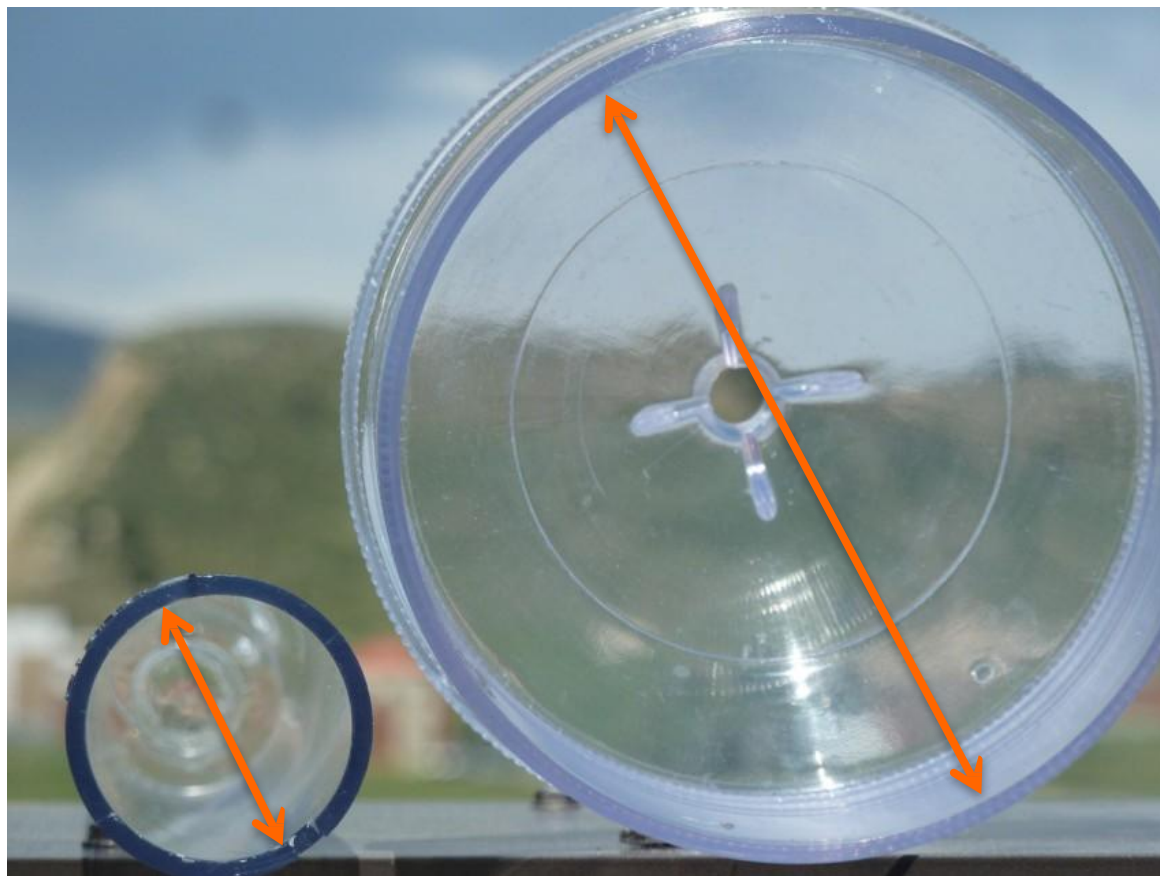
Bevel the top of the post to reduce rain splashing into the gauge

Measuring Rainfall with your Gauge

*“Accuracy and consistency
are very important”*



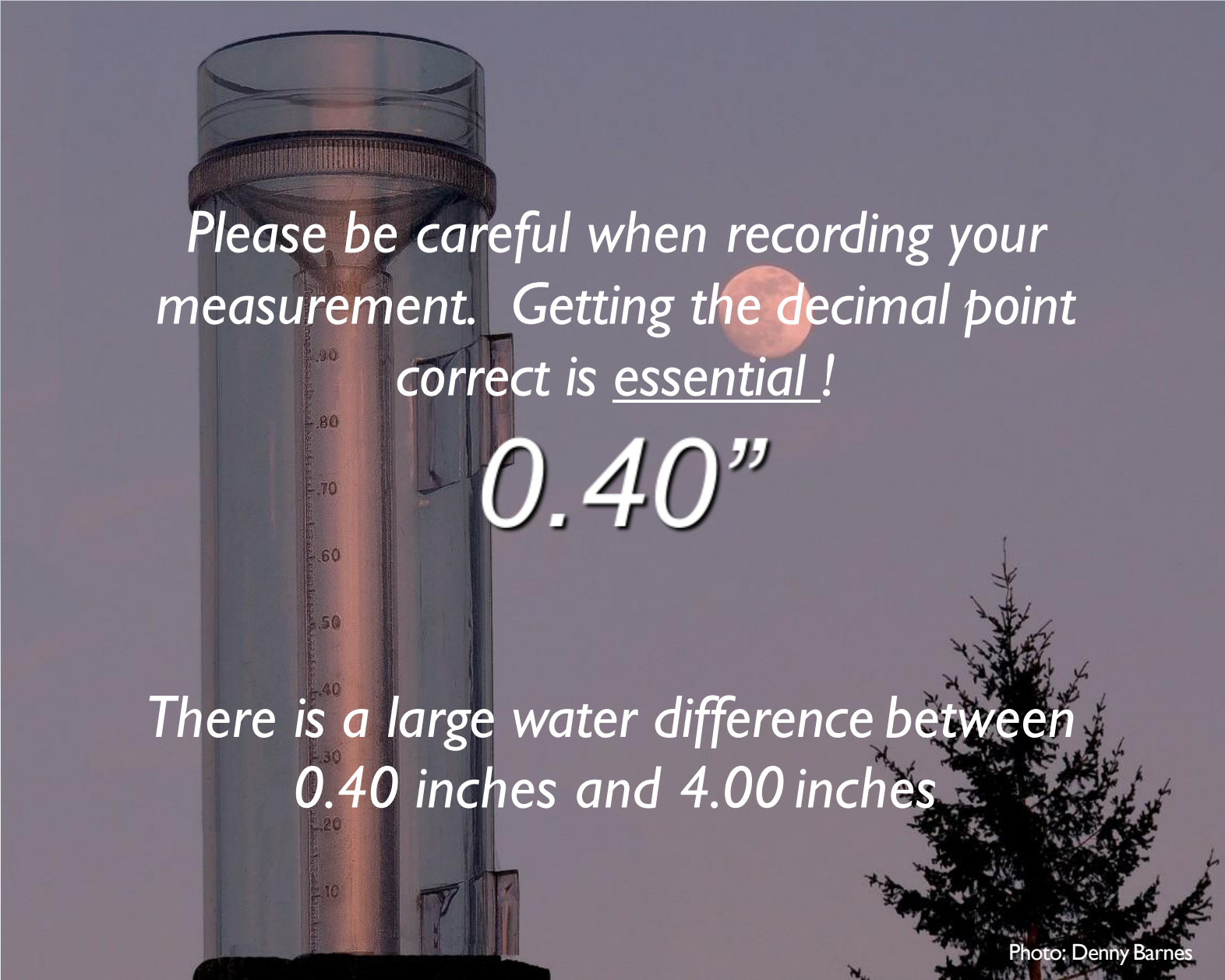
Photo: Steve Camp



One inch of rain in the inner tube looks different than one inch of rain in the outer tube



A Word about Decimals



Please be careful when recording your measurement. Getting the decimal point correct is essential!

