

MODELING BEACH EROSION

BACKGROUND The physical properties of the ocean including waves, winds, tides and currents shape, mold and redistribute the sediments of the shoreline. Human intervention, in the form of seawall, jetties and groins, were designed in an attempt to control beach erosion and manipulate the shoreline. Using models, we can study the effect of waves, currents and human-made structures, such as groins and seawalls on a beach.

- PROCEDURES**
1. Each team will be responsible for modeling ONE of the four diagrammed beachfront situations in the trays provided. Your team will need to provide measurements of your "beach" BEFORE and AFTER wave action. Your team will also be responsible for a drawing of your beach AFTER wave action.
First your team will need to build one of the four beachfront situations, using sand, brick, rocks, etc. Record the dimensions of your beach in the "before" diagram.
 3. Next add about one inch of water to the tray. The water should surround, not submerge your shoreline. **GENTLY** rock the tray up and down from one side to create waves. Count 25 waves then record your results noting new dimensions and shape in the space provided for "after" diagrams.
 4. Provide a report to the rest of the class describing your results.
 5. If time permits, try and model your own beachfront situation and observe the effects of wave action on it. Try to design a structure to preserve your beachfront and test its' effectiveness under wave action. Use the worksheet "MODELING BEACH EROSION: POSSIBLE SOLUTIONS" to record your results and ideas.

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**The Education Program at the
New Jersey Sea Grant Consortium**

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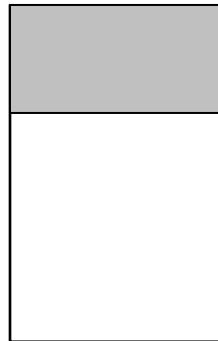


BEACHFRONT SITUATIONS BEACH 1:

Beach under wave attack

Observations:

SET UP



AFTER

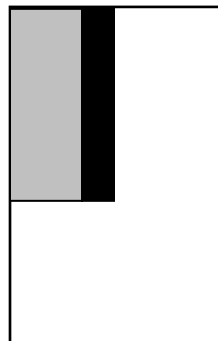


BEACHFRONT SITUATIONS BEACH 2:

**Beach with seawall and
longshore current**

Observations:

SET UP



AFTER



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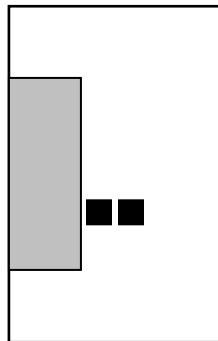


BEACHFRONT SITUATIONS BEACH 3:

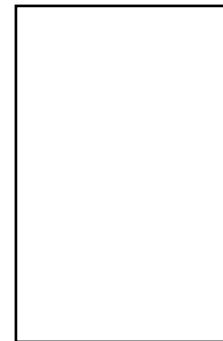
Beach with groin and
longshore current

Observations:

SET UP



AFTER

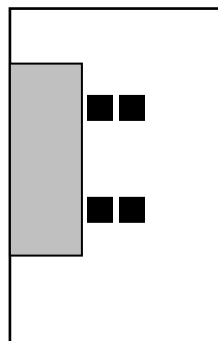


BEACHFRONT SITUATIONS BEACH 4:

Beach with several groins

Observations:

SET UP



AFTER



The New Jersey Sea Grant Consortium (NJS GC) is an affiliation of colleges, universities and other groups dedicated to advancing knowledge and stewardship of New Jersey's marine and coastal environment. NJS GC meets its mission through its innovative research, education and outreach programs. For more information about NJS GC, visit njseagrants.org.

MODELING BEACH EROSION: POSSIBLE SOLUTIONS

DATE: _____ SCHOOL: _____

Team Members: _____

Humans have built various structures (i.e. seawalls, jetties, artificial reefs, groins) and designed projects in an attempt to control and manipulate our shorelines. A perfect solution has not been developed yet, but it is certain that attempts to control beach erosion will continue. You have modeled some of the traditional attempts at shoreline protection and have discovered their success and failure. You have also studied some of the physical properties of the ocean that work daily upon our shoreline. Using your knowledge, imagination and creativity, create and test your own shoreline protection solution. Record your results in the space below. GOOD LUCK and GOOD THINKING!!

BEFORE

AFTER