Mission SnowGLOBE Informational Webinar for Educators and Partners

https://www.globe.gov/web/united-states-of-america/home/events/-/eventsdetail/14718/mission-snowglobe

15 December 2022

What is Mission SnowGLOBE?

- Partnership with the [NASA Investigation of Microphysics and Precipitation for Atlantic Coast-Threatening Snowstorms](#) (IMPACTS) field campaign

- Students collect measurements during snow events and upload the data to the GLOBE website.

- The IMPACTS team will provide webinars for students to meet the mission pilots and will mentor students participating in the [U.S. GLOBE Regional Student Research Symposia](#) or the [International Virtual Science Symposium](#) using data from this project.

Who can participate?

- Anyone is welcome to participate!

- Specifically looking for data from these areas: southern Maine, New Hampshire, Vermont, New York, Massachusetts, Rhode Island, Connecticut, Pennsylvania, New Jersey, Maryland, Ohio, Michigan, Indiana, Illinois, and southern Wisconsin. If storms occur over North Carolina and Virginia, the IMPACTS team can fly there as well.
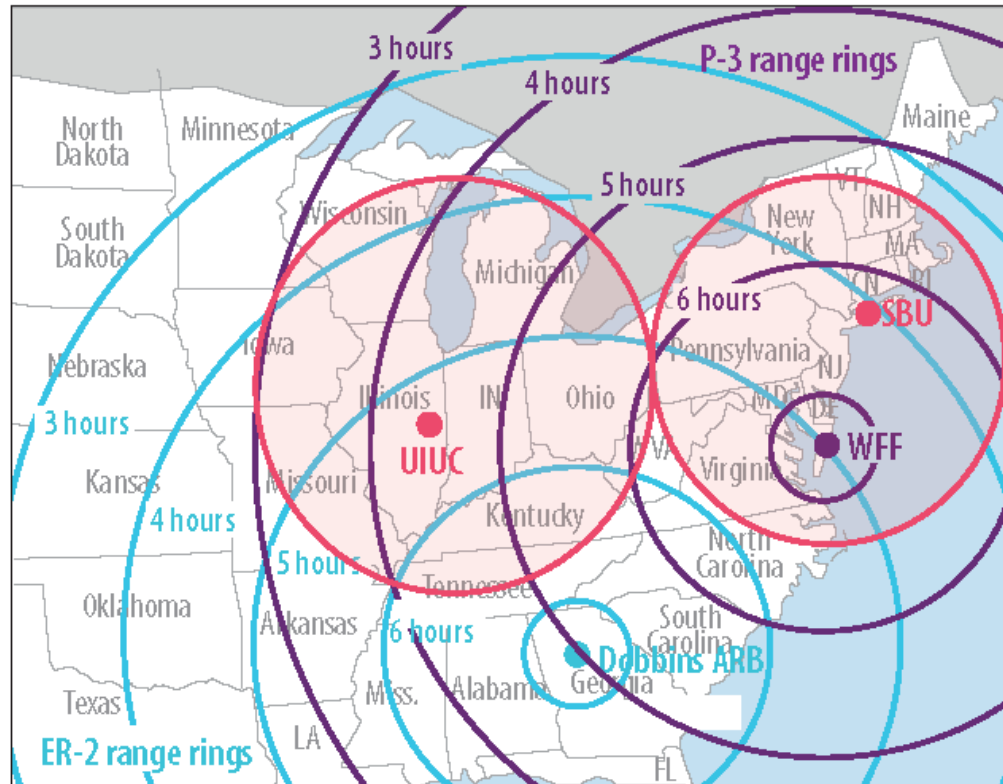
What happens when I sign up?

- Join Mission SnowGLOBE through this Google Form: https://forms.gle/6VUUHKfSGFXaoc8P7

- You will be alerted through the SnowGLOBE Community with 48 hours notice of snow event

- Remind App

- During the snow event, you and your students collect snow data

- Upload your data to GLOBE!

What data will we collect?

