

Snow Measurement Guidelines for National Weather Service Snow Spotters

National Weather Service Forecast Office
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Introduction

The following snow measurement guidelines were developed from previously existing National Weather Service (NWS) procedures. The NWS Forecast Office in Wakefield, Virginia is responsible for forecasts and warnings. This weather office serves 66 jurisdictions in parts of three states. These include four Maryland counties on the lower Maryland Eastern Shore, 38 counties and 15 independent cities in central and southeast Virginia, and nine counties in northeaster North Carolina. Volunteer weather spotters are a key source of information to fill in the gaps between official NWS observing sites.

Definitions

Freezing Rain – Falls as **liquid rain** and **freezes upon contact** with surfaces such as sidewalks, roads, and trees.

- Is there a glaze accumulation on roads and sidewalks or only on elevated surfaces, such as trees and power lines?

-How much ice has accumulated on surfaces? This can be difficult to measure directly, but can be easily estimated.

Measuring trick – **Crack a piece of ice off a railing and measure the thickness.**

Sleet – Rain drops freeze into ice pellets **prior to reaching ground.**

Snow – An aggregation of many ice crystals

Graupel – Snowflakes which have been heavily rimed. It is also called snow pellets, soft hail, and hominy snow. Looks like uncooked white grits.

Heavy Snow – for example, snow falling at the rate of 1 inch per hour

Relaying Real Time Information

Real time reports are just as important to the NWS as snowfall measurements. Here are a few examples of information that would be beneficial to forecast and warning operations.

- Change in precipitation type (rain to snow, snow to freezing rain, etc)
- Snow Accumulation of 1 inch or more
- Heavy Snowfall Rate (example: snowing at 1 inch per hour)
- Significant Blowing or Drifting snow
- Is the snow, ice, or blowing snow having a major impact on travel
- What is occurring is not what is in the forecast
- Anything significant that you think we should know about

Before the First Snow

First choose a convenient spot away from the obstacles such as a house, garage, shed, fence, large bushes, and trees. Generally it should be about 10-12 feet from a 6 foot fence. These objects aid in the piling up (drifting) of the snow near them. The ideal spot will usually be in the middle of your back or front yard away from trees and not in an area frequently disturbed by pets. Figure a) shows the red oval denoting the best place to measure snow. When measuring take several readings within the red oval, especially with a backyard like b), where drifting will be more of an issue.



a)



b)

Measure Snow Using a Snowboard

The goal is to achieve the most representative and accurate measurement of snow accumulation, which is widely known to be obtained using a snowboard.

A snowboard should be any lightly colored board that is about 2 feet by 2 feet. A piece of plywood painted white works very well. Ideally, it should be painted white to minimize heating by sunlight. Place your snowboard in the spot you have chosen. Mark the location of the snowboard with a stake so you can find it after a fresh snowfall.

Picture of a Snowboard



HELPFUL TIP - use stakes on side to find it

Measuring Snowfall

Snowfall is measured to the nearest tenth of an inch. Measure the greatest amount of snowfall that has accumulated on your snowboard since the last observation. You can measure on a wooden deck or ground if a snowboard is not available. **Snowfall should not be measured more than 4 times in 24 hours.** You can measure the hourly snowfall rate, but do not clean off your board each hour. Only clean off the board when you take one of the four daily measurements. Once the snow ends, add up the measurements from each time the snowboard was cleaned to reach a storm total.

Special cases:

- Snow falls and accumulates on the snowboard, but then melts. In this case, the snowfall is the greatest depth of snow observed on the board before it begins to melt. If this occurs several times, measure the snowfall after each snow shower and add each measurement for the total snowfall.
- Snow falls and melts continuously on the board. In this case, if the snow never reaches a depth of a tenth of an inch, then a trace of snowfall is recorded.
- Snow has blown or drifted onto the snowboard. In this case, take several measurements from around the yard where the snow has not drifted, being careful only to measure new snow. Take an average of the various measurements to arrive at a total.
- Sleet counts towards total snowfall, freezing rain accumulation does not.



Measuring Snow Depth

The depth of snow on the ground includes both new snow and old snow which was in place. Measure the total snow depth at several locations in your yard which have not drifted or blown. Take an average of these measurements to arrive at the snow depth. Sometimes old snow can be very hard and crusty underneath the new snow. Be sure that the ruler gets all the way down to the underlying ground. **Snow depth is measured to the nearest inch.**

Two types of measurements are reported

Newly fallen snow is reported in INCHES and TENTHS (such as 6.3").

Total depth of snow on the ground is reported to the nearest WHOLE INCH (such as 5").



Measuring Snow Water Equivalent (SWE)

Snow water equivalent is the amount of liquid water contained in the snow. This information is very useful to the NWS, especially just before a thaw in order to assess river flood potential. In order to measure the SWE, all you need is a round container, such as a coffee can, and a ruler. Take the coffee can and push it into the snow pack, taking a core of the snow. Bring your sample inside to melt and then measure the amount of liquid water in the can.