Volume 1, Issue 1

Fall/Winter 2012

The Montana Meso

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Welcome Message

Thank you for participating in the CoCoRaHS program. We are excited to introduce the first edition of the Montana state CoCoRaHS newsletter! The purpose of this publication is to keep Montana residents and weather observers informed about the latest weather events in the state. We will also include various training tips to help you make the best possible measurements and observations. This newsletter will be issued seasonally and is a collaborative effort between all the Montana CoCoRaHS coordinators.

If you have any requests for information you would like to see in future editions of this newsletter, as well as comments or questions, please e-mail NWS Meteorologist, Megan VanDenHeuvel at the following Megan.VanDenHeuvel@noaa.gov .

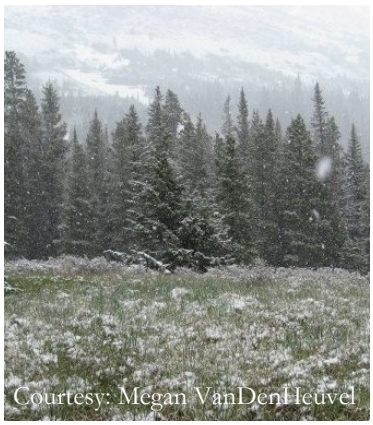
Thank you again for your time and commitment and for being great weather observers!

Because Every Drop Counts!

The slogan "Every Drop Counts!" could not be any truer than in Montana. In 2011, many places experienced record flooding while this year many of those same areas affected by flooding are now facing drought conditions. This is only one of many reasons how CoCoRaHS observers can make an impact. As of September 2012, there were approximately 340 CoCoRaHS observers in Montana. It is difficult to quantify how many observers report per day but your reports matter! Even if you did not receive any precipitation, please submit your report of "0.00" because it is important. Why do the "0.00" reports matter? If you have a string of days or weeks where no precipitation fell this can provide an indication of prolonged dryness and possible drought. Between agriculture, industry, energy, fire, relief response, public health, recreation, water supply, water quality and many more – "Every Drop Counts!" in Montana. Share with your friends or tell a neighbor about CoCoRaHS and let's continue to build our precipitation and weather network!

Is Anyone Really Viewing My Reports?

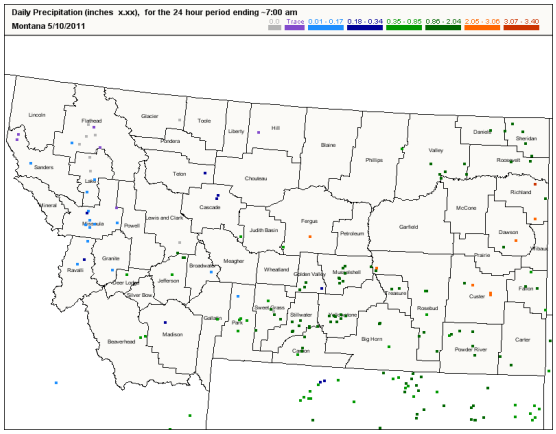
By Amy Schnetzler, NWS Glasgow, NE Montana CoCoRaHS Coordinator


Courtesy: Megan VanDenHeuvel

At some point I'm sure you've wondered why I am putting forth the effort to record daily precipitation, who is actually viewing my data. The National Weather Service has been using daily temperature and precipitation reports from cooperative observers for decades to establish climate averages and records. Since the CoCoRaHS network established in 1998, observers across the United States and portions of Canada have been filling in the data gap between cooperative observers. This combined dataset is used by National Weather Service offices to help verify thunderstorms, heavy rain, winter storms and other weather conditions, in addition to post event reviews and climatic studies.

Other branches within the National Weather Service, and various other private and government agencies, monitor the data from the cooperative observers and the CoCoRaHS network. There are 13 River Forecast Centers that keep tabs on moisture across several river basins and they can be found at (http://www.nwrfc.noaa.gov/misc/rfcs.cgi).

This data is used in their hydrologic models to forecast if a certain river or stream will flood. The National Operational Hydrologic Remote Sensing Center



(http://www.nohrsc.noaa.gov) runs an operational airborne snow survey program to measure snow water equivalent and soil moisture. These measurements are used by both weather forecast offices and the river forecast centers when issuing river and flood forecasts, spring flood outlooks, and water supply forecasts. The U.S. Drought Monitor

(http://droughtmonitor.unl.edu) is a collaborated effort between the National Drought Mitigation Center, the University of Nebraska-Lincoln, the U.S. Department of Agriculture and the National Oceanic and Atmospheric Administration. The map on this sites indications the short-term and long-term drought conditions that are present in all 50 states and Puerto Rico. These centers and agencies mentioned here are just a few who use and rely on the daily moisture reports that you and other observers report across the nation.