- Snowpack depth
- New snow depth
- Snow water equivalent
- *Optional: pictures of snow crystals*
- *Optional: Cloud measurements*
- *Snow pH is not necessary*

Protocol Training Slides
Precipitation-Snow

Picture by Kevin Czajkowski

Step 1: Define your Study Site

A. What is snow?

B. Why collect snow data?

C. How your measurements can help!

D. How to collect your data.

E. How to report data to GLOBE.

F. Understand the data.

G. Quiz yourself!

H. Further resources.

- Complete this step *before* the flights start in January

Step 2: Collect your materials

- Complete this step *before* the flights start in January

- Snow Board*
- Meter stick
- Straight sided container
- Overflow tube from your rain gauge
- 2 clean sampling jars with covers
- A container for the snowpack rain equivalent sample
- Something flat and clean to slide under inverted containers
- Labels for snow sample

*Click here for *Snow Board Directions*

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Use Data Sheet OR GLOBE Observer App

Atmosphere Integrated 1-Day Data Sheet
Enter the data on page 2

OR Download the GLOBE Observer App

Collecting Data-Snowpack

1) Insert the measuring stick vertically into the snow until it rests on the **ground.** Be careful not to mistake an ice layer or crusted snow for the ground. Read and record the depth of the snowpack to the nearest millimeter. If not measurable but there is some snow, pick Trace.
2) Repeat at least 2 more times in areas with little drifting snow.
3) Report the observations on the data sheet.

Snowpack

Sample 1	Sample 2	Sample 3
Select one: ☐ Measurable ☐ Trace ☐ Missing	Select one: ☐ Measurable ☐ Trace ☐ Missing	Select one: ☐ Measurable ☐ Trace ☐ Missing
If measurable, record amount (mm): ____	If measurable, record amount (mm): ____	If measurable, record amount (mm): ____

10

Measuring Snow Depth

- Use a measurement device such as a ruler that starts at 0 at the edge and read to the nearest millimeter.

Use this type

Not this type

Photos by Kevin Czajkowski

Reading the Ruler

- Read the ruler to the nearest millimeter.

What depth is this?
61 mm

Picture by Kevin Czajkowski

12

Collecting Data: New Snowfall

1) After a new snowfall, gently insert the measuring stick vertically into the snow until it touches the snowboard. Read and record the depth of new snow to the nearest millimeter. If no new snow has fallen, record 0 as the depth of new snow.

2) If there is new snow, take at least two more measurements at different spots on the snowboard.

3) Report these numbers as the depth of new snow. If the snowfall is so small that a depth can't be read, record the letter "T" (for trace) for new snow. If the snow on the snowboard has been disturbed before you can take an accurate measurement, report "M" for missing.

4) Record the number of days since the last reading of snow on the snowboard.

13

Collecting Data- New Snow and Snowpack Water Equivalent

1) Take the overflow tube from the rain gauge. Choose a place where the snow has not been disturbed away from the snowboard for snowpack and on the snowboard for new snow. Push the tube into the snow with the opening facing down until it touches the ground. Use a flat object placed under the tube opening to trap the snow in the tube.

2) Save this sample in your tube or another container, cover it, and label.

Pictures by Kevin Czajkowski

Clear the Snowboard

1) Once you have taken all of your samples, clear off the snowboard. Place a flag or other marker nearby to help you locate the snowboard after the next snowfall.

2) Take your labeled samples inside to melt and measure.

Testing For Snow Water Equivalent

1) Once your snow samples are indoors, allow them to melt. Be sure they are covered to prevent evaporation.
2) Pour the melt water from the "new snow" sample into the measuring tube of the rain gauge (you may want to use the rain gauge funnel to help).
3) Repeat and record the rain equivalent in millimeters to the nearest 10th of a meter.
4) If there is more water that can fit into the measuring tube, empty the tube, repeat steps 2 and 3 and add the amounts.
5) Record this and the rain equivalent on your Data Sheet and log book.
6) Pour melted snow water back into the sample jar.
7) Repeat steps 2-6 for the "snowpack" sample.

Entering Precipitation Data

- Download the **GLOBE Observer app**.

- OR

- **Live Data Entry** on the GLOBE website.

GLOBE Observer App

After downloading the GLOBE Observer App, you will need to sign in with your GLOBE educator account.

Click 'Data Entry' to navigate to Atmosphere - Precipitation to record a new snow observation.

Live Data Entry

A. What is snow?

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D. How to collect your data.

