The Hoosier Observer

Indiana CoCoRaHS monthly e-newsletter

January 2024

December 2023 Statistics

Total observers reporting	496
Observers with no missing reports	287
Percent of total	58
Average Daily Reports per Day	399
Max # of Daily Reports and Day	432/01
Significant Weather Reports	4
Condition Monitoring Reports	24
E-T Reports	0

January Coordinator Update

The cold has certainly arrived in central Indiana and we greatly appreciate each and every one of you that went out and both measured the snow and the inevitable frozen liquid within your gauge. Those snow reports are extremely valuable, especially during particularly heavy snows.

We also want to highlight those observers that reported every single day of 2023. We had lots of folks that had a complete calendar year when including multi-day reports but we had 75 stations in 2023 that entered 365 daily reports.

We'd also like to recognize the 6 new Indiana observers (Howard, Perry, Tippecanoe,

December 2023 Precipitation

The statewide total precipitation for December 2023 was 2.14 inches, which was 0.87 inches below normal or 71 percent of normal. Northwestern Indiana had the highest precipitation with totals in excess of 3 inches (Figure 1). Central and southern Indiana observed between 25 and 75 percent of normal precipitation.

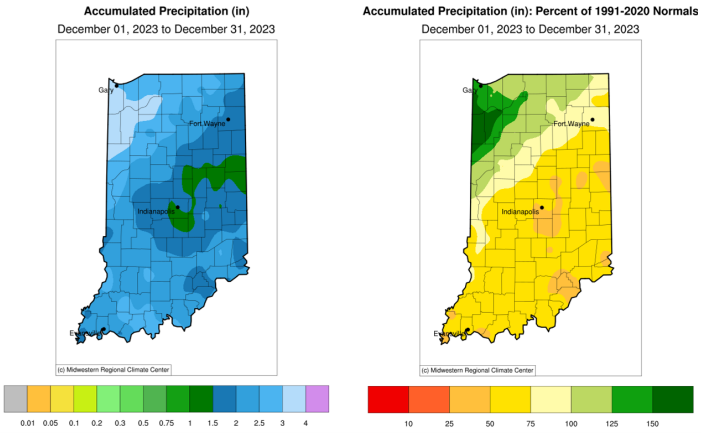

Figure 1: Left - Accumulated precipitation for December 2023. Right - Accumulated precipitation represented as the percent of 1991-2020 climatological average. Click for a larger image.

In December, snowfall was rather limited as most of the state received less than 50 percent of normal snowfall (Figure 2). Knox, Greene, and Daviess counties had the highest snowfall totals with accumulations up to almost 5 inches. The ELNORA NWS COOP station (Daviess County) measured 4.70 inches of snowfall, most of which fell on December 28 (3.5 inches). The highest CoCoRaHS snowfall (1.40 inches) occurred at SOUTHBEND 4.6 SE (St. Joseph County).

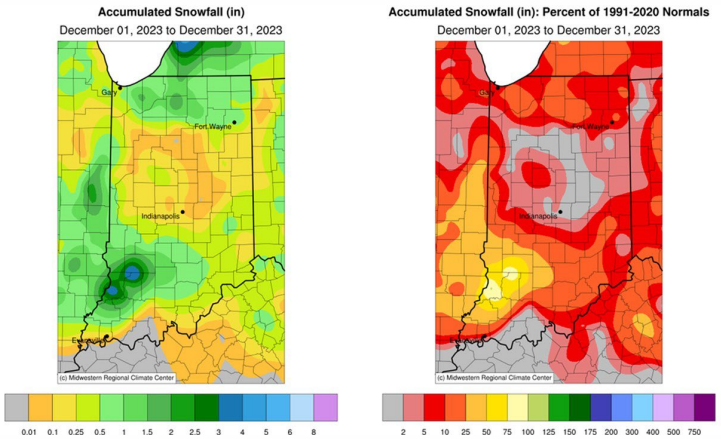

Figure 2: Left - Accumulated snowfall for December 2023. Right - Accumulated snowfall represented as the percent of 1991-2020 climatological average. Click for a larger image.

St. Joseph [3]) that joined CoCoRaHS in the last month. Thanks for joining the team!