0.40"

*There is a large water difference between
0.40 inches and 4.00 inches*

Photo: Denny Barnes

Please do not round up

*It is very important to record as accurately
to the nearest hundredth of an inch.*

*Please **do not** round up to the nearest tenth!*

*If you measured **0.98"** please record that amount.
Do not record it as **1.00"***

When should we take our observations?



7:00AM is preferred

Between 4:30AM and 9:30AM is OK

Other times are accepted.

Reading your Gauge

Here are the most common situations you will encounter



YOUR MOST COMMON OBSERVATION WILL BE ...

ZERO 0.00"

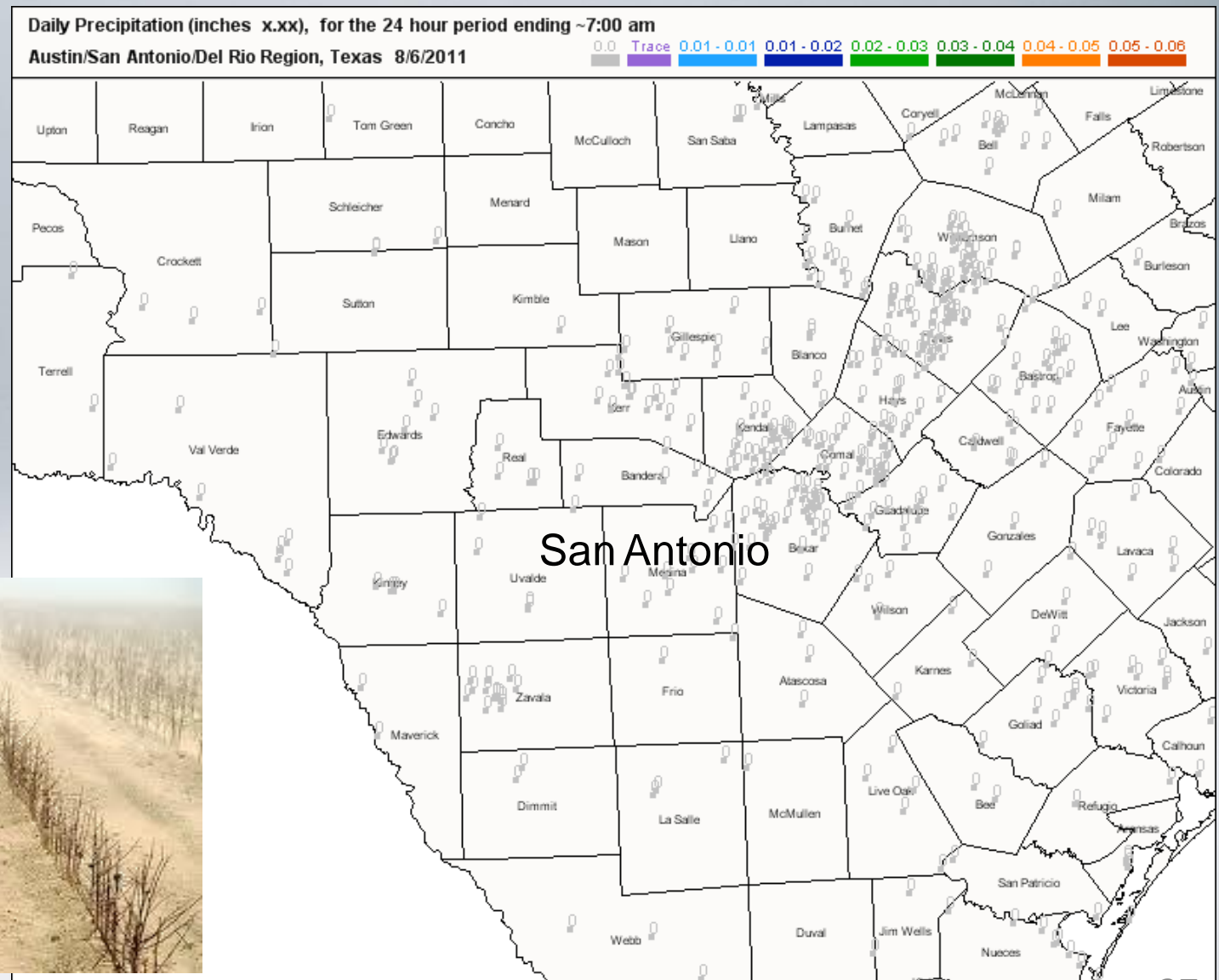
*It is important to know
where it did NOT rain.*

Please report zeros!



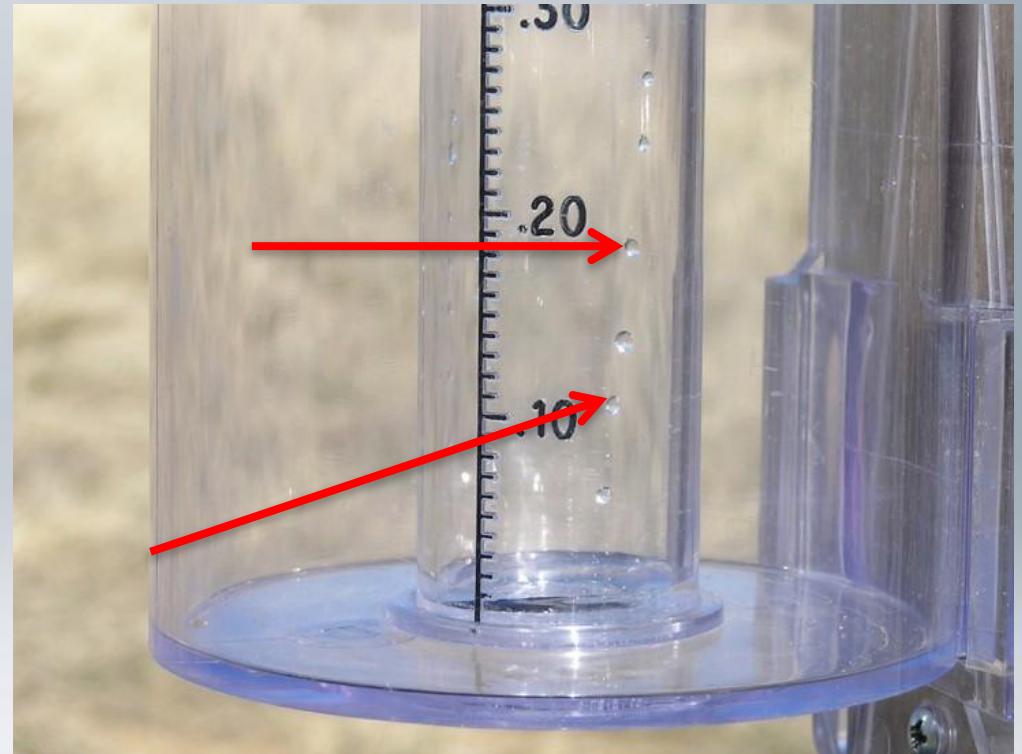
Texas Drought 2011

Reporting Zeros



Trace “T”