E. How to report data to GLOBE.

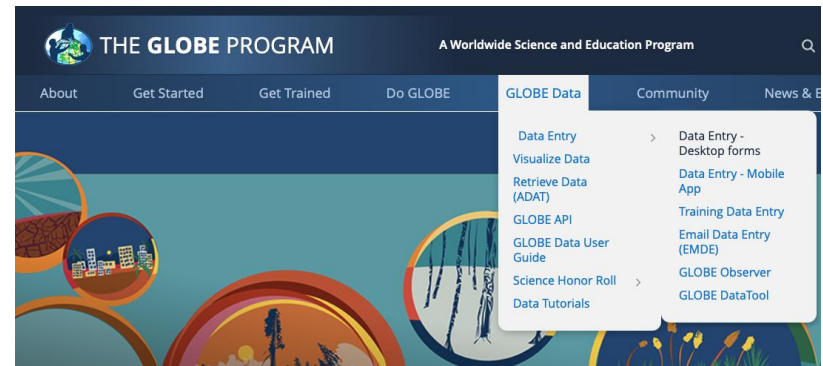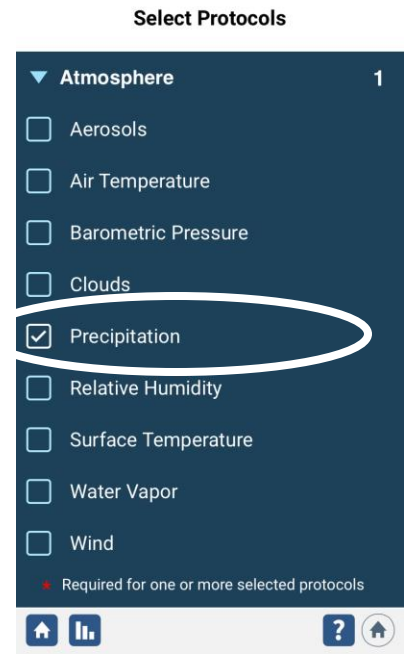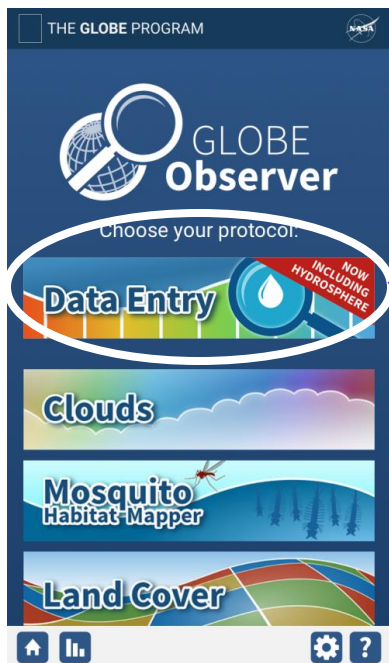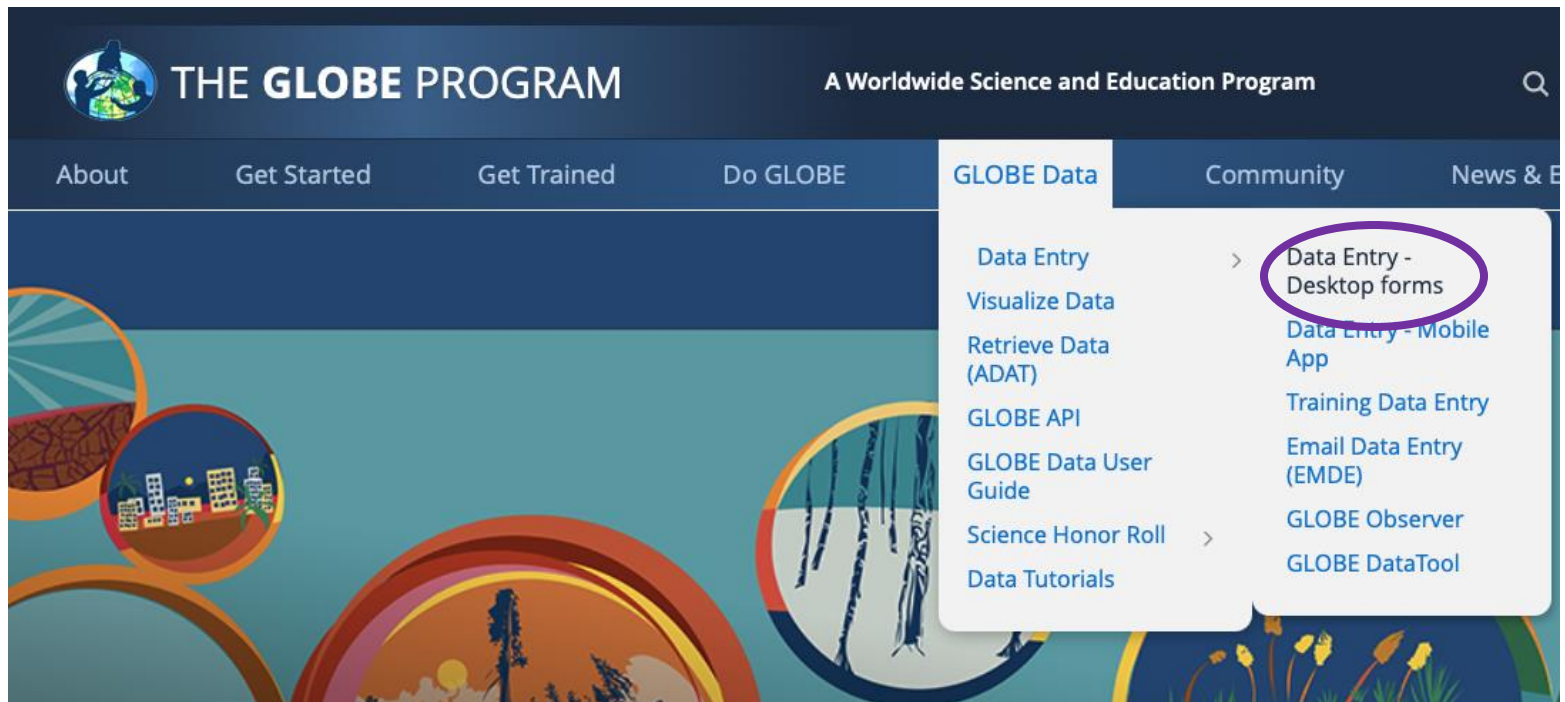F. Understand the data.

