

CoCoRaHS Puerto Rico

June 2023 | Newsletter Vol. 1



69 ACTIVE STATIONS



[VIEW HERE](#)



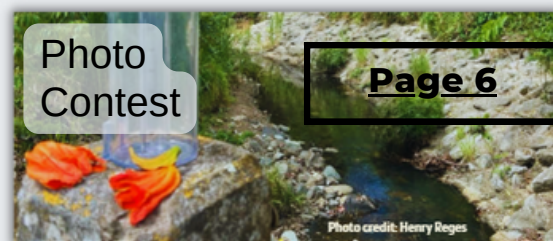
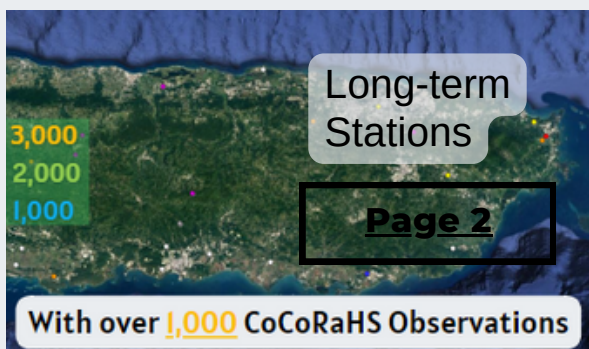
WFO
San Juan

Rain Gauge



Meet Our
Observers

Page 4



**Best CoCoRaHS PR
Photo Contest**

AND MORE...!

**FRIENDLY
REMINDERS**

HOW TO REGISTER, INSTALL, AND
MORE!

[Step by Step Guide](#)

[YouTube Video](#)

Recognizing our Long-term Stations

7 > 3,000
6 > 2,000
6 > 1,000

With over 1,000 CoCoRaHS Observations

Station Number	Station Name	Daily Obs Count	Day of Creation Date	Day of Last
PR-RN-4	Rincon 2.8 SE	3248	06/09/2014	05/08/2023
PR-CR-1	Cabo Rojo 0.8 SE	3118	05/31/2014	05/11/2023
PR-RN-3	Rincon 1.5 N	3098	06/05/2014	05/12/2023
PR-AL-3	Aguadilla 5.5 NNE	3086	06/29/2014	05/11/2023
PR-AC-1	Arecibo 5.2 ESE	3049	06/19/2014	05/12/2023
PR-PC-4	Ponce 5.0 NNW	3041	06/16/2014	05/11/2023
PR-MY-5	Mayaguez Arriba	3025	01/25/2015	05/12/2023
PR-LJ-2	Lajas 2.2 E	2987	06/10/2014	05/12/2023
PR-TB-1	Levittown 1.0 SE	2923	05/09/2014	05/12/2023
PR-PC-2	Ponce 3.2 NNE	2894	06/01/2014	05/09/2023
PR-JN-1	Juncos 0.3 WSW	2866	05/22/2015	05/12/2023
PR-JD-2	Juana Diaz 2.9 SW	2238	03/14/2017	05/12/2023
PR-LM-1	Las Marias 9.6 ESE	2116	07/10/2016	05/12/2023
PR-LR-2	Lares 1.6 SSW	1716	07/06/2016	05/12/2023
PR-GM-2	Guayama 1.1 W	1611	04/16/2018	05/12/2023
PR-QB-1	Quebradillas 1.6 SE	1495	04/08/2018	05/10/2023
PR-LR-5	Lares 2.0 NNE	1345	05/21/2019	05/11/2023
PR-MC-1	Moca 0.3 S	1201	06/18/2016	05/12/2023
PR-TB-5	Campanilla 0.3 S	1009	08/09/2020	05/06/2023

A giant round of applause!!



Did You Know?

COCORAHS CELEBRATES 25 YEARS DURING 2023

CoCoRaHS officially began on June 17, 1998. With a few observers along Colorado's Front Range, we had no idea that the network would become what it is today, with over 25,000 active observers in the United States, Canada, Puerto Rico, the U.S. Virgin Islands, Guam and the Bahamas.



A history of the rain gauge

When you look at a rain gauge, do you really appreciate the thought that has gone into it? I was surprised to discover quite how much work went into its development, and think it important that this early work is not forgotten.

Originally invented in the Orient the rain gauge was reinvented much later in Western Europe. There is also evidence to suggest that a form of rain gauge was used to monitor rainfall for irrigation purposes in several parts of India as early as the 4th century BC. Research indicates that around 50,000 rain gauges were being used in Palestine to measure rainfall, again for agricultural purposes.

In 1910, Dr Y Wida, Director of the Korean Meteorological Observatory, published an article about 15th century Korean rain gauges.

