

A photograph of a snowy forest path. The path is covered in a thick layer of snow and is flanked by wooden railings. The trees on either side are heavily laden with snow, creating a dense, white canopy. In the distance, a car is visible on the path, driving away from the viewer. The overall scene is serene and wintry.

# Measuring Winter Precipitation

# Before The First Flakes



## Snowboards:

- Use at least two
- Site in an open area on level ground and away from obstructions (e.g. buildings, trees, etc.)

## Rain Gauge(s):

- Remove inner measuring tube & funnel to increase catchment accuracy



# What to Measure

- **Snowfall**
  - Maximum amount of new snow that has fallen since the previous observation
- **Snow Depth**
  - The total depth of ALL snow, including sleet, on the ground at 1200 UTC
- **Snowfall Water Content**
  - The liquid water content of new snow in the rain gauge since the previous observation (1200 or 0000 UTC)

# When to Measure

- **Snowfall**
  - At least every 6 hours, *more frequently if it may melt (e.g. hourly)*
  - Always immediately after the snow ends
- **Snow Depth**
  - Once per day at 1200 UTC
- **Snowfall Water Content**
  - Once per day at 1200 UTC (8-inch gauge) or 0000 UTC (4-inch gauge)

# Snowfall Timeline



2.8 inches

Melting &  
settling occur

1.6 inches

Measure as close to 2 PM as possible!

Friday  
7 AM

Snow Begins  
10 AM

Snow Ends  
2 PM

Saturday  
7 AM

# Snowfall

- Use first snowboard for measuring snowfall
- Clean off snowboard after each measurement
- If blowing or drifting have occurred, take an average of several measurements
- Measure to the nearest tenth of an inch



**Measure snow on grassy surfaces as a last resort!**

# Special Situation



1.5 inches



2.6 inches



24-hr Snowfall?

Friday  
6 AM

Saturday  
6 AM

$$\begin{array}{r} 1.5 \text{ inches} \\ + 2.6 \text{ inches} \\ \hline 4.1 \text{ inches} \end{array}$$

# Snow Depth

- Use second snowboard for measuring depth
- Measure at 1200 UTC
- If blowing or drifting have occurred, take an average of several measurements
- Measure to the nearest whole inch
  - 0.4 inches → T
  - 0.5 inches → 1"

# No Snow on Snow Board?



Average snow on covered and bare areas.  
Although the average is 0.5", it rounds up  
to 1"



If more than half the ground is bare,  
report trace

# Snowfall Water Content

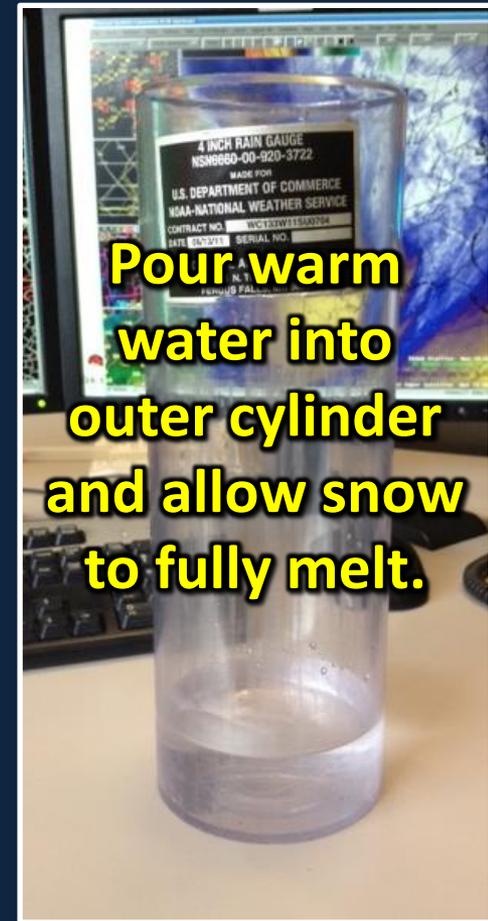
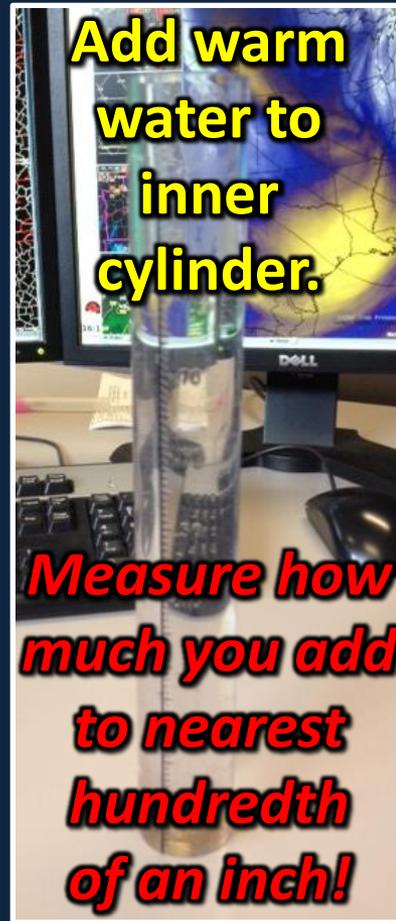
- Liquid equivalent of the snow
- Melt the snow in gauge or take snow core
- Measure every 24 hours (1200 or 0000 UTC)
- Measure to the nearest hundredth of an inch



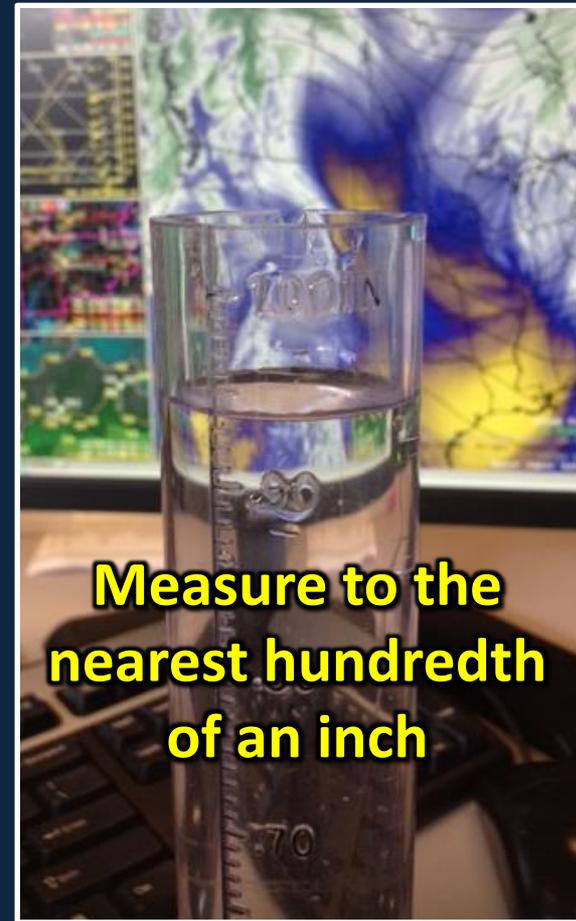
# Melt Snow in Rain Gauge



# Melt Snow in Rain Gauge



# Melt Snow in Rain Gauge



# Calculations

All liquid melted contents	0.95"
- Water added to inner tube	0.83"
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Snow Liquid Equivalent	0.12"

Snow to Liquid Ratio (snow/liquid)

1" of snow with 0.12" liquid

SLR =  $1/0.12 = 8:1$  ratio

# Measuring Ice Accretion

- Break off a small twig or tree branch that has ice on it
- Measure to the nearest tenth of an inch
  - If ice is different thicknesses on both sides, take an average of the two
  - Ice accretion less than 0.10" should be reported as a trace



General Ruler Measurement	Ice Accretion Conversion
1/16	0.1
1/8	0.1
3/16	0.2
1/4	0.3
5/16	0.3
3/8	0.4
7/16	0.4
1/2	0.5
9/16	0.6
5/8	0.6
11/16	0.7
3/4	0.8
13/16	0.8
7/8	0.9
15/16	0.9



**Average Ice Accretion**  
**5/16" = 0.3"**

# Measuring Freezing Rain



Melt and measure the moisture accumulated *inside* of the rain gauge in exactly the same way as snowfall water content



# Public Service Products

- **Climate**
  - Only Nashville will report any snowfall or snow depth on the CLIs
  - Clarksville and Crossville will be set to missing

# Public Service Products

- **Don't hoard information!**
- **Winter precipitation amounts**
  - Be proactive! Ask for reports on social media and pick up the phone to call EMs, law enforcement, etc.
  - Enter reports into ECLAIRS for LSRs
    - Any freezing rain or freezing drizzle
    - $\geq 0.25$ " of sleet
    - $\geq 0.50$ " of snow
    - $\geq 1$ " snow depth
    - Any ice storm

# Public Service Products

- Generate summary LSR and/or PNS through ECLAIRS regularly during winter events
  - Always send well before the big newscasts start!
- Graphics for web and social media
  - Collect reports to generate snowfall maps
  - GIS snowfall map?

