

Rising Sea Simulation in Buzzards Bay!

Via the Augmented Reality Sandbox

Concepts:

- Contour Maps/Topography
- Buzzards Bay Estuary/Basin
- Hurricanes
- Storm surge/Coastal Flooding
- Human development
- Sea Level Change



The Learning Objective is twofold:

- To understand how elevation of land (3D) or topography is represented by contour lines (a line of equal elevation) in a 2 dimensional map format (topographic map).
- To see how sea level rise floods lower elevations of land where lots people live and work.

Materials – Augmented Reality Sandbox provided at Zephyr Education Foundation, your hands, ruler, worksheet, marker

Procedures:

1. Students take turns investigating change in topography and contour lines based on sediment movement (in other words, get your hands in the sand box and **free play!!!**)
2. Make a mound feature in the sandbox. Sketch the 2-D contour map representation (must be looking down from above – birds eye view!)



C.I. = _____

3. Make a depression (or pond) irregularly shaped. Sketch the 2-D contour map representation.



C.I. = _____

0 (Zero) cm = Sea Level

4. Label each contour line on your 2D map (elevation in cm), add a CI (Counter Interval) legend (C.I. = ____ cm)

5. Create a landform in the shape of Buzzards Bay Estuary

Teacher: while you create Buzzards Bay formation in the sandbox, explain glacial retreat 16,000 years ago and sediment deposition of loose glacial till which formed Cape Cod + Islands. Explain how gravity and water (agents of erosion) have reworked the sediment, and sea level rise moved coastline landward and created the estuary we call BB.

- Show Contour Map of Buzzards Bay – point out map features...contour lines, CI, moraines etc.
6. Add 3D landforms or toy pieces to proper locations along BB to represent landmarks such as: ferry terminals, schools, fire stations, hospital, grocery stores etc.
 7. Sketch Topographic Map (a 2D contour map representation) of Buzzards Bay...birds eye view!
 - Add Landforms (Mark with an X) - be sure they are on or near the right contour lines.



C.I. = _____

8. Generate Sea Level Rise (explain for 20th century, SL rose 1 ft (~30cm) in New England).
 - Why is Sea Level rising? Discuss
 - Hypothesize what will happen to landforms, what impacts on humans and development – have a discussion while your hand is making the water level rise.
 - Watch the water rise and cover first counter line then second etc.
9. Sketch, using blue marker, the resulting water level in the box above.

Discussion :

- Which structures are flooded?
- Which are safe? Did “safe” structures become islands and lose access to flooded roads?
- What is the monetary damage? How do you calculate that?
- How can we protect things we value?
- Should we look at this map before building anything new?

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