Wyoming CoCoRaHS

Jan-Mar 2013 Volume 2, Issue 1

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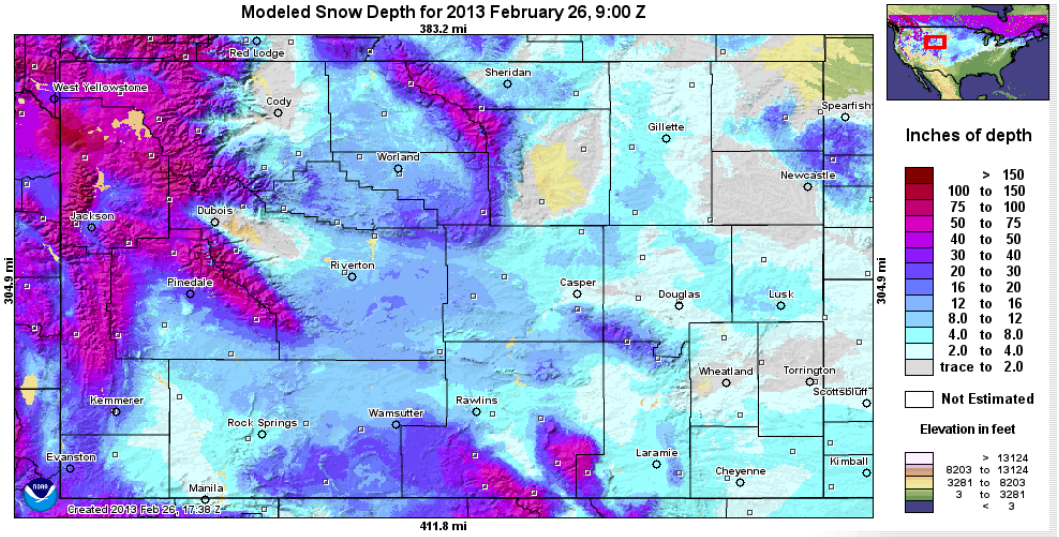
Who uses CoCoRaHS data? NOHRSC does.



The National Operational Hydrologic Remote Sensing Center (whew!) or NOHRSC provides comprehensive snow observations, analyses, datasets, and map products for the nation. One of their data sources is CoCoRaHS.

http://www.nohrsc.nws.gov/interactive/html/map.html

The interface allows you to zoom in to a particular location and see the various stations in the area. Note that your station will not show up as the familiar Station ID that you are used to. Instead, it will have it's own code that NOHRSC uses, however the Station Name (Laramie 0.8NNE, for example) is retained and can be used to confirm that the station is yours.

Once you select your station, you can see your observations as well as the modeled values for snow water equivalent and depth throughout a user-selected time frame. In addition, you can view other modeled parameters such as snow pack temperature and density and snow surface energy.

This is a prime example of where your observations help refine particular models. NOHRSC is one of the reasons behind the Monday Morning Total SWE that you may have seen on occasion on the CoCoRaHS site. By using a consistent day of the week (Monday) this maximizes the amount of data collected for the water equivalent of the snow on the ground at your location. This gives NOHRSC the largest possible dataset from which to do their modeling and forecasting. A big thank you to those of you doing "Total SWE Mondays!"

The map above was generated after the storms in late February and shows a number of "holes" such as parts of Park County which just have not received a lot of precipitation lately. Most of Weston County is another bare area and this can be confirmed by looking at the precipitation totals from that area, too.

I would encourage observers to try to report New Snowfall and Total Snow Depth whenever they are able to. The more of these observations that are entered, the clearer the picture of conditions is that can be drawn.

Wyoming CoCoRaHS

1st Quarter 2013

- Most observations in a day: 158 Reports on Mar 22nd
- Greatest Amount: 1.45" on Jan 28th, Jackson
- 12 days with no precipitation statewide
- 20 days with a trace or less statewide
- 12,276 daily reports submitted
- 215 active observers

Why the need for so many stations?