CoCoRaHS in Canada

CoCoRaHS is now international! The story of CoCoRaHS Canada is similar to that of our CoCoRaHS program as it began after a massive flood. Heavy snowfall in the winter of 2010/2011 followed by rainfall the following spring caused a massive flood in the providence of Manitoba and parts of Saskatchewan. CoCoRaHS first expanded to Manitoba in December 2011. The program, CoCoRaHS Canada currently has approximately 50 registered observers and expects to become country-wide within the next few years. The program is coordinated by WeatherFarm, a web-based weather network that provides real-time, localized weather data to farmers, industry, and the general public in Western Canada. Starting in 2009, WeatherFarm began installing weather stations at farms and businesses across the prairie provinces, and the network has now grown to include more than 800 weather stations. Check out CoCoRaHS Canada online at

www.cocorahs.org/Canada.aspx.

Snow Refresher

Strong winds are quite common during the winter months with significant blowing snow and drifts several feet high. So, how can you provide more accurate snow measurements?

1. Use your snow board or find a level location to measure where drifting or melting has not occurred.

2. Slide your yardstick or snow stick into the snow until it reaches the surface of the ground/board.

3. Measure to the nearest tenth of an inch and then sweep it clean.

4. If several drifts are present, take approximately 10 different measurements and average them to obtain an average snowfall or depth.

5. If more than half the ground is bare, report a "Trace".

6. Even if no new snow fell on a particular day, note how much snow is on the ground on that particular day.

Remember: New snowfall of less than a tenth of an inch is reported as a Trace. This includes flurries or a very light dusting of snow.

Record Dry Spell

By Trent Smith, NWS Missoula. Western Montana CoCoRaHS Coordinator

A historic ridge of high pressure developed over the western United States during the latter part of August through September. The ridge caused the driest period in Montana and one of the warmest in recorded history. The following tables indicate the magnitude of the dryness across the region.

"The combination of warmth and dryness allowed late summer to be one of the most active fire sesaons since 2007."

Consecutive Days without Measurable

Missoula: 42 days ties the record set in 1896

Great Falls: 47 days breaks record of 44 days set in 1965

Helena: 36 days ranks 2nd

Billings: 48 days ranks 3rd

Precipitation Records for September

Missoula: Trace breaks record of 0.03 set in 1904
Helena: 0.00 breaks record of 0.04 set in 2011
Billings: 0.00 breaks record of 0.06 set in 1964
Great Falls: Trace ties record set in 1932
Glasgow: 0.02 ranks 2nd

Precipitation Records for August through September

Butte: 0.28 breaks record of 0.29 set in 1914
Missoula: 0.16 ties record set in 1904
Billings: 0.30 ranks 2nd

On top of the extremely dry period, the average temperatures reported from many observation sites during August and September were in the top 25 of the warmest on record. The combination of warmth and dryness allowed late summer to be one of the most active fire seasons since 2007. The ridge of high pressure finally shifted to the west on October 3rd as a strong polar front moved into the area from Canada. This front brought widespread precipitation with many locations seeing snow for the first time this season. The following table is a small sample of the reports that National Weather Service offices received from our CoCoRaHS observers. Again this was just a small sampling of the CoCoRaHS reports that we received on October 3rd. Thank you to all our observers for reporting.

Station ID	Station Name	Precipitation	New Snow
MT-DN-2	Scobey 1.2 ENE	0.35"	
MT-RC-1	Savage 1.0 S	0.41"	
MT-SG-3	Big Timber 8.2 SSE	0.38"	
MT-SG-8	Melville 0.3 W	0.24"	2.0"
MT-CH-5	Floweree 0.3 SW	0.68"	
MT-GR-4	Cut Bank 0.2 E	0.70"	
MT-JF-3	Montana City 2.3 SE	0.22"	2.0"
MT-DL-1	Anaconda 7.4 NW	0.19"	1.9"
MT-FH-2	Kalispell 10.1 SW	0.47"	
MT-MS-1	Evaro 2.7 NNW	0.24"	1.5"

