Training Slide-Show

CoCoRaHS

Community Collaborative Rain, Hail & Snow Network

"Because every drop counts!"

Version 6.5

What Is CoCoRaHS??

"CoCoRaHS is a grassroots, non-profit, community-based, high-density precipitation network

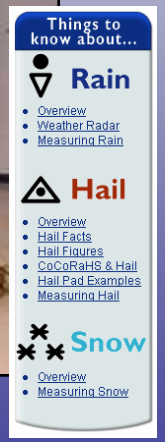
made up of volunteers of all backgrounds and ages . . .

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

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

4-inch diameter
high capacity rain gauges

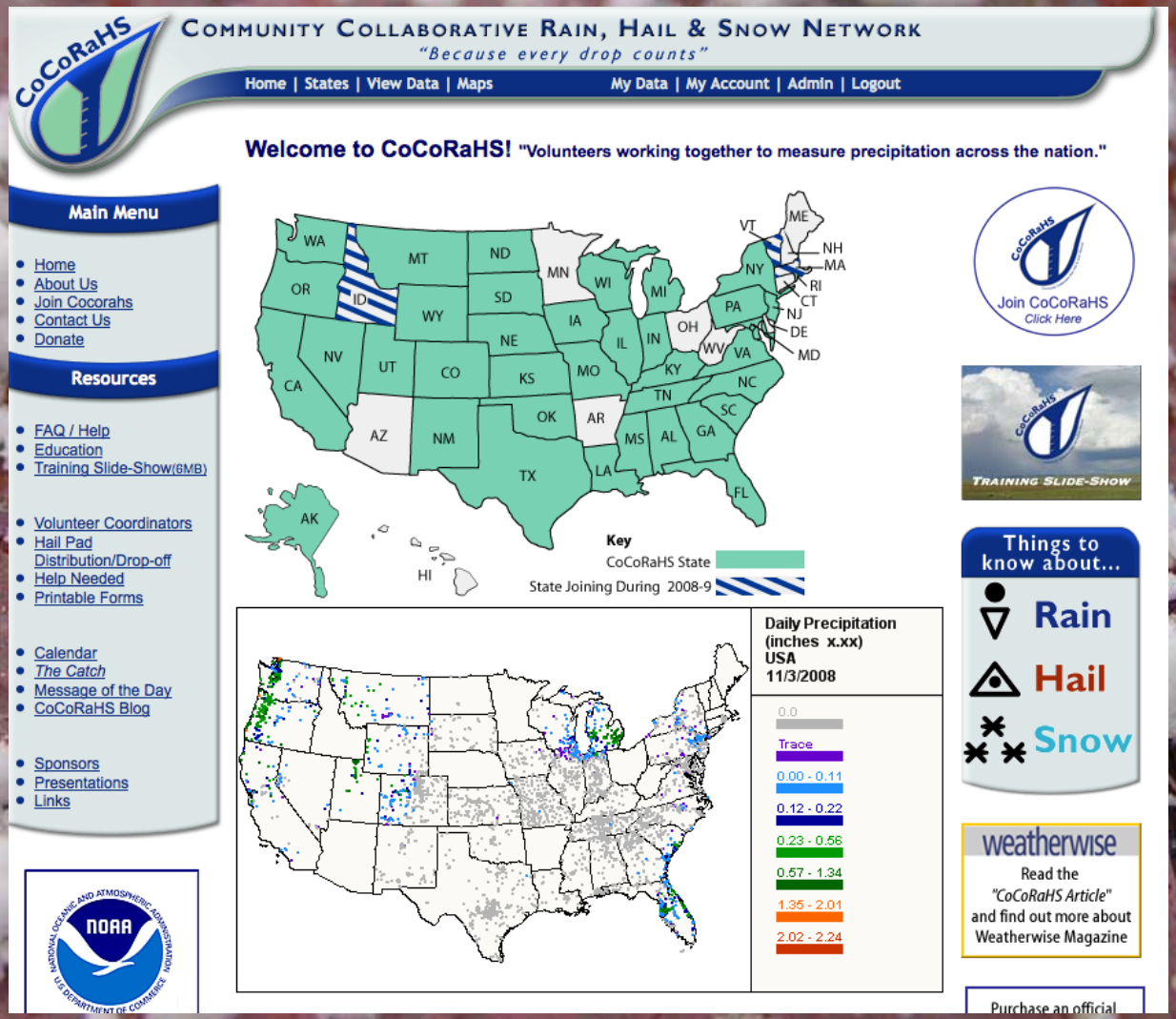
Aluminum foil-wrapped
Styrofoam hail pads



Training is important to assure accurate, high quality data

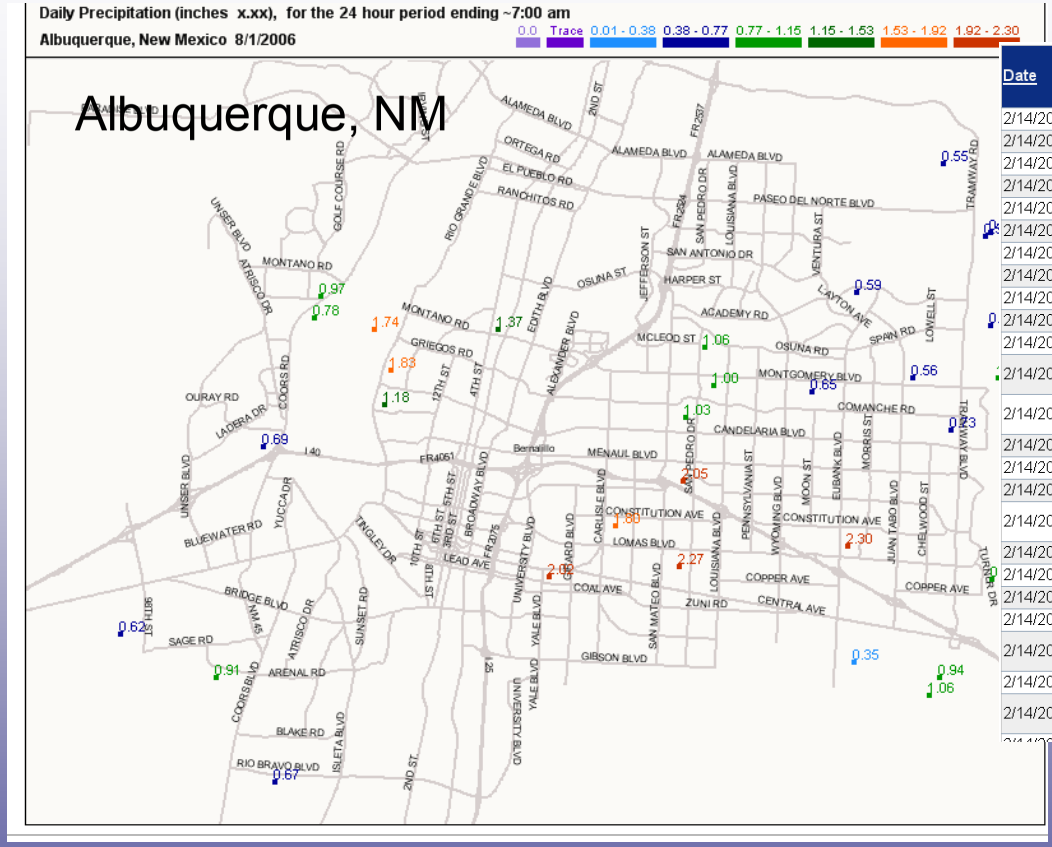
CoCoRaHS

Volunteers report their daily observations on our interactive Web site: **www.cocorahs.org**



CoCoRaHS's main focus is to provide:

quality precipitation *data* . . .



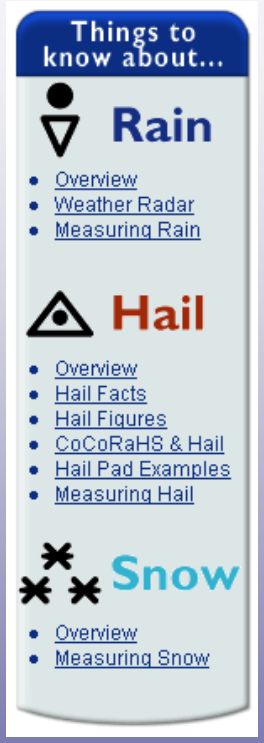
Daily precipitation maps:
Rainfall, Hail and Snowfall

Date	Time	Station Number	Station Name	Total Precip .in	New Snow .in	Total Snow .in	State	County	View
2/14/2007	7:00 AM	MD-GR-1	Mc Henry 4.0 SSE	2.85	6.7	12.5	MD	Garrett	
2/14/2007	11:59 PM	MD-MG-8	Gaithersburg 2 WNW	2.80	4.2	4.0	MD	Montgomery	
2/14/2007	10:00 AM	MD-CR-7	Westminster 1.0 W	2.10	5.5	5.5	MD	Carroll	
2/14/2007	7:40 AM	MD-MG-1	Montgomery Village 1.3 SSW	2.05	4.1	3.0	MD	Montgomery	
2/14/2007	5:44 AM	MD-WH-1	Williamsport 2.8 ENE	1.92	2.6	5.0	MD	Washington	
2/14/2007	7:15 AM	MD-CR-3	Mount Airy 0.2 SE	1.90	5.1	5.0	MD	Carroll	
2/14/2007	7:00 AM	MD-CR-6	Taneytown 3.2 NE	1.83	5.0	NA	MD	Carroll	
2/14/2007	7:00 AM	MD-HW-2	Sykesville 1.7 SSE	1.78	5.0	5.0	MD	Howard	
2/14/2007	7:00 AM	MD-HW-12	Sykesville 2.6 SE	1.61	0.0	NA	MD	Howard	
2/14/2007	8:00 AM	MD-MG-3	Potomac 0.9 NNW	1.54	3.2	NA	MD	Montgomery	
2/14/2007	7:00 AM	MD-MG-2	Redland 0.8 NNE	1.52	4.5	4.5	MD	Montgomery	
2/14/2007	7:00 AM	MD-PG-37	Brandywine 6.7 ESE	1.49	T	T	MD	Prince George's	
2/14/2007	7:00 AM	MD-PG-1	Bowie 0.5 E	1.47	1.0	1.5	MD	Prince George's	
2/14/2007	7:00 AM	MD-SM-3	Leonardtown 0.6 NE	1.42	0.0	NA	MD	St. Mary's	
2/14/2007	7:00 AM	MD-CH-7	Waldorf 3.2 SW	1.40	0.8	0.7	MD	Charles	
2/14/2007	7:00 AM	MD-HW-11	Columbia 1.7 W	1.40	3.2	3.5	MD	Howard	
2/14/2007	7:00 AM	MD-PG-7	Camp Springs 1.6 NNW	1.38	1.8	NA	MD	Prince George's	
2/14/2007	4:00 PM	MD-BL-7	White Hall 3.5 NE	1.38	NA	NA	MD	Baltimore	
2/14/2007	7:00 AM	MD-CV-1	Marlton 6.0 E	1.37	0.3	0.0	MD	Calvert	
2/14/2007	7:00 AM	MD-SM-4	Charlotte Hall 3.6 ENE	1.37	0.3	T	MD	St. Mary's	
2/14/2007	7:00 AM	MD-MG-24	White Oak 1.2 N	1.35	2.5	2.0	MD	Montgomery	
2/14/2007	7:00 AM	MD-PG-35	Brandywine 2.5 NNW	1.35	1.0	1.4	MD	Prince George's	
2/14/2007	7:00 AM	MD-WC-1	Vienna 11.3 SSW	1.35	0.0	NA	MD	Wicomico	
2/14/2007	7:00 AM	MD-PG-6	Friendly 1.0 N	1.32	2.4	1.8	MD	Prince George's	

Daily data
in table form

This data allows CoCoRaHS to supplement existing networks and provide many useful results to scientists, resource managers, decision makers and other end users on a timely basis.

. . . as well as *educational opportunities*

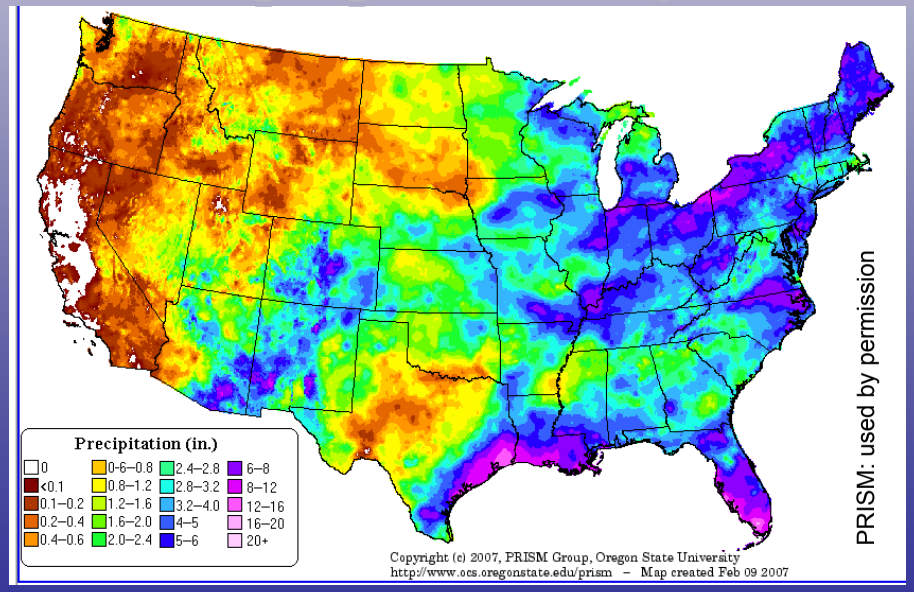


"Helping to provide the public with a better understanding of weather"

Why CoCoRaHS ??

