

# Co-op Weather Observation Quick Reference Guide

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Please call your local National Weather Service if you have any questions, maintenance issues, or need supplies. The office is staffed 24 hours a day, 7 days a week.

**Take and record the observation at your designated time each day.**

## **TEMPERATURE DATA**

Most observers use a Nimbus (image at right) which has a 35-day memory.



- Record the max and min temp which occurred during the past 24 hours to the nearest whole degree, in addition to the temp at the time of your observation. The max and min temp are viewed by pressing and holding the Max/Min RECALL button. The “at observation” temp (i.e. current temp) will be displayed when no buttons are pressed. Immediately after reading the “at observation” temp, push and hold the CLEAR button (to reset the recall data) until the display reads ‘E2E.2’, which takes about 5 seconds.
- If you are unable to view the high and low temp data at the time of the observation, you can use the memory feature to gather past data. Flip the memory switch to on, then press RECALL once and “0.0” will be displayed. Click RECALL again to see the high temp so far this 24 hour period (i.e. since your observation time). Then click RECALL again to see the time the high was set. Click RECALL again to see the low, then click again to see the time of the low. Click RECALL again and “0.1” will be displayed, meaning the data to follow will be from the 24 hour period

that is one day back (i.e. what would have been reported at your last observation time). Continue to click RECALL to see the all of the data from one day back. Then when you see “0.2”, you will be viewing data that is from two days back. If additional past data are needed, continue to click on RECALL until you view all of the needed data. Flip the memory switch to “off” when you’re done using the memory feature.

- During a power failure, the Nimbus automatically operates off a 9 volt battery. After a power failure, or at least once a year, the battery should be replaced. Contact the NWS for replacement batteries.

## **RAINFALL**

The two main pieces of equipment used for precip measurements are the Standard 8 inch diameter Rain Gauge (SRG) and the Fisher & Porter Rain Gauge (FPG). Only a handful of sites have the FPG in addition to the SRG. We will focus on measurements taken using the SRG (shown in image below).






- The rain collects in a plastic tube inside the large 8 inch diameter metal cylinder through the funnel on the top. To measure the rainfall, lift the funnel off the top of the gage, lift out the inner tube and insert the black measuring stick into the tube. Note the amount of rain to the nearest hundredth of an inch (i.e. 0.48 inches). The inner tube will fill completely when 2 or more inches of rain has fallen.
- If the tube is completely full, note 2 inches of precip, then dump out the rain in the inner tube. Then take the funnel and place it over the top of the inner tube. Lift up the outer metal cylinder, and slowly pour the remaining water in the outer can into the funnel so it can be measured in the inner tube. Be careful not to spill any liquid. If you fill the tube up



again, record another 2 inches of rain, then repeat the process. When all of the water has been measured, add the separate measurements together to get the final total. The total precip should be recorded as the 24 hour precip value.

- You also have the option to indicate the beginning and ending times of the precip, observed or estimated, on the report form. You may also indicate the type(s) of weather during the observation period (i.e. sleet, hail, thunder, damaging wind) on the form.
- On occasion, you may need to record a multi-day precip total. In the event that you are unable to measure the precip on a particular day (i.e., office is closed on the weekends; you are on vacation and the back-up observer is unavailable; dangerous weather at observation time, etc.), you can provide a multi-day precip accumulation total.

In WXCODER, use the “accumulation” drop down menu (to the right of the precip column) to select the number of days the accumulated precip total is for. Below is an example of how to enter a multi-day precip report in WXCODER.

	<a href="#">13</a>	42	31	32	M	1	M	M
	<a href="#">14</a>	32	30	31	M	1	M	M
	<a href="#">15</a>	33	22	22	0.84	3	M	4
	<a href="#">16</a>	42	22	30	0.00	1	0.0	4
	<a href="#">17</a>	33	26	28	0.06	1	0.7	4

*Example: You were unable to take a daily precip measurement on the 13<sup>th</sup> and 14<sup>th</sup>. When you returned on the 15<sup>th</sup>, you found 1.46” precip in your gauge. On the 13<sup>th</sup> and 14<sup>th</sup> when you were unable to measure the precip enter an “M” for missing in the precip column. On the day you take your reading, use the “accumulation” drop down*

*menu and choose “3” indicating the precip total entered is a 3-day total. Also, add the following remark on the 15<sup>th</sup>: “3-day precip total”, because the accumulation column does not appear on the printed form.*

On paper B-91 forms, put M for missing on the days when a precip measurement was not taken, and put the accumulated precip total on the day you take the accumulated measurement. Also add the remark “x-day precip total”, where “x” is the number of days the total is for.