G. Quiz yourself!

H. Further resources.

1) Go to the GLOBE website and sign in

2) Click 'GLOBE Data' and navigate to 'Data Entry- Desktop Forms' to open Data Entry.

Why are my data important?

YOUR observations can help NASA scientists to
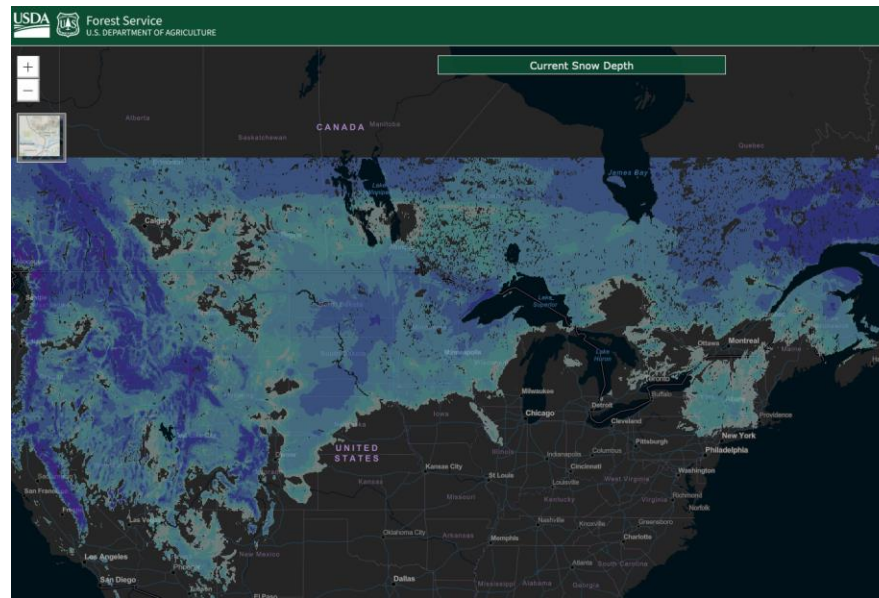
- Understand year-to-year variation in snow cover

- Predict water available from snow melt

- Improve forecasting of snowfall

- Understand key processes of how snowstorms form and evolve

How will you collect data during a snow day?

Resources

- [Current Snow Depth Map](#) from the U.S. Forest Service

- GLOBE eTraining on [Snow Precipitation](#)

Literacy Connections

- It's Snowing by Gail Gibbons

- The Story of Snow: The Science of Winter's Wonder by Mark Cassino

- Snowflake Bentley by Jacqueline Briggs Martin

- Curious About Snow by Gina Shaw

- Snowflakes in Photographs by W.A. Bentley

- The Secret Life of a Snowflake by Kenneth Libbrecht

- Studying Snowflakes by Joseph Otterman

Questions?

NEXT WEEK on December 22 at 1p ET: Webinar for educators and students with IMPACTS Principal Investigator Dr. Lynn McMurdie to hear more about the science behind the mission.

[Learn more and register here](#).

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Credits

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