

Why Minnesota is Cuckoo for CoCoRaHS: Sharing a successful strategy for recruiting and retaining CoCoRaHS observers



Michelle Margraf
NWS Forecast Office - Minneapolis



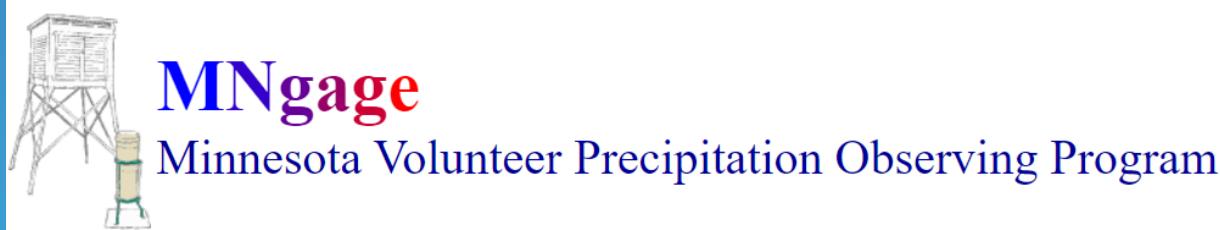
Presentation Overview

- History of Volunteer Precipitation Networks in Minnesota
- Review of March Madness Recruitment for 2020, 2021, and 2022
- Best Practices for Recruitment
- Partners in Recruiting Across Minnesota
- Impact of CoCoRaHS on Minnesota Weather Monitoring
- Strategies for Supporting and Retaining CoCoRaHS Observers



History of Volunteer Precipitation Networks in Minnesota

- 49th State to Join CoCoRaHS in December of 2009
 - Pre-Existing Backyard Precipitation Network since 1970 - HIDEN/MNgage
 - Goal of one observer for each of the 2,600 plus townships (a survey unit six miles on a side) in Minnesota.
 - About 1200 MNgage observers currently across state (89 districts)
 - Includes observers from MN DNR, FFA, Soil and Water Conservation Districts, MN Association of Watershed Districts, weather enthusiasts
 - Discussed merging MNgage network with CoCoRaHS but decided to keep current network in place, and add additional observers to CoCoRaHS (some report to both)



HIDEN/MNgage Network in Minnesota

“In 1973, the FFA, armed with a \$36,000 grant, asked a local rehabilitation workshop to construct an accurate rain gauge. The result was a heavy-duty 4-inch diameter plastic rain gauge with an outer and inner cylinder that can hold eleven inches of rain with accuracy to a hundredth of an inch. This gauge is called the ‘All Weather Gauge’ and is the primary gauge used today.”

Source: [History of High Spatial Density Precipitation Network in Minnesota](#)

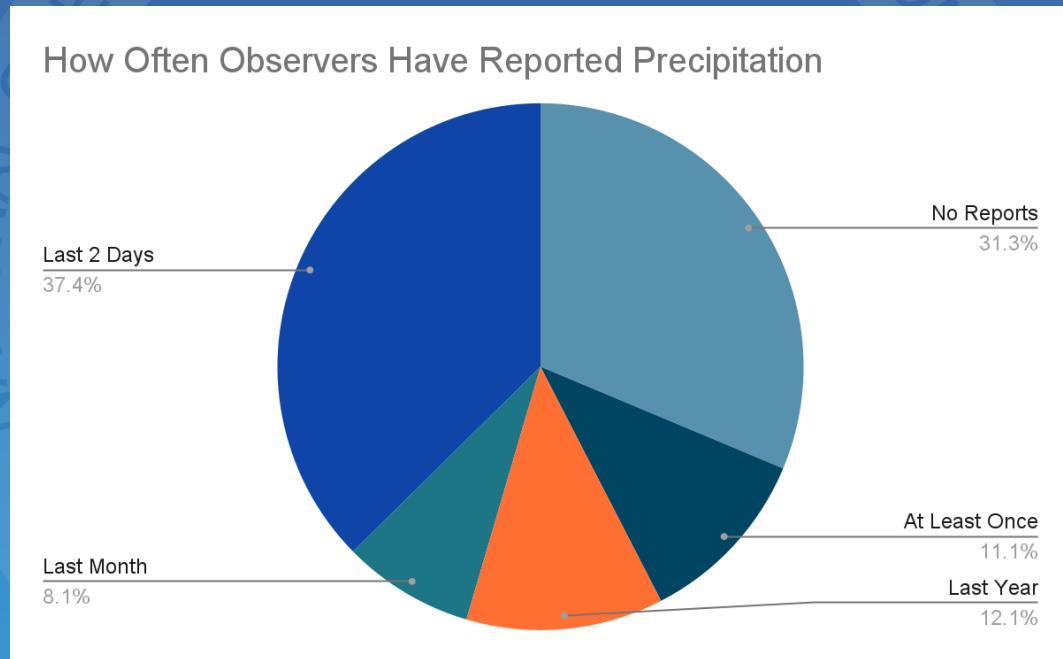


Pete Boulay, MN CoCoRaHS Coordinator - MN State Climate Office

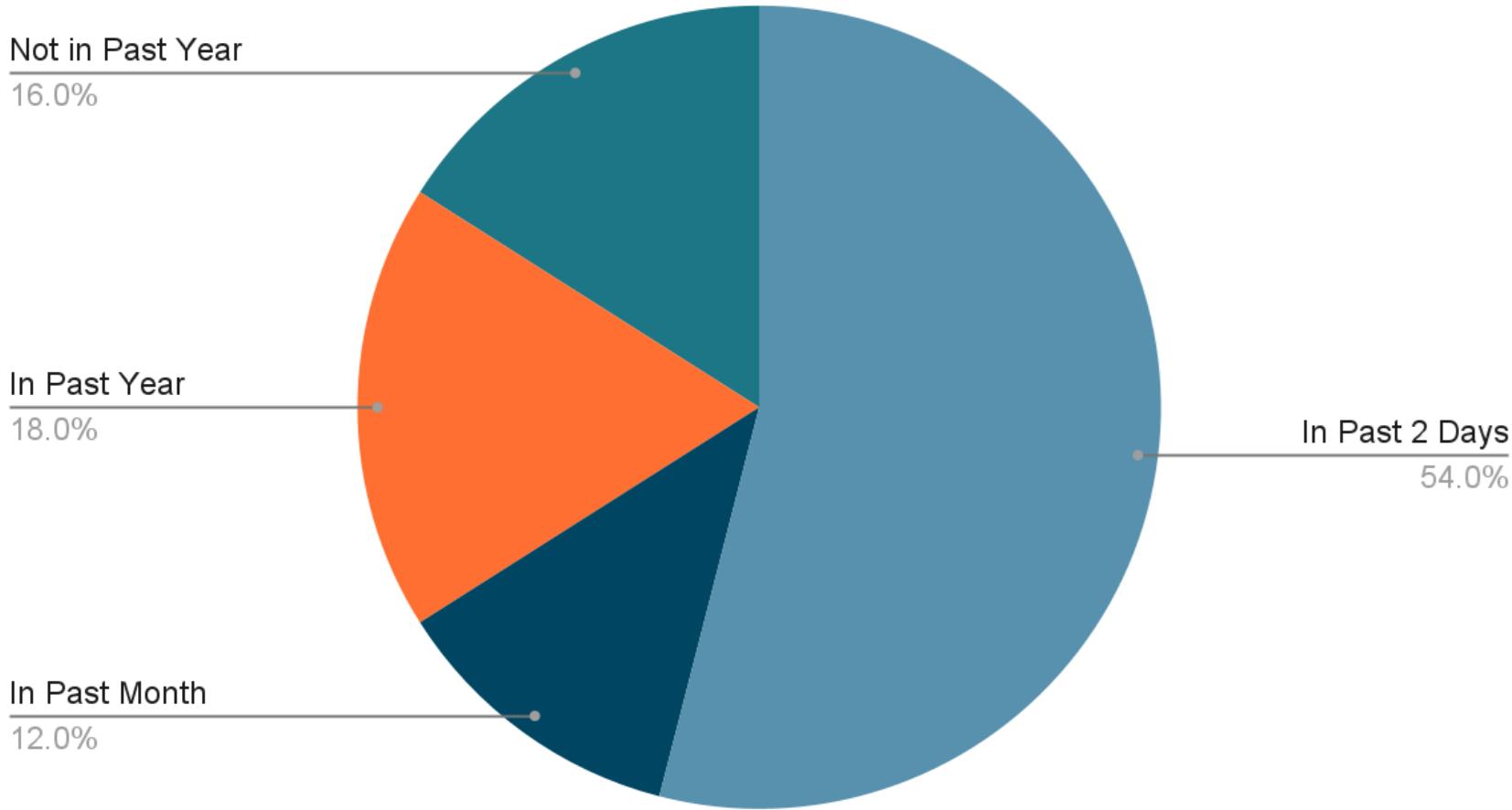
CoCoRaHS Observers in Minnesota (as of May 10th)

