

COCORAHS
SNOWFALL MEASURING BOARD
RECOMMENDATIONS

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Background

Through most of our Nation's history snow was not measured on snowboards placed on the ground, but on grass or other surfaces. During the last ~30 years snowfall measuring boards were recommended for NWS COOP observers. The boards were used to obtain more accurate and consistent snowfall measurements.

Typical guidance recommended homemade boards using plywood painted white and 16 x 24, 18 x 24, or 24 x 24 inches in size.

In 2002, the NWS began issuing SMBs to COOP observers as standard equipment. See attached undated notice "JP2.4, Snowfall for National Weather Service Snowfall Measurements."

The official NWS snowboard is made from PVC, measures 16 inches by 24 inches, is eight millimeters thick (just under 1/3 inch thick). See NWS, NWSM 10-1315 dated April 18, 2007 A-35 at:

<https://www.weather.gov/media/lwx/coop/COOP%20Station%20Observations.pdf>

Analysis

PVC is desirable because it is light weight and does not need painting. Life expectancy is 5+ years. It has a smoother surface than various grades of plywood. Unfortunately, the smoother surface can cause dry snowfall (~20:1+ SWE) to blow off the board in moderate to high winds. In contrast, most plywood snowboards have a grain that allows dry snowfall to adhere better to the surface.

During 12+ inch wet snowfalls (~8:1- SWE) a SMB can become heavy and for some observers, not easy to lift and clear. With light weight SMBs, after observers measure and clear the board, they must push the board into the old snow just far enough that the top of the board is level with the top of the old snow. If the SMB is simply placed on top of the old snow it can blow away under high wind conditions. While this procedure is spelled out in NWSM 10-1315 and some C-Rahs guidance, it is not mentioned in all C-Rahs, and other snowfall measuring training sites.

Below is a photo of a basic PCV SMB with flag marker. The board has a reflective border to make it easier to see the edges in dim light. The board has a translucent C-Rahs emblem in the middle. The board in the photo below has been used for the last 7 plus years with no deterioration or need for painting. Due to PVC being smooth, this writer would recommend sanding the measuring side of the board before its first deployment. Sanding can change the surface texture to better hold dry snow.



Current C-Rahs guidance is to take a core sample (biscuit) by (1) pressing the 4" outer tube of the rain gauge into the snow on the board and then (2) place a spatula or fly swatter underneath the tube opening and (3) flipping the tube over capturing the snow in the outer tube rain gauge. Instead of using a spatula, the core sample plate (see photos below of plate on SMB) allows the observer to ensure no snow is lost in taking a core sample.





At observation time, the observer places the 4" outer tube of the rain gauge directly on the plate as shown in the attached photo.



The observer then lifts the plate and outer tube of the rain gauge from the board and turns it upright as shown in the photo below. (For illustration purposes the plate in the photos was made from a white 3-ring notebook binder. However, it is recommended that it should also be made from PVC with a roughen surface.)



If the core sample plate is used on the SMB, the plate needs to be placed on the board when the board is first deployed so that both the board and plate reach the ambient air temperature.

Recommendation

Based on many years taking snowfall measurements, this writer would recommend that WYW and/or Climalytic develop PVC SMBs, if possible. Please keep in mind that my station is in the humid east, gets 15" or less annual snowfall, and only occasionally gets dry snow. I have not had a problem with snow blowing off the board. Another reason observers might want to purchase WYW/Climalytic PVC SMBs is that no other vendor sells this type of SMB (or even snowfall measuring boards of any kind), to this writer's knowledge.

Acronyms Used

C-Rahs -- CoCoRahs

COOP -- Cooperative Weather Observer Program

NWS -- National Weather Service

NWSM -- National Weather Service Manuals

PVC -- Polyvinylchloride

SMB -- Snow Measuring Board

WYW -- Weather Your Way

Attachment (JP2.4, Snowfall for National Weather Service Snowfall Measurements.)

ATTRIBUTION

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Nolan Doesken, founder, CoCoRahs, and former Colorado State Climatologist for his publication *The Snow Booklet*, 1997, and other guidance on snowfall measurements when there is blowing and drifting snow

Dr. David Robinson, New Jersey State Climatologist, for his thoughts about measuring snowfall on surfaces above ground level and related matters.

Steve Hilberg, Meteorologist, CoCoRahs, for his great insights in his *Hilberg's Tips and Messages of the Day*

Kevin Shaw, Observer, Atlantic Coast Observer Network Coordinator, for his incredibly positive attitude toward snow and accurate snowfall measurements. His positive attitude helped me greatly to get out there to measure snowfall when it was dark, very cold, and windy.