



Wyoming CoCoRaHS

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How Many Observers are Enough? (It's a trick question, there are never enough!)

One common question I get asked many times by potential and current observers is if their data are really necessary. Usually they ask this because they know there are other observers in their community and don't know if their data will add anything.

It is certainly an understandable question and one that I think is best answered with a real-life situation.

The map below, from the 14th of June, shows an area a bit more than 15 miles east to west and about 11 miles north to south around the city of Casper.

Imagine if only the station reporting 0.07" in the northwest part had submitted a report this day. It would look like the Casper area received just a minor amount of rain for the

14th.

Now, imagine if only the station with 1.20" had reported. It would then seem that the Casper area had received quite a downpour, but nothing would be known of the extent, ie, did that whole area receive over an inch.

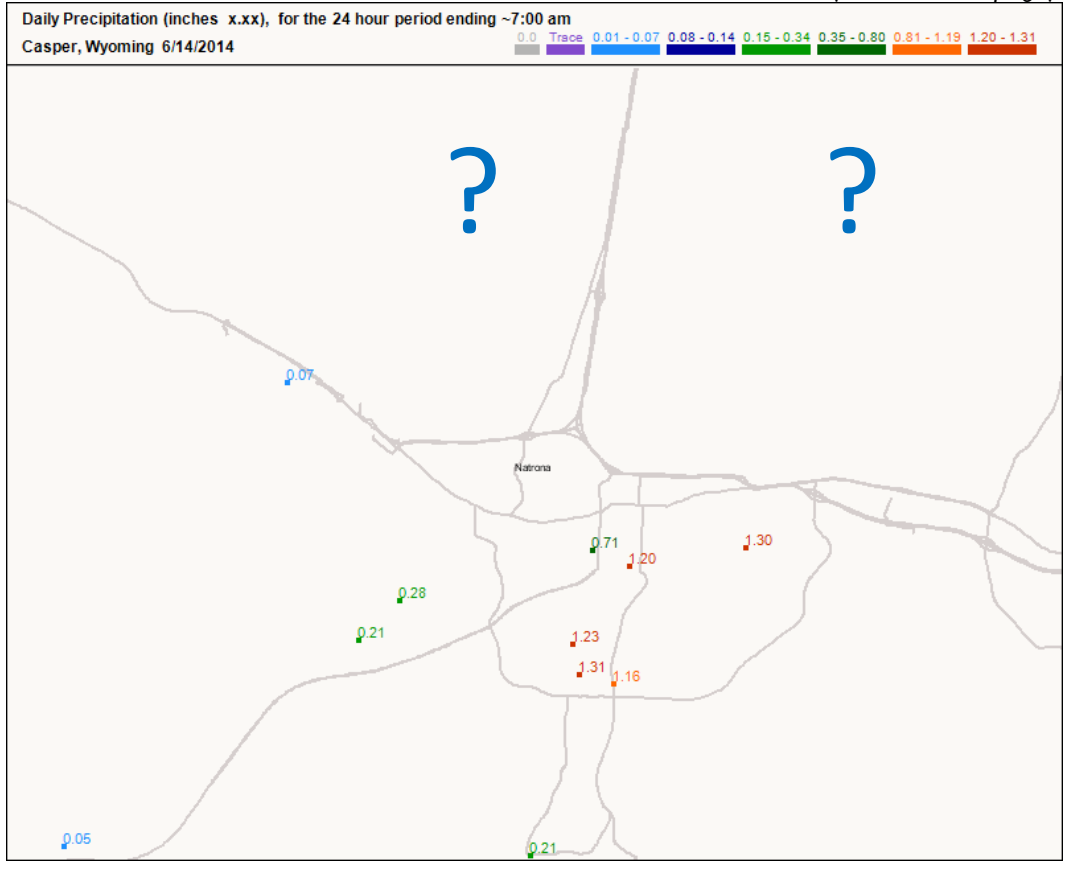
Let's take this a bit further and consider the case where both of those stations were the only reports from the area. At first glance it might seem that one of them was possibly incorrect. But which one? With no other reports from the area, it would be difficult to tell.

