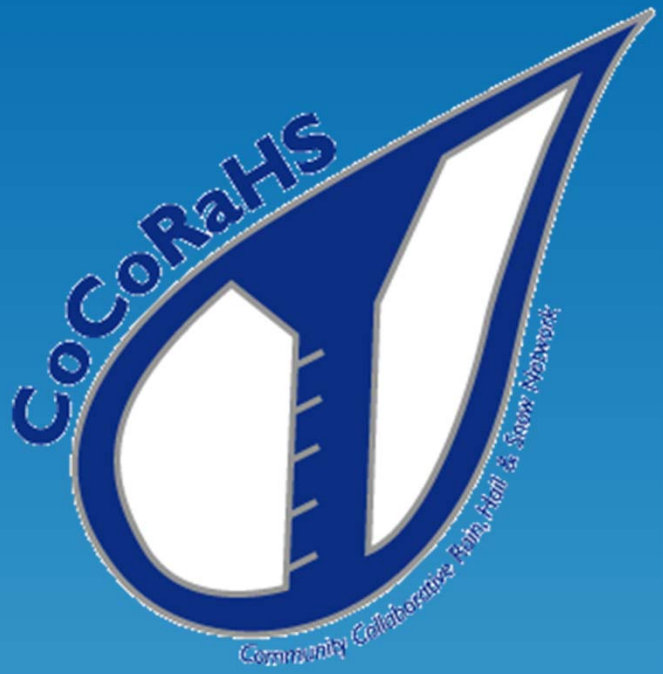


Measuring Snow Water Equivalent (SWE)

Snow Measurements - Terminology

- **Gauge Catch**
  - The amount of water in your gauge measured after it is melted
- **24-hour snowfall**
  - The maximum depth of new snow in the past 24 hours
- **24-hour Snowfall Snow Water Equivalent (SWE)**
  - The amount of water measured from melting a core of snow obtained from the snow on the ground at the depth of the 24-hour snowfall
- **Snowpack Depth**
  - The total depth of new snow and old snow and ice at observation time
- **Snowpack Snow Water Equivalent (Snowpack SWE)**
  - The amount of water measured from melting a core of snow obtained from a location that is equal to the Snowpack Depth

Measuring the 24-hr Snow Water Equivalent (24-hr Snowfall SWE)

- This is NOT the amount melted in your rain gauge!
- The measurement is obtained by first taking a core of snow using the outer cylinder, then melting and measuring it.

Taking a Snow Core of New Snow

- Use your snow board or other hard surface
- Take core after you have measured snow depth, but before you have cleared the board or surface of snow
- For example, if you determined the depth of the new snow is 4 inches, then take your core sample from an area where the depth of new snow is 4 inches.

Taking a Snow Core of New Snow

- Capture a core by inverting the outer cylinder and pushing straight down into the snow

- Use something thin and sturdy to slide under the cylinder (spatula, snow swatter,aluminum flashing)

Taking a Snow Core of New Snow

- Melt and measure the core of snow
- Enter in the correct field on the form

The depth of snow and/or sleet that fell in the past 24 hours measured on your snow board or flat, level surface is entered here.

This is the water measured by melting a core of the 24-hour snowfall taken from your snow board. If you do not take a separate core leave this as NA. Do not copy your Gauge Catch into this field.