- Currently 2180 Observers Across State
 - 1508 observers reported precipitation at least once (69%)
 - 1265 observers reported in past year (59%)
 - 994 observers reported in past month (45%)
 - 814 observers reported in past two days (37%)

*223 observers who haven't reported yet started Mar 1st or later (may not have gauge yet...10% of total)



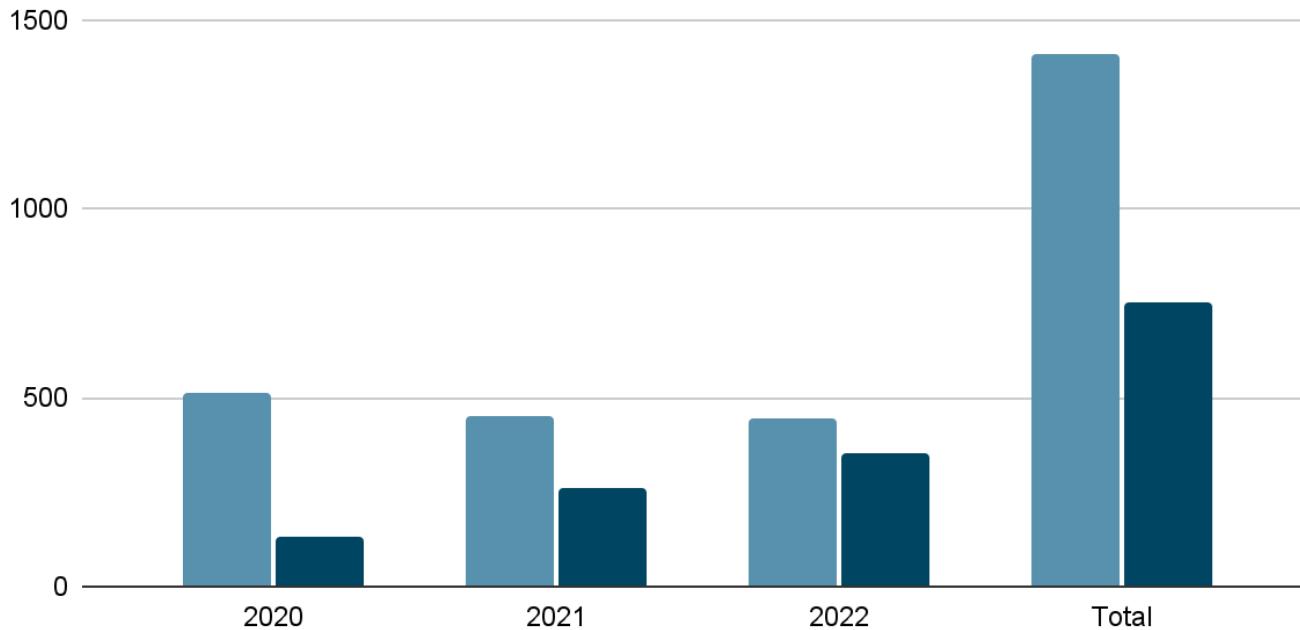
1508 Observers Report Frequency - With At Least 1 Report



New Observers Recruited in Minnesota in Past 3 Years

CoCoRaHS Observers Recruited in Minnesota

Year March



*so far this year



March Madness - CoCoRaHS Cup - 2022



COCORAH'S 2022 MARCH MADNESS FINAL RESULTS - MINNESOTA WINS BOTH CATEGORIES!! 1,302 NEW OBSERVERS OVERALL

FINAL STANDINGS

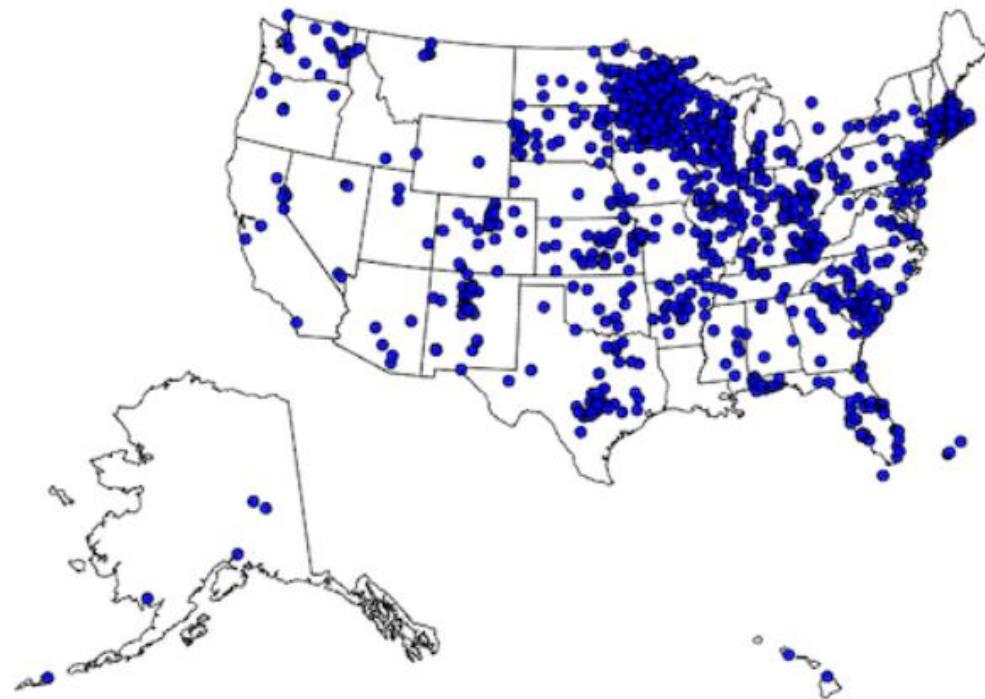
Traditional Count Top Five

365	Minnesota
124	Wisconsin
51	South Carolina
50	Florida
49	Massachusetts

Per Capita* Count Top Five

63.96	Minnesota
39.47	South Dakota
33.72	Rhode Island
21.04	Wisconsin
16.06	New Mexico

New CoCoRaHS Observers March 2022



March Madness - CoCoRaHS Cup - 2021

State	State Abbriv iation	*2010 estd. Population	March 2021 New CoCoRaHS Stations		March 2021 New CoCoRaHS Stations	New Stations per million residents
Minnesota	MN	5,303,925	270			
Wisconsin	WI	5,686,986	163			
South Carolina	SC	4,625,364	119			
North Carolina	NC	9,535,483	91			
Texas	TX	25,145,561	75			
	State	Abbriv iation	*2010 estd. Population		March 2021 New CoCoRaHS Stations	New Stations per million residents
	Rhode Island	RI	1,052,567	66	62.70384688	
	Minnesota	MN	5,303,925	270	50.9056972	
	North Dakota	ND	672,591	23	34.19611621	
	Wisconsin	WI	5,686,986	163	28.66193094	
	South Carolina	SC	4,625,364	119	25.72770489	