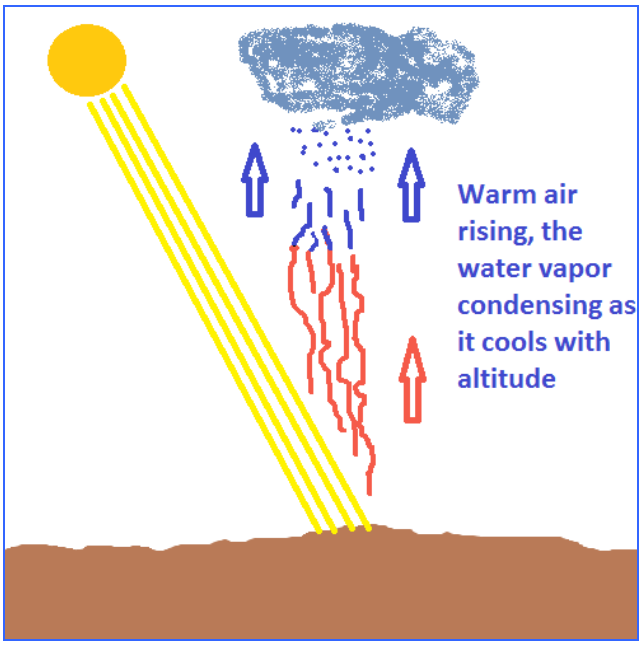
I've been asked more than a few times why there is the need for so many stations or, similarly, "I see you have an observer a half mile from me, do you still want me to join?"

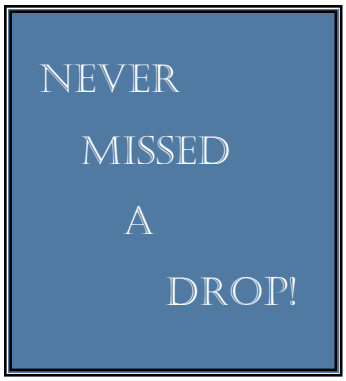
The answer to that question is "YES" and the reason is because precipitation, especially during summertime convective storms, can be extremely variable across short distances.

Convective precipitation often occurs over a limited area for a short period of time. It happens when the ground in a particular area is heated. This heating causes warm air to rise. As it rises, the air cools causing a condensing of the water vapor which then forms clouds. See diagram (right).

Since the horizontal extent of this phenomenon can be of limited distance, the amount of precipitation that falls can be vastly different over a few miles.

See photo (bottom right) of a rain shaft that was taken by CoCoRaHS National Coordinator Henry Reges. What a difference a mile or two would make if there were a gauge in the center of the shaft and one just outside it! (*continued below*)

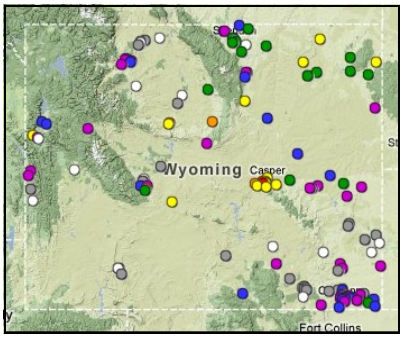




40 Stations reporting every day 01 Jan thru 31 Mar

WY-AB-1	WY-GS-9	WY-LM-113	WY-PK-11
WY-AB-8	WY-GS-20	WY-LM-121	WY-PK-14
WY-AB-40	WY-JN-14	WY-LN-2	WY-SH-9
WY-CM-9	WY-LM-23	WY-LN-17	WY-SH-14
WY-CM-16	WY-LM-36	WY-NT-24	WY-SH-17
WY-CM-20	WY-LM-38	WY-NT-35	WY-SH-18
WY-CV-11	WY-LM-63	WY-NT-48	WY-SH-22
WY-CK-6	WY-LM-73	WY-NB-9	WY-SH-24
WY-FM-30	WY-LM-106	WY-PK-7	WY-SW-1
WY-GS-8	WY-LM-112	WY-PK-8	WY-WH-1

Why the need for so many stations? (continued)



Situations like this emphasize just how important your observations are and it doesn't matter whether you're one of two observers in a county or one of seventy-one.

Imagine if the observer whose gauge would have been located in the area affected by the rain shaft did not exist. This event would be missed or might only be known through a comment from another observer like: "*No precip at my station but it looked like the area a few miles to the southwest got hammered!*"

The more observers there are, the better picture we can put together of an event. And the more events we have with detailed information on the amounts that fell, the better the picture that we can get about precipitation patterns in an area.