24-hr Snowfall

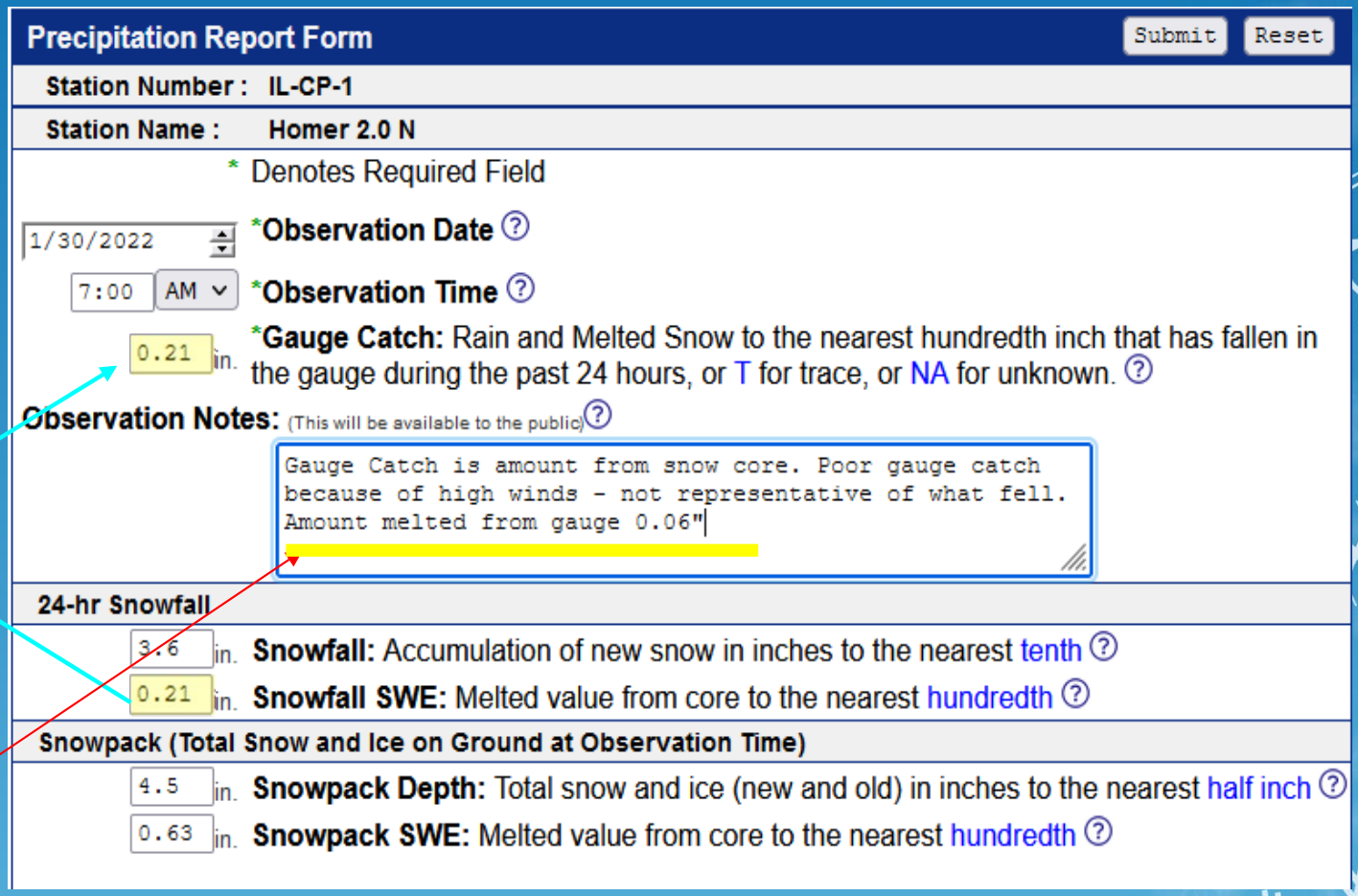
3.6	in.	**Snowfall:** Accumulation of new snow in inches to the nearest tenth ⓘ
0.29	in.	**Snowfall SWE:** Melted value from core to the nearest hundredth ⓘ

Windy conditions may create a situation where the amount of snow in the rain gauge is not representative of what fell on the ground.

- In this case, we need to take a “snow core” from the snowboard or an area representative of the average new snow depth.
- Melt and measure the snow core. This is your 24-hour Snow Water Equivalent (24-hour Snowfall SWE)
- If you feel this is more representative of the actual precipitation, then report this amount as your Gauge Catch and make a note in the Comments. Include the melted amount from the snow that actually fell in the gauge in your comments

Water melted from core is reported as the Gauge Catch

Include amount melted from gauge in comments



Precipitation Report Form Submit Reset

Station Number : IL-CP-1

Station Name : Homer 2.0 N

* Denotes Required Field

1/30/2022 *Observation Date

7:00 AM *Observation Time

0.21 in. *Gauge Catch: Rain and Melted Snow to the nearest hundredth inch that has fallen in the gauge during the past 24 hours, or T for trace, or NA for unknown.

