



CoCoRaHS

Community Collaborative Rain, Hail & Snow Network



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Introduction to CoCoRaHS

- CoCoRaHS is a non-profit precipitation network made up of volunteers who take daily measurements of precipitation right in their own backyards
- CoCoRaHS utilizes a low-cost rain gauge and an interactive website/app
- Website/app and data are all free to use



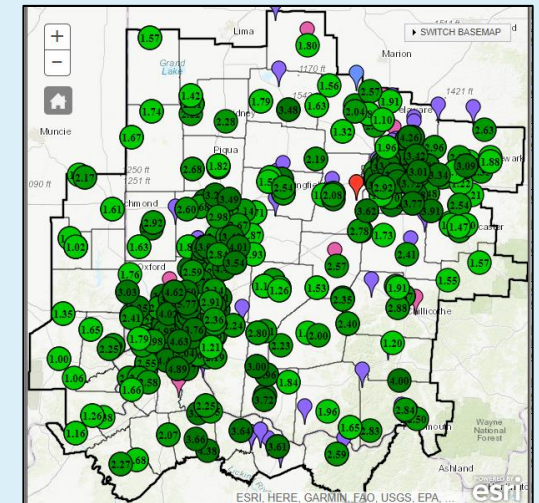
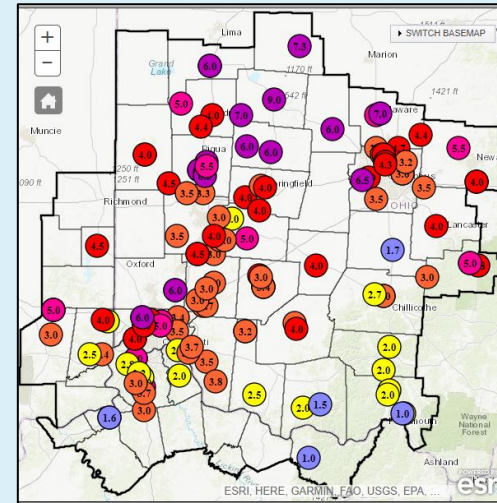
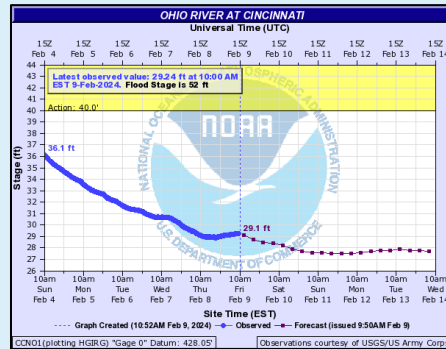
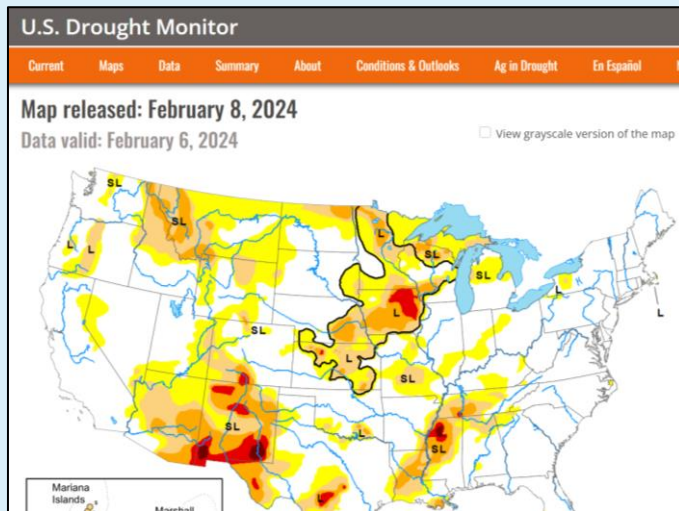
History and Purpose of CoCoRaHS

- Began in 1998 in Colorado in response to devastating flash flood in 1997 with a need for a dense precipitation network since precipitation is highly variable.
- Now observers are present across the country in every state and in other countries as well!
- You can be a part of the mission to save lives!



Uses by NWS Meteorologists and Hydrologists

- Aid in issuing and verifying life saving warnings
- Increases climatological network
- Better tracking of wet/dry areas
- River forecasting
- Research
- Improved preparedness/mitigation working with partners

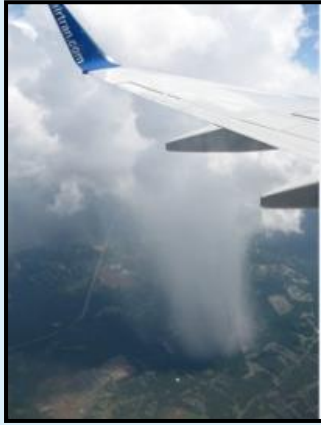


The U.S. Drought Monitor is produced through a partnership between the National Drought Mitigation Center at the University of Nebraska-Lincoln, the United States Department of Agriculture, and the National Oceanic and Atmospheric Administration.

Many People and Groups Rely on CoCoRaHS

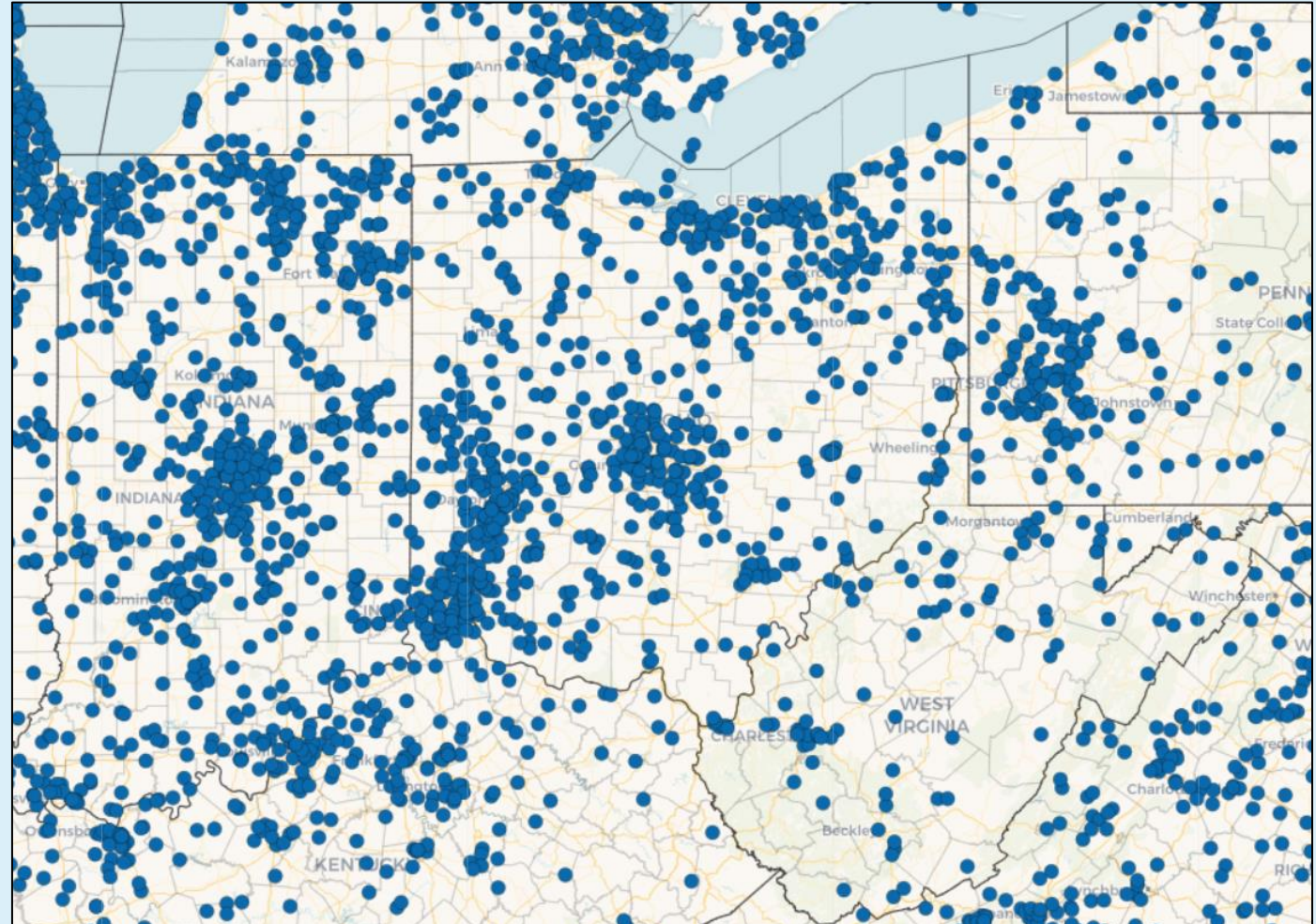
- Teachers and Students
- Media
- Farmers
- Emergency Managers
- FEMA declarations for disaster assistance
- Turf and Landscape Professionals
- Hydrologists
- City Utilities
- Insurance adjusters
- Engineers
- Mosquito control
- Outdoor & Recreation
- And many more!





