



# *CoCoRaHS*

## *“CITIZEN SCIENCE IN YOUR OWN BACK YARD”*



*Ciencia ciudadana en  
Su propio patio trasero*



***“CoCoRaHS is a national  
grassroots, non-profit,  
community-based,  
high-density  
precipitation network***



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



*CoCoRaHS es una red nacional  
promovida por el pueblo, sin  
fines de lucro,  
basado en la comunidad, que  
incluye muchas personas  
estudiando la precipitación*

*...compuesta de voluntarios  
de diferentes orígenes y  
de todas las edades*

**CoCoRaHS**

Snow Netw.

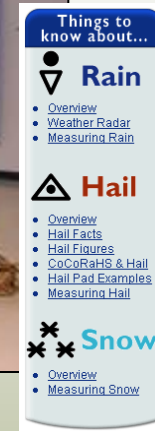
***. . . who take daily measurements of  
“precipitation” right in their own backyards ”***



*...que toman medidas diarias de  
la “precipitación” en sus propios patios traseros.*

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

*Una vez entrenados, los  
voluntarios colectan datos  
de medida utilizando  
herramientas de bajo costo.*



Training is important to assure  
accurate, high quality data

*La formación es importante para  
asegurar datos precisos y de  
alta calidad*

CoCoRaHS



4-inch diameter  
high capacity rain gauges

*Pluviómetro de 4-pulgadas  
de diámetro  
de alta capacidad.*



Aluminum foil-wrapped  
Styrofoam hail pads

*Almohada de espuma de  
poliestireno forrada en  
papel de aluminio*

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

*y reportan sus observaciones diarias en nuestro sitio interactivo en la Web: **www.cocorahs.org***

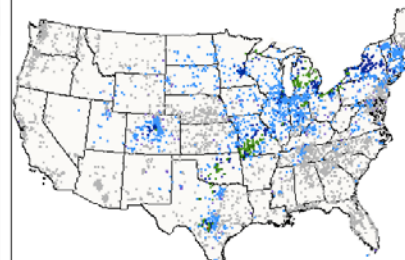
#### My Data Entry : Daily Precipitation Report Form

| Precipitation Report Form                                                                              |                                                                         | Submit Data | Reset |
|--------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|-------------|-------|
| Station Number : CO-LR-610                                                                             |                                                                         |             |       |
| Station Name : Fort Collins 3.5 SW                                                                     |                                                                         |             |       |
| * Denotes Required Field                                                                               |                                                                         |             |       |
| 5/20/2008                                                                                              | *Observation Date                                                       |             |       |
| 7:00 AM                                                                                                | *Observation Time                                                       |             |       |
| 0.59                                                                                                   | *Total Rain and Melted Snow in gauge in inches to the nearest hundredth |             |       |
| <input checked="" type="radio"/> Yes <input type="radio"/> No Report was taken at registered location? |                                                                         |             |       |
| Observation Notes: (This will be available to the public)                                              |                                                                         |             |       |
| It has been so dry, that the cows are now giving powdered milk. Thank God for today's rain!!           |                                                                         |             |       |
| 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                         |             |       |

**COMMUNITY COLLABORATIVE RAIN, HAIL & SNOW NETWORK**  
*"Because every drop counts"*  
Home | States | View Data | Maps | My Data | My Account | Admin | Logout

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

Has your community been  
**IMPACTED BY DROUGHT?**  
Tell us by submitting a "CoCoRaHS Drought Impact Report"



**Daily Precipitation (inches x.xx)**  
USA  
5/14/2010

|             |
|-------------|
| 0.0         |
| Trace       |
| 0.00 - 0.09 |
| 0.10 - 0.19 |
| 0.20 - 0.29 |
| 0.30 - 0.39 |
| 0.40 - 0.49 |
| 0.50 - 0.59 |
| 0.60 - 0.69 |
| 0.70 - 0.79 |

**DONATE**  
CLICK HERE TO GIVE TO COCORAHHS

  
Join CoCoRaHS  
Click Here

  
TRAINING  
SLIDE-SHOWS

Things to know about...

