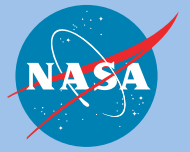


Classroom Viewing Guide



Our World: ICESat-2 Measures Ice Sheets <http://youtu.be/5BdYLkxOpk4>

Introduction:

Why is NASA interested in Earth's ice? The creation of ICESat-2 is allowing NASA's scientists to make accurate maps of polar ice sheets. These maps help them make informed predictions about weather patterns, climate change, and the effects of changing ice structures. The maps are so accurate they can measure to within 3 centimeters of an ice sheet's actual thickness from a huge distance!

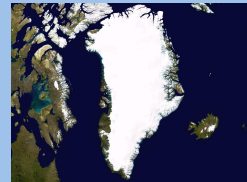
Guiding Questions:

Where is Antarctica and Greenland?

What are ice sheets?

What is sea ice?

Greenland



Antarctica



Possible Next Generation Science Standards Addressed:

2-ESS2-3. Obtain information to identify where water is found on Earth and that it can be solid or liquid.

4-ESS2-1. Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.

Glossary of Terms

Climate: the long-term pattern of weather in a particular area

Ice: frozen water

Ice Sheet: a permanent layer of ice covering an extensive area of land

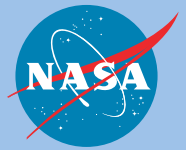
ICESat-2: the Ice, Cloud, and land Elevation Satellite-2

Polar Areas (Regions): the part of the Earth's surface forming a cap over a pole; characterized by a very cold climate

Sea Ice: frozen sea water

Weather: the state of the atmosphere at a particular place and time





Mini-Lesson

Part 1: Understanding the size of the Greenland and Antarctic ice sheets

1. Let's say you have an ice cube that has a Length of 4cm, a Width of 2cm, and a Height of 2cm. Calculate its Volume and fill in the appropriate box in Table 1 below.
2. Next, in order to compare it to the volume of ice on the Greenland and Antarctic ice sheets, you will need to convert your ice cube volume units to kilometers (km). Enter that in the appropriate box in Table 1.
3. Now, determine how many of your ice cubes it would take to equal the volume on the Greenland and Antarctic ice sheets and enter those numbers in the appropriate boxes in Table 2

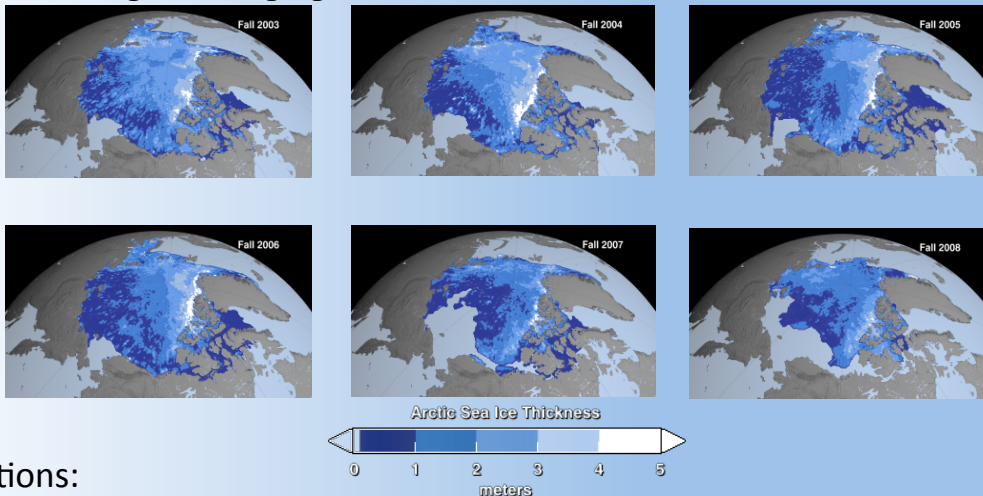
Table 1:

Volume of your ice cube (cm ³)	Volume of your ice cube (km ³)	Volume of Greenland (km ³)	Volume of Antarctica (km ³)
		2,850,000	25,700,000

Table 2:

Number of your ice cubes it would take to equal the volume of the Greenland ice sheet
Number of your ice cubes it would take to equal the volume of the Antarctic ice sheet

Part 2: Looking at changing sea ice concentration



Questions:

1. What can you infer about the sea ice concentrations from the images above?
2. What effects do melting sea ice have on the world's climate system?
3. What is NASA doing to better understand the melting of sea ice and ice sheets?