- The precip amount must be recorded to the hundredth of an inch. For example, record nine-hundredths as 0.09; two and one quarter inches as 2.25; and a half inch as 0.50. If no precip fell during the 24-hour period, enter 0.00. **If the amount was too small to measure, or evaporated before it reached the ground (i.e. sprinkles), enter a “T” for trace. Condensation from fog/dew and frost does not count as precip.**

### **SNOWFALL or MIXED PRECIPITATION**

**Snowfall and snow depth should be reported every day between October 1<sup>st</sup> and April 30<sup>th</sup>, even if it is zero.**

- In the fall when temperatures start to drop below freezing, remove the plastic funnel and inner tube from the rain gage to keep the plastic equipment from cracking when water freezes in the funnel. Put a white snowboard out and mark the location with a flag or stake so it can be found when it snows. The snowboard should be located near your rain gage in an open location that is not prone to drifting – and away from trees, obstructions, and buildings.



You will need to record three values when frozen/freezing precipitation occurs (such as snow, sleet /i.e. ice pellets/, freezing rain, freezing drizzle):  
**Snowfall, Snow Depth, and Precipitation.**

1. **Snowfall:** Measure and record the amount of snow and sleet found on the snowboard at your observation time to the nearest tenth of an inch, like 1.0 or 3.7 inches. Make sure to wipe the snowboard clean after the measurement is taken to reset for the next 24 hour period.
  - a. **Record amounts too small to measure, such as flurries or snow that melted as it hit the ground, as a “T” for trace.**
  - b. If snowfall accumulated, but melted before you took your daily observation, you have two options. If you happened to note how much snow was on your snowboard before it began to melt, you can report that total as your snowfall for the 24 hour period. If you only have the measurement from the snowboard at the observation time, but know that some (or all) of the snow melted before it was measured, enter the amount of snow you measured on the snowboard, and note in remarks, “snowfall melted prior to measurement”.
  - c. If the snow didn’t collect on the snowboard, or blew off before it could be measured (i.e. high winds), an estimate of the snowfall can be made. Please call the NWS for help with estimating snowfall, based on your precipitation amount. The ratio of snow to liquid varies with each event. If you enter a snowfall estimate, you must put “snowfall was estimated” in remarks.
  - d. It is permissible to use another location on your property to measure the snowfall if a snowboard isn’t available (or the board didn’t capture the snowfall due to blowing and drifting, etc.) Possible alternate snowfall observing locations include a deck, picnic table, sidewalk, driveway,

or any spot that appears to have captured the recent snowfall accurately. Be sure that the alternate spot only includes snow that fell during the past 24 hours, and is not too close to a snow drift, building, fence, or other man-made structure that would influence measurements. Make sure to note in remarks where the snowfall measurement was taken if you didn't use a snowboard.

- e. **Multi-day snowfall measurements cannot be entered in the snowfall column. Twenty four hours is the longest that new snow can sit before being officially measured. Measurements longer than 24 hours will be affected too much by settling, blowing and drifting, and compaction to be official. However, you can mention the amount of snow you measured after a multi-day period in remarks.**

- 2. **Snow Depth:** Determine the total depth of snow, sleet, and ice on the ground at your observation time using the snow measuring stick. Take 4 to 6 snow depth readings on your property to get an average value. Do not take snow depth measurements in areas impacted by blown, plowed, or shoveled snow, or in snow drifts. Record the average snow depth to the nearest inch (i.e. 0.4" is reported as "T" for trace; 3.5" is reported as 4"; and 1.2" is reported as 1"). **Do not report zero for snow depth if snow is on the ground.** Leave the snow depth blank if a snow depth measurement isn't available.



- a. What if the snow has melted in south-facing areas, but it remains in shaded or north-facing areas? If half the ground is snow free and the other half has an average of 4" of snow on the ground, the snow depth is entered as the

average of the two readings (i.e. 2"). When less than 50% of the ground is covered by snow, even though covered areas may have significant depth, the snow depth is recorded as a "T" for trace. When no snow or ice is on the ground, record the snow depth as zero.