- Home
- About Us
- Join CoCoRaHS
- Contact Us
- Donate

**Resources**

- FAQ / Help
- Education
- Training Slide-Shows
- Drought Impacts

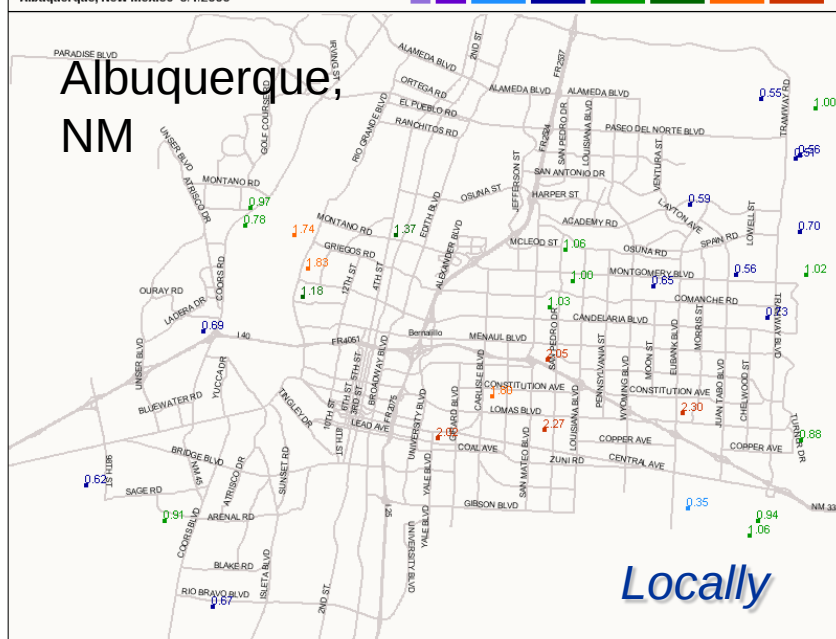
- Volunteer Coordinators
- Hail Pad
- Distribution/Drop-off
- Help Needed
- Printable Forms

- The Catch
- Message of the Day
- Data Analysis

Daily Precipitation (inches x.xx), for the 24 hour period ending ~7:00 am

Albuquerque, New Mexico 8/1/2006

0.0 Trace 0.01-0.38 0.38-0.77 0.77-1.15 1.15-1.53 1.53-1.92 1.92-2.30



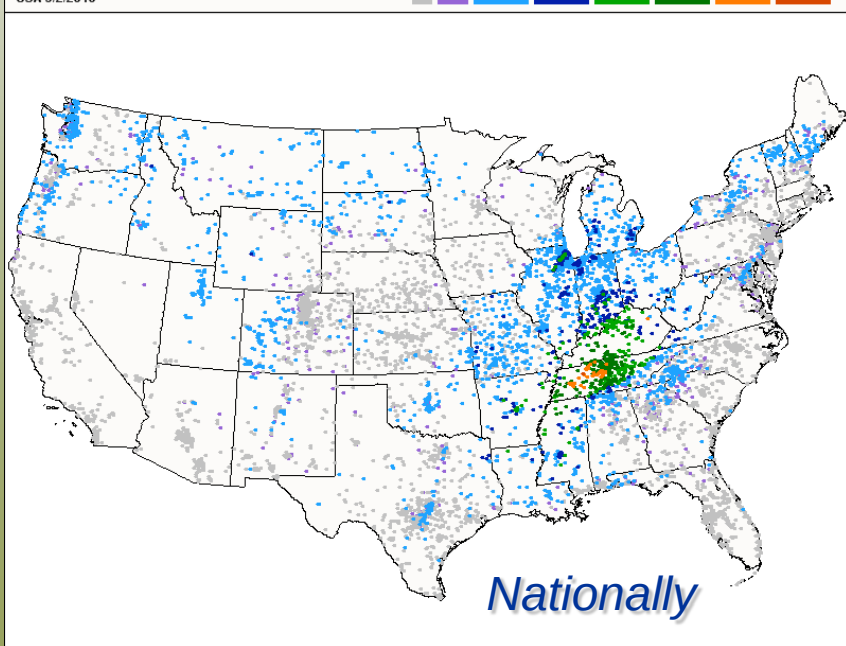
**Volunteer's observations are immediately available in map and table form for the public to view.**