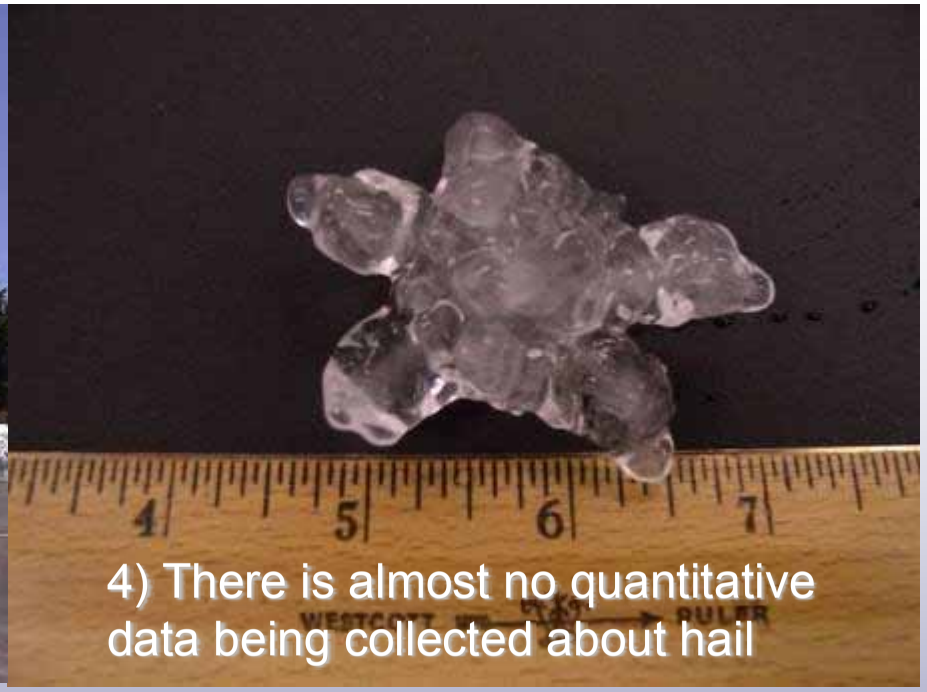
1) Precipitation is important and highly variable

2) Data sources are few and rain gauges are far apart



PRISM: used by permission

3) Measurements from many sources are not always accurate (especially snow)



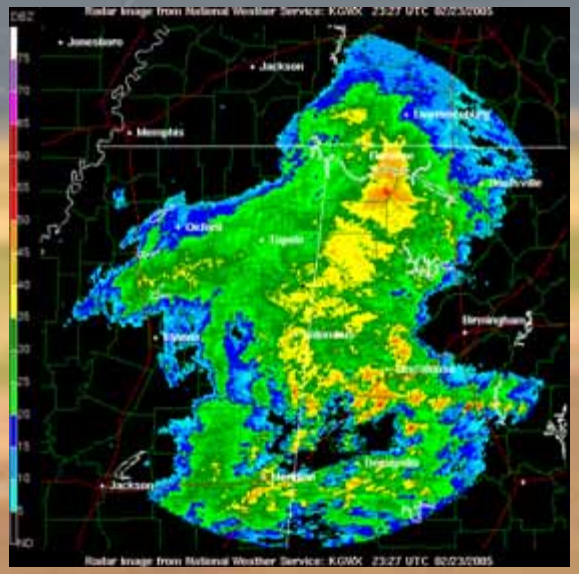
4) There is almost no quantitative data being collected about hail

5) Storm reports can save lives

CoCoRaHS data is used by many

- 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

- Teachers and Students
  - Geoscience education tool
  - Taking measurements
  - Analyzing data
  - Organizing results
  - Conducting research
  - Helping the community



Who Sponsors CoCoRaHS?

The National Oceanic and Atmospheric Administration

Colorado State University and other universities

USDA, BLM, Cooperative Extension

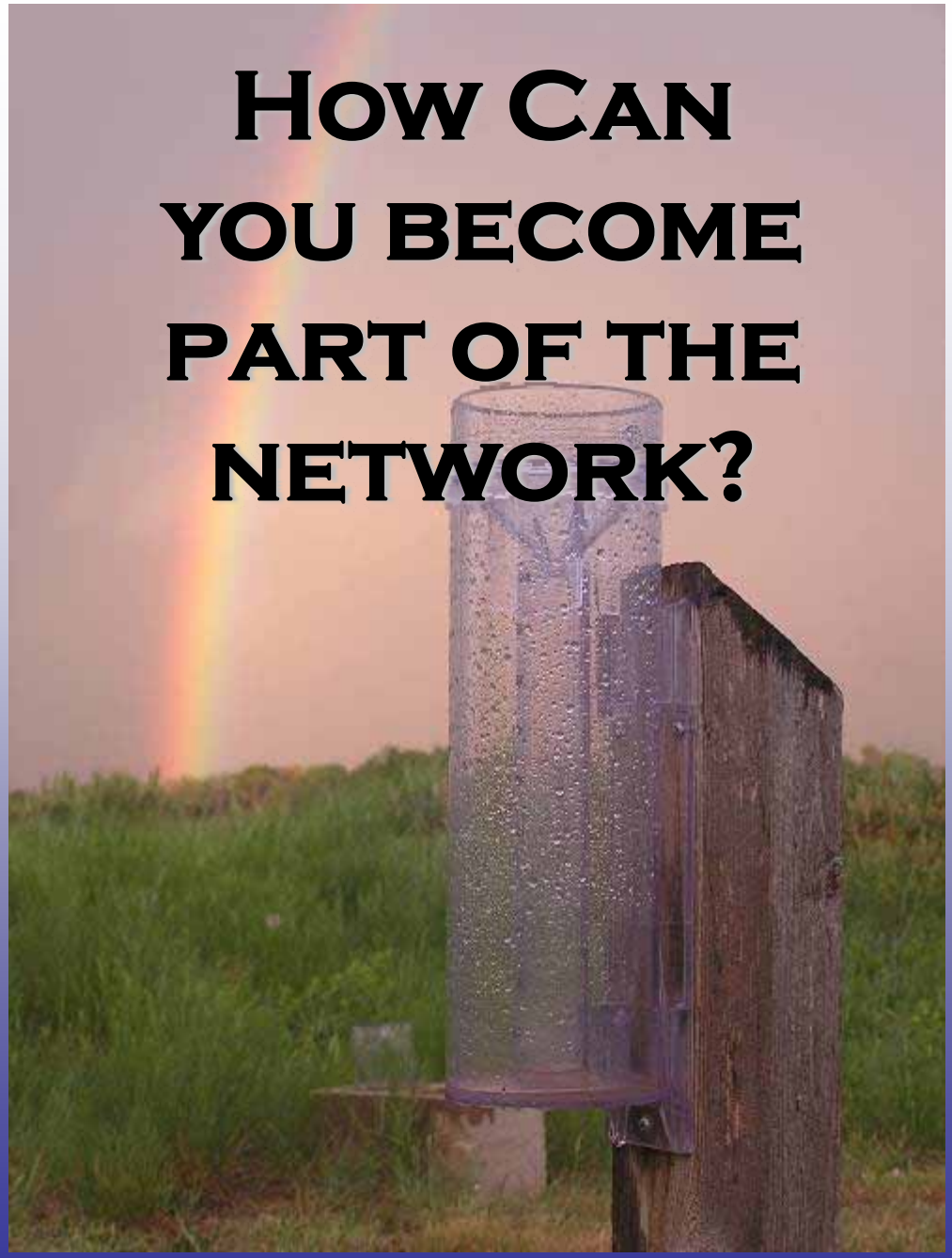
US Bureau of Reclamation

National Weather Service Local Offices

Individual Contributors

As well as many others

How Can you become part of the network?



Five easy steps

Simply sign-up on the CoCoRaHS web page ***www.cocorahs.org***

Obtain a 4" plastic rain gauge (info available on web site)

View the "training slide show" or attend a training session

Set-up the gauge in a "good" location in your backyard

Start observing precipitation and report on-line daily

SECTION ONE:

Setting Up Your Equipment and Observing Precipitation

In this section we will:

a) Show how/where to place your gauge and hail pad

b) Explain how to measure rainfall

c) Illustrate how to observe hail

d) Show how to measure snow depth and water content

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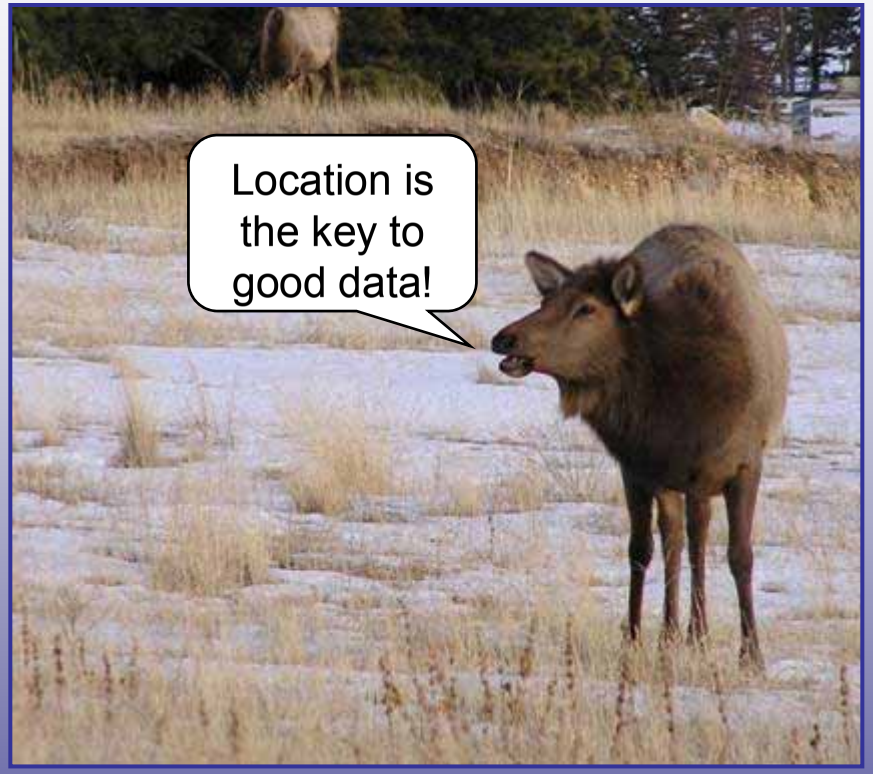
a) Placement of your rain gauge



Location! Location! Location!

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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!

Avoid placing it under trees or any structure

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

Also avoid placing your gauge near:

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Avoid anything that would artificially increase or decrease your gauge catch

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

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Ideal placement of your gauge

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.

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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

This is to improve gauge catch by reducing wind speed

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

This is to improve gauge catch by reducing the impact of nearby obstacles

LEVEL and BEVEL

Make sure your gauge is level

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

Hail Pad Placement

Where should I place my hail pad?

When you've found a good place for your rain gauge, that should be good enough for your hail pad as well.

Elevate and Attach

The pad must be horizontal.
It is best, but not necessary, to elevate the hail pad.
It should also be firmly attached so that . . .

. . . it doesn't blow away!

"When last seen, our hail pad was headed north at 3rd and Elm"

Write the direction the pad is facing on the pad's back

This example shows an "N" for North

b) Measuring Rainfall

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& Snow Network

When should we read our gauges?

7:00AM is preferred

Between 5:00AM and 9:00AM is OK

Other times are accepted, but they will not appear on CoCoRaHS Maps

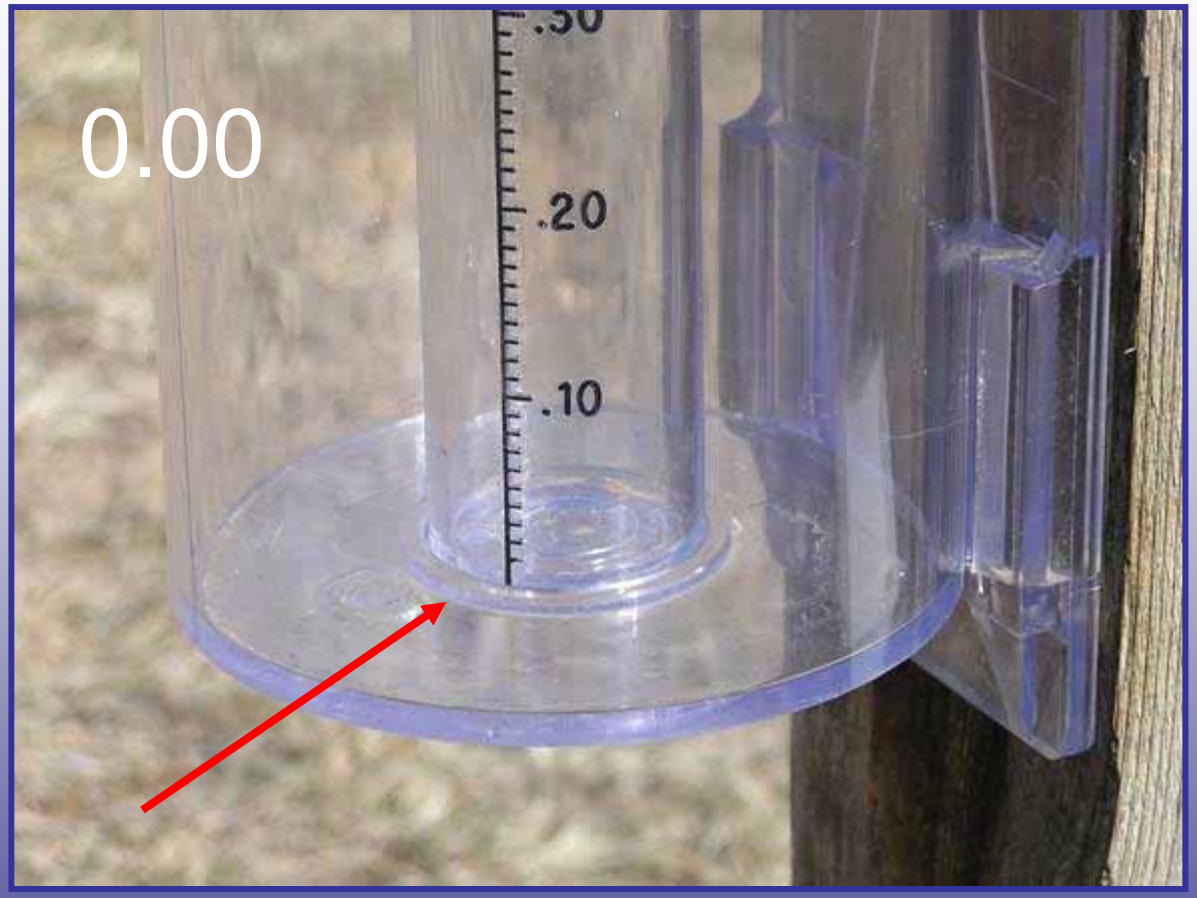
Photo by Henry Reges

Reading your rain gauge

- Reading the rain gauge is easy but accuracy & consistency are important.

- Here are the most common situations you may encounter when reading your gauge.