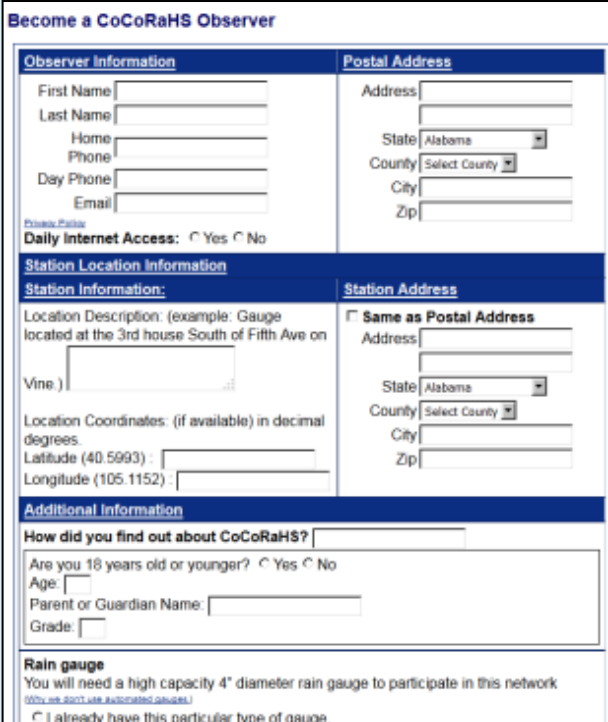
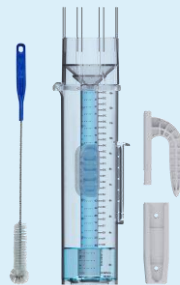
CoCoRaHS Stations

- Some counties have very few or no observers, while some have several
- Even in areas with several observers, precipitation is highly variable and therefore more observers are appreciated and the data heavily utilized



How to Join

- Computer or app access
- Fill out quick application form on CoCoRaHS website
- CoCoRaHS standard rain gauge
 - Automated gauges are not utilized b/c they can underestimate heavy rain, have a hard time with snow, and they are not used in order to make sure everyone is utilizing the same gauge
 - Can be found on the CoCoRaHS website and many other places online for around \$35. There is another gauge the tropo gauge that is more expensive with more included. It doesn't matter which one of the two you get. This training will show the original (upper right gauge).
- Snowboard/measuring stick



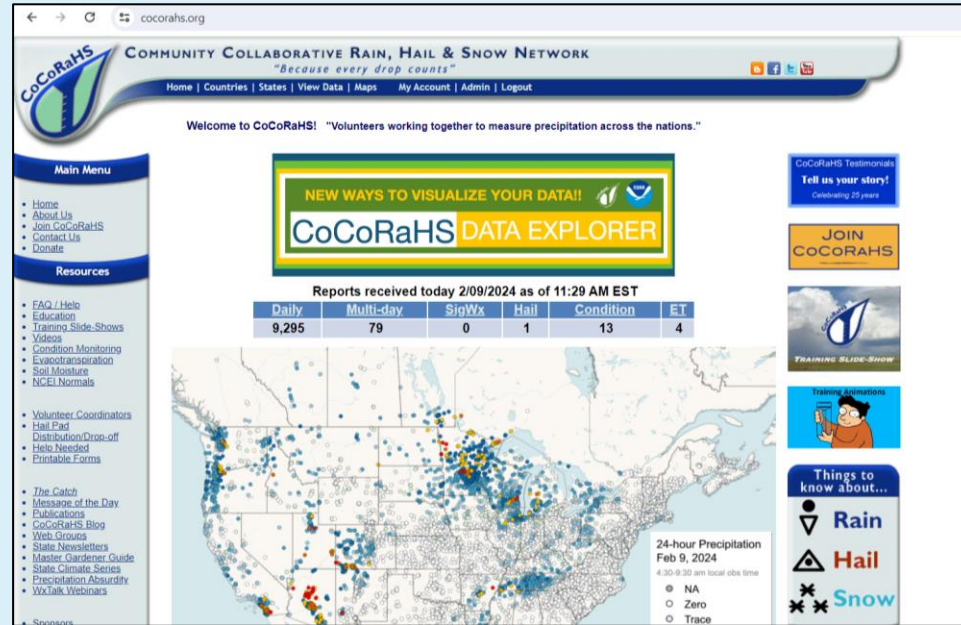
A screenshot of the "Become a CoCoRaHS Observer" application form. The form is divided into several sections: "Observer Information", "Postal Address", "Station Location Information", "Station Information", "Station Address", and "Additional Information". Each section contains various input fields, including text boxes, dropdown menus, and checkboxes. The "Additional Information" section includes a question about how the user found out about CoCoRaHS, age, parent/guardian name, and grade. At the bottom, there is a note about the rain gauge requirements.

Station Number : OH-CN-16

Station Name : Wilmington 1.6 SSE

CoCoRaHS Data and Viewing

- Observations can be submitted via web (www.CoCoRaHS.org) or app and viewable within minutes
- Types of observations:
 - 24 hour daily precipitation (rain, snow, ice etc)
 - Real time occurrences (hail, significant precip)
 - Condition monitoring (drought etc)
 - Other reports (frost, thunder, etc)



View Data : List Daily Precipitation Reports [US Units]

Search Daily Precipitation Reports

Station Fields: Station Number Station Name

Location: USA | Ohio | ALL COUNTRIES

Date Range: Start Date: [2/9/2024] End Date: [2/9/2024]

Precip Value: All Precip Values | Operator

Searched: Stations in Ohio. Report date on 2/9/2024.

Showing 1 - 50 of 241 Records.

Obs Date	Obs Time	Station Number	Station Name	Gauge Catch In.	24hr Snowfall			Snowpack			State	County	View	Maps
					in	in	SLR	in	Density					
2/9/2024	4:00 AM	OH-CB-8	Hanoverton 0.4 ENE	0.03	NA	NA	NA	NA	NA	NA	OH	Columbiana	Active Statc	
2/9/2024	4:30 AM	OH-ST-11	Canton 2.0 ENE	0.01	NA	NA	NA	NA	NA	NA	OH	Stark	Active Statc	
2/9/2024	4:45 AM	OH-MH-11	Canfield 0.5 N	0.03	NA	NA	NA	NA	NA	NA	OH	Mahoning	Active Statc	
2/9/2024	5:00 AM	OH-BT-22	Hamilton 1.2 NNW	0.00	0.0	NA	NA	NA	NA	NA	OH	Butler	Active Statc	
2/9/2024	5:00 AM	OH-DR-7	Versailles 1.6 WSW	0.00	0.0	NA	NA	NA	NA	NA	OH	Darke	Active Statc	
2/9/2024	5:00 AM	OH-GV-10	Cambridge 3.2 NE	0.00	0.0	0.00	NA	0.0	0.00	NA	OH	Guernsey	Active Statc	
2/9/2024	5:00 AM	OH-HM-13	Cincinnati 8.9 NW	0.00	0.0	NA	NA	NA	NA	NA	OH	Hamilton	Active Statc	
2/9/2024	5:00 AM	OH-LS-40	Toledo 3.3 ESE	0.00	0.0	NA	NA	NA	NA	NA	OH	Lucas	Active Statc	
2/9/2024	5:00 AM	OH-MA-9	London 1.2 N	T	NA	NA	NA	NA	NA	NA	OH	Madison	Active Statc	
2/9/2024	5:00 AM	OH-MD-1	Wadsworth 4.7 WNW	0.00	0.0	NA	NA	0.0	NA	NA	OH	Medina	Active Statc	
2/9/2024	5:00 AM	OH-MD-18	Spencer 1.5 E	0.00	0.0	NA	NA	0.0	NA	NA	OH	Medina	Active Statc	

Verizon LTE 2:30 PM

Logout Precip Report Details

CoCoRaHS OH-CN-6
 Wilmington 3.6 W
 US Units (in)
 Precipitation Report

Observation Date 2019-02-19

Observation Time 19:00

Rain/Melted Snow NA

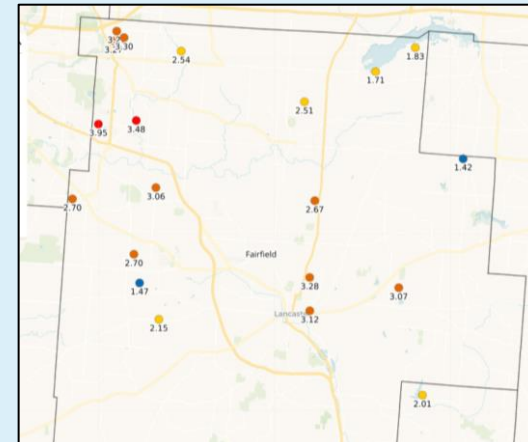
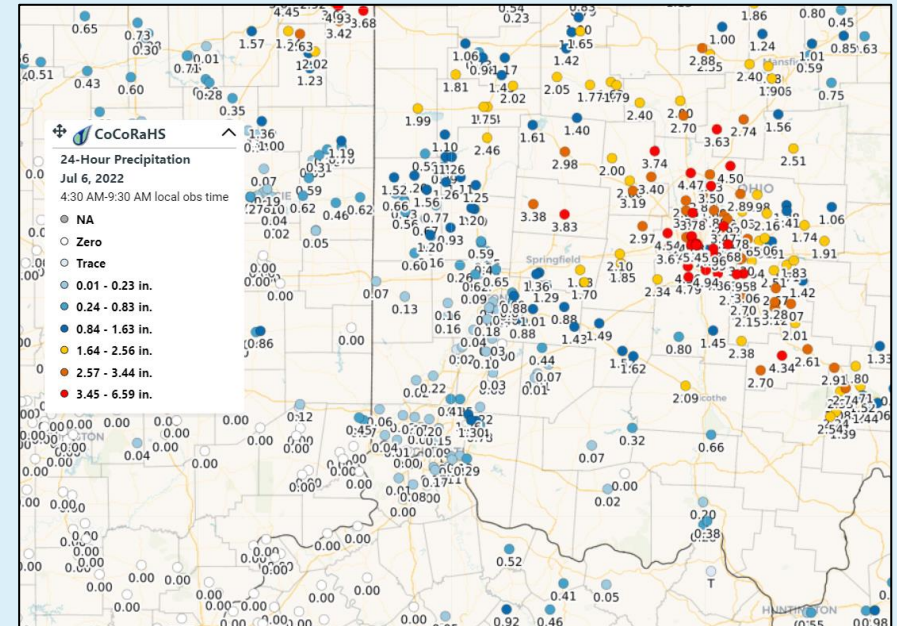
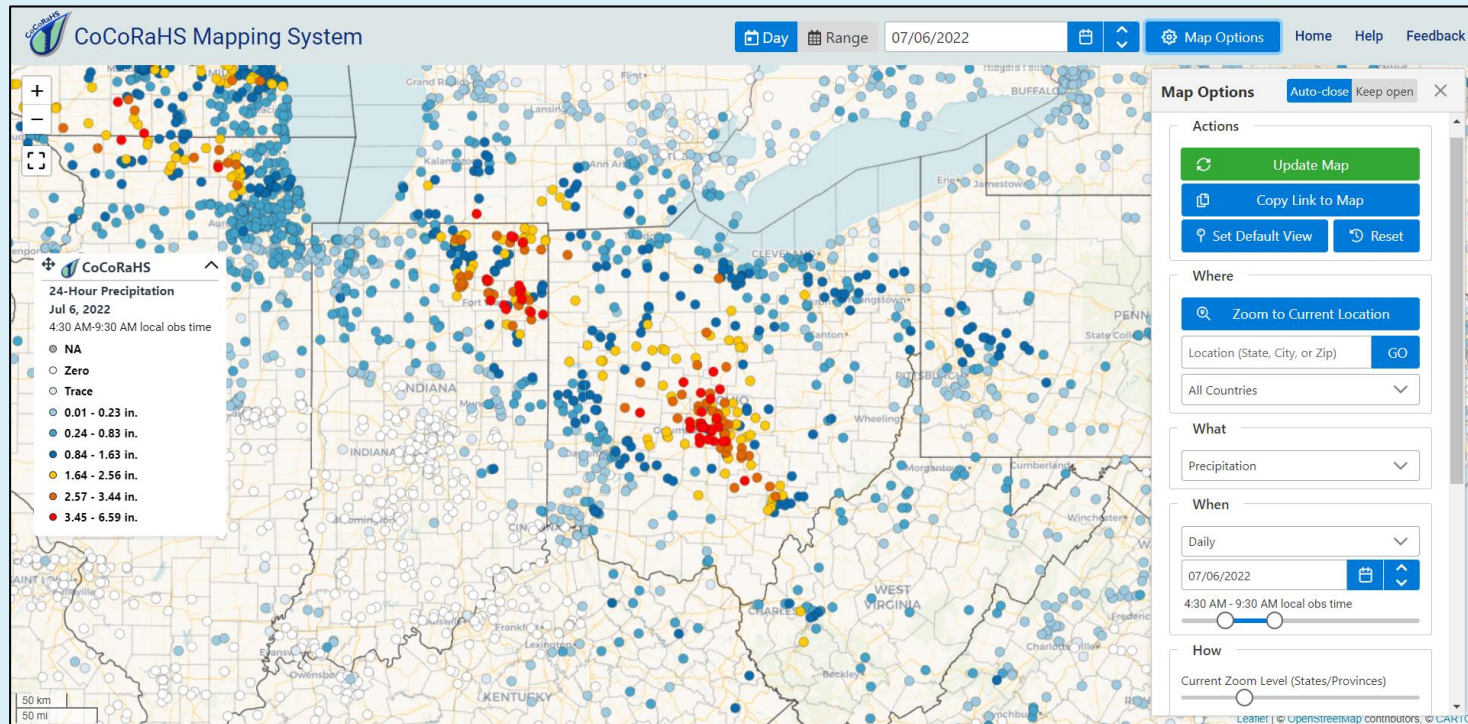
More Details