March Madness - CoCoRaHS Cup - 2020



Key to Success for Recruiting in Minnesota

Partnerships with government agencies, citizen science groups, and media who have large following across the state

Help advertise need for more observers in newsletters, publications, social media, and broadcasts, timed with March Madness campaign

Help share why observations are needed, and how their observations are used

Partners are motivated because they can use the data as well





Partnerships Include:

- Minnesota State Climatology Office (State CoCoRaHS Coordinator)
- 6 National Weather Service Forecast Offices (Regional CoCoRaHS Coordinators)
- Minnesota Department of Natural Resources (MN DNR)
- Minnesota Soil and Water Conservation Districts (SWCD)
- Minnesota Pollution Control Agency (MPCA)
- Local Watershed Districts
- Minnesota Master Naturalists/Master Gardeners
- Local and Regional TV/Radio Stations & and Local Newspapers
 - Share stories from DNR press releases, and postings by State Climate Office and NWS Offices
- Local Governments (City and Townships)
 - Newsletters and social media posts to help find additional observers in their area

Minnesota State Climatology Office

Minnesota State Climatology Office

State Climatology Office - DNR Division of Ecological and Water Resources

about us 

Quick Links

Twin Cities Climate Data

Mark Seeley's WeatherTalk

Climate Journal

MNgage [report data]

CoCoRaHS

NWS Data Retrieval

Data Summary Tables

Last 3 Days MSP

Hourly Roundup

Other Topics

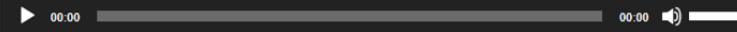
MN Climate Trends Tool

Kuehnast Lecture Series

Climate Change

Climate is like the Dow Jones index and weather is picking an individual stock. -- AASC


Institutional Associate Member - American Association of State Climatologists (AASC)
NOAA Weather-Ready Nation Ambassador



MN DNR State Climatologist Luigi Romolo is asking for OUR help this week! He tells us about the [Community Collaborative Rain Hail and Snow Network](#) and Minnesota's quest to win the CoCoRaHS Cup for an unprecedented third year in a row! You can reach out to [Luigi](#) with questions about joining and get your [official CocoRaHS rain gauge here](#).

More Posts for Show: [The Morning Show](#)



Minnesota State Climatology Office

March 16 

...

Want to become a weather observer? Want to get your kids more involved in real science??

The Minnesota State Climatology Office would love to recruit you to be a volunteer rainfall observer for the Community Collaborative Rain, Hail and Snow Network (CoCoRaHS). Anyone can join.

Just sign up at: ... See more

Want to Become a Weather Observer?



JOIN COCORaHS

The National Weather Service is looking for additional precipitation observers across Wisconsin & Minnesota.

All you need is a 4 inch diameter rain gauge and Internet access to be a CoCoRaHS observer.

No experience is needed. Free training is provided online!

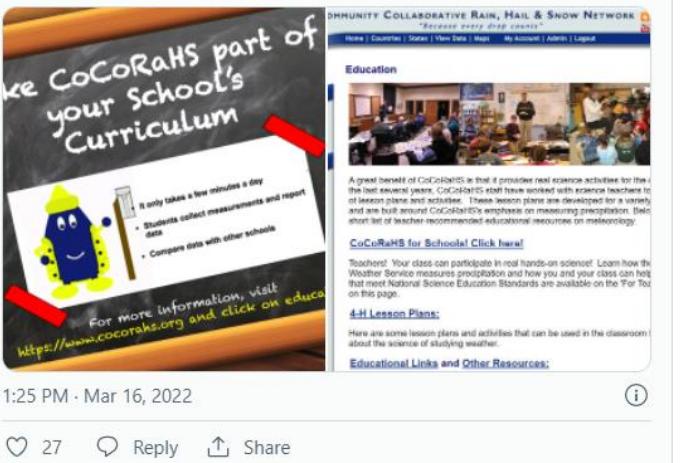
Sign up at cocorahs.org

Join [CoCoRaHS](#)! The Community Collaborative Rain, Hail & Snow Network

National Weather Service

 **NWS Twin Cities** 

Looking for a fun STEM activity for kids? Children are welcome to participate in CoCoRaHS! Many families & schools have signed up as weather observers. Free training is provided online. Join [@CoCoRaHS](#) today at cocorahs.org More info: weather.gov/mpx/2022cocora...#mnwx #wiwx



1:25 PM · Mar 16, 2022

 27  



Help Us Recruit More Weather Observers!



cocorahs.org



CoCoRaHS is a grassroots, non-profit, community-based, high-density precipitation network made up of volunteers of all backgrounds and ages who take daily measurements of precipitation, snowfall and snow depth in their backyards.

JOIN
COCORAHS

The National Weather Service is looking for additional precipitation observers across Minnesota and Wisconsin.

All you need is a 4" diameter rain gauge and internet access.

No experience is needed. Free training is provided online!

CoCoRaHS: Community Collaborative Rain, Hail, and Snow Network

Twin Cities, MN
Weather Forecast Office

Weather observers needed across Minnesota and Wisconsin - Join CoCoRaHS!

[Weather.gov](#) > [Twin Cities, MN](#) > Weather observers needed across Minnesota and Wisconsin - Join CoCoRaHS!

[Current Hazards](#) [Current Conditions](#) [Radar](#) [Forecasts](#) [Rivers and Lakes](#) [Climate and Past Weather](#) [Local Programs](#)

Additional weather observers are needed across Minnesota and Wisconsin!



Because every drop (and snowflake) counts - [Join CoCoRaHS today!](#)

Minnesota Department of Natural Resources (MN DNR)



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Rainfall monitoring network seeks volunteer members

March 1, 2022

Reports provide important data about rainfall amounts, climate trends

The State Climatology Office is looking for volunteer rainfall monitors for the Community Collaborative Rain, Hail and Snow Network (CoCoRaHS). The network includes more than 20,000 volunteers nationwide who measure precipitation in their backyards using a standard 4 inch diameter rain gauge and submit reports online.

Climatologist Pete Boulay said the data from backyard rain gauges are helpful and important in many ways.

"These volunteers help to verify high rain totals after big events, monitor drought and flooding, make our precipitation maps more accurate and provide needed guidance on Minnesota's changing climate," Boulay said. "This is also a great educational activity for families with kids and a rewarding hobby for anyone interested in weather or climate."

Volunteers are particularly needed outside the immediate Twin Cities metro area. Volunteers receive training on how to observe weather trends and submit their precipitation and weather event reports. All training material is available online. They must purchase or provide a standard 4 inch diameter rain gauge (available at discount through CoCoRaHS) and have internet access to submit reports.