“When only a drop or two wet the gauge record “T” for Trace



Between “*T*” and
“*one tenth*” of
an inch

“That’s **0.04**” or four
hundredths



The Meniscus

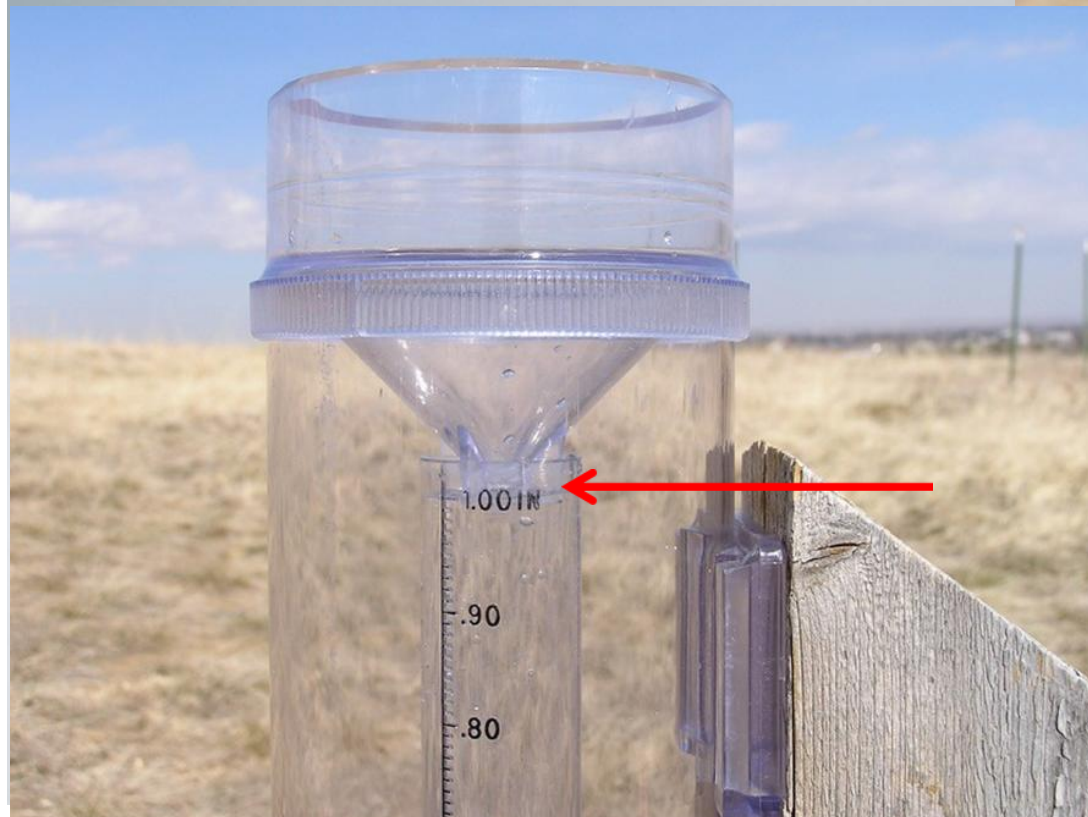
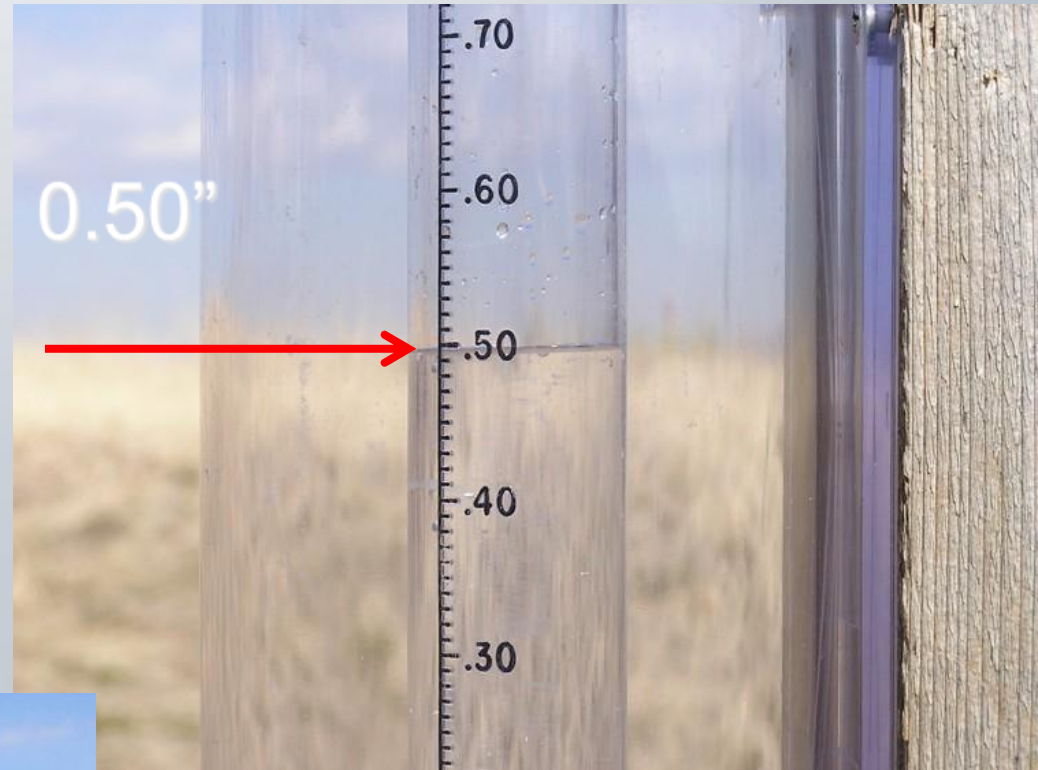
*The surface of the water in the gauge looks curved.
How do I know where to read?*

As water fills up the measuring tube, a curved surface is formed called a meniscus. It is formed by the surface tension of a liquid in contact with the sides of the tube.

Always read the bottom of the **meniscus**, when the making your daily rain measurements.



“This is “one half” inch and is recorded as 0.50”



*“This is “one inch”
and is recorded as
1.00”*

Lots of rain !!

When more than an inch of rain falls the precipitation will overflow into the outer cylinder.

The whole gauge has a capacity to hold eleven inches.



To measure greater than one inch . . .



Pour out the first inch from the inner tube and write it down.



Pour the remaining water into the funnel and measure the inner tube.



Continue until all of the water has been measured. Make sure you keep track of your measurements along the way.

Finally add up all of your measurements

1.00 inch
0.97 inches
0.88 inches
+ *0.92 inches*
Total = 3.77"





IF THERE IS VERY HEAVY RAIN OR SNOW FALLING



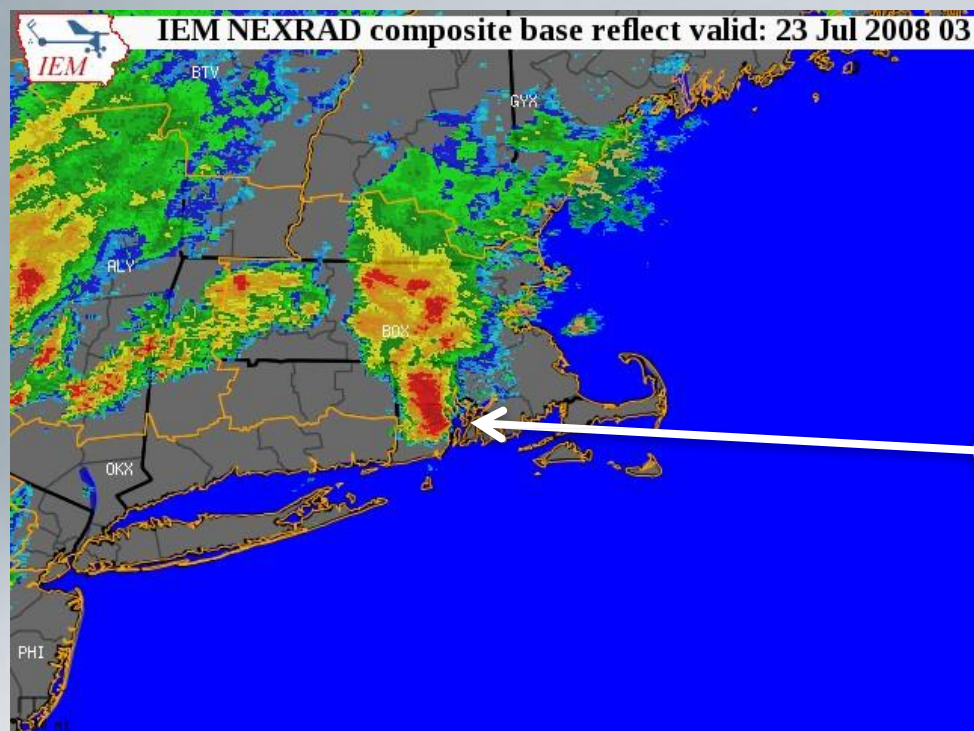
PLEASE submit a
“Significant Weather Report”
via the CoCoRaHS website -- ASAP