Archived Newsletters

If you are ever interested in viewing past issues of *The Hoosier Observer*, visit the State Newsletter Archive on the CoCoRaHS website and scroll down to Indiana. You may also access other state newsletters from this website as well.

High and low precipitation for December 2023

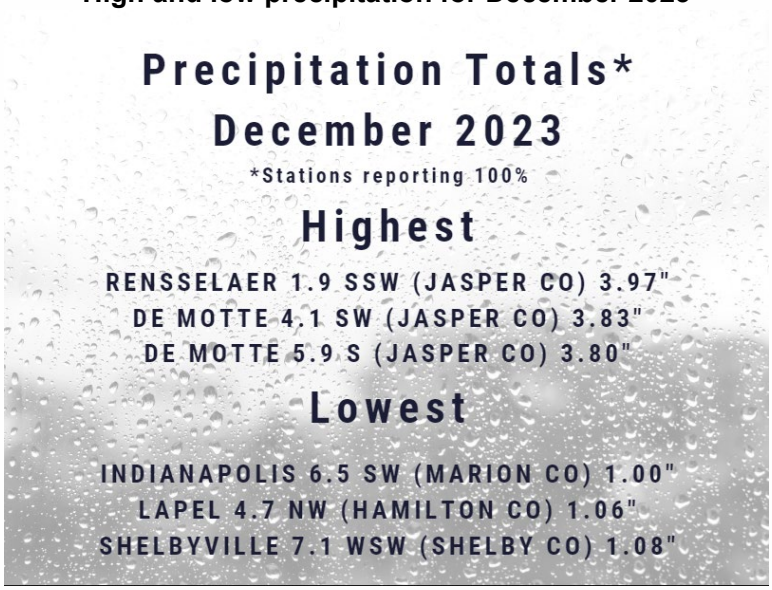

Figure 3: Highest and lowest precipitation totals for CoCoRaHS observers reporting 100% of data for December 2023. Click for larger image.

2023 Year in Review

In 2023, the statewide precipitation averaged 6.64 inches below normal or 85 percent of normal (Figure 1). The state experienced conditions that oscillated between wet and dry throughout the year, but ultimately ended in a deficit. Indiana spent a large majority of 2023 in abnormally dry or drought conditions in the weekly US Drought Monitor maps. Indiana has 9 climate divisions, which can be seen represented in the map below. Central Indiana (Climate Divisions 4 and 5) were driest as they received 80 percent of normal precipitation for the year. Some spots in central Indiana saw as low as 75 percent of normal precipitation (Figure 2). The average temperature for the state was 54.4F, which was 2F above normal.

Region	Precipitation (in)	Normal Precipitation (in)	Precipitation Departure (in)	Precipitation Percent of Normal	Temperature (F)	Normal Temperature (F)	Temperature Departure (F)
Indiana 1	36.37	39.81	-3.44	91	52.4	50.4	2
Indiana 2	35	40.04	-5.04	87	52.5	50.3	2.2
Indiana 3	33.94	38.76	-4.82	88	52.2	50.1	2.1
Indiana 4	34.29	43.03	-8.74	80	54.3	52.3	2
Indiana 5	35.04	43.7	-8.66	80	54.3	52.1	2.2
Indiana 6	35.13	42.47	-7.34	83	53.4	51.5	1.9
Indiana 7	40.38	47.98	-7.6	84	57.3	55.3	2
Indiana 8	42.61	48.79	-6.18	87	56.1	54.5	1.7
Indiana 9	40.73	47.4	-6.67	86	56	54.2	1.9
Statewide Indiana	36.99	43.63	-6.64	85	54.4	52.3	2

Figure 1: 2023 precipitation and temperature statistics broken down by Indiana Climate Division. The table contains observed precipitation, the 1991-2020 normal precipitation, precipitation departure from normal, precipitation percent of normal, average temperature, the 1991-2020 normal temperature, and the temperature departure from normal. Click for a larger image.