'In the 24th year (1442) of the reign of King Sejo, the King caused a bronze instrument to be constructed, in order to measure the rain. This is a vase (30 cm) in depth and (14 cm) in diameter, standing on a pillar. The instrument has been installed at the Observatory, and each time that rain falls, the officials of the Observatory measure the height with a scale, and make it known to the King. These instruments were distributed in the provinces and canons, and the results of the measurements were sent to the court.'

This refers to probably the earliest meteorological instrument of its kind. It is astonishing to consider that the design of the instrument used are very similar to the standard Met. Office gauge: 30 cm high.

First rain gauges in England

One of the earliest gauges recorded can be found in the Royal Society's 'Experiments of filling a vessel which employed it self, filled at a certain height (sic), to use this 'tipping bucket' mechanism in a rain gauge. "...at the year's end discovers how much rain has fallen on a space of land...". It is remarkable that a variant of this bucket mechanism is still used in today's automatic rain gauges.

In 1663, Wren produced a recording gauge that worked by bringing a succession of containers under a collecting funnel, one every hour. He abandoned this idea when he realised that the collected rain would largely evaporate before it might be measured. However, the basic idea persisted and is found, in slightly refined form, in a book of machines by Jacob Leupold in 1726. This was driven by a discontinuous motion provided by a one-toothed gear, as shown opposite.

Development continued throughout Europe, but the rain gauges were of such disparate size, shape and mechanism, that comparisons between readings over large areas were difficult to make.

4 Network

19th century work on standardisation begins



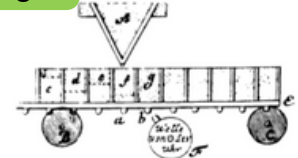
Mr G J Symons

In England, Mr G J Symons was one of the first to address the problem of standardisation of gauges for use in a network. When he issued his *English Rainfall 1860*, he had to organise a body of observers and determine which instruments and methods were to be used. In 1863, at Calne in Wiltshire, a set of gauges was established, designed to test the effect of aperture size and height above ground level on the amount of rainfall catch.

In 1865, a Mr R Chimes set up an elaborate set of gauges on the flat roof covering of the Boston reservoir at Rotherham, Yorkshire. A work examining the effects of elevation, these gauges were used to test the effect of wind direction and the angle of

Select image to read about the history of the rain gauge.

...and TE Crallan began observing rain with a uniform aperture but composed of a series of small gauges. In 1870, an enthusiastic observer of Strathfield, Mr Symons, carried out a series of experiments. Eventually, Mr Symons' early rain gauges at Calne were sent to join the gauges already under Reverend Giffith's care. In 1870, Mr Symons carried out a series of experiments to test in a rougher climate, on the coast, facing the sea, by the Reverend FW Stone. The gauges were sent to join the gauges already under Reverend Giffith's care. The gauges were sent to join the gauges already under Reverend Giffith's care.



THE HISTORY OF RAIN MEASUREMENT

Trying to find the history of rain measurement is somewhat similar to finding the proverbial needle in a haystack. There are many "most likely's" or "probably's", and few certainties. For instance, one might say the Mayan Indians most likely took measurements, or that measurements were probably taken by early scientists in Greek laboratories. However, finding actual instances of quantitative measurements that were recorded is very difficult.

In his book *Meteorologica*, Aristotle (340BC) certainly presented topics such as clouds, mist, rain, snow, etc, but did not mention the measurement of precipitation. In the ancient times, man depended upon atmospheric conditions of rain and drought because they were farmers and hunters. If it didn't rain, they didn't eat! However, measuring the rain and keeping records of it was apparently out of the question.

Aristotle's ideas were almost unchallenged for nearly 2000 years. The beginning of meteorology as a true science in the Western World came at the end of the 16th century. However, some research indicates that rain gauges were being used around Palestine to measure rainfall for agricultural purposes.

The earliest quantitative rain gauge was invented from 1397 to 1450. One of the first to invent a rain gauge, was a Korean called King Sejong who made his people literate, so not only did he invent a rain gauge, but he also created a movable type for printing in his own language.

He decided that instead of digging into the ground to measure moisture, it would be better to have a standardized container about 30 cm high and 14 cm in diameter. The containers were to help villagers determine their potential for growing crops. The gauge was invented in the fourth month of 1441 according to records.

He ordered books to be written about agricultural farming methods, medical dictionaries, and acupuncture therapy. King Sejong promoted art, music and science in his country. Koreans still celebrate King Sejong day, and in Seoul there is a museum and library named after him.


One can go to find many more very interesting weather people at www.islandnet.com/~see/weather/history on the internet.

