# 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



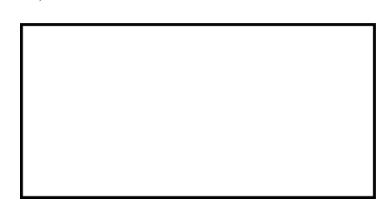
## The Learning Objective is twofold:

- 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 l	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
depo	sition of loose glacial reworked the sedimen	Buzzards Bay formation in the sandbox, explain glacial retreat 16,000 years ago and sediment till which formed Cape Cod + Islands. Explain how gravity and water (agents of erosion) nt, and sea level rise moved coastline landward and created the estuary we call BB. our Map of Buzzards Bay – point out map featurescontour lines, CI, morraines etc.
6.		or toy pieces to proper locations along BB to represent landmarks such as: ferry terminals, s, hospital, grocery stores etc.
7.	<ul> <li>7. Sketch Topographic Map (a 2D contour map representation) of Buzzards Baybirds eye view!</li> <li>Add Landforms (Mark with an X) - be sure they are on or near the right contour lines.</li> </ul>	

- 8. Generate Sea Level Rise (explain for 20<sup>th</sup> 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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