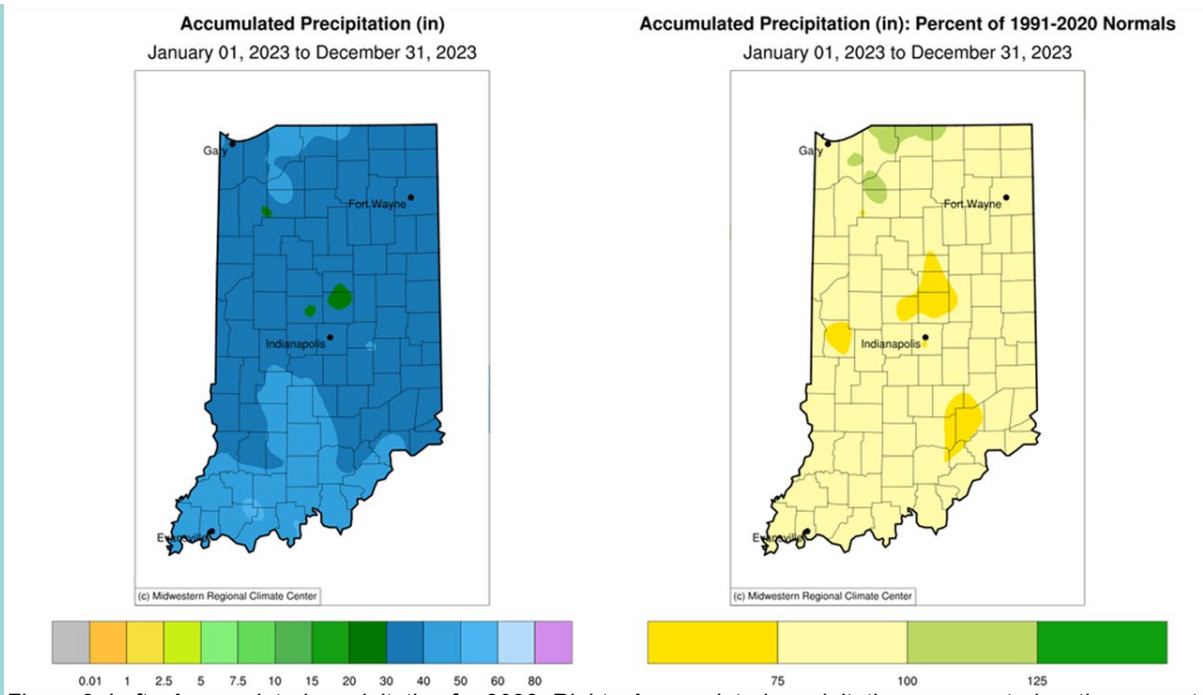

Figure 2: Left - Accumulated precipitation for 2023. Right - Accumulated precipitation represented as the percent of the 1991-2020 climatological average. Click for a larger image.

Top 10 and bottom 10 station precipitation totals are included below (Figure 3). Holland 0.2W (Dubois County) took the top spot with 58.02" in 2023. The lowest precipitation occurred at Lapel 4.7 NW (Hamilton County).

Top 10 Precipiation Totals for 2023 (stations reporting 100%)					
Name	County	Climate Division	Precip (in)	Departure from Normal	1-Day Maximum
HOLLAND 0.2 W	Dubois County	IN07	58.02	---	3.8 (6/30/2023)
MILLTOWN 5.7 SSE	Harrison County	IN08	52.7	1.36	2.77 (6/26/2023)
GEORGETOWN 1.6 E	Floyd County	IN08	51.91	---	2.83 (6/26/2023)
GALENA 3.0 SE	Floyd County	IN08	47.35	-3.24	2.62 (6/26/2023)
VALPARAISO 0.9 NNW	Porter County	IN01	47.14	4.87	2.16 (8/6/2023)
JEFFERSONVILLE 0.8 NW	Clark County	IN09	46.92	-4.13	2.48 (3/4/2023)
BOONVILLE 1.4 N WBNL RADIO	Warrick County	IN07	45.86	-5.07	3 (6/30/2023)
SPENCER 5.7 SE	Owen County	IN04	45.71	---	2.38 (3/24/2023)
NASHVILLE 6.6 WNW	Brown County	IN08	45.55	---	2.58 (5/14/2023)
VALPARAISO 2.2 NW	Porter County	IN01	45.36	---	1.86 (10/5/2023)