*Las observaciones de los voluntario están disponibles de inmediato en el mapa y en forma de tabla para que el público las vea.*

Daily Precipitation (inches x.xx), for the 24 hour period ending ~7:00 am

USA 5/2/2010

0.0 Trace 0.01-0.66 0.67-1.32 1.33-3.32 3.33-7.99 7.99-11.97 11.98-13.30



| Date      | Time     | Station Number | Station Name            | Total Precip .Ins | New Snow .In | Total Snow .In | State | County     | View                 |
|-----------|----------|----------------|-------------------------|-------------------|--------------|----------------|-------|------------|----------------------|
| 1/19/2009 | 7:00 AM  | RI-PR-10       | Woonsocket 0.3 W        | 1.00              | 11.5         | NA             | RI    | Providence | <a href="#">View</a> |
| 1/19/2009 | 7:00 AM  | RI-PR-7        | Cranston 1.9 E          | 0.84              | 7.0          | 9.5            | RI    | Providence | <a href="#">View</a> |
| 1/19/2009 | 8:00 AM  | RI-PR-13       | Pawtucket 1.4 NE        | 0.83              | 8.7          | 13.0           | RI    | Providence | <a href="#">View</a> |
| 1/19/2009 | 7:00 AM  | RI-PR-11       | Providence 3.0 ENE      | 0.82              | 9.0          | 12.0           | RI    | Providence | <a href="#">View</a> |
| 1/19/2009 | 8:00 AM  | RI-WS-8        | Saunderstown 2.2 NW     | 0.73              | 6.0          | NA             | RI    | Washington | <a href="#">View</a> |
| 1/19/2009 | 8:30 AM  | RI-KN-2        | East Greenwich 2.3 ESE  | 0.67              | 5.5          | 9.5            | RI    | Kent       | <a href="#">View</a> |
| 1/19/2009 | 7:00 AM  | RI-NW-3        | Jamestown 2.6 NNW       | 0.62              | 5.4          | 11.0           | RI    | Newport    | <a href="#">View</a> |
| 1/19/2009 | 7:00 AM  | RI-WS-7        | North Kingstown 3 N     | 0.59              | 5.0          | 9.0            | RI    | Washington | <a href="#">View</a> |
| 1/19/2009 | 8:30 AM  | RI-KN-1        | Coventry Center         | 0.54              | 8.6          | 10.0           | RI    | Kent       | <a href="#">View</a> |
| 1/19/2009 | 7:00 AM  | RI-WS-6        | Narragansett Pier 0.5 N | 0.49              | 4.2          | 7.5            | RI    | Washington | <a href="#">View</a> |
| 1/19/2009 | 8:00 AM  | RI-WS-9        | Charlestown 3.9 NNW     | 0.46              | 6.2          | 9.0            | RI    | Washington | <a href="#">View</a> |
| 1/19/2009 | 9:00 AM  | RI-WS-1        | Hope Valley 3.7 S       | 0.34              | 3.9          | NA             | RI    | Washington | <a href="#">View</a> |
| 1/19/2009 | 9:30 AM  | RI-WS-5        | Kingston 0.5 NW         | 0.31              | 3.4          | 8.0            | RI    | Washington | <a href="#">View</a> |
| 1/19/2009 | 11:59 PM | RI-PR-14       | Woonsocket 1.3 ESE      | 0.13              | 2.0          | 12.0           | RI    | Providence | <a href="#">View</a> |
| 1/19/2009 | 7:00 AM  | RI-NW-4        | Middletown 1.1 SW       | NA                | 3.0          | 7.0            | RI    | Newport    | <a href="#">View</a> |