For the past two years, Minnesota has won the "CoCoRaHS Cup" for recruiting the most new volunteers of any state.

"We're hoping Minnesotans will again come through in 2022, to keep the Cup in Minnesota and, more importantly of course, to improve our state's precipitation recording," Boulay said.

To sign up or for more information, visit [CoCoRaHS.org](#) or contact Pete Boulay at peter.boulay@state.mn.us. The website includes lesson plans for STEM students and instructional videos for all participants.

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Minnesota breaks national rainfall monitor recruiting records

April 28, 2022

Minnesota added more rainfall monitoring volunteers during the annual March recruitment than any other state and set a new national recruiting record for the Community Collaborative Rain, Hail and Snow Network (CoCoRaHS).

The recruiting effort led by the Minnesota Department of Natural Resources and the Minnesota office of the National Weather Service resulted in 365 new volunteers and brought the "CoCoRaHS Cup" to Minnesota for the third year in a row. Minnesota broke the previous record last year as well by recruiting 270 new volunteers.

The rain, snow and hail data gathered and reported by volunteers are not only important in tracking weather trends and the effects of climate change, but they also serve anyone who needs daily local area precipitation reports for any purpose.

"We're so grateful to our national record number of volunteers in Minnesota," State Climatologist Luigi Romolo said. "While it's fun to win cups and set records, the real winner here is science. The data from these new recruits will go a long way to help our day-to-day operations."

The new observers join more than 1,000 other daily precipitation observers who volunteer as part of the state's MnGage network, making Minnesota's resident precipitation observing program the most comprehensive in the country.

County and State Citizen Science Agencies



Volunteer weather observers needed in Scott County

Since 1978, the Scott Soil and Water Conservation District (SWCD) in Jordan has been part of the Minnesota Soil and Water Conservation District's Rain Gauge Observation Program. The Scott SWCD is currently looking for new community members to join our volunteer team!



The State of Minnesota relies on volunteer observers to collect data on Scott County's precipitation. The information collected provides empirical insight for weather, water supply, and flood forecasts, for assessing drought severity and impacts, for severe storm prediction, and so much more. No prior experience with data collection is required.

"Rain gauge observers are invaluable resources for reporting to the State's weather data system. They help us track and learn from major weather events happening within the county," Shelby Roberts, SWCD rain gauge program coordinator, states.

Scott County currently has 10 volunteer observers. The SWCD is looking for additional volunteers in the Elko New Market, Helena Township, Blakely Township, and Cedar Lake Township areas to send daily precipitation readings to the District on a monthly basis.

Denis Haack, a rain gauge observer since 2015 reflects upon his experience. "Being a part of a coordinated effort to track precipitation patterns and climate change over time has been deeply satisfying. Besides, as an observer in Minnesota I have something to say in



UNIVERSITY OF MINNESOTA EXTENSION

Minnesota Master Naturalist

CoCoRaHS weather watcher trainings:

Become a weather watcher! You can take the trainings on line and order your own equipment to get started!

<https://www.youtube.com/user/cocorahs>



HOME SERVICES

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This is a post from a Service Provider



Minnesota Pollution Control Agency

Communications & Outreach Team • 11 Mar



Become a CoCoRaHS volunteer! The Minnesota State Climatology Office is looking for Community Collaborative Rain, Hail and Snow Network program (CoCoRaHS) volunteers! Volunteers track precipitation in their own backyards then enter the data online to help monitor drought and verify high rainfall or snowfall totals. Learn more about the program from the Minnesota Department of Natural Resources: <https://bit.ly/3tYCdU>



Rainfall monitoring network seeks volunteer members : Mar 1,... [dnr.state.mn.us](#)

Posted to Subscribers of Minnesota Pollution Control Agency

1 77

Like

26 Comments

Share

Local and Regional TV/Radio/Newspapers



The screenshot of the Belle Plaine Herald website shows a news article titled "Rainfall Monitoring Network Seeks Volunteer Members". The article discusses a network that provides data on rainfall amounts and climate trends. A man in a dark jacket and glasses is shown holding a clear cylindrical rain gauge. The website has a standard layout with a navigation bar at the top and social media sharing options.



A screenshot from a CBS 3 news broadcast titled "CITY BY CITY" in a red box. The main headline reads "DNR Looking for Volunteers Ahead of Spring" and "Minnesota". The broadcast includes a weather forecast for 5:10 with a temperature of 14°. The video player shows a progress bar at 0:37 and a total duration of 1:59.



ON AIR 0:00
All Things Considered with Tom Crann



Updraft®

National Weather Service looking for volunteer weather observers

CoCoRaHS program needs volunteers in certain areas

Paul Huttner March 9, 2022 1:54 PM

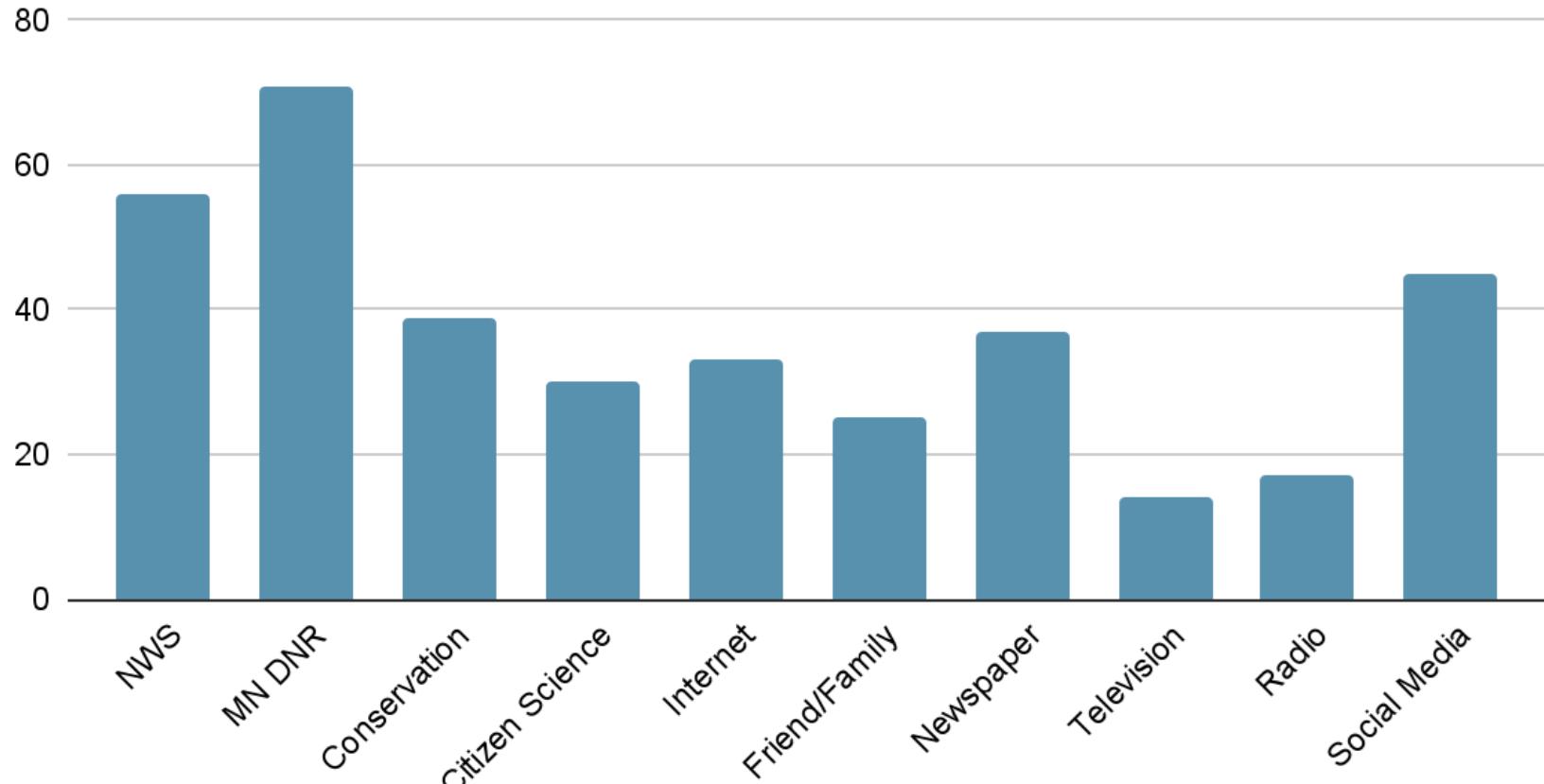


New Observer Referral Sources (3/1/22 through 5/10/22)