*Your report immediately goes to your
National Weather Service Office*

*Your report provides them with much
needed information to issue severe
weather statements such as flash flood
warnings and these can save lives!*

| Significant Weather Report | | Submit Data | Reset |
|--|---------|--|-------|
| Station Number : CO-LR-610 | | | |
| Station Name : Fort Collins 3.5 SW | | | |
| * Denotes Required Field | | | |
| 8/4/2014 | | *Observation Date | |
| 4:25 | PM | *Observation Time | |
| 35 | Minutes | Time duration that the report covers | |
|  Rain | | | |
| 2.45 | in. | New Rain and Melted Snow that has fallen during the report duration, in inches to the nearest hundredth | |
| 2.45 | in. | Total Precipitation, rain and melted snow, since storm began, in inches to the nearest hundredth | |
|  Snow | | | |
| | in. | Depth of New Snow that has fallen during the report duration, in inches to the nearest tenth | |
| | in. | Total depth of snow and ice on ground at the time of this observation to nearest half inch | |
| Additional Information | | | |

Significant Weather Reports



View Data : View Significant Weather Report

Significant Weather Report

| | |
|-------------------------------|-------------------|
| Station Number: | RI-WS-1 |
| Station Name: | Hope Valley 3.7 S |
| Date: | 7/23/2008 3:15 PM |
| Submitted | 7/23/2008 3:23 PM |
| Notes: | |
| Taken at Registered Location: | True |
| Precip Duration Minutes: | 15 |
| New Precip Amount: | 1.00 |
| Total Precip Amount: | NA |
| New Snow Depth: | NA |
| Total Snow Depth: | NA |
| Flooding: | No |

July 23, 2008 – “A CoCoRaHS observer in Hope Valley, RI provided an intense rainfall report which led to the issuance of a timely Flash Flood Warning. Life threatening urban flooding was reported in Warwick and Providence at the start of the evening rush hour, where several cars were stranded in more than 2 feet of water, requiring people to be rescued. Lead time would have been much less without the CoCoRaHS report.” - Joe Dellicarpini, NWS Taunton, MA

Observing Hail



If possible submit an

“On-Line Hail Report”

as soon as possible

(a hail pad is not required to submit a report)



*Your report goes right to the
National Weather Service.*

*It provides them with much
needed information to issue
severe weather statements.*

weather.gov

National Weather Service

Watches, Warnings & Advisories

Local weather forecast by "City, St" or zip code City, St

Special Weather Statement

SPECIAL WEATHER STATEMENT
NATIONAL WEATHER SERVICE HOUSTON/GALVESTON TX
225 PM CDT SAT OCT 3 2009

TXZ226-235-032015-
JACKSON-WHARTON-
225 PM CDT SAT OCT 3 2009

...SPECIAL WEATHER STATEMENT...

AT 222 PM CDT...NATIONAL WEATHER SERVICE DOPPLER RADAR INDICATED A STRONG THUNDERSTORM OVER EXTREME NORTHWESTERN JACKSON COUNTY...MOVING EAST SOUTHEAST AT 15 MPH.

HAIL UP TO ONE HALF INCH IN DIAMETER...BRIEF HEAVY DOWNPOURS...ARE POSSIBLE WITH THIS STORM.

Measuring Snow

“ Snow is good ”

- Nolan Doesken



Two ways in which snow is measured

Our observers measure:

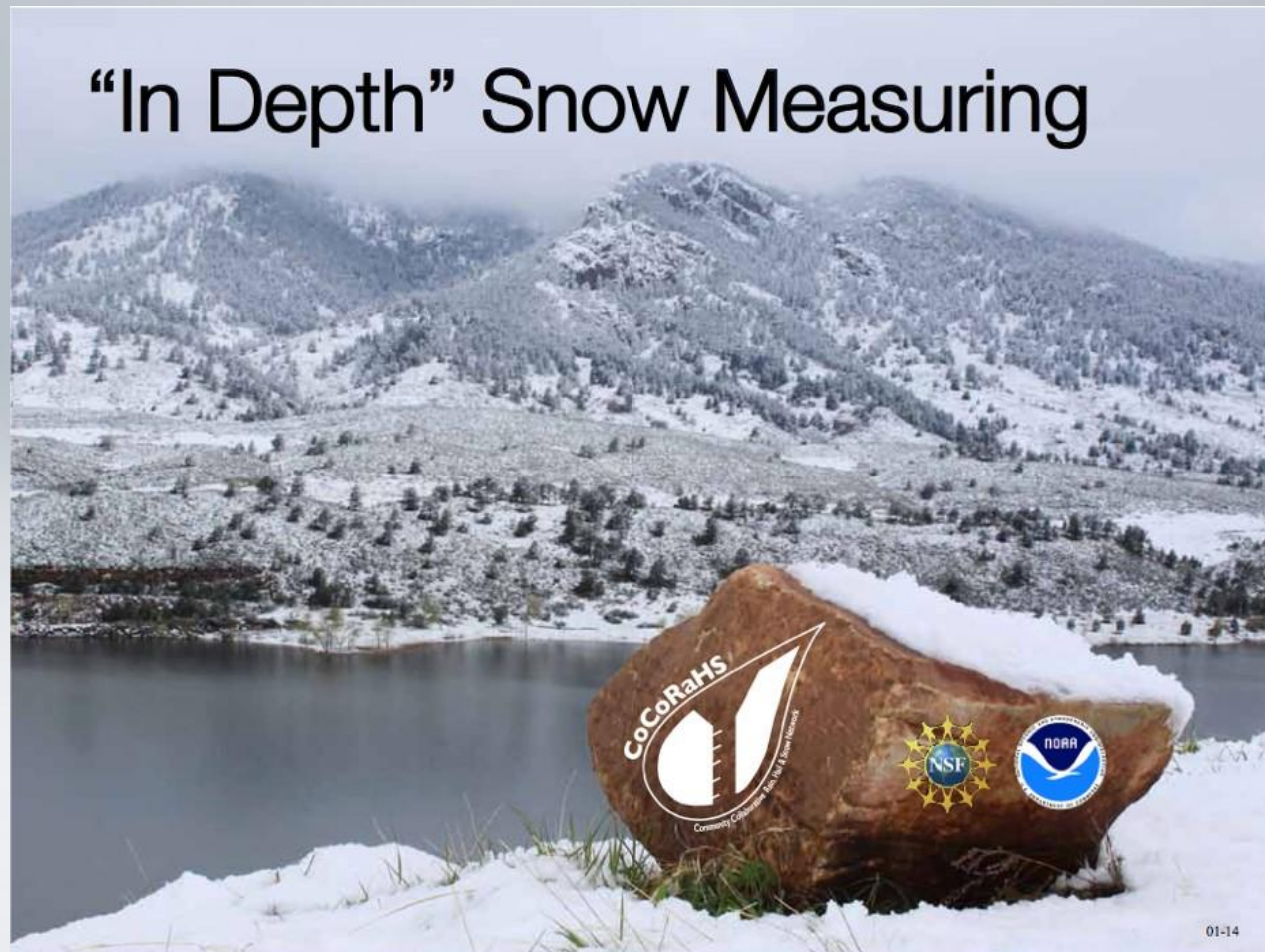
1. Liquid water content of snow
 - from the gauge
 - from a core sample
2. Depth of snow
 - 24 hour snowfall accumulation
 - existing snow depths



You can learn more about Snow Measurement
under the Training Slide Shows on
CoCoRaHS website.

www.cocorahs.org

“In Depth” Snow Measuring



Section II

Reporting Observations

My Data Entry : Daily Precipitation Report Form

Precipitation Report Form Submit Data Reset

Station Number : CO-LR-610

Station Name : Fort Collins 3.5 SW

* Denotes Required Field

* **Observation Date** ?