Your most common observation

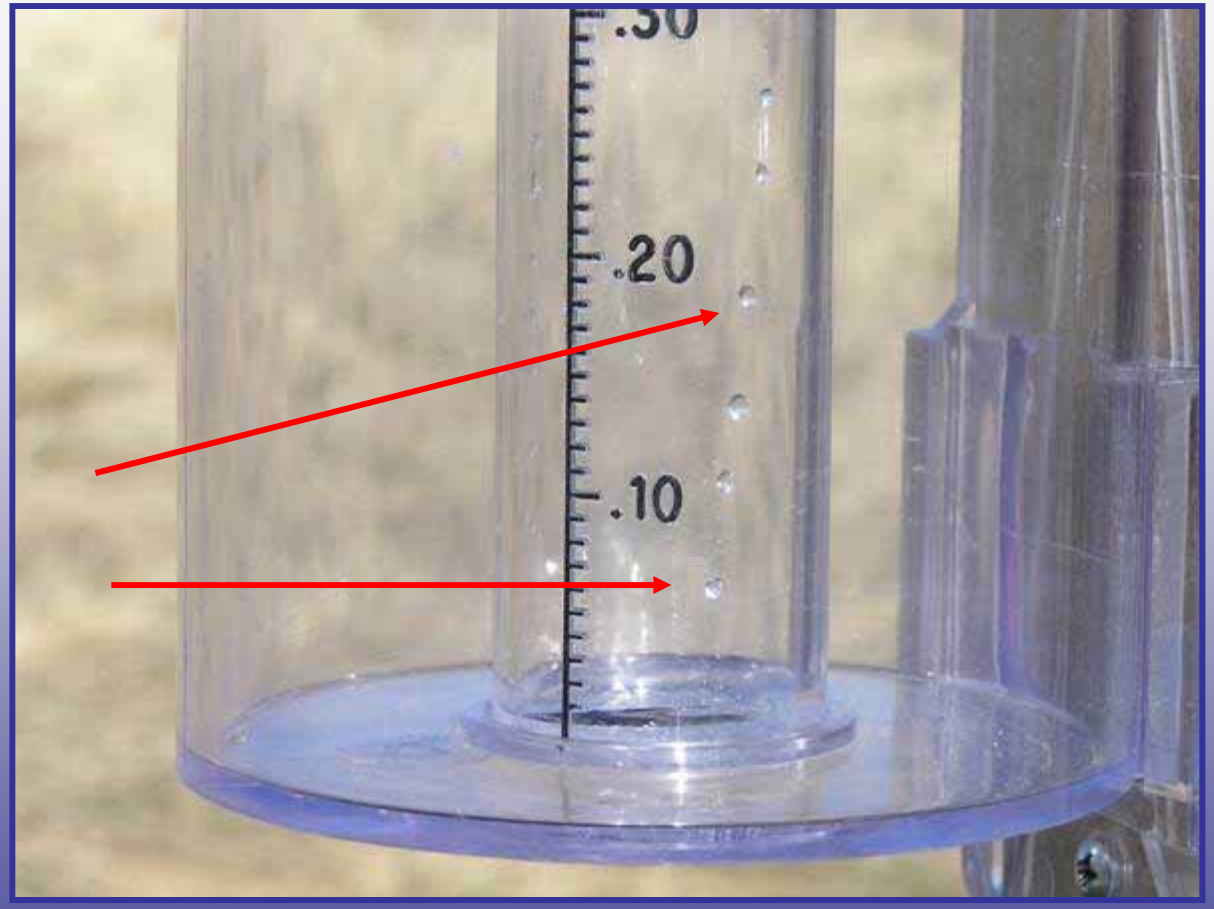


. . . will be zero, (0.00), nada, nothing, zilch!

It is important to know that it did NOT rain. Please report zeros!

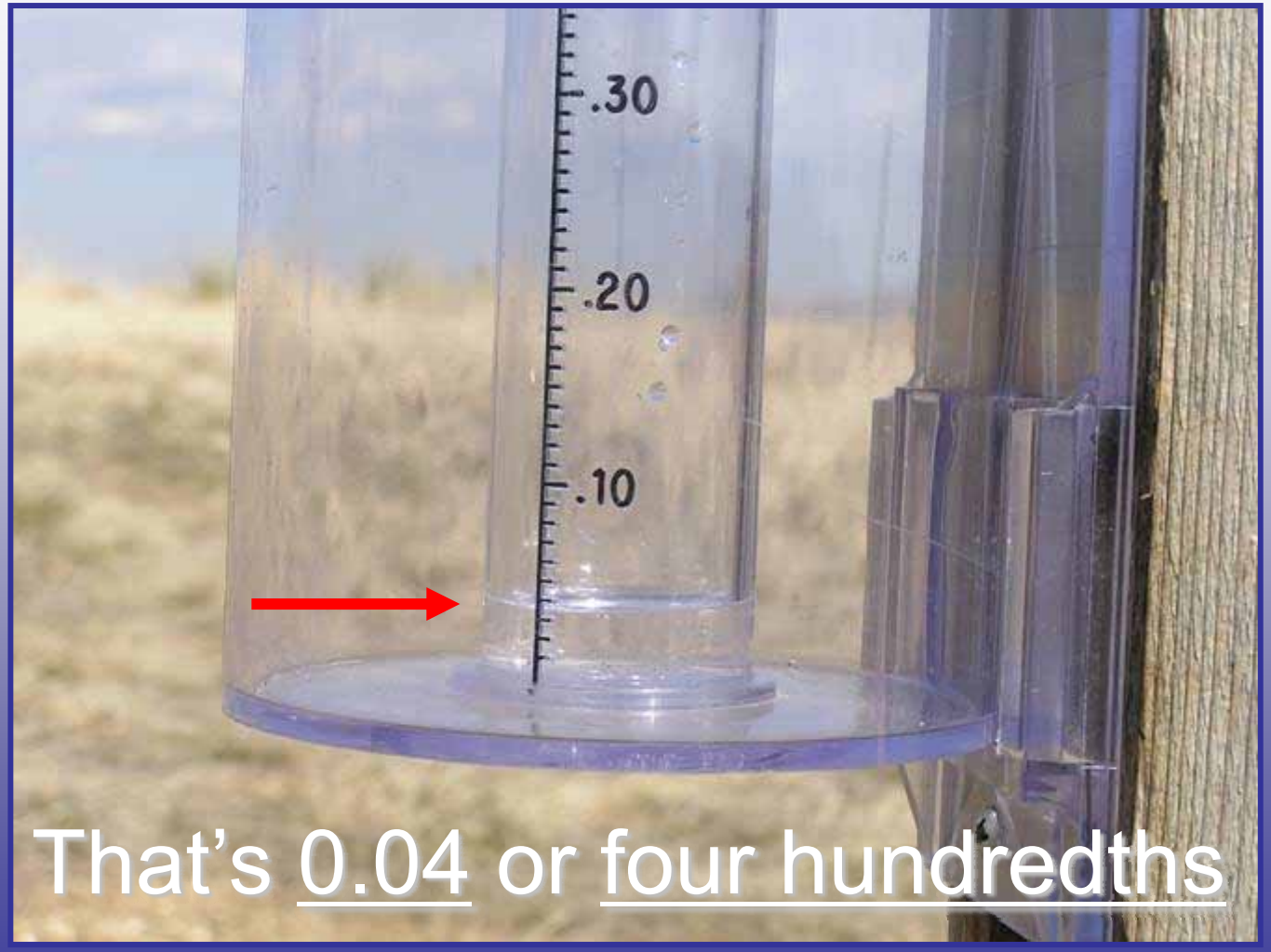
Trace “T”

T



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

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



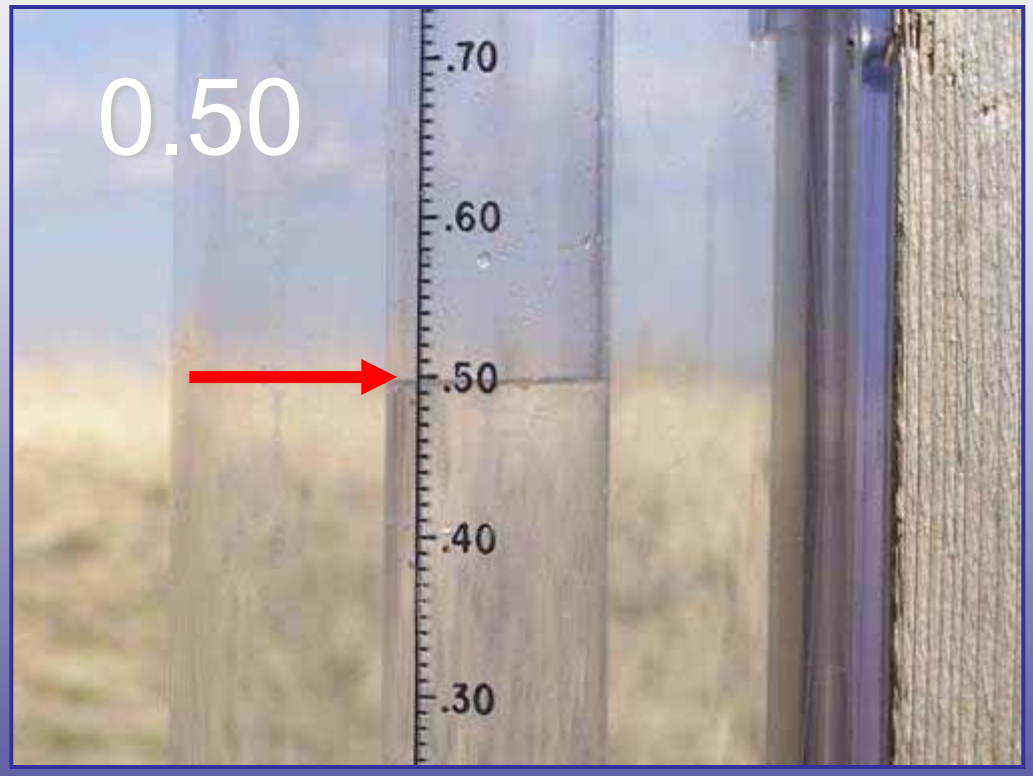
That’s 0.04 or four hundredths

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**. This meniscus is formed by the surface tension of a liquid in contact with the sides of the tube.

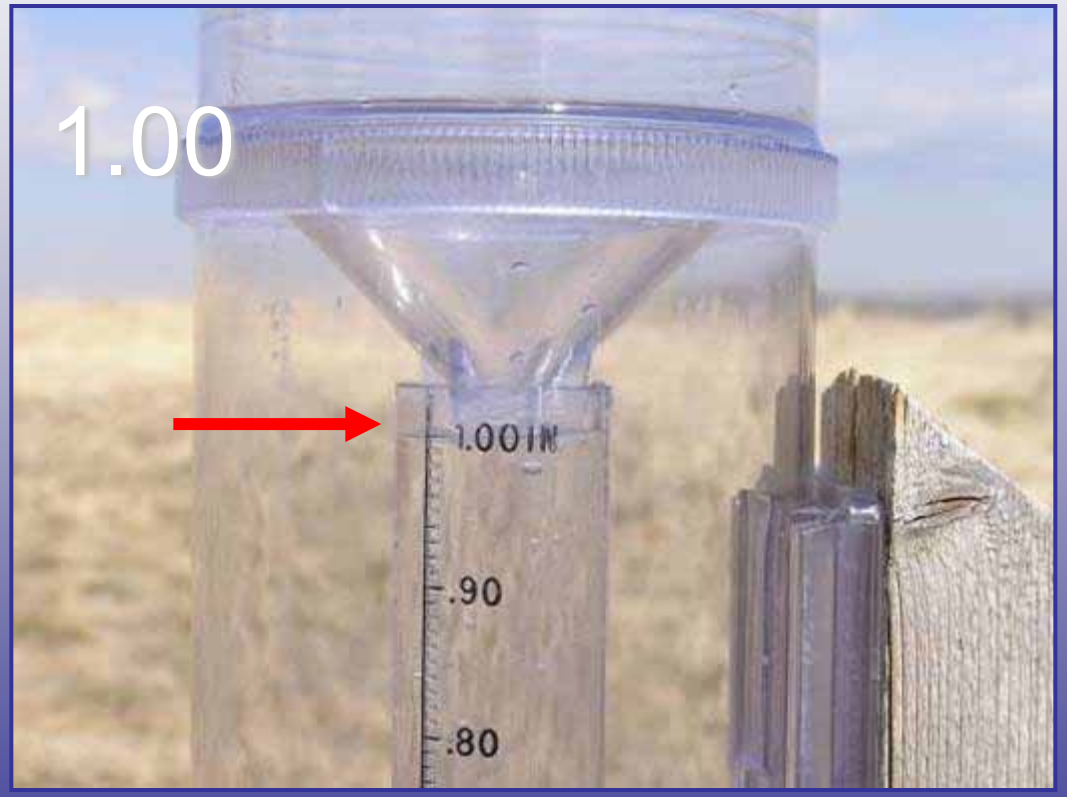
Always read the bottom of the **meniscus**, when the making your daily rain measurements.

A nice soaking rain



This is “one half” inch it’s . . . NOT 5.0, nor 0.05, but <u>0.50</u>
(kind of like 50 cents out of a dollar)

A good rain



The inner tube holds 1.00 inch

DECIMALS

Getting the decimal point correct is <u>ESSENTIAL</u>

0.40”

There is a large water difference between ***<u>0.40</u>*** inches and ***<u>4.00</u>*** inches

Photo by Henry Reges

Water! Water! Everywhere!

When more than an inch of rain falls the precipitation will overflow into the outer cylinder. The whole gauge has a capacity to hold 11 inches.

To measure greater than one inch . . .

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

Now pour the remaining water into the funnel & measure using the inner tube.

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

c) Observing Hail

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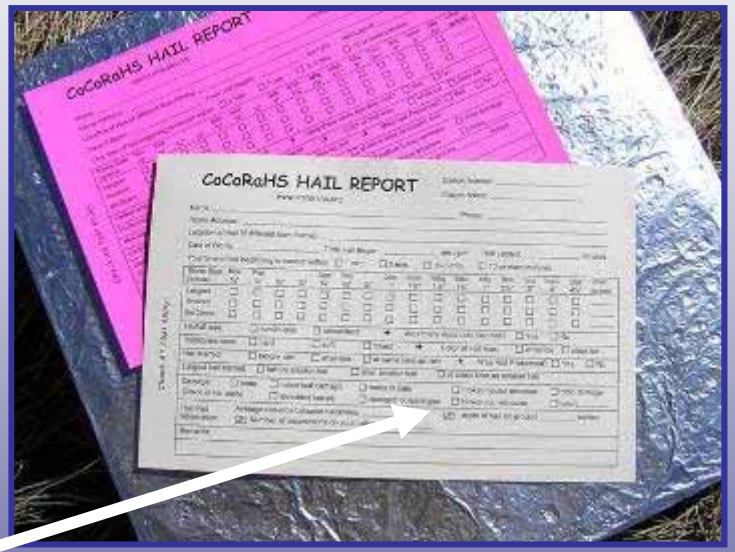
Three steps in
Observing hail

#1

As hail is falling



Fill out your CoCoRaHS Hail Report Card.
After the storm is over attach it the back of the pad.

#2 Fill out an on-line hail report

Submit an on-line hail report as soon as you can

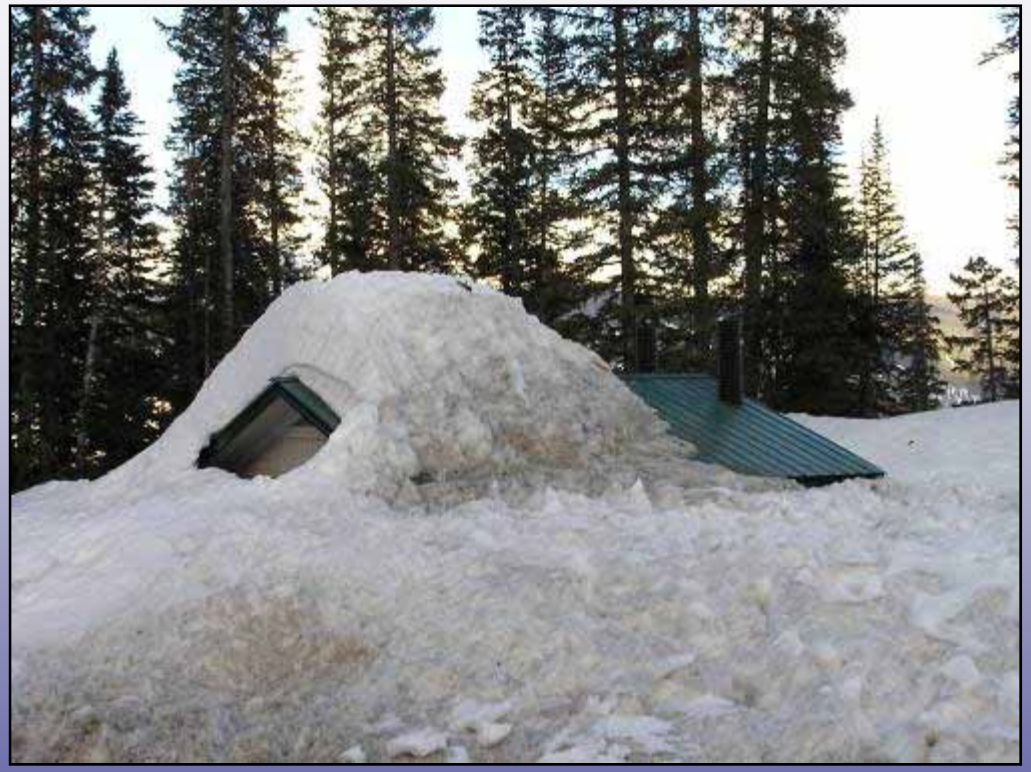
Your report goes right to the the National Weather Service and it may help them in issuing a "Severe Thunderstorm Warning".