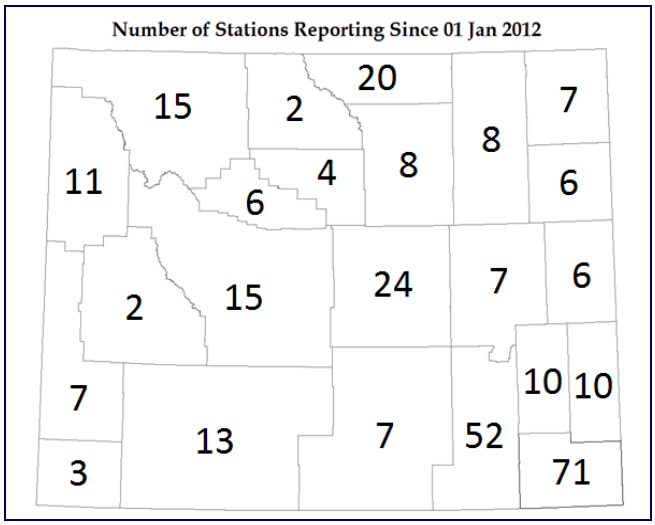
Welcome new volunteers!

Welcome!			
WY-AB-41	WY-AB-60	WY-AB-80	WY-NT-50
WY-AB-42	WY-AB-61	WY-AB-81	WY-NT-51
WY-AB-43	WY-AB-62	WY-AB-82	WY-NT-52
WY-AB-44	WY-AB-63	WY-AB-83	WY-NT-53
WY-AB-45	WY-AB-64	WY-AB-84	WY-NT-54
WY-AB-46	WY-AB-65	WY-CV-17	WY-PT-20
WY-AB-47	WY-AB-66	WY-FM-31	WY-PT-21
WY-AB-48	WY-AB-67	WY-FM-32	WY-PT-22
WY-AB-49	WY-AB-68	WY-GS-24	WY-PT-23
WY-AB-50	WY-AB-69	WY-GS-25	WY-SH-26
WY-AB-51	WY-AB-70	WY-JN-23	WY-SH-27
WY-AB-52	WY-AB-71	WY-JN-24	WY-SW-20
WY-AB-53	WY-AB-72	WY-LM-131	WY-SW-21
WY-AB-54	WY-AB-73	WY-LM-132	WY-SW-22
WY-AB-55	WY-AB-74	WY-LM-133	WY-SW-23
WY-AB-56	WY-AB-75	WY-LM-134	WY-SW-24
WY-AB-57	WY-AB-76	WY-LM-135	WY-SW-25
WY-AB-58	WY-AB-77	WY-LM-136	WY-WH-11
WY-AB-59	WY-AB-78	WY-LM-137	WY-WH-12
	WY-AB-79	WY-LN-19	

Wyoming CoCoRaHS had over 75 new volunteers join during the first quarter of 2013 and I'd like to thank them, along with the long time observers, for their participation. These new observers come from 12 counties and add to the data coming from Albany, Converse, Fremont, Goshen, Johnson, Laramie, Lincoln, Natrona, Platte, Sheridan, Sweetwater, and Washakie counties.

The map at right shows the number of observers in each county that have been active since the start of 2012.

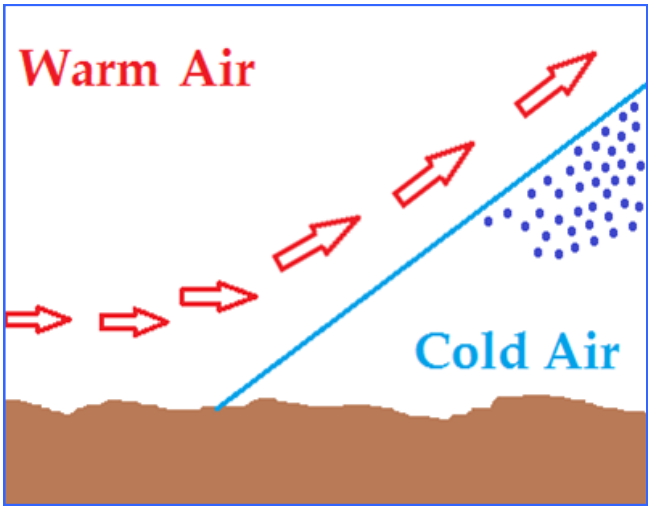
Thanks to all of your efforts and help, Wyoming is having more observations than ever reported. Thank you!



