COCORAHS BAHAMAS
Volunteers measuring rainfall throughout the islands

Training Slide Show
What is CoCoRaHS?
The Community Collaborative Rain, Hail and Snow Network

CoCoRaHS is a grassroots, non-profit, community-based, high-density precipitation network across the family islands...

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

... who take daily measurements of precipitation right in their own communities
Once trained, our volunteer observers collect data using low-cost measurement tools...

Training is important to assure accurate, high quality data.

4-inch diameter high capacity rain gauges
Bahamas CoCoRaHS Network

Officially began June 2016
Volunteers report their daily observations on our interactive website.
Immediately viewable

Volunteers' observations are viewable in both map and table form within a few minutes.
Why CoCoRaHS?
Great question!

Why CoCoRaHS?
Great question!

Data sources are few and rain gauges are far apart

Precipitation is important and highly variable

What falls at the airport may not be what falls at your house
Even though hail is rare here, there is almost no quantitative data being collected about hail on the islands.

Measurements from many sources are not always accurate.

Storm reports can save lives, but giving advanced warning of possible flooding.
7.12” May 6, 2008, New Braunfels, Texas

“All but .02” fell between 3:30 and 5:30 pm.”
Station TX-CML-17

Why one observation **CAN** make a difference
CoCoRaHS’s main focus is to provide:

Quality Precipitation Data & Educational Opportunities to help the public better understand weather and climate
Examples of CoCoRaHS data users

- The Bahamas Dept of Meteorology
- Other Meteorologists
- Hydrologists
- NEMA (Emergency Managers)
- Island Utilities
  - Water and Sewage Corporation
  - BTC (telephone)
  - BEC (electric)
- Insurance adjusters
- Crop production (BAMSI)
- Engineers
- Scientists studying storms
- Mosquito control
- Environmental Health
- Dept. of Tourism
- Outdoor & Recreation
- Teachers and students
- The National Hurricane Center
NOAA’s National Hurricane Center - Tropical system post storm analysis

“We use the CoCoRaHS data in our post-storm summary to describe the overall impacts of a tropical cyclone event.”
Dan Brown - National Hurricane Center

2015 – Hurricane Joaquin
Section One

Setting up your equipment and measuring precipitation
In this section we will:

a) Show how/where to place your gauge

b) Explain how to measure rainfall with your gauge
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!

Putting your gauge under 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:

Sprinklers both big and small

Animals (dogs, birds, potcakes . . . iguanas!)
Avoid anything that would artificially increase or decrease your catch gauge. This can cause updrafting during strong winds, which may reduce your gauge catch. Example: a solid fence.
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”
One inch of rain in the inner tube looks different than one inch of rain in the outer tube.
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
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, but they will not appear on CoCoRaHS Maps
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!*
We do experience drought among the family islands

Your reports of zero are extremely helpful

And are used to forecast drought conditions, which can lead to wildfires and water shortages
A “spry” … only a few drops

Trace “T”

“When only a drop or two wet the gauge record “T” for Trace
Between “T” and “two tenths” of an inch

“That’s 0.16” or sixteen 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 making your daily rain measurements.
A nice soaking rain

“This is “forty-six hundredths” of an inch and is recorded as 0.46”
A really good rain!

Almost at the top of the inner-tube.

This is “one inch” and is recorded as 1.00”
IF THERE IS VERY HEAVY RAIN FALLING

PLEASE submit a

“Significant Weather Report”
as soon as possible

Your report immediately goes to the Bahamas Dept of Meteorology

Your report provides them with much needed information to issue severe weather statements such as flash flood warnings and these can save lives!
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 a little over eleven inches.
To measure greater than one inch of rain . . .

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
\(+0.24\) inches

Total = 2.21”
Although not common on the islands, if you see hail, please submit an “On-Line Hail Report” as soon as possible.

Your report goes right to the Bahamas Dept of Meteorology.

It provides them with much needed information to issue severe weather statements.
Section Two
Reporting Observations
Welcome to CoCoRaHS Bahamas!