Bottom 10 Precipiation Totals for 2023 (stations reporting 100%)					
Name	County	Climate Division	Precip (in)	Departure from Normal	1-Day Maximum
LAPEL 4.7 NW	Hamilton County	IN05	27.66	-13.94	1.47 (3/4/2023)
KOKOMO 4.6 ESE	Howard County	IN05	29.91	---	3.46 (8/6/2023)
FORT WAYNE 5.7 NE	Allen County	IN03	30	---	2.27 (2/23/2023)
MILFORD 0.9 N	Kosciusko County	IN02	30.65	-8.79	2.34 (2/23/2023)
MONROEVILLE 0.2 ESE	Allen County	IN03	31.51	---	1.99 (3/23/2023)
WESTFIELD 1.4 ESE	Hamilton County	IN05	31.99	---	2.32 (7/6/2023)
INDIANAPOLIS 3.2 S	Marion County	IN05	32.05	---	2.19 (3/4/2023)
LA FONTAINE 0.3 SE	Wabash County	IN02	32.18	---	3.45 (8/6/2023)
GREENWOOD 4.9 SW	Johnson County	IN05	32.29	---	2.56 (3/4/2023)
ANDERSON 2.2 NNE	Madison County	IN05	32.4	---	1.95 (8/10/2023)

Figure 3: 2023 Top and Bottom 10 Precipitation totals for CoCoRaHS stations reporting 100 percent. Click for a larger image.

Thank you for Providing Quality Data!

Adapted from Steve Hilberg

CoCoRaHS has an active quality control process. In addition to basic input checks, a number of people review CoCoRaHS observations for possible errors. Most of the errors are simple - typographical errors, an observation entered for the wrong date, or an inadvertent zero. We track potential errors through a "ticketing' system" that helps us track what types of errors are made. This information is used not only to improve the data but to improve training and instructional materials. When we find an observation that is a potential error, that value is usually set to "NA".

When an observation needs to be corrected (or in some cases, verified, like for a very high rainfall amount), you may receive an email from me or your local coordinator asking about the observation. Please don't ignore it. We are not criticizing or admonishing you - we just want to clarify or correct an observation. There is nothing to be embarrassed or feel bad about. We include the reason for setting an observation to "NA' in the comments. If you are using the mobile app and see that one of your observations has been set to NA, check the observation notes.

Thanks to those of of you who have received a message from myself or one of our Indiana coordinators about an observation and quickly responded. That really helps to resolve questions about and verify observations. There are 9000 to 13000+ CoCoRaHS observations each day and it takes many eyes and a significant effort to check observations and make sure that they are correct. It really helps when we get a response back from you. Thanks again!

It Bears Repeating - Snow Water Equivalent (SWE) is NOT Your Gauge Catch

By Steve Hilberg

We find that many observers melt the snow in their rain gauge, report it as the Gauge Catch (correct), but then copy it into the New Snowfall SWE field on the report, thinking that they must be the same. They are not! This is a common error among many of our volunteers, but we are doing our best to get everyone out of the habit of re-entering their Gauge Catch into the Snowfall SWE field. These are separate physical measurements, and we do not want volunteers entering SWE unless they take a core from the snowboard or other flat surface, and then melt and measure it.

Our **Glossary of Terms** defines the 24-hour New Snow Water Equivalent as follows: The amount of water measured from melting a core of snow obtained from the snow on the ground at the depth of the 24-hour snowfall, measured to the nearest hundredth (0.01) of an inch.

The Gauge Catch and the Snowfall SWE are often not the same value, even if the precipitation is all snow. An entry should be made in the Snowfall SWE field only if you take a snow core from your board or other flat surface, melt the core, and measure it. If you do not make an actual Snowfall SWE measurement from a snow core, please leave the Snowfall SWE value as NA.

If your measured Gauge Catch and measured 24-hour New Snowfall Water Equivalent do happen to be the same, please include a comment with your observation along the lines of "Gauge catch and new snow SWE are the same".

Finding Resources on the CoCoRaHS Website

I often see comments from observers that they don't know where to find information on snow measurement, or multiple-day reports, or how to view data for their area, or a host of other topics. Many of these comments are from users of the mobile apps. The mobile apps, unfortunately, are limited to entering and viewing your own data. However, the answers to most of your questions can be found on the CoCoRaHS web site. So fire up your table or desktop and pull up **www.cocorahs.org**.

On the left-hand side of the page is all of the menu options. The one you want is **Resources**. Here you will find access to training slide programs, a FAQ, and information about our "special" observations such as Condition Monitoring and Evapotranspiration. If you have questions about the standard measurements you will find them addressed in the FAQ/Help option.