What if, in addition to the 0.07" and 1.20" observations, the 0.05" report is also entered? It might look like the 1.20" report was an error since it was so much higher. In fact, it could be

(continued next page)

Wyoming CoCoRaHS 2nd Quarter 2014

- ◆ Most observations in a day: 220 Reports on June 9th
- ◆ Greatest Amount: 2.76" on May 25th in Gillette
- ◆ One day (May 5th) with no precipitation statewide
- ◆ Three days with a trace or less statewide
- ◆ 17,597 daily reports submitted
- ◆ 308 active observers
- ◆ Average of 193 reports per day



How Many Observers are Enough? (continued)

explained by the observer having shifted the decimal, perhaps making a mistake when entering a 0.12" value. But, as more observations are made, a pattern develops which shows that all the reports are valid and they start to paint a picture of what happened.

But, what did Mills get? How much fell in Evansville? What happened up in Bar Nunn and other places north of the Casper area?

These questions are another reason for entering your zero when there has been no precipitation. It helps define the boundaries of these storm

events.

I briefly touched upon the possibility of an incorrect value being entered and how the additional stations confirmed that the value that could have been questioned was indeed valid. A dense concentration of observers and reports does help when it comes to quality control of the data.

While the reports in this example were all valid and illustrate the variability that we can see in precipitation, there **have** been cases where, for example, a lone "zero" shows up in the Cheyenne area in the middle of a bunch

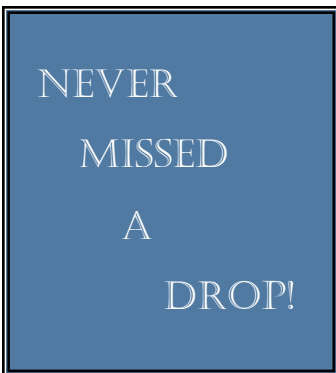
of reports ranging from 0.55" to 0.78". What likely happened was that the observer forgot to report that day. Then, several days later was using the *Monthly Zeros* form and reported what we call a "false zero".

In that type of situation, the value stands out and we can contact the observer to verify the value and correct it if necessary.

If there had been no other observers around, this report could have gone unnoticed. And forgetting to report can easily happen, too...I just did it this morning, in fact. I didn't realize it until I was summing

the reports and noticed that one of my stations was short by a day. I had read the gauge and then got caught up in something before I could enter it.

A quick way to look at your reports for the current month is to use the *Station Precipitation Summary Report* found on the *View Data* page (accessed from the top menu bar). Just enter your station number and click *Get Summary*. Your reports for the month will be listed and any that are missing will show up as a '--' for that day.



Stations reporting every day 01 Apr thru 30 Jun 2014

WY-AB-1	WY-FM-21	WY-LM-96	WY-PK-11	WY-SH-33
WY-AB-8	WY-GS-7	WY-LM-106	WY-PK-26	WY-SW-19
WY-AB-40	WY-GS-8	WY-LM-107	WY-PT-14	WY-SW-26
WY-AB-76	WY-GS-20	WY-LM-113	WY-PT-18	WY-TT-1
WY-AB-97	WY-JN-13	WY-LM-129	WY-PT-24	WY-WH-1
WY-CM-20	WY-LM-8	WY-LN-2	WY-SH-10	WY-W5-16
WY-CR-4	WY-LM-22	WY-LN-17	WY-SH-14	
WY-CR-18	WY-LM-23	WY-NT-3	WY-SH-17	
WY-CV-11	WY-LM-36	WY-NT-24	WY-SH-18	
WY-CK-6	WY-LM-63	WY-NT-35	WY-SH-29	

Flooding

With the above normal snowpack that was experienced around most of Wyoming this year, runoff was strong with several locations experiencing flooding. The picture at far right was taken looking upstream at the Laramie River at Bosler on the first of June at a stage of 6.83 feet. The river at this station reached a high of 6.89 feet on the following day which is the 4th highest on record.