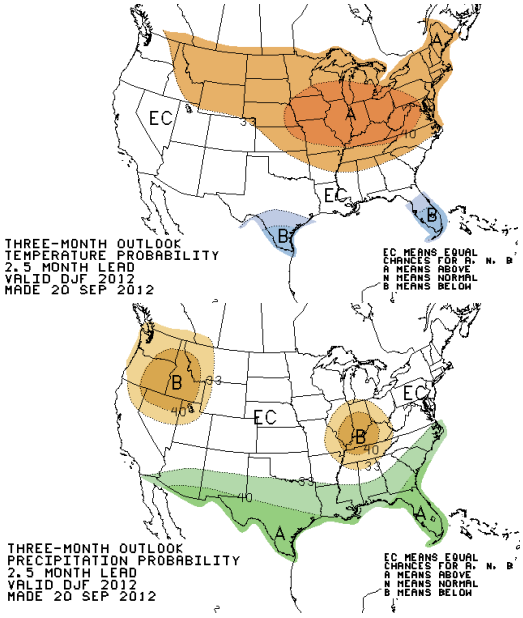
Snow Water Equivalent Refresher

As autumn arrives it's time to start thinking about winter and of course, snow. As CoCoRaHS observers in Montana, measuring snow and finding the amount of water in that snow is one of the most difficult tasks. Here are some reminders of what you need and how to measure. First, in addition to your rain gauge it would be handy to have a dedicated "snow board" and I don't mean the kind that you stand on and fly down the mountain. A snow board can be as simple as a 24 inch by 16 inch of plywood up to one inch thick. You will also need a yard stick or for our purposes a snow stick. Now what? Place your snow board on the ground in an area where drifting does not occur or occurs very little and mark the location with a bright flag or reflector so that you can find it. Be sure to also remove the funnel and inner tube of your rain gauge, otherwise snow will become stuck in the funnel. If snow becomes stuck on the outside of the gauge, gently brush it off and disregard. Keep in mind that your snow board is what is used to measure snowfall, while the snow inside the outer part of your rain gauge is used to determine the water content of the snow.

Example of a good snow board and rain gauge location. Remember, find an area not subject to drifting.

Determining amount of water in the snow or snow water equivalent is very important because it can be used later for runoff calculations done by scientists. Most storms will have different water content depending on where the storm is coming from. For instance in Montana, if a winter storm is coming off of the Pacific Ocean the snow water equivalent would be low. In other words, you would have more water in the snow. On the side of the spectrum, if you have a storm coming from the north with a lot of cold, Canadian air then the snow will have less water. With drier storms for example in Montana, it is possible to have 20 inches of snow fall in a single storm but only have an inch of water within the snow. The simplest way to measure the water content in your outer tube is to run the outside of the tube under hot water. Be careful not to get any tap water inside your tube – "Every drop counts!" Once your snow is melted, pour it into the smaller inner rain gauge and measure to the nearest hundredth of an inch.

Winter 2012/2013—What Can We Expect?



Images Courtesy:
www.cpc.ncep.noaa.gov

Click on the link above for more!

Weather forecasting is still an inexact science; however clues from past weather and global weather patterns can provide hints of what the upcoming winter may be like. Drier than average conditions have been felt across much of the state this past Spring/Summer with drought conditions developing in portions of the state. According to the Climate Prediction Center, the forecast does not favor much relief from the current warmer and drier than average conditions across the state. The 3-month outlook for December-January-February indicates that the entire state may have better chances for above average temperatures. This does not mean that the entire state will have above average temperatures or that temperatures will be 40 percent above average. This is simply a forecast indicating that a higher probability exists that temperatures may be above average. As for precipitation, most of the state has equal chances for above, near or below average precipitation. The exception is in southwestern Montana where there is a 33 to 40 percent chance that precipitation may be below average.

"For Montana, El Nino tends to favor drier and warmer than average conditions."

One of the main factors that contribute to the forecast issued by the Climate Prediction Center is El Nino/ La Nina (ENSO). El Nino or La Nina is characterized by warmer or cooler than average sea surface temperatures in the Equatorial Pacific which basically extends from Indonesia to Central/South America. As of September 2012, the status of ENSO was neutral which means neither El Nino or La Nina conditions are occurring. The Climate Prediction Center has a higher probability that El Nino conditions will develop this fall and continue through the 2012-13 winter season. For Montana, El Nino tends to favor drier and warmer than average conditions because the position of the jet stream reduces the frequency of storm systems. Keep in mind that there are many other climate factors that can affect our weather, especially during the winter months. These include the Arctic Oscillation (AO), North Atlantic Oscillation (NAO) and Madden-Julian Oscillation (MJO).

