Activity #4	Land and Ocean Relationships
Time	Four 45 minute sessions
Materials	• Stream table with buckets and stage, water, sediment, rocks of various sizes, sheet of heavy-duty aluminum foil, clay, toothpicks The lab may be found at: http://www.cposcience.com/home/Portals/2/Media/post_sale_content/PES/PES_Chap_23/StudentRecordSheets/PES_INV_AS_23B.pdf

Guiding Questions

1. What is the relationship between the oceans and land?

Plan

Plans for part 1 of activity – Coastal Erosion

1. Set up your stream table so that it is on the lowest rung of the stand.
2. Fill the top third of the stream table with a layer of sand that is nearly to the top of the stream table's walls.
3. Adjust the spigot at the end of the stream table so that water will not drain from it.
4. Use the buckets and fill the bottom portion of the stream table with water so that it just reaches the sand.
   Note: The water level should not be more than half the thickness of the sand.
5. Shape out a unique coastline in the stream table using your hands. If necessary wet the sand a bit to help shape your coastline.

Students make the prediction and answer the question for Part 1. Discourse on Part 1

Plans for part 2 of activity

1. Draw the shape of your original coastline in Table 1.
2. Use the plastic trough and generate waves in the stream table. Observe and draw the resulting eroded coastline in Table 1
3. Students will sketch and describe the coastline before waves and after the waves. Discourse

Plans for part 3 of activity – Breakwaters

1. Using the rocks, create a wall that extends just above the level of the water and runs parallel to half of your coastline. (Make your breakwater about 3–4 cm away from the shoreline.
2. What do you think will happen to the coastline when you start generating waves? Make a prediction about the coastline behind the breakwater, and the coastline not behind the breakwater in Table 2.
3. Use the plastic trough and begin generating waves. Watch what happens to the shoreline behind the breakwater and also along the coastline that is not behind the breakwater. Record your observations in Table 2.
4. Sketch the new eroded shape of the coastline with the model breakwater in your stream table in Table 2. Discourse

Plans for part 4 of activity – Seawalls

1. Remove your breakwater. Refer to your sketch in Table 1 to reshape the coastline as close as possible to the original coastline.
2. The piece of aluminum will serve as your model seawall. Fold it over upon itself several times until your piece is about 10 centimeters tall. Insert the seawall down
3. into the sand so that at least 5 centimeters of aluminum sticks up above the sand. Place the seawall 15 cm landward from the edge of the water.
4. Make a prediction and sketch a side view (not a birds-eye view as used with the breakwater example) of what will happen to the part of the coast in front of the seawall and the beach behind the

seawall. Record your prediction in Table 3.
5. Use the plastic trough and begin generating waves.
6. Observe and record what happens to the coast in front of the seawall and the beach behind the seawall in Table 3.
7. Sketch a side view of the new eroded shape of the coastline with the seawall in your stream table in Table 3. Discourse

Plans for part 5 activity – Houses

1. Remove your seawall. Reshape the coastline as close as possible to the original coastline you shaped.
2. Make 2 to 3 miniature houses with the clay. Stick toothpicks in each corner of the bottom of your houses. Insert these "stilt houses" near the edge of your coastline.
3. Make a prediction and sketch a side view of what will happen to the sand on the coastline that is supporting the three stilt houses, and the sand where there are no houses. Record your prediction in Table 4.
4. Use the plastic trough and begin to generate waves in your model. Observe the erosion in areas where houses have been built in the coastline and areas where there are no houses. Record your observations in Table 4.
5. Sketch a side view of the new eroded shape of the coastline with houses in your stream table in Table 4. Answer questions included in the lab. Discourse

Differentiation	• **Simplify the lab**
ELL Modification	• Pair student with English speaking student.
Check for Understanding	• Listen to responses in Discourse and read answers to the questions in the lab. Look over the sketches.