# CoCoRaHS was born in response to the 1997 Fort Collins, Colorado Flood



## STORM TOLL

Deaths - 5 confirmed  
Injuries - 40  
Missing - 16  
Rescued - 160

Damages - Tens of millions of dollars at Colorado State University, \$1.5 million to \$2 million to city roads and bridges; \$1 million to city parks and trails; no estimate for private property.

Source: Emergency Officials  
All information as of 1 a.m. today

## Wednesday

FORT COLLINS  
COLORADOAN

## City death toll at 5; damage in millions



## CSU's book losses speak volumes



## Rainfall breaks 20-year record

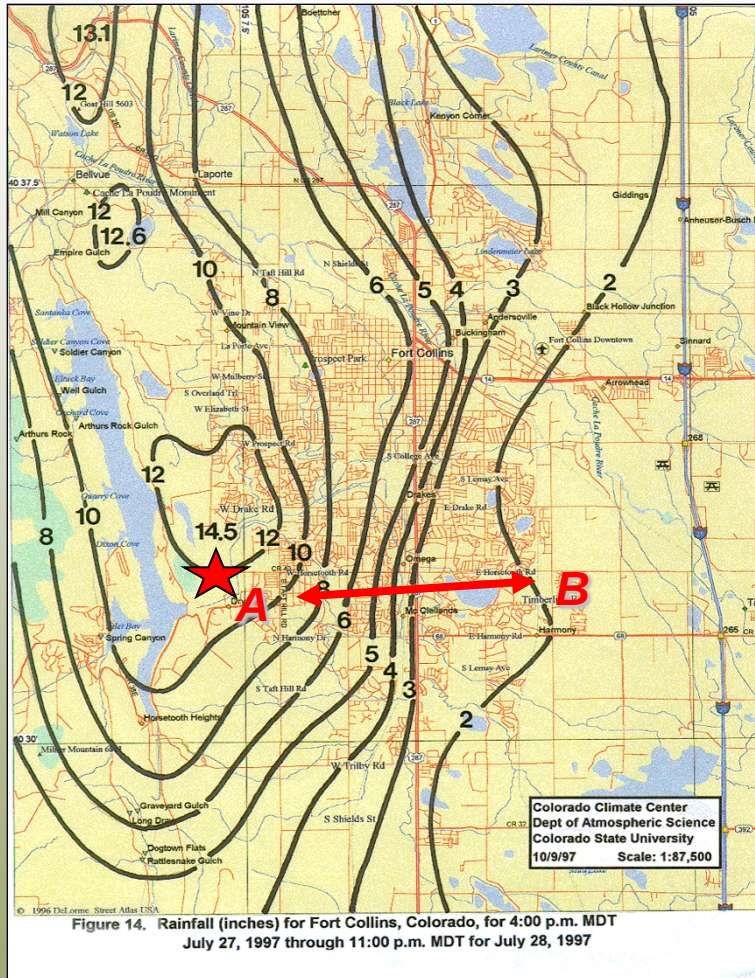


## July 30th 1997



*CoCoRaHS nació en respuesta a las inundaciones de 1997 en Fort Collins, Colorado*

# The flood pointed out:



1. The extreme local variations in rainfall.
2. The important role individuals can play in measuring, mapping and reporting precipitation.