Trace Precip

Cancel Submit

Report Multi-Day Report History Multi-Day History Other

CoCoRaHS Data and Viewing



Gauge Placement and Installation

Preferred



Level and bevel
if you can

Not Preferred



How to Read the Gauge and When to Report

- Read at eye level
- Read the bottom of the meniscus (contact lens)-caused by surface tension
- 7:00 AM is the preferred time, however any time between 4:30am and 9:30 AM will show up on the default map. Whatever time is good for you as long as it is pretty consistent from day to day.
- It is ok if you can't report everyday, you can submit a multi-day report!



Your Most Common Observation

- Your most common observation will be 0.00, nothing. It is important to know where it did not rain!



- Also, dew/fog, while it may accumulate in the gauge this still counts as a 0.00. Best way to think of this is if it falls from the sky count it, if it condenses count as 0.



Trace (T)



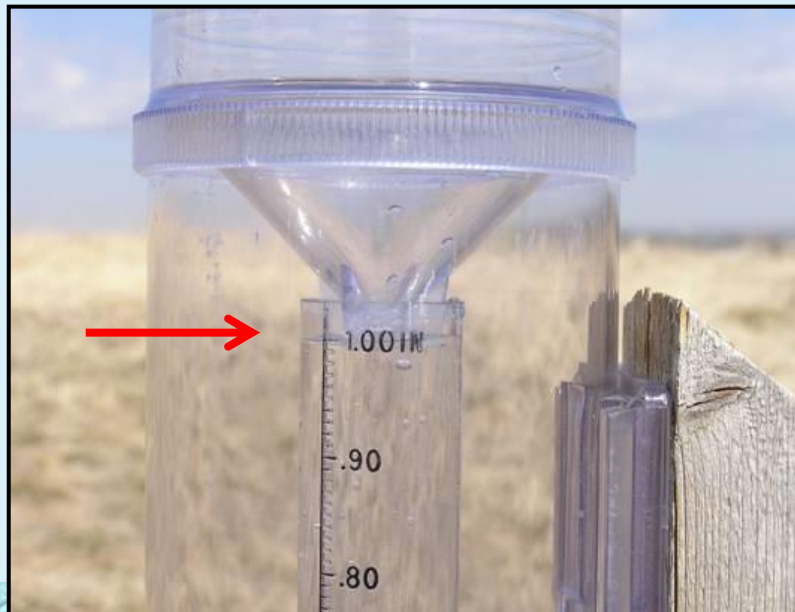
0.04 inch



0.50 inch



1.00 inch



Over an inch



Over an Inch of Precipitation

- When more than an inch of rain falls, the precipitation will overflow into the outer cylinder. The whole gauge has the capacity to hold 11 inches.
- In order to measure this amount pour out the first inch from the inner tube.
- 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!



Then add up all of your measurements

$1 \text{ inch} + 0.97 \text{ inches} + 0.88 \text{ inches} + 0.92 \text{ inches} = 3.77 \text{ inches}$

Total = 3.77"

Submitting CoCoRaHS



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

Home | Countries | States | View Data | Maps | My Data Entry | Login

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

CoCoRaHS Testimonials
Tell us your story!
Celebrating 25 years

JOIN CoCoRaHS

Reports received today 2/11/2023 as of 9:41 AM EST

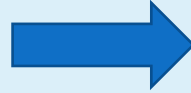
Daily	Multi-day	SigWx	Hail	Condition	ET
5,636	30	0	0	51	2

24-hour Precipitation Feb 11, 2023
4:30-9:30 am local obs time

- NA
- Zero
- Trace

Things to know about...

- ▼ Rain
- ▲ Hail
- ✖✖ Snow



My Data Entry : Daily Precipitation Report Form

24-Hour Precipitation Report Form Submit Reset

Station Number : OH-CN-6
Station Name : Wilmington 3.6 W

* Denotes Required Field

2/9/2024 *Observation Date ? For observations spanning more than 24 hours
7:00 PM *Observation Time ? Enter Multi-Day Accumulation
0.00 in. *Gauge Catch: 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) ?

24-hr Snowfall

NA in. Snowfall: Accumulation of new snow in inches to the nearest tenth ?
NA in. Snowfall SWE: Melted value from core to the nearest hundredth ?

Snowpack (Total Snow and Ice on Ground at Observation Time)

NA in. Snowpack Depth: Total snow and ice (new and old) in inches to the nearest tenth ?
NA in. Snowpack SWE: 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

Logout Precip Report Details

CoCoRaHS OH-CN-6
Wilmington 3.6 W
US Units (in)
Precipitation Report

Observation Date 2019-02-19
Observation Time 19:00
Rain/Melted Snow NA

More Details
 Trace Precip

Cancel Submit

Report Multi-Day Report History Multi-Day History Other

Winter Precipitation

- Take the funnel and inner tube out so the rain gauge won't freeze and crack.
- Can't accurately catch snow in the funnel and small tube.
- If it rains when you have removed the funnel and small tube, it's ok. You can just dump the rain back into the funnel and the small tube and measure just like you would with an overflow heavy rain sample.

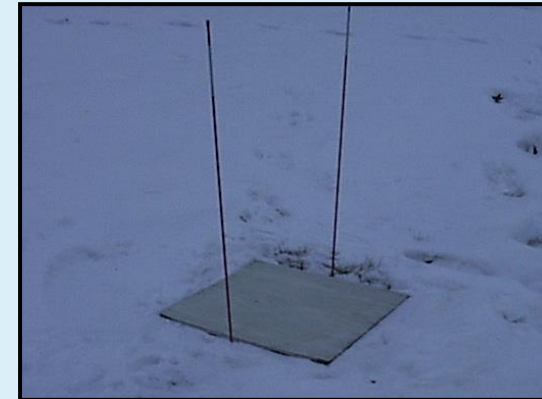


Additional Winter Tools

- **Snow Stick**- ruler/yard stick, aluminum works best to keep from warping. If you do not have one in tenths of an inch here is a conversion.

Measurement on ruler	Measurement in tenths of an inch
3/4 th	0.8
1/2	0.5
1/4 th	0.3
1/8 th	0.1
1/16 th	0.1
Less than 1/16 th	Trace

- **Snow Board**- board or flat surface to measure snow. 2'x2' sheet of plywood painted white works great.
- **Snow Swatter or Spatula**- helps with core samples (more info later)



Winter Precipitation

- 1) **Gauge Catch**– measured to the nearest hundredth and measured with your rain gauge
- 2) **Snowfall**– measured to the nearest tenth of an inch and measured from snow board using snow stick (last 24 hrs)
- 3) **Snowfall SWE**– measured to the nearest hundredth and measured with gauge (typically if windy and gauge catch is not representative). Leave N/A if separate core is not taken.
- 4) **Snowpack Depth**– measured to the nearest half inch and measured from ground using snow stick
- 5) **Snowpack SWE(optional, but encouraged...especially on Mondays)** – measured to the nearest hundredth and measured with gauge.). Leave N/A if separate core is not taken.

***If you can't take all of these measurements that is perfectly alright. Do not put a value in if you did not measure. It is ok to NA!**

My Data Entry : Daily Precipitation Report Form

For observations spanning more than 24 hours, please use the [multiple day accumulation report](#).

Precipitation Report Form

Station Number : OH-CN-6

Station Name : Wilmington 3.6 W

* Denotes Required Field

***Observation Date** ?

***Observation Time** ?

1 in. ***Gauge Catch:** 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) ?

Precipitation is amount from snow core. Poor gauge catch because of high winds - not representative of what fell. Amount melted from gauge 0.06"

24-hr Snowfall

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

3 in. **Snowfall SWE:** Melted value from core to the nearest hundredth ?

Snowpack (Total Snow and Ice on Ground at Observation Time)

4 in. **Snowpack Depth:** Total snow and ice (new and old) in inches to the nearest half inch ?