#3

Drop off or send in your hail pad

Drop off your hail pad and pick up a new one at one of our drop off locations in your community (see the Web site for locations)

d) Measuring Snow



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If snow is anticipated . . .

Remove the funnel AND inner tube, otherwise snow will clog the funnel

There are two ways in which snow is measured:

1. Liquid water content
   - From the gauge
   - From a core sample

2. Depth of snow
   - 24 hour snowfall accumulation
   - Existing snow depths

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Measuring liquid water content from your gauge

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If you live in a protected area many times you will have an accumulation of snow on the rim of your gauge

How do I know what to measure and what not to??

Take your snow-swatter and tap gently on the rim of the gauge

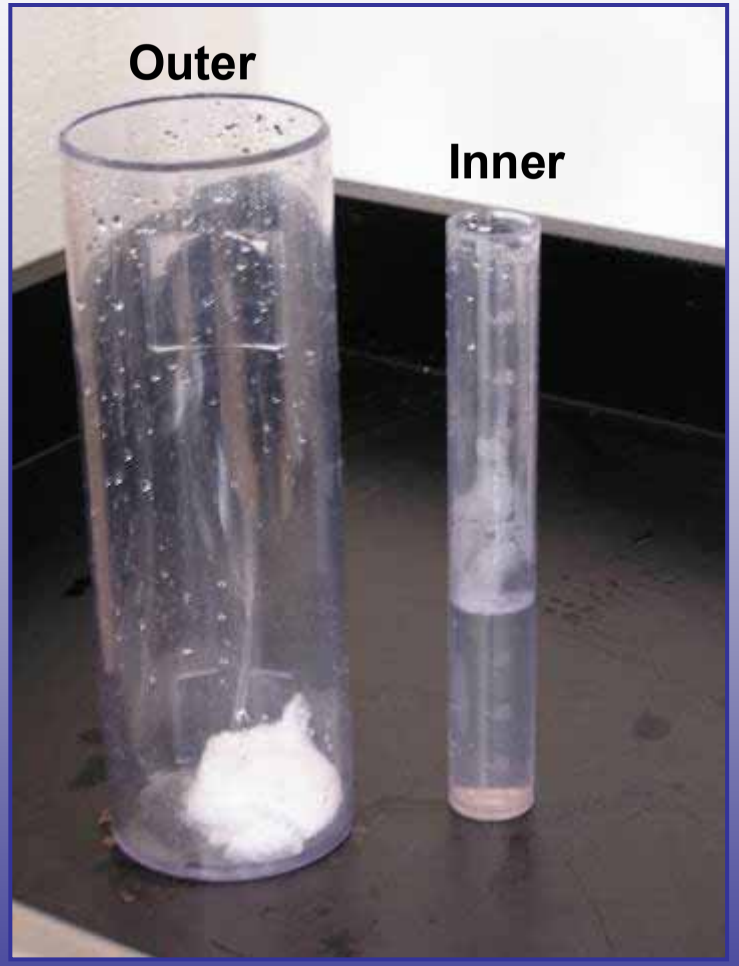
What falls in gauge we measure

We will disregard the snow that lands outside the gauge.

Go ahead and clear away the snow from the gauge

Melting snowfall

Add some warm water to the inner cylinder

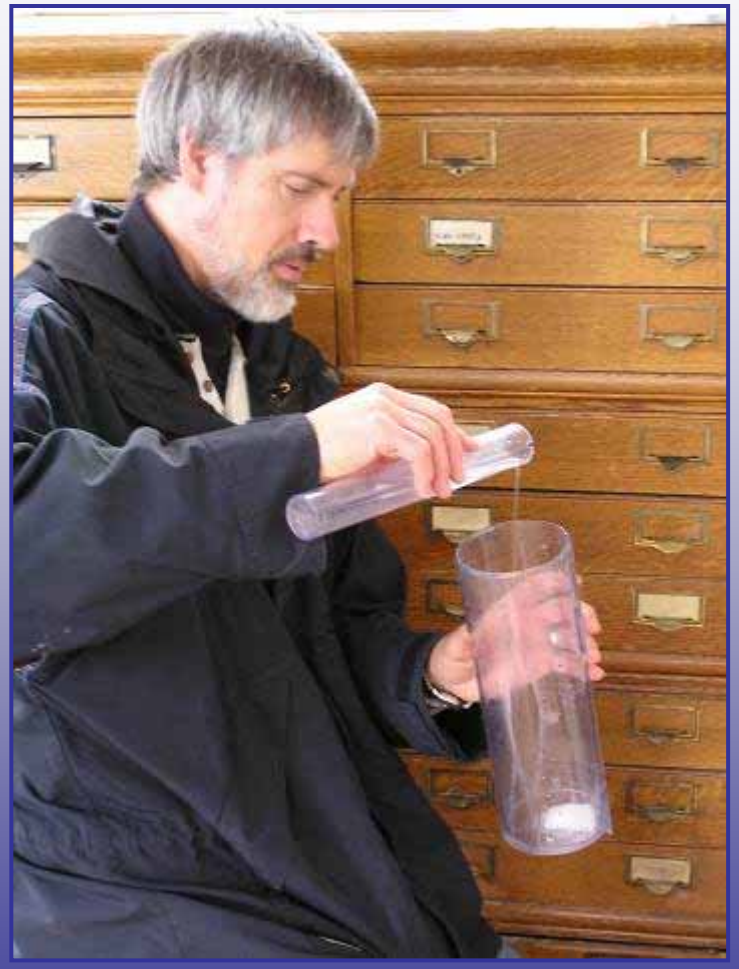


Notice that you have two cylinders

Carefully measure your tap water before adding to outer cylinder

Be sure to measure to nearest hundredth of an inch

Add the warm water to the snow sample



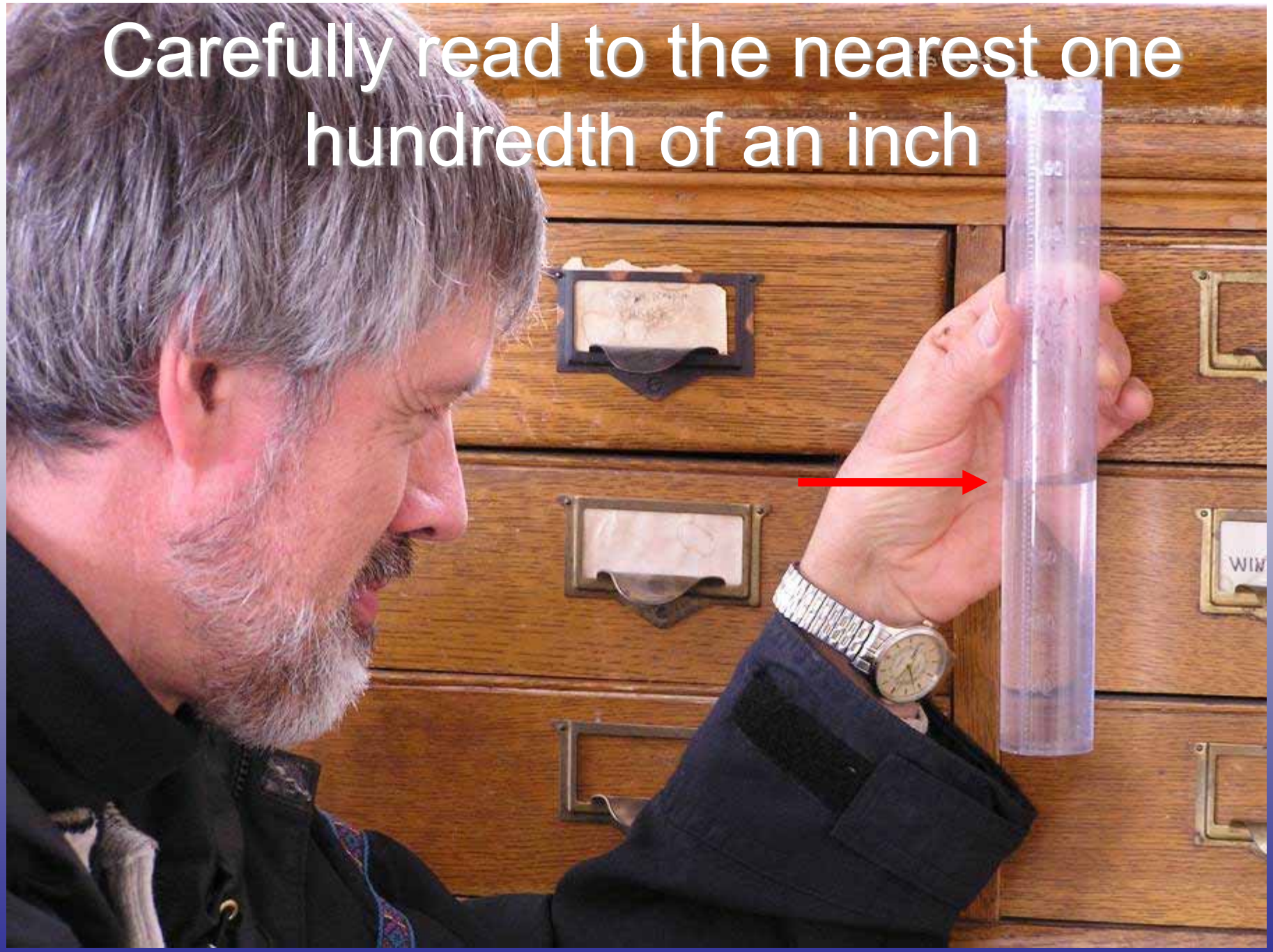
Pour water directly into sample

Allow sample to completely melt

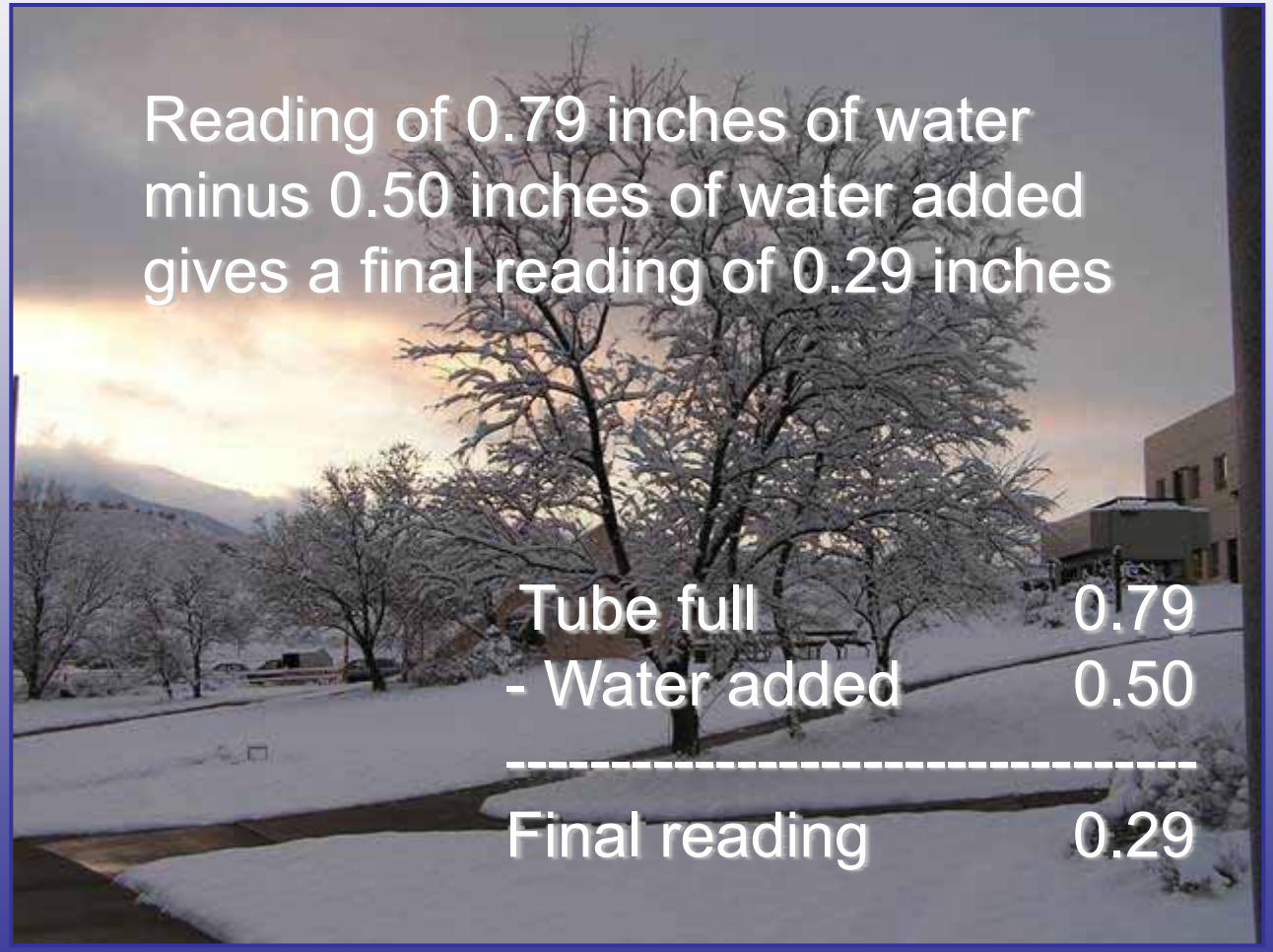
Measure the liquefied snowfall sample

Pour snow sample into smaller tube

Remember “Every drop counts!”