So, the next time you have a question about how to report something or how to view data, check out the Resources section on the web site.

The Importance of Filling the Gaps

Your CoCoRaHS observations are extremely important. National Weather Service COOP station

data are helpful for determining precipitation totals throughout the state, but there are only so many COOP observers in the state (Figure 1, left). CoCoRaHS helps fill these gaps to more accurately represent the precipitation that falls within Indiana's borders (Figure 1, right). You'll certainly see areas in Indiana that could use additional CoCoRaHS volunteers. If you know anyone in less represented areas that would be interested in volunteering, please send them our way!

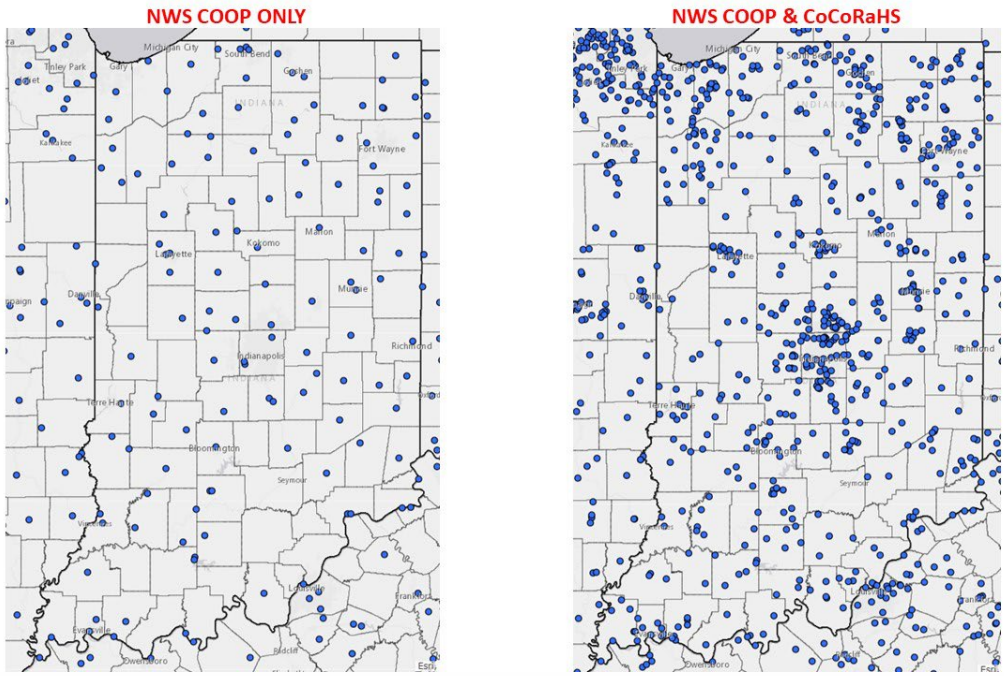

Figure 1: Left - Indiana NWS COOP observer sites. Right - Indiana NWS COOP observer sites in addition to CoCoRaHS observer locations. Observations from both networks enhance Indiana's precipitation monitoring capabilities.

Your observations help data users determine changes in precipitation amounts over short distances and provide valuable insight for data users to make value-added decisions. For example, the Indiana State Climate Office and Indiana's drought task force include CoCoRaHS data in interpolated precipitation maps (maps like Figure 2) that are used to make weekly recommendations to the US Drought Monitor authors. The interpolated maps below show the difference in interpolated precipitation between NWS COOP data and NWS COOP + CoCoRaHS observations for December 2023 (Figure 2-4). Each monthly newsletter moving forward, will include a comparison of these interpolated maps to continue to demonstrate the value of having CoCoRaHS observations in Indiana.