Observation Notes: (This will be available to the public)

Gauge Catch is amount from snow core. Poor gauge catch because of high winds - not representative of what fell. Amount melted from gauge 0.06"

24-hr Snowfall

3.6 in. **Snowfall:** Accumulation of new snow in inches to the nearest tenth

0.21 in. **Snowfall SWE:** Melted value from core to the nearest hundredth

Snowpack (Total Snow and Ice on Ground at Observation Time)

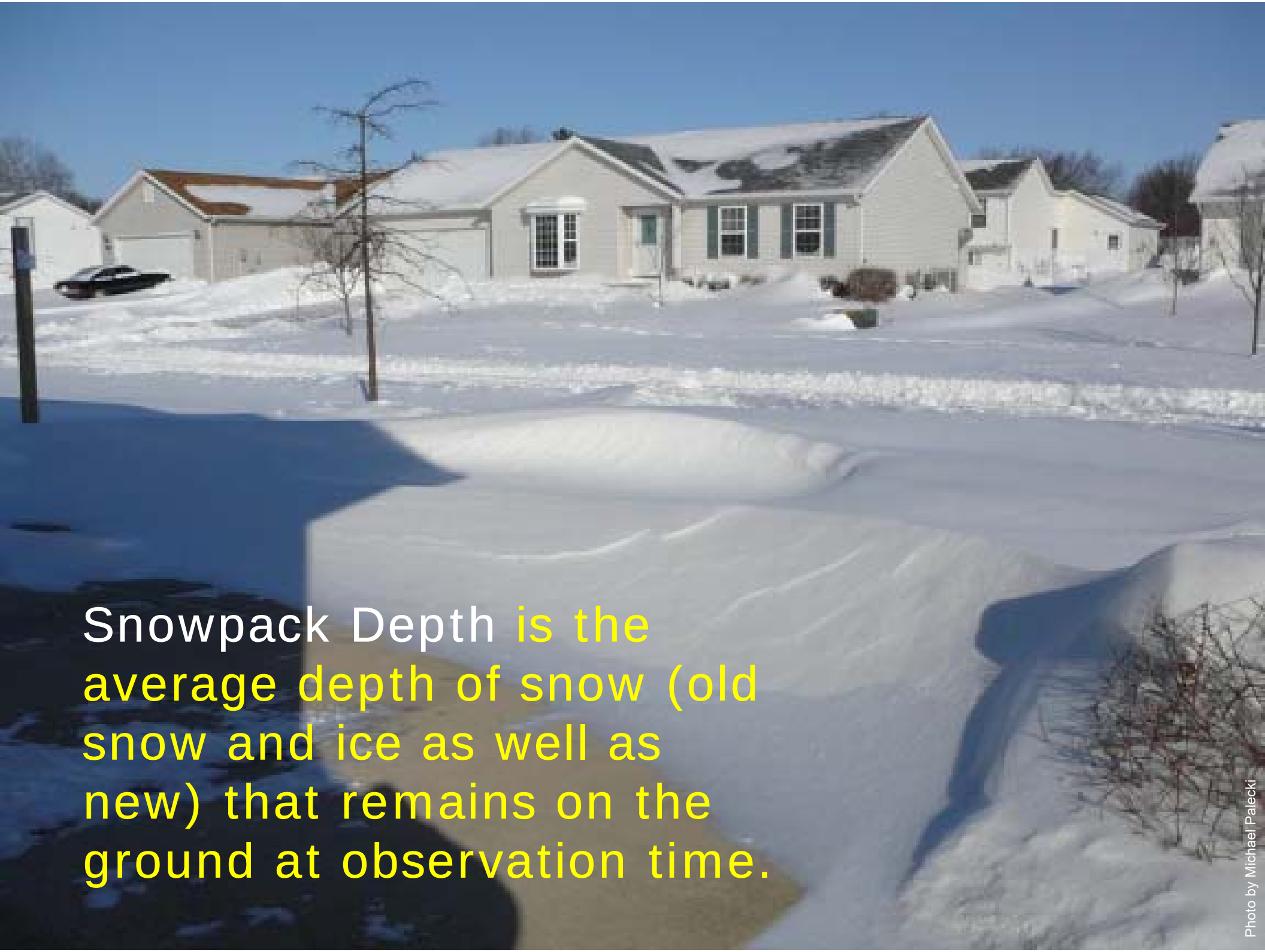
4.5 in. **Snowpack Depth:** Total snow and ice (new and old) in inches to the nearest half inch