The "tipping bucket" rain gauge invented by Christopher Wren in Europe around 1661, used the standard of weight, or sometimes volume of the liquid precipitation. (Assuming the standards then were similar to the standards now, one gram of water is equal to one cubic centimeter of volume of water.) We need to remember, however, the metric system as we know it did not exist then. They most likely used something similar. This "tipping bucket" idea is still used in many of the automatic electronic gauges today.

Select image to read about the history of the rain measurement.

A Visit from Henry Reges CoCoRaHS U.S. National Coordinator



During May 2023, we received a visit from Henry Reges, the CoCoRaHS U.S. National Coordinator who was able to experience our island for the first time. He spent his time enthusiastically helping to recruit and retain observers. Henry visited various towns including San Juan, Carolina, Luquillo, Mayagüez, and Jayuya. Among his visits he had the opportunity to go to the EcoExploratorio to provide additional information to the museum and public in general. You can see the [Facebook Live](#) 

Henry and the WFO San Juan staff was able to discuss various aspects about our initiative to recruit and retain volunteers. The knowledge and ideas he shared will be a great advantage for CoCoRaHS Puerto Rico.



Are you aware? Webinars and Reports

COCORAHWS WXTALK WEBINARS

CoCoRaHS WxTalk consists of a series of monthly one-hour interactive Webinars featuring engaging experts in the fields of atmospheric science, climatology and other pertinent disciplines. These easy to follow presentations are live and approximately sixty minutes long. The audience is given the chance to submit questions which the experts answer live on the air.

TOTAL PRECIPITATION SUMMARY

STATION	INCHES	01/01-06/21/2023	STATION	INCHES
PR-AL-3	12.8		PR-FJ-5	24.37
PR-AC-1	15.52		PR-FJ-6	26.45
PR-AC-3	28.45		PR-GC-2	4.36
PR-BY-1	35.77		PR-GM-2	18.1
PR-BY-2	25.5		PR-GM-3	7.11
PR-CR-1	12.96		PR-HM-2	2.53
PR-CR-4	9.86		PR-JY-1	28.29
PR-CR-5	6.39		PR-JD-2	14.42
PR-CG-3	1.31		PR-JN-1	24.69
PR-CL-6	4.04		PR-LJ-2	14.73

SO FAR
THIS YEAR



Photo credit: Henry Reges

Best CoCoRaHS PR Photo Contest

Precipitation

THE TOP 3 CONTESTANTS

Surface Irrigation



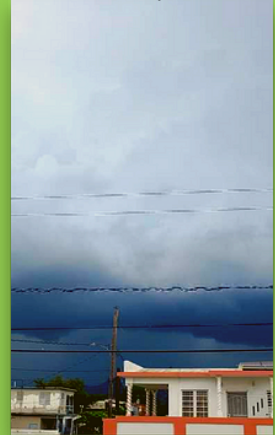
PR-BY-1

The Future of Observers



PR-SJ-17

Storm Watcher



PR-JD-2

Congratulations & Thank you for sharing!

Top 3 contestants will be receiving a token of our appreciation.

CoCoRaHS Headquarters Sends its Greetings and Thanks to our Puerto Rico Observers

Greetings from CoCoRaHS headquarters located at Colorado State University in Fort Collins, Colorado. We are so happy to have you as part of our rainfall observing team. Your observations make a difference not only to the National Weather Service, but to so many other users of your data. Recently, I visited Puerto Rico and was amazed by its beauty as well as the friendliness of the people there. So many were very kind and extremely helpful. I can see why you live where you do. One thing I also noticed was the amazing variability of precipitation from passing showers, where it would be wet on one side of the road and dry on the other. Isn't that the way in the tropics! And that's why we need and appreciate you so much to capture that variability and help fill in the precipitation observing gaps over the commonwealth. The more observers we have on the island the better the picture of what fell where and how much fell from the sky above (feel free to recruit a family member or friend). The longer you participate and observe the better handle we have on the spacial variation of precipitation there.



There are two other requests I have to ask you. 1) if you see unusually heavy rainfall falling, please file a "significant weather report" (<https://cocorahs.org/Admin/MyDataEntry/IntensePrecipReport.aspx>) in real-time. These go directly to the National Weather Service and provide life-saving information that could lead to the issuance of "flash flood warnings" to those in danger; 2) if once a week you might find five minutes file a "condition report" (<https://cocorahs.org/Admin/MyDataEntry/ConditionMonitoringReport.aspx>), most likely on the weekend, letting us know what the condition of your surroundings look like . . . are they severely dry, near normal, moderately wet? Let us know if you can. It will help in accessing oncoming drought. <https://cocorahs.org/Content.aspx?page=condition>

Finally I would like to thank my friends at the National Weather Service (especially Xiomara, Rosalina and Odalys), as well as our new partners at the Puerto Rico Climate Center (Hector Jimenez) at the Univ. of Puerto Rico-Mayaguez for their hospitality shown to me as well as their dedicated service to CoCoRaHS to help make us all better Citizen Scientists.

