

1.2

SEA LEVEL CHANGE

Is sea level rise due to land ice or sea ice?

Activity Time: 30 minutes

Background

There are two kinds of ice in the Polar Regions, sea ice and land ice. Sea ice forms from ocean water and is about 1 meter thick after a cold winter. Some of the sea ice melts each summer. Land ice forms on land from precipitation that falls and accumulates on the ground. Layers of snow build up, causing pressure on the snow crystals beneath, pushing the air out. Eventually the snow is compacted from the weight above into layers of ice. This ice becomes a glacier that acts like a river, flowing downhill. Once the glaciers meet the ocean, they break off and become floating icebergs. This activity helps students understand which ice is causing the sea level to rise.

Directions

1. Mark one cup "land ice" and the other "sea ice". (See Example Sheets 1.2 for pictures of land ice and sea ice.)
2. Show pictures of sea ice and land (glacier) ice.
3. Using the given materials, design an experiment that shows what happens to sea level when the glaciers on land melt and when floating sea ice melt.
4. Before doing the experiment, write a prediction of what will happen in each cup.
5. Set up the experiment and do it.
6. Record your observations.
7. Write a conclusion that states what happens to sea level with land and sea ice melt.
8. Report your results to class.

Discussion

- How did you design your experiment?
- Was there a difference in your sea level between the 2 cups?
- Which should scientists be more concerned with, land ice or sea ice?
- Why?

Assessment

Use the student worksheet to evaluate their understanding of sea level rise.

Extension

For an interactive world map of sea level rise visit:

www.cresis.ku.edu/research/data/sea_level_rise/index.html

Materials

Per 2 students:

- 2 ice cubes
- 2 clear cups
- 2 popsicle sticks
- Warm water
- 1 piece of clay or playdough
- 1 paper towel
- 1 marker
- Student worksheet "Sea Level Rise"

Related Activities

- How do glaciers change sea level? (1.1)

Vocabulary

Displace: to replace a volume of fluid with a floating object, forcing the original fluid to move elsewhere [an ice cube in water].

Glacier: an enduring accumulation of ice, snow, water, rock, and sediment that moves under the influence of gravity..

ALIGNMENT TO NGSS:

Scientific and Engineering Practices

- Asking questions
- Using models
- Planning and carrying out investigations
- Analyzing and interpreting data
- Constructing explanations
- Engaging in argument from evidence
- Obtaining, evaluating, and communicating information

Crosscutting Concepts

- Cause and effect
- Systems and models
- Stability and change

Disciplinary Core Ideas

- K-5: ESS2.A; ESS2.C; ESS3.B; PSI.A
- 6-8: ESS2.A; ESS2.C; ESS3.B; PSI.A