0.63 in. **Snowpack SWE:** Melted value from core to the nearest hundredth

Measuring the Snowpack Depth

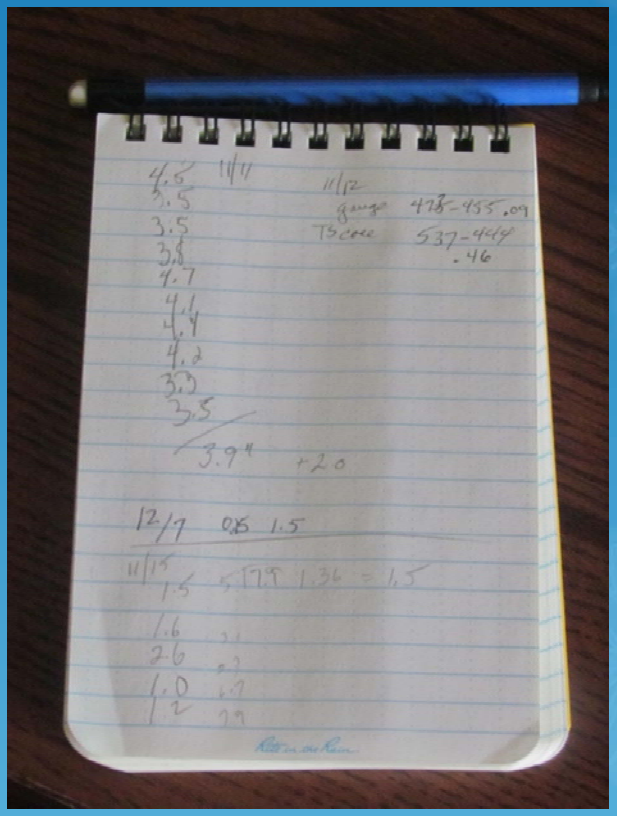
Total Depth of Snow and Ice on the Ground

- Report the Snowpack Depth each day there is snow on the ground


Snowpack Depth is the average depth of snow (old snow and ice as well as new) that remains on the ground at observation time.
Photo by Michael Palecki

Measuring Snowpack Depth

- Snow is rarely uniform in coverage, so take several measurements and average them to obtain your total depth of snow.
  - Write them down!
- Slide snow stick through all layers of snow (new and old).
- Read value on snow stick and record (values are to the nearest ½" like 4.5 or 5.0).
- Don't measure "artificial accumulations", such as plowed piles, large drifts, or shoveled snow.



Snowpack

On some days snow will only partially cover the ground. To determine the snowpack depth, determine the average snow depth in the snow covered area, and multiply it by the percent of the area the snow covers..

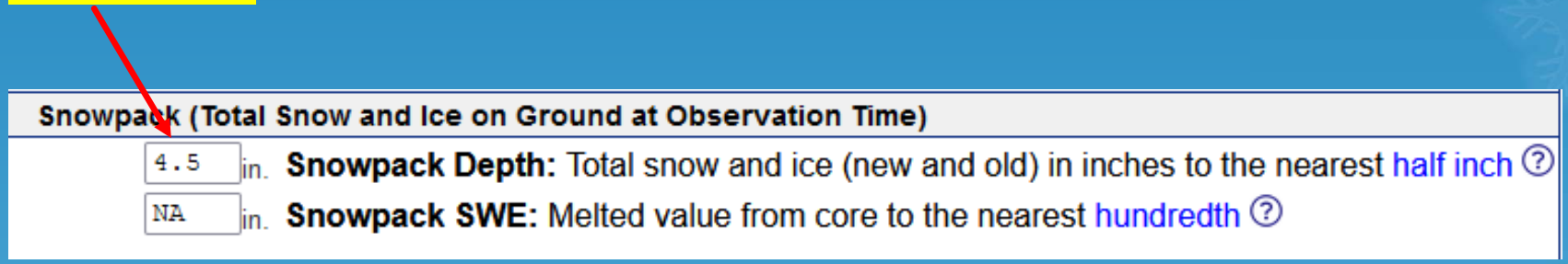
EXAMPLE

If 60 percent of the ground has 2.0” and the rest is bare, your total depth is 2.0*0.6, or 1.2 inches.