* **Observation Time** ?

in. * **Rain and Melted Snow to the nearest hundredth inch that has fallen in the gauge during the past 24 hours, or T for trace, or NA for unknown.** ?

Observation Notes: (This will be available to the public) ?

Quick thunderstorm dumped over a half of inch of rain.
Tree branches down do to windy conditions.

New Snowfall

in. **Accumulation of new snow in inches to the nearest tenth** ?

in. **Melted value from core to the nearest hundredth** ?


Total Snow and Ice on Ground at Observation Time

in. **Depth of total snow and ice (new and old) in inches to the nearest half inch** ?

in. **Melted value from core to the nearest hundredth** ?

www.cocorahs.org

The CoCoRaHS Web site



COMMUNITY COLLABORATIVE RAIN, HAIL & SNOW NETWORK
"Because every drop counts"

[Home](#) | [Countries](#) | [States](#) | [View Data](#) | [Maps](#) | [My Data](#) | [My Account](#) | [Admin](#) | [Logout](#)

[e](#) [f](#) [t](#) [v](#)

Welcome to CoCoRaHS! "Volunteers working together to measure precipitation across the nations."

Main Menu

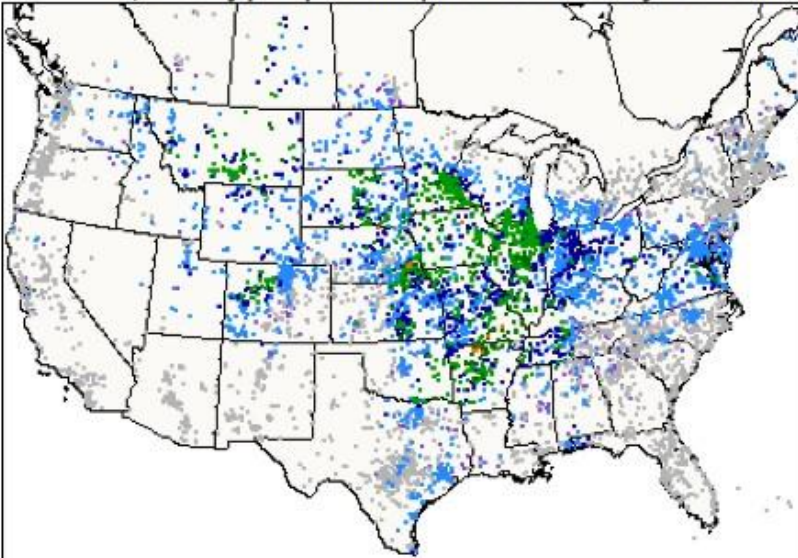
- [Home](#)
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Resources

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- [Education](#)
- [Training Slide-Shows](#)
- [Videos](#)
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- [Evapotranspiration](#)
- [Volunteer Coordinators](#)
- [Hail Pad](#)
- [Distribution/Drop-off](#)
- [Help Needed](#)
- [Printable Forms](#)
- [The Catch](#)
- [Message of the Day](#)


Who uses CoCoRaHS Observations?

9,362 daily precipitation reports received today as of 5/10/2016 5:03 PM EDT






Daily Precipitation (inches x.xx)
USA
5/10/2016


| |
|-------------|
| 0.0 |
| Trace |
| 0.00 - 0.25 |
| 0.26 - 0.50 |
| 0.51 - 1.26 |
| 1.27 - 3.02 |
| 3.03 - 4.53 |
| 4.54 - 5.04 |



TRAINING
SLIDE-SHOWS


Things to know about...

-  Rain
-  Hail
-  Snow

 Canada

YOUR DAILY “24 HOUR” OBSERVATION

Click on “My data” from the top menu bar



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Home | States | View Data | Maps | **My Data | My Account** | Admin | Logout

My Data Entry : Daily Precipitation Report Form

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Precipitation Report Form

[Submit Data](#) [Reset](#)

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Total Snow and Ice on Ground at Observation Time

in. **Depth of total snow and ice (new and old) in inches to the nearest half inch** ?

in. **Melted value from core to the nearest hundredth** ?

Duration Information

Enter the total precipitation measured in your gauge.
Record your measurement in hundredths (0.00")



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You can enter comments under “notes”

These are very helpful to augment your observation



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Precipitation Report Form [Submit Data](#) [Reset](#)

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Total Snow and Ice on Ground at Observation Time