Carefully read to the nearest one hundredth of an inch

Remember to subtract the amount of warm water that you've added to the tube



Measuring liquid water content from a core sample

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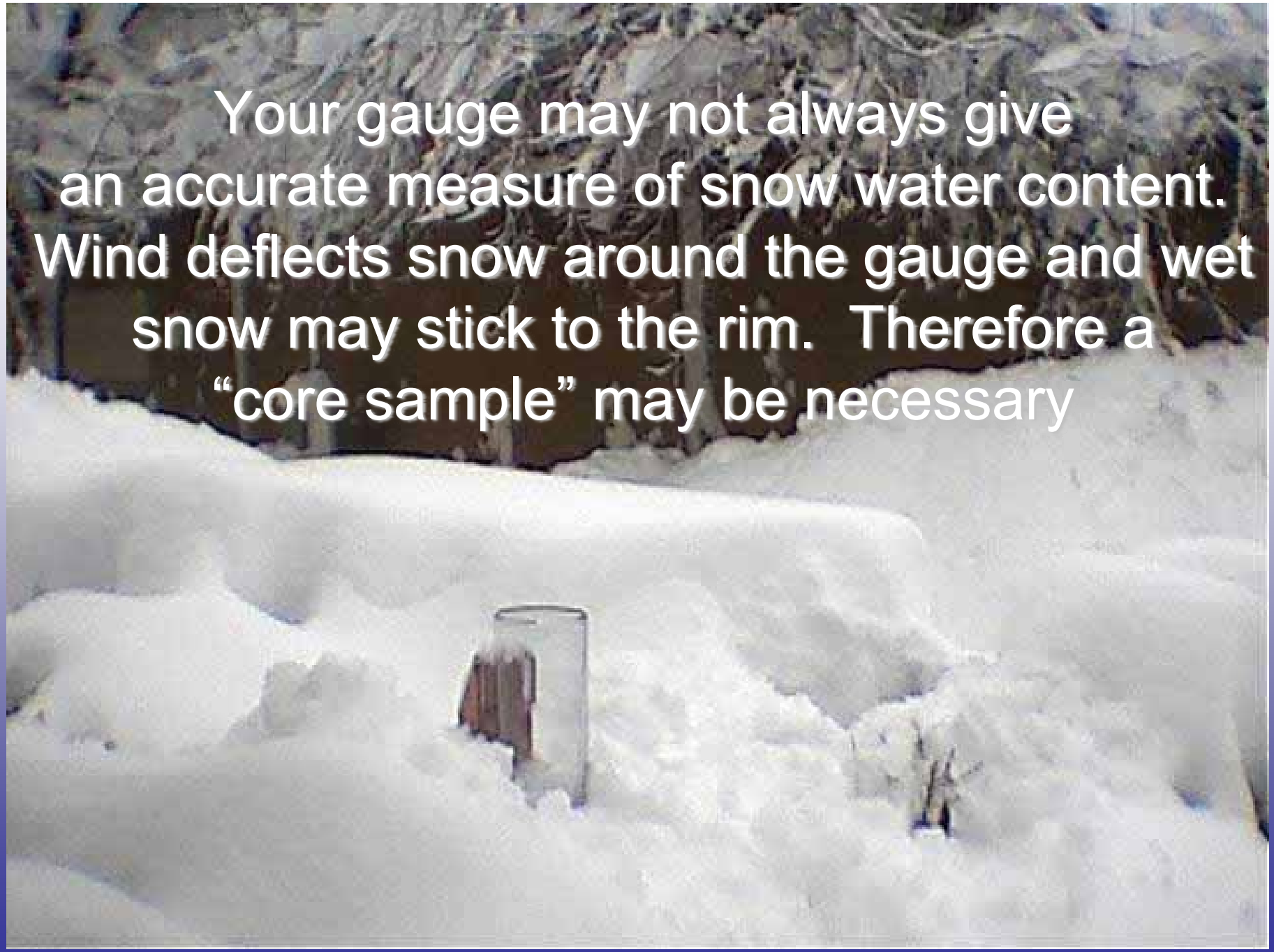
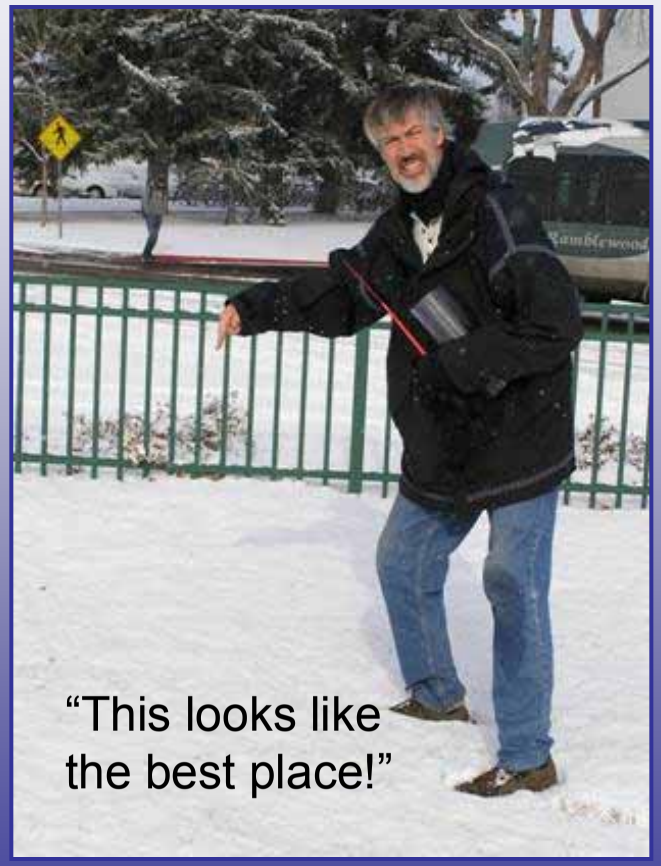

Your gauge may not always give
an accurate measure of snow water content.
Wind deflects snow around the gauge and wet
snow may stick to the rim. Therefore a
“core sample” may be necessary

First find a representative location



The location should have not drifted, melted, or blown clear

Steps to cutting a sample

Place gauge upside down and push down into the snow

Clear snow from around the gauge

Capturing the core

Slide snow-swatter under gauge

Carefully lift and get ready to flip the gauge

Bring the sample inside to melt

Snow Cores in deeper snow

In wetter snow, the core will come out as one piece

Record your measurement

Enter your data on the precip sheet . . .

or using the CoCoRaHS Web site
www.cocorahs.org

Again, there are two ways in which snow is measured:

1. Liquid water content
   - From the gauge
   - From a core sample

2. Depth of snow
   - 24 hour snowfall accumulation
   - Existing snow depths

Now let's look at the second way — Depth of Snow

What is Snowfall ?

Snowfall is the accumulation of new snow and sleet in the past 24 hours prior to melting or settling

When do I measure new snowfall?

Your observation is normally around 7AM. Because snow melts settles and drifts it is wise to measure when the snow first stops.

The goal of reporting new snowfall is to report the maximum accumulation prior to melting and settling

Measuring snowfall

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Where to measure new **snowfall**

Measure newly fallen snow your snowboard if the snow has fallen and accumulated uniformly.

Snow measured under a tree

Notice that only 3.0 inches of snow has accumulated here

Snow measured in the open

Where as 6.5 inches has fallen in the open

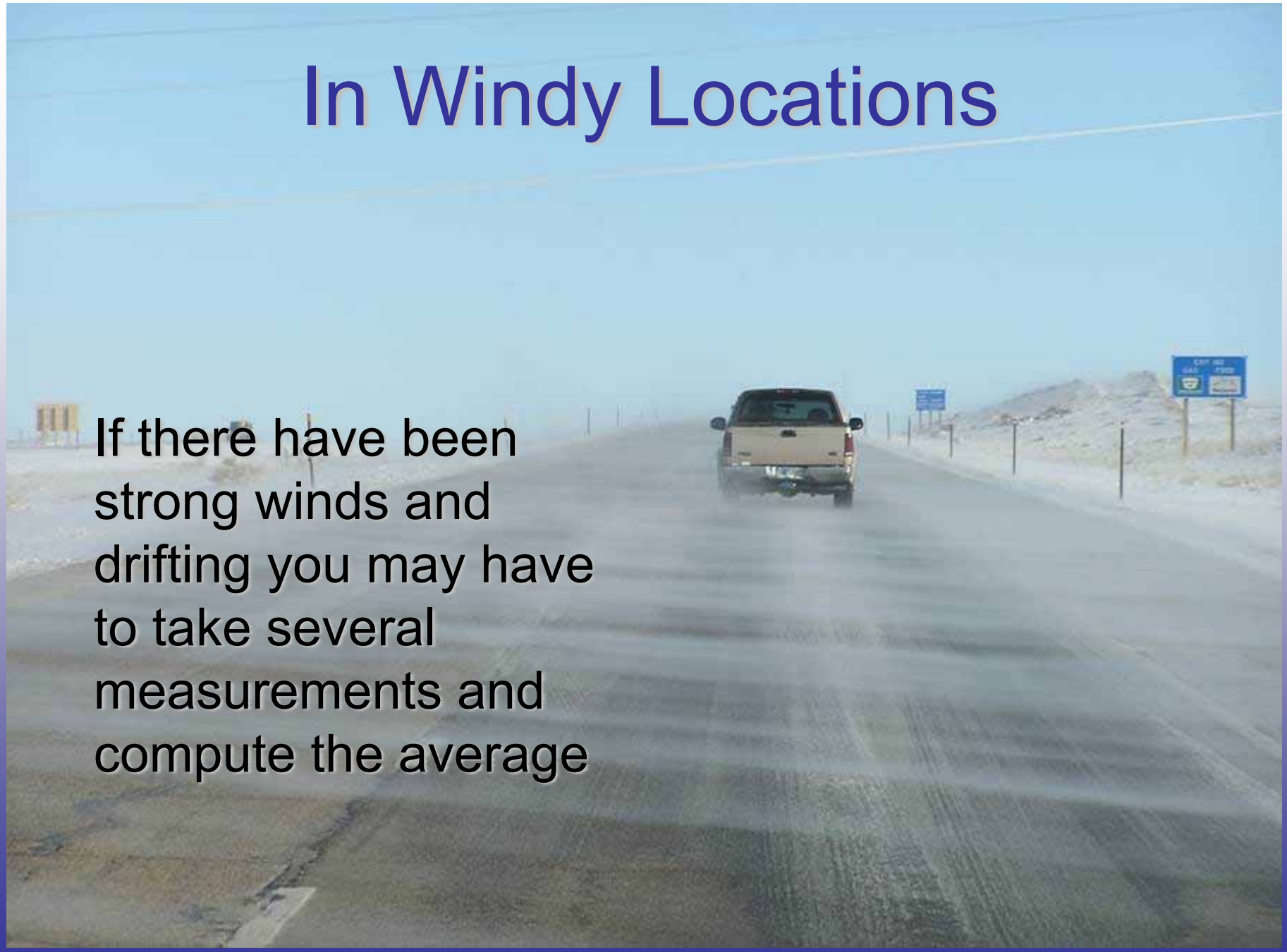
Angle of Measurement

Measure at eye level, as an angle will give you an inaccurate measurement

Replace the Board

After you have measured the snow on your board, clean it off and replace it on top of the newly fallen snow. Be sure to mark its location. Now you are ready for the next snowstorm.

In Windy Locations



If there have been strong winds and drifting you may have to take several measurements and compute the average

Snow depth is the average depth of snow (including old snow as well as new) that remains on the ground at a particular time of year.
Photo by Henry Reges

Reporting snow on the ground

If half the ground has 2.0” and half the ground is bare, report 1.0” as your total depth.

If more than half the ground is bare report “T” (trace) and mention the range of depths in your comments.

How do I measure Freezing Rain?

“Freezing rain” is rain that falls in liquid form but freezes on contact with a surface.

Do NOT report freezing rain as "Snow". Melt and measure the moisture that has accumulated inside your gauge and report that as your daily precipitation amount.

Report ZERO for your new snow amount (assuming that it all fell as rain, and no sleet or snow accumulated).

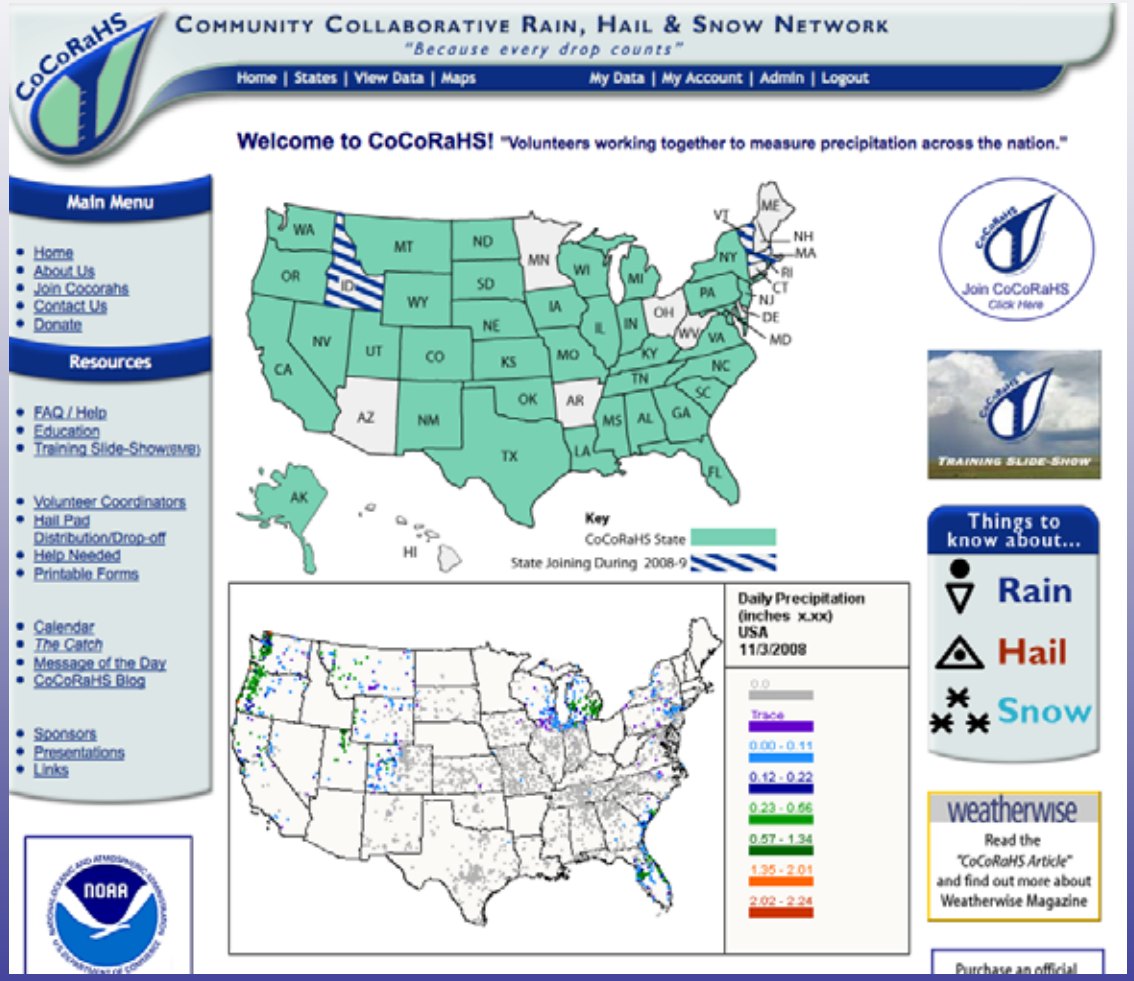
Report the total depth of freezing rain remaining on the ground at time of observation and enter that in the "Total Snow on Ground" column. Make a note in your comments section so that we know it's freezing rain.