If more than half the ground is bare report “T” (trace) and mention the range of depths in your comments.

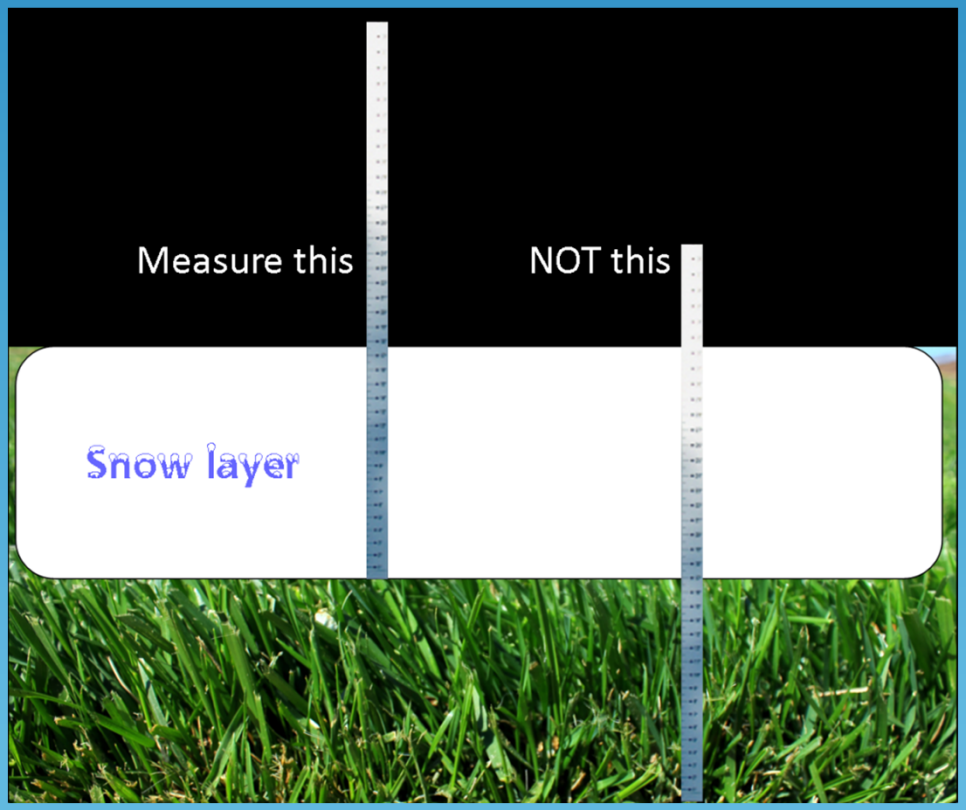
Snowpack: Total Snow and Ice on the Ground

This is the total depth of snow and ice on the ground each day, whether or not any new snow has fallen.



24-hr Snow and Snowpack Reminder

- If you are measuring your snow on a grassy surface, be careful how you measure.
- Snow may “perch” on top of the grass. Measure the layer of snow only.



Measuring Snowpack Snow Water Equivalent

- This is a measurement that is useful to hydrologists and river forecasters
- Provides an estimate of how much water is “on the ground” that can potentially run off into rivers and streams
- It does not have to be done every day (though you can). Measure it after a new snowfall, and then once a week.
- CoCoRaHS promotes “SWE Mondays” where we ask observers to measure and report Snowpack SWE each Monday there is snow on the ground.

How to Measure Snowpack SWE

- The basic process is the same as 24-hr Snowfall SWE
  - Take a “core” from the snow
  - Melt the core
  - Measure the amount of water in the core

First find a representative location

- The location should have not drifted, melted, or blown clear
- For example, if you determined the total depth of the snow is 3 inches, then take your core sample from an area where the depth of snow is three inches

Steps to Taking a Core

Place gauge upside down and push down into the snow

Clear snow from around the gauge

Capturing the Core

Slide a spatula or other thin, flat object under gauge

Carefully lift and get ready to flip the gauge

Bring the sample inside to melt

Snowpack SWE

- Melt and measure
- Report this on your Daily Report form

Snowpack (Total Snow and Ice on Ground at Observation Time)

4.5 in. **Snowpack Depth:** Total snow and ice (new and old) in inches to the nearest half inch

0.39 in. **Snowpack SWE:** Melted value from core to the nearest hundredth