Distance between A and B = 5 miles

A = 14.5 inches

B = 2.0 inches

*La inundación indicó:*

- 1. Las variaciones extremas de las lluvias locales.*
- 2. La importancia del papel que individuos pueden desempeñar en la medida, la cartografía y la presentación de informes sobre la precipitación.*

*Distancia entre A y B = 5 millas*

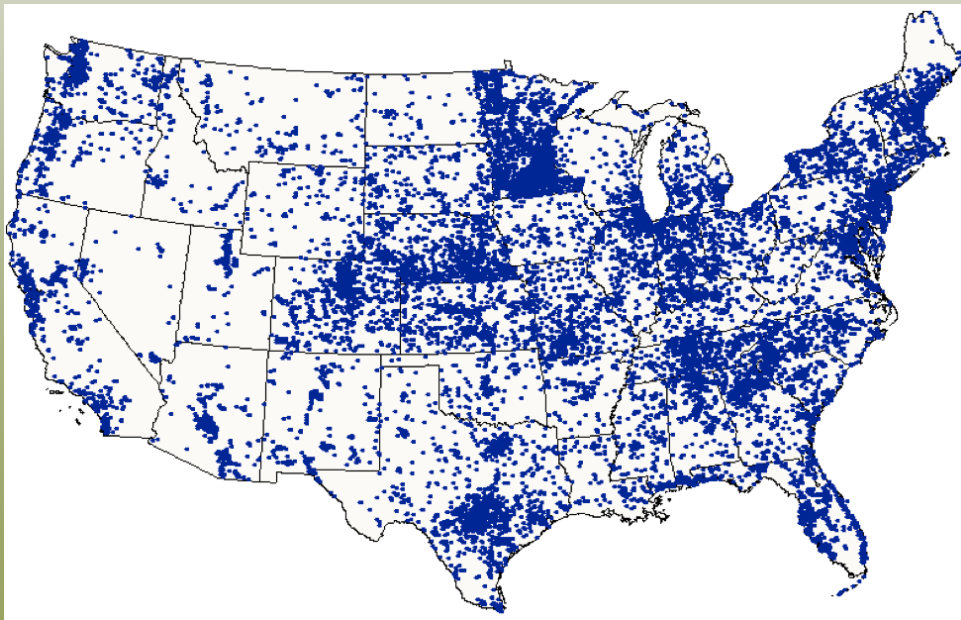
*A = 14.5 in*

*B = 2.0 in*



## *What began as a community project*

*Lo que comenzó como un proyecto comunitario*



## *Has turned into an important nationwide precipitation database*

*Se ha convertido en una base de datos de las precipitaciones importante en todo el país*

# CoCoRAHS DATA IS USED BY MANY

*Los datos de CoCoRaHS son ocupados por muchos*

- National Weather Service
- Other Meteorologists
- Hydrologists
- Emergency Managers
- City Utilities
  - Water supply
  - Water conservation
  - Storm water
- Insurance adjusters

- *Servicio Nacional de la Meteorología*
- *Otros meteorólogos*
- *Los hidrólogos*
- *Administradores de emergencias*
- *Servicios de la Ciudad*
  - *Ministro del agua*
  - *Ministro de conservación del agua*
  - *Ministro de aguas pluviales*
- *Los ajustadores de seguros*

# CoCoRAHS DATA IS USED BY MANY

*Los datos de CoCoRaHS son ocupados por muchos*

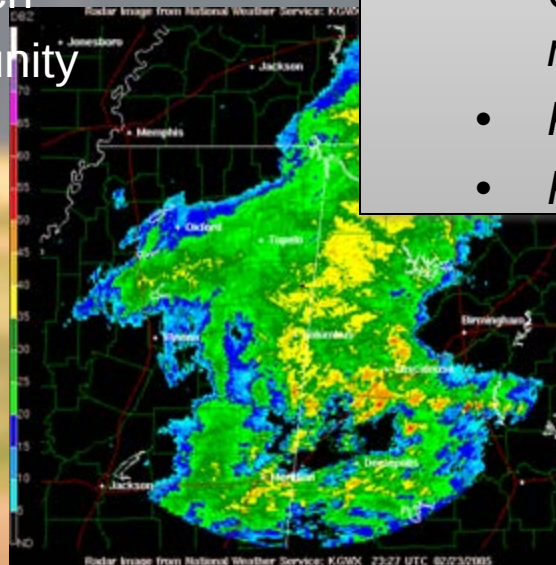
- USDA—Crop production
- Engineers
- Scientists studying storms
- Mosquito control
- Farm Service Agency
- Ranchers and Farmers
- Outdoor & Recreation