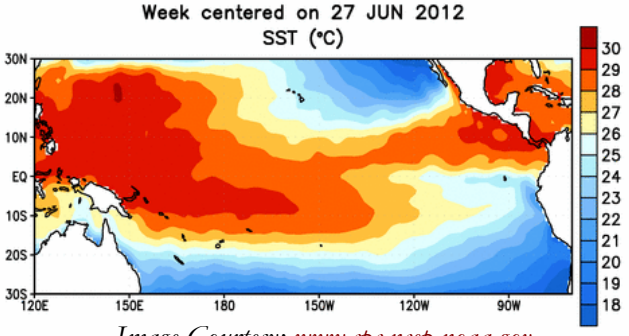
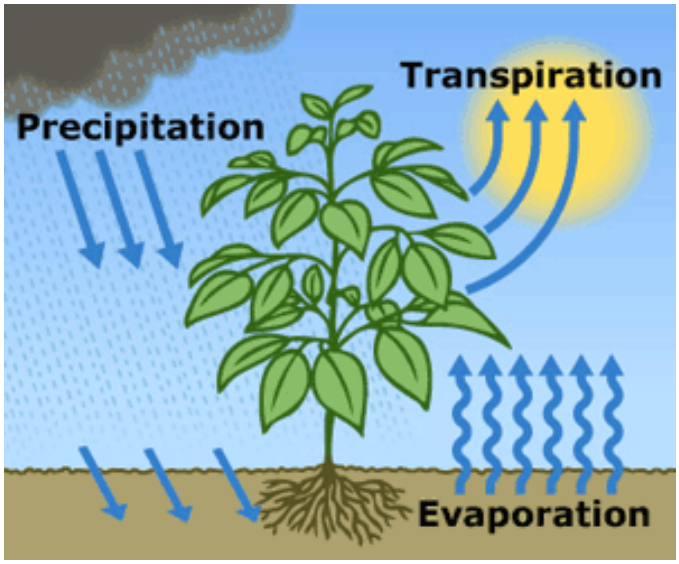


Image Courtesy: www.cpc.ncep.noaa.gov

Click on the link above for more!

Evapotranspiration What?!

As observers we know how much water falls from the sky, but how do we measure how much water is leaving the ground and returning to the sky? CoCoRaHS is looking for observers to take measurements of how much water evaporates into the atmosphere and it is called Evapotranspiration or ETo. Evapotranspiration as defined by CoCoRaHS "is the water evaporated from the ground back to the atmosphere both as transpiration from the leaves of plants and also as direct evaporation from open water and soil." Evapotranspiration is important for agriculture, weather forecasting, hydrology and many others. To put it simply, just as we breathe, plants need to "transpire". The process of water evaporating from plants is nearly invisible though it is necessary in order for the plant to gather more nutrients and water from the soil and continue to grow. During drier periods, transpiration can contribute to the loss of moisture in the top layers of soil and this can negatively affect plants and crops because the plant would be losing more water than it is taking in.



Credit: Salinity Management Guide

Interested in becoming a ETo observer and learning more?

Some things to consider as you apply:

1. CoCoRaHS is looking for "ideal" locations (open exposures with surrounding vegetation that is representative of your area) and highly motivated observers (you have reported on a consistent daily basis for CoCoRaHS over time).
2. You are up for the challenge of taking on a more complex daily observation.
3. You or a sponsoring organization are willing to make the substantial investment in purchasing this delicate instrument, the ETgage ($216 plus tax and shipping from www.weatheryourway.com).

Still interested?

Please contact Zach at info@cocorahs.org with a photo of the site where you will install the gauge and he will follow up with you.

Visit Us Online:

http://www.weather.gov/billings

http://www.weather.gov/glasgow

http://www.weather.gov/greatfalls

http://www.weather.gov/missoula

National Weather Service Mission Statement:

The National Weather Service (NWS) provides weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters and ocean areas, for the protection of life and property and the enhancement of the national economy. NWS data and products form a national information database and infrastructure which can be used by other governmental agencies, the private sector, the public, and the global community.

Visit Us Online:

http://www.cocorahs.org

CoCoRaHS Mission Statement:

CoCoRaHS is a unique, non-profit, community-based network of volunteers of all ages and backgrounds working together to measure and map precipitation (rain, hail and snow). By using low-cost measurement tools, stressing training and education, and utilizing an interactive Web-site, our aim is to provide the highest quality data for natural resource, education and research applications.

Training Corner—What is a Snow Event?