

Guided Inquiry Activity: Impact of Sea Level Rise on a Local Coastal Community

Student Activity Packet

Core Question: What will be the impact of sea level rise due to global warming on my coastal town?

Materials: USGS Quadrangle topographic maps, scale 1:24 000
Local topographic map, scale 1"=100'
Handout: Topographic Map Symbols
Wet/dry markers
Science Journals
Pencils

Exploration:

Part 1: USGS Quadrangle Topographic Maps

In this activity you will investigate the changes that may occur on your town's shoreline if the sea level were to rise significantly.

First you will examine a topographic map published by the US Geological Survey. Make sure that your group has the necessary materials.

Using the handout "Topographic Map Symbols" and the map legend get comfortable reading the map by completing the following activities:

1. What do these colors on the map represent?

green - _____

blue - _____

red - _____

purple - _____

2. Find a primary highway, and a light duty road. Trace a primary highway (major road) with the red marker. Trace light duty road (local road) with the black marker.

3. Locate a major building like a school. Look for residential homes. Circle a school with the green marker. Circle a neighborhood of homes with the black marker.

4. Find these places: a river, a marsh, a beach, a rocky shore, and a breakwater. Trace a river with the blue marker. Circle a marsh with the green marker. Circle a beach in red. Circle a rocky shoreline in black.

5. Locate the contour lines. Index contour lines are wider and darker and show the elevation in feet. Each brown line represents a 10 foot change in elevation. Find an area along the coastline where the elevation is very steep (contour lines will be very close together) and circle it in red. Find a place of relatively level ground along the coastline (widely spaced contour lines) and circle it in green.

Part 2: Local Coastal Town Topographic Maps

Now you will examine a topographic map of your coastal town. You will notice that the contour lines have a different elevation interval. What is the new elevation interval?

_____ ft.

Scientists record data in metric measurements; what is the elevation in cm?

Make sure that your group has the necessary materials.

For this activity you will look at what impact a rising sea level will have on your town. Then each of you will take on the role of a community member. Within your new role you will make suggestions about what changes, if any, should be made to prepare for a rising sea level.

1. Choose an area of your local map that covers a coastal area with relatively level ground. It will be more interesting to have an area with natural features (marsh, beach, rocky shoreline) as well as man-made features (houses, businesses, jetties, piers).
2. Looking at your map, first find the current shoreline, as determined by the mean high water mark. Trace an area of the current coastline with the blue marker.
3. Now trace a new coastline if sea level was to rise 60cm. What is this in ft?
_____ Trace this new shoreline in red.
4. Look at the features of the map that are now inundated (covered) with seawater. Within your group discuss the implications of the shoreline change and make notes in your Science Journal. For instance:
Is the entire coastline affected in the same manner?
What natural and man-made features will be affected?
How much land will be lost?
Will buildings, houses, marshes, etc. be inundated?
What animals/plants will be affected?
Will there be economic costs due to the coastal change?
Will the impact be short-term or permanent?

5. What if sea level was to rise 90cm? What is this in ft? _____ Trace this new shoreline in green. Discuss the same questions and make additional notes based on this new shoreline.

6. Your teacher will assign you your community role. From this point of view write some notes in your Journal about the effect of the new sea level have and what remedies (fixes) you will recommend.

7. Share your thoughts with the class as the teacher compiles the comments on the board.