

MY NASA DATA Lesson:

Comparison of Snow Cover on Different Continents

Purpose:

Students will use the Live Access Server (LAS) to form maps and a numerical text file of snow cover for each continent on a particular date. They will analyze the data for each map and corresponding text file to determine an estimate of snow cover for each continent.

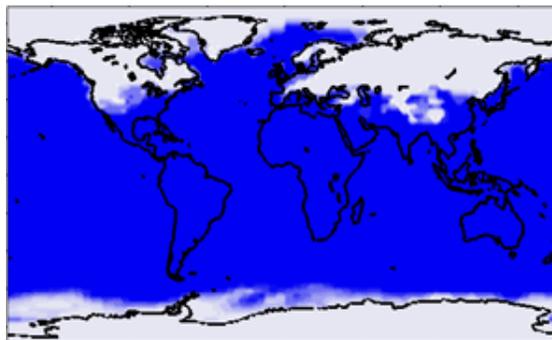


Image courtesy MY NASA DATA Live Access Server. Monthly Snow and Ice Amount
December 1998

Grade Level: 4 – 8

Estimated Time for Completing Activity:

One 50 minute class period

Learning Outcomes:

- Gain knowledge in using the Live Access Server
- Compare measurements from maps and raw data
- Practice estimating percentages

Prerequisite

- Geographical familiarity with the different continents
- Prior experience with estimating percentages
- Familiarity with using latitude and longitude and an atlas to locate geographical areas

Tools

- Computer with access to the internet
- Atlas

Vocabulary:

- [ISCCP](#)
- [land mask](#)
- [latitude](#)
- [longitude](#)
- [percentage](#)

Lesson Links:

- [Live Access Server \(Advanced Edition\)](#)
- [Snowmap](#)
- [Excel file for Extension Activity](#)

Background:

The Earth is covered by many different things. For example, a majority of the Earth is covered by water. Some regions of the world are covered in ice. Plants, animals and people that reside in these regions must make special adaptations to their environment. In some of these regions the ice is so thick that it is permanently frozen, while in others the ice grows and retreats in correspondence with seasons.

The data used in this lesson comes from the International Satellite Cloud Climatology Project (ISCCP). ISCCP computes fractional snow and ice coverage by scanning the earth using visible, infrared and microwave imagery.

Procedure:**Overview:**

Students will create maps of the snow cover of each continent for a particular date. They will then compare their image with the text file for that map. From that information they will estimate the percentage of snow cover for each continent. They will then present their information in the form of a letter, a power point presentation, or a brochure.

Instructions:

1. Students will be read a letter from Mr. Claus (or similar motivator).

Letter:

Dear Students,

Last year after the holidays I came down with a terrible cold. Mrs. Claus was very upset

with me, suggesting I retire. I said I would retire only if more than 75 percent of any continent on the planet (excluding Antarctica) was covered in snow on my big day. Can you write me a report to convince Mrs. Claus that I do not need to retire?

Sincerely,
Mr. Claus

2. Students will be instructed on how to use the Live Access Server to produce maps and to view the accompanying text files.

Directions:

1. Click on the Live Access Server (Earth System Data Explorer) in the lesson links section of the lesson

2. Click on 'Choose Dataset' if it does not automatically appear.

3. Click on Land, Monthly Snow Ice Amount (ISCCP)

4. In the upper left hand corner of the map above the navigation map, click on the double downward arrow and select North America as your region.

5. For the date, use the drop down menus below the navigation map and select, December, 1998 as your date.

6. At the top, click on the 'Update Plot' Radio button to update your selection.

7. Above the map select 'Link To' and save one of the links to return to the plot for later analysis.

8. Return to LAS

9. Now Save the plot as a text file. To do this Click on 'Save As' and select ASCII from the drop down menu, verify your time range and click 'next'.

10. Compare the text information to the map. Analyze both to determine the percent of land you would estimate to have snow cover.

11. Record the percentage from the map and the text analysis beside each continent below. Repeat steps 1 through 9 for the other continents (To save some time assign a single region to a group that can compare the data with other groups after plotting the data).

N. America

Europe

Australia

Asia

Africa

S. America

Antarctica (S. Pacific)

Questions:

1. What can you conclude about the snow cover on each continent?

2. What relationships do you see between the maps you have created and the text data?

3. What are some things that could affect the snow cover amounts from year to year?

Extensions:

1. Students may pick out a specific latitude and longitude for a location in the world and create charts or maps for that location.
2. Students may explore other ways of representing the snow cover data using the Live Access Server. For example, one area over a certain span of time.
3. Students may create maps for other months in order to see the difference in snow cover.
4. For students learning Excel or other spreadsheet technology, an Excel file is available in the Lesson Links which contains both snow cover and land mask data. With the land information included, students may calculate the actual percentage of snow cover over a continent of interest.

Lesson plan contributed by DeAnn Scarce, Mount Vernon, IA

[Click here for Teachers Notes](#)

[View lesson without Standards](#)