From Colorado's Front Range,
Henry





Stations and Observers



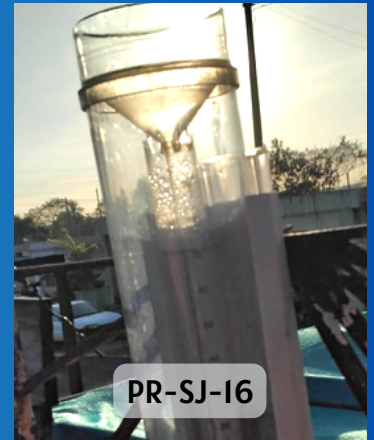
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PR-SJ-17



PR-TR-3



PR-SJ-16



PR-PC-7



PR-LJ-4



PR-MC-1



PR-BY-1



PR-TA-2



PR-JN-1



PR-TB-1



PR-CR-4



PR-FJ-5



PR-LR-3



PR-SJ-15



PR-GM-2



Stations and Observers



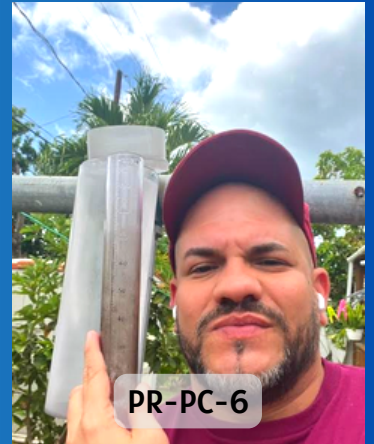
PR-JD-2



PR-QB-1



PR-LM-1



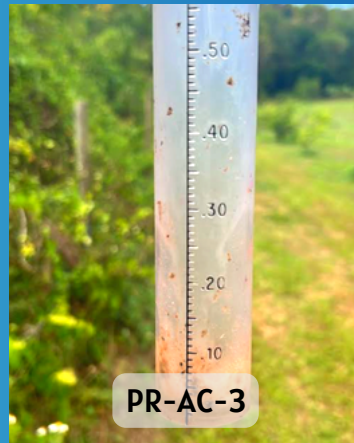
PR-PC-6



PR-LJ-2



PR-AC-1



PR-AC-3



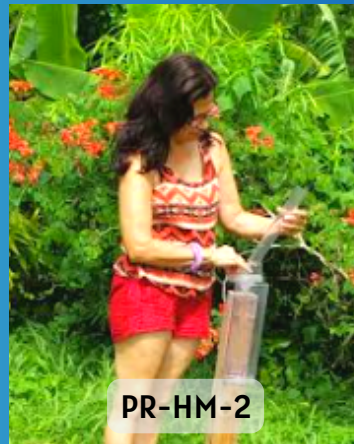
PR-VL-5



PR-LQ-6



PR-PC-8



PR-HM-2



PR-JY-1

Thanks to each and every one of you for being part of

CoCoRaHS Puerto Rico

Thank you from the National Weather Service WFO San Juan, Puerto Rico

A FEW WORDS FROM THE NEW METEOROLOGIST IN CHARGE OF THE WEATHER FORECAST OFFICE OF SAN JUAN, PUERTO RICO



Ernesto Rodriguez
Meteorologist in
Charge
San Juan, Puerto Rico



PR-CL-6

Hi CoCoRaHS Observers, I am Ernesto Rodriguez the new Meteorologist-In-Charge of the National Weather Service Weather Forecast Office San Juan. I have seen the importance of rainfall observations since 2008 when my career began in San Juan. Puerto Rico exhibits a range of microclimates due to its geographic location in the northeast Caribbean and topography. As a result, it is important to have a good network of rain gauges to monitor drought, flooding, changes in precipitation patterns as well as long-term trends. Water management is also crucial for the people in Puerto Rico, as it affects agriculture, irrigation, and drinking water consumption. All in all, the information that COCORaHS observers collect will help in many areas of planning, monitoring, and long-term climate change studies. Therefore, we all recognize the value of your effort as citizen scientists to provide the critical data needed for the sustainability and resiliency of our islands in the northeast Caribbean region. Thank you!



Xiomara Cruz



Rosalina Vázquez-Torres

State Coordinators



Join our private
Facebook Group

CoCoRaHS PR

for
Active CoCoRaHS
Observers



LET'S CHAT!

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WWW.COCORaHS.ORG