

WELCOME TO:

**COOPERATIVE
WEATHER OBSERVER**

**SNOW MEASUREMENT
TRAINING**



OBJECTIVES OF SNOW MEASUREMENT TRAINING



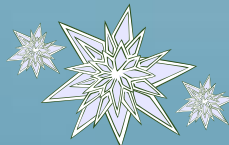
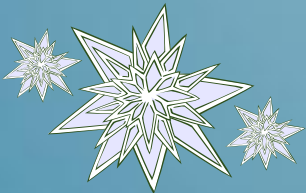
1. Equipment

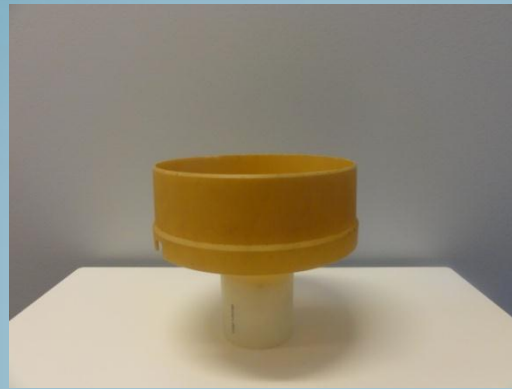
- a) 8" Standard Rain Gage Collector
- b) Inner 2" Diameter Measuring Tube
- c) Funnel Cap
- d) Precipitation Measurement Stick
- e) Snow Measurement Stick
- f) Snow Board

2. Snow Measurement Techniques

- a) [Defining Terms & Measurements](#)
- b) [Snow Board Placement](#)
- c) [Measuring Snowfall](#)
- d) [Measuring Snow Depth](#)
- e) [Measuring Snowfall Liquid Equivalent](#)
- f) [Measuring Snow Core](#)
- g) [Snowfall Myths](#)

- ## 3. Special situation such as wind swept areas affected by blowing/drifts , poor Snowfall catch in 8" Collector, Multi-Day Precipitation Accumulation and other "What If?" scenarios.





EQUIPMENT



EQUIPMENT

Standard Rain Gage

8" Collector

Snow falls directly into the open 8" Collector. The Funnel Cap is removed during the Cold Season. When the snow that falls into the Collector is representative of new snowfall, the observer melts down the new snowfall to liquid and measures the liquid equivalent. This measured liquid value is the **precipitation** amount for the observation.

When windy conditions do not allow a representative amount of snow to fall into the Collector, the observer will use the Collector to take a "biscuit" from the snowboard to measure the precipitation amount. (Section 3 of this training will address – Special situations, including wind swept areas/drifts/blowing and poor Snowfall catch in the 8" Collector).



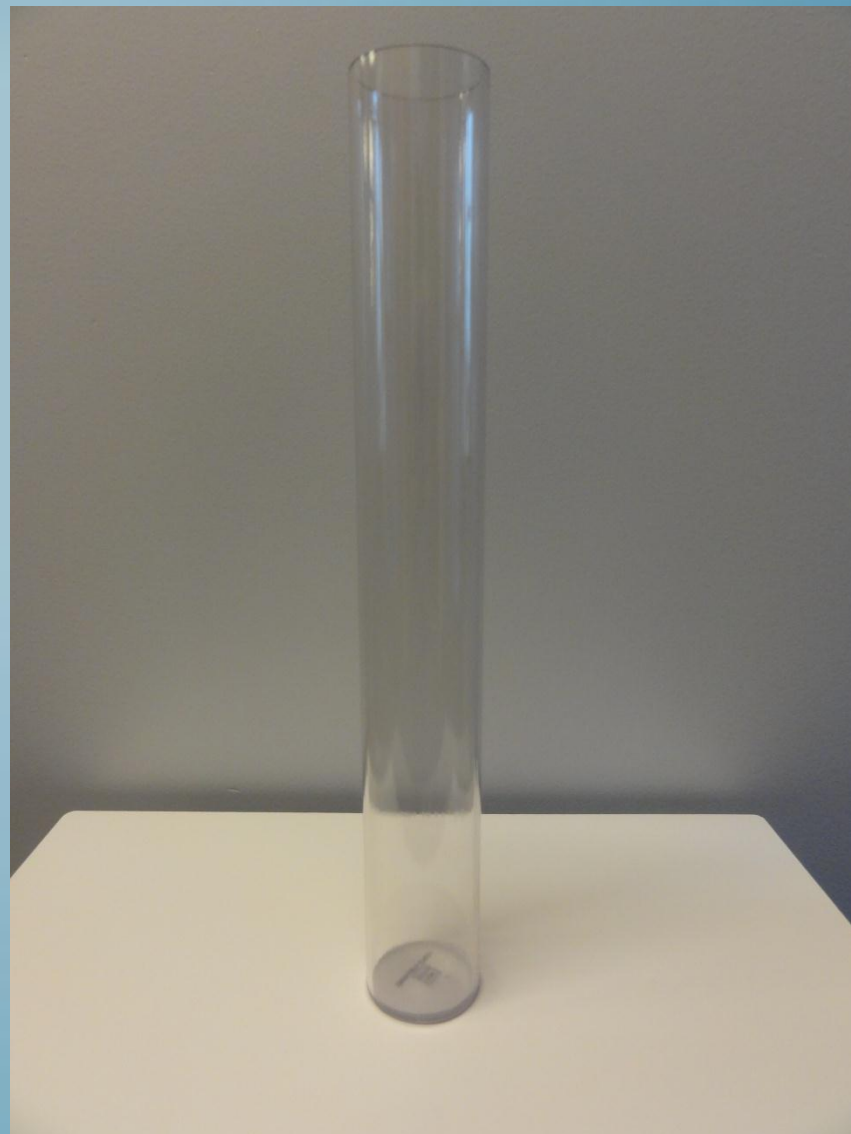
EQUIPMENT

Standard Rain Gage

2" Inner Tube

The Inner Tube will hold up to 2.00" of liquid precipitation.

The Inner Tube is removed from the 8" Collector during the Cold Season.



EQUIPMENT

Standard Rain Gage

8" Funnel Cap for Warm Season

The bottom of the Funnel Cap is inserted into the 2" Inner Tube and placed on top of the 8" Outer Collector during the Warm Season.

The Cap is removed from the 8" Collector during Cold season.



EQUIPMENT

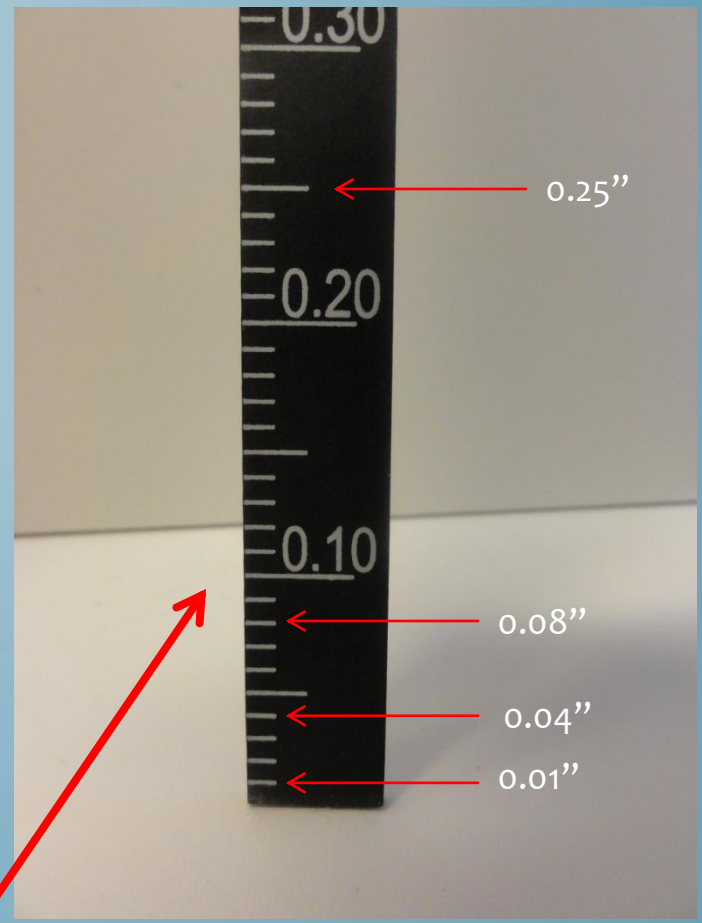
Standard Rain Gage

Precipitation Measuring Stick

Used to measure precipitation (rainfall – or melted snowfall liquid)

The precipitation Measuring Stick is read in 0.01" (hundredths) increments. Each line represents a measurement of 0.01".

