

Beat the Surge [MC]

Adapted from Learn NC

Grades: 6-8

Time: 45 minutes to 1 hour

Goals: To understand the biological processes of shoreline erosion and how humans have attempted to prevent erosion over time.

Objectives:

Students will be able to: define the different man-made and natural structures used to prevent the erosion of a shoreline; explain the effects these structures have on erosion rates and natural movement of barrier islands; and describe the differences in erosion during normal tides, spring tides, and storm surges during nor'easters and tropical storms.

Key Words:

Beach erosion

Storm surge

Bulkhead

Jetty

Groins

Sea wall

Dunes

Hardened structures

Temporary structures

Background Information:

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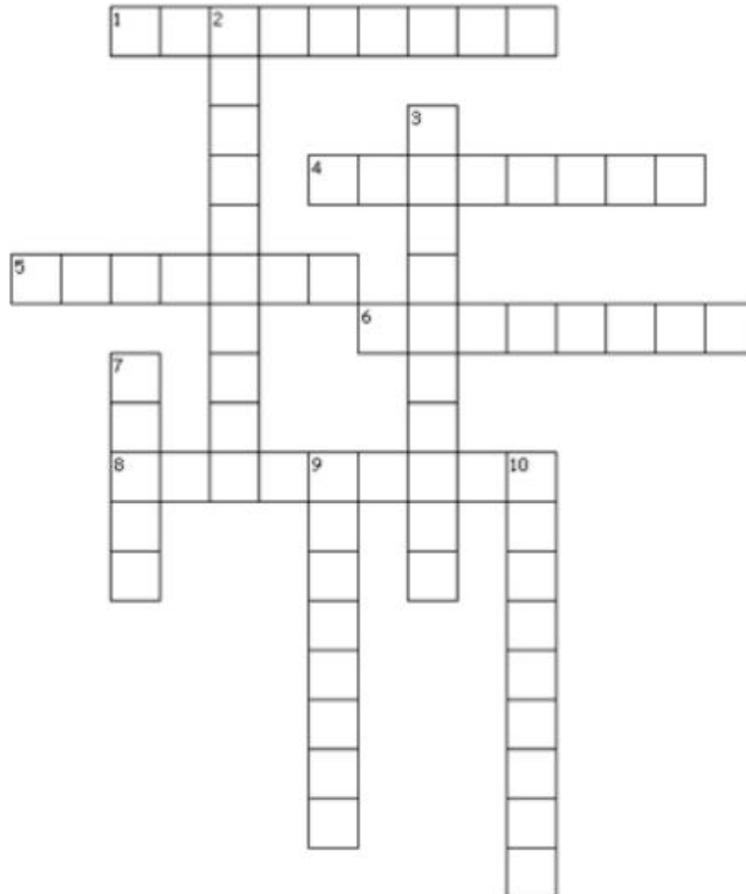
A natural barrier island ebbs and flows, just as tides will do daily. On one side of the island, waves, currents, tides, and winds will erode the sand away; on the other side, the sand will accrue. Barrier islands will change shape and appear to move closer to the mainland and north and south parallel to the coastline as time progresses. Because of this natural shift in the landscape, and the overdevelopment of these islands, decision makers have added hardened structures to literally stop an island from moving altogether.

These structures, such as rock sea walls, bulkheads, groins, and jetties, were once thought of as permanent solutions to the problem of barrier island movement and erosion. What decisions makers failed to realize was that these hardened structures not only continued to allow coastal erosion to occur, it exacerbated the problem. If you place a hardened structure next to one piece of property, the erosion to the neighboring property would increase. In the case of groins along the New Jersey coastline, for example, an aerial photo would reveal a series of eroded beaches. This is one reason beach replenishment is funded every three to five years.

When storm surges, hurricanes, and tropical storms come in contact with barrier islands, they are slowed down and their power is slightly diminished. The purpose of a barrier island is to act as a “barrier” for the mainland. When coastal erosion, due to the placement of hardened structures, occurs, these natural phenomena have no place to go but directly onto the mainland. Since the mainland is much more developed than a barrier island, this causes much more damage.



Directions: Use the clues to fill in the erosion crossword puzzle.



Across

- 1. small pieces of rock or organisms that have been broken down from larger pieces
- 4. types of weathering that reacts with the rock to dissolve it into smaller pieces
- 5. weathered materials moved by wind, water, gravity, or ice
- 6. forces (such as wind, water, ice, gravity, plants, or animals) breaking down rocks into smaller pieces
- 8. type of erosion that involves large portion of loose rock or soil breaking off a mountain

Down

- 2. eroded materials placed in a new location
- 3. breaking down of rocks into smaller pieces
- 7. types of deposition found at the mouth of a river
- 9. type of deposition found on the beach
- 10. a set of ecosystems in the same region that share similar types of soil and landforms