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Duration Information

Submit your report

Click “Submit Data” and your observation is recorded on our site



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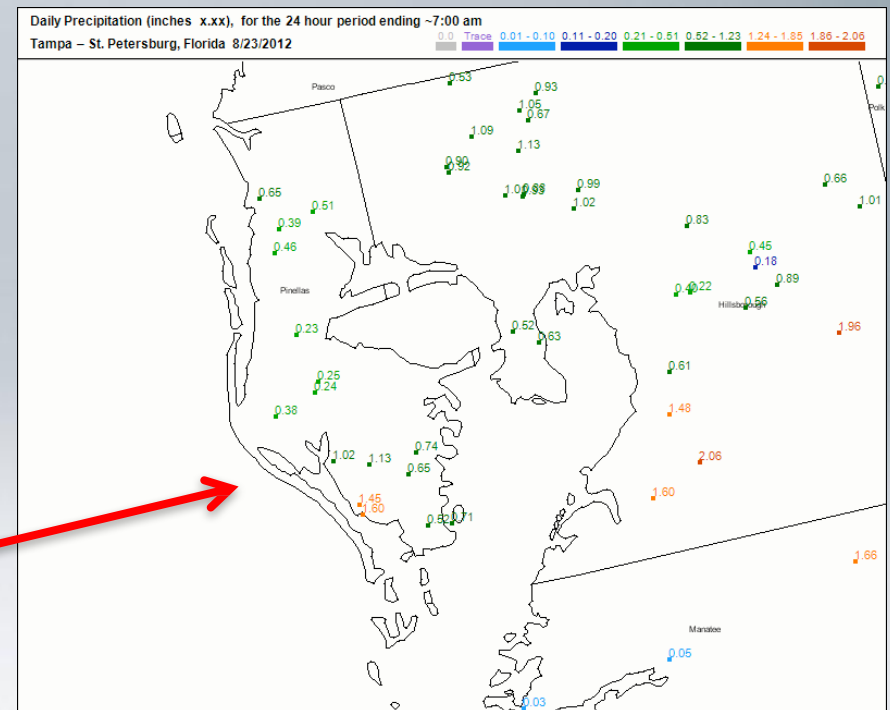
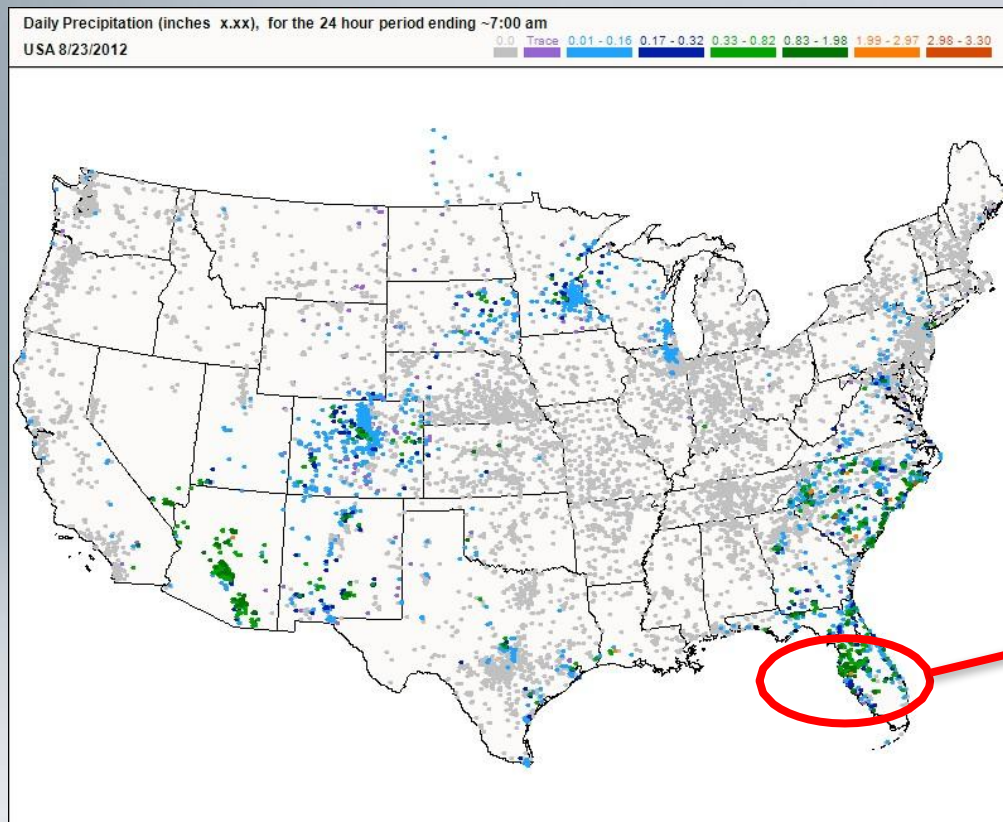
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Duration Information


To see your Observation on our maps

Click on your state from our main page and then click on your county



Observations are available (and sortable) in table form by clicking on “View Data” from the main menu.

Re-entering an erroneous report



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FROST Reports




















- [Optics](#)
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My Data Entry : List My Daily Precipitation Reports

US Units ▾

Showing 1 - 50 of 2079 Records.

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Page 1 ▾
[Next>](#)

| Date ▲ | Time | Station Number | Station Name | Total Precip In. | New Snow In. | Total Snow In. | State | County | Actions |
|-----------|---------|----------------|---------------------|------------------|--------------|----------------|-------|---------|---|
| 5/28/2014 | 7:00 AM | CO-LR-610 | Fort Collins 3.5 SW | 0.11 | NA | NA | CO | Larimer |  |
| 5/27/2014 | 7:00 AM | CO-LR-610 | Fort Collins 3.5 SW | 0.02 | NA | NA | CO | Larimer |  |
| 5/26/2014 | 7:00 AM | CO-LR-610 | Fort Collins 3.5 SW | 0.10 | NA | NA | CO | Larimer |  |
| 5/25/2014 | 7:00 AM | CO-LR-610 | Fort Collins 3.5 SW | T | NA | NA | CO | Larimer |  |
| 5/24/2014 | 7:00 AM | CO-LR-610 | Fort Collins 3.5 SW | 0.66 | NA | NA | CO | Larimer |  |
| 5/22/2014 | 7:00 AM | CO-LR-610 | Fort Collins 3.5 SW | 0.36 | NA | NA | CO | Larimer |  |
| 5/18/2014 | 7:00 AM | CO-LR-610 | Fort Collins 3.5 SW | T | NA | NA | CO | Larimer |  |
| 5/17/2014 | 7:00 AM | CO-LR-610 | Fort Collins 3.5 SW | 0.10 | NA | NA | CO | Larimer |  |
| 5/13/2014 | 7:00 AM | CO-LR-610 | Fort Collins 3.5 SW | 0.00 | NA | NA | CO | Larimer |  |
| 5/12/2014 | 7:00 AM | CO-LR-610 | Fort Collins 3.5 SW | 0.82 | NA | NA | CO | Larimer |  |
| 5/11/2014 | 8:00 AM | CO-LR-610 | Fort Collins 3.5 SW | 1.20 | 1.0 | NA | CO | Larimer |  |
| 5/9/2014 | 7:00 AM | CO-LR-610 | Fort Collins 3.5 SW | 0.17 | NA | NA | CO | Larimer |  |
| 5/8/2014 | 7:00 AM | CO-LR-610 | Fort Collins 3.5 SW | 1.08 | NA | NA | CO | Larimer |  |
| 5/7/2014 | 7:00 AM | CO-LR-610 | Fort Collins 3.5 SW | 0.03 | NA | NA | CO | Larimer |  |
| 5/6/2014 | 7:00 AM | CO-LR-610 | Fort Collins 3.5 SW | 0.00 | 0.0 | NA | CO | Larimer |  |
| 5/5/2014 | 7:00 AM | CO-LR-610 | Fort Collins 3.5 SW | 0.00 | 0.0 | NA | CO | Larimer |  |
| 5/4/2014 | 7:00 AM | CO-LR-610 | Fort Collins 3.5 SW | 0.00 | 0.0 | NA | CO | Larimer |  |
| 5/3/2014 | 7:00 AM | CO-LR-610 | Fort Collins 3.5 SW | 0.00 | 0.0 | NA | CO | Larimer |  |
| 5/2/2014 | 7:00 AM | CO-LR-610 | Fort Collins 3.5 SW | 0.00 | 0.0 | NA | CO | Larimer |  |

Other Important Reports


Hail Report

Significant Weather Report (Rain and Snow)

Monthly Zeros

Multi-Day Precipitation Report

Hail Report



COMMUNITY COLLABORATIVE RAIN, HAIL & SNOW NETWORK
"Because every drop counts"

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Hail Report Form

[Submit Data](#) [Reset](#)

Station Number : CO-LR-610

Station Name : Fort Collins 3.5 SW

* Denotes Required Field

***Date of Hail Storm** ?

***Time Hail Storm Began** ?

☒ Yes ☐ No **Report was taken at registered location?**

Size of hailstones

Smallest:

Average:

Largest:

Hail Lasted

Minutes This time is accurate within

Hailfall was: ☒ Continuous ☐ Intermittent

Hailstones were:

(Check all that apply)

☒ Hard ☐ Soft ☐ Mixed (Hard & Soft) ☐ Clear Ice ☐ White Ice

Was there more rain than hail? ☐ Yes ☐ No


Hail Started:

☒ Before rain ☐ After rain ☐ Same time as rain

Largest Hail Started

☐ Before smaller hail ☒ After smaller hail ☐ Same time as smaller hail

Monthly Zeros Report



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Monthly Zeros

SubmitReset

Station Number : CO-LR-610Station Name : Fort Collins 3.5 SW

≤

May 2014

≥

| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|--|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|--|--|
| 27 | 28 | 29 | 30 | 1 | 2 | 3 |
| | | | | Precip: 0 | <input checked="" type="checkbox"/> 0.0 Precip | <input checked="" type="checkbox"/> 0.0 Precip |
| 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| <input checked="" type="checkbox"/> 0.0 Precip | Precip: 0 | Precip: 0 | Precip: 0.03 | Precip: 1.08 | | |
| 11 | 12 | 13 | 14 | 15 | | |
| Precip: 1.20 | Precip: 0.82 | Precip: 0 | <input type="checkbox"/> 0.0 Precip | <input type="checkbox"/> 0.0 Precip | | |
| 18 | 19 | 20 | 21 | 22 | | |
| Precip: T | <input type="checkbox"/> 0.0 Precip | <input type="checkbox"/> 0.0 Precip | <input type="checkbox"/> 0.0 Precip | Precip: 0.36 | | |
| 25 | 26 | 27 | 28 | 29 | | |
| Precip: T | Precip: 0.10 | Precip: 0.02 | Precip: 0.11 | <input type="checkbox"/> 0.0 Precip | | |
| 1 | 2 | 3 | 4 | 5 | | |

Monthly Zeros

SubmitReset

Station Number : CO-LR-610Station Name : Fort Collins 3.5 SW

≤

May 2014

≥


| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|--|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|--|--|
| 27 | 28 | 29 | 30 | 1 | 2 | 3 |
| | | | | Precip: 0 | <input checked="" type="checkbox"/> 0.0 Precip | <input checked="" type="checkbox"/> 0.0 Precip |
| 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| <input checked="" type="checkbox"/> 0.0 Precip | Precip: 0 | Precip: 0 | Precip: 0.03 | Precip: 1.08 | Precip: 0.17 | <input type="checkbox"/> 0.0 Precip |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| Precip: 1.20 | Precip: 0.82 | Precip: 0 | <input type="checkbox"/> 0.0 Precip | <input type="checkbox"/> 0.0 Precip | <input type="checkbox"/> 0.0 Precip | Precip: 0.10 |
| 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| Precip: T | <input type="checkbox"/> 0.0 Precip | <input type="checkbox"/> 0.0 Precip | <input type="checkbox"/> 0.0 Precip | Precip: 0.36 | <input type="checkbox"/> 0.0 Precip | Precip: 0.66 |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 |
| Precip: T | Precip: 0.10 | Precip: 0.02 | Precip: 0.11 | <input type="checkbox"/> 0.0 Precip | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Click a empty box and it will automatically fill in a zero (0.00") for that day.

Don't forget to hit submit.

Significant Weather Report

(both rain and snow)



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Significant Weather Report

Submit Data Reset

Station Number : CO-LR-610

Station Name : Fort Collins 3.5 SW

* Denotes Required Field

***Observation Date**

***Observation Time**

Time duration that the report covers

Rain

in. **New Rain and Melted Snow that has fallen during the report duration, in inches to the nearest hundredth**

in. **Total Precipitation, rain and melted snow, since storm began, in inches to the nearest hundredth**

Snow

in. **Depth of New Snow that has fallen during the report duration, in inches to the nearest tenth**

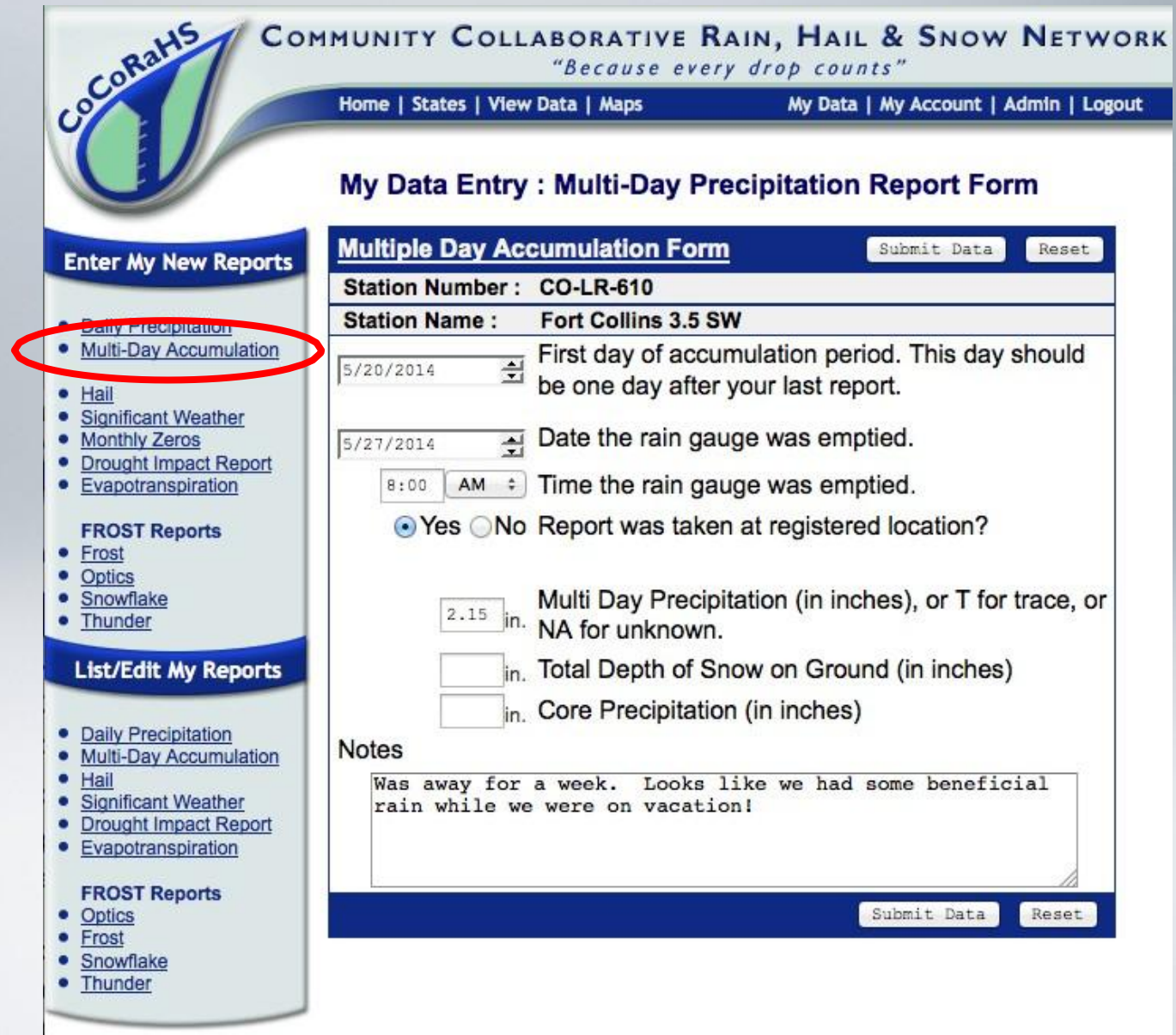
in. **Total depth of snow and ice on ground at the time of this observation to nearest half inch**

Multi-Day Precipitation Form

If you are away on vacation or out of town this is the form for you.

Just put in the dates that you were gone and record what you found in the gauge.

There is no need to file an additional daily report.



CoCoRaHS COMMUNITY COLLABORATIVE RAIN, HAIL & SNOW NETWORK
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My Data Entry : Multi-Day Precipitation Report Form

Multiple Day Accumulation Form

Submit Data Reset

Station Number : CO-LR-610

Station Name : Fort Collins 3.5 SW

5/20/2014 First day of accumulation period. This day should be one day after your last report.

5/27/2014 Date the rain gauge was emptied.