Never Used to measure snowfall or snow depth! The precipitation stick is used to measure the liquid (precipitation) obtained by melting snowfall .



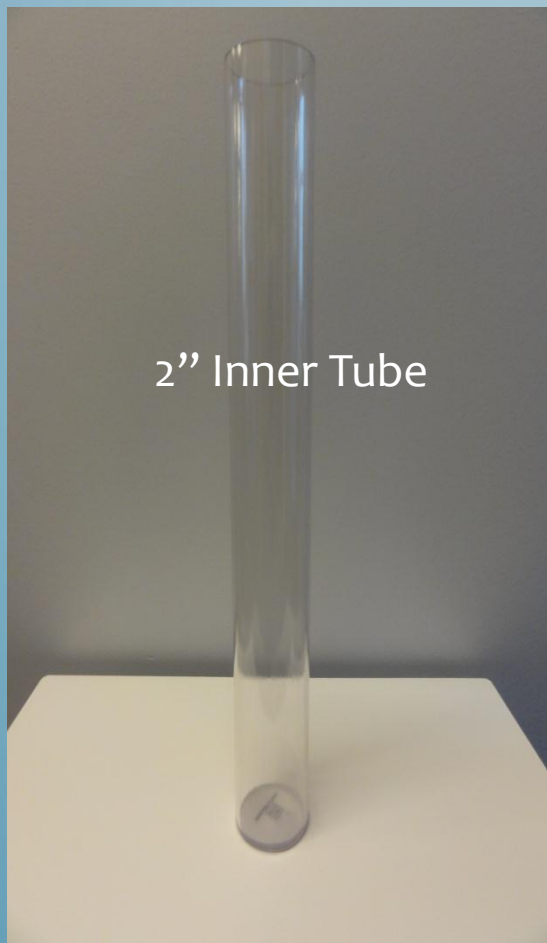
Each line is incremented as 0.01"

EQUIPMENT

Standard 8" Rain Gage

Complete 8" Standard Rain Gage Set

Precipitation Measurement Stick



2" Inner Tube



Funnel Cap



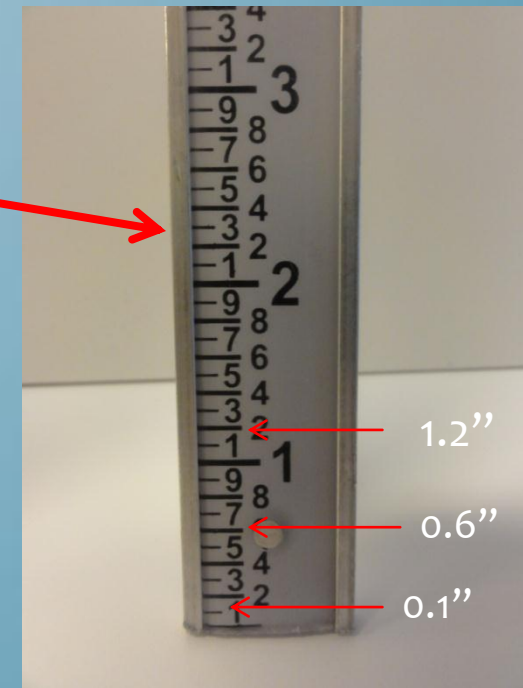
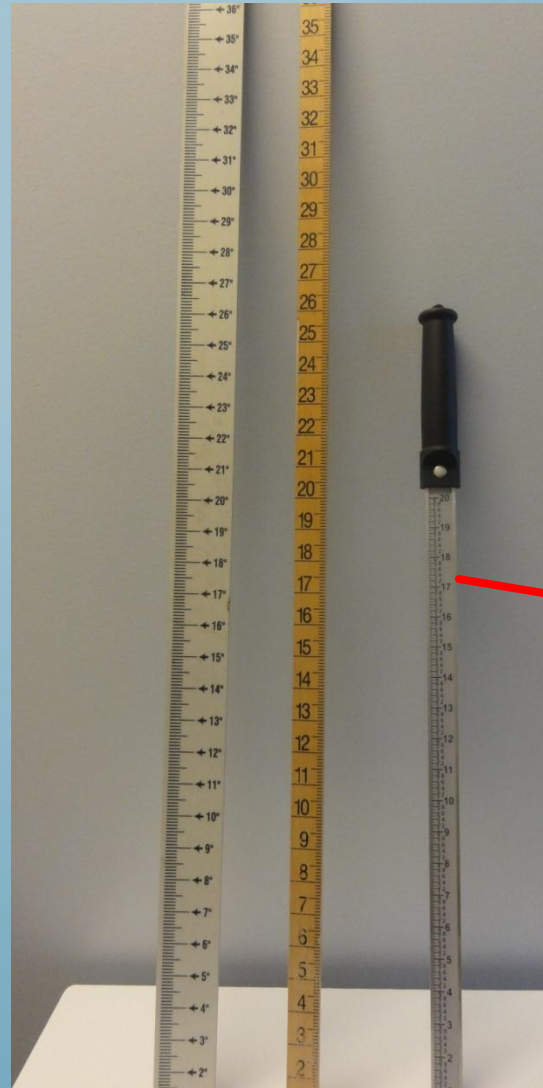
8" Collector

EQUIPMENT

Snow Measurement Stick

A number of **Snow Measurement Sticks** are in use.

All Snow Measurements Sticks provide measurement in whole inches and tenths. (i.e. 1.2")



EQUIPMENT

Snow Board

The white surface of the Snow Board does not absorb incoming radiation from the sun which reduces the amount of melting snow on the Snow Board.

The hard surface allows an accurate measurement of new snowfall that has accumulated.





SNOW MEASUREMENT TECHNIQUES



DEFINING TERMS & MEASUREMENTS



Snowfall:

Snowfall is defined as “NEW SNOW” that has fallen over the last 24 hours. Snowfall is measured to the nearest one tenth of an inch on the Snow Board or another hard surface.



DEFINING TERMS & MEASUREMENTS



Over Reporting Snowfall:

Snowfall is measured to the nearest one tenth of an inch.

DO NOT round Snowfall “UP” to the nearest whole or one half inch.

For example: We have 5 Snowfall events, and each of these events actually measured identically as 1.5” Snowfall, BUT were incorrectly reported by rounding “UP” to 2.0” of Snowfall.

We would be over reporting the Snowfall amount for these 5 events by +2.5”.

Over reporting of Snowfall can make a significant error in the total amount of Snowfall for a season.



DEFINING TERMS & MEASUREMENTS



Under Reporting Snowfall:

Snowfall is measured to the nearest one tenth of an inch.

DO NOT round Snowfall “DOWN” to the nearest whole or one half inch.

Additional example: If we under reported each of these same 5 Snowfall events (from example on previous page) by rounding “DOWN” to 1.0” when the actual Snowfall amount was 1.5”; we would be under reporting the Snowfall amount for these 5 events by -2.5”. Under reporting of Snowfall can also make a significant error in the total amount of Snowfall for a season.



DEFINING TERMS & MEASUREMENTS



Snow Depth:

Snow Depth is defined as the average depth of snow in the representative measurement area. Snow Depth is rounded to the nearest whole inch.