SECTION TWO:
Reporting Observations

In this section we will introduce you to the Web-site and show you how to record your observations

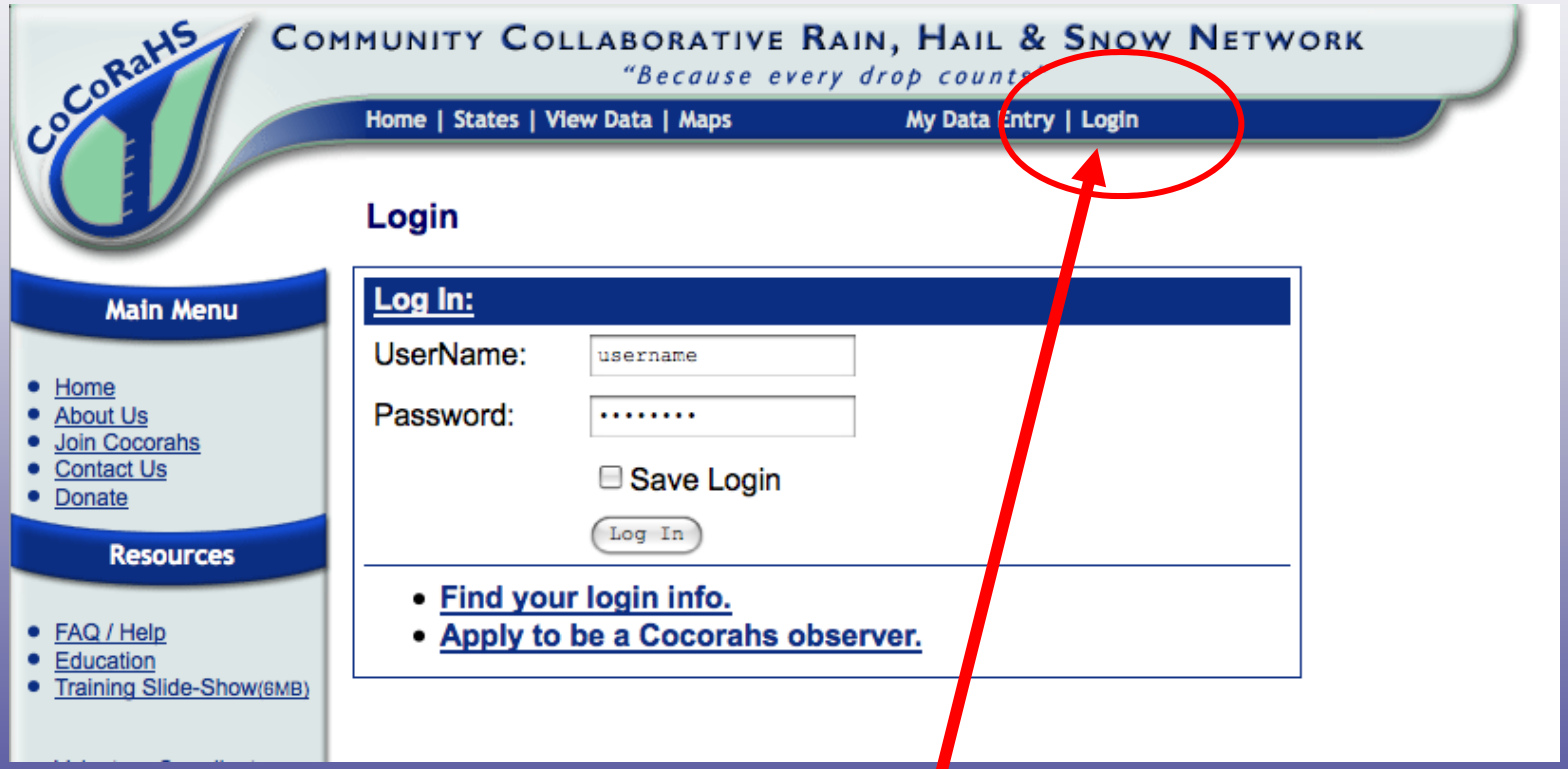
The CoCoRaHS Web site

www.cocorahs.org



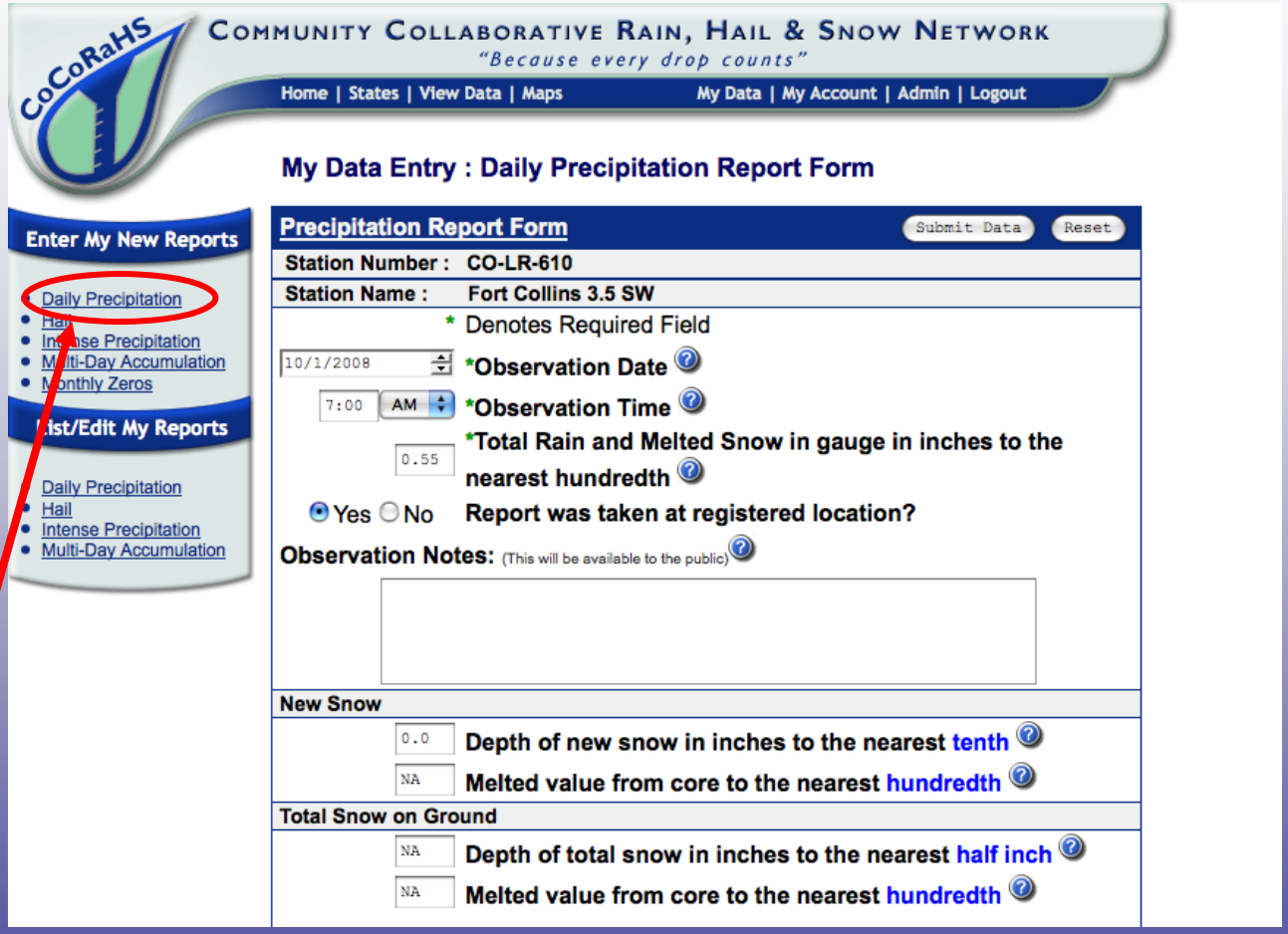
Our Web site is informative and easy to use. Here's how to begin →

Login to CoCoRaHS



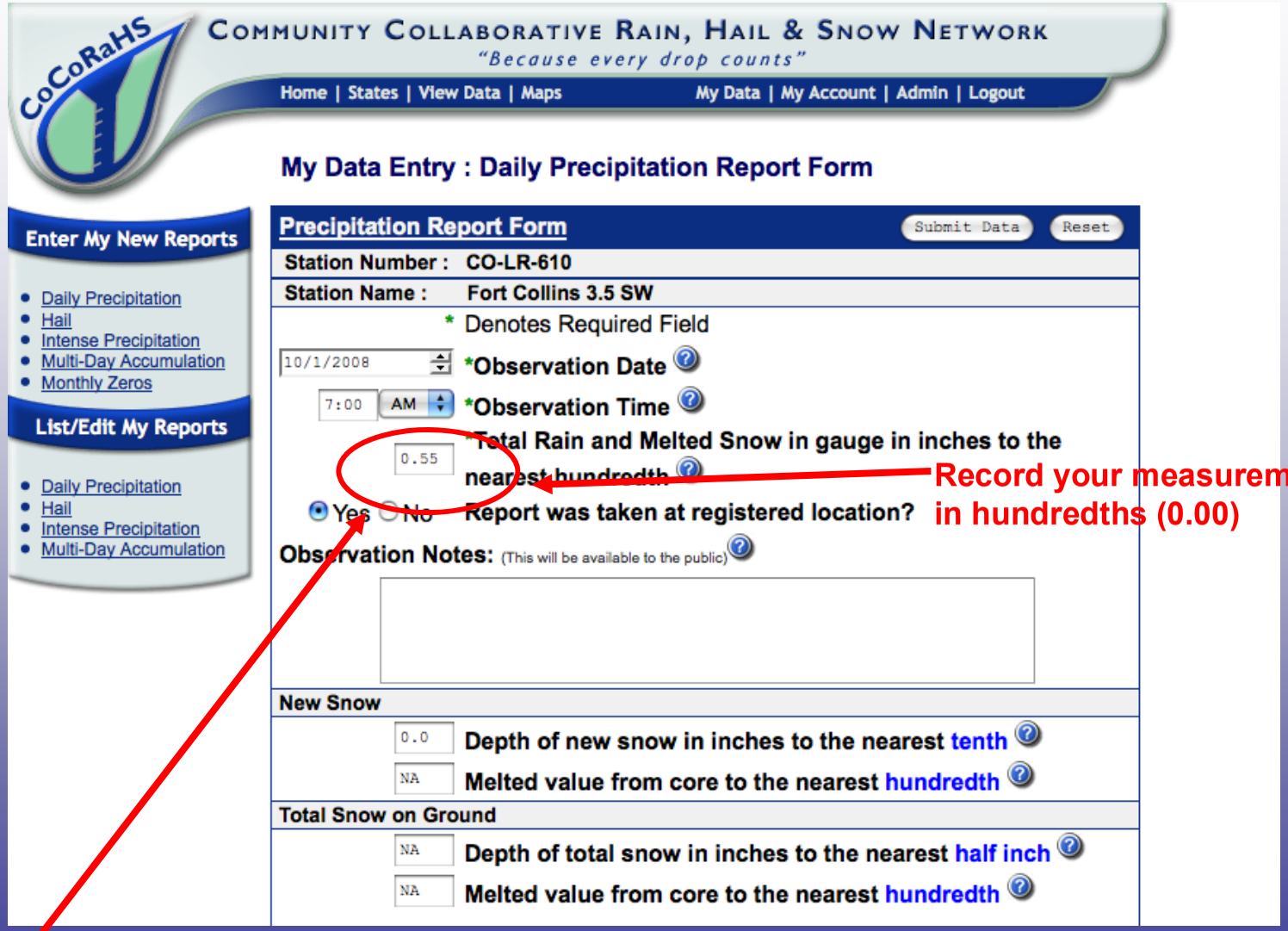
First, Click to Login

Recording your Daily Precipitation



After you login, the screen will automatically take you to the Daily Precip. Report

Enter Your Report



Record your measurement in hundredths (0.00)

Here you will enter the total precipitation measured in your gauge

Recording Comments

Customize Links | Free Hotmail | Windows Marketplace | Windows Media | Windows

CoCoRaHS

COMMUNITY COLLABORATIVE RAIN, HAIL & SNOW NETWORK

"Because every drop counts"

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

My Data Entry : Daily Precipitation Report Form

Enter My New Reports

- Daily Precipitation
- Hail
- Intense Precipitation
- Multi-Day Accumulation
- Monthly Zeros

List/Edit My Reports

- Daily Precipitation
- Hail
- Intense Precipitation
- Multi-Day Accumulation

Precipitation Report Form Submit Data Reset

Station Number : CO-LR-610

Station Name : Fort Collins 3.5 SW

* Denotes Required Field

6/12/2006 *Observation Date

7:00 AM *Observation Time

0.05 *Total Rain and Melted Snow in gauge in inches to the nearest hundredth

Yes No Report was taken at registered location?

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

Brief, but intense thunderstorm at 8PM last night.
Several brances broken on tree due to gusty winds.

New Snow

0.0 Depth of new snow in inches to the nearest tenth

NA Melted value from core to the nearest hundredth

Total Snow on Ground

NA Depth of total snow in inches to the nearest half inch

NA Melted value from core to the nearest hundredth

Duration Information

If a time is unknown or the storm has not ended leave it blank.

Precipitation Began AM PM

Precipitation Ended AM PM

Heaviest Precipitation Began AM PM

Heaviest Precipitation Lasted minutes

These times are: Select Time Accuracy

Feel free to enter comments about the day's weather under "notes"

Submit your Report

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Several brances broken on tree due to gusty winds.

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0.[illegible] Depth of new snow in inches to the nearest tenth

NA Melted value from core to the nearest hundredth

Total Snow on Ground

NA Depth of total snow in inches to the nearest half inch

NA Melted value from core to the nearest hundredth

Duration Information

If a time is unknown or the storm has not ended leave it blank.

Precipitation Began AM PM

Precipitation Ended AM PM

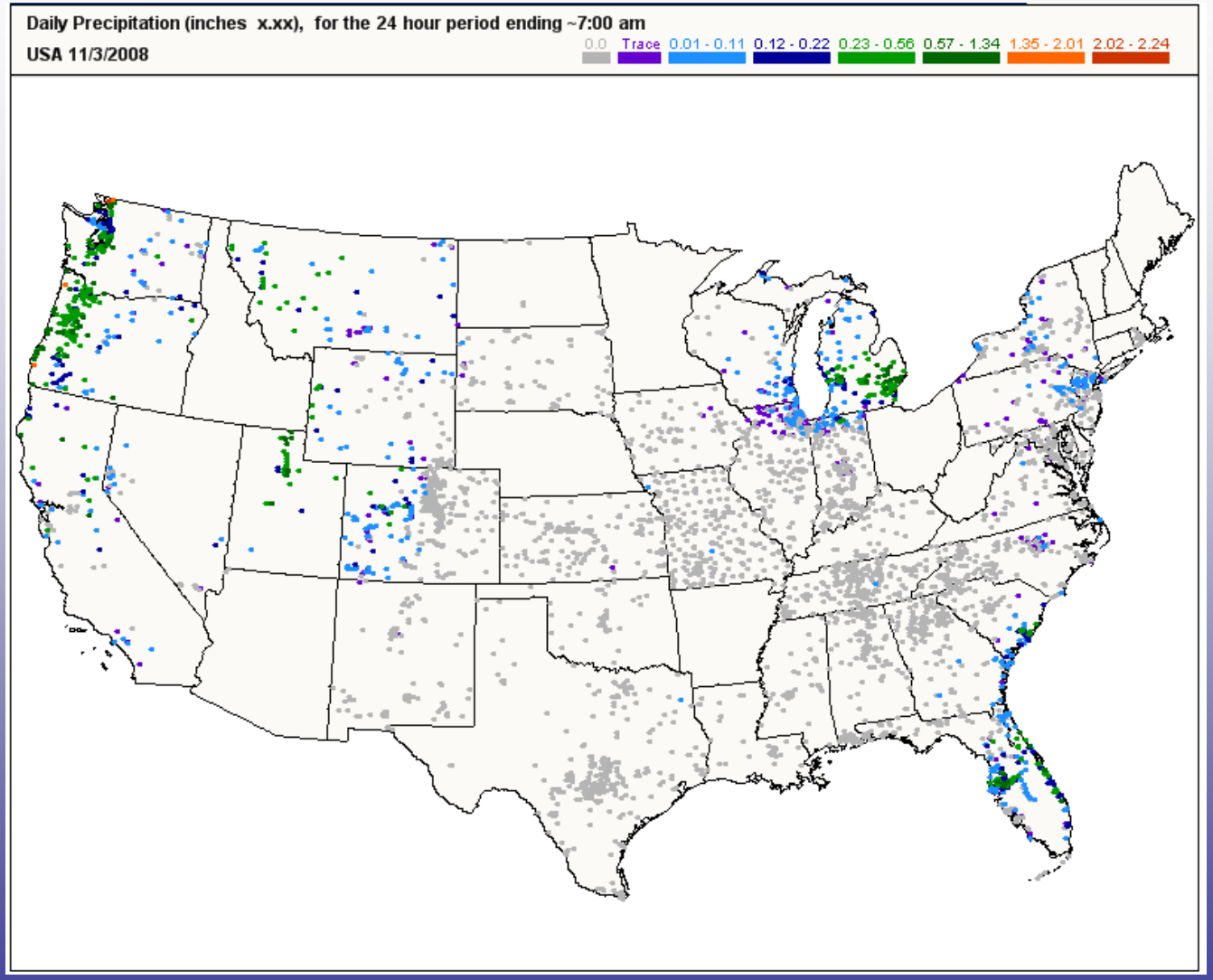
Heaviest Precipitation Began AM PM

Heaviest Precipitation Lasted minutes

These times are: Select Time Accuracy

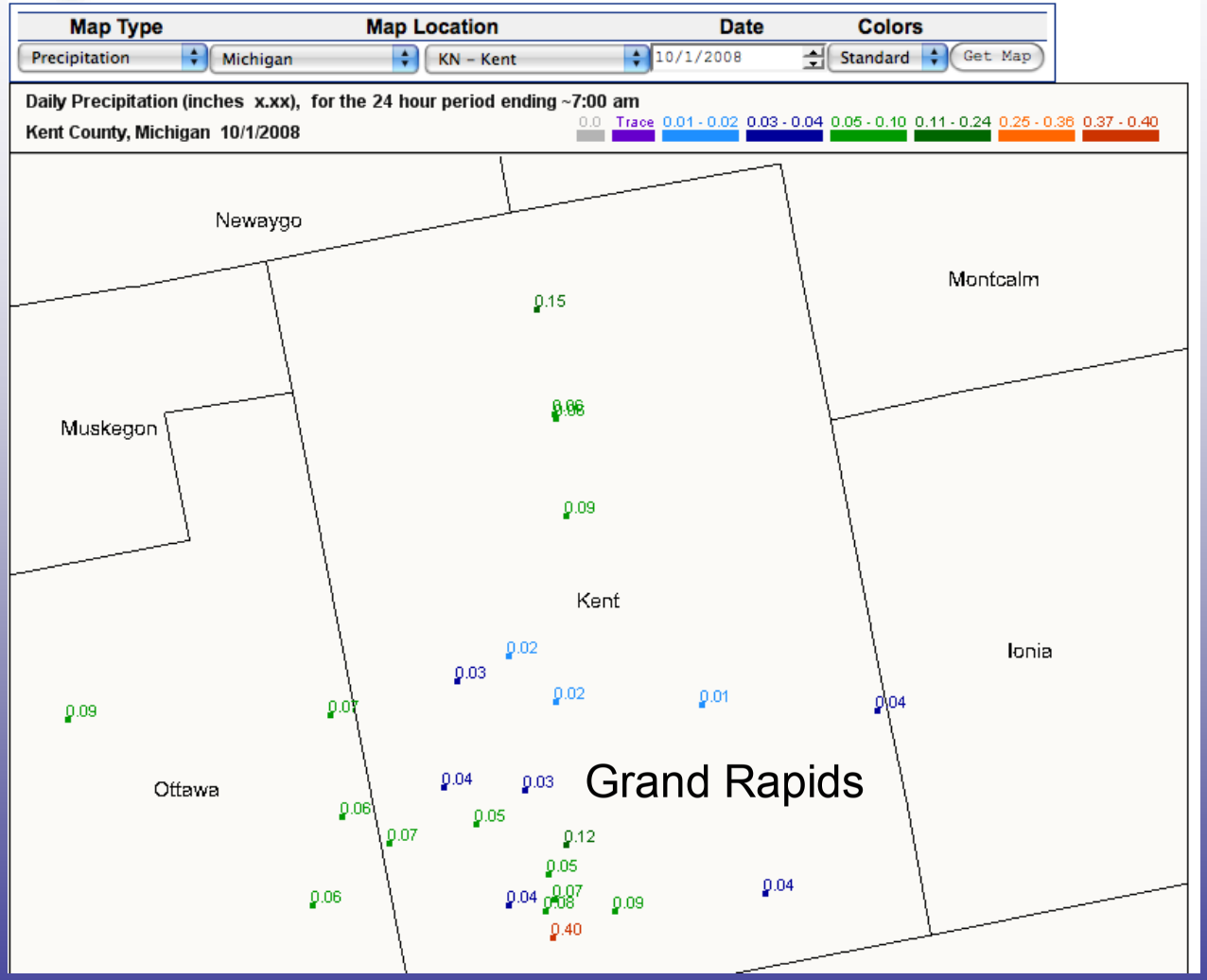
Click "Submit" and your data is recorded on our site

To See Your Report on our Maps



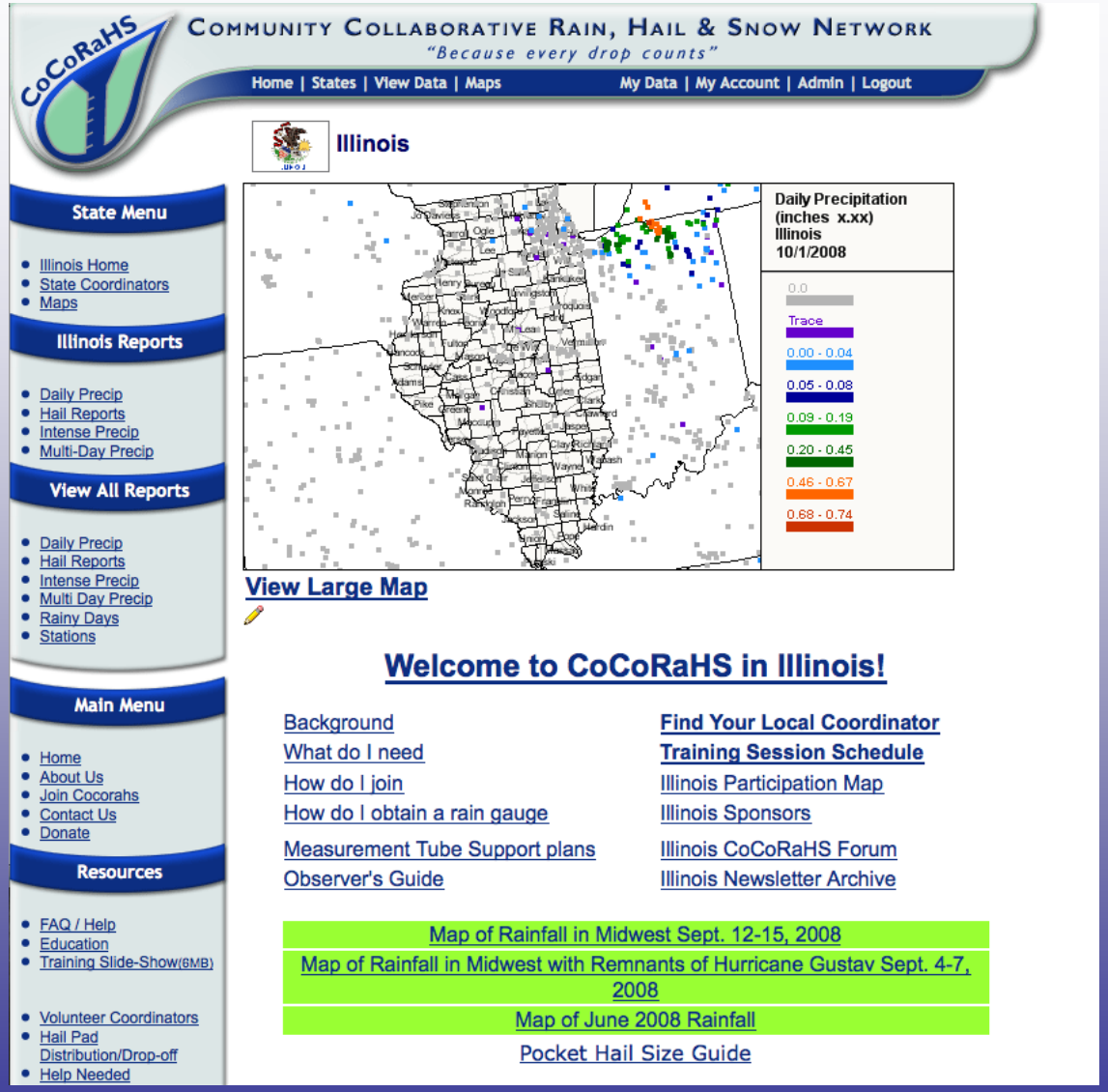
Click on your state and then click on your county

Your Report on our Daily Map



The amount of precipitation you entered shows up at <u>your</u> location on the map

Your state's Page



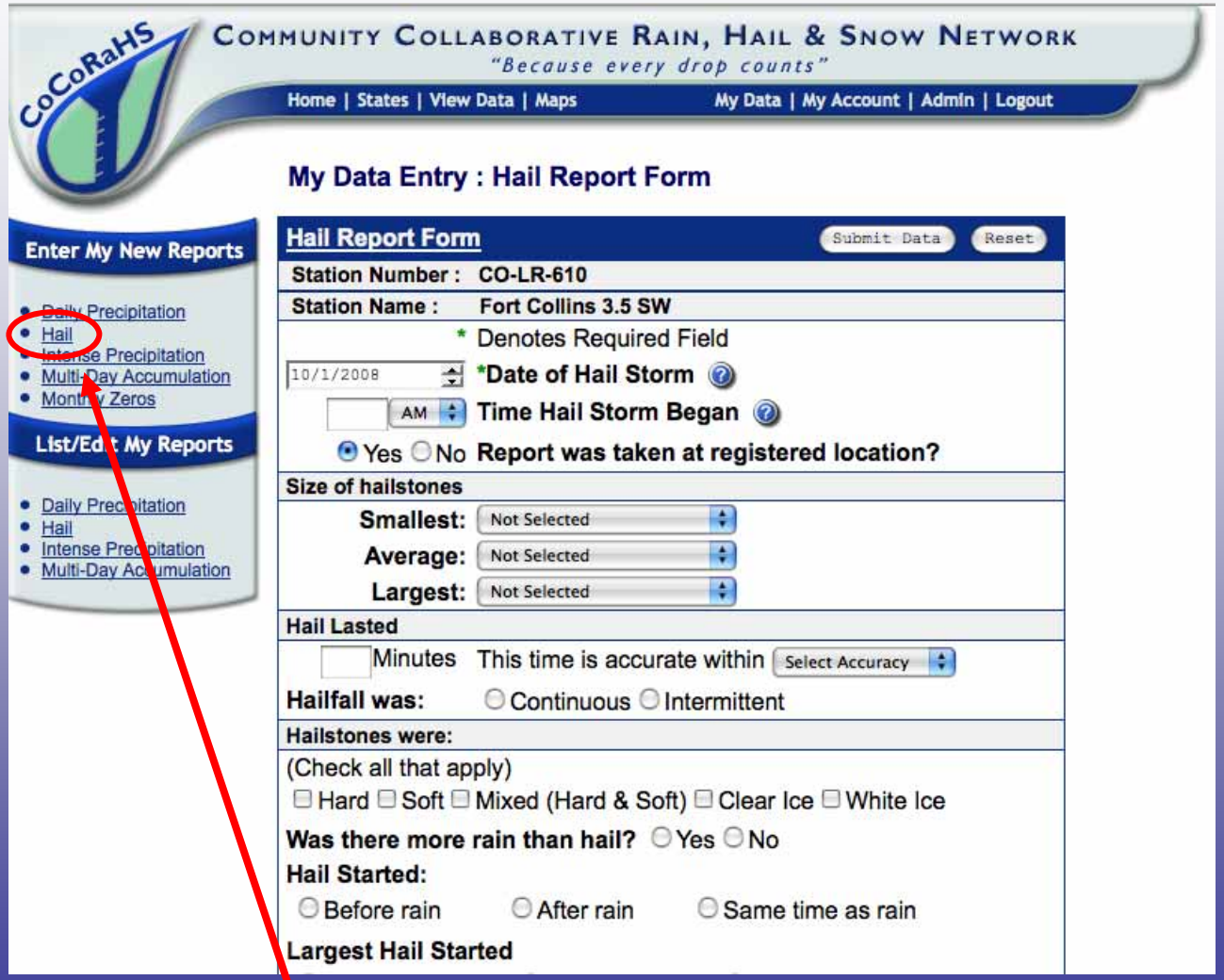
Each CoCoRaHS State has it's own page

Other Reports

- Hail Report
- Intense Precipitation Report
- Monthly Zeros
- Multi-Day Precipitation Report
- Daily Precipitation Report