- NWS (website, social media posts, Skywarn classes) - 56
- MN DNR (website, newsletters, email list, press releases) - 70
- MN DNR Conservation Volunteer Magazine (Circulation = 135,000) - 39
- Citizen Science Networks & State Agencies (MPCA, Master Naturalists, 3 Rivers Park District, Lake Association, Citizen Lake/Water Monitors, Citizen Stream Monitoring Network, Master Gardeners, Mississippi Headwaters Audubon Society) - 30
- Family/Friend/Coworker - 25
- Social Media (Facebook, Twitter, Instagram, Reddit, Nextdoor) - 45
- Internet (Google Search, Non-specific source) - 33
- Newspaper, TV, and Radio - 68

And the most unique response: *“I've seen your logo near drain sewers”*

Referral Source - 366 Replies

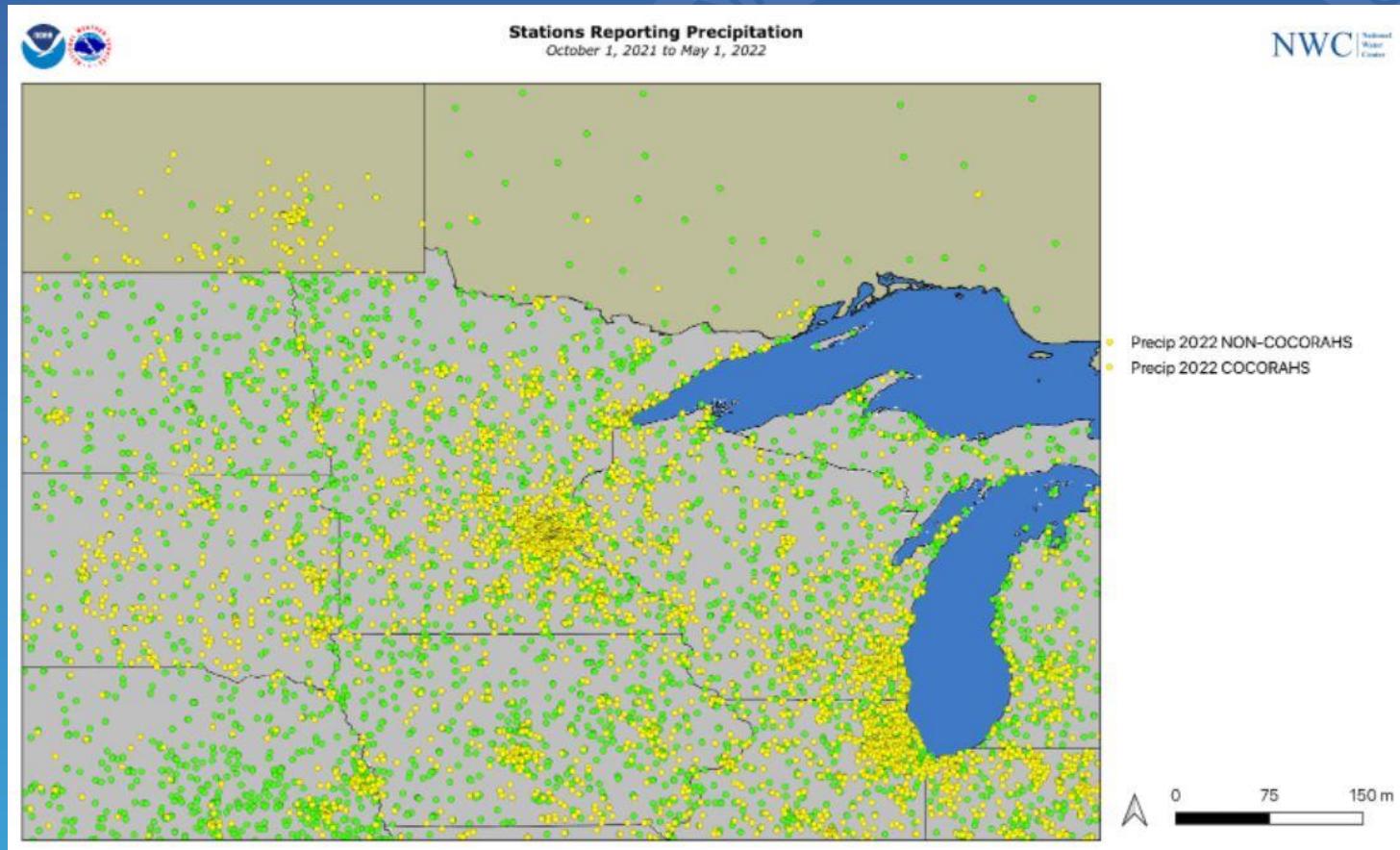


Why Minnesota is Cuckoo For CoCoRaHS

- High density of manual precipitation, snowfall, snow depth, and SWE measurements are key to understanding Minnesota's climate & impact of weather events year round
- Manual precipitation measurements are vital to have accurate data for freezing and frozen precipitation
- Snowfall and snow depth measurements widely used for winter recreation
- Manual SWE measurements provide major support for spring flood outlooks
- Many local and state agencies need accurate and high density precipitation and snow measurements to support operations, maintenance, mitigation, and planning (MN SCO, SWCD, MN DNR, agriculture, MPCA, Local Watershed Districts, MMCD)

CoCoRaHS Reports Greatly Increase Available Data in Minnesota

Maps and Charts Courtesy of Carrie Olheiser - National Water Center, Chanhassen, MN