At Saratoga the river reached its 3rd highest stage of 10.17 feet on May 28th (about a third of a foot under its record of 10.49 feet back in 2011).

Stream gauges on the Wind River were generally ranked in their 5th to 10th highest on record.

The Big Horn River at Basin only reached 7.41 feet which was ranked 16th highest on record.

The Little Snake River at Savery reached 8.38 feet on May 30th which is the 2nd highest at this location and less than a tenth of a foot below the record high in 2011.



21 New Observers Joined in 2nd Quarter 2014 and Gauge Cleaning

Welcome!

WY-AB-125	WY-FM-40	WY-LM-167
WY-AB-127	WY-FM-41	WY-LN-23
WY-BH-13	WY-HS-14	WY-NT-70
WY-BH-14	WY-JN-27	WY-NT-71
WY-CM-26	WY-JN-28	WY-PK-31
WY-CM-27	WY-LM-165	WY-PK-32
WY-CR-21	WY-LM-166	WY-SW-29

elements with no precipitation for a while, accumulations of dust can form in the bottom. Questions have arisen about putting it in the dishwasher. This is **not** recommended.

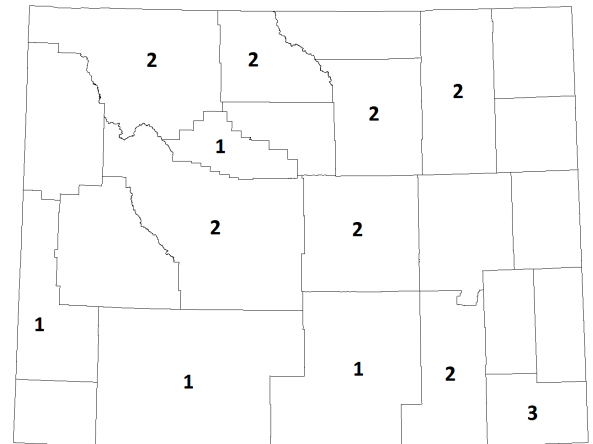
If you want to keep your gauge clean and looking like new, put some warm water with a little gentle liquid hand soap in the tube and let it soak for a few minutes. Then twist a thin soft towel and spin it into the cylinder until it reaches the bottom. This will wipe out most of the dirt. It is not recommended to use a firm bottle brush to clean the gauge, nor is using your automatic dishwasher (This will gradually scuff and haze the inside of the gauge).

Another method is to take a newspaper, roll it to make a tight cylinder, and then rotate the paper on the inside of the tube all the way to the bottom. It will usually clean out the dirt.

In the second quarter of 2014, we had 21 new observers sign up, representing 12 of our 23 counties. Two-thirds (14) of those 21 have already begun reporting! Of the 79 new observers in 2014, just over half (42) have begun to submit reports and I will take this opportunity to make my standard request that if you have **not** yet begun to report to please let me know if you need any assistance getting started.

Setting up and making that first report is the “hard” part, but after that it starts to become part of your routine. As you can see from *How Many Observers are Enough?*, we need as many observers as we can to truly get a good picture of what happens during some of these storms.

I’ve had a few questions recently about cleaning the gauge, especially the inner cylinder. After being out in the



What if I make a mistake?

It can happen to the best of us.

- A missed decimal. Wow, a 21” rain storm instead of 0.21”!
- Catching up on reports and entering a precipitation amount for the day it fell rather than the next day (an afternoon storm on the 22nd would be entered on the morning of the 23rd if you are an observer that reports in the morning).
- New snow depth entered as the precipitation value?
- Gone for three days and input the total in your gauge as a daily report instead of a multi-day.

No problem! If you think you might have made an error on your entry and aren’t able to fix it, just send me an email (antonius@uwyo.edu) and let me know. Usually it is something that can easily be fixed. Often we will find these values before the observer realizes the mistake. A mutli-day total or a shifted decimal may show up as a large value among a bunch of much lower ones. The 21” rainfall is an obvious catch since it will show up even on the national map!