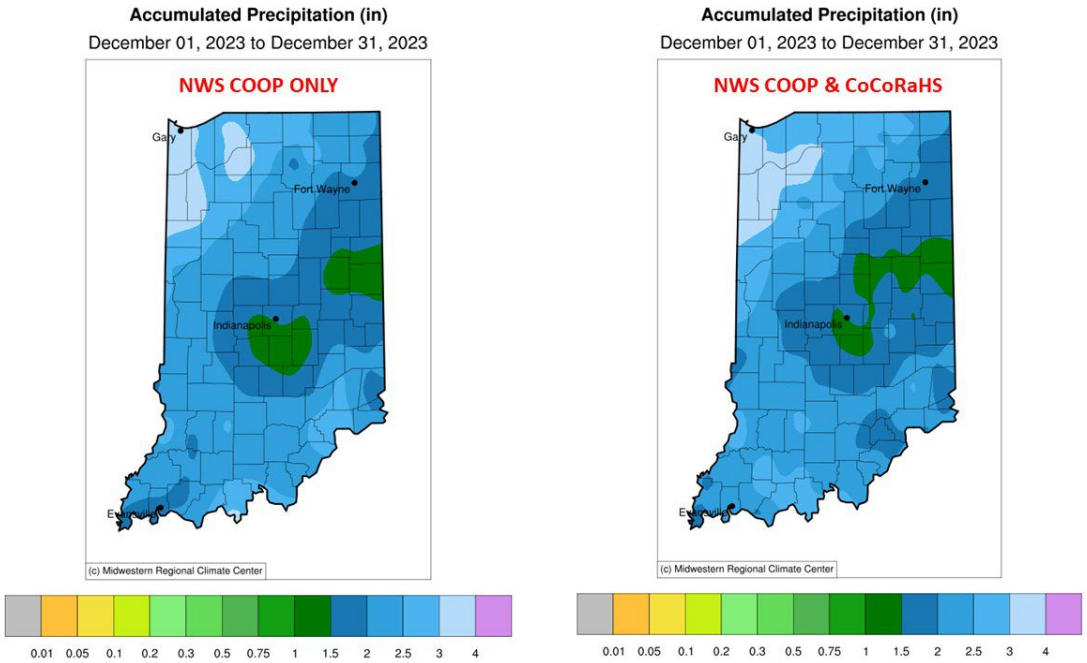

Figure 2: Left - December 2023 precipitation using only NWS COOP sites. Right - December 2023 precipitation using both NWS COOP and CoCoRaHS sites.

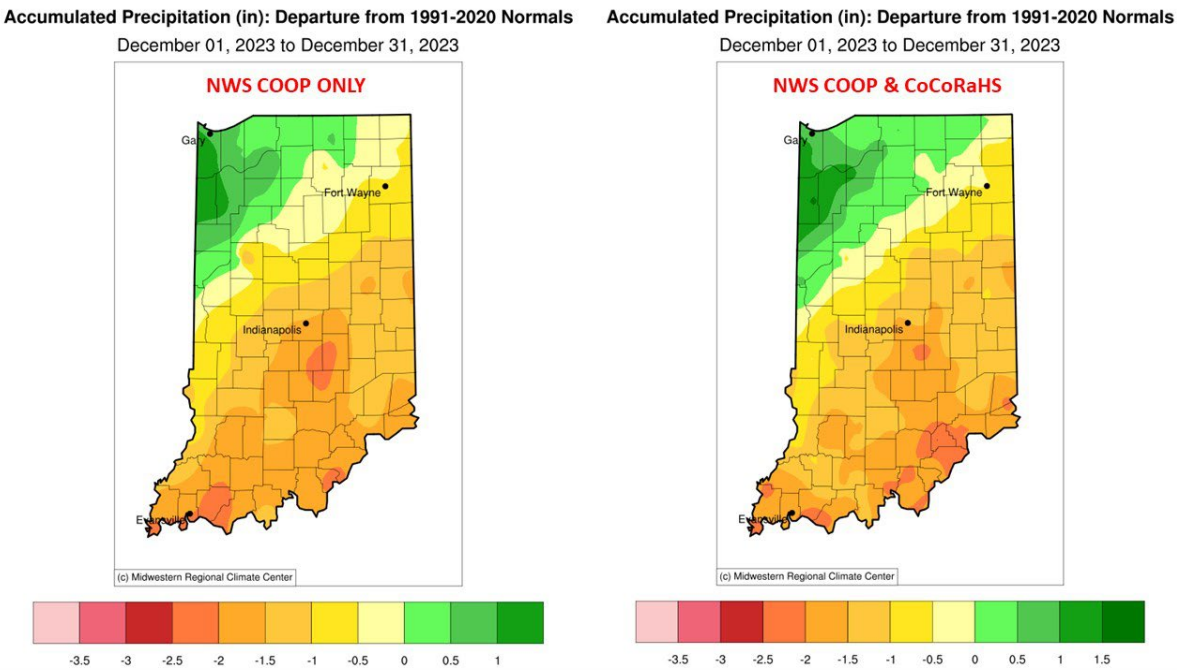

Figure 3: Left - December 2023 precipitation represented as the departure from the 1991-2020 climate normal using only NWS COOP sites. Right - December 2023 precipitation represented as the departure from the 1991-2020 climate normal using both NWS COOP and CoCoRaHS sites.