3. **Precipitation:** Measure and record the water equivalent of the wintry precipitation (snow, sleet, freezing rain, freezing drizzle) and rain (if applicable) in the 8 inch rain gage at your observation time. This measurement is reported under the precip column.
  - a. If no precip occurred during the 24 hour period, enter 0.00. **If the amount that fell was too small to measure or has evaporated, such as a few light flurries, enter a "T" for trace.**
  - b. To determine the water equivalent of the wintry precip, melt the contents of the rain gage by bringing it inside, and allow the frozen precip to melt. If precip is occurring at the time of your observation, you can dump the contents of your rain gage into a bucket and bring the bucket inside, leaving the rain gage outside to catch the falling precip.
  - c. You can speed up the melting process by adding a measured amount of hot water to the wintry precip. When everything is in liquid form, pour the liquid into the funnel and inner measuring tube. Measure the liquid to the nearest hundredth of an inch using the rain gage measuring stick. Be careful not to spill the water when transferring it to the funnel and inner tube. If you added hot water, be sure to subtract the amount of hot water from the total liquid measurement to get the final precip amount.

## TOTAL SNOW WATER EQUIVALENT (i.e. Snow Core)

This measurement is similar to recording the water equivalent of new snowfall, EXCEPT this is the measurement of the amount of water frozen in the total snow pack (i.e. if your snow depth is 10", the snow core would be the amount of water frozen in the 10" snow pack). This measurement is taken by observers who volunteer to provide this data at their normal observation time on either Sunday or Monday, when two or more inches of snow depth is reported. The data are critical to providing more accurate forecasts of spring snowmelt flooding potential.



Observers who use paper B-91 forms to record their data will call their snow depth and snow core measurement into the National Weather Service using the toll-free line.

Observers who use WXCODER will enter the snow core data on the "Daily Observation Page" when a snow water equivalent measurement is actually taken. **Do not enter zero for the snow core on days when no snow core is taken.** If there is snow on the ground, and a zero is entered for the snow core, computers will assume there is no water in the snowpack at that location, which causes errors in forecasts and maps.

### **How to take the total snow water equivalent (snow core) observation:**

- At a location equal to your reported snow depth, turn the metal rain gage can upside down and push it straight down through the snow, ensuring that you reach the ground.





This may be a bit of a challenge if you have an ice layer in the snowpack. The photos show a clear plastic rain gage to make it easier to see the snow inside.

- If your snowpack is taller than the rain gage you will need to take the core sample in pieces. To do this, push the rain gage into the snowpack until the snow is just about to fill the can. Then move away some of the surrounding snow so you can put a clipboard, spatula, etc. under the opening of the can to help you turn it over without losing any snow. Dump the snow you collect into a separate container like a bucket or trash can. Then take the empty rain gage back to the same location, turn it upside down and push it back into the snow to gather the remainder of the snow down to the ground. Dump the additional snow into the bucket with the previous sample, so all of the snow can be melted down and measured.
- Take all of the collected snow inside and let it melt. Then pour the water into the rain gage inner funnel and measure it with the rain gage stick. Report this value as the snow core to the nearest tenth of an inch (i.e. 1.57" would be reported as 1.6").
- The snow can take a long time to melt from a core sample. You can add a measured amount of hot water to the snow to help speed up the melting process. Just remember to subtract the amount of hot water from the measurement to get the final snow core value.

### **END OF THE MONTH DUTIES**

After the last observation of the month, please check the data on your monthly form for completeness and accuracy. Your data will become the

official climate record for your community so it needs to be as accurate and complete as possible.

For observers who use WxCoder: At the end of each month, open the “monthly form” and make sure all of the days of the month contain data, and the data looks accurate. Then click on the “closeout” button at the bottom of the monthly data screen to let us know that you have checked the data, and it is ready to be transmitted. Please review the data no later than the 10<sup>th</sup> of the following month so that we can download the complete data set for the state and national archives.

Observers using paper B-91 forms should mail the completed monthly form in the self-addressed, stamped envelope to the National Weather Service as soon as possible at the end of the month. We need to receive the paper B-91 forms no later than the 10<sup>th</sup> of the following month so they can be sent to the state and national archives on time for those who are waiting to use the data.

If there is a day when the observation is not available, please enter an “M” for each missing element so that we know that the data should be missing.

**Please contact the Data Acquisition Program Manager or Observing Program Leader at your local National Weather Service if you have any questions.**

**A note of gratitude...**

***Thank you for all that you do to record the weather in your community, regardless of the conditions. You are an important part of the National Weather Service family, and we are honored to work with you.***



***The data you provide every day are used by countless local, state, and federal agencies as well as businesses and citizens. Your data becomes part of the official historical record and will be used today, and for generations to come.***