The Bahamas Islands are delighted to be participating in the growing CoCoRaHS network. Bahamas CoCoRaHS observers provide important information about rainfall that is used by meteorologists, hydrologists, farmers, water resource managers, and your friends and neighbors. This effort in the Bahamas is especially important given the great variation in rainfall across the islands from Grand Bahama to Great Inagua.
YOUR DAILY “24 HOUR” OBSERVATION

Click on “My data” from the top menu bar

My Data Entry: Daily Precipitation Report Form

Precipitation Report Form

Station Number: BHS-NP-0
Station Name: Nassau 2.4 SW

* Denotes Required Field

Observation Date: 2/23/2016
Observation Time: 7:00 AM

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)

New Snowfall
Enter the total precipitation measured in your gauge. Record your measurement in hundredths (0.00"").
You can enter comments under “notes”

These are very helpful to augment your observation
Submit your report

Click “Submit Data” and your observation is recorded on our site.
To see your Observation on our maps

Click on maps from our main page and then click on your country

The Bahamas
From here click on your island administrative district

Right click on your dot to get additional information about the observation

You can zoom in on your island to get more detail

Observations are available (and sortable) in table form by clicking on “View Data” from the main menu.
<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Station Number</th>
<th>Station Name</th>
<th>Total Precip in.</th>
<th>New Snow in.</th>
<th>Total Snow in.</th>
<th>State</th>
<th>County</th>
<th>View</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/2/2016</td>
<td>8:00 AM</td>
<td>BHS-CE-3</td>
<td>Rock Sound 0.0 N</td>
<td>0.63</td>
<td>0.0</td>
<td>NA</td>
<td>BHS</td>
<td>Central Eleuthera</td>
<td>![View](47x159 to 751x447)</td>
</tr>
<tr>
<td>5/2/2016</td>
<td>9:00 AM</td>
<td>BHS-CE-4</td>
<td>Tarum Bay 0.1 NW</td>
<td>0.02</td>
<td>NA</td>
<td>NA</td>
<td>BHS</td>
<td>Central Eleuthera</td>
<td>![View](47x159 to 751x447)</td>
</tr>
<tr>
<td>5/2/2016</td>
<td>7:00 AM</td>
<td>BHS-NP-1</td>
<td>Nassau 14.4 SW</td>
<td>0.01</td>
<td>NA</td>
<td>NA</td>
<td>BHS</td>
<td>New Providence</td>
<td>![View](47x159 to 751x447)</td>
</tr>
<tr>
<td>5/2/2016</td>
<td>7:00 AM</td>
<td>BHS-FP-1</td>
<td>Freeport Lucaya 7.4 WNW</td>
<td>0.00</td>
<td>0.0</td>
<td>NA</td>
<td>BHS</td>
<td>City of Freeport</td>
<td>![View](47x159 to 751x447)</td>
</tr>
<tr>
<td>5/2/2016</td>
<td>8:00 AM</td>
<td>BHS-NP-3</td>
<td>Nassau 12.8 WSW</td>
<td>0.00</td>
<td>0.0</td>
<td>NA</td>
<td>BHS</td>
<td>New Providence</td>
<td>![View](47x159 to 751x447)</td>
</tr>
<tr>
<td>5/2/2016</td>
<td>8:00 AM</td>
<td>BHS-CE-5</td>
<td>North Palmetto Point 1.0 SSW</td>
<td>0.00</td>
<td>0.0</td>
<td>NA</td>
<td>BHS</td>
<td>Central Eleuthera</td>
<td>![View](47x159 to 751x447)</td>
</tr>
</tbody>
</table>

Observations are available (and sortable) in table form by clicking on “View Data” from the main menu.
Re-entering an erroneous report

Click on “Daily Precipitation” under List/Edit My Reports. Click on the date and then enter the corrected data. Be sure to put a short note in the observations box.
Other Important Reports

Hail Report

Significant Weather Report (Rain and Snow)

Monthly Zeros

Multi-Day Precipitation Report
Hail Report

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: 1/4" Pea Size
Average: 1/2" Grape
Largest: 3/4" Penny Size

Hail Lasted:
15 Minutes This time is accurate within 2 min.

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 After smaller Same time as smaller

Hail
Significant Weather
Drought Impact Report
Evapotranspiration
FROST Reports
Frost Optics Snowflake Thunder

List/Edit My Reports

Daily Precipitation Multi-Day Accumulation Hail Significant Weather Drought Impact Report Evapotranspiration
Monthly Zeros Report

Click an 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)

My Data Entry: Significant Weather Report Form

Notification:
• Use this form to report heavy rain or snow that has just fallen, or is still falling.

Significant Weather Report

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

Denotes Required Field

Observation Date
9/6/2013

Observation Time
5:15 PM

Time duration that the report covers
20 minutes

Rain

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

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

1.35 in.

Snow

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

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

1.35 in.
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.
Section Three

Frequently asked questions
Do I have to be home everyday to participate in CoCoRaHS? What if I’m away?

**Answer:** No, report when you are able. If you are gone or away on vacation, 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 the results.
Although hail in the Bahamas is rare, what if it hails when I’m not home?

**Answer:** We still would like your hail report. 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?

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 being one of our volunteer observers!