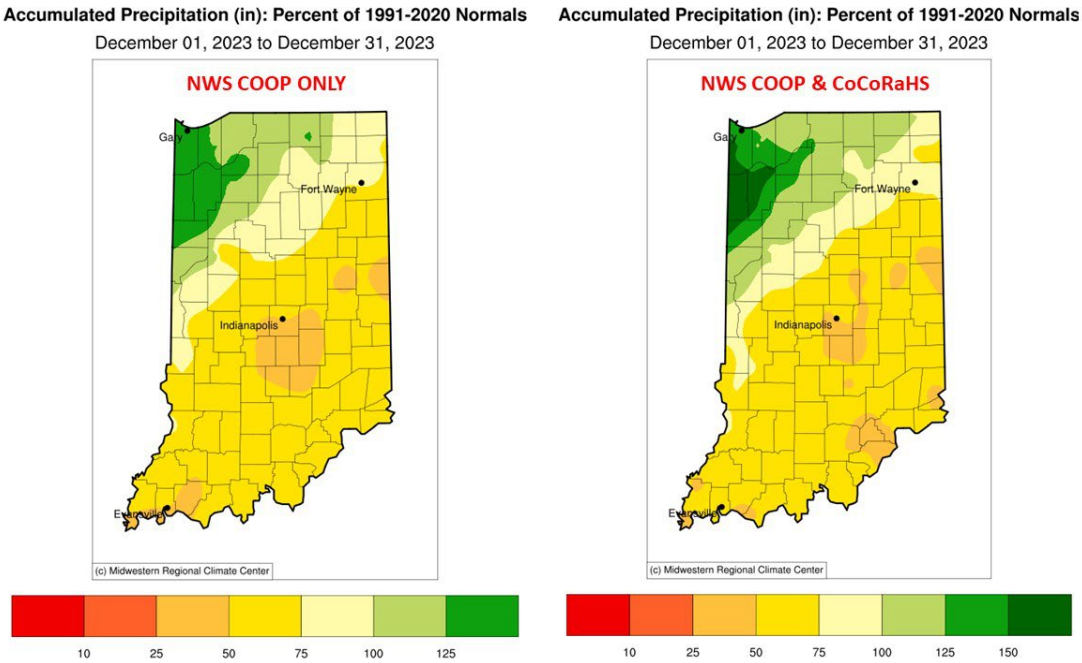

Figure 3: Left - December 2023 precipitation represented as the percent of the 1991-2020 climate normal using only NWS COOP sites. Right - December 2023 precipitation rrepresented as the percent of the 1991-2020 climate normal using both NWS COOP and CoCoRaHS sites.

If You Move, or Change Your Email Address

If you are moving to a new home and want to continue to participate in CoCoRaHS, please let us know as soon as possible. Your observations are tied to a specific location, so we don't want observations from your new location associated with your previous location. The value of the observations are increased by their continuity at a location, so consider suggesting to the buyer or new tenant of your home that they participate in CoCoRaHS! We have a brochure that you can download, print and give to them.

When you know your new address, let us know. When you are ready, we will close your old station and open a new station at your new address (DO NOT sign up for CoCoRaHS again). Once that's done, you can enter observations from your new location. If you are moving to a different state, we can help you get in touch with that state coordinator so you can get started there.

Let us know if you change your email address so that your record is up to date. You can update your email address in the CoCoRaHS database yourself by logging in and clicking on My Account in the top line menu. Click on Edit in the My Information box. Make any corrections, then click save.

Please also send a message to in-sco@purdue.edu with the email change as well so we can update your address on our newsletter mailing list. This list is maintained separately from the main CoCoRaHS database.

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