Each day there are several eyes that look at the maps throughout the day and values that seem anomalous are checked in more detail. Often we will look to see when a report was entered. If it was a report for a day last week and it was just entered today and it stands out as high or perhaps as a zero among a bunch of 0.10 to 0.30 values, there is a good chance that the report is actually for another date. Or, perhaps the observer assumed that, since he or she had missed a day, that it was a zero.

Sometimes an observer may realize that a daily value that was entered was actually for multiple days and then will file a Multiple Day Report. In that case, the station may have 32 values for the month instead of 31 because one of the days gets “doubled up”. These are all fixable. On the other side, though, the anomalous value may be just fine. We may still contact you to verify it and you might have experienced a case of very localized precipitation. We will mark the value as valid so that it doesn’t get flagged when data are used later. There are often valid high values sitting among significantly lower ones. The map on the first page shows an example of how this could be. And I’m always reminded of a day in the middle of August of 2006 where a station in Goshen County reported 2.79” when the highest other value in the county was 0.02” That value was very anomalous. It was also very valid!

State Coordinator

Tony Bergantino
Dept 3943, 1000 E University Ave
Laramie, WY 82071

Phone: 307-766-3786

Email: antonius@uwyo.edu

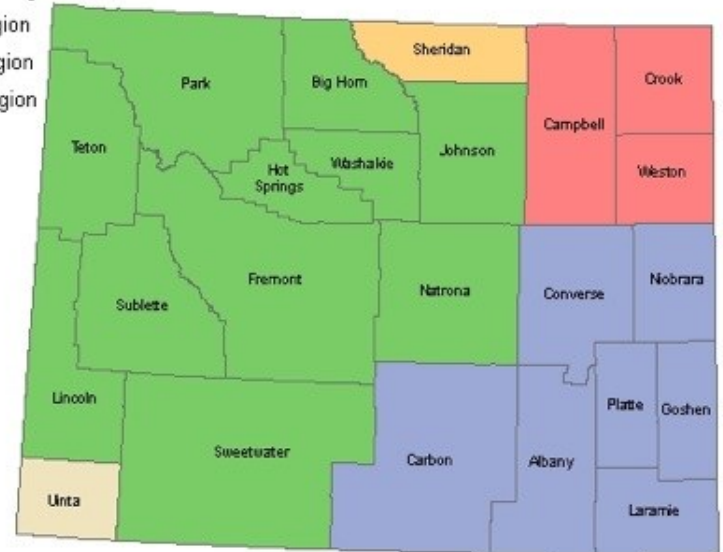
<https://www.facebook.com/WyomingCoCoRaHS>

<http://cocorahs.org>
<http://www.wrds.uwyo.edu>

Wyoming Regions

-  West-Central Region
-  North-Central Region
-  Northeast Region
-  Southeast Region
-  Southwest Region

Wyoming CoCoRaHS Regions



Wyoming Regional Coordinators

Northeast

David King
dking@vcn.com

Southwest

Monica Traphagan
monica.traphagan@noaa.gov

Southeast

Arthur Hutcheon
arthur.hutcheon@noaa.gov

North-Central

Carolyn Willis
carolyn.willis@noaa.gov

West-Central

Trevor Lavoie
Trevor.lavoie@noaa.gov



Spring is finally here!
Photo by Tony Bergantino

We Need You!

If you are not a CoCoRaHS observer and would like to take part joining is simple.

Just go to <http://cocorahs.org> and click on the **Join CoCoRaHS** link on the left side of the page.

Participation requires only a few minutes a day, an internet connection, and an interest in measuring and reporting rainfall.

Your observations will appear each day on a map and you can see how much you received compared to your neighbors, neighboring counties, and neighboring states.

Meanwhile, your data are used by various entities throughout the

country such as the National Weather Service, the National Drought Mitigation Center, researchers, and those who are just curious about how much rain fell where.

CoCoRaHS helps to fill in holes in places where there are no observers for other networks. CoCoRaHS is a high-density network which allows us to see the variations in precipitation across the country **and** across town.

If you are interested in joining or have any questions, please contact Tony Bergantino at:

antonius@uwyo.edu