- *USDA- Los ingenieros en la producción de cultivos*
- *Los científicos que estudian las tormentas*
- *El control de mosquitos*
- *Agencia de Servicios Agrícolas*
- *Ganaderos y Agricultores de*
- *Recreación y Actividades al aire libre*

# CoCoRaHS DATA IS USED BY MANY

*Los datos de CoCoRaHS son ocupados por muchos*

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



- *Maestros y Estudiantes*
  - *Herramienta de educación*
  - *Ciencias de la Tierra*
  - *Tomar medidas*
  - *El análisis de los datos*
  - *Organización de los resultados*
  - *Para investigaciones*
  - *Para ayudar a la comunidad*

# Placement of your gauge

Location is the key to good data

But, please remember the  
bottom line...

Do Your Best 😊

## ***Colocación de su medidor***

*La ubicación es la clave para buenos  
datos*

*Pero, por favor, recuerde que al fin...*

*Haga lo mejor que pueda 😊*



# Places not to place your gauge

***Lugares donde no poner su medidor***

*El #1, el peor lugar donde poner su medidor  
es en la caja!*



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

Some things can't be avoided

*Algunas cosas no se pueden prevenir*

*Ideal placement  
for your gauge*



***Lugar ideal para su medidor***

# Measuring Rainfall with your Gauge

Accuracy and consistency  
are very important

***Medida de las precipitaciones  
con su pluviómetro***

***La precisión y la consistencia son  
muy importantes!***



# Reading your Gauge

Here are the most common  
situations you will  
encounter

## ***Leyendo su medidor***

*Estas son las situaciones más  
comunes que se encontrará*



# YOUR MOST COMMON OBSERVATION WILL BE . . .

*Su observación más común será...*

## ZERO “0.00”

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

***Please report zeros!***

*Es importante saber cuando NO  
llovió.*

***¡Favor de reportar los ceros!***

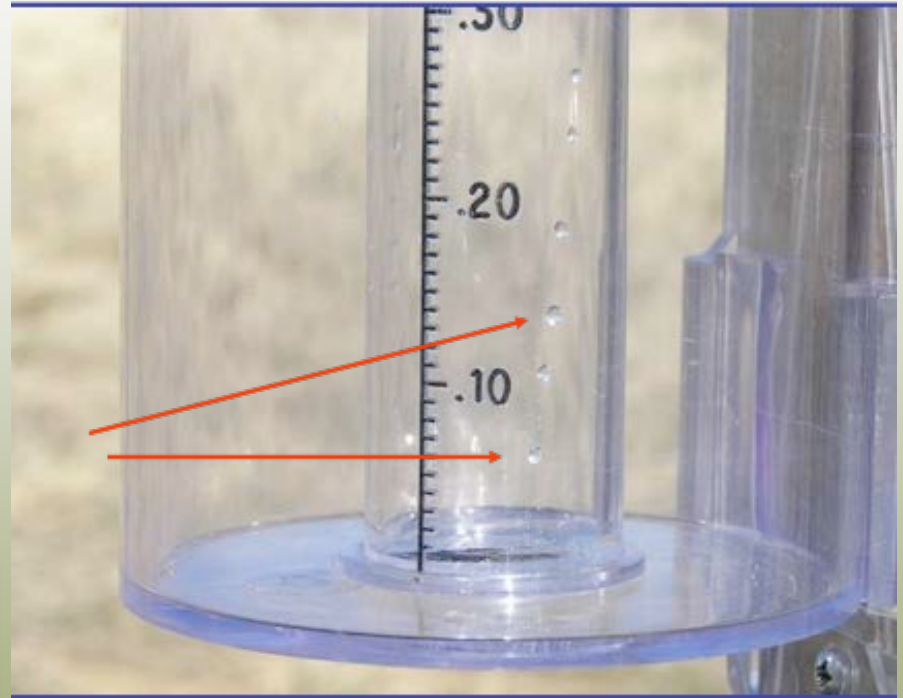


# Trace “T”

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

## **Rastro “T”**

*Cuando sólo una o dos gotas mojan el pluviómetro indíquelo con "T" para rastro*