8:00 AM Time the rain gauge was emptied.

☒ Yes ☐ No Report was taken at registered location?

2.15 in. Multi Day Precipitation (in inches), or T for trace, or NA for unknown.

in. Total Depth of Snow on Ground (in inches)

in. Core Precipitation (in inches)

Notes

Was away for a week. Looks like we had some beneficial rain while we were on vacation!

Submit Data Reset

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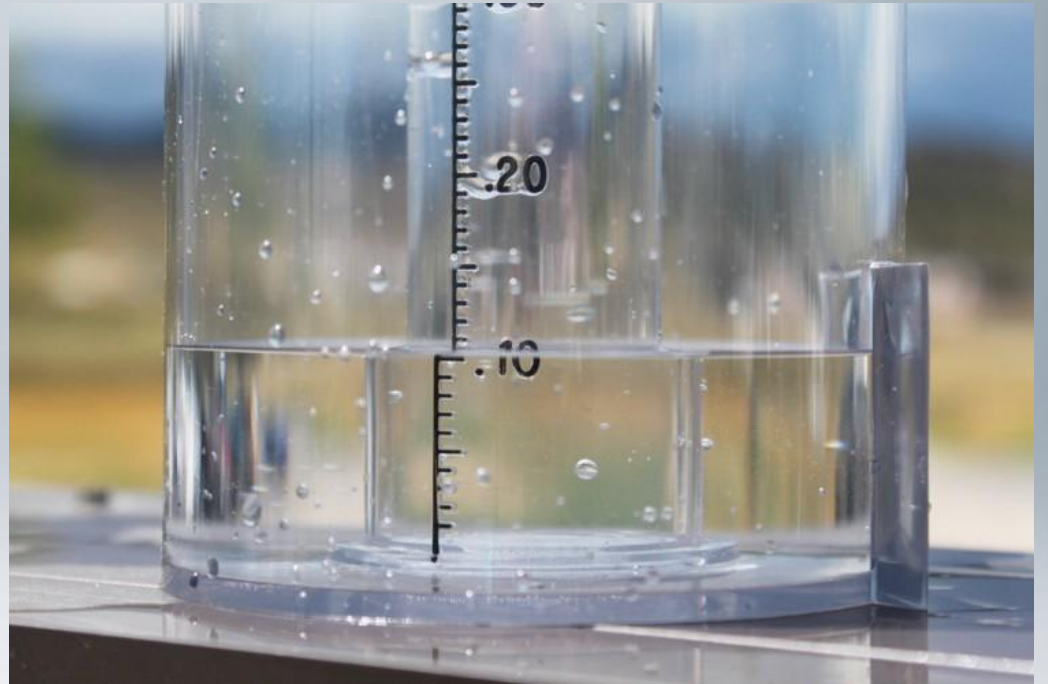
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Section III

Frequently asked questions



Do I have to be home everyday
to participate in CoCoRaHS?



Answer: *No. Report when you are able. If you are gone, you may leave your gauge outside and report a multi-day total when you return*

What if it hails when I'm not home ?



Answer: *We still would like your hail pad. Report as much info as you can find out from friends and neighbors.*

Do I report morning dew that has collected in my rain gauge?



Photo: Tanya Phillips

Answer: *No. Dew is not precipitation, but you may note the dew in the comments*

How long is my commitment to CoCoRaHS ?



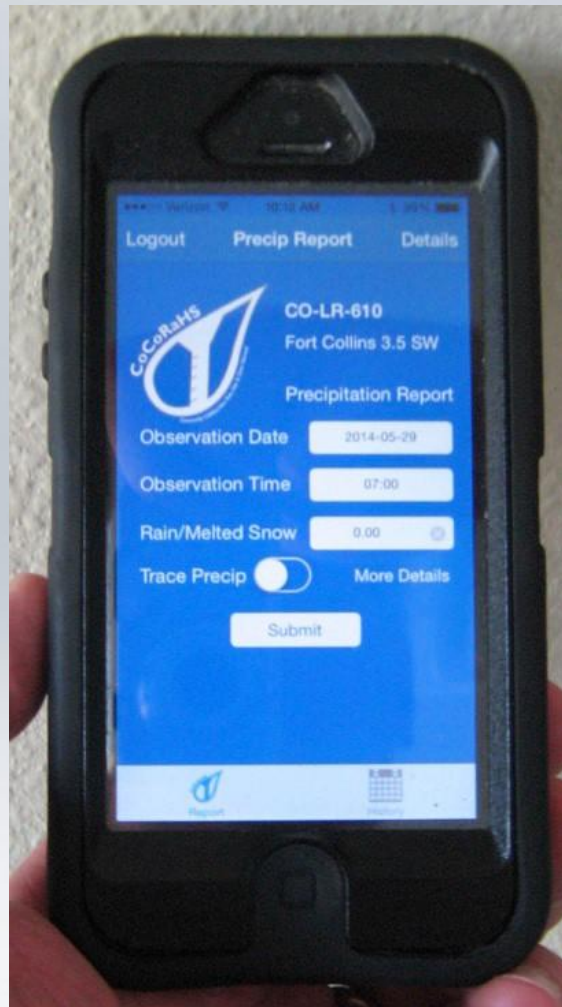
Answer: *Ideally, at least one season, but the longer you contribute, the more valuable the data become.*

I have an automated weather station with a rain gauge. Can I use that instead of the CoCoRaHS gauge?



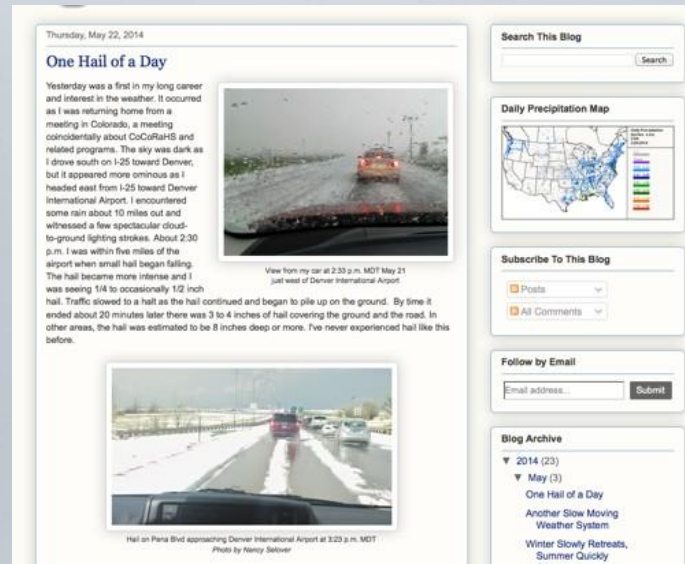
Answer: *In order to accurately compare CoCoRaHS reports, all observers must use the 4-inch CoCoRaHS gauge. Automated rain gauges tend to underestimate a heavy rainfall and do not accurately measure water content of snow. You are welcome to place the automated gauge beside the 4-inch gauge to compare measurements, but report what falls in the 4-inch gauge.*

Can I file my observations on my mobile device?



Answer: Yes, a CoCoRaHS app is available for both the iPhone and Android Phone

Where can I go for additional resources?



Answer: CoCoRaHS has a variety of resources to connect to from its homepage. There are educational YouTube videos, the CoCoRaHS Blog, Messages of the Day, State Newsletters, Measuring Evapotranspiration and a climate guide for Master Gardeners just to name a few. You can also connect to CoCoRaHS via social media such as Facebook and Twitter.

You are now ready to measure precipitation
for the CoCoRaHS Network



Thanks for joining this evening!

Bel Melendez
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