DEFINING TERMS & MEASUREMENTS



Snow Depth:

Snow Depth is measured to the nearest whole inch. The Snow Depth is measured to the nearest whole inch and is rounded up when Snow Depth measurements equals 0.5" or greater ($>$) of any value. Snow Depth is rounded down when Snow Depth is less than 0.5" of any value.

For example: We measure the Snow Depth at several representative locations and the combined measurements average 2.5". The 2.5" should be rounded **↑** up and reported as 3" Snow Depth.

Additional example: We measure Snow Depth at several representative locations and this time the combined measurements averages 2.4". The 2.4" should be rounded down **↓** and reported as 2" Snow Depth.

It is important to remember that Snow Depth maps are created from and based upon whole inch values. Over or Under Reporting will give a false representation of Snow Depth.



SNOW MEASUREMENT TECHNIQUES

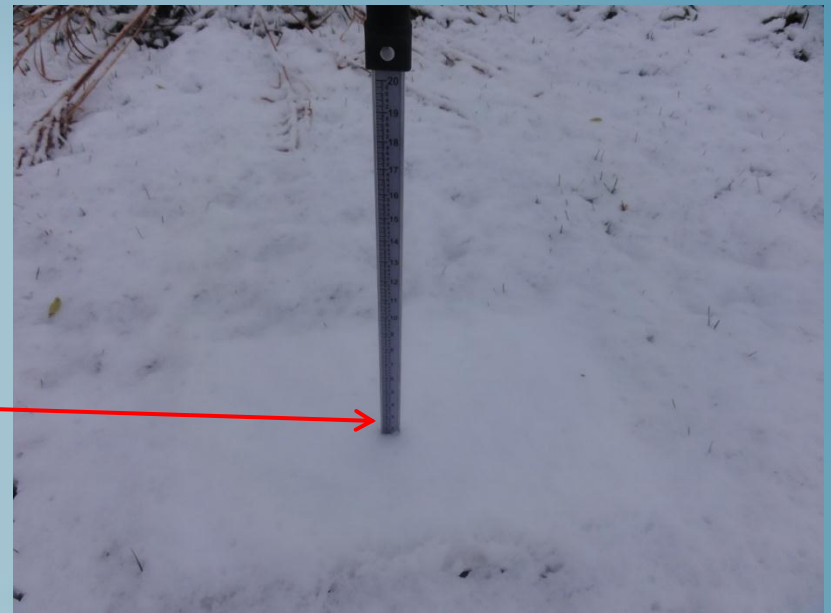
- Snow Board Placement
- The Snow Board should be located in an area not subject to drifting or wind swept areas and close to the Standard Rain Gage.
- Placing a marker near the Snow Board will help locate the Snow Board.



In this example, the Standard Rain Gage is located approximately 15' to the east of Snow Board.

SNOW MEASUREMENT TECHNIQUES

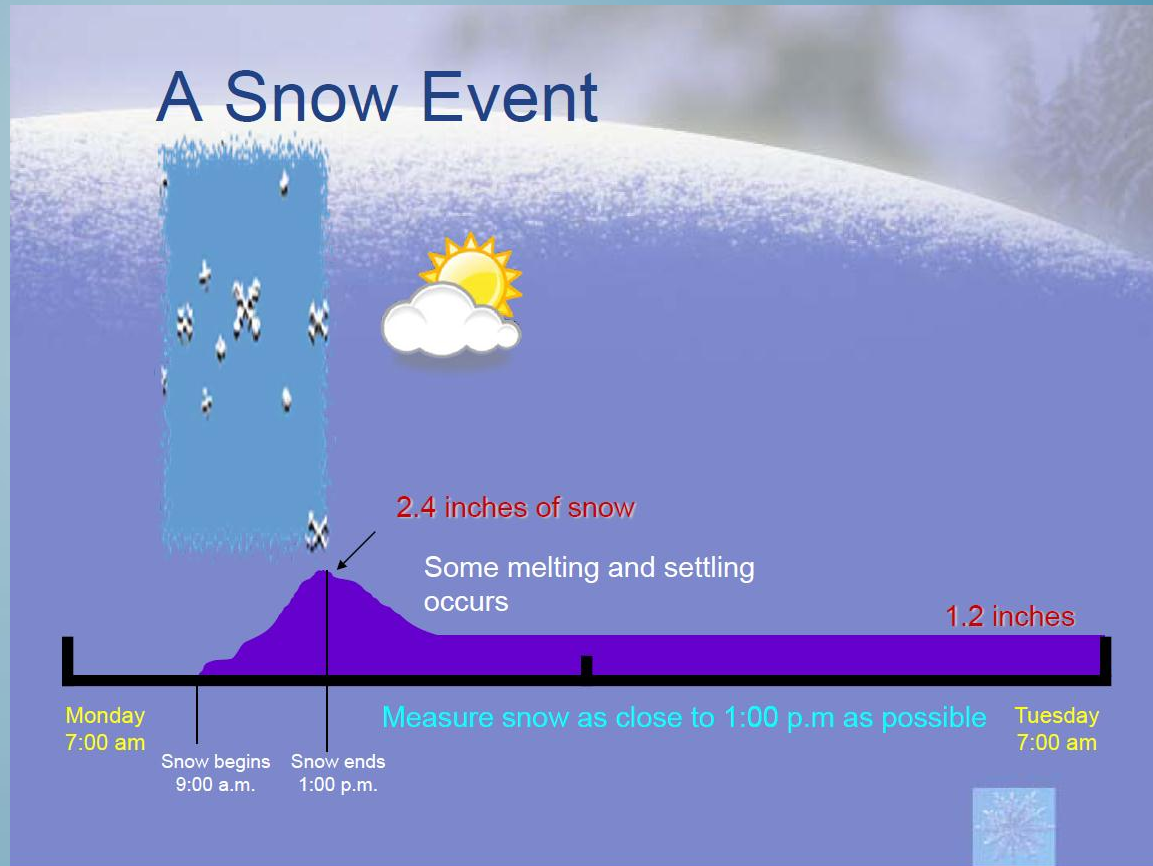
- **Measuring “Snowfall”**
- The observer takes the Snowfall measurement from the Snow Board. The Snow Board outline can be seen at right.



This photograph shows a cut away of Snowfall on Snow Board.

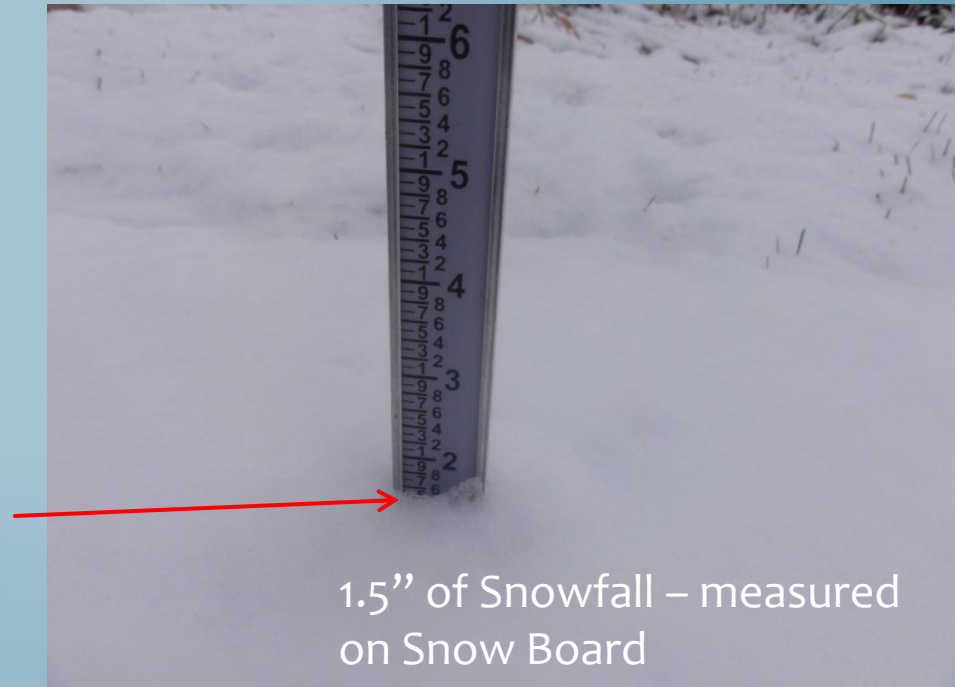
SNOW MEASUREMENT TECHNIQUES

- **Measuring “Snowfall”**
- **Measure new Snowfall as soon as possible after it ends, before settling and melting occur.**
- **This does not change the time of your observation for reporting purposes.** (Most observers report at 7 a.m.)