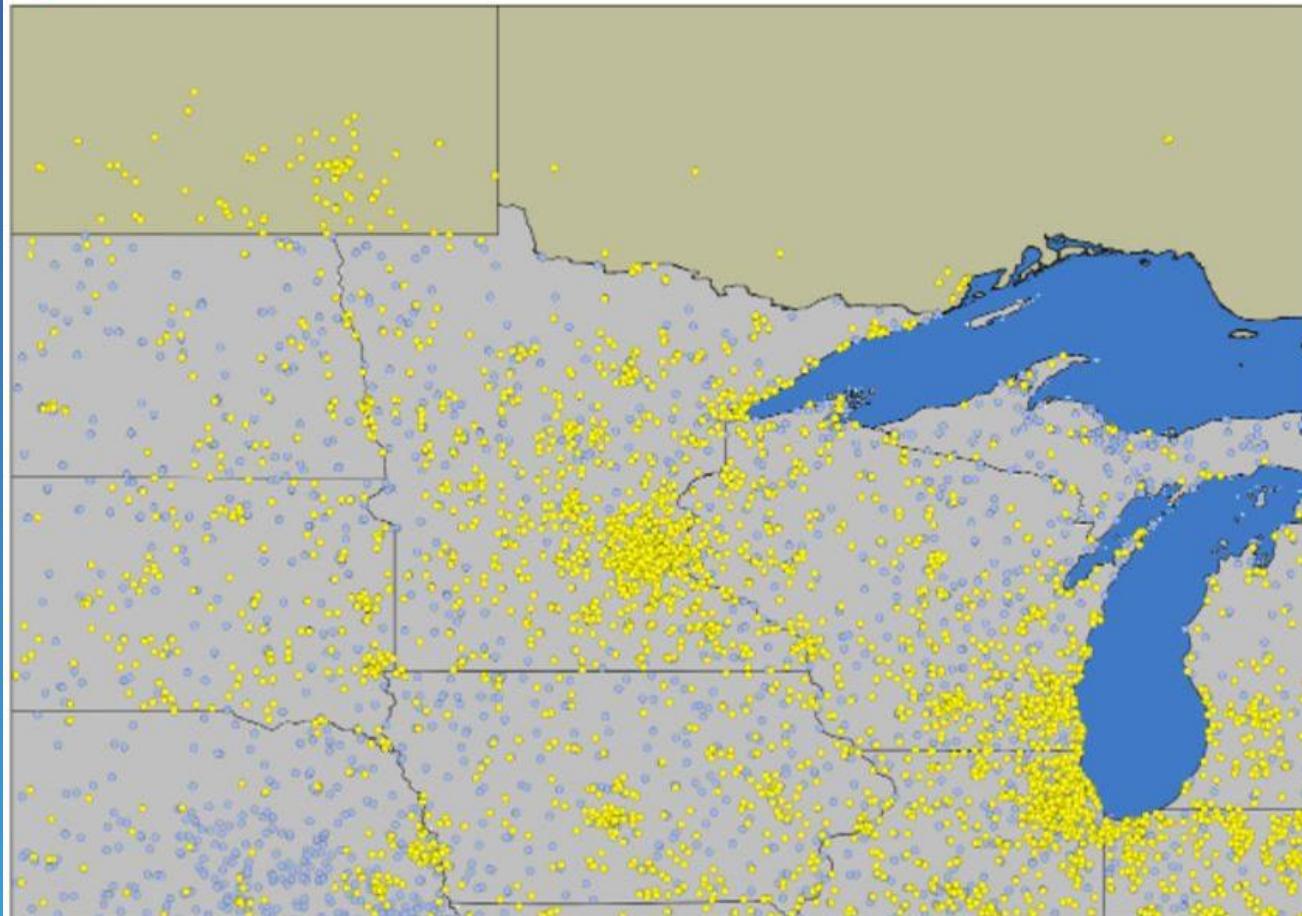




Stations Reporting Snowfall

October 1, 2021 to May 1, 2022

NWC
National
Weather
Center

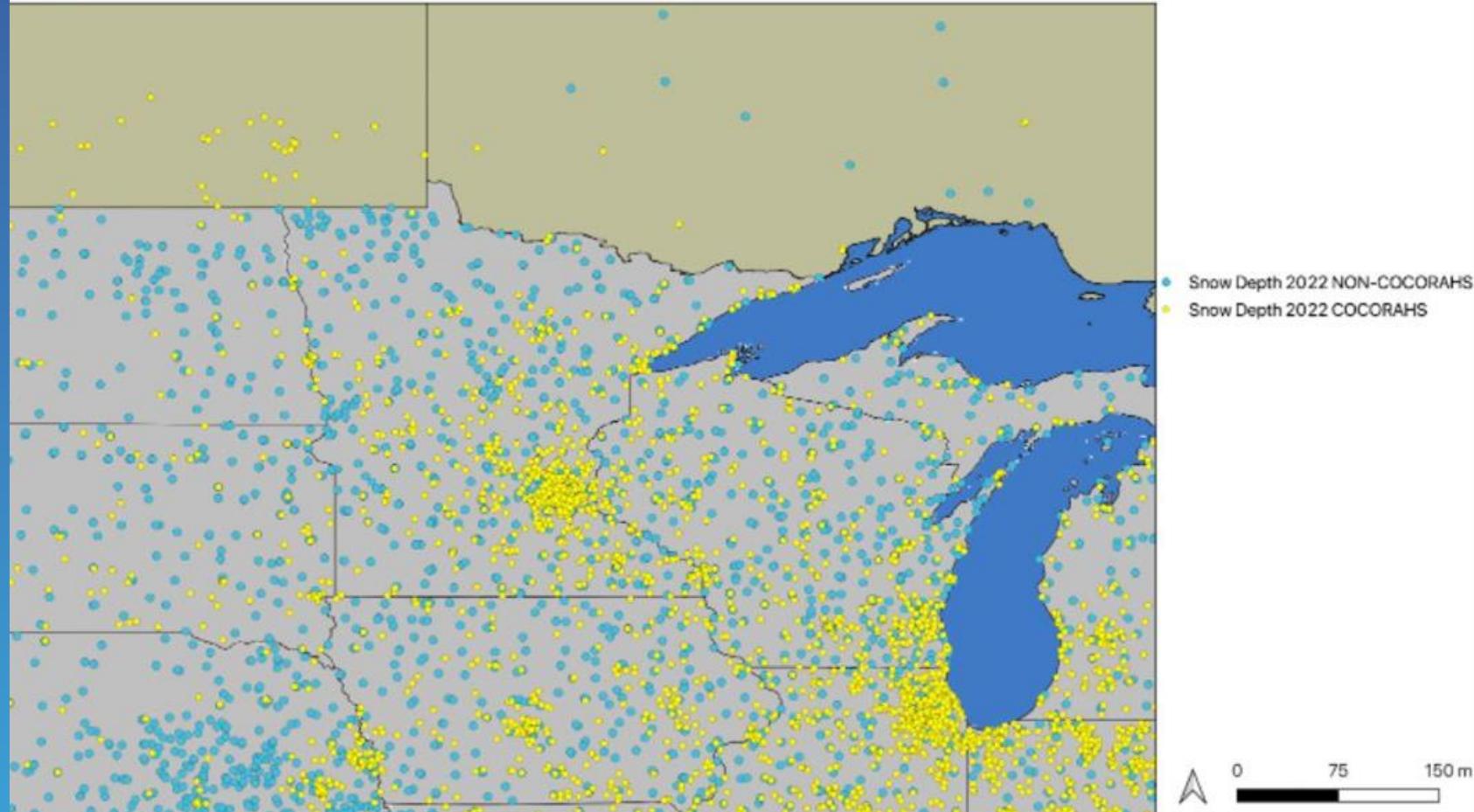




Stations Reporting Snow Depth

October 1, 2021 to May 1, 2022

NWC | National Water Center

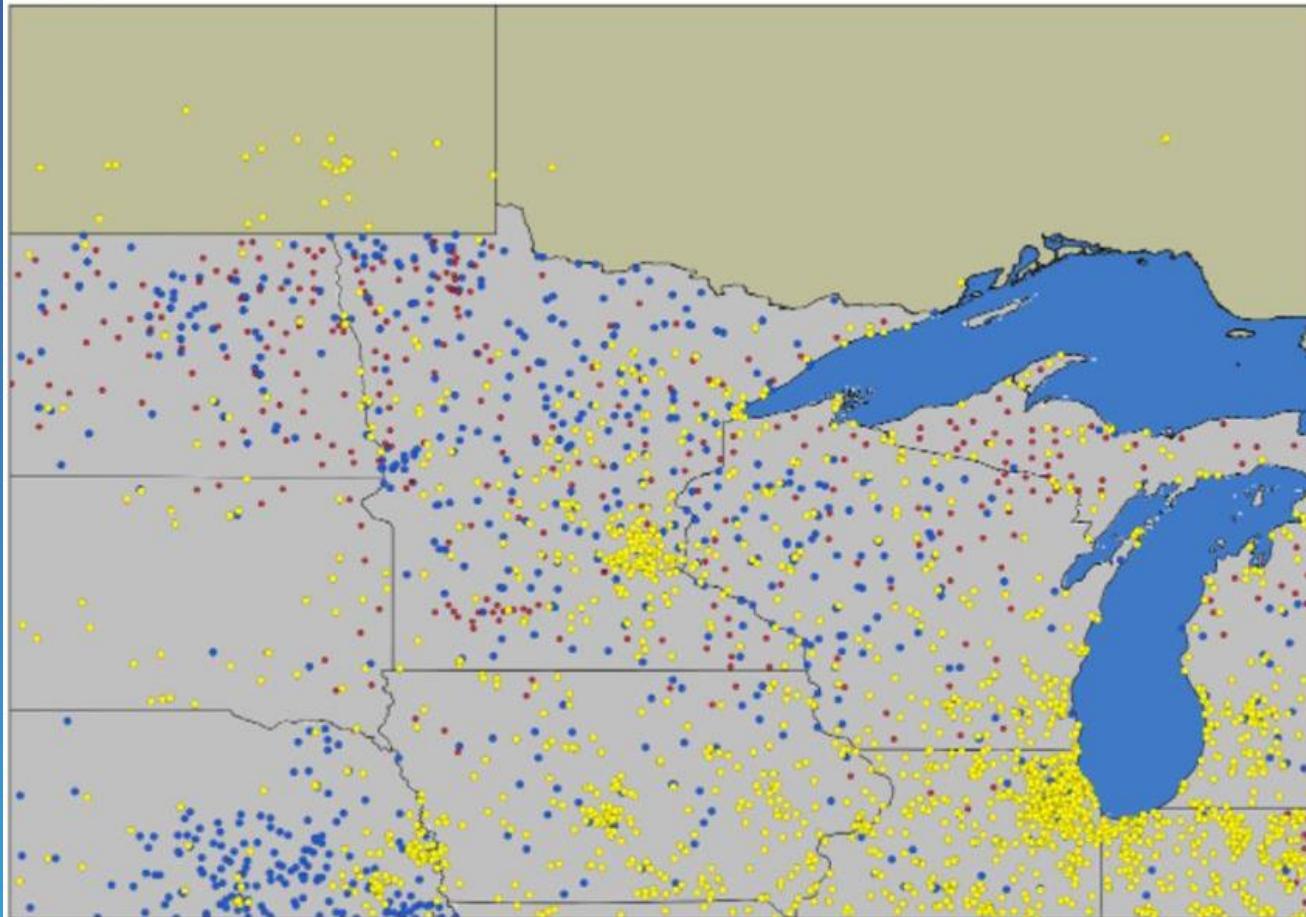




Stations Reporting Snow Water Equivalent

October 1, 2021 to May 1, 2022

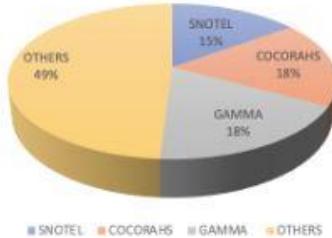
NWC
National Water
Center