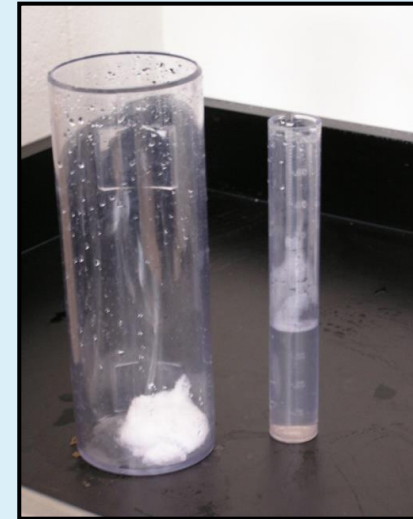
5 in. **Snowpack SWE:** Melted value from core to the nearest hundredth ?

1) *Gauge Catch*— measured to the nearest hundredth and measured with your rain gauge with the goal of determining how much liquid is in the snow (or mix of precipitation)

- Tools: 4 inch CoCoRaHS rain gauge, possible snow swatter
- Remove your gauge from its mounting bracket and bring the gauge inside

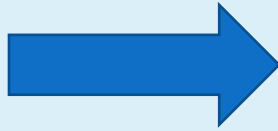


- Take your inner cylinder and add warm water to it.
- Carefully measure and record the amount of warm water you added to the inner cylinder. Now you have two cylinders, one with the snow inside it and the other with a carefully measured amount of warm water.
- Pour the carefully measured amount of warm tap water into the snowfall sample. Allow the snow sample to completely melt (swishing it around can help). Now the cylinder contains all water, some of it melted snow and the rest tap water.
- Pour the water back through the funnel into the smaller cylinder. Carefully read the amount in the cylinder. This amount represents the melted snow + the water you added.
- Subtract the amount of tap water you added earlier to get your melted snowfall to the hundredth of an inch.



Tube full 0.71- Water added 0.50 =
Final reading 0.21

Daily Precipitation Form



My Data Entry : Daily Precipitation Report Form

For observations spanning more than 24 hours, please use the [multiple day accumulation report](#).

Precipitation Report Form

Station Number : OH-CN-6

Station Name : Wilmington 3.6 W

* Denotes Required Field

* **Observation Date** ?

* **Observation Time** ?

in. * **Gauge Catch:** 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) ?

Precipitation is amount from snow core. Poor gauge catch because of high winds - not representative of what fell. Amount melted from gauge 0.06"

24-hr Snowfall

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

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

Snowpack (Total Snow and Ice on Ground at Observation Time)

in. **Snowpack Depth:** Total snow and ice (new and old) in inches to the nearest **half inch** ?

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

2) *Snowfall*– measured to the nearest tenth of an inch and measured from snow board using snow stick. The goal of this is to measure snowfall from the past 24 hours.

- Tools: Snow stick and snow board
- Find a nice, level place to measure where drifting or melting has not occurred (like a snowboard)
- Slide snow stick into snow until it reaches the board surface
- Read the value on the snow stick (value is always to the nearest tenth of an inch like 3.6 inches)
- Sweep the snowboard clean and place on top of snow



Note that we never measure the depth of the snow in the rain gauge itself. Any frozen precipitation in the rain gauge must first be melted, then measured.



Frequently Asked Questions on Snowfall

- **What if snow accumulates, melts, and accumulates again?**
 - The snowfall is the sum of each accumulation before melting.
 - For example: Three separate snowfalls occur during the day. You go out and measure the snow after each has ended. The first snowfall is 2.0 inches, the second is 1.5 inches, and the third is 1.0 inch. The snow melts after each snowfall and therefore there is nothing on the snowboard at observation time the next morning. The snowfall for the 24-hour period should be recorded as the sum of the individual events or 4.5 inches.
- **What if you see snow flurries, but there is nothing in the gauge?**
 - Snowfall would be reported as a trace. If this is the only precipitation, the 24hr gauge catch value would also be a trace.

Myth

THE 10:1 MYTH

Do NOT estimate snowfall by converting the liquid in your rain gage to a snowfall amount!

- The adage that “*one inch of rain equals 10 inches of snow*” is a myth!
- The snow/water equivalent ratio is dependent on many factors, not just surface air temperature.
- Snow to water ratios can vary from 8:1 or less to 20:1 or more!



Daily Precipitation Form

My Data Entry : Daily Precipitation Report Form

For observations spanning more than 24 hours, please use the [multiple day accumulation report](#).

Precipitation Report Form

Station Number : OH-CN-6

Station Name : Wilmington 3.6 W

* Denotes Required Field

*Observation Date ?

*Observation Time ?

in.

*Gauge Catch: 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) ?

Precipitation is amount from snow core. Poor gauge catch because of high winds - not representative of what fell. Amount melted from gauge 0.06"

24-hr Snowfall

in.

Snowfall: Accumulation of new snow in inches to the nearest tenth ?

in.

Snowfall SWE: Melted value from core to the nearest hundredth ?

Snowpack (Total Snow and Ice on Ground at Observation Time)

in.

Snowpack Depth: Total snow and ice (new and old) in inches to the nearest half inch ?

in.

Snowpack SWE: Melted value from core to the nearest hundredth ?



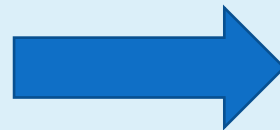
3) Snowfall SWE (optional, but encouraged when needed) – measured to the nearest hundredth and measured with gauge

- Sometimes windy conditions might create a situation where an accurate amount of snow has not fallen into the gauge. If this is the case a core sample can be taken from the snow on the snow board in order to find out the liquid content of the new snow.
- Core samples of new snow are not required, however you should do this when the amount of snow in the gauge is not representative of what fell on the ground.
- In order to obtain a core sample turn the empty outer cylinder of your gauge upside down on your snowboard.
- Slide a thin, flat object under the core sample in the gauge.
- Carefully lift and flip the gauge.
- Now you can melt the snow the same as you normally would. This value will be to the nearest hundredth of an inch.
- **Only report if you actually do a separate core sample, otherwise leave NA on the form.**



Daily Precipitation Form

- If your original gauge catch was not accurate, you can put your water melted from the core as the gauge catch amount.
- Please include this information in the comments section.



My Data Entry : Daily Precipitation Report Form

For observations spanning more than 24 hours, please use the [multiple day accumulation report](#).

Precipitation Report Form

Station Number : OH-CN-6

Station Name : Wilmington 3.6 W

* Denotes Required Field

***Observation Date** ?

***Observation Time** ?

in. ***Gauge Catch:** 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) ?

Precipitation is amount from snow core. Poor gauge catch because of high winds - not representative of what fell. Amount melted from gauge 0.06"

24-hr Snowfall

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

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

Snowpack (Total Snow and Ice on Ground at Observation Time)

in. **Snowpack Depth:** Total snow and ice (new and old) in inches to the nearest half inch ?

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

4) *Snowpack Depth*— measured to the nearest half inch and measured from ground using snow stick. This includes both new snow and snow that was already there.

- Tools: Snow stick
- Find a level spot, not drifted over, blown clear, or melted
- Slide snow stick through all layers of snow (new and old)
- Read value on snow stick and record the value (values are to the nearest ½” like 4.5)

REMEMBER: Report total snowpack depth every day there is any snow on the ground!



Frequently Asked Questions on Snowpack Depth

- **Snow only covers part of my yard. What do I report as my total snowpack?**
 - You will want to take the average of the bare and covered areas. If there is 1 inch in the covered area and 0 in the bare area, your average would be a snowpack depth of 0.5 inches.
 - You can also report a T for a trace of snowpack depth if it is less than half an inch.
 - You shouldn't count artificially made piles of snow as snow depth (from snowplows or shoveling, etc.)



Daily Precipitation Form

My Data Entry : Daily Precipitation Report Form

For observations spanning more than 24 hours, please use the [multiple day accumulation report](#).

Precipitation Report Form

Station Number : OH-CN-6

Station Name : Wilmington 3.6 W

* Denotes Required Field

3/9/2022

*Observation Date ?

7:00

PM

*Observation Time ?

0.21

in.

*Gauge Catch: 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) ?

Precipitation is amount from snow core. Poor gauge catch because of high winds - not representative of what fell. Amount melted from gauge 0.06"

24-hr Snowfall

3.6

in.

Snowfall: Accumulation of new snow in inches to the nearest tenth ?

0.21

in.

Snowfall SWE: Melted value from core to the nearest hundredth ?

Snowpack (Total Snow and Ice on Ground at Observation Time)

4.5

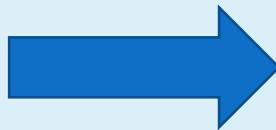
in.

Snowpack Depth: Total snow and ice (new and old) in inches to the nearest half inch ?

NA

in.

Snowpack SWE: Melted value from core to the nearest hundredth ?



5) Snowpack SWE (optional, but encouraged...especially on Mondays) – measured to the nearest hundredth and measured with gauge. This helps determine how much liquid is in the new and old snow (Snow Water Equivalent)

- Core samples taken from the ground can provide valuable information for National Weather Service offices and River Forecast Centers! It provides information on how much water is “on the ground” that can potentially run off into rivers and streams.
- SWE Mondays! Although core samples of snow on the ground would be appreciated everyday, we realize this takes time and therefore Mondays have been designated as SWE Mondays. If possible, please report SWE values on Monday if applicable.
- In order to take a core sample of snow on the ground find a good spot free of drifting and melting. Push the gauge upside down in the snow to cut a core. Slide a thin, flat object under the core sample and the gauge. Carefully lift and flip the gauge.
- Now you can melt the snow the same as you normally would. This value will be to the nearest hundredth of an inch.
- **Only report if you actually do a separate core sample, otherwise leave NA on the form.**



Let's Review Melting Snow



- Measure and add warm water
- Measure the entire sample
- Math skills

Tube full	0.59
- Water added	0.50

Final reading	0.09

Daily Precipitation Form

My Data Entry : Daily Precipitation Report Form

For observations spanning more than 24 hours, please use the [multiple day accumulation report](#).

Precipitation Report Form

Submit Reset

Station Number : OH-CN-6

Station Name : Wilmington 3.6 W

* Denotes Required Field

3/9/2022 *Observation Date ?

7:00 PM *Observation Time ?

0.21 in. *Gauge Catch: 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) ?

Precipitation is amount from snow core. Poor gauge catch because of high winds - not representative of what fell. Amount melted from gauge 0.06"

24-hr Snowfall

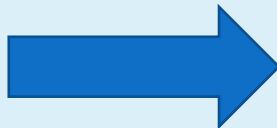
3.6 in. Snowfall: Accumulation of new snow in inches to the nearest tenth ?

0.21 in. Snowfall SWE: Melted value from core to the nearest hundredth ?

Snowpack (Total Snow and Ice on Ground at Observation Time)

4.5 in. Snowpack Depth: Total snow and ice (new and old) in inches to the nearest half inch ?

NA in. Snowpack SWE: Melted value from core to the nearest hundredth ?

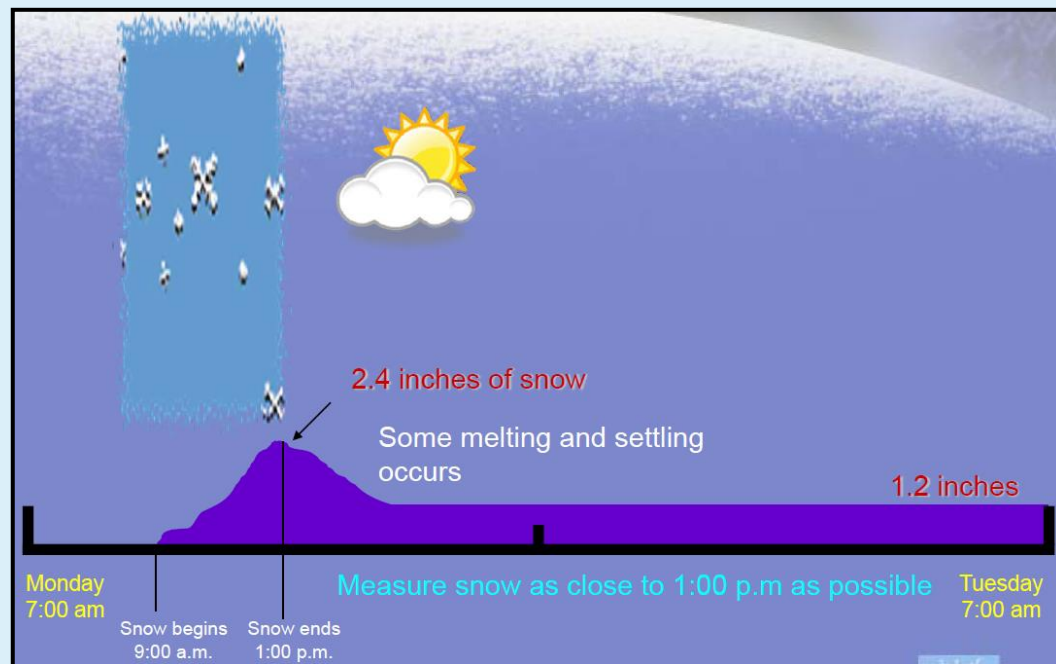


Winter Precipitation FAQ



- **How do you measure sleet, freezing rain, and mixed precipitation?**
 - **Sleet** is measured just like snow. In addition to reporting it as new snow and snow on the ground if applicable, also put a note in the comments sections saying that sleet occurred.
 - **Freezing rain** is measured like rain. Melt and measure what is in the gauge and report as rain. In the comments section note that freezing rain occurred and how much ice accretion had occurred. More on this on the next slide. 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 is freezing rain. Fill out an ice accretion report if you are able.
 - **Mixed Precipitation** just do the best you can! Water content in the gauge is reported as the daily precipitation. Report un-melted content on the snow board and ground the same as you would with just snow.

Winter Precipitation FAQ







- **It's done snowing, the sun is coming out, and the snow will melt. Should I measure it now instead of waiting until 7 AM?**
 - Yes! If you know the snow will melt, you should measure the amount now.
 - This is the 24 hour new snowfall on your next report (2.4 inches)
 - You will report 1.0 for the snowpack depth, since that measurement means snow on the ground at the time of observation (to the nearest half inch)!

Can I find water content by weight? Yes!

Training Slide Shows

Click on one of the CoCoRaHS Training Slide Shows below to view as HTML or download as PDF.

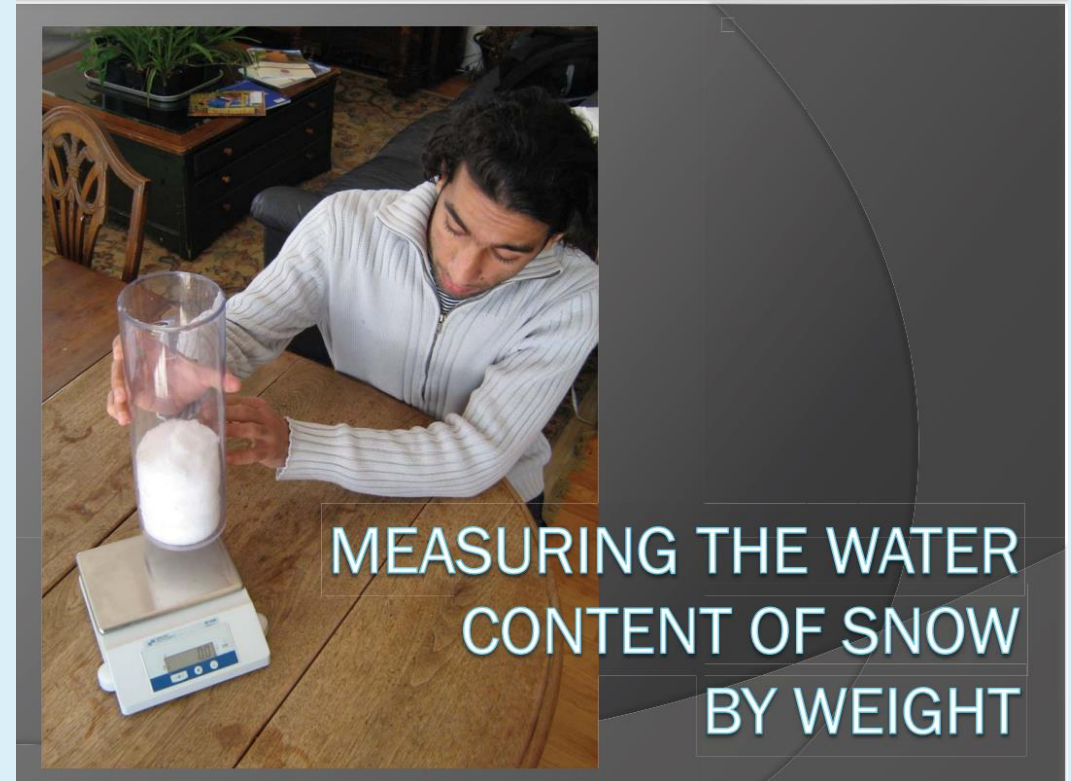
- 
[PDF](#) [French](#)
- 
[PDF](#) [French \(v2.1\)](#)
- [2022 Winter Weather Measurements Webinar](#)
- 
[PDF](#)
- 
[HTML](#) [PDF](#)

Main Menu

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

Resources

- FAQ / Help
- Education
- Training Slide-Shows
- Videos
- Condition Monitoring
- Evapotranspiration
- Soil Moisture
- NCEI Normals
- Volunteer Coordinators
- Hail Pad
- Distribution/Drop-off
- Help Needed
- Printable Forms
- The Catch
- Message of the Day
- Publications
- CoCoRaHS Blog
- Web Groups
- State Newsletters
- Master Gardener Guide
- State Climate Series
- Precipitation Absurdity
- WxTalk Webinars
- Sponsors
- Links
- CoCoRaHS Store



https://media.cocorahs.org/docs/Training_SnowByWeight.pdf

Freezing Rain-Pilot

Ice Accretion: Setting up the dowel

Document before an ice event

Measure the base thickness (with no accumulation)



-- This is only needed once at the beginning of the season

-- Enter the value to the nearest 1/10th of an inch

Category	Descriptions of Impacts
0	No ice or a trace
1	Enough to be annoying/need scraping off your car. Looks pretty on bushes, shrubs. Dangerous to walk or drive.
2	Shrubs and other non-native shrubbery weighed down, trees manage ok
3	Small tree branches start to bend
4	Small and medium branches bend, a few small branches may fail
5	Birch trees are starting to bend, minor branch damage to weak trees
6	Birch trees sag moderately, small and large limbs start to break, ~5-10% branch loss
7	Birch trees bent nearly completely, ~10-20% branch loss on small and large limbs
8	Moderate to significant tree damage, most trees have some damage

Credit: Jason Shafer, Northern Vermont University-Lyndon

Recommended Method for measuring ice accretion using the CoCoRaHS rain gauge post

Affixing a 3/4 inch dowel to the post



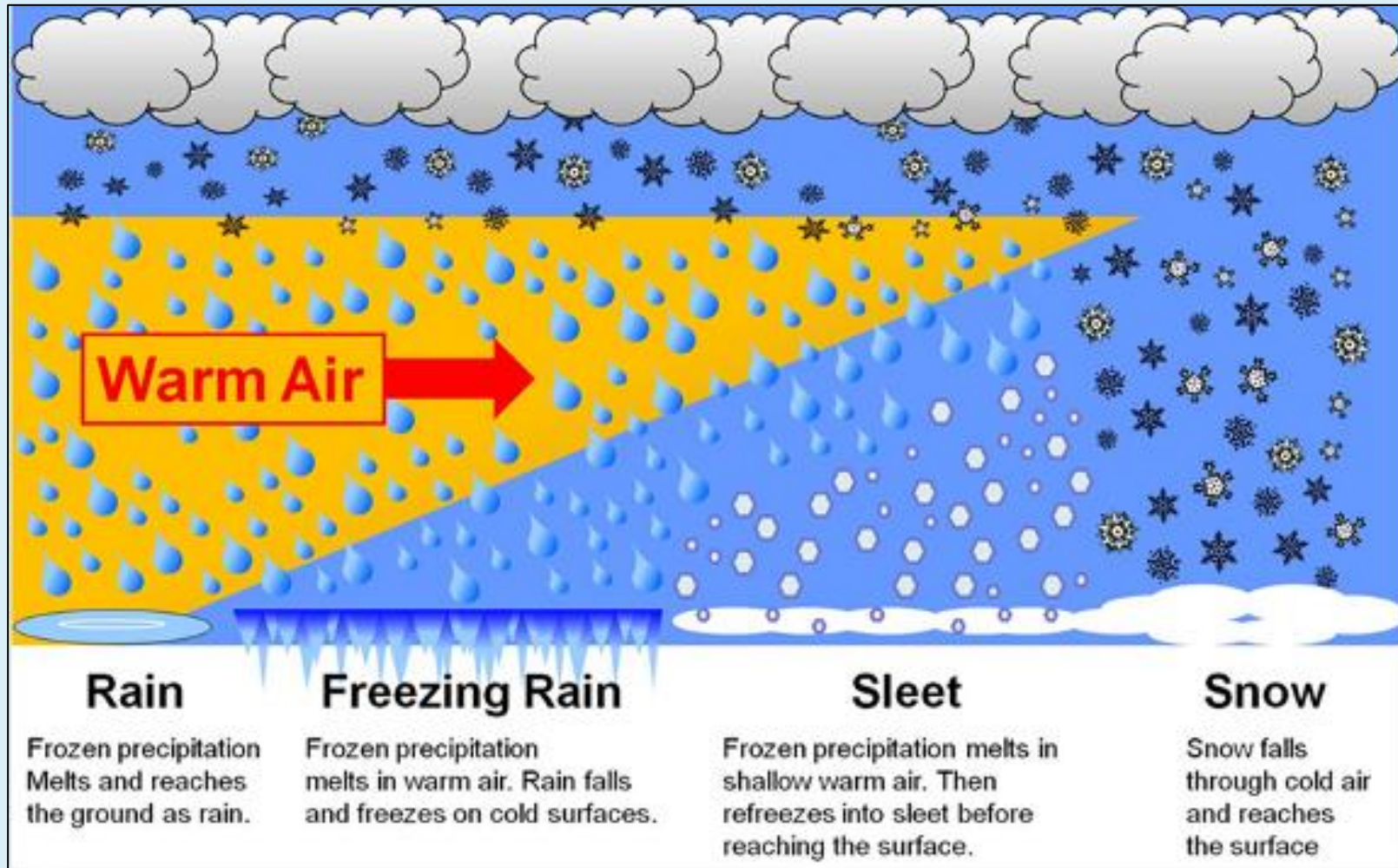
Measuring Ice Accretion After an ice event

Measure the TOTAL thickness (Dowel + Ice)

-- Horizontal and Vertical Measurements are encouraged
-- Enter the value to the nearest 1/10th of an inch



Why am I getting that precipitation type?



Measuring Hail

- Use a standard ruler and measure the diameter of the hail stone.
- Hail reports are extremely important to National Weather Service Meteorologists and go straight to NWS meteorologists.
- Your reports can help them issue or verify warnings, helping to protect lives and property.
- Report using the CoCoRaHS Website- this is just as useful as calling it in.
- Don't wait until your standard reporting time, report it in as soon as you can safely do so!
- Hail reports are very important, but no report is worth risking your safety.
- **NEVER** collect hail stones while it is still hailing.
- **ALWAYS** remember lightning safety!
- Use your best judgment...your health and safety are number 1 !

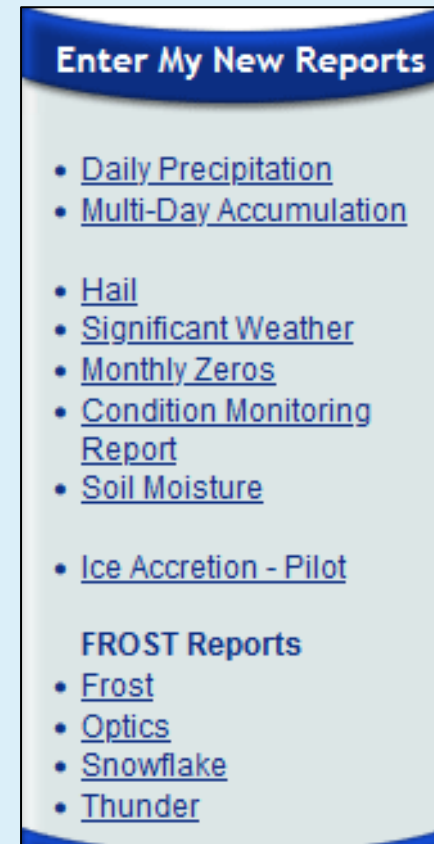


Typical Hail References

- 0.25 inch Pea Size
- 0.50 inch Mothball or Grape Size
- 0.75 inch Penny Size
- 0.88 inch Nickel Size
- 1.00 inch (**Severe Criteria**) Quarter Size
- 1.25 inch Half Dollar Size
- 1.50 inch Walnut or Ping Pong Ball Size
- 1.75 inch Golf Ball Size
- 2.00 inch Hen Egg Size
- 2.50 inch Tennis Ball Size
- 2.75 inch Baseball Size
- 3.00 inch Teacup Size
- 4.00 inch Grapefruit Size
- 4.50 inch Softball Size

Report Types on the CoCoRaHS Website

Daily Precipitation
Multi-Day Precipitation
Hail
Significant Weather
Monthly Zeros
Condition Monitoring
Soil Moisture
Ice Accretion - Pilot
FROST Reports



Daily Precipitation Report

If you are unable to report any aspect of the report, that is ok! Just make sure to leave the NA in place.

Rain and water content of melted snow and ice that fell in the last 24 Hours

Comments

Depth of new snow in the last 24 hrs on snowboard.

Melted core from snowboard (optional)

Total depth of snow on the ground (new + old)

Melted core from ground (optional)

Help button

My Data Entry : Daily Precipitation Report Form

For observations spanning more than 24 hours, please use the [multiple day accumulation report](#).

Precipitation Report Form [Submit] [Reset]

Station Number : OH-CN-6

Station Name : Wilmington 3.6 W

* Denotes Required Field

Observation Date : 3/9/2022

Observation Time : 7:00 PM

Gauge Catch : 0.36 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)

24-hr Snowfall

0.6 in. **Snowfall:** Accumulation of new snow in inches to the nearest tenth

NA in. **Snowfall SWE:** Melted value from core to the nearest hundredth

Snowpack (Total Snow and Ice on Ground at Observation Time)

0.5 in. **Snowpack Depth:** Total snow and ice (new and old) in inches to the nearest half inch

NA in. **Snowpack SWE:** 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 [v]

Additional Information

Any Flooding? Select a Flooding Value [v]

Yes No **Did you record hourly precipitation (or other detailed time increments) for this storm?** If yes, CoCoRaHS personnel may request a copy of this data later, so please save it.

[Submit Data] [Reset]

Daily precipitation report is not utilized if you are not able to read your gauge at your observation time and additional precipitation occurs. Use a multi-day report!

Multi-Day Accumulation Report

Click here to access the multi-day accumulation report

You can even enter information after you've been away for several days. Use this form for the days your have been away instead of the daily precipitation form.

My Data Entry : Multi-Day Precipitation Report Form

Multiple Day Accumulation Form

Station Number : OH-CN-6

Station Name : Wilmington 3.6 W

3/5/2022 **Obs Start Date:** This day should be one day after your last daily report or one day after the End Date of the last multi-day report.

3/9/2022 **Obs End Date:** The date the rain gauge was emptied.

7:00 PM **Obs End Time:** The time the rain gauge was emptied.

0.24 in. **Gauge Catch:** The rain and melted snow, to the nearest hundredth of an inch, or T for trace, or NA for unknown. Information about snowfall should be included in the comments.

Notes

Snowpack (Total Snow and Ice on Ground at Observation Time)

T in. **Snowpack Depth:** Total Depth of Snow on Ground (to the nearest half inch)

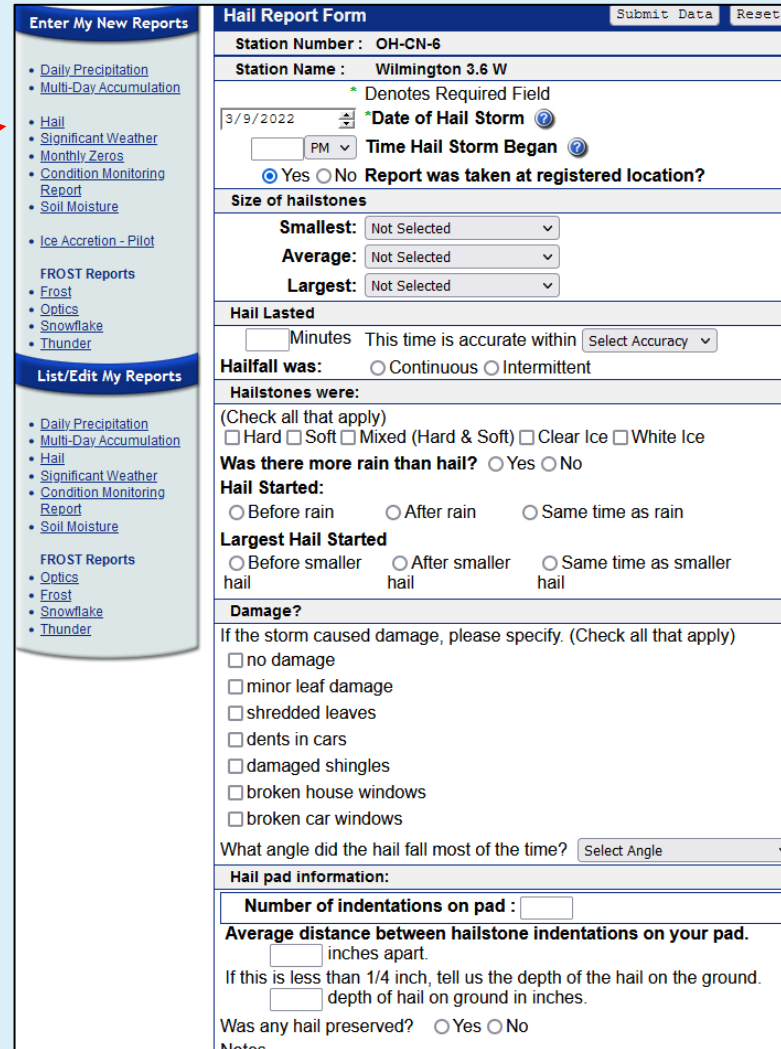
NA in. **Snowpack SWE:** Water content of core sample (The amount of water present in a core sample of the total depth of snow on the ground, to the nearest hundredth of an inch)

I was away and looked at my gauge when I got back.

Hail Report

Click here to access hail report

-Goes directly to NWS forecasters real time.
-Take report and submit when you can safely do so, do not wait until observation time.



Enter My New Reports

- [Daily Precipitation](#)
- [Multi-Day Accumulation](#)
- [Hail](#)
- [Significant Weather](#)
- [Monthly Zeros](#)
- [Condition Monitoring Report](#)
- [Soil Moisture](#)
- [Ice Accretion - Pilot](#)
- FROST Reports**
- [Frost](#)
- [Optics](#)
- [Snowflake](#)
- [Thunder](#)

List/Edit My Reports

- [Daily Precipitation](#)
- [Multi-Day Accumulation](#)
- [Hail](#)
- [Significant Weather](#)
- [Condition Monitoring Report](#)
- [Soil Moisture](#)
- FROST Reports**
- [Frost](#)
- [Optics](#)
- [Snowflake](#)
- [Thunder](#)

Hail Report Form Submit Data Reset

Station Number : OH-CN-6

Station Name : Wilmington 3.6 W

Date of Hail Storm * Denotes Required Field

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

Damage?

If the storm caused damage, please specify. (Check all that apply)

no damage

minor leaf damage

shredded leaves

dents in cars

damaged shingles

broken house windows

broken car windows

What angle did the hail fall most of the time?

Hail pad information:

Number of indentations on pad :

Average distance between hailstone indentations on your pad. inches apart.

If this is less than 1/4 inch, tell us the depth of the hail on the ground. depth of hail on ground in inches.

Was any hail preserved? Yes No

Notes

Significant Weather Report

Click here to access the significant weather report

-Goes directly to NWS forecasters real time.

-Take report and submit when you can safely do so, do not wait until observation time.

-No strict definition, but good guidance is greater than an inch of rain in an hour or flooding is occurring.

For snow, one inch or more falling in an hour and/or if your total snowfall at the end of the event is greater than four inches. You can put freezing rain of a tenth of an inch or greater in the comments section and also indicate if you did the new ice form as well.

My Data Entry : Significant Weather Report Form

Enter My New Reports

- [Daily Precipitation](#)
- [Multi-Day Accumulation](#)
- [Hail](#)
- [Significant Weather](#)
- [Monthly Zeros](#)
- [Condition Monitoring Report](#)
- [Soil Moisture](#)
- [Ice Accretion - Pilot](#)

FROST Reports

- [Frost](#)
- [Optics](#)
- [Snowflake](#)
- [Thunder](#)

List/Edit My Reports

- [Daily Precipitation](#)
- [Multi-Day Accumulation](#)
- [Hail](#)
- [Significant Weather](#)
- [Condition Monitoring Report](#)
- [Soil Moisture](#)
- [FROST Reports](#)
- [Frost](#)
- [Optics](#)
- [Snowflake](#)
- [Thunder](#)

Notification:

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

Significant Weather Report

Station Number : OH-CN-6

Station Name : Wilmington 3.6 W

Observation Date 3/9/2022 * Denotes Required Field

Observation Time PM

Time duration that the report covers Minutes

Rain

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

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

Snow

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

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

Additional Information

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

Was There Flooding?

No

If Yes, how severe?

Minor (typical). Street or field flooding.

Unusual street or field flooding (only see this every few years)

Severe Flooding

Extreme (never seen it this bad before)

Observation Notes (This will be available to the public)

Monthly Zeros

Enter My New Reports

- [Daily Precipitation](#)
- [Multi-Day Accumulation](#)
- [Hail](#)
- [Significant Weather](#)
- [Monthly Zeros](#)
- [Condition Monitoring Report](#)
- [Soil Moisture](#)
- [Ice Accretion - Pilot](#)

FROST Reports

- [Frost](#)
- [Optics](#)
- [Snowflake](#)
- [Thunder](#)

Monthly Zeros Submit Reset

Station Number : OH-CN-6 Station Name : Wilmington 3.6 W

March 2022

Sun	Mon	Tue	Wed	Thu	Fri	Sat
27	28	1	2	3	4	5
		Precip: 0.00	Precip: T	Precip: T	Precip: 0.00	Precip: 0.00
6	7	8	9	10	11	12
Precip: 0.23	Precip: 1.09	Precip: T	Precip: 0.04	Precip: 0.00	Precip: 0.04	Precip: 0.08
13	14	15	16	17	18	19
Precip: 0.00	<input checked="" type="checkbox"/> 0.0 Precip					
20	21	22	23	24	25	26
27	28	29	30	31	1	2
3	4	5	6	7	8	9

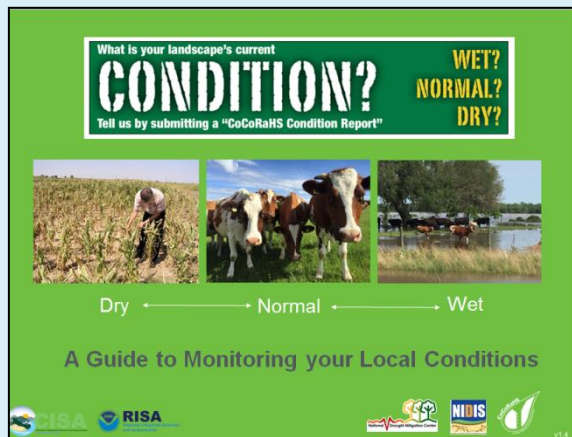
Click here to access the monthly zeros report

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

Condition Monitoring Report

Click here to access the condition monitoring report

You can enter how dry/wet conditions are impacting your activities and you. Submitted on a regular (weekly, biweekly, monthly) basis to share info about the effects of local precipitation on the environment and society.



My Data Entry : Condition Monitoring Report Form

Submit Data Reset

Condition Monitoring Report Form

Station Number : OH-CN-6

Station Name : Wilmington 3.6 W

Condition monitoring reports are submitted on a regular (weekly, biweekly, monthly) basis to share information about the effects of local precipitation on the environment and society. By submitting reports on a regular basis, you create a baseline to see change through time, such as seasonal differences or changes caused by more or less precipitation. Please refer to the [Condition Monitoring training slide show](#) for more information.
** indicates required field*

Report Date *
3/9/2022

Condition Scale Bar [More information on the scale bar](#) Clear Scale Bar

Severely Dry	Moderately Dry	Mildly Dry	Near Normal	Mildly Wet	Moderately Wet	Severely Wet
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Description

Please provide a description of how dry, normal or wet conditions are affecting you, your livelihood, your activities, etc. *

Report Categories

Please check at least one report category. If you check a category, please provide supporting information in the description. [More information on condition monitoring categories.](#)

- General Awareness
- Agriculture
- Business & Industry
- Energy
- Fire
- Plants & Wildlife
- Relief, Response & Restrictions
- Society & Public Health
- Tourism & Recreation
- Water Supply & Quality

Submit Data Reset

Soil Moisture

Click here to access the soil report

Main Page-Resources

CoCoRaHS Soil Moisture Monitoring

**COCORAHS
SOIL MOISTURE MONITORING**

CoCoRaHS Soil Moisture Monitoring

We measure rainfall every day, but how much of that rain is soaking in? CoCoRaHS is now offering a soil moisture reporting option. It's more time and labor-intensive than measuring rain, so it won't be for everyone, and that is okay. It is a great opportunity to play outside, get your hands dirty, and learn something!

The materials cost approximately \$50. Anybody with a little bit of land, and access to an oven is welcome to join.

Take a look at the requirements:
[CoCoRaHS Soil Moisture Protocol](#)

To report your findings:
<https://cocorahs.org/Admin/MyDataEntry/SoilMoistureReport.aspx>

To view your submissions:
<https://www.cocorahs.org/ViewData/ListSoilMoistureReports.aspx>

Why participate?
 By taking soil moisture measurements for CoCoRaHS, you will have the opportunity to be a part of the calibration/validation process for [NASA's Soil Moisture Active/Passive \(SMAP\) Satellite](#), aid in regional drought monitoring, and help close our understanding of the water cycle in your area.

If you have any questions about if this is right for you, please send an email to: peter.goble@colostate.edu or noah.newman@colostate.edu

My Data Entry : Soil Moisture Report Form

Soil Moisture Report Form Submit Data Reset

Station Number : OH-CN-6

Station Name : Wilmington 3.6 W

3/10/2022 Denotes Required Field *Observation Date ?

AM ? *Observation Time ?

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

Information about where the sample was taken

Distance from previous sample in meters:

Is the land irrigated? Yes No

Did you begin a new row? Yes No

Soil Samples

Depth	Soil Type	Weight Before Drying (grams)	Volume of Rocks and Roots Removed (cm3)	Weight After Drying (grams)
0-2"	Select Soil Type...	<input type="text"/>	<input type="text"/>	<input type="text"/>
7-9"	Select Soil Type...	<input type="text"/>	<input type="text"/>	<input type="text"/>

Submit Data Reset

Ice Accretion - Pilot

Click here to access the Ice Accretion

CoCoRaHS Ice Accretion

Document ice accretion or freezing rain with optional photo upload! (Photos will NOT be public)

What do you want to do? *

- Document the base thickness of my dowel BEFORE an ice event
- Report ice thickness measured on my dowel AFTER an ice event
- Report ice thickness measured on something else (branch or other flat object)
- I only have photos and no measurements

[Next](#)

- ### Enter My New Reports
- [Daily Precipitation](#)
 - [Multi-Day Accumulation](#)
 - [Hail](#)
 - [Significant Weather](#)
 - [Monthly Zeros](#)
 - [Condition Monitoring Report](#)
 - [Soil Moisture](#)
 - [Ice Accretion - Pilot](#)
- ### FROST Reports
- [Frost](#)
 - [Optics](#)
 - [Snowflake](#)
 - [Thunder](#)

Ice Accretion Pilot

Welcome to the Ice Accretion Pilot page

Safety First! Please use precautions and do not put your personal safety or health at risk. [Click here to read our volunteer safety tips.](#)

As we test this new protocol (including photo submission!), we will use [feedback](#) from data users (NWS and researchers) and data contributors (CoCoRaHS volunteers) to make changes and refine the process. For this reason, data entry and data viewing will be hosted outside of the CoCoRaHS website through a site called JotForm.

For the first time ever, CoCoRaHS volunteers will have the ability to submit photos, but for privacy concerns, we will initially only provide photos to the NWS and CoCoRaHS Coordinators. Eventually, as the process is refined, it will be implemented onto a normal CoCoRaHS data entry page and viewing the data will be available to the public.

Ice Accretion Pilot Training Guide

New!




Report impacts

Submit photos

Category	Descriptions of impacts
0	No ice or a trace
1	Enough to be annoying/need scraping off your car. Looks pretty on bushes, shrubs. Dangerous to walk or drive.
2	Shrubs and other non-native shrubby weighed down, trees manage ok
3	Small tree branches start to bend
4	Small and medium branches bend, a few small branches may fall
5	Birch trees are starting to bend, minor branch damage to weak trees
6	Birch trees sag moderately, small and large limbs start to break, ~5-10% branch loss
7	Birch trees bent nearly completely, ~10-20% branch loss on small and large limbs
8	Moderate to significant tree damage, most trees have some damage

Credit: Jason Shaffer, Northern Vermont University-Lyndon

Install and document a dowel before an ice event



Measure and report ice accretion on branches or other flat objects

This guide goes over the basics of ice accretion and instructions for installing a dowel on your rain gauge post, as well as reporting impacts. New Features with optional photo upload!

Click here to enter data

Or point your smartphone camera at the QR code to enter data from your phone

Frost Reports

Click here to access the
FROST reports

Enter My New Reports

- [Daily Precipitation](#)
- [Multi-Day Accumulation](#)
- [Hail](#)
- [Significant Weather](#)
- [Monthly Zeros](#)
- [Condition Monitoring Report](#)
- [Soil Moisture](#)
- [Ice Accretion - Pilot](#)
- FROST Reports**
- [Frost](#)
- [Optics](#)
- [Snowflake](#)
- [Thunder](#)

List/Edit My Reports

- [Daily Precipitation](#)
- [Multi-Day Accumulation](#)
- [Hail](#)
- [Significant Weather](#)

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

Station Number : OH-CN-6
Station Name : Wilmington 3.6 W

3/9/2022 * Denotes Required Field
*Observation Date ?
7:00 AM *Observation Time ?
 Yes No Report was taken at registered location?

Percent coverage of frost on surface:
 No frost coverage
 Less than 25% coverage
 25%-50% coverage
 50%-75% coverage
 Greater than 75% coverage

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

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

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

Station Number : OH-CN-6
Station Name : Wilmington 3.6 W

3/9/2022 * Denotes Required Field
*Observation Date ?
Not Selected *Observation Time of Day ?
 Yes No Report was taken at registered location?

What did you see?
 22° Halo Sundog Corona Rainbow

Did you see a double rainbow? Yes No
Click [here](#) to see optical effects.

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

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

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

Station Number : OH-CN-6
Station Name : Wilmington 3.6 W

3/9/2022 * Denotes Required Field
*Observation Date ?
7:00 AM *Observation Time ?
 Yes No Report was taken at registered location?

Snowflake shapes were predominantly:
 Stellar Dendrites Sectored Plates Hollow Columns Needles
 Spatial Dendrites Capped Columns Rimed Crystals Other

If present, select up to two (2) other snowflake shapes:
 Stellar Dendrites Sectored Plates Hollow Columns Needles
 Spatial Dendrites Capped Columns Rimed Crystals Other
Click [here](#) see snowflake types

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

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

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

Station Number : OH-CN-6
Station Name : Wilmington 3.6 W

3/9/2022 * Denotes Required Field
*Observation Date ?
 Yes No Report was taken at registered location?

Number of Thunder Claps
For information about counting thunderclaps, click [here](#).
 Morning (12AM-12PM)
 Afternoon (12PM-5PM)
 Evening (5PM-9PM)
 Night (9PM-12AM)

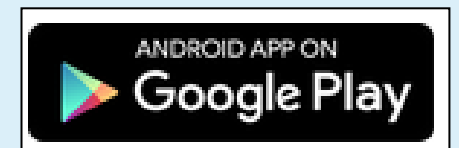
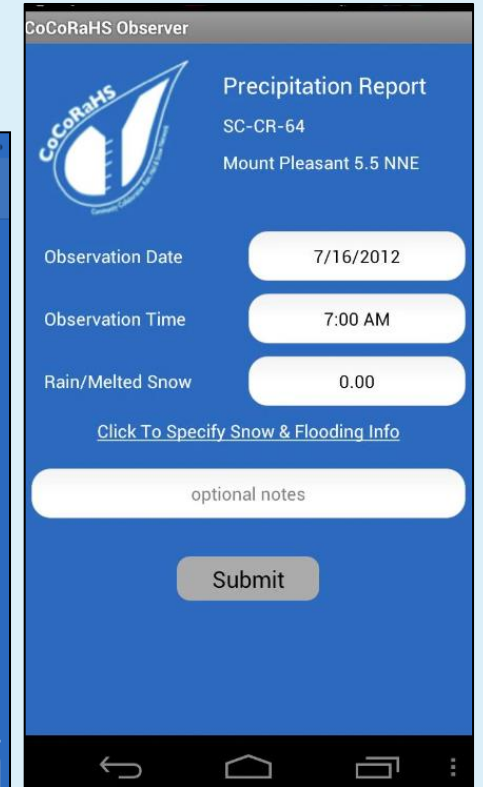
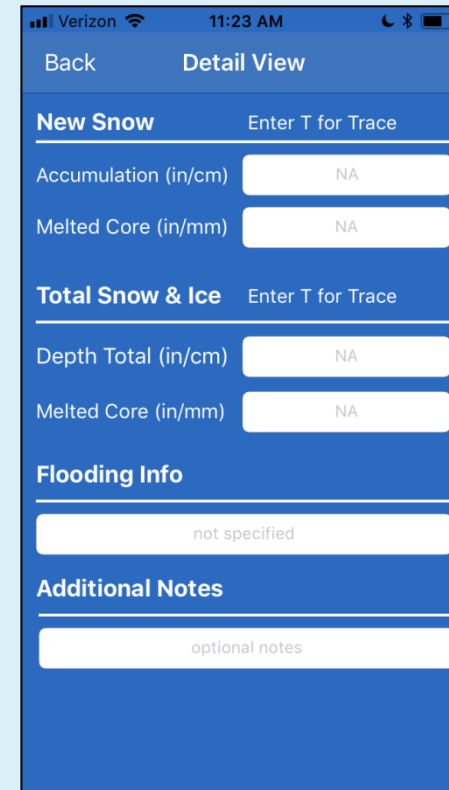
Observation Notes: (This will be available to the public) ?

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

CoCoRaHS App

○ CoCoRaHS app is available for both iPhone and Android Phone

○ You can submit daily precipitation reports, multi-day accumulation reports, view history, edit reports on the history tabs, or go to the CoCoRaHS website.



CoCoRaHS QC

Editing Your Report

The screenshot displays the 'My Data Entry : List My Daily Precipitation Reports' web interface. The page shows a list of 4330 records, with the first 10 records visible. The table columns include: Obs Date, Obs Time, Station Number, Station Name, Gauge Catch in., 24hr Snowfall (in, SLR), Snowpack (in, Density), State, County, Actions, and Maps. A red arrow points from the 'Editing Your Report' title to the 'Actions' column of the first record. Below the table, a mobile app interface is shown, displaying the 'OH-CN-6' report details. The app interface includes fields for Observation Date (2019-02-19), Observation Time (19:00), Rain/Melted Snow (NA), and a 'Trace Precip' toggle. The app also has 'Cancel' and 'Submit' buttons. A red arrow points from the 'Submit' button in the app to the 'Submit' button in the web interface.

Obs Date	Obs Time	Station Number	Station Name	Gauge Catch in.	24hr Snowfall			Snowpack			State	County	Actions	Maps
					in	in	SLR	in	in	Density				
3/9/2022	7:00 PM	OH-CN-6	Wilmington 3.6 W	0.04	0.1	NA	NA	0.0	NA	NA	OH	Clinton	Active Static	
3/8/2022	7:00 PM	OH-CN-6	Wilmington 3.6 W	T	T	NA	NA	T	NA	NA	OH	Clinton	Active Static	
3/7/2022	7:00 PM	OH-CN-6	Wilmington 3.6 W	1.09	0.0	NA	NA	0.0	NA	NA				
3/6/2022	7:00 PM	OH-CN-6	Wilmington 3.6 W	0.23	0.0	NA	NA	0.0	NA	NA				
3/5/2022	7:00 PM	OH-CN-6	Wilmington 3.6 W	0.00	0.0	NA	NA	0.0	NA	NA				
3/4/2022	7:00 PM	OH-CN-6	Wilmington 3.6 W	0.00	0.0	NA	NA	0.0	NA	NA				
3/3/2022	7:00 PM	OH-CN-6	Wilmington 3.6 W	T	0.0	NA	NA	0.0	NA	NA				
3/2/2022	7:00 PM	OH-CN-6	Wilmington 3.6 W	T	0.0	NA	NA	0.0	NA	NA				
3/1/2022	7:00 PM	OH-CN-6	Wilmington 3.6 W	0.00	0.0	NA	NA	0.0	NA	NA				

- Mistakes happen it is a part of life.
- If you think you made a mistake you can edit it on the website or via the app. On app go to history and tap the report you want to edit twice.
- Please do not discouraged if you get an email from a CoCoRaHS coordinator asking for clarification on your report

Additional Resources

- 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.



Resources found on left hand side of main page.



Main Menu
<ul style="list-style-type: none">• Home• About Us• Join CoCoRaHS• Contact Us• Donate
Resources
<ul style="list-style-type: none">• FAQ / Help• Education• Training Slide-Shows• Videos• Condition Monitoring• Evapotranspiration• Soil Moisture• NCEI Normals
<ul style="list-style-type: none">• Volunteer Coordinators• Hail Pad Distribution/Drop-off• Help Needed• Printable Forms
<ul style="list-style-type: none">• The Catch• Message of the Day• Publications• CoCoRaHS Blog• Web Groups• State Newsletters• Master Gardener Guide• State Climate Series• March Madness• WxTalk Webinars
<ul style="list-style-type: none">• Sponsors• Links

Join the CoCoRaHS Family



- Sign-up using the CoCoRaHS website www.cocorahs.org and obtain a CoCoRaHS rain gauge.
- Click “Join CoCoRaHS” in the left hand menu or the button on the right hand side.
 - You will get an e-mail response with your info.
- Any questions please feel free to ask a CoCoRaHS Coordinator!

State Coordinator (Ohio)

Ashley.Novak@noaa.gov or

Jeffrey Rogers at rogers.21@osu.edu

Local National Weather Service

Regional Coordinators are also listed along
with state coordinators from other states.



*You are now ready to measure precipitation with
CoCoRaHS!*

Thank you for being a volunteer observer!



Ashley Novak

CoCoRaHS Coordinator

National Weather Service Wilmington, Ohio

Ashley.Novak@noaa.gov