# The Meniscus

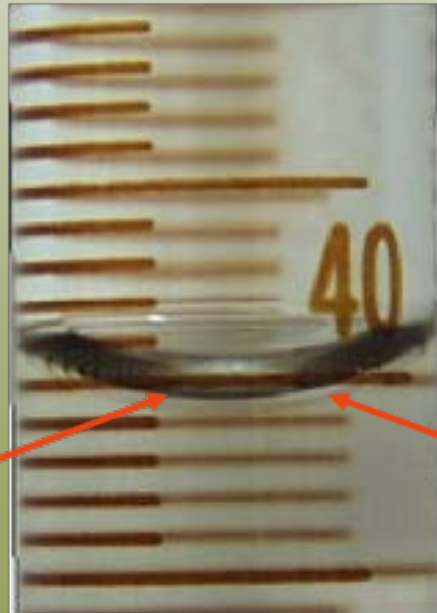
## *El menisco*

*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.



*La superficie del agua en el medidor se ve curvada.*

***¿Cómo puedo saber dónde leer?***

*Como el agua llena el tubo de medición, una superficie curvada se forma llamada **el menisco**. Está formado por la tensión superficial de un líquido en contacto con los lados del tubo.*

*Siempre lea la parte baja del menisco cuando tome su medida diaria de la lluvia*

# 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!

***Favor de no redondear***

*Es muy importante que se registre la mayor precisión a la centésima de pulgada.*

*Por favor, ¡**no** redondeé a la décima más cercana!*

# ***When should we take our observations?***

*¿Cuándo debemos hacer nuestras observaciones?*

7:00AM is preferred

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

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

*7:00 AM es preferido  
Entre las 5:00 y las 9:00 am  
esta bien  
Otras horas serán  
aceptadas, pero no se  
documentarán en los mapas  
de CoCoRaHS*



# To measure greater than one inch . .

*Para medir más de una pulgada...*

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



*Vierta la primera pulgada de la tubo interior y anótelo.*

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



*Vierta el resto del agua en el embudo y mida el tubo interior.*

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



*Continúe hasta que mida toda el agua. Asegúrese de mantener un registro de sus medidas a lo largo del camino.*

# Observing Hail

*Observando el  
granizo*



CoCoRaHS has become one of the largest repositories of hail data in the United States

*CoCoRaHS se ha convertido en uno de los repositorios mayores de datos de granizo en los Estados Unidos*

# As hail is falling

*Fill out your  
"CoCoRaHS Hail Report  
Card"*

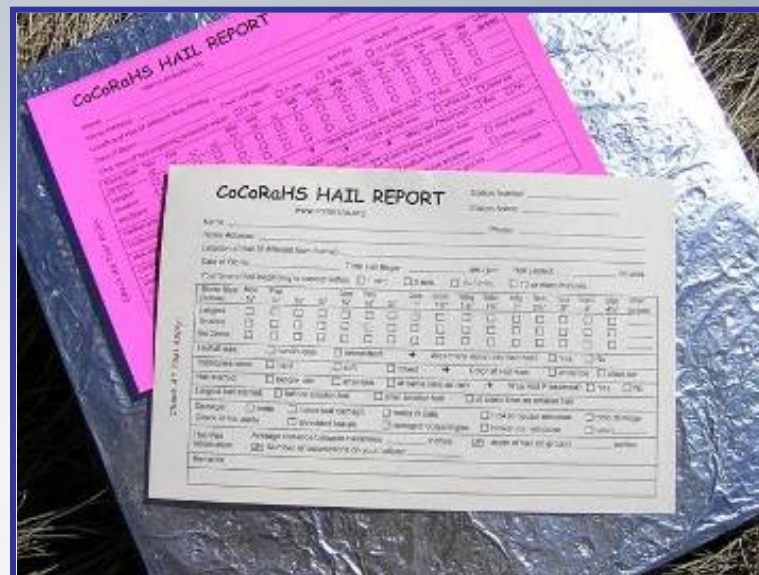
*After the storm is over attach  
it onto the back of the pad*



## ***Cuando el granizo este cayendo***

*Llene su  
"CoCoRaHS Hail Report Card"*

*Después de la tormenta colóquela en  
la parte posterior de la almohadilla*



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.*

***Si es posible entregue  
un***

***“Online Hail Report”  
lo más pronto posible.***

***(no necesita una almohadilla de granizo  
para presentar un informe)***

***Su reporte va directo al Servicio  
Nacional del Tiempo.***



Photo by Carl Whitehurst

**National Weather Service**

**Watches, Warnings & Advisories**

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

**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*

***Midiendo la nieve***

*“La nieve es buena”*

*– 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



## ***Dos formas que se mide la nieve***

*Nuestro observadores miden:*

1. *Contenido de agua líquida de la nieve*
  - *Del medidor*
  - *A partir de una muestra de la base*
2. *Altura de la nieve*
  - *La acumulación de nieve 24 horas*
  - *Profundidad de nieve existentes*

*YOU CAN LEARN MORE ABOUT SNOW MEASUREMENT  
BY VIEWING OUR “IN DEPTH” SLIDESHOW ON THE  
WEB*



*USTED PUEDE APRENDER MAS SOBRE LA MEDICIÓN DE NIEVE AL  
VER NUESTRA PRESENTACIÓN “**IN DEPTH SNOW MEASURING**” EN  
LA WEB*

# What else???

## Besides contributing to science...

- Opportunities to meet and ask questions to scientists
- Meet new friends through CoCoRaHS social networking and events

It's FUN!!! ☺

## *¿Qué más?*

*Aparte de contribuir a la ciencia...*

- *Oportunidades para conocer y hacer preguntas a los científicos*
- *Conocer nuevos amigos por medio de la red social de CoCoRaHS*
- *¡¡Es DIVERTIDO!!*

CoCoRaHS

## CoCoRaHS events: The 'Make it Rain Game'



*Eventos de CoCoRaHS: El juego "haz que llueva"*

# HOW CAN YOU GET INVOLVED?



[www.cocorahs.org](http://www.cocorahs.org)  
[noah@cocorahs.org](mailto:noah@cocorahs.org)

## *Five Easy Steps*

Sign-up on the  
CoCoRaHS web page  
[www.cocorahs.org](http://www.cocorahs.org)

Obtain a 4" plastic rain gauge

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.

# **¿CÓMO SE PUEDE INVOLUCRAR?**



**[www.cocorahs.org](http://www.cocorahs.org)  
[noah@cocorahs.org](mailto:noah@cocorahs.org)**

## **Cinco pasos fáciles**

***Regístrese en la página web de  
CoCoRaHS  
[www.cocorahs.org](http://www.cocorahs.org)***

***Obtenga un pluviómetro plástico de 4"***

***Ve la presentación de diapositivas  
"training slide show" o  
asista una sesión de  
entrenamiento***

***Ponga el medidor en un "buen"  
lugar en su patio trasero***

***Comience a observar la  
precipitación  
y ponga sus informes en el  
sitio Web.***



Just 2 minutes a day!  
Sólo 2 minutos al día

It's easy and fun!  
Es fácil y divertido

# We're Cuckoo For CoCoRaHS!

[www.cocorahs.org](http://www.cocorahs.org)