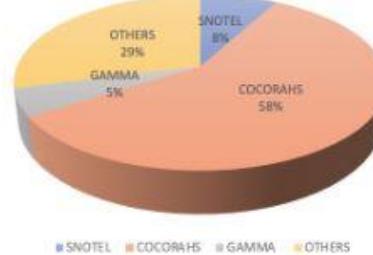
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Unique SWE Observations

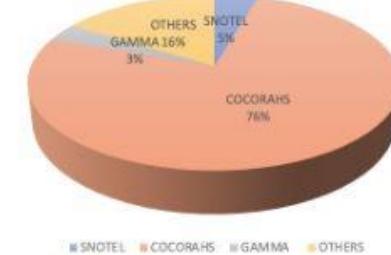
Unique SWE Stations 2006



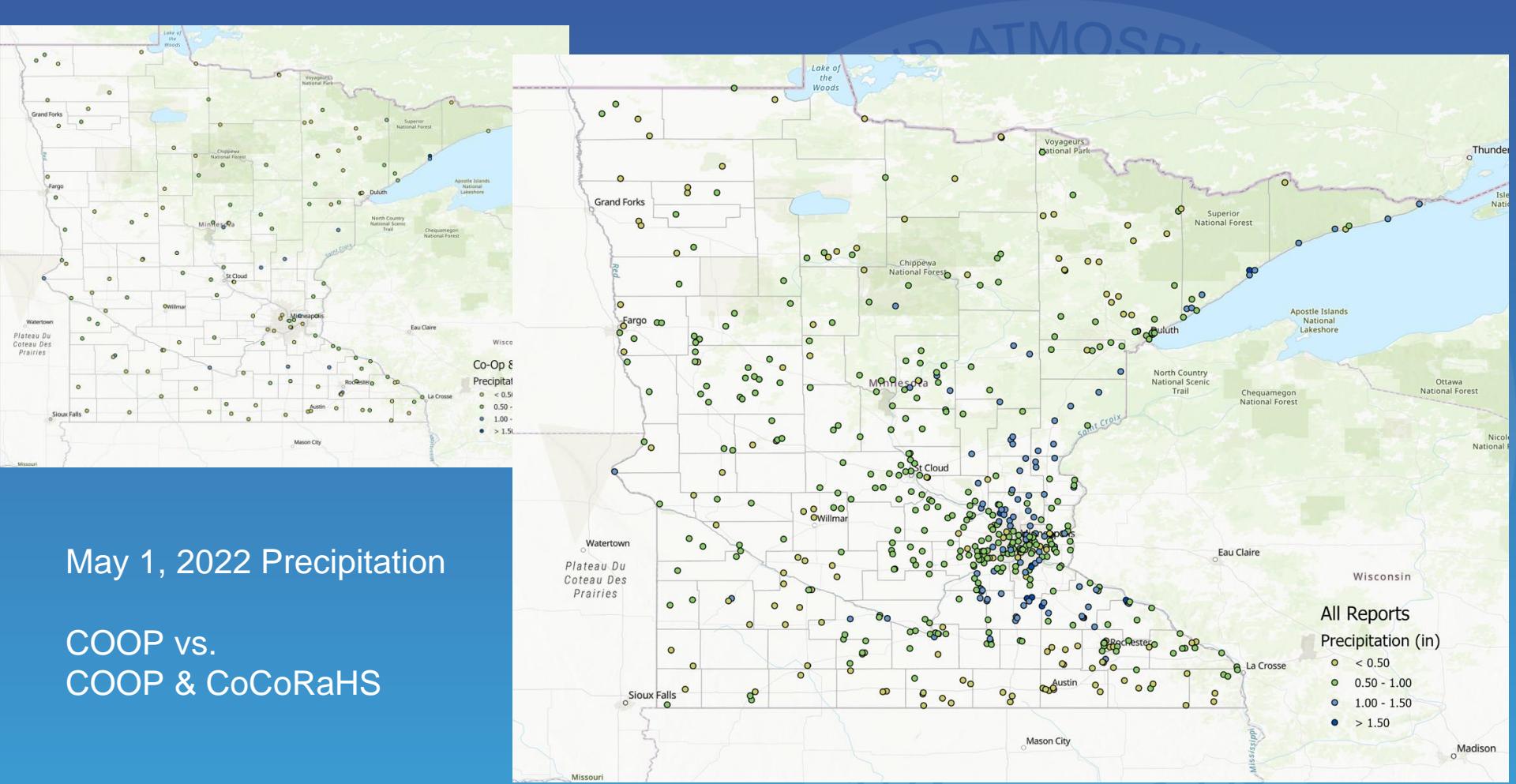
Unique SWE Stations 2014



Unique SWE Stations 2021



- Since 2006 the number of SWE stations has increased from ~4000 to more than ~12500 stations.
- The total contribution of SWE reporting stations from CoCoRaHS has increased from 18% to 76% !