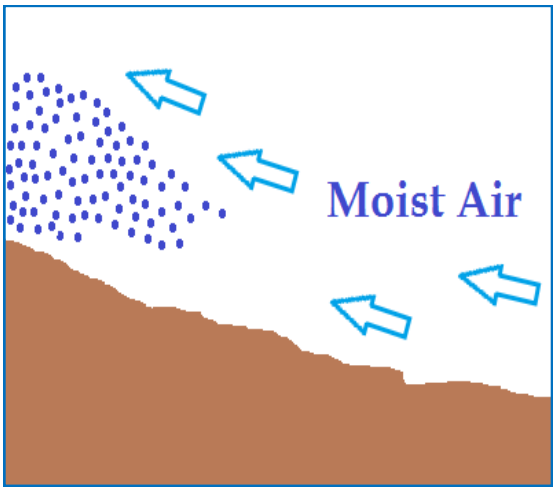
Other types of precipitation

Convective precipitation was described in "Why the need for so many stations?" (Page 2) There are two other major mechanisms that can cause precipitation.

The first of these is **stratiform** or **frontal** precipitation. This type of precipitation occurs when warm and cold fronts meet. When this happens, the warm air is forced over the cold air (right figure). As the warm air rises, it cools and can become saturated to the point where the water vapor condenses, forms clouds, and, potentially, precipitation. Because of the sizes of air masses, frontal or stratiform precipitation can occur over large areas.



The second type is **orographic** or **upslope** precipitation. This occurs when moist air is forced upward (figure below) This can occur when a mountain range alters the air flow or when a low pressure system, spiraling counter-clockwise, sends moist air upward across the plains toward the higher west. When either of these situations happen and the air rises, the increase in elevation causes the air to cool and the moisture within it to condense and fall. If the temperatures are low enough, the precipitation will occur as snow and, if the system is large enough, it can continue sending the moist air through this process. This is why upslope snow events can sometimes result in quite a lot of snowfall.



The snowstorm of December 20-21, 2006 that brought over a foot of snow to southeast Wyoming and the March 17-20, 2003 storm that brought twice that much are prime examples where this upslope-type condition caused heavy snowfall to a large area. There was also a very recent event this April that you might recall!

State Coordinator

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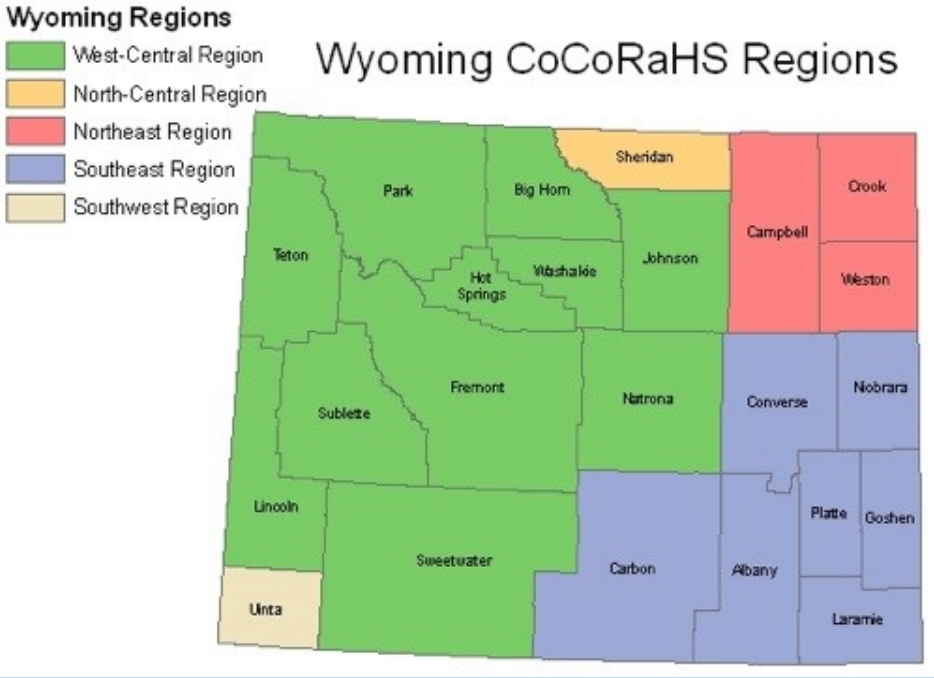
http://cocorahs.org
http://www.wrds.uwyo.edu



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An Unsettled Day (24 May 2010)
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:

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