

1.3

SEA LEVEL CHANGE

How does a topographic map show sea level rise?

Activity Time: 30 minutes

Background

Sea level rise is a rise in the water level of Earth's oceans. For the past 3,000 years the sea level has remained nearly stable. However, in recent years the sea level has been rising, influenced by the warming of the ocean as well as the melting glaciers and ice sheets. Coastal communities and ecosystems at or near sea-level are the first to be affected by the rising ocean; however, sea-level rise is a global concern that will impact us all. Changing sea levels on an island can be represented by contour lines on a topographical map.

Directions

1. Watch the 7 minute video about sea level rise:
www.amnh.org/explore/science-bulletins/watch/earth/documentaries/melting-ice-rising-seas
2. As a class, view the CReSIS Interactive Sea-Level Rise Maps:
<https://www.cresis.ku.edu/data/sea-level-rise-maps>
3. Sculpt a model island using a softball size amount of clay. Make sure your island has relief—differences between high and low elevations.
4. Place in clear, plastic tub and place transparency on tub. Leave room on one edge of tub to add water. Tape transparency sheet to tub.
5. The transparency needs to stay in the same place for each trial, so draw an outline of two opposite corners' edges with your marker. Line up your transparency marks with the corners of the tub each time the transparency moves to ensure accuracy.
6. Measuring up from the bottom of the tub, mark six lines on the outside of the tub in 1 cm increments. Label each line 1–6.
7. Using the pitcher, pour the colored water around the island until the water level reaches the 1 cm mark.
8. Looking straight down into the container, trace around the island on the sheet where the water meets the island.
9. Add the water until it reaches the 2 cm line. To ensure the line drawings are consistent, make sure your mark on the transparency lines up with the edge of the tub. Trace the new outline of the island.
10. Repeat this sequence by adding water and tracing where the water meets the island for each of the lines marking 3, 4, 5, and 6 cm of sea level.

Discussion

- Which line on your topographic map represents the highest sea level?
- Why would sea level rise be a concern for your island?
- Where would be the best location to live on your island?

Assessment

Complete **Assessment Mapping Sea Level Rise (1.3)**

Extension

- Photographic documentation of sea-level rise:
<http://www.worldviewofglobalwarming.org/pages/rising-seas.html>
- NBC Learn, Changing Planet Series video Rising Sea Levels (6.5 minutes):
http://www.nbclearn.com/_portal/site/learn/changing-planet

Materials

Per 2 students:

- 1 two-liter plastic pitcher
- 1 wet-erase marker
- 1 ruler
- 2 liters of water colored with blue food coloring
- Modeling clay (softball size)
- 1 clear plastic tub with flat bottom (large enough to hold island)
- Transparency sheet or lid for tub
- Tape
- Student directions and worksheet 1.3

Related Activities

- Is sea level rise due to land ice or sea ice? (1.2)

Vocabulary

Relief: The variations in elevation of an area of the earth's surface.

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
- Scale, proportion and quantity
- Systems and models
- Stability and change

Disciplinary Core Ideas

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