SNOW MEASUREMENT TECHNIQUES

- **Measuring “Snowfall”**
- Measure the Snowfall to the nearest one tenth of an inch.
- Do not **“round”** to the nearest whole or one half inch. It is important for climate records that Snowfall be measured in increments of **whole units** and **tenths**.
- In this photograph, the Snowfall is measured as 1.5”.
- The observer would report this as Snowfall of 1.5”.



SNOW MEASUREMENT TECHNIQUES

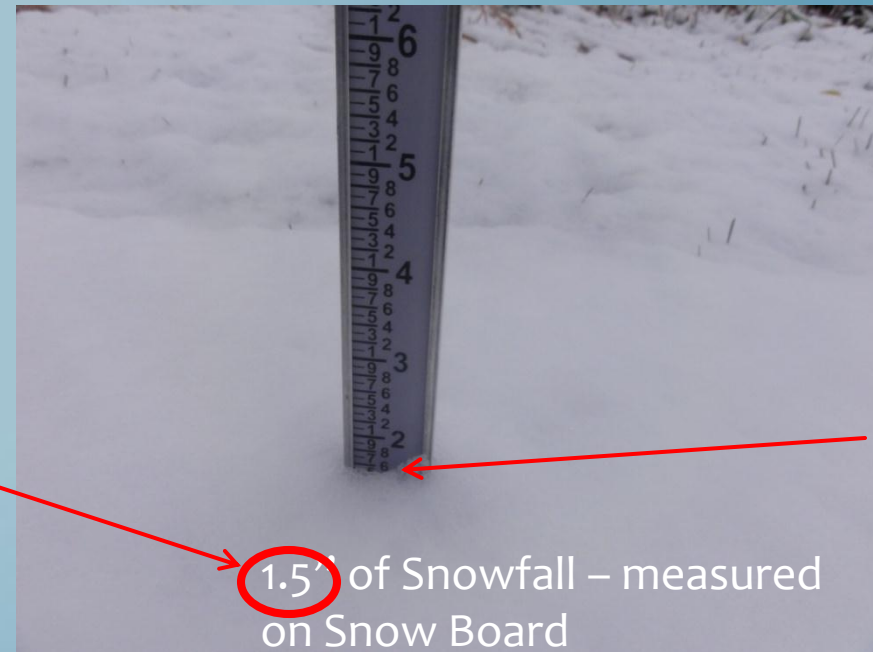
- **Measuring “Snowfall”**
- To “ready” the Snow Board for the next Snowfall; Clear the Snow Board by flipping or by tapping the board with the flat side of the Snow Stick.



SNOW MEASUREMENT TECHNIQUES

- Measuring “Snowfall”

WxCoder Input



1.5' of Snowfall – measured on Snow Board

Air Temperature	
Max temperature	<input type="text"/> x °F help
Min temperature	<input type="text"/> x °F help
At observation	<input type="text"/> x °F help

Precipitation	
Precipitation	<input type="text"/> x.xx in help
<small>Reminder: set the accumulation if this value represents more than one observation period.</small>	
Multi-day Accumulation	1 <input type="text"/> days help
Precipitation type	Snow <input type="text"/> help
Snowfall	1.5 x.x in help
Snow depth	<input type="text"/> x in help
Snow core	<input type="text"/> x.x in help
Precipitation Time of Occurrence	<input type="text"/> ?

SNOW MEASUREMENT TECHNIQUES

- **Measuring “Snow Depth”**
- Measure the Snow Depth in several “representative” locations to obtain an average.
- Taking several Snow Depth measurements in whole inches and tenths is necessary to obtain the average depth.



SNOW MEASUREMENT TECHNIQUES

- **Measuring “Snow Depth”**
- Measure the Snow Depth in several “representative” locations to obtain the average depth .
- Avoid locations with tree overhang and tall grass cover. These locations will not work well.



SNOW MEASUREMENT TECHNIQUES

- **Measuring “Snow Depth”**
- When measuring Snow Depth, avoid areas that are drifted or have man made impacts, such as plowing or shoveling.
- Avoid areas under trees and next to sidewalks.

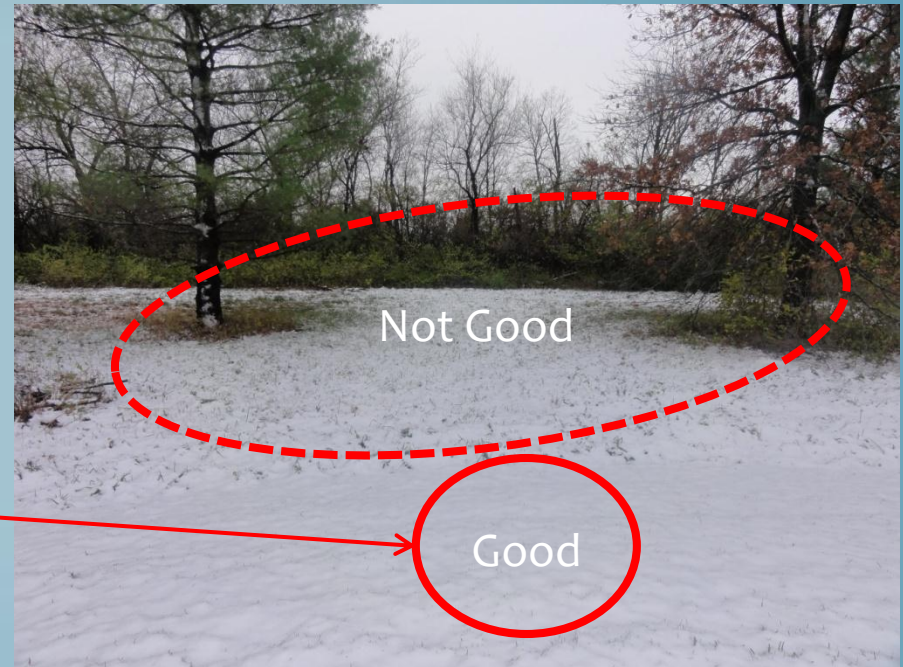


- This area is likely to give a false reading due to shoveling or snow blower use.

SNOW MEASUREMENT TECHNIQUES

- **Measuring “Snow Depth”**

- When measuring Snow Depth, avoid areas that have tall grass or where Snowfall is blocked by trees or man made objects.
- Good locations may be found where Snowfall is “not too near” trees or man made interference.



SNOW MEASUREMENT TECHNIQUES

- **Measuring “Snow Depth”**
- Take accurate measurements of the Snow Depth in whole units and tenths, and then round the Snow Depth to the nearest “whole” unit.



- For example: Several measurements average to a Snow Depth of 2.9”. Round to 3”, and reported as a 3” Snow Depth.
- Another example: An average Snow Depth of 3.5” is rounded to 4”, and reported as a 4” Snow Depth.

SNOW MEASUREMENT TECHNIQUES

- Measuring “Snow Depth”

WxCoder Input

The screenshot shows a web-based data entry form for weather observations. It is divided into two main sections: 'Air Temperature' and 'Precipitation'. Under 'Air Temperature', there are three input fields: 'Max temperature', 'Min temperature', and 'At observation', each with a unit of '°F' and a 'help' link. The 'Precipitation' section contains several fields: 'Precipitation' (with a unit of 'in' and a 'help' link), a yellow-highlighted reminder box stating 'Reminder: set the accumulation if this value represents more than one observation period.', 'Multi-day Accumulation' (a dropdown menu set to '1' with a unit of 'days' and a 'help' link), 'Precipitation type' (a dropdown menu set to '-Select-' with a 'help' link), 'Snowfall' (with a unit of 'in' and a 'help' link), 'Snow depth' (with a unit of 'in' and a 'help' link), and 'Snow core' (with a unit of 'in' and a 'help' link). The 'Snow depth' field contains the number '4' and is circled in red. A red arrow points from the 'WxCoder Input' text to this field. Another red arrow points from the 'Snow depth' field to a text block on the right.

IMPORTANT NOTE:

- **Report Snow Depth daily, even when no new Snowfall occurs.**
- **Report Snow Depth daily whenever a Trace (T) or more of Snow is on the ground.**

- *An average Snow Depth of 3.5” is rounded to 4”, and reported as a 4” Snow Depth.*

SNOW MEASUREMENT TECHNIQUES

- **Measuring “Snowfall Liquid Equivalent” (Precipitation)**
- *The Snowfall Liquid Equivalent is the 24 hour precipitation (liquid) that fell in the form of new snow.*
- *This measurement determines the amount of liquid in the new Snowfall and is critical for accurate climate records of precipitation.*
- *The photograph to the right shows the new Snowfall that has fallen into the 8” Collector over the past 24 hours.*
- *The amount of new snow in the 8” Collector should be representative of what was measured on the Snow Board.*
- *Windy conditions can sometimes negatively affect the amount of Snowfall in the 8” Collector. (Section 3 of this training will address – Special situations, including wind swept areas/drifts/blowing, poor Snowfall catch in the 8” Collector, and Multi-Day Precipitation Accumulation.)*



8” Collector with new Snowfall

SNOW MEASUREMENT TECHNIQUES

- **Measuring “Snowfall Liquid Equivalent” (Precipitation)**
- *Take the 8” Collector with new Snowfall inside to melt down for a liquid (precipitation) equivalent.*



8” Collector with new Snowfall

SNOW MEASUREMENT TECHNIQUES

- **Measuring “Snowfall Liquid Equivalent” (Precipitation)**
- *Items needed to properly melt new snow include:*
 - *8” Collector with new Snowfall*
 - *Funnel Cap*
 - *2” Inner Tube*
 - *Precipitation Measurement Stick*
 - *Hot Water*



SNOW MEASUREMENT TECHNIQUES

- **Measuring “Snowfall Liquid Equivalent” (Precipitation)**
- *Measure out an amount of hot water in the 2” Inner Tube using the Precipitation Measurement Stick.*
- *A good amount to start with is 1.00 inches of hot water. The hot water will be subtracted from the total liquid.*
- *It is necessary to keep track of the measured amount of hot water that is added to the new Snowfall.*



SNOW MEASUREMENT TECHNIQUES

- **Measuring “Snowfall Liquid Equivalent” (Precipitation)**
- Pour the “measured” hot water of 1.00 inches into the 8” Collector that has the new Snowfall inside.
- Stir the hot water and snow to break up any ice, or until everything is liquefied.

1



Pour in “measured” hot water



Stir hot water until everything is liquid

2



Melted down to liquid!

3

Training Objective No. 2e

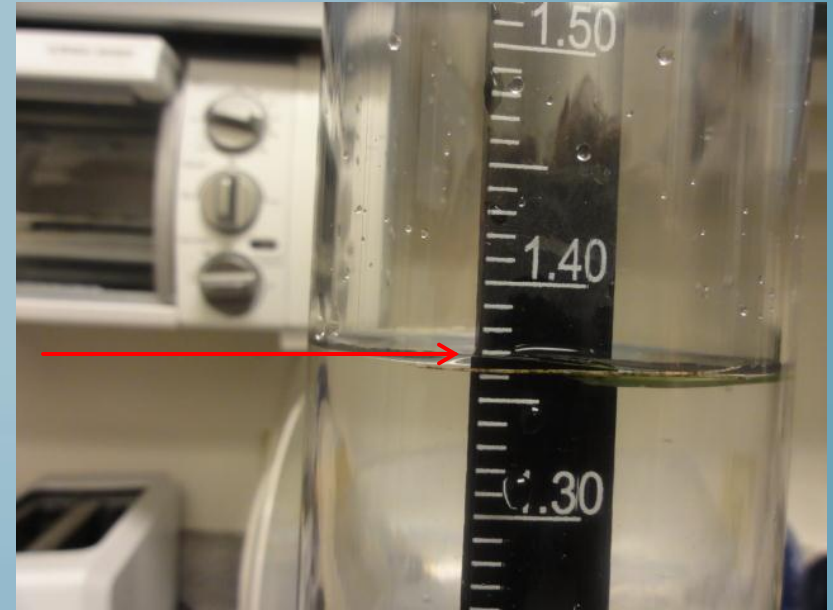
SNOW MEASUREMENT TECHNIQUES

- **Measuring “Snowfall Liquid Equivalent” (Precipitation)**
- *Pour the entire liquefied contents from the 8” Collector into the 2” Inner Tube.*



SNOW MEASUREMENT TECHNIQUES

- **Measuring “Snowfall Liquid Equivalent” (Precipitation)**
- Measure the contents of the 2” Inner Tube with the Precipitation Measurement Stick. Precipitation is measured in whole inches, tenths and hundredths. (i.e. 1.37”)
- Subtract the amount of hot water added!
- The remaining value is the liquid equivalent or the precipitation amount of the new snowfall!



Precipitation Amount

1.37	[Total of hot water and melted snowfall]
<u>-1.00</u>	[Hot water added]
0.37	[Liquid equivalent or precipitation amount of new snow. Reported as precipitation]

SNOW MEASUREMENT TECHNIQUES

- **Measuring “Snowfall Liquid Equivalent” (Precipitation)**

WxCoder Input

The screenshot shows the WxCoder input form for precipitation measurement. It is divided into two sections: "Air Temperature" and "Precipitation".

Air Temperature

- Max temperature: x °F [help](#)
- Min temperature: x °F [help](#)
- At observation: x °F [help](#)

Precipitation

- Precipitation: x.xx in [help](#)
- Reminder: set the accumulation if this value represents more than one observation period.
- Multi-day Accumulation: days [help](#)
- Precipitation type: [help](#)
- Snowfall: x.x in [help](#)
- Snow depth: x in [help](#)
- Snow core: x.x in [help](#)
- Precipitation Time of Occurrence:

Red circles highlight the "0.37" in the "Precipitation" field and the "Snow" in the "Precipitation type" dropdown. A red arrow points from the "0.37" to the "0.37" in the table below.

Precipitation Amount

1.37

[Total of hot water and melted snowfall]

-1.00

[Hot water added]

0.37

[Liquid equivalent or precipitation amount of new snow. Reported as precipitation]

SNOW MEASUREMENT TECHNIQUES

- **Measuring “Snow Core”**
- Snow Core is an important observation of the total liquid equivalent that is encapsulated in the snow pack.
- The Snow Core measurement is used by River Forecast Centers to model the amount of precipitation that sits on top of the ground in the form of snow!
- Hydrologists use this measurement to aid in forecasting river levels and/or potential Flooding or Flash Flooding.
- The Snow Core observation is normally taken on Mondays when there is a Snow Depth of 2” or more. (Some observers take this observation on other days, as time allows).



SNOW MEASUREMENT TECHNIQUES

- **Measuring “Snow Core”**
- To measure Snow Core:
 - Take the 8” Collector to the location where the Snow Depth was determined.
 - Place the Collector – open side down into the snow.
 - Push the Collector down through all snow and/or ice to the ground level.
 - It is important that all snow/ice from this 8” diameter cut be collected and measured.



SNOW MEASUREMENT TECHNIQUES

- **Measuring “Snow Core”**
- To measure Snow Core:
 - A clipboard may be used to clear snow away from the Collector.



SNOW MEASUREMENT TECHNIQUES

- **Measuring “Snow Core”**
- To measure Snow Core:
 - *Clipboard was used to clear snow away from the Collector.*



SNOW MEASUREMENT TECHNIQUES

- **Measuring “Snow Core”**
- To measure Snow Core:
 - The clipboard may be used to capture the snow and ice at the ground level by carefully sliding the clipboard under the opening of the Collector.



SNOW MEASUREMENT TECHNIQUES

- **Measuring “Snow Core”**
- To measure Snow Core:
 - The Collector can then be turned over while holding the clipboard against the opening to capture the snow/ice.
 - It is important that all snow/ice from the 8” Diameter cut be captured in the Collector.
 - If snow/ice is left on ground where the Snow Core was taken – pick up the pieces (from the 8” Diameter cut only) and place in the Collector.
 - The snow/ice in the Collector can now be melted down in the same manner that the snowfall is melted and measured.
 - There is one difference in measuring and reporting the water equivalent in Snow Core. **Snow Core water equivalent is measured and reported in whole units and tenths. (i.e. 1.2”)**



SNOW MEASUREMENT TECHNIQUES

- **Measuring “Snow Core”**
- *Take the 8” Collector with new Snow Core inside to melt down for a liquid (precipitation) equivalent.*



8” Collector with Snow Core

SNOW MEASUREMENT TECHNIQUES

- **Measuring “Snow Core”**
- *Items needed to properly melt snow core include:*
 - *8” Collector with new Snowfall*
 - *Funnel Cap*
 - *2” Inner Tube*
 - *Precipitation Measurement Stick*
 - *Hot Water*



SNOW MEASUREMENT TECHNIQUES

- **Measuring “Snow Core”**
- *Measure out an amount of hot water in the 2” Inner Tube using the Precipitation Measurement Stick.*
- *A good amount to start with is 1.00 inches of hot water. The hot water will be subtracted from the total liquid.*
- *It is necessary to keep track of the measured amount of hot water that is added to the Snow Core.*



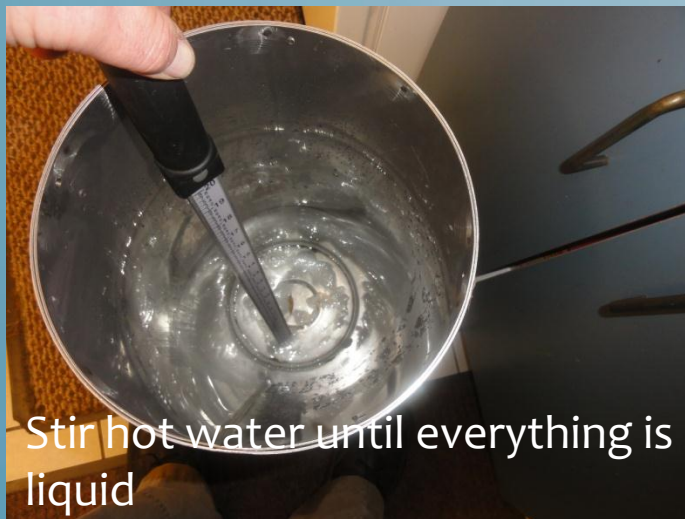
SNOW MEASUREMENT TECHNIQUES

- Measuring “Snow Core”
- Pour the “measured” hot water of 1.00 inches into the 8” Collector that has the Snow Core inside.
- Stir the hot water and snow (from Snow Core) to break up any ice, or until everything is liquefied.

1



Pour in “measured” hot water



Stir hot water until everything is liquid

2



Melted down to liquid!

3

Training Objective No. 2f

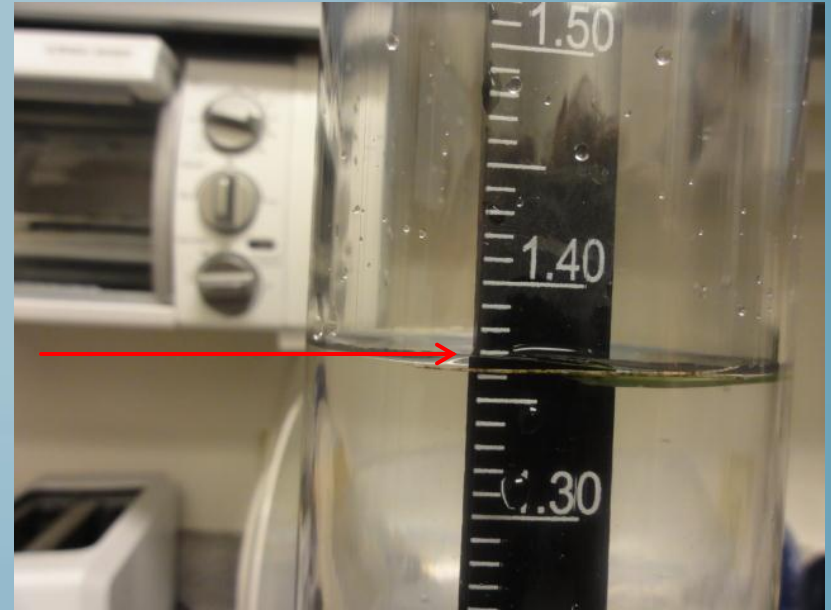
SNOW MEASUREMENT TECHNIQUES

- **Measuring “Snow Core”**
- *Pour the entire liquefied contents from the 8” Collector into the 2” Inner Tube.*



SNOW MEASUREMENT TECHNIQUES

- **Measuring “Snow Core”**
- Measure the contents of the 2” Inner Tube with the Precipitation Measurement Stick.
- Snow Core liquid equivalent is measured in whole inches, tenths & hundredths (i.e. 1.37) and then rounded to whole inches and tenths (i.e. 1.4) for reporting.
- Subtract the amount of hot water added!
- The remaining value is the liquid equivalent or the precipitation amount of the Snow Core sample.



Precipitation Amount

1.37	[Total of hot water and melted snowfall]
<u>-1.00</u>	[Hot water added]
0.37	[Liquid equivalent of Snow Core is reported in whole inches and tenths, so this value would be rounded up and reported as 0.4]

It should be understood that **“only”** the Snow Core liquid equivalent is reported in whole inches and tenths! All other forms of precipitation is reported in whole inches, tenths & hundredths! (i.e. 1.62”)

SNOW MEASUREMENT TECHNIQUES

- Measuring “Snow Core”

WxCoder Input

The screenshot shows the WxCoder input form with the following fields:

- Air Temperature**
 - Max temperature: x °F [help](#)
 - Min temperature: x °F [help](#)
 - At observation: x °F [help](#)
- Precipitation**
 - Precipitation: x.xx in [help](#)
Reminder: set the accumulation if this value represents more than one observation period.
 - Multi-day Accumulation: 1 days [help](#)
 - Precipitation type: [help](#)
 - Snowfall: x.x in [help](#)
 - Snow depth: x in [help](#)
 - Snow core: x.x in [help](#)

Precipitation Amount

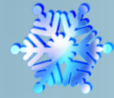
1.37 [Total of hot water and melted snowfall]
-1.00 [Hot water added]
0.37 [Liquid equivalent of Snow Core is reported in whole inches and tenths, so this value would be rounded up and reported as 0.4]

It should be understood that “only” the Snow Core liquid equivalent is reported in whole inches and tenths! All other forms of precipitation is reported in whole inches, tenths & hundredths! (i.e. 1.62”)

Note: Only enter a Snow Core value on the day that the Snow Core is taken. Make no entry on other days! (i.e. 0.0 is not a valid entry)

SNOWFALL MYTHS

The 10:1 Myth



DO NOT estimate snowfall by converting the liquid in your rain gage to a snowfall amount!

The adage that one inch of rain equals 10 inches of snow is a myth!

The snow/water equivalent ratio is dependent on many factors, not just surface air temperature.

Snow to water ratios **can vary from 8:1 or less to 20:1 or more!**



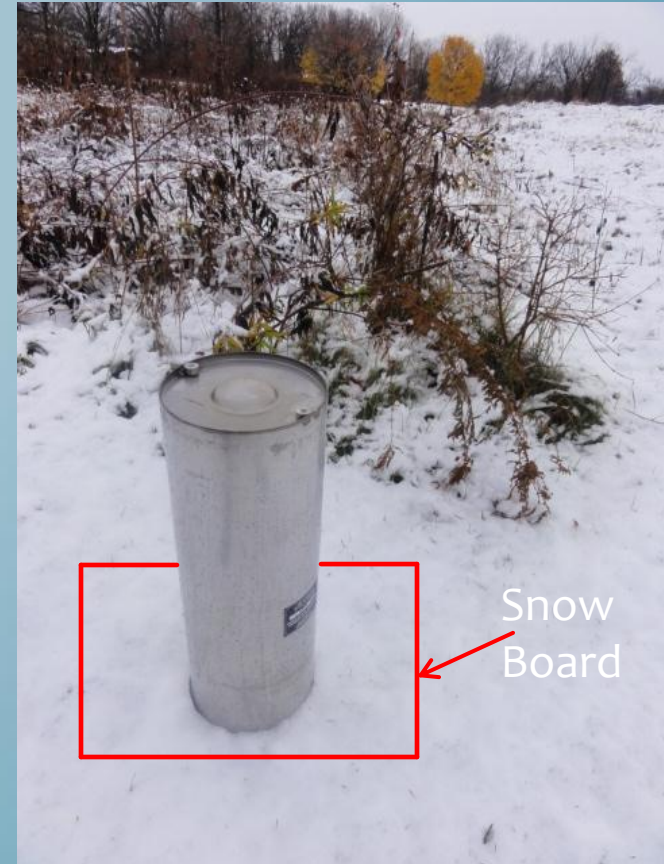
SPECIAL SITUATIONS SUCH AS WIND SWEEPED AREAS AFFECTED BY BLOWING/DRIFTING , POOR SNOWFALL CATCH IN 8” COLLECTOR, MULTI-DAY PRECIPITATION ACCUMULATION AND OTHER “WHAT IF?” SCENARIOS.

Windy conditions may create a situation where the amount of **NEW Snowfall** in the 8” Collector is not representative of snow that fell on either the Snow Board or the ground.

- In this case, we may need to take a “sample or biscuit cut” from the Snow Board or another area representative of the average new Snowfall. **(Remember: In this example - we are only trying to determine the liquid equivalent (precipitation) of the NEW SNOWFALL).**
- The **NEW Snowfall** sample is taken using the 8” Collector to cut a biscuit from the Snow Board or another representative area. This “biscuit” is then melted down and compared to the amount that fell directly into the 8” Collector.
- If you determine that the sample (biscuit cut) provides a more accurate representation of the actual Precipitation, then report this amount as your 24 Hour Daily Precipitation. **Instructions on next page.**

SPECIAL SITUATIONS SUCH AS WIND SWEPT AREAS AFFECTED BY BLOWING/DRIFTING , POOR SNOWFALL CATCH IN 8” COLLECTOR, MULTI-DAY PRECIPITATION ACCUMULATION AND OTHER “WHAT IF?” SCENARIOS.

- **Measuring “Snowfall Liquid Equivalent” (Precipitation) by Cutting a Biscuit of the NEW Snowfall**
- The following technique is used to obtain a liquid equivalent (precipitation) when the 8” Collector does not receive a representative amount of **NEW SNOWFALL** from the snow event.
- The Snowfall Liquid Equivalent is the 24 hour precipitation (liquid) that fell in the form of **NEW SNOWFALL**.
- The photograph to the right shows the 8” Collector turned open side down on the Snow Board. (The 8” Collector was emptied before being used)
- If the Snow Board does not have a representative amount of **NEW SNOWFALL**, another hard surface may be used as long as “only” **NEW SNOWFALL** is taken in the sample.



Biscuit cut from Snow Board using 8” Collector.

SPECIAL SITUATIONS SUCH AS WIND SWEEPED AREAS AFFECTED BY BLOWING/DRIFTING , POOR SNOWFALL CATCH IN 8” COLLECTOR, MULTI-DAY PRECIPITATION ACCUMULATION AND OTHER “WHAT IF?” SCENARIOS.

- **Measuring “Snowfall Liquid Equivalent” (Precipitation) by Cutting a Biscuit of the NEW Snowfall**
- *Flip the Snow Board and 8” Collector over at the same time to capture a representative amount of **NEW SNOWFALL** in the Collector.*



Biscuit cut from Snow Board using 8” Collector.

SPECIAL SITUATIONS SUCH AS WIND SWEPT AREAS AFFECTED BY BLOWING/DRIFTING , POOR SNOWFALL CATCH IN 8” COLLECTOR, MULTI-DAY PRECIPITATION ACCUMULATION AND OTHER “WHAT IF?” SCENARIOS.

- **Measuring “Snowfall Liquid Equivalent” (Precipitation) by Cutting a Biscuit of the NEW Snowfall**
- *Take the 8” Collector with **NEW SNOWFALL** indoors to melt down for a liquid (precipitation) equivalent.*



8” Collector with **NEW SNOWFALL** obtained from the Snow Board or other hard surface

SPECIAL SITUATIONS SUCH AS WIND SWEPT AREAS AFFECTED BY BLOWING/DRIFTING , POOR SNOWFALL CATCH IN 8” COLLECTOR, MULTI-DAY PRECIPITATION ACCUMULATION AND OTHER “WHAT IF?” SCENARIOS.

- **Measuring “Snowfall Liquid Equivalent” (Precipitation) by Cutting a Biscuit of the NEW Snowfall**
- *Items needed to properly melt new snow include:*
 - *8” Collector with new Snowfall*
 - *Funnel Cap*
 - *2” Inner Tube*
 - *Precipitation Measurement Stick*
 - *Hot Water*



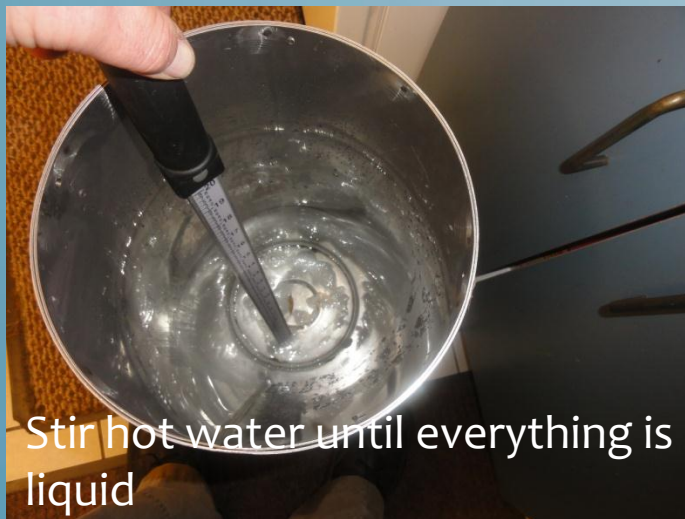
SPECIAL SITUATIONS SUCH AS WIND SWEPT AREAS AFFECTED BY BLOWING/DRIFTING , POOR SNOWFALL CATCH IN 8" COLLECTOR, MULTI-DAY PRECIPITATION ACCUMULATION AND OTHER "WHAT IF?" SCENARIOS.

- **Measuring "Snowfall Liquid Equivalent" (Precipitation) by Cutting a Biscuit of the NEW Snowfall**
- *Measure out an amount of hot water in the 2" Inner Tube using the Precipitation Measurement Stick.*
- *A good amount to start with is 1.00 inches of hot water. The hot water will be subtracted from the total liquid.*
- *It is necessary to keep track of the measured amount of hot water that is added to the new Snowfall.*



SPECIAL SITUATIONS SUCH AS WIND SWEPT AREAS AFFECTED BY BLOWING/DRIFTING , POOR SNOWFALL CATCH IN 8" COLLECTOR, MULTI-DAY PRECIPITATION ACCUMULATION AND OTHER "WHAT IF?" SCENARIOS.

- **Measuring "Snowfall Liquid Equivalent" (Precipitation) by Cutting a Biscuit of the NEW Snowfall**
- Pour the "measured" hot water of 1.00 inches into the 8" Collector that has the new Snowfall inside.
- Stir the hot water and snow to break up any ice, or until everything is liquefied.



2



3 Training Objective No. 3

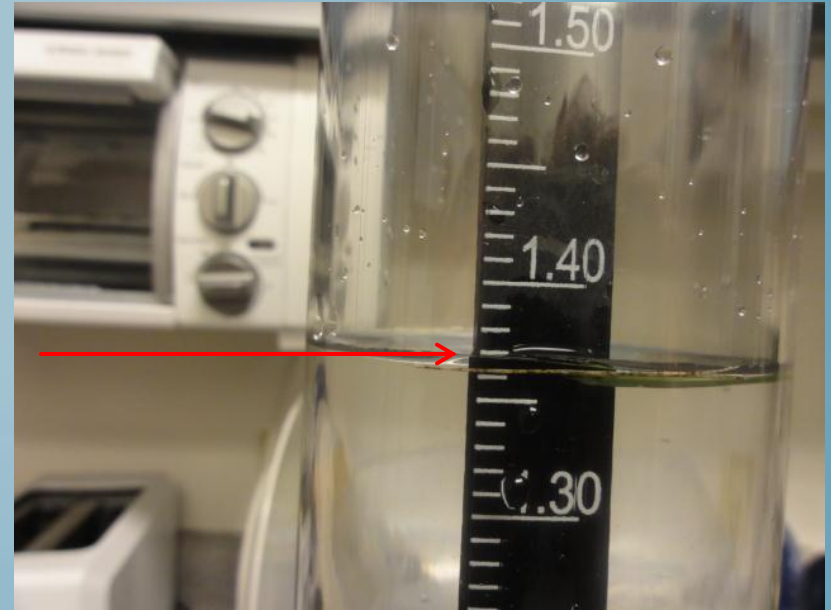
SPECIAL SITUATIONS SUCH AS WIND SWEEPED AREAS AFFECTED BY BLOWING/DRIFTING , POOR SNOWFALL CATCH IN 8” COLLECTOR, MULTI-DAY PRECIPITATION ACCUMULATION AND OTHER “WHAT IF?” SCENARIOS.

- **Measuring “Snowfall Liquid Equivalent” (Precipitation) by Cutting a Biscuit of the NEW Snowfall**
- *Pour the entire liquefied contents from the 8” Collector into the 2” Inner Tube.*



SPECIAL SITUATIONS SUCH AS WIND SWEEPED AREAS AFFECTED BY BLOWING/DRIFTING , POOR SNOWFALL CATCH IN 8" COLLECTOR, MULTI-DAY PRECIPITATION ACCUMULATION AND OTHER "WHAT IF?" SCENARIOS.

- **Measuring "Snowfall Liquid Equivalent" (Precipitation) by Cutting a Biscuit of the NEW Snowfall**
- Measure the contents of the 2" Inner Tube with the Precipitation Measurement Stick. Precipitation is measured in whole inches, tenths and hundredths. (i.e. 1.37")
- Subtract the amount of hot water added!
- The remaining value is the liquid equivalent or the precipitation amount of the new snowfall.



Precipitation Amount

1.37	[Total of hot water and melted snowfall]
<u>-1.00</u>	[Hot water added]
0.37	[Liquid equivalent or precipitation amount of new snow. Reported as precipitation]

SPECIAL SITUATIONS SUCH AS WIND SWEEPED AREAS AFFECTED BY BLOWING/DRIFTING , POOR SNOWFALL CATCH IN 8" COLLECTOR, MULTI-DAY PRECIPITATION ACCUMULATION AND OTHER "WHAT IF?" SCENARIOS.

WHAT IF: Snow melts as it falls and never accumulates?

- Report the precipitation in your gauge (melted) as the Daily Precipitation
- Report a Trace of new snow
- In comments write "Snow melted as it fell"
- If possible measure new Snowfall as practical before it melts

WHAT IF: Snow or sleet is mixed with rain and doesn't actually accumulate on the ground?

- Report the precipitation in your gauge (melted) as the Daily Precipitation
- Report a "T" Trace of new snow
- Make a note as above in your comments such as "Snow and sleet was mixed with rain but melted as it fell"
- If possible measure new Snowfall as practical before it melts

SPECIAL SITUATIONS SUCH AS WIND SWEEPED AREAS AFFECTED BY BLOWING/DRIFTING , POOR SNOWFALL CATCH IN 8” COLLECTOR, MULTI-DAY PRECIPITATION ACCUMULATION AND OTHER “WHAT IF?” SCENARIOS.

WHAT IF: Only a few Snow Flakes fall?

New snowfall of less than a tenth of an inch is reported as a Trace. This could be a few flurries, or a very light dusting of snow. Snow does not have to end up in the rain gauge!

In some situations you might have measurable snow of a couple of tenths, but the snow in the rain gauge only melts down to a Trace. This can happen when the snow is very dry and/or it is windy.

SPECIAL SITUATIONS SUCH AS WIND SWEEPED AREAS AFFECTED BY BLOWING/DRIFTING , POOR SNOWFALL CATCH IN 8" COLLECTOR, MULTI-DAY PRECIPITATION ACCUMULATION AND OTHER "WHAT IF?" SCENARIOS.

WHAT IF: Observer is away for a few days and Snow or Precipitation falls?

The Observer will use the "Multi-day Accumulation."

If the total precipitation observed is for more than a single observing period AND cannot be subdivided into individual observing periods, choose the total number of days for which the precipitation value represents. For example, if you have been away for the weekend (left after the Friday observation and returned on Monday) and have 0.57" but cannot ascertain whether it fell on Saturday, Sunday, Monday or some combination, select 3 days.

In this example 0.57" of precipitation fell over a 3 day period.

6.4" of Snowfall was measured on the Snow Board.

Snow Depth was rounded to 6".

The screenshot shows a weather observation form with the following fields and values:

- Air Temperature**
 - Max temperature: x °F [help](#)
 - Min temperature: x °F [help](#)
 - At observation: x °F [help](#)
- Precipitation**
 - Precipitation: x.xx in [help](#)
 - Reminder: set the accumulation if this value represents more than one observation period.
 - Multi-day Accumulation: days [help](#)
 - Precipitation type: [help](#)
 - Snowfall: x.x in [help](#)
 - Snow depth: x in [help](#)
 - Snow core: x.x in [help](#)
 - Precipitation Time of Occurrence: [help](#)

Red arrows point from the text on the left to the following fields in the form: 0.57, 3, Snow, 6.4, and 6.



Thank you for attending this Webinar.

AND – most importantly – Thank You for the volunteer work you do! Your efforts are very much appreciated...



We know that measuring Snow takes time and dedication to be done correctly. Getting ready for work, clearing snow off driveways, sidewalks, cars and then measuring snow takes a dedicated individual. The observations you take are historical records and will be used for many scientific purposes for years to come.

If you would like a copy of these instructions – please let us know.