May 1, 2022 Precipitation

COOP vs.
COOP & CoCoRaHS

Maps Courtesy of John Margraf, NWS Minneapolis

Strategies for Retaining Observers

- Welcome email after signing up from regional coordinator
- Email with links to local training resources, targeted at start of snow season
- Sharing how CoCoRaHS observations are used, and saying thank you after significant events

Welcome to CoCoRaHS! From Michelle Margraf, Regional Coordinator

 **Michelle Margraf - NOAA Federal** < michelle.margraf@noaa.gov >
to Ruders172 ▾

Hi Ross,

Welcome to CoCoRaHS! Thank you for volunteering to share weather reports from your community. You join a group of others who are making a difference by sharing their observations with the National Weather Service.

The National Weather Service has a network of official cooperative weather observing sites spaced roughly 20 miles apart, which are located in or near official weather stations. We are grateful for volunteers like you who provide reports from additional locations, which make up the CoCoRaHS network.

The National Weather Service is proud to support CoCoRaHS, and we use the data you provide every day. If you haven't already done so, please take a few minutes to review the following training materials:

http://www.cocorahs.org/Content.aspx?page=training_slideshows

Instructional Materials for Volunteer Weather Observers - NWS Twin Cities

[Weather.gov](#) > [Twin Cities, MN](#) > Instructional Materials for Volunteer Weather Observers - NWS Twin Cities

[Current Hazards](#) [Current Conditions](#) [Radar](#) [Forecasts](#) [Rivers and Lakes](#) [Climate](#)

The links below are to resources for Cooperative Weather Observers.

- [Coop Observer Winter Weather Observation Training Document](#)
- [Coop Observer Quick Reference Guide](#)

The links below are to resources for CoCoRaHS Weather Observers.

- [CoCoRaHS Quick Reference for Reporting Winter Precipitation](#)
- [CoCoRaHS Winter Weather Observation Training Document](#)
- [CoCoRaHS Winter Weather Observation Training Videos](#)
- [Conversion Chart for Snowfall Measurements to the Tenth of an Inch](#)
- [How to Report a Multi-Day Precipitation Total](#)

Additional Resources

- [Types of Winter Precipitation, and Best Practices for Observing](#)



US National Weather Service Twin Cities Minnesota

Published by Bill Andersen · 5h

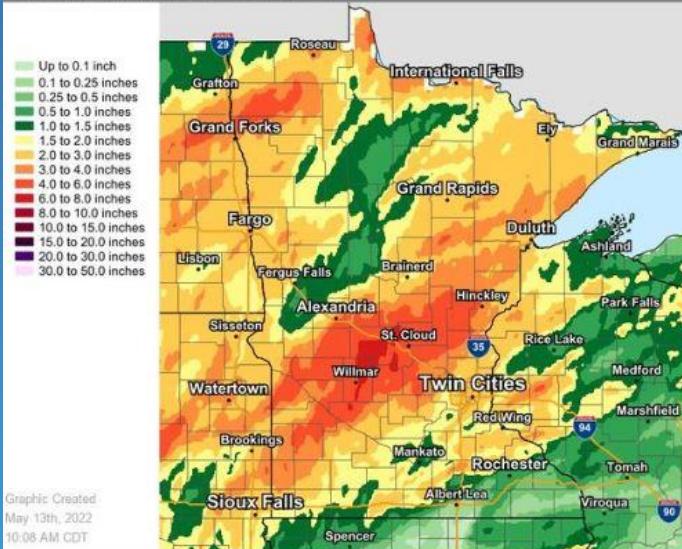
...

Three rounds of severe weather this week have brought significant rainfall to the region. Map shows rainfall totals from the past 7 days. Thank you to the volunteer COOP and CoCoRaHS observers for the measurements that make this map possible. Several rivers have risen significantly over the past few days. The latest river levels & forecasts are available at: <https://water.weather.gov/ahps2/index.php?wfo=MPX>



Observed Precipitation

Valid Ending Friday May 13th, 2022 at 9 AM CDT



Public Information Statement

National Weather Service Twin Cities/Chanhassen MN

122 PM CDT Thu May 12 2022

...PRECIPITATION REPORTS FROM PAST 24 HOURS ENDING AROUND 7 AM...

Thank you to our volunteer COOP and CoCoRaHS observers for the following rainfall measurements.

Location	Amount	Time/Date	Provider
...Minnesota...			
...Anoka County...			
Saint Francis 0.5 WNW	2.11 in	0800 AM 05/12	COCORAHS
Nowthen 2.9 SSE	2.11 in	0600 AM 05/12	COCORAHS
Centerville 0.3 ENE	2.05 in	0832 AM 05/12	COCORAHS
2 SE Centerville	2.04 in	0700 AM 05/12	COCORAHS
Ramsey 1.5 <u>WSW</u>	2.00 in	0700 AM 05/12	COCORAHS
Oak Grove 2.8 NW	1.83 in	0831 AM 05/12	COCORAHS
Ramsey 2.9 <u>WSW</u>	1.82 in	0600 AM 05/12	COCORAHS
Columbia Heights 0.9 SSE	1.68 in	0525 AM 05/12	COCORAHS
Ramsey 1E	1.64 in	0600 AM 05/12	COCORAHS
Lino Lakes 2.4 NNW	1.58 in	0830 AM 05/12	COCORAHS
Columbia Heights 1.1 NNW	1.56 in	0700 AM 05/12	COCORAHS

Future Plans to Support Observers

- Planning upcoming webinars to welcome new observers and for winter weather training
- Working on local strategy for data QC and contacting observers who need help with data entry

Winter Weather Observations at CoCoRaHS Sites

National Weather Service - Twin Cities



Contents:

- ❖ Getting your weather station ready for the winter season
- ❖ How to take winter weather measurements
- ❖ How to report precipitation, snowfall, snow depth, and snow core online

MINNESOTA April 2022 QC Frequent Ticket Summary

Steve Hilberg [via csucocorahs.onmicrosoft.com](mailto:csucocorahs.onmicrosoft.com)

CoCoRaHS QC Ticket Notification

qc@cocorahs.org

to me, QC ▾

A CoCoRaHS QC ticket has been submitted for Station number 1234567890. Please log in to the CoCoRaHS website to correct/verify the observation.

Station: MN-KD-20

ObsDate: 2022-05-13

Precip Reported: 6.83

New Snow Reported: NA

New Snow Water Eq: NA

Total Snow on Ground: NA

Total Snow Water Eq: NA

Thank you!

Michelle Margraf
Observing Program Leader
National Weather Service - Minneapolis
michelle.margraf@noaa.gov