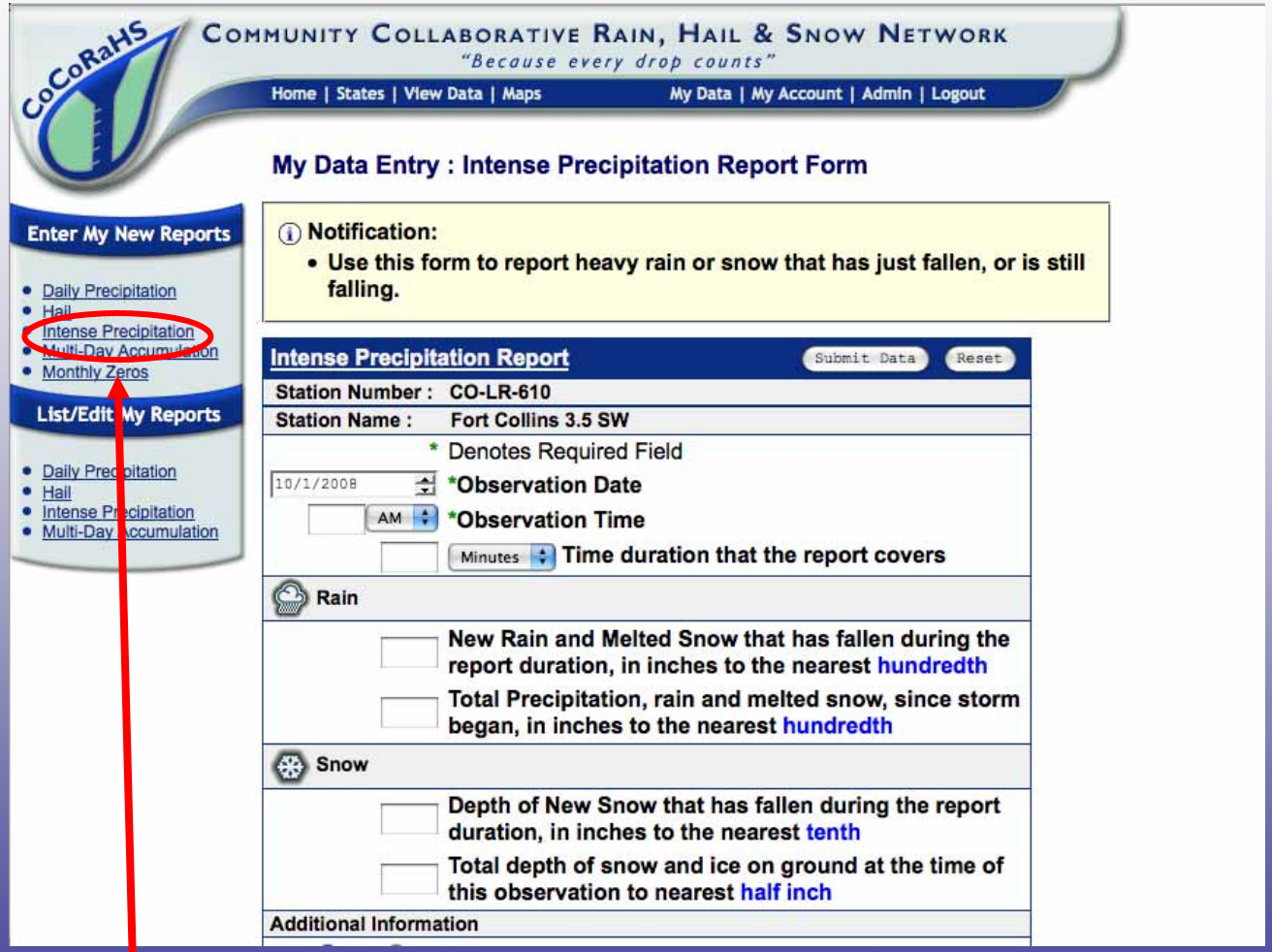
Photo by Henry Reges

Hail Report



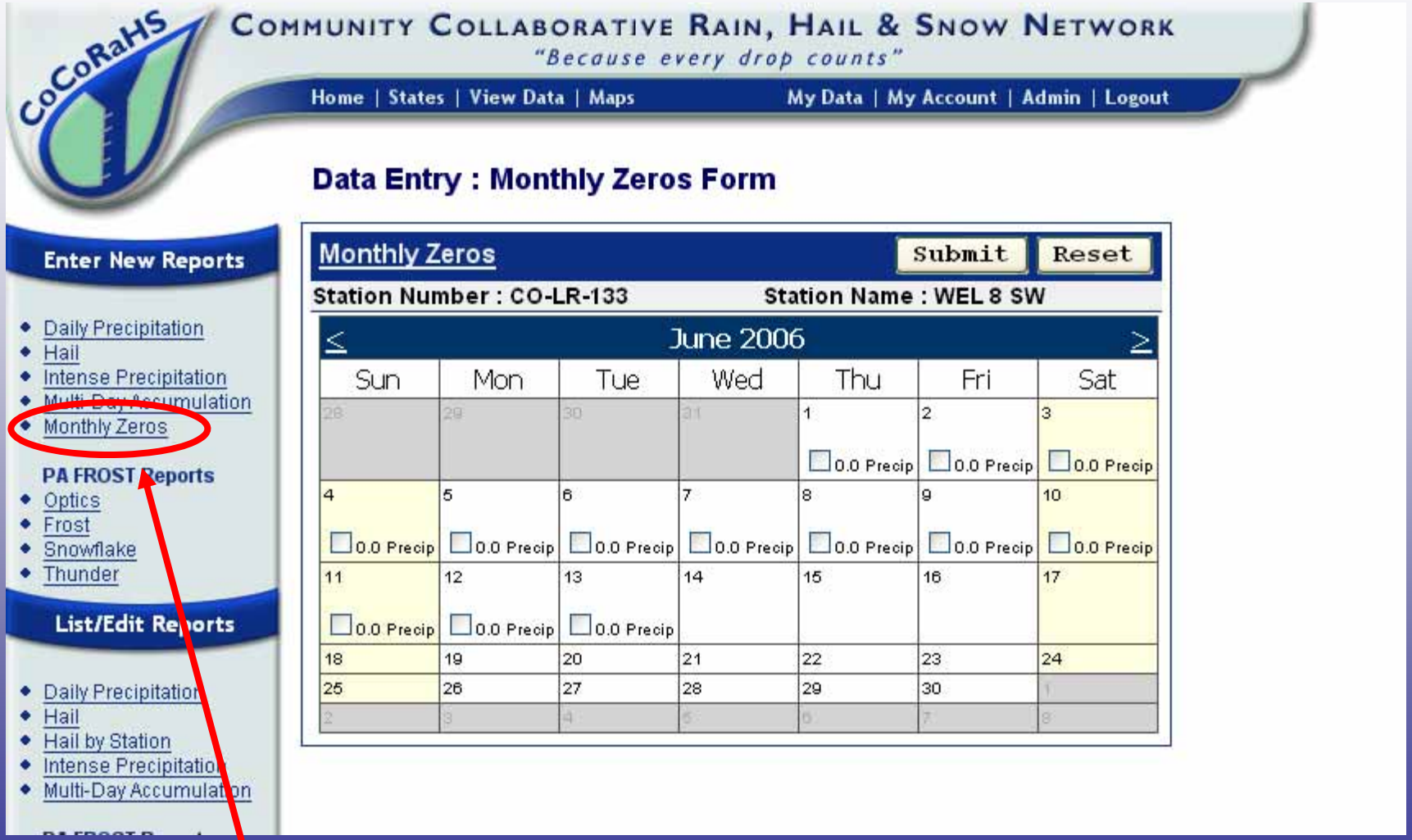
Click here to access a Hail Report

Intense Precipitation Report



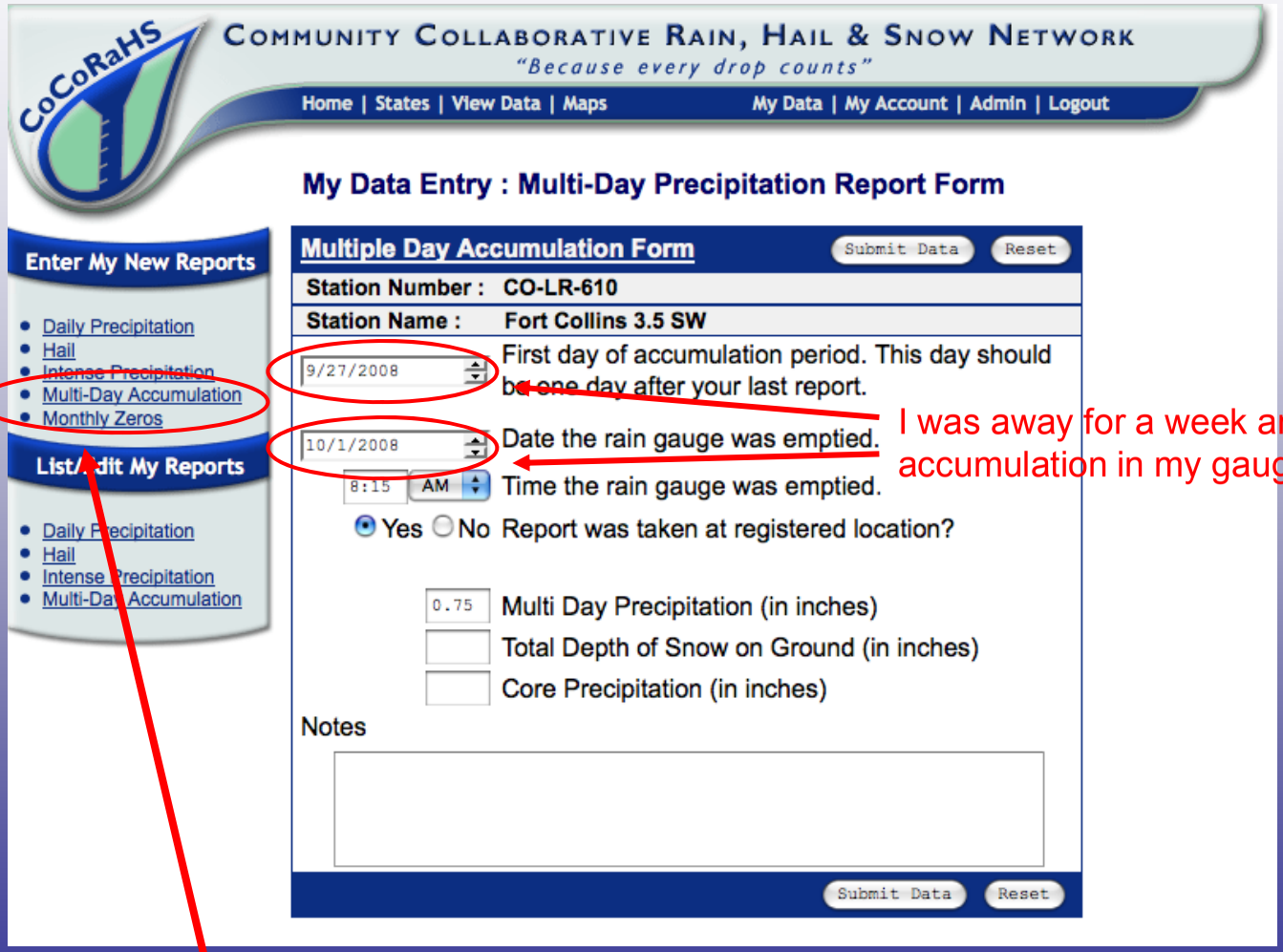
Click here to access the Intense Precipitation Report

Monthly Zeros



You can go back in and enter days of zero precipitation on one "simple to use" page

Multi-Day Precipitation



I was away for a week and read the accumulation in my gauge when I returned.

You can even enter information after you've been away for several days

Daily Precipitation Reports

COMMUNITY COLLABORATIVE RAIN, HAIL & SNOW NETWORK

"Because every drop counts"

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

View Data : List Daily Precipitation Reports

View Data

- Daily Precip Reports
- Daily Comments Reports
- Intense Precip Reports
- Multiple Day Reports
- Days with Hail
- Search Hail Reports
- Station Hail Reports
- Station Precip Summary
- Station Snow Summary
- Rainy Days Report
- Total Precip Summary
- List Stations

PA FROST Data

- Frost
- Optics
- Snowflake
- Thunder

Main Menu

- Home
- About Us
- Join Cocorahs
- Contact Us
- Donate

Resources

- FAQ / Help
- Education
- Training Slide-Show(6MB)
- Volunteer Coordinators
- Hail Pad Distribution/Drop-off
- Help Needed

Search Daily Precipitation Reports

Station Fields: ☐ Station Number ☐ Station Name

Location: Select State | No State Selected

Date Range:

Start Date: 10/1/2008 **End Date:** 10/1/2008

Precip Value: All Precip Values | Operator

Search

Searched: Report date on 10/1/2008.

Showing 1 - 50 of 4802 Records. <Back Page 1 Next>

Date	Time	Station Number	Station Name	Total Precip .ins	New Snow .in	Total Snow .in	State	County	View
10/1/2008	7:15 AM	FL-MN-9	Marathon 1.7 ENE	2.64	0.0	NA	FL	Monroe	
10/1/2008	7:00 AM	FL-MD-17	Cutler 1.3 SW	2.37	0.0	NA	FL	Miami-Dade	
10/1/2008	6:00 AM	PA-ER-2	Erie 5.6 SW	2.31	0.0	NA	PA	Erie	
10/1/2008	7:00 AM	FL-MD-2	Miami 4.9 NNE	1.89	0.0	NA	FL	Miami-Dade	
10/1/2008	7:00 AM	FL-MD-10	South Miami Heights 1.3 SSW	1.77	0.0	NA	FL	Miami-Dade	
10/1/2008	6:00 AM	NC-CN-10	Vanceboro 6.9 NW	1.64	0.0	NA	NC	Craven	
10/1/2008	6:00 AM	NC-RN-1	Asheboro 2.2 SSE	1.58	0.0	NA	NC	Randolph	
10/1/2008	7:00 AM	MD-MG-47	Wheaton-Glenmont 1.5 NNE	1.57	0.0	NA	MD	Montgomery	
10/1/2008	8:00 AM	PA-ER-5	North East 1.2 WNW	1.54	0.0	NA	PA	Erie	
10/1/2008	7:00 AM	NY-ER-12	West Seneca 1.4 E	1.50	0.0	NA	NY	Erie	
10/1/2008	7:00 AM	FL-BV-24	Indialantic 0.8 N	1.44	0.0	NA	FL	Brevard	
10/1/2008	8:00 AM	MD-CV-11	North Beach 0.3 W	1.38	0.0	0.0	MD	Calvert	
10/1/2008	7:00 AM	GA-CT-2	Skidaway Island 2.3 S	1.32	0.0	NA	GA	Chatham	
10/1/2008	7:00 AM	FL-CR-7	Naples 0.7 SSW	1.31	0.0	NA	FL	Collier	
10/1/2008	8:15 AM	FL-MN-4	Key Largo 5.3 SW	1.27	0.0	NA	FL	Monroe	
10/1/2008	8:00 AM	FL-MN-8	Islamorada 7.8 SW	1.25	0.0	NA	FL	Monroe	
10/1/2008	5:25 AM	NY-ER-15	Lancaster 2.3 SE	1.21	0.0	NA	NY	Erie	
10/1/2008	7:00 AM	MD-HW-2	Sykesville 1.7 SSE	1.21	0.0	NA	MD	Howard	

SECTION THREE:
Frequently Asked Questions

In this section we will try to answer common questions asked by observers.

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 I don't have a good place to put my gauge?

Answer: Few people have ideal locations. Do your best. Send site photos if possible to help interpret results.

What if it hails when I'm not at home?

<u>Answer</u>: 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?

<u>Answer</u>: No. Dew is not precipitation, but you may note the dew in the comments.

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 equivalent 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

How long is my commitment to CoCoRaHS?

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

Photo by Henry Reges

Thanks for joining us today!
You can find out more about the CoCoRaHS Network by visiting our web site or speaking with your local coordinator.
Photo by Henry Reges

Just 5 minutes a day!
It's easy and fun!
We're Cuckoo For CoCoRaHS